

QAD Adaptive Applications
Enterprise Edition

User Guide

QAD Warehousing

Setting Up QAD Warehousing
Using QAD Warehousing
Reference

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Warehousing Change Summary

Product Name Changes

Starting in September 2019, the new name for QAD's complete portfolio of products is QAD Adaptive Applications. Additionally, QAD Adaptive ERP is the new name for QAD's flagship ERP solution. QAD Adaptive ERP includes the functionality previously associated with QAD Cloud ERP and QAD Enterprise Applications - Enterprise Edition, plus the QAD Enterprise Platform and Adaptive UX which resulted from the Channel Islands program. Going forward, the terms QAD Enterprise Applications, QAD Cloud ERP, and Channel Islands will be deprecated but will remain in previous documentation and training materials. QAD's intention is to—as soon as possible—eliminate the use of the deprecated terms going forward.

Change Summary

The following table summarizes significant differences between this document and previous versions.

Date/Version	Description	Reference
September 2022/2022EE	Rebranded for QAD 2022 EE	--
September 2021/2021EE	Rebranded for QAD 2021 EE	--
September 2020/2020EE	Rebranded for QAD 2020 EE	--
September 2019/2019EE	Rebranded for QAD 2019 EE	--
September 2018/2018EE	Rebranded for QAD 2018 EE	--
September 2017/2017EE	Rebranded for QAD 2017 EE	--
	Added new Selective Pallet Inspection field to Item-Warehouse Maintenance (4.4.11) program.	page 447
March 2016/2016EE	Rebranded for QAD 2016 EE	--
March 2015/2015EE	Rebranded for QAD 2015 EE	--
March 2014/2014EE	Rebranded for QAD 2014 EE Added new Item-Warehouse browse	-- page 470
September 2013.1	Rebranded for QAD 2013.1	--
March 2013	Rebranded for QAD 2013	--
	Added new field to print customer addresses in Print Paperwork frame of Batch Control to print load optimization paperwork	page 430
September 2012/2012.1 EE	Rebranded for QAD 2012.1 EE	--
March 2012/2012 EE	Rebranded for QAD 2012 EE	--
September 2011/2011.1 EE	Rebranded for QAD 2011.1 EE	--
	Added new Prefix field to External Device Setup (4.23.22)	page 179
	Added new Date Created field to Cycle Count Generation (4.18.12)	page 433

Section 1

Setting Up QAD Warehousing

This section includes tells you how to set up the data required to use QAD Warehousing.

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Chapter 1

Introduction to QAD Warehousing

The following topics explain the principal elements that you deal with when setting up QAD Warehousing to control your inventory management procedures. They also briefly describe the whole process of setting up the system so that it is ready to handle inventory transactions in conjunction with system software.

Note The QAD Document Library includes related training material. See *QAD Warehousing Fundamentals Training Guide* and *QAD Warehousing - Advanced Concepts Training Guide*.

Warehousing Elements 4
QAD Warehousing introduces a set of new elements that let you be very specific about the way you receive, store, and pick your inventory.

Setting Up QAD Warehousing 9
Describes the workflow for setting up QAD Warehousing.

Displaying Setup 14
Describes Warehouse Control Table Report, which displays QAD Warehousing setup settings

QAD Warehousing and Domains 14
Describes the separate, logical partitions called domains.

Warehousing Elements

QAD Warehousing provides highly flexible and adaptable warehousing functions that let you integrate a full range of inventory management features into your business.

Without QAD Warehousing, system software recognizes sites and locations; however, running a complex warehousing operation using only these elements is limiting. QAD Warehousing introduces a set of new elements that let you be very specific about the way you receive, store, and pick your inventory.

These new elements start at the warehouse level. In QAD Warehousing, a *warehouse* is the highest level of specific data. The other elements of warehousing are all subsidiary to the warehouses. They represent ways of:

- Arranging storage locations within each warehouse
- Defining the routes through the warehouses that you want your inventory to take
- Handling the inventory management transactions that are involved in managing your warehousing activities on a day-to-day basis

The following main elements of QAD Warehousing are introduced:

- Warehouses
- Internal Routing Groups (IRGs)
- Internal Routings (IRs)
- Storage Location Groups (SLGs)
- Work Location Groups (WLGs)
- Locations
- Items
- Units of Measure (UM)
- Algorithms
- Transaction types
- Engine processes

Introducing Warehouses

A warehouse consists of a group of storage locations. These can constitute a single building, but this is not necessary. A warehouse could be part of a larger building, or, for storage of material such as construction materials, the storage locations could be in the open air. A single warehouse could actually consist of a number of separate buildings. To define it as a warehouse, you identify the storage locations that you want to group together and manage in the same way.

Because system software does not have to be aware of all the workings within the warehouse, each warehouse is defined as a standard location. This approach lets you keep all the internal warehouse operations separate from other system activities. When you want to send inventory into a warehouse, as far as system software is concerned, you are simply putting it in a location. However, when that location is also identified as a warehouse, all the warehousing functions become available within it.

From system software's point of view, you receive inventory into a location such as WHSE01, which is associated with a site. However, because this is a warehouse, the inventory does not actually stay in that location. The location is used as a gateway into the actual storage locations that exist within the warehouse.

Eventually, the inventory is put away in one or more storage locations within the warehouse. These are real locations, not placeholders. Each of these locations is defined in the same way as other locations, so the inventory is again recognized by the system as residing in a known location in a known site. The system selects locations for inventory.

In order for QAD Warehousing to put your inventory away in the way you require, you must define the characteristics of your warehouses. This involves setting up a range of fields that control the inventory management processes, and also defining the way that the storage locations within each warehouse are grouped.

The main groupings of locations within a warehouse are:

- Internal routing groups
- Storage location groups
- Work location groups

Note Locations are unique to a site. Because of this, two locations in two different warehouses but at the same site cannot have the same name.

As explained, items are received in a location representing a warehouse. The inventory status of this location should be non-available but nettable. Even though the inventory does not remain for long in that warehouse location, the non-available status prevents the picking process from looking there.

Warehouse Location Groupings

QAD Warehousing manages the movement of inventory within and between warehouses by defining pathways that take the inventory from one part of the warehouse to another. These pathways are called *internal routings*, and defining them involves specifying a sequence of steps that determine which part of the warehouse the next step goes to and any specific controls that should be applied at each step.

The parts of the warehouse involved in these internal routings are the major breakdown of the warehouse storage locations into areas that have a specific purpose. In the warehousing system, the top-level grouping of the storage locations is known as an *internal routing group (IRG).*

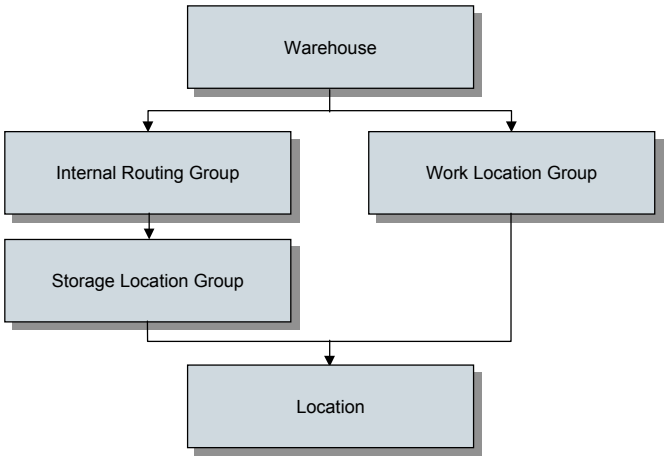
Example You define an internal routing group for receipt, another for bulk storage, and another for dispatch. Each internal routing that specifics route for inventory to take through the warehouse involves moving the inventory from one of these groups to another.

The next level below the internal routing groups is the *storage location group (SLG)*. All the storage locations within an IRG can have the same basic function, such as bulk storage, but the use of SLGs enables you to group your storage locations in more specific ways. For example, you can group all the locations in which a particular type of item is stored, or that have a common purpose, such as a primary picking area within bulk storage.

In parallel with the storage location groups is another way of grouping locations called the *work location group (WLG)*. This way of grouping locations enables you to account for factors related to working practices. For example, you can specify the printers to use, and the format of the printed output, for each separate work location group.

When you have set up all the groupings within a warehouse, every location belongs to a particular storage location group as well as a particular work location group. Each SLG is defined as being within an internal routing group. The hierarchy of these groupings is shown in Figure 1.1.

Fig. 1.1
Warehouse and Groups



Part of the flexibility of the warehousing system comes from the fact that you can set up as many IRGs as you need within a warehouse, you can set up as many SLGs as you need within each IRG, and you can set up just one WLG, or as many as you need for your different working areas.

No rules govern the type of internal routing groups that you have to set up in a warehouse. Most users define areas such as receipt, inspection, storage, picking, packing, and dispatch. However, none of these are mandatory—you choose the areas you want, and you then choose the routes through these areas that you want your inventory to take.

Note You use IRGs to distinguish between the major functional areas of your warehouse. Although you have as many IRGs as you need for the goods-in and goods-out areas, you normally need only one or at the most two IRGs in your main storage area. Within your main storage IRG, you use SLGs to distinguish between the different types of storage areas.

QAD Warehousing recognizes two basic types of internal routing group: functional and non-functional. The functional IRGs are areas that have a particular warehousing function, such as receipt or dispatch. Non-functional IRGs are used for storing inventory. The difference between the two types is the way in which locations in the group are considered when putting inventory away:

- In functional IRGs, the system uses routines that simply find a location for the inventory, without considering capacity—the location-find algorithms.
- In non-functional IRGs, the system uses routines that consider the size and quantity of the inventory, and the available capacity of the locations—the put-away algorithms.

This is because when you are receiving inventory, you simply want to find somewhere to put it in the goods-in part of the warehouse, and when you are shipping inventory, you just want to move it to the goods-out area. In either case, available storage space is not a relevant factor. However, when you are storing inventory—whether in bulk storage or in a picking area—you want the system to choose the most efficient locations that meet your warehouse storage strategy.

Locations and Items

Both the locations that you define in your warehouses and the items of inventory that you intend to receive, store, and ship are also important elements in the system. In both cases, though, some additional information is required by the system to manage your inventory procedures in the warehouses.

For locations, you must define groups to which the location belongs (SLG and WLG), and specify a number of fields that control the way that inventory is stored in and picked from the location. QAD Warehousing provides a Warehouse Location Maintenance (4.3.13) function that replaces standard Location Maintenance (1.1.18). You can, therefore, set up all your location details within the warehousing system. Standard Location Maintenance options are not recognized by QAD Warehousing, and are not available for warehouse functions.

For items, the system requires certain additional fields that relate to item storage. However, it does not provide full item maintenance functions. Therefore, you define the basic item data using standard programs, and then use the warehouse item data functions to define the additional warehouse storage information.

Sizing and Units of Measure

One significant type of information about locations and items that the system needs is the way they are sized and the units of measure. The system has a flexible approach that does not require you to specify a warehouse as being palletized or non-palletized. You can mix palleted goods with different types and sizes of pallets and loose items within the same location.

To be able to do this and still retain accurate records of the quantities of inventory and the available location capacities, the system uses a system of alternate units of measure (UM). This enables you to define a base UM for an item, and also define alternate UMs that can be used for receipt, storage, and picking the item. You must define the conversion factors between the different UMs, such as how many items are in a box, or how many on a pallet. You also must define whether a unit can be split when picking inventory from a location.

When you have given QAD Warehousing all the sizing data about your inventory items and your storage locations, it is then able to offer you complete flexibility regarding the storage and picking of those items.

Algorithms and Transaction Types

“Warehouse Location Groupings” on page 5 mentions the different routines that the system uses when putting stock away in functional and non-functional areas. These routines are called *algorithms*. Each algorithm is a separate program that takes into account particular conditions before attempting to carry out an inventory movement transaction.

Advanced users can set up new types of algorithms to perform special functions; the following set of algorithms is supplied with the system:

- Container move (CM) algorithms find suitable stage, truck, and dock locations, including empty locations, locations with the least goods, and locations that already contain stock designated for a particular ship-to.
- Lane (LA) algorithms find suitable shipping lanes, including empty lanes, lanes with the best load, and lanes for a given carrier.
- Location-find (LF) algorithms are used in functional IRGs to find a location for the inventory without considering capacity.
- Put-away (PA) algorithms are used in non-functional IRGs to find locations in storage areas by considering the size and available space.
- Picking (PK) algorithms are used when picking stock to fill sales orders or work orders.
- Shortage clearance (SC) algorithms are used when receiving stock that is immediately required to fill short orders. The inventory is moved directly from receipt to dispatch, being stored in between. This type of movement is also known as cross-docking.
- Inspection (QA) algorithms are used to determine when an inspection must take place.

The system lets you choose which algorithm to use in any given situation. At the simplest level, you can just assign a particular algorithm to a particular transaction type.

See Chapter 8, “Algorithms,” on page 105.

Example When you receive inventory as a result of a purchase order, the transaction type is RCT-PO. You can define an internal routing for a RCT-PO transaction that moves it first to the receipt IRG and then to the storage IRG. The first movement uses a location-find algorithm to find a space in the functional receipt area; the second movement uses a put-away algorithm to find suitable locations for the inventory in the non-functional storage area.

In each of these movements, you can select which algorithms you want to assign. In put-away, you can choose different criteria, such as empty locations, or popular locations, or locations where the inventory can be merged with existing stock.

You can assign a sequence of different algorithms for each transaction type. The system tries your first choice algorithm, but if this does not succeed in completing the transaction, the second choice algorithm is applied, and so on until the transaction is complete.

As well as assigning algorithms to each transaction type, you can also specify combinations of site, warehouse, item, supplier, or customer for which a different sequence of algorithms is to be applied. This approach lets you be very specific about exactly how you handle supplies of stock from particular suppliers and how you pick particular inventory for particular customers.

Algorithm assignment setup can be as simple or as complicated as needed.

The most general setup of algorithm is for a generic transaction type RCT-*, which represents all kinds of receipt—such as unplanned, PO, DO, WO—for a given site and warehouse combination, and for a blank item, item type, and address.

On the other hand, you can define a very specific algorithm assignment for a given item for a given transaction type, in a given site/warehouse, and coming from a given supplier or going to a given customer.

Engine Processing

When all the fields have been specified and you are operating your warehouses, the system uses processing engines to process all the inventory transactions.

Processing engines are run-time programs that select and process all the required inventory transactions. The way you set up your internal routings controls the way that inventory transactions are created and confirmed, and each step of an internal routing specifies the next step that is to follow when the current step is complete.

For each transaction type in each internal routing, you can specify the type of engine processing that you want applied. The types are:

- AUTO mode specifies that the transaction is processed immediately.
- MANUAL mode specifies that the transaction is processed only when it is selected for processing by warehousing staff.

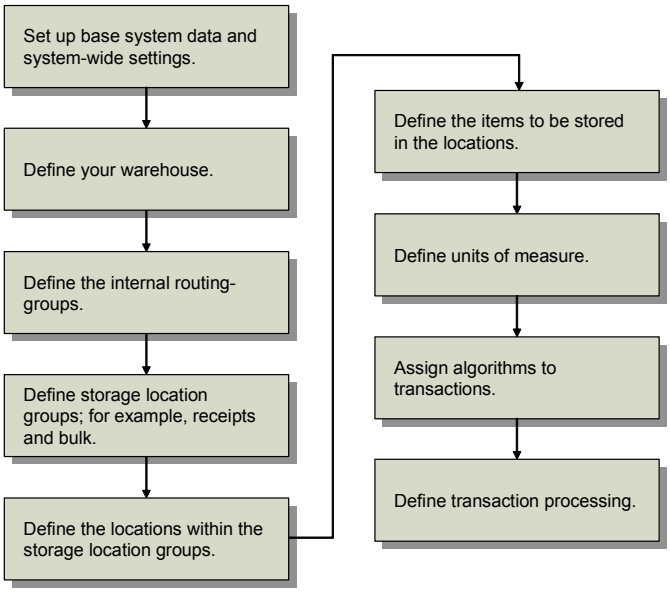
By applying these different types of engine processing, you can control whether inventory passes through an internal routing automatically or with intervention from warehouse staff.

Example An internal routing is defined to go from Storage to Packing, and then from Packing to Dispatch. In AUTO mode, as soon as the transaction from Storage to Packing is confirmed, the next transaction is created. This could mean that somebody receives a task before the packing really takes place. In order to avoid this, you can use the MANUAL mode so the next step (from Packing to Dispatch) is only created when the mode is changed to AUTO.

Setting Up QAD Warehousing

See Figure 1.2 for an illustration of the workflow for QAD Warehousing setup. Each workflow step is discussed on the following pages.

Fig. 1.2
QAD Warehousing Setup Workflow



The warehousing system supports many different types of warehouse implementations. This section describes basic setup of warehousing components. These components can be combined in many different ways. Some specific implementation requirements are discussed in topics on bulk picking, batch picking, and wave planning. Review the setup sections for these topics for instructions are setting up these types of warehouse activities:

- “About Bulk Picking” on page 274
- “Setting Up Batch Picking” on page 293
- “Setting Up Wave Planning” on page 322

Prepare Environment

The first step in setting up QAD Warehousing is to ensure that the base data your warehouses need to operate are already completely defined. This means that you must ensure that the following elements have been set up:

- All the sites in which you want to set up warehouses
- All the inventory items you want to store in your warehouses

For more information on setting up, see *QAD Master Data User Guide*.

Also, you must set up system control fields that govern the entire operation using Warehouse Management Control (4.24). You can also define the numbering sequences that you want to use for automatically generated pallet references and for generating location identifiers when creating a range of storage locations. You do this using the Sequence Definition options on the Warehouse Manager Functions Menu (4.23).

See “Warehouse Management Control” on page 19.

Define Warehouse

The second step is to set up details of the warehouses you want to operate. Each warehouse must have its individual fields defined. However, often you have similar requirements for a number of warehouses, so you can set up generic defaults used for each warehouse. You can also set up master lists of warehouses, which define the order the system should use looking for a warehouse for an item. The sequence is:

1. Use Warehouse Control (4.1.24) to set up generic defaults for your warehouses. This step is optional. See page 20.
2. Use Warehouse Maintenance (4.1.1) to set up the individual fields for your warehouses. This step is mandatory. See page 22.
3. Use Warehouse Master List Maintenance (4.1.5) to set up master lists of warehouses that you can attach to inventory items. This step is mandatory for multi-warehouse picking or inter-warehouse transfers and picking only. See page 40.

See “Warehouse Maintenance” on page 22.

Define Internal Routings

The third step is to define the internal routing groups (IRGs) within each warehouse, then define the internal routings you want to use to move inventory between these IRGs, and finally assign the internal routings to the inventory transaction types. This sequence is as follows:

1. Use Internal Routing Group Maintenance (4.2.1) to set up your IRGs. You must define these before you can create internal routings.
2. Use Internal Routing Maintenance (4.2.5) to set up your internal routings. These define specific pathways through the warehouse by way of the IRGs.
3. Use Internal Routing Assignment Maintenance (4.2.9) to assign your internal routings to particular transaction types.

See Chapter 3, “Defining Internal Routings,” on page 43.

Define Location Groups

The fourth step is to define the storage location groups and work location groups within the warehouse. You must set up these groups before defining locations, so you can specify the groups to which each location belongs.

1. Use Storage Location Group Maintenance (4.3.1) to set up your SLGs. You must define these before you can set up your locations.
2. Use Storage Location Group List Maintenance (4.3.5) to set up lists of SLGs, which you can use in place of an individually specified SLG to widen your choices for storage for an item. This step is optional.
3. Use Work Location Group Maintenance (4.3.9) to set up your WLGs. You must define these before you can set up your locations.
4. Use Inter-Work Location Group Maintenance (4.2.21) to specify any special requirements you have when moving inventory within a warehouse from one WLG to another. This step is optional.

See Chapter 4, “Defining Location Groups,” on page 55.

Define Location

The fifth step is to set up all the individual storage locations within the warehouse. You define the standard location details as well as the required fields. Where you have a large number of similar locations, you can use Mass Location Maintenance (4.3.21) to avoid repetition.

Set up locations using one of the following methods:

1. Use Warehouse Location Maintenance (4.3.13) to set up individual locations one at a time.

   —Or—

2. Use Mass Location Maintenance (4.3.21) to set up a range of similar locations.

If you want to set up a range of locations:

a Use Sequence Definition Maintenance (4.23.1) to set up a sequence definition code. This identifies the template to use for setting up the individual locations.

b Use Mass Location Maintenance (4.3.21) to generate the range of locations. You specify the Location Sequence Definition to use, and the system uses the format and range you defined in step a.

See Chapter 5, “Defining Locations,” on page 71.

Define Items

The sixth step is to define the fields for the inventory items you want to store in your warehouses. The items must already exist. In addition to setting up the basic fields for each item, you can specify information that links the storage or picking of an item with a particular site, warehouse, storage location group, supplier, or customer. The sequence is as follows:

1 Use Item Maintenance (4.4.7) to set up generic default values for items. This step is optional.

2 Use Item-Site Maintenance (4.4.9) to set up default values for items that apply to all warehouses at the specified site. This step is optional, and uses the generic default values from Item Maintenance if you defined them.

3 Use Item-Warehouse Maintenance (4.4.11) to set up the actual fields to use for each item in the specified warehouse. This step is mandatory, and uses the site-level default values from Item-Site Maintenance if you have set these up.

4 Use Item-Storage Location Group Maintenance (4.4.1) to specify additional warehousing fields for items related to a specific storage location group. This step is optional.

5 Use Supplier Item Inspection Maintenance (4.4.13) to specify inspection parameters for a supplier-item relationship. This step is optional.

6 Use Customer Item Status Maintenance (4.4.17) to specify particular inventory status codes for particular customers. This step is optional.

See Chapter 6, “Defining Items,” on page 81.

Note An additional option, Multi-Level Item Maintenance (4.4.5), combines the first three steps in a single program, so that you can set up generic defaults, site-level defaults, and item-warehouse data in one continuous process. This option is an alternative to using Item Maintenance (4.4.7), Item-Site Maintenance (4.4.9), and Item-Warehouse Maintenance (4.4.11).

Define Units of Measure

The seventh step is to set up details of the units of measure you want to use in the system sizing calculations. In practice, you may want to set up these details before you define the warehouses.

1 Use Alternate Unit of Measure Maintenance (4.5.1) to define the alternate units of measure you want to use for sizing calculations for inventory and location capacities.

2 Use UM Group Maintenance (4.5.5) to set up groups of related units of measure, with specified conversion factors between the different units. A UM group can then be attached to an item, with all the relevant conversion factors already defined. This step is optional.

3 Use UM Conversion Generation (4.5.10) to attach the conversion factors for UM groups to selected ranges of items. This step is optional.

See Chapter 7, “Sizing,” on page 95.

Note Defining UM groups helps to simplify the process of defining the conversion factors and assigning them to items. The system does not use the UM groups other than to generate the conversion factors in UM Conversion Generation.

Assign Algorithms to Transactions

The eighth step is to link a specified sequence of algorithms to each transaction type that is used in your internal routings. A range of standard algorithms is supplied, but you can customize these, or add new algorithms, if required.

1 Use Algorithm Type Maintenance (4.6.1) to modify the verbosity level for reporting purposes of any of the existing algorithm types. This step is optional.

2 Use Algorithm Master Maintenance (4.6.5) to modify the descriptions of existing individual algorithms within each of the algorithm type categories, or to add new algorithms to any of the categories.

3 Use Algorithm Assignment Maintenance (4.6.9) to link a specified sequence of algorithms to each transaction type or combination of transaction type, site, warehouse, item, and address. This step is required to define what algorithms run when processing your inventory transactions.

4 Define Transaction Processing

See Chapter 8, “Algorithms,” on page 105.

The ninth step is to define the processing fields associated with each of the transaction types you are using in your internal routings. Again, in practice, you may want to set up these details before you define warehouses. However, because the main transaction types are supplied with the system and because they take default values from the basic warehouse fields, you may not need to make many alterations to the supplied transaction type fields.

1 Use Transaction Type Maintenance (4.7.1) to modify the processing fields for any of the existing transaction types, or to add new transaction types.

2 Use Warehouse Transaction Type Maintenance (4.7.5) to modify the processing fields for any of the existing transaction types, in relation to their operation within a specified warehouse. This step is optional. Refer to Section 2, “Using QAD Warehousing,” beginning on page 197.

See Chapter 9, “Engine Processing,” on page 137.

When you have completed these setup steps, your system is ready for use.

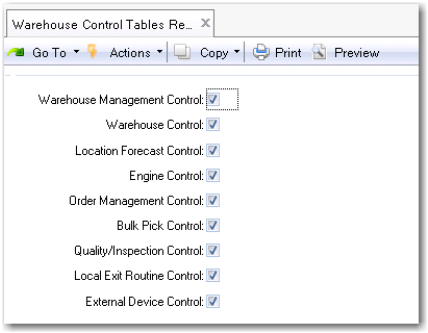
Displaying Setup

Use Warehouse Control Table Report (4.23.24) to display QAD Warehousing setup settings. Indicate Yes to display control settings for the following:

- System Control (Warehouse Management Control (4.24))
- Warehouse Control (4.1.24)
- Location Forecast Control (4.3.19.24)
- Engine Control (4.7.24)
- Order Management (4.13.24)
- Bulk Pick Control (4.14.24)
- Quality/Inspection Control (4.19.24)
- Local Exit Routine Setup (4.23.10)
- External Device Control

Note External Device Setup (4.23.22) provides control options.

Fig. 1.3
Warehouse Control Tables Report (4.23.24)



QAD Warehousing and Domains

Operations in a QAD application database can be stored in separate, logical partitions—called *domains*—in a single database. Each domain represents a separate business unit, and all the entities in a domain share the same base currency and chart of accounts. Each domain has a distinct configuration for manufacturing, distribution, warehousing, services, and financials. QAD Warehousing can be used with multiple domains/databases and fully supports all cross-domain features. However, none of the warehousing activities themselves span across domains. You should set up QAD Warehousing in each domain where you plan to implement it.

Chapter 2

Defining Warehouses

The following topics explain how the warehouse fields determine the way QAD Warehousing operates and describe how you can use the warehouse maintenance functions to configure the operation of the system in your own warehouses. They also explain how you can define structured sequences of reference numbers to be used for pallet references and for setting up a range of locations in Mass Location Maintenance.

Overview 16
Outlines and defines warehouses with examples.

Control Settings 18
Describes Warehouse Management Control (4.24) and Warehouse Control (4.1.24).

Warehouse Maintenance 22
Illustrates the Warehouse Maintenance (4.1.1) frame and its various functions.

Warehouse Master List Maintenance 40
Describes how to use Warehouse Master List Maintenance (4.1.5), including examples.

Warehouse Report and Inquiry Functions 42
Lists and describes various report options.

Overview

In its broadest possible definition, a warehouse consists of a grouping of storage locations. The logical grouping of these storage locations is further broken down into a hierarchy of internal routing groups, storage location groups, and, at the bottom of the hierarchy, the locations. In parallel with this logical structure is one relating to working practices that breaks the locations down into work location groups within the warehouse.

Managing the movement of inventory within your warehouses is a matter of specifying internal routings, which define a sequence of movements from internal routing group to internal routing group. These internal routings are associated with transaction types and items within the warehouse.

Example When a particular item is received as a result of a purchase order, the internal routing that is linked to the purchase order receipt transaction type for the item determines where the item is received and what route it takes through unpacking and inspection before it arrives in bulk storage.

You set up each warehousing elements—warehouses, internal routing groups, storage location groups, work location groups, locations, and internal routings—by setting values for a number of fields that control how that element operates within your inventory management system. For example, for each storage location group, you can define fields that control whether issue of stock from locations in the group is allowed, and whether receipt of stock into locations in the group is allowed.

Because the warehousing structure is in the form of a hierarchy, many of the fields are applied at more than one level in the structure.

For example, you can specify at the warehouse level whether locations in the warehouse are allowed to contain stock with mixed inventory status codes. The value you specify for the warehouse becomes the default setting for each storage location group within the warehouse. At the storage location group level, you can either accept the default from the warehouse level, or override it with a different setting.

Because you can have several related warehouses within a site, a level in the hierarchy exists above warehouse defined in Warehouse Control (4.1.24). The fields you set at this level do not control anything directly, but become defaults for each warehouse you set up. The highest level of all is Warehouse Management Control (4.24). However, the system control fields relate to overall use of the system, and do not provide defaults lower down the hierarchy.

The most efficient way to set up your warehousing elements, therefore, is to start at the top of the hierarchy and work down. In this way, you only need to enter exceptions to the general field settings at the lower levels.

Use of both Warehouse Management Control and Warehouse Control is described in “Control Settings” on page 18; use of Warehouse Maintenance is described in “Warehouse Maintenance” on page 22.

Warehouse Master Lists

Warehouses and individual locations are also defined as standard system locations. This enables them to use both the standard system functions and the additional warehouse functions. One instance of this combined functionality is the feature where each item can have a default location. This default location can be a dummy location that is defined as a warehouse. The QAD warehouse functions then take over from standard system functions to find the actual location within the warehouse for the specified item.

However, you may need to specify a different warehouse for the item, depending on the type of inventory transaction being performed. For example, you can receive items in one warehouse, but pick for sales orders in another.

QAD Warehousing supports this by letting you specify master lists of warehouses, which define different warehouses for different transaction types. You can attach one of these warehouse master lists to an item instead of a default location.

Example When a purchase order line is created, the system examines the Location field in the line. If it identifies the code as a warehouse master list, it looks in the list for the warehouse specified for purchase order receipts. That warehouse is then used as the location for the item.

Use of Warehouse Master List Maintenance is described in “Warehouse Master List Maintenance” on page 40.

Inventory Account Synchronization

Standard system Inventory accounts are specified by product line. The cost of the full on-hand quantity of an item is posted to the general ledger (GL) account identified as the Inventory account for that item’s product line. This is how the system represents the value of your company’s inventory within the general ledger. It is adjusted by any inventory transactions or cost adjustments that occur.

The system lets you further refine this accounting process by defining a different set of Inventory accounts for each site. The is important since when an item is stored in multiple sites, site-specific GL accounts let you generate separate balance sheets for each site. If an Inventory account is not defined for a site, product line accounts are used.

This accounting refinement is extended still further. Within any site, you can give each individual location a different set of accounts. This process is frequently used to store all consignment stock—inventory held by your company but owned by somebody else—in a separate location that has a different set of Inventory accounts. GL reports then split the costs of this stock out to a different account.

In summary, the system checks to see which Inventory accounts are affected whenever an inventory movement occurs. It does this by looking in the following order:

1. Accounts defined for a product line/site/location combination
2. Accounts defined for a product line/site combination
3. If neither of these is available, accounts defined for the product line

Within the warehousing system, you can specify GL accounts at an additional level: for the warehouse. This lets you set up different accounts for all inventories stored in a specific warehouse. The system makes this possible using a process called account synchronization.

Based on standard system features that support GL accounts at the location level, if you define Inventory accounts for a product line/site/warehouse combination, the system automatically duplicates this definition for every location within that warehouse.

Example Warehouse W in site S contains 1000 locations. When you create an entry for product line PL in Inventory Account Maintenance (1.2.13) (product line set to PL, site set to S, location set to W), the system creates a duplicate record for every location within warehouse W. The single record you create results in 1001 Inventory account records.

The Inventory Acct Sync field in Warehouse Maintenance, which defaults from Warehouse Control, lets you specify how you want your Inventory accounts synchronized for a warehouse. The options are Full, Partial, and Blank.

- Full creates Inventory account records for the locations as described in the previous example, over-writing any existing definitions. That is, location accounts are always synchronized with the corresponding warehouse accounts.
- Partial is similar. It creates Inventory account records for the locations, but any existing location definitions are not over-written. This allows some location accounts to be different from the warehouse accounts.
- Blank prevents any automatic Inventory account synchronization. Instead, you can use Inventory Account Synchronization (4.1.13) to perform that function manually. With this approach, you define all of the warehouse accounts required in Inventory Account Maintenance without creating any corresponding location accounts. The location accounts are created only when you run Account Synchronization.

See “Inventory Account Sync” on page 23.

Control Settings

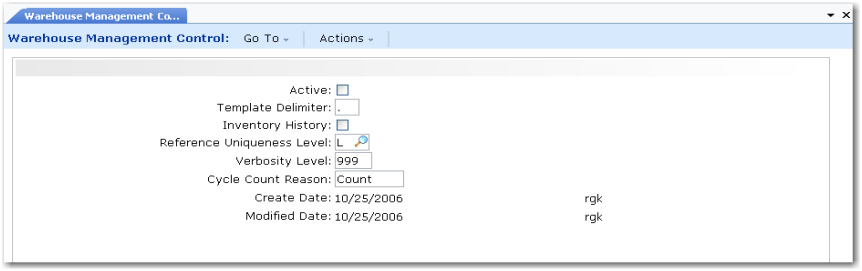
Two control programs affect the way QAD Warehousing operates:

- Use Warehouse Management Control (4.24) to set a few fields that affect the entire setup.
- Use Warehouse Control (4.1.24) to set system-wide default values for fields that you can specify for individual warehouses. These values default to each warehouse, but you can modify them as required.

Warehouse Management Control

Warehouse Management Control (4.24) is shown in Figure 2.1.

Fig. 2.1
Warehouse Management Control (4.24)



Active. Indicate whether the system is active. Set this to Yes when you want to implement the warehousing system. If this field is No, none of the warehouse functions operate, and the system uses all the standard functions.

Template Delimiter. Enter the ASCII character to use as the delimiter between fields. This is relevant when data is downloaded to another system; for example, for producing pallet labels. The default is the tilde character (~), but you can enter another delimiter, if required.

Inventory History. Indicate whether the system should keep a permanent history of inventory master records. These relate to movements of inventory with a sizing type of R (reference), where the reference unit of measure is, for example, a pallet. The system creates an inventory master record when the reference stock is received, and this record is moved when the stock is moved, along with the inventory detail records. When the inventory is shipped or broken down into inventory other than sizing type R, the inventory master record is deleted if you set Inventory History to No, or permanently retained if you set it to Yes. Using inventory history lets you perform pallet tracking audits.

Reference Uniqueness Level. Indicate how you want the system to enforce unique pallet reference numbers. Valid entries are:

Blank—References are unique throughout the system.

S—References are unique within each site.

W—References are unique within each warehouse.

L—References are unique within each location.

B—References are unique within each batch/lot/serial.

The L and B options effectively tell the system that the references are not actually unique, but prevent duplicate references being used in the same location or batch.

Verbosity Level. This field determines how many messages the system captures to be displayed on the Verbosity Report (4.23.12.3). You can set a value in the range 0 to 999 depending on the amount of message detail you want include, for example, for use when solving problems.

- Setting a low value such as 10 or 20 causes only the most important system messages to be reported.
- Setting a value of 999 causes all system messages to be reported.
- Setting a value of 0 switches off the function; no messages are reported.

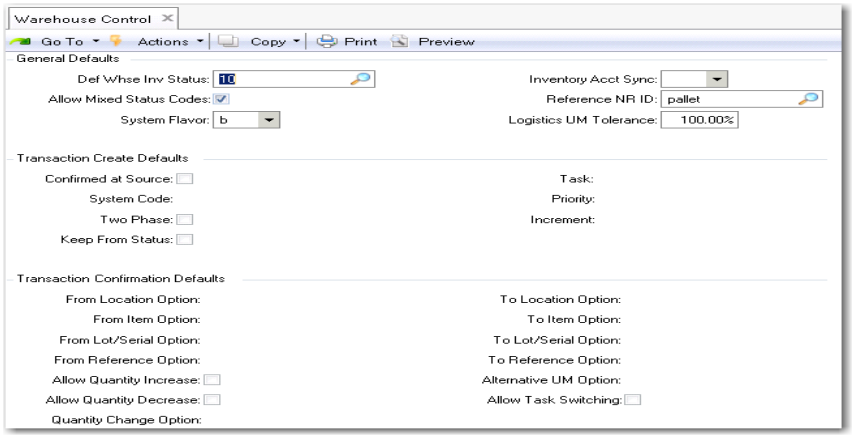
Note Be careful when setting this field value. Even a low value can affect system performance. It is intended to be used only for trouble-shooting purposes.

Cycle Count Reason. This field sets the default for the reason for generating a cycle count, which you can enter in Cycle Count Generation (4.8.12). You can override the default as required when generating a cycle count.

Warehouse Control

Use Warehouse Control (4.1.24) to set default values for fields associated with individual warehouses.

Fig. 2.2
Warehouse Control (4.1.24)



General Defaults

Def Whse Inv Status. You set up the warehouses as dummy locations within the system. Each location, including warehouse locations, takes as a default value the inventory status from the site definition. However, for warehouses you normally want an inventory status that is unavailable, so that you do not hold inventory in the warehouse dummy location. This field lets you set up a default inventory status for each warehouse.

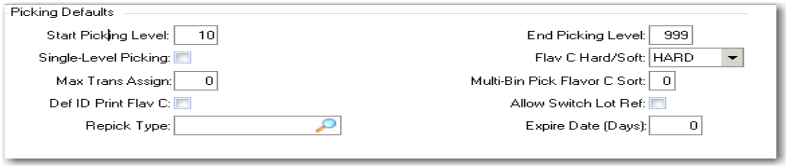
Note The inventory status you specify for the warehouses should be not available but nettable. Use Inventory Status Code Maintenance (1.1.1) to set up your inventory status codes.

The remaining fields in the General Defaults frame, the Transaction Create Defaults frame, and the Transaction Confirmation Defaults frame set default values used when you define individual warehouse details.

See “Warehouse Maintenance” on page 22.

The Picking Defaults frame is shown in Figure 2.3.

Fig. 2.3
Warehouse Control, Picking Defaults



The fields in the Picking Defaults frame set the default values for defining individual warehouse details.

See “Picking Defaults” on page 30.

The Hold Defaults frame is shown in Figure 2.4.

Fig. 2.4
Warehouse Control, Hold Defaults

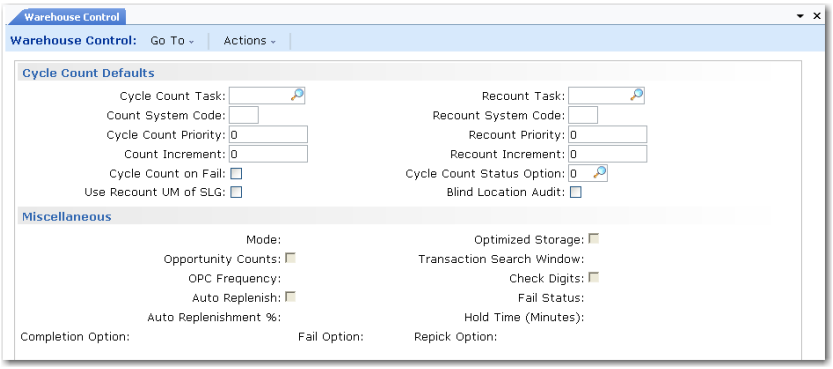


The fields in the Hold Defaults frame set the default values for defining individual warehouse details.

See “Hold Defaults” on page 32.

The Cycle Count Defaults and Miscellaneous frames are shown in Figure 2.5.

Fig. 2.5
Warehouse Control, Cycle Count Defaults and Miscellaneous

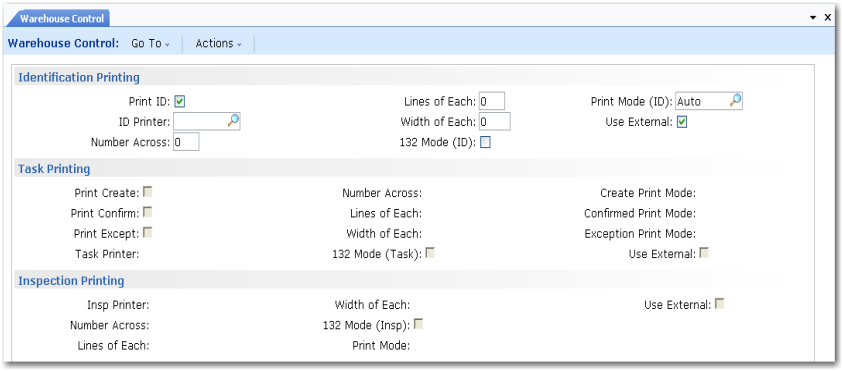


The fields in the Cycle Count Defaults frame and the Miscellaneous frame set default values used when you set up individual warehouse details.

See “Cycle Count Defaults” on page 33, and “Miscellaneous” on page 34 for details.

The Printer Defaults frame is shown in Figure 2.6.

Fig. 2.6
Warehouse Control, Printer Defaults



The fields in the Printer Defaults frame set default values used when you set up individual warehouse details.

See “Printing” on page 193 for details.

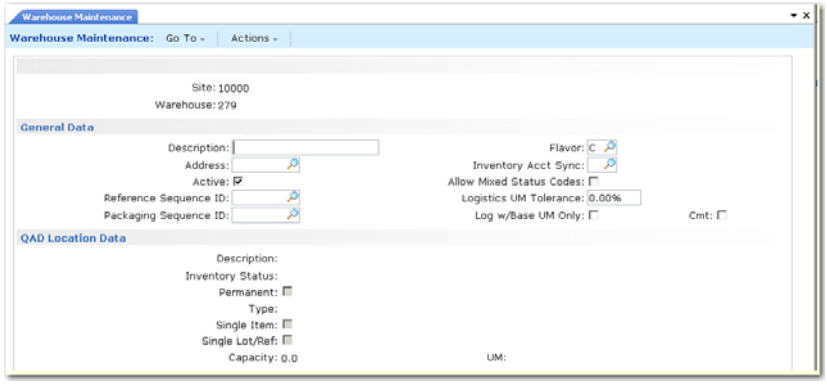
Warehouse Maintenance

Use Warehouse Maintenance (4.1.1) to set values for the fields associated with individual warehouses. Some of these fields directly control aspects of warehouse operation, while other fields act as default settings further down the hierarchy for internal routings or storage location groups associated with a warehouse. Most of the fields in Warehouse Maintenance default from Warehouse Control.

See “Warehouse Control” on page 20.

Figure 2.7 illustrates the first frame of Warehouse Maintenance (4.1.1).

Fig. 2.7
Warehouse Maintenance (4.1.1)



Enter values for the following fields:

Site. Enter the name of an existing site.

Warehouse. To modify the fields for an existing warehouse, enter the name of an existing warehouse.

To create a new warehouse, enter the name of the warehouse.

General Data

The General Data frame contains fields that relate to overall operation of the warehouse.

Description. Enter an optional text description of the warehouse.

Address. Enter the code for the address of the warehouse. Set up addresses for the company using Company Address Maintenance (2.12). This field is for information only.

Active. Enter Yes to make this an active warehouse using all the functions. If you enter No, the warehouse is inactive and does not use the functions.

Reference Sequence ID. Enter a code for the format and sequence for reference numbers used to identify items such as pallets. The sequence definition format codes are set up using Sequence Definition Maintenance (4.23.1).

Packaging Sequence ID. Enter a code for the format and sequence for packaging units, such as boxes or eaches. The sequence definition format codes are set up using Sequence Definition Maintenance (4.23.1).

Flavor. Enter the code to define the style and format of Radio Frequency screens to be used for displaying information. The Flavor codes are set up in Generalized Code Maintenance (36.2.13), and relate to display of information in situations such as forklift truck screens or Radio Data Terminals (RDTs).

Inventory Account Sync. This field controls the synchronization of warehouse, location, and Inventory account records. The options are as follows:

F (Full synchronization)

P (Partial synchronization)

Blank (no synchronization)

See “Inventory Account Synchronization” on page 17 for a more detailed explanation.

Allow Mixed Status Codes. Indicate whether a single location in this warehouse can contain inventory with a mixture of different status codes. Enter Yes to allow mixed status codes; otherwise, enter No. This setting defaults to storage location groups within this warehouse.

Logistics UM Tolerance. Enter the tolerance percentage to be used when determining whether a location containing reference stock, such as pallets, is full.

Example If your standard pallet can hold 100 items, and you set the tolerance percentage to 5%, a location containing a pallet with 95 items is considered full, while one with 94 items is not.

This value defaults to the storage location groups you set up within this warehouse.

Log w/Base UM Only. Indicate if the Logistic UM must be used when an item is received in a UM other than this base UM. For instance, if the logistic UM of an item is pl (pallet), the item is received in bx (box), and the base UM is ea (each), the system generates pallet numbers only if Log w/Base UM Only is set to No. If set to Yes, no reference is generated.

Comments. Enter Yes to display a standard page of comments when you click Next.

QAD Location Data

Because the warehouse is handled as a special type of location, you must specify the same location data that you do for any other location in the system. This frame displays the relevant QAD location fields.

The Description is an optional text description of the location.

The inventory status indicates the status of any inventory that is placed in the dummy location that corresponds to this warehouse. It is strongly recommended that you choose a status that specifies the inventory as unavailable. This status defaults from the Default Warehouse Inventory Status field defined in Warehouse Control (4.1.24).

The Single Item and Single Lot/Reference fields are both automatically set to No. The dummy location—the warehouse—must be allowed to contain multiple items and multiple lot/references.

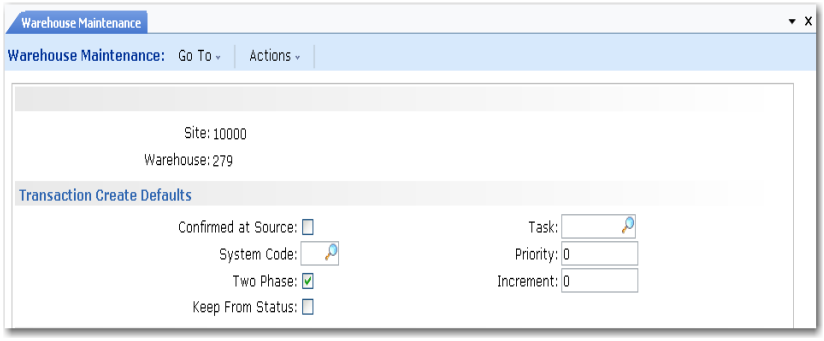
You can enter values for the other fields, but these do not affect warehouse activity.

For more information on locations, see *QAD Master Data User Guide*.

Transaction Create Defaults

Figure 2.8 illustrates the Transaction Create Defaults frame.

Fig. 2.8
Warehouse Maintenance, Transaction Create Defaults



The fields in this frame determine the default characteristics of stock movement transactions created in the warehouse. The values you enter here default to all internal routings and work location groups within this warehouse and can be changed as needed.

See “Transaction Create” on page 49.

Confirmed at Source. Indicate how transactions are typically confirmed:

No: Transactions are typically confirmed by the warehouse staff who complete the stock movement at its destination.

Yes: Transactions are typically confirmed by the warehouse staff who initiate the stock movement.

Example In a warehouse with the three basic work areas—Receipts, Stores, and Dispatch—and two work teams—Receiving and Shipping—the receiving team logs on to their devices in the Receipts area, and the shipping team logs on in the Dispatch area. Put-away transactions are created FROM receipts TO stores, and are confirmed by the receiving team. These transactions are defined with Confirmed at Source set to Yes. Picking transactions are created FROM Stores TO Dispatch, and are confirmed by the Shipping team. These transactions are defined with Confirmed at Source set to No since they are confirmed at their destination.

System Code. Specify the type of screen that confirms transactions:

Blank: Normal screens are used.

RF: Transactions are confirmed using Radio Data Terminals (RDTs), also known as Radio Frequency (RF) terminals.

This field defaults to the internal routings and work location groups that you set up within this warehouse

Two Phase. This field defaults to the internal routings and work location groups that you set up within this warehouse.

No: Inventory movements are created and confirmed in a single step, the single phase.

Yes: Inventory movements are created in one step—the first phase— and confirmed in a second step, the second phase. Between the two phases, the stock is marked as being booked out of the first location and expected in the second location. However, the anticipated inventory levels are only confirmed when the stock is confirmed as arriving at the destination.

Note Two-phase operation is a much safer way of ensuring precision in inventory management. Single-phase operation should only be used in special circumstances.

Keep From Status. Indicate how the system should set the status of transferred inventory.

No: The inventory takes its status from the new location.

Yes: The inventory status of the transferred inventory retains its original value.

This field defaults to the internal routings and work location groups that you set up within this warehouse.

Task. Specify the task associated with any inventory transaction that is created. This field defaults to internal routings and work location groups that you set up within this warehouse. You use it here simply to specify the most frequent task. Set up task codes in Task Maintenance (4.11.1.1), described in “Defining Tasks” on page 164.

Priority. Assign a default priority value to transactions. The value you enter here defaults to the internal routings and work location groups that you set up within this warehouse. You normally assign different priorities to different types of transaction. The RDTs select the highest priority task as the next action: the lower the number you specify, the lower the priority.

Increment. Specify the increment that is added to a transaction’s priority as time elapses when you run the increment addition program as a background process.

Specifying an increment prevents the situation where a relatively low priority transaction never reaches the top of the priority list, and therefore, never gets performed. By gradually incrementing the priority, you ensure that even low priority tasks are eventually performed. This field defaults to the internal routings and work location groups that you set up within this warehouse.

Transaction Confirmation Defaults

Figure 2.9 illustrates the Transaction Confirmation Defaults frame.

Fig. 2.9
Warehouse Maintenance, Transaction Confirmation Defaults



The fields in this frame determine characteristics of the confirmation of stock movements entered in the warehouse. The values you enter here default to internal routings within this warehouse, but you can change the values for individual routings.

See “Transaction Confirmation” on page 49.

From Location Option. Enter a number to define whether warehouse staff are allowed to modify the From Location aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0 No change allowed.

1 Issue a warning if the From location is changed.

2 Request confirmation if the From location is changed.

3 Require re-entry if the From location is changed.

From Item Option. Enter a number to define whether warehouse staff are allowed to modify the From Item aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0 No change allowed.

1 Issue a warning if the From Item is changed.

2 Request confirmation if the From Item is changed.

3 Require re-entry if the From Item is changed.

From Lot/Serial Option. Enter a number to define whether warehouse staff are allowed to modify the From Lot/Serial aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0 No change allowed.

1 Issue a warning if the From lot/serial is changed.

2 Request confirmation if the From lot/serial is changed.

3 Require re-entry if the From lot/serial is changed.

From Reference Option. Enter a number to define whether warehouse staff are allowed to modify the From Reference aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0 No change allowed.

1 Issue a warning if the From Reference is changed.

2 Request confirmation if the From Reference is changed.

3 Require re-entry if the From Reference is changed.

Allow Quantity Increase. Enter Yes if warehouse staff are allowed to increase the quantity when a transaction is confirmed; otherwise, enter No.

Example You might want sales orders to be picked in whole packaging quantities from Bulk Storage and then split down to the required quantity in a Repackaging area. The internal routing from Bulk Storage to Repackaging would then allow an increase in the original transaction quantity.

Allow Quantity Decrease. Enter Yes if warehouse staff are allowed to decrease the quantity when a transaction is confirmed; otherwise, enter No. This is normally set to Yes, unless your inventory management system can guarantee that sufficient inventory is always available in every possible circumstance.

Quantity Change Option. Specify the action to take when the quantity is changed as controlled by the Allow Quantity Increase and Allow Quantity Decrease settings. The options are as follows:

0	Accept the change.
1	Accept the change and display a warning.
2	Accept the change after positive confirmation.
3	Force second entry of the quantity to confirm.

To Location Option. Enter a number to define whether warehouse staff are allowed to modify the To Location aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0	No change allowed
1	Reprompt; must be different location
2	Reprompt; can be same location
3	Reprompt; can be same location, warn if different
4	Reprompt; can be same location, confirm if different
5	Reprompt; can be same location, re-enter if different

To Item Option. Enter a number to define whether warehouse staff are allowed to modify the To Item aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0	No change allowed
1	Reprompt; must be different item
2	Reprompt; can be same item
3	Reprompt; can be same item, warn if different
4	Reprompt; can be same item, confirm if different
5	Reprompt; can be same item, re-enter if different

To Lot/Serial Option. Enter a number to define whether warehouse staff are allowed to modify the To Lot/Serial aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0	No change allowed
1	Blank the lot/serial field
2	Reprompt; must be new, non-blank lot/serial number
3	Reprompt; allow old lot/serial number

4 Reprompt; any value of lot/serial number allowed
5 3 + warning if changed
6 4 + warning if changed
7 3 + confirmation of change required
8 4 + confirmation of change required
9 3 + re-entry of change required
10 4 + re-entry of change required

To Reference Option. Enter a number to define whether warehouse staff are allowed to modify the To Reference aspect of inventory transactions, and, if so, what action is required. The options are as follows:

0 No change allowed
1 Blank the Reference field
2 Reprompt; a new, non-blank reference is required
3 Reprompt; allow old reference, blank reference not allowed
4 Reprompt; any value of reference is allowed
5 Automatically regenerate a new reference
6 3 + warning if changed
7 4 + warning if changed
8 3 + confirmation required if changed
9 4 + confirmation required if changed
10 3 + re-entry required if changed
11 4 + re-entry required if changed
12 5 + Reprompt

An example of a reference change is to facilitate backflushing. When backflushing is used, either in repetitive production or discrete production (work orders), it is easier to issue inventory if it is as standard as possible: no lot/serial (when possible), and no pallet number (reference). Using option 1 that blanks the reference lets you do that.

Another example is used for multi-bin pickup. When processing a multi-bin pickup movement, it is possible to assign a new pallet number to all items picked during the process. Option 12 that generates a new reference with a possible reprompt is the option to use in that case.

Note Some of the To Reference options are less accurate than the following alternate UM option. For instance, if an inventory record has a reference and an alternate UM pl and you use To Reference option 1 to blank the reference, the alternate UM pl is still on record, which is wrong. Instead, if you use an alternate UM option to set the Alternate UM field to the item's default stocking UM (1) together with a UM change action that blanks the reference when going from pl to ea (each), you obtain the expected result. See "Alternate Unit of Measure Maintenance" on page 99.

Alternate UM Option. Specify the action to be performed regarding any change to the Alternate Unit of Measure field during the transfer of any inventory moved by this sequence in an internal routing. The options are as follows:

0 No change allowed
1 Set the Alternate UM field to the item's default stocking UM

2	Reprompt and force entry of a new UM: the item's default stocking UM is not allowed
3	Reprompt, allow use of the old alternate UM, but not the item's default stocking UM
4	Reprompt, allow any value including the old alternate UM or the item's default stocking UM
5	Automatically set the alternate UM to the default of the From storage location group
6	Automatically set the alternate UM to the UM of the internal routing
7	3 + warning if changed
8	4 + warning if changed
9	3 + confirmation required if changed
10	4 + confirmation required if changed
11	3 + re-entry required if changed
12	4 + re-entry required if changed
13	Automatically set the alternate UM to the default of the To storage location group
14	Put-away in base UM, then take SLG acquisition UM

Allow Task Switching. This field is used to specify for a work location group whether warehouse staff are allowed to switch to a different task. The setting of this field is important whenever any of the task confirmation fields has been set to allow a different value—for example, of a reference or lot/serial number, from that which was expected. You must indicate whether a user who enters a different reference is changing the value for the current task or switching to another task. In Warehouse Maintenance, you set the default for each work location group in the warehouse.

No: Prevent task switching. When a user enters a different value, the system assumes that the value is being changed for the current task.

Yes: Allow task switching. When a user enters a different value such as a reference, the system checks to see whether another task exists with the reference.

When a task is hard assigned, it cannot be switched with another task.

When this field is Yes and staff are confirming a transaction in batch picking, once the user has selected the From inventory, if the scanned data does not match that of the original transaction, the system will try to execute a task switch. Task switching in batch picking is restricted to tasks that belong to the same transaction's batch.

If it were not possible to switch the task, the system might attempt to execute a lot/serial and reference switch if the Allow Switch Lot Ref flag is activated. There is no restriction to lot/serial and reference switch in batch picking.

Specifying Non-System-Selected Pallets/References

Occasionally, you may need to specify a different pallet or reference other than the one the system selected to fill an order. You can specify a substitute pallet or reference in the same location or another location by setting fields in the Transaction Confirmation Defaults frame:

- From Location Option
- From Lot/Serial Option

- From Reference Option

You must activate the functionality to switch lot/serial references by setting Allow Switch Lot Ref to Yes in:

- Warehouse Maintenance (4.1.1)
- Warehouse Maintenance Control (4.1.24)
- Internal Routing Maintenance (4.2.5)

These fields work together to let you substitute pallets or references, depending upon their settings and whether substitute pallets are available. If substitute pallets do not exist at the current location, you cannot make pallet or reference changes, regardless of the other two field settings, when:

- From Location Option is 0
- From Location Option is 2, but the confirmation of the change is No.

If substitute pallets do exist at the current or another location, you can make pallet or reference substitutions when:

- From Location Option is 0, 1, 2, or 3
- If any Lot/Serial or Reference fields have a non-existent value for the current pallet

Warehouse staff can pick the pallet as long as the system did not:

- Allocated it to another order
- Associate a replenishment task with it (inventory is reserved)

If the substitute pallet has been allocated to another order, or has a task associated with it, then you can switch tasks for the pallet as long as the task associated with it is not active. You can also de-allocate the substitute pallet from its current order by deleting the task associated with the order, creating a new task, and reinitiating the picking algorithm for the task.

If the picking algorithm fails or the system cannot find inventory for the new task, you cannot use the substitute pallet nor switch tasks for it.

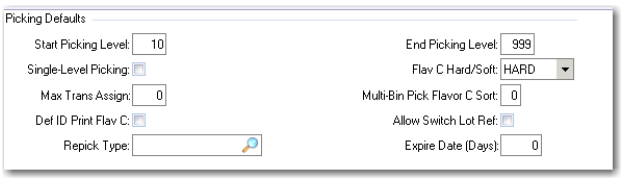
Use this field with From Lot/Serial Option, From Reference Option, and Expire Date (Days) to set up picking substitute pallet or lot/serial numbers.

Note This functionality is only available for tasks that are of PICK type, excluding bulk-picking and only if you use the RF Next Task and RF Select Task for flavors A or B and RF batch picking.

Picking Defaults

Figure 2.10 illustrates the Picking frame in Warehouse Maintenance.

Fig. 2.10
Warehouse Maintenance, Picking



The fields in this frame define which storage location groups the system should use for picking inventory. Each SLG has a picking level defined. Any SLG with a picking level that is not between the Start and End levels you specify here is not considered for picking by the picking algorithms in this warehouse.

Start Picking Level. Enter the numerical code for the picking level at which picking is to start. The picking algorithms do not consider any storage location group with a picking level below that value.

End Picking Level. Enter the numerical code for the picking level at which picking is to end. The picking algorithms do not consider any storage location group with a picking level above that value.

Note Start and end picking levels are useful to restrict picking to one storage location group. You can define the start and end picking levels for a given transaction type within Warehouse Transaction Type Maintenance (4.7.5). See “Storage Location Group Maintenance” on page 59.

Single-Level Picking. Enter Yes if all the picking quantity must be taken from only one picking level; otherwise, enter No.

Flavor C Hard/Soft Assignment. Indicate how transactions for the multi-bin pickup process are managed:

Hard: Tasks are reserved for a given person and cannot be exchanged with another one.

Soft: Tasks are reserved for a given person but can be exchanged with another one.

Max Trans Assign. Enter the maximum number of transactions for a multi-bin process where the multiple transactions have a common destination. The maximum number of transactions assigned indicates how many transactions the system reserves for such a process.

Multi-Bin Pick Flavor C Sort. The Sort Code indicates the criteria for grouping transactions for a multi-bin pickup process. The minimum requirement is to have a common destination.

0	Sort by order and destination location
1	Sort by ship-to and destination location
2	Sort by destination location

Allow Switch Lot Ref. Enter Yes to activate the switch lot/serial and reference functionality by warehouse and internal routing.

Setting this field to Yes lets you use QAD Warehousing and RF functionality to specify a different pallet or reference other than the one the system selected to fill an order.

For more information, refer to “Specifying Non-System-Selected Pallets/References” on page 29.

Default ID Print Flavor C. Specify the default value for the Print ID field that appears at the confirmation of a multi-bin pickup movement.

Repick Type. Specify the transaction type that should be used if a repick is required. The entry you make here defaults to internal routings you set up in this warehouse.

It is possible when confirming an inventory transaction, if allowed by the quantity change fields described above, to confirm a quantity picked less than the quantity expected. In this case, warehouse staff can set a field at confirmation to allow a repick of the missing items. For the repick, the system uses an internal routing and a picking algorithm for the transaction type you specify in the Repick Type field.

Note This repick transaction type must start with PICK-, and must be defined in Transaction Type Maintenance (4.7.1). If you leave the Repick Type field blank, the repick uses the same transaction type as the original picking.

Expire Date (Days). Enter the maximum number of days (0 to 9999) that the expiration date of the new pallet or lot/serial number can differ from the expiration date of the original pallet or lot/serial number. For example, if you enter 5, and the expiration date of the original pallet is 12/1/2008, then the expiration date of the new pallet must fall between 12/1/2008 and 12/6/2008. The default value for this field is 0.

Note If you enter 0 (zero), then the expiration date of the original pallet or lot/serial number must match the expiration date of the new pallet.

Hold Defaults

Hold defaults are defined at the warehouse level, for internal routing groups, storage location groups, and for specific item/SLG combinations.

You can use Hold Maintenance (4.3.23.1) to put stock on hold so that it is not picked. You can put a hold on any element from a warehouse: a storage location group, a location, or an item. The values you define in this frame default when you put stock on hold, but you can modify the settings as needed.

Figure 2.11 illustrates the Hold Defaults frame in Warehouse Maintenance.

Fig. 2.11
Warehouse Maintenance, Hold Defaults



Allow Issues. Enter Yes if stock on hold can be issued or moved to another location; otherwise, enter No.

Allow Receipts. Enter Yes if stock can be received into the hold location; otherwise, enter No.

Allow Picking. Enter Yes if picking from the hold location is allowed; otherwise, enter No.

Allow Incoming Returns. Enter Yes if stock returned from a customer can be placed in the hold location; otherwise, enter No.

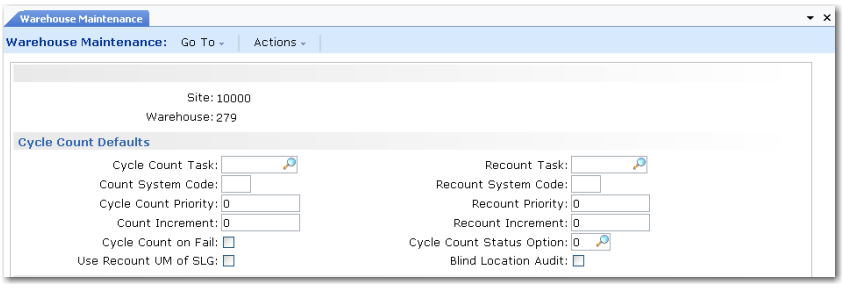
Allow Outgoing Returns. Enter Yes if stock to be returned to a supplier can be issued from the hold location; otherwise, enter No.

Allow Cycle Counts. Enter Yes if the hold location is to be included in system-generated cycle counts; otherwise, enter No.

Cycle Count Defaults

The Cycle Count Defaults frame is shown in Figure 2.12.

Fig. 2.12
Warehouse Maintenance, Cycle Count Defaults



The fields in this frame control the way cycle counts and recounts are performed. The values you enter here default to all work location groups you set up within this warehouse, but you can change the values for individual work location groups.

Cycle Count Task. Specify the task of any cycle counts created in the work location group. The tasks must already have been set up in Task Maintenance.

Warehouse staff perform count tasks when stock quantities are inside the tolerance; they perform recount tasks when stock quantities are outside the tolerance. You define the tolerance in the inventory count parameters specified in Inventory Control (3.24).

Count System Code. Specify the system code associated with any cycle counts created in the work location group. The system code determines the type of screen that is used to confirm cycle count transactions. Leave blank for normal screens; enter RF for RDT screens.

Cycle Count Priority. Specify a priority value for cycle count transactions created in the work location group. The RDTs select the highest priority task as the next action. The higher the number you specify, the higher the priority.

Count Increment. Specify the increment that is added to a cycle count transaction's priority as time elapses, when you run the increment addition program as a background process. This prevents low priority tasks from never reaching the top of the priority list, and, therefore, never being performed.

Cycle Count on Fail. Indicate whether a cycle count should be automatically generated for the inventory if that inventory is failed, for example, when a transaction is completed for less than the required quantity.

Use Recount UM of SLG. Indicate whether recounts should result in inventory with the alternate unit of measure specified for the storage location group.

This field is especially useful when a CIM load in Cycle Count Entry (3.14) is required to load the stock into the system. The way session triggers work prevents the system from creating the alternate UM correctly. The consequence is an incorrect capacity calculation. When this field is set to Yes, the system gives any pallet recounted in Cycle Count Entry the alternate UM defined in the recount UM of the corresponding storage location group.

See "Alternate Unit of Measure Maintenance" on page 99.

Recount Task. Specify the task of any recounts created in the work location group. The tasks must already have been set up in Task Maintenance.

Recount System Code. Specify the system code for any recounts created in the work location group. System codes define the type of screen that is used to confirm recount transactions, blank for normal screens, RF for RDT screens.

Recount Priority. Specify a priority value for recount transactions created in the work location group. The RDTs select the highest priority task as the next action: the higher the number you specify, the higher the priority.

Recount Increment. Specify the increment that is added to a recount transaction's priority as time elapses when you run the increment addition program as a background process. You use this to prevent low priority tasks from never reaching the top of the priority list, and, therefore, never being performed.

Cycle Count Status Option. Enter a number to define how the system manages the inventory status upon confirmation of a recount or in-tolerance count in this storage location group. In Warehouse Maintenance, you set the default for each SLG in the warehouse.

The options are as follows:

0	No status change.
1	Change to Location Status: The status of the inventory is changed to the default inventory status of the location.
2	Status change based on Fail Status: The status of the inventory is changed to the good status associated with the current fail status specified in the Warehouse Management Data frame in Inventory Status Maintenance (1.1.1). The frame displays only when QAD Warehousing is active.

Blind Location Audit. Indicate whether you want the recounted quantity displayed on the RF during a cycle recount.

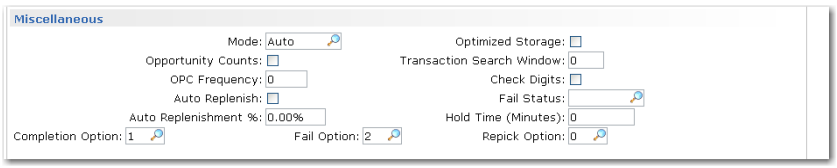
No (the default): The system displays a 0 (zero) on the RF and staff must enter a value for the recounted stock.

Yes: The value of the recounted stock displays on the RF and staff can press Enter to validate the value.

Miscellaneous

The Miscellaneous frame is shown in Figure 2.13.

Fig. 2.13
Warehouse Maintenance, Miscellaneous



The fields in this frame affect the operation of storage location groups and internal routings. The values you enter here default to all storage location groups or internal routings you set up within this warehouse, but you can change the values for individual storage location groups or routings.

Mode. The Mode relates to internal routings and specifies how processes defined by the routing are initiated. This field defaults to the internal routings that you set up within this warehouse. The options are as follows:

AUTO	The process in a routing sequence is started automatically as soon as the previous process is complete.
MANUAL	The process is only started when it is manually selected for processing.

Opportunity Counts. This field defaults to storage location groups that you set up within this warehouse. Enter Yes to specify that staff can be requested to perform cycle counts while they are at locations within this storage location group; otherwise, enter No.

OPC Frequency. If you enter Yes for Opportunity Counts, enter the frequency, in days, with which counts can be initiated. This field defaults to storage location groups that you set up within this warehouse.

Auto Replenish. Enter Yes to select automatic replenishment. If an existing replenishment definition for a location/item or an SLG/item is active, when the inventory level falls below the replenishment point, the system automatically starts a replenishment process. This process picks the missing items and transfers them to the location/SLG to be replenished.

With auto replenishment, no need exists to start a manual replenishment; the process is triggered automatically. Enter No to switch off automatic replenishment. This field defaults to item-warehouse data that you set up within this warehouse. To enable automatic replenishment, both fields at the warehouse level and at the item-warehouse level must be Yes.

Auto Replenishment %. This field specifies the tolerance for the replenishment point. The replenishment point is the quantity of stock below which an automatic replenishment is triggered.

Example If the replenishment point is defined as 50 EA, when the inventory level drops below 50 EA, the system initiates a replenishment process. If the Auto Replenish percentage is 80%, the automatic replenishment occurs only when the stock level falls below 40 EA.

Note A value of 0% has the same effect as a value of 100%. This field defaults to item-warehouse data that you set up within this warehouse.

Optimized Storage. Indicate how you want the system to organize put-away of inventory in your warehouse storage locations.

Yes: The system completely fills one location before moving on to another during put-away.

No: Other factors control put-away, such as the ability to place the entire stock to be put away in a single location.

You can specify optimized storage separately for the warehouse and for individual storage location groups within the warehouse. You can, therefore, have different combinations of optimized storage settings at warehouse and SLG level.

See “About Optimized Storage” on page 57 for more details about optimized storage.

Note You normally minimize the number of put-away transactions, which requires the No setting for optimized storage at both levels. Only when your warehouse is very full do you want to use optimized storage, so that the system tries to find locations to put away the inventory by examining the available space within each available location, without regard for the number of put-away transactions.

Transaction Search Window. To speed up processing, some put-away algorithms consider the last location, the last item, the last lot/serial, or the last reference used for put-away when that same item, lot, or reference is received again. The algorithm does this by searching backwards through previous transactions.

You should limit the age of transactions that are searched in this way, because it is unlikely that the location found is still the most efficient for storage if the previous transaction is more than a few days old. Use this field to specify the number of days that the algorithms should search backwards for previous transactions relating to the current item.

Example Set this value to 1 if you want the algorithms to search only the transactions that were created today or yesterday.

Check Digits. Enter Yes to specify that entry of the check digit defined for a location is required to confirm movement of stock to that location. You can specify the use of check digits individually for locations within each storage location group. Enter No if check digit entry is not required.

This field defaults to the storage location groups that you set up within this warehouse.

Fail Status. When the quantity confirmed is less than the expected quantity, you can fail the transaction. When a transaction fails, the system changes the status of the remaining stock in the source location to the Fail Status you define here. The Fail Status must be defined in Inventory Status Code Maintenance (1.1.1).

Example Consider a transaction of 10 items where only 9 are confirmed because the remaining item is damaged. If you fail the transaction, the remaining item in the source location changes its status to the Fail Status you define. If the original status was GOOD, and the corresponding Fail Status is BLOCKED, this item takes the BLOCKED status.

Hold Time (Minutes). When confirming movement using Movement Confirmation By Order (4.8.3), you can generate a hold, which prevents any receipt or issue in that location for a certain period of time. When confirming with the Generate Hold field set to Yes, a hold on that location is created in the source location for a duration equivalent to the Hold Time field entered at the Warehouse Maintenance level. It is used when some action must be taken on the source location before it can be used again by another process. The Hold Time field is set in Minutes.

Occasionally, the quantity available in a location is lower than the task quantity; for instance, because of an inventory error. Set the Repick Option, Completion Option, and Fail Option so that the RF displays any or all of the following options when the quantity to pick is less than the total quantity. When the user using batch picking enters a quantity that is less than the total quantity, the system displays the following prompt:

```
Other scan?
```

If the user specifies No because the quantity at the location is less than the quantity needed for the actual pick, any or all of the options display, depending on how you set the three option fields.

Completion Option. This field indicates if a transaction must be confirmed or stay unconfirmed when the transaction quantity is changed. In some cases, on RF, a pop-up window appears where this field can be changed. Different setup values are:

0	Always complete
1	Default to complete

2 Default to NOT complete

3 Never complete

Fail Option. Indicate if a transaction must be failed when the transaction quantity is changed. In some cases, on RF, a pop-up window appears where this field can be changed. Failing a transaction can have different consequences: create a count task in the source location and change the inventory status of the stock failed. Different setup values are:

0 Always fail

1 Default to fail

2 Default to NOT fail

3 Never fail

Repick Option. Indicate if a repick process must be started when the transaction quantity is changed. In some cases, on RF, a pop-up window appears where this field can be changed. Different setup values are:

0 Always repick

1 Default to repick

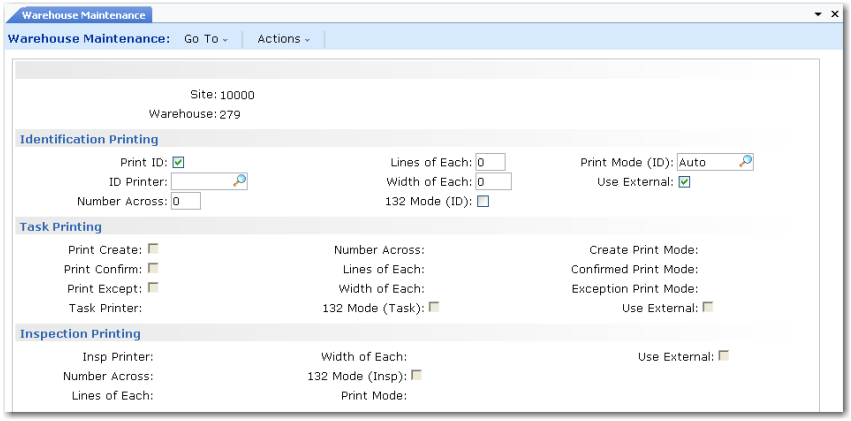
2 Default to NOT repick

3 Never repick

Printing

The Printing frame is shown in Figure 2.14.

Fig. 2.14
Warehouse Maintenance, Printing



The frame is divided into several areas: Identification, task, inspection, form, external, and miscellaneous printing. You can control the printing of transaction details in each of the areas. These cover the following:

- Printing an identification of inventory coming into the warehouse, such as a pallet label
- Printing transactions for tasks when they are created
- Printing transactions for tasks when they are confirmed
- Printing exceptions when changes have been made to the original transaction; for example, a change to the put-away location or quantity

- Printing transactions relating to external devices
- Printing QA sampling inspection tags
- Printing to a specific printer for inspection results

See “Printing” on page 193 for additional details about print setup.

Each type of printing has a common set of fields that define print-related settings. Only the settings for the identification print fields are described here; settings for the other print events are the same, but you can use different printers or print parameters to accommodate different print tags or locations as needed.

The fields relating to identification printing are as follows:

Print ID. Enter Yes to print an identification of inventory coming into the warehouse; otherwise, enter No. If you enter No, you can ignore the other fields in this group.

ID Printer. Enter the name of the printer on which the IDs are to be printed.

Number Across. Enter the number of identifications that are to be printed across each page.

Lines of Each. Enter the number of printed lines in each identification.

Width of Each. Enter the width in character positions of the lines of the identification.

132 Mode. Enter Yes if the identifications are to be printed in 132 character position mode; otherwise, enter No.

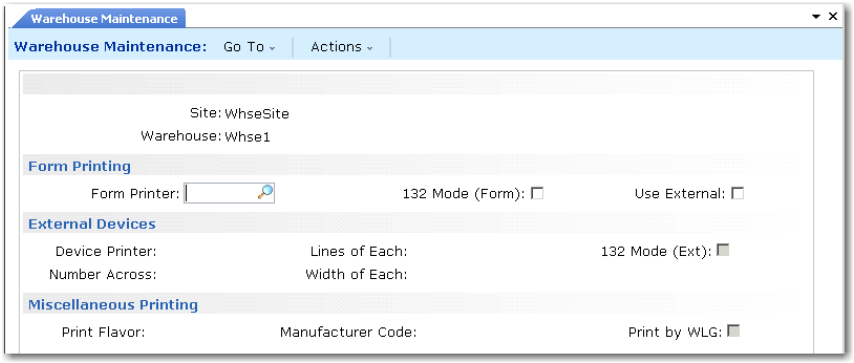
Print Mode. Select a print mode to determine when output should be printed. The options are as follows:

AUTO	The system prints identifications automatically as soon as they are created.
MANUAL	The system holds identification print requests until an online or batch process activates printing.
AUTOSIG	The system prints identifications automatically but holds them until a signal to print is received.

The signal to trigger AUTOSIG printing is normally a sign that the process creating print requests is complete and that all requested prints can be output at one time. This is particularly relevant when, for example, printing multiple transactions on the same task sheet.

Use External. Enter Yes if you want RDT users to be able to print the identifications on an external printer such as the local printer in a fork-lift truck. Enter No if the identifications must be printed on the ID printer.

Fig. 2.15
Additional Printing



The following group of fields in the Miscellaneous Printing frame covers general print format:

Print Flavor. This field defaults to each work location group you set up within the warehouse. Select the Print Flavor code to determine the format of the printed output. Print Flavor codes are set up in Generalized Code Maintenance (36.2.13).

- A. Use the default print formats.
- B. Use a print template. The system lets you create your own templates from ASCII files, described in the next section. See “Print Templates” on page 194.

Print by WLG. Indicate whether the sequence in the printed output is sorted by work location group.

If you are using barcode prefixes, update the Manufacturer Code field.

Manufacturer Code. Specify the code that identifies your company’s site. This code is a required component of serial shipping container codes (SSCC) used in some barcode pallet IDs. See “Serial Shipping Container Code (SSCC)” on page 187 for details.

Defining a Warehouse for a Site

After you activate QAD Warehousing in Warehouse Management Control (4.24), you do not have to link all locations to a warehouse. If a site is defined without any warehouse, the picking process is a standard system picking process. The algorithms will not be started.

If you define at least one warehouse in a site, active or not, all locations of that site have to be linked to a warehouse. Warehouse picking algorithms are started instead of standard picking rules.

This is useful if you have multiple sites but do not use warehouse functions at all of them. Generally, you do not want to make additional warehouse setup such as defining warehouses, linking locations to warehouses, and defining picking algorithms, unless these features are needed.

Warehouse Master List Maintenance

When an inventory transaction is created for a particular item, you should link a default warehouse to that item, specifically for that type of transaction.

Example You can specify that when purchased supplies of item X are ordered, they are normally received in warehouse A. This links transaction type RCT-PO for item X with warehouse A. However, after internal storage, transfers, and repackaging, sales order picking of item X is normally carried out in warehouse B. This links transaction type PICK-SO for item X with warehouse B.

In some cases, you can specify an alternate warehouse to cover situations where the first choice has insufficient stock. The first choice for picking item X can be warehouse B, but the second choice, if warehouse B runs out of stock, is to pick directly from warehouse A.

You achieve this by creating warehouse master lists. You identify each list by a unique name, and then specify the warehouses to associate with particular transaction types within that list. You can specify more than one warehouse for a given transaction type by giving each warehouse a sequence number. For that transaction type, the system tries to use the warehouses in the order of the sequence numbers you have assigned.

Note Warehouses in the warehouse master list provide default values. If you want to specify a different warehouse or location for the item you can override the warehouse that the system has offered from the warehouse master list. Warehouse master lists are completely optional; if an item has all its operations performed in the same warehouse, you can simply specify that warehouse as the default location for the item, without using a master list at all.

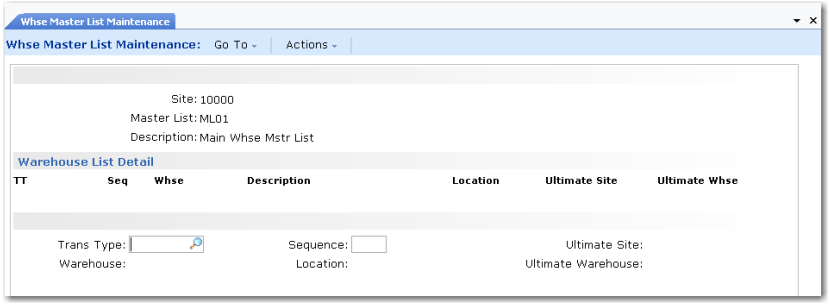
You set up warehouse master lists using Warehouse Master List Maintenance (4.1.5). You can then attach a warehouse master list to an item using Item Master Maintenance (1.4.1). Enter the name of the warehouse master list in the Location field for the item.

In summary, use a warehouse master list:

- To receive/issue stock from different warehouses.
- For inter-warehouse picking.
- For multiple warehouse picking. If the stock is not available in one warehouse, start looking in the next one.

Figure 2.16 illustrates Warehouse Master List Maintenance.

Fig. 2.16
Warehouse Master List Maintenance (4.1.5)



Enter values in the following fields:

Site. Enter the site associated with the warehouse master list.

Master List. To add a new list, enter the name of the list. To modify an existing list, enter the name of the list.

Description. Enter a description of the master list. Description displays in the lookup to help you select the required list, either for future modification or when attaching lists to items.

Trans Type. Enter the transaction type code for which you want to specify one or more default warehouses.

Warehouse. Enter the name of the warehouse you want to default to this sequence number and this transaction type.

Sequence. Enter a sequence number. You can specify one default warehouse for each sequence number. The lowest sequence number is the first warehouse that the system tries to use for this transaction type.

Location. Enter the location to display from the master list. See the discussion below for more information about the Location field.

Ultimate Site. If the transaction type relates to inter-warehouse picking where you pick in one warehouse and transfer to a different warehouse before issue, enter the site for the final issuing warehouse. Otherwise, leave this field blank.

Ultimate Warehouse. If the transaction type relates to inter-warehouse picking, enter the final issuing warehouse. Otherwise, leave this field blank.

Use the Location field to minimize the number of transactions created. For instance, specify a location such as a receipt dock instead of a warehouse for receipt transactions.

When the receipt is into a warehouse, the inventory is moved next to the location determined by the first step of the internal routing linked to the receipt movement. This is generally the receipt dock. From there, a transaction is created to move the stock from the dock to the destination location, which is calculated by a put-away algorithm.

This means that five system transactions are created:

- RCT-PO in the dummy warehouse
- ISS-TR from the dummy warehouse
- RCT-TR in the dock
- ISS-TR from the dock
- RCT-TR in the destination location

Note The last two are created after confirmation only.

If, instead, you use a location such as the dock, and not a warehouse, the system makes the initial receipt (RCT-PO) in this location and the system creates a task to move it from the dock (ISS-TR) to the destination location (RCT-TR), which means three transactions only. This can make a significant difference in performance and disk usage.

Warehouse Report and Inquiry Functions

Table 2.1 lists report and inquiry options available from the Warehouse menu.

Table 2.1
Warehouse Reports

Program	Description
Warehouse Report (4.1.3)	This option lets you select a range of sites and warehouses, and then specify where you want the report results printed or displayed. The report shows the current values of the fields that have been set up for the selected warehouses.
Whse Master List Report (4.1.7)	This option lets you select a range of sites and warehouse master lists, and then specify where you want the report results printed or displayed. The report shows the current entries that have been set up for the selected warehouse master lists.

Chapter 3

Defining Internal Routings

The following topics explain the QAD Warehousing concept of internal routing groups and internal routings. They also describe how you can use the Routing Maintenance functions to set up and assign routing groups and routings.

About Internal Routings 44
Describes the basic functions of Internal Routings, with examples.

Internal Routing Group Maintenance 46
Describes how to use the Internal Routing Group Maint (4.2.1) frame.

Internal Routing Maintenance 48
Explains how internal routing groups can be linked together and defined using Internal Routing Maintenance (4.2.5).

Internal Routing Assignment Maintenance 52
Explains how to use Internal Routing Assignment Maintenance (4.2.9) to link transaction types to internal routings.

Internal Routing Reports 54
Lists and describes report options from the Routings menu.

About Internal Routings

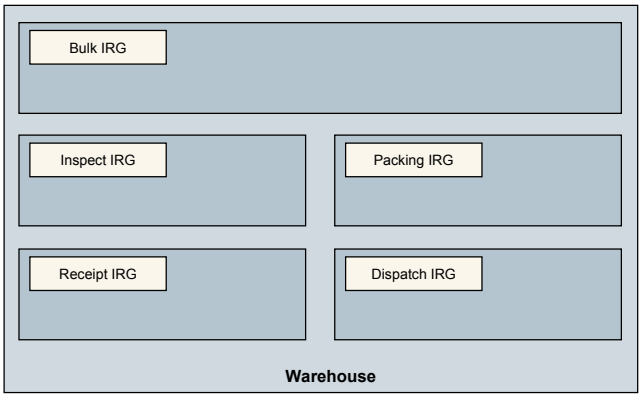
QAD Warehousing offers great flexibility regarding the way you handle inventory movements. Any inventory transaction involves a particular item, a particular warehouse, and a particular transaction type such as receipt, transfer, or issue. You can distinguish between items that originate from a particular supplier, or that are destined for a particular customer. The particular combination of these factors creates a special set of requirements for the way the inventory movement is handled.

Example You can have one very trustworthy supplier of an item whose reliability is such that you do not need to route supplies of the item through an inspection stage. Another supplier of the same item, however, could be less reliable and you therefore, need to inspect all items from this source before putting them away in the warehouse.

Internal routings within the system provide the flexibility to handle such situations. You can set up as many internal routings as you need. Each routing specifies a particular path through different warehouse areas. The first step is to define the different warehouse areas as internal routing groups. Then set up internal routings, each of which describes a path consisting of a sequence of internal routing groups. Finally, assign the appropriate internal routing to each transaction type, combined, where appropriate, with particular items, item types, or addresses.

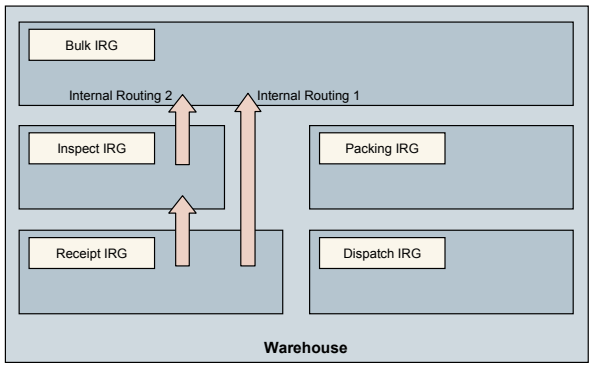
Figure 3.1 shows a simple arrangement of internal routing groups within a typical warehouse.

Fig. 3.1
Internal Routing Example



The two internal routings would work as shown in Figure 3.2.

Fig. 3.2
Internal Routing Example



Internal routing 1 takes the items directly to Bulk storage from the receipt area, while internal routing 2 takes the items first to the Inspect area, and then to the Bulk storage area.

Internal Routing Definition

There are two aspects to the definition of an internal routing:

- An internal routing is a list of steps that specify the path inventory should follow through the warehouse.
- An internal routing is the means by which you specify the properties for inventory transactions.

Note Although you can also specify transaction properties for a work location group, it is important that you always specify the properties you require for inventory transactions as part of the internal routing.

You can specify internal routings that consist of a single step. Such an internal routing would represent a movement within the IRG, and would be used to specify the transaction properties, such as the options for making changes to the original transaction.

You could also create a simple internal routing with two steps, such as:

10	Receipt
20	Bulk

Each step has transaction properties specified, but only one transaction is present: the movement from the Receipt IRG to the Bulk IRG. In all such cases, the properties for the transaction are taken from the second step. A three-step internal routing has two transactions. The second step of the IR specifies the properties for the first transaction, and the third step specifies the properties for the second transaction.

You can have two identical steps in an internal routing. Use this to avoid creating any transaction but complete other tasks, such as printing a label.

Example During work order receipt, you want to receive the pallets in the production area without moving them immediately. If you do not define any internal routing for these RCT-WO movements, a message "No internal routing could be found" is displayed at receipt. However, the result is the expected result: no transaction is created to move the pallet from the production area. To avoid the warning message, define two identical steps from PROD to PROD. This avoids any task creation and does not cause any warning message. However, print of a pallet ID is still possible, if set up in the second step of the internal routing.

Functional and Non-functional Routing Groups

When you define each of your internal routing groups within the warehouse, one of the fields you set indicates whether the area is functional. The term *functional* refers to areas of a warehouse that perform some specific function; examples are receipt and dispatch areas.

The difference between functional and non-functional areas relates to the way that the system chooses a location within the internal routing group when inventory is moved into the area.

- In functional areas, the system uses location-find algorithms to select locations where the capacity of the location and the size of the inventory are not relevant. Location-find algorithms can make use of other inventory management criteria, such as ensuring that all picks for a sales order are kept together, ready for dispatch.
- In non-functional areas, put-away algorithms are used to select locations based on the capacity of the location and the size of the inventory. These are the standard criteria used in warehouse storage areas.

Be careful when defining your internal routing groups to make sure that you set the Functional field according to the type of processing you want for the area.

Note Some common mistakes result from a wrong setup of this Functional field. For instance, if you define an IRG as non-functional and do not define any capacity, the put-away process does not work. Another common mistake is to define a put-away algorithm for a functional area, instead of a location-find algorithm or the opposite. This causes a no source location could be found or no destination location could be found error.

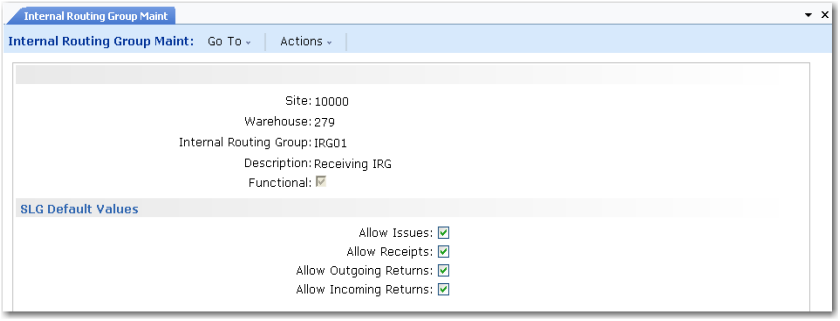
Internal Routing Group Maintenance

When you have defined your warehouse, the next step is to set up all the internal routing groups (IRGs) within that warehouse. You do this using Internal Routing Group Maintenance (4.2.1). This lets you define a name and a description for each area in the warehouse, and to define whether the area is functional. See "Functional and Non-functional Routing Groups" on page 46.

You can also specify values relating to issues, receipts, and returns that default to storage location groups within the internal routing group.

Internal Routing Group Maintenance (4.2.1) is shown in Figure 3.3.

Fig. 3.3
Internal Routing Group Maint (4.2.1)



Enter values in the following fields:

Site. Enter the name of an existing site.

Warehouse. Enter the name of the warehouse in which you want to maintain IRGs.

Internal Routing Group. Enter the name of the internal routing group (IRG) that you want to modify or create.

Description. Enter a description of the internal routing group. This is displayed in the lookup when you select the required internal routing groups for each of the sequence steps that define an internal routing.

Functional. Enter Yes if this internal routing group is a functional area, such as receipt or dispatch, in which the system uses location-find algorithms to select locations when stock is moved into the area. Enter No if this is a non-functional area, such as general storage, in which the system uses put-away algorithms to select locations when stock is moved into the area.

Note You normally need only one IRG, or at the most two, for bulk or general storage: that is, one non-functional IRG. You use storage location groups to define the different types of area within this main storage grouping.

SLG Default Values

The fields in this frame relate to the permitted movement of stock into and out of locations in the area. The values you choose for these fields are not applied directly, but default to all the storage location groups you set up within this internal routing group.

Allow Issues. This field controls whether inventory can be issued out of the system from locations in this area. Generally, you limit issues to specially designated areas, such as Goods-Out. Enter Yes if stock can be issued; otherwise, enter No.

Allow Receipts. This field controls whether inventory can be received from outside the system into locations in this area. Generally, you limit receipts to specially designated areas, such as Goods-In. Enter Yes if stock can be received; otherwise, enter No.

Allow Outgoing Returns. This field controls whether inventory can be issued from locations in this area as part of a returned receipt. Generally, you limit outgoing returns to specially designated areas, such as Goods-In Returns or Rejects. Enter Yes if stock to be returned to a supplier can be issued from locations in this area; otherwise, enter No.

Allow Incoming Returns. This field controls whether inventory can be received into locations in this area as part of a returned issue. Generally, you limit incoming returns to specially designated areas, such as Goods-Out Returns or Rejects. Enter Yes if stock returned from a customer can be placed in locations in this area; otherwise, enter No.

When you are modifying an existing internal routing group, if you change any of the SLG default values, the system displays the following message:

```
CHANGE ALL MATCHING STORAGE LOCATION GROUPS? yes/no
```

Because the values you enter for the internal routing group act as defaults for all the storage location groups within the IRG, the system lets you make the same change to the related SLGs within the IRG. Enter Yes to change the related SLG field values; otherwise, enter No.

Internal Routing Maintenance

When you have defined the internal routing groups (IRGs) within a warehouse, you can link specific sequences of IRGs together to form internal routings. Each step, or sequence, within an internal routing defines the IRG to which the inventory is next moved. For each sequence step within an internal routing, you also specify a number of fields that control how the inventory is processed as it reaches that point in the sequence.

Default values display form most fields based on settings in Warehouse Maintenance. You can accept the default values or override them with new values.

Remember that a three-step sequence represents two inventory transactions. For example:

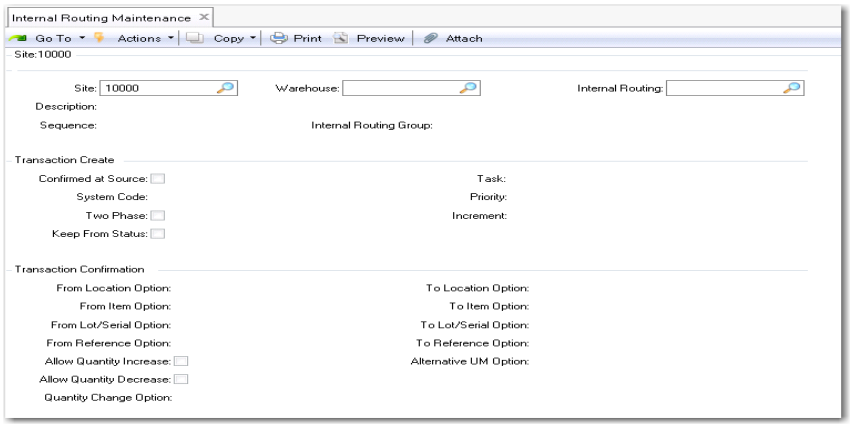
10	Receipt
20	Inspect
30	Bulk

The first inventory transaction is the movement from Receipt to Inspect. The properties for this transaction are defined in IR sequence step 20. The second inventory transaction is the movement from Inspect to Bulk. The properties for this transaction are defined in IR sequence step 30.

See “Warehouse Maintenance” on page 22.

You define internal routings using Internal Routing Maintenance (4.2.5), shown in Figure 3.4.

Fig. 3.4
Internal Routing Maintenance (4.2.5)



Enter values in the following fields:

Site. Enter the name of an existing site.

Warehouse. Enter the name of the warehouse in which you want to maintain internal routings.

Internal Routing. To modify the fields for an existing internal routing, enter its name. To create a new internal routing, enter a new name for the routing.

Description. Enter a description of the internal routing. This is displayed in the lookup when you select internal routings for assignment to transaction types within the warehouse.

Sequence. Each internal routing consists of a number of steps, identified by a sequence number. To make it easier to add steps within the sequence later, standard practice is to number the sequences as 10, 20, 30 rather than 1, 2, 3. The process of setting up an internal routing consists of entering a sequence number in the Sequence field, entering the relevant internal routing group in the next field, and then specifying the processing required for this sequence step.

Internal Routing Group. Enter the name of an existing IRG.

Transaction Create

The fields in this frame determine the characteristics of stock movement transactions that are created in this sequence step of the internal routing. The initial values default from Warehouse Maintenance, but you can change the values for individual sequence steps of your internal routings.

See the field descriptions for the Transaction Create Defaults frame in Warehouse Maintenance for details about these fields.

See “Transaction Create Defaults” on page 24.

Transaction Confirmation

The fields in this frame determine the characteristics of the confirmations of stock movements relating to this step in the internal routing sequence. The initial values default from Warehouse Maintenance, but you can change the values for individual sequence steps of your internal routings.

See the field descriptions for the Transaction Confirmation Defaults Frame in Warehouse Maintenance for details about these fields.

See “Transaction Confirmation Defaults” on page 26.

The site, warehouse, and internal routing details, and the current Sequence number and IRG, remain displayed in the top part of the frame.

Specifying Non-System-Selected Pallets/References

Occasionally, you may need to specify a pallet or reference that holds the same item other than the one the system selected to fill an order. You can specify a substitute pallet or reference in the same location or another location by setting fields in the Transaction Confirmation Defaults frame:

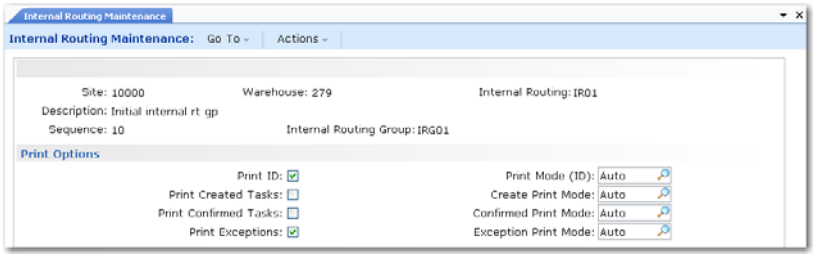
- From Location Option
- From Lot/Serial Option
- From Reference Option
- Expire Date

For more information, see page 29.

Pick Options

The Print Options frame shown in Figure 3.6 contains fields where you define the picking options that are performed for this sequence step in the internal routing.

Fig. 3.5
Internal Routing Maintenance, Print Options



Repick Type. Specify the transaction type that should be used if a repick is required. The entry you make here defaults to internal routings you set up in this warehouse.

It is possible when confirming an inventory transaction, if allowed by the quantity change fields described above, to confirm a quantity picked less than the quantity expected. In this case, warehouse staff can set a field at confirmation to allow a repick of the missing items. For the repick, the system uses an internal routing and a picking algorithm for the transaction type you specify in the Repick Type field.

Note This repick transaction type must start with "PICK-" and must be defined in Transaction Type Maintenance (4.7.1). If you leave the Repick Type field blank, the repick uses the same transaction type as the original picking.

Allow Switch Lot Ref. Enter Yes to activate the switch lot/serial and reference functionality by warehouse and internal routing.

Setting this field to Yes lets you use QAD Warehousing and RF functionality to specify a pallet or reference other than the one the system selected to fill an order.

For more information, refer to "Specifying Non-System-Selected Pallets/References" on page 29.

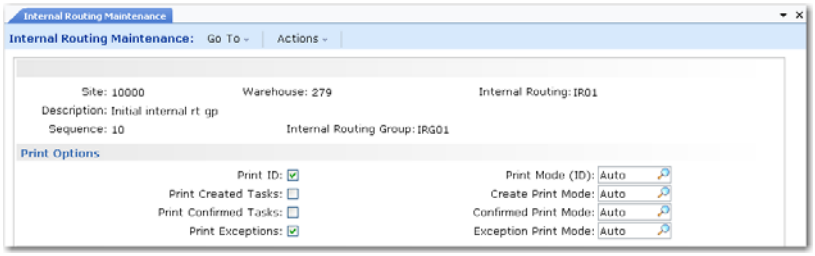
Expire Date (Days). Enter the maximum number of days (0 to 9999) that the expiration date of the new pallet or lot/serial number can differ from the expiration date of the original pallet or lot/serial number. For example, if you enter 5, and the expiration date of the original pallet is 12/1/2008, then the expiration date of the new pallet must fall between 12/1/2008 and 12/6/2008. The default value for this field is 0.

Note If you enter 0 (zero), then the expiration date of the original pallet or lot/serial number must match the expiration date of the new pallet.

Print Options

The Print Options frame shown in Figure 3.6 contains fields where you define the printing operations that are performed in relation to inventory transactions for this sequence step in the internal routing.

Fig. 3.6
Internal Routing Maintenance, Print Options



The types of printing are:

- ID, identification of the inventory
- Created tasks
- Confirmed tasks
- Exceptions, when changes have been made to the original transaction

For each of these, you can enter Yes to specify whether the element is printed. The initial values default from the Printing frame in Warehouse Maintenance, but you can change the values for individual sequence steps of your internal routings. See the field descriptions in Warehouse Maintenance for details on these fields.

See “Printing” on page 37.

Miscellaneous Options

The fields in the Miscellaneous Options frame affect the operation of this sequence step in the internal routing.

Fig. 3.7
Internal Routing Maintenance, Miscellaneous Options



Mode. Specify how processes defined by the routing are initiated. The initial value defaults from Warehouse Maintenance, but you can change the value for individual sequence steps of your internal routings.

The options are as follows:

AUTO	The process in the routing sequence is started automatically as soon as the previous process is complete.
MANUAL	The process is only started when it is manually selected for processing.

New Unit of Measure. This field is used to specify the new unit of measure to be used for items upon reaching this step in the internal routing sequence, only if option 6 has been selected for the Alternate UM option.

Example You can split a pallet into boxes on arrival at a particular area of your storage. As it is unlikely that all your items use the same UM, you would normally use this field in assignments that specify a particular item number or item type.

Enter the existing new unit of measure.

See “Alternate Unit of Measure Maintenance” on page 99.

Use Alternate Unit of Measure Maintenance (4.5.1) to define units of measure and to specify the action that must be taken when changing an item’s UM.

See “Alternate Unit of Measure Maintenance” on page 99.

Clear Shortages. Enter Yes to cause the shortage clearance algorithms to be run before a location is identified to receive the inventory. These algorithms look for orders that were not fully satisfied in the original picking because of insufficient inventory levels. Enter No if you do not want the shortage clearance algorithms to be run.

Create Shipper. Enter Yes to create standard shippers. You can then use standard shipping functions to consolidate and print these shippers as shippers, containers, or bills of lading. Standard shipping functions can also be used for bulk shipment of, for example, multiple sales orders that have been combined onto a single shipper. Enter No if you do not want to create shippers.

Note QAD Warehousing and RF shipper functionality do not support QAD Enterprise Edition core shipper validation functionality.

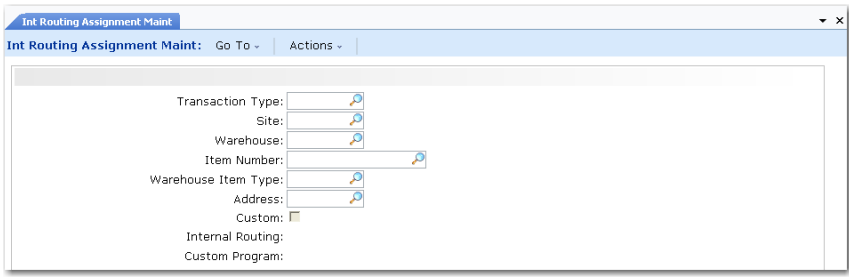
Check Inspection. Entering Yes causes the Inspection (QA) algorithm to be run to determine whether inspection must take place. See “Quality Inspection Internal Routings” on page 449.

Internal Routing Assignment Maintenance

When you have defined the internal routings within a warehouse, you can link specific transaction types to particular internal routings. You can also specify a combination of a transaction type with an item, an item type, or an address relating to a supplier or customer, so that the internal routing is used when that particular combination occurs.

You link transaction types to internal routings using Internal Routing Assignment Maintenance (4.2.9), as shown in Figure 3.8.

Fig. 3.8
Internal Routing Assignment Maintenance (4.2.9)



Enter values in the following fields:

Transaction Type. Enter the transaction type to which you want to assign an internal routing. You can maintain transaction types using Transaction Type Maintenance (4.7.1).

Site. Enter the name of the site.

Warehouse. Enter the name of the warehouse for which you want to assign internal routings.

Item Number. If you want to assign an internal routing to a combination of transaction type and item, enter the item number here. If you leave this field blank, the assignment is valid for all items.

Warehouse Item Type. If you want to assign an internal routing to a combination of transaction type and warehouse item type, enter the item type code here. If you leave this field blank, the assignment is valid for all item types.

The warehouse item type codes are a way of grouping together items that have similar properties. You assign the codes to items using the Item Maintenance options.

See “Multi-Level Item Maintenance” on page 82.

Address. If you want to assign an internal routing to a combination of transaction type and address, enter the address code here. If you leave this field blank, the assignment is valid for all addresses. For receipt transaction types, the address relates to the supplier of the item being received; for issue transaction types, the address relates to the customer to whom the goods are to be dispatched.

Custom. Enter Yes in this field if you want to use a custom program; otherwise, enter No. If you enter Yes, the system skips the Internal Routing field and moves to the Custom Program field.

Use custom assignments when there is more than one possible assignment for a transaction type. You create the custom program to determine which internal routing the system should use. When you run the custom program, you must provide the input fields that enable it to decide which IRG to assign.

Internal Routing. Enter the name of the internal routing you want to assign to this transaction type.

Custom Program. If you entered Yes at the Custom field, enter the name of the Custom Program to run for this transaction type.

Resolving Conflicting Routing Assignments

Every internal routing assignment involves a transaction type, a site, and a warehouse. You can also specify an item number or an item type and an address. When you use these additional assignment options, there can be conflicts between different assignments.

Example You could assign one internal routing for receipt of item ABC, and a different internal routing for receipts from the address for supplier XYZ. The system has to decide which internal routing to use when you have a receipt of item ABC from supplier XYZ.

In such situations, the system uses the following sequence to look for a match between the specified conditions:

1. Look for a match of both item number and address
2. Look for a match of both item type and address
3. Look for a match of item number only
4. Look for a match of item type only
5. Look for a match of address only
6. Use the specified transaction type, site, and warehouse—no other conditions

Using these rules, you can see that the internal routing for receipt of item ABC takes precedence over the internal routing for receipts from the address for supplier XYZ.

Internal Routing Reports

Table 3.1 lists report options available from the Routings menu.

Table 3.1
Internal Routing Reports

Program	Description
Internal Routing Group Report (4.2.3)	This option lets you select a range of sites, warehouses, and IRGs for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each IRG.
Internal Routing Report (4.2.7)	This option lets you select a range of sites, warehouses, and internal routings for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each internal routing.
Internal Routing Assignment Report (4.2.11)	This option lets you select ranges of transaction types, sites, warehouses, item numbers, item types, and addresses to define the internal routing assignments for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each internal routing assignment.

Chapter 4

Defining Location Groups

The following topics explain the purpose of grouping locations into both storage location groups and work location groups and describe how you can use the Location Group Maintenance functions to set up your groups:

About Location Groups 56
Describes the ways to subdivide warehouse areas.

Storage Location Group Maintenance 59
Describes how to use Storage Location Group Maintenance (4.3.1) to set up storage location groups (SLGs).

Storage Location Group List Maintenance 63
Explains how and when to use Storage Location Group List Maintenance (4.3.5) to set up SLG lists.

Work Location Group Maintenance 64
Explains how and when to use Work Location Group Maintenance (4.3.9) to set up work location groups (WLGs).

Inter-Work Location Group Maintenance 67
Describes how to use Inter-Work Location Group Maintenance (4.2.21) to specify field settings for various combinations of movements between WLGs.

Location Group Reports 69
Lists and describes Location Group Report options.

About Location Groups

QAD Warehousing offers you two parallel ways of subdividing the areas within your warehouses:

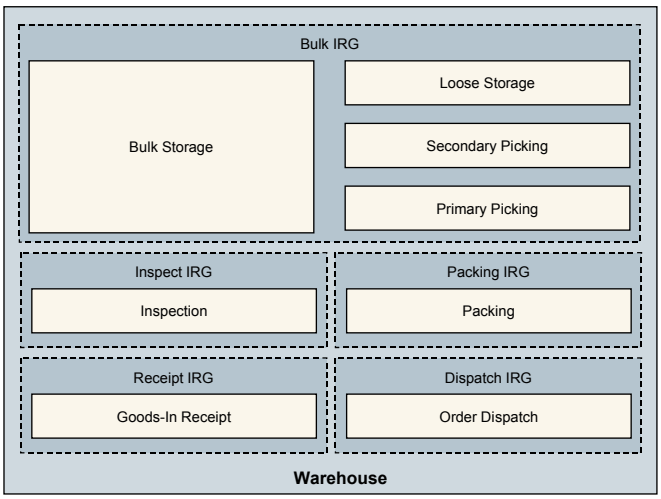
- Division into different types of storage areas. This is achieved by defining different storage location groups (SLGs) within each internal routing group (IRG), and then defining the individual storage locations within each SLG.
- Division into different types of work areas. This is achieved by defining different work location groups within each warehouse, and then identifying which work location group each storage location belongs to.

Storage location groups group storage locations that have a common storage function, such as a primary picking area, or a bulk storage area for a particular type of pallet. The hierarchy relating to storage functions is site – warehouse – internal routing group – storage location group – location.

Work location groups group storage locations that have common working practices, such as access using fork-lift truck, or that have a common physical location, such as all storage locations on the first floor of the building. It is also used if several printers are used and assigned to different warehouse areas. The hierarchy relating to working practices is site – warehouse – work location group – location.

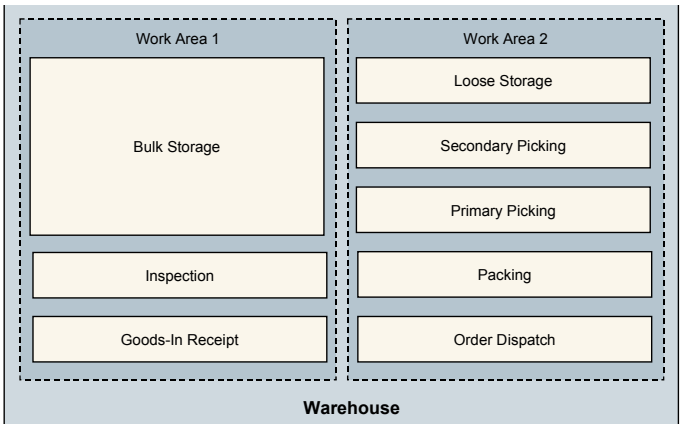
Figure 4.1 shows a simple arrangement of storage location groups within IRGs in a warehouse.

Fig. 4.1
Storage Location Groups



Each IRG can contain one or more storage location groups. Figure 4.2 shows the same locations, but now grouped into two work location groups.

Fig. 4.2
Work Location Groups



Note Work location groups do not have to contain entire SLGs; work Area 1 could include half of the Loose Storage area, with the other half being in Work Area 2. The arrangement of the work location groups is entirely independent of the arrangement of the storage location groups and internal routing groups.

The options you use for setting up and maintaining storage location groups and work location groups are both on the Location Menu (4.3).

About Optimized Storage

You can specify optimized storage separately for the warehouse and for individual storage location groups within the warehouse. You can, therefore, have different combinations of optimized storage settings at warehouse and SLG level.

Note You normally want to minimize the number of put-away transactions, which requires the No setting for optimized storage at both levels. Only when your warehouse is very full do you want to use optimized storage, so that the system tries to find locations to put away the inventory by examining the available space within each available location, without regard for the number of put-away transactions.

At the SLG level, the Optimized field determines whether the system sorts locations within the SLG in ascending or descending capacity, when looking for locations in which to put away stock.

If the warehouse is optimized, the order in which the system selects SLG locations is as follows:

- First, the non-optimized SLGs and locations that have the highest capacity
- Second, the optimized SLGs and locations that have the least capacity

If the warehouse is not optimized, the system considers the SLGs in the order specified in the storage location group list sequences. Within each SLG, the system looks for locations as follows:

- If the SLG is optimized, the system looks for the location with the smallest capacity.
- If the SLG is not optimized, the system looks for the location with the highest capacity.

Non-optimized storage location groups offer a large performance advantage. The system sorts the location with the highest capacity first, which reduces the number of movements that must be made in the warehouse, and terminates the program as soon as a suitable location has been found

for all the inventory. If the warehouse is also non-optimized, the put-away program could end with the first SLG to be considered, without having to consider the other SLGs in the list. However, if the warehouse is optimized, the system must consider all the locations in order to sort them.

How Optimization Works

The way in which optimization is carried out depends on the combination of warehouse and SLG optimization. There are four possible combinations.

Fig. 4.3
Optimization 1

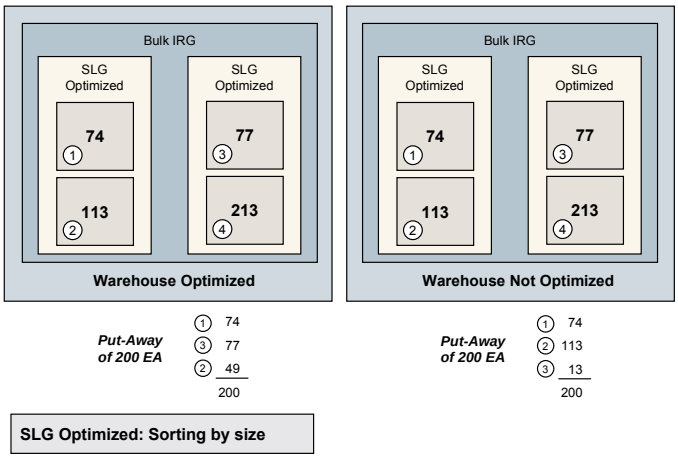
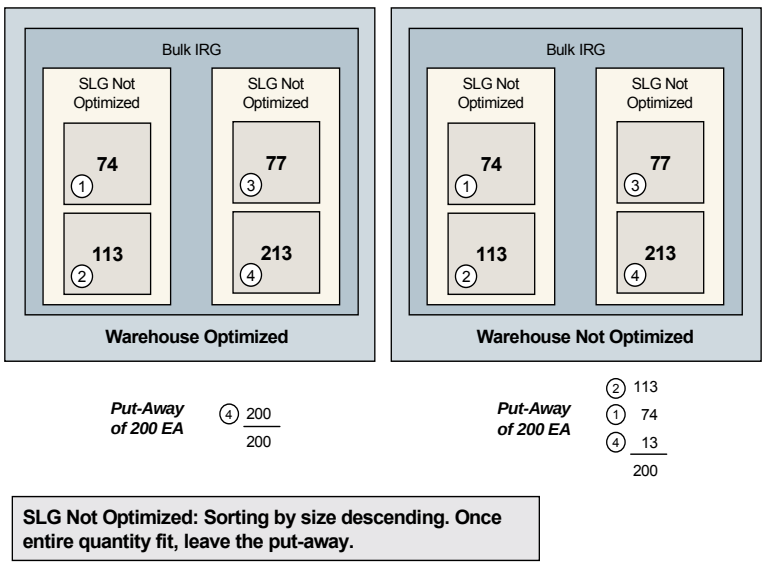


Fig. 4.4
Optimization 2



There is a trade-off between optimization and the performance of QAD Warehousing. The more optimized locations in a warehouse, the slower the system runs. Conversely, the lower the optimization, the faster the system runs.

When the system is first set up and stock levels are low, you usually have no need for optimization. It is only as the number of locations and stock levels grows that optimization is useful.

A general recommendation for a balance of locations to performance is 500 SLGs/locations in a warehouse.

The following table compares how the different combinations of optimization affect three different benchmarks of system performance. The benchmarks are:

1 Number of transactions

2 Stock levels

3 System performance

		Warehouse Optimized	Warehouse Not Optimized
SLG Optimized	Good	2	2
	Medium		3
	Poor	3, 1	1
SLG Not Optimized	Good	1	3
	Medium		1
	Poor	2, 3	2

How to Optimize a Warehouse

Use Warehouse Maintenance (4.1.1) to set the Optimized Storage field to Yes.

See page 35.

In Storage Location Group Maintenance (4.3.1), set the Optimized Storage field to Yes. To optimize a group of SLGs, first enter the name of an SLG list in the Storage Loc Group field.

See page 62.

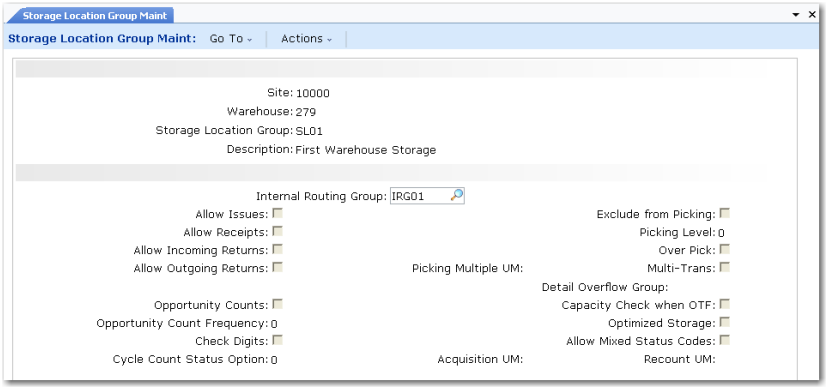
Note You can optimize both warehouse and storage location groups; or optimize the warehouse but not the storage location groups; or optimize the storage location groups but not the warehouse.

Storage Location Group Maintenance

When you have defined your warehouse and its internal routing groups (IRGs), the next step is to set up all the storage location groups (SLGs) within each IRG in the warehouse. You do this using Storage Location Group Maintenance (4.3.1). This lets you define a name and a description for each storage location group, and to define fields relating to the control of inventory movements, cycle counts, and picking for locations in the SLG.

Storage Location Group Maintenance (4.3.1) is shown in Figure 4.5.

Fig. 4.5
Storage Location Group Maintenance (4.3.1)



Enter values in the following fields:

Site. Enter the name of the existing site.

Warehouse. Enter the name of the warehouse in which you want to maintain SLGs.

Storage Location Group. To modify the fields for an existing storage location group, enter its name. To create a new storage location group, enter the name of the SLG.

Description. Enter a description of the storage location group.

Click Next to accept the site, warehouse, and storage location group details and move to the next frame.

Internal Routing Group. Enter the name of the existing IRG to which this storage location group belongs.

When you have specified the IRG, the system displays default values for most of the remaining fields in the frame. The defaults for the first four fields relating to allowing issues and receipts are taken from the default values that were entered for the IRG. The other defaults come from the default values entered for the warehouse.

See “Internal Routing Group Maintenance” on page 46.

For each SLG, you can accept the defaults or override them with new values.

See “Warehouse Maintenance” on page 22.

Allow Issues. This field controls whether inventory can be issued out of the system from locations in this SLG. Generally, you limit issues to specially designated areas, such as Goods-Out. Enter Yes if stock can be issued; otherwise, enter No.

Allow Receipts. This field controls whether inventory can be received from outside the system into locations in this SLG. Generally, you limit receipts to specially designated areas, such as Goods-In. Enter Yes if stock can be received; otherwise, enter No.

Allow Incoming Returns. This field controls whether inventory can be received into locations in this SLG as part of a returned issue. Generally, you limit incoming returns to specially designated areas, such as Goods-Out Returns or Rejects. Enter Yes if stock returned from a customer can be placed in locations in this SLG; otherwise, enter No.

Allow Outgoing Returns. This field controls whether inventory can be issued from locations in this SLG as part of a returned receipt. Generally, you limit outgoing returns to specially designated areas, such as Goods-In Returns or Rejects. Enter Yes if stock to be returned to a supplier can be issued from locations in this SLG; otherwise, enter No.

Opportunity Counts. Enter Yes to specify that staff can be requested to perform cycle counts while they are at locations within this storage location group; otherwise, enter No.

Warehouse staff perform opportunity counts at the SLG level only. If the quantity drops below a level defined in Item-Warehouse Maintenance (4.4.11) and if the OPC frequency is past the last OPC date, then staff can perform an opportunity count.

Opportunity Count Frequency. If you have entered Yes for Opportunity Counts, enter the frequency, in days, with which counts can be initiated. This field defaults to the locations that you set up within this SLG.

Check Digits. This field specifies whether check digits are to be used for locations that you set up within this storage location group. Enter Yes to specify that entry of the check digit defined for a location is required to confirm movement of stock to that location. You can specify the use of check digits individually for locations within each storage location group. Enter No if check digit entry is not required.

Cycle Count Status Option. Enter a number to define the action that should be performed on the inventory status upon confirmation of a recount or in-tolerance count in this storage location group. In Warehouse Maintenance, you set the default for each SLG in the warehouse. The options are as follows:

0	No status change.
1	Change to Location Status: The status of the inventory is changed to the default inventory status of the location.
2	Status change based on Fail Status: The status of the inventory is changed to the good status associated with the current fail status specified in the Warehouse Management Data frame in Inventory Status Code Maintenance (1.1.1). The frame displays only when QAD Warehousing is active.

See “Cycle Count Status Option” on page 34.

Exclude From Picking. Enter Yes if locations within this SLG are to be excluded from picking; otherwise, enter No. If you enter Yes, the other picking fields are not relevant. Generally, you exclude from picking all SLGs in your functional IRGs, such as receipt, inspect, pack, and dispatch.

Picking Level. You can assign a picking level number to each storage location group. You can set default start and end picking levels in Warehouse Maintenance, or by using Warehouse Transaction Type Maintenance (4.7.5). These start and end settings determine the picking levels to be used for the pick. The system then looks for inventory in the storage location groups that correspond to the specified range of picking levels.

Over Pick. This field specifies whether you can pick more stock from locations in this storage location group than is specified in the order. Enter Yes if over picking is allowed; otherwise, enter No.

Note The Over Pick setting at SLG level is taken into account only if the Control Over Pick at SLG field is set to Yes in Transaction Type Maintenance or Warehouse Transaction Type Maintenance.

This field works in conjunction with the Allow Split field to control whether stock can be picked from locations in the SLG in situations where the quantity required for the pick does not match the unit of measure in which the item is stocked in the location.

See “Control Over Pick at SLG” on page 144.

Example If a location contains boxes of 100 of the item, and the required picking quantity is 70 pieces, the following possibilities can be specified:

Over Pick	Allow Split	Result
Yes	Yes	Pick 70 by splitting a box
Yes	No	Over pick—take a box of 100
No	Yes	Pick 70 by splitting a box
No	No	No pick from this location

Picking Multiple UM. Enter the unit of measure (UM) multiples of which must be used when picking inventory from locations in this storage location group.

Example Inventory could be stored on pallets, with the pallets containing a number of boxes. Each box contains a number of individual items. You might want to allow splitting of the pallet, but restrict such splitting to multiples of whole boxes.

Multi-Trans. Specify whether the system should create multiple transactions when picking in multiples of the UM.

Example If BX (for Box) is the picking multiple UM, and a box contains 20 EA, for individual items, you have two ways of creating transactions when you pick 40 EA:

Setting	Effect
Yes	Two transactions each for 1 BX
No	One transaction for 40 EA

Detail Overflow Group. Specify a storage location group that the system should use if the locations of the current storage location group cannot contain any additional goods replenished from the main storage area. This overflow storage location group must also be defined in Storage Location Group Maintenance (4.3.1).

The overflow group can be used during wave replenishment when put-away algorithms 150 or 151 are being used.

See Table 8.5 on page 116.

Capacity Check when OTF. Indicate whether you want the system to verify if this location has sufficient capacity for items when warehouse staff initiate an on-the-fly transfer from the RF device.

A put-away algorithm never selects a location without sufficient capacity, but a forced transfer initiated from the RF can by-pass this check.

See “On-the-Fly Transfer” on page 243.

Optimized Storage. This field relates to the way put-away of inventory is organized in your warehouse storage locations. Enter Yes for optimized storage, in which the system completely fills one location before moving to another during put-away. Enter No if you want other factors to control put-away, such as the ability to place the entire stock in a single location.

See “About Optimized Storage” on page 57.

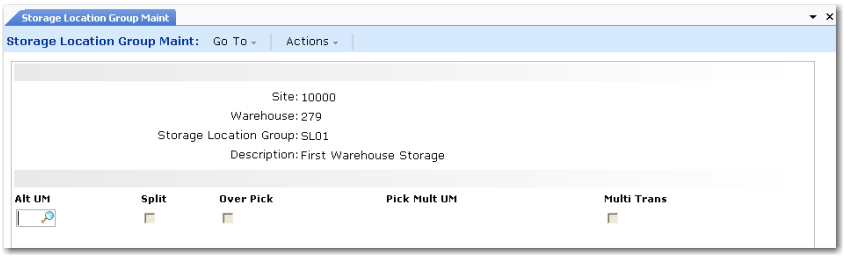
Allow Mixed Status Codes. This field determines whether a single location in this SLG can contain inventory with a mixture of different status codes. Enter Yes to allow mixed status codes; otherwise, enter No. This setting is used by put-away algorithms for all the locations you set up within this SLG.

Acquisition UM. The acquisition UM is used in conjunction with some of the options, such as option 13, of the Alternate UM option from the internal routing definition. This option sets the inventory record UM to the acquisition UM of the destination storage location group.

Recount UM. This field specifies the alternate UM that should result from recounts or in-tolerance counts of inventory in this storage location group. This applies mainly to recounts entered using the system's cycle counting functions, not the Cycle Count Generation options.

The second Storage Location Group Maintenance frame is shown in Figure 4.6.

Fig. 4.6
Storage Location Group Maintenance, Second Frame



The five fields in this frame define alternate units of measure to be used in relation to inventory in locations in this storage location group. You can specify more than one alternate UM by using more than one line in this frame.

Alt UM. Enter the two character identifier for the Alternate unit of measure.

Split. Enter Yes if splitting this alternate UM is allowed when picking from locations in this SLG. Enter No if splitting the UM is not allowed.

Over Pick. This field specifies whether you can pick more stock from locations in this storage location group than is specified in the order. Enter Yes if over picking in the alternate UM is allowed; otherwise, enter No.

Pick Mult UM. Enter the two-character identifier for the UM multiples which must be used when specifying the quantity to pick.

Multi Trans. Indicate whether the system should produce multiple transactions, one for each of the picking multiple UM, or a single transaction for the total number of items in the base UM.

Storage Location Group List Maintenance

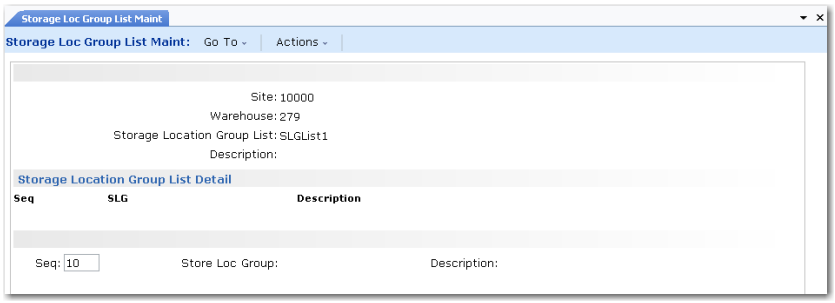
To control which storage location groups the system uses to put away particular items, you can specify a particular SLG for the item using Item-Warehouse Maintenance (4.4.11). If you have more than one SLG in which you might want to store the item, you can alternatively specify a list of SLGs. These lists specify the order in which you want the system to consider them for put-away of the item. You set up these SLG lists using Storage Location Group List Maintenance (4.3.5).

See “Multi-Level Item Maintenance” on page 82.

Note The system also considers the setting of the optimized field when considering the list of SLGs. See “About Optimized Storage” on page 57 for details.

Storage Location Group List Maintenance (4.3.5) is shown in Figure 4.7.

Fig. 4.7
Storage Location Group List Maintenance (4.3.5)



Enter values in the following fields:

Site. Enter the name of the existing site.

Warehouse. Enter the name of the existing warehouse in which you want to maintain storage location group lists.

Storage Location Group List. To modify the fields for an existing storage location group list, enter the name of the existing list.

To create a new SLG list, enter the name of the list.

Description. Enter a description of the SLG list.

Click Next to accept these entries and move to the list detail frame.

Seq. Enter a sequence number. You can specify one storage location group for each sequence number. The lowest sequence number is the first SLG that the system tries to use for put-away of the item.

SLG. Enter the name of the SLG for this sequence number.

Description . This field displays the description associated with the SLG. You cannot edit the description.

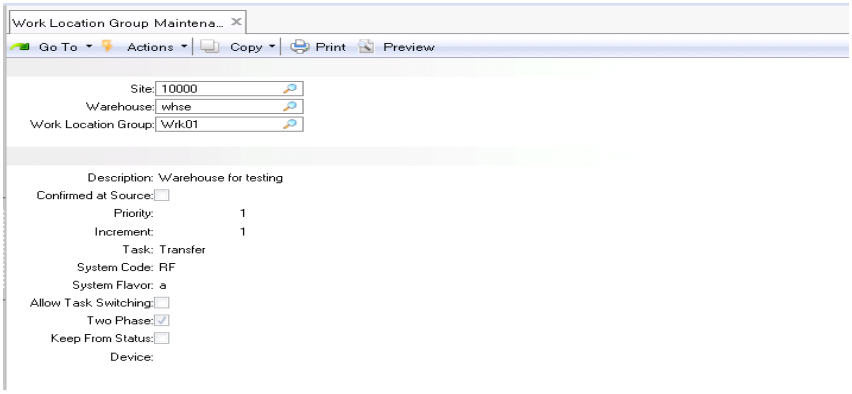
Work Location Group Maintenance

When you have defined your warehouse, its internal routing groups (IRGs), and storage location groups (SLGs), the next step is to set up all the work location groups (WLGs) within the warehouse using Work Location Group Maintenance (4.3.9). This lets you define a name and a description for each work location group, and to define fields relating to the WLG.

The main purpose of work location groups is to enable you to control which warehouse staff work in which areas of the warehouse using User- Work Location Group Maintenance (4.11.3.13). The second purpose is to define the cycle count and printing fields for each work area.

Work Location Group Maintenance (4.3.9) is shown in Figure 4.8.

Fig. 4.8
Work Location Group Maint (4.3.9)



Enter values in the following fields:

Site. Enter the name of an existing site.

Warehouse. Enter the name of an existing warehouse in which you want to maintain work location groups.

Work Location Group. To modify the fields for an existing work location group, enter its name. To create a new work location group, enter its name.

Click Next to accept the site, warehouse, and work location group and move to the second frame.

Description. Enter a brief description (maximum 24 characters) of the work location group.

Confirmed at Source. Enter Yes if transactions in this work location group are confirmed by the warehouse staff who initiate the stock movement. Enter No if transactions are confirmed by the warehouse staff who complete the stock movement at its destination. See “Confirmed at Source” on page 24.

Priority. This field assigns a priority value to transactions in this WLG. If no priority is assigned to the internal routing, RDTs select the highest priority task at the work location group as the next action. The lower the number you specify, the lower the priority.

Increment. This field specifies the increment that is added to a transaction’s priority as time elapses.

Task. Specify the task associated with any inventory transaction that is created in this WLG. Task codes are set up in Task Maintenance (4.11.1.1).

System Code. Specify the type of screen that confirms transactions in this work location group. Leave this blank for normal screens; enter RF for transactions confirmed using Radio Data Terminals (RDTs), also known as RFs.

System Flavor. Enter the code to define the style and format of screens to be used for displaying information in this work location group other than in the standard system frames. The Flavor codes are set up in Generalized Code Maintenance (36.2.13) and relate to display of information in situations such as fork-lift truck screens or Radio Data Terminals (RDTs).

Allow Task Switching. This field is used to specify for a work location group whether warehouse staff are allowed to switch to a different task. The setting of this field is important whenever any of the task confirmation fields has been set to allow a different value, for example, of a reference or lot/serial number, to that which was expected. You have to specify whether a user who enters a different reference is changing the value for the current task, or switching to another task.

Enter Yes to allow task switching. Upon entry of a different value, such as a reference, the system checks to see whether another task exists with the reference. Enter No to prevent task switching. On entry of a different value, assumes that the value is being changed for the current task.

Two Phase. Enter Yes to specify that inventory movements in this WLG are created in one step, the first phase, and confirmed in a second step, the second phase. Between the two phases, the stock is marked as being booked out of the first location and expected in the second location. However, the anticipated inventory levels are only confirmed when the stock is confirmed as arriving at the destination. If you enter No, inventory movements are created and confirmed in a single step (single phase). The default value that was set up in Warehouse Maintenance is initially displayed.

Note Two-phase operation is a much safer way of ensuring precision in inventory management. Single-phase operation should only be used in special circumstances.

Keep From Status. This field specifies whether, when an inventory transaction is created and confirmed, the inventory status of the transferred inventory retains its original value by entering Yes here, or takes its status from the new location by entering No here. The default value that was set up in Warehouse Maintenance is initially displayed.

Device. Enter the code to define the device to be used within this work location group, if applicable. If a single device code is not applicable, leave this field blank.

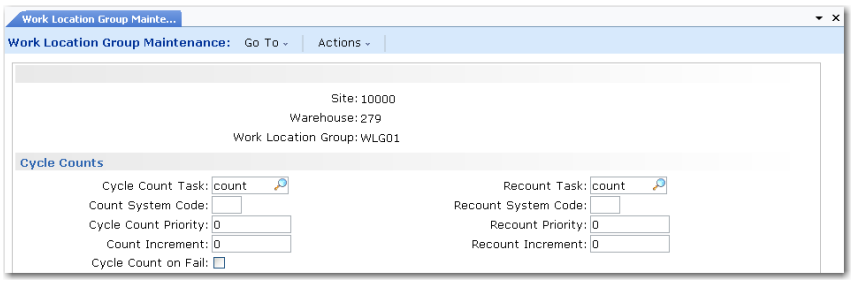
Reporting on Workload by WLG

You can use the Workload by WLG Browse (4.11.12.15) to display workload data by the work location group. You can display data for users, including pending, active, and total tasks, and time to complete tasks for the WLG in both man-hours and estimated hours. In .NET UI, you can also use the browse chart designer to create various charts of the data.

Cycle Counts

The WLG Cycle Counts frame is shown in Figure 4.9.

Fig. 4.9
Work Location Group Maint, Cycle Counts



The fields in this frame control the way cycle counts and recounts are performed in this work location group. The system initially displays default values set up in Warehouse Maintenance, but you can change these values for individual work location groups.

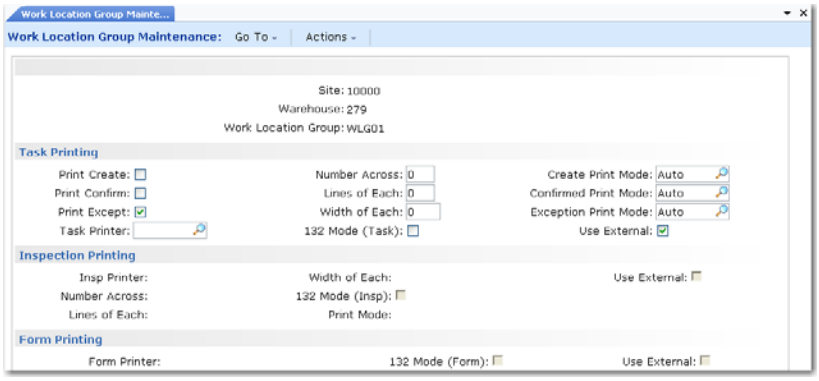
See the descriptions of the fields in the Cycle Count Defaults frame for details on how these fields work.

See “Cycle Count Defaults” on page 33

Printing

The Printing frame shown in Figure 4.10 contains fields where you define the printing operations that are performed in this work location group.

Fig. 4.10
Work Location Group Maint, Printing



The initial values default from the Printing frame in Warehouse Maintenance, but you can change the values. See the field descriptions in Warehouse Maintenance for details on these fields.

See “Printing” on page 37.

Print Setup for the RF

You specify printer options in Work Location Group Maintenance (4.3.9) so that RF users have access to a printer to collect the labels before they pick. Occasionally, RF users have dedicated RF printers for label printing. More often, though, each cart is equipped with a roll of pre-printed labels with unique IDs for the boxes or totes. The IDs are unique for the person and the warehouse. This method is much more economic than using RF printers.

Inter-Work Location Group Maintenance

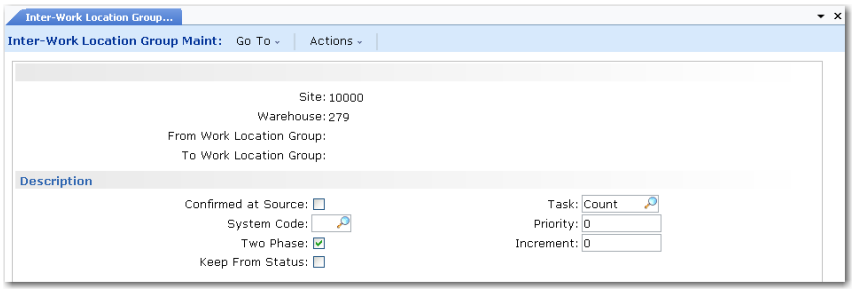
In situations where inventory movements between two work location groups are not defined by an internal routing. For example, when both WLGs are in the same internal routing group, you must specify the Inter-work location group transaction fields. Otherwise, the system does not know whether to take the transaction properties from the source WLG or the destination WLG.

You do this by using Inter-Work Location Group Maintenance (4.2.21) to specify what the transaction field settings should be for each combination of possible movements from one WLG to another.

Example If you have three WLGs, A, B, and C, you have six possible types of inter-WLG movement: from A to B, from A to C, from B to A, from B to C, from C to A, and from C to B. Note that if you leave the destination WLG blank, the inter-WLG definition applies to all destination WLGs.

Inter-Work Location Group Maintenance (4.2.21) is shown in Figure 4.11.

Fig. 4.11
Inter-Work Location Group Maintenance (4.2.21)



Enter values in the following fields:

Site. Enter the name of an existing site.

Warehouse. Enter the name of an existing warehouse in which you want to maintain inter-work location group fields.

From Work Location Group. Enter the name of an existing source WLG for this movement combination.

To Work Location Group. Enter the name of an existing destination WLG for this movement combination.

Click Next to display the Description frame.

The fields in the Description frame are the same as those that in Work Location Group Maint, only here they relate to a specific movement between the two WLGs you entered in the first frame.

See “Work Location Group Maintenance” on page 64.

Location Group Reports

In addition to several storage location and work location group browses, Table 4.1 lists report options.

Table 4.1
Location Group Reports

Program	Description
Storage Location Group Report (4.3.3)	This option lets you select a range of sites, warehouses, and SLGs for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each SLG.
Storage Location Group List Report (4.3.7)	This option lets you select a range of sites, warehouses, and SLG lists for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current entries that have been set up for each SLG list.
Work Location Group Report (4.3.11)	This option lets you select a range of sites, warehouses, and WLGs for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each WLG.
Inter-Work Location Group Report (4.2.23)	This option lets you select a range of sites, warehouses, from WLGs, and to WLGs for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each inter-work location group combination.

Chapter 5

Defining Locations

The following topics describe how to set up the fields for defining the characteristics of individual storage locations in your warehouses. They also explain how to use Mass Location Maintenance (4.3.21) to set up a range of similar storage location details to minimize the repetition of the setup process.

About Locations 72
Introduces the basic rules of location definition and the three types of definition.

Warehouse Location Maintenance 72
Illustrates the Warehouse Location Maintenance (4.3.13) frame and its uses.

Mass Location Maintenance 77
Outlines how to use Mass Location Maintenance (4.3.21) to define similar locations in a warehouse quickly and easily.

Using Check Digits with Locations 78
Explains how Check Digit Generation (4.3.22) can be used to check digit functionality.

Location Reports 79
Lists and describes Location and Mass Location Maintenance report options.

About Locations

To be seen by all system function, all inventory locations must be defined as standard locations. When you are using warehousing, you also have to define additional fields for each location in each warehouse. Within the broader system, the warehouse location is a placeholder. As a result, locations can be defined in three different ways:

- A warehouse is defined as a standard system location and as a warehouse. You define both the warehouse fields and the standard location data in Warehouse Maintenance. See “Warehouse Maintenance” on page 22.
- A storage location that you want to use in a warehouse is defined as a standard location, so that the system can report on its capacity, contents, and so on, and is also defined as a warehouse location so that it can be used for put-away, storage, and picking. You define both the warehouse fields and the standard location data using Warehouse Location Maintenance (4.3.13).

A storage location that is outside the warehouse system is defined only as a standard location. The system can report on its capacity and contents, but the warehouse system is not aware of its existence. These locations are set up using the standard Location Maintenance (1.1.18) function and are not part of the warehouse system. Put-away or picking algorithms do not consider those locations. For more information on locations, see *QAD Master Data User Guide*.

You do not need to use Location Maintenance (1.1.18) to set up either your warehouses or the locations within them. However, warehouses and locations are stored in the location master table and can be accessed using Location Maintenance (1.1.18).

Important You should not use standard Location Maintenance to maintain your warehouses and warehouse locations, since the data defined there is not available to warehouse functions.

Warehouse Location Maintenance

When you have defined your warehouse and its internal routing groups (IRGs), storage location groups (SLGs), and work location groups (WLGs), the next step is to set up all the locations within the warehouse. You can do this for individual locations using Warehouse Location Maintenance (4.3.13).

This lets you define a name for each location and define both the standard system location data and the warehouse- specific data. When you have many locations to define, use Mass Location Maintenance (4.3.21).

See “Mass Location Maintenance” on page 77.

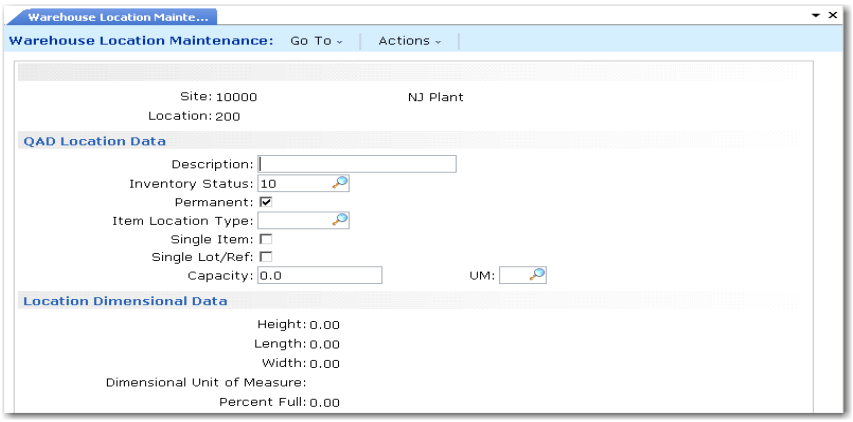
Locations do not need to be permanent storage areas. Use Location Warehouse Maintenance to:

- Set up individual user IDs as locations, representing the carts where these users place picked inventory. See “Specifying Locations for User Carts” on page 295 for details.
- Set up trucks as locations for tracking shipped inventory. See “Defining a Truck Location” on page 395.

You must also set up docks and shipping lanes as locations before they can be referenced in wave planning functions. See “Defining Lanes and Docks” on page 325.

Enter the site and location in the header. The system displays the QAD Location Data and Location Dimensional Data frames; see Figure 5.1.

Fig. 5.1
Warehouse Location Maintenance (4.3.13)



QAD Location Data

The fields in this frame define the location of data. Refer to the system user documentation for full details of each field.

Following is a brief summary of the use of each field.

Description. Enter a brief description of this location, usually describing where to look for it.

Inventory Status. Enter the status typically assigned to inventory held in this location.

Permanent. Enter Yes to indicate that the location is permanent; it is retained even if the balance on hand is zero. Enter No to indicate that the location is temporary. Temporary locations are created and deleted by the system. They exist only when the on-hand balance in the location is greater than zero.

Item Location Type. If required, enter a code to indicate the type of storage location. These codes define special storage conditions.

Single Item. Enter Yes if quantities of only one item or product can be stored in this location; otherwise, enter No.

Single Lot/Reference. Enter Yes if only one lot/serial number of the same item can be stored in this location; otherwise, enter No.

Capacity. Enter the capacity of this storage location, in terms of the capacity unit of measure, in the next field.

Note This value is for reference only. The capacity value that warehouse functions use for all calculations is the one you define in the Quantity field for a specific UM or UM and item number combination. See “Quantity” on page 76.

Dimensional Unit of Measure. Enter the unit of measure in which the location capacity is expressed.

If you are using the optional Supplier Consignment Inventory module, a Transfer Ownership field also displays. For more information on Supplier Consignment Inventory, see *QAD Purchasing User Guide*.

Location Dimensional Data

Location dimensions are used for reference purposes only, so you do not have to enter values. If you do enter dimensions, the values are all in terms of the dimensional unit of measure, specified in the Dimensional Unit of Measure field, below the three dimensions. The system does not perform any validation between this reference dimensional data and the functional capacity of the location, which you define as described on page 77.

Height. Enter the height of the location.

Length. Enter the length of the location.

Width. Enter the width of the location.

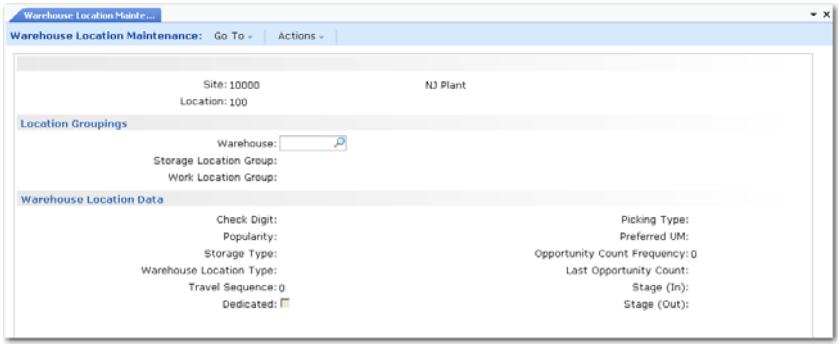
Dimensional Unit of Measure. Enter the unit of measure used to define the dimensions.

Percent Full. This field is for display only; you cannot modify it. It shows the percentage full value for the location, which is blank when you first set up the location.

Location Groupings and Warehouse Location Data

After you click Next, the system displays the Location Groupings and Warehouse Location Data frames; see Figure 5.2. The field descriptions following the figure describe fields for both frames.

Fig. 5.2
Location Groupings and Warehouse Location Data



Warehouse. Enter the name of the warehouse in which the location is found.

Storage Location Group. Enter the name of the storage location group to which the location belongs.

Work Location Group. Enter the name of the work location group to which the location belongs.

Check Digit. If check digits are in use for this storage location group, enter the code used to confirm the movement of inventory into or out of this location. Leave this field blank if check digits are not in use for this location. See “Using Check Digits with Locations” on page 78 for details.

Popularity. Enter a code to define the relative priority for choosing this location when more than one location could be used to put away inventory. Low alphanumeric values for the Popularity code indicate greater popularity.

Example A popularity code of AAA indicates a popular location that is easily accessed, while a code of ZZZ indicates an unpopular location, which is perhaps difficult to access. You normally want to put fast moving stock in the low value Popularity code locations, and slow moving stock in the higher ones.

You can base the popularity codes on an ABC analysis of the number of transactions. Item ABC Status Report/Update (3.6.3) provides a report on item-ABC status.

Storage Type. Unless you are doing cycle counts, storage type codes are optional and are used only for information to define different types of storage locations.

Warehouse Location Type. This field is not currently in use; leave it blank.

Travel Sequence. This field is optional. You can use it to assign a number to this location that is used in conjunction with the numbers assigned to other locations to define a travel sequence within the warehouse. This is effective only in an RDT environment using the Next Task function. When the next task is selected, the system considers all outstanding tasks and selects the task where the source location has a travel sequence number closest to the value of the current location's travel sequence number. You can use this feature to minimize travel within the warehouse. See "Labor Management Workbench" on page 169.

Note When working with priorities, the Next Task function first sorts tasks by priority. This means that travel sequences are only efficient for tasks having the same priority.

Dedicated. Enter Yes if this location is dedicated to storage of only one item or product; otherwise, enter No. If you enter Yes, only specific algorithms for dedicated items consider this location for put-away. You must also specify the item for which the location is dedicated in the next frame of Location Maintenance. See Figure 5.3 on page 76.

Picking Type. You must enter a valid picking type code for the location. The standard values are FIFO (First In First Out), LIFO (Last In First Out), and blank, which takes the first database record for the location.

Preferred UM. Enter the preferred unit of measure for this location. This can be used by the relevant put-away algorithms; for example, to put away only pallets in a location.

Opportunity Count Frequency. This field is used only if opportunity counts are in use for the storage location group to which this location belongs. If opportunity counts are in use, you can specify a number to control the frequency with which such counts are initiated. When inventory is taken out of the location, the system checks whether the quantity on-hand falls below the threshold level for the item, and also checks the OPC frequency value for the location.

- Enter 0 to allow unlimited numbers of opportunity counts.
- Enter 1 to allow an opportunity count at a frequency of one per day.
- Enter 2 to allow an opportunity count at a frequency of one every two days, and so on.

Last Opportunity Count. This field is for display purposes only. It shows the date of the last opportunity count for this location.

Stage (In). This field identifies the location that must be used prior to arriving in the current location.

Stage (Out). This field identifies the location that must be used when leaving the current location.

Stage in and out locations are useful when certain fork-lift trucks or engines are used within the aisle while other equipment is used from another area to the aisle itself. When you make a put-away for instance, you must find the destination location, but the RF terminal shows the movement from the receipt area to the stage in first and then another task is created to move goods from the stage in to the destination location. For issue, when picking goods out of the location to the dispatch area, the first movement is from the location to the stage out and the second is from the stage out to the dispatch area. The two movements have the same transaction number.

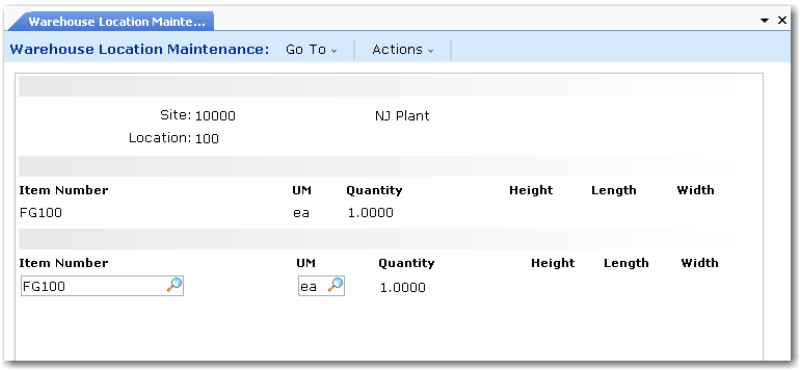
The stock is never in the stage location in the system, although physically, it is a mandatory step for the goods in movement. The stage in and out locations may or may not be defined as locations in the system.

See “Confirming in Staged Locations” on page 175.

Location Capacities

The Location Capacity frame is shown in Figure 5.3.

Fig. 5.3
Location Maintenance, Capacity



The fields in this frame specify item quantities in a particular unit of measure that fits in the location. You can enter multiple lines for different items and different units of measure.

Item Number. Enter the number for the inventory item to which this quantity definition relates. You can leave this field blank if the quantity relates to all items.

Example You could define how many standard pallets fit in the location, regardless of the items contained on the pallets.

If you entered Yes in the Dedicated field on the previous frame, you must also specify the item to which this location is dedicated.

UM. Enter the unit of measure in which this quantity definition is specified.

Quantity. Enter the quantity of the selected UM that fits in this location.

In Alternate Unit of Measure Maintenance (4.5.1), pallets typically have the Sizing Type field set to R for sizing by reference so that reference numbers are unique to pallets.

If you specify 99999 as the quantity of a UM that is not sized by reference in Alternate UM Maintenance, the system does not calculate the % full for non-functional IRG locations.

Height, Length, Width. If the quantity is sized by reference, you have access to the height, length, and width fields to tell the system how many pallets of a given kind can be stored in that location. The Quantity field is automatically updated with the multiplication of the three dimensions. If a maximum pallet height is defined at the item/warehouse level, the capacity of the location is truncated to take into account the stacking for this item.

Mass Location Maintenance

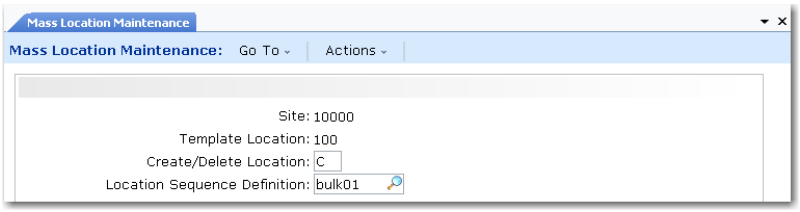
When you have a large number of similar locations to define in a warehouse, you can simplify and speed up the setup procedure by using Mass Location Maintenance. There are two steps involved:

1. Use Sequence Definition Maintenance (4.23.1) to set up a sequence definition code. This identifies the template to use for setting up the individual locations. Then define the format and range of the location names that are generated. You can specify fixed-value parts and incrementing parts of the location names, so that you end up with location names such as Bulk0101, Bulk0102, Bulk0103, and so on.
2. Use Mass Location Maintenance (4.3.21) to generate the range of locations. You specify the location sequence definition you specified in Sequence Definition Maintenance, and the system uses the format and range you defined in step 1.

The final stage of creating a range of locations is to run Mass Location Maintenance to generate the location records based on one of the sequence definitions you have set up using the Sequence Definition Maintenance.

Mass Location Maintenance (4.3.21) is shown in Figure 5.4.

Fig. 5.4
Mass Location Maintenance (4.3.21)



Enter values in the following fields:

Site. Enter the name of an existing site.

Template Location. As well as specifying a sequence definition code to define the way the location identifiers are generated, you must also specify a template location, which is used to provide the field settings for all the new locations you generate. It is useful, therefore, to create the first location in the sequence using Location Maintenance, set up the location field settings the way you want them for the entire group of locations, and then specify this location as the Template Location for Mass Location Maintenance.

Create/Delete Location. If you are running Mass Location Maintenance to create a block of locations, enter C in this field. The sequence definition code specifies the range of locations that are created.

You can also use Mass Location Maintenance to delete a block of locations; for example, if you are restructuring your warehouse with a different location layout. You do this by entering D in the Create/Delete Location field. Again, the sequence definition code specifies the range of locations that are deleted.

Location Sequence Definition. Specify the sequence definition code you want to use to create or delete a block of locations.

When you click Next to accept these entries, frame display the field settings for the template location so that you can modify them if required. When you have checked all the fields, you are prompted to continue. Enter Yes to continue with the process or No to quit.

At the bottom of the frame, the system displays another message to inform you of the number of locations that are created or deleted based on the sequence definition you have selected.

Note If you are using the optional Supplier Consignment Inventory module, a Transfer Ownership field also displays. For more information on Supplier Consignment Inventory, see *QAD Purchasing User Guide*.

Using Check Digits with Locations

Check digit functionality exists for warehouse staff when picking items from storage locations. You can specify a check digit value that warehouse staff enter when they move items from the storage location.

The check digit can be from 1 to 8 alphanumeric characters. The system generates the check digits randomly. This function is useful for warehouses that are not managed with RF devices to ensure that the correct locations are being referenced during picking.

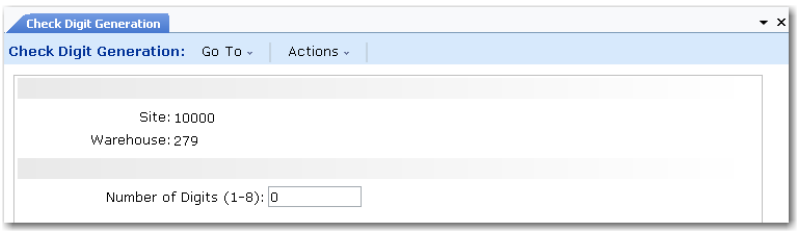
To implement check digit functionality, use Check Digit Generation (4.3.22); see Figure 5.5.

Set the following:

- Check Digit to Yes in Storage Location Group Maintenance (4.3.1). See page 74.
- Enter a digit value in the Number of Digits field in Check Digit Generation.

Check digit functionality does not exist when moving items to containers during picking.

Fig. 5.5
Check Digit Generation (4.3.22)



Location Reports

In addition to browses, Table 5.1 lists report options available relating to Locations and Mass Location Maintenance.

Table 5.1
Location Reports

Program	Description
Warehouse Location Report (4.3.15)	This option lets you select a range of sites, warehouses, and locations for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each location.
Location Full % Report (4.3.17.13)	This option lets you display a relative percentage of a location. An empty location is considered 0% and a location containing any items, regardless of the quantity, is considered 100%.

Chapter 6

Defining Items

The following topics explain how you define item data relating to warehousing activities. Items you store in your warehouses must exist in the system, but you have to specify additional information concerning the storage and picking of items that relates the items to the warehousing activities.

Defining Item Data for QAD Warehousing 82
Explains similarities and differences in defining standard item data in Warehousing.

Defining Item Data for Storage Location Groups 89
Describes how to use Item-Storage Location Group Maintenance (4.4.1) to specify warehousing fields for items related to a specific storage location group.

Defining Item Data for Suppliers 91
Describes how and when to use Supplier Item Inspection Maintenance (4.4.13) to specify default units of measure and quantities for specific items from specific suppliers.

Defining Customer Status for Items 91
Illustrates how to use Customer Item Status Maintenance (4.4.17) to specify inventory status codes for specific customers.

Displaying Item Data 92
Lists and describes report options relating to Item Data and Item Maintenance.

Defining Item Data for QAD Warehousing

You define all your standard item data in the usual way using Item Master Maintenance (1.4.1). However, because additional item attributes must be specified to enable the system to perform its put-away, storage, and picking functions, the system provides extra item maintenance functions that enable you to enter the required information.

For more information on Item Master Maintenance fields, see *QAD Master Data User Guide*.

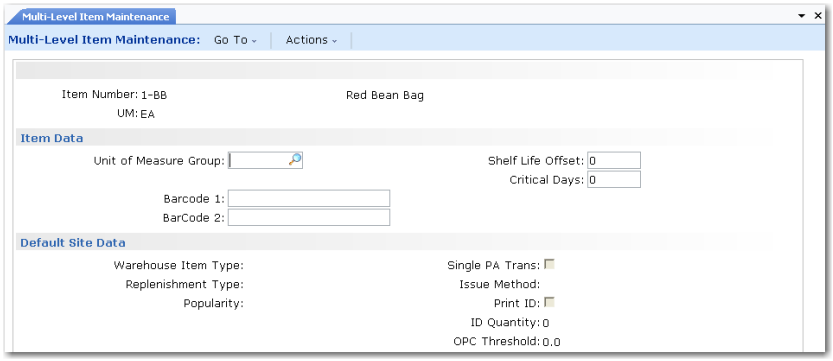
The information that the system requires relates to the storage of items in individual warehouses. You enter this information for items using Item-Warehouse Maintenance (4.4.11). Much of this information might be the same for other warehouses in the same site, so an additional program is provided: Item-Site Maintenance (4.4.9). This program lets you enter much of the item-warehouse data in the form of default values used when you enter the details for a warehouse in that site. Similarly, much of the item-site data might be the same for other sites. You can use another additional program—Item Maintenance (4.4.7)—to enter item-site data that defaults to each site.

To simplify the procedure, you can use Multi-Level Item Maintenance (4.4.5), which combines the three item functions into one program. Because this program encompasses functions from the other three programs and therefore, can be the only program you use to add warehousing data to item data, this section discusses it first.

Multi-Level Item Maintenance

Use Multi-Level Item Maintenance (4.4.5) to maintain all of the additional item data required within the QAD Warehousing system; see Figure 6.1.

Fig. 6.1
Multi-Level Item Maintenance (4.4.5)



Item Data

Unit of Measure Group. If the units of measure used for this item belong to a group, you can enter the UM group code here. Any future revisions to the conversion factors in this UM group are then applied to this item when you run UM Conversion Generation. Leave this field blank if a UM group is not applicable. See “UM Conversion Generation” on page 102.

Note UM groups are a tool to help generate conversion factors. Defining a group and linking it to an item is not enough to have conversion factors created. You must run UM Conversion Generation.

Barcode 1. Enter a barcode number to use for this item. The system uses this number instead of the original barcode number. The barcode number must be unique; that is, the same barcode number cannot be linked to multiple items.

Typically EAN/UCC 13 or EAN/UCC 14 codes and customer item numbers that you define in Customer Item Maintenance (1.16) are alternate barcodes used in most warehouses.

For an example, see “EAN-128 Barcodes” on page 186.

Barcode 2. Enter an alternate barcode number to use in place of the original barcode number. The alternate barcode number must be unique; that is, the same alternate barcode number cannot be linked to multiple system items.

Shelf Life Offset. For inventory that has a limited shelf life, enter the number of days between the customer’s best before date and the expiry date for the item. This time period is taken into account by some of the picking algorithms to prevent picking inventory which would have insufficient shelf life remaining to be saleable. If shelf life is not applicable, leave this field blank. This field is frequently used in the food industry when the customer is a distributor/grocer and not the end customer.

Critical Days. For inventory that has a limited shelf life, enter the number of days counting back from the item’s expiry date during which time the inventory can be regarded as critical inventory. This time period is taken into account by some of the picking algorithms that pick only critical inventory. If critical days are not applicable, leave this field blank.

Default Site Data

The entries you make in this frame default when you enter the Item-Site data. You can override these values for individual sites.

Warehouse Item Type. Enter a code to categorize items in groups of similar type; for example, handling characteristics or put-away method. These codes can be used in some algorithms and in internal routing assignment. Leave this field blank if the item does not belong to a particular item type. Set up type codes in Generalized Codes Maintenance (36.2.13).

Replenishment Type. Enter a code to categorize items in groups that have the same replenishment requirements. Replenishment can then be specified for a group of items, rather than for individual items. Leave this field blank if the item does not belong to a particular replenishment type.

Set up type codes in Generalized Codes Maintenance (36.2.13).

See Chapter 15, “Replenishment,” on page 259.

Popularity. Locations are assigned popularity codes that represent the ease of access. Similarly, you assign a popularity code to each inventory item so that the system can match popular inventory with popular locations. You can use this feature to ensure that fast moving items are stored in the most accessible locations. A sensible way to define this value is to use an ABC analysis and make categories for fast and slow moving items. Locations have a popularity code as well, and using the appropriate algorithm, the system tries to put away fast-moving items in very accessible locations.

Single PA Trans. Enter Yes if the system should attempt to put away received quantities of this item in a single put-away transaction, that is, all the inventory in the same location. Otherwise, enter No.

Issue Method. This field specifies the picking transactions that are created for this item in the bulk picking process. See “Load ID” on page 275.

Print ID. Enter Yes to print identification labels for this item; otherwise, enter No.

ID Quantity. If you have entered Yes for Print ID, enter the number of identification labels to be printed; otherwise, leave this field blank.

OPC Threshold. This field relates to opportunity counts, which you can specify when this item is stored in an RDT environment. When inventory is taken out of the location, the system checks whether the quantity on-hand falls below the threshold level you specify for the item, and also checks the OPC frequency value for the location where the item is stored. If both conditions are met, a cycle count is requested.

Inspection Data

Define values related to how inspections occur in the Inspection Data frame. See Chapter 23, “Quality Inspection,” on page 452 for details on managing inspections. These values can be configured for specific suppliers in Supplier Item Inspection Maintenance (4.4.13).

Fig. 6.2
Inspection Data



Selective Inspection. Enter Yes if you want this item to be inspected every time the corresponding algorithm is used. Only items marked for selective inspection are considered for inspection.

Inspection Frequency. Specify the number of receipts between each inspection of this item when the corresponding algorithm is used.

Insp Freq (Days). Specify the number of days separating two consecutive inspections of this item when the corresponding algorithm is used.

Random %. Specify the probability of this item being inspected when the corresponding algorithm is used.

Sample Quantity. Specify the sample quantity to consider. If Reference is Yes, quantity indicates a number of references, such as pallets, to consider for inspection. Otherwise, quantity is in the base UM of the item.

Ref. Indicate if the inventory to be inspected includes pallet reference numbers.

Sample %. The sample % is used in place of the sample quantity. It represents the percentage of items inspected out of those being received.

Destructive. Indicate if the inspection test is a destructive test. When set to Yes, the inspection sample is assigned a specific status after inspection. This stock must be deleted manually, using an unplanned issue, for example.

Default Site Data for Merging Items into Warehouse

After you enter inspection data, the system displays the Default Site Data frame if this is the first time you associate this item with warehousing data; see Figure 6.3. If you are editing existing warehousing item data, the system prompts you to enter the site, then displays the Site Data and Default Warehouse Data frame.

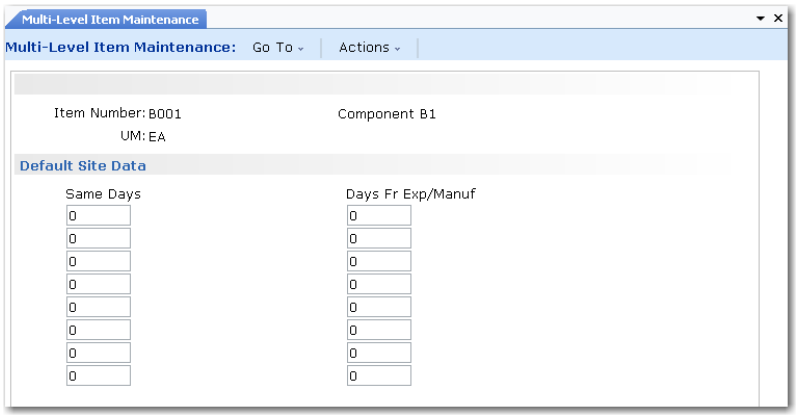
See “Site Data and Default Warehouse Data” on page 86.

Note The frames associated with site data in Multi-Level Item Maintenance are identical to those in Item-Site Maintenance (4.4.9).

See “Item-Site Maintenance” on page 89.

The fields in the Default Site Data frame define the merging rules when the system considers whether to merge newly received quantities of this item with quantities already stored in a warehouse location. The merging rules work by comparing the number of days left before the item reaches its expiry date. If the difference between the days remaining for the newly received inventory and the existing inventory is sufficiently small, the items can be merged; if the difference is too large, the items must be kept separate.

Fig. 6.3
Default Site Data for Merging Items



Same Days. Enter the number of days by which the days remaining before expiry date can differ while allowing the inventory to be merged.

Example If the existing inventory in the location has 70 days remaining before its expiry date, the newly received inventory has 80 days remaining, and the Same Days value for the item is 12, the inventory can be merged in the same location because the difference between 70 and 80 is less than 12. If the Same Days value was 5, the system would not allow the inventory to be merged.

Days Fr Exp/Manuf. Enter the maximum number of days remaining before expiry date to which this Same Days value applies. You can use this field to set bands of merging rules which depend on the length of time remaining until expiry.

Example You might want a figure of 10 for the Same Days field if the inventory is within 100 days of expiry, but a figure of 5 if the inventory is within 50 days from expiry. To achieve this, you would specify values of 10 and 100 on the first line, and 5 and 50 on the second line.

Note The provision of multiple lines on which you can enter Same Days and Days Fr Exp/Mfg values lets you specify that the further away the expiry date is, the greater the acceptable difference is when merging stock. In practice, this is very useful in a LIFO location, where only the last pallet can be picked. By merging the stock, you can ensure that the last pallet in, if not the oldest, is one of the oldest.

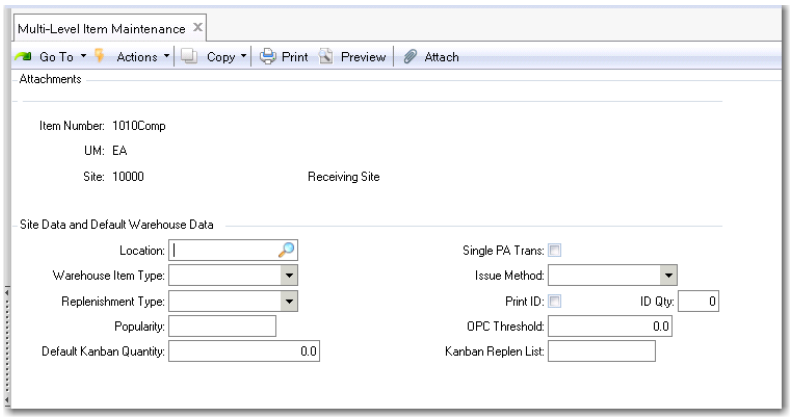
The next section of Item Master Maintenance corresponds to Item-Site Maintenance, where you set up default values for the item-warehouse data for a particular site.

Site Data and Default Warehouse Data

After you specify default site data, the system prompts you to enter the site associated with the item. Once you enter the site and click Next, the system displays the Site Data and Default Warehouse Data frame.

The values you enter in these fields apply to the whole site, the Site Location field, or default to each warehouse in this site when you enter data for the warehouses of the site.

Fig. 6.4
Site and Default Warehouse Data



Location. Enter a valid location that can be either a warehouse or a warehouse master list for this item on this site. This value is used when an item is issued from one site using that site's location, warehouse or master list, and received at another site, where a different location, warehouse or master list applies. It is therefore necessary to identify the location, warehouse or warehouse master list for the item on each site.

The remaining fields (Warehouse Item Type, Replenishment Type, Popularity, Single PA Trans, Issue Method, Print ID, ID Quantity, and OPC Threshold, Default Kanban Quantity, Kanban Replen List) display the default values—if any—that you entered at the item level. At the item-site level, you can accept the generic defaults or override them with different values for this site.

After you enter this data, the system redisplays the Inspection Data and Default Site Data frames. You can enter item-site data in these frames. These frames also display in Item-Site Maintenance.

After you enter item-site data, the system prompts you to enter the warehouse

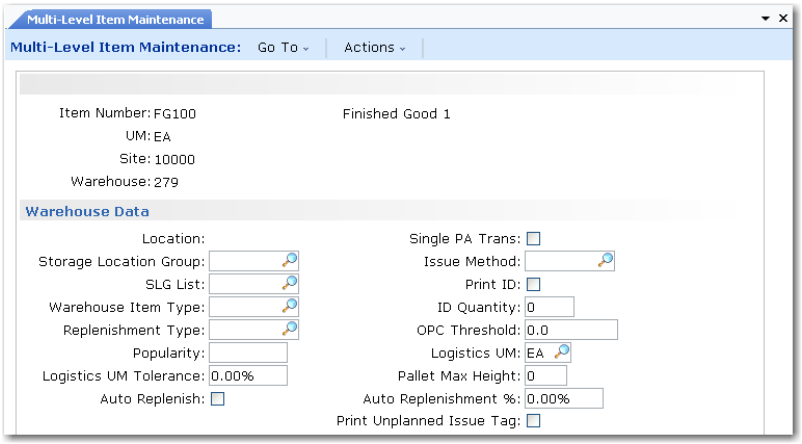
Warehouse Data

The next section of Multi-Level Item Maintenance lets you set up values used in all inventory transactions relating to this item at a specific warehouse.

Note The frames associated with warehouse data in Multi-Level Item Maintenance are identical to those in Item-Warehouse Maintenance (4.4.9).“Item-Warehouse Maintenance” on page 89.

Enter the warehouse to which the item data applies. When you have selected the warehouse, the system displays the first of the Item-Warehouse Maintenance frames shown in Figure 6.5.

Fig. 6.5
Warehouse Data



Location. This field is accessible only when the warehouse is inactive, when you can enter or modify the default location for this warehouse, if required. When the warehouse is active, the SLG or the SLG list specified in the following fields is used to identify locations for the item.

Storage Location Group. Enter the storage location group where you want the put-away algorithms to search for locations to store receipts of this item. If you are using storage location group lists, you can leave this field blank and enter a list in the SLG List field. You cannot enter values in both of these fields.

SLG List. If you have left the Store Loc Group field blank, you can enter the name of a storage location group list. The put-away algorithms consider each SLG on the list in sequence when searching for locations to store receipts of this item.

The fields Warehouse Item Type, Replenishment Type, Popularity, Single PA Trans, Issue Method, Print ID, ID Quantity, and OPC Threshold display the default values—if any—that you entered at the Item-Site Maintenance level. At the item-warehouse level, you can accept the item-site level defaults or override them with different values for this warehouse.

See “Default Site Data” on page 83.

Logistics UM Tolerance. Enter a percentage value to specify when the sizing calculations use the Logistics UM and when they use base UM.

Example The base UM for an item is EA (each), the logistics UM is PL (pallet), and a pallet contains a maximum of 100 EA. The location where the item is stored can hold two pallets or 200 EA of the item. If you set the Logistics UM Tolerance to 10%, a pallet containing 90 items is within the tolerance of 10%, so the location is considered to have one full pallet and be 50%

full. However, a pallet containing 80 items is outside the 10% tolerance, so the calculation for the space used in the location is performed in base UM (EA). Since the location holds 80 items in a capacity of 200, the location is considered to be 40% full. The main difference with pallet sizing is that additional pieces can be received in that location.

Auto Replenish. This field specifies the tolerance for the replenishment point. The replenishment point is the quantity of stock below which an automatic replenishment is triggered.

Example If the replenishment point is defined as 50 EA, when the inventory level drops below 50 EA, the system initiates a replenishment process. If the Auto Replenish value is set to 80%, the automatic replenishment occurs only when the stock level falls below 40 EA. Note that a value of 0% has the same effect as a value of 100%.

Logistics UM. Enter the logistics unit of measure to be used as the receipt UM when the receipt is made in base UM.

Note The logistics UM is only used if the receipt is made in the base UM for the item. Its use lets you make the receipt in pieces. For example, if the logistics UM is a pallet (PL) which holds 100 EA, and you receive 280 EA, the system creates 3 records with reference information: 2 full pallets of 100 EA, and 1 partial pallet of 80 EA. The logistics UM Tolerance % field specifies whether the partial pallet is considered as full. You can use the logistic UM even when receiving in alternate UM, like boxes. At the warehouse level, the Log w/Base UM Only field indicates whether logistics UM is used with base UM only or also with alternate UM.

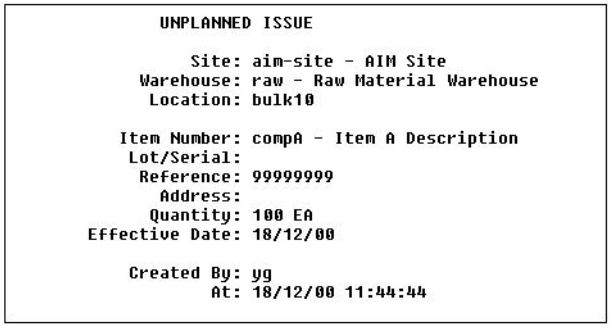
Pallet Max Height. This field modifies the capacity calculation for the corresponding item to consider the stacking of pallets. When the location capacity is defined in referenced unit of measures such as pallets, the result of the capacity calculation is the multiplication of the height, width, and length. When the maximum pallet height is defined for a given item, the multiplication is made using this maximum height and not the location height.

Auto Replenish. Enter Yes to select automatic replenishment. If an existing replenishment definition exists for a location/item or an SLG/item, when the inventory level falls below the replenishment point, the system automatically starts a replenishment process. This process picks the missing items and transfers them to the location/SLG to be replenished. With auto replenishment, you do not need to start a manual replenishment; the process is triggered automatically. Enter No to switch off automatic replenishment.

Print Unplanned Issue Tag. This field enables you to print an unplanned issue tag to request the issue of material out of stock. It is created when using Issues–Unplanned (3.7). Make sure that the ISS-UNP transaction type is defined in Transaction Type Maintenance (4.7.1) with print procedure code PK. The printer used is the same as for pallet ID. Make sure the printer is defined correctly at the work location group level.

Figure 6.6 shows the unplanned issue tag generated by the system. When printed, the system is already updated. Its purpose is to help in knowing which goods are manually issued from the warehouse.

Fig. 6.6
Unplanned Issue Tag Generated by QAD Warehousing



Item-Site Maintenance

Use Item-Site Maintenance (4.4.9) to enter only the item-site data to existing item data. The system displays the following frames, discussed in the Multi-Level Item Maintenance section:

- Site Data and Default Warehouse Data. See page 86.
- Inspection Data. See page 84.
- Default Site Data. See page 85.

Item-Warehouse Maintenance

Use Item-Warehouse Maintenance (4.4.11) to enter only item-warehouse data to existing item data. The system displays the following frames, discussed in the Multi-Level Item Maintenance section:

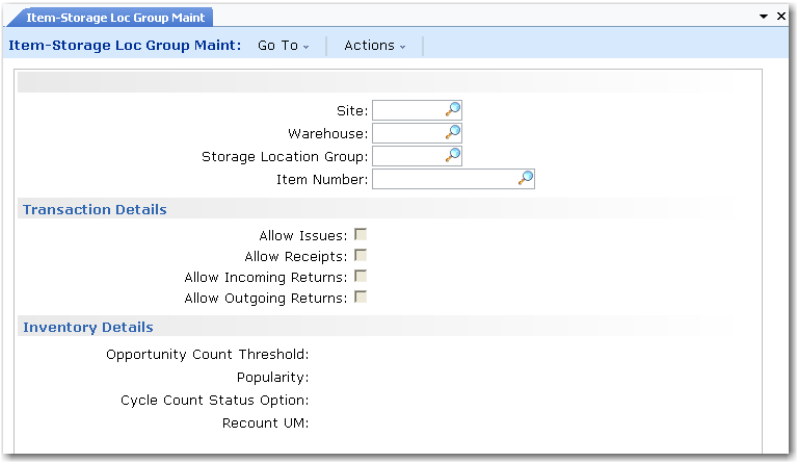
- Warehouse Data. See “Warehouse Data” on page 87.
- Inspection Data
- Default Site Data

Defining Item Data for Storage Location Groups

In addition to defining data for items at the warehouse level, you can also use Item-Storage Location Group Maintenance (4.4.1) to specify warehousing fields for items related to a specific storage location group; see Figure 6.7.

In the header, enter the site, warehouse, SLG, and item number, then click Next. The system displays the Transaction Details and Inventory Details frames.

Fig. 6.7
Item-Storage Location Group Maintenance (4.4.1)



Transaction Details

The Transaction Details fields show the settings for this storage location group. If you want to modify these settings for this item only, you can modify the field values in this frame.

Allow Issues. This field controls whether inventory can be issued out of the system from locations in this SLG. Generally, you limit issues to specially designated areas, such as Goods-Out. Enter Yes if this item can be issued; otherwise, enter No.

Allow Receipts. This field controls whether inventory can be received from outside the system into locations in this SLG. Generally, you limit receipts to specially designated areas, such as Goods-In. Enter Yes if this item can be received; otherwise, enter No.

Allow Incoming Returns. This field controls whether inventory can be received into locations in this SLG as part of a returned issue. Generally, you limit incoming returns to specially designated areas, such as Goods-Out Returns or Rejects. Enter Yes if this item, when returned from a customer, can be placed in locations in this SLG; otherwise, enter No.

Allow Outgoing Returns. This field controls whether inventory can be issued from locations in this SLG as part of a returned receipt. Generally, you limit outgoing returns to specially designated areas, such as Goods-In Returns or Rejects. Enter Yes if quantities of this item to be returned to a supplier can be issued from locations in this SLG; otherwise, enter No.

Note If Allow Receipts is set to Yes in a bulk storage location group, for example, the system lets you make a direct receipt into these locations without generating any transactions.

Inventory Details

Opportunity Count Threshold. You can set the OPC Threshold for the item for the whole warehouse using Item-Warehouse Maintenance, but you can also enter a value in this field to apply only to this item in this SLG. See “OPC Threshold” on page 84.

Popularity. You can set the Popularity for the item for the whole warehouse using Item-Warehouse Maintenance, but you can also enter a value in this field to apply only to this item in this SLG. See “Popularity” on page 83.

Cycle Count Status Option. Enter a number to define the action that should be performed on the inventory status upon confirmation of a recount or in-tolerance count in this storage location group. This field defaults from Warehouse Maintenance. The options are as follows:

0	No status change.
1	Change to Location Status: The status of the inventory is changed to the default inventory status of the location.
2	Status change based on Fail Status: The status of the inventory is changed to the good status associated with the current fail status specified in Warehouse Management Data frame in Inventory Status Maintenance (1.1.1). The frame displays only when QAD Warehousing is active.

See “Cycle Count Status Option” on page 34.

Recount UM. This field is especially useful when you use CIM load with Cycle Count Entry (3.14) to load stock in the system.

When the Use Recount UM of SLG field is set to Yes in Warehouse Maintenance (4.1.1), the system gives any pallet recounted in Cycle Count Entry the alternate UM defined in the recount UM of the corresponding item-storage location group, if any.

Defining Item Data for Suppliers

Supplier Item Inspection Maintenance (4.4.13) lets you specify default units of measure and quantities relating to the pallet, or other container, capacities for particular items from specified suppliers.

These values are used during purchase order flow to provide the default quantity of the item from the particular supplier. If no record is available for a supplier-item combination, the default quantity is taken from the unit of measure records.

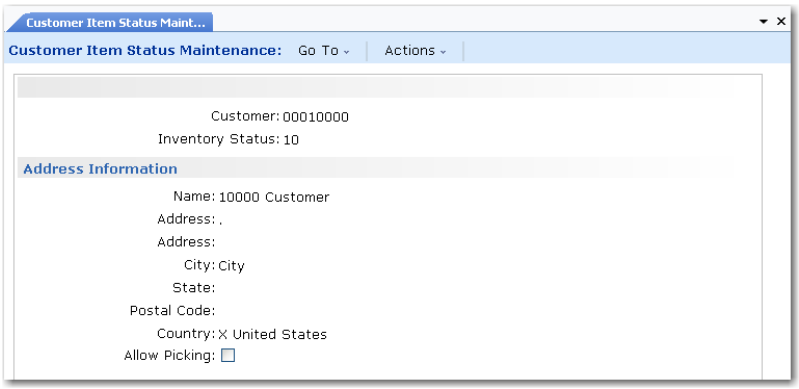
Enter the supplier and item. The system displays the Inspection Data frame. The fields are the same as the Inspection Data frame fields in Multi-Level Item Maintenance.

See “Inspection Data” on page 84.

Defining Customer Status for Items

Customer Item Status Maintenance (4.4.17) lets you specify a particular inventory status code for a specified customer; see Figure 6.8. When the system is picking inventory to fill an order for that customer, it picks only inventory with that status. You can use this function, for example, to pick only Grade 1 status inventory for a particularly valued customer.

Fig. 6.8
Customer Item Status Maint (4.4.17)



Enter values in the following fields:

Customer. Enter a valid code for the customer.

Inventory Status. Enter the item status code you want to specify for this customer.

The name and address details are taken from the customer address record created in Customer Create; you cannot modify them on this frame.

Displaying Item Data

In addition to several browses, Table 6.1 lists report options relating to Item Data and Item Maintenance.

Table 6.1
Item Data Reports

Program	Description
Item-Storage Loc Group Report (4.4.3)	Lets you select a range of sites, warehouses, SLGs, and items for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each item and SLG.
Supplier Item Inspection Report (4.4.15)	Lets you select a range of addresses, item numbers, and UMs for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current quantities that have been set up for each supplier-item and UM.
Customer Item Status Report (4.4.19)	Lets you select a range of customer addresses, and inventory status codes for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows the current fields that have been set up for each customer and status code.

Displaying Item Data on the RF

You can display item data from the RF by selecting the Stock Inquiry (1.9) option from the RF Work Menu.

You enter the reference number that contains the item for which you want data to display. The RF displays the site, item location, alternate UM, item number, and the quantity on hand.

Chapter 7

Sizing

The following topics explain how sizing and units of measure, for both items and locations, are used in the warehouse system. They also explain how you can use alternate units of measure, and set up conversions between the various units.

About Sizing and Units of Measure 96
Introduces Warehousing's sizing functions.

Alternate Unit of Measure Maintenance 99
Describes how to use Alternate Unit of Measure Maintenance (4.5.1) to define units of measure and gives information on sizing rules.

UM Group Maintenance 101
Explains how to use UM Group Maintenance (4.5.5) to simplify how conversion factors are generated for different items.

UM Conversion Generation 102
Explains how and when to run UM Conversion Generation (4.5.10) to attach conversion factors to selected items.

Sizing and UM Reports 103
Lists and describes report options available which relate to Sizing and UM Maintenance.

About Sizing and Units of Measure

The sizing functions are designed to give you complete flexibility in the way you handle units of measure (UMs) relating to ordering, receipt, storage, picking, and shipping of inventory. You do not have to define your warehouses as either palletized or non-palletized. The system can handle both methods of measuring the quantities of inventory, and can easily merge palletized and non-palletized stock in the same location.

This flexibility is supported by letting you maintain sizing definitions for both individual locations and individual inventory items. In both cases, you can define a range of sizing definitions using alternate units of measure.

Example A location sizing definition could specify that location Bulk0101 has the following capacities for item A:

UM	Capacity
EA (loose items)	100,000 items
P1 (Pallet type 1)	10 P1 pallets
P2 (Pallet type 2)	12 P2 pallets

The inventory sizing definition for item A specifies a base UM of EA (each), but it can also be supplied, stored, and picked in two different types of pallet. The conversion factors for these pallets are that a P1 pallet contains 10,000 of item A, and a P2 pallet contains 8,000 of item A.

When the system attempts to put away a quantity of item A in location Bulk0101, it must first examine the quantity and UM of the received inventory, and then consider the inventory records for the location that show the quantities and UMs of the items already stored in the location.

One of the key elements the system uses to perform these calculations is the sizing type.

Sizing Types

Each warehouse unit of measure has a specified sizing type. You specify this in Alternate UM Maintenance. Table 7.1 lists the two possible sizing types.

Table 7.1
Sizing Types

Sizing Type	Explanation
blank	This sizing type is used for basic UMs to be applied to individual items or pieces. The blank sizing type indicates either that this unit is the base UM for the item, or that a conversion factor must be applied to convert to the base UM. In the example, the UM EA would have a blank sizing type.
R (reference)	This sizing type is used for UMs that are counted as a single quantity, regardless of the actual number of items contained. In the example, the pallets P1 and P2 would have a sizing type of R. Each reference type container is assigned a reference number, which can be used to identify the record that specifies the actual quantities of inventory held in the container.

You need to be careful when defining your units of measure to make sure that you assign each UM with the correct sizing type.

Example If you allow a carton to be split, you cannot then be sure that one carton represents 200 EA, as some may have been removed from the carton. In such cases, you would need to handle cartons like pallets, and assign a sizing type of R.

Calculating Location Capacities

When calculating location capacities and the available space in each location, the system considers both the UM and the sizing type for each inventory record in the location. Calculating capacity by simply converting every record into the base UM and then adding them all up would not create the correct results.

Taking the example location that holds 10 pallets of type P1, the situation could exist where the location contains 10 P1 pallets, each of which is part full. The total number of items in the location might be only 50,000, indicating that the location is only half full. However, if the required put-away is for another pallet, there is not any space for it.

The key element in location capacity calculations is to use a percentage full figure for each individual inventory record relating to the location. This is best understood by considering an example.

Sizing Definition for a Location

UM	Capacity	Sizing Type
EA (loose items)	100,000	
P1 (Pallet type 1)	10	R
P2 (Pallet type 2)	12	R

Inventory Records for the Location

Assume that items A and B both have the same sizing definition.

Record	Item	Lot	Ref	Alt UM	Qty (in EA)	% Full
1	A	Lot1	67088	P1	10,000	10.00
2	A	Lot1	67090	P1	8,500	10.00
3	A	Lot1	67105	EA	30,000	30.00
4	B			EA	3,000	3.00
5	B	Lot2	67090	P1	1000	N/A
6	A	Lot1	67089	P2	9,200	8.33
Total:						61.33

Record 1. This record's alternate UM is P1, and the Reference field contains a value other than the item's default UM. This indicates that it is a pallet, which is counted as a single unit. The location can contain 10 of these pallets, so the percentage full is 10%.

Record 2. This is the same situation as Record 1, but the reference value is different, indicating a different pallet. Although the quantity of item A on this pallet is different, it still counts as 10% full (being a whole pallet).

Record 3. This record has a reference, but also has an alternate UM which is the same as the item's default UM. This indicates that the item is stored in EA, so the percentage full is 30%.

Record 4. This record has a blank reference, indicating that the item is stored in base UM of EA. The percentage full is 3%.

Record 5. This record has the same reference as Record 2. It is a pallet, but this pallet has already been counted, so this record does not have any effect on the percentage full.

Record 6. This record has an alternate UM of P2 and a reference. This indicates that it is a different sort of pallet. The Sizing definition for the location specifies that it can hold 12 of these pallets, so one pallet represents 8.33% full, regardless of the quantity in EA.

The Total Percentage Full for the location is obtained by summing the percentage for the individual records relating to the location.

Each time that the system considers this location for put-away of inventory, it first adds the record for the new inventory to the existing location records and calculates the new Total Percentage Full. If this exceeds 100%, the new record cannot be accepted, and the inventory cannot be put away in this location. The exception to this is when the new inventory is received in base UM, in which case the system could put away part of the inventory in the location.

Relative Sizing

Because you can specify the quantities of a particular item that make up a unit of measure, the system can provide relative sizing for locations.

Example Consider three items, each of which can have an alternate UM of pallet type P1.

Item	Quantity (in EA) that Fit on a P1 Pallet
Item A	1000
Item B	1500
Item C	2000

If a location can contain 10 pallets of type P1, consider a receipt of 6,000 EA of each of the three items, assuming that full pallets are received.

Receipt	Number of Pallets	Percentage Full
6,000 of Item A	6	60%
6,000 of Item B	4	40%
6,000 of Item C	3	30%

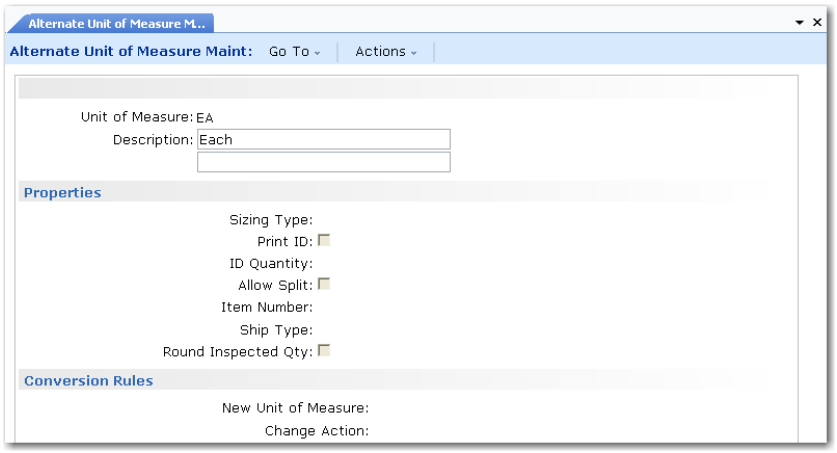
Note Relative sizing plays an important role in reducing the number of records that must be maintained to be able to calculate capacities for all possible combinations of items and locations. If you have 100 different items that can be stored in 2,000 different locations, without relative sizing you need 200,000 sizing definitions, one for each possible combination. If you use relative sizing, you can define each location's pallet capacity (2,000 records) and each item's quantity per pallet (100 records).

Alternate Unit of Measure Maintenance

Define the units of measure for sizing definitions for locations and items using Alternate Unit of Measure Maintenance (4.5.1). Alternate Unit of Measure Maintenance lets you provide a description and a sizing type for each UM, and to specify additional fields, such as whether the unit can be split and the change action to take when converting from this UM to a new one.

Alternate Unit of Measure Maintenance is shown in Figure 7.1.

Fig. 7.1
Alternate Unit of Measure Maintenance (4.5.1)



Enter values in the following fields:

Unit of Measure. Enter the two-character code for the unit of measure.

Description. Enter the description of the UM.

Properties

Sizing Type. Enter the code for the sizing type. Valid sizing types are as follows:

Blank	This sizing type is used for basic UMs to be applied to individual items or pieces. The blank sizing type indicates either that this unit is the base UM for the item, or that a conversion factor must be applied to convert to the base UM.
R (Reference)	This sizing type is used for UMs that are counted as a single quantity, regardless of the actual number of items contained.

Print ID. This field controls the printing of ID labels for inventory measured in this UM. This is the main level of printing control. However, it is not mandatory to define an alternate unit of measure. If no alternate UM is defined, the printing control comes from the item-warehouse definition. See “Item-Site Maintenance” on page 89.

Example If an alternate UM is defined for pallets with the Print ID field set to Yes and an item is received on a pallet, an ID label is printed. However, if the same item is received as a number of eaches, and no alternate UM is defined for EA, whether the ID is printed is determined from the item-warehouse.

ID Quantity. This field controls the quantity of ID labels to be printed.

Allow Split. Enter Yes if this unit of measure can be split into smaller units; otherwise, enter No. You can override the Allow Split setting for a selected storage location group using Storage Location Group Maintenance.

Item Number. This field is used when the unit of measure is also an item; for example, a pallet. Enter the item number for the unit. Leave this field blank for UMs that are not also items.

Ship Type. If the alternate UM is also an item, you can track the item in inventory.

Example An item number is defined for pallets. This item is entered as the alternate UM's item number. Ship type determines if the item is to be considered as actual inventory or just as a memo item.

Leave the Ship Type field blank to maintain inventory levels for the item. When you enter a non-blank value—the convention is M for Memo—standard inventory transactions are created to show the movement of the item, but no on-hand or other inventory details are maintained.

Round Inspection Qty. Indicate if you want the quantity that must be inspected to be rounded to a whole unit. Use this field when you are sampling by percentage by setting the Sample % field to a value for the item. This can result in a decimal value. If your units are boxes, for example, you probably do not want to sample a percent of a box, but rather round up to a complete box. See "Quality Inspection Parameters" on page 447.

Conversion Rules

These fields specify what change action must be taken when changing from the UM specified at the top of the frame to another new UM. Typically, the change action is to clear the reference when changing from a pallet or other reference sizing type UM to a UM such as EA, and to generate a reference when changing from EA to a reference UM such as a pallet.

New Unit of Measure. Enter the two-character code for the new unit of measure. This is the UM you are changing to.

Change Action. Specify the action to be performed when the first UM is changed to the new UM. The options are as follows:

0	No change
1	Blank reference
2	Prompt user for reference (Other)
3	Prompt user for reference (Same/Other)
4	Prompt user for reference (Blank Allowed)
5	Automatic reference generation
6	NRM and prompt user for reference (Other)
7	NRM and prompt user for reference (Same/Other)
8	NRM and prompt user for reference (Blank Allowed)

When you have selected the change action for a change to this new UM, you can specify another new UM and continue to set up conversion rules. When you have finished specifying conversion rules, press End to move back to the Sizing Type field, and End again to move back to the UM field at the top of the frame.

UM Group Maintenance

You can use UM Group Maintenance (4.5.5) to simplify the process of generating the same conversion factors for a number of different items. To do this, follow these steps:

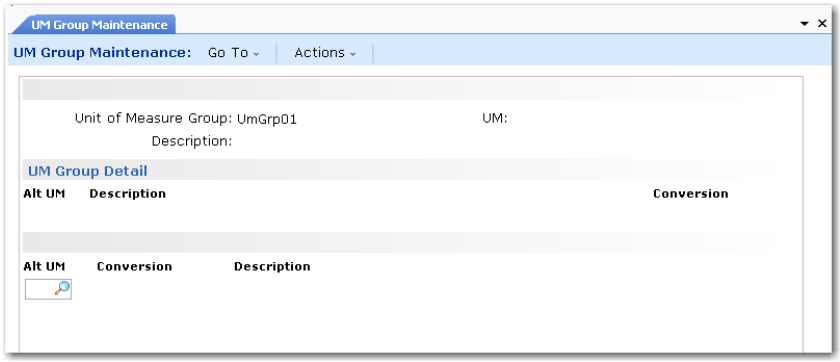
1. Define a UM group in UM Group Maintenance, which specifies all the conversion factors from the selected base UM to a range of other alternate UMs.
2. Attach this UM group to the relevant items using Item Maintenance functions.
3. Run UM Conversion Generation to attach the required conversion factors to each of the items.

See “Multi-Level Item Maintenance” on page 82.

Note This option is not mandatory. It helps in defining conversion factors. They can still be defined using Alternate UM Maintenance (1.13).

UM Group Maintenance is shown in Figure 7.2.

Fig. 7.2
UM Group Maintenance (4.5.5)



Enter values in the following fields:

Unit of Measure Group. Enter a code to identify the UM group you want to define.

UM. Enter the two-character code for the base UM.

All the conversions in the group are specified in terms of the base UM. If the base UM is EA and the group includes conversion factors for boxes, cartons, and P1 pallets, you define each of these alternate UMs in terms of the number of EA it represents. You do not set up a hierarchy, in which pallets convert to cartons, cartons convert to boxes, and boxes convert to EA.

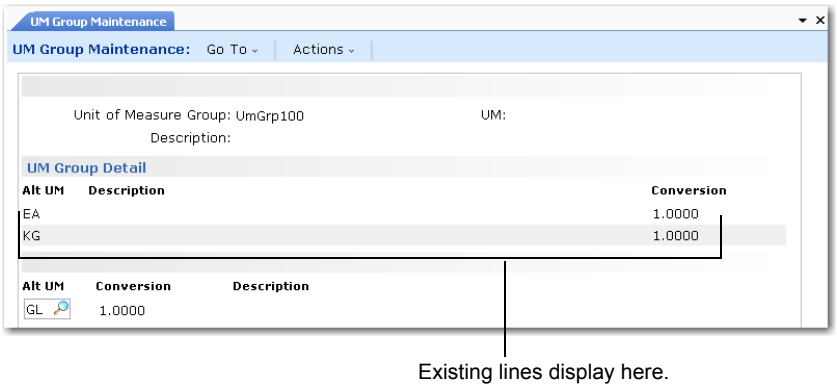
Description. Enter a description of the UM group, which normally identifies the range of items to which it applies.

Alt UM. Enter the two-character code for the alternate UM.

Conversion. Enter the conversion factor. This is the number of base UM that equates to one of the alternate UM.

You can enter multiple lines of conversions. After each line, a new line displays, as shown in Figure 7.3.

Fig. 7.3
UM Group Maintenance (4.5.5), Multiple Conversion Lines



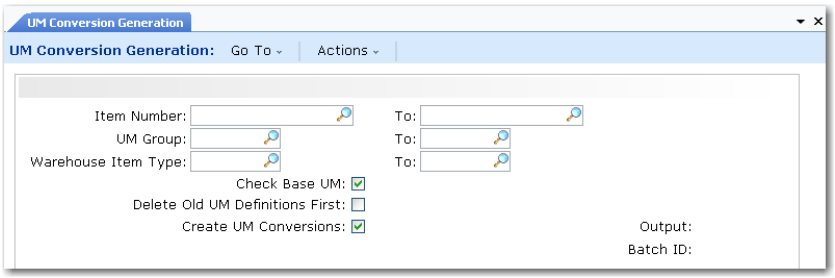
UM Conversion Generation

When you have defined the conversion factors between the base UM and a number of alternate UMs using UM Group Maintenance and then assigned the UM group to the relevant items, the next step is to run UM Conversion Generation (4.5.10) to attach the conversion factors to the selected items.

See “Multi-Level Item Maintenance” on page 82.

UM Conversion Generation is shown in Figure 7.4.

Fig. 7.4
UM Conversion Generation (4.5.10)



You can run the conversion generation for a range of item numbers, a range of UM groups, and a range of warehouse item types. Enter the From and To values for these ranges in the fields at the top of the frame.

Check Base UM. Enter Yes if you want the system to check first that the base UM specified for the UM groups is the same as the base UM for the items which the conversion factors are to be associated with. Having base UMs that are not the same can result in inconsistencies. This check is not mandatory, so you can enter No if you want to omit the check.

Note You can run this check separately without generating conversions by using Base UM Check Report (4.5.10).

Delete Old UM Definitions First. Enter Yes to delete any existing alternate UM definitions from the selected items before attaching the new alternate UM conversion factors. This eliminates any inconsistencies between previous conversions and those being generated. Enter No if you want to retain any existing alternate UM definitions for the items.

Create UM Conversions. Enter Yes to generate the conversions and attach them to the selected items. Enter No to run the report only, without generating the actual conversions. This is the same as running the Base UM Check Report (4.5.10).

Sizing and UM Reports

In addition to sizing browses, Table 7.2 lists report options available relating to Sizing and UM Maintenance.

Table 7.2
Sizing and UM Reports

Program	Description
Alternate Unit of Measure Report (4.5.3)	Lets you select a range of alternate UMs, and then specify where you want the report results printed or displayed. The report shows the current values of the fields that have been set up for the selected alternate UMs.
UM Group Report (4.5.8)	Lets you select a range of item numbers, UM groups, and warehouse item types, and then specify where you want the report results printed or displayed. The report shows the current values of the conversion factors that have been set up for the selected ranges.
Base UM Check Report (4.5.12)	Lets you select a range of item numbers, UM groups, and warehouse item types, and then specify where you want the report results printed or displayed. The report lists inconsistencies caused when the base UM specified for the UM groups is the not same as the base UM for the items to which the conversion factors are attached.

Chapter 8

Algorithms

The following topics describe the purpose of the warehouse algorithms that control how locations are found in which to put away stock items, and from which to pick stock for orders. They also list the standard algorithms that are supplied with QAD Warehousing.

About Algorithms 106
Describes when algorithms are used and lists and describes algorithm types.

Algorithm Type Maintenance 107
Lists the basic types of algorithms and describes how to use Algorithm Type Maintenance (4.6.1) to modify them.

Algorithm Master Maintenance 108
Explains how to use Algorithm Master Maintenance (4.6.5) to modify the descriptions of individual algorithms or add new algorithms to any category0.

Algorithm Assignment 108
Explains how to use Algorithm Assignment Maintenance (4.6.9) to link a sequence of algorithms to a defined combination of transaction types, sites, warehouses, item number or warehouse item type, or address.

Simulation 111
Lists and describes different types of simulations.

Algorithm Listings 114
Lists existing algorithms by category.

Algorithm Master Report 135
Describes how and when to use Algorithm Master Report (4.6.7).

About Algorithms

Algorithms are used both for putting inventory away in warehouse locations and for selecting locations from which to pick inventory when filling sales orders or works orders. Each algorithm is a program that takes into account a particular set of criteria for choosing the location. A wide range of standard algorithms are provided with QAD Warehousing, but you can add custom programs to perform special functions if the standard algorithms do not meet your requirements.

Although the purpose of the algorithms is basically either putting inventory in locations or finding locations to take inventory out of, several types of algorithms exist, listed in Table 8.1.

Table 8.1
Algorithm Types

Type	Code	Description
Container Move	CM	Container move algorithms find suitable stage, truck, and dock locations, including empty locations, locations with the least goods, and locations that already contain stock for an SO shipper or DO ship-to code.
Lane	LA	Lane algorithms find suitable shipping lanes, including empty lanes, lanes with the best load, and lanes for a given carrier.
Location Find	LF	Location-find algorithms find suitable locations for inventory in the functional storage locations—the receipt, inspection, packing, and dispatch areas. LF algorithms do not consider the quantity of the inventory or the capacity of the relevant locations.
Put Away	PA	Put-away algorithms find suitable locations for storage of inventory in the non-functional storage locations—your main storage and picking locations. PA algorithms always take into account the quantity of the inventory to be put away and the capacity of the relevant locations.
Picking	PK	Picking algorithms find suitable locations from which to pick inventory to fulfil orders. You can have designated picking areas, but you can also allow picking from locations in your bulk storage or other areas. Different PK algorithms consider the available picking locations in different sequences.
Inspection	QA	Quality sampling algorithms define whether inspection must take place. When conditions for inspection are met, a sample is sent to an inspection area. Based on the internal routing definition, an inspection tag is printed, and inventory status is changed—to a non-available status, for instance.
Shortage Clearance	SC	Shortage clearance algorithms cut out unnecessary inventory movements by identifying newly received stock that can be used to fill sales or work order shortages directly. Instead of finding suitable storage locations for the inventory, and then picking stock to fill the back orders, SC algorithms move the inventory directly from the receipt area to the packing or dispatch area. This function is also known by the name cross-docking. See “Cross-Docking” on page 221.

Within each of these categories, QAD Warehousing provides a wide range of algorithms that perform the same basic activity, but satisfy different selection criteria.

Example During put-away, you can look for empty storage locations or you can select the most popular locations.

You can make sure that the system uses the right criteria for any given circumstance by linking algorithms to inventory transaction types, and also specifying any combination of site, warehouse, item number, item type, and supplier or customer address. In this way, you can arrange to pick stock from one set of locations when the item is item A and the customer is customer X, but you can specify a different set of locations, or even a different site or warehouse, when another item number or another customer is involved.

All of these detailed adjustments to the way inventory is put away and picked are made using the options on the Algorithms menu.

The standard algorithms supplied with the system are listed in “Algorithm Listings” on page 114. The descriptions associated with each algorithm provide a brief explanation of the precise function performed.

Note As part of continuous product development, additional algorithms are defined from time to time, so the number supplied can increase.

Algorithm Type Maintenance

The basic types of algorithm are listed in Table 8.1 on page 106:

CM: Container Move

LA: Lane

LF: Location Find

PA: Put-Away

PK: Picking

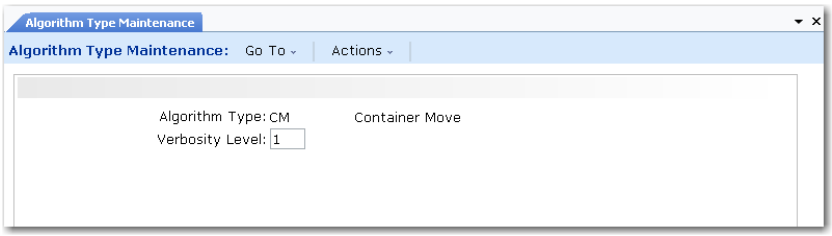
QA: Quality Sampling (Inspection)

SC: Shortage Clearance

These codes are supplied with the system. Normally you do not need any other algorithm types. If you do need to add another algorithm type code, you must create it and its description using Generalized Code Maintenance (36.2.13).

Use Algorithm Type Maintenance (4.6.1) to modify the verbosity level for any of the existing algorithm types. Algorithm Type Maintenance is shown in Figure 8.1.

Fig. 8.1
Algorithm Type Maintenance (4.6.1)



Enter values in the following fields:

Type. Enter the algorithm type code. When you select a code, the relevant description is shown in the Description field.

Verbosity Level. Enter a number to determine the importance level of messages that you want printed in reports relating to algorithms of this type. You can set a different value (in the range 0 to 999), depending on the amount of message detail you want included in reports; for example, for use when solving problems.

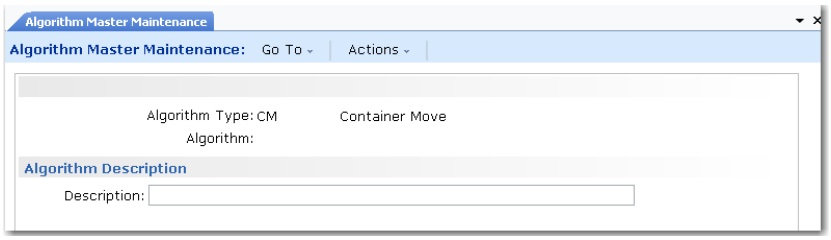
- Setting a low value such as 10 or 20 causes only the most important system messages to be reported.
- Setting a value of 999 causes all system messages to be reported.
- Setting a value of 0 switches off the function; no messages are reported.

Algorithm Master Maintenance

Use Algorithm Master Maintenance (4.6.5) to modify the descriptions of individual algorithms within each of the algorithm type categories, or to add new algorithms to any of the categories. To add a new algorithm, you must first create the program that the system runs to perform the algorithm tasks.

Algorithm Master Maintenance is shown in Figure 8.2.

Fig. 8.2
Algorithm Master Maintenance (4.6.5)



Enter values in the following fields:

Type. Enter the algorithm type code.

Algorithm. Enter the number of an existing algorithm of this type if you want to modify its description.

To set up a new algorithm, enter an unused number in the range 0 to 999.

Description. For existing algorithms, the description is displayed; you can modify it if required. For new algorithms, enter the description of the algorithm.

Algorithm Assignment

Use Algorithm Assignment Maintenance (4.6.9) to link a specified sequence of algorithms—of one type per sequence—to a defined combination of the following:

- Transaction type
- Site
- Warehouse
- Item number or warehouse item type
- Address (supplier for received inventory, customer for shipped inventory)

Setting up as many combinations of these elements as you choose provides flexibility in the way you define the algorithms that are run in any given situation.

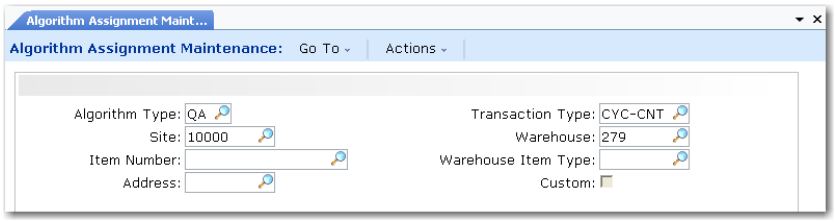
The reason for setting up a sequence of algorithms is so that you can specify the ideal method for selecting locations as the first step in the sequence. If the system cannot meet the full requirements either of put-away or picking by running the first choice algorithm, it then runs the second algorithm in the sequence, and so on until the requirement has been met.

Include a very general algorithm as the last one in the sequence, so that the task can always be completed.

Example A general put-away algorithm merely asks the system to look for any storage location that has available capacity. While this does not meet any specific requirements, including it as a last step in the sequence means that the system can always put inventory away somewhere, preventing the task from failing.

Algorithm Assignment Maintenance is shown in Figure 8.3.

Fig. 8.3
Algorithm Assignment Maintenance (4.6.9)



Enter values in the following fields:

Algorithm Type. Enter the two-character code for the type of algorithm you want to assign. The standard codes are LF, PA, PK, SC and QA.

Transaction Type. Enter the transaction type to which you want to assign algorithms. You can use an asterisk as a wild card if you want to assign the same algorithm to a range of transaction types.

Example The transaction type RCT-* covers all receipt transaction types, such as RCT-PO, RCT-UNP, RCT-WO, and so on.

Site. If this algorithm assignment is valid only for one site, enter the site name.

Warehouse. If this algorithm assignment is valid only for one warehouse, enter the warehouse name.

Item Number. If this algorithm assignment is valid only for one item, enter the item number. If you limit the assignment to an item number, you cannot also specify a warehouse item type; you can enter one or the other, but not both.

Warehouse Item Type. If you want to assign a sequence of algorithms to a combination of transaction type and warehouse item type, enter the item type code here. If you leave this field blank, the assignment will be valid for all item types.

The warehouse item type codes are a way of grouping together items that have similar properties. You assign the codes to items using the any of the warehouse item Maintenance functions.

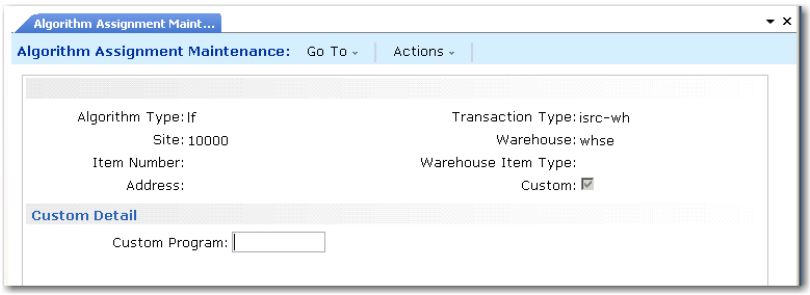
If you enter a warehouse item type code, you cannot also enter an item number.

Address. If this algorithm assignment is valid only for one supplier or customer address, enter the address code.

Custom. If you want to assign a custom program instead of a sequence of algorithms, enter Yes in the Custom field; otherwise, enter No.

If you enter Yes in the Custom field, the system displays the Custom Detail frame shown in Figure 8.4.

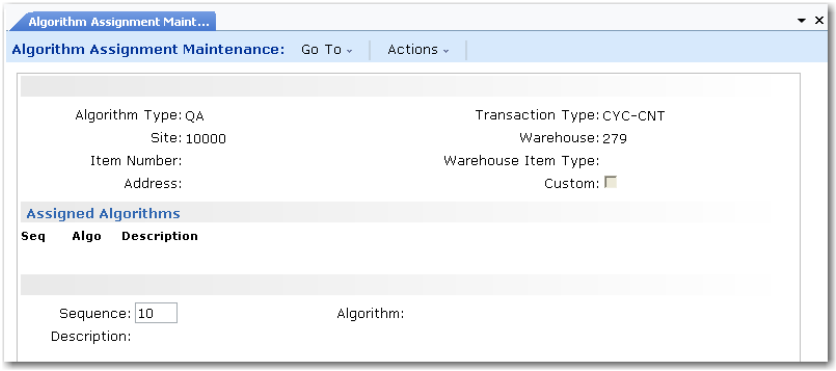
Fig. 8.4
Algorithm Assignment Maintenance, Custom Detail



Custom Program. Enter the name of the custom program to be run in place of any assigned algorithms. The custom program must exist before you can use this assignment.

If you enter No in the Custom field, the system displays the frame shown in Figure 8.5.

Fig. 8.5
Algorithm Assignment Maintenance, Assignment Fields



Enter values in the following fields:

Sequence. For a new assignment, Sequence defaults to 10. Number sequences by 10's (10, 20, 30, and so on) so that additional steps can be inserted easily later, if required.

Algorithm. Assign algorithms of the type you selected at the top of the frame.

Example If you selected algorithm type PA, you can assign any of the put-away algorithms. You can either type in the required number, or use the Up and Down arrow keys to move through the list of algorithms.

Use Algorithm Master Maintenance (4.6.5) to modify the description of the algorithm you select.

Description. The system displays the description of each algorithm as its number is shown in the Algorithm field. You cannot modify the descriptions here.

Remember, the system tries to use the first algorithm in the sequence first, typically sequence 10. If that fails to complete the transaction, it moves on to the second algorithm (20). You should, therefore, put your ideal solution first, and finish the sequence with a fail-safe option designed to prevent complete failure of the transaction.

As you enter the required algorithms in the assignment sequence, the system adds them to the list in the center of the frame.

Simulation

QAD Warehousing provides functions that let you test your algorithm assignments without altering inventory records:

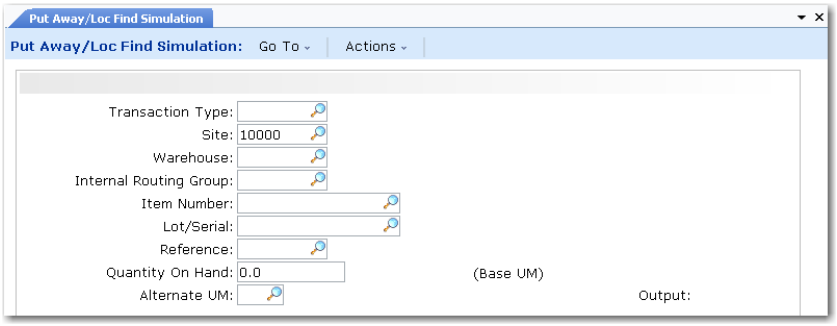
- Put Away/Loc Find Simulation (4.6.13) lets you simulate the put-away of some received inventory
- Picking Simulation (4.6.15) lets you simulate picking of inventory from your existing locations.
- Lane Assignment Simulation (4.6.17) lets you simulate lane algorithm assignments without actually modifying the inventory records in your database.
- Container Move Simulation (4.6.19) lets you test your CM type algorithms without actually modifying the inventory records in your database. The system displays or reports suitable stage, truck, and dock locations, including empty locations, locations with the least goods, and locations that already contain stock for an SO shipper or DO ship-to code.

In each case, the system displays or reports on the locations that would have been used if the simulation had been carried out as a real receipt or pick.

Put Away/Location Find Simulation

Put Away/Location Find Simulation (4.6.13) is shown in Figure 8.6.

Fig. 8.6
Put Away/
Location Find Simulation (4.6.13)



Enter values in the following fields:

Transaction Type. Enter the transaction type that you want to simulate. This must be a transaction type to which you have assigned PA or LF algorithms.

Site. Enter the site name.

Warehouse. Enter the warehouse name.

Internal Routing Group. Enter the name of the IRG into which the simulated inventory is to be received. If this is a functional IRG, the LF algorithm assigned to this transaction type is used for the simulation. If this is a non-functional IRG, the PA algorithm is used.

Item Number. Enter the item number of the simulated inventory to be received.

Lot/Serial. Enter the lot/serial number for the inventory, if applicable.

Ref. Enter the reference number for the inventory, if applicable.

Quantity On Hand. Enter the quantity of the received inventory, in base UM.

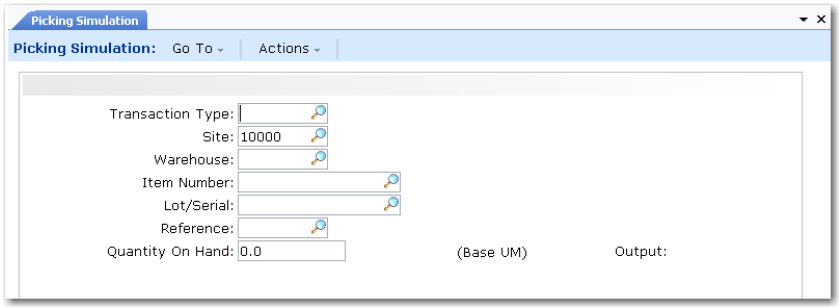
Alternate UM. Enter the alternate unit of measure in which the inventory is to be received. Note that the quantity you entered in the previous field is the number of items in base UM, and not the number of, for example, pallets, if this is the alternate UM.

When you click Next to accept the simulation entries, the system runs the relevant algorithms and displays the results of the put-way or location-find.

Picking Simulation

Picking Simulation (4.6.15) is shown in Figure 8.7.

Fig. 8.7
Picking Simulation (4.6.15)



Enter values in the following fields:

Transaction Type. Enter the transaction type that you want to simulate. This must be a transaction type to which you have assigned PK algorithms.

Site. Enter the site name.

Warehouse. Enter the warehouse name.

Item Number. Enter the item number of the simulated inventory to be picked.

Lot/Serial. Enter the lot/serial number for the inventory, if applicable.

Reference. Enter the reference number for the inventory, if applicable.

Quantity On Hand. Enter the quantity of the inventory to be picked, in base UM.

When you click Next to accept the simulation entries, the system runs the relevant algorithms and displays the results of the picking.

Lane Assignment Simulation

Use Lane Assignment Simulation (4.6.17) to test your lane algorithm assignments without actually modifying the inventory records in your database. The system displays or reports on the lanes that would have been used by the system if the simulation had been carried out as a real assignment.

Available lane assignment algorithms include:

1: Merge with same carrier. The system looks for a shipping lane in use for a given carrier.

2: Find empty shipping lane. The system looks for an unassigned shipping lane.

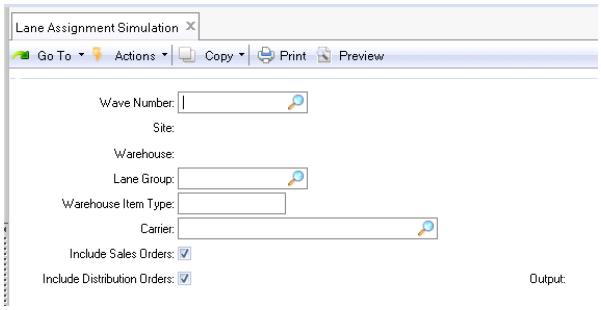
3: Find shipping lane by best load (active tasks). The system looks for a shipping lane with the lowest number of tasks assigned to it.

4: Find a dedicated unique lane for carrier. The system considers carriers assigned to a specific shipping lane in Lane/Dock Maintenance. A carrier can only be assigned to one shipping lane.

5: Find the last previously selected shipping lane to use when automatic wave release is active.

The system automatically populates the site and warehouse fields.

Fig. 8.8
Lane Assignment Simulation



Wave Number. Enter the number of the wave for which you want to simulate a lane assignment. When you specify a wave number, the system automatically populates the site and warehouse.

Lane Group . Enter a valid lane group for this function to consider.

Warehouse Item Type. Enter a valid warehouse item type for this function to consider.

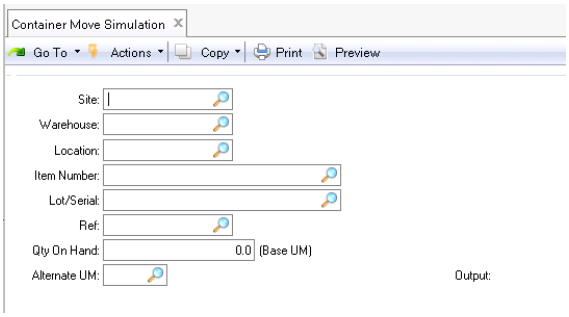
Include Sales Orders . Indicate Yes to include sales orders in this lane assignment simulation.

Include Sales Orders . Indicate Yes to include distribution orders in this lane assignment simulation.

Container Move Simulation

Use Container Move Simulation (4.6.19) to test your CM type algorithms without actually modifying the inventory records in your database. The system displays or reports suitable stage, truck, and dock locations, including empty locations, locations with the least goods, and locations that already contain stock for an SO shipper or DO ship-to code as if the simulation had been carried out as a real assignment.

Fig. 8.9
Container Move Simulation



Location. Enter the location for the container move simulation.

Quantity On Hand. When defining the fields for the container move simulation, enter the quantity of the inventory on hand for the simulation in the base UM for the item.

Alternate UM. When defining the fields for the container move simulation, enter the alternate unit of measure for the quantity on hand.

Note The quantity you entered in the Quantity On Hand field is the number of items in Base UM, and not the number of, for example, pallets, if this is the Alternate UM.

Algorithm Listings

This section lists the existing algorithms in each category: container move (CM), lane (LA), location-find (LF), put-away (PA), picking (PK), shortage clearance (SC), and quality inspection (QA).

Container-Move Algorithms

Table 8.2 lists the container-move algorithms that are supplied with the system.

Table 8.2
Container-Move Algorithms

	Algorithm	Description
1	Move to Stage–Find First Location	The system finds the first location defined as a stage location.
2	Move to Stage–Find Empty Location	The system finds the first location defined as a stage location.
3	Move to Stage–Merge with Same Shipper/Ship-To	The system finds a location in the stage area that already contains stock for the SO shipper or DO ship-to code.

	Algorithm	Description
4	Move to Stage–Find Location with Best Load	The system looks for a stage location with the least number of containers/pallets in it.
10	Move to Dock–Find First Location	The system finds the first location defined as a truck location.
11	Move to Dock–Find Empty Location	The system looks for an empty dock location.
12	Move to Dock–Merge with Same Shipper/Ship-To	The system finds a dock location that already contains stock for the SO shipper or DO ship-to.
13	Move to Dock–Find Location with Best Load	The system looks for a dock location that has the least number of containers/pallets in it.
14	Move to Dock–Find a Dedicated Dock	The system finds a dock dedicated to a given carrier.

Lane Algorithms

Table 8.3 lists the lane algorithms that are supplied with the system.

Table 8.3
Lane Algorithms

	Algorithm	Description
1	Merge with Same Carrier	The system looks for a shipping lane in use for a given carrier.
2	Find Empty Shipping Lane	The system looks for an unassigned shipping lane.
3	Find Shipping Lane by Best Load (active tasks)	The system looks for a shipping lane with the lowest number of tasks assigned to it.
4	Find a Dedicated Unique Lane for Carrier	The system considers carriers assigned to a specific shipping lane in Lane/Dock Maintenance (8.15.13). A carrier can only be assigned to one shipping lane.
5	Find the last shipping lane	Find the last previously selected shipping lane to use when automatic wave release is active.

Location-Find Algorithms

Table 8.4 lists the location-find algorithms that are supplied with the system.

Table 8.4
Location-Find Algorithms

	Algorithm	Description
1	First Location in First	Finds the first location in the first SLG in the internal routing group.
2	Empty Functional Location	Looks for a location containing no inventory
3	Merge with same order	Looks for a location containing inventory from the same order.
4	Merge with same order line	Looks for a location containing inventory from the same order line.
5	Merge with same part	Looks for a location containing inventory of the same item number.

	Algorithm	Description
6	Merge with same address	Looks for a location containing inventory destined for the same customer address.
7	Best Load by Ship Weight	Looks for a functional location with the least load weight in it.
8	Best Load by Number of Items	Looks for a functional location with the smallest number of items in it
9	Best Load by Number of Ref. Sized Items (such as pallets)	Looks for a location with the smallest number of items of sizing type R.
10	Find Work Center from Routing	For work orders, look at the work center coming from the routing of the operation linked to the component of the BOM. It is used to send raw material to the work center that requires this item for production.
11	Find first location different than work center	Look for the first location in a group that is not defined as a work center.
12	Find last work center of Routing	As a complement to algorithm 10, this algorithm finds the last work center defined on the production routing. It is used when making the work order receipt, so the system creates a task to move stock from the last production step to a storage area.
13	Merge with same Bill of Lading	Looks for a location containing inventory from the same bill of lading.

Put-Away Algorithms

Table 8.5 lists the put-away algorithms that are supplied with the system.

Table 8.5
Put-Away Algorithms

	Algorithm	Description
1	Storage Locations	Put-away looks for locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG.
2	Empty Storage Locations	Put-away looks for empty locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG.
3	Storage Locations–Merge with Part	Put-away looks for locations in the item's storage location group, or list of SLGs. locations must already contain the item being put away. The locations are selected in popularity code order within each SLG.
4	Storage Locations–Merge with Lot/Serial	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the lot/serial and item being put away. The locations are selected in popularity code order within each SLG.

Table 8.5 — *Put-Away Algorithms* — (Page 1 of 13)

	Algorithm	Description
5	Storage Locations–Merge with Reference	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the reference, lot/serial, and item being put away. The locations are selected in popularity code order within each SLG.
6	Storage Locations–Merge with Any	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain inventory and are selected in popularity code order within each SLG.
7	Storage Locations–Merge with Rules	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain inventory and are selected in popularity code order within each SLG. Additional validation is performed to ensure that the merging rules are satisfied.
8	Storage Locations–Merge with Unit of Measure	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain inventory with the alternate UM being put away, and are selected in popularity code order within each SLG.
9	Storage Locations–Merge with UM and Part	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the item being put away with the same alternate UM as this put away, and are selected in popularity code order within each SLG.
10	Storage Locations–Merge with UM and Rules	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain inventory with the alternate UM being put away, and are selected in popularity code order within each SLG. Additional validation is performed to ensure that the merging rules are satisfied.
11	Storage Locations–Merge with Part and Rules	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the item being put away. The locations are selected in popularity code order within each SLG. Additional validation is performed to ensure that the merging rules are satisfied.
15	Multi-Item Pallet split and Put-Away	When multi-item pallets, this algorithm makes put-away for each of the components of the pallet, and not put-away the pallet as a whole. Each item could eventually go in another location.

Table 8.5 — *Put-Away Algorithms* — (Page 2 of 13)

	Algorithm	Description
16	Multi-Item Pallet split and Put-Away – No Partial	When multi-item pallets, this algorithm makes put-away for each of the components of the pallet, and not put-away the pallet as a whole. Each item could eventually go in another location, but for a given item, it must go completely in one single location
21	Replenished Locations	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence.
22	Empty Replenished Locations	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence.
23	Replenished Locations–Merge with Part	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain the item being put away.
24	Replenished Locations–Merge with Lot/Serial	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain the lot/serial and item being put away.
25	Replenished Locations–Merge with Reference	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain the reference, lot/serial, and item being put away.
26	Replenished Locations–Merge with Any	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain inventory.
27	Replenished Locations–Merge with Rules	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain inventory. Additional validation is performed to ensure that the merging rules are satisfied.

Table 8.5 — *Put-Away Algorithms* — (Page 3 of 13)

	Algorithm	Description
28	Replenished Locations–Merge with Unit of Measure	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain inventory with the same alternate UM as this put away.
29	Replenished Locations–Merge with UM and Part	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain the item being put away, with the same alternate UM as this put away.
30	Replenished Locations–Merge with UM and Rules	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain inventory with the same alternate UM as this put away. Additional validation is performed to ensure that the merging rules are satisfied.
31	Replenished Locations–Merge with Part and Rules	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Locations must already contain the item being put away. Additional validation is performed to ensure that the merging rules are satisfied.
41	Reverse-Replenished Locations	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence.
42	Empty Reverse-Replenished Locations	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick level sequence.
43	Reverse-Replenished Locations–Merge with Part	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick level sequence. Locations must already contain the item being put away.

Table 8.5 — *Put-Away Algorithms* — (Page 4 of 13)

	Algorithm	Description
44	Reverse-Replenished Locations–Merge with Lot/Serial	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain the lot/serial and item being put away.
45	Reverse-Replenished Locations–Merge with Reference	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain the reference, lot/serial, and item being put away.
46	Reverse-Replenished Locations–Merge with Any	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain inventory.
47	Reverse-Replenished Locations–Merge with Rules	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain inventory. Additional validation is performed to ensure that the merging rules are satisfied.
48	Reverse-Replenished Locations–Merge with Unit of Measure	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain inventory with the same alternate UM as this put away.
49	Reverse-Replenished Locations–Merge with UM and Part	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain the item being put away, with the same alternate UM as this put away.
50	Reverse-Replenished Locations–Merge with UM and Rules	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain inventory with the same alternate UM as this put away. Additional validation is performed to ensure that the merging rules are satisfied.

Table 8.5 — *Put-Away Algorithms* — (Page 5 of 13)

	Algorithm	Description
51	Reverse-Replenished Locations–Merge with Part and Rules	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick-level sequence. Locations must already contain the item being put away. Additional validation is performed to ensure that the merging rules are satisfied.
61	Storage Locations by Popularity Code	Put-away looks for locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
62	Empty Storage Locations by Popularity Code	Put-away looks for empty locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
63	Replenished Locations by Popularity Code	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
64	Empty Replenished Locations by Popularity Code	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick-level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
65	Storage Locations by Descending Popularity Code	Put-away looks for locations in the item's storage location group, or list of SLGs, with the locations selected in descending popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
66	Empty Storage Locations by Descending Popularity Code	Put-away looks for empty locations in the item's storage location group, or list of SLGs, with the locations selected in descending popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.

Table 8.5 — *Put-Away Algorithms* — (Page 6 of 13)

	Algorithm	Description
67	Replenished Locations by Descending Popularity Code	Put-away looks for locations in the item's replenished location groups, with the locations selected in descending popularity code order within each SLG, which are selected in pick-level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
68	Empty Replenished Locations by Descending Popularity Code	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in descending popularity code order within each SLG, which are selected in pick-level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
69	Merge with Part–Ascending Popularity Code	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the item being put away. The locations are selected in popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
70	Merge with Part and Lot–Ascending Popularity Code	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the item and lot being put away. The locations are selected in popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range.
81	Storage Locations–Preferred Unit of Measure	Put-away looks for locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG. The system considers only locations with a preferred UM the same as the UM of this put away.
82	Empty Storage Locations–Preferred Unit of Measure	Put-away looks for empty locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG. The system considers only locations with a preferred UM the same as the UM of this put away.
83	Replenished Locations–Preferred Unit of Measure	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick level sequence. The system considers only locations with a preferred UM the same as the UM of this put away.

Table 8.5 — *Put-Away Algorithms* — (Page 7 of 13)

	Algorithm	Description
84	Empty Replenished Locations–Preferred UM	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick level sequence. The system considers only locations with a preferred UM the same as the UM of this put away.
85	Reverse-Replenished Locations–Preferred UM	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick level sequence. The system considers only locations with a preferred UM the same as the UM of this put away.
86	Empty Reverse-Replenished Locations–Preferred UM	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in descending pick level sequence. The system considers only locations with a preferred UM the same as the UM of this put away.
87	Storage Locations by Popularity Code–Preferred UM	Put-away looks for locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.
88	Empty Storage Locations by Popularity Code–Preferred UM	Put-away looks for empty locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.
89	Replenished Locations by Popularity Code–Preferred UM	Put-away looks for locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.

Table 8.5 — *Put-Away Algorithms* — (Page 8 of 13)

	Algorithm	Description
90	Empty Replenished Locations by Popularity Code–Preferred UM	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in popularity code order within each SLG, which are selected in pick level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.
91	Storage Locations by Descending Popularity Code–Preferred UM	Put-away looks for locations in the item's storage location group, or list of SLGs, with the locations selected in descending popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.
92	Empty Storage Locations by Descending Popularity Code–Preferred UM	Put-away looks for empty locations in the item's storage location group, or list of SLGs, with the locations selected in descending popularity code order within each SLG. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.
93	Replenished Locations by Descending Popularity Code–Preferred UM	Put-away looks for locations in the item's replenished location groups, with the locations selected in descending popularity code order within each SLG, which are selected in pick level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.
94	Empty Replenished Locations by Descending Popularity Code–Preferred UM	Put-away looks for empty locations in the item's replenished location groups, with the locations selected in descending popularity code order within each SLG, which are selected in pick level sequence. Additional validation is performed to ensure that the selected locations are in the correct popularity code range. The system considers only locations with a preferred UM the same as the UM of this put away.

Table 8.5 — *Put-Away Algorithms* — (Page 9 of 13)

	Algorithm	Description
95	Merge with same Part – Preferred UM	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the item being put away. Only locations with a preferred UM, the same as the item being put-away, are considered.
96	Merge with same Lot/Serial – Preferred UM	Put-away looks for locations in the item's storage location group, or list of SLGs. Locations must already contain the item and lot/serial being put away. Only locations with a preferred UM, the same as the item being put-away, are considered.
101	Empty Dedicated Storage Locations	Put-away looks for empty dedicated locations in the item's storage location group, or list of SLGs, with the locations selected in popularity code order within each SLG.
102	Dedicated Storage Locations– Merge with Part	Put-away looks for dedicated locations in the item's storage location group, or list of SLGs. The locations must already contain the item being put away, and are selected in popularity code order within each SLG.
103	Dedicated Storage Locations– Merge with Any	Put-away looks for dedicated locations in the item's storage location group, or list of SLGs. The locations must already contain inventory, and are selected in popularity code order within each SLG.
104	Dedicated Storage Locations – Merge with Part and Lot	Put-away looks for dedicated locations in the item's storage location group, or list of SLGs. The locations must already contain the item and lot/serial, and are selected in popularity code order within each SLG.
106	Empty Dedicated Storage Locations – Ascending Popularity Code	Search for an empty dedicated location in the item's storage location group, or list of SLGs. Locations are selected in popularity code order within each storage location group. Additional validation is performed to ensure that selected locations are in the correct popularity code range.
107	Dedicated Storage Location – Merge with Part – Ascending Popularity Code	Search for dedicated locations in the item SLG or the item list of SLG but locations that already contain the same item as the one being put-away. The locations are selected in popularity code order within each storage location group. Additional validation is done to ensure that the selected locations are in the correct popularity code range.

Table 8.5 — *Put-Away Algorithms* — (Page 10 of 13)

	Algorithm	Description
109	Dedicated Storage Location–Merge with part and lot – Ascending Popularity Code	Search for dedicated locations in the item SLG or the item list of SLG but locations that already contain the same item & lot as the one being put-away. Locations are selected in popularity code order within each storage location group. Additional validation is done to ensure that the selected locations are in the correct popularity code range.
111	Consume Reference Forecast	Consume any receipt forecasts that identify the specific order line, item number, lot/serial, and reference being received. The locations are selected in popularity code order within each SLG. Generally, this is used when all of the receipts details are known ahead of time, probably on an ASN.
112	Consume Lot/Serial Forecast	Consume any receipt forecasts that identify the specific order line, item number, and lot/serial being received. The locations are selected in popularity code order within each SLG. Generally, this is used when the lot/serial details are known ahead of time, probably on an ASN, but not details of specific pallets, containers, and so on. Any reference detail on the receipt or the forecast is ignored.
113	Consume Order Line Forecast	Consume any receipt forecasts that identify the specific order line being received. The locations are selected in popularity code order within each SLG. Generally, this is used when no details apart from the quantity are known ahead of time. Any lot/serial or reference detail on the receipt or the forecast is ignored.
121	Merge with Reference Forecast	This functions as per algorithm 111, except that the forecast is not consumed. The forecast quantity is left open. The forecast is simply used to identify the location.
122	Merge with Lot/Serial Forecast	This functions as per algorithm 112, except that the forecast is not consumed. The forecast quantity is left open. The forecast is simply used to identify the location.
123	Merge with Order Line Forecast	This functions as per algorithm 113, except that the forecast is not consumed. The forecast quantity is left open. The forecast is simply used to identify the location.

Table 8.5 — *Put-Away Algorithms* — (Page 11 of 13)

	Algorithm	Description
124	Merge with Order Forecast	This algorithm allows inventory received on an order line to be placed into a location with a forecast for the same order but a different order line. The locations are selected in popularity code order within each SLG. No consumption can occur as the forecast is for a different item with, potentially, different rules for sizing.
133	Merge with Item Outside of Storage Location Groups	Put-away looks for locations outside the item's storage location group, or list of SLGs. Locations must already contain the item being put away. The locations are selected in popularity code order within each SLG.
134	Use Last Item Number Transaction	The system looks for the last similar transaction for this item—transactions with the same from site, warehouse, and SLG as this put away. The destination location from that transaction is used for this put away.
135	Use Last Lot/Serial Transaction	The system looks for the last similar transaction for this lot/serial—transactions with the same from site, warehouse, and SLG as this put away. The destination location from that transaction is used for this put away.
136	Use Last Reference Transaction	The system looks for the last similar transaction for this reference—transactions with the same from site, warehouse, and SLG as this put away. The destination location from that transaction is used for this put away.
137	Use Storage Location Group From Last Item Number Transaction	Search for the location that was used with the last transaction referring to same item number. Look for location inside the same SLG starting from the location found.
138	Use Storage Location Group from Last Lot/Serial Transaction	Search for the location that was used with the last transaction referring to same lot/serial. Look for location inside the same SLG starting from the location found.
139	Use Storage Location Group from Last Reference Transaction	Search for the location that was used with the last transaction referring to same reference. Look for location inside the same SLG starting from the location found.
140	Storage Location by Popularity Code–UM in Capacity	Search for locations in the item SLG or the item list of SLG. The locations are selected in popularity code order each storage location group. Additional validation that the selected locations are in the correct code range. Only locations with a capacity defined for this UM are considered.

Table 8.5 — *Put-Away Algorithms* — (Page 12 of 13)

	Algorithm	Description
142	Storage Locations by Full%–UM in Capacity	Search for locations in the item SLG or the item list of SLG. The locations are selected in Full% order each storage location group. Additional validation that the selected locations are in the correct code range. Only locations with a capacity defined for this UM are considered.
150	Detail Overflow Location Put-Away–EXACT NEED	Put-away in the Overflow storage location group. Only the needed quantity is put-away.
151	Detail Overflow Location Put-Away–INFINITE CAPACITY	Put-away in the Overflow storage location group. Capacity in destination location is Infinite, so the total quantity is put-away in the location, for instance a full pallet, even if the requirement is less.
170	Storage Locations Merge with same Item/Lot in SLG	Search for locations in the item SLG or the item list of SLG. The locations are selected in popularity code order within each storage location group. Only select storage location containing same item/lot.
171	Storage Locations Merge with same Item in SLG	Search for locations in the item SLG or the item list of SLG. The Locations are selected in popularity code order within each storage location group. Only select storage location containing same item.
172	Storage Locations. Consider Only Empty SLGs	Search for locations in the item SLG or the item list of SLG. The locations are selected in popularity code order within each storage location group. Only select empty storage location.

Table 8.5 — *Put-Away Algorithms* — (Page 13 of 13)

Picking Algorithms

Table 8.6 lists the picking algorithms that are supplied with the system.

Table 8.6
Picking Algorithms

	Algorithm	Description
1	Pick by Location	Picking is sorted by location so that lower location values are picked first.
2	Pick by Lot/Serial	The lot/serial numbers sort picking so that lower lot/serial values are picked first.
3	Pick by Date	Picking is sorted by manufacture date so that inventory manufactured earlier is picked first.
4	Pick by Expiration Date	Picking is sorted by expiration date so that inventory due to expire earliest is picked first.
5	Pick by Location (Descending)	Picking is sorted by location so that higher location values are picked first.

Table 8.6 — *Picking Algorithms* — (Page 1 of 6)

	Algorithm	Description
6	Pick by Lot/Serial (Descending)	Lot/serial numbers sort picking so that higher lot/serial values are picked first.
7	Pick by Date (Descending)	Picking is sorted by manufacture date so that inventory manufactured most recently is picked first.
8	Pick by Expiration Date (Descending)	Picking is sorted by expiration date so that inventory due to expire furthest into the future is picked first.
9	Pick by Level by Location	Picking is sorted, first, by the storage location group's picking level and then, within that, by the location with lower location values picked from first.
10	Pick by Level by Lot/Serial	Picking is sorted, first, by the storage location group's picking level and then, within that, by the lot/serial number with lower lot/serial values picked first.
11	Pick by Level by Date	Picking is sorted, first, by the storage location group's picking level and then, within that, by the manufacture date with the earliest manufactured inventory being picked first.
12	Pick by Level by Expiration Date	The storage location group's picking level sorts picking first and then, within that, by the inventory's expiration date with the inventory expiring earliest being picked from first.
13	Pick by Level by Location (Descending)	Picking is sorted, first, by the storage location group's picking level and then, within that, by the location with higher location values picked from first.
14	Pick by Level by Lot/Serial (Descending)	The storage location group's picking level sorts picking first and then, within that, by the inventory's lot/serial number with higher lot/serial values picked from first.
15	Pick by Level by Date (Descending)	Picking is sorted, first, by the storage location group's picking level and then, within that, by the manufacture date with the most recently manufactured inventory being picked first.
16	Pick by Level by Expiration Date (Descending)	The storage location group's picking level sorts picking first and then, within that, by the inventory's expiration date with the inventory expiring furthest into the future being picked from first.
17	Pick by Month	Picking is sorted by manufacture date so that inventory manufactured earlier is picked first. However, all inventory manufacture within the same calendar month is considered as having the same manufacture date.

Table 8.6 — *Picking Algorithms* — (Page 2 of 6)

	Algorithm	Description
18	Pick by Expiration Month	Picking is sorted by expiration date so that inventory expiring earliest is picked first. However, all inventory due to expire within the same calendar month is considered as having the same expiration date.
19	Pick by Month (Descending)	Picking is sorted by manufacture date so that inventory manufactured last is picked first. However, all inventory manufacture within the same calendar month is considered as having the same manufacture date.
20	Pick by Expiration Month (Descending)	Picking is sorted by expiration date so that inventory expiring furthest into the future is picked first. However, all inventory due to expire within the same calendar month is considered as having the same expiration date.
21	Pick by Level by Month	This algorithm functions as PK11 except that all inventory manufactured in the same calendar month is considered to have the same manufacture date.
22	Pick by Level by Expiration Month	This algorithm functions as PK12 except that all inventory due to expire in the same calendar month is considered to have the same expiration date.
23	Pick by Level by Month (Descending)	This algorithm functions as PK15 except that all inventory manufactured in the same calendar month is considered to have the same manufacture date.
24	Pick by Level by Expiration Month (Descending)	This algorithm functions as PK16 except that all inventory due to expire in the same calendar month is considered to have the same expiration date.
25	Pick by Date Range	This algorithm picks inventory by manufacture date, with inventory manufactured first being picked first, but using the merge rules to determine ranges of dates that can be considered the same when picking.
26	Pick by Expiration Date Range	This algorithm picks inventory by expiration date, with inventory due to expire first being picked first, but using the merge rules to determine ranges of dates that can be considered the same when picking.
27	Pick by Date Range (Descending)	This algorithm picks inventory by manufacture date, with inventory manufactured last being picked first, but using the merge rules to determine ranges of dates that can be considered the same when picking.

Table 8.6 — *Picking Algorithms* — (Page 3 of 6)

	Algorithm	Description
28	Pick by Expiration Date Range (Descending)	This algorithm picks inventory by manufacture date, with inventory due to expire last being picked first, but using the merge rules to determine ranges of dates that can be considered the same when picking.
29	Pick by Level by Date Range	This algorithm functions as PK25 except that inventory is first selected and sorted by picking level.
30	Pick by Level by Expiration Date Range	This algorithm functions as PK26 except that inventory is first selected and sorted by picking level.
31	Pick by Level by Date Range (Descending)	This algorithm functions as PK27 except that inventory is first selected and sorted by picking level.
32	Pick by Level by Expiration Date Range (Descending)	This algorithm functions as PK28 except that inventory is first selected and sorted by picking level.
33	Pick Critical Inventory Only.	This algorithm only picks inventory that has fallen into its critical period that is now within the number of critical days, defined per item, of it's expiration date.
34	Pick By Date By Reference	Picking is sorted by manufacture date so that inventory manufactured earlier is picked first. If several references, such as pallets, have the same manufacture date, they are selected in ascending order
35	Pick By Reference	Picking is sorted by reference so that lower reference values, normally the oldest, are picked first.
36	Pick By Level by Reference	Picking is sorted, first, by the storage location group's picking level and then, within that, by the reference number with lower reference values picked first.
37	Pick By Date – Full Pallets Only	Picking is sorted by manufacture date so that inventory manufactured earlier is picked first. Only full pallets are picked, so the alternate UM must be the item/warehouse logistics UM, the pallet must have at least the quantity defined in the conversion factor between the alternate and base UM and there can not be any allocation on the pallet.
38	Pick By Level By Date – Full Pallets Only	Picking is sorted, first, by the storage location group's picking level and then, within that, by the manufacture date with the earliest manufactured inventory being picked first. Only full pallets are picked, so the alternate UM must be the item/warehouse logistics UM, the pallet must have at least the quantity defined in the conversion factor between the alternate and base UM and there can not be any allocation on the pallet.

Table 8.6 — *Picking Algorithms* — (Page 4 of 6)

	Algorithm	Description
39	Pick By Level By Date – FULL ALLOCATION (OverPick)	Picking is sorted, first, by the storage location group's picking level and then, within that, by the manufacture date with the earliest manufactured inventory being picked first. The entire quantity is allocated and selected for transfer, even if the requirement is less.
40	Pick in Last Work Center from Routing	Picking is done in the work center associated with the last step of the routing for a given work order.
44	Pick By Date By Reference – FULL PALLETS ONLY	Picking is sorted by manufacture date so that inventory manufactured earlier is picked first. If several references, such as pallet, have the same manufacture date, they are selected in ascending order. Only full pallets are picked, so the alternate UM must be the item/warehouse logistics UM, the pallet must have at least the quantity defined in the conversion factor between the alternate and base UM and there can not be any allocation on the pallet.
45	Pick by Expiration Date – FULL PALLETS ONLY	Picking is sorted by expiration date so that inventory due to expire earliest is picked first. Only full pallets are picked, so the alternate UM must be the item/warehouse logistics UM, the pallet must have at least the quantity defined in the conversion factor between the alternate and base UM and there cannot be any allocation on the pallet.
47	Pick By Level (Descending) by Date – FULL PALLETS ONLY	Picking is sorted, first, by the storage location group's picking level from the biggest to the smallest and then, within that, by the manufacture date with the earliest manufactured inventory being picked first. Only full pallets are picked, so the alternate UM must be the item/warehouse logistics UM, the pallet must have at least the quantity defined in the conversion factor between the alternate and base UM and there ca not be any allocation on the pallet.
48	Pick By Level (Descending) by Date	Picking is sorted, first, by the storage location group's picking level from the biggest to the smallest and then, within that, by the manufacture date with the earliest manufactured inventory being picked first.
49	Pick By Level (Descending) by Lot/Serial	Picking is sorted, first, by the storage location group's picking level from the biggest to the smallest and then, within that, by the lot/serial number with lower lot/serial values picked first.

Table 8.6 — *Picking Algorithms* — (Page 5 of 6)

	Algorithm	Description
50	Pick by Level by Lot/Serial – FULL PALLETS ONLY	Picking is sorted, first, by the storage location group's picking level and then, within that, by the lot/serial number with lower lot/serial values picked first. Only full pallets are picked, so the alternate UM must be the item/warehouse logistics UM, the pallet must have at least the quantity defined in the conversion factor between the alternate and base UM and there cannot be any allocation on the pallet.
61	Pick by Location Consignment Stock Only	Picking is sorted by location so that consignment stock is picked first from lower location values.
62	Pick by Lot/Serial Consignment Stock Only	The lot/serial numbers sort picking so that consignment stock is picked first from lower lot/serial values.
63	Pick by Date Consignment Stock Only	Picking is sorted by manufacturer date so that consignment stock manufactured earlier is picked first.
64	Pick by Expiration Date Consignment Stock Only	Picking is sorted by expiration date so that consignment stock due to expire earliest is picked first.
65	Pick by Location Nonconsignment Stock Only	Picking is sorted by location so that non-consignment stock is picked first from lower location values.
66	Pick by Lot/Serial Nonconsignment Stock Only	Picking is sorted by lot/serial numbers so that non-consignment stock is picked first from lower lot/serial values.
67	Pick by Date Nonconsignment Stock Only	Picking is sorted by manufacturer date so that non-consignment stock manufactured earlier is picked.
68	Pick by Expiration Date Nonconsignment Stock Only	Picking is sorted by expiration date so that non-consignment stock due to expire earliest is picked first.

Table 8.6 — *Picking Algorithms* — (Page 6 of 6)

Quality Inspection Algorithms

Table 8.7 lists the quality inspection algorithms that are supplied with the system.

Table 8.7
Quality Inspection Algorithms

	Algorithm	Description
1	Inspection of Item Every X Days	Inspection on a cyclic basis, using the frequency in days defined at the item/warehouse level or at the item/supplier level from the last receipt of a given item.
2	Inspection of Item from Given Supplier every X Days	Inspection on a cyclic basis, using the frequency in days defined at the item/warehouse level or at the item/supplier level from the last receipt of a given item from a given supplier.
3	Inspection if previous Item Inspection was bad	Inspection takes place if previous inspection failed for the item.
4	Inspection if previous Inspection from supplier was bad	Inspection takes place if previous inspection failed for *any* item coming from a given supplier.
5	Inspection if previous Item Inspection from supplier was bad	Inspection takes place if previous inspection failed for a *given* item coming from the given supplier.
6	Inspection if inspection required on order (PO,WO only)	Inspection takes place if the order field for Inspection Required has been set to Yes.
7	Inspection ID Quantity Received is greater Quantity Required (PO Only)	Inspection takes place if the quantity received is larger than expected. This algorithm only works with purchase orders.
8	Inspection of All Items with Inspection Required	Inspection takes place if the item is marked for inspection in Item/Warehouse Maintenance.
9	Inspection of Item every X receipts	Inspection frequency is based on the receipt frequency defined at the item/warehouse level or at the supplier/item level.
10	Random Inspection	Inspection is based on a random % defined at the item/warehouse level or at the item/supplier level. This percentage can be dynamically changed based on the results of the inspection.
11	Inspection if new Item (No existing PO Receipt)	Inspection takes place if no existing PO receipt exists for this item; it is received for the first time.

Shortage-Clearance Algorithms

Table 8.8 lists the shortage-clearance algorithms that are supplied with the system.

Table 8.8
Shortage-Clearance Algorithms

	Algorithm	Description
1	Sales Order Clearance by Priority by Due Date	Clears short sales orders, highest priority first.
2	Sales Order Clearance by Due Date by Priority	Clears short sales orders, earliest due date first.
11	Work Order Clearance by Priority by Due Date	Clears short work orders, highest priority first.
12	Work Order Clearance by Due Date by Priority	Clears short work orders, earliest due date first.
21	Distribution Order Clearance by Priority by Due Date	Clears short distribution orders, highest priority first.
22	Distribution Order Clearance by Due Date by Priority	Clears short distribution orders, earliest due date first.
31	Unplanned Issue Clearance by Priority by Due Date	Clears short unplanned issues, highest priority first.
32	Unplanned Issue Clearance by Due Date by Priority	Clears short unplanned issues, earliest due date first.
41	Global Clearance by Priority by Due Date	Clears shortages regardless of order type, highest priority first.
42	Global Clearance by Due Date by Priority	Clears shortages regardless of order type, earliest due date first.

Algorithm Master Report

In addition to several algorithm browses, you can use the Algorithm Master Report (4.6.7) to report algorithm numbers and descriptions. In the report, select a range of algorithm type codes and algorithm numbers for inclusion in the report, and then specify where you want the report results printed or displayed.

Chapter 9

Engine Processing

The following topics explain how engine processing handles inventory movements in the warehouses, and how you can link inventory transaction types to different modes of engine processing:

About Engine Processing 138
Introduces engines and explains how and when they are used.

Setting Up Engine Processors 141
Describes the prerequisite steps to processing engine workfiles.

Creating Transaction Types 143
Describes how to add transaction types to define special types of transactions.

Creating Warehouse Transaction Types 146
Describes how to set fields for transaction types that apply to transaction types in specific warehouses using Warehouse Transaction Type Maintenance (4.7.5).

Using Engine Processors 149
Explains how and when to use engine processors to process engine workfiles, and the various ways engine workfiles can be processed.

Modifying Engine Workfiles 152
Describes the two frames used to modify engine workfiles, Engine Workfile by Order Maintenance (4.7.13) and Engine Workfile by Date Maintenance (4.7.14).

Archiving/Deleting Engine History Data 155
Explains how to use Engine History Delete/Archive (4.7.21.23) to delete or archive engine history data by a range of sites, locations, or item numbers.

About Engine Processing

QAD Warehousing lets you use software routines, or *engines*, to process transactions within a warehouse. The system creates *engine workfiles*—requests for a transaction—when processing warehouse tasks, such as picking and put-away. You can use the engines to process engine workfiles in the Engine menu (4.7). The engine workfiles are always in use, though, in QAD Warehousing, whether you choose not to process them with the engines.

Programs in the Engine menu let you process different time-consuming functions and decrease user waiting by running the processes in the background. You can use the programs to delay the creation of warehouse transactions, select and modify engine workfiles, and process engine workfiles singularly or in batch mode.

Engine workfiles have two different modes: AUTO and MANUAL. When in AUTO mode, the system processes engine workfiles automatically without user intervention. This is the most common use. When in MANUAL mode, you must start one of the engine processor programs in the Engine menu to process an engine workfile request. Engine workfiles can be any of the following requests:

- Create a task, including the put-away logic when applicable.
- Start the picking logic and create a picking task.
- Confirm a task.
- Print a tag.

See “AUTO and MANUAL Mode Processing” on page 139.

Note Warehouse staff typically print tags during task creation, confirmation, exception processing, or when they need an ID tag.

You can modify engine workfiles using the following engine workfile programs:

- Engine Workfile by Order Maint (4.7.13)
- Engine Workfile by Date Maint (4.7.14)

See page 152.

You use the following engine processor programs to process engine workfiles:

- Engine Processor – Order Display (4.7.9)
- Engine Processor – Date Display (4.7.10)
- Engine Processor – Lot/Serial Ref (4.7.11)

See page 149.

Use Transaction Type (4.7.1) and Warehouse Transaction Type Maintenance (4.7.5) to define fields related to consolidating similar records—such as the receipt of two separate shipments of the same item, which could be consolidated into a single put-away. You can also specify whether the controls that allow overpicking should have priority at the storage location group level or at the transaction type level.

Warehouse Transaction Type Maintenance (4.7.5) lets you set up values for the same fields as Transaction Type Maintenance, but relating only to a specified warehouse at a specified site. At the warehouse level, you can also set values for picking level fields related to the transaction type.

AUTO and MANUAL Mode Processing

Engine workfile records are created in either AUTO or MANUAL mode. The following sections describe the processing for each mode.

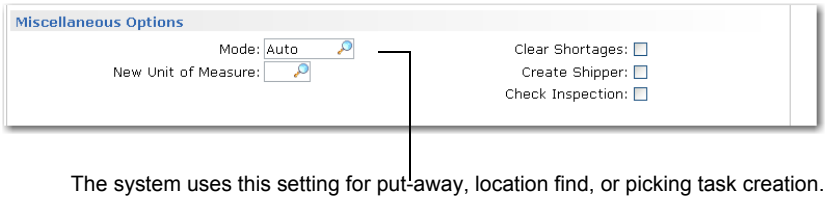
AUTO Mode

For AUTO processing of an engine workfile, the system first determines the type of logic to use—picking, put-away, location find, cross-docking, inspection, or other logic. After it determines the type of logic needed, it creates the task. The system stores the task record in the TranD table. Also, when a user performs a task, the system starts the task confirmation process. This typically involves the system recording the move of inventory quantities from one location to another, balancing in and out quantities, and moving the task to the transaction history table (TranH).

Depending on the process involved, the system determines the mode or the task from different programs in this order.

1. For put-away, location find, or picking task creation, the system looks first at any available internal routing defined for the movement in Internal Routing Maintenance (4.2.5). If available, it uses the mode defined in the Mode field in the Miscellaneous frame; see Figure 9.1.
2. If internal routing is not available for the movement, the system uses the transaction type mode in Transaction Type Maintenance (4.7.6). The system looks at the task type for the current task being worked on; for example, RCT-PO for a receipt; see Figure 9.6 on page 144.

Fig. 9.1
Internal Routing Maintenance, Miscellaneous Options Frame



MANUAL Mode

You use the MANUAL mode to process engine workfiles as you need them processed. This is useful should you need to delay processing of a warehouse task.

Example You set up the picking process to include a packing step. You want warehouse staff to go from inventory to a packing area and when packing is complete, to a dispatch area. To do this, you define a three-step process that includes:

1. Step 10: storage
2. Step 20: packing
3. Step 30: dispatch

Normally, you want the system to use the AUTO mode for step 20 and step 30; however, you set up step 30 as a MANUAL mode because the shipment is large and the packing staff is short-handed. This lets the packing department take more time.

Note Although you still need to set up a mode for step 10, movement properties between two steps are defined on the destination step in the system, not the origin step.

Since step 30 is in MANUAL mode, the system does not create the task from the packing area to the dispatch area when staff confirm that goods are moved from the storage area to the packing area. Instead, it creates a request for movement in the form of an engine workfile. The dispatch staff use the Engine Activation (1.6) menu option on the RF device to process the engine workfile. When the engine is activated, the system creates the movement from the packing area to the dispatch area. As an alternative to the RF Engine Activation function, you can also use one of the engine processor programs in Engine Menu (4.7).

Note If you specify a mode in the Engine and Printing Details frame of Transaction Type Maintenance (4.7.1) or Warehouse Trans Type Maintenance (4.7.5), that value overrides the mode value for the transaction for that specific site or site and warehouse combination.

Confirmation Processing

When you specify AUTO mode, there is no background processing to start a process. The system creates the engine workfile with a request for movement, printing, or confirmation, and it processes the request automatically without user intervention.

When you specify MANUAL mode, the engine processors can process confirmation in the background, while other warehouse activity processing continues in the foreground. This is useful when you have several confirmations to process.

If you set confirmation tasks to AUTO, then use Labor Management Workbench (4.11.15) to confirm all tasks, you must wait for the workbench to confirm all tasks before you can continue processing. Even though the system processes the confirmation of each task when it creates the request using AUTO mode, processing several tasks simultaneously may take some time.

Print Processing

For printing tags, the system uses the Print Mode fields in the Print Options frame of Internal Routing Maintenance (4.2.5) to determine the mode for printing for created, confirmed, and exception tasks.

See Figure 3.6 on page 51.

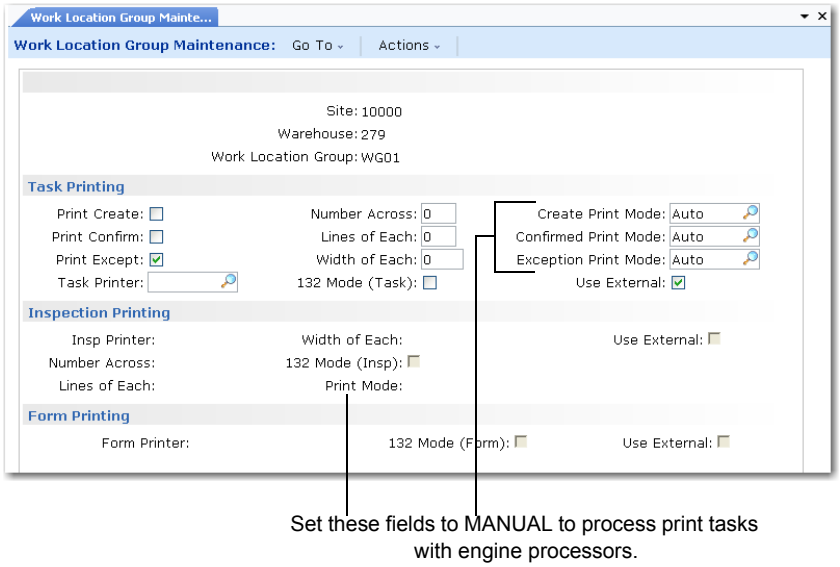
When an internal routing for the movement does not exist, the system determines the print mode for specific movements, such as transfers, from the work location group using the values you specify in the Print Mode fields in each of the printing frames of Work Location Group Maintenance (4.3.9):

- Identification Printing
- Task Printing
- Inspection Printing

See Figure 4.10 on page 67.

Figure 9.2 shows the Task Printing and Inspection Printing frames for Work Location Group Maintenance.

Fig. 9.2
Work Location Group Maintenance (4.3.9), Task and Inspection Printing Frames



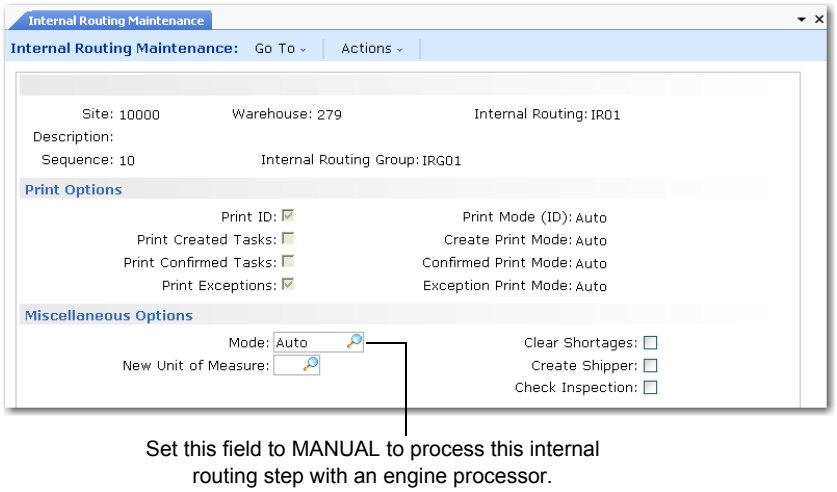
Setting Up Engine Processors

Before you can process engine workfiles, you must:

- Define transactions in either Transaction Type Maintenance (4.7.1) or Warehouse Transaction Type Maintenance (4.7.5).
- Set the mode to MANUAL for the internal routing sequence step you want to process with engine workfiles in the Print Options and Miscellaneous frame of Internal Routing Maintenance; see Figure 9.3.

See page 143 and page 146.

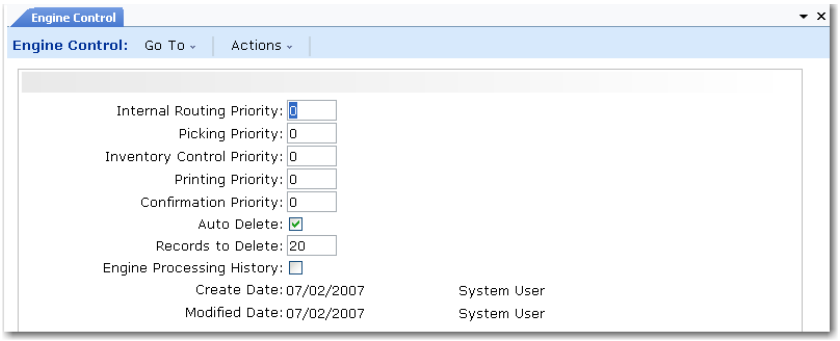
Fig. 9.3
Internal Routing Maintenance (4.2.5), Mode Field



Setting Engine Control Parameters

Use Engine Control (4.7.24) to set up parameters for the engine processors and engine workfiles.

Fig. 9.4
Engine Control (4.7.24)



Internal Routing Priority. Specify a priority value for internal routing tasks. The lower the number you specify, the lower the priority. The system processes the task with the highest priority as the next task that requires action.The default is 0 (zero).

This field defaults to the Priority field in Engine Workfile by Order Maint (4.7.13) and Engine Workfile by Date Maint (4.7.14) for engine workfiles that are a request for an internal routing.

Picking Priority. Specify a priority value for picking tasks. The lower the number you specify, the lower the priority.The system processes the task with the highest priority as the next task that requires action. The default is 0 (zero).

This field defaults to the Priority field in Engine Workfile by Order Maint (4.7.13) and Engine Workfile by Date Maint (4.7.14) for engine workfiles that are a request for picking.

Inventory Control Priority. Specify a priority value for inventory control tasks. The lower the number you specify, the lower the priority. The system processes the task with the highest priority as the next task that requires action. The default is 0 (zero).

This field defaults to the Priority field in Engine Workfile by Order Maint (4.7.13) and Engine Workfile by Date Maint (4.7.14) for engine workfiles that are a request for inventory updating or balancing.

Printing Priority. Specify a priority value for printing tasks. The lower the number you specify, the lower the priority. The system processes the task with the highest priority as the next task that requires action. The default is 0 (zero).

This field defaults to the Priority field in Engine Workfile by Order Maint (4.7.13) and Engine Workfile by Date Maint (4.7.14) for engine workfiles that are a request for printing.

Confirmation Priority. Specify a priority value for confirmation tasks. The lower the number you specify, the lower the priority. The system processes the task with the highest priority as the next task that requires action. The default is 0 (zero).

This field defaults to the Priority field in Engine Workfile by Order Maint (4.7.13) and Engine Workfile by Date Maint (4.7.14) for engine workfiles that are a request for confirmation.

Auto Delete. Indicate whether the system automatically deletes engine workfiles when the engine processor finishes processing them.

Yes (the default): The system automatically deletes engine workfiles when it finishes processing them.

No: The system does not delete engine workfiles when it finishes processing them.

Records to Delete. Indicate the number of records to delete. The default is 0 (zero).

Engine Processing History. Indicate whether the system maintains a history of the engine processing.

No (the default): The system does not keep engine processor history records.

Yes: The system keeps engine processor history records. You can use the programs in the Engine History Menu to view or delete the records.

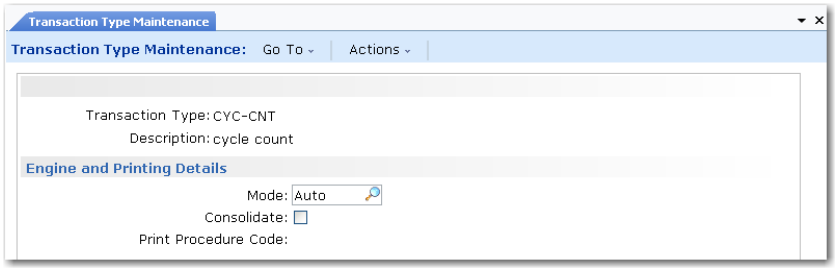
Creating Transaction Types

Each type of inventory transaction is identified by a transaction type code. Examples are a purchase order receipt (RCT-PO) or a sales order pick (PICK-SO). All standard transaction types are already set up within the system.

You can add extra transaction type codes to define special types of inventory transactions that are not covered by the standard types. You can also modify the field settings for the standard transaction type codes so that the system processes the transactions in the way you require.

Transaction Type Maintenance (4.7.1) is shown in Figure 9.5.

Fig. 9.5
Transaction Type Maintenance (4.7.1)



Enter values in the following fields:

Type. Enter the code for the transaction type.

Description. Enter the description of the transaction type.

Mode. Specify how processes involving this transaction type are initiated. The options are as follows:

AUTO	The next process in the routing sequence is started automatically as soon as the previous process is complete.
MANUAL	The next process is only started when it is manually selected for processing with an engine workfile.

Consolidate. This option applies only to MANUAL mode. Enter Yes to allow the system to consolidate similar records that are waiting to be processed.

Example If one manual record awaiting processing is to put away 100 of item A and a second record is to put away 50 of item A, consolidation lets the system process one record to put away 150 instead of the two separate records.

Enter No if you do not want to consolidate records, or if the mode is AUTO.

Print Procedure Code. Enter a code to define the printing procedures to be carried out for this transaction type. Set up codes in Generalized Code Maintenance (36.2.13). The basic codes are AJ (adjustment), IN (inspection), PK (picking), RC (receipt), SH (shortage), and TF (transfer). See “Print Procedure Codes” on page 193.

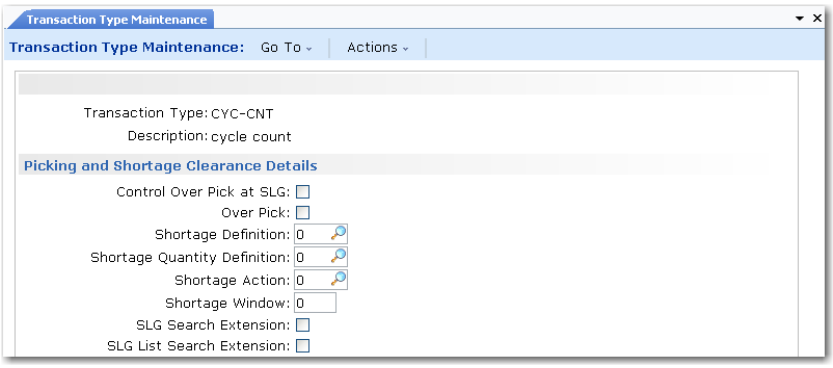
Together with the print flavor code defined at the work location group level, the print procedure code specifies the name of the program to start to print a transaction task or a pallet ID.

Example The print ID program, used when making a receipt, is called `whprirca.p`:

(wh + pr (print) + i (ID) + RC (Print Procedure Code for a Receipt) + A (Print Flavor))

The next Transaction Type Maintenance frame is shown in Figure 9.6.

Fig. 9.6
Transaction Type Maintenance, Picking and Storage Clearance Details



The fields in this frame apply only to transaction types that involve picking. You must enter shortage definition settings for these so that the system can deal with shortages correctly, but you can ignore them for other transaction types.

Control Over Pick at SLG. Enter Yes if over picking is to be controlled by the setting of the field at the SLG level, or No if it is to be controlled from the setting of the field for the transaction type.

Over Pick. Indicate whether transactions of this type can pick more stock from locations than is specified in the order. Enter Yes if overpicking is allowed; otherwise, enter No.

This field works in conjunction with the Allow Split field—specified at the storage location group level—to control whether stock can be picked from locations in the SLG in situations where the quantity required for the pick does not match the unit of measure in which the item is stocked in the location.

See “Allow Split” on page 100.

Example If a location contains boxes of 100 of the item and the required picking quantity is 70 pieces, the following possibilities can be specified:

Over Pick	Allow Split	Result
Yes	Yes	Pick 70 by splitting a box
Yes	No	Over pick—take a box of 100
No	Yes	Pick 70 by splitting a box
No	No	No pick from this location

Shortage Definition. For picking transaction types, enter a code from 0 to 10 to specify what constitutes a shortage. The options are as follows:

Code	Definition
0	A field is available on each order detail record that can be manually set to Yes to indicate a shortage.
1	A field is available on each order detail record that is automatically set to Yes when picking is attempted. This constitutes a shortage.
2	General allocation: an allocated quantity greater than zero that is not detail allocated indicates a shortage.
3	Open order quantity: an order quantity greater than the sum of the allocated quantity, picked quantity, and shipped quantity indicates a shortage.
4	Non-detail allocated quantity: an order quantity greater than the sum of any detail allocations and the picked quantity and shipped quantity indicates a shortage.
5	General allocation previously picked: as 2 except that the sum of the quantity picked and quantity shipped must be greater than zero.
6	Open order quantity previously picked: as 3 except that the sum of the quantity picked and quantity shipped must be greater than zero.
7	Non-detail allocated quantity previously picked: as 4 except that the sum of the quantity picked and quantity shipped must be greater than zero.
8	General allocation, other line previously picked: as 2 except that sum of the quantity picked and quantity shipped of a different line on the same order must be greater than zero.
9	Open order quantity, other line previously picked: as 3 except that sum of the quantity picked and quantity shipped of a different line on the same order must be greater than zero.
10	Non-detail allocated, other line previously picked: as 4 except that sum of the quantity picked and quantity shipped of a different line on the same order must be greater than zero.

Shortage Quantity Definition. For picking transaction types, enter a code from 0 to 2 to specify how the shortage quantity is calculated. The options are as follows:

Code	Definition
0	General allocated quantity
1	Open order quantity (ordered, less allocated, less picked, less shipped)
2	Non-detail allocated quantity (ordered, less total detail allocations, less picked, less shipped)

Shortage Action. For picking transaction types, enter a code from 0 to 3 to specify the action that the system should take when a shortage is detected. The options are as follows:

Code	Definition
0	No action: Warehouse transactions are created.
1	Order line is general allocated; warehouse transactions are created.
2	Order line is detail allocated. These allocations are converted to detail picks that create warehouse transactions.
3	Order Line is detail allocated—not detail picked, and warehouse transactions are created.

Shortage Window. Enter a number indicating the number of days before an order line due date that it can be considered short.

Example 1 indicates that an order line due tomorrow is short, but that one due the day after—2 days away—is not.

SLG Search Extension. When doing a transfer with a user-provided destination location, if the destination is full, the put-away takes place in the storage location group of the destination location given by the user.

SLG List Search Extension. When doing a transfer with a user-provided destination location, if the destination is full, the put-away takes place in the storage location groups linked to the list of SLGs defined at item/warehouse level of the destination location given by the user.

Note You can either first check in the SLG of the current destination location and then in the complete list of SLGs or only look at the current SLG for the given location. If you set the SLG List Search Extension field to Yes you must set the SLG Search Extension field to Yes also.

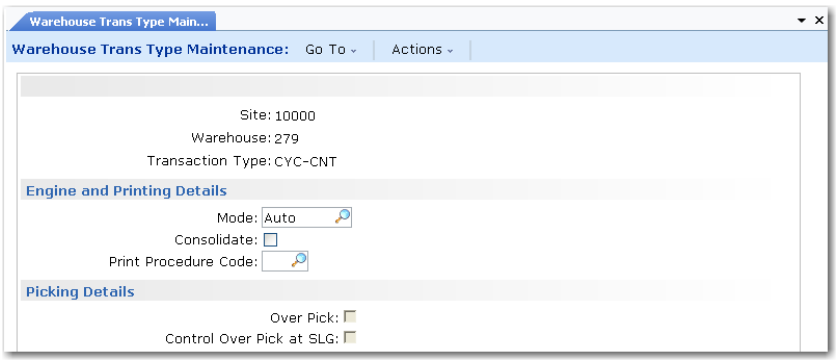
Creating Warehouse Transaction Types

In addition to setting fields for each transaction type, you can also set fields that apply to a transaction type only in a particular warehouse. For example, if you need to set different shortage definitions for different warehouses, you can do so using Warehouse Transaction Type Maintenance.

See “Creating Transaction Types” on page 143.

Warehouse Transaction Type Maintenance (4.7.5) is shown in Figure 9.7.

Fig. 9.7
Warehouse Transaction Type Maintenance (4.7.5)



Enter values in the following fields.

Site. Enter the site.

Warehouse. Enter the warehouse.

Type. Enter the code for the transaction type.

Note You should use Transaction Type Maintenance to set up new transaction type codes. The system displays a warning message if you enter a transaction type code that does not exist. The purpose of this option is to set up fields for an existing transaction type that apply only to the specified warehouse.

Engine and Printing Details Frame

The Mode, Consolidate, and Print Procedure Code fields are used in the same way as in Transaction Type Maintenance.

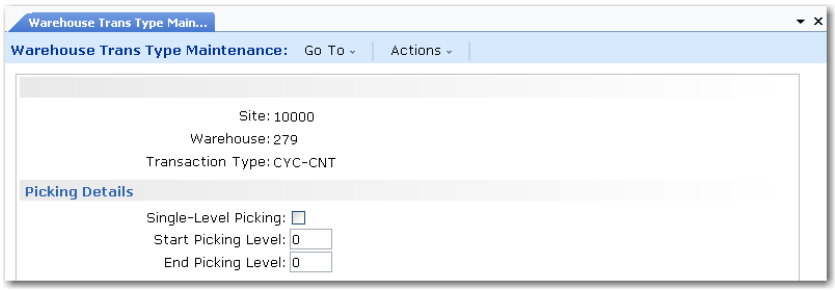
See “Creating Warehouse Transaction Types” on page 146.

Picking Details

The Over Pick and Control Over Pick at SLG fields are used in the same way as in Transaction Type Maintenance.

The Picking Details frame is shown in Figure 9.8.

Fig. 9.8
Warehouse Transaction Type Maintenance, Picking Details Screen



The fields in this frame define the picking levels associated with this transaction type. Each storage location group has an associated picking level value. For any picking transaction type, you can define the picking levels at which picking should start and end. The system then looks in the relevant storage location groups that have the specified picking level.

Single Level Picking. Enter Yes if all the picking quantity must be taken from only one picking level; otherwise, enter No.

Start Picking Level. Enter the numerical code for the picking level at which picking is to start.

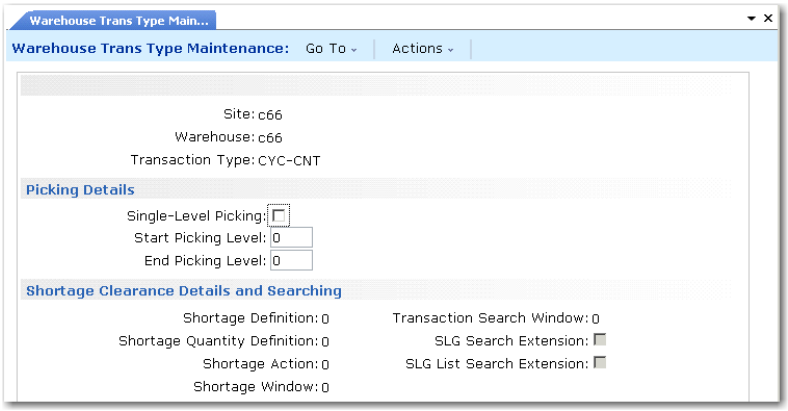
End Picking Level. Enter the numerical code for the picking level at which picking is to end.

Shortage Clearance Details and Searching

The Shortage Definition, Shortage Quantity Definition, Shortage Action, and Shortage Window fields are used in the same way as in Transaction Type Maintenance.

See page 146.

Fig. 9.9
Shortage Clearance Details and Searching



Transaction Search Window. To speed up processing, some of the picking algorithms consider the last location used for picking of a specific item when that item is to be picked again. The algorithm does this by searching backwards through previous transactions. However, you can limit the age of transactions that are searched in this way, because it is unlikely that the last location is still the most efficient for picking if the previous transaction is more than a few days old.

This field specifies the number of days that the algorithms should search backwards for previous transactions relating to the current item. For example, set this value to 1 if you want the algorithms to search only the transactions that were created today or yesterday.

SLG Search Extension. When doing a transfer with a user-provided destination location, if the destination is full, the put-away takes place in the storage location group of the destination location given by the user.

SLG List Search Extension. When doing a transfer with a user provided destination location, if the destination is full, the put-away takes place in the storage location groups linked to the list of SLGs defined at item/warehouse level of the destination location given by the user.

Viewing Transaction Data

In addition to browses, Table 9.1 lists report options available on the Engine Menu relating to transaction types and warehouse transaction types.

Table 9.1
Transaction Type Reports

Program	Description
Transaction Type Report (4.7.3)	Lets you enter a range of transaction types for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows details of all the transaction types in the specified range.
Warehouse Transaction Type Report (4.7.7)	Lets you enter ranges of sites, warehouses, and transaction types for inclusion in the report, and then to specify where you want the report results printed or displayed. The report shows details of all the transaction types in the specified ranges.
Transactions by WLG Report (4.9.11)	Lets you display all open transactions sorted by work location group (WLG).
Transaction History Browse (4.9.23)	Lets you display a list of transactions by transaction number, sequence, site, and warehouse. You can view the start date and time, and the user who started the transaction.

Using Engine Processors

Use the engine processors to process MANUAL engine workfiles. You can run the engine processors to process engine workfiles singularly or in batch mode. You can process engine workfiles by engine type, site, date, order, item, transaction number, and so on, and process at a later time.

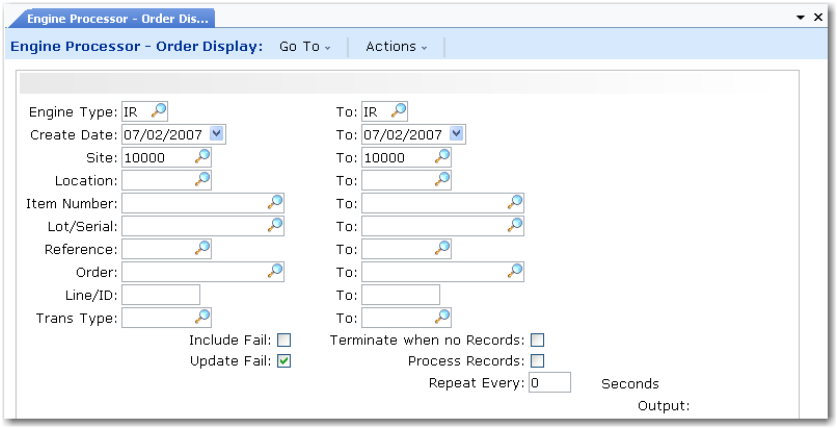
You can run the processor programs in simulation mode first to view transaction processing by setting Process Records to No. The system displays the engine workfiles to process that meet your selection criteria. Optionally, specify the time in seconds at which you want to repeat engine processing.

After you specify engine workfiles for processing, the system locks the engine workfiles to prevent further processing by other engines. If an engine workfile is already locked and you specified a range, the system skips that engine workfile and continues with the next engine workfile in the range. Once the engine completes processing, it deletes the engine workfiles if you set control options to delete the files.

If the system cannot find engine workfiles to process, it terminates the engine if you have Terminate when no Records set to Yes; otherwise, it repeats engine processing, pausing at the time in seconds that you specify in Repeat Every before starting again. If you set Repeat Every to 0 (zero), the engine terminates when all records are processed. This is different from terminating when no records are found. If Repeat Every is set to 0, the engine can run repeatedly until all records have been processed before it ends the processing.

Figure 9.10 shows the display for Engine Processor-Order Display (4.7.9). Fields for Engine Processor-Date Display (4.7.10) are the same.

Fig. 9.10
Engine Processor–Order Display (4.7.9)



Engine Type and To. Specify a range of the following engine types:

PK: A picking type that the system uses when it must create a picking task. The system creates a picking task when there is an increase in the Qty Picked field in detail allocation. This is typically the result when you print a picklist for orders in the system. When the system creates detail allocation and nothing is picked, it does not create a QAD Warehousing task.

IR: An internal routing type that the system uses when it needs to create a task for a receipt, transfer, or other types of tasks.

OD: A print type to print a tag at task creation.

OH: A print type to print a tag at task confirmation.

OU: A print type to print an unplanned issue tag.

OI: A print type to print a pallet ID tag.

OQ: A print type to print a Quality Inspection tag.

OR: A print type to print pallet IDs.

CF: A confirmation type for confirming tasks.

Create Date and To. Specify a range of creation dates for the engine workfiles.

Site and To. Specify a range of sites for the engine workfiles.

Location To. Specify a range of warehouse locations for the engine workfiles.

Item Number and To. Specify a range of items for the engine workfiles.

Lot/Serial and To. Specify a range of lot or serial numbers for the engine workfiles.

Reference and To. Specify a range of reference numbers for the engine workfiles.

Order and To. Specify a range of order numbers for the engine workfiles.

Line/ID and To. Specify a range of order line numbers for the engine workfiles.

Trans Type and To. Specify a range of transactions for the engine workfiles. You define transaction types in Transaction Type Maintenance (4.7.1) or Warehouse Trans Type Maintenance (4.7.5). See page 143 and page 146.

Include Fail. Indicate whether the system reprocesses engine workfiles that previously failed processing.

No (the default): Do not reprocess failed engine workfiles.

Yes: Reprocess failed engine workfiles.

Update Fail. Indicate whether the system updates the engine workfile with a FAIL status if the engine processing for printing, confirmation, picking, and so on, fails for any reason.

No (the default): The system does not update the engine processor status with a FAIL status.

Yes: The system updates the engine processor status with a FAIL status. The Fail status displays in the Status field of the Process Details frame of the engine workfiles programs. You can change the status there and reprocess the engine workfile that failed to process if you have Include Fail set to Yes.

Terminate When No Records. Indicate whether to terminate the engine processing if the system cannot find records.

No (the default): The system repeats the engine processing based on the number of seconds you specify in Repeat Every.

Yes: The system terminates the engine processing if it cannot find records.

Process Records. Indicate whether the system processes the engine workfiles that match the criteria you specify.

No (the default): The system does not process the engine workfiles. It runs a simulation of the records it will process and reports the records.

Yes: The system processes the records based on criteria you set in the Terminate when no Records and Repeat Every fields.

Repeat Every. Specify a time in seconds at which the system repeats the engine processing. For example, if you specify 600 seconds, the system looks for engine workfiles that match the criteria you specified and processes them if found every 10 minutes. The system repeats this process indefinitely.

If you set this field to 0 (zero), the system processes all transactions for the criteria you specify until no engine workfiles remain.

Activating Engine Processing from the RF

Warehouse staff can activate engine processing and process engine workfiles from a radio frequency (RF) device. To do this, some steps within the internal routing must be defined as MANUAL. When a step is MANUAL, the system does not automatically create a task for the step; instead, it creates a request for movement in the form of an engine workfile. RF users can use the RF Engine Activation (1.6) to process the workfile. This lets warehouse staff delay tasks until they are ready to start on them.

Once you select the RF Engine Activation option, the system prompts you to enter the location. Depending on the activity being processed, the engine type, and engine workfile, the system may prompt warehouse staff to enter additional data, such as the reference number for containers they are moving to another location. Once all data is entered, the engine processor processes the MANUAL engine workfile.

“Setting Up Engine Processors” on page 141.

Modifying Engine Workfiles

Use the engine workfile programs to select and modify engine workfiles by either order or date:

- Engine Workfile by Order Maint (4.7.13)
- Engine Workfile by Date Maint (4.7.14)

The system creates engine workfiles for different activities and each activity is linked to an engine type.

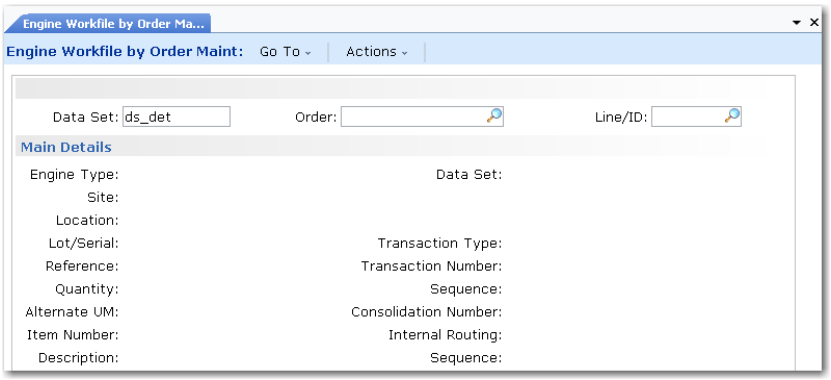
See “Type” on page 143

Figure 9.11 depicts Engine Workfile by Order Maintenance. Fields for Engine Workfile by Date are the same, except that you specify the creation date for the engine workfile in the header, rather than the data set and order/line.

Specify data in the header of either program to retrieve an existing engine workfile record. You cannot create a new engine workfile. Click Next to display the Main Details frame and Activity Details frame. Both frames are display only; see Figure 9.11. Click Next again to display the Process Details frame.

See “Process Details” on page 154.

Fig. 9.11
Engine Workfile by Order Maint (4.7.13)



Data Set. Enter the name of a dataset that identifies an existing engine workfile. This field is in the header of Engine Workfile by Order Maint only.

ds_det: Data set for distribution orders

pod_det: Data set for purchase orders

sod_det: Data set for sales orders

wod_det: Data set for work orders

Order. Optionally enter the order for the engine workfile. This field is in the header of Engine Workfile by Order Maint only.

Line/ID. Optionally enter the order line for the engine workfile. This field is in the header of Engine Workfile by Order Maint only.

Create Date. Enter the date the system created the engine workfile. This field in the header of Engine Workfile by Date Maint only.

Engine Type. The system displays one of the following engine types for the engine workfile:

PK: A picking type that the system uses when it must create a picking task. The system creates a picking task when there is an increase in the Qty Picked field in detail allocation. This is typically the result when you print a picklist for orders in the system. When the system creates detail allocation and nothing is picked, it does not create a QAD Warehousing task.

IR: An internal routing type that the system uses when it needs to create a task for a receipt, transfer, or other types of tasks.

OD: A print type to print a tag at task creation.

OH: A print type to print a tag at task confirmation.

OU: A print type to print an unplanned issue tag.

OI: A print type to print a pallet ID tag.

OQ: A print type to print a Quality Inspection tag.

OR: A print type to print pallet IDs.

CF: A confirmation type for confirming tasks.

Site. The system displays the site for the engine workfile.

Location. The system displays the warehouse location for the engine workfile.

Lot/Serial. The system displays the lot or serial number for the engine workfile.

Reference. The system displays a reference number for the engine workfiles.

Quantity. The system displays the quantity for picking or for internal routing to another location.

Alternate UM. The system displays the alternate unit of measure (UM) for items.

Data Set. The system displays the data set for the engine workfiles. See page 152.

Trans Type. The system displays the transaction type for the engine workfiles. You define transaction types in Transaction Type Maintenance (4.7.1) or Warehouse Trans Type Maintenance (4.7.5). See page 146 and page 146.

Transaction Number. The system displays either the picking or internal routing transaction number.

Sequence. The system displays the transaction sequence number.

Consolidation Number. The system displays the number of similar records the system consolidates when processing. You specify whether the system consolidates similar records in the Consolidation field in Transaction Type Maintenance. See page 143.

Internal Routing. The system displays the current routing code for the engine workfiles.

Sequence. The system displays the current sequence code for the engine workfiles.

Item Number/Description. The system displays the item number and optionally, a description of the item for the engine workfiles.

Process Details

Click Next to display engine processing details. You can enter detail parameters. You can modify the engine workfile mode, priority, and status, or add remarks.

Mode. Accept the mode for the workfile of specify a new mode:

AUTO: The workfile transaction is processed immediately.

MANUAL: The workfile transaction is processed only when users select it for processing.

For put-away, location find, or picking task creation, this field defaults from the same-named field in Internal Routing Maintenance (4.2.5). If internal routing is not available for the movement, it defaults from the same-named field in Transaction Type Maintenance (4.7.6).

For printing, this field defaults from the Print Mode fields in Internal Routing Maintenance. When an internal routing for the movement does not exist, it defaults from the Print Mode fields for the various printing frames in Work Location Group Maintenance (4.3.9).

Priority. Accept or modify the priority value for tasks. This field defaults from Engine Control (4.7.24) from the priority you specify there for the engine type. For example, if you are modifying a picking engine workfile, this field defaults from the Picking Priority field in Engine Control.

Status. Accept or modify the status of the engine workfile to one of the following:

Blank (the default): The engine workfile has not failed a previous processing by an engine processor.

Fail: The engine workfile failed a previous processing by an engine processor. The system assigns the Fail status if you have Include Fail set to Yes in one of the three engine processor programs in the Engine Menu. If the engine workfile failed to process before, you can change the status to blank and reprocess the engine workfile as long as you set Update Fail to Yes in the engine processor programs.

Remarks. Enter any remarks about the engine workfile.

Viewing Engine Workfile Data

You can view engine workfile data or engine history data using the reporting programs described in Table 9.2.

In addition to the reports, you can run inquiries for engine workfiles and engine history, engine history by date, and engine history by order.

Table 9.2
Engine Workfile and History Data

Menu	Program	Descriptions
4.7.16	Engine Workfile Report	Displays the engine workfile create date and time, consolidation number, order/line, site, warehouse, location, and transaction type.
4.7.18	Failed Engine Workfile Report	For failed engine workfiles, displays the engine type, transaction number, site, data set, order/line, mode, and remarks.

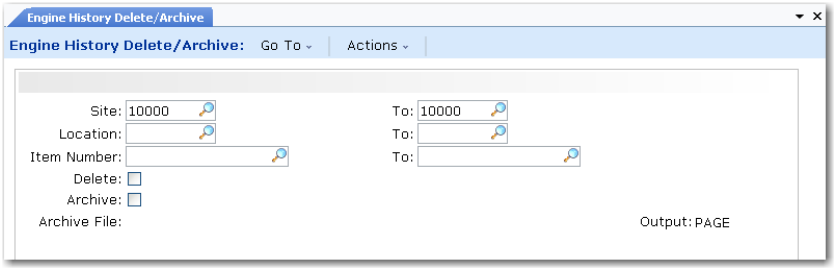
Menu	Program	Descriptions
4.7.21	Engine History Menu...	
4.7.21.4	Engine History Report	Displays the same data as engine workfile report, but displays the delete date and time instead of the create date and time.

Archiving/Deleting Engine History Data

Use Engine History Delete/Archive (4.7.21.23) to delete or archive engine history data. You specify engine history data to delete/archive by a range of sites, locations, or item numbers.

You can set the Delete field to No to display the data first. Once you view the engine history data, you can set Delete to Yes to delete data. You must set both Delete and Archive to Yes to archive data. When both Delete and Archive are Yes and you click Next, the system displays the name of the archive file.

Fig. 9.12
Engine History Delete/Archive (4.7.21.23)



Site and To. Specify a range of sites for engine processing history records you want to delete or archive.

Location and To. Specify a range of locations for engine processing history records you want to delete or archive.

Item Number and To. Specify a range of item numbers for engine processing history records you want to delete or archive.

Delete. Specify whether the system deletes and archives engine processing history records:

No (the default): The system does not delete records.

Yes: The system deletes engine processing history records and archives them if you set Archive to Yes, too.

Archive. Specify whether the system archives engine processing history records:

No (the default): The system does not archive records.

Yes: The system archives engine processing history records. You must set Delete to Yes, too, to archive files.

Archive File. The system displays the name of the archive file. This field is display only.

Chapter 10

Labor Management

QAD Warehousing lets you manage resources by using resources and groups of resources and assigning tasks to them. Resources are simply individuals or users of the system, who work specifically within the warehouse. The following topics describe the Labor Management functions:

About Labor Management 158
Describes and outlines the flow of labor management.

Labor Management Control 158
Explains how to use Labor Management Control (4.11.24) to activate Labor Management and set default values for options in the Labor Management Workbench.

Setting Up Labor for Users 159
Explains how to use programs in the Labor Management Users Menu (4.11.3) to add data to users and user groups.

Defining Tasks 164
Describes which frames to use to define certain tasks in Warehousing.

Assigning Resources to Tasks 166
Explains how and when to assign tasks to defined resources using Task Assignment Maintenance (4.11.1.9).

Updating Task Priorities 168
Explains how to use Transaction Priority Update (4.11.5) to change and report task priorities.

Labor Management Workbench 169
Describes how to use Labor Management Workbench (4.11.15) to automatically or manual assign resources to tasks.

Viewing Labor Data 171
Lists the names and menu numbers of the reports in the Labor Management Reports Menu.

Performing RF Tasks 172
Describes the prerequisites for completing RF tasks and how to assess and confirm those tasks.

About Labor Management

In a warehouse, it is inefficient for staff to work in many different areas on many different types of tasks and on tasks located physically distant from each other.

Using labor management, the warehouse staff can be assigned the tasks most suited to their individual or collective skill sets or experience.

Inventory movements within a warehouse generate warehouse transactions. These can be viewed using Warehouse Transaction Inquiry (4.9.1). These warehouse transactions are essentially tasks within the warehouse. You can assign warehouse staff to these tasks.

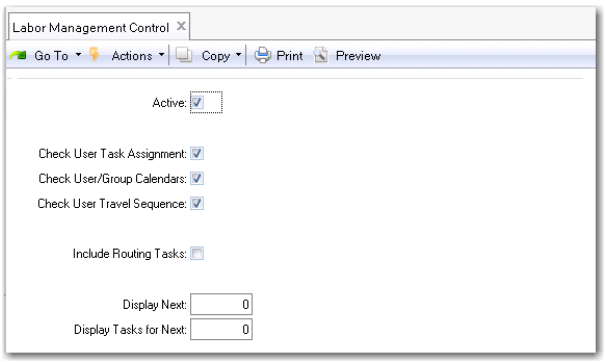
The basic flow of labor management is as follows:

1. Defining Resources. Define each warehouse staff, the warehouse groups, and optionally the warehouse shifts. Each warehouse staff member is a resource.
2. Defining Tasks. Define each variation of warehouse task (transaction), alternate tasks, and optionally the expected time required to complete these tasks.
3. Assigning Resources to Tasks. Use Task Assignment Maintenance (4.11.1.9) and the labor management workbench to assign resources to the tasks.
4. Approving Tasks. Use the RF (Radio Frequency), RDT (Radio Data Terminal), or non-RF movement confirmation frames to approve the movement of inventory from one location to another (tasks).

Labor Management Control

Use Labor Management Control (4.11.24) to activate Labor Management and set some default values for options in the Labor Management Workbench.

Fig. 10.1
Labor Management Control (4.11.24)



Complete the fields as follows:

Active. If set to Yes, labor management functionality becomes active.

Check User Task Assignment. Indicate whether the Labor Management Workbench should check user-task assignment lists, or assign tasks irrespective of skill sets or experience.

Check User/Group Calendars. Indicate whether the Labor Management Workbench should check the user or group shift calendar, or assign tasks irrespective of time/date details.

Check User Travel Sequence. Indicate whether the Labor Management Workbench should check the user's last know physical location prior to assigning tasks, or assign tasks irrespective of physical location within the warehouse.

Include Routing Tasks. Indicate whether the Labor Management Workbench should calculate the times and tasks using the complete routing as opposed to the individual routing sequence.

Display Next. Indicate how many tasks the Labor Management Workbench should display.

Display Tasks for Next. Indicate how many minutes worth of tasks the Labor Management Workbench should display.

Setting Up Labor for Users

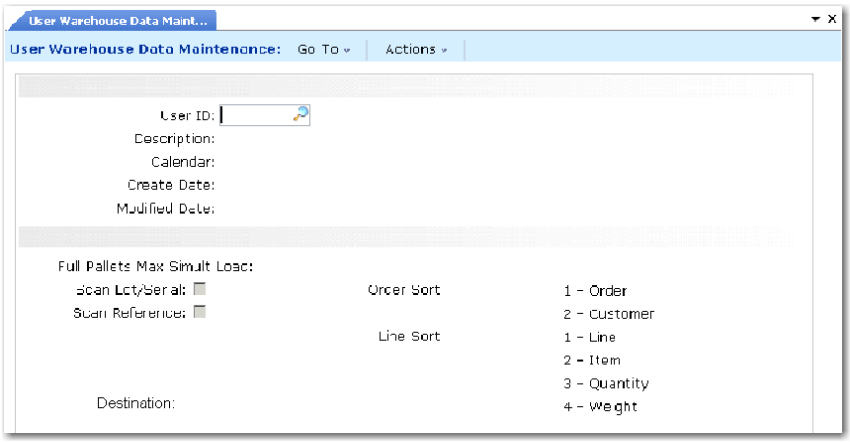
You can use the programs in the Labor Management Users Menu (4.11.3) to add warehouse data to user and user groups within a warehouse.

Note These groups are not the same as user roles used throughout the system.

User Warehouse Data Maintenance

Use User Warehouse Data Maintenance (4.11.3.1) to define tasks that are best suited for warehouse staff. You can also define the calendar for each user.

Fig. 10.2
User Warehouse Data Maintenance (4.11.3.1)



Complete the User Warehouse Data Maintenance fields as follows:

User ID. Indicate the ID of the warehouse staff. An entry should be made for each warehouse staff.

Note This must be a valid user defined in User Maintenance (36.3.1).

Description. Enter a brief description (maximum 24 characters) of the associated user. Typically, description is related to labor management.

Calendar. Indicate the calendar for this user. You define calendars in Warehouse Calendar Maintenance (4.11.3.9).

Full Pallets Max Simult Load. Enter the maximum number of full pallets this user handles simultaneously in the warehouse. For example, if you specify 3, the user can move three pallets at the same time with his forklift or other equipment.

Scan Lot/Serial. Indicate whether this user scans lot/serial numbers while completing tasks in the warehouse.

No (the default): The user does not scan lot/serial numbers.

Yes: The user scans lot/serial numbers and the lot/serial field displays on the RF device.

Scan Reference. Indicate whether this user scans the destination reference when performing tasks in the warehouse.

No: The user does not scan the reference ID.

Yes: The user scans the reference ID and the Reference field displays on the RF device.

Order Sort. Indicate how the system sorts orders for this user:

1 (the default): The system sorts orders by order number

2: The system sorts orders by customer code.

Line Sort. Indicate how the system sorts lines for this user:

1 (the default): The system sorts lines by line number.

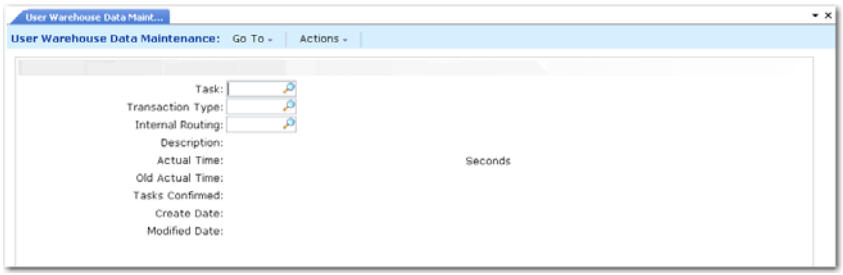
2: The system sorts lines by item number.

3: The system sorts lines by quantity number.

4: The system sorts lines by item weight.

Destination. Specify a location within the warehouse that this is typically used when this user moves items. You can specify any valid location that you define within QAD Warehousing, such as a storage location, warehouse location, or a warehouse.

Fig. 10.3
User Warehouse Data Maint, Tasks



Task. Indicate the task. The values entered in this frame are used by the Labor Management Workbench to calculate the most efficient warehouse staff to allocate tasks. This frame is optional and is populated and updated automatically upon completion of every task.

Type. Indicate the type of task.

Internal Routing. Indicate the internal routing associated with this task.

Description. Indicate the description of this task.

Actual Time (Seconds). Indicate the actual time taken to complete this task. This field is updated automatically upon completion of this task by this user.

Tasks Confirmed. Displays the number of tasks this user has confirmed.

Note Task and Type are internal routing specific.

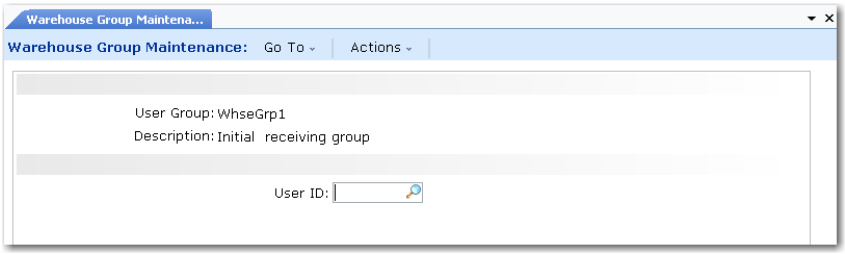
Warehouse Group Maintenance

Use Warehouse Group Maintenance (4.11.3.5) to group users into defined categories.

Example Two groups could be defined for picking. One group can have three members (morning shift calendar) and another group can have seven members (evening shift calendar). These groups can later be assigned to tasks.

This can save time, since groups of warehouse staff can be moved quickly from one location to another, and warehouse staff can be quickly added or removed from multiple warehouse groups.

Fig. 10.4
Warehouse Group Maintenance (4.11.3.5)



Complete the fields as follows:

User Group. Enter the name of the warehouse group.

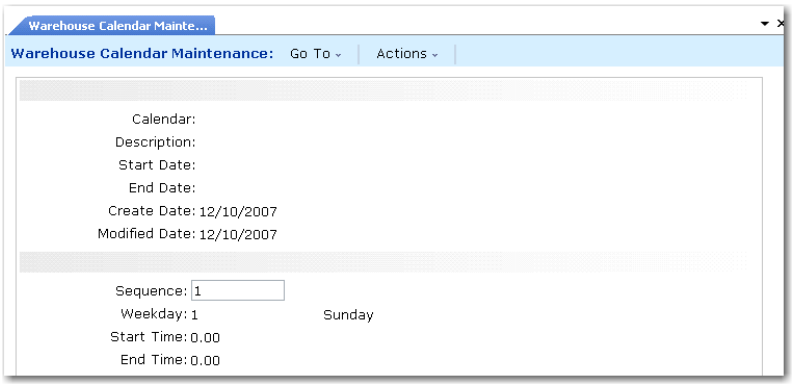
Description. Specify the description of the associated group. This description is typically related to labor management.

User ID. Specify the IDs of all the users that belong to this group.

Warehouse Calendar Maintenance

Use Warehouse Calendar Maintenance (4.11.3.9) to define calendars or working shifts, which can optionally be associated with users. The Labor Management Workbench can be set up to consider user calendar details when assigning tasks to employees.

Fig. 10.5
Warehouse Calendar Maintenance (4.11.3.9)



Complete the fields as follows:

Calendar. Indicate the name of the calendar.

Description. Enter a description of the calendar. This description is typically related to labor management.

Start. Indicate the start effective date range of this calendar.

End. Indicate the end effective date range for this calendar.

Sequence. Specify a sequence number for a controlled sequence of weekdays to use for the calendar. For example, if warehouse staff work Monday through Friday from January to November, define a sequence that includes the five days and the typical hours. If staff work Monday through Friday and a half day on Saturday for December only, define another sequence that includes these six days.

Weekday. Enter a code for the day of the week in the sequence:

1: Sunday

2: Monday

3: Tuesday

4: Wednesday

5: Thursday

6: Friday

7: Saturday

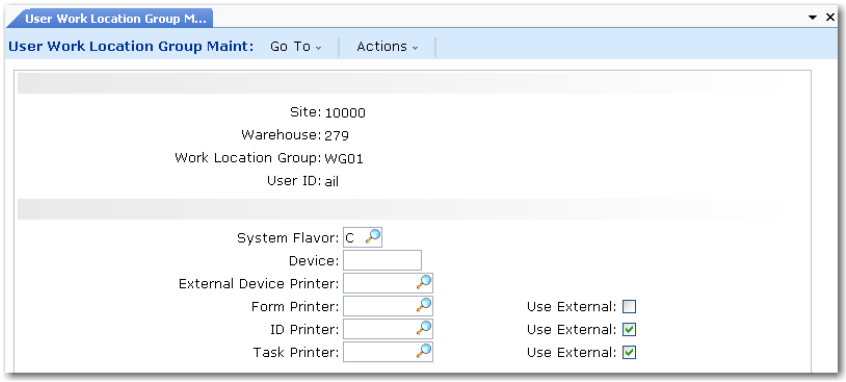
Start Time. Indicate the start time for this sequence.

End Time. Indicate the end time for this sequence.

User Work Location Group Maintenance

Use User Work Location Group Maint to assign a user to a work location group and set up print options specific to that user.

Fig. 10.6
User Work Location Group Maintenance (4.11.3.13)



Site. Enter a site for the user and work location group.

Warehouse. Enter a warehouse for the user and work location group.

Work Loc Group. Enter the work location group to link to the user.

User ID. Enter the ID of the user to link to the work location group.

System Flavor. Enter the code to define the style and format of Radio Frequency (RF) screens that display warehouse information.

Device. Enter the code for the device to be used, such as an RF or Radio Data Terminal (RDT), within this work location group.

External Device Printer. Enter the code for the device printer.

Form Printer. Enter the code for the form printer.

ID Printer. Enter the code for the ID printer.

Task Printer. Enter the code for the task printer, or select a code from the drop-down list.

Use External. Indicate whether tasks/forms/IDs should be printed on an external printer.

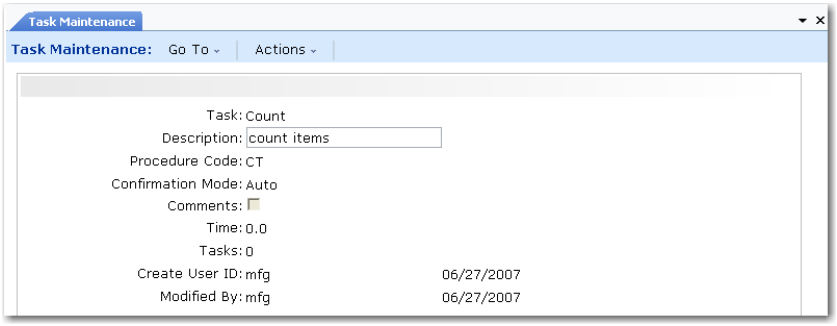
Defining Tasks

The following sections tell you how to define tasks in QAD Warehousing.

Task Maintenance

Use Task Maintenance (4.11.1.1) to create and update the tasks performed in a warehouse.

Fig. 10.7
Task Maintenance (4.11.1.1)



Complete the fields as follows:

Task. Enter the task name, such as PICKING.

Description. Enter the description of the task. This description is typically related to labor management.

Procedure Code. Enter the 2-character procedure code such as PK for this task.

Confirmation Mode. Enter the default confirmation method for this task type.

- A confirmation mode of AUTO requires the user to perform a movement confirmation.
- A confirmation mode of MANUAL is confirmed by the confirmation engine.

Comments. Enter additional comments as required for this task.

Time. This display-only field defaults from the time you set in Task Time Maintenance (4.11.1.13).

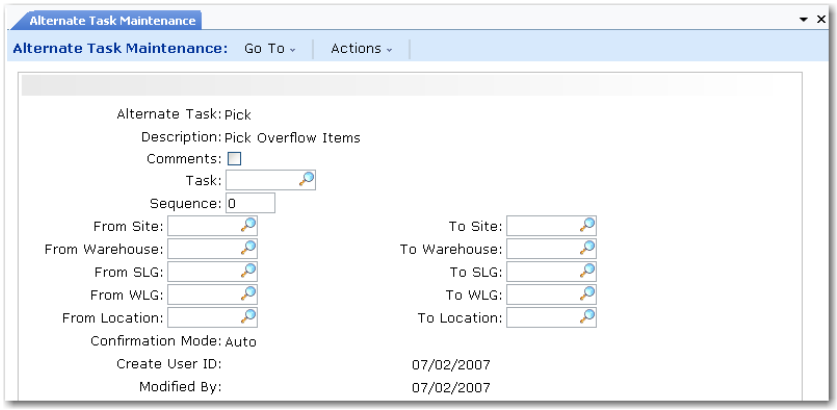
Tasks. This display-only field depicts the number of confirmed tasks (warehouse transactions) for the task you are defining. The system stores the number of tasks and the average time per task; it uses the information in labor management reports to display pending tasks.

Alternate Task Maintenance

Alternate Task Maintenance (4.11.1.5) is an optional program you can use to define subcategories of tasks. Tasks are generally associated with specific inventory movements.

Example Task Transfer has a subtask Transfer1 to cover a transfer of inventory between specific locations.

Fig. 10.8
Alternate Task Maintenance (4.11.1.5)



Example A receipt within a specific work location group or storage location group can be confirmed by a specific individual.

Within Alternate Task Maintenance, tasks can be set up for specific transactions. These alternate tasks can later be associated with individuals or specific groups. Alternate tasks are only necessary if not enough standard tasks can cope with the distribution of labor within the warehouse.

Complete the fields as follows:

Alternate Task. Indicate the alternate task name.

Description. Indicate the description of the alternate task defined above. This description is typically related to labor management.

Comments. Indicate whether additional comments are required for this task.

Task. Indicate the standard task for this alternate task.

Sequence. Indicate the sequence in which the alternate tasks should be considered, as defined in Task Assignment Maintenance.

From and To Site. Indicate the effective transaction from and to site. These fields are not range fields; they are the actual transaction from site and transaction to site.

From and To Warehouse. Indicate the effective transaction from/to warehouse.

From and To SLG. Indicate the effective transaction from/to storage location group.

From and To WLG. Indicate the effective transaction from/to work location group.

From and To Location. Indicate the effective transaction from/to location.

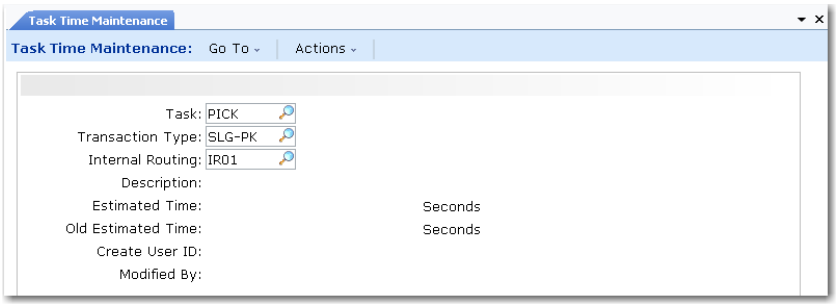
Confirmation Mode. Indicate the default confirmation method for this alternate task type.

- A confirmation mode of AUTO requires the user to perform a movement confirmation.
- A confirmation mode of MANUAL is confirmed by the confirmation engine.

Task Time Maintenance

Use Task Time Maintenance (4.11.1.13) to specify an estimated amount of time to complete a task for a particular internal routing. These times are used by Labor Management Workbench to calculate estimated resource requirements and estimated completion time for tasks. The workbench can also be used for reallocating resources and tasks to reduce times.

Fig. 10.9
Task Time Maintenance (4.11.1.13)



Complete the fields as follows:

Task. Indicate the standard or alternate task name.

Type. Specify the task type.

Internal Routing. Specify the internal routing associated with this task.

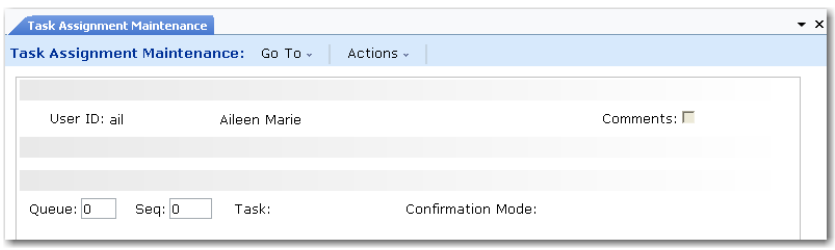
Description. Enter a brief description of the task defined above. This description is typically related to labor management.

Estimated Time. Specify the estimated task completion time. This value is used by the Labor Management Workbench and is compared against the user's estimated task completion time. This field can be updated automatically based on all past transactions using Task Time Update (4.11.1.17).

Assigning Resources to Tasks

After defining the resources and tasks that are being undertaken within the warehouse, you must assign the tasks to the resources. This is achieved by using Task Assignment Maintenance (4.11.1.9).

Fig. 10.10
Task Assignment Maintenance (4.11.1.9)



Complete the fields as follows:

User ID. Enter the name of the warehouse staff. An entry should be made for each warehouse staff.

Comments. Indicate whether additional comments are required for this task assignment.

Queue. Indicate the queue for this task. The queue contains a number of sequences, and queues are examined sequentially. Therefore, when the system is assigning tasks to resources, it checks all the sequences in queue 1 before queue 2. If multiple tasks exists for a user, the user is prompted to perform the task with the higher priority within the queue.

Sequence. Indicate the order within the queue for examining tasks.

Task. Indicate the tasks that are assigned to the specified employee (user).

Note This does not assign a specific task; it indicates that the user can undertake this task, assuming some are available.

If two outstanding tasks exist within the warehouse—a pick and a receipt—and a user is defined with sequence 1 receipt and sequence 2 pick, the user is prompted to move the receipt first, since this has a higher priority within the queue.

Confirmation Mode. Indicate the default confirmation method for this task type.

- A confirmation mode of AUTO requires the user to perform a movement confirmation.
- A confirmation mode of MANUAL is confirmed by the confirmation engine.

Reassigning Hard-Assigned Tasks

The system assigns tasks for the selected order/pre-shipper/customer combination to one user only according to the settings in Task Assignment Maintenance (4.11.9). The tasks are viewable only by that user. You can restrict the number of tasks assigned to a user and re-sort tasks by editing the `whbpklx2.p` sorting procedure. The sorting procedure is the default procedure in the Batch Picking Task Sort field in the Local Exit Routine Setup (4.23.10).

See “Local Exit Routines Setup” on page 182.

You can edit `whbpklx2.p` to change the following default task-sorting order:

- Travel sequence
- Alphabetical order of location
- Task priority (descending, highest priority first)

  Note When determining the priority for tasks, the system looks at the task queue, priority, and sequence, respectively.

Additionally, since the `whbpklx2.p` program receives the current user ID parameter, you can use the sorting procedure to retrieve all tasks assigned to a user. Once retrieved, you can re-sort tasks and remove task assignments based on any logic. For example, you can re-sort tasks by weight rather than travel location so that pickers can place heavy items on the bottom of a pallet. You can add a lookup to the `whbpklx2.p` program so that warehouse staff can re-sort the tasks manually before starting to pick.

Updating Task Priorities

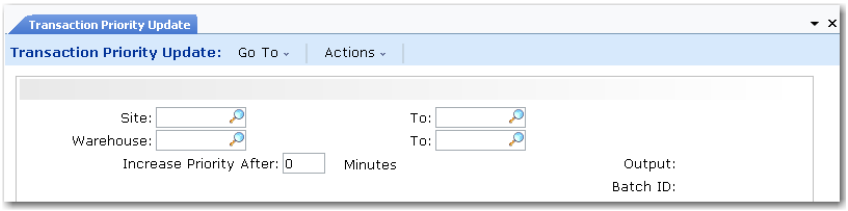
Use Transaction Priority Update (4.11.5) to change and report the priority of tasks. You can enter a range of sites or warehouses; then enter a period in minutes that determines how old tasks must be before the system increases their priority. After taking the delay period you specify into account, the frequency at which the system changes task priority is defined by the frequency at which you run a batch picking program. When you run batch picking, the system increments the task priority when it creates the tasks.

The system bases the task priority first on the setting of the Priority field in Internal Routing Maintenance (4.2.5). If it is not set there, it uses the priority that you set for transactions in the Priority field in Work Location Group Maintenance (4.3.9).

See “Internal Routing Maintenance” on page 48.

If you specify changes to priority in Task/Priority Update Report/Batch, the system ignores any changes to priority that you make in either Internal Routing Maintenance or Work Location Group Maintenance. However, you can change both values manually by setting the Priority field in Transaction Maintenance (4.8.13).

Fig. 10.11
Transaction Priority Update (4.11.5)



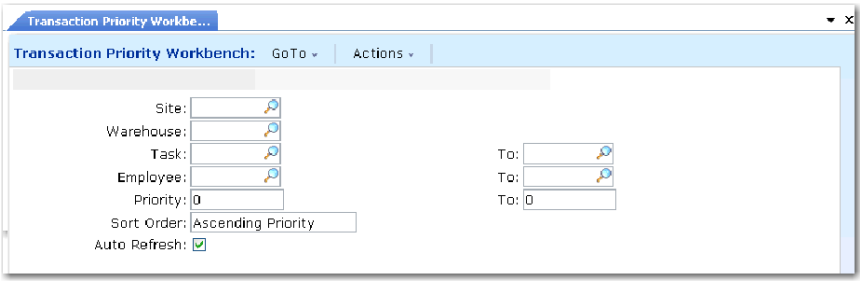
Updating Task Priorities for Specific Warehouse and Employee

Use Transaction Priority Workbench (4.11.6) to change the priority of tasks assigned to a specific user within a warehouse.

You can specify a range of tasks and a range of employees assigned to the task within the warehouse. You can re-sort tasks with new priorities based on ascending or descending priority, task, or employee.

If you set Auto Refresh to Yes, all system displays re-sorted tasks for the employee.

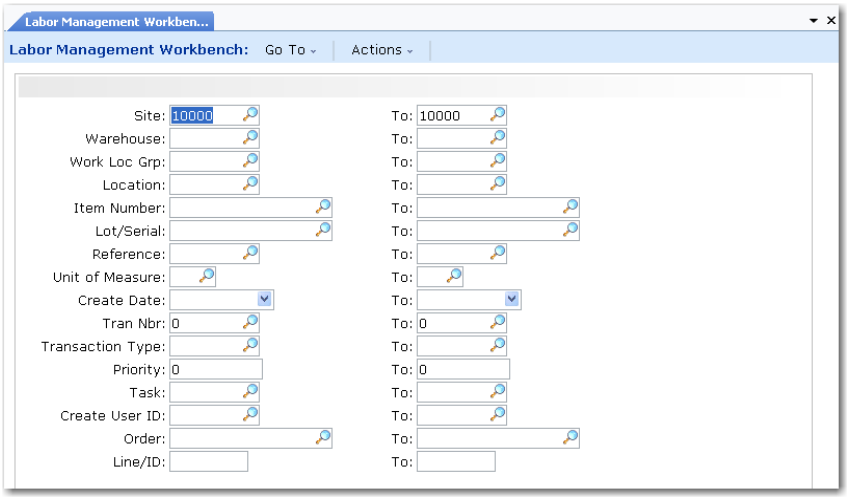
Fig. 10.12
Transaction Priority Workbench (4.11.6)



Labor Management Workbench

Use Labor Management Workbench (4.11.15) to automatically or manually assign resources to tasks. Automatically, the workbench assigns tasks to the most suitable resource, depending on task assignment, user/group calendars, and travel sequence. Manually, the workbench allows the operator to assign the resources to the tasks.

Fig. 10.13
Labor Management Workbench (4.11.15)



Complete the fields as follows:

From and To Site. Indicate the From/To site range that should be included on the workbench.

From and To Warehouse. Indicate the From/To warehouse range that should be included on the workbench.

From and To Work Loc Grp. Indicate the From/To work location group range that should be included on the workbench.

From and To Location. Indicate the From/To location range that should be included on the workbench.

From and To Item Number. Indicate the From/To item number range that should be included on the workbench.

From and To Lot/Serial. Indicate the From/To lot/serial range that should be included on the workbench.

From and To Reference. Indicate the From/To reference range that should be included on the workbench.

From and To Unit of Measure. Indicate the From/To UM range that should be included on the workbench.

From and To Created. Indicate the From/To create date range that should be included on the workbench.

From and To Transaction. Indicate the From/To transaction number range that should be included on the workbench.

From and To Transaction Type. Indicate the From/To transaction type range that should be included on the workbench.

From and To Priority. Indicate the From/To transaction priority range that should be included on the workbench.

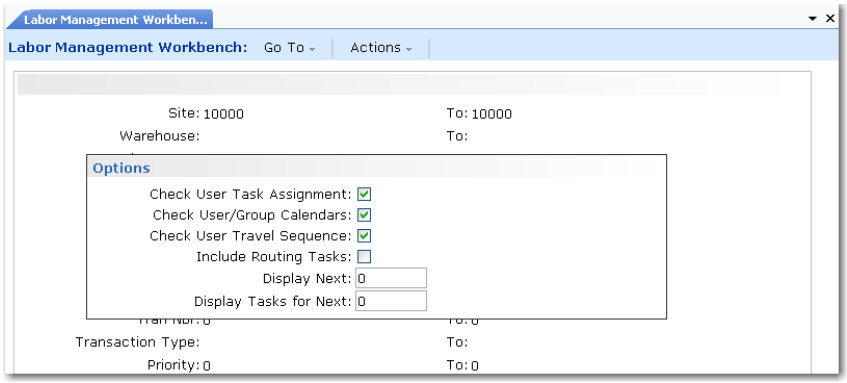
From and To Task. Indicate the From/To transaction task range that should be included on the workbench.

From and To Create User ID. Indicate the From/To transaction created by user ID range that should be included on the workbench.

From and To Order. Indicate the From/To transaction order number range that should be included on the workbench.

From and To Line/ID. Indicate the From/To transaction order line range that should be included on the workbench.

Fig. 10.14
Labor Management Workbench, Options



Check User Task Assignment. Indicate whether the workbench should check the user or group task assignment.

Check User/Group Calendars. Indicate whether the workbench should check the user or group calendars.

Check User Travel Sequence. Indicate whether the workbench should check the user's last known physical location prior to assigning tasks, or assign tasks irrespective of physical location within the warehouse.

Include Routing Tasks. Indicate whether the workbench should calculate the times and tasks using the complete routing as opposed to the individual routing sequence.

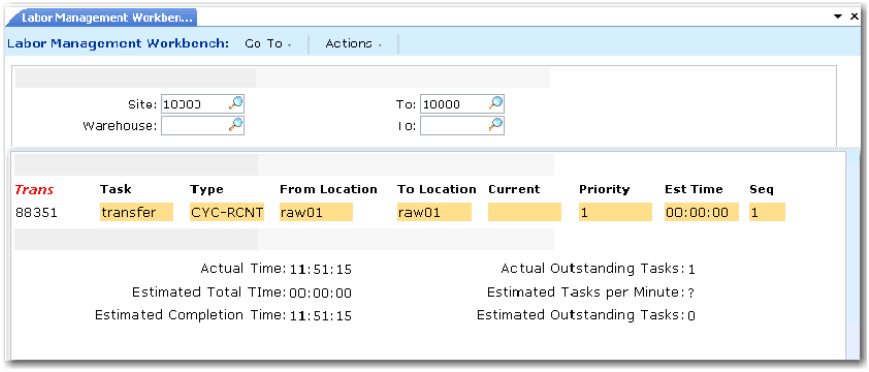
Display Next. Indicate how many tasks the workbench should display.

Display Tasks for Next (Minutes). Indicate how many minutes worth of tasks the workbench should display.

The Labor Management Workbench displays the current outstanding tasks based on the selection criteria entered in the first frame, together with the currently assigned warehouse staff, priority, and estimated time required to complete the task.

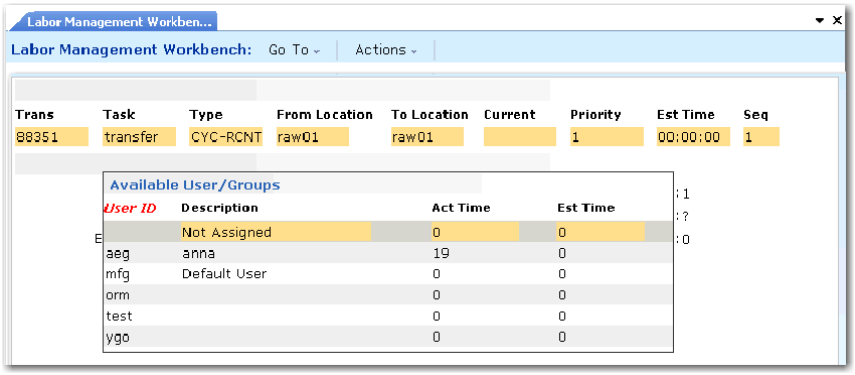
The lower frame displays the actual time that the report was generated, together with the estimated total time for all displayed tasks, and the estimated completion time for all displayed tasks.

Fig. 10.15
Labor Management Workbench, Active Tasks



The operator can select the required transaction to display a list of all valid warehouse staff that can undertake this task and add additional users if needed.

Fig. 10.16
Labor Management Workbench, Available Users/ Groups



Viewing Labor Data

Use the reports in the Labor Management Reports Menu to view labor data for QAD Warehousing.

Table 10.1
Labor Reports

Menu	Name
4.11.12	Labor Management Reports Menu...
4.11.12.1	Next Task Inquiry
4.11.12.2	Pending Tasks Inquiry
4.11.12.3	Task by Completion Time Inquiry
4.11.12.4	Task by Completion Date Inquiry
4.11.12.7	Performance by Task Report
4.11.12.8	Performance by User Report
4.11.12.10	Productivity by User Report
4.11.12.12	Closed Transactions by User Rpt

Menu	Name
4.11.12.13	Task Load Report
4.11.12.15	Workload by WLG Browse
4.11.12.17	Tasks by User and Date Inquiry
4.11.12.18	Tasks by User and Date Report
4.11.12.19	Tasks by Group and Date Inquiry
4.11.12.20	Tasks by Group and Date Report

Performing RF Tasks

The following subsections describe tasks you can complete on the RF and information you should know before beginning RF tasks. Tasks include the following:

- Accessing Tasks
- Confirming Tasks

Accessing Tasks

Use Task Assignment Maintenance (4.11.1.9) to define tasks for warehouse staff.

Before the system can automatically select a task and present it on the RF or a warehouse user can manually select a task from the RF, the following must be true:

- The user's login site, warehouse, work location group, and task must be valid, and the system code must be correct.
- If user/work location group (WLG) records are defined for the WLG of a specific task, only users defined for that WLG can access the task. If no user/WLG records are defined for a WLG, all users can access tasks in that WLG.
- The task associated with the transaction must be on the task list assigned to a user in Task Assignment Maintenance (4.11.1.9).
- Tasks cannot be locked by or assigned to another user.

  Tasks can be soft assigned or hard assigned. A soft assigned task is assigned to a user but can be manually selected by another user. A hard assigned task is assigned to one user and is not accessible by other users.

  Note You can restrict the number of tasks assigned to a user and re-sort tasks so that hard-assigned tasks are reassigned by editing the `whbpklx2.p` sorting procedure. The sorting procedure is the default procedure in the Batch Picking Task Sort field in Local Exit Routines Setup (4.23.10). See "Assigning Resources to Tasks" on page 166.

Selecting Tasks on the RF

When the proper setup is complete for a user, tasks are automatically assigned to that user. Users select tasks from the RF Work Menu (1.). Users can select from any of the following:

- Next Task: The RF automatically displays the next task assigned to the user once the user confirms completion of the current task.
- Select Task: Users can select the next task to perform from a list of tasks.
- PreShip Sel Task: Lets users select all tasks from an SO pre-shipper.

- On-Line SO Pick: Lets users pick and allocate sales orders dynamically.

See “Task Confirmation Setup” on page 173.

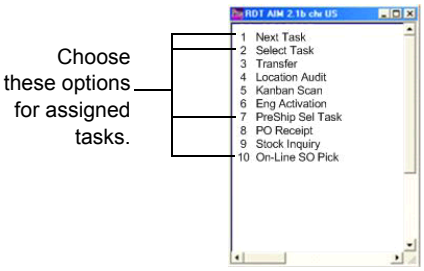
Note Users can also enter the current task assigned to them in the Task field that displays in the RF login screen.

Batch picking tasks are available through the RF Picking/Container (3) menu option.

See Chapter 17, “Batch Picking,” on page 287.

The screen layout for the Select Task function varies, depending on the setting of the OS variable. If no value is specified, then users select a task from scrolling window.

Fig. 10.17
RF Tasks



Confirming Tasks

Warehouse staff use the RF to inform the system that tasks are complete. This process is called *movement confirmation*.

Task Confirmation Setup

Warehouse staff can confirm that tasks are completed through the RF. To confirm tasks, ensure the steps listed in Table 10.2 are completed.

Table 10.2
Confirmation Setup

Description	Program
Ensure tasks are defined.	Task Maintenance (4.11.1.1)
Ensure the RF user is defined as a user.	User Maintenance (36.3.1; 36.3.18 before eB2.1)
Ensure the RF user is defined as a warehouse user.	User Warehouse Data Maintenance (4.11.3.1)
Set the System Code field to RF.	Internal Routing Maintenance (4.2.5)
Ensure tasks are assigned to the user.	Task Assignment Maintenance (4.11.1.9)

You use Task Assignment Maintenance (4.11.1.9) to define tasks for the warehouse staff. You define the queue; the tasks within a queue; the sequence number of the task within the queue; and whether confirmation of the task is automatic, manual, or timed.

See “Assigning Resources to Tasks” on page 166.

When you set Confirmation Mode to AUTO, the system updates inventory, quantities on hand, detail allocations, and so on, immediately after warehouse staff confirm the task. The RF may pause until it completes the update and warehouse staff cannot control the RF during the pause. If warehouse staff want to control the RF at all times, set the Confirmation Mode to MANUAL. The system completes the remaining updates when you manually instruct the engine processor to do so in the Engine Menu (4.7).

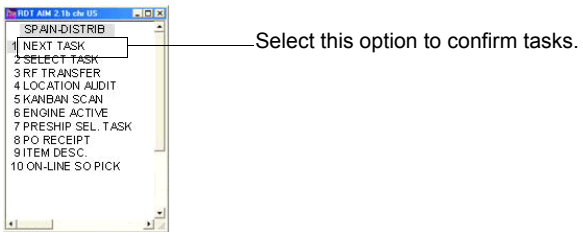
See “Confirmation Mode” on page 165.

Note You can set the engine processor to process records within fractions of a second so that records are updated immediately, even if done manually, or you can delay updating until a predefined time by setting the Repeat Every field in the engine processor options (4.7.9 through 4.7.11) within the Engine Menu. See “Engine Processing” on page 137.

RF Next Task Option

Users confirm movement on the RF through the Next Task option in the WORK menu.

Fig. 10.18
RF Work Menu



Confirmation Options

Some warehouse maintenance programs, such as Internal Routing Maintenance (4.2.5), contain confirmation option fields. Confirmation options define which values can be changed during confirmation and the action resulting from any permitted change. For example, you can specify confirmation options that let a user enter a different location when a task instructs the user to go to a specific location and whether the user receives a warning when he enters the location change or must confirm the location change. In most cases, you set the options so that RF users cannot make changes during confirmation.

Some of the options provide a static outcome; for example, always blank the reference. These options are calculated and performed when the transaction is created. This improves performance and stability since the correct inventory is referenced throughout the life cycle of the transaction.

Task Switching with Confirmation Options

The Allow Task Switching field in Work Location Group Maintenance (4.3.9) plays an important role when you set confirmation option fields. If you set this field to Yes, you allow RF users to switch to another task when they enter confirmation option values that are different than the expected one.

See “Allow Task Switching” on page 66.

Example You set Allow Task Switching to Yes, then set task confirmation options to allow a different value for reference or lot/serial number. When the user enters a different reference, the system checks for another task for the reference and the user can switch to the other task.

If you set Allow Task Switching to No, the user cannot switch to another task. This can cause problems if the task is a requirement to satisfy an order. Each pick task is linked to a specific order and each order is associated with a specific detail allocation. If users change a value, the system assumes that the changed value is for the current task and confirms the task. This affects the detail allocation and picked quantities available for an order and can cause errors.

Confirming in Staged Locations

Providing a stage for a location means that a task must be confirmed more than once before it is considered closed. A staged location is one that is not directly accessed. Instead, inventory coming in or going out of the location is placed on a temporary stage prior to the inventory movement. This type of environment is frequently used when fork-lift hand-offs must be performed, or when inventory is being taken out of, or placed into, an automated storage area.

The Stage In and Stage Out fields in Warehouse Location Maintenance (4.3.13) identify whether a location is staged. If both fields are blank, the location is not staged.

See “Stage (In)” on page 75 and “Stage (Out)” on page 76.

Example If a location has a value populated in the Stage Out field, stock is taken from the location, moved to its stage, and then on to the task’s destination. This requires that the transaction be confirmed twice:

1 From the location to its stage

2 From stage to the final destination

Similarly, a location with a must have tasks moving stock into it confirmed twice:

1 Onto the stage

2 From the stage to the location

If a transaction moves inventory from a location with a Stage Out to a location with a Stage In, the task has to be confirmed three times:

1 From the source location to its stage

2 Between the source location’s stage and the destination location’s stage

3 From the destination location’s stage into the destination location

Confirmation Transaction Status

As a task is being confirmed, the system updates the status. This is largely invisible to the RF user but is included here as technical information. The status flow is listed in Table 10.3.

Table 10.3
Transaction Status Flow

Status	Meaning
OPEN (Task is not locked)	Task has been created and is awaiting confirmation.
ACTIVE (Task is not locked)	Task has been selected by a user but has not reached the point where the user has confirmed completion. The task is soft assigned to the user so that no other user is offered it as the next task, but a user can manually select it.
OPEN (Task is locked)	The user has identified that the task is started. Physically, this indicates that the user has picked up the identified inventory. Because the record is locked, no other user can access this task. The status is put back to a status of OPEN so that if a software, hardware, or communications failure occurs after the transaction is locked, the task is not left in a state that cannot be accessed. If such a failure occurs, the task is soft assigned to the user who had started it, but still OPEN so other users can select it, if necessary.
PROCESS	A transaction is at a status of PROCESS only when a confirmation mode of MANUAL is in effect. It indicates that the transaction has been confirmed by a user but that it has not yet been processed by the engine processor.
CLOSED (Lock is released)	The confirmation of the task is complete and the transaction is deleted from the task queue and placed into transaction history.

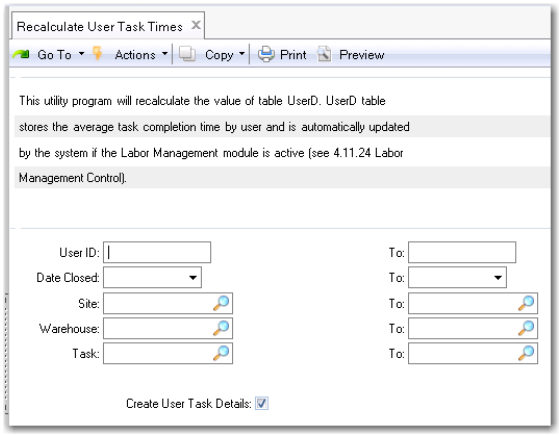
Recalculating User Task Time

Typically, the system calculates task time automatically when the Labor Management module is active. System administrators can use Recalculate User Task Time (4.25.13) to recalculate user task time that the system stores in the UserD table.

Note Set Active to Yes in Labor Management Control (4.11.24) to activate the Labor Management module.

Calculating task time can be time consuming as the system recalculates every time a task is closed. To save time, system administrators can deactivate the Labor Management module by setting the Active field to No in Labor Management Control, then run the Recalculate User Task Time utility to recalculate user task time in batch mode. Optionally, system administrators can create user task details in the utility.

Fig. 10.19
Recalculate User Task Time (4.25.13)



Chapter 11

System Administration

The following topics describe menu options used to manage the system and control printing:

Sequence Definition 180
Illustrates the uses of the sequence definition option and how to maintain them.

Cross-Referencing Program Names 182
Describes how to use Program X-Reference Maintenance (4.23.6) to cross-reference program names with custom programs.

Local Exit Routines Setup 182
Describes how to use Local Exit Routines Setup (4.23.10) to specify programs for selected functions.

Verbosity 184
Explains how verbosity levels can be controlled, maintained, and deleted or archived.

Warehouse Security 185
Describes how Warehouse Security Maintenance (4.23.13) can be used to control access to warehouse data.

Barcode Prefixes 186
Describes different types of barcode prefixes, how the system uses them, and how they can be maintained, disabled, or tested.

External Devices 191
Describes how to use External Device Setup (4.23.22) to set up RF and other external devices.

Printing 193
Describes the circumstances under which printing can be controlled, the print procedure and flavor codes, and templates.

Miscellaneous Utilities 194
Lists and describes the Miscellaneous Utilities and their menu numbers.

Sequence Definition

The sequence definition options on the Warehouse Manager Functions Menu (4.23) let you define how controlled sequences of numbers are structured. The main uses include specifying the:

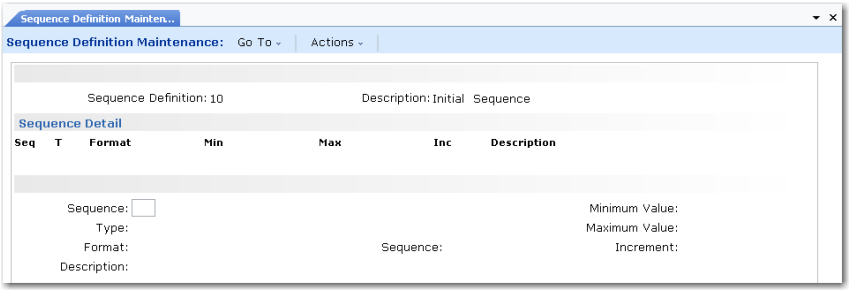
- Number sequences for use in generating pallet references, or other sized-by-reference units of measure.
- Format and range of the location identifiers when you use Mass Location Maintenance to create a number of storage locations.
- Number sequences for bulk-picking orders
- Number sequences for pre-shipper
- Number sequences for loads

Use Sequence Definition Maintenance (4.23.1) to define either the automatically incrementing sequence number for pallet references, or the format and range of generated location identifiers. You can specify fixed-value parts and incrementing parts of the location names, so that you end up with location names such as Bulk0101, Bulk0102, Bulk0103.

Sequence Definition Maintenance

Figure 11.1 illustrates Sequence Definition Maintenance (4.23.1).

Fig. 11.1
Sequence Definition Maintenance (4.23.1)



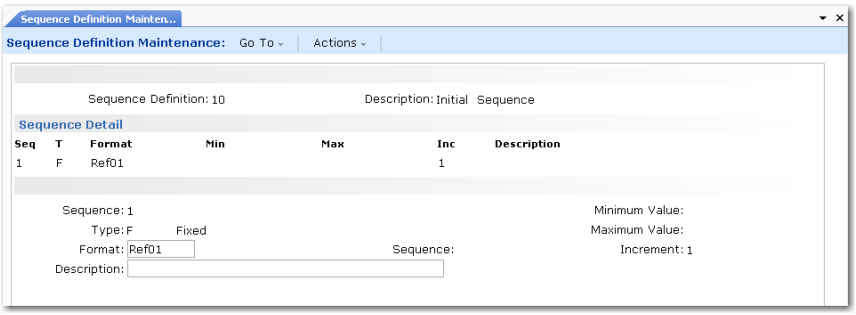
Sequence Definition. Enter a code to identify this sequence definition, which can be a pallet numbering scheme or a template for creating a particular set of locations.

Description. Enter a description to explain how this sequence definition is used.

You can enter a number of sequence definitions in succession using these two fields.

When you have set up your sequence definition codes, the next step is to define the details of the way the system generates the next required pallet reference, or identify a whole sequence of locations; for example by including an incrementing number in one part of the location identifier.

Fig. 11.2
Sequence Detail Frame



Sequence. The pallet reference numbers or location identifiers for the range of locations are constructed from sequential segments, which can be fixed values or incrementing numbers; for example, Bulk01, Bulk02, where the Bulk segment is fixed and the number segment is incremented. Enter a sequence number like 1, 2, or 3 to specify which sequential segment of the identifier you are defining in the remaining fields of this program.

Type. Enter the type for this segment of the identifier. Valid types are:

- I for integer
- C for character
- F for fixed
- D for Date
- S for Sequence

Depending on the type you select, you enter additional details in other fields in the frame.

Example If you enter S for sequence, you specify only which sequence you want in the DB Sequence field, and optionally, a description.

Format. Enter the format for this segment of the reference number or location identifier. Valid formats are:

Segment Type	Format Entry
I	Enter an integer for each numeric position.
C	Enter a character for each character position.
F	Enter the actual text to use for the fixed value.
D	Enter one of the following valid date formats: DD, MM, YY, or YYYY. Use consecutive segments if you want a full DDMMYY date.

Note The I (Integer) type and the S (Sequence) type are very different. The I type is used when you want to generate all values between boundaries. S is used when you want to have an increment that is not limited only by the maximum size of the sequence. For instance, for a pallet number generation, you want to generate a new number for each pallet. Use type S for the increment. When you want to use the sequence definition to generate locations within a range such as from Bulk10 to Bulk99, use an Integer sequence.

In the previous example (Bulk01, Bulk02, and so on), the first segment has type F, format Bulk; the second segment has type I, format 99.

DB Sequence. For sequence segments, enter the sequence you want to use. Each time a new pallet reference is required, the system takes the next sequential number from the specified sequence.

Minimum Value. For incrementing segments, enter the start value for the incrementing range. Leave this field blank for fixed segments.

Maximum Value. For incrementing segments, enter the end value for the incrementing range. Leave this field blank for fixed segments.

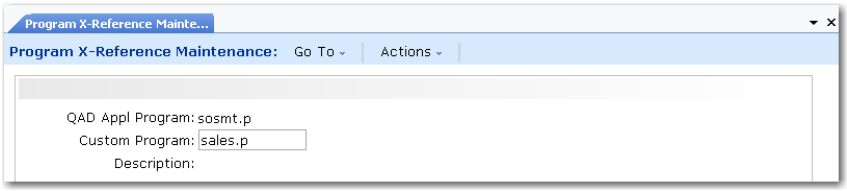
Increment. For incrementing segments, enter the amount by which each successive location identifier or reference number should be incremented.

Description. Enter a description of this segment of the reference number or location identifier, if required. This is used for information purposes only.

Cross-Referencing Program Names

If you create custom programs, for example, for localization purposes, use Program X-Reference Maintenance (4.23.6) to cross-reference standard program names with your custom programs. Figure 11.3 illustrates the Program X-Reference Maintenance screen.

Fig. 11.3
Program X-Reference Maintenance (4.23.6)



QAD Appl Program. Enter the name of the QAD system program that you customized.

Custom Program. Enter the new name of the customized program.

Description. Enter a short description of the cross-referenced programs.

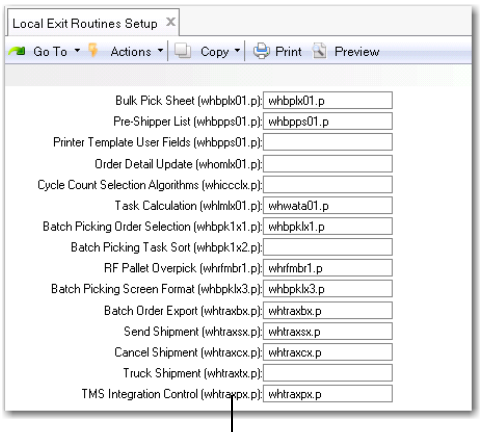
Local Exit Routines Setup

You can extend warehousing functions by specifying custom programs that you have modified for your specific requirements. Use Local Exit Routines Setup (4.23.10) to specify programs for selected functions.

For example, you can use Local Exit Routines Setup to define the program to call when warehouse staff replenish from a single pallet.

QAD Warehousing supplies a custom program for each function. The supplied program is shown in parenthesis ( ) with each function.

Fig. 11.4
Local Exit Routine Setup (4.23.10)



Bulk Pick-Sheet (whbplx01.p). Specify this program to let users print all bulk-picking tasks by item.

Pre-Shipper List (whbpps01.p). Specify this program to print a pre-shipper list during bulk picking. The pre-shipper list is similar to the standard picklist that shipping programs create.

Printer Template User Fields (whprlx01.p). Specify this empty printer template to use as a basis when you want to create and manage your own printer user fields.

Order Detail Update (whomlx01.p). Specify this program when you want local values to be set on the order detail. Use this program before you create order detail data on the order.

Cycle Count Selection Algorithms (whiccclx.p). Specify this program to determine if a cycle count should be created.

Task Calculation (whlmlx01.p). Specify this program before you replenish a wave in Wave Replenishment (4.15.6) and release a wave in Wave Release (4.15.8). The Def Priority After Activ field in Wave Planning Control (4.15.1.24) gives priority to tasks once the system activates them. Activation occurs when you launch release groups during a wave release. The program you specify in this field takes priority into account when creating tasks.

Batch Picking Order Selection (whbpklx1.p). Specify this program to manipulate selected orders; for example, when you want to remove orders.

Batch Picking Task Sort (whbpklx2.p). This program is the default procedure for sorting batch picking tasks. You can restrict the number of tasks assigned to a user and re-sort tasks so that hard-assigned tasks are reassigned by editing the `whbpklx2.p` sorting procedure.

RF Pallet Overpick (whrfmbr1.p). During replenishment, run this overpick program so that warehouse staff can return items that are not picked. When you use this program, the system sets the Allow Split Replen in Batch Picking Control (4.15.24) to Yes.

Batch Picking Screen Format (whbpklx3.p). Use this program to change the format of the RF screen during batch picking. You can edit the program and alter the layout and type of batch picking information that displays.

Batch Order Export (whtraxbx.p). Order Batch Export/Load Import (4.15.2.7) uses this routine to send and receive export messages with a Transportation Management System (TMS). Order Batch Export/Load Import lets you export the order batch selections created in Order Batch Selection (4.15.2.5). It uses this routine to create the batch shipment (BTCH) message, send the message to the TMS, receive a reply, and create loads.

Ship Shipment (whtraxsx.p). RF Print Paperwork (3.8) uses this routine to send and process ship shipment (SHIP) messages with the TMS. QAD Warehousing sends the final contents of shippers, including containerization information, to the TMS. It then receives the shipping labels, freight charges, and tracking or PRO numbers that it stores in header records of the shipment.

Cancel Shipment (whtraxcx.p). The RF Cancel Shipment uses this routine to send a void shipment (VOID) message to the TMS should you need to cancel a shipment. QAD Warehousing first validates that this shipment was sent to TMS using the ship shipment routine message and RF Print Paperwork function. Once validated, it sends a message to the TMS to cancel the shipment and receives a reply of the cancellation.

Truck Shipment (whtraxtx.p). The RF Ship Truck (3.5) uses this routine to process the process end of day (PEOD) message. This message lets the system recalculate final freight charges and prorating truck level charges over individual shipments. Depending on the additional freight charges, the charges can be prorated over individual sales orders.

For shipments belonging to a load, the system verifies that when users attempt to confirm a shipment, all other shipments for that same load are selected in the same transaction. If not selected, warnings or errors display, depending on Warehouse Transportation Control (4.15.2.24) settings. When communication problems occur, the system displays messages.

TMS Integration Control (whtraxpx.p). Wave Transportation Control uses this routine to set up any TMS-dependant values that it needs to process messages between QAD Warehousing and a Transportation Management System (TMS). Typical information might include the TMS host name, service, protocol and other necessary information needed for communication between the two programs.

Verbosity

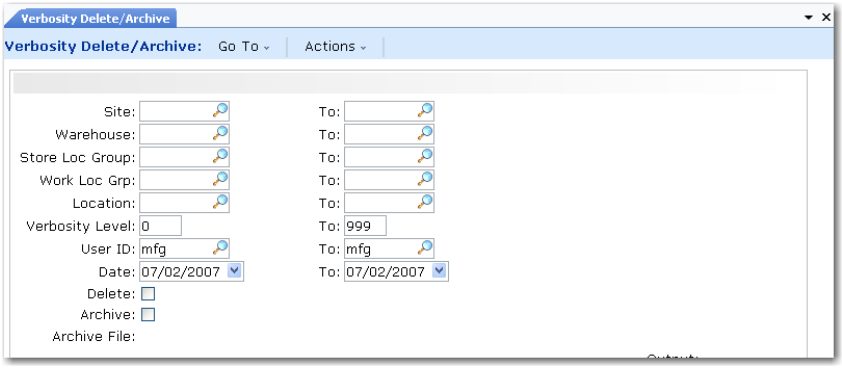
Warehouse reporting can be verbose. You can control the level of verbosity in all QAD Warehousing reports by setting a Verbosity Level field in Warehouse Management Control (4.24). Other reports and functions may include a Verbosity Level field where you can override the system setting.

When you set a value other than zero for the Verbosity Level in Warehouse Management Control, the system creates verbose messages that indicate different processes the system is following. You can see those messages using either Verbosity Injury (4.23.12.1) and Verbosity Report (4.23.12.3).

The system uses the VerbH table to hold messages. The table can grow quite large over time. Use Verbosity Delete/Archive (4.23.12.23) to delete old messages; see Figure 11.5.

You can delete/archive by specifying a range of sites, warehouses, storage location groups, locations, verbosity levels, and user IDs.

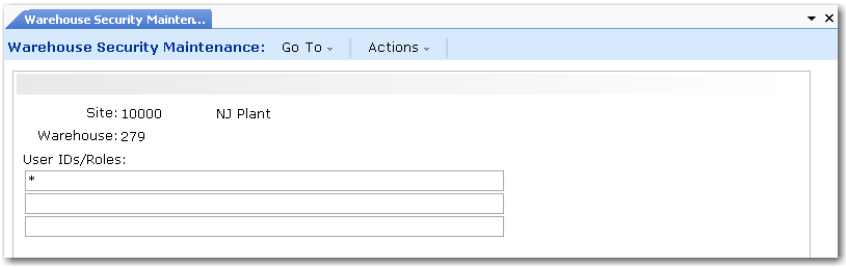
Fig. 11.5
Verbosity Delete/Archive (4.23.12.23)



Warehouse Security

Warehouse Security Maintenance (4.23.13) enables you to control which users or groups of users can access data for a warehouse.

Fig. 11.6
Warehouse Security Maintenance (4.23.13)



The frame contains three fields:

Site. Specify the site owning the warehouse being modified. Site security validation applies.

Warehouse. Specify the warehouse being modified. It must exist, in combination with the site, as a valid warehouse.

User IDs/Roles. Enter a list of user IDs or roles that can update data associated with this warehouse site. The system validates entries against records in User Maintenance (36.3.1) and Role Create (36.3.6.1).

Separate user IDs and roles with commas. Spaces are eliminated upon entry. Blank (the default) or an asterisk indicates all user IDs or roles. The exclamation point is used to restrict specific users by user ID. For example, the string ap, sales means only those users who were assigned the role of ap or sales have security access. Exclusions must be entered first. Specifying *, !user1 is the same as * (all roles).

Two further warehouse security options are provided:

- Warehouse Security Browse (4.23.14) enables you to review the security levels set for a specific warehouse.
- Warehouse Security Report (4.23.15) enables you to print a report showing users/roles for a specific warehouse or all warehouses.

Barcode Prefixes

Barcode numbers are typically divided into two parts: a company code prefix, which is assigned to the entire system, and the remainder of the code which designates a particular product within that system. Figure 11.7 illustrates a typical barcode with a prefix.

Fig. 11.7
Barcode Prefix Example



The system uses prefixes in barcode labels to identify a customer or ship-to code, while the remainder of the barcode identifies additional information about the item or shipment. Warehouse staff scan barcode shipping labels when building shipments for the customer or ship-to code. The system needs to know the barcode prefix to validate that the correct barcode data value has been scanned.

See page 189.

Note When scanning items, warehouse staff can scan alternate barcode numbers, including the customer code as an alternate barcode number. You define alternate barcodes in either Multi-Level Item Maintenance (4.4.5) or Item Maintenance (4.4.7).

EAN-128 Barcodes

EAN-128 is a variant of the universal commercial code (UCC) 128. UCC code 128 provides a world-wide format and standard for exchanging common data between companies. European Article Number (EAN-128) is a superset of the uniform product code (UPC) that allows extra digits for country identification; it is primarily used in retail distribution.

While other barcodes simply encode data with no respect to what the data represents, UCC/EAN-128 encodes both data and what the data represents. UCC/EAN-128 contains two components:

- Data with its application identifier (AI)
- Barcode symbology that codes data

The barcode symbology is code 128. The AI is a prefix code that identifies the meaning and the format of the data that follows it (data field).

You specify the non-encrypted `whean128.p` program in the Program field in Barcode Prefix Maintenance (4.23.17). The `whean128.p` program reads and interprets UCC/EAN-128 codes. It supports only the following AI prefixes:

00	15	231	235	239	335
01	30	232	236	310	340
02	37	233	237	320	
10	230	234	238	330	

The system runs `whean128.p` during batch picking. You can customize `whean128.p` or create your own EAN 128 program. If you create your own program, you must enter the name of the customized program and the name of the program it is replacing in Program X-Reference Maintenance (4.23.6).

You can also specify an alternate barcode in the Barcode 1 and Barcode 2 fields in Item Maintenance (4.4.7) to use with the `whean128.p.`

Example You define an EAN/UCC-13 alternate barcode as 1234567890123 in the Barcode 1 field. During batch picking, the RF displays an item as MyItem1. Warehouse staff scan a UCC/EAN-128 code that contains (01)1234567890123(310)12334, where (01) is the prefix identifying the EAN/UCC-13 terminology. The `whean128.p` program:

- Reads the full barcode
- Determines that staff need to scan the item
- Identifies (01) as a EAN/UCC-128 standard for the item number in EAN/UCC-13 terminology
- Determines that 01234567890123 corresponds to MyItem1
- Accepts the scan

You can also test the barcode print of an EAN-128 barcode by specifying the `whean128.p` program in EAN/UCC Barcode Testing (4.23.20).

See “Testing a Barcode” on page 191.

Serial Shipping Container Code (SSCC)

SSCC is a specific pallet identification code that contains the manufacturer code and 7 to 11 digits for pallet identification. The SSCC uses a common vendor numbering scheme that can include EAN.UCC prefixes.

You specify a code in the Manufacturer Code field in the Printing Frame of Warehouse Maintenance (4.1.1). The code identifies the enterprise’s site-named manufacturer code. This code is included in every SSCC used by the enterprise.

You specify the non-encrypted `whsscc.p` program in the program field in Barcode Prefix Maintenance. This program reads and interprets SSCC codes. You can customize `whsscc.p` or create your own SSCC program. If you create your own program, you must enter the name of the customized program and the name of the program it is replacing in Program X-Reference Maintenance (4.23.6).

See page 189.

During batch picking, when staff scan an SSCC, the `whsscc.p` program extracts the enterprise code, verifies that it corresponds to the site, verifies that the SSCC check digit is correct, and displays the eight-digit pallet reference for the scanned container or tote.

Note Pallet numbers are eight digits; therefore, if an SSCC is more than eight digits, the system only uses the last eight digits of the code as the pallet number. Some reports and inquiries display only the eight digits.

Warehouse staff can print labels for the SSCCs. You must set Print Flavor to 1 in Warehouse Maintenance (4.1.1) to print the labels. When set, the system creates the SSCC by adding the enterprise code you define in Warehouse Maintenance to the reference for the container. It also adds a check digit for the code.

If you use barcodes in EAN/UCC-128 that contain a (00) prefix, the prefix is an SSCC that contains the manufacturing code, including a prefix, country prefix, pallet number, and a check-digit suffix. In this case, `whean128.p`:

- Extracts the SSCC identity with the (00) prefix
- Runs the `whsscc.p` program to extract the pallet number from the SSCC
- Validates the pallet number with the task, if required

You can also test the barcode print of an SSCC type barcode by specifying the `whsscc.p` program in EAN/UCC Barcode Testing (4.23.20).

See “Testing a Barcode” on page 191.

Specifying Barcode Prefixes

Use Barcode Prefix Maintenance (4.23.17) to define a one- to four-digit prefix for any or all of following fields:

- Date (expiration date)
- Item
- Location
- Lot/serial
- Quantity
- Reference
- Tote

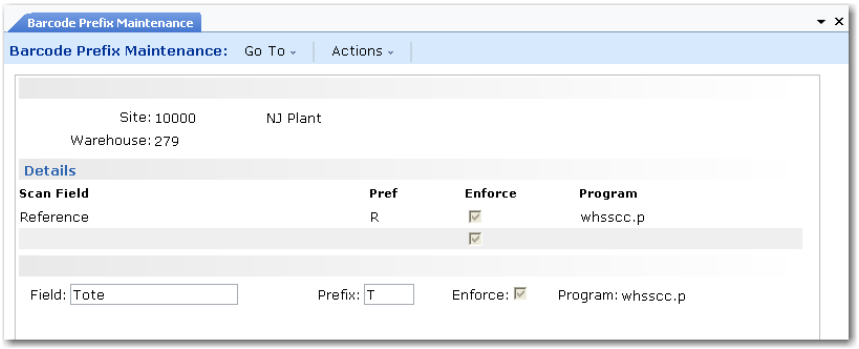
  Note Tote is used in batch picking and consolidation.
- Carrier
- Pick-list
- Shipper
- Master Bill of Lading
- Order
- Address

  Note Address is used in receipts and shipments. Also, you set up the order and address prefixes as generalized codes for the ScanField field.

You can set up prefixes when using RF containerization or container move features. Because you cannot determine whether staff scan a tote they create in batch picking or scan a reference through full-pallet picking of wave replenishment, the prefixes are valid for both boxes/pallets that are either totes or references.

Similarly, when using the RF Print Paperwork function for scanning pick-lists (pre-shippers), shippers, or master bill of ladings, the system validates prefixes for all these document types.

Fig. 11.8
Barcode Prefix Maintenance (4.23.17)



Site. Enter the site for scanning prefixes.

Warehouse. Enter the warehouse for scanning prefixes.

Scan Field. Enter one of the following fields:

- Date
- Item
- Location
- Lotserial
- Quantity
- Reference
- Tote
- Carrier
- Picklist
- Shipper
- MBOL
- Order
- Address

Prefix. Enter up to a four-character prefix that represents the scan field definition. For example, enter L for location, R for reference, or D for date.

The system uses the expiration date for the date prefix. Only the RF PO Receipt (1.8) menu option prompts for the expiration date.

Enforce. Indicate whether to enforce prefix use during barcode scanning.

No: Staff can scan barcodes without prefixes.

Yes: Staff must scan a barcode with a prefix, unless the environment variable `AIMSkipPrefix` is set to Yes for that user (see the following section on disabling prefixes).

Program. Enter a program to read and interpret barcodes:

`whsscc.p`: for SSCC barcodes

`whean128`: for UCC/EAN-128 barcodes

Warehouse users can scan either EAN or SSCC codes and have values displayed for the various prefixes in the RF.

See page 191 and page 187.

Example You specify the `whean128.p` program for use with the Q(uantity) prefix. The RF prompts the user for the quantity. The user enters the EAN-128 code 30100. The `whean128.p` program reads the 30100 code and identifies the EAN prefix 30 for the quantity. It removes the prefix 30 and returns the value of 100 as the valid quantity.

Disabling Prefixes

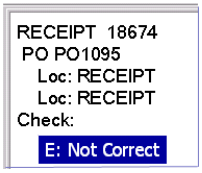
It is cumbersome to type a prefix for every field when warehouse staff use a terminal to enter barcode numbers rather than a scanning device; for example, for testing purposes. For this reason, you can disable a prefix by specifying No in the Enforce Prefix field in Barcode Prefix Maintenance.

Processing Orders with Prefixes

Once you define the prefixes in Barcode Prefix Control, staff can scan tags using the prefixes.

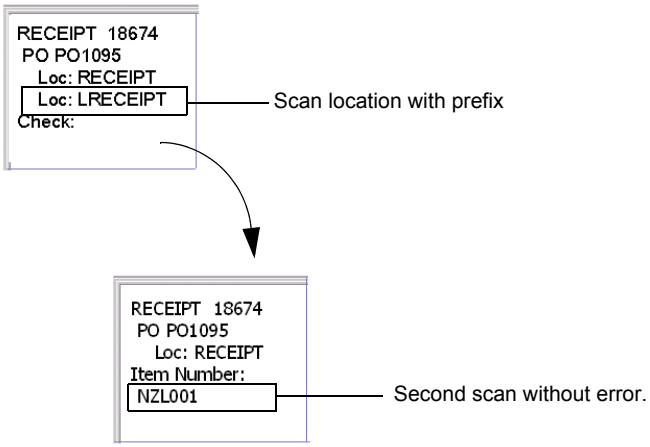
For example, if you define a location prefix as L and staff scan the location `RECEIPT` without scanning the prefix, the RF displays an error message as shown in Figure 11.9.

Fig. 11.9
RF Scan Error Message



However, if staff scan the prefix with the label by scanning `LRECEIPT`, staff can proceed to scan the item number without errors as shown in Figure 11.10.

Fig. 11.10
RF with Prefix Scanned

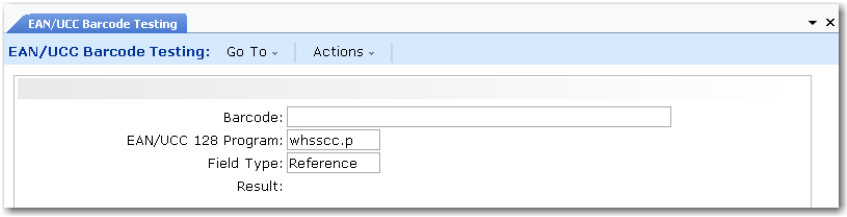


Testing a Barcode

Use EAN/UCC Barcode Testing (4.23.20) to test barcode results when you use barcode programs such as `whsscc.p` or `whean128`; see Figure 11.11. For example, when you use `whsscc.p`, you can run a test to ensure that the system uses the eight characters before the last check-digit character at the end of the SSCC barcode.

Enter the barcode you want to test, the barcode program that reads and interprets the code, and the field prefix for the barcode. Click Next to see a sample of the barcode that staff can print from the RF in the Result field.

Fig. 11.11
EAN/UCC Barcode Testing (4.23.20)



Barcode. Enter the barcode that you want to test.

EAN/UCC 128 Program. Enter the program that reads or interprets either SSCC or UCC/EAN-128 codes: `whsscc.p` or `whean128`.

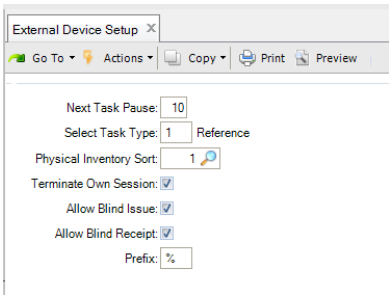
Field Type. Enter the field type for which the program in EAN/UCC 128 Program attaches. See “Barcode Prefixes” on page 186.

Result. The system displays extracted code in this read-only field. If you specify the flavour 1 print option and are testing SSCC code, the system displays the `whsscc` code only.

External Devices

You can use External Device Setup (4.23.22) to set up the radio frequency (RF) device used by warehouse staff.

Fig. 11.12
External Device Setup (4.23.22)



Next Task Pause. Specify the time in seconds that the RF device pauses during the RF Next Task (1.1) or RF Select Task (1.2) options when there are no open tasks.

Select Task Type. Indicate whether the RF Select Task option is controlled by reference or by transactions:

1: Reference

2: Transaction number

PO Shipper ID Sequence. Enter the Sequence to be used when generating Po shippers in the External Device PO Shipper Receipt Function. These sequences need to be created using Sequence Definition Maintenance (whseqmt.p).

Physical Inventory Sort. Specify the tag-sorting method that the RF device uses during a physical inventory.

0 (the default): Sort by travel sequence: The system uses the last location scanned with any other RF function, or if it is the first action after login, the system uses the location entered in the RF login screen. This is the default setup if no entry exists in Generalized Codes Maintenance.

1: Sort by location name: The system uses locations by alphabetical order, starting with the first alphabetical location. Travel sequence is not considered.

2: Sort by count number: The system sorts by the count number.

For more information on conducting physical inventories within the warehouse, see your QAD Warehousing user documentation.

Terminate Own Session. Specify Yes to terminate your own user session on the RF. Occasionally, the RF can keep a user session running, even when the user is not logged into the RF.

Once activated, if the user logs into the RF, the system prompts to terminate the session. If the user responds with Yes, the system attempts to stop the currently running session of that user. Once the current session stops, the user can log in as usual.

Allow Blind Issue. Set this field to Yes so that RF users can conduct a blind issue (unplanned issue) from the RF device.

Allow Blind Receipt. Set this field to Yes so that RF users can conduct a blind receipt (unplanned receipt) from the RF device.

Prefix. Specify a symbol to use as a barcode separator—a prefix—that the system uses with scanned-in barcodes that comply with UCC/EAN-128 encoding standards. You set up barcode prefixes in Barcode Prefix Maintenance (4.23.17); see “Specifying Barcode Prefixes” on page 188.

Entering a prefix lets EAN/UCC Barcode Testing (4.23.20) correctly display values in the Result field when the barcode string contains a similar prefix value, and you use the EAN-128 `when128.p` program. For information on this program, see “EAN-128 Barcodes” on page 186.

When the prefix does not match stored prefixes within the system in the mfg_ctrl table, the system displays one of two errors:

- `Defined prefix not found in the barcode:` The prefix you entered is not defined in mfc_ctrl, and therefore, not available for use.
- `Prefix does not match barcode`: The prefix for the barcode does not match prefix-barcode records in mfc_ctrl.

Printing

You can control the printing of tags, pallet labels, or exception tags from various menus within the system, with a flexible choice of format for the output.

You have the choice of printing at the following times:

- When creating transactions
- When confirming transactions
- When transactions do not complete successfully (exceptions)
- When inventory is received into the warehouse

Some or all of these four fields can be set for:

- All warehouses (4.1.24)
- A specific warehouse (4.1.1)
- A work location group (4.3.9)
- An item (4.4.11)
- An individual step in an internal routing (4.2.5)
- A transaction type (4.7.1)

Note Inter-warehouse or inter-work location group transfers that are not associated with an internal routing take their printing control from the warehouse or work location group controlling the transaction.

For full details of how to complete the printer fields in these maintenance frames, refer to the online help. The following sections explain the most important fields.

Print Procedure Codes

Print procedure codes are defined per transaction type. The following codes are supported:

- AJ (Adjustment)
- IN (Inspection)
- PK (Picking)
- RC (Receipt)
- SH (Shortage)
- TF (Transfer)

Print Flavor Codes

These codes determine the format of the printed output. Two flavors are supported:

- A. Use the default print formats.
- B. Use a print template. You can create your own templates from ASCII files, described in the next section.

Print Templates

Templates are flat ASCII files that contain the layout of required printed output. Use Print Template Load (4.21.3) to load the template into the database.

A template can contain the following elements:

- All the escape and control sequences required by specific printer types for specific functions such as bar coding, line drawing, font selection, and character position.
- Literal text that should appear as output such as field labels, headings, and banner messages.
- Token labels that are replaced by actual data when output is generated.

Token labels supported are:

- All base transaction fields. For transaction creation, all transaction detail fields are available.
- Associated fields. These are fields that are not on the base transaction but are related to it, such as item description or storage location group description.
- User-definable fields, values determined in a local exit routine.

Processing Print Requests

The Print Mode field determines how printed output is processed:

- MANUAL results in print requests being queued up until you run Print Request Maintenance (4.21.7). You can run this online or in a batch; for example, once every hour.
- AUTO means that as soon as the print request is made, output is printed.

Other Printer Options

The following options are also available on the Printer menu:

- Print Template Inquiry (4.21.4). Select from a list of existing templates.
- Print Template Report (4.21.5). Print details of selected templates.
- User Printer Maintenance (4.21.9). Change the printer defined for you in a work location group. You can only change your own printer assignment, not that of another user.

Miscellaneous Utilities

Miscellaneous utilities (4.25) include the options described in Table 11.1.

Table 11.1
Miscellaneous Utilities

Utility	Menu	Description
Rebuild Invent Records	4.25.1	Lets you rebuild InventM records from location detail (ld_det) records. You should run this utility in a single-user mode. The system uses InventM records to store multi-item pallet data. Since multi-item pallets are unique to QAD Warehousing, other system functions may not create InventM records. Some warehouse locations may have ld_det records with the same ld_ref record. This indicates that the ld_det records belong to the same pallet, and therefore, should have InventM records so that the properties of multi-item pallets apply.
Recalculate Location Full %	4.25.2	Lets you run a report to recalculate the full percentage of locations. You can also update the database with the results.
Rebalance Expected In/Out Qty	4.25.3	Lets you recalculate balances if you think there are mistakes in the order quantities. You can also update the database with the results.
Container Creation Utility	4.25.4.	Lets you create a container level below a pre-shipper. See “Creating a Container Level Below a Pre-Shipper” on page 382.
Populate Order Whse Maint Tables	4.25.5	Use this option when first installing or installing a revised QAD Warehousing software. It takes all outstanding orders in the system and populates the appropriate database tables with updated information.
Incomplete Hanging Tasks Report	4.25.6	Lets you check for outstanding warehouse tasks that must be confirmed by warehouse staff.
Hanging lad_det Report (No Task)	4.25.7	Lets you check for detail allocations without any referenced tasks. QAD Warehousing has tasks that add fields to the location detail (lad_det) record that indicate expected quantities in and out of warehouse locations. If processing is disrupted or system errors occur, tasks may no longer exist in the system, but ld_det records may still indicate that they do. When this occurs, stock can remain at a location while the system awaits the transaction to move it. Use this utility to synchronize the lad_det records with actual tasks.
Persistent Procedure Inquiry	4.25.8	System administrators and developers can use this inquiry to check whether QAD Warehousing triggers have been fired for warehousing transactions.
External Device Session Inquiry	4.25.9	Lets you view data on RF user sessions.
Inspection Workfile Delete/Archive	4.25.10	Lets you delete stranded inspection records. The utility optionally deletes or archives obsolete inspection workfile records. The system creates the records during receipt processing when the Quality/Inspection module is active.

Utility	Menu	Description
Delete Planned Order Whse Tables	4.25.11	Lets you delete warehouse order management detail records for planned orders that are unused by the system. If you installed QAD Patch R1GP, run this utility immediately after you install the patch.
Delete Task List Workfile Record	4.25.12	Lets you delete inactive task list records. Previously, the system stored linked transaction-task or transaction-alternate task records in two tables. The system now creates records for both tasks and alternate tasks in a single table. You can use the utility to delete old records. Indicate Yes when prompted to continue to delete the records
Recalculate User Task Times	4.25.13	Lets you recalculate user task times in batch mode. The system recalculates the value of the UserD table, which stores the average task completion time by user. You must set the Active field in Labor Management Control to No to manually recalculate user task times with this utility; otherwise, the system recalculates the task times automatically.
Populate Item-Site Location	4.25.14	Lets you repopulate the Item-Site Maintenance (4.4.9) Location field with data from the removed Site Location field from the same program. If you installed QAD Patch R1K5, run this utility immediately after you install the patch. Indicate Yes when prompted to continue to repopulate the Location field with Site Location field values

Section 2

Using QAD Warehousing

This section includes information on using QAD Warehousing for day-to-day operations:

Introduction to Using Warehouse Features 199
Describes how Warehousing helps control inventory.

Processing Transactions 215
Describes how transactions are processed using examples from a typical warehouse layout.

Replenishment 259
Describes how Warehousing handles the replenishment process for a warehouse.

Bulk Picking 273
Defines bulk picking and explains how it works.

Batch Picking 287
Describes batch picking functionality.

Wave Planning 315
Defines wave planning and explains how it works.

Using Containers 373
Describes how containerization works.

Parcel Manifest, Container Move, and Truck Ship 389
Describes QAD Warehousing container move and truck ship features.

Cycle Counts and Physical Inventory 433
Explains how cycle counts work in relation to physical inventory.

Quality Inspection 445
Describes the necessary steps to set up a quality inspection.

Chapter 12

Introduction to Using Warehouse Features

The following topics describe how QAD Warehousing helps you to keep tight control of inventory:

Overview 200
Describes some of the functions of the inventory control features.

Inventory Transactions 200
Lists and describes types of inventory transactions.

Using the RF 203
Outlines basic RF functionality, including setup, login, options, and recovery.

Using .NET UI Browse Collections 210
Describes how you can use the NET UI visual tools to help manage transactions.

Overview

Using the inventory control features of QAD Warehousing, you can:

- Control all stock movements by a series of internal routings
- Specify storage requirements for inventory.
- Request stock movements.
- Monitor and authorize unplanned receipts and issues.
- Control and report on inventory by warehouse.

Transactions produce printed documents, such as task lists, movement tags, and pallet labels that tell warehouse staff what to do and provide confirmation and auditing of what has been done. The documents can have barcodes printed on them and can be used with RF devices.

The chapter discusses the following user topics:

- Inventory Transactions
- Using the RF
- Using .NET UI Browse Collections

Inventory Transactions

Table 12.1 shows the five types of inventory transaction processed by the system, and indicates where you can find detailed information about each one.

Table 12.1
Inventory Transactions

Type of Transaction	Transaction	For full details, refer to …
Receipts	Purchase order receipt	"Processing Receipts" on page 216
	Work order receipt	
	Unplanned receipt	
	Distributed order receipt	
Transfers	Single item transfer	"Processing Inventory Transfers" on page 241
	Multi-item transfer with pallet type	
	Clearing shortages in sales order or works orders	
	Inter-warehouse transfer	
	Stock optimization transfer	
Issues	Work order issue	"Processing Picking Transactions" on page 232
	Unplanned issue (inventory)	
	Unplanned issue (warehouse)	
	Bulk picking confirmation	
Returns		"Processing Shipments" on page 243

Viewing Transaction Data

You can use QAD Warehousing browses and browse collections in the .NET UI to help you monitor and view transaction data.

You can find the following browses by menu number and name:

- Transactions by Pre-Shipper Browse (4.9.9.1)

  Lets you review all picking transactions linked to a pre-shipper.
- Transactions by Wave Browse (4.9.9.2)

  Lets you review all picking and replenishment transactions linked to a wave.
- Put Away Transactions Browse (4.9.9.4)

  Lets you review all put-away and cross-docking transactions in the system.
- Picking Transactions Browse (4.9.9.5)

  Lets you review all picking transactions in the system.
- Transaction History Browse (4.9.9.13)

  Lets you review all transactions already processed in the system.

For more information on using QAD Warehousing browse collections, see “Using .NET UI Browse Collections” on page 210.

The browses provide all tools required in a single tool to manage warehouses transaction. You can filter and sort transactions by their most widely used attributes, such as site, order, item, user, and so on.

Also, you can use actions within the browses to perform other operations, such as exporting; see “Exporting Data” on page 212.

Certain actions have been linked to the mouse when you select a transaction number, so that you can easily execute the following programs for the selected transaction:

- Movement Confirmation and Inq (4.8.9)
- Transaction Detail Maintenance (4.8.15)
- Transaction Inquiry (4.9.1)
- Transaction Maintenance (4.8.13)
- Transaction Priority Boost (4.11.7)

Processing Transactions

Warehouse transactions are the key to the QAD Warehousing system. Each transaction is an instruction, or task, for a user to take specified inventory from a specified location (the source) and deposit it in the location required or previously specified (the destination). Special transactions can be created that are from and to the same location. Generally, these are to perform some kind of inventory adjustment such as a cycle count.

Transactions are created in many different ways, but generally result from:

- A request to pick inventory to satisfy an order requirement such as a sales order or work order. Picking transactions can also result from inventory management functions such as replenishment, repetitive, unplanned issues, or inter-warehouse transfers.

- The receipt of inventory into the warehouse that must be put away. Usually this is as a result of a purchase order receipt but can also be from manufacturing, distribution orders, unplanned receipts, or inter-warehouse transfers.
- Inventory management such as stock transfers or cycle counts.

Every step in the movement of inventory is recorded by a transaction, from the moment it is received at a receiving point through put-away, storage, selection for requirement, and movement to an issue point.

All movements of inventory require that a transaction is created, indicating:

- The source and destination locations of the movement
- The inventory that requires moving
- The quantity that is required and multiple attributes that determine how the movement is to be carried out

Transactions are created with a status of OPEN, indicating that the transaction, or task, is yet to be carried out. Once the task is complete, the transaction is closed and the record is deleted. A copy is made, creating a transaction history record. The transaction is closed by the action of confirming that the task is complete. This can be done separately from the creation of the two-phase transaction or automatically at the time of single-phase creation.

In general, all inventory is moved according to information that you enter during your warehouse setup.

Although setup is time-consuming, the actual process of managing inventory is largely automated. Each inventory movement that you request is processed according to the internal routing and associated fields for the transaction type.

See Section 1, “Setting Up QAD Warehousing,” beginning on page 1.

Internal Routings and Transaction Properties

When you define an internal routing, you:

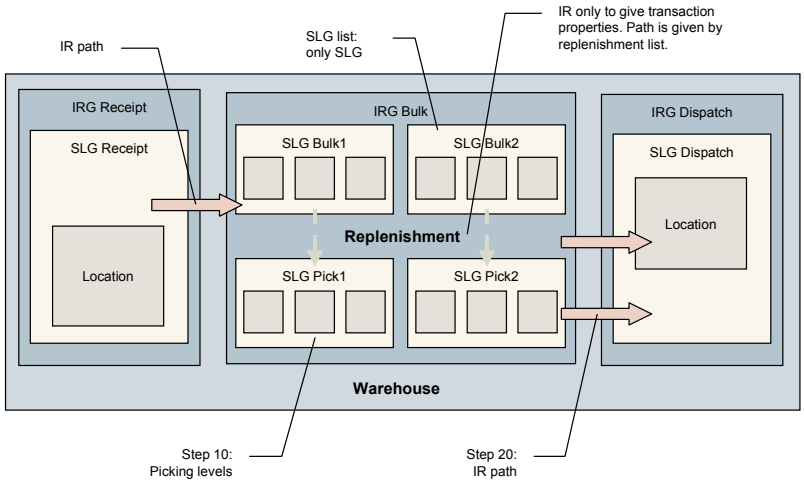
- Define the movement of inventory between internal routing groups; for example, from IRG receipt to IRG bulk.
- Set the properties for the transactions that use this internal routing—creating the transaction, confirming the transaction, and printing the transaction/confirmation.

You only need to define a sequence of movements if the transaction involves moving inventory between IRGs, such as receipts or issues. If the inventory is being moved within an IRG such as a replenishment, you set up the internal routing only in order to define the transaction properties. The path for the inventory comes from the replenishment list and the known location/SLG.

When you define an IR for a movement between IRGs, the transaction properties do not come from step 10, but from step 20.

Figure 12.1 summarizes the relation between internal routings and transaction properties.

Fig. 12.1
Internal Routings and Transactions

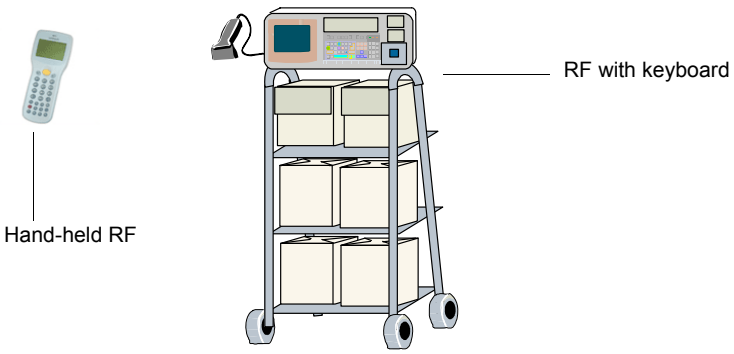


Using the RF

QAD Warehousing supports the use of Radio Frequency Terminals (RFs), also known as Radio Data Terminals (RDTs). These are small terminals that communicate with the host system by radio waves. The terminals are small enough to be hand-carried, mounted on a fork-lift, or mounted on a picking cart; see Figure 12.2.

RFs display open transactions for a work location group as the transactions are created. Employees can select the next transaction, or be informed of the next transaction in the task queue based on their location and the priorities of the transactions.

Fig. 12.2
RF on a Picking Cart



As a transaction is performed, you can view its progress and status. When it is completed, stock is updated. This gives you an accurate picture of the stock, without any delays for confirmation of the stock movement within a warehouse.

RF Menus

The following subsections describe the RF menu options.

Work Menu

The Work menu contains options for accessing and confirming tasks, RF transfer, location audits, Kanban scans, activating engines, selecting pre-shipper tasks, PO receipts, item descriptions, and online SO picking.

Table 12.2
Work Menu

Menu	Menu Label	Description or Reference to Description
1.1	Next Task	See “Performing RF Tasks” on page 172.
1.2	Select Task	See “Performing RF Tasks” on page 172.
1.3	Transfer	See “On-the-Fly Transfer” on page 243.
1.4	Location Audit	See “Location Audit” on page 437.
1.5	Kanban Scan	See “RF Real-Time Replenishment Request” on page 265.
1.6	Eng Activation	See “Engine Processing” on page 137.
1.7	Preship Sel Task	See “Selecting Tasks on the RF” on page 172.
1.8	Receipts	See “Processing Receipts” on page 216.
1.9	Shipments	“Processing Shipments” on page 243.
1.10	On-Line SO Pick	See “Selecting Tasks on the RF” on page 172.
1.11	Tag Count Entry	See “Physical Inventory” on page 438.

Printing Menu

The Printing menu contains options for changing printer options and requesting reprints of tags, IDs, and so on. You can only change your printers from this option if they have been defined at the user/work location group level. You cannot change the printers for another user or for the entire work location group.

Table 12.3
RF Printing Menu

Menu	Menu Label	Description or Reference to Description
2.1	Change Printers	See “Printing” on page 193.
2.2	Reprint	See “Printing” on page 193.

Picking/Container Menu

The Picking/Container Menu contains sales order only picking, all order picking, container build, container move, ship truck, and pallet explosion options.

Table 12.4
RF Picking/Container Menu

Menu	Menu Label	Description or Reference to Description
3.1	BP Pick SO/DO	See Chapter 17, “Batch Picking,” on page 287.
3.2	BP Pick All	See Chapter 17, “Batch Picking,” on page 287

Menu	Menu Label	Description or Reference to Description
3.3	Container Build	See Chapter 19, “Using Containers,” on page 373.
3.4	Container Move	See Chapter 19, “Using Containers,” on page 373.
3.5	Ship Truck	See Chapter 20, “Parcel Manifest, Container Move, and Truck Ship,” on page 389.
3.6	Pallet Explosion	See “Exploding Pallets” on page 384.
3.7	Move Item	See “Moving Items to Another Container” on page 381.
3.8	Print Paperwork	See Chapter 19, Chapter 20, “Parcel Manifest, Container Move, and Truck Ship,” on page 389.
3.9	Cancel Shipment	See “Canceling a Shipment” on page 430.

Inspection Menu

The Inspection Menu provides one option that lets you maintain and enter sample details during inspection, indicate pass or fail of inspection, and indicate if failed items should be returned.

See Chapter 23, “Quality Inspection,” on page 445.

Inquiry Menu

RF users can access the RF Inquiries (5) option to view several inquiries, including the following:

Table 12.5
RF Inquiry Programs

Menu Number	Inquiry	Description
5.1	Item Inv Inq	Provides inventory data for a single, scanned item in location(s), including the item, location, quantity, reference, expected in/out quantities, and item description. If more data displays than can fit in the RF screen, users can use the arrow keys to scroll through the list. Two screens are presented, with the second screen displaying a list of locations in the warehousing having inventory (quantity) for this item.
5.2	Loc Inv Inq	Provides inventory data for one scanned location. User can select an item present in this location and see details of each Lot/Ref, and expected in/out movements.
5.3	Ref Inv Inq	Provides inventory of a single, scanned reference. System presents a list of items (option 1) or locations (option 2) if the reference is multi-item or multi-location. User has ability to scroll through the items (option 1) or through the locations (option 2) and view details of the reference, including expected in/out movements. If there is more than one reference for the item, the user can scroll through different locations using arrow keys.
5.4	Lot Inv Inq	Provides inventory data of a single scanned lot ID. System presents a list of items (option 1) or locations (option 2) if this lot is multi-item or multi-location. User has ability to scroll through the items (option 1) or through the locations (option 2) and see the details of this Lot, including expected in/out movements. If there is more than one lot for the item, users can scroll through different locations using arrow keys.
5.5	Daily Prod	Lets the user see his or her own daily productivity, including completed tasks, picks done, time by task, last location worked, current location working, and productivity time total.
5.6	Preshipper Inq	For a selected Pre-Shipper (scanned by user), the system provides the remaining opened tasks and information for each pending task.
5.7	Item Master Inq	Provides basic date from Item Master Maintenance on the item scanned.

Menu Number	Inquiry	Description
5.8	Loc Master Inq	Provides data about the location when RF users scan a location code, including the location ID, SLG, WLG, storage type, percentage full, and whether the location is functional or not.
5.9	Sto Loc Gp Inq	Provides data about the location when RF users scan an SLG, including the settings for these SLG-related fields: Allow Issues, Allow Receipts, Splittable, Pickable, Allow Incoming Receipt, Allow Outgoing Receipts, and Picking Level.
5.10	Address Inq	Provide address data when RF users scan an address bar code, including the address, type, name, city, state, post, country and priority.

RF Receipt and Shipping

For information on RF receipt and shipment processing, refer to “Processing Transactions” on page 215. The Processing Transaction chapter discusses shipping without a pre-shipper. For information on shipping with a pre-shipper, see “Truck Ship” on page 402.

RF Read Messages

Warehouse staff can use the RF device to receive messages sent to warehouse staff from QAD Warehousing users; refer to “Messages and Alerts” on page 459.

RF Basic Setup

This section describes the setup required before you can use an RF. RF setup varies depending on the tasks warehouse staff intend to complete with the RF; however, some basic setup is required for every RF, regardless of the specific warehouse tasks performed.

You must set the following for every RF device:

- Startup parameters
- System codes
- System procedure codes
- System flavors

Startup Parameters

You can optionally set startup parameters for the RF. The system includes three parameters that have defaults; however, you can change the defaults. Table 12.6 describes the parameters.

Table 12.6
RF Startup Parameters

Parameter	Description	Value to Enter	Default
aimsyscode	Informs the startup procedure that this is not a regular full-screen session but an RF device session.	RF	RF If nothing is entered, the system assumes RF.
aimshortmsg	Sets error and warning messages to 20 characters maximum, which displays on the RF correctly. Normal screen 80-character messages are unreadable on the RF.	Yes	True If nothing is entered, the system assumes true.
aimselecttype	Determines the screen type for the RF Select Task function work menu: • Non-blank specifies a transaction prompt type of screen. • b or blank specifies a scrolling window type of screen.	b	b If nothing is entered, the system assumes b.

To set the parameters, use the -param function with the startup script with the parameter and the value; for example:

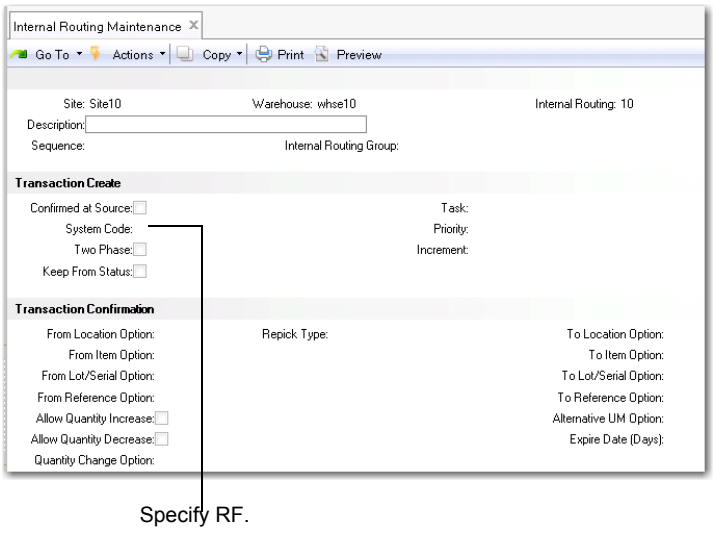
```
-param aimshortmsg=false
```

Setting System Codes

Use the System Code field in warehouse programs to specify that created transactions are confirmed in the RF. Specify RF in the field to create transactions confirmed in RF screens.

When you specify the System Code in Warehouse Maintenance (4.1.1), the value defaults to the same-named field in Internal Routing Maintenance (4.2.5), shown in Figure 12.3; however, you must specify RF for every other occurrence of the System Code field.

Fig. 12.3
Internal Routing Maintenance (4.2.5), System Code Field



Setting System Procedure Codes

You set system procedure codes in Task Maintenance (4.11.1.1). The procedure codes along with flavor codes determine which program runs when RF users select the Next Task or Select Task menu option.

See “Task Maintenance” on page 164.

Example The RF user is assigned a put-away task with an RC procedure code and flavor b. This specifies only prompt for pallets and not for items/lots. The system uses the `whrfRCB.p` program for the next task. If the RF user’s next task is a pick with procedure code PK and flavor b, the system uses the `whrfPKB.p` program.

Enter one of the following codes in the Procedure Code field in Task Maintenance (4.11.1.1):

AJ: This option is for cycle counting adjustments.

PK: This option displays the issue order number. It also defaults the From Location field to blank and the To Location field to the expected destination.

RC: This option displays the receipt order number. It defaults the From Location field to the expected source and defaults the To Location field to blank.

TF: This option does not display any order information. It defaults both the From Location and To Location fields to blank.

Setting System Flavors

The system uses flavor codes to set different RF screen layouts. For example, a fork-lift operator may use an RF layout to pick several pallets at once, while a warehouse picker may use an RF layout to pick just one pallet at a time. You specify these codes in the Flavor field in Work Location Group Maintenance (4.3.9):

b: Selection by reference

c: Multi-bin pickup

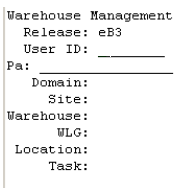
d: Dynamic sizing

See “Work Location Group Maintenance” on page 64.

RF Login

After login on the RF, the system presents the RF login screen.

Fig. 12.4
RF Login



Use the following procedure to log in to the RF:

1. Enter your existing user ID and password as specified in User Maintenance (36.3.1) in the UserId and PW fields.
2. Enter the site in which you are working.
3. Enter the warehouse in which you are working in the Whse field.
4. Optionally enter the work location group (WLG) in the WLocGP field. If you leave this field blank, tasks are allocated to you from anywhere in the warehouse.
5. Optionally enter your current location. You can change the current location at any time by returning to this login screen; however, changing locations is only effective if travel sequences are in effect, so the system can allocate the task that is closest to your current location.
6. Optionally enter your task. If you leave this field blank, the system allocates any tasks available in the warehouse and, if entered, the work location group.

The system validates the information you entered and presents the RF main menu.

Function Key Options

You can use function keys on the RF while you perform certain tasks. Table 12.7 describe the function keys.

Table 12.7
RF Function Keys

Function Key	Description	Task
F2	Display order comments for sales and distribution orders on the RF screen. Press F2 on any field in the picking screen to view the order line comments.	Picking
F3	Display the order picking status. The system displays pick information per order, including the item number, the quantity already picked, and the quantity remaining to pick.	Picking
F3	Fails the task. The system creates a recount task.	Overpick replenishment and put-away
F5	Skip a task and move it to the end of the task queue. This is useful, for example, if a warehouse aisle become blocked.	Any task
F6	If all tasks are for the same destination, the system displays the Drop All prompt, letting you drop all or some boxes completed during picking.	Picking
F6	Lets staff repick missing items.	Overpick replenishment and put-away

Function Key	Description	Task
F7	Move contents from one box to another box during picking. This helps staff balance the content of different boxes based on the volume of the different items. The system prompts to enter a new container ID.	Picking
F11	Launches the read messages function. Performs the same action as the RF Read Messages option (6) and reads messages; however, warehouse staff can launch the function from any program in the RF device by pressing F11 and read messages.	Anywhere

Note Some UNIX terminals, LINUX terminals, and RF devices do not map the F5 key. Typically, terminal users can use the emulation software's key.

In addition to using function keys when picking, sales order header comments display in the RF device even when RF users select a pre-shipper. If the pre-shipper has multiple orders, the RF displays comments for the first order on the pre-shipper.

Note Sales order header comments display only if Print Packing List Comments is set to Yes in Sales Order Maintenance (7.1.1).

RF Recovery

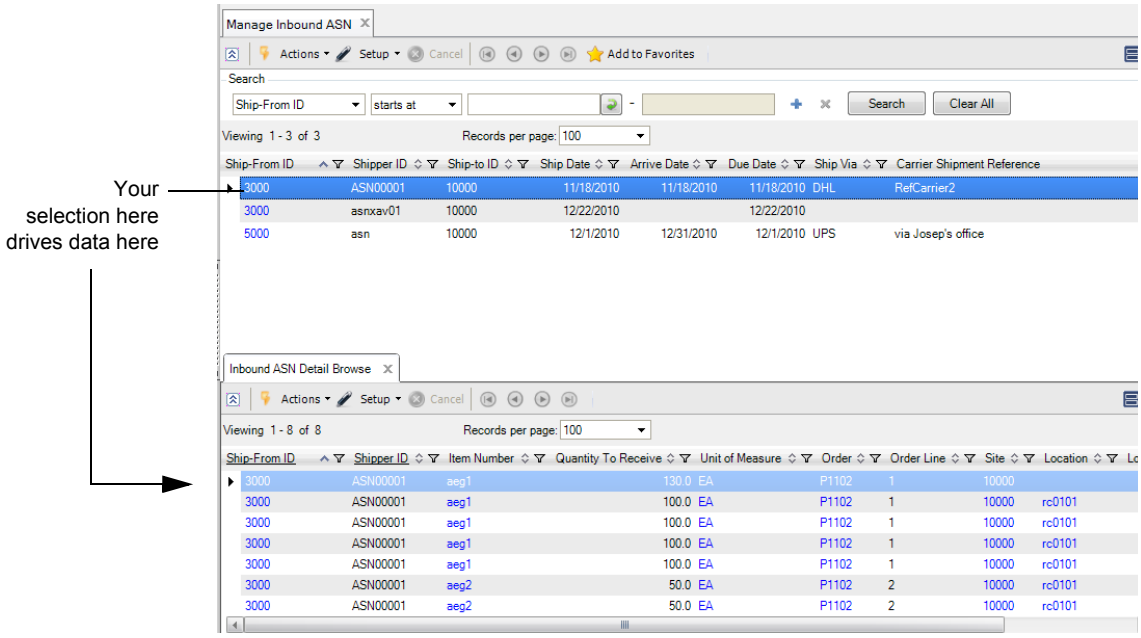
Warehouse staff who were batch picking from an RF device can automatically resume picking when they are back online. The system skips the order-selection frame on the RF and redisplays the picking screen that displayed when the system went offline. The recovery functionality ensures that tasks previously selected but not picked are available for picking. Warehouse staff can resume picking and dropping off all or some boxes as usual.

Using .NET UI Browse Collections

In a browse collection, typically data in the top portion drives the data in supporting browses, or the elements of the main browse collection. So, for instance, if you are using the Manage Inbound ASN menu collection, which embeds the Inbound ASN Detail Browse, the selection you make in the top portion within Manage Inbound ASN drives the data you see in the bottom portion within Inbound ASN Detail browse.

When data displays in supporting element browses, an arrow displays in the row of data that relates to your selection in the main browse. This helps you trace back to the record for which you are reviewing data.

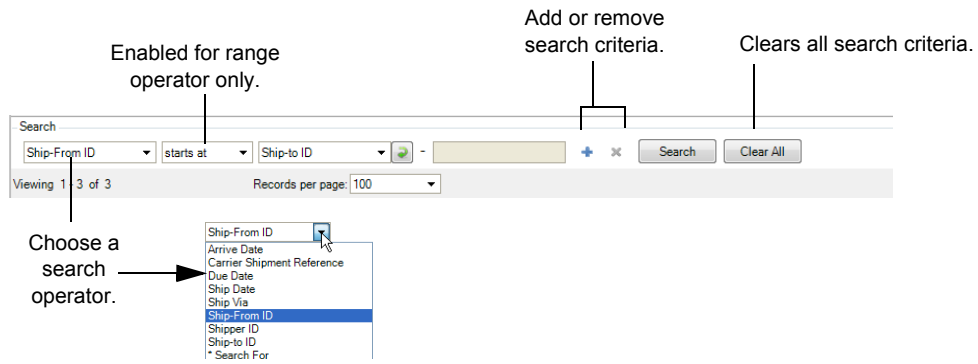
Fig. 12.5
Browse Collection Relationship



Search Criteria

You use the fields in the Search Panel at the top of the menu collection to specify criteria for the records you want to display in the main browse collection. Use the fields to build complex data retrievals to focus on the specific records you want to review.

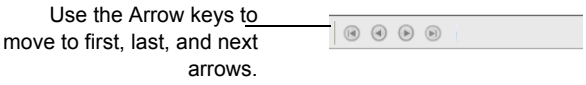
Fig. 12.6
Search Criteria



You can search for items within the search box on the heading. The search box searches across all fields in all collections for any term that you put in the search box in any order. You can search by different criteria, depending upon the QAD Warehousing browse collection you use.

Within a supporting browse, you can use the arrow keys to go to first, last, and next pages of records:

Fig. 12.7
Moving through Records

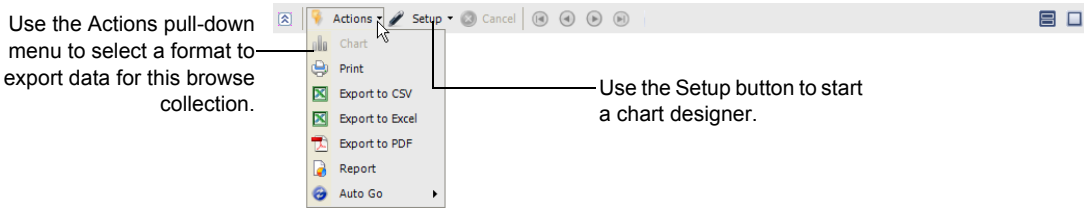


Exporting Data

For some menu collections, such as Work Order Operations, you can export data in addition to viewing data. You can click the Actions button, then use the pull-down menu to export to a spreadsheet, PDF, or other forms of data.

You can also select the Setup button to activate the chart designer. Doing so lets you build spreadsheet-type charts (bar charts, pie charts, and so on) for the data that displays.

Fig. 12.8
Exporting Data



List of Menu Collections, Browse Collections, and Their Elements

The following table lists the menu collections, browse collections, the elements within the collections, and the fields for each. To find the fields within the element browses, find the browse name in the Browse, Browse Collection, or Menu Collection Name column.

Table 12.8
Warehousing Browse Collections

Browse, Browse Collection, or Menu Collection Name	Elements	Fields Displayed
Inbound ASN Detail Browse		Ship-from, shipper ID, item number, quantity to receive, UM, order number and line, site, location, lot/serial, reference
Inbound Order Warehouse Browse		Site, warehouse, address, description, type, order, line, item number, open quantity, UM, carrier, due date
Inventory Detail by SLG		Item number, site, warehouse, SLG, location, QOH, UM, lot/serial, reference, alternate UM, quantity expected in/out
Manage Inbound ASN	Inbound ASN Detail Browse	Ship-from/to, shipper ID, ship date, arrive date, due date, ship via, carrier shipment reference

Table 12.8 — *Warehousing Browse Collections* (Page 1 of 3)

Browse, Browse Collection, or Menu Collection Name	Elements	Fields Displayed
Manage Work Centers	Work Order Operations Put Away Transactions Inventory Detail by SLG Browse Picking Transactions Browse	Site, warehouse, work center, machine, description, department, queue time, wait time, setup crew, run crew, work order status, quantity completed/ordered/rejected, UM, order date, due date, release date
Manage Work Orders	Work Order Bill Browse Put Away Transactions Browse Picking Transactions Browse Inventory Detail by SLG Browse	Site, warehouse, type, work order and ID, item number, type, production line
Put Away Transactions Browse		Site, warehouse, transaction number, transaction type, task, create date/time, priority, current user ID, hard assignment, status, item number, quantity expected, UM, from-/to-location, To refererence/lot, type, order, line ID.
Picking Transactions Browse		Site, warehouse, transaction number, transaction type, create date/time, priority, current user ID, hard assignment, status, item number, quantity expected, UM, to-/from-location, from reference, from lot/serial, type, order, order line
Warehousing Manufacturing	Manage Work Orders • Work Order Bill Browse • Put Away Transactions Browse • Picking Transactions Browse • Inventory Detail by SLG Browse Manage Work Centers • Work Order Operations • Put Away Transactions Browse • Inventory Detail by SLG Browse	.
Warehousing Receipts	Inbound Order Warehouse Browse Manage Inbound ASN • Inbound ASN Detail Browse Manage Inspection Samples • Inventory Inspection Detail Browse • Inventory Shortage Detail Browse Put Away Transactions Browse	

Table 12.8 — *Warehousing Browse Collections* (Page 2 of 3)

Browse, Browse Collection, or Menu Collection Name	Elements	Fields Displayed
Work Order Bill Browse		Type, work order/ID, location, item number, status, line, reference, lot/serial, quantity required/allocated/picked, UM, issue date
Work Order Operations		Work center, type, work order ID, item number, operation, machine, quantity ordered, quantity WIP, quantity completed, quantity rejected, UM

Table 12.8 — *Warehousing Browse Collections* (Page 3 of 3)

Defining Other Browse Collections

You can define other collections of related browse and maintenance programs within the .NET UI that let you browse and maintain related item, site, schedule, and order data that you can then save under Favorites. Use Browse Collection Maintenance in .NET UI to do this.

Chapter 13

Processing Transactions

The following topics describe how transactions are processed using examples based on a typical warehouse layout. They include the following major sections:

Processing Receipts ***216***
Discusses how receipts are processed, gives general information about receipts, and describes types of receipts.

Processing Picking Transactions ***232***
Details how the system handles transactions with picking algorithms, including examples.

Processing Inventory Transfers ***241***
Discusses how Warehousing processes inventory transfers, including details on different types of transfer transactions.

Processing Shipments ***243***
Discusses how shipments are processed and provides instructions to ship using the RF device.

Processing Receipts

The key to processing receipts is the internal routing. The flexibility of the internal routing function means that any received inventory can move through any combination of locations before being put away.

All receipts work in the same way:

- You create a transaction; for example, unplanned receipt.
- The warehouse system looks for the internal routing associated with the item, transaction type, warehouse, or address.
- The system runs the algorithms associated with the transaction type; for example, put-away.
- The receipt location can be a final location, a location in the receipt area, or a warehouse.
- Confirmations can be printed or sent to the RF. The setup fields for this can be defined for the warehouse, the item, or the transaction type.

This section provides a general overview of receipts, including the following topics:

- General Receipt Information
- RF Inventory Receipt
- Cross-Docking (using items received to fill backorders)
- Multiple UM and Pallet Receipt
- Multi-Lot/Item Pallet Receipt
- Consignment Receipt
- Location Forecasts

See Chapter 3, “Defining Internal Routings,” for information on internal routing and internal routing groups.

General Receipt Information

This section covers the following topics:

- Discusses how transactions are confirmed by either two-phase or single-phase method
- Provides an example of a PO receipt
- Discusses unplanned receipts and provides an example of an unplanned receipt
- Discusses distribution order receipts

Two-Phase or Single-Phase

With all transactions, you can choose how the transaction is confirmed:

- Automatically, when you create the transaction. This is called single-phase.
- Manually, after you create the transaction and after you have had time to check the inventory movement. This is called two-phase.

You can define whether a transaction is single-phase or two-phase as follows:

- Warehouse Maintenance (4.1.1). This sets the default for transactions for the warehouse.See page 22.

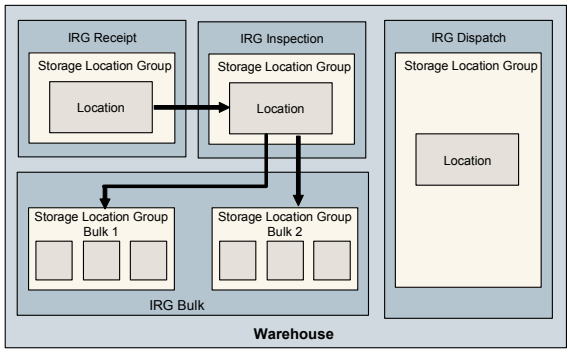
- Internal Routing Maintenance (4.2.5). The Two-Phase field enables you to specify whether transactions moved under a particular internal routing should be single-phase or two-phase. See page 48.

You can check that the inventory has been moved to the location using the Inventory Detail Inquiry (4.9.13).

Example: Purchase Order Receipts

Suppose that you want to make a purchase order receipt of 1000 EA of component A. Because of known problems with a particular supplier, you want to ensure that any receipts of component A always go through the inspection area before they are put away. In addition, you want to allow the receipt to be stored in two storage location groups, Bulk1 and Bulk2. Figure 13.1 illustrates this scenario.

Fig. 13.1
Sample Purchase Order Receipt



The setup would be exactly the same for this transaction as for an unplanned receipt, except that the internal routing would contain an extra step:

- Internal routing RCT-PO:
  - Sequence 10: Receipt
  - Sequence 20: Inspect
  - Sequence 30: Bulk

Also, you would need to:

- Define a storage location group list using Storage Location Group Maintenance (4.3.5).
- Link the storage location group to the item using Item-Warehouse Maintenance (4.4.11).

You would then:

1. Create a purchase order using Purchase Order Maintenance (5.7) for 1000 of component A.
2. Create a receipt of the purchase order using Purchase Order Receipts (5.13.1).

The system then uses the storage location group list associated with the item to look for a location for the put-away. The put-away would occur as follows:

1 Look at the first SLG on the list. If the entire receipt can be put in Bulk1, do the put-away and end the transaction.

2 If Bulk1 has no suitable locations, look in Bulk2. If the entire receipt can be put in Bulk2, do the put-away and end the transaction.

3 If the entire receipt cannot go into one location in Bulk1 or Bulk2 but you have space across several locations, divide the receipt between the locations.

4 If no locations are available, a message displays and lets you select another location.

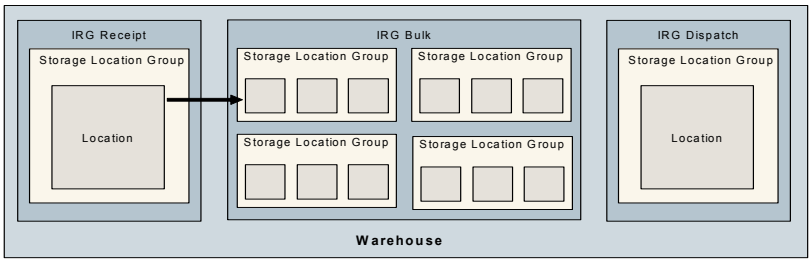
Unplanned Receipt

Set Allow Blind Receipt in External Device Setup (4.23.22) to specify an unplanned, or *blind,* receipt. Unplanned receipts let you receive inventory without an order. The system uses the Address field to determine the type of receipt. The value of the field determines whether the receipt is for a purchase, distribution, or sales order. When the address field is blank and you set Allow Blind Receipt to Yes, staff can perform the unplanned receipt.

In the RF Receipt function (1.8), the address field identifies a supplier, a customer, a site, and so on. When more than one address type exists with the same ID, the system prompts staff to confirm the type of receipt. If you leave the Address field blank, you can perform an unplanned receipt.

Example Suppose you want to make an unplanned receipt of 200 EA of component A. Figure 13.2 shows the simplest route for this receipt—that is, from the Receipt area straight into Bulk.

Fig. 13.2
Sample Receipt



You would need to define the following:

1 Define the item component A using Item Master Maintenance (1.4.1). Provide a default location for the component—location, warehouse, or warehouse master list.

2 Link component A to a storage location group in IRG Bulk. Alternatively, link component A to a storage location group list. An SLG list is a list of SLGs that can be considered for storing items. You define an SLG using Storage Location Group Maintenance and then link an item to an SLG or SLG list using Item-Warehouse Maintenance. See Chapter 4, “Defining Location Groups,” on page 55.

3 Define an internal routing for transaction type RCT-UNP using Internal Routing Maintenance (4.2.5) to move the inventory from receipt to bulk. The internal routing would consist of two steps; for example:

- Step 10: Receipt
- Step 20: Bulk

See “Internal Routing Maintenance” on page 48.

4 Assign the internal routing RCT-UNP to the transaction type RCT-UNP using Internal Routing Assignment Maintenance (4.2.9). At this point you could also specify an item, which would mean that all unplanned receipts of this item would in future follow the same internal routing. If you leave the Item field blank, this internal routing would be used for all items arriving as unplanned receipts. See “Internal Routing Assignment Maintenance” on page 52.

5 Assign the location-find and put-away algorithms to the transaction type RCT-UNP using Algorithm Assignment Maintenance (4.6.9). See “Algorithm Assignment” on page 108.

You would then receive 200 EA for component A using Receipts–Unplanned (3.9). Because of the information that you have entered linking the item and locations with an internal routing, the transaction is processed automatically and the inventory can be moved to one of the indicated storage locations.

Distribution Order Receipts

Receipt processing for distribution orders is through the same RF receipt menu option as for any other order receipt. When a new intersite request is created, the default receipt location is the location associated with the item at the receiving site in Item Master Maintenance (1.4.1). The system verifies if the default value is a master list, warehouse, or a location that belongs to the receiving site. If this is not true, the system uses the value specified for Site Location in Warehouse Item-Site Maintenance (4.4.9). This lets you set up warehouse-specific default receipt locations for distribution orders at each site.

When you receive orders with Distribution Order Receipt (12.15.20), the system automatically creates references for items set up as being received in a different unit of measure. This only occurs when the inventory in transit from the supplying site does not contain reference numbers.

RF Inventory Receipt

Using the RF device, warehouse staff can perform a variety of receipts, including:

- Distribution order receipts
- Sales order returns
- Purchase order receipts
- ASN receipts
- Unplanned receipts
- MO returns
- RMA receipts

The RF Receipt (1.8) option provides the following features for warehouse staff:

- Receive one or multiple pallets, with or without pallet IDs.When scanning, if a pallet ID is blank, the system prompts to generate a pallet ID.
- Perform unplanned receipts.
- Recover from the receipt processing when the system fails or halts unexpectedly.
- Several RF users can unload a truck simultaneously, except for ASN receipts, when only one RF user can perform the receipt and reconciliation process.

Since you scan for receipts by pallets and items and this can be several for your warehouse, warehouse staff can stop the receipt process by pressing the Cancel function (F4) at any time. When staff log onto the RF device again and enter the receipt function, the system returns them to the point at which they cancelled the receipt function; so, if warehouse staff previously scanned 200 pallets, for example, there is no need to rescan those pallets.

Use the following procedure to receive inventory using the RF device.

1 Log onto the RF, then enter the RF Receipt function (1.8).

2 Enter or scan the location where you are receiving inventory.

3 Enter a customer, supplier, or site, depending on the order type in the Address field or leave blank for a unplanned receipts.

Note The system prompts you to enter a supplier, customer, or site if the order type is not clear; for example, when the customer or supplier have the same code. See Figure 13.3.

4 Optionally, scan or enter the packing slip/ASN in the PA field.

If you scan a packing slip or ASN, the system prompts you to receive without scanning. If you respond with Yes, the system processes the receipt with items from the ASN. If you respond with No, scan the pallets.

Once you finish scanning, the system prompts you to display (print) discrepancies between the inventory listed on the ASN and the received inventory you scanned. Select Yes to display the differences on the RF devices.

5 Enter the alternate UM of the pallet you are receiving.

The UM is the QAD Warehousing UM as defined in Alternate Unit of Measure Maint (4.5.1). If you leave UM blank, the system does not generate a pallet and you can receive without pallets.

6 Scan or enter a pallet.

Note If you do not enter a pallet, the system prompts you to generate one.

7 Scan the items that belong to the pallet. This can be single items per pallet or many different items per pallet.

8 If WIP Lot is used, enter the Lot number in the Lot field.

9 Enter the order and line number.

10 Enter the quantity.

Note You can enter a 0 (zero) to delete items/pallets from the receipt.

11 Continue scanning items and entering quantities for that pallet.

12 Press F4 to indicate the completion of pallet scanning. The system lets you scan another pallet.

13 Once done scanning all pallets for a receipt, press F4 to launch the receipt process.

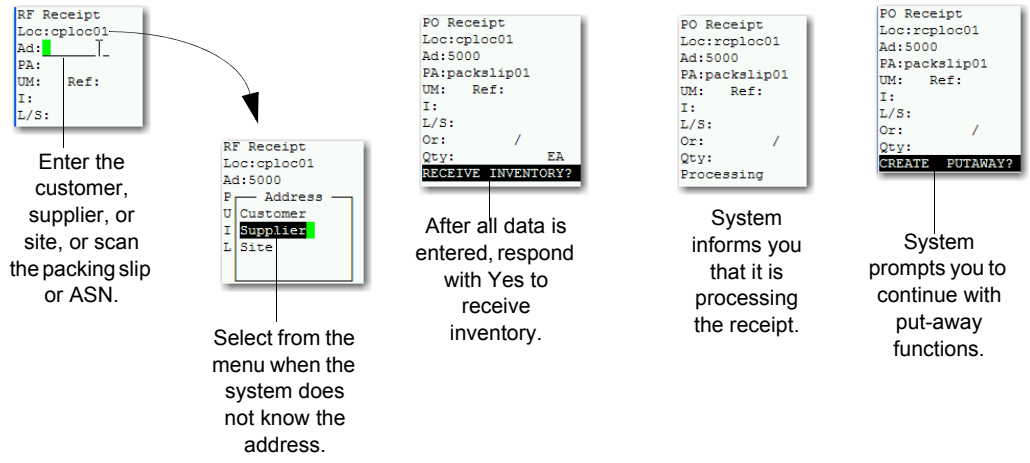
The system prompts to receive the inventory. If you answer No, you can either delete all information you have scanned or leave it in the system for later processing. When you resume RF receipt processing, the system lets you complete your data scanning and launches the receipt process again.

Once the inventory has been received, the system prompts to generate the put-away tasks. If you answer No, the system does not generate put-away tasks.

Go to the RF Select Task (1.2) or Next Task (1.3) option to confirm system-created put-away tasks.

You can check the receipt processing using Transaction Detail Inquiry (3.21.1).

Fig. 13.3
RF Receipt



Cross-Docking

In situations where insufficient stock prevents the complete filling of an order, the system keeps track of the order shortage quantities, item by item. To help you to fill the back orders with a minimum of inventory movements, you can use shortage clearance algorithms. When you link these algorithms to inventory receipt transactions, the system automatically checks to see if the received stock can be used to fill back orders. The inventory is moved from receipt to dispatch, being stored in between. This type of movement is also known as *cross-docking*.

By linking the appropriate internal routings to the transaction types, you can route the relevant stock directly from the receipt dock to the shipping dock, thus removing the need for additional put-away and picking activities. The remaining received stock that is not required for shortage clearance is put away using the normal routines.

A *repick* is new, typically shortened picking that staff perform when inventory is missing and they want to fulfill the order quantity by picking the item in another location. When staff repick for cross-docking, the system looks for any open pre-shipper and adds lines to it. This only works if the pre-shipper was not converted to a shipper; if converted, the system adds the lines on a new pre-shipper.

Defining Shortages

You create a shortage transaction type using Transaction Type Maintenance (4.7.1). You link the transaction in Internal Routing Assignment (4.2.9). Set the Clear Shortages field to Yes in Internal Routing Assignment. Then, you assign the shortage clearance algorithms to the appropriate transaction types using Algorithm Assignment Maintenance (4.6.9).

See Chapter 8, “Algorithms,” on page 105.

You can specify cross-docking details for the shortage clearance using the following four shortage fields defined for distribution order (SHRT-DO), sales order (SHRT-SO), and work order (SHRT-WO) transactions in Transaction Type Maintenance:

Shortage Definition. Specify what constitutes a shortage.

Shortage Quantity Definition. Specify how the system calculates a shortage quantity.

Shortage Action. Specify the action to take for a shortage.

Shortage Window. Specify a window of time to fulfill the order in terms of days.

Multiple UM and Pallet Receipt

Standard Receipts

All standard receipt functions let users receive inventory items in either their normal stocking unit of measure (UM) or in a different UM. When items are received in a UM different than their stocking UM, the system converts the quantity of items received in the receipt UM to the corresponding quantity of items in the stocking UM.

The conversion is done on the basis of:

- The unit of measure conversion factor that applies to the item being received
- Its stocking unit of measure
- The receipt unit of measure entered by the user

However, this unit of measure factor only acts as a default that you can modify.

Example In your system, a UM conversion of 1 PL = 12 EA is defined. You record a receipt of 2 PL of an item that is stocked in EA but override the default conversion factor of 12 with the value 13. In this case, the system records the receipt of 26 EA (2 PL) in inventory when the transaction is completed.

Receipt functions also provide multi-entry functionality. Setting this field to No during a single receipt transaction of a particular item means that the entire receipt quantity is received into the same site and location with the same lot or serial number and reference. Setting it to Yes, on the other hand, means that when a single receipt of a quantity of an item is made, that quantity can be divided between different references, lot or serial numbers, locations or even sites.

Example The 2 PL = 26 EA of the item in the previous example could be received in a single transaction split between two sites each with two locations, where each location was split between two lot numbers and each lot number was split between two references. Doing this subdivides the single receipt into 16 separate multi-entry quantities. The system stores information on each of these separately.

Receipt transactions can involve both a receipt UM different than the normal stocking UM and multi-entry. When this happens, all receipt quantities entered on the multi-entry frame are in the receipt UM (PL in the example).

Warehouse Receipts

In all receipt transactions in a warehouse, most standard receipt functionality is still present. In addition to this, you can receive stock in the default item UM, alternate palletized receipt UMs, or alternate non-palletized UMs. Additionally, you can enter different alternate receipt UMs on different receipt detail lines when using purchase order receipts provided that none of the alternate receipt UMs used in multi-entry is palletized.

Note When receiving in a UM different than the stocking UM of an item, you can only override the default UM conversion when the receipt UM is sized by reference (palletized) or sized by blank.

In the warehouse system, a fundamental difference in the interpretation of UM conversions occurs when a receipt of a quantity of an item is made in a palletized UM. In this case, regardless of whether the palletized receipt UM used is the stocking UM of the item, one record is created automatically for each pallet being received. Therefore, if PL is a palletized UM and a receipt quantity of 2 PL is entered, two records are created. Each record created is assigned a unique reference number that identifies a particular pallet, and it holds all the receipt details relating to that pallet.

The difference in interpretation comes about because when these records are shown in purchase order receipts, the quantity field now denotes the number of eaches in a particular pallet reference, rather than a quantity in the receipt UM.

Regardless of this difference, the correct unit of measure conversions have to be applied during a palletized receipt to enable the receipt quantity to be converted to the item stocking unit of measure and hence recorded correctly in the database. Conversion to the item stocking unit of measure before inventory update is also necessary for receipt quantities in alternate non-palletized units of measure.

Examples

The following examples illustrate the concepts associated with entering a palletized receipt and multiple units of measure during warehouse receipts.

Suppose that you have defined a default item stocking unit of measure of EA. You have also defined the alternate units of measure and conversion factors listed in Table 13.1.

Table 13.1
Palletized Receipt Example

Alternate UM	Conversion	Sizing Type
TN	1 TN = 10 EA	<blank>
DZ	1 DZ = 12 EA	<blank>
EU	1 EU = 1000 EA	Reference
PL	1 PL = 1200 EA	Reference

Example 1

In one transaction in purchase order receipts, you enter the following:

- Receipt quantity of 5
- Receipt UM of PL
- Default conversion factor of 1 PL = 1200 EA

Because the receipt is for a palletized unit of measure, five records are created, each with its own unique pallet reference number, and a default quantity of items on the pallet and item unit of measure of 1200 EA. These details are then shown on the frame automatically. You then attempt to override the default quantity and alternate UM values as shown in Table 13.2.

Table 13.2
Palletized Receipt Example 1

Old Qty	Old Alt UM	Old Ref	New Qty	New Alt UM	New Ref	Swap Message	Valid
1200	EA	PL000001	115	TN	PL000001	No	Yes
1200	EA	PL000002	90	DZ	PL000002	No	Yes
1200	EA	PL000003	21	PK	PK	Yes	Yes
1200	EA	PL000004	11	BX	BX	Yes	Yes
1200	EA	PL000005	1	EU	N/A	No	no
1200	EA	PL000006	1	PL	N/A	No	no

Table 13.2 shows that the EA stocking unit of measure cannot be overridden by a size-by-reference unit of measure, but can be overridden by another unit of measure with a sizing type of blank. When a size-by-reference alternate unit of measure is entered, the following error message displays:

```
ERROR: CANNOT RECEIVE MORE THAN ONE PALLET UM. Please re-enter.
```

You are prompted to input another alternate unit of measure.

If the stocking unit of measure is overridden by a unit of measure with sizing type of blank, the pallet numbers generated in the Reference field remain unchanged.

Example 2

In another transaction, you enter:

- Receipt quantity of 5000
- Receipt UM of EA

Because the receipt is for a non-palletized unit of measure, no records holding pallet information are created, and you are not automatically taken into the multi-entry frame. You then manually set the multi-entry field to Yes. In this frame, only one record with a quantity of 5000 and an alternate unit of measure of EA is shown. In the multi-entry frame, you attempt to override the default quantity and alternate UM values as shown in Table 13.3.

Table 13.3
Palletized Receipt Example 2

Old Qty	Old Alt UM	Old Ref	New Qty	New Alt UM	New Ref	Swap Message	Valid
5000	EA	<blank>	900	EA	<Blank>	No	Yes
			1	PL	<Blank>	No	no
			2	EU	<Blank>	No	no
			25	BX	BX	yes	Yes
			20	PK	PK	yes	Yes
			50	DZ	<Blank>	No	Yes

Table 13.3 shows that the EA stocking unit of measure cannot be overridden by a size by reference unit of measure, but can be overridden by another unit of measure with a sizing type of blank or a sizing type of multiple.

This receipt is then processed in the same way as for example 1.

Example 3

In a third transaction, you enter:

- Receipt quantity of 500
- Receipt UM of TN

Because the unit of measure TN is a size by blank alternate UM, this means that the default unit of measure conversion factor between EA and TN (10) can be overridden at the start of the receipt transaction.

Suppose that you override the default conversion factor of 1 TN = 10 EA by 1 TN = 11 EA. After you have manually set the multi-entry field to Yes, a single detail record is shown with an initial quantity of 500 and an alternate unit of measure of TN. From then on, this receipt is processed as for example 1.

Example 4

In a fourth transaction, you enter a receipt quantity of 50, and a receipt UM of BX. Because the receipt is for a non-palletized unit of measure, no records holding pallet information are created. Note that you cannot override the default conversion factor for this receipt unit of measure, because BX is a size by multiple unit of measure. You then manually set the multi-entry field to Yes. In this frame, only one record with a quantity of 50 and an alternate unit of measure of BX is shown at first. You would modify the record shown and manually enter the details in Table 13.4 using the multi-entry frame.

Table 13.4
Palletized Receipt Example 4

Old Qty	Old Alt UM	Old Ref	New Qty	New Alt UM	New Ref	Swap Message	Valid
50	BX	<blank>	16	BX	BX	No	Yes
			2	PL		No	no
			3	EU		No	no
			40	PK	PK	Yes	Yes

Old Qty	Old Alt UM	Old Ref	New Qty	New Alt UM	New Ref	Swap Message	Valid
			50	DZ	<Blank>	No	Yes
			50	TN	<Blank>	No	Yes
			300	EA	<Blank>	No	Yes

This receipt is then processed as per example 1.

Multi-Lot/Item Pallet Receipt

When staff receive a multi-item or multi-lot pallet, they typically want a single task to move the pallet to the destination location. The put-away process finds a single location for the entire pallet and does not send different pallet components to different locations.

Setting Up Multi-Lot/Item Pallet Receipt

Additional setup is required when staff put away multi-lot/item pallets as a single movement.

For more information on defining multiple items, see *QAD Master Data User Guide*.

Before you receive multi-lot/item pallets, ensure the following:

- Storage location groups (SLGs) or a list of SLGs are defined and linked to the pallet items.

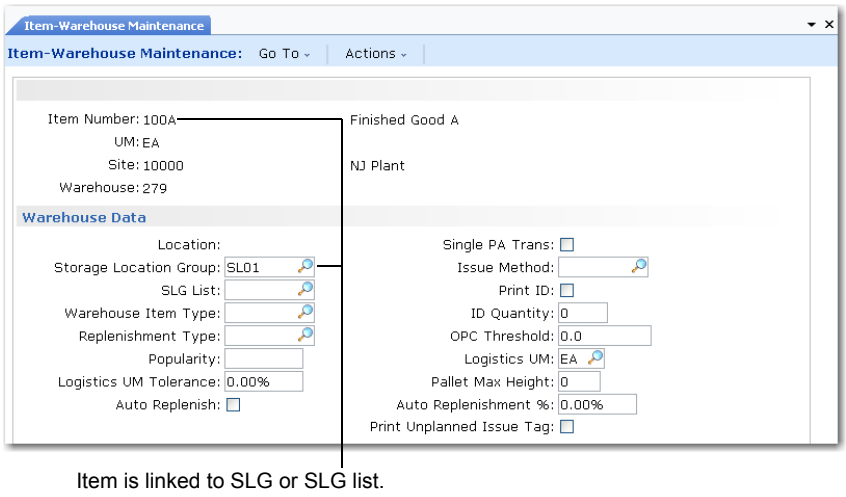
  Since staff perform the put-away in the SLG or an SLG list linked to an item, if multiple items exist, each can go to a different area. To avoid this situation, you must set up the SLG or SLG list so that they link to the pallet item.

  The pallet item is the item you define in:

  - Alternate Unit of Measure Maintenance (4.5.1)
  - Item Master Maintenance (1.4.1)
  - Item-Warehouse Maintenance (4.4.11)

  The system uses the SLG or the SLG list linked to the combination of item and warehouse in Item-Warehouse Maintenance to determine which SLG should be used for the multi-lot/item pallet put-away.

Fig. 13.4
Item-Warehouse Maintenance (4.4.11)



Receiving Multi-Lot Pallets

Use the RF Receipt menu (1.8) to receive multi-item pallets; see “Processing Receipts” on page 216.

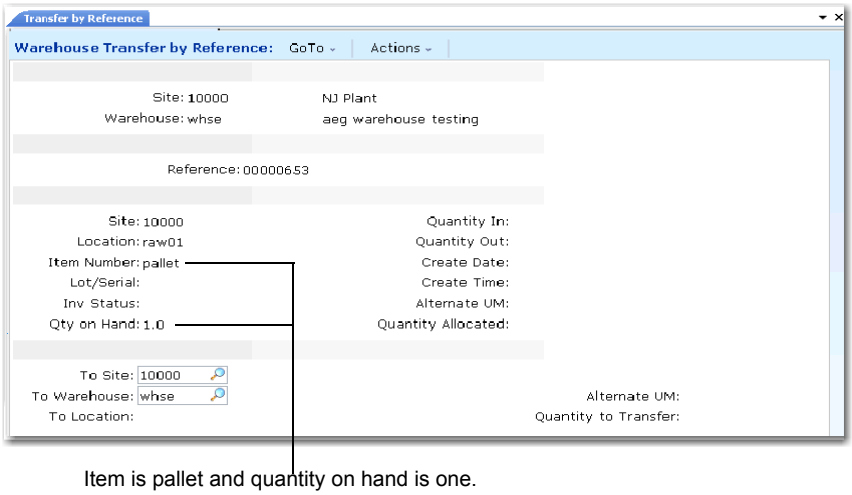
Displaying Multi-Lot/Item Pallet Data

The warehousing system creates a task for multi-lot/item pallets that is different than those created for single-item pallets. For multi-lot/item pallets, the task item number is the pallet item number.

Also, since the system does not display the total amount of units for all items on the pallet, the quantity that displays in warehouse reports and inquiries is one pallet.

Also, when you select a multi-item pallet for a transfer using Warehouse Transfer by Reference (4.17.1), the item that displays is the pallet item and the quantity is a single pallet. When you select the reference, a warning indicates that the pallet is a multi-item pallet.

Fig. 13.5
Warehouse Transfer by Reference (4.17.1)



Finally, the RF Transfer (1.3) option lets staff perform on-the-fly transfers. When they do, the RF indicates that the pallet is a multi-item pallet.

Fig. 13.6
RF On-the-Fly Transfer



Consignment Receipt

If you plan to use Supplier Consignment Inventory with your warehouse system, you must link the consignment transaction types with internal routings in Internal Routing Assignment Maintenance (4.2.10) and with algorithms in Algorithm Assignment Maintenance (4.6.9).

See “Defining Internal Routings” on page 43 and “Algorithms” on page 105.

The consignment transaction types are:

CN-RCT. This transaction records a purchase order receipt of consigned inventory.

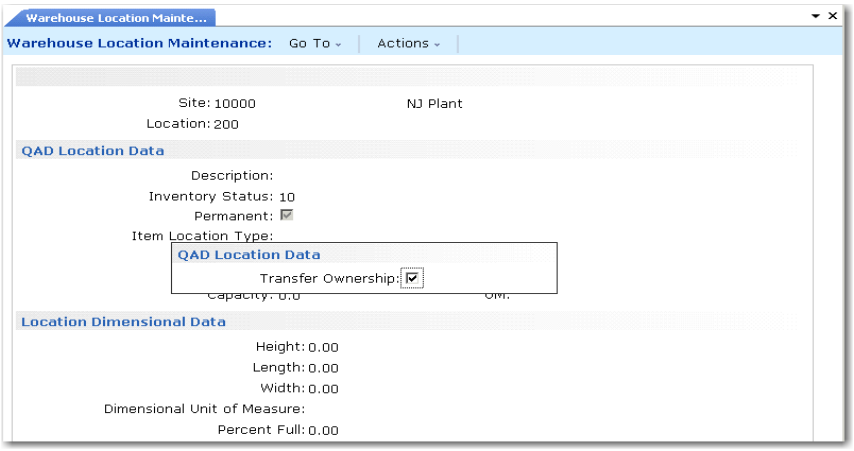
INSP-CN. Use this transaction to route consigned inventory (received with the CN-RCT transaction) to inspection.

BACK-CN. Use this transaction to move consigned inventory to the main storage area after inspection.

FAIL-CN. Use this transaction to move consigned inventory to the reject area when the inspection fails.

In addition, use the Transfer Ownership field in Warehouse Location Maintenance (4.3.13) and Mass Location Maintenance (4.3.21) to indicate whether inventory received into the location retains its consigned status or receipt initiates a transfer of ownership.

Fig. 13.7
Warehouse Location Maintenance (4.3.13), Transfer Ownership Field



Location Forecasts

Some warehousing situations require that locations are prepared for a specific receipt before the inventory is actually received. Such locations need to be reserved ahead of time to prevent their use for any other purpose. In other situations, running the put-away algorithms at the moment of receipt may not provide optimum system performance; for example, if receipts tend to occur during the day time when the system usage is highest.

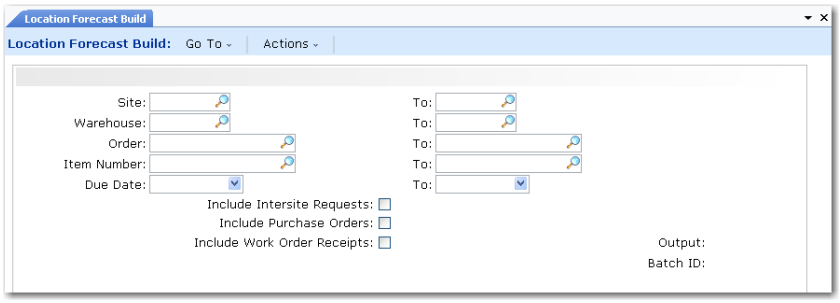
If details of receipts are known in advance, locations can be identified and reserved ahead of time during periods when system use is low, such as at night. When the physical receipt is subsequently made, the locations to be used for storage are pre-identified, and the put-away processing is quicker and more efficient.

You can generate this kind of planned put-away using Location Forecast Build (4.3.19.1) and Location Forecast Maintenance (4.3.19.2). Special put-away algorithms are provided to search specifically for the reserved locations.

Location Forecast Build

Use Location Forecast Build (4.3.19.1) to create new location forecasts.

Fig. 13.8
Location Forecast Build (4.3.19.1)



Select the order and due date range for which forecasts are generated. Specify default values in Location Forecast Control (4.3.19.24) for the order types to include and for the number of days in the forecast horizon. Forecasts are generated in locations identified by the defined internal routing and algorithm assignments.

Internal Routings, Algorithms, and Transaction Types

In order to determine which internal routings should be used to identify the receipt paths that enable location forecasts to be generated, a set of specific transaction types are provided. These are:

- FOR-PO for the receipt of purchase orders
- FOR-WO for the receipt of work orders
- FOR-DO for the receipt of distribution orders

This means that, though actual receipts can take many different routes, forecasts can be rationalized to only function on some or all of them. This is best explained using an example.

Two internal routings are defined:

- RECEIVE moves stock from the receipts area and puts the stock directly away.
- INSPECT moves stock from the receipts area to an inspection area before the stock is put-away.

Purchase order receipts (transaction type RCT-PO) for some item types are assigned to use the INSPECT routing, while the remainder use the RECEIVE routing.

However, locations need only be reserved in the main storage area. Therefore, all purchase order receipt forecasts (transaction type FOR-PO) are assigned to use the RECEIVE routing.

Note It should rarely be required to create a specific internal routing for receipt forecasts, only a specific internal routing assignment. Only two-step internal routings fully support location forecasts. In the previous example where inventory is moved from receipts to inspection and then on to stores, if location forecasts are assigned to this routing, the forecasts are only created in the Inspection area. Unfortunately, if this is what is required, no location-find algorithms can identify and consume the forecast.

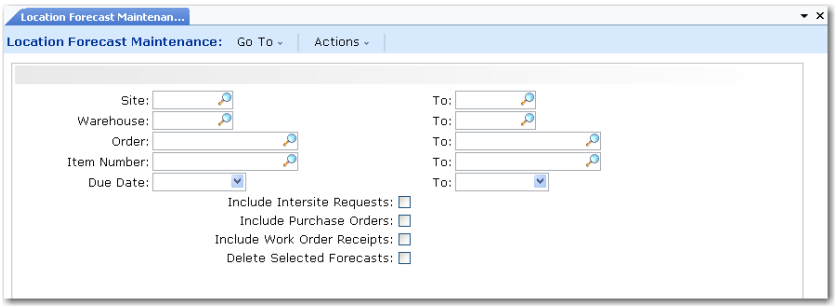
Similar to the assignment of internal routings, the algorithms to be used to identify the locations for forecasting must be assigned using the FOR transaction types. While the system lets any algorithms be used for the FOR transaction types, any algorithm that does more than just identify a location fails when used to generate a forecast.

Example If an algorithm to consume location forecasts is assigned to be run when location forecasts are generated, the algorithm runs but does not do any processing or return any locations.

Receipt Forecast Maintenance

Location Forecast Maintenance (4.3.19.2) enables you to modify or delete previously generated forecasts, or to create new forecasts manually.

1 Select Location Forecast Maintenance (4.3.19.2).



2 In the fields in the top half of the frame, select the range of forecasts to modify. You can delete all selected forecasts by entering Yes in the Delete Selected Forecasts field. Click Next.

3 A scrolling window is displayed. To create a new forecast, click Next when the scrolling window displays. Alternatively, highlight any specific record to modify it and press Enter.

4 The details of the record are displayed in the lower frame where you can make your changes.

To delete a forecast, enter a forecast quantity of zero.

5 To return to the scrolling window, press End. You can then repeat steps 3 and 4.

6 To return to the initial selection frame, press End in the scrolling window.

The Location Forecast menu options also contain standard reports and inquiries that let you review existing receipt forecasts.

Location forecasts are created for an order line before that order line is physically received. If a location forecast is created, it must be used at the moment of the receipt to identify the locations to use. This is achieved by using put-away algorithms 111 through 124. See Table 8.5, “Put-Away Algorithms,” on page 116.

General RF Receipt Procedure

1 Scan the warehouse location where the items are received.

2 Scan or enter the address ID

When the address is blank, the system lets you perform an unplanned receipt.

3 Scan or enter the packing slip for items being received.

4 Enter alternate UM: of the pallet being received.

5 Scan the pallet reference from the label attached to the pallet.

When the pallet ID is blank, the system prompts to generate a reference number.

Note You can delete a scanned pallet.

6 Scan the item number from the label.

7 If applicable, scan the lot/serial number where items are received.

8 Scan the quantity of items being received.

If staff set the quantity to 0 (zero), the system deletes the item from the pallet contents.

9 Scan or enter the order number.

The system display an open order, based on previous scanned fields. Accept the order number or enter a different order number.

The system positions the cursor in the Item field to scan a new item contained in a previous pallet.

10 Scan or enter the order line.

The system displays an open order line, based on previous scanned fields. Accept the order line number or enter a different order line number.

11 Continue scanning items and entering quantities.

12 Press F4 to indicate the completion of pallet scanning.

The system captures results and displays them on the RF.

13 Go to the RF Select Task (1.2) or Next Task (1.3) option to confirm system-created put-away tasks.

14 Scan the order line.

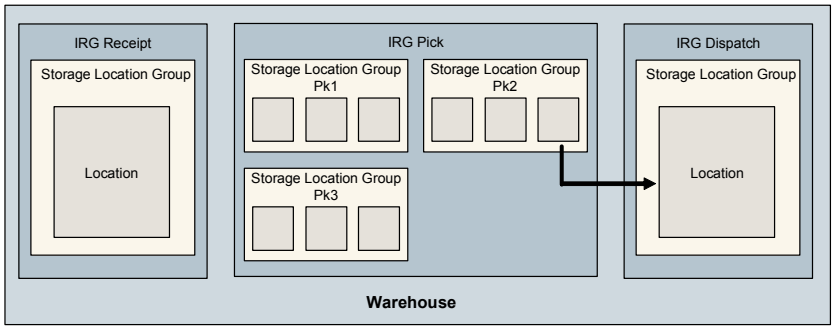
The system proposes an open order based on previous scanned fields (PO or DO) being received.

15 Continue confirming tasks.

Processing Picking Transactions

As with receipts, picking transactions are governed by the internal routing for the specific transaction. In addition, you need to define in advance a set of rules governing how inventory is picked for each transaction, known as *picking algorithms*.

For full details of the setup procedures for transactions, refer to Chapter 8, “Algorithms,” on page 105.



The following is a brief outline of what you must define:

- Define the items to include in the pick using Item Master Maintenance (1.4.1).
- Define the picking properties for the transaction type and the storage location group. The main points are:
  - Picking Levels: The minimum and maximum amount of inventory that can be picked from a location. These can be set for the warehouse, the default warehouse transaction type, the storage location group, and the transaction type.
  - Over Pick: whether you can pick more inventory from a location than is specified in the order.
  - Allow Split: whether the UM for a storage location group can be split for an order; for example, whether a pallet can be split into boxes for an order.
  - Pick by multiple UM: Whether to allow picking in different UM—for example, both pallets and boxes to meet an order.
  - Allow Multiple Transactions: Whether the system should create one transaction for the whole quantity to be picked, or allow multiple transactions using Storage Location Group Maintenance (4.3.1).

  Example If Pick Multiple UM = BX, and one BX = 20 EA in the receipt, then allow multiple transactions could result in two transactions of 20 EA; while not allowing multiple transactions would result in one transaction of 40 EA.
- Define the internal routing for the transaction using Internal Routing Maintenance (4.2.5). The simplest would be a two-step movement from Bulk to Dispatch.
- Assign the internal routing to a transaction type using Internal Routing Assignment Maintenance (4.2.9).
- Assign a location-find and picking algorithm to the transaction type using Algorithm Routing Maintenance (4.6.9).

When you create an order, the following occurs:

1. The system looks for the site/warehouse/location from which the inventory can be picked.
2. The algorithms for the transaction type are run until the quantities specified in the order have been picked.

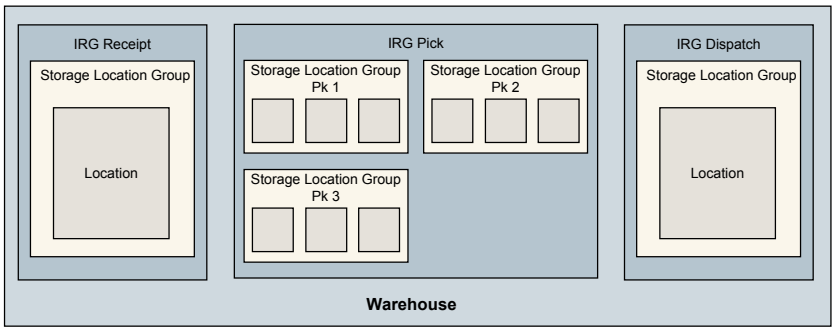
3 Open sales order inventory pick transactions, which are two-phase transactions, must be confirmed by one of the movement confirmation functions. Confirming such transactions records that the movement of inventory to the appropriate dispatch dock has been completed. The picked stock can then be shipped against the order for which it was picked. Single-phase transactions do not go through this process.

The picking flow described here specifically for sales orders is also used in all functions where picking is performed, such as work orders, distribution orders, and the repetitive modules.

Example: Sales Order Pick

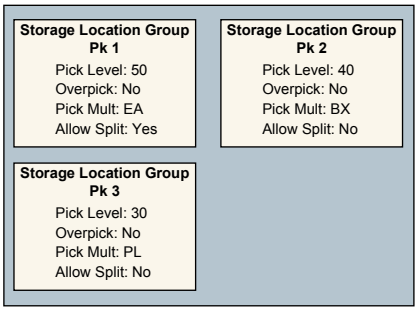
This example takes a simple sales order for 243 EA of component A, and considers how the inventory would be picked from the warehouse setup illustrated in Figure 13.9.

Fig. 13.9
Warehouse Setup for Sales Order Picking



The picking properties for storage location groups Pk 1, Pk 2, and Pk 3 have been set as shown in Figure 13.10.

Fig. 13.10
Example Picking Properties



- One PL = 100 EA
- One BX = 20 EA

For the customer order of 243 EA, the result of the pick is shown in Table 13.5.

Table 13.5
Picking Results

Result	Reason
2 PL from SLG Pk 3	• Pick Level is 30, so look in this SLG first. • Picking multiple pallets is allowed, but pallet split is not. • Therefore, pick 2 pallets to get 200 EA.
2 BX from SLG Pk 2	• Pick level is 40, so look in this SLG after SLG 3. • Picking multiple boxes is allowed, so pick 2 BX to get 40 EA. • Splitting a BX is not allowed, so cannot get the remaining 3 EA from this SLG.
3 EA from SLG Pk 1	• Pick level is 50, so look in this SLG last. • Splitting is allowed, so take the last 3 EA from SLG 1.

Example: Work Order Pick

The principles of picking described in the previous section apply to all types of issue transactions. However, in order to illustrate the flexibility that internal routings give you, this section shows different routes that a work order pick could take.

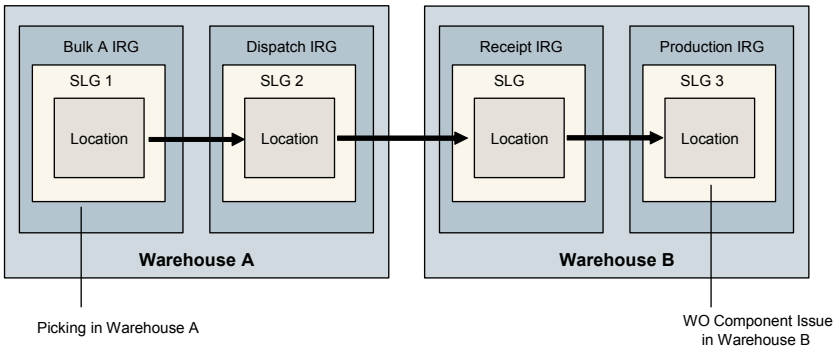
Using the Balance of a WO for Another WO

In this scenario, inventory is left over from one work order, so you want to:

- See whether the remainder can be used in warehouse B (Prod).
- If not, go back to warehouse A (Raw) and pick the inventory from there.

Figure 13.11 shows an example of work order picking setup.

Fig. 13.11
Work Order Picking Example Setup



In order to set up this movement, you would first need to define a warehouse master list using Warehouse Master List Maintenance (4.1.5). The master list defines the source and destination warehouses for the work order pick. For this scenario, a two-step sequence is created for the transaction:

1 Step 1 begins the pick in warehouse Prod.

2 If the inventory for the WO cannot be found in Prod, the system goes to step 2 and picks the inventory from warehouse Raw. The Ultimate warehouse in step 2 tells the system to make an inter-warehouse transfer from Raw to Prod after picking the inventory.

Next, you must set up the internal routings and algorithm assignments shown in the following table:

Picking in Prod	IR: No IR.
	Algorithm: PK for PICK-WO
Picking in Raw + Inter-Warehouse Transfer	1. IR: PICK-WO
	Step 10: Bulk
	Step 20: Dispatch
	2. IR: ISRC-WO
	(No steps)
	3. IR: IWRC-WO
	Step 10: Receipt
	Step 20: Prod
Algorithm Assignments	PK for PICK-WO in Raw
	LF for PICK-WO in Raw
	LF for IWRC-WO in Prod
	PA for IWRC-WO in Prod

Because IRs are defined per warehouse, the IR in step 1 is defined in Raw, and the IR in step 3 is defined in Prod. The way that the transaction is created between each warehouse, from Dispatch in Raw to Receipt in Prod, cannot be described in any IR that relates to one warehouse only. Therefore, you must use an external routing to define the transaction properties for all movements that involve an inter-warehouse transfer.

Note The transaction type IWRC-WO (inter-warehouse receipt) is used to avoid confusion with RCT-WO. Furthermore, IWRC-WO designates an inter-warehouse receipt for the components of a WO, while RCT-PO is the receipt of the finished product after production.

Pick and Move Inventory Between 2 IRGs in Same Warehouse

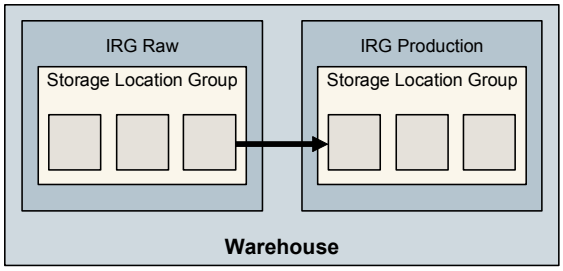
This scenario covers the possibility of having the raw materials area and the production area in the same warehouse; see Figure 13.12. This would be a PICK-WO transaction with:

- An internal routing of two steps (Raw and Production)
- Algorithm assignments of PK, LF, and PA

Pick and Dispatch Within Same IRG

In this scenario, the warehouse has an IRG containing both raw materials and a production area.

Fig. 13.12
Warehouse with Two IRGs



The PICK-WO transaction would therefore, have no IR defined since no movement occurs between IRGs. Instead, you would only assign LF, PK, and PA algorithms to PICK-WO.

Repicking

For picking transactions with a detail allocation, you must repeat the picking process in case the pick fails. You do this using Internal Routing Maintenance (4.2.5). The Repick Type field enables you to specify the transaction type that is used for any resulting repicks. If you leave this field blank, the original transaction type is used.

The repick transaction type is important because it determines which internal routing is used for the repick.

Example You can choose whether repicks follow the same route as the original pick or go immediately to dispatch.

Repicking only works if the transaction type for the pick was PICK-*. This is the only way that the system can identify that the type refers to a picking process.

If the transaction type for the pick is PICK-WO and you leave the Repick Type field blank, the same transaction type PICK-WO is used to find the appropriate internal routing and picking algorithm for a repick. In other words, the repick works exactly the same way as the original pick.

Picking for Different Lot/Serial/Reference

When warehouse staff pick for orders, QAD Warehousing typically allocates specific pallets to be picked as specified by the appropriate algorithm selected; however, many warehouses have multiple pallets containing the same item that are housed in the same warehouse location. For more efficient picking, it may be easier for staff to pick pallets with different lot/serial or reference numbers than those assigned to be picked by the system. QAD Warehousing provides the flexibility to let warehouse staff pick other pallets for the same item, thereby letting staff ship and complete the order expeditiously.

You must activate the functionality to switch lot/serial references by setting Allow Switch Lot Ref to Yes in:

- Warehouse Maintenance Control (4.1.24)
- Warehouse Maintenance (4.1.1)
- Internal Routing Maintenance (4.2.5)

You can set fields in QAD Warehousing so that warehouse users who access the following can switch location, lot/serial, or reference numbers to substitute pallets when confirming tasks on the RF:

- RF Next Task (1.1) option
- RF Select Task (1.2) option
- Batch Pick SO/DO (3.1) or Batch Pick All (3.2)

Picking for different lot/serial references, sometimes referred to as *switch lot/serial functionality*, can be used for distribution, sales, and work orders that run the RF BP Pick SO/DO and BP Pick All options.

Note Bulk picking does not support picking for different lot/serial or reference numbers.

Setup

You can set up switch lot/serial functionality for:

- All warehouses in Warehouse Control (4.24)
- A single warehouse in Warehouse Maintenance (4.1.1)
- Every specific internal routing in menu Internal Routing Maintenance (4.2.5)

To substitute pallets, you set up:

- Task switching
- System flavor
- From lot/serial, reference, and location options
- Expiration date

The following topics discuss the setup.

Task Switching

To implement picking for lot/serial or references other than those the system suggests, you must set Allow Task Switching to Yes in Warehouse Control (4.1.24).

If Allow Task Switching is Yes, warehouse staff can pick for different lot/serial and/or pallets (references) than those originally selected by the system. They do this by switching the task they are trying to confirm to the task for which the newly selected lot/serial/reference is allocated. If there is no such task, the system simply allocates the newly selected lot/serial/reference to the task being confirmed; this frees the inventory originally allocated.

If Allow Task Switching is No, warehouse staff can pick for different lot/serial/pallet than those originally selected by de-allocating the substitute pallet from its current order. To do this, they must:

- Delete the task associated with the order, if any.
- Create a new task.
- Reinitiate the picking algorithm for the new task.

For switch lot/serial functionality within batch picking, you must set Allow Task Switching to No.

When you disable switch lot/serial functions, the Expire date field has no effect on task-switching functionality.

See “Expire Date (Days)” on page 240.

System Flavor

Next Task and Select Task lot/serial and reference switching work when the Flavor field in Warehouse Maintenance (4.1) is set to either A or B.

From Lot/Serial, Reference, and Location Options

You can specify a substitute pallet or reference in the same location or another location by setting fields in the Transaction Confirmation Defaults frame of Warehouse Control (4.1.24):

- From Location Option
- From Lot/Serial Option
- From Reference Option

These fields default to the same-named fields in Warehouse Maintenance (4.1), and from Warehouse Maintenance to the same-named fields in Internal Routing Maintenance (4.2.5). To substitute pallets, you must set these fields in Internal Routing Maintenance.

These fields work together to let you substitute pallets or references, depending upon their settings and whether substitute pallets are available. If substitute pallets do not exist at the current location, you cannot make pallet or reference changes, regardless of the other two field settings, when:

- From Location Option is 0
- From Location Option is 2, but the confirmation of the change is No.

If substitute pallets do exist at the current or another location, you can make pallet or reference substitutions when:

- From Location Option is 0, 1, 2, or 3
- If any Lot/Serial or Reference fields have a non-existent value for the current pallet

Warehouse staff can pick the pallet as long as the system did not:

- Allocated it to another order
- Associate a replenishment task with it (inventory is reserved)

If the substitute pallet has been allocated to another order, or has a task associated with it, then you can switch tasks for the pallet as long as the task associated with it is not active. You can also de-allocate the substitute pallet from its current order by deleting the task associated with the order, creating a new task, and reinitiating the picking algorithm for the task.

If the picking algorithm fails or the system cannot find inventory for the new task, you cannot use the substitute pallet nor switch tasks for it.

Expire Date (Days)

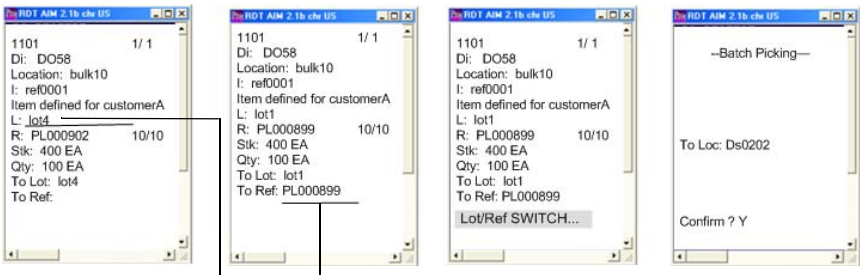
You can specify the maximum number of days (0 to 9999) that the expiration date of the new pallet can differ from the expiration date of the original pallet. For example, if you enter 5, and the expiration date of the original pallet is 12/1/2008, then the expiration date of the new pallet must fall between 12/1/2008 and 12/6/2008. The default value for this field is 0, which means that the expiration date of the original pallet must match the expiration date of the new pallet.

Switching from Batch Picking on the RF

You can use the switch lot/serial functionality while batch picking on the RF from either the SO/DO (3.1) or Batch Pick All (3.2) options. When the system prompts you to enter lot and reference, you can switch to another lot and reference by entering different lot and reference values.

When you enter lot and reference numbers from an order other than the one for which you were currently batch picking, the system displays warnings. The first warning indicates that you are switching lots; the second warning indicates that you are switching references. The system prompts for the picking destination. Once you enter the destination, the system displays a message, indicating that lot/reference switching has occurred. It then prompts you to confirm. When you reply with Yes, the system displays the confirmed picking.

Fig. 13.13
Batch Picking Switch Lot/Serial Functions



System-proposed lot and reference,

Enter different lot and reference

Lot/reference switch message displays.

Confirm switch.

Use Inventory Detail Inquiry (4.9.13) to review inventory movement.

Processing Inventory Transfers

This section describes how QAD Warehousing processes inventory transfers. The following transfer transactions are possible:

- Transfer by reference
- Transfer multiple items
- Transfer single item

Inventory transfers can take place:

- Inside one warehouse
- Between warehouses (inter-warehouse transfers)

Inventory transfers work in the same way as other inventory movements. That is:

- You define internal routings for the transfer.
- You assign the internal routing to the transaction type, warehouse, item number, or address.
- You assign the appropriate algorithms to the transaction.

When you create an inventory transaction using warehouse functions, the stock is moved according to the internal routing, and put away using the algorithm linked to the transaction type.

Typically you have a one-step internal routing in the main storage area. The internal routing covers all movements within the area and to the area from another internal routing group (IRG). But the internal routing does not cover transfer movement from the main storage area to another area. For this type of movement, the system uses transaction parameters that you specify in Work Location Group Maintenance (4.3.9) for the phase, system code, and task type. If the movement is from one work location group (WLG) to another WLG, you define an inter-WLG definition that would cover the transaction parameters in Work Location Group Maintenance.

Transfer Inside One Warehouse

For transfers within a warehouse, the setup process is as follows:

1. Define an internal routing for transaction type PUT-TR, with one step set to BULK using Internal Routing Maintenance (4.2.5).
2. Assign the location-find and put-away algorithms to the transaction type PUT-TR using Algorithm Assignment Maintenance (4.6.9).

When you create a transaction for a stock transfer by reference, the movement would be exactly as for a receipt, except that there would be one movement within the Bulk storage location group.

Inter-Warehouse Transfer

An inter-warehouse transfer is processed using a sequence of internal routings, the same as other warehouse transactions. The key difference is that a movement between warehouses involves several transactions and the setup needs to reflect this.

Example A transfer of 100 EA from warehouse A (raw materials) to warehouse B (production) requires the following internal routings.

1. An issue transaction in warehouse A:
   - Transaction type: ISS-WH
   - Internal routing: ISS-WH
     - Step 10: Bulk
     - Step 20: Dispatch
   - Algorithm Assignment: Location Find
2. An inter-warehouse receipt transaction in warehouse B:
   - Transaction type: IWRC-WH
   - Internal routing: IWRC-WH
     - Step 10: Receipt
     - Step 20: Prod
   - Algorithm assignment: location-find and put-away
3. An inter-warehouse transfer transaction type:
   - Transaction type ISRC-WH
   - Internal routing
   - Algorithm assignment

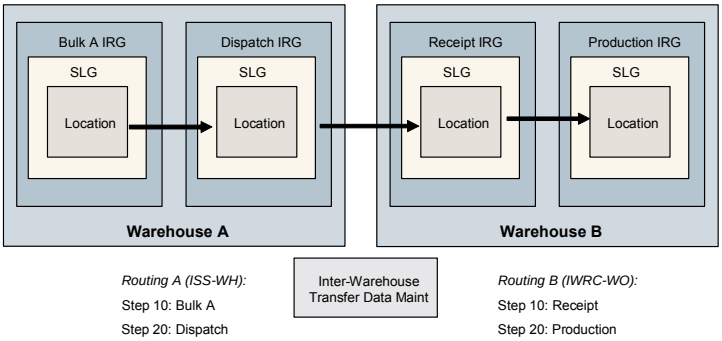
For sales order, work orders, and so on, you need to define a similar set of transaction types if the inventory movement involves an inter-warehouse transfer.

Example For a work order you would need to create:

- PICK-WO for warehouse A
- ISRC-WO
- IWRC-WO for warehouse B

Figure 13.14 summarizes the movement of 100 EA mentioned at the beginning of this section.

Fig. 13.14
Inter-Warehouse Transfer Example



On-the-Fly Transfer

If you reorganize your warehouse when it is full or if you need to move pallets to clear aisles, you can set up the system so that RF users can do an on-the-fly (OTF) transfer within a single warehouse.

OTF Setup

Setup is the same for an OTF transfer as it is for other transfers, except that you use the OTF-TR transaction type.

- Use Internal Routing Maintenance (4.2.5) to define a transfer internal routing for the site and warehouse.
- Use Internal Routing Assignment Maintenance (4.2.9) to assign OTF-TR to the transfer internal routing.
- Use Algorithm Assignment Maintenance (4.6.9) to assign algorithms to the OTF-TR transaction type.

RF Procedure

1. On the RF, select RF Transfer (1.3).
2. Accept the default location, or scan or enter the location.
3. Enter or scan the reference.
4. Enter the quantity to transfer.

You can add more fields to the RF OTF screens by setting different flavor codes in the Flavor field in Work Location Group Maintenance (4.3.9).

You can verify the transfer through any of the transaction history reports in the Reports Menu (4.9).

Processing Shipments

Warehouse staff can ship material using the RF device from the warehouse with orders that were previously picked with QAD EE programs. Using just one RF shipment menu option, you can ship sales, distribution order; return material authorization; or return a purchase order as well as perform an unplanned issue.

Warehousing offers two shipping functions:

- Shipping with a pre-shipper: Uses the QAD Warehousing *Ship Truck* functions; refer to “Truck Ship” on page 402.
- Shipping without a pre-shipper: Uses the RF shipping option (1.9). The following topics discuss this option.

Shipping functionality through the RF device is based on shippers. You can ship orders created through:

- Picklist/Pre-Shipper - Automatic (7.9.1)
- Wave Planning module

- DO Pick List/Pre-Shipper - Auto (12.19.1)
- Sales Order Packing List (7.9.13)
- Distribution Order Picklist Print (12.17.19)

Additionally, RF shipment functions handle:

- Purchase Order Return (5.13.7)
- Unplanned Issues (3.7)
- Sales Order Shipments (7.9.15)
- Distribution Order Shipments (12.17.22)
- RMA Shipments (11.7.1.16)

Functionality included in the RF shipment program includes:

- Ship one pallet to one customer in two different orders, the same pallet to different customers, or one pallet for two different orders
- Ship the same pallet to different customers in the same process or transaction.
- Ship partial pallets or multi-item pallets
- Ship from the storage location group with Allow Issue set to Yes in Storage Location Maintenance.

You can change the RF screen layout or set up different flavors of the RF shipment screen to accommodate changes among your various warehouses. For example, you could set Flavor A to have more updateable fields, while Flavor B can be for pallets only. Typically:

- Flavor A prompts for location, address, item, lot, reference, and quantity.
- Flavor B prompts for location, address, and reference.

Note You specify flavors in Warehouse Maintenance (4.1.1), Work Location Group Maintenance (4.3.9), or User Work Location Group Maint (4.11.3.13).

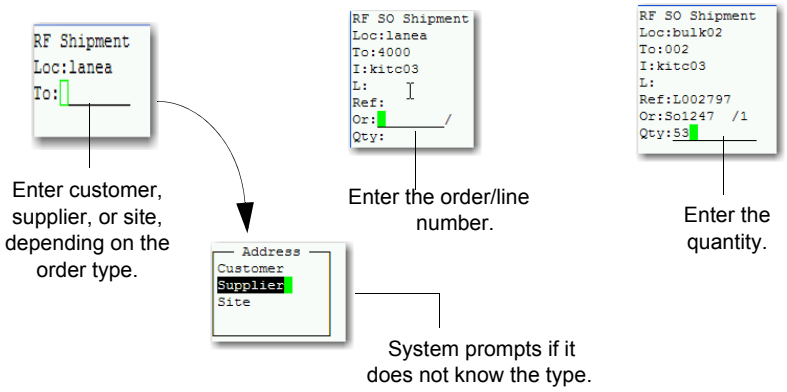
Use the following procedure for Flavor A:

1. Select the RF Shipment (1.9) option.
2. Enter or scan the location from the label.
3. Enter or scan the address in the To field.

   The system determines if the shipment belongs to a distribution order (site), sales order (customer), purchase order (supplier) or unplanned issue (blank).

   If the system cannot determine the To address, it prompts you to select from a pop-up menu whether the address is a customer, supplier, or site; see Figure 13.15.
4. Enter or scan the item number from the label.
5. Enter or scan the lot from the label.
6. Enter or scan the reference from the label.
7. Enter or scan the quantity from the label.
8. When complete, follow the prompts to launch the shipment process.

Fig. 13.15
RF Shipment (1.9)



Use the following procedure for Flavor B:

1. Select the RF Shipment (1.9) option.
2. Enter or scan the location from the label.
3. Enter or scan the address in the To field.

   The system determines if the shipment belongs to a distribution order (site), sales order (customer), purchase order (supplier), or unplanned issue (blank).
4. Enter or scan the reference from the label.
5. When complete, follow the prompts to launch the shipment process.

Chapter 14

Order Management

This chapter tells you how to add warehouse details to order, address, and site data and to generate allocations for orders through programs in the Order Management Menu (4.13).

Overview 248
Lists order management programs and discusses their uses.

Control Settings 248
Describes how Order Management Control (4.13.24) can be used to specify order management parameters.

Adding Warehouse Data to Orders 250
Describes how to use Order Warehouse Data Maint (4.13.1) to add warehouse details to order data.

Adding Warehouse Data to Addresses 253
Describes how to use Address Whse Detail Maint (4.13.13) to add route, priority, dates, and other warehouse function data to company addresses or customer records.

Adding Warehouse Details to WO Receipts 254
Describes how to use WO Receipts Whse Maintenance (4.13.8) to add specific warehouse details to a work order receipt.

Generating Allocations for Orders 254
Describes how to use Order Warehouse Allocations (4.13.17) to generate general allocations for selected sales, work, and distribution orders.

Using the .NET UI to View Order Data 255
Describes .NET UI browse collections that show order data.

Overview

QAD Warehousing contains order management programs that are similar to those within the core system; however, the QAD Warehousing order management programs let you add warehouse details to orders. There are separate order maintenance programs within QAD Warehousing for sales, purchase, distribution, or work orders as well as intersite requests. Or, you can select individual order types from Order Warehouse Data Maint (4.13.1). The fields are the same, regardless of whether you use Order Warehouse Data Maint or one of the individual order programs.

You can also use other order programs in the Order Data Maintenance menu (4.13) to:

- Add specific warehouse details to the standard properties for work order component issues using WO Issues Whse Data Maintenance (4.13.7).
- Add specific warehouse details to the standard properties for the work order receipt of finished product (4.13.8).
- Create general allocations for orders using Order Warehouse Auto Allocations (4.13.17).

The following table lists the programs on the Order Data Maintenance menu:

Table 14.1
Order Data Maintenance Programs

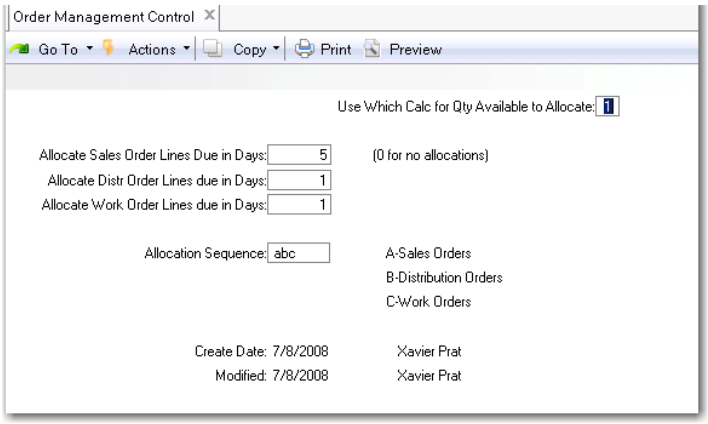
Menu	Menu Label	Program Name
4.13.1	Order Warehouse Data Maintenance	whommt.p
4.13.3	SO Warehouse Data Maintenance	whomsomt.p
4.13.4	PO Warehouse Data Maintenance	whompomt.p
4.13.5	IR Warehouse Data Maintenance	whomirmt.p
4.13.6	DO Warehouse Data Maintenance	whomdomt.p
4.13.7	WO Issues Whse Data Maintenance	whomwimt.p
4.13.8	WO Receipts Whse Data Maint	whomwrmt.p
4.13.10	Allocated Order Warehouse Report	whomrp02.p
4.13.12	Order Detail Report	whomrp01.p
4.13.13	Address Whse Detail Maintenance	whadddmt.p
4.13.14	Address Whse Detail Browse	whbr051.p
4.13.15	Address Whse Detail Report	whaddrrp.p
4.13.17	Order Warehouse Auto Allocations	whomal01.p
4.13.24	Order Management Control	whompm.p

Control Settings

Use Order Management Control (4.13.24) to specify parameters for allocating items for sales, distribution, and work orders. You can specify:

- The number of calendar days from the sales order due date by which the system allocates work order line item
- Calculations for allocations
- The sequence in which the system allocates order lines

Fig. 14.1.
Order Management Control (4.13.24)



Use which Calc for Qty Available to Allocate. Enter 1, 2, 3, or 4 to select the method the system uses to calculate the quantity of items available to allocate for an order. The default is 1.

1: Quantity Available to Allocate = Qty Available – Qty Allocated

2: Quantity Available to Allocate = Qty Available – Qty Allocated + Qty On Order

3: Quantity Available to Allocate = Qty Available – Qty Required

4: Quantity Available to Allocate = Qty Available – Qty Required + Qty On Order

Allocations reserve inventory for an order, so it is not available for other orders in the system. When you enter an order, the system compares the order quantity to the quantity available to allocate. If available quantities are insufficient, the order cannot be filled, although allocation functions do not prevent you from entering a confirmed order line.

For most business situations, calculation 1 is recommended. This calculation includes orders due to ship within the time set in Allocate Sales or Distr Order Lines Due in Days and manufacturing orders that have been released to the shop floor. This calculation does not consider future requirements or supply sources.

Calculations 2, 3, or 4 are not time sensitive. The system includes all orders regardless of due date. For example, when you enter a sales order due in 6 months, calculations 3 and 4 subtract the order total when calculating current availability. When you enter a work order due to be completed in 6 months, calculation 2 adds the total to quantity available. Therefore, it is recommended that you use calculations 2, 3, or 4 only if you have a very short cycle time and planning horizon.

Allocate Sales Order Lines due in Days. Enter the number of calendar days from the sales order due date by which the system allocates sales order items. The system creates allocations for any orders due within this number of days.

Allocate Distribution Order Lines due in Days. Enter the number of calendar days from the sales order due date by which the system allocates distribution order line items. The system creates allocations for any orders due within this number of days.

Allocate Work Order Lines due in Days. Enter the number of calendar days from the sales order due date by which the system allocates work order line items. The system creates allocations for any orders due within this number of days.

Allocation Sequence. Enter the sequence in which the system allocates order lines. For example, abc means that the system allocates sales orders, then distribution orders, and finally work orders.

Adding Warehouse Data to Orders

Use Order Warehouse Data Maint (4.13.1) to select one of the following order types and add warehouse details to the order data:

- Bulk pick orders
- Distribution orders
- Intersite requests
- Purchase orders
- Unplanned receipts
- Sales orders
- Work order issues or receipts

Note You can display data for sales orders for configured kits using Order Warehouse Data Maint, then selecting SO, or using SO Warehouse Data Maint (4.13.3). To display kit configurations, set Show Configurations to Yes in either program.

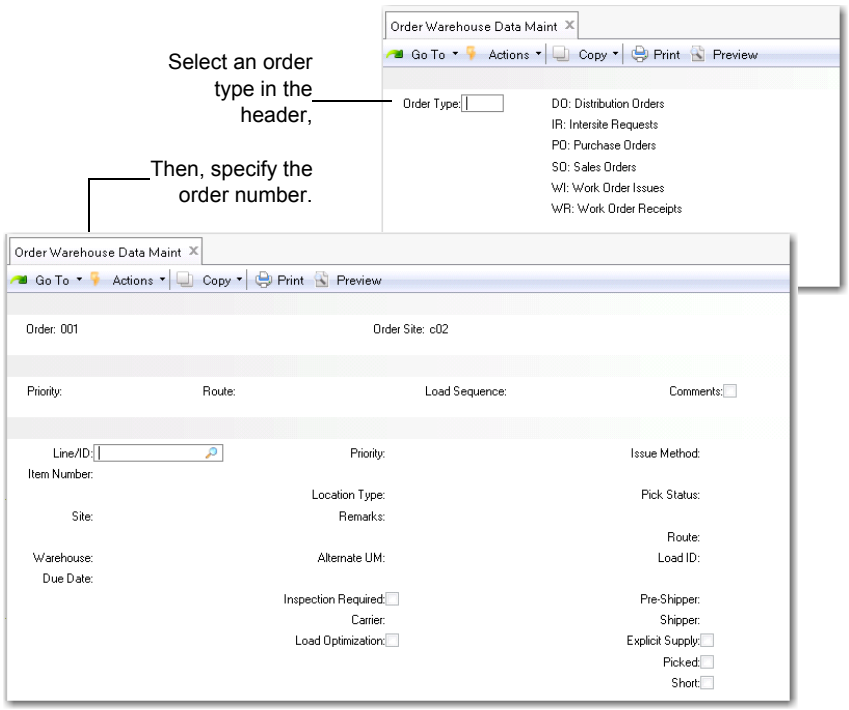
Once you select the order, you can assign a transaction priority, routing code, or a sequence number to indicate the order for loading the items; see Figure 14.2.

For the line item data, you can assign a site or warehouse, due date, priority, location type, alternate UM, carrier, pre-shipper/shipper, load IDs routes, and so on. You can also specify the pick status and indicate whether:

- Inspection is required for the line item.
- The item is short or picked.

Most of the fields in the program are similar to those in core order maintenance programs. Unique fields are described in this section.

Fig. 14.2
Order Warehouse Data Maint (4.13.1)



Short. Specify whether the inventory items are short. This field is used when you specify option 0 for the Shortage Definition field in Transaction Type Maintenance.

Carrier. Enter a valid carrier defined in Carrier Maintenance to be used for shipments for these orders.

pre-shipper. Enter a pre-shipper ID associated with the order.

Explicit Supply. Indicate whether you want shortage clearance functionality to be activated for this order line.

Load Optimization. Indicate if this order line is to be processed through load optimization functions in the Wave Transportation menu. The load optimization module works in conjunction with the wave planning module, which means that only sales and distribution orders can be selected for load optimization processing.

No: This order line is not included in load optimization.

Yes: The order line is pre-processed by a transportation management system (TMS) before starting the picking process in QAD Warehousing. The TMS either consolidates orders into shipments to reduce overall shipping costs or optimizes the loads by calculating routes with drop-off sequences. The TMS sends the optimized or consolidated loads back to QAD Warehousing for further processing.

You set up default load optimization parameters in Load Optimization Setup Maint. When you specify a ship-to address or an item in Load Optimization Setup Maint, the system sets this field to Yes at order entry.

When Yes and QAD Warehousing is enabled, warehouse staff cannot pick for the order using Picklist/Pre-Shipper - Automatic (7.9.1), Distrib Order Picklist Print, or Sales Order Packing List.

You cannot set this field to Yes for sequenced customer schedules. You cannot change the value of this field if the picking process has already started for the order line that was selected for load optimization.

Use programs in the Wave Transportation Menu (4.15.2) to set up a load. Use Order Batch Selection to create a selection of order lines to be processed by the TMS. Use Order Batch Export/Load Import to export/import data from and to the TMS. Use Carrier Service Assignment Maint to assign carriers or other services for TMS load optimization calculations. Use Load Maintenance to create, edit, or delete loads in the system.

See Chapter 21, “TMS Interface,” on page 405

Other Order Data Maintenance Programs

You can access orders individually by type using any of the following:

- Use SO Warehouse Data Maintenance (4.13.3) to add specific warehouse details to the standard properties for sales orders.
- Use PO Warehouse Maintenance (4.13.4) to add specific warehouse details to the standard properties for purchase orders.
- Use IR Warehouse Data Maintenance (4.13.5) to add specific warehouse details to the standard properties for intersite requests.
- Use DO Warehouse Data Maintenance (4.13.6) to add specific warehouse details to the standard properties of distribution orders. These details include the priority for task assignment, the internal routing for the order, and the load sequence.

In each program, enter the site from which the items on this distribution order will be shipped. When items are shipped on the order, inventory is reduced at the order site. Most fields are similar to core system order maintenance programs. Unique fields are as follows:

Priority. This field assigns a priority value to transactions. RDTs select the highest priority task as the next action: the lower the number you specify, the lower the priority.

Load Sequence. Optionally enter the load ID. Load IDs identify groups of orders that are combined in one warehouse transaction. The load sequence appears on reports and inquiries.

Picked. Specify whether the items are picked or not. This field is used when you specify option 1 for the Shortage Definition field in Transaction Type Maintenance. Option 1 updates the order detail record when picking starts to indicate a shortage.

Pick Status. This field is used by bulk picking functions to indicate the current order status as one of the following:

Blank: Default Order Status

S: Selected for Bulk Picking

A: Approved for Bulk Picking

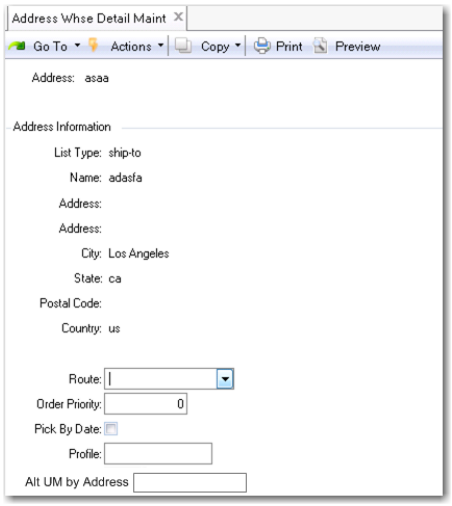
Load Optimization. Indicate if this order line is to be processed through load optimization functions in the Wave Transportation menu. See “Load Optimization” on page 252.

Adding Warehouse Data to Addresses

Use Address Whse Detail Maint (4.13.13) to add route, order priority, a date by which to pick items, and other data used in warehouse functions to company addresses or customer records.

To display details of an address, select an address code from the drop-down list.

Fig. 14.3
Address Whse Detail Maint (4.13.13)



Address. Specify a valid customer address.

The system displays the name, list type, address, city, and state of the customer, as well as postal code and country.

Route. Enter a route code to add route data for orders with specific routes in the warehouse. For example, if orders from a customer you specify in the Address field require a particular delivery area, specify a route that includes that area. You associate a route with an order in Order Warehouse Data Maintenance.

Order Priority. Enter the order priority for selecting orders for the warehouse associated with the specified address.

Pick By Date. Enter Yes to specify that picking and shipment of inventory to this address must be in strict FIFO order; otherwise, enter No.

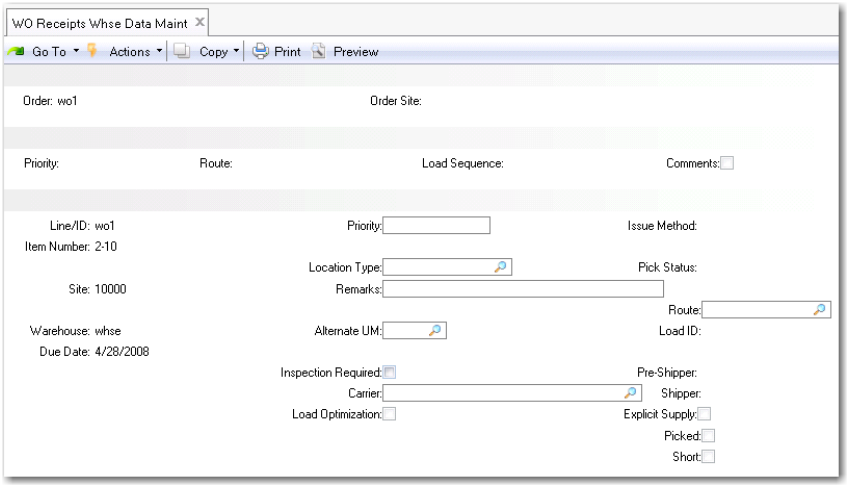
Profile. Enter a code up to eight characters that defines a particular profile for the address/customer. In QAD Warehousing, profiles provide an additional means to categorize and select orders to process and are not associated with system security profiles. For example, you can create a Top profile for all of your top customers, then select orders by this profile to process first or monitor until shipment.

Alt UM by Address. Enter a default alternate unit of measure by address as defined in Alternate Unit of Measure Maint (3.5.1). The system uses this field with the RF Receipts option to set the default alternate UM when warehouse staff scan a new pallet during a receipt. RF Receipts is the only function that uses this field. When this field is blank, the system does not default an alternate UM.

Adding Warehouse Details to WO Receipts

Use WO Receipts Whse Maintenance (4.13.8) to add specific warehouse details to the standard properties for the work order receipt of finished product.

Fig. 14.4
WO Receipts Whse Maintenance (4.13.8)



Generating Allocations for Orders

Use Order Warehouse Allocations (4.13.17) to generate general allocations for selected sales, work, and distribution orders. Allocations reserve inventory for shipment on confirmed orders, so it is not available for other orders in the system.

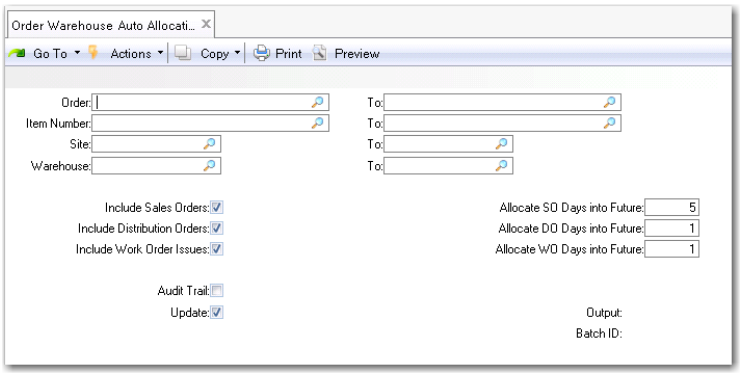
- General allocations reserve only the quantity needed at a particular site.
- Detail allocations set aside specific quantities by location, lot/serial, or reference numbers. Detail allocations are created automatically when picking.

Allocations also control shipment quantities when you cannot fill all orders. You can choose to ship the quantity allocated or the quantity picked.

The system calculates quantity available to allocate based on the calculation method specified in Order Management Control. The calculation is the same for all items and sites. The system only allocates inventory to order line items due within the number of days specified in the Allocate SO, DO, or WI Days into Future fields.

Using allocations is optional but recommended. Allocations and printed picklists give you control over which orders are shipped and when inventory can be allocated. Inventory balances are not decreased until a shipment is processed.

Fig. 14.5
Order Warehouse Auto Allocations (4.13.17)



Most fields are similar to those found throughout QAD Warehousing programs. Unique fields are described in the following topics.

Include Sales Orders. Indicate Yes to include sales orders with items to allocate.

Include Distribution Orders. Indicate Yes to include data from distribution orders with items to allocate.

Include Work Orders. Indicate Yes to include work orders with items to allocate.

Allocate SO Days into Future. Optionally, enter the number of calendar days until cutoff date for allocating sales orders items. Use this field to manually control allocations. The system allocates inventory only to line items due within this number of days.

Allocate DO Days into Future. Optionally, enter the number of calendar days until cutoff date for allocating distribution orders items. Use this field to manually control allocations. The system allocates inventory only to line items due within this number of days.

Allocate WO Days into Future. Optionally, enter the number of calendar days until cutoff date for allocating work order issue items. Use this field to manually control allocations. The system allocates inventory only to line items due within this number of days.

Using the .NET UI to View Order Data

You can use the following browses and browse collections in the .NET UI to monitor and view order data:

- Inbound Order Warehouse Browse (4.13.19)

  Lets you review all inbound orders pending to be received.
- Manage Inbound ASN Browse Collection

  Lets you review ASNs sent from suppliers.
- Manage Work Orders Browse Collection

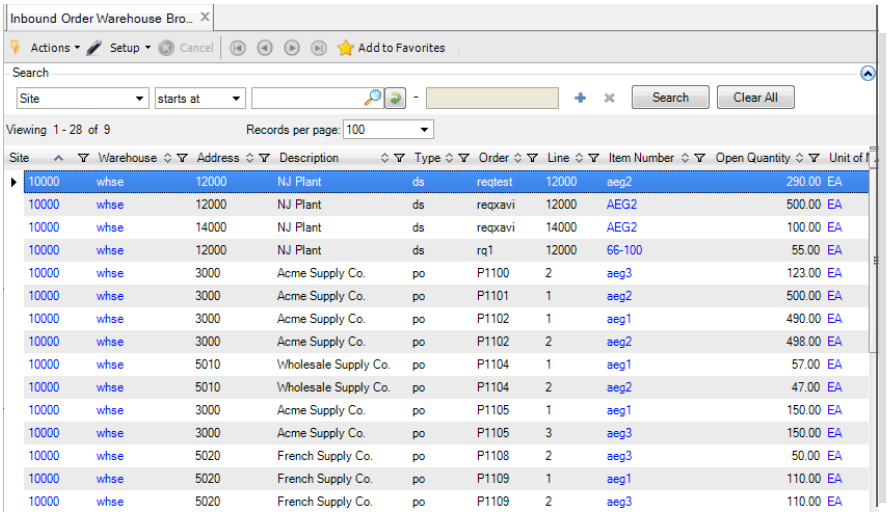
  Lets you review work orders releases to the shop floor for production.
- Manage Work Centers Browse Collection

  Lets you review work centers and inventory levels, linked to work orders released to the shop floor for production.

Inbound Order Warehouse Browse

You can use Inbound Order Warehouse Browse to review all open inbound orders. The system shows in a single browse all order types: purchase and distribution orders, sales order returns, and RMAs. This browse makes it easy to plan your receipt operations in a warehouse, regardless of the type of receipt.

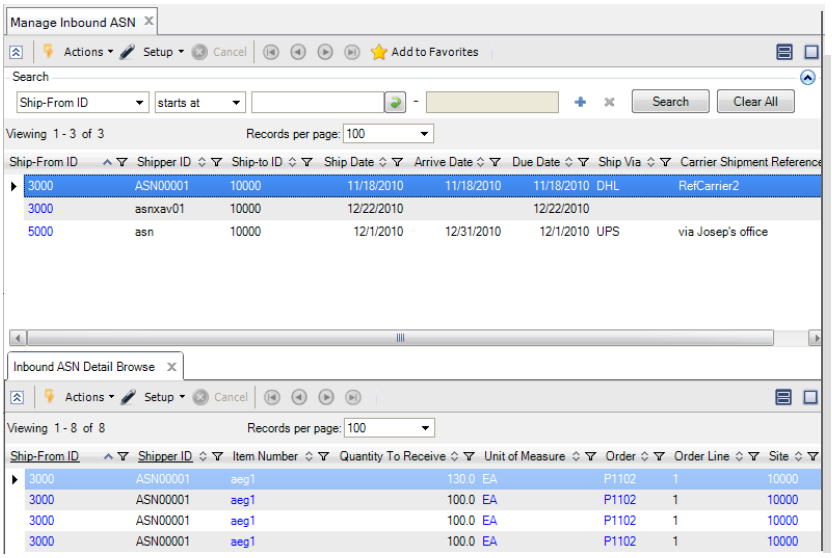
Fig. 14.6
Inbound Order Warehouse Browse



Manage Inbound ASN Browse Collection

Manage Inbound ASN browse collection shows all open ASNs as well as information about the contents of each ASN; for example, order line quantities and details of the individual pallets to receive. You can trigger the ASN receipt function directly from the browse collection.

Fig. 14.7
Manage Inbound ASN Browse Collection

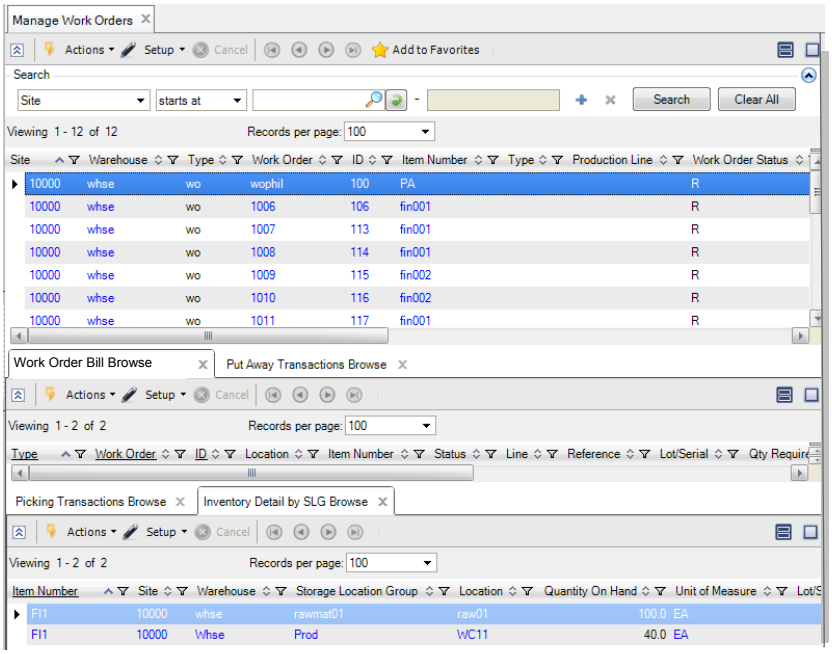


Manage Work Orders Browse Collection

Manage Work Orders browse collection helps you manage the flow of materials in a warehouse to ensure that staff can perform released production with minimal impact from unavailable inventory. You can select any work order released to the shop floor and review the different components required. Then, for each component, you can review the inventory levels as well as the picking transactions in the system. You can directly create picking transactions when the inventory is available or assign/prioritize existing transactions.

This browse collection also helps you manage the put-away transactions for each work order after production has been declared.

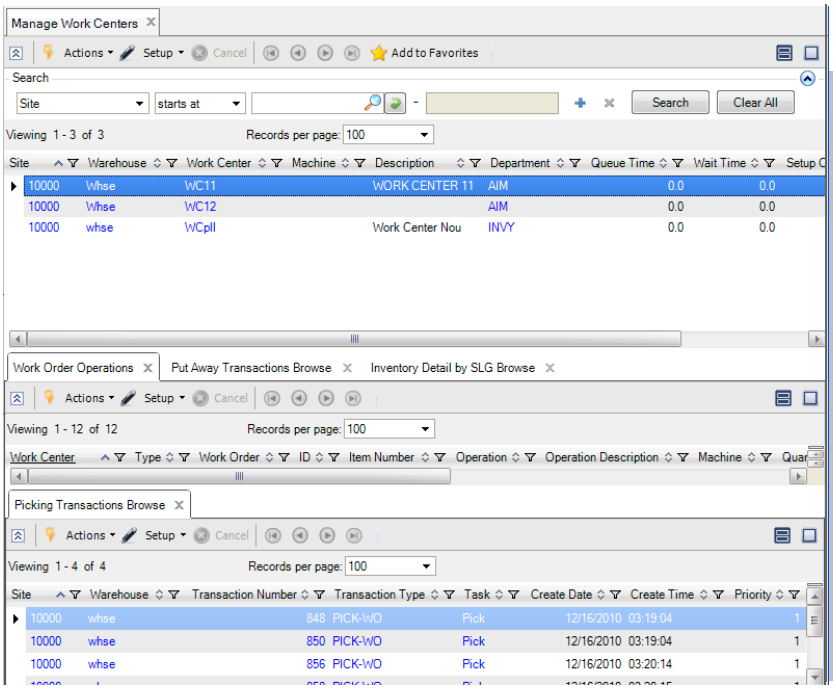
Fig. 14.8
Manage Work Orders Browse Collection



Manage Work Centers Browse Collection

Manage Work Centers browse collection helps you manage the flow of materials in all warehouse work centers. You can select any work center and review all operations belonging to released work orders that are assigned to this work center. Moreover, you can review the picking transactions linked to each operation, pending put-away transactions for the work center, and work center inventory levels.

Fig. 14.9
Manage Work Centers Browse Collection



Chapter 15

Replenishment

The following topics describe how QAD Warehousing handles the replenishment process for a warehouse:

Defining Replenishment 260
Defines the replenishment process and explains how and why it is used.

Linking Replenishment Lists to Items 263
Describes how to link replenishment lists to locations/items or storage location groups/items using either Replenishment Location Maintenance (4.16.5) or Replenishment SLG Maintenance (5.16.9).

Replenishment Request 264
Describes how to use Replenishment Request (4.16.13).

RF Real-Time Replenishment Request 265
Explains how to setup and execute RF Kanban Scan (1.5) and the prerequisites.

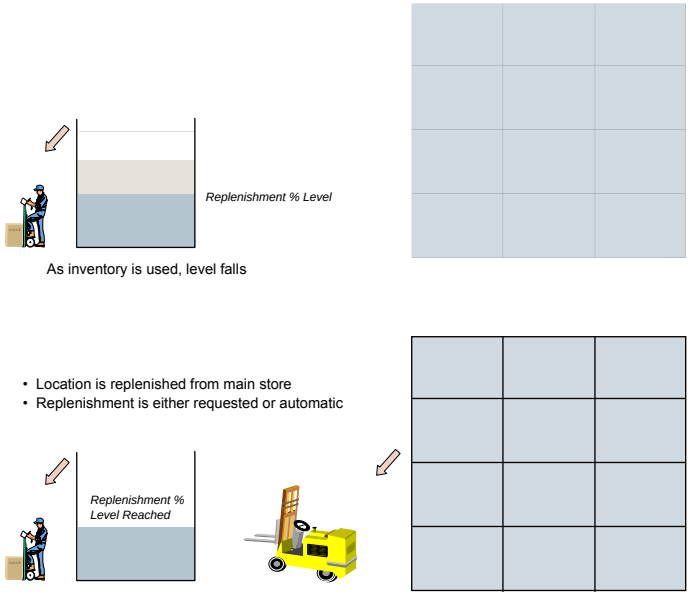
RF Overpick Replenishment and Put Away 266
Describes how to use RF devices to replenish locations.

Defining Replenishment

QAD Warehousing lets you define areas in the warehouse where the main picking activity occurs. In order for this area to be maintained at the optimum stock levels, the system uses a process called *replenishment*. The area in which stock is stored prior to picking is generally called the primary picking area. This area would typically contain the stock required for picking first and in quantities and locations that are easy to maintain.

You define the types of items and the quantities that can be stored in the replenishment, or primary picking, locations. Picking functions look in these locations first before searching the rest of the warehouse.

Fig. 15.1
Diagram of Replenishment



Using the put-away algorithms and storage techniques, you can divide the stock into areas each consisting of common units of storage.

Example You can have an area holding pallets, one holding cartons, and one holding piece quantities. The carton locations are stocked from split pallets, and the piece locations from the carton area. This is performed by the replenishment functionality. Using this process optimizes the picking process and creates areas of the warehouse where fork-lift trucks can operate, and areas where people can walk and gather stock.

Note You can still mix pallets and pieces in the same location, if you want to.

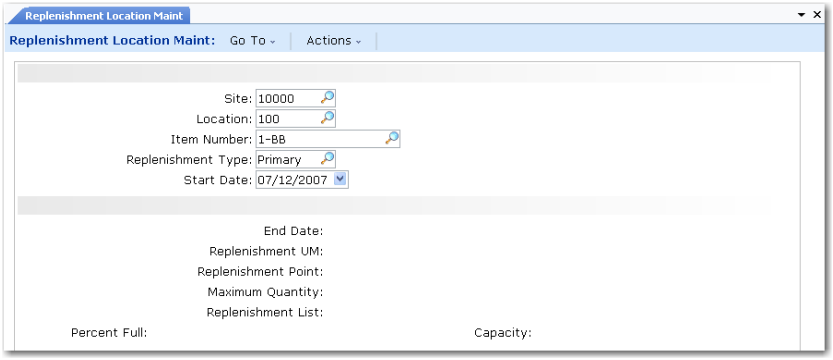
Using warehouse features, you can define:

- Replenishment for a given item and a given location.
- Replenishment for a given item in a storage location group. This means that a put-away is performed in the storage location group in order to place the items at the best suitable location inside this storage location group.

- Replenishment lists. A series of storage location groups in which the system looks for the item to replenish. Sequences allow searching some storage location groups first and then others by order corresponding to the sequence.
- Replenishment in real-time on the RF.
- Overpick Replenishment. Warehouse staff can select a multi- or single-item pallet from the reserve area and replenish one or multiple locations from the pallet in the picking area. After staff replenish, they can return the remainder on the pallet to the reserve area.

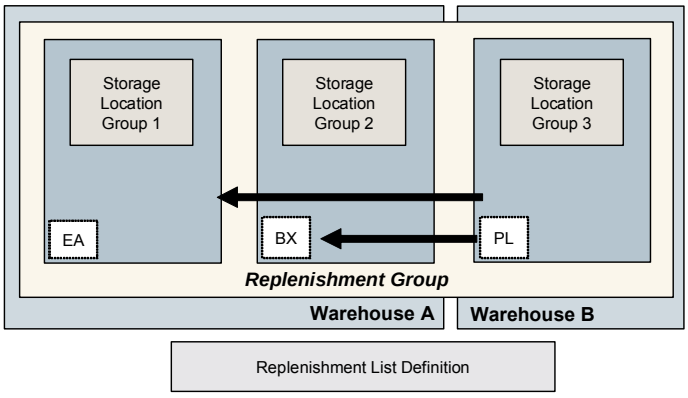
You define a list using Replenishment List Maintenance (4.16.1), shown in Figure 15.2.

Fig. 15.2
Replenishment List Maintenance (4.16.5)



The following examples illustrate types of replenishment lists that you can set up.

Fig. 15.3
First Sample Replenishment List



Replenishment list definition:

Warehouse	Storage Location Group	Sequence
Warehouse A	Group 2	20
Warehouse B	Group 3	30

This means that whenever storage location group 1 must be replenished, the system first looks in storage location group 3. If the item is available, it is replenished according to the picking definition associated with the storage location group.

See “Picking Multiple UM” on page 62.

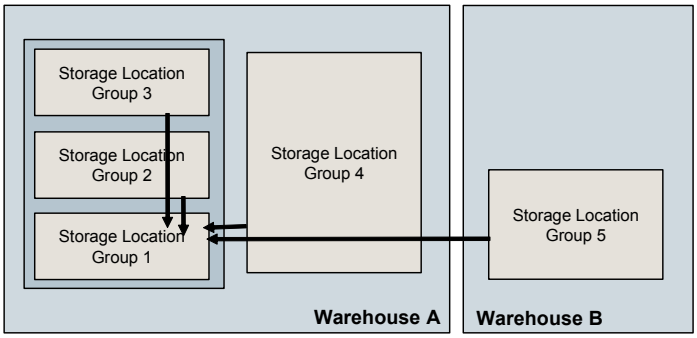
If the item is not available in this storage location group, then the system looks in storage location group 2, which can be in another warehouse, as shown in Figure 15.3.

If storage location group 2 must be replenished from storage location 3, you would define the replenishment list as shown in the following table:

Warehouse	Storage Location Group	Sequence
Warehouse B	Group 3	20

The second replenishment list example is shown in Figure 15.4.

Fig. 15.4
Second Sample Replenishment List



In this second example, storage location group 1 is replenished from storage location groups 2, 3, 4, and 5. Storage location group 2 can be replenished from storage location groups 1,3,4,5, and so on. To match this example and define the replenishment for storage location group 1, you would have to define the following replenishment list:

Warehouse	Storage Location Group	Sequence
Warehouse A	Group 2	20
Warehouse A	Group 3	30
Warehouse A	Group 4	40
Warehouse B	Group 5	50

At the item/storage location group level, you must define the replenishment list to use in order to replenish the item from storage location group 1.

For storage location group 2, you would define the following replenishment list, attached in the item/storage location group record in the Replenishment List field.

Replenishment list definition:

Warehouse	Storage Location Group	Sequence
Warehouse A	Group 1	20
Warehouse A	Group 3	30
Warehouse A	Group 4	40
Warehouse B	Group 5	50

Linking Replenishment Lists to Items

When you have created a replenishment list, you must link it to the location/item or storage location group/item using either:

- Replenishment Location Maintenance (4.16.5)
- Replenishment SLG Maintenance (4.16.9)

In each of these functions, you can enter the information for these fields:

Site. The site in which the location/SLG resides. You must complete this field.

Location/Storage Group Location. The name of the location or SLG. If you leave this field blank, the replenishment list is applied to all locations or SLGs at the site.

Item Number. The item to replenish.

Replenishment Type. A set of replenishment fields that you can apply to one or more items.

Start Date. If you want the location to be replenished on a specific date, enter the start date. Otherwise, leave the field blank.

End Date. If you want the location to be replenished by a specific date, enter the end date. Otherwise, leave the field blank.

Replenishment UM. The conversion factor between the UM for the location and the UM for the item. For example, you could have 1 PL = 100 EA, and you could define the Maximum Quantity = 2 PL. This would mean that the maximum quantity for the base UM of an item would be 200 EA.

Replenishment Point. Enter the quantity of stock at which the location should be replenished. See the next section for an explanation of the replenishment point.

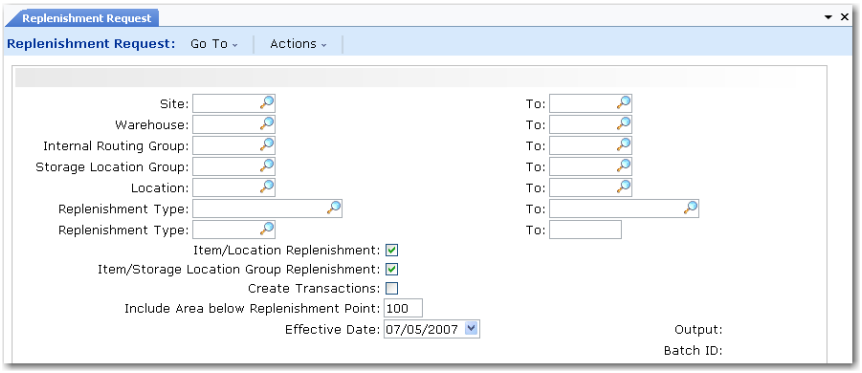
Maximum Quantity. The maximum quantity by which the location can be replenished. Leave this field blank to allow any quantity.

Replenishment list. Enter the name of the replenishment list to link to this location.

Replenishment Request

When you have created a replenishment list and linked it to a location or storage location group, you can start a Replenishment Request (4.16.13).

Fig. 15.5
Replenishment Request (4.16.13)



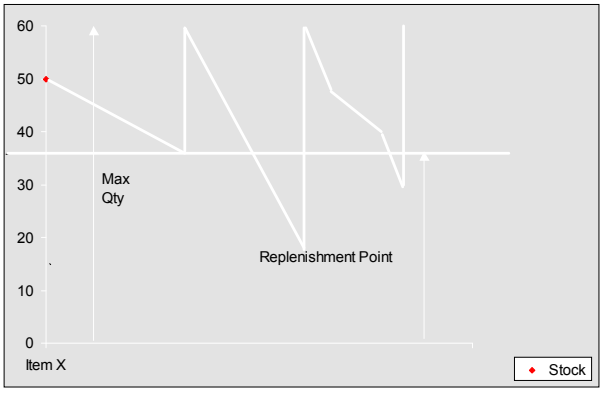
This function lets you:

- Run a simulation of the replenishment. By default, the Create Transactions field is set to No. You can then run a report to look at all the replenishments to be done, simulate a picking, and generate a list of all potential transactions, without actually creating the transactions. You can run this report several times using different percentages each time, until you select a quantity of work that can be handled by the current staffing levels.
- When you are satisfied that the replenishment report contains a manageable workload, change the Create Transactions field to Yes, and then run the report again.

The field Include Area Below Replenishment Point enables you to adjust the value of the replenishment point defined in Replenishment-Location Maintenance or Replenishment-SLG Maintenance.

Figure 15.6 explains the principle of replenishment for a location.

Fig. 15.6
Location Replenishment



When the inventory for a given item in a given location stays above the replenishment point, running the replenishment has no effect. When an inventory movement makes the inventory in that location drop below the replenishment point, running the replenishment request with Create Transactions set to No tries to find available stock for the replenishment. The Include Area Below Replenishment Point field enables you to change the value of the replenishment point. This is a way to have fewer transactions to carry out if the load is too high.

Example The warehouse has an item A with the following details:

- Replenishment details:
  - Maximum quantity 100
  - Replenishment point 50
- Location details:
  - On-hand quantity 20

Therefore, if the stock is below the replenishment point—20 being less than 50—replenishment can take place.

If you change the value of the Include Area Below Replenishment Point field to 20%, the new replenishment point is:

*20 / 100 * 50 = 10*

This time, the on-hand quantity is greater than the replenishment point, so replenishment does not take place.

RF Real-Time Replenishment Request

With replenishment functionality, warehouse staff define a minimum level of inventory for an item in a location. As soon as the system issues inventory and stock drops below the minimum level, a replenishment task is created for staff to move inventory from the main storage area to the location to be replenished. Inventory is successfully replenished in this way except during a work order backflush. During a backflush, the system does not issue inventory until the receipt of the quantity of end items. Because time can lapse between when items are actually issued from inventory and when the system backflushes items, it is possible to run out of stock before the system is aware of the actual level.

Warehouse staff can use the RF Kanban Scan (1.5) to correct this and manually request replenishment of a specified quantity of an item. They can also use RF Kanban Scan when they need an item in the production area but warehouse staff are not picking the item.

Setup

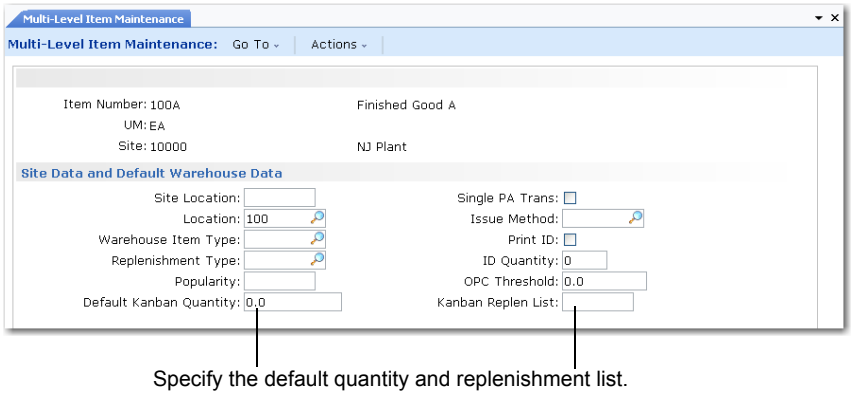
Before you run Kanban Scan, you specify the following in the Site Data and Default Warehouse Data frame in Multi-Level Item Maintenance (4.4.5):

- Replenishment list
- Default quantity to replenish

The replenishment list contains SLGs you want to consider for picking the scanned item. You create the list in Replenishment List Maintenance (4.16.1)

See “Defining Replenishment” on page 260.

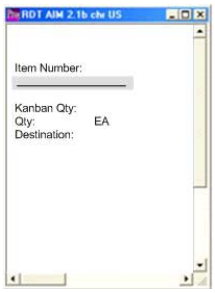
Fig. 15.7
Multi-Level Item Maintenance (4.4.5)



Running Kanban Scan

To run the RF Kanban Scan, warehouse staff scan the item, enter the quantity required, and scan the destination location; see Figure 15.8. This notifies the system that an item requires replenishment and creates a replenishment task for it at the correct time. A default quantity displays in the Kanban Qty field if you specified a default quantity in Multi-Level Item Maintenance (4.4.5). Warehouse staff enter the actual quantity in the Qty field.

Fig. 15.8
RF Scan Kanban Function



The system dynamically creates an item-location replenishment definition for the duration of the scan and a replenishment task for the quantity required, and then removes the definition from the system.

RF Overpick Replenishment and Put Away

Using the RF, warehouse staff can select a multi- or single-item pallet from the reserve area and replenish one or multiple locations from the pallet in the picking area. After staff replenish, they can return the remainder on the pallet to the reserve area.

Staff select a complete pallet, then replenish in the home (dedicated) location. If you set up the system to use the RF pallet overpick program, the system is now using overpick logic. The quantity to replenish in the location displays on the RF, but staff typically put as much as they can into the home location. The remainder of the pallet that is not used for replenishment is returned to

stock using put-away logic. For this reason, this functionality is termed *overpick replenishment and put away*. Staff can return items individually from a multi-item pallet or return the complete pallet.

Note Staff can also put away in an overflow area as long as you specify the correct put-away algorithm for this area. See “Put-Away Algorithms” on page 116.

Once the user selects the pallet, all stock that the user picks is moved to the user location. Transferring stock to the user location avoids errors should other warehouse staff have to recount the source location before the replenishment movement is completed. If the system sees stock is in the source location and not in the user location when the recount starts, the quantities would be in error.

Using the single pallet, the user can optionally:

- Meet the total replenishment requirement for a pick.
- Replenish more than the total replenishment requirement for a pick.
- Replenish less than the total requirement for a pick.

When replenishing beyond the requirement, the system still considers the task complete. When replenishing less than the total requirement, the replenishment is not complete and the status of the replenishment task is open and required.

Transactions

The system records a pick-replenishment transaction (PICK-RE) for the replenishment task and a return put-away transaction (RCT-BACK) for the returned pallet and put-away task.

RCT-BACK is similar to an on-the-fly transfer transaction (OTF-TR). The RCT-BACK transaction typically has one step in the reserve area to put away stock. This is because in most warehouses, both the reserve area and detail picking area are part of a general storage area. This makes it possible to have a single step within that storage area.

You must link the transactions to an internal routing using Internal Routing Assignment Maintenance (4.2.9). In most cases, you can link to the same internal routing as that defined for the OTF-TR transaction type.

See page 52.

For the return to stock movement, you must link a put-away (PA) algorithm to the RCT-BACK transaction type in Algorithm Assignment Maintenance (4.6.9).

See “Algorithm Assignment” on page 108.

Replenishment for a Wave

When a replenishment is linked to a wave, the RF displays a `W` next to items. The system links a replenishment task to a wave when:

- You run Wave Replenishment (4.15.6) for that wave.
- A standard replenishment task that is based on min/max levels considers the item a requirement for another wave. See “Replenishing a Wave” on page 350.

Note When you run Wave Replenishment, the system considers the requirement for the item on the wave and all open waves that require the item.

Overpick Replenishment Setup

To use the overpick replenishment and put-away feature, you must:

- Create the transactions and link them to internal routings and algorithms. See page 267.
- Specify a user location. See page 295.
- If replenishing and putting away for a wave, you must create a wave replenishment list and specify the list in Wave Planning Control (4.15.1.24). See page 340.
- Set up a multi-item pallet. See page 268.
- Define the program called when warehouse staff replenish and then return items that are not picked. See page 268.

Multi-Item Pallet Setup

You must take extra steps to set up a multi-item pallet. The put-away process for a multi-item pallet is for the item linked to the UM that you define in Alternate Unit of Measure Maintenance (4.5.1).

In Alternate Unit of Measure Maintenance, the Item Number field indicates the multi-item pallet item. You must also define this pallet item in the following menu options:

- Item Master Maintenance (1.4.1)
- Item-Site Planning Maintenance (1.4.17), if the site is different than the site in Item Master Maintenance
- Item-Warehouse Maintenance (4.4.11)

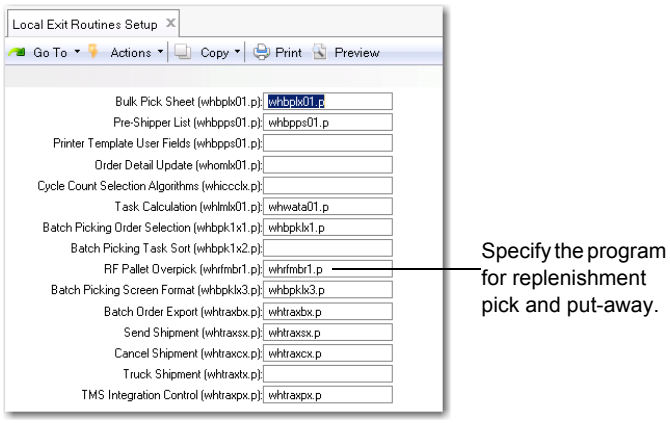
The system conducts the put-away for a multi-item pallet in the SLG or an SLG in the SLG list that is linked to the pallet item. When you define a pallet item and link it to a UM in Alternate Unit of Measure Maintenance, the put-away logic considers the multi-item pallet a single, whole item and the put-away is for the pallet as a whole; otherwise, the put-away logic may put away each item to different SLGs.

Defining the Replenishment Overpick Program

You specify the correct program in the RF Pallet Overpick (whrfmbr1.p) field in Local Exit Routine Setup (4.23.10). The `whfmbr1.p` program is included with the system and used by default. If you do not specify a program in this field, the standard replenishment program is used for the RF Next Task/Select Task option.

See “Local Exit Routines Setup” on page 182.

Fig. 15.9
Local Exit Routines Setup (4.23.10)



RF Pallet Overpick (whrfmbr1.p). Specify the overpick program that runs during replenishment so that warehouse staff can pick the exact required amount, overpick to fill bins, and return items that are not picked.

When you specify the `whrfmbr1.p` default program, the system resets Allow Split Replen in Wave Planning Control (4.15.1.24) to Yes. This forces the pallet to be splittable, and the system can create a task for the exact quantity required.

Example 12 EA are needed on a pallet of 100 EA. The system creates a task for 12 EA. The `whrfmbr1.p` overpick replenishment program lets the user know that 12 EA is the required quantity, but the user puts away as much as can fit into the bin, regardless of the required amount.

If the pallet is not splittable, then overpicking depends on the setting of the Replenishment OverPick field in Wave Planning Control (4.15.1.24). If set to Yes, the system creates a task to pick for the entire pallet of 100 EA. This does not indicate the exact quantity required nor the amount that would fill the bin.

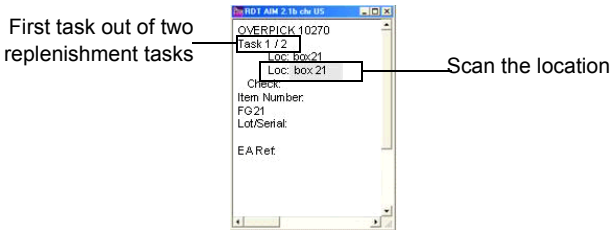
See “Replenishment OverPick” on page 337.

Replenish Procedure

The following procedure illustrates how to replenish from a single pallet and return unused quantities from the RF. Although you can perform this task with the RF Select Task function (1.2), the following procedure uses the Next Task (1.1) function.

Figure 15.10 shows the initial RF screen that displays to perform replenishment pick and put-away.

Fig. 15.10
RF Overpick Screen



1 Log in to the RF and enter your ID, password, site, warehouse, and if applicable, your work location group.

2 Select Work (1), then Next Task (1.1).

The RF displays the Overpick screen; see Figure 15.10.

Note If the system displays other tasks, cancel the Next Task program, return to the RF login screen, and enter REPLEN in the Login screen's Task field; then select Work (1), then Next Task (1.1).

3 To pick for the replenishment, scan the source location, then scan the pallet number.

The RF displays the number of replenishment tasks to perform for the pallet in the counter at the top; see Figure 15.10.

4 To replenish a bin, scan the destination location, then scan the items.

The system prompts for the quantity in the base UM; see Figure 15.11.

5 Enter the quantity that fits into the location, attempting to completely fill the location:

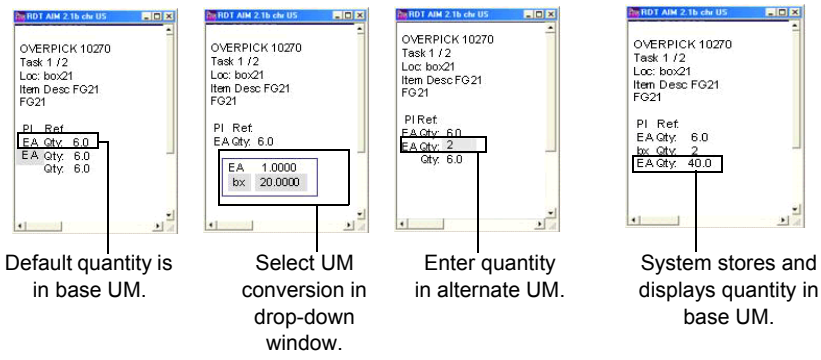
- **a** On the RF, scroll down to select the UM/Conversion drop-down window.
- **b** Select the Alternate UM.
- **c** Enter the quantity in the alternate UM.

  The system stores the quantity and displays the quantity in the base UM; see Figure 15.11.

6 Confirm the quantity.

7 Repeat steps 3 though 6 for multiple replenishment from the pallet.

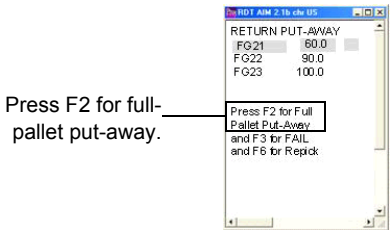
Fig. 15.11
RF Overpick, Quantity Conversion



Return Put-Away Procedure

When staff complete all replenishment tasks from the single pallet, the RF automatically displays the Return Put-Away screen; see Figure 15.12. The following procedure shows how to return unused quantities one item at a time from the RF once you finish replenishing.

Fig. 15.12
RF Return Put-Away Option



1 Return the pallet to the stock area.

2 On the RF, press F2.

The RF prompts you to enter or scan the destination location; see Figure 15.13.

3 Choose one of the following:

a Scan or enter the destination location.

b If a warehouse defaults in the Location field, place your cursor on the warehouse; then press Return.

Pressing Return in the Location field indicates that the system should find the return location in the warehouse to start the put-away.

Note You can set up locations in the SLG list that are either the home location or locations that are closest to the home location to decrease travel time. Define the SLG list with the home location or the location closest to the home in the first sequence so that the system checks for this location in each SLG first. See “Storage Location Group List Maintenance” on page 63.

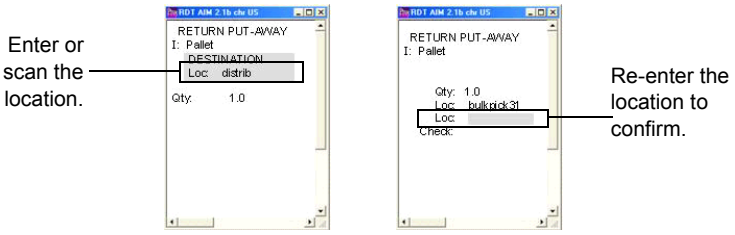
The RF prompts you to confirm the location.

4 Confirm the destination location by re-entering the location.

5 Put away the item.

6 Repeat steps 1 through 5 for all items remaining on the pallet.

Fig. 15.13
RF Put-Away Location Prompt



Handling Exceptions

During the replenishment process, warehouse staff handle exceptions and issues.

Staff can press F3 once they are in the RF Overpick menu. The system prompts to:

- Complete the task.
- Fail the task.
- Repick the task.

If staff fail the task, the system creates a recount task for the user. You can use Inventory Detail Inquiry (4.9.13) to display the failed tasks for the location and the item and Warehouse Transaction Inquiry (4.9.1) to display the new recount task.

During replenishment, if the quantity on the pallet is less than the quantity needed to replenish, the system displays an R next to the item to repick the missing items. Staff can press F6 to repick the item.

Chapter 16

Bulk Picking

QAD Warehousing lets you group several different work, sales, or distribution orders containing the same item, and then pick a bulk amount of stock, regardless of order. This process is called *bulk picking.* The following topics describe how bulk picking works.

About Bulk Picking 274
Discusses bulk picking.

Key Concepts 274
Illustrates the key concepts of bulk picking, including bulk pick details, load ID, temporary sequence ID, and pre-shipper ID.

Setting Up Bulk Picking 275
Outlines Bulk Picking Control (4.14.24) and its uses.

Processing Bulk Pick Orders 278
Describes the basic bulk pick workflow and discusses how to select and approve order lines for bulk pricing, modify and print bulk pick orders, create pre-shippers, and confirm transactions.

Shipping Bulk Pick Orders 283
Discusses the processes involved in preparing bulk-picked items for shipping, including a shipment workflow, obtaining shipper numbers, and issuing goods.

Displaying Bulk Pick Data 285
Lists and describes the inquiries and reports used to display buck pick data.

Archiving/Deleting Empty Bulk Picks 285
Describes how to use Empty Bulk Pick Delete/Archive (4.14.23) to delete or archive bulk packing data that is no longer needed.

About Bulk Picking

In a warehouse, it is inefficient if staff have to visit the same area more than once in a short period of time. Picking stock needs to be managed so that this happens as little as possible. The orders that can be collected to form a bulk pick are sales, distribution, and works orders.

When orders are created, you can optionally group them together into *routes*. You can request orders by route, so that all orders for a particular delivery area can be picked together. When creating sales orders, the route can be defined by customer and the ship-to address. For distribution orders the route can be defined by customer and the ship-to site address. Works orders can be grouped together in a similar way.

These bulk picks accumulate the items together, and, using the defined picking rules, issue the instructions to the staff to pick the stock. Efficiency is improved by grouping the orders, since the detail allocations are examined and, if necessary, the allocations rationalized. There is no direct link between orders in a bulk pick, other than the fact that they have items in common and can thus be grouped together.

By using replenishment and viewing the planned bulk pick, the stock position can be viewed and stock moved so that the bulk pick is performed as efficiently as possible.

Orders that need packing are grouped by issuing instructions to the warehouse staff to group the orders prior to shipment. This allows pallets to be made up.

Sales orders for the same ship-to address or distribution orders for the same ship-to site address can be grouped, forming one consolidated pack list. This can then be used to decide the packing of the order.

By setting control fields, you can choose whether the bulk pick is either shipped or issued as part of the bulk pick process, or issued as individual orders using standard system work order component issues and sales or distribution order shipment routines.

Bulk picking supports both two-phase and single-phase methods. At each step, the quantity picked, location, lot/serial, and reference can be manually modified.

Note Bulk picking supports configured products for type KIT, but not for type ATO (Assembled to Order). Bulk picking does not support Enterprise Material Transfer (EMT) order processing. For more information on EMT, see *QAD Sales User Guide*.

Key Concepts

A major key to understanding how bulk picking works is the relationship between a bulk pick number, bulk pick details, temporary sequence IDs during order line selection, load IDs, and pre-shipper IDs.

Bulk Pick Details

Bulk pick details form a link between a warehouse transaction and one or more detail allocations. Bulk pick details are generated when you approve the order selection. The system generates a single bulk pick number to contain all bulk pick details that result from a single approval.

Load ID

All order lines with the same load ID are combined, if possible, in the same warehouse transaction. The load ID is automatically generated when you select the order line for inclusion in a bulk pick. Multiple bulk pick details can still result from a single load ID.

If different item numbers are grouped within one load ID, they generate separate warehouse pick transactions. The way transactions are created for multiple order lines for the same item number that are grouped within one load ID depends on the issue method:

- DISCRETE: Generates a separate transaction for each order line.
- ADDRESS: Generates a separate transaction per ship-to address.
- ROUTE: Generates a separate transaction per route code.
- BULK: Generates a single transaction for the entire load ID. This assumes that the entire requirement can be satisfied from a single location. If it cannot, then the requirement is satisfied according to the picking algorithms and rules.
- ORDTYPE: Generates a separate transaction per order type, grouping all the sales orders, work orders, and distribution orders together.
- MEMO: Does not generate transactions. Use this issue method for sales order lines with memo items. Memo items do not update inventory.

Temporary Sequence ID

When you select order lines, rather than generating all load IDs at the start, order lines are grouped by temporary sequence ID. This lets you group order lines together without having to assign them load IDs. When you accept the selections and groupings, the load IDs are generated, assigning one per temporary sequence ID.

Pre-Shipper ID

Pre-shipper IDs are not generated until you approve the order. One pre-shipper ID is assigned for each combination of any or all of the following:

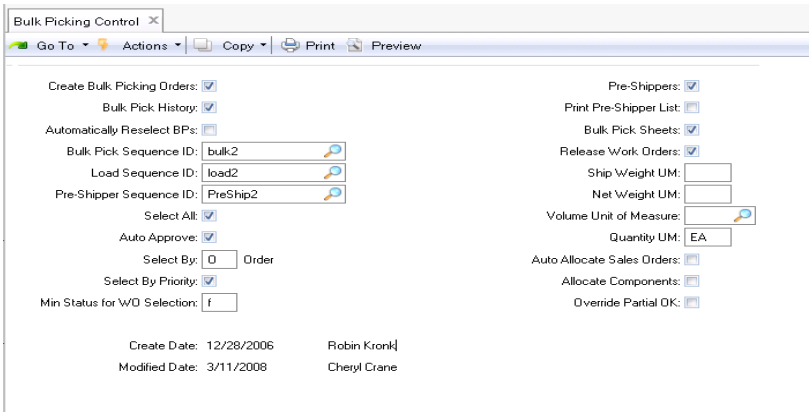
- Load ID
- Site
- Order type
- Ship-to address

The pre-shipper IDs that are then associated with each order line are only effective and converted to shipper IDs when the transfer of picked inventory reaches a step in an internal routing with the Create Shippers field set to Yes.

Setting Up Bulk Picking

Use Bulk Picking Control (4.14.24) to set parameters for bulk picking and to set default values for other bulk pick programs.

Fig. 16.1
Bulk Picking Control (4.14.24)



Complete the fields as follows:

Create Bulk Picking Orders. If set to Yes (the default), bulk picking orders are created automatically in the Bulk Pick Selection and Approval programs.

Bulk Pick History. Indicate whether to keep history of all bulk pick details processed.

Automatically Reselect BPs. If set to Yes, whenever an order line has been approved but not picked, the order line is automatically reselected (pick status set to S) for future bulk pick approval.

Bulk Pick Sequence ID. Identify the number range management (NRM) sequence ID to use for creating bulk picking order numbers. If not correctly defined, it is not possible to create bulk picking orders. You create bulk picking sequences in Sequence Definition Maintenance (4.23.1). See “Sequence Definition” on page 180.

Load Sequence ID. Identify the NRM sequence ID to use for defining load IDs. If not correctly defined, it is not possible to create bulk picking orders. You create load sequences in Sequence Definition Maintenance (4.23.1).

Pre-Shipper Sequence ID. Identify the NRM sequence ID to use for creating pre-shipper numbers. If not correctly defined, it is not possible to create bulk picking orders.You create pre-shipper sequences in Sequence Definition Maintenance (4.23.1).

Note This system does not use this field to create SO or DO pre-shippers. The system creates data in bulk picking tables for later printing of pre-shippers.

Select All. If set to Yes, the automatically calculated load ID assignments are used for selection. If set to No, a window is displayed in the selection and approval programs enabling you to include and exclude selected order lines, and to manipulate which order line is assigned to each load ID.

Auto Approve. If set to Yes, the selected order lines are automatically approved.

Select By. You can set this to A (Address), O (Order), P (Part), or R (Route).

Select by Priority. If set to Yes, order lines are selected within the address, order, part, or route selection by priority, and then by due date. If set to No, the subselection is by due date and then priority.

Min Status for WO Selection. This field enables you to enter the minimum status needed for work orders selection.

You can set this to A (Allocated), B (Batch), E (Exploded), F (Firm), P (Planned), or R (Released).

Pre-Shippers. If set to Yes (the default), a pre-shipper ID is automatically generated and assigned to each line in the selection and approval programs. See “Printing Bulk Pick Orders” on page 282 for more details.

Print Pre-Shipper List. When Pre-Shippers is Yes, indicate if a list of generated pre-shippers should also print.

Bulk Pick-Sheets. If set to Yes (the default), bulk pick sheets are automatically created in the selection and approval programs.

Release Work Orders. If set to Yes (the default), work orders are automatically released for the bulk pick.

Ship Weight UM. Enter the default UM for the shipping weight of bulk pick orders.

Net Weight UM. Enter the default UM for the net weight of bulk pick orders.

Volume Unit of Measure. Enter the default UM for the volume of bulk pick orders.

Quantity UM. Enter the default UM for the quantity of bulk pick orders.

Auto All Sales Orders. If set to Yes, the system performs general allocations for sales order lines that are not yet generally allocated at the time the bulk picking process is run. Allocations depend on the settings in Sales Order Control (7.1.24).

Allocate Components. Indicate whether the system automatically applies pick logic and creates detail inventory allocations for components of configured kits.

Yes: The system creates detail allocations for confirmed sales order lines.

No: The system uses sales order line site for the site and default item location. In both cases, the quantity to ship for a component is determined by the quantity open for the configured kit item, and not the quantity available to allocate for component.

Modify detail allocations for components of configured kits in Pre-Shipper/Shipper Workbench (7.9.2).

Override Partial OK. Indicate whether the system overrides the sales order Partial OK field setting in Sales Order Maintenance. When Partial OK is Yes, the system prints a packing list and lets you make shipments when the entire quantity is not available. When Partial OK is No, the system checks that all line items are available for shipping before printing a packing list. If they are not, you cannot print a packing list for the order.

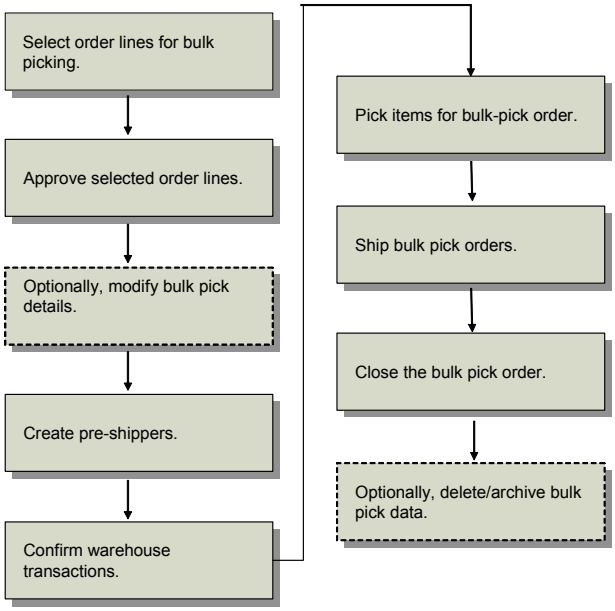
No (the default): Do not override the Partial OK setting.

Yes: Override the Partial OK setting and reset it to Yes. You can print a packing list and create a partial shipment for the customer. You can ship the remainder of the order when items are available.

Processing Bulk Pick Orders

The basic processing flow for bulk picking is shown in the following figure. Topics following the diagram detail each step.

Fig. 16.2
Basic Bulk Pick Workflow



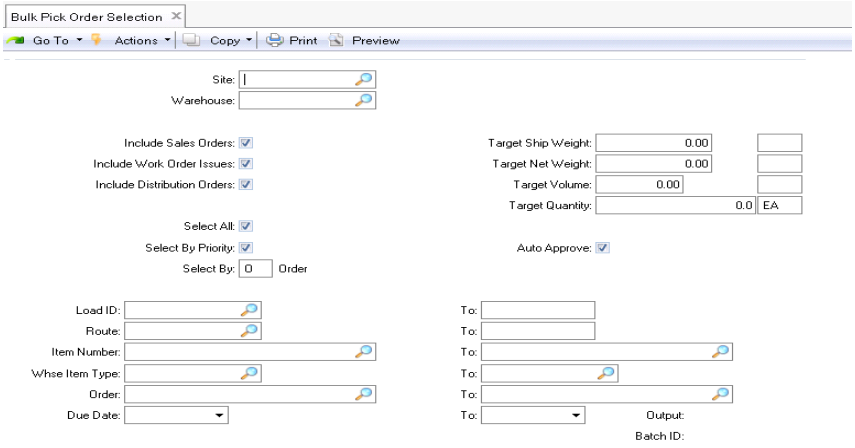
Each of the steps from selecting order lines for bulk picking through picking items for bulk-pick orders is discussed as a separate topic. Shipping bulk pick orders and archiving bulk pick data are separate topics that follow.

Selecting Order Lines for Bulk Picking

Use Bulk Pick Order Selection (4.14.1) to select orders for a bulk pick.

When you select order lines, the system sets the picking status to S (for selected). Selected order lines are automatically general allocated. Selecting work order components results in the selected work order being upgraded to a status of A (Allocated).

Fig. 16.3
Bulk Pick Order Selection (4.14.1)



1 Enter the site and warehouse.

2 Most of the fields are set to default values, determined by Bulk Picking Control. You can change these defaults as needed; for example, you can choose to exclude certain kinds of orders.

- If the Select All field is set to No, a window is displayed in which you can manually assign order lines to load IDs.
- The field Select By lets you display the selected order lines by address (A), order (O), part (P) or route (R).
- If you enter the target weight, volume, and quantity for the bulk pick, a new load ID is automatically created after the target weight is reached.
- If the Auto Approve field is set to No, you must run Bulk Pick Selection Approval (4.14.4) in order to perform the picking; otherwise, the order approval process is executed right after the selection process.

See “Setting Up Bulk Picking” on page 275.

Depending on the settings in the first Bulk Pick Order Selection screen, a new window with additional options can display; see Figure 16.4 on page 280. The setting for each of these additional options defaults from the same-named option in Bulk Picking Control.

See page 277.

3 The fields at the bottom of the frame let you specify the range of lines from the orders that should be included in the bulk pick:

Load ID/To. If you leave this field blank, the system generates a load ID automatically. If you enter a range of load IDs, the system selects order lines with load IDs within the range. This is also true when you reselect orders lines that warehouse staff partially picked.

Route/To. Enter a range of routes if you want to include orders only from specific routes.

Item Number/To. Enter a range of item numbers if you want to include only order lines containing the items in the range in the bulk pick. Otherwise, leave these fields blank.

Warehouse Item Type/To. Enter a warehouse item type if you want to include only order lines containing this group of items in the bulk pick. Otherwise, leave these fields blank.

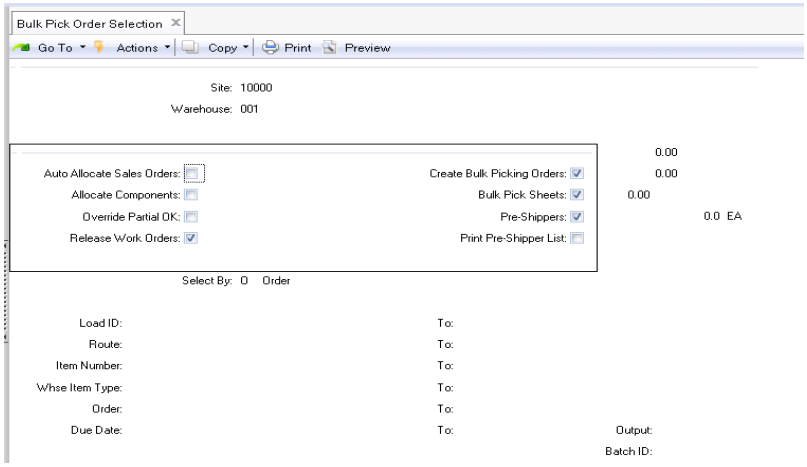
Order and To. Enter a range of order numbers if you want to include lines only from specific orders.

Due Date and To. Enter a range of due dates on which the bulk pick should be carried out.

4 In the Output field, select whether you want to save, display, or print the bulk pick details.

To deselect an order from a bulk pick, use Bulk Pick Order Deselection (4.14.2). This program is only for deselection and can only be used before approving the bulk pick selection.

Fig. 16.4
Bulk Pick Order Selection, Options

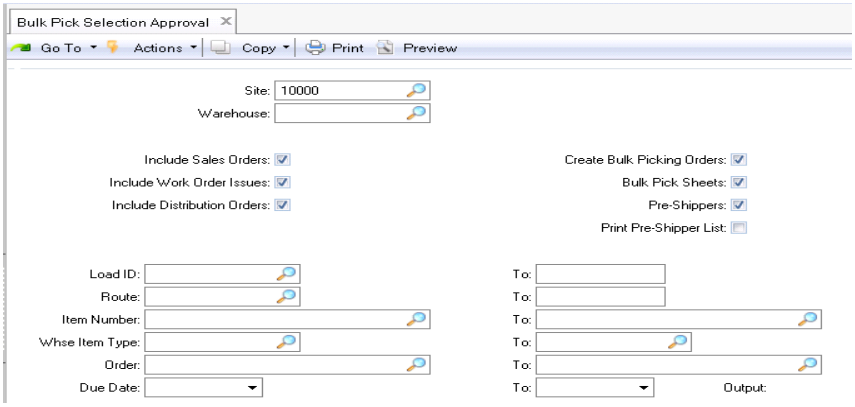


Approving Selected Order Lines

Use Bulk Pick Selection Approval (4.14.4) to approve a set of order lines that you have previously selected for a bulk pick, and to create bulk pick transactions for them.

When you approve selected order lines, you change the status from S to A (approved). Once approved, the system creates detail allocations, bulk pick details, and warehouse transactions. When you approve selected work order components, you can upgrade the approved work order's status to R (Released).

Fig. 16.5
Bulk Pick Selection Approval (4.14.4)



Site, Warehouse. Enter the site and warehouse.

Sales Orders, Work Order Issues, Distribution Orders. Select the type of orders for the bulk pick.

Create Bulk Picking Orders. If set to No, standard picking is performed with each created detail allocation resulting in a separate warehouse transaction. If set to Yes (the default), a bulk picking order is created letting you regroup detail pickings for the same warehouse transaction. To do this, you must first define a valid bulk pick sequence ID in Bulk Picking Control (4.14.24).

Bulk Pick Sheets. If set to Yes, a Bulk Pick Sheets Report is printed.

Pre-Shippers. If set to Yes, pre-shipper IDs are generated and assigned to each sales and distribution order line.

Print Pre-Ship List. If set to Yes, the Pre-Shipper List Report is printed after you exit the program.

Load ID, Route, Item Number, Whse Item Type, Order, Due Date. Optionally enter a range of load IDs, routes item numbers, item types, orders, and due dates for previously selected order lines for approval.

Depending on the type of orders selected for approval, another frame with additional fields displays. The settings for the fields defaults from Bulk Picking Control:

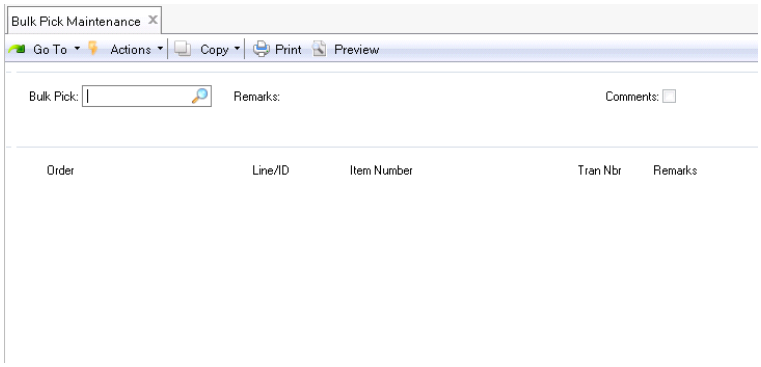
- If the Auto All Sales Orders field is Yes, the system performs general allocation for sales order lines that are not yet general allocated at the time bulk picking process is run.
- If Allocate Components is Yes, the system automatically applies pick logic and creates detail inventory allocations for components of configured kits.
- If Override Partial OK is Yes, the system overrides the sales order Partial OK field setting in Sales Order Maintenance (7.1.1).
- If the Release Work Orders field is Yes, approved work orders are released (status set to R).

Once you have selected the output method, the system creates the pick transactions for the order lines, and prints the pick sheets.

Modifying Bulk Pick Details

If you selected Create Bulk Picking Orders when approving order lines in Bulk Pick Selection Approval (4.14.4), the system created details under a single bulk pick number. Use Bulk Pick Maintenance (4.14.6) to modify the details of a previously saved bulk pick order; see Figure 16.6.

Fig. 16.6
Bulk Pick Maintenance (4.14.6)



1 Enter the order number for the bulk pick, then click Next.

The system approves the order for picking, then displays the number of bulk picks, bulk pick details, and the number of warehouse transactions created.

As needed, you can delete the entire bulk pick by pressing Delete in the first Remarks field. If detail allocations exist for the bulk pick, a message is displayed asking whether you want to remove them.

2 Alternatively, select a line from the bulk pick. You can then change the details of the line, or delete the line by pressing Delete in the second Remarks field. Again, if detail allocations exist for the bulk pick, a message is displayed asking whether you want to remove them.

Printing Bulk Pick Orders

Use Bulk Pick Print (4.14.10) or Multiple Bulk Pick Print (4.14.12) to:

- Reprint bulk pick orders if Bulk Pick Sheets was set to Yes in Bulk Pick Selection Approval (4.14.4).
- Print bulk pick orders for the first time if Bulk Pick Sheets was set to No in Bulk Pick Selection Approval (4.14.4).

To print bulk pick orders, specify one of the system-supplied programs in the Bulk Pick Sheet field in Local Exit Routines Setup (4.23.10):

- `whbplx01.p`: Bulk pick sheet print by item number
- `whbplx02.p`: Bulk pick sheet print by location

See “Local Exit Routine Setup (4.23.10)” on page 183.

Creating Pre-Shippers

In Bulk Pick Order Selection (4.14.1), if the Pre-Shippers field is set to Yes, the system generates a pre-shipper for each selected sales and distribution order. The system creates different pre-shippers, grouping together order lines depending on the different ship-to addresses.

If you set Print Pre-Shipper List to Yes in Bulk Pick Selection Approval (4.14.4), the system printed the pre-shipper list at the printer specified for the warehouse. However, you can use Bulk Picking Pre-Shipper Print (4.14.18.4) or Multiple Bulk Pre-Shipper Print (4.14.18.6) to reprint bulk pick pre-shippers or print them for the first time if Print Pre-Shipper List was not selected when approving the orders.

Confirming Transactions

Once you approve the bulk pick orders and optionally create bulk pick details and pre-shippers, the system generates warehouse transactions to confirm the movement of goods the standard way. When these transactions are confirmed, the system deletes the bulk pick details associated with them. You can confirm warehouse transactions created by bulk picking as for any other transactions, except that the system does not let you repick.

Note In the case of sales order lines for memo items, no warehouse transactions are generated, although bulk pick details are created.

When you confirm the transactions for a sales order line or distribution order requisition, if the Create Shipper field is Yes in the Miscellaneous frame of Internal Routing Maintenance (4.2.5) and the pre-shipper was generated, the confirmation of the warehouse transactions ensures that confirmed item quantities are included on a standard shipper, just like items are created and confirmed in the Shipment Processing Menu (7.9) for sales orders or in the Distribution Orders Shipping Menu (12.19) for distribution orders.

When confirmed, staff pick inventory and move it according to the internal routing detail associated with the items. When no more bulk pick details are open, the bulk picking order is closed.

After confirming the transactions, it is still possible to reprint bulk pick pre-shippers using Bulk Picking Pre-Shipper Reprint (4.14.18.12) provided the Bulk Pick History flag is set to Yes in Bulk Picking Control (4.14.24).

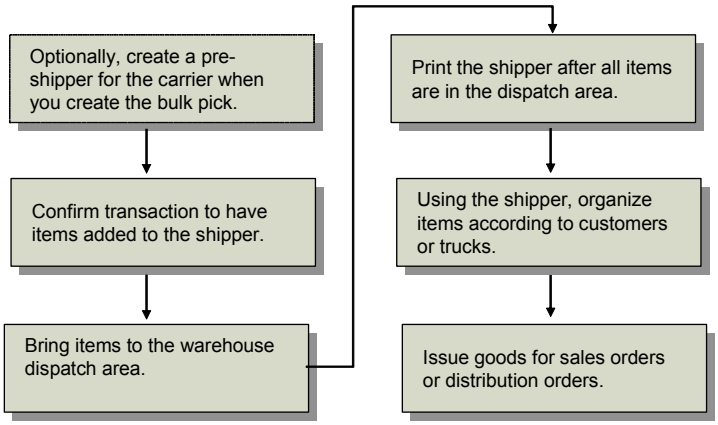
Shipping Bulk Pick Orders

The following topics describe the main processes involved to prepare bulk-picked items for shipping.

Shipment Flow

The following diagram depicts the main shipping flow for bulk picked orders.

Fig. 16.7
Shipment Flow



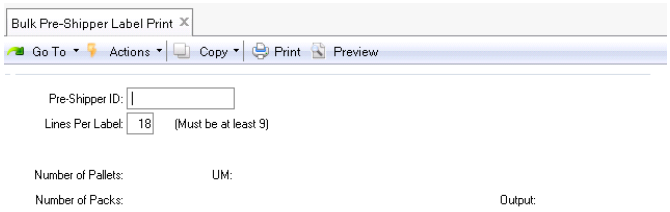
Use Bulk Picking Shipping Forecast (4.14.18.10) to print the necessary documentation to send it to the carrier who prepares the truck shipments.

In Bulk Pick Order Selection (4.14.1), if Pre-Shippers is Yes, a pre-shipper document is generated when you save the information you enter in the bulk-pick selection frame.

You can reprint this document in Bulk Picking Pre-Shipper Print (4.14.18.4) for a certain pre-shipper, helping you with the packing of all the confirmed items. By adding the number of pallets and boxes, you automatically get the total ship weight for your pre-shipper.

Use Bulk Pre-Shipper Label Print (4.14.18.4) or Bulk Pre-Shipper/Shipper Labels (4.14.18.15) to print shipping labels. Use Bulk Pre-Shipper Label Print in the same way as you would Sales Order Shipping Label Print (7.9.14), but specify bulk-picking pre-shippers instead of sales orders. If you print labels with Bulk Pre-Shipper Label Print, the system automatically calculates the total ship weight.

Fig. 16.8
Bulk Pre-Shipper Label Print (4.14.18.4)



Obtaining Shipper Numbers

Since bulk pick details are deleted when the transaction is confirmed, you can obtain shipper numbers to use from SO Warehouse Data Maintenance (4.13.3), DO Warehouse Data Maintenance (4.13.6), or Order Warehouse Detail Report (4.13.12).

When Bulk Pick History is Yes in Bulk Picking Control (4.14.24), you can also use Bulk Pre-Shipper/Shipper Inquiry (4.14.18.13) or the programs included in the Bulk Picking History Menu (4.14.21) to find shipper numbers.

Issuing Goods

Once your pre-shipper or shipper is complete for the bulk-picked orders, you issue the goods using the standard system Pre-Shipper/Shipper Confirm (7.9.5) or DO Pre-Shipper/Shipper Confirm (12.19.13). Pre-Shipper/Shipper Confirm transforms pre-shippers to shippers and creates, posts, and prints invoices for sales orders based on the shipments.

Displaying Bulk Pick Data

Use inquiries and reports in the Bulk Picking Menu to display bulk pick data.

Table 16.1
Bulk Pick Inquiries and Reports

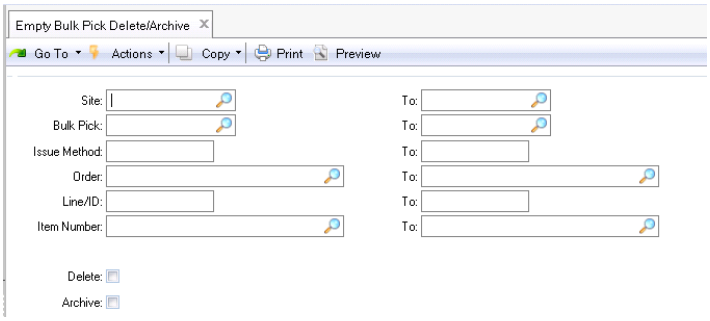
Menu	Program	Descriptions
4.14.7	Bulk Pick Inquiry	Displays the bulk pick details including bulk pick number, allocation order/line, item number, transaction, and issue method
4.14.8	Bulk Pick Report	Displays the bulk pick number, allocation order/line, item number, transaction, issue method, and remarks
4.14.13	Bulk Pick Transaction Inquiry	Displays the transaction details linked to a set of bulk pick details, including transaction number, item number, from site, warehouse and location, to location, and expected quantity
4.14.15	Bulk Pick by SLG Inquiry	Displays bulk picking warehouse transactions grouped by storage location group
4.14.16	Bulk Pick by WLG Inquiry	Displays bulk picking warehouse transactions grouped by work location group
4.14.18.1	Bulk Picking Pre-Shipper Inquiry	Displays the bulk pick pre-shipper details: pre-shipper number, bulk pick number, allocation order/line, item number, and transaction
4.14.18.2	Bulk Picking Pre-Shipper Report	Displays the pre-shipper number, load ID, bulk pick number, number of pallets and boxes, allocation order/line, item number, and quantity picked

Archiving/Deleting Empty Bulk Picks

Use Empty Bulk Pick Delete/Archive (4.14.23) to delete or archive bulk picking data no longer needed. When bulk pick details are created for memo items (memo issue method), the system does not create warehouse transactions; therefore, memo item data displays in inquiries and reports until you delete the data using Empty Bulk Pick Delete/Archive.

You can set the Delete field to No to display the data first. Once you view bulk picking data, you can set Delete to Yes to delete it, or set Archive to Yes to archive the data to a file you specify in Archive File. You specify bulk picking data to delete/archive by a range of sites, bulk picks, issue methods, orders, lines, or item numbers.

Fig. 16.9
Empty Bulk Pick Delete/Archive (4.14.23)



Chapter 17

Batch Picking

The following topics provide information about batch picking functionality:

Overview 288
Describes the uses of batch picking with an example.

Setting Up Batch Picking 293
Outlines the basic requirements of batch picking and the setup steps which must be completed to use it.

Processing Batch Picked Orders 303
Describes how to start a batch-picking session on the RF.

Picking for Multi-Boxes 306
Outlines the different procedures for picking boxes which are not full, calling for more items than are available, using RFDs to pick boxes, moving items between boxes, reassigning batch picking tasks, or changing batch picking task priorities.

Batch Picking Crash Recovery 309
Discusses how to use the two batch-picking crash recovery features which allow tasks to be recovered, confirmed, and viewed.

Viewing Batch Picking Data 312
Describes the Batch Picking Tasks Report (4.15.4.13) frame.

Backflushing Items From Dedicated Locations 312
Describes how to use a picking algorithm to backflush repetitive items from dedicated locations and how to pick from negative inventory during a backflush.

Batch Picking to a Kit 313
Defines kit and discusses how to batch pick to a kit in addition to a box.

Check Digit Functionality when Batch Picking 313
Discusses how to check digit functionality when batch picking.

Overview

Batch picking functionality enhances picking tasks for users for radio frequency (RF) devices, also known as radio data terminals (RDTs). Batch picking lets warehouse staff pick items in a more efficient way. The time it takes to travel through the warehouse completing tasks at various locations, or the *travel sequence*, constitutes the largest amount of time involved when picking items from a warehouse. Batch picking functionality reorders the order-picking sequence and tasks so that warehouse staff can pick multiple items from multiple orders at various locations throughout the warehouse with a shortened travel sequence.

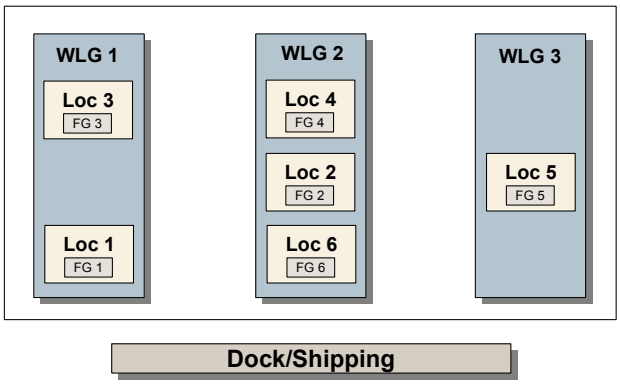
Batch picking functionality is applicable when picking the following:

- Small items with small volume from multiple order lines
- Multi-bin items for a single order

Batch-picking functionality calculates the smallest difference in location from the warehouse staff's current location, letting them pick several small items from the same storage location for several different orders, then move to the next storage location nearest their current location to pick items there. For multi-bin orders, warehouse staff can build a pallet with large boxes of large items for one order with a shortened time sequence through the warehouse. You can also specify the maximum number of orders to pick.

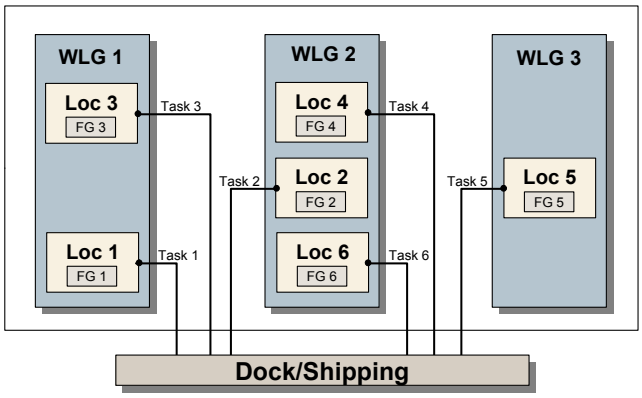
Figure 17.1 depicts a warehouse with three work location groups (WLGs) and the dock where items are shipped. There are six locations (Loc 1 through Loc 6) in various areas of each WLG. Each location stores a finished good (FG1 through FG6).

Fig. 17.1
Warehouse with WLGs



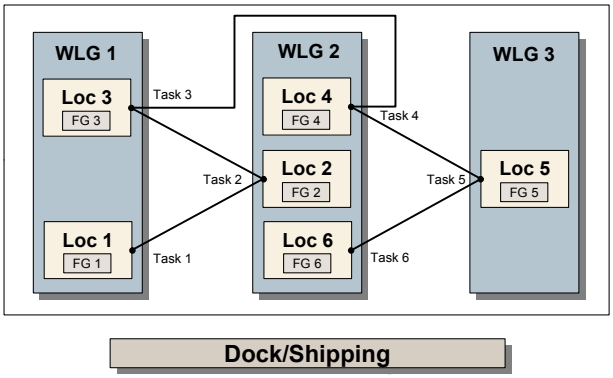
Without batch picking, warehouse staff pick the items for orders for their assigned tasks, making several trips to and from each location to the dock or shipping area. Figure 17.2 depicts tasks to pick items from six different locations.

Fig. 17.2
Picking Tasks



Batch-picking functionality reorders the order-picking sequence and tasks so that warehouse staff can pick the items for different orders with a shortened travel sequence, as shown in Figure 17.3.

Fig. 17.3
Reordered Travel Sequence



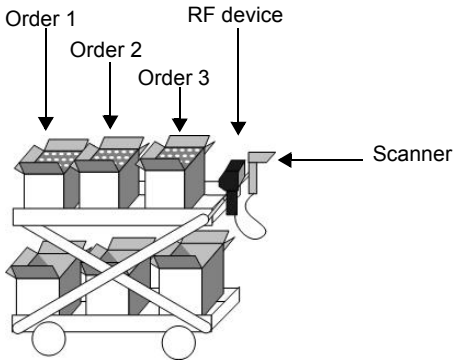
Unlike bulk picking, batch picking uses a *sort-by-pick* methodology. Warehouse staff can pick items from the same location for multiple orders while keeping the orders separated in different containers (boxes or totes) on their cart. Optionally, they can merge items for orders into a container, as long as order lines use the same pre-shipper and you have set control options to allow order merging.

Figure 17.4 depicts a typical warehouse cart that staff use to pick orders. The cart contains six boxes for six separate orders. The RF device displays the pick tasks for the orders, as shown in Figure 17.5 on page 290. Staff can scan either the location, item, lot/serial number, reference, or quantity picked from the location or scan the container—such as a box, tote, or pallet—that they pick to, depending on control settings.

Because batch picking can take several hours, the stock can be physically out of the location and on the cart. You define a user cart as a location to temporarily store the stock until staff move stock to the shipping location.

See “Specifying Locations for User Carts” on page 295.

Fig. 17.4
Separated Orders During Pick



Batch picking lets RF users select and pick items from a mixed group of the following order types:

- Sales orders
- Work orders
- Distribution orders

You can merge the following order types in the same box when batch picking:

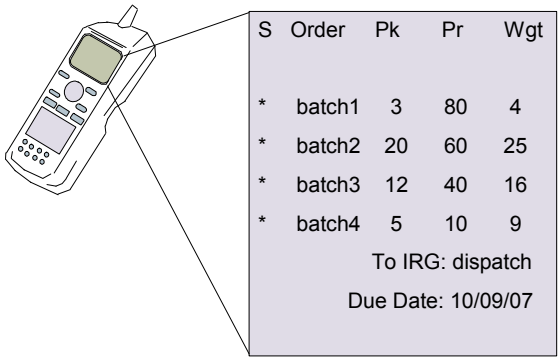
- Distribution orders, work orders, and sales orders
- Sales orders/distribution orders on different pre-shippers

When staff log onto the RF and specify their WLG, the RF lets them select orders from the following:

- Only sales and distribution orders
- All orders (work, sales or distribution orders, or combinations of sales, work, and distribution orders)

The RF displays all open pick tasks for orders that are part of the WLG in which the staff work, as shown in Figure 17.5.

Fig. 17.5
RF with Pick Tasks



Batch picking functionality searches and reorganizes the tasks for the orders by:

1 Travel sequence, if defined

2 Location name in alphabetical order if no travel sequence is specified

Note Specify location names and define the travel sequence in Warehouse Location Maintenance (4.3.13). See “Warehouse Location Maintenance” on page 72.

You can set control options so that the RF device displays picking tasks by order, customer, or pre-shipper.

Batch picking includes functionality that lets warehouse staff pick for actual quantities, regardless of the quantity of each full box. For example, if staff are required to pick 67 each of an item and the box contains 20 each, they can pick three full boxes of 60 each and create a fourth box that holds only the remaining seven items.

At any time during the picking process, warehouse staff can press F3 in the RF to display the order picking status. This displays pick information per order, including the item number, the quantity already picked, and the quantity remaining to pick. The system also displays the number of remaining tasks to perform and the total number of tasks performed.

Order comments are visible for sales and distribution orders on the RF screen. If order header comments exist, warehouse staff can display the header comments by pressing F2. Once staff select a sales or distribution order, an asterisk displays beside the order number on the picking screen if order comments exist. Staff can press F2 on any field in the picking screen to view the order line comments.

Note For work orders, comments only exist at the header level, not at the line level.

Once warehouse staff complete all picks from the selection, the system directs them to the location where they transfer the reference.

Batch picking lets warehouse staff print labels for each box or tote they require during the picking process. For example, if you select four orders for picking, the system can print four labels to paste on four different boxes or totes.

You specify printer options in Work Location Group Maintenance (4.3.9) so that RF users have access to a printer to collect the labels before they pick. Occasionally, RF users have dedicated RF printers for label printing. More often, though, each cart is equipped with a roll of pre-printed labels with unique IDs for the boxes or totes. The IDs are unique for the person and the warehouse. This method is much more economic than using RF printers.

When picking is complete, staff can post-print labels, too. This is useful if staff need to add information to a label, such as the content of each box.

Batch picking supports configured items.

Batch Picking Example

You have three sales orders with various quantities of six finished goods, located at six different locations. When you print the pre-shipper for the sales orders, the system initiates warehouse batch-picking functionality. The picklist and tasks state that you have nine tasks to pick six different items—FG1 through FG6—for the three orders. Table 17.1 lists the pick tasks for the three orders.

Table 17.1
Tasks for Three Orders

Order No.	Qty	Item	Tasks
Order 1	3	FG1	1
Order 1	4	FG2	4
Order 1	2	FG3	2
Order 2	5	FG2	5
Order 2	2	FG3	3
Order 2	4	FG5	8
Order 3	1	FG5	9
Order 3	2	FG6	6
Order 3	2	FG4	7

A box is needed per order. You set the reference as a box and the first box ID to start at ID 1285622. Table 17.2 shows how the system reorders the tasks by location. The locations are restructured to shorten the travel sequence, but actual picking of quantities and the orders themselves have not changed.

Table 17.2
Reordered Tasks

Order No	Location	Qty	Item	Box No.
Order 1	Loc 1	3	FG1	1285622
Order 1	Loc 2	4	FG2	1285622
Order 2		5	FG2	1285623
Order 1	Loc 3	2	FG3	1285622
Order 2		2	FG3	1285623
Order 3	Loc 4	2	FG4	1285624
Order 2	Loc 5	4	FG5	1285623
Order 3		1	FG5	1285624
Order 3	Loc 6	2	FG6	1285624

Features

Batch-picking functionality includes the following features:

- Use more efficient travel sequence time when picking.
- Sort while picking into different orders or optionally merge items for orders.
- Pick items per order, customer, or pre-shipper.
- Display order picking status during pick.
- Print labels before or after picking.
- Print labels automatically, never, or let the system prompt for printing.
- List orders for picking by order priority.
- Specify maximum number of orders to pick.
- Specify whether scanning is required once items are picked.
- Specify scanning the location, item, lot/serial, reference, or quantity from which items are picked.
- Specify scanning the container to which items are picked.

- Specify whether RF users enter 1 or 0 (logical display) or yes or no at the RF device.
- Specify RF screen size.

Setting Up Batch Picking

Before you set up batch picking, you must set up basic warehouse data, including warehouses, locations, tasks, and users. In addition, you must complete the following setup:

- Assign users to a work location group (WLG).
- Specify user carts as locations to record movement of stock from a picking location to a cart.
- Set batch-picking control options.

The following sections describe these setup functions.

Assigning Users to a WLG

Use User Work Location Group Maintenance (4.11.3.13) to assign users to a workgroup and to set up print options specific to the user. You must complete this step for all users if you intend to use task reassignment features.

For the system to function properly, if you define one user-WLG relationship in a warehouse, you must define a relationship for all users in all WLGs in which they work.

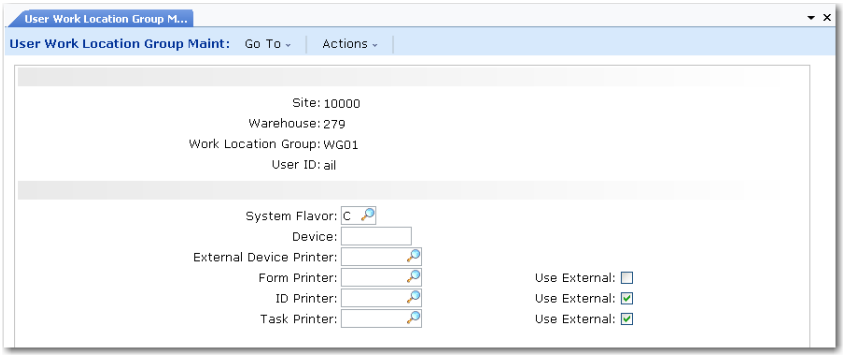
Setting Up Print Options

Data can display for printing in either standard screens or the RF device, including printing any of the following types of information:

- Inventory coming into the warehouse
- Transactions for system-created tasks
- Transactions for confirmed tasks
- Transactions for inspections
- Changes to original transactions (for example, a change to the put-away location)
- Transactions relating to external devices or form printers

For each type of information that you can print, you specify the name of the printer to use for printing. You can specify the code for a form, ID, or task printer.

Fig. 17.6
User Work Location Group Maintenance (4.11.3.13)



Site. Enter the site for the work location group of the user.

Warehouse. Enter the warehouse for the work location group of the user.

Work Location Group. Enter the work location group of the user.

User ID. Enter the ID of the user you are assigning to this WLG.

Flavor. Specify the code to define the style and format of screens to use for displaying warehouse information:

b: Selection by Reference

c: Multi-Bin Pick-Up

d: Dynamic Sizing

You set up flavor codes in Generalized Codes Maintenance (36.2.13). The codes determine the format for information display on devices such as fork-lift truck screens or RF devices.

Device. Enter a code to define the device, such as an RF device, for the user within the WLG. Leave blank to indicate no device.

External Device Printer. Enter the code that identifies the printer the external device uses.

Form Printer. Indicate the code for the form printer for the user or use the lookup to select a printer code.

Enter Yes to Use External if you want RF users to print identifications on an external printer such as a forklift printer. Enter No to Use External if you want RF users to print using the ID printer.

ID Printer. Indicate the code for the ID printer for the user or use the lookup to select a printer code.

Indicate whether the ID printer is an external printer by specifying either Yes to Use External.

Task Printer. Enter the code for the printer or use the lookup to select a printer code for the user when printing tasks.

Enter Yes to Use External if you want RF users to print identifications on an external printer such as a forklift printer. Enter No to Use External if you want RF users to print using the ID printer.

Specifying Locations for User Carts

Use Warehouse Location Maintenance (4.3.13) to define a location for each user that represents the carts used to temporarily store picked stock until staff move it to the shipping location.

See page 73.

Before you can define a user location:

- Define the user in User Warehouse Data Maintenance (4.11.3.1).
- Optionally, assign the user to a WLG (4.11.3.13).

Important If you define one user-work location group relationship, you must define all possible relationships between all users and all work location groups.

When staff pick an item and place it on a cart, the stock moves from the picking location to the user location. To reflect stock movement, the system reduces the quantity in the picking location and increases the quantity in the user location. When staff confirm the batch pick, the system:

- Moves the stock from the user location to the shipping location
- Reduces the quantity in the user location
- Increases the quantity in the shipping location

When a batch pick is not confirmed, the system returns stock from the user location back to the stocking location, thereby reducing user location quantities and increasing location quantities. You specify the ID of the picker as the cart location in the Location field in Warehouse Location Maintenance.

See “Warehouse Location Maintenance” on page 72.

Setting Up Control Options

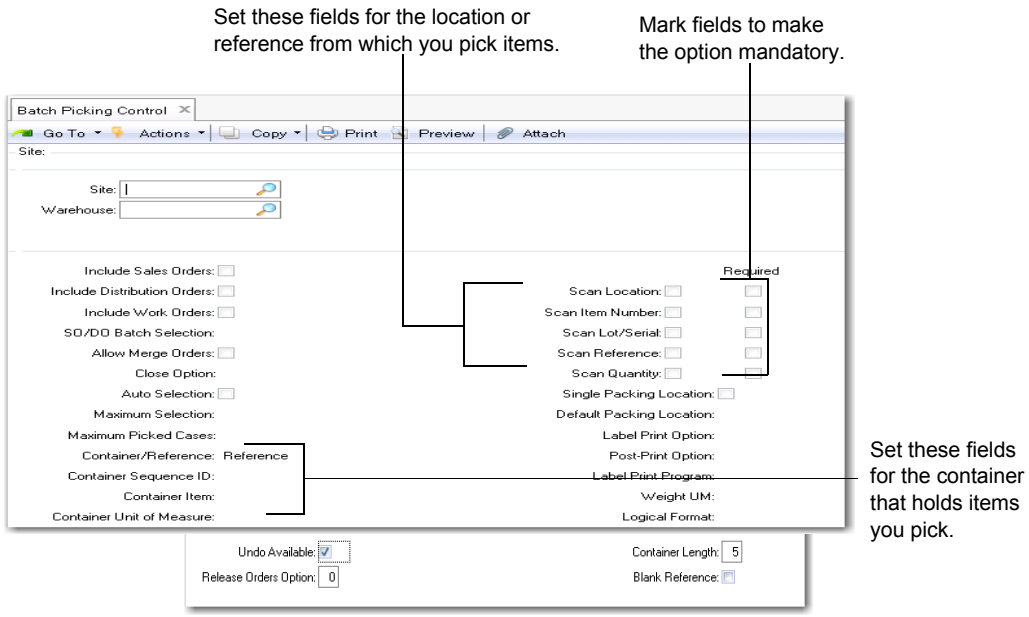
For batch picking, you complete most setup tasks using Batch Picking Control (4.15.24). Specify options for determining settings such as order types, the RF device, printing labels, displaying tasks, scanning during the pick tasks, and containers.

Figure 17.7 illustrates Batch Picking Control. Field explanations follow the figure.

Fields that relate to containers set options for the container into which staff place picked items, while fields that relate to scanning set options for the warehouse location and containers from which items are picked. There is a separate Containerization Frame that follows the main frame, too; see Figure 17.8.

For containerization fields, see “Batch Picking Control Options” on page 376.

Fig. 17.7
Batch Picking Control (4.15.24)



Site. Enter the site to use for batch picking.

Warehouse. Enter the warehouse to use for batch picking.

Include Sales Orders. Indicate whether sales orders are included for batch picking when using Batch Pick-All on the RF.

No: The system does not include sales orders for batch picking.

Yes: The system includes sales orders for Batch Pick-All on the RF. When warehouse staff select sales orders, the orders display with the letter S preceding the order number.

Include Distribution Orders. Indicate whether to include distribution orders for batch picking when using Batch Pick-All on the RF.

No: The system does not include distribution orders for batch picking.

Yes: The system includes distribution orders for Batch Pick-All on the RF. Warehouse staff specify Batch Pick-ALL from the RF selection screen to select distribution orders. Distribution orders display with the letter D preceding the order number.

Include Work Orders. Indicate whether to include work orders for batch picking.

No: The system does not include work orders for batch picking.

Yes: The system includes work orders for Batch Pick-All on the RF. Warehouse staff specify Batch Pick-ALL from the RF selection screen to select work orders. Work orders display with the letter W preceding the order number.

SO/DO Batch Selection. Indicate whether to display customers, orders, or pre-shippers when selecting from the RF screen. The system displays the following options for this field at the bottom of the screen:

```
C=Customer O=Order P=Pre-shipper
```

The system validates these codes against Generalized Codes Maintenance (36.2.13).

Customer: Display customer IDs to select from in the RF screen. You define customers in Address Warehouse Detail Maintenance (4.13.13).

Order (the default): Display order numbers to select from in the RF screen. The system displays orders by priority, then due date. The system checks order priority in SO Warehouse Data Maintenance (4.13.3) or in DO Warehouse Data Maintenance (4.13.6). The priority defaults from Address Warehouse Detail Maintenance when you create a new order. You can also manually update priority in Address Warehouse Detail Maintenance by modifying the Priority field.

Pre-shipper: Display pre-shipper numbers to select from in the RF screen. The priority defaults from the Priority field in Address Warehouse Detail Maintenance.

Allow Merge Orders. Indicate whether warehouse staff can combine items from different orders into containers. The items can be from separate orders but must have the same pre-shipper.

No: Do not combine items from different orders into the same container.

Yes: Combine items from different orders and the same pre-shipper into the same container.

Close Option. Indicate the action to be performed when staff scan a container other than the one the system defaults in the batch-picking process.

When staff select a container for a given order, the system defaults that container for additional order lines to pick for the same order. If the container is full, staff can scan another container—new box or tote—and the system prompts to close the previous box.

If staff specify Yes to close the box, the system determines the action required for the remaining order lines through options you set in Release Orders Option.

0: Never close container. The system confirms the pick and leaves the previous container open. For the next pick on the same order, staff can use either an old or new container.

1: Always close container. The default container is closed. Because carts can hold only a certain number of boxes or totes, specify this option if it is not practical to open more boxes on the cart. The system determines whether it should continue proposing additional lines by options you set in Release Orders Option.

2: Prompt to close container. The system prompts to close the container and order. The system considers the option you set in Release Orders Option depending on the response to this prompt.

See “Release Orders Option” on page 300.

Auto Selection. Indicate whether to automatically select orders with the highest priority.

No (the default): Warehouse staff can select orders for batch picking.

Yes: Select orders with the highest priority for picking. The orders are marked with an asterisk (*) on the RF screen. Staff must pick for orders in the order that they display on the RF; they cannot scroll to the bottom of the list or skip orders.

Maximum Selection. Enter the maximum number of sales orders, pre-shippers, or customers that display on the RF screen. The system displays the orders with the highest priority.

Maximum Picked Cases. Enter the maximum number of orders that warehouse staff can pick at the same time. The default is one open container/tote per order, but staff can open additional containers/totes during the picking process. You cannot leave this field blank. This number typically depends on the capacity of the cart. When selecting orders from the RF, staff cannot select more orders, customers, or pre-shippers than the maximum number of picked cases.

Container/Reference. Specify a container level to create for each tote/box/pallet staff use during the batch-picking process. This field applies to sales and distribution orders only.

Container: The system creates a container level for every tote or pallet in the pre-shipper structure. The items that staff pick and place in the container display as a sub-level of the container. If you set this field to Container, you must specify an item number in Container Item.

Reference: The system does not create a container level. Instead, it uses the reference field of the inventory record as the placeholder for a container number or a kit number. All items staff place in the same container or kit have the same reference number. This field applies to work orders only when specifying a reference for a container. This field also applies to sales orders, if specifying a reference for a kit.

See “Batch Picking to a Kit” on page 313.

Container Sequence ID. Enter the starting sequence ID for box/tote/container numbers when staff print labels before picking. You specify the sequence IDs in Sequence Definition Maintenance (4.23.1). If staff use preprinted labels, the system does not consider this field.

Container Item. Enter the item number of the container. If you set Container/Reference to Container, you must specify an item number.

Container Unit of Measure. Enter the unit of measure for the container. For example, if batch picking items to a box, enter the box UM. You define the UM in Alternate Unit of Measure Maintenance (4.5.1).

Modified. This field is display only and displays the date that control values were last modified and the user who modified them.

Scan Location. Indicate whether to scan the location from which items are picked.

No: Do not scan the location label or barcode from which items are picked.

Yes: Warehouse staff can access the Location field on the RF and scan. To make scanning mandatory, mark the Required field next to the scan option field.

Note Pressing Enter while in the Required field selects or deselects the requirement.

Scan Item Number. Indicate whether to scan the item being picked.

No: Do not scan the item when picking.

Yes: Warehouse staff can access the Item field on the RF and scan. To make scanning mandatory, mark the Required field next to the scan option field.

Scan Lot/Serial. Indicate whether to scan the lot/serial number for the picking location.

No: Do not scan the lot/serial number when picking.

Yes: Warehouse staff can access the Lot/Serial field on the RF and scan. To make scanning mandatory, mark the Required field next to the scan option field.

Scan Reference. Indicate whether to scan the source reference (pallet ID) when picking. Typically, pallet IDs are not maintained in the picking area; however, you can set the second step of an internal routing so that pallet numbers are blank when staff move the pallet from the reserve area to the picking area.

No: Do not scan the reference ID when picking.

Yes: Warehouse staff can access the Reference field on the RF and scan. To make scanning mandatory, mark the Required field next to the scan option field.

See “Defining Internal Routings” on page 43.

Scan Quantity. Indicate whether to scan the quantity picked.

No: Do not scan the quantity picked.

Yes: Warehouse staff can access the Quantity field and scan. To make scanning mandatory, mark the Required field next to the scan option field.

Single Packing Location. Indicate whether batch-picked items are for a single-packing location. For example, if you use a single-shipping location as the packing location, set this option to Yes. Locations are defined in Warehouse Location Maintenance (4.3.13). Specify a default packing location in Default Packing Location.

No: There are multiple packing locations. When creating picking tasks, the system uses a location-find algorithm to determine the destination location for each task. You can reassign tasks to a specific shipping lane using Wave Release (4.15.8). When staff have different possible destinations for picking tasks, they must drop off each box and scan the destination location; for example, the shipping lane.

Yes: There is a single packing location. The system eliminates an RF screen since all picks from all references go to the same destination. Once picking tasks are complete and confirmed as completed, the RF screen displays the selection screen with the default location in the To Location field.

See “Releasing a Wave” on page 360.

Default Packing Location. Specify a default packing location. Locations are defined in Warehouse Location Maintenance (4.3.13). You define this field when you set Single Packing Location to Yes.

Label Print Option. Indicate whether labels print automatically, not at all, or if the system prompts to print labels after the order selection is complete but before picking begins. You must specify the print program in the Label Print Program field. The system prints UCC128/EAN128-format labels for cases, empty boxes, or totes that do not already have a label.

0: Never print labels before picking.

1: Always print labels before picking.

2: Prompt RF user to print labels before picking.

Note To specify printing after picking, set Postprint Option to Yes.

Printing before picking is useful when staff perform multiple order picking. Warehouse staff can print labels for containers, scan the labels, then use the scanned data to ensure that each order is put into the right container.

Warehouse staff frequently use different sized containers, depending on their picking experience and the picking information the system provides in the picking order selection program specified in the Batch Picking Order Selection (`whbpklx1.p`) field in Local Exit Routines Setup (4.23.10).

See “Local Exit Routines Setup” on page 182.

Since the system does not recommend the size of the container/box that staff should use for a given number of picks, staff can select a container/box, then paste the pre-printed box label on the edge of the box, so that it can be easily removed should a different size container be needed when the batch picking is complete.

Post-Print Option. Indicate whether labels print automatically after picking, not at all, or if the system prompts to postprint labels.

0: Never postprint labels.

1: Always postprint labels.

2: Prompt to postprint labels.

Printing after picking—postprinting—is useful when warehouse staff know the exact contents of the box, tote, or pallet to which they picked items. If you use batch picking for multi-bin pickup with only one pallet, staff typically use post-printed labels, not preprinted labels.

Label Print Program. Specify the print program to use when printing labels. The `whpripkz.p` print program, which is Loftware-format compatible, is supplied with the system You can edit `whpripkz.p`, using a standard text editor; rename the program; then, enter it here.

Weight UM. Specify the unit of measure in which each transaction’s weight is calculated on the main batch picking selection screen. When blank, the system adds each item’s unit of measure weight.

Logical Format. Indicate whether RF users enter logical values 1/0 or Yes/No, Y/N, or any other logical format. Yes/No is applicable to RF devices that have a keyboard.

This field is mandatory. Enter the forward slash (/) with either the 1/0 or Yes/No. The system treats the value preceding the slash as positive, and the value following the slash as negative.

Note Entering characters without the slash can cause errors in interpretation. For example, if RF users specify 10, the system interprets the number 10 as negative.

1/0: RF users can enter the number 1 for positive and 0 (zero) for negative responses.

Yes/No: RF users can type Yes or No on the keypad.

Undo Available. Indicate whether the system prompts to undo picking tasks and leave the batch picking process on the RF when the RF user presses cancel (F4) during picking.

No: RF users are not prompted to undo tasks and leave picking functions after they click Back.

Yes: If RF users click Back on the RF screen during picking, the system first displays a prompt to exit the process. If the user specifies Yes, the system displays a prompt to undo and leave picking tasks. If Yes, the system rolls back all completed picks and sets pick tasks to unassigned. Upon exiting the picking process, the system sets confirmed to No or 0 (zero).

Note RF use of Yes/No or 1/0 depends on control settings.

Release Orders Option. Indicate whether to release the order after staff close a box. Use this field in conjunction with the Close Option field.

0: Never Release Order: When staff close a box, they can continue picking for the next order lines and open additional boxes for the order.

1: Always Release Order: Staff cannot open additional boxes and the picking process for the order is complete. You should unallocate all remaining picking tasks for the same order so that the system does not present remaining tasks to the picker assigned. You can assign remaining tasks to other pickers.

2: Prompt for Releasing Order. The system prompts to release the order and execute the appropriate action.

See “Close Option” on page 297.

Container Length. Specify the number of characters for the container ID. For example, if you specify 8 characters, you can have a container ID as CA000001.

Blank Reference. Indicate whether the system retains the pallet reference number or blanks the reference number when RF users confirm a transaction when the Container/Reference field in Batch Picking Control is set to Container.

Yes: The system voids the To Reference field and leaves it blank.

No: The system supplies the default To Reference value for the transaction.

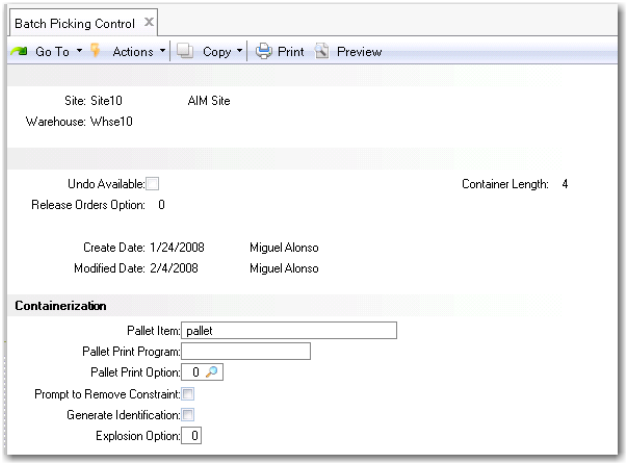
Typically, it is ideal to have a blank reference on the RF when warehouse staff scan a tote to populate the pre-shipper. This setting has no effect when working with work orders. In this case the To reference field inherits the value from the container as no pre-shippers are created for work orders.

Containerization Options

The Containerization frame in Batch Picking Control (4.15.24) lets you set up containerization options.

See page 293.

Fig. 17.8
Containerization Frame



Print Paperwork Options

The Print Paperwork frame in Batch Picking Control lets you set defaults for shipper printing when using the RF Print Paperwork function.

See “Printing Load Optimization Paperwork” on page 430.

Container Move Options

You can set options for the container move functionality for QAD Warehousing in the Batch Picking Control Container Move frame.

See “Setting Up Container Moving” on page 394.

Ship Truck Options

You can set options for the ship truck functionality in the Batch Picking Ship Truck frame.

See “Truck Ship” on page 402

Batch Picking Setup for the RF

You can set several fields in Batch Picking Control for the RF device. Table 17.3 describes each field and indicates whether setting the field is mandatory.

Table 17.3
RF Setup for Batch Picking

Field	Description	Mandatory
AutoSel	Specify whether to select order with the highest priority or if warehouse staff select orders for picking in the RF.	No
Device	Define the RF device for the user within the WLG.	Yes
Logical Format	Specify whether RF users enter 1 or 0 (logical display) or yes or no at the RF device.	Yes
Scan Location	Specify whether warehouse staff can access the Location field on the RF and scan.	No
Scan Lot/Serial	Specify whether warehouse staff can access the Lot/Serial field on the RF and scan.	No
Form Printer	Specify the code for the form printer. Enter Yes to Use External if you want RF users to print identifications on an external printer such as a forklift printer. Enter No to Use External if you want RF users to print using the ID printer.	No

Field	Description	Mandatory
Task Printer	Enter the code for the printer when printing tasks. Enter Yes to Use External if you want RF users to print identifications on an external printer such as a forklift printer. Enter No to Use External if you want RF users to print using the ID printer.	No
Label Print Option	Specify whether labels print automatically, not at all, or if the system prompts to print labels after the order selection is complete but before picking begins. You must specify the print program in the Label Print Program field in Batch Picking Control.	No

Processing Batch Picked Orders

The system processes batch picked orders from the RF. Use the following procedure to start a batch-picking session on the RF:

1 Specify control options in Batch Picking Control (4.15.24). See “Setting Up Batch Picking” on page 293.

2 A pre-shipper is not required; however, when a pre-shipper exists and the Container/Reference field is set to Container, the system creates a container structure in the system’s pre-shipper/shipper table (abs_mstr).

3 Printing the pre-shipper in Picklist/Pre-Shipper-Automatic (7.9.1) or DO Picklist-Pre-shipper (12.19.1) or releasing a wave in Wave Release (4.15.8) initiates warehouse batch-picking functionality.

4 On the RF session, log in, specifying your login ID and password.

5 Specify the site and WLG in which you are picking.

You can specify a default WLG in User Warehouse Data Maintenance (4.11.3.1). The default WLG displays after login.

When you enter a WLG, that WLG defaults to the RF screen. The system looks at the WLG and the task types specified for you to determine the picking tasks to select.

If you leave WLG blank, the system combines all WLGs as if they were one WLG and links the single WLG to you.

See “Defining Workload Groups” on page 329.

Note Specify WLGs in Work Location Group Maintenance (4.3.9). Assign WLGs to users in User Warehouse Data Maintenance (4.11.13.1).

6 On the RF screen, select the Picking/Container function.

7 On the RF, select either Batch Pick-SO/DO for only sales orders and distribution orders or Batch Pick-ALL for distribution orders, work orders, or combinations of all three types of orders.

8 Choose one of the following:

- Select the orders by entering the order number.
- Use the arrow keys to move up or down; then press Enter to select the order.

- Press any character key launches the search capabilities. You can search any order, customer or pre-shipper, depending upon batch picking selection criteria. The search functionality is disabled when Auto Selection is Yes in Batch Picking Control.

Once you have finished selection, press F1 to launch the picking process or F4 to deselect all selections and exit batch picking. When you press F1, the system validates data. Prior to starting the picking process, the system sorts the transactions selected by travel sequence. The order sorting can be modified by specifying an order selection in Local Exit Routines Setup (4.23.10).

The RF displays selected orders with an asterisk (*). The orders that display are open and available, and have unassigned tasks.

If you selected Batch Pick-SO/DO, orders are preceded with an S or D depending on the type of order you selected.

If you selected Batch Pick-ALL, orders are preceded with an S, D, or W, depending on control options that specify sales, distribution, or work orders.

Other order information that displays includes the number of open picks for the order, the order priority and due date, and the total weight of items for open tasks. Figure 17.5 on page 290 illustrates an RF screen with selected sales orders.

Orders can display by customer, pre-shipper, or order number, depending on control settings.

Before presenting the selection screen, the system determines whether there are pending unprocessed transactions. If this is the case, the system always recovers the previous session first. See “Error Management” on page 311.

9 Click Next when you finish selecting orders.

The system assigns tasks to you and records the tasks assigned in the transaction file. The assigned tasks are not visible to other users.

10 Pick items, and either scan location data from which you pick or the container into which you place picked items, depending on control settings.

If an asterisk displays near the end of the RF screen, you can view order line comments. Use the following keys to help you during picking:

- Press F2 to display line comments on the order.
- Press F3 to display a summary of the items and quantities to be picked and those already picked.
- Press F5 to skip the current task and move to the end of the batch transaction. The transaction is still active, and the system presents the task later. Task skipping is only active when entering data in the From inventory picking screen. You cannot skip a transaction for which you have already picked the inventory.
- Press F6 to display the drop container/reference screen and to drop off your inventory before completely finishing your batch of orders.
- Press F7 to display the move-item screen to move inventory from a given container or reference into a new one.
- Press Enter, Tab, or the down arrow key to move to and from RF fields.

The system prompts to confirm the picked quantity; lot/serial, if applicable; and the container or alternative UM and reference, depending on Batch Picking Control settings. If the total transaction’s quantity is not picked, the system prompts for a next scan until either the entire

transaction's quantity is picked or you reply with No to the `Other Scan?` prompt. When you reply with No, the complete, fail, and repick screen appears to close the picking of this transaction and move to the next transaction.

When you confirm a quantity moved to a container (or reference), the system displays `Picked Confirmed` on the RF screen.

When you finishing entering the From data and press Enter, the RF displays a second screen for you to enter the To destination reference (To Reference) data. The To is typically blank until you scan the box or tote. Once scanned, that reference defaults each subsequent time you pick the order.

When you pick an item and place it on a cart, the system moves the stock from the picking location to your user location. Press F3 to show contents of the picking cart.

11 If Check Digit is set to Yes in Storage Location Group Maintenance (4.3.1) and a check digit value is specified in Check Digit Generation (4.3.22), enter a check digit code when moving items from the storage locations. See "Check Digit Functionality when Batch Picking" on page 313.

Note Check digit functionality does not exist when moving items to containers during picking.

12 Print labels for the container either before you pick, when picking is complete, or when you are prompted, depending on control settings.

13 Optionally, close the container (box or tote) when it is full, depending on control settings.

14 Confirm all picking tasks when you are finished.

The system moves stock from your user location to the shipping location.

Dropping All or Some Boxes

The orders for which staff pick can be very large. Occasionally, staff need to drop off boxes at consolidation areas or shipping lanes before they complete batch picking for an order. This is especially useful if staff are picking at locations that are close to the shipping lanes or consolidation areas.

When all completed pick tasks have the same destination location, warehouse staff can optionally drop off all items they finished picking. This lets them avoid scanning each box and the destination location for confirmation.

If one completed pick task is for a different destination location, staff can still drop off completed boxes, but they must drop off the boxes one by one, scanning the box number, then the location in which they drop off boxes, such as the shipping lane.

If all picked boxes are going to the same destination, for example, the same shipping lane, warehouse staff can press F6 on the RF during picking tasks to display the following prompt:

```
Drop All?
```

Staff should specify Yes to drop off all boxes for which they completed picking tasks if the destination location is the same for all boxes.

If one or more boxes are going to a different destination, then staff must scan each box and destination location each time they drop off a single box.

Staff confirm the destination locations, then move to the To Location screen. Staff can press Enter, Tab, or the arrow keys to move among fields, or press F4 to end the drop-off process.

If staff select to end the drop-off process, the system prompts to undo all previously picked items and not confirm transactions. When the user responds with Yes, the system returns items to the original locations from the user's picking cart and de-assigns all transactions. If settings in Batch Picking Control do not allow the undo transactions, all pending transactions are deselected and the system moves to the confirmation/drop screen. When staff invoke the drop screen from the picking screen, they cannot undo transactions as this option is available only through picking screens.

When staff decide to leave the dropping process without undoing transactions, those transactions remain with a pending status. The next time staff choose the batch-picking option from the RF, the system immediately returns to the drop-off screen to complete the process.

When the drop-off or drop-all is complete, the user can continue the batch-picking process for the remaining allocated tasks.

Picking for Multi-Boxes

Batch picking sets the total quantity to pick based on the item, order, or location. However, the actual quantity to pick is not always the same as:

- The total quantity
- The number of items in full boxes

Example Warehouse staff enter 67 each of an item as the total quantity to pick, but boxes are set to hold 20 each of the item. This means staff can pick three full boxes but cannot complete the pick without the remaining seven items.

Batch picking functionality lets staff pick complete boxes and create additional boxes that have less than the full amount. The system prompts warehouse staff to use another scan method. This lets staff print and paste a pre-printed label on both the full boxes and the newly created box with the remainder of the items.

See "RF Multi-Box Procedure" on page 307.

Batch picking functionality works with settings in Warehouse Maintenance (4.1.1) so that staff can complete picking when the quantity at a location is lower than the task quantity.

Setting Location Maintenance Options

Occasionally, the quantity available in a location is lower than the task quantity; for instance, because of an inventory error.

You can set the Completion Option, Fail Option, or Repick Option in the Miscellaneous frame of Warehouse Maintenance (4.1.1) so that the RF displays any or all of the options when warehouse staff find the quantity is lower than the task quantity.

See "Miscellaneous" on page 34.

RF Multi-Box Procedure

Use the following RF procedure to use multi-box picking to complete your picking tasks:

1. Select batch picking tasks as usual and enter the actual quantity you need to pick in the Qty field.

   The system displays the following prompt:

   `Other Scan?`

2. Specify Yes.

   Note To use logical format on the RF, set Logical Format in Batch Picking Control. See page 300.

3. Scan full boxes and the box with the remaining items that make up the total you need to pick.

   At each scan, the system displays the remaining quantity to pick and prompts you again to scan others until the quantity required is picked.

4. Print labels for full boxes and the box with the remainder of the items.

Use the following procedure if the quantity available in the location is lower than the task quantity:

1. When the system prompts to `Scan other?`, specify No.
2. If the system prompts you to complete the picking tasks, choose one of the following:

   a. Specify Yes.

      The system confirms the task with the actual quantity.

   b. Specify No.

      The system confirms the task with the actual quantity and writes the task into history records. However, the task remains open with the remaining quantity to pick even though they are no longer on your batch-picking tasks.

3. If the system prompts you to repick, choose one of the following:

   a. Specify Yes.

      The system starts an on-line repick to locate missing quantities from the same location or another location.

      In batch picking, you can only see a new task after the picking process is complete. If the system selected an order because it has the highest priority, when you complete the current batch picking, the system displays the newly created repick task for the order on top of the RF selection list. The repick displays on top of the selection list because the repick is for the same high-priority order.

   b. Specify No.

      You cannot repick for the order.

4. If the system prompts to fail the picking task, choose one of the following:

   a. Specify Yes.

      The system fails the task and determines which fail option to present at the WLG level.

The system changes the status of the source inventory to Fail. The Fail status is typically a non-available inventory status; therefore, the system no longer considers this specific inventory for picking.

If Cycle Count on Fail is Yes in the Cycle Count Defaults frame of Warehouse Maintenance, the system creates a recount task to recount stock in this location and assigns the task to the appropriate warehouse staff.

See “Cycle Count on Fail” on page 33.

b Specify No.

The system does not fail the task and does not display fail options for the pick.

Moving Items to Another Box

Warehouse staff can press F7 on the RF device to move contents from one box to another box during picking. This helps staff balance the content of different boxes based on the volume of the different items. Once staff press F7, the system prompts to enter a new container ID.

Reassigning Batch Picking Tasks

In batch picking, the system assigns all lines on an order that belong to a user’s zone. In a typical warehouse situation, an order may have too many order lines for a single user to complete before a truck arrival, so you can reassign orders to another user.

Note Before you reassign tasks, you must assign users to a WLG.

Use Batch Picking Trans Reassignment (4.15.20.15) to reassign picking tasks to another user in the same WLG or reassign them to a user in a different WLG. The program lets you:

- View the users and the number of tasks assigned to each user in a WLG.
- View up-to-date task information for each user.
- Reassign tasks from one user to another user within the same WLG.
- Assign tasks from one user to another user in a different WLG.
- Unassign tasks from a user and leave them unassigned.

See “Assigning Users to a WLG” on page 293.

Be careful when reassigning tasks in batch picking. The system sorts picking tasks for the most efficient travel sequence throughout the warehouse. Removing tasks randomly could adversely affect the travel sequence, resulting in lost efficiency and longer distances to travel.

Also, before reassigning tasks, consider whether the picker may have started tasks. For this reason, it is best not to reassign the first tasks listed for the user and to reassign tasks from the end of the user’s list of tasks. Also, selecting tasks randomly from the list to reassign may not be effective.

Use the following procedure to reassign tasks:

1 Specify a site, warehouse, and work location group; then click Next.

The system displays a split screen with users and tasks for the work location group you specified in the left side and other work location groups and users in the right side.

2 Use the arrow keys to move to the user who receives the tasks.

If the user is in another work location group, use the Tab key to move to the user, then use arrow keys to select the user who receives the tasks.

3 Press F3.

The system displays task details, including the item, location, order type, and so on.

4 Use the arrow keys to move to the task you want to transfer; then click Next.

The system displays the user to whom you are transferring tasks, then prompts you to confirm the change.

5 Specify Yes and click Next.

See “Reassigning Hard-Assigned Tasks” on page 167.

Changing Batch Picking Task Priorities

You can also change the priority of a batch-picking task by using Transaction Priority Update (4.11.5).

See “Updating Task Priorities” on page 168.

Batch Picking Crash Recovery

Two batch-picking crash recovery features let you recover, confirm, and view picking tasks that took place when the system crashed or connections were lost:

- Batch Picking Crash Recovery (4.15.20.13)
- Crash recovery features built into batch-picking functionality described in “Built-In Recovery” on page 311

Crash Recovery Utility

You can use Batch Picking Crash Recovery to confirm tasks completed by warehouse staff and information processed by the system when a system failure occurs. The utility:

- Lets you view unprocessed tasks for a specific user, site, and warehouse combination or for all users for a warehouse/site combination.
- Lets you confirm tasks completed before the system failure.
- Lets you drop off all or some completed boxes at shipping lanes or a staging area.
- Makes selected, but not picked, tasks available to the user again.

Utility Procedure

To use the utility to confirm tasks and drop off boxes, use the following procedure:

1 Enter the user ID of the warehouse staff whose tasks you want to confirm.

2 Enter a site and warehouse.

The utility displays picked, but unconfirmed tasks that were interrupted because the system went offline. The system displays the task number, user ID, destination location, packing container, and the quantity picked/to pick in a read-only frame.

3 When tasks display, press F1.

If all tasks are for the same destination, the system displays the `Drop All` prompt.

If tasks are for different locations, the system prompts you to enter a location. Go to Step 5.

Note The drop-all functionality is the same as that for the RF device. See "Dropping All or Some Boxes" on page 305.

4 At the `Drop All` prompt, specify whether staff drop some boxes to another location or drop all boxes to the same location:

No: Staff drop some boxes one by one to another location. Go to Step 5.

Yes: Staff drop all boxes to the same location. Go to Step 6.

5 Enter the new location in the To Loc field.

Note The container and order that display are read-only fields. The system prompts once for the container and order that display, even when there are multiple tasks for the same box.

6 Confirm the task completion by specifying Yes at the `OK to Confirm` prompt.

The system displays the number of confirmed tasks.

Utility Fields

Use the following field descriptions when using this program:

Start User. Enter the ID for the user whose picking tasks you want to confirm. This field is required.

Site. Enter the site for the tasks you want to see.

Warehouse. Enter the warehouse for the tasks you want to see.

Drop All. Specify whether staff drop some boxes to another location or drop all boxes to the same location.

No: Staff drop some boxes one by one to another location.

Yes: Staff drop all boxes to the same location.

Container. The container ID for the box you want warehouse staff to drop off. You cannot edit this field.

Order. The order number for the box. You cannot edit this field.

To Loc. Enter the location where warehouse staff drop off boxes.

OK to Confirm. Specify whether to confirm the batch-picking tasks that display.

No: Do not confirm the tasks. The system displays 0 (zero) tasks confirmed.

Yes: Confirm the tasks. The system displays the number of tasks confirmed and a list of confirmed tasks.

Task Availability

There may be other picking tasks that warehouse staff selected but failed to process because of a system failure. The recovery utility ensures these tasks have an open status and are unassigned and available to be processed by any user from the RF batch-picking program. Use Warehouse Transaction Inquiry (4.9.1) to view the status of the tasks.

Built-In Recovery

Warehouse staff who were batch picking from an RF device can automatically resume picking when they are back online. The system skips the order-selection frame on the RF and redisplays the picking screen that displayed when the system went offline. The recovery functionality ensures that tasks previously selected but not picked are available for picking. Warehouse staff can resume picking and dropping off all or some boxes as usual.

Error Management

In the event of an error during the picking or confirmation processes, the system sets the transaction's status to error and stops the processing of the individual transaction. The user can continue working normally for the remaining transactions.

The RF does not provide detailed messages to the user about the error. Instead, it shows a summary of the transactions processed correctly and those in error.

QAD Warehousing users can use Batch Picking Crash Recovery to analyze and fix the batch picking errors. This function has the same available functions as the external device batch picking, but with the ability of provide detailed warning and error messages as transactions are being processed.

When you first enter Batch Picking Crash Recovery and enter a user ID, the system first validates the ID. If the user is logged in to an RF device session, the system prompts to try to terminate that session.

If you respond with Yes, the system analyzes the unprocessed transactions for that user and displays the transactions with a status of picking, complete, or error.

The system changes the current user to the batch picking user. When you select a transaction for the list, the system creates a batch-picking record with a blank status for the record. Blank status indicates an unprocessed transaction. You can unselect an unprocessed transaction by undoing the previous selection process. When the system creates the batch picking record, it also calculates the distance to the current location. This aids in sorting transactions by travel sequence.

You can choose to process the complete transactions by confirming them. The system displays all transactions at once. Press Enter to edit the destination location of a highlighted record. The system does not validate the transaction's internal routing when updating the destination location.

Hard-assigned transactions can only be selected by the user to whom they are assigned; soft-assigned transactions can be selected by other users.

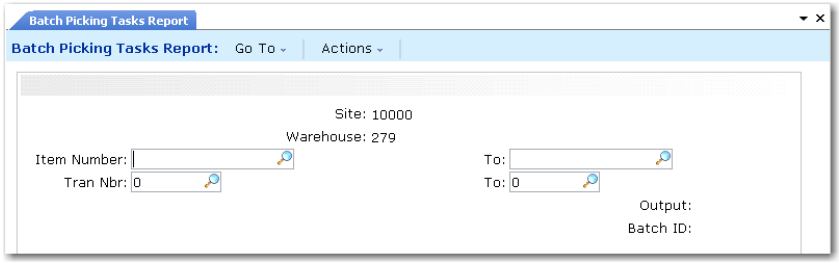
Once you review or modify transactions, you can launch the confirmation process by pressing F1/Go or undo the changes by pressing F4/End.

When the RF user presses F1/Go, the system reprocesses transactions with a picking or error status. The system can display detailed warning or error messages on the transaction processing

Viewing Batch Picking Data

The Batch Picking Tasks Report (4.15.4.13) displays all open batch-picking tasks. Use the report to determine which tasks warehouse staff have performed and when. You specify the site and warehouse, then enter a range of item numbers or transaction numbers.

Fig. 17.9
Batch Picking Tasks Report (4.15.4.13)



Site. Enter the site for the open tasks you want to report.

Warehouse. Enter the warehouse for the open tasks you want to report.

Item Number and To. Enter a range of item numbers with open tasks.

Transaction and To. Enter a range of transaction numbers with open tasks.

The system reports information from transaction history and displays the open tasks for the item or transaction.

Backflushing Items From Dedicated Locations

You can backflush repetitive items from a dedicated location. Dedicated locations, or home locations, are picking area locations that always store the same item. A picking (PK) algorithm (algorithm 70) finds stock in a dedicated location, so warehouse staff can pick items there. The PK algorithm works with the PICK-RBK transaction type that backflushes repetitive items from a dedicated location. You can modify parameter settings for the PICK-RBK transaction type in Transaction Type Maintenance (4.7.1).

To use the PICK-RBK transaction type, you must set up the algorithm by performing the following:

1. Use Algorithm Master Maintenance (4.6.5) to optionally modify the description of the pick-by-dedicated location algorithm. See page 108.
2. Use Transaction Type Maintenance (4.7.1) to review the transaction and Whse Master List Maintenance (4.1.5) to ensure that the PICK-RBK transaction is linked to the item you want staff to pick from the dedicated location. See page 143.

3 Use Algorithm Assignment Maintenance (4.6.9) to link the algorithm sequence to the PICK-RBK transaction. This ensures that the correct algorithm is used when inventory is processed from the dedicated location. See page 108.

4 In Warehouse Location Maintenance (4.3.13), specify the physical location for the dedicated location in the header and set the Dedicated field in the Location Data frame to Yes. This ensures the location is for only one item or product. See page 72.

Picking from Negative Inventory during a Backflush

Warehouse staff do not always have the time to update the system with the last transfer. During a backflush, this can result in a negative inventory from a system point of view. Warehouse staff can pick components during a repetitive backflush from a dedicated location even when the inventory is negative.

Warehouse staff can pick from negative inventory for transaction type PICK-RPS when the inventory status code associated with the location has Overissue set to Yes in Inventory Status Code Maintenance (1.1.1). Warehouse staff can continue to receive work orders and continue with shipping when inventory is negative. You can check the status of the inventory using Inventory Detail Inquiry (4.9.13).

Batch Picking to a Kit

You can pick to a kit in addition to picking to a box when batch picking. A kit is a set of items that are picked for shipment. You set up kits as configured items; however, for kits, no real assembly takes place. The configured item is not itself a physical element—it only exists as a logical superset of its components. The configuration defines the content of a kit, and a shipment contains the end items that comprise the kit.

For more information on picking for a kit for a pre-shipper, see *QAD Sales User Guide*.

To pick to a kit, specify a kit as a reference by setting the Container/Reference field in Batch Picking Control (4.15.24) to Reference. When you specify a kit as a reference, the system uses the reference field of the inventory record as the placeholder for a kit number. All items placed in the same kit have the same reference number. See page 298.

Check Digit Functionality when Batch Picking

Check digit functionality exists for warehouse staff when batch picking items from storage locations. You can specify a check digit value that warehouse staff enter when they move items from the storage location.

See “Using Check Digits with Locations” on page 78.

Chapter 18

Wave Planning

QAD Warehousing provides the ability to group several different sales and distribution orders and coordinate and manage the warehouse replenishment, picking, and movement activities for them. This process is called *wave planning.* The following topics describe how wave planning works.

Overview 317
Discusses the principles behind wave planning and illustrates some of the features of wave planning.

Key Concepts 317
Describes the relationship between warehouse areas and stock movement among them, and outlines how to use waves in warehouses, replenishment techniques, warehouse flow, and wave features, programs, selection, and replenishment.

Setting Up Wave Planning 322
Lists the steps required to set up for wave planning and outlines how to complete them.

Selecting Orders and Creating the Wave 343
Discusses how to use Wave Selection (4.15.3) to create a wave.

Replenishing a Wave 350
Describes how to replenish a wave and outlines the steps of wave replenishment and the results of the replenishment.

Releasing a Wave 360
Describes how to release a wave, how the system deals with a released wave, and the customizable release options for a wave.

Manually Managing Release Groups 365
Explains how to manage release groups manually when a wave is released.

Deleting Order Lines on a Wave 366
Describes two different ways to delete order lines on a wave.

Initializing Orders in a Wave 366
Explains how waves can be used to initialize open orders.

Closing the Wave 367
Describes how to close a wave and view open or closed waves.

Deleting/Archiving Closed Waves 368
Explains how to use Closed Wave Delete/Archive (4.15.23) to delete or archive data for waves.

Viewing Wave Information 368
Lists and describes wave reports and inquiries and their menu numbers, and describes how to monitor order and wave status.

Overview

Wave planning involves the same principles as lean distribution; that is, the objective is to plan activities in a warehouse and eliminate inefficiencies and waste. Like kanban systems or other just-in-time (JIT) manufacturing principles that streamline the replenishment process, wave planning pulls items to areas—such as the picking area— just before they are needed.

Wave planning features let you create and release a wave. A *wave* is a collection of either sales orders (SO) or distribution orders (DO) or both. Sales orders include scheduled orders and sales orders for configured kits. Warehouse staff can pick for the collection of orders together at a certain point in time. For example, if you know that a carrier arrives at 4:00 pm, you can create a wave for all orders linked to the carrier.

Note You specify carriers in the Ship Via field on sales order or distribution order trailers.

Because you can see the orders in the wave and the quantities required for each order, you can foresee tasks and the workload; this lets you plan accordingly. Based on the workload and the available capacity, you can determine when to start the wave to ensure that warehouse staff pick, pack, and prepare the orders for shipping when the carrier arrives at the warehouse.

The system combines orders for the same customer ship-to address on the same pre-shipper, even when the carriers are different. Warehouse functions, however, put the orders for different carriers on different pre-shippers. You can also maintain carriers at the line level in the system using SO Warehouse Data Maintenance (4.13.3) for sales orders and DO Warehouse Data Maintenance (4.13.6) for distribution orders.

Key Concepts

A major key to understanding how the wave features work is the relationship between the different areas of a warehouse and how stock moves among the areas. To fully understand the flow of a wave, concepts from functional areas outside of wave planning are introduced in the following paragraphs.

Using Waves in a Warehouse

Wave planning applies best to companies that have many sales or distribution order lines. For example, large component manufacturers can typically fulfill 7,000 sales order lines with as many as 14,000 different items to pick per day.

In this scenario, extra space can be required to hold numerous pallets full of different types of items. This, in turn, results in greater distances for picking staff to travel. To reduce travel time, companies typically designate smaller areas to pick items and keep items in reserve to replenish the items being picked. These *picking areas* typically consists of a few aisles of pallets, boxes, or containers with items. The picking area is sometimes called the *forward picking area*, *detail picking area*, or the *pickface area*.

Picking for waves is done through batch picking or normal picking. Working with a separate picking area, though, is not a mandatory requirement. When volumes are lower or staff pick mostly in full pallets, you typically only need one picking area. Wave planning can accommodate both situations.

The holding area or the *reserve area* has larger quantities of the items, usually in pallets, that replenish the picking area. For this reason, the reserve area is sometimes termed the *pallet area*, *bulk area*, or *full pallet area*. When order lines can be filled with pallets, it saves time to simply move the pallets from the reserve area to the shipping area, bypassing the picking area.

Wave planning lets you have a continuous throughput of stock across the warehouse from the reserve area to the forward picking area to the consolidation area to the staging area. The *consolidation area* is an area where warehouse staff assemble items on pallets or containers; the *staging area* is the area where warehouse staff drop off wrapped pallets that are ready for shipment.

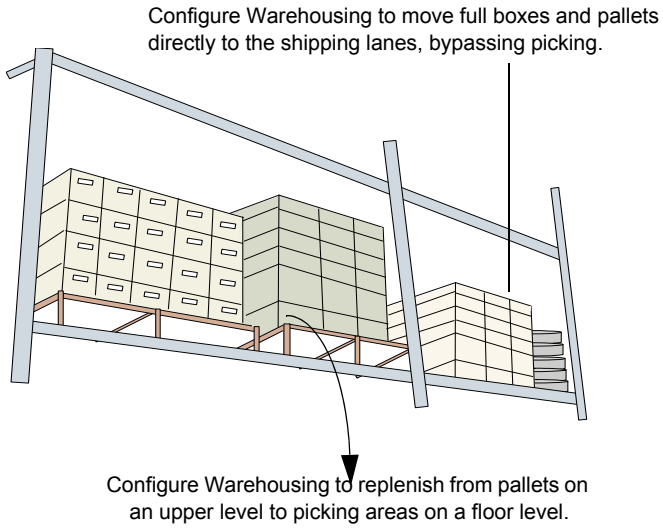
Replenishment is the movement of stock from the reserve area to the picking area. The picking area should always maintain enough stock to complete order lines of the planned wave. But because the picking area is a finite area within the warehouse, it may not be large enough to hold all items needed for the order lines. Therefore, a method of replenishment must be in place to move stock from the reserve area to the picking area to complete the orders.

Replenishment is not always required, though. For example, if a warehouse does not include a specific picking area, there is no need to move items. In this case, stock is randomly distributed throughout the warehouse. Also, if enough inventory exits to cover the requirements of a wave for a particular item, there is no need to replenish that item. Usually inventory is sufficient to cover the items of a wave because warehouse staff use multiple replenishment techniques and because the locations are big enough to cover a few days' worth of requirements.

In some warehouses, detail picking areas are on the floor levels of the racks, while reserve areas with full pallets are upstairs. In this case, the replenishment movement is from the upper levels to the floor levels. You can configure wave planning to do this. Figure 18.1 depicts a typical reserve area in a warehouse.

If the warehouse stores pallets on upper levels, typically the detail picking area contains stock for fast moving items only. In this case, the replenishment is a very short movement.

Fig. 18.1
Reserve Area



Replenishment Techniques

Wave replenishment involves three steps, so setup is different from standard replenishment where you set up picking parameters for a specific storage location group (SLG).

Also, most replenishment techniques replenish a location to its maximum level and not to just the wave's required level. This technique is called *overpicking* since staff bring more then the quantity required.

Many different techniques can be used to replenish the picking area. The following common techniques are often combined:

- *Put-away replenishment* is replenishment to a certain level of inventory; for example, when warehouse staff put away after a receipt from the supplier.
- *Automatic or manual replenishment* is a traditional replenishment technique to replenish the stock in a given location or storage location group.
- *Wave replenishment* is wave action that considers the level of stock in the picking area and compares it to the requirements for all the order lines in a given wave. If inventory is missing to fulfill some order lines, replenishment is needed.

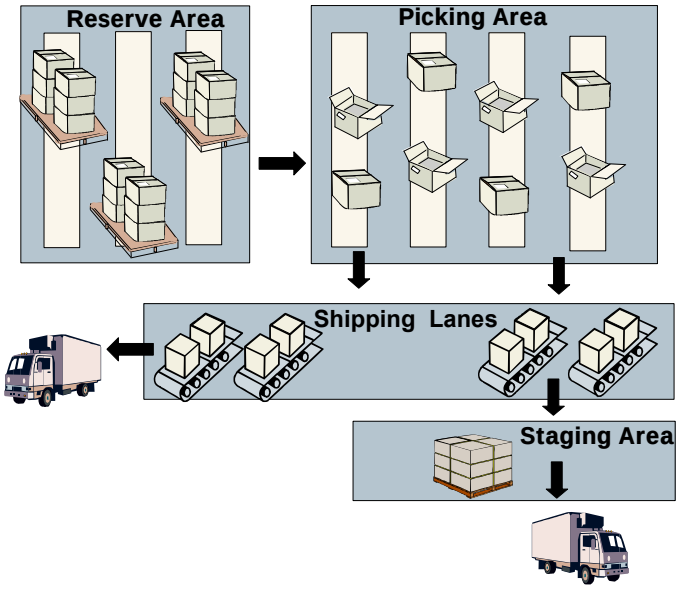
Wave planning reorganizes the workload so that aisles and the lanes leading to the shipping dock, or where you consolidate the items for the different orders—*shipping lanes*—hold the most efficient number of staff, who pick for or move items for the most efficient number of order lines.

Finally, most warehouses use containers to package and consolidate goods going to the same location. A container can be a box of finished goods, a pallet of boxes, or a truckload of pallets. A location can be an area, such as the shipping lanes or staging area, or the cart or truck. *Containerization* is a process of assembling pallets and orders for shipment.

Warehouse Flow

Figure 18.2 depicts a typical flow in a warehouse. Stock moves from the reserve area to the picking area through replenishment. Once picked, stock moves to the shipping lanes (consolidation area) and to a staging area, if used, where wrapped pallets are dropped off awaiting truck arrival. Optionally, stock can go directly from the shipping lanes to the truck.

Fig. 18.2
Warehouse Flow of Items



Wave Features

Wave planning lets you plan the picking and replenishment activities so that you have control over all workload areas of a warehouse. Organizing the picking activities by wave lets you:

- Spread the workload for picking activities across the entire business day.
- Start picking activities on time for carrier arrival at the dock.

  If picking activities start too late, this wastes time for the carrier who waits at the dock.

  This is especially crucial with the Hours of Services regulation. The U.S enacted this regulation in January 2004 and it requires that drivers account for their day and week time. This can result in cost increases for the trucking industry and the customer.

  If picking activities start too early, this can result in too much stock in the staging area awaiting truck loading and a waste of warehouse inventory space.
- Streamline the picking operations by having a continuous throughput of stock across the warehouse. Streamlining operations lets you have better use of warehouse resources and avoid peaks.
- Spread the workload in aisles and shipping lanes based on carriers so that items are moved to the correct shipping lane for a particular carrier type.
- Save time and tasks by fulfilling order lines with full pallets or boxes that you can move directly to the dock, bypassing picking and other areas.
- Use waves interactively to initiate some tasks and release orders before one wave is complete while starting tasks for another wave.
- Manage throughput of large quantities by releasing orders in a wave incrementally or all at once.
- To complete orders faster, you can automatically release a wave when replenishment completes. See page 365.

Using wave planning, you can:

- Organize the picking by waves.
- Configure waves by carrier route, customer (ship-to), due date, or profile.
- Start wave activities based on picking loads.
- Have stock ready to load when trucks arrive.
- Optimize docking selection based on various criteria.
- Merge order lines to shipping lane by carrier.
- Specify a maximum number of order lines at a time by shipping lanes.
- Re-allocate picking tasks to shipping lanes.
- Dedicate shipping lanes for particular carriers.

Wave Programs

Wave programs are in the Wave Planning/Batch Picking Menu (4.15).

The basic processing flow of wave planning is as follows:

1. Wave selection
2. Wave replenishment
3. Wave release

For a complete list of Wave Planning programs, see “Menu Listing” on page 469.

The following subsections provide more information on each portion of the process.

Wave Selection

When you select a wave, you select from sales orders, customer scheduled orders, or distribution orders. Within wave planning, the order types are not distinguished. Wave planning creates the picking and replenishment tasks associated with the orders in the wave.

You can define wave options so that the maximum number of order lines can be set for a single wave. You can also set other options that let you create a wave based on order type, due date, weight, priority, carrier, route, and so forth.

See page 343.

You can also use a wave utility program to change the order priority of the wave, as needed.

See page 349.

Wave Replenishment

When you know the items needed for each order, you can ensure that stock moves from the reserve area to the picking area before the picking takes place.

Wave replenishment typically includes the following three steps; however, depending on the setup, you may not use all steps:

Step 1: Full-pallet picking

Step 2: Box picking from the reserve area

Step 3: Picking area replenishment

Wave replenishment is not mandatory. If your warehouse does not have a dedicated picking area and all stock is randomly distributed in the warehouse, replenishment is usually not required.

See “Replenishing a Wave” on page 350.

Wave Release

There are three objectives when releasing waves:

- Create the picking tasks for staff in the picking area.
- Assign shipping lanes to a task that determine which items go where.
- Manage the picking throughput.

See page 360.

Batch picking or normal picking begins and staff can put all stock in shipping lanes only after you release the wave. Staff confirms the tasks for the wave through the RF device.

To manage throughput of large quantities, you can release orders on a wave incrementally. Or you can release all orders at once for smaller quantities.

You can implement wave releases as an iterative process. In theory, staff should complete replenishment for a wave before they start the release. However, if staff have not completed replenishment for a current wave and the picking of the previous wave is complete, staff can start picking for the current wave, even though all items are not yet replenished.

Further, if the replenishment is not complete for a wave, you can still release orders for which all order lines are replenished.

Setting Up Wave Planning

To set up for wave planning, complete the following steps:

- Plan for waves.
- Set the task calculation.
- Define lanes and docks.
- Assign lane and dock algorithms.
- Define lane groups.
- Define workload groups.
- Assign lane groups.
- Set options in Wave Planning Control.

The following subsections provide more information on each setup task.

Planning for Waves

You should set up your wave or waves at the beginning of the day to reflect the order lines your company typically completes for a particular time period, such as a single day or a couple of days. Wave planning creates the picking and replenishment tasks for the wave. Use Wave Open Order Report (4.15.13) at the start of a work day to globally view the workload for the current day, next few days, and so on.

Before creating the wave, you should consider which orders to pick for the wave and how many orders to include on the wave. If your company typically completes about 7000 order lines in a day, you can set the maximum for each wave to be 1000 order lines. This means setting up seven waves at 1000 order lines for a single day or setting up 70 waves at 100 order lines for a day, and so on.

You can set defaults for the maximum order lines in a wave and this helps control the wave size. If you have too many waves, they are difficult to monitor. If you have too few, you loose flexibility.

The main objective of wave planning is to have continuous throughput for picking and shipping operations. Plan the wave based on workload, staff, and carrier type; then monitor the workload based on aisles, congested areas, and carrier arrival.

To do this, consider the workload in the different aisles (workgroups) to determine the size of the wave. You must also consider the capacity of the shipment area before you release orders. If you release too many orders at the same time, you may block aisles with staff and their carts. Next, consider the number of orders for each carrier type and know the arrival time and location for each carrier type.

Further, a method to manage the location of staff and the movement of carts or forklifts is required to move the items with maximum efficiency. For example, if you have 30 staff picking in 18 different aisles, you may want only two or three staff picking in a single aisle at any given time. Moreover, if your warehouse uses wire-guided forklifts, you may want only a single forklift in an aisle at any given time.

While monitoring, you can optionally move, add, or delete order lines. Although you can have multiple order lines from multiple orders on a single wave, you cannot have the same order line on two different waves. The system allocates only one order line from a single order per wave. Certain criteria must be met before you move or delete an order line from a wave.

Wave Sizes

It is difficult to recommend how many order lines you should have on a wave to constitute a typical wave size. The number of lines, and hence, the size of the wave, depends on the industry, items, order volume, and the number of shipments.

Typically, you can reasonably manage 10-15 waves per day. This allows enough visibility for the person controlling the waves to ensure that waves are processed and closed.

Take the following into consideration when determining the size of your waves:

1 The more waves you have in the system, the less wave visibility.

   One or more users should act as wave planners who manage warehouse staff workflow and capacity, replenish waves on time, and release waves so that the system assigns tasks to warehouse staff. Too many waves can complicate and confuse both planners and staff.

The wave planner's objective is to start, replenish, release, and complete a wave with some overlapping when the next wave is started. To this end, there may be several waves at the same time, but not so many as to increase the amount of time needed to complete the waves.

2 Processing only a few big waves in a day impacts the space required in the picking locations.

For a single large wave, the required quantity in the picking location increases. It may not be possible to increase the picking locations in your warehouse. If your warehouse has on overflow area that you can use, this may not provide the best result. Wave planners lose visibility in overflow areas. Because overflow areas are typically floor locations near aisles, wave picking becomes more cumbersome, complicated, and dangerous for warehouse staff who may have to avoid pallets in walkways.

3 Consider the carriers, truck loads, and so on, departing from your warehouse each day.

Wave planners should consider step 1 and step 2 before determining the number of waves per carrier, truck load, route, and so on. After examining the first two steps above, wave planners may decide, for example, that it is better to have one wave for two truck loads or two waves per one truck load.

Setting Task Calculation

You must set the Task Calculation field in Local Exit Routine Setup (4.23.10) before you:

- Replenish a wave in Wave Replenishment (4.15.6).
- Release a wave in Wave Release (4.15.8).

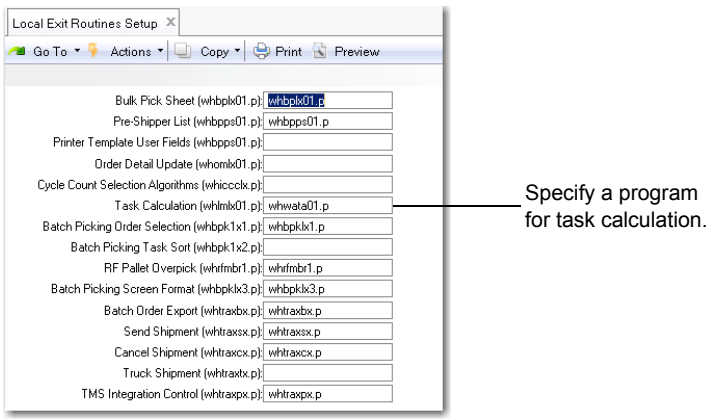
See page 182.

The Priority After Active field in Wave Planning Control (4.15.1.24) gives priority to tasks once the system activates them. Activation occurs when you launch release groups during a wave release. The program you specify in Task Calculation in Local Exit Routine Control takes priority into account when creating tasks.

See "Priority after Active" on page 333.

Figure 18.3 shows the location and correct setting of the field.

Fig. 18.3
Local Exit Routines Setup (4.23.10)



Assigning Picking Algorithms

Wave planning functionality contains the logic for pick-by-level algorithms; therefore, when picking for waves, you must assign pick-by-level algorithms in Algorithm Assignment Maintenance (4.6.9). For example, use a pick-by-level-by-date algorithm to pick in all areas for items by the most recent date first. If you do not use a pick-by-level algorithm, warehouse staff can pick in the wrong areas during wave release and replenishment. This is because only pick-by-level algorithms consider full pallet areas.

See “Algorithm Assignment” on page 108.

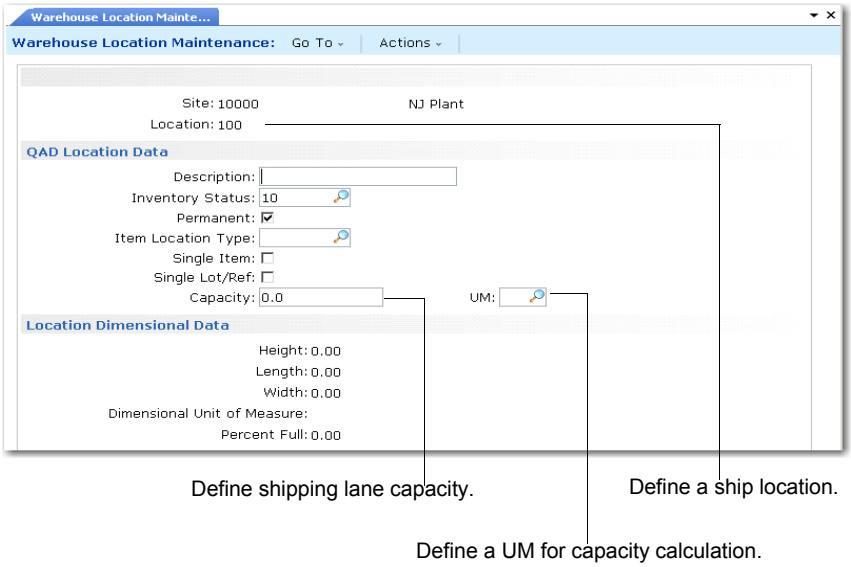
Defining Lanes and Docks

Use Lane Maintenance (4.15.1.1) to define a shipping lane or a dock.

A shipping lane and a dock are locations. Typically shipping lanes are locations to which staff bring all boxes for an order, customer, or carrier. Docks are locations where staff load the boxes onto trucks. The loading dock includes various components, including platforms where goods are stacked, ramps for truck loading, and so on. Shipping lanes and docks can also be dedicated areas where you process orders in a specific way; for example, for a specific carrier type. The system considers shipping lanes and docks when it processes orders for a wave.

Before you define a shipping lane or a dock, you must set them up as locations in Warehouse Location Maintenance (4.3.13). For shipping lanes, you also specify the capacity in Location Maintenance. Figure 18.4 shows a shipping lane defined as a location.

Fig. 18.4
Warehouse Location Maintenance (4.3.13), Shipping Lane



Docks are typically in a functional IRG and do not require capacity specifications. In Warehouse Location Maintenance, you should define the Storage Type for the dock as Truck; see Figure 18.5.

Fig. 18.5
Warehouse Location Maintenance (4.3.13), Storage Type Field

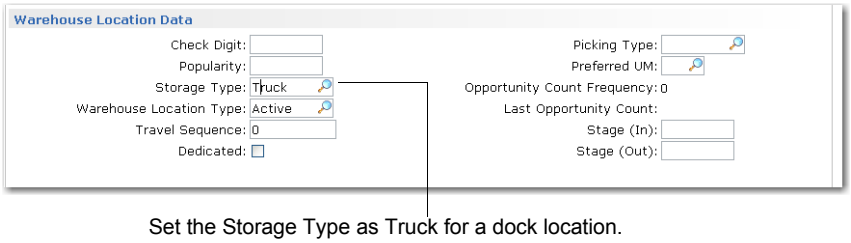
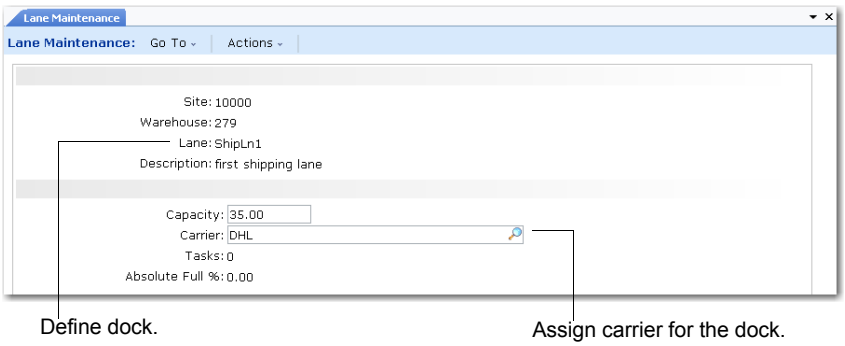


Figure 18.6 shows a dock set up in Lane Maintenance (4.15.1.1). You can assign a specific carrier to a lane or dock. In the setup shown in Figure 18.6, a carrier is assigned to the dock. You specify the carrier in the Carrier field.

Fig. 18.6
Lane Maintenance (4.15.1.1), Dock Setup



Site. Enter the site for the shipping lane.

Warehouse. Enter the warehouse for the shipping lane.

Lane. Enter a location previously defined in Location Maintenance that represents this shipping lane.

Description. Enter a brief description (maximum 24 characters) of the shipping lane.

Use Lane Group Maintenance (4.15.1.5) to group several shipping lanes together.

Capacity. Enter the capacity of this shipping lane, in terms of the dimensional unit of measure specified for the lane in Warehouse Location Maintenance (4.3.13). See Figure 18.4 on page 325.

Carrier. Specify the carrier for this shipping lane. Specify multiple carriers with a comma-separated list.

Number of Open Tasks. This field is display only and indicates the open, existing tasks for the shipping lane.

ABS Full %. The system displays the absolute full percentage of the location. An absolute % is a count of the exact content of that location. In the Location Full % Report (4.3.17.13), the system displays a relative percentage that considers an empty location as 0 % and a location containing any items, regardless of the quantity, as 100%.

The absolute full % also displays in Warehouse Location Maintenance (4.3.13).

Assigning Algorithms to a Lane

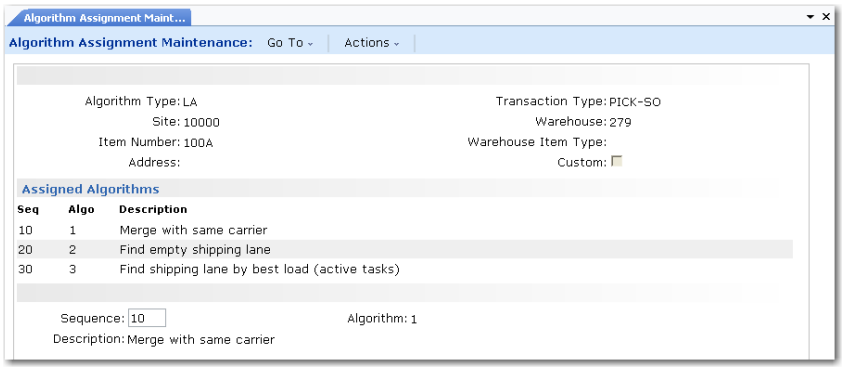
Use Algorithm Assignment Maintenance (4.6.9) to assign an algorithm to a shipping lane. Specify LA as the Algorithm Type for a shipping lane; see Figure 18.7.

For both shipping lanes and docks, you can define a combination of algorithms. The system finds a shipping lane using the first algorithm in the list. If it does not find any, it considers the next algorithm to use, and so on.

See “Algorithm Assignment” on page 108.

Note When the automatic wave release is active, the system can use a lane assignment algorithm (5) that selects the last lane previously selected for the same wave. See page 365.

Fig. 18.7
Algorithm Assignment Maintenance (4.6.9), Shipping Lane



You need to assign one or more algorithms to a site/warehouse, specifying the LA algorithm type. The different available algorithms include:

1: Merge with same carrier. The system looks for a shipping lane in use for a given carrier.

2: Find empty shipping lane. The system looks for an unassigned shipping lane.

3: Find shipping lane by best load (active tasks). The system looks for a shipping lane with the lowest number of tasks assigned to it.

4: Find a dedicated unique lane for carrier. The system considers carriers assigned to a specific shipping lane in Lane/Dock Maintenance. A carrier can only be assigned to one shipping lane. See page 325.

5: Find the last previously selected shipping lane to use when automatic wave release is active. See page 365.

Assigning Algorithms to a Dock

You need to assign one or more algorithms to a site/warehouse, specifying the CM (container move) algorithm type in Algorithm Assignment Maintenance (4.6.9).

See page 365.

The different available algorithms include:

1: Move to stage. The system finds the first location defined as a stage location.

2: Move to stage. The system finds an empty stage location.

3: Move to stage. The system finds a location in Stage that already contains stock for the SO shipper or DO ship-to code.

4: Move to stage. The system looks for a stage location with the least number of containers/pallets in it.

10: Move to dock. The system finds the first location defined as a truck location.

11: Move to dock. The system looks for an empty dock location.

12: Move to dock. The system finds a dock location that already contains stock for the SO shipper or DO ship-to.

13: Move to dock. The system looks for a dock location that has the least number of containers/pallets in it.

14: Find a dedicated dock. The system finds a dock dedicated to a given carrier.

Note The jump from 4 to 10 allows room to add future algorithms.

You can use Algorithm Assignment Maintenance to set up a logical sequence of dock algorithms so that the system selects ideal locations when moving goods to the dock.

For example, you can set up the sequence in Table 18.1.

Table 18.1
Logical Setup for Dock Algorithm

Sequence #	Algorithm #	Dock Algorithm Description
10	3	Move to stage – merge with same shipper
20	2	Move to stage – find empty location
30	1	Move to stage – find first location
40	14	Find dedicated dock
50	12	Move to dock – merge with same shipper
60	11	Move to dock – find empty location
70	4	Move to stage – find location with least pallets

Defining Lane Groups

A *lane group* is a collection of shipping lanes. You define lane groups in Lane Group Maintenance (4.15.1.5). You must define the shipping lane first in Warehouse Location Maintenance (4.3.13), then in Lane Maintenance (4.15.1.1). You must have at least one lane group defined. Specify a lane group that you define here in the Lane Group field in Wave Planning Control (4.15.1.24).

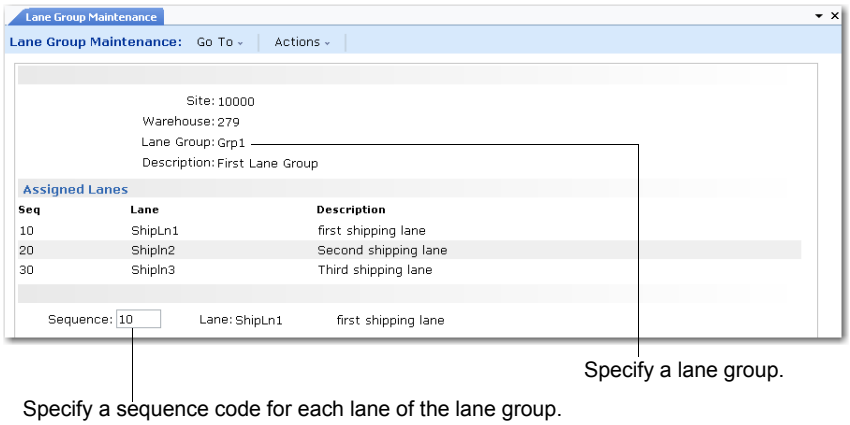
When you create a new lane group, you can base it on an existing one; the system prompts you to copy another lane group.

You can group several shipping lanes together to serve other purposes; for example, you may have several shipping lanes that you use for one item type and other shipping lanes that you use for a different item type. You can group the shipping lanes based on the item type.

Use Lane Group Assignment (4.15.1.13) to link a warehouse item type to a shipping lane group. Specify lane load algorithms in Wave Planning Control (4.15.1.24).

See page 331.

Fig. 18.8
Lane Group Maintenance (4.15.1.5)



Site. Enter the site for the lane group.

Warehouse. Enter the warehouse for the lane group.

Lane Group. Enter a lane group name.

Description. Enter a brief description (maximum 24 characters) of the lane group.

Sequence. Enter the sequence code for this shipping lane. Enter codes by 10s (10, 20, 30, and so on) so that you can insert additional steps easily later.

Lane. Enter the lane for sequence. You define lanes in Lane Maintenance (4.15.1.1).

Description. The system displays the description of the lane.

Defining Workload Groups

A *workload group* is a collection of work location groups (WLGs). You use Workload Group Maintenance (4.15.1.9) to define a workload group and assign it to a warehouse and site. When the system uses workload calculations, it takes into account all workload groups you define in Workload Group Maintenance for the site and warehouse to which it applies the calculations.

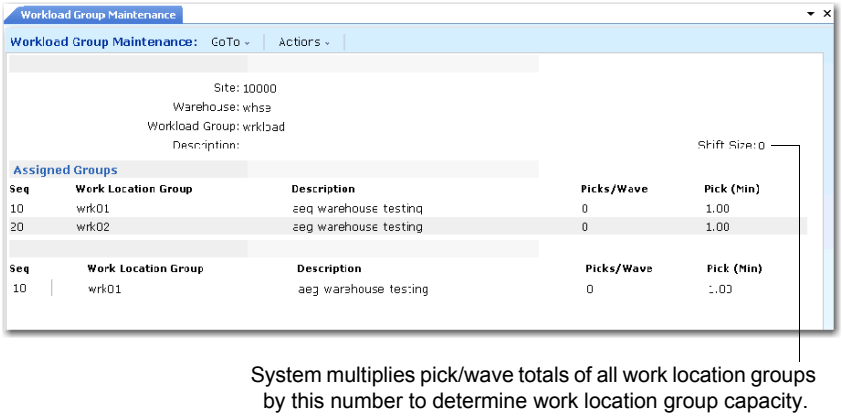
Workload Group Maintenance displays the shift size at the workload group level. The shift size indicates the number by which the system multiplies the capacity of all WLGs.

See “Shift Size” on page 330.

In Wave Selection (4.15.3), the system displays the capacity and workload for all workload groups.

See page 343.

Fig. 18.9
Workload Group Maintenance (4.15.1.9)



Site. Enter the site for the workload group.

Warehouse. Enter the warehouse for the workload group.

Workload Group. Specify the workload group for this site and warehouse.

Description. Enter a brief description (maximum 24 characters) of the the workload group.

Shift Size. Enter the number of warehouse staff in a shift when you create a new workload group. The system uses this value to determine the capacity of all WLGs.

Example You have a capacity of 64 picks/wave per person; therefore, for a shift of two people that work in that workload group, the total capacity is 128 picks/wave.

Seq. Enter a sequence number identifying the work location group within this workload group. Sequence numbers must be unique within a workload group. The system prints work location group sequence numbers in ascending sequence. For example, work location group 20 follows work location group 10.

Number sequences by 10s or 100s, so you can add new work location groups without renumbering existing ones. For example, if you have work location group 10, 20, and 30 and need to add another work location group after 20, you can enter it as work location group 25.

Work Location Group. Enter the name of the work location group for this sequence of the workload. The system displays the description that you previously specified.

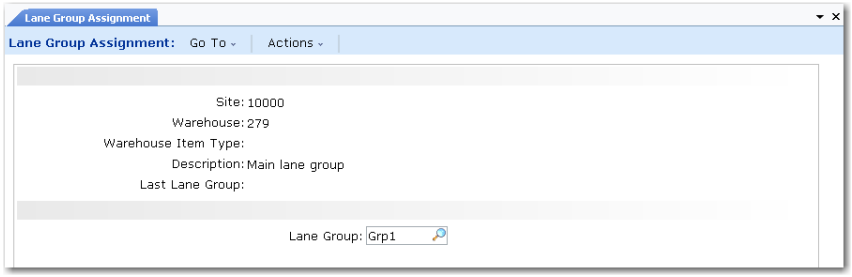
Picks/Wave. Enter the quantity that indicates the number of picks per wave per person.

Picks (Min). Enter the number of minutes per pick. The default value for this field is define defined in the Time per Pick (Min) field in Wave Planning Control. See “Time per Pick (Min)” on page 335.

Assigning Lane Groups

Use Lane Group Assignment (4.15.1.13) to link a shipping lane group to a site and warehouse, and optionally, link a warehouse item type to a shipping lane group.

Fig. 18.10
Lane Group Assignment (4.15.1.13)



Site. Enter the site for the lane group.

Warehouse. Enter the warehouse for the lane group.

Warehouse Item Type. Optionally, enter the type of item for this shipping lane group. Assign types to items on the warehouse item maintenance functions. See “Warehouse Item Type” on page 83.

Description. Enter a brief description (maximum 24 characters) of the the warehouse item type.

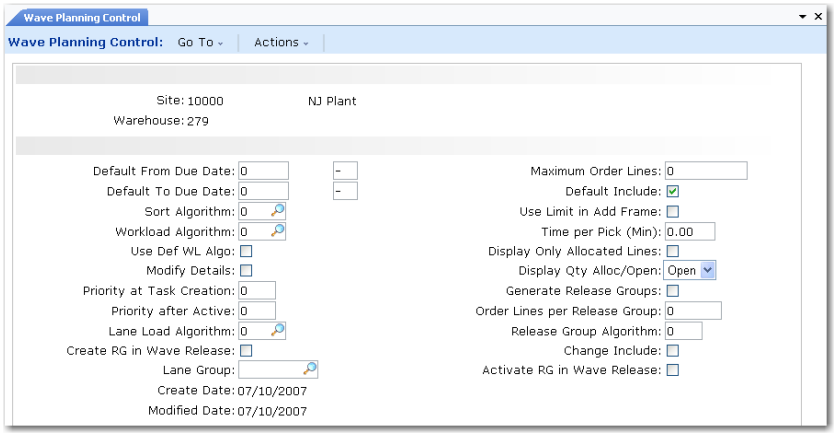
Last Lane Group. The system displays the last lane group that was used for a particular warehouse item type. You can define several lane groups so that when waves overlap, they use different lanes for each wave. When using the appropriate lane-group algorithm, the system uses one lane group first, then proceeds to the next lane group, and so on.

Lane Group. Enter a lane group name, defined in Lane Group Maintenance (4.15.1.5).

Setting Up Wave Planning Control

Use Wave Planning Control (4.15.1.24) to set default values for other wave planning programs.

Fig. 18.11
Wave Planning Control (4.15.1.24)



Site. Enter the site for the wave.

Warehouse. Enter the warehouse for the wave.

Default From Due Date. Specify a number of days to be added to or subtracted from the current date when setting a default value for the Due Date field in Wave Selection (4.15.3).

Specify in terms of days from the due date; for example, specify 9 for 9 days from the due date.

Use the second entry field to specify a plus (+) or minus (–) to indicate past dates or future dates. Valid past dates include today's date minus 9,999 days. Valid future dates include today's date plus 9,999 days. Use negative numbers to indicate past due items for which you want picking completed.

When you enter –9999 here, the field is blank in Wave Selection. In this case, the system includes all due dates until the To Due Date value.

Default To Due Date. Specify the number of days to be added to or subtracted from the current date when setting a default value for the To field in Wave Selection. Use the second entry field to specify a plus (+) or minus (–) to indicate past dates or future dates.

Sort Algorithm. Specify the algorithm the system uses to sort orders for a wave. Currently only one algorithm is available; future releases of wave planning will include additional algorithms.

Algorithm 1: Sort by priority by order. The program for this algorithm is `whwa001.p` Algorithm 1 considers all orders with the highest priority.

Define priority for a customer in Address Warehouse Detail Maintenance (4.13.13), which defaults to any order you create for the customer. Use Order Warehouse Data Maintenance (4.13.1) to view priority.

Note In QAD Warehousing, profiles provide an additional means to categorize and select orders to process and are not associated with system security profiles. For example, you can create a Top profile for all of your top customers, then select orders by this profile to process first or monitor until shipment.

If you restrict wave selection to a specific number of order lines by specifying a maximum number of order lines in the Def Max Order Lines field, the system selects only the orders with the highest priority for that wave.

You can customize `whwa001.p` with any text-editing tool, and then enter your customized program here. For example, you can change the sort algorithm to sort by customer class and define a new algorithm as `whwa999.p`. You must add the customized program to Generalized Code Maintenance (36.2.13) for the SortAlgo field before you can use it in warehouse functions. If you create `whwa999.p`, you enter 999 in SortAlgo because the system assumes algorithm program names begin with `whwa.`

You can change the priority of the order using Wave Priority Boost (4.15.15); for example, if you have an urgent request to fill orders immediately.

See page 349.

Workload Algorithm. Enter an algorithm to calculate the workload during the wave selection process.

Note Currently only one algorithm is available; future releases of wave planning will include additional algorithms.

Algorithm 1: Workload by WLG – dedicated location. The default program name for this algorithm is `whlo001.p`. This algorithm first considers a dedicated location for the item. If there are multiple dedicated locations, it only considers the first one found in the system. If no

dedicated locations are found, the system looks for an item-location replenishment definition. If a definition exists, then the algorithm uses this location. When multiple item-location replenishment definitions exist, the system only considers the first.

The system calculates the number of forecasted picks based on the rule:

1 order line = 1 pick

A pick occurs in a given WLG because the system links the item needed to a dedicated location and that location belongs to a WLG. If you use multiple dedicated locations for a given item, then the algorithm supplies a correct result only if the different locations belong to the same WLG. The algorithm always looks for the first location dedicated for the item.

You must define the workload group that you monitor in a specific site/warehouse for a wave in Workload Group Maintenance (4.15.1.9).

See page 329.

Use any text editor to edit and customize the algorithm and save it with a different name. Define and describe the new algorithm in Generalized Codes Maintenance (36.2.13) for the LoadAlgo field.

Use Def WL Algo. When different workload algorithms are available, you can specify which algorithm to use for calculations when you select a wave in Wave Selection (4.15.3). Indicate whether the system prompts you to use the default workload algorithm in Wave Selection.

No: Prompt for which algorithm to use during wave selection.

Yes: Do not prompt for which algorithm to use during wave selection. Use the default algorithm specified in Workload Algorithm. If you always use only one algorithm, set to Yes to remove the prompt for the algorithm to use during wave selection.

Modify Details. Indicate whether to select or deselect order lines in Wave Selection.

No: You cannot select or deselect order lines in Wave Selection. You can only deselect an entire order.

Yes: You can select or deselect order lines in Wave Selection.

Priority at Task Creation. Specify a default priority value for a wave release. The system creates the release group when you release the wave. Once created, you can assign the release group to a lane; however, the system may create tasks and an RF device can receive the tasks before you assign the release group to a shipping lane. To prevent this, set this field to 0 (zero). The default is 0. The field defaults to the same-named field in Wave Release (4.15.8).

Priority after Active. Specify a default priority value to use when you release the wave in Wave Release. This is the priority the system assigns to the picking tasks once you activate release groups. If you want the tasks to be processed with RF devices, specify a non-zero value. When using batch picking in the picking area, this value is not important as long as it is a non-zero value. This is because batch picking sorts orders by order priority, not task priority, and selects tasks based on the travel sequence. For other picking techniques, though, when warehouse staff use the RF Next Task screen, the task priority is important.

Important You must set the Task Calculation field in Local Exit Routines Setup (4.23.10) to the `whwata01.p` program. See “Setting Task Calculation” on page 324.

Lane Load Algorithm. Enter a load algorithm to use when you use lane groups.

Before you set this field, you must:

- Define lanes in Lane Maintenance (4.15.1.1). See page 325.
- Define lane groups in Lane Group Maintenance (4.15.1.5). See page 328.

Table 18.2 lists load algorithms you can specify, the program that corresponds to the algorithm, and a short description of the algorithm.

Note The load algorithms are unique to Wave Planning Control and are not algorithm types that you assign to movements, items, or warehouses.

Table 18.2
Load Algorithms

Algorithm	Program	Description
Algorithm 0: Take Next Lane Group	whlalo00.p	This algorithm considers the last lane group used, then takes the next one based on alphabetical order. If the last one is reached, it takes the first one again. Use this algorithm when you want to split shipping lanes and use sets of shipping lanes for different waves. In this case, each wave uses the next lane group and the system selects a lane within that lane group.
Algorithm 1: By Number of Tasks	whlalo01.p	This algorithm selects the lane group that has the least number of tasks allocated to a shipping lane that belongs to that lane group.
Algorithm 2: By Current Stock	whlalo02.p	This algorithm selects the lane group containing the smallest amount of items. It sums the inventory records—stock on-hand and stock coming in—regardless of the base unit of measure. This means the total is not always relevant.
Algorithm 3: By Number of Orders	whlalo02.p	This algorithm selects the lane group containing the smallest amount of orders, regardless of the number of lines for those orders.
Algorithm 4: By Number of Order Line	whlalo04.p	This algorithm selects the lane group containing the smallest amount of lines.

Create RG in Wave Release. Indicate whether the system creates wave release groups automatically when you release the wave.

No: Release groups are not created automatically in Wave Release (4.15.8). Only picking tasks take place when you release the wave. You must use Wave Release Group Creation (4.15.9) to create release groups and assign them to shipping lanes and Wave Release Group Activation (4.15.10) to activate them.

Yes: The system automatically creates release groups when you release the wave in Wave Release.

Lane Group. Specify the default lane group created in Lane Group Maintenance (4.15.1.5). This field defaults to the Lane Group field in Wave Release (4.15.8). The wave release process requires that at least one group exist; even when you do not need different lane groups, you must create one and assign all shipping lanes to it.

You must leave the Lane Group field blank in Wave Release if you want to use the lane load algorithms to find the most suitable lane for a wave release; otherwise, the system uses the lane group you specify in Default Lane Group.

Maximum Order Lines. Enter the maximum order lines for a typical wave. This field defaults to the same-named field in Wave Selection (4.15.3).

The size of a wave depends on many factors, such as the number of order lines per day, carriers, and work load capacity. With experience, you can learn the optimal size of the wave that streamlines the throughput of operations in your warehouse and set this field to achieve the optimal wave size.

See “Planning for Waves” on page 323.

Default Include. Indicate the default value of the Include field that displays when orders display in Wave Selection (4.15.3).

No: The default value of the Include field is No. You must toggle the Include field to Yes in Wave Selection to include the order or order lines in the wave.

Yes: The default value of the Include field is Yes. You must toggle the Include field to No to deselect the order or order lines in the wave.

See Figure 18.15 on page 347.

Use Limit in Add Frame. When the system displays orders for a wave in Wave Selection, additional function keys can be used. One function lets you add more orders than originally selected to create the wave. Indicate whether the system considers the setting of Def Max Order Lines when you add more orders.

No: The system does not take the maximum number of order lines into account when you add more orders.

Yes: The system considers the Def Max Order Lines you specify before you can add more orders.

See “Using Additional Functions in the Wave Order Display” on page 347.

Time per Pick (Min). Enter the default value for the average pick time in a WLG measured in minutes. This is the value the system uses when you add a WLG in a workload group in Workload Group Maintenance (4.15.1.9). You can modify this value for each WLG.

Display Only Allocated Lines. Indicate whether the system selects only order lines with a general allocation when it selects orders for a wave in Wave Selection.

No: The system selects all order lines for the wave even if no general allocation exists.

Yes: The system selects only order lines with a general allocation for the wave.

By default, the picking that takes place when you replenish the wave has Auto Allocation set to Yes. This means that if the order line is not generally allocated before the system selects it in the wave, it is generally allocated during the picking process.

Display Qty Alloc/Open. Indicate whether the system displays the quantity generally allocated for the order line or the quantity open for the order line in Wave Selection.

Open (the default): The system displays the quantity open for the order line.

Alloc: The system displays the quantity generally allocated for the order line.

Generate Release Groups. Indicate whether the system creates multiple release groups or only one release group for the entire wave when you release the wave. This field defaults to the same-named field in Wave Release (4.15.8).

No: The system creates only one release group for the entire wave you are releasing.

Yes: The system creates more than one release group for the wave you are releasing.

See “Releasing a Wave” on page 360.

Order Lines per Release Group. Indicate a number for the limit of picks per release group. This field defaults to the same-named field in Wave Release. If you do not want to limit the number of picks per release group, enter the maximum value of 99999.

Release Group Algorithm. Enter an algorithm that the system uses to create the release group.

Note The release group algorithm is unique to Wave Planning Control; it is not an algorithm type that you assign to movements, items, or warehouses. Currently only two algorithms are available; future releases of wave planning will include additional algorithms.

Release Group Algo 1: Standard release group creation. The default program name for this algorithm is `whre001.p`. This algorithm creates different release groups if the order lines are for different due dates, carriers, and warehouse item types.

Release Group Algo 2: Release group creation without due date. The default program name for this algorithm is `whre002.p`. This algorithm creates different release groups if the order lines are for different carriers and warehouse item type. Order lines are a part of the same release groups even if they have different due dates.

You can create a new release group algorithm. Add the new selection in Generalized Codes Maintenance (36.2.13) for the RelAlgo field.

Release Group Algo 3: Used for load optimization. The program name for this algorithm is `whre003.p`. This algorithm creates different release groups if the order lines belong to different loads.

See “TMS Interface” on page 405.

Change Include. Indicate whether shipping lanes are included as the default when the system launches release groups during a wave release.

No: When you manually assign a shipping lane to a release group in Wave Release Groups Creation (4.15.9), the system does not include the shipping lane by default when it launches the release group during a wave release. When releasing a wave, you must manually enter the shipping lane in the Lane Group field in Wave Release.

Yes: When you manually assign a shipping lane to a release group, the system includes the shipping lane by default when it launches release groups in a wave release.

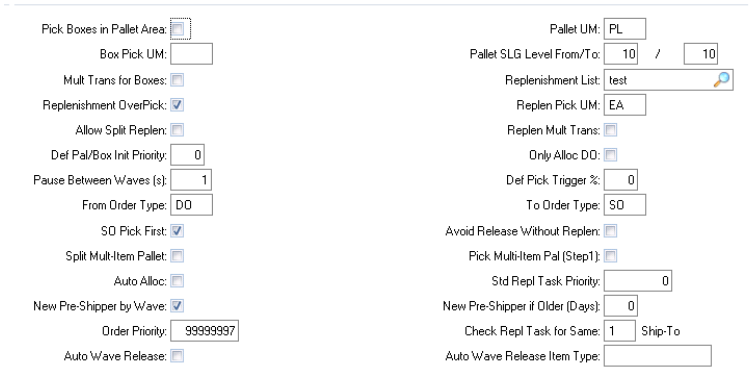
See “Releasing a Wave” on page 360.

Activate RG in Wave Release. Indicate whether the system activates release groups automatically when you release the wave.

No: The system does not automatically activate release groups that it automatically creates by setting Create RG in Wave Release to Yes. You must activate release groups using Wave Release Group Activation (4.15.10).

Yes: The system automatically activates release groups when you release the wave in Wave Release.

Fig. 18.12
Wave Planning Control, Second Frame



Pick Boxes in Pallet Area. Indicate whether this second step of a wave replenishment is implemented or bypassed.

No: The system skips this step. Staff can replenish enough items in the detail picking area to cover box picking from that area.

Yes: The system implements this step and sets tasks to pick boxes from the pallet area and move them directly to the consolidation area or dock.

See “Step 2: Box Picking from the Reserve Area” on page 353.

Box Pick UM. Enter the UM for picking boxes. The system uses this setting in step 2 of wave replenishment. For this step, the system considers only the reserve area. The following picking parameters are hard-coded and unchangeable for this step:

- Pallet splittable allowed
- Overpicking not allowed

See “Step 2: Box Picking from the Reserve Area” on page 353.

You can optionally omit the second step of wave replenishment by specifying No to Pick Boxes in Pallet Area. When you omit the step, the system does not use the value you enter here.

See page 337.

If this field is blank, the system uses the Pick/Multi Of field in Storage Location Maintenance (4.3.1) to set up multiple pallet units of measure.

See “Storage Location Group Maintenance” on page 59.

Mult Trans for Box. Indicate whether the system creates a task for each box picked in step 2 of wave replenishment.

No: The system creates only one task for the entire quantity that staff pick from the pallet, regardless of the number of boxes on the pallet.

Yes: The system creates a task for each box picked during step 2.

See “Step 2: Box Picking from the Reserve Area” on page 353.

Replenishment OverPick. Indicate whether staff can overpick during step 3 of replenishment.

No: Staff cannot overpick for the replenishment and can only pick the quantity required.

Yes: Staff can overpick for the replenishment and pick more than the quantity required. If you set Allows Split Replenishment to No, set this field to Yes.

See “Step 3: Picking Area Replenishment” on page 353.

Allow Split Replenishment. Indicate whether staff can split the pallet in the reserve area during step 3 of wave replenishment.

No: Staff can only pick the full alternate UM; for example, a complete pallet based on standard picking rules. If set to No, set Replenishment Overpick to Yes; otherwise, the system creates no tasks if the remaining required quantity is less than the pallet quantity.

Yes: Staff can split the pallet in the reserve area during the picking for replenishment. The system does not consider Replenishment Overpick if set to Yes.

See page 353.

Pallet/Box Initial Priori. Specify the default priority for tasks in the first and second steps of the wave replenishment. In these two steps, staff pick full pallets or boxes in the reserve area and move them directly to the consolidation area or dock. This field defaults to the same-named field in Wave Replenishment (4.15.6).

The default is 0 (zero). When the priority is 0, the system creates the tasks but they are not yet visible on the RF device. When you release the wave, the system modifies the priority of the tasks when it launches the release groups during the wave release. The system does this to synchronize picking tasks in the reserve area and detail picking area. Also, during the wave release, the system reassigns the destination location of the tasks, moving the task location to the same shipping lanes as the remaining picking tasks.

You can view picking tasks for each wave by using Wave Task Inquiry (4.15.4.8).

See page 369.

Pause Between Waves. Enter the rate based on the number of seconds at which the system refreshes the display in Wave Status Inquiry (4.15.4.3). The display in Wave Status Inquiry is auto-refreshable, and the rate is set by the value you enter here.

See “Monitoring Waves and Wave Releases” on page 371.

From Order Type. Enter the first order type in a range of order types to:

- Use as the default when selecting orders for the wave in Wave Selection (4.15.3).
- Determine which order type to pick first during step 1 and step 2 of wave replenishment.

Enter the last order type in the range in To Order Type.

Valid values are SO and DO. The default is SO.

Select orders as follows:

- From SO To SO: Use sales order lines.
- From DO To DO: Use distribution order lines.
- From DO To SO: Use distribution orders and sales orders.

Note If you specify From SO To DO, the system cannot display the orders. The system searches for orders in alphabetical order and cannot find a sales order before a distribution order.

During step 1 and step 2 of wave replenishment, this field determines whether staff start with SO picking or DO picking. When enough stock to cover all orders does not exist, the setting of this field can have important consequences. Typically, general allocation prevents this

problem. If Display Only Allocated Lines is Yes in Wave Planning Control, the system selects only the lines already generally allocated for the wave; that is, only order lines for which there is enough inventory.

This field defaults to the Order Type field in Wave Selection (4.15.3).

See page 351 and page 353.

SO Pick First. Indicate whether warehouse staff pick first for sales orders in the wave.

No: Warehouse staff pick first for either distribution orders or sales orders in the wave.

Yes: Warehouse staff pick first for sales orders in the wave.

Split Multi-Item Pallet. Indicate whether the system splits a multi-item pallet for step 1 of replenishment.

No: The pallet cannot be split. You should set Pick Multi-Item Pal to indicate whether staff can pick from the complete pallet.

Yes: The pallet can be split and the system proposes a picking task only for the item required on the pallet instead of the full pallet.

See “Step 1: Full-Pallet Picking” on page 351.

Auto Allocation. Indicate whether the system automatically performs general inventory allocations for confirmed order lines that are not yet generally allocated.

No: The system does not automatically perform general allocations.

Yes: The system automatically performs general inventory allocations for confirmed order lines.

New Pre-shipper by Wave. Specify whether to generate a new pre-shipper even when orders on a new wave are for a ship-to or carrier that is on an existing pre-shipper. The system typically sets up wave picking so that an open pre-shipper for a given ship-to and carrier is reused and wave order lines are added to it.

No: Do not generate a new pre-shipper. Use an existing pre-shipper and add lines for the new wave to it.

Yes: Generate a new pre-shipper by wave.

Note You can use Wave Pre-Shipper Workbench (4.15.14) to review pre-shippers linked to a wave, view wave pre-shipper details, and perform additional wave pre-shipper functions.

Priority. This field contains the value of the priority for the next wave. During wave release, all orders that are released take the priority of the wave. After the wave is released, this counter is decremented one unit at a time. This means that the first wave that is released gets a higher priority than the next wave. As a result, the Batch Picking screen on RF devices displays the wave that was released first before the other waves. This lets staff complete all the tasks for a given wave before picking for the next wave.

Pallet Unit of Measure. Specify the common pallet alternate unit of measure (UM) for the reserve area. The default is blank.

The system uses the setting of this field during the first step of wave replenishment. During the first step, pallets are never splittable and there is no overpicking. These parameters are hard coded for the first step. The system sets up pick tasks by multiples of the pallet UM that you enter here.

If this field is blank, the system uses the Pick/Multi Of field in Storage Location Maintenance (4.3.1) to set up multiple pallet units of measure.

See “Step 1: Full-Pallet Picking” on page 351.

Pallet SLG Level From/To. Enter a range of Storage Location Group (SLG) picking levels. The field includes two entry points: the first for the first level in the range, and the second for the last level in the range.

Set levels here to ensure the following:

- Picking from the detail picking area only during wave release
- Picking from the reserve area only in step 1 of the wave replenishment. See “Step 1: Full-Pallet Picking” on page 351.

During a wave release, the system does not consider stock in the reserve area. The system avoids picking in the reserve area by skipping the SLG that has a picking level equal to or within the range of the values you specify here.

Note All picking algorithms the system uses in wave planning should be pick-by-level types such as the pick-by-level-by-month or pick-by-level-by-expiration-date algorithms. These types of algorithms contain the logic the system uses when setting pallet SLG picking levels. Use Algorithm Master Report (4.6.7) to find a pick-by-level algorithm.

Replenishment List. Enter a valid replenishment list that contains a list of all SLGs in the reserve area to use during wave replenishment. You define replenishment lists in Replenishment List Maintenance (4.16.1).

Replenishment Pick UM. Enter a UM to use during step 3 of wave replenishment when staff replenish detail picking area stock from the reserve area. The default is blank.

If this field is blank, the system uses the Pick/Multi Of field in Storage Location Maintenance (4.3.1) to set up multiple pallet units of measure.

See “Step 3: Picking Area Replenishment” on page 353.

Replenishment Multi Trans. Indicate whether the system creates a task for each alternate UM staff pick during step 3 of wave replenishment. The system determines an alternate UM based on the setting of Replen Pick UM.

No: The system creates only one task for all alternate UMs that staff pick.

Yes: The system creates a task for each alternate UM that staff pick.

For example, if you set Pick UM to bx (for box) and this field to Yes, the system creates a task for each box that staff move to the detail picking area. If you set this field to No, the system creates only one task regardless of the number of boxes on the pallet.

Note If you set Pick UM to pl (pallet), the system does not consider this field since the system creates only one task.

Only Allocate Distribution Orders. Indicate whether to allocate distribution orders only.

No: Allocate both sales orders and distribution orders.

Yes: Allocate distribution orders only.

Pick Trigger %. Specify a percentage of completed picking tasks in a wave to use as the trigger to start the next wave.

The system displays an asterisk (*) next to the wave you need to start in Wave Status Inquiry (4.15.4.3).

Your experience with wave releases dictates the percentage you enter here. Typically, wave replenishment starts just before the previous wave completes, but you can start replenishment too late, resulting in too little stock to release the wave; and multiple releases are then required to complete the wave.

Avoid Rel w/o Replen. Indicate whether wave replenishment is required to release the wave.

Note Do not set this field to Yes if your warehouse does not use a picking area; wave replenishment is not needed if a picking area does not exist.

No: You can skip the wave replenishment and release the wave. You should ensure that you have enough stock in the picking area to cover the wave requirements before you avoid replenishment.

Yes: You must replenish the wave using Wave Replenishment (4.15.8) before you release the wave, even if no replenishment tasks are necessary for the current wave.

Pick Multi-Item Pal. Indicate whether warehouse staff can pick a full pallet if it contains multiple items.

No: Skip step 1 of replenishment for the pallet and instead replenish using step 3—replenishment from the picking area.

Yes: Allocate only the required item, but staff can move the complete pallet.

See “Step 1: Full-Pallet Picking” on page 351.

Replenishment Task Priority. Enter the default task priority for standard replenishment tasks.

When the system creates wave replenishment tasks, standard non-wave replenishment tasks may exist for wave items. Wave replenishment tasks are for an order, while non-wave tasks may not be for an order. When they are not for an order, the replenishment task can have a lower priority than a wave replenishment task. When the standard replenishment task has a lower priority, staff may not perform the task right away and the wave release can be blocked until that task is confirmed. Use this field to increase the priority.

New pre-shipper if Older (days). Specify the number of days that the system adds wave orders for a given ship-to to an open pre-shipper. After this period, the system creates a new pre-shipper for wave orders.

Auto Wave Release. Indicate Yes to automatically release a wave. When you automatically release a wave, it is not necessary to wait until all replenishment tasks are complete. You can release so that warehouse staff can pick the order as soon as the replenishment is complete.

No: The wave is not automatically released. You must release the wave using Wave Release after all replenishment tasks for the wave are completed.

Yes: Once activated (Auto wave Release = yes) you can activate it for all items (Auto wave Release Item Type blank) or just for a certain Warehousing Item Type. In this case it has been activated for all item types.

See page 365.

Check Repl Task for Same. When you release a wave, the system checks the status of the replenishment tasks for that wave. The system looks for an open replenishment task for the same:

1: ShipTo

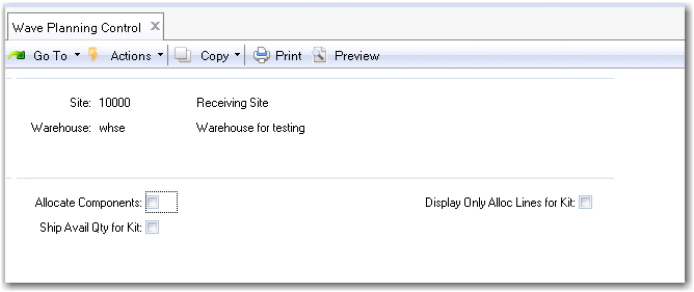
2: Order

3: Part

When it finds the same shipto, order, or part in an order line other than the order line you are trying to release, the system prevents releasing.This feature is specially useful when you set Auto Wave Release to Yes.

Auto Wave Release Item Type. Indicate the type of item for which you want to automatically release a wave. Leave blank to select all item types for automatic wave release

Fig. 18.13
Wave Planning Control, Third Frame



Allocate Components. Specify Yes to automatically apply pick logic and create detail inventory allocations for components of configured kits.

No: The system uses the site from the sales order line for the site and default item location. The quantity to ship for a component is determined by the quantity open for the configured kit rather than the quantity available to allocate for the component.

Yes: The system creates detail allocations for confirmed sales order lines. For detail allocations, set this field to Yes even when Available Kit Quantity to Ship has been used to update detailed allocations.

You can modify detail allocations for components of configured kits in Pre-Shipper/Shipper Workbench.

Display Only Alloc Lines for Kit. Indicate whether the system selects only configured kit sales order lines with a general allocation when it selects orders for a wave in Wave Selection.

No: The system selects all kit sales order lines for the wave even if there is no general allocation.

Yes: The system selects only kit sale order lines with a general allocation for the wave.

By default, the picking that takes place when you replenish the wave has Auto Allocation set to Yes. This means that if the order line is not generally allocated before the system selects it in the wave, it is generally allocated during the picking process.

When selecting order lines that reflect a kit, the system does not allocate the kit parent item, only the components. Since a kit is a set of items that are picked for shipment, no real assembly takes place, and the configured item is not a physical entity—it only exists as a logical superset of its components. The configuration defines the content of a kit, and a shipment contains the end items that comprise the kit.

Ship Avail Qty for Kit. This field determines the quantity picked for kit items. A kit is a type of configured item that represents a set of items that are picked and shipped together; no real assembly takes place.

No: The quantity to ship for the kit item is set to the corresponding quantity open on the order line.

Yes: The system determines the component of the kit with the least quantity available to allocate. The quantity to ship for the kit item is set to this quantity. This ensures that complete kits are shipped.

Selecting Orders and Creating the Wave

Use Wave Selection (4.15.3) to select orders and create the wave. The system uses the default sort algorithm that you specify in Wave Planning Control (4.15.1.24) to sort through orders. For example, you can specify that the system sort by-order-by-priority.

See “Sort Algorithm” on page 332.

Note It is highly recommended that only one person at a time use Wave Selection.

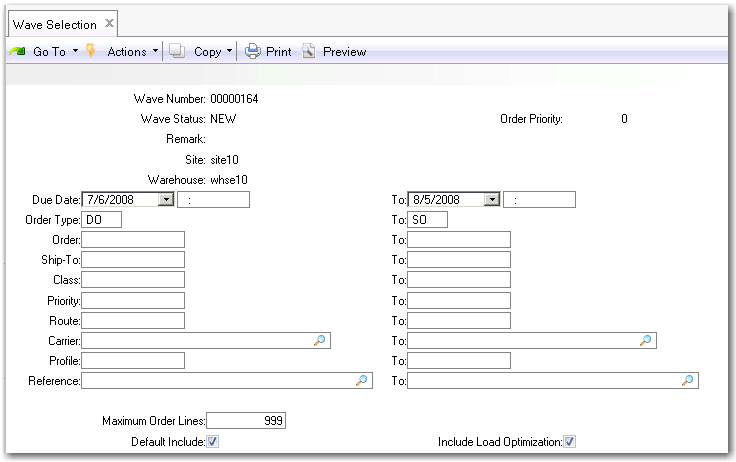
In Wave Selection, fields marked with an asterisk (*) have indexes. This lets you search the indexes and sort by different criteria, display additional information about the orders, add more orders matching the same criteria, and so on.

Example You select only orders for a specific carrier. You can search all orders for that carrier, then select orders that ship to a specific region of the country and add them to the wave.

Searchable indexes let you create a wave that provides optimal efficiency for your warehouse and optimal performance for the system.

Figure 18.14 illustrates Wave Selection.

Fig. 18.14
Wave Selection (4.15.3)



Procedure

To select orders and create the wave, use the following procedure:

1. If this is a new wave, leave Wave Number blank. If editing an existing wave, enter a wave number.

   The system assigns the wave number for a new wave. The system displays criteria for an existing wave.

   The system also assigns the order priority for a new wave as 0 (zero). The Order Priority field is display only; however, you can change the priority using Wave Priority Boost (4.15.15).

   See “Changing the Order Priority of a Wave” on page 349.

2. Specify the site and warehouse for the wave; then click Next.

3. Specify criteria by which the system selects the waves:

   a. For SOs and DOs, enter or accept due date, order type, ship-to, customer class, priority, route, carrier, and profile.

   b. For customer schedules, enter or accept all fields for SOs and DOs and due time and reference fields.

4. Set Default Include to Yes to set the Inc field in the order display frame to Yes. This automatically includes the orders that match the criteria you specify.

   See “Selecting Orders” on page 347.

   Note You can manually deselect orders or order lines in the order display.

5. Choose one of the following:

   a. If Load Optimization is set for this site/warehouse has been activated in Load Optimization Setup Maintenance (4.15.2.1), a new selection screen displays for you to select loads.

   b. If Load Optimization is not set, click Next.

      A list of all orders that fit the criteria display.

   See “TMS Interface” on page 405.

6. Select the orders for the wave. See page 347.

7. Click Next.

   The system prompts you to complete the wave.

8. Specify Yes.

   The system creates a wave number and displays the first screen of the wave selection with the new number.

The following sections provide Wave Selection field descriptions, instructions to select orders, and additional function descriptions.

Wave Selection Fields

Set the wave selection fields to specify criteria by which the system selects orders for your wave.

Wave Number. Enter a wave number to edit an existing wave or leave blank to let the system create a wave number for a new wave. If you enter a value, the system displays data for that wave.

Wave Status. The system displays the status of an existing wave or automatically assigns a status of NEW to a new waves. Wave status is managed and updated by the system during the wave life cycle. You can view wave status details using Wave Status Inquiry (4.15.4.3). Possible statuses are:

NEW: New wave

INCREPL: Incomplete replenishment

REPLEN: Replenishment

RGASSIGN: Release groups assigned orders

RGCREATE: Release groups created

RGACTIVE: Release groups active

CLOSED: Closed

See page 371.

Remark. Optionally enter any brief remarks about the wave (maximum 40 characters). These display in other wave functions such as Wave Replenishment, Wave Release, and Wave Close.

Site. Enter the name of the site to use for wave planning.

Warehouse. Enter the warehouse to use for wave planning.

Due Date and To. Enter a range of due dates for selecting orders to include in the wave. Enter two-digit months, days, and years. You can also enter the time of day, based on a 24-hour clock; for example, enter July 4, 2006, 1:00 PM as 07/04/06 13:00.

The default values for Due Date and To are calculated based on entries in the Default From Due Date and Def To Due Date fields in Wave Planning Control (4.15.1.24).

Order Type. Enter the order type or range of order types as follows:

From SO To SO: Use sales order lines for this wave.

From DO To DO: Use distribution order lines for this wave.

From DO To SO: Use distribution orders and sales orders for this line.

See “Default From Due Date” on page 332.

Note If you specify From SO To DO, the system cannot display the orders. The system searches for orders in alphabetical order and cannot find a sales order before a distribution order.

This field defaults from the same-named field in Wave Planning Control (4.15.1.24).

Order. Enter a range of specific order numbers if you want to include lines from those orders only.

Ship-To. Enter a range of ship-to codes for selecting orders to include in the wave.

Class. Enter a range of customer class codes for selecting orders to include in the wave.

Priority. Enter a range of priorities for the orders for selecting orders to include in the wave. You associate a priority with an order in Order Warehouse Data Maintenance (4.13.1).

Route. Enter a range of route codes if you want to include orders only from specific routes in the wave. You associate a route with an order in Order Warehouse Data Maintenance.

Carrier. Enter a range of carrier codes for selecting order lines for this wave. If you specified the carrier for order lines in warehouse order maintenance functions, the system selects lines that match. Otherwise, if you do not specify the line-level carrier, the system uses the carrier you specify at the order header level.

Profile. Enter a range of specific profiles to use when selecting orders for a wave. You define profiles in Address Whse Detail Maintenance (4.13.13). You can update the Profile in the wave selection screen by pressing P.

Reference. For customer scheduled orders, enter a range of references for selecting orders to include in the wave.

Def Max Order Lines. Enter a numeric value for the default maximum number of order lines to include in a single wave. This field defaults from the Maximum Order Lines field in Wave Planning Control (4.15.1.24). See “Maximum Order Lines” on page 335.

Default Include. Indicate how to set the Inc field in the wave order display. This field defaults from the Default Include field in Wave Planning Control.

No: Do not set the Inc field to Yes in the order display to automatically include the orders that match the defaults set in Wave Selection.

Yes: Set the Inc field to Yes in the order display to include all orders that match the defaults set in Wave Selection.

Use this field to streamline program execution if you typically include all selected orders when creating a wave.

See “Default Include” on page 335.

Include Load Optimization. Indicate Yes to include load optimization for this wave. Refer to the Wave Selection procedural help for more information on load optimization.

No: Do not include orders that are marked for load optimization by a Transportation Management System (TMS).

Yes: The system displays the Load Selection frame that lets you include load orders in a wave. Select loads by a range of load numbers, arrival/departure dates, carrier, ship via, FOB point, MOT, vehicle ID or language. You can also specify whether to include full or less than full truck loads or parcel shipping.

QAD Warehousing sends shipping and other data for orders to the TMS. The TMS creates a load that sets up picking based on truck capacity, loading sequence, carrier costs, and other factors for improved picking, routes, loading, and billing. You can also create a load in Load Maintenance.

See Chapter 21, “TMS Interface,” on page 405.

Selecting Orders

Once you specify criteria to select orders and click Next, the system displays orders that match that criteria. Figure 18.15 depicts the order display.

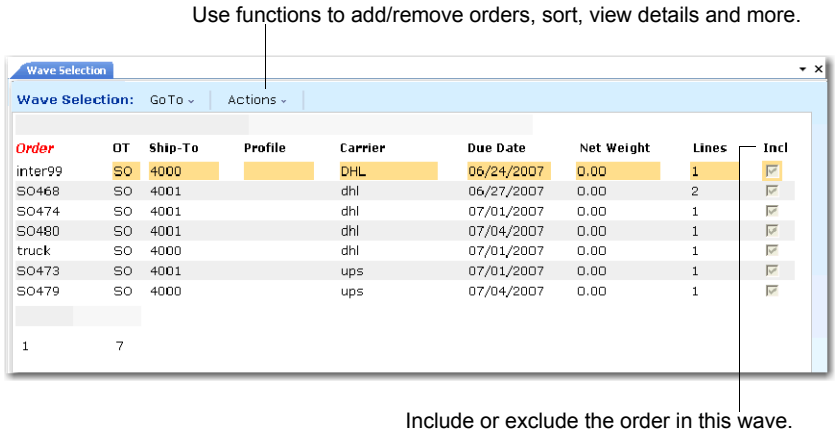
In the Include column, press Enter to toggle between Yes and No to select or deselect the orders to include in the wave.

Use additional functions in the order display to further customize your order selections for the wave. Use function keys at the bottom of the list of orders or if using the .NET UI interface, select Actions for additional functions. Press R to refresh the display, D to display details of an order, W to display the workload of an order, U to undue, and H for help. When you press H for help, additional sort and editing options display.

Click Next to complete wave selection.

See page 347.

Fig. 18.15
Wave Selection (4.15.3), Order Display



Using Additional Functions in the Wave Order Display

You can use additional functions when orders display in Wave Selection:

- Remove orders from the wave using either the Keep Only or Remove Frame function.
- Add orders to the wave using wave selection criteria.
- Sort the frame by carrier, due date, ship-to, net weight, order or profile. You can find a line, once you sort.
- Select/deselect all orders of a given ship-to in real time after you sort by ship-to.
- See order details and select/deselect order lines one at a time.
- Edit the Profile or Carrier.
- Display a summary. The summary displays the number of orders and order lines based on the last sort criteria used. For example, first sort by carrier by pressing C; then press M.
- Refresh the frame. When you refresh a frame, the system deletes all orders or order lines having Include set to No.
- Undo the last action. The system will undo only the latest action.
- Display the workload and once displayed, calculate the workload.
- Display a summary of all loads included in a wave selection, add loads to a selection, or deselect closed load orders from a wave.

Figure 18.16 shows some of the additional functions you can access to manipulate order data in a wave.

Fig. 18.16
Additional Functions Menu

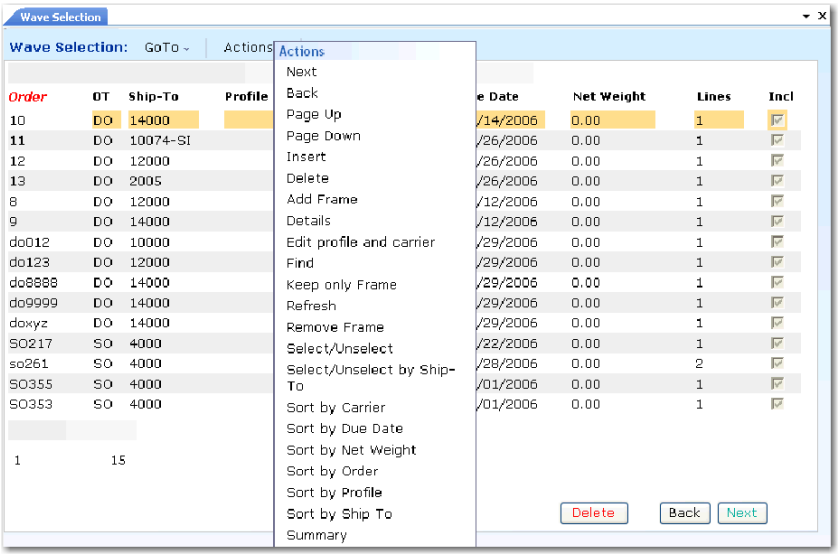
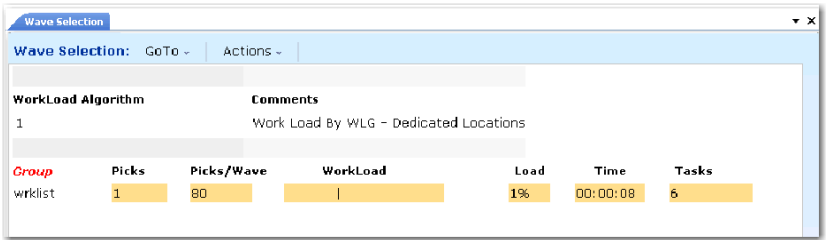


Figure 18.17 shows the frame that displays when you display by workload.

Fig. 18.17
Workload Calculations



The workload calculation uses the algorithm you specify in the Workload Algorithm field in Wave Planning Control. You specify whether to use the workload algorithm as the default in Use Default WL Algo.

See page 332.

The system calculates the workload for all WLGs belonging to the workload group that you define in Workload Group Maintenance (4.15.1.9). When you select W to show the workload, the system displays a frame that shows the capacity and workload for all workload groups. You can then select a particular workload group to see individual WLG capacity.

See “Defining Workload Groups” on page 329.

Use the following additional functions in the workload order display:

- Press P to see the details by order. The system displays the number of picks by order and by WLG.
- Press Q to display the ordered quantity by order and by WLG. The system displays the quantities. Quantity information is useful when managing workloads and replenishment, regardless of the UM your warehouse uses.

Wave Selection for Configured Kits

A kit is a set of items that are picked for shipment. No real assembly takes place, and the configured item is not a physical entity; it only exists as a logical superset of its components. The configuration defines the content of a kit, and a shipment contains the end items that comprise the kit. Kit picking uses the PICK-FAS transaction, not the PICK-SO transaction. Wave reports and inquiries display data for the PICK-FAS transactions just as for the PICK-SO transactions. You can use Wave Open Order Report and set the Only Allocated Lines (Kit) to Yes to view data for allocated configured kits.

When selecting sales orders for kits for a wave, you select the kit parent item, not individual components; therefore, the kit parent item generates a warehousing order detail record. This is because the system always assigns the carrier (ship via) to the parent, not to the kit components, and carriers are important for waves.

Kit components require an Item-Warehousing Maintenance record so that you can select them for a wave and the system can use a warehouse item type to assign to lane groups in Lane Group Assignment; however, you do not need an Item-Warehousing Maintenance record for the parent item. If component records are not assigned, the system assigns a blank warehouse item type for the kit parent. If this occurs, you can assign a different warehouse item type in Item-Warehousing Maintenance.

You can press C in the Wave Selection Order Details frame to display kit configuration; the selected order line is a kit configuration.

You can use fields in Wave Planning Control to allocate kit components, display only allocated components for a kit, or ship available quantities for a kit.

When releasing a wave, the system creates PICK-FAS tasks just as does for PICK-SO tasks. When replenishing, the system creates for kit components and not the parent item. During wave release and release group creation/activation, all algorithms, ship-to and ship via codes, and orders are correctly retrieved for PICK-FAS picking tasks.

See “Wave Planning Control, Third Frame” on page 342.

Changing the Order Priority of a Wave

Use Wave Priority Boost (4.15.15) to manually change the order priority or the task priority of a wave. When you boost the priority of a wave, you boost the priority of all the orders or all tasks on the wave. Since batch picking displays orders by descending priority, those orders display at the top of the list once you boost priority.

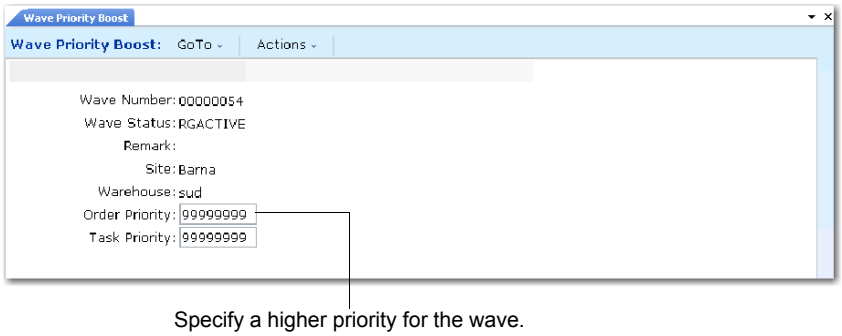
You assign task priority in the Priority field in Internal Routing Maintenance (4.2.5). If there is no internal routing defined for the movement, then the task priority is set for transactions in the Priority field in Work Location Group Maintenance (4.3.9).

You define the order priority for a customer in Address Warehouse Detail Maintenance (4.13.13), which defaults to any order you create for the customer. You use Order Warehouse Data Maintenance (4.13.1) to view priority.

To change the order or task priority, specify the wave number. The system displays the site, warehouse, and any remarks about the wave. Change the priority by entering new values in either the Order Priority or Task Priority field.

See “Sort Algorithm” on page 332.

Fig. 18.18
Wave Priority Boost (4.15.15)



Replenishing a Wave

When you know the items needed for each order, you can ensure that stock moves from the reserve area to the picking area before the picking takes place. Use Wave Replenishment (4.15.6) to replenish items in the picking area. This ensures that quantities are sufficient to meet the demands for the order lines in the wave.

When you run wave replenishment, the system considers the requirement for the item on the wave and all open waves that require the item. If other waves require the item, the system adds the requirement to the warehouse staff assigned to the replenishment task for the waves. When you run wave replenishment for the other waves that require the item, the system checks not only existing stock in the picking location but all the stock expected to arrive in the picking location. This ensures that there is enough stock to cover existing replenishment tasks.

Inventory and SLG Considerations

The system considers inventory in the storage location group (SLG) during wave replenishment to determine if enough inventory is available in the forward pick location. The system checks for stock first in the home SLG for the item, then in the overflow SLG linked to the home SLG.

Note You link the overflow SLG to the home SLG in Storage Location Group Maintenance (4.3.1). See “Storage Location Group Maintenance” on page 59.

The system looks for the home location using the following sequence:

1 Use the first dedicated location for the item.

The system uses the SLG that corresponds to the item and the dedicated location that you specify in Location Maintenance (4.3.13). You set the Dedicated field to Yes for the home location.

If you have multiple dedicated locations, the system uses the first location it finds.

2 If the SLG in the home location is not available, use the SLG that corresponds to these definitions in this order:

   a The first item-SLG replenishment definition in Replenishment SLG Maintenance (4.16.9)

   b The first item-location replenishment definition in Replenishment Location Maintenance (4.16.5)

The quantity to replenish is calculated as follows:

Qty to replenish = Qty required (1) – Qty available and coming in (2)

Where:

Qty required = qty needed on that wave for the item + qty required on all waves for that item (1)

Qty available = stock QOH + stock coming in for open replenishment tasks for the SLG you need to replenish + overflow QOH and overflow qty coming in for the associated SLG (2)

You define a replenishment list in Wave Planning Control that contains the SLGs that you want to pick from to replenish other SLGs during wave replenishment.

Wave Replenishment Steps

Wave replenishment typically includes the following three steps; however, depending on the setup, you may not use all steps:

- Step 1: Full-pallet picking
- Step 2: Box picking from the reserve area
- Step 3: Picking area replenishment

The following subsections describe each step in more detail. Setup information is provided in the subsections. The following warning message displays when at least one item is not set up correctly:

```
No Replenishment Definition
```

You can view a list of all items that are not set up correctly in Wave Unprocessed Orders Inquiry (4.15.4.6).

Step 1: Full-Pallet Picking

For larger quantities to pick, such as for distribution orders, staff can pick full pallets from the reserve area and move them either to the picking area or directly to the shipping lanes, bypassing the picking area. You can bypass the picking area only if the quantity on a single order line is bigger then the pallet quantity. The system uses picking algorithms and other replenishment options to split pallets, overpick, and so on, that you specify when you set up replenishment tasks for warehouse staff.

The system can create tasks associated with full-pallet picking with a priority of 0 (zero). Even though the system creates the tasks, warehouse staff cannot process the tasks on the RF device. When you release the wave, you activate full-pallet picking tasks along with detail picking tasks. This means that warehouse staff complete full-pallet picking tasks and detail picking tasks at the same time.

If you create full-pallet picking tasks with a non-zero priority when you replenish the wave, warehouse staff bring full pallets to the consolidation or staging area before they replenish items for the wave and before they pick items for the rest of the wave. Moving the full pallets directly to the staging area at this point means that staff use unnecessary space in the staging area. Also, since the system already created the task, it reserves the pallet for the task, even though you have not activated the task.

Step 1 creates a pre-shipper for sales orders or distribution orders. You must print the pre-shipper in Wave Replenishment (4.15.6) at the end of step 2.

Skipping Step 1

To skip the full-pallet picking step, set the Pallet SLG Level From/To field in Wave Planning Control to SLG levels that do not correspond to the picking levels of the pallet SLG levels. The system avoids picking in the reserve area by skipping the SLG that has a picking level equal to or within the range of the values you specify in Pallet SLG Level From/To.

See “Pallet SLG Level From/To” on page 340.

Example The storage location groups in the pallet area have a picking level between 10 and 20. When you set Pallet SLG Level From/To from 30 to 40, picking does not occur in the pallet area.

Setting Up Step 1

Set up step 1 of the replenishment in the same way you set up traditional order picking. Set the following:

- Use Internal Routing Group Maint (4.2.1) to assign an internal routing group to the pallet area.
- Use Internal Routing Maintenance (4.2.5) to assign an internal routing from the pallet area to the dock/consolidation area for a transaction type that is based on the order you use in the wave; for example, transaction type PICK-SO for sales orders, transaction type PICK-FAS for sales orders for configured kits, or PICK-DO for distribution orders.
- Use Algorithm Assignment Maintenance (4.6.9) to assign a pick-by-level algorithm to a PICK-SO or PICK-DO transaction type. Assign a pick-by-level algorithm such as pick-by-level-by-location to ensure that the first step consists of picking only in the pallet area.
- Set up Wave Planning Control picking parameters as shown in Table 18.3. See page 354.
- Set up other replenishment picking parameters in Wave Planning Control. See “Setting Up Wave Planning Control” on page 331.

Step 2: Box Picking from the Reserve Area

In step 2, staff can pick either:

- Full boxes from the reserve area
- Full or open boxes from the picking area

You can use this step to pick multiple boxes from the reserve area and move them directly to the consolidation or staging area.

The same rules apply when applying a zero or non-zero priority to the picking tasks as when using the full-pallet picking.

See “Step 1: Full-Pallet Picking” on page 351.

Skipping Step 2

You can skip this step by setting the same option in Wave Planning Control that you set to skip step 1. If you do, staff replenish the picking area and pick full boxes from the picking area; for example, through batch picking.

See page 352.

Setting Up Step 2

If you want to pick full boxes from the reserve area in this step, set the following:

- Set Pick Boxes in Pallet Area to Yes in Wave Planning Control.

  When Yes, staff can perform box picking after the full-pallet picking. When No, the system sets the box picking completion percentage to 100% without processing any picking tasks.
- Set up Wave Planning Control picking parameters as shown in Table 18.3 on page 354.
- Set up other replenishment picking parameters in Wave Planning Control.

Step 3: Picking Area Replenishment

When full-pallet picking or box picking is complete for a wave, the system calculates the remaining missing quantities in the picking area to fulfill all order lines from the wave. The system creates the tasks to move items to the picking area from the reserve area.

The system calculates the requirement per item across the entire wave; that is, the remaining quantities needed are the sum of all order line quantities needed for a given item at a time. You can view the remaining quantity replenishment as *bulk replenishment* because staff replenish multiple orders at the same time.

For replenishment examples, see page 356.

Also, depending on the setup, you can over-replenish (overpick) a location by creating one or multiple tasks for each box and moving entire pallets to the replenishment area.

See “Replenishment Multi Trans” on page 340.

When step 3 of replenishment finishes, the system creates a dynamic replenishment SLG definition for the given item and an SLG to replenish.

See “Replenishment Results” on page 356.

Setting Up Step 3

- Use Internal Routing Assignment Maint (4.2.9) to assign an internal routing group between the pallet area and the detail picking area.

  Because these two areas are typically part of the same storage internal routing group, set up a one-step internal routing and assign it to the replenishment picking transaction type PICK-RE.
- Use Algorithm Assignment Maintenance (4.6.9) to assign a pick-by- level algorithm to transaction type PICK-RE. Assign a pick-by-level algorithm such as pick-by-level-by-location to ensure that staff do not pick in the pallet area for this step.

- Use Algorithm Assignment Maintenance to assign a put-away algorithm to the PICK-RE transaction type.
- Use Replenishment SLG Maintenance (4.16.9) to create an SLG replenishment definition.
- Set up Wave Planning Control picking parameters as shown in Table 18.3 on page 354.
- Specify a Replenishment List in Wave Planning Control.
- Set other default replenishment controls in Wave Planning Control.

Specifying Replenishment Options

Table 18.3 explains which fields the system considers for picking parameters in the three steps of wave replenishment. You can also refer to Table 18.4 on page 357 and Table 18.5 on page 359, which list replenishment setup for explicit examples.

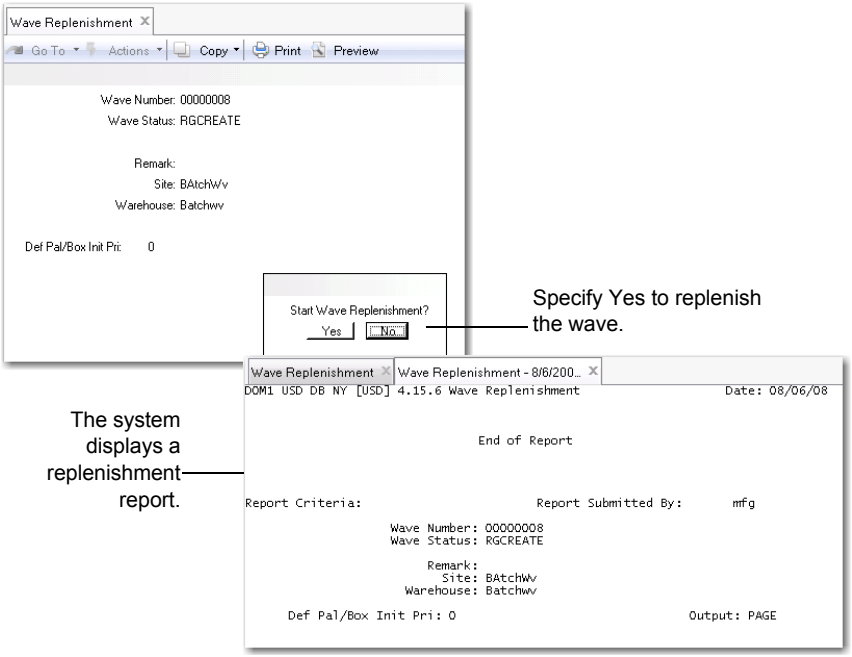
Table 18.3
Fields Considered During Replenishment

Step	For Pallet Splitting	For Over-Picking	For Picking by Multiples of	For Multiple Transactions
Step 1: Full-pallet picking	Set Allow Split Replen to No.	Set Replenishment Overpick to No.	Set Pallet UM to pallets or blank. If blank, set Pick Multi Of in Storage Location Maintenance (4.3.1) to pallets.	Set Replen Multi Trans to No.
Step 2: Box picking	Set Allow Split Replen to Yes.	Set Replenishment Overpick to No.	Set Box Pick UM to box.	Set Replen Multi Trans to No.
Step 3: Replenish picking	Set Allow Split Replen to Yes.	Set Replenishment Overpick to Yes.	Set Replen Pick UM to either pallets or boxes or leave blank. If blank, set Pick Multi Of in Storage Location Maintenance (4.3.1) to pallets or boxes.	Set Replen Multi Trans to Yes.

Wave Replenishment Procedure

Figure 18.12 illustrates the Wave Replenishment (4.15.6) function.

Fig. 18.19
Wave Replenishment (4.15.6)



1 In the header, specify the number of the wave for which you want to replenish items. The system displays wave information, including the status, site, warehouse, and remarks specified in Wave Selection.

2 Specify the default priority for tasks in the first and second step of the wave replenishment.

Note If you want staff to perform pallet and box picking at the same time as the detail picking, set this field to 0 (zero). See page 356.

3 Click Next.

The system displays the following prompt:

```
Start Wave Replenishment?
```

4 Respond Yes; then click Next.

The system displays a replenishment summary and creates a pre-shipper for sales orders at the end of step 2; it then prompts you to specify the output device for the pre-shipper.

5 Print the pre-shipper to a screen, a printer, or a file.

Note Printing the pre-shipper is a mandatory step for SOs. If the wave contains only DOs, the system does not prompt warehouse staff to print.

The system displays a replenishment summary that includes the number of reserve picking tasks and replenishment tasks.

You can use Wave Pre-Shipper Workbench (4.15.14) to review pre-shippers linked to a wave, view wave pre-shipper details, and perform additional wave pre-shipper functions.

Wave Replenishment Fields

The following paragraphs present the Wave Replenishment (4.15.6) user interface and describe fields you enter.

Wave Number. Enter the number of the wave you want to replenish. The system displays the status of the wave, and the site, warehouse, and remarks entered in Wave Selection.

Default Pal/Box Init Priority. Specify the default priority for tasks in the first and second step of the wave replenishment. In these two steps, staff pick full pallets or boxes in the reserve area and move them directly to the consolidation area or dock.

If you want staff to perform pallet and box picking at the same time as the detail picking, set this field to 0 (zero). When 0, the system creates tasks but the tasks are not visible by RF device users. When you release the wave, the system activates the tasks and sets the priority to a non-zero value. By setting priorities, the system synchronizes all picking activities for the wave.

This field defaults from the Pallet/Box Initial Priori field in Wave Planning Control.

See “Pallet/Box Initial Priori” on page 338.

Replenishment Results

When step 3 of replenishment finishes, the system:

- Performs one of the following functions:
  - Creates both a dynamic replenishment SLG definition for the given item and an SLG to replenish, if neither exists.
  - Copies replenishment definitions for the item and the SLG to a temporary table, if both exist.

    Once copied to a temporary table, the system creates a new replenishment definition for wave requirements. After you start replenishment, the system replaces the temporary wave SLG replenishment definition with the one it creates. This ensures that wave replenishment is for the required wave quantity only.
- Starts a dedicated-location put-away logic to find a suitable location in the detail picking area. This is standard setup for SLG replenishment.
- Creates a task to move the required quantity.

  Note If Replenishment Overpick is Yes in Wave Planning Control, the system can create tasks to move more than the required quantity.
- Deletes the temporary replenishment definition that was specific for the wave and replaces the definition with the static SLG replenishment definition if one exists.

Replenishment Examples

The following example shows how item replenishment occurs. In the example, you replenish for a single wave A with two orders for item B.

The following conversion factors are set:

Program	UM	Alternate UM	UM Conversion
Storage Location Maintenance (4.3.1)	PL (Pallet)	EA	100
Storage Location Maintenance (4.3.1)	BX (Box)	EA	20

For Wave A, item B, two order lines exist:

Order Line 1	=	182 EA
Order Line 2	=	173 EA
Total:		355 EA

The total requirement is for 355 EA.

Setup and Results for No Box Picking from Reserve Area

Table 18.4 shows which fields to set in Wave Planning Control for replenishment for no box picking from the reserve area.

See page 331.

Table 18.4
Replenishment Setup for No Box Picking from Reserve Area

Field to Set	Set To	Results
Pick Boxes in Pallet Area	No	Step 2 of the replenishment does not take place.
Pallet UM	blank	The system considers the setting of the Pick Multi Of field in Storage Location Maintenance (4.3.1) for step 1 (full pallet picking). In the SLGs, the alternate UM is PL and staff need to pick by multiples of PL. **Note:** For step 1 of wave replenishment—full pallet picking—the following picking properties are hard-coded and, therefore, not impacted by setup: • Split allow is No. • Overpicking is No.
Replenishment Overpick	Yes	Staff bring full pallets only to the detail picking area.
Allow Split Replen	No	Staff can only move full pallets to the detail area, even if the quantity required is less than the pallet quantity. This is because Replenishment Overpick is set to Yes.

Field to Set	Set To	Results
Replen Pick UM	PL	This determines the pick by multiples of setup for step 3 of wave replenishment, which is picking for replenishment once full boxes and pallets are complete. Staff pick by PL multiples from the reserve area. **Note:** This field can be blank. If blank, the system considers the Pick Multi Of field setting in Storage Location Maintenance (4.3.1) and the alternate UM of the inventory record it is processing. The system does not consider other parameters such as overpicking, multiple transactions, and split pallets from the SLG for step 3 of wave replenishment. The settings always come from Wave Planning Control.
Replen Mult Trans	No	This setup creates multiple tasks if, for example, staff pick by box from the pallet area and you want staff to move one task per box as opposed to one task for all the boxes. This setup is not relevant for picking by multiples of pallets.

Using the setup illustrated in Table 18.4 generates the following results for the three steps of wave replenishment:

Step 1: During full-pallet picking, the system considers each order line at a time. For order line 1, 182 EA were required. In the SLG for picking, there are pallets with a PL UM. The SLG picking details dictate the following:

- PL is a non-splittable unit of measure.
- Overpicking is not allowed.
- Staff pick by PL with no multiple transactions created.

Based on this standard setup, staff can pick one full pallet of 100 EA for order line 1 and one full pallet of 100 EA for order line 2.

Of the 355 EA required, staff have already picked two pallets of 100 EA. At this stage, the missing quantity is 155 EA for Item B.

Step 2: The system skips this step because of control settings.

Step 3: This is the actual replenishment. This step is a bulk replenishment by item. The system considers each item, but the requirements are the sum of all orders for the item in the entire wave. The system removes the item requirement for items staff already picked in step 1 or 2. Based on this, the remaining requirement of 155 EA for item B remains for step 3.

Finally, the system considers the quantity already available in the detail picking area for this item:

- Available in picking area: 11 EA
- Replenishment quantity needed: 144 EA (155 EA – 11 EA)

When the replenishment starts, the system considers the picking default properties from Wave Planning Control. This is different from traditional setup, when the system considers picking defaults coming from the SLG. In this example, staff pick by non-splittable pallets and cannot overpick.

Picking results also depend on the type of algorithm the system uses. Typically you specify a pick-by-level type algorithm. Using this type algorithm, the system sets up two replenishment tasks to move two pallets from the reserve area to picking area. Each task is for a pallet of 100 EA; therefore, in this example you replenish more than the required quantity.

Setup and Results for Use Box Picking from Pallet Area

Table 18.5 lists the Wave Planning Control setup when you use boxes from the pallet area. The UM for box picking is set to bx (box).

Table 18.5
Replenishment Setup for Use Box Picking from Pallet Area

Field to Set	Set To	Results
Set all fields as in Table 18.4		For results of these settings, see Setup and Results for No Box Picking from Reserve Area on page 357.
Pick Boxes in Pallet Area	Yes	Step 2 of the replenishment will take place after the full pallet picking step.

Using the setup illustrated in Table 18.5 generates the following results for the three steps of wave replenishment:

Step 1: The same as setup for box picking from reserve area.

Step 2: Picking by boxes in the pallet area is set to Yes so the system processes step 2. For this step, the following picking properties are hardcoded and cannot be changed by any setup:

- Allow split is set to No.
- Overpicking is set to No.

The Pick by Multiple UM value is from the Box Pick UM field in Wave Planning Control or if not found, from the Pick Multi Of field setting in Storage Location Maintenance (4.3.1). Based on the picking algorithm, staff pick as many boxes as possible from the pallet area but without picking more than what is required (overpicking is No). This works per order line as per step 1.

For order line 1, the requirement is 82 EA (182 – 100). This means if staff pick by multiples of box without overpicking and one box contains 20 items EA, staff pick four boxes of 20, or 80 EA.

For order line 2, the requirement is 73 EA. (173 – 100). This means staff pick three boxes and move them directly to the consolidation or staging/dock area.

Step 3: This is the actual replenishment. This step is a bulk replenishment by item. The system considers each item, but the requirements are the sum of all orders for the item in the entire wave. The system also considers the quantity already picked in step 1 or 2 and removes those requirements. There is a remaining requirement of 15 EA for item B. The 15 includes 2 EA remaining for order line 1 and 13 EA for order line 2. Finally, the system considers the quantity already available in the detail picking area for this item:

- Available in picking area: 11 EA
- Replenishment quantity needed: 4 EA (15 EA – 11 EA)

Replenishing Customer Scheduled Orders in Two Waves

The same customer scheduled order can be an open order on two different waves. However, the system cannot process customer scheduled orders correctly when they are set up for multiple picking and pegging that occur in the wave replenishment and release steps. If you attempt to replenish a wave that has a customer schedule order on another open wave, the system displays an error message and blocks replenishment by:

- Skipping step 1 and step 2 of replenishment
- Ignoring the requirement for step 3 of replenishment

When the system considers the quantity open on a wave with customer schedules, it does not take into account the quantities on other open waves. This is correct even though the quantity open on a wave does not reflect any other open, non-allocated quantities on another wave.

If another open wave for a customer schedule is in the replenishment stage, once you release that wave and the system processes it, you can replenish the other wave with the customer schedule that the system previously blocked. After you release a wave and the system completes detail allocations, the quantity open corresponds to the exact quantity.

Locked Files During Replenishment

Occasionally, orders can be locked when they are being updated by other users during a replenishment. If this happens, the system displays a message in Wave Replenishment (4.15.6) and changes the status of the wave to INCREPL (incomplete replenishment). Use Wave Unprocessed Orders Inquiry (4.15.4.6) to display the login ID of the user that is locking the order. Once the order is unlocked, you can release the wave.

Incomplete Batch Order Selection During Replenishment

It is possible that order lines selected in batch selection are not selected for a load. If this happens, the system displays a message in Wave Replenishment and changes the status of the wave to incomplete replenishment (INCREPL). Use Wave Unprocessed Orders Inquiry (4.15.4.6) to display the login ID of the user that is locking the order. Once the remaining order lines in the batch selection are selected as part of a load, you can release the wave.

Releasing a Wave

Use Wave Release (4.15.8) to release a wave. When you start a picking process, the system creates a pre-shipper. In the warehousing system, when you release the wave, you release the sales and distribution orders for picking and the system creates and prints a pre-shipper.

When you release a wave, the system:

- Uses picking logic to calculate the number of items needed for the wave
- Makes tasks available to staff through the RF device
- Creates and prints the pre-shipper for sales and distribution orders

See page 365.

For SOs only, the system looks for any previously open pre-shipper for the same ship-to and carrier. If an open pre-shipper exists, the system adds more lines to the pre-shipper. This occurs primarily when you specify full-pallet picking during the replenishment step, but staff have more lines to pick in the picking area during the wave release step. The system also considers pre-shippers created for other waves but for the same ship-to and carrier. However, once the pre-shipper is printed and you create a shipper from it, the system no longer considers the pre-shipper and creates a new pre-shipper number. This process has important consequences when staff consolidate since they can only put items for the same pre-shipper on the same pallet.

Note You can use Wave Pre-Shipper Workbench (4.15.14) to review pre-shippers linked to wave, view wave pre-shipper details, and perform additional wave pre-shipper functions, including merging wave pre-shippers.

When you release a wave, the system collects orders for a wave and groups them in wave release groups. The system then activates the groups.

- Set Create RG in Wave Release to Yes in Wave Planning Control to automatically create the release groups when you release the wave.
- Set Activate RG in Wave Release to Yes in Wave Planning Control to automatically activate the release group when you release the wave.

See page 334.

If you set both options to No in Wave Planning Control, you can manually create and activate release groups, assigning your own orders from the wave using Wave Release Groups Creation (4.15.9). You can manually activate the release groups using Wave Release Groups Activation (4.15.10).

To manage throughput of large quantities, you can release orders on a wave incrementally. Or you can release all orders at once for smaller quantities.

Example You have 30 staff picking 1000 order lines for a UPS carrier, but you have only one shipping lane for that carrier. Instead of releasing all 1000 order lines at the same time and creating a congestion of workers in the single shipping lane, you release the 1000 order lines in increments of 100 lines each. This continual throughput eliminates the shipping lane congestion and ensures all items are in the shipping lane in time for the carrier.

You can release orders for which the stock has been completely replenished for all lines. This lets you do multiple releases of the same wave and release more orders.

The system applies priority to wave releases so that staff are not picking for multiple waves released at the same time. So, if you release three waves that are open at the same point in time, the system arranges them so that staff finish picking for one wave before picking for another.

Important You can only release an order if there are no open replenishment tasks for the complete pre-shipper; that is, there are no existing replenishment tasks for any item of any order line belonging to the same pre-shipper.

Use Order Whse Detail Status Inquiry (4.15.4.1) or Wave Open Order Inquiry (4.15.4.5) to view order status.

Use Wave Status Inquiry (4.15.4.3) to view the status of a wave release and to determine when to release a wave. This inquiry shows when the wave is ready to be released and when all orders on the wave can be released. It also shows when the wave can be partially released, when some orders can be released, or when other orders require additional replenishment before releasing them.

See “Viewing Wave Information” on page 368.

Determining the Number of Order Lines to Release

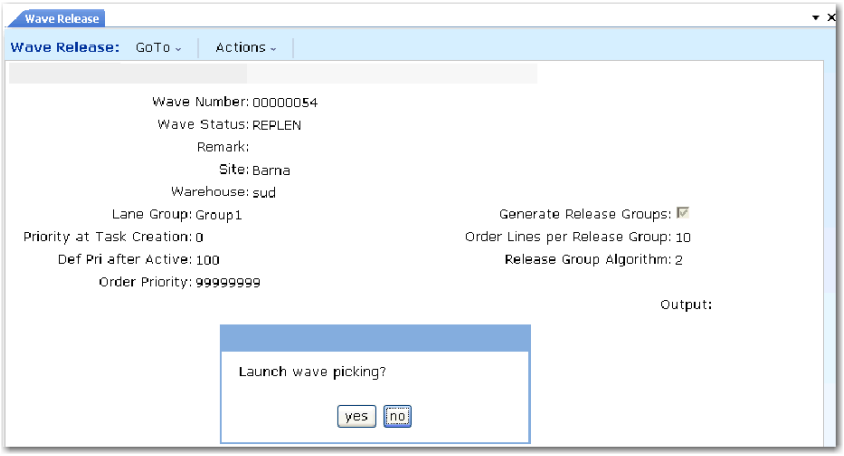
The number of order lines typically equates to the number of picking tasks. For example, 30 order lines results in 30 picking tasks. The system automatically creates release groups for the 30 order lines as:

- 30 lines per group
- A single group for the same ship date
- Warehouse item type and carrier

  Note Item carrier equates to the Ship Via field.

Wave Release Procedure

Fig. 18.20
Wave Release (4.15.8)



Use the following procedure to release a wave.

1 Enter the open wave number you want to release; then click Next.

2 Specify the additional header information such as the lane group, order priority, release group algorithm, and so on. See “Wave Release Fields” on page 363.

3 Click Next.

  The system displays the following prompt:

  `Launch wave picking?`

4 Specify Yes.

  The system prompts you to print a pre-shipper.

5 Specify terminal, a file, or a printer to print results.

The system automatically creates a single or multiple release groups if you specify to do so, then displays the number of tasks it creates for the release group. It also displays the carrier, the due date, and the shipping lane to use.

Note You can optionally manually create and activate a release group outside of Wave Release.

6 Follow procedures to launch the release groups. See “Launching Release Groups” on page 364.

Wave Release Fields

The following paragraphs describe the fields in Wave Release (4.15.8).

Wave Number. Enter the number for the wave you want to release. The system displays the status of the wave, and any remarks entered when the wave as created, as well as the associated site and warehouse.

Lane Group. Enter a valid lane group. A lane group is a collection of shipping lanes. You define lane groups in Lane Group Maintenance (4.15.1.5).

The system creates release groups (collections of orders) automatically and assigns them to shipping lanes when you release the wave if you set options in Wave Planning Control, or you can do this manually in Wave Release Group Creation (4.15.9).

See page 334.

Generate Release Groups. Indicate whether the system creates multiple release groups or only one release group for the entire wave when you release the wave. This field defaults from the same-named field in Wave Planning Control.

No: The system creates only one release group for the entire wave you are releasing.

Yes: The system creates more than one release group for the entire wave you are releasing.

Priority Task Creation. Specify a default priority value for a wave release. This field defaults from the same-named field in Wave Planning Control. The system creates the release group when you release the wave. Once created, you can assign the release group to a lane; however, the system may create tasks and an RF device can receive the tasks before you assign the release group to a shipping lane. To prevent this, set this field to 0 (zero). The default is 0.

Order Lines per Rel Group. Indicate a number for the limit of picks per release group. This field defaults from the same-named field in Wave Planning Control. If you do not want to limit the number of picks per release group, enter the maximum value of 99999.

Def Pri After Activate. Specify the default priority the system assigns to the picking tasks once you activate release groups. If you want the tasks to be processed with RF devices, specify a non-zero value. When using batch picking in the picking area, this value is not important as long as it is a non-zero value. This is because batch picking sorts orders by order priority, not task priority, and selects tasks based on the travel sequence. For other picking techniques, though, when warehouse staff use the RF Next Task screen, the task priority is important. This field defaults from the same-named field in Wave Planning Control.

Important You must set the Task Calculation field in Local Exit Routines Setup (4.23.10) to the `whwata01.p` program. See page 324.

Release Group Algorithm. Enter an algorithm that the system uses to create the release group. This field defaults from the Release Group Algorithm field in Wave Planning Control. See page 336.

Order Priority. Specify the value of the priority for the next wave. This field defaults from the Priority field in Wave Planning Control.

When you release the wave, the system updates the wave priority and all order priorities for the wave you are releasing based on the value of this field. The order priority value is decremented by one for each new wave that you release. When you re-release a wave, however, the priority does not change. For the highest priority wave, the system sorts orders or pre-shippers by descending order with the highest number orders or pre-shippers displaying first in the RF batch-picking screens.

See page 339.

Launching Release Groups

After you specify criteria for the release and print the pre-shipper, the system displays release groups to select for the wave release.

The system displays the shipping lane algorithm it uses to calculate the lane. You can manually change the shipping lane by pressing L.

See “Assigning Algorithms to a Lane” on page 327.

1 In the Inc column, press Enter to toggle between Yes and No to select or deselect release groups for the wave release.

The system reports the number of release groups you select at the bottom of the screen. For example, if three release groups display and you include two, the system displays `2/3`.

2 When you are finished including release groups, press End.

The system prompts you to confirm the exit.

3 Specify Yes.

The system prompts you to launch the release groups.

4 Specify Yes.

The system creates and activates the release groups and displays a status of the activation.

Using Additional Functions in the Task Display

When the system displays tasks in Wave Release, additional functions display at the bottom of the frame. Table 18.6 lists the additional functions.

Table 18.6
Functions in Task Selection

Key to Press	Function Description
L	Displays a list of shipping lanes and lets you choose a new shipping lane
U	Prompts you to undo changes you made to the display
Enter	Toggles between Yes/No in the Inc column

Locked Orders During Release

Occasionally, orders can be locked during a release when they are being updated by other users. If this happens and the status of the wave is NEW, the system displays a message in Wave Release (4.15.8) and you cannot release the wave even if you set Avoid Rel w/o Replen to Yes in Wave Planning Control. Use Wave Unprocessed Orders Inquiry (4.15.4.6) to display the login ID of the user that is locking the order. Once unlocked, you can release the wave.

Automatically Releasing a Wave

Set Auto Wave Release to Yes in Wave Planning Control to automatically release a wave. When you automatically release a wave, it is not necessary to wait until all replenishment tasks are complete. You can release so that warehouse staff can pick the order as soon as the replenishment is complete.

You can set Auto wave Release Item Type to blank in Wave Planning Control to automatically release a wave for all item types.

To automatically release a wave:

1. Use Wave Selection to select the order lines for the wave.
2. Use Wave Replenishment to create picking tasks for full pallets and other replenishment tasks.
3. Use Wave Release to initially release the wave if this is the first release so that the system:
   - Activates tasks for full pallets
   - Creates release groups
   - Launches LA algorithms
   - Increases task priorities
   - Creates picking tasks for items in a wave for which no replenishment task was created

When warehouse staff confirm the replenishment task, the system automatically creates picking tasks for the order lines on the automatic-released wave only. Without automatic release, the system can prevent picking when there are open replenishment tasks for any of the items of a wave that ship to the same destination. Staff can then use any program to confirm the task since the system links the automatic wave release to the task history.

Manually Managing Release Groups

When you release a wave using Wave Release (4.15.8), the system automatically creates *release groups*—a collection of orders within a wave if you set options in Wave Planning Control. You can then assign those release groups to shipping lanes by carrier.

If you do not create release groups automatically, you can manually create and activate them using Wave Release Groups Creation (4.15.9). Use Wave Release Groups Activation (4.15.10) to only activate the release groups.

See page 334.

The frames that display for both programs are similar to Wave Release (4.15.8); however, there is no Order Priority field in Wave Release Groups Creation and Wave Release Groups Activation.

For field descriptions, see page 363.

You must select the release groups individually and launch them.

See page 364.

Deleting Order Lines on a Wave

To delete an order line from an existing wave, use one of the following methods.

If tasks are open on the wave, use this procedure:

1. Use Wave Selection (4.15.3) to open the existing wave with the order line you want to delete.
2. Select the lines you want to remove.
3. Press Enter to toggle the Inc field from Yes to No.

If the wave has no open tasks, you can delete the order line, using this procedure:

1. Use Wave Selection to open the wave with the order line you want to delete.
2. Press F11-Remove.

   The system displays the Remove Orders frame.

   The system displays a warning even when no tasks are open for the wave; however, you can ignore the warning.
3. Specify a range of criteria for selecting the order you want to delete; then click Next.

   The system displays the orders and lines deleted.

Initializing Orders in a Wave

If you have open orders in the system when you install QAD Warehousing, you can use Wave Planning Orders Initialize (4.15.20.1) to:

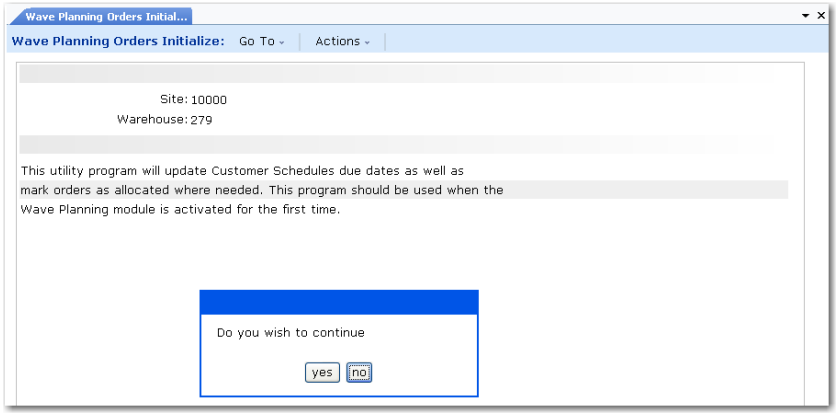
- Update customer schedule order line due dates.
- Mark all orders that are allocated for use by sort algorithm 1. See “Sort Algorithm” on page 332.

Customer schedules can span multiple days. The initialize program updates the order line due dates so that they reflect the date of the last active customer schedule for that order.

Algorithm 1 sorts by-priority-by-order and considers all orders with the highest priority. The initialize program marks all allocated orders and builds an index that points to only lines with general allocations instead of all orders in the system. This increases system performance. You must set Display Only Allocated Lines to Yes in Wave Planning Control to initialize orders.

See “Display Only Allocated Lines” on page 335.

Fig. 18.21
Wave Planning Orders Initialize (4.15.20.1)



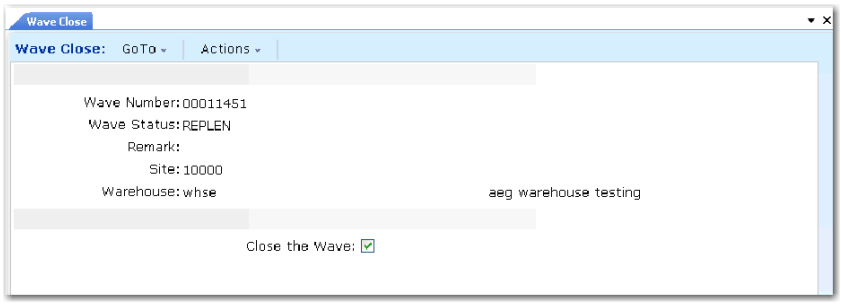
Closing the Wave

Use Wave Close (4.15.17) to close a wave. You can only close a wave when both replenishment and release are complete and no tasks exist for the wave.

Closing a wave is important since an order line can only be in one wave at a time for sales and distribution orders. If the system does not process an order line in a wave, you can close the wave so you can add the line to another wave.

Wave Status Inquiry (4.15.4.3) displays all open waves. When numerous waves exist in the system, the report can be difficult to read. For reporting efficiency, you should close waves. Figure 18.22 shows the Wave Close screen.

Fig. 18.22
Wave Close (4.15.17)



Wave Number. Enter a number for the wave you want to close. The system display the wave status and site, warehouse, and remarks specified when the wave was created in Wave Selection.

Close the Wave. Indicate whether to close the wave.

No: Do not close this wave.

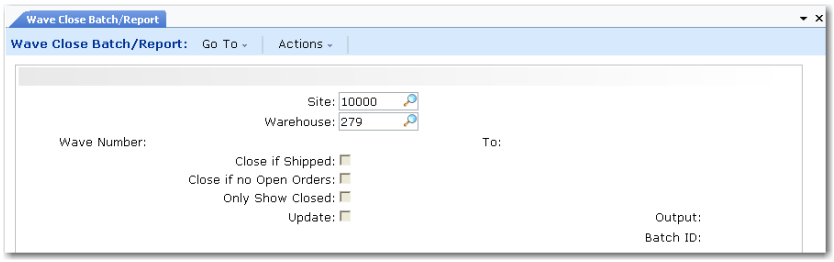
Yes: Close this wave.

You can also close a wave when reporting using Wave Close Batch/Report; see Figure 18.23. You can use the report to close a batch of waves or a single wave. You can specify to close waves that have:

- Orders that shipped
- No open orders

Enter Yes in the Update field to close the waves.

Fig. 18.23
Wave Close Batch/Report (4.15.18)

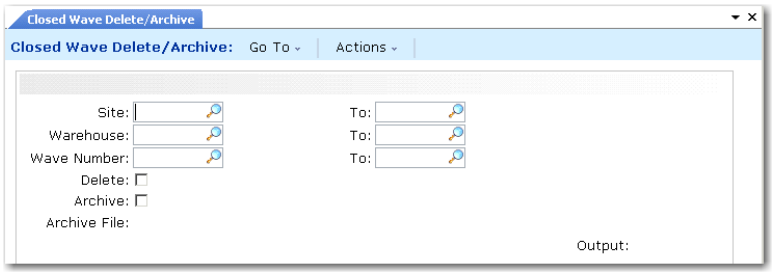


Deleting/Archiving Closed Waves

Use Closed Wave Delete/Archive (4.15.23) to permanently delete or archive wave data for waves that you closed in Wave Close (4.15.17) or Wave Close Batch/Report (4.15.18).

You can select a range of closed records by site, warehouse, or wave number. You must set both Delete and Archive to Yes to archive closed wave data. You should run this function twice. The first time, set Delete to No to review the list of closed waves to delete/archive. The second time, set Delete to Yes to delete/archive the closed waves.

Fig. 18.24
Closed Wave Delete/Archive (4.15.23)



Viewing Wave Information

To process orders in a wave effectively, you need to continually view the status of a wave. Monitoring a wave is especially important since waves can overlap; that is, staff can replenish for a wave while picking for another wave. You can also release more than one wave at time and release orders on a wave that is not complete.

You can use various reports and inquiries in the Wave Planning/Batch Picking menu (4.15) to view waves, orders, workloads, workload groups, open tasks, percentages of completion, and so on. Table 18.7 lists important inquiries and reports and you can use during wave processing.

Table 18.7
Wave Reports and Inquiries

Menu No.	Report/Inquiry	Description
4.15.4.3	Wave Status Inquiry	This inquiry displays the status of a wave and the wave release. Use this inquiry to monitor the progress of different waves or to know when a wave is ready for release. Specify how often the system refreshes the display. See “Monitoring Waves and Wave Releases” on page 371.
4.15.13	Wave Open Order Report	This report displays the number of open orders. The number of open lines displays below the number of open orders. It also displays orders that are past due in a Before column. Optionally, you can display only allocated lines for SOs, DOs, or configured kits.
4.15.4.4	Wave Detail Report	This report presents detailed information about the orders in a wave. Use it to know wave details such as the order and line number data, carrier, due date, weight per lines, and a description of the items.
4.15.4.11	Wave Progress Browse	Use this .NET UI browse to display picking tasks created for this wave that are complete, not complete, and total. You can also use the browse chart designer to create various charts of the data. See page 365.
4.15.1.7	Lane Group Report	This report displays shipping lanes for the site, warehouse, and group. It also displays the sequence of the lanes and the user who created and modified the lane.
4.15.1.11	Workload Group Report	This report displays workload group information, including the site, warehouse, group number, the user who created or modified the group, the number of picks per wave, and the number of minutes per pick.
4.15.20.4	Wave with Blank AbsID Report	This inquiry displays waves by wave number, the number of tasks, and the blank ABS IDs as 0 (zero). You can optionally display only failed waves.

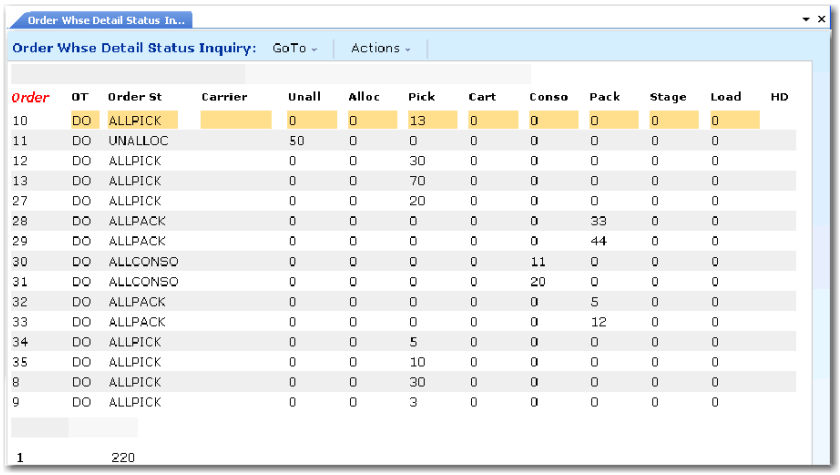
Monitoring Order Status

Use Order Warehouse Detail Status Inquiry (4.15.4.1) throughout the entire wave process to monitor the status of all orders in the wave.

Once you release the wave and the system creates the picking tasks, you can use Order Warehouse Detail Status Inquiry to view the status of every order during the picking process. For example, after staff pick for the first order in your wave, if the Status displays as CART, you know that staff completed the picking for the order and placed it on the cart, but that all orders in the wave are not on the cart yet.

Or, if staff remove boxes through the RF device, you can use the inquiry to see that the pallet is empty.

Fig. 18.25
Order Warehouse Detail Status Inquiry (4.15.4.1)



Order	OT	Order St	Carrier	Unall	Alloc	Pick	Cart	Conso	Pack	Stage	Load	HD
10	DO	ALLPICK		0	0	13	0	0	0	0	0	
11	DO	UNALLOC		50	0	0	0	0	0	0	0	
12	DO	ALLPICK		0	0	30	0	0	0	0	0	
13	DO	ALLPICK		0	0	70	0	0	0	0	0	
27	DO	ALLPICK		0	0	20	0	0	0	0	0	
28	DO	ALLPACK		0	0	0	0	0	33	0	0	
29	DO	ALLPACK		0	0	0	0	0	44	0	0	
30	DO	ALLCONSO		0	0	0	0	11	0	0	0	
31	DO	ALLCONSO		0	0	0	0	20	0	0	0	
32	DO	ALLPACK		0	0	0	0	0	5	0	0	
33	DO	ALLPACK		0	0	0	0	0	12	0	0	
34	DO	ALLPICK		0	0	5	0	0	0	0	0	
35	DO	ALLPICK		0	0	10	0	0	0	0	0	
8	DO	ALLPICK		0	0	30	0	0	0	0	0	
9	DO	ALLPICK		0	0	3	0	0	0	0	0	

1 220

When orders display in the inquiry, you can press additional keys for more information:

D: Display details

P: Show picked only

A: Show all

S: Display shipper information

M: Display a summary

See “Viewing Container Information” on page 386.

Table 18.8 lists the order statuses that display in the Status column with a brief description.

Table 18.8
Order Statuses

Status	Description
ALLALLOC	All items are allocated.
ALLCART	All orders for the wave are on the cart.
ALLCONSOL	All items are in the consolidation area, the pick was confirmed, and the container specified on the RF device.
ALLLOAD	All items are loaded on the truck.
ALLPACK	All items are packed into containers.
ALLPICKED	The entire order has been picked, but it is not on the cart yet.
ALLSTAGE	All items are in the staging area.
CART	This order is on the cart, but not all orders for the wave are on the cart.
CONSOL	Items have been dropped in consolidation area, but have not been consolidated yet. Items are not packed into containers yet.
LOAD	Items are loaded onto the truck.
PACK	Items are being packed into containers, but not all items are in containers.

Status	Description
PICK	This order has been picked, but not all orders for the wave have been picked.
STAGE	Items are in the staging area, but not all items are in the staging area.
UNALLOC	Items are unallocated.

In addition, you can report the total number of open orders by carrier using Open Order Report (14.15.13).

Monitoring Waves and Wave Releases

Use Wave Status Inquiry (4.15.4.3) to monitor the status of a wave or wave release.

Wave Status Inquiry indicates any of the following statuses for a wave:

NEW: New wave

INCREPL: Incomplete replenishment

REPLEN: Replenishment

RGCreate: Release groups created

RGACTIVE: Release groups active

CLOSED: Closed

You can also use Wave Status Inquiry to monitor the release of a wave to determine when to release another wave; see Figure 18.26.

Fig. 18.26
Wave Status Inquiry (4.15.4.3)

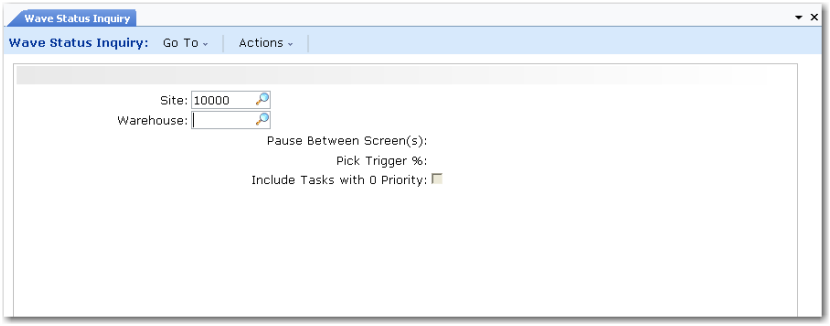


Table 18.9 lists each possible status of a wave release.

Table 18.9
Wave Release Statuses

Status	Description
READY	The wave is ready to be released and all orders on the wave can be released.
PARTIAL	The wave can be partially released. Some orders can be released, while other orders require additional replenishment before releasing them.

Status	Description
WAIT	Release must wait and you cannot release orders because either: • The wave is a new wave and replenishment has not taken place. • There are open replenishment tasks and no orders can be released.
COMPLETE	No more open orders are on the wave. Picking tasks have been created for all order lines. Orders can still be open; however, no more releases are necessary for the orders.
INCOMPLETE	Some open order lines on the wave could not be picked during a wave release; for example, if stock is missing, Some of the quantities required will not be processed. You can reprocess the wave release when the stock becomes available or close the wave so that order lines can be included in another wave. Use Wave Open Order Inquiry (4.15.4.5) for more information on the open lines.

Different actions can activate a change in the status of a wave release. Table 18.10 lists the action and the resulting change in status.

Table 18.10
Actions that Change Wave Release Status

Action	Status Change
You create a new wave.	WAIT
You launch wave replenishment.	WAIT
The system does not need to create replenishment tasks.	READY
The system creates some replenishment tasks.	PARTIAL
Warehouse staff confirm some replenishment tasks.	READY, PARTIAL, or WAIT
Warehouse staff confirm all replenishment tasks and there are no open lines on the wave.	READY
You release all orders that can be released on a wave, but there are more open replenishment tasks to confirm.	WAIT
You release all open lines on a wave.	COMPLETE

Chapter 19

Using Containers

The following topics describe how containerization works in QAD Warehousing:

Overview 374
Defines containerization, explains container levels, and lists containerization features.

Setting Up Containerization 375
Describes how to set up containerization for batch picking.

Processing Orders with Containers 377
Explains how to process container orders with RFDs and explains status and error messages.

Creating a Container with a Zero Quantity 381
Explains how the system handles new containers and how quantity amounts can be affected by new containers with values of 0 or 1.

Creating a Container Level Below a Pre-Shipper 382
Describes how warehouse managers can create container levels using Container Creation Utility (4.25.4).

Exploding Pallets 384
Illustrates how the RF pallet explosion option works and how to explode pallets and boxes from the RF, as well as how to view exploded pallets and edit DO shipper data.

Viewing Container Information 386
Describes how to use Order Warehouse Detail Status Inquiry (4.15.4.1) to view containerization data.

Overview

Containerization is the process of assembling pallets and orders for a shipment. You can manually create a container and link it to a pre-shipper in Pre-Shipper/Shipper Workbench (7.9.2) or in DO Container Maintenance (12.19.7) for distribution orders.

QAD Warehousing provides multilevel containerization through the RF that lets staff assemble pallets for shipment until all shipments for a particular customer ship-to address are complete. The RF containerization option lets warehouse staff use the RF to place all boxes or pallets they filled during picking into other containers for shipping.

The RF containerization functionality is available for both sales orders (SOs) and distribution orders (DOs).

Warehouse staff can create a container and link it to a pre-shipper number. All boxes for a container must be on the same pre-shipper; otherwise, the RF displays an error message.

Through the RF device, warehouse staff can create a new or modify an existing pallet and attach boxes to the pallet. When they do, the system updates the shipper to reflect this.

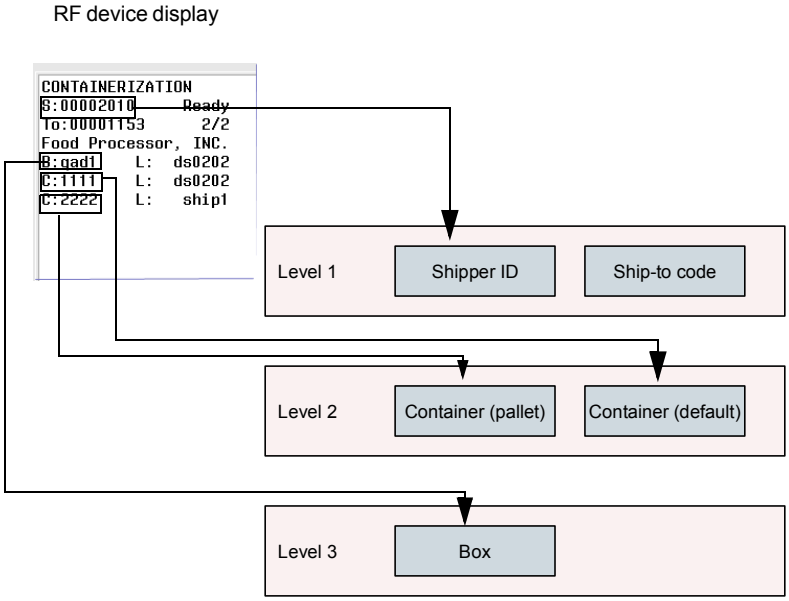
When all boxes have been containerized for a shipper, the RF displays a message notifying staff that the shipper is ready for shipping.

Container Levels

RF containerization is based on levels. Shipper IDs are the highest level, containers are the second level, and boxes are the lowest level. When staff link the box to a new container, the container level displays between the shipper and the box level.

Note Current containerization functionality lets staff put the picking containers (boxes) into other containers (pallets) only.

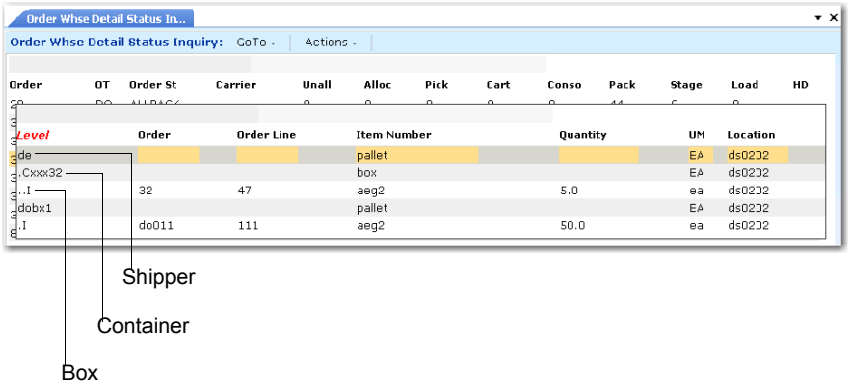
Fig. 19.1
Container Levels



If you remove boxes and the container at the next level up is empty, the system deletes the empty container. For example, if staff remove all boxes from a pallet, the pallet container does not display under the shipper. When staff remove a container that belongs to a shipper, the box attaches to the shipper.

Figure 19.2 shows the container levels that display in Order Warehouse Detail Status Inquiry (4.15.4.1). To view these details, use the S option to view shipper information.

Fig. 19.2
Order Warehouse Detail Status Inquiry (4.15.4.1), Container Levels



Containerization Features

Containerization features let warehouse staff:

- Scan boxes first and add them to a pallet.
- Transfer a scanned box to a pallet that is in another location on the same shipper.
- Remove boxes from containers or pallets.
- View pallets to use.
- View order status or shipper data that reflects warehouse containerization.
- View the number of boxes already containerized and the remaining boxes to be containerized on the RF.
- Move a container and its contents to a truck, with the system moving all containerization levels and detail allocations with the container.
- Merge a pallet into another pallet.
- Create a container level for a full pallet.
- Create a container level below a pre-shipper.
- Explode a pallet.

Setting Up Containerization

Containerization lets staff scan a box that the system identifies by the reference field on the inventory record. You set up whether staff pick to a container or enter a reference in Batch Picking Control (4.15.24).

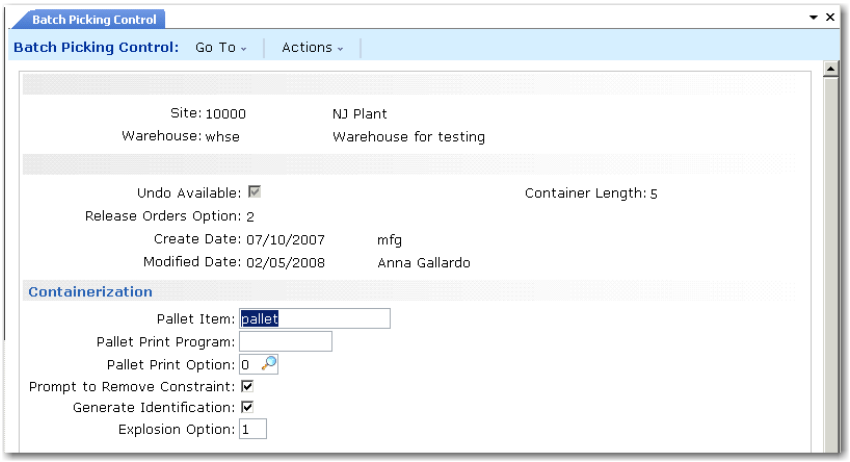
Once staff pick and complete containerization, they move a container and its contents to a truck. The system moves all containerization levels and detail allocations along with the container.

See “Parcel Manifest, Container Move, and Truck Ship” on page 389.

Batch Picking Control Options

You can set up the system so that it generates container IDs, prints labels for a pallet, prompts to remove containers, and so on during containerization. To do this, use settings in the Batch Picking Control (4.15.24) Containerization frame.

Fig. 19.3
Batch Picking Control (4.15.24), Containerization Frame



Pallet Item. Enter the default pallet container item. You must define the container item first in Item Maintenance (1.4.1).

Pallet Print Program. Enter a print program to use when printing labels for pallets. The default program is `whprtpal.p`.

Pallet Print Option. Indicate whether pallet labels print automatically, not at all, or if the system prompts to print labels. You must specify the print program in Pallet Print Program. The system prints labels for pallets that do not already have a label.

0: Never print pallet labels.

1: Always print pallet labels.

2: Prompt RF user to print pallet labels.

Blank Reference. Indicate whether the system retains the pallet reference number or blanks the reference number when RF users confirm a transaction when the Container/Reference field in Batch Picking Control is set to Container.

Typically, it is ideal to have a blank reference on the RF when warehouse staff scan a tote to populate the pre-shipper.

Prompt to Remove Container. Indicate if you want the system to prompt RF users to remove a container. If users respond to the prompt with Yes, the box is removed from the pallet. When you view the shipper structure in Order Warehouse Detail Status Inquiry (4.15.4.1), the display shows the box below the shipper level, instead of below the pallet. When you remove all boxes in a pallet, the system automatically deletes the pallet and moves all items below the shipper level for the pallet.

No (the default): The system removes the box from the pallet without prompting warehouse staff for confirmation.

Yes: The system prompts warehouse staff to remove the box from the pallet.

Generate Identification. Specify whether the system generates a new container ID when warehouse staff use the RF Container Build menu option.

No: The system does not generate a new container ID.

Yes: The system generates a new number during RF containerization. You should set up pallet label printing if the system generates new numbers.

Generating a new ID can lead to errors if warehouse staff accidentally press Return in the RF containerization process and Generate Identification is set to Yes. The system considers stock to be on the newly generated pallet number while it may actually be on a different pallet ID.

Explosion Option. Specify whether the system prompts the RF user to enter the number of boxes or splits the items into boxes when you explode a pallet.

0: The RF does not prompt the user to specify the number of boxes. The system splits goods into x boxes of y items, where x and y are values that the system calculates based on the item's base UM conversion factor. You define the conversion factor in Alternate Unit of Measure Maintenance (4.5.1). If the items cannot be split into boxes equally, the last box contains the remaining items from the conversion.

1: The RF prompts the user to enter the number of boxes into which the contents of the pallet are exploded.

Processing Orders with Containers

RF staff select the Container Build option presented in the RF; see Figure 19.4.

Fig. 19.4
RF Container Menu

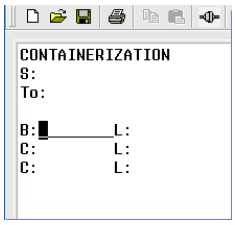


Using the container features, staff scan each box; then the system proposes a list of pallets from which to choose. The containerization can occur at different locations. With the Container Build option, staff can:

- Scan boxes in one location and containerize on a pallet in another location.
- Move a box from a pallet in one location to another pallet in another location.

Figure 19.5 shows the RF screen that displays when staff select the Container Build option.

Fig. 19.5
RF Containerization



Containerization Procedure

Use the following procedure when containerizing sales or distribution orders using the Container Build option:

1 From the RF, select 3 Container Build.

The system displays the Containerization frame as shown in Figure 19.5.

2 Scan a box.

The scanned box displays in the B: field and the box location displays in the L: field.

If this is an existing order, the last scanned-in pallet for the shipper displays in the C: field.

If there is more than one pallet, the system prompts the user to press F2 to see all other possible pallets for the box. When staff select another pallet from the lookup, that pallet displays as the default pallet above the actual field to scan the pallet. Staff can scan the proposed pallet or any pallet that is acceptable for the box.

3 Scan the destination pallet or press Enter to generate a new pallet number.

Note The system generates a new number if you set Generate Identification to Yes in Batch Picking Control. If set to No, you cannot generate a new number. See “Generate Identification” on page 377.

If the pallet is new to the system, the system prompts for the pallet location. This location can be the same as or different from the box location. If different, the system moves all items in the box to the pallet location. Also, depending on the Label Print Option field in Batch Picking Control (4.15.24), staff can print a pallet label when the pallet is new.

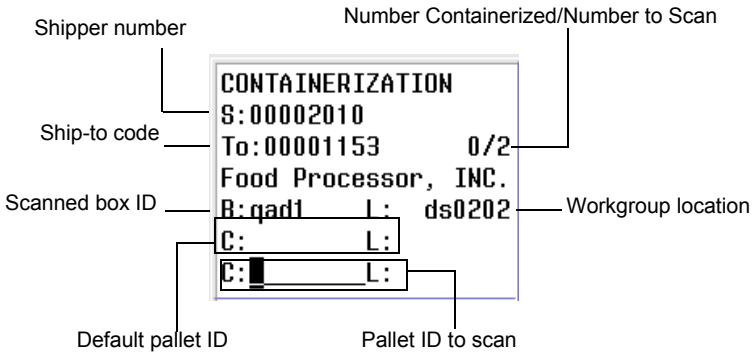
See “Label Print Option” on page 299.

4 Complete assembling the pallet by scanning additional boxes.

The system displays `Box Added` each time you scan a box.

5 Complete the pallet and other pallets for the order until truck shipments for the shipper are complete.

Fig. 19.6
Containerization, Box Scanned



When assembly of pallets is complete, staff can physically load the pallets onto a truck.

RF Containerization Status

The RF displays the number of boxes containerized, the number of boxes to containerize, and containerization status in the upper right corner of the screen. Containerization status can be any of the following:

Blank: More containerization is required.

Pick: There are open pick tasks for the pre-shipper. The total number of boxes to scan does not reflect the actual number because totals are unknown at this point.

Ready: There are no more open pick tasks for the pre-shipper, and all boxes have been containerized.

Note The status displays boxes, not full pallet picking.

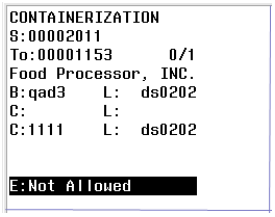
RF Containerization Error Messages

The RF displays error messages when staff:

- Scan an order box that is not from the current shipper.
- Scan a pallet that is not for the same pre-shipper as the box.

When error messages display, staff should not add the box that caused the error to the shipper. Figure 19.7 shows the error message that displays when you scan a box that is not from the current shipper when containerizing items for a sales order.

Fig. 19.7
RF Containerization Error

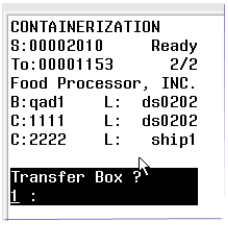


Transferring a Box to Another Container

Staff can move a box from one pallet to another; for example, for size issues. To do this, they must first physically move the box to the correct container location, then scan the container to which they want to transfer the box.

Example Figure 19.8 shows a `qad1` box already scanned and in the container with the ID `1111`. Both the box and the container are in the work location `ds0202`. Staff then scanned a container with the ID `2222` in the location `ship1`. The system prompts to transfer `qad1` box to container `2222`.

Fig. 19.8
RF Containerization, Transfer Box



Removing Boxes from Containers

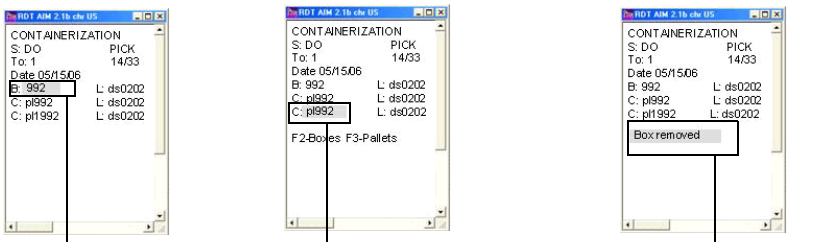
You remove boxes and containers using the RF Container Build (3.3) menu option. To delete a box, staff scan the box and its container. The system knows the pallet for the box and understands this action is to remove the box from the pallet; see Figure 19.9.

If you remove one box from a pallet, the system displays the message:

```
Box Removed
```

If you remove all boxes from a pallet container, the pallet container is removed, too, so the pallet container level does not display under the shipper ID on the RF device.

Fig. 19.9
RF Box Removal



Merging Pallet Contents

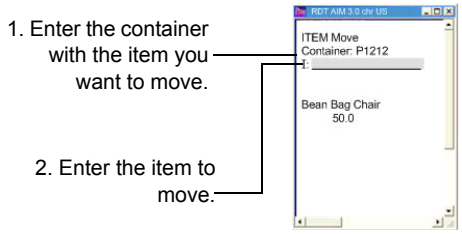
You may need to merge pallet contents, for example, when you have only a few boxes on a pallet and you want to optimize your shipment by adding those few boxes to another open pallet for the pre-shipper.

When you scan a pallet and the destination is a pallet as well, the system merges the contents of the first pallet into the second one. The system then deletes the initial pallet container level. If the first pallet was not in the same location as the destination pallet, the system moves the content to the destination pallet location.

Moving Items to Another Container

You may need to move items from one container to another container. To do this, select Item Move (3.7) from the RF menu. To move an item, enter the container ID from which you want to move an item. The system displays items in the container; see Figure 19.10. Enter an item at the I: prompt, then specify the quantity to move. The system prompts you to enter the container ID to which you want to move the item. Enter the ID, then click Next. The system displays a message informing you the transfer is complete.

Fig. 19.10
RF Item Move



Full Pallet Scanning

To add visibility to a shipper, staff can pick a full pallet, then scan the pallet to add a container level to the pallet.

Staff can scan the full pallet using the RF Containerization option. When they do, the system creates a container level for the full pallet; however, the pallets do not go through a containerization process, and staff do not move the pallets to the shipping lane or dock using the RF Next Task screen.

When staff scan a pallet number in the RF containerization screen, the system identifies a full-pallet pick and creates a container level with the container number as the pallet number. The system creates the new container level between the pre-shipper and the inventory reference record. The inventory record, however, still indicates the reference is the pallet number.

If you do not scan full pallets using the RF containerization option, when the system displays data using Order Warehouse Detail Status Inquiry (4.15.4.1), the quantity on the full pallet displays in the Conso(lidate) column. The system moves the quantity to the Pack column only after you scan the full pallet or explode the pallet using the RF Pallet Explosion option.

See “Exploding Pallets” on page 384.

Creating a Container with a Zero Quantity

When staff create a container using batch picking and RF containerization features, the system creates the container with a 0 (zero) quantity. There is no negative stock when the container ships.

When you create a container level in Pre-Shipper/Shipper Workbench (7.9.2) for a sales order or in DO Container Maintenance (12.19.7) for a distribution order, you cannot enter a 0 quantity for that container. You can, however, enter a quantity of 1 for the container. When the system issues stock for the container, if not monitored carefully, the result can be a negative quantity for the container item.

To create a zero-quantity container using Pre-Shipper/Shipper Workbench, create a phantom item in Item Master Maintenance (1.4.1). The system lets you enter a 0 quantity for the container of that phantom item. A phantom item is directly consumed into its parent items and not planned or stocked upon completion.

Creating a Container Level Below a Pre-Shipper

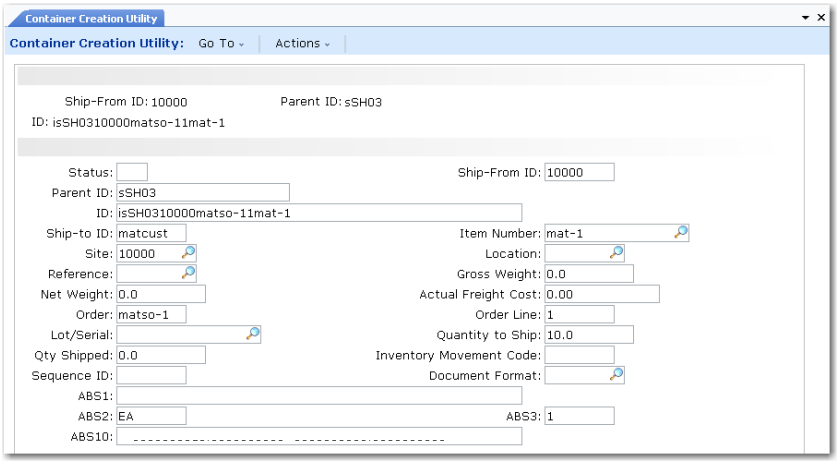
Warehouse managers can create a container level below a pre-shipper using the Container Creation Utility (4.25.4). Warehouse managers should use this program primarily to make corrections; it should not be accessible to typical users.

Warehouse managers can manually link a box to a pallet by creating a container in DO Container Maintenance (12.19.7) for a distribution order; however, they must still link the item to the container using Pre-Shipper/Shipper Workbench (7.9.2).

To create a container level, warehouse managers can enter data for only the parent ID, ship-to code, container item, and site or location of the container they are creating; all other data entered is optional.

Figure 19.11 shows the Container Creation Utility; fields are described after the figure.

Fig. 19.11
Container Creation Utility (4.25.4)



Ship-From ID. Enter the ship-from code. This is the shipping site that you use for warehousing operations.

Parent ID. Enter a parent ID or leave this field blank. The parent ID is the upper container you want to link to the current container and typically starts with the letter c.

Note If you leave this field blank, you can specify a parent ID after you click Next. The system displays the Parent ID field when it displays container details.

ID. Enter the identification code for a container below the pallet container. Precede the ID with the letter that corresponds to the abs_id for the container; for example, the letter c.

Status. Enter the status of the container:

S: Shipped

NS: Not shipped

Parent ID/ID. If you did not enter a parent ID/ID in the header, enter a parent ID for the upper container that you want to link to the current container or enter a container ID.

Ship-To ID. Enter the ship-to code for the destination of this container. This should match the ship-to code of the pre-shipper. Use SO Container/Shipper ID Inquiry (4.15.20.3) to find the ship-to code.

Site. Enter the warehouse site where this container is used.

Reference. Enter a reference number for the pallet to which the container you are creating belongs.

Net Weight. Enter the net weight of the container.

Order. Enter the order number for this container.

Lot/Serial. Enter the lot/serial number for this container.

Qty Shipped. Enter the quantity to ship for this container.

Item Number. Enter the container item ID. This should be the same ID as the one in the same-named field in Batch Picking Control (4.15.24).

Location. Enter the location code of the container you are creating.

Gross Weight. Enter the gross weight for the container you are creating. Typically, freight charges apply to the boundary weight.

Actual Freight Cost. Specify the active freight cost for the container. You must specify a freight list, freight class, and freight zone before establishing freight charges. For more information on freight charges, see *QAD Master Data User Guide*.

Order Line. Enter the order line number for the container you are creating.

Quantity to Ship. Enter the quantity to ship for the container you are creating.

Inventory Movement Code. Enter the inventory movement code that is associated with the shipment.

Document Format. Enter the code that identifies the format of the printed document. See “Printing” on page 193.

Sequence ID. Enter a sequence ID for the container you are creating.

ABS1 through ABS10. Enter the ABS identification number for the container you are creating. The abs_id uniquely identifies the shipper record. Container records are assigned to shipper records.

Linking Items to Containers

You must link an inventory item to the container you created using Pre-Shipper/Shipper Workbench (7.9.2) for a sales order or using DO Container Maintenance (12.19.7) for a distribution order.

- In the Ship-From ID field, enter the same ID that you entered in the same-named field in Container Creation Utility.
- In the Number field, enter the ID you created in Container Creation Utility in the ID field, including the letter `c`.

Exploding Pallets

Use the RF pallet explosion option to pick a single-lot/item pallet, typically from the reserve storage area, and:

- Display the pallet contents, much like a bill of materials.
- Add containers to an exploded pallet.
- Explode boxes and add a new box level to the exploded box.

Pallets are the highest container level; they are the first level under a pre-shipper. You can explode a pallet and you can explode a box within a pallet.

Staff can scan a container ID that is different from the pallet ID and add that container ID as an extra level on the pre-shipper. They can also scan a box ID and add an extra box level within that box on the pre-shipper.

You must specify whether the system prompts the RF user to specify the number of boxes to explode or the system divides the pallet contents into an equal number of boxes in the Explosion Option field in the Batch Picking Control Containerization frame (4.15.24).

See “Explosion Option” on page 377.

Once the pallet contents display on the RF, staff can:

- Add a new container level to the pallet.
- Add a new box level to a box.
- Move item quantities between boxes.
- Change the quantity in each box.
- Delete a box by entering a 0 quantity for the box.
- Generate new or existing barcode numbers and labels.

Exploding a Pallet from the RF

Use the following procedure to explode a pallet from the RF.

1. In the RF, select Pallet Explosion (3.6).
2. Scan the pallet you want to explode or enter the pallet number in the `P:` field.
3. Click Next to explode the pallet content.

   The system explodes the pallet, then prompts to generate new references.

4 Choose one of the following:

a Specify No to scan containers manually for the pallet.

You can scroll through a list of boxes, select a box container to explode, and modify the container of each box after you explode it.

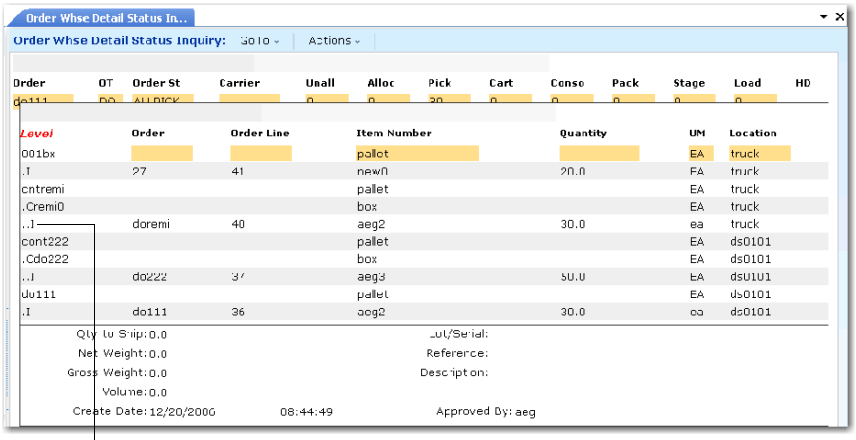
b Specify Yes to generate references for containers for the pallet.

The system creates a new container level under the pallet level, using the method you specify in the Explosion Option field in Batch Picking Control.

Exploding a Box from the RF

The procedure to explode a box is similar for exploding pallets. After you select Pallet Explosion (3.6) on the RF, scan or enter the box number in the `P:` field. The system explodes the box, showing item contents, then prompts to generate a new box. If you specify Yes, you create a new box level within a box as shown in Order Warehouse Detail Status Inquiry (4.15.4.1); see Figure 19.12 on page 385.

Fig. 19.12
Order Warehouse Detail Status Inquiry (4.15.4.1), Exploded Box



Viewing Exploded Pallet Contents

You can view exploded pallet contents by running a report using Order Warehouse Detail Status Inquiry (4.15.4.1). Once data displays in the report, put your cursor in the Load field, then press S for shipper details. To view details of containers for DO shippers, use the programs in the Distributed Order Shipping Menu (12.19.).

See Figure 19.2 on page 375.

Deleting/Archiving DO Shipper Data

Use the following programs in the Distribution Order Shipping Menu (12.19) to delete DO shipper or container data:

- DO Container Delete/Archive (12.19.22)

- DO Shipper Delete/Archive (12.19.23)

Viewing Container Information

Use Order Warehouse Detail Status Inquiry (4.15.4.1) to view the following containerization data:

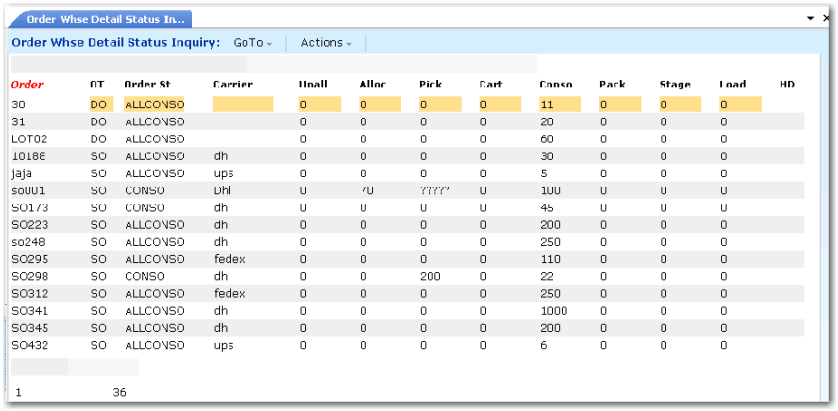
- Orders that are fully picked but not consolidated
- Orders that are picked and containerized, but not moved to a truck
- The number of units already containerized and the remaining boxes to be containerized
- Outstanding picking tasks for the shipper or ship-to

In the inquiry, you can enter 4 in the header Status field to display all consolidated orders. You can enter 5 to view all packed orders.

Figure 19.13 shows three orders that display in Order Detail Status Inquiry: two for the same carrier and the same pre-shipper, and another for a different carrier and pre-shipper. In the figure, the orders are in the consolidation area, which is the containerization area. The display indicates that the status is `ALLCONSO`, but the orders require containerization because the Pack column reflects 0 packed.

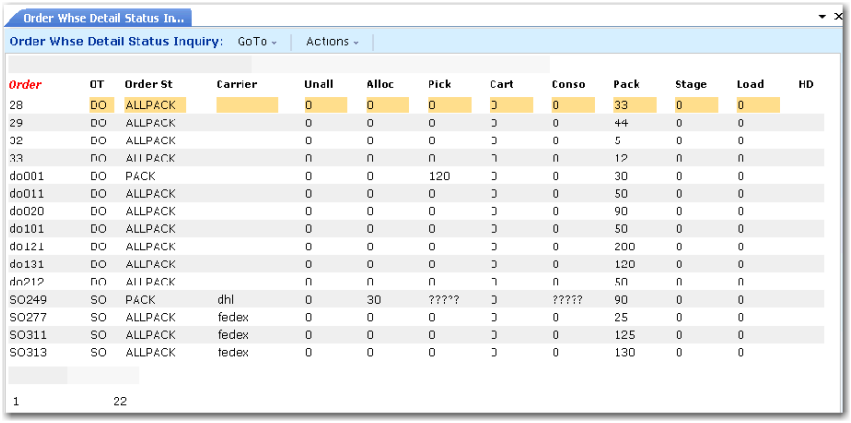
See “Monitoring Order Status” on page 369 for additional details about order status.

Fig. 19.13
Order Warehouse Detail Status Inquiry (4.15.4.1), Orders in Consolidation



When orders are containerized, the status changes to `ALLPACK` and quantities display in the Pack column, as shown in Figure 19.14.

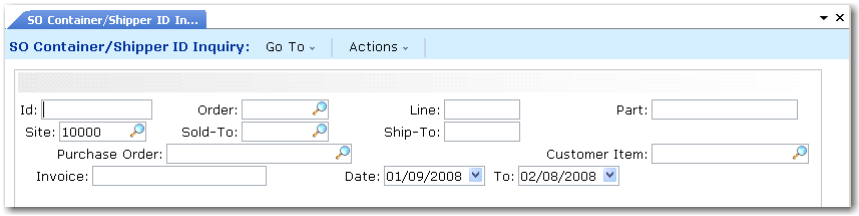
Fig. 19.14
Order Warehouse Detail Status Inquiry (4.15.4.1), Orders Containerized



If you are building containers for sales orders, press S to view shipper information and containerization levels. Figure 19.2 on page 375 shows the shipper data display.

You can also use SO Container/Shipper ID Inquiry (4.15.20.3) to display all containers corresponding to either a pre-shipper or container ID. You can also find container IDs by order, order line, and ship-to or sold-to codes. For each container, the system displays the container content, quantity, location, and shipper to which the container belongs.

Fig. 19.15
SO Container/Shipper ID Inquiry (4.15.20.3)



Chapter 20

Parcel Manifest, Container Move, and Truck Ship

The following topics describe QAD Warehousing container move and truck ship features:

Overview 390
Describes how shipment documentation can be generated to enable product movement.

Parcel Manifest 390
Defines manifest and explains how different types of manifests are generated with the Print Paperwork (3.8) function.

Container Move 394
Outlines the features of the container move functionality, the container move setup process, and various monitoring steps.

Truck Ship 402
Describes how to set up truck shipping, monitor truck shipping, and use truck shipping efficiently.

Overview

After your staff assemble pallets to ship to customers, they can use print paperwork functionality to produce all necessary shipment documentation, including:

- Carrier shipping labels if using QAD Warehousing with a Transportation Management System (TMS)
- Shipper documentation
- Other additional documentation

Once shipment documentation is produced and shipping labels placed onto containers, warehouse staff can use container move functionality to move allocated boxes or pallets from the dock location to a truck location.

When warehouse staff scan pallet tags and labels that they load onto a truck, warehouse reports and inquiries indicate that an SO or DO order line has been loaded onto a truck. When all pallets for a shipper have been loaded, an RF message displays notifying warehouse staff that the shipper is ready to be shipped. The system automatically creates a bill of lading (BOL) for the truck shipment.

Parcel manifest functionality is discussed first, followed by container move and truck ship functionality.

Parcel Manifest

A manifest is a list of goods carried on a truck, train, or ship. Before starting the container move and truck load process, RF users can produce the necessary shipment manifest by using the RF Print Paperwork (3.8) function. Print Paperwork allows RF users to:

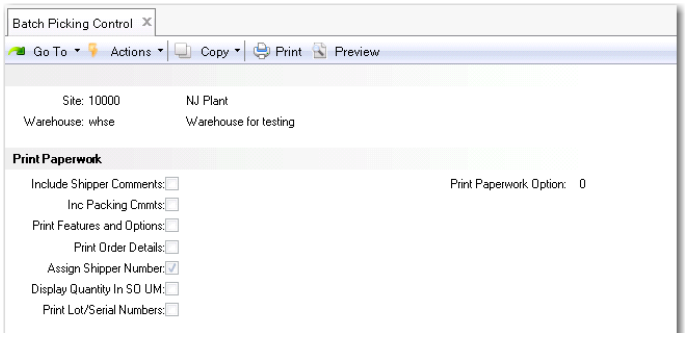
- Print pre-shipper/shippers by scanning the document number in the RF device.
- Convert pre-shippers to shippers by assigning a shipper number.
- If the Send Shipment (whtraxsx.p) routine is specified in Local Exit Routines Setup (4.23.10), the system produces a ship shipment (SHIP) message and exports it to the TMS for rating.

The following sections tell you how to set control options for the RF, print pre-shippers/shippers from the RF, convert pre-shippers to shippers from the RF, and eventually revert this process if further manipulation on the goods is needed once the shipment documentation prints.

Print Paperwork Control Options

Use options in the Print Paperwork frame of Batch Picking Control (4.15.24) to set defaults for shipper printing when using the RF Print Paperwork function.

Fig. 20.1
Batch Picking Control (4.15.24), Print Paperwork Frame



Print Paperwork Option. Indicate the type of message the RF displays when the system finds pending tasks (unconfirmed tasks) or finds that inventory is not on the truck when staff attempt to print shipper paperwork to ship items.

0: The system does not display messages and does not take action when either condition exists.

1: The system displays a warning message when either condition exists.

2: The system displays a message when either condition exists and prompts for user confirmation of the message before continuing.

3: The system displays an error message when either condition exists.

See “Defining a Truck Location” on page 395.

Include Shipper Comments. Enter Yes to include shipper comments when printing paperwork from the RF or No to exclude such comments.

Inc Packing Cmmts. Enter Yes to include packing comments when printing paperwork from the RF or No to exclude such comments.

Print Features and Options. Enter Yes to print order line item numbers followed by a list of features and options selected for the item or No to only print the item number.

Note This setting applies to sales order shipper processing.

Print Order Details. This field determines whether the order number and order line number associated with line items on the shipper are included in the printed output when printing from the RF.

Assign Shipper Numbers. This field specifies whether you want the system to assign a shipper number when printing shippers from the RF. Assigning numbers converts pre-shippers to shippers on the RF.

In order for the system to generate a number, the NRM sequence for the pre-shipper/shipper must be an internal sequence generated by the system. If the assigned NRM sequence is external, the pre-shipper/shipper is skipped. To use an external sequence, you can assign the shipper number during shipper creation (if pre-shippers are not used), or during confirmation (if pre-shippers are used).

Display Quantity in SO UM. Specify Yes for the RF device to display quantities in the UM specified in the sales order.

Note This setting applies to sales order shipper processing.

Print Lot/Serial Numbers. Specify whether a complete list of each of the lot/serial and lot reference numbers shipped print on the shipper when printing from the RF.

No: Each line item shipped is followed by a list of the lot/serial and lot reference numbers shipped.

Yes: Only the total shipped quantity prints for each line item.

Printing Pre-Shippers/Shippers

You can optionally print the pre-shipper/shipper for both sales and distribution orders from the RF. You can print before beginning the container move or truck ship process so that users can collect shippers before they pack the truck.

Before printing the pre-shipper/shipper, you must assign a form printer to the user who scans and loads the truck in User Work Location Group Maint (4.11.3.13). You can also assign a form printer to the work location group (WLG) in Work Location Group Maintenance (4.3.9).

To print pre-shippers/shippers from the RF:

1 Select Print Paperwork (3.8) in the RF Picking/Container Menu (3).

2 Scan the pre-shipper or shipper ID.

3 Select a printer.

Fig. 20.2
Print Paperwork Process

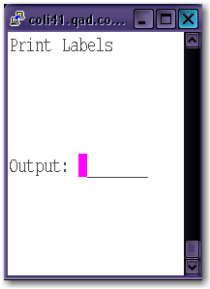


Printing Carrier Shipping Labels

Depending on the settings in the Send Shipment (whtraxsx.p) field in Local Exit Routines Setup (4.23.10), a ship shipment (SHIP) message can be produced and exported to the TMS as part of the print paperwork process.

As a result of the ship shipment message, the TMS returns carrier shipping labels in its reply to QAD Warehousing. To print carrier shipping labels from the RF, select the appropriate labels printer when prompted to do so:

Fig. 20.3
RF Print Prompt



Assigning Shipper Numbers to Pre-Shippers

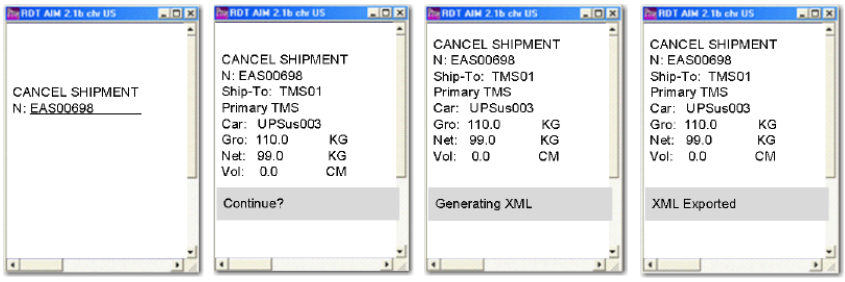
Depending on the settings in the Print Paperwork frame in Batch Picking Control, pre-shippers are converted to shippers in the same way the system converts them for sales orders in the Shipment Processing Menu (7.9) or for distribution orders in the Distribution Orders Shipping Menu (12.19). When the system converts the pre-shipper to a shipper, the new shipper number appears on the RF device screen after the shipper is printed.

Undoing an Assigned Shipper Number

Use RF Cancel Shipment (3.9) to unassign a shipper number and change the document type from shipper to pre-shipper. You can only undo an unconfirmed shipper. Cancel Shipment allows RF users to:

- Convert shippers back to shippers by assigning the shipper's old pre-shipper number.
- If specified in the Cancel Shipment (whtraxcx.p) field in Local Exit Routines Setup (4.23.10), a void shipment (VOID) message can be produced and exported to the TMS for cancelling a previous ship shipment (SHIP) message. This is necessary if you need to change the contents of the shipper once the shipper has been exported to the TMS. RF users must first execute Cancel Shipment and then modify the shipper. Once done, it is possible to produce the shipping label document by using Print Paperwork again.

Fig. 20.4
RF Cancel Shipment



When you undo a shipper number, the original pre-shipper number is reassigned. This can occur only if NRM permits the discarding of the associated sequence number. If the sequence number cannot be discarded, the shipper is not rolled back, although the system can send the void shipment message to the TMS.

Container Move

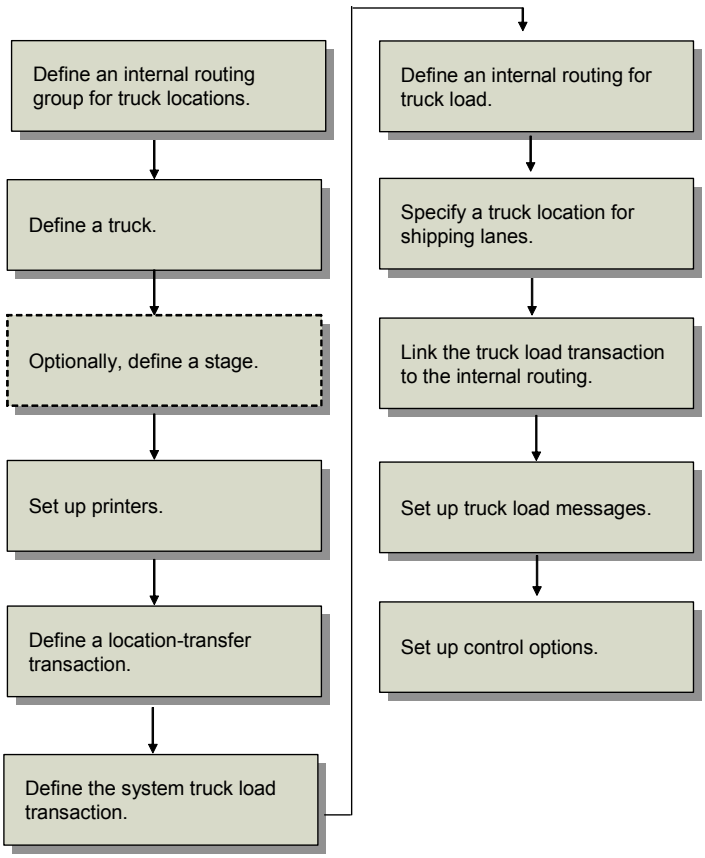
The following sections describe setup, processing, and monitoring for container move functionality, which includes features that:

- Let staff move any pallet with detail allocation and containerization to any other location, including another truck.
- Optionally, let you add staging or validation steps when moving containers.
- Facilitate cross-docking functionality.
- Report the position of each pallet in the truck.
- Load pallets in the appropriate reverse dropping order if a drop-off sequence has been specified in a load.

Setting Up Container Moving

There are several steps involved to complete the setup for container moving. Once completed, all processing takes place on the RF device. Although you can define any location for moving containers, the examples, figures, and paragraphs in this section focus on setting up a truck as a location. Figure 20.5 shows the setup tasks for container move functionality.

Fig. 20.5
Container Move Setup



Defining an IRG for Truck Load

You must define an internal routing group (IRG) for all truck locations in Internal Routing Group Maintenance (4.2.1). To do this:

- Specify the truck as the Internal Routing Group.
- Set Functional to Yes.
- Optionally, set additional fields or accept the defaults.

See “Internal Routing Group Maintenance” on page 46 for details.

If you optionally define a stage location instead of a truck location, you must define the IRG for the stage location, not the truck location. By defining an IRG for a stage location rather than a truck location, you let staff perform the following movements:

- From the shipping lane to the stage area
- Between locations in the stage area
- Between the stage area and the truck location
- Between a truck and the stage area (that is, return to a stage area from the truck location)

See “Defining an Optional Stage Location” on page 396.

Staff cannot return to the stock area or any other IRG from the stage area. If you require staff to perform this type of return movement, build a custom IR assignment program.

See “Customizing Internal Routings” on page 398.

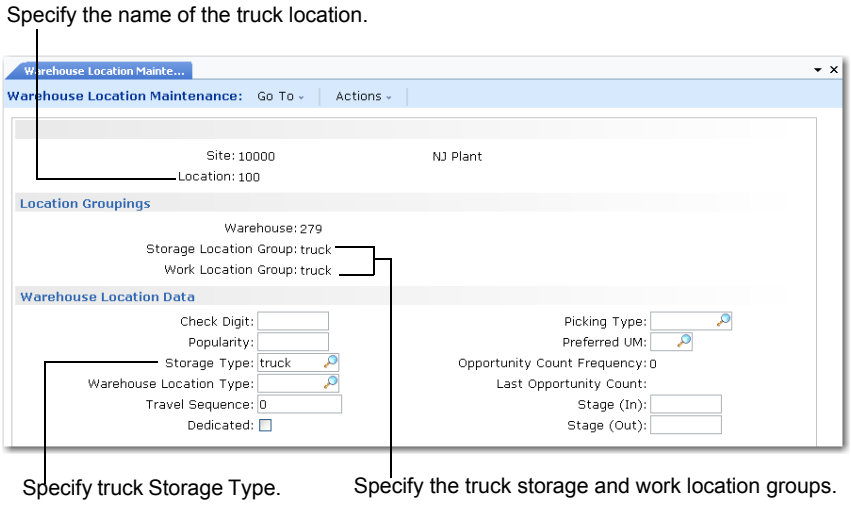
Defining a Truck Location

To use container move features, you must set up the truck as a location and specify its storage location group and storage type. For example, you can define a Truck location and specify the storage location group and storage type as Truck. When a truck is defined as a storage location, you can use functions to report on truck capacity and contents and the warehousing system can use the truck location for storage.

Use Warehouse Location Maintenance (4.3.13) to specify storage location and work location groups for the truck. Figure 20.6 shows the fields to set.

See “Warehouse Location Maintenance” on page 72.

Fig. 20.6
Warehouse Location Maintenance (4.3.13), Truck Location



Defining an Optional Stage Location

Optionally, you can define a *stage* location—a shipment staging area—instead of a truck location. To do this, in Warehouse Location Maintenance (4.3.13), set the same fields for a stage location that you do for a truck location; see Figure 20.6.

Note The stage area must be part of the same internal routing group as the truck. See “Defining an IR for Truck Load” on page 397.

Setting a Printer

You must print the shipper before using truck-loading features. Typically you print the shipper before confirming the shipment. To do this, you must assign a form printer to either the:

- User who scans while loading
- Work location group (WLG) of the truck location

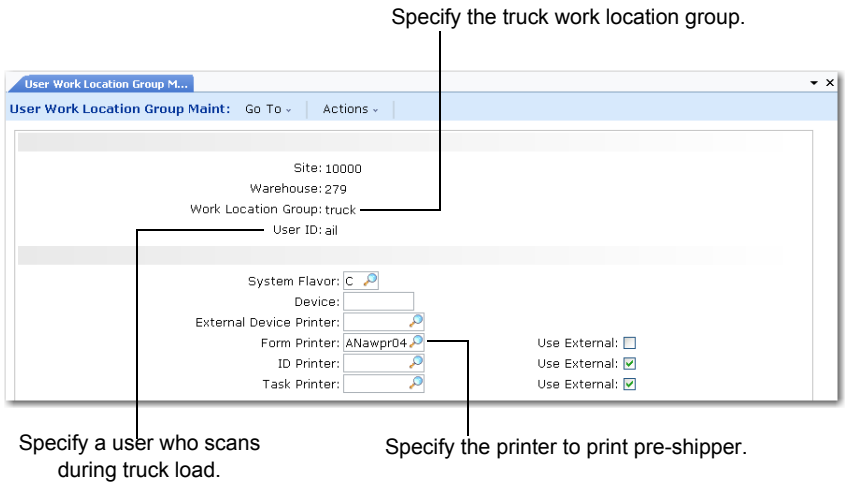
Important If you decide to assign printers to users, you must create a record for all users. Typically it is easier to simply assign the printer to a work location group.

The system looks first for a printer assigned to the user who is logged onto the RF device and performing the truck loading, then for a form printer assigned to the WLG of the truck location.

Create a work location group for the truck location with Work Location Group Maintenance (4.3.9). You can associate the user with the truck work location group in User Work Location Group Maintenance (4.11.3.13). Then define print options for that user.

See “Assigning Users to a WLG” on page 293.

Fig. 20.7
User Work Location Group Maintenance (4.11.3.13)



If you do not set up printers for a combination of user and work location group, use Work Location Group Maintenance to assign the form printer to the work location group in the Printing frame.

Defining an IR for Truck Load

You must define an internal routing (IR) for the truck load transaction type. Define the internal routing for type LOC-TR with a single step that moves to the truck IRG.

Note The location transfer transaction (LOC-TR) is included with the system data as a generalized code for field tr_type.

Define a single-step movement that lets staff move items:

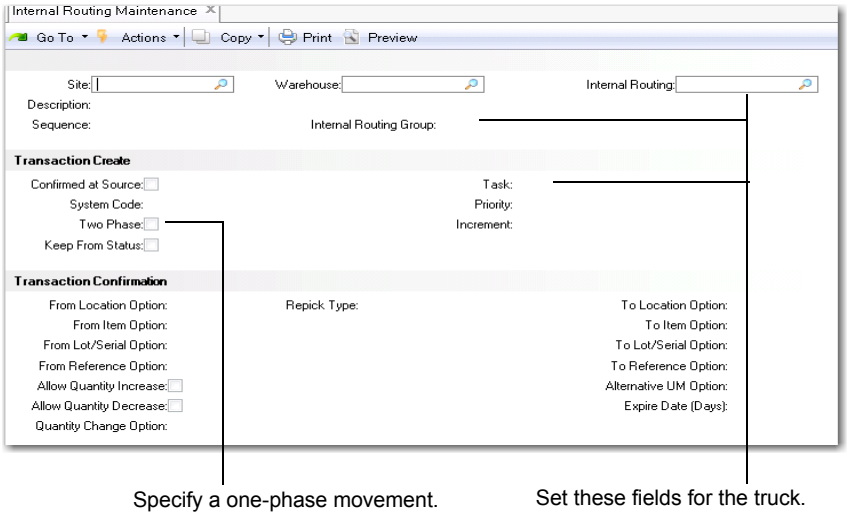
- From the shipping lane IRG to the IRG truck location
- Between locations of the same IRG should you need to transfer from one truck to another

Use Internal Routing Maintenance (4.2.5) to define a one-phase movement for the truck. A one-phase internal routing represents movement within the IRG.

See “Internal Routing Maintenance” on page 48.

Important Do not specify a two-phase movement for the truck.

Fig. 20.8
Internal Routing Maintenance (4.2.5)

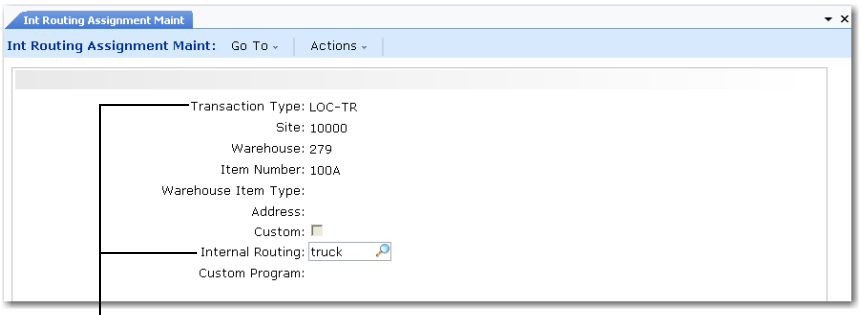


Linking the Truck Load Transaction Type to the IR

You must link the truck load internal routing to the truck location transfer transaction. Use Internal Routing Assignment Maintenance (4.2.9) to assign an internal routing to the LOC-TR transaction.

See page 52.

Fig. 20.9.
Internal Routing Assignment Maintenance (4.2.9)



Customizing Internal Routings

When you set up internal routings for a truck or stage location, typically staff cannot return to the stock area or any other IRG from the truck or stage area. If you require staff to perform this type of return movement, build a custom IR assignment program. You must consider the different combinations between the truck/stage area and the IRGs.

Specify the custom program in Internal Routing Assignment Maintenance (4.2.9) by:

- Setting Custom to Yes
- Entering the name of the custom program in Custom Program

When you run the custom program, you must provide the input fields that enable the program to decide which IR to assign.

Specifying Truck Location for Lanes

You define the truck as a destination location by:

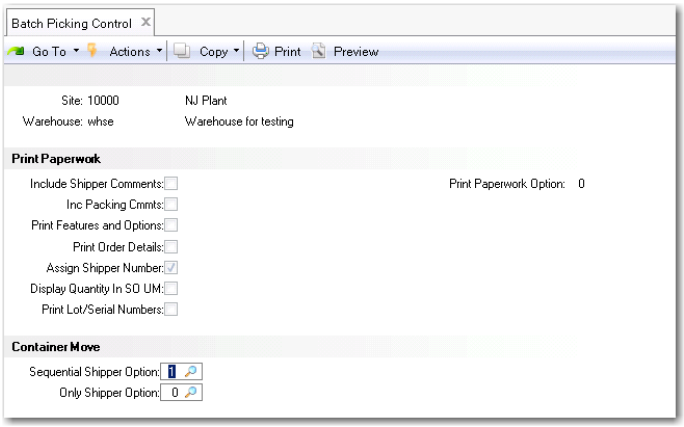
- Specifying the ship-to code in the Ship-To field for the order in Sales Order Maintenance (7.1.1)
- Specifying the truck location name in the Lane/Dock field in Lane Maintenance (4.15.1.1) See “Defining Lanes and Docks” on page 325.

If you do not specify a truck location, the system uses the warehouse as the truck location; however, warehouse staff can override the warehouse location and manually enter a valid truck location or stage area on the RF device.

Setting Up Control Options

Set up container move options in the Batch Picking Control (4.15.24) Container Move frame.

Fig. 20.10
Batch Picking Control (4.15.24), Container Move Frame



Sequential Shipper Option. Specify the type of message the system displays when it checks for partially loaded pre-shippers or shippers; that is, pre-shippers/shippers for which the truck loading began, but pallets still remain to be loaded.

0: The system does not display messages and does not take action.

1: The system displays a warning message.

2: The system displays a message and prompts for user confirmation of the message before continuing.

3: The system displays an error message and you cannot continue.

Use the setting to ensure all pallets for a given shipment are loaded consecutively in the truck, ideally in the reverse order of unloading so that the unloading process is easier.

Example You have three shippers for which you are loading a truck: Shipper 1 has three pallets, all of which are loaded. Shipper 2 has two pallets, only one of which is loaded. Shipper 3 has two pallets, none of which are loaded. You set this option to 3. The system displays an error message when you attempt to load and scan pallets for Shipper 3 because Shipper 2 has a pallet remaining to be loaded.

Only Shipper Option. Specify the type of message the system displays when it verifies whether users can load both pre-shippers and shippers or just shippers. If you set this option so that users can continue processing despite messages before loading the truck, the system converts any selected pre-shippers to shippers.

0: The system does not display messages and does not take action.

1: The system displays a warning message.

2: The system displays a message and prompts for user confirmation of the message before continuing.

3: The system displays an error message and you cannot continue.

Loading a Truck

Warehouse staff use the RF for truck loading; however, since the truck is defined as a location, you do not have to associate an RF transaction to a warehouse task. From the RF, staff select the option to move items, specify the truck location or accept the default, and scan references. Staff must specify the location because the truck load transaction does not generate any put-away.

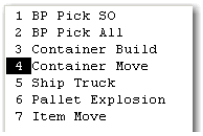
Staff can load boxes or pallets onto the truck. The boxes or pallets can be totes or references. Typically, the user who implements truck loading cannot predict whether warehouse staff scan:

- Totes that were created in batch picking
- References from full pallets that were moved directly from the reserve area to the shipping area

If staff are loading a pallet onto a truck, the system records the pallet ID, and moves the detail record, detail allocations, and shipper information. If the pallet ID is a container-level shipper, the system moves all detail records and detail allocations for the content of the container. When staff scan the pallet, the system moves the stock detail allocation and shipper information.

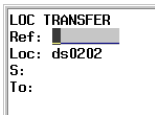
Use the following procedure for truck loading:

1 From the RF, select Container Move.



The system displays the Loc Transfer RF frame.

See “Specifying Truck Location for Lanes” on page 399.



2 Scan the references.

The system displays the truck location. If you assign a shipping lane to a truck location in Lane Maintenance (4.15.1.1) in the Associated Dock/Truck field, the default truck location displays in the Loc field. Otherwise, the system uses the warehouse as a location and you must enter either a valid truck or stage location.



3 Click Next.

The system displays the `Transfer Complete` message, then informs you that the truck is ready to ship.



Transferring Items to Another Truck

Occasionally, warehouse staff may have to transfer items from one truck to another or use an entirely different carrier. For example, if you want to ship one order of a wave to the customer overnight, you may need a different carrier, and therefore, a different truck location for that carrier.

If using a different carrier, change the carrier first in Pre-Shipper/Shipper Workbench (7.9.2) for sales orders or in DO Pre-Shipper/Shipper Maint (12.19.3) for distribution orders. Specify the new carrier in the Ship Via/Carrier field, then reprint the pre-shipper/shipper to start the truck load process. Warehouse staff can then use the RF to select Loc Transfer, then enter a different truck location in the LOC field.

Note You can use warehouse order maintenance functions to specify carriers for both SOs and DOs for order lines. The carrier defaults from the header Ship Via fields in the maintenance programs for both order types.

Monitoring Container Move

Use Order Warehouse Detail Status Inquiry (4.15.4.1) to verify that all items are in the designated location, such as the truck location. When items are loaded on the truck, the Load column indicates the number of boxes that are loaded onto the truck.

Truck Ship

The following sections describe setting up and processing truck ship functionality.

After the truck has been loaded, shipment documentation has been printed, and the shipment is ready, you can use a single transaction to confirm that the truck shipped. You use the truck ship transaction to confirm a sales order shipper, much like you use Pre-Shipper/Shipper Confirm (7.9.5) for a sales order or DO Pre-Shipper/Shipper Confirm (12.19.13) for a distribution order.

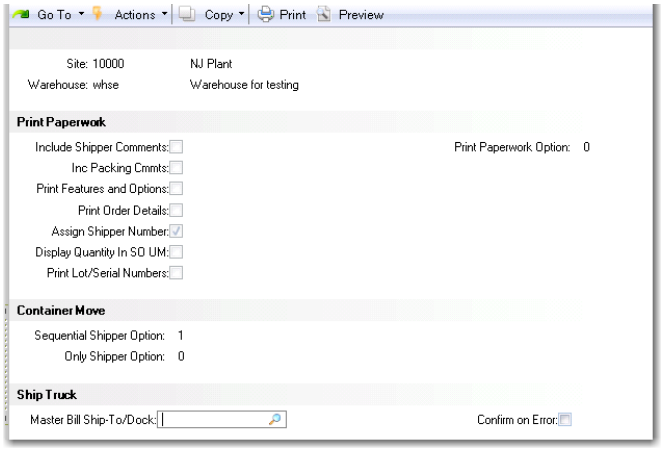
Truck ship features let you:

- Indicate truck shipment, resulting in shipment of all orders on the truck.
- Create a master bill of lading (MBOL) that includes all shippers for both SOs and DOs.
- View all shippers loaded on the truck for a given truck location.
- If specified in the Truck Shipment (whtraxtx.p) field in Local Exit Routines Setup (4.23.10), a process end of day (PEOD) message can be produced and exported to the TMS.

Setting Up Truck Shipping

You set up truck ship in the Truck Ship frame in Batch Picking Control (4.15.24).

Fig. 20.11
Batch Picking Control, Truck Ship Frame



Master Bill Ship-To/Dock. Specify the default ship-to/dock to be used in the RF Ship Truck option when creating master bills of ladings in Master Bill of Lading Maintenance (7.9.12.2). RF Ship Truck creates an MBOL that includes all shippers being confirmed; this is the ship-to/dock against which the system creates the MBOL.

Confirm on Errors. Specify whether RF Ship Truck option should confirm shipments when errors are received from a Transportation Management System (TMS).

No: If there is an error in the communication between QAD warehousing and the TMS, no shipments are confirmed. In this case you should use other system shipper confirmation programs to confirm shippers.

Yes: A warning displays, but you can proceed and confirm shippers.

Shipping on a Truck

Warehouse staff use the RF to confirm truck shipping. The RF displays print documentation. Staff can use the up and down arrows to scroll available carriers for ship-to codes that are based on truck weight rules.

The system maintains a link between the pre-shipper/shipper number and the truck location. The system creates the link for pre-shippers with associated orders completely in the truck.

Use the following RF procedure to confirm shipping on a truck for sales and distribution orders:

1. From the RF, select Ship Truck (3.5).
2. Select the shippers by truck location.

   The RF displays shipper IDs.
3. Optionally, enter the carrier shipment reference, vehicle ID, or master bill of lading (MBOL).

   Note If you do not enter an MBOL, the system generates one and assigns shippers that are being confirmed to it. Print the MBOL using the RF Print Paperwork option. If you enter an MBOL, the system adds the shippers that are being confirmed to the existing MBOL.

   If Truck Shipment (whtraxtx.p) is specified in Local Exit Routines Setup (4.23.10), the system prompts for a valid carrier.
4. Specify a valid carrier as defined in Carrier/Service Assignment Maintenance (4.15.2.13).

   The system validates that all shippers being confirmed belong to a service of the carrier. The RF displays shipper IDs with varying shipper status.

   See “Shipper Status” on page 403.
5. Press Enter to select shippers.

   An asterisk (*) next to a shipper indicates open tasks exist. If no asterisk displays, no open tasks exist and staff confirm the ship truck.

   Note Press Enter to deselect one shipper at a time.
6. Press F2 to show load details. This option is only available when using load optimization in wave planning.
7. Press F3 to show shipper details.
8. Confirm the ship truck.

   If specified in the Truck Shipment (whtraxtx.p) field in Local Exit Routines Setup, the system exports a process end of day (PEOD) message to the TMS prior to confirming the shipper issue inventory transactions.

Shipper Status

Possible shipper status includes the following:

TASK: There are open warehouse transactions for this shipper and you cannot select the shipper for confirmation.

CARR: The shipper is assigned a service (Ship Via) that is not for the carrier defined in Carrier/Service Assignment Maintenance and you cannot select the shipper for confirmation.

TMS: This status is used only when TMS interfaces are set.The shipper did not export to the TMS using RF Print Paperwork or it was cancelled after export using RF Cancel Shipment. This is necessary so that the RF Ship Truck option can process an end of day message.

N/OK: Not all containers for this shipper are in the truck location. Pallets may still require truck loading using RF Container Move.

OK: The shipper is ready for confirmation.

Monitoring Truck Shipping

You can use any of the programs listed in Table 20.1 to view truck shipment information.

Table 20.1
Programs to Monitor Truck Shipment

Menu Number	Program	Used to Monitor
3.21.1	Transaction Detail Inquiry	View the issue transaction for the order on the wave that was placed on the truck.
7.9.12.2	Master Bill of Lading Maint	Using the Ship Via from a shipper, view the BOL the RF created.
7.9.12.4	Master Bill of Lading Print	View the shipper on the BOL and the shipper coming from the pre-shipper.
4.9.2	Transaction History Inquiry	View the location of the ship truck.
4.15.4.1	Order Warehouse Detail Status Inquiry	Press S to verify that the pallets contain the boxes that the user picked.

Using Truck Ship Efficiently

RF Truck Shipment works efficiently when complete DOs or SO pre-shippers/shippers can be loaded in one truck. When using a single truck, the system:

- Scans the location representing the truck or dock.
- Finds all SO and DO pre-shippers/shippers for all items loaded in the truck.
- Prompts to confirm the pre-shipper/shipper and issues all items for them.

If the pre-shipper/shipper is large and the items cannot fit in a single truck, warehouse staff can partially load another truck. When this occurs, the RF does not display an `N/OK` message near the pre-shipper/shipper during truck shipment, indicating that some items are not in the truck.

Users can still confirm the shipment, though. When they do, the system issues all inventory for the pre-shipper/shipper even when inventory for them is in different trucks.

Chapter 21

TMS Interface

QAD Warehousing can interface with a transportation management system (TMS). This chapter describes the features, setup, and processing involved when interfacing with a TMS.

Overview 406
Discusses how TMS can be used to improve safety inventory, order backlog, and carrier selection.

Key Concepts 406
Describes key concepts including distribution orders, kits, TMS, and load optimization.

Features 408
Outlines some of the features and options of interfacing with TMS.

Load Optimization Setup 412
Illustrates the optimization setup workflow, including exit routines, load optimization, control file parameters, specifying carriers, creating selections, exporting data, creating and editing loads, and adding loads to waves.

Processing Shipments 428
Discusses how warehouses process shipments and how load priority can be edited manually.

Printing Load Optimization Paperwork 430
Describes how to send and process shipment messages with RF Print Paperwork (3.8).

Canceling a Shipment 430
Outlines how to cancel a shipment with RF Cancel Shipment (3.9) and explains the effects this has on some programs.

Viewing Load Optimization Data 431
Lists the information which is sent to Warehousing by the TMS and outlines how to modify information received from TMS in Load Maintenance (4.15.2.17).

Deleting, Archiving, and Closing Load Data 432
Describes how to delete or archive closed order selections or loads.

Overview

Most companies attempt to reduce freight spending. By integrating QAD Warehousing with a transportation management system (TMS), you gain the benefits of solutions in a common supply chain flow that improves the following:

- Safety inventory - Inbound lead times are more accurate, resulting in less safety inventory.
- Order backlog- Customer service representatives are more certain of order arrival and can accept orders for the goods that are in transit instead of creating back orders.
- Carrier selection - Companies that operate private fleets can determine on a stop-by-stop basis whether to utilize their own or contracted carriers.

QAD Warehousing includes functions for a TMS interface in distribution picking, packing, and shipping. Specifically, wave planning, and the RF batch pick, container move, truck ship, print paperwork, and cancel shipment functions have flows that allow interface with a TMS.

Key Concepts

To fully understand the interface between QAD Warehousing and a TMS, concepts from QAD 2008 EE, a TMS, and third-party information-exchange components are discussed first.

Distribution Orders

Distribution centers play a key role in a successful supply chain implementation. QAD Warehousing works with a TMS to improve productivity, quality, and throughput for distribution centers.

QAD Warehousing lets warehouse staff batch pick for distribution orders. During bulk picking when staff confirm transactions for a distribution order requisition, if the Create Shipper field is Yes in the Miscellaneous frame of Internal Routing Maintenance (4.2.5) the system creates the pre-shipper for distribution orders. When staff confirm the warehouse transactions, the confirmed item quantities are included on a distribution order shipper, just like those created in the Distribution Orders Shipping Menu (12.19).

Likewise, in wave planning, the system creates and confirms distribution order pre-shippers and shippers. Using the RF, warehouse staff can update the distribution order pre-shipper/shipper. You can choose to add distribution orders, sales orders, or both to a selection that is sent to the TMS for load optimization. Once optimized, you can add the distribution order to a wave for batch picking.

The following RF functions work with distribution orders:

- Pallet explosion
- Item move
- Container build
- Container move
- Ship truck

Order Management Control (4.13.24) lets you allocate distribution and work order lines due in days, specify calculations for allocations, and define in which sequence the system allocates order lines gets allocated. Order Warehouse Allocations (4.13.17) let you create order line allocations.

This program allocates distribution and work orders in the same way that Sales Order Auto Allocations (7.1.7) allocates lines for sales orders. The order in which the system allocates is determined by settings in Order Management Control.

Kits

A kit is a set of items that are picked for shipment. No real assembly takes place, and the configured item is not a physical entity; it only exists as a logical superset of its components. The configuration defines the content of a kit, and a shipment contains the end items that comprise the kit. Kit picking uses the PICK-FAS transaction, not the PICK-SO transaction.

When using a TMS with sales orders for kits, you can use Order Batch Selection (4.15.2.5) to select allocated kits. The system correctly calculates weights and volumes for kit sales orders and exports them to the TMS. When the TMS directs that the shipment be split, wave replenishment and release set up picking for component quantities of the kit.

TMS

A typical TMS supports the following transportation processes within a supply chain:

- Multi-carrier shipping
- Parcel manifesting
- International trade classification and documentation
- Regulatory compliance screening
- Freight forwarding

A TMS can consist of functions that provide freight management, global trade management, and trade compliance.

Freight management is a transportation execution system that automatically selects the lowest cost carrier, consolidates loads, and provides carrier-approved labels and electronic manifesting for all modes of shipment, from parcel deliveries to ocean containers.

Global trade management creates all international documentation required to execute import and export shipments, including the new e-reporting functions now required by the U.S. and the European Union. It handles preferential trade and pricing agreements, as well as providing an option of attaching any electronic file to the documentation of any shipment.

Trade compliance ensures that shipments are not made to any individual, corporate entity, or country that has been listed by the various trade and customs agencies of the governments of the U.S., the European Union, and the United Nations. It provides an audit trail of all activities relevant to compliance issues, and ensures that corporate policies and procedures are followed by all shippers, regardless of their location within the company.

Load Optimization

A *load* (truck) is a collection of pre-shippers and shippers with an optional, given stop sequence. The stop sequence, or *drop-off sequence*, is the order in which a truck stops for the different shipments. Load optimization provides route calculation with drop-off sequencing that both expedites shipments and decreases shipment costs.

Most TMSs either consolidate orders into shipments to reduce overall shipping costs or optimize the loads by calculating routes with drop-off sequences. The TMS creates the optimized or consolidated loads and sends them back to QAD Warehousing. You can also create loads in QAD Warehousing.

Features

QAD Warehousing works with a TMS to provide the following:

- Check carrier rates and routing guide for best cost, lead time, or delivery window
- Perform order consolidation, route optimization, and drop off sequencing
- Perform compliance checks if defined
- Produce native carrier or packing labels

The following topics discuss features in QAD Warehousing that let you interface with a TMS.

Wave Planning, Replenishment, and Release

When using QAD Warehousing wave planning functions, the system relies on workload capacity constraints for planning warehouse picking, packing, and shipping activities. The system uses a TMS to consider load consolidation and optimization during wave planning. The TMS factors in different modes of available shipping such as parcel shipping, less than truckload (LTL), and full truck load (FTL) when selecting orders for a wave. See Figure 21.1.

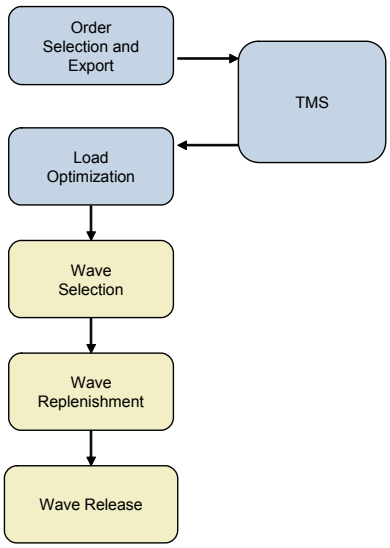
During wave replenishment and release, the system creates picking tasks and groups them for pre-shippers per ship-to address. Load optimization functions within wave planning let you:

- Import TMS load optimization information to produce more efficient task groups for pre-shippers
- Organize task groups to optimize picking, packing, and shipping of loads by similar means of transport.
- Execute checking against waves lines and quantities
- Drive the replenishment and release processes

The relationship between waves and loads is many to one.

See Chapter 18, “Wave Planning,” on page 315.

Fig. 21.1
Wave Planning with a TMS



Order Selection and Export

As a step to using a wave planning flow with a TMS, the system flags order lines to either follow a load optimization flow or follow the original wave planning flow. The system selects orders flagged for load optimization and exports them to a TMS before making them eligible for selection in a wave. You can export all or a subset of the selected sales or distribution order lines for TMS processing.

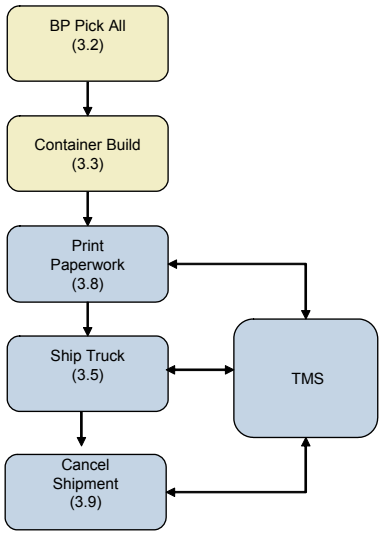
QAD Warehousing exports a detailed list to a TMS of sales/distribution order lines, quantities, weights, and volumes that you want to optimize and consolidate to streamline shipping. The TMS performs calculations to optimize the load, then sends the optimized information back to QAD Warehousing.

You can set up load optimization parameters in Load Optimization Set Up Maint (4.15.2.1)

Batch Picking and RF Options

Batch picking and other RF options are linked to the TMS; see Figure 21.2.

Fig. 21.2
Batch Picking with a TMS



Although task confirmation and related activities are the same, the system enhances task orders that display on the RF to take advantage of load optimization.

Warehouse staff can no longer mix items belonging to different loads into the same container (tote, box, or pallet) when picking.

When building containers through the RF, the system ensures the containers cannot contain items from different loads in the same container.

Load Verify

QAD Warehousing performs load verification functions when it:

- Converts a pre-shipper to a shipper
- Prints the shipper and shipping labels
- Verifies all tasks for a given load have been completed

Print Paperwork, Container Move and Pallet Explosion

Container Move functionality uses TMS drop-off sequencing information to stage pallets in the right order, inverse to the drop-off sequence linked to each pre-shipper. That is, when loading containers that belong to a load, the system verifies that the containers belonging to pre-shippers with the last stop sequence are loaded first.

QAD Warehousing also sends packing information to the TMS so that the TMS can produce the appropriate shipping labels. During print paperwork functions, QAD Warehousing exports packing information to the TMS; the TMS, in turn, returns shipping labeling information or prints shipping labels.

The system produces all necessary documentation for individual shipments (manifesting), including cross-border transactions within governmental and customs regulations.

When exploding pallets on the RF, the system ensures containers that are built per load.

Ship Truck

During ship truck activities, QAD Warehousing sends shipping information to the TMS so that the TMS can calculate shipment freight charges, track information, and send this information back to QAD Warehousing.

During ship truck activities, the system validates that a shipper has been sent to the TMS before it sends an end of day (EOD) message to the TMS.

Wave Transportation Menu

Programs in the Wave Transportation Menu (4.15.2) let you set up load optimization, create selections for the load, create/edit the load, export/import data for the load to/from the TMS, and report on load optimization.

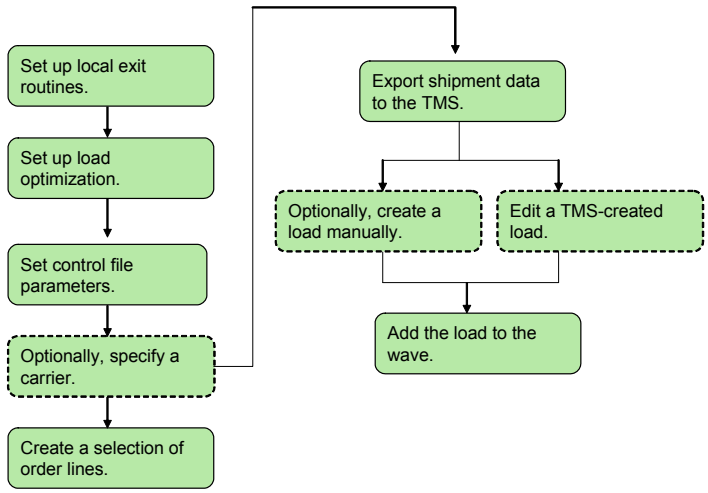
Table 21.1
Wave Transportation Menu (4.15.2)

Menu	Menu Label	Program Name
4.15.2.1	Load Optimization Setup	whtmlsmt.p
4.15.2.2	Load Optimization Inquiry	whtmlsiq.p
4.15.2.3	Load Optimization Setup Report	whtmlsrp.p
4.15.2.5	Order Batch Selection	whtmbsmt.p
4.15.2.7	Order Batch Export/Load Import	whtmbsex.p
4.15.2.9	Order Batch Inquiry	whtmbsiq.p
4.15.2.10	Order Batch Report	whtmbsrp.p
4.15.2.12	Reports Menu...	
4.15.2.12.1	Load Shipments by Order Report	whtmldr1.p
4.15.2.12.2	Load Shipments by Item Report	whtmldr2.p
4.15.2.12.3	Load Shipments by Ship-To Report	whtmldr3.p
4.15.2.12.7	Load Detail Status Inquiry	whtmstiq.p
4.15.2.12.12	Transmission Log Inquiry	whtmlgiq.p
4.15.2.12.13	Shipper Charges Report	whtmchrp.p
4.15.2.12.15	Shipper/Container Tracking Inq	whtmiq01.p
4.15.2.12.16	Carrier Tracking Numbers Inquiry	whtmiq02.p
4.15.2.12.22	Transmission Log Delete/Archive	whtmlgup.p
4.15.2.12.23	Charges/Tracking Delete/Archive	whtmtrup.p
4.15.2.13	Carrier/Service Assignment Maint	whtmssmt.p
4.15.2.14	Carrier/Service Assignment Inq	whtmssiq.p
4.15.2.15	Carrier/Service Assignment Rpt	whtmssrp.p
4.15.2.17	Load Maintenance	whtmldmt.p
4.15.2.18	Load Inquiry	whtmldiq.p
4.15.2.19	Load Report	whtmldrp.p
4.15.2.20	Load Priority Boost	whtmldpr.p
4.15.2.22	Closed Order Batch Delete/Archive	whtmbsup.p
4.15.2.23	Closed Load Delete/Archive	whtmldup.p
4.15.2.24	Wave Transportation Control	whtmpm.p

Load Optimization Setup

Before you can use load optimization while batch picking for waves and truck shipping, you must set up load optimization parameters; see Figure 21.3.

Fig. 21.3
Load Optimization Setup Flow



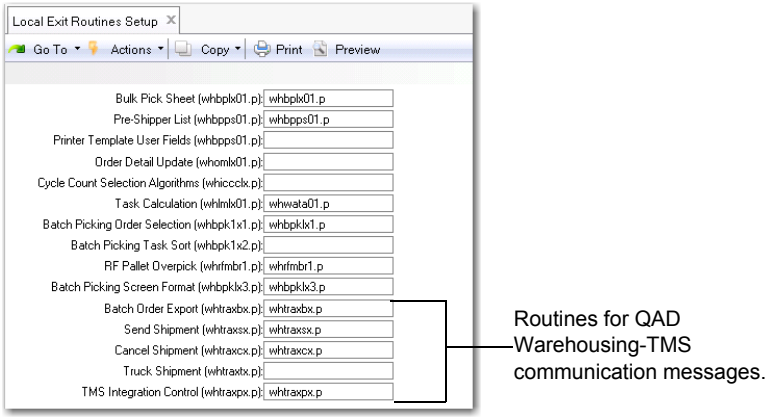
The following topics discuss setup tasks for QAD Warehousing to interface with the TMS.

Setting Up Local Exit Routines

You must set routines in Local Exit Routines Setup (4.23.10) that support necessary communication between QAD Warehousing and the TMS. You can customize and rename the routines.

See “Local Exit Routines Setup” on page 182.

Fig. 21.4
Local Exit Routine Setup (4.23.10)



Set routines for the following or use the system-supplied routine indicated within parenthesis:

Batch Order Export (whttraxbx.p). Order Batch Export/Load Import (4.15.2.7) uses this routine to send and receive export messages with the TMS. Order Batch Export/Load Import lets you export the order batch selections created in Order Batch Selection (4.15.2.5). It uses this routine to create the batch shipment message, send the message to the TMS, receive a reply, and create loads.

Ship Shipment (whtraxsx.p). RF Print Paperwork (3.8) uses this routine to send and process ship shipment messages with the TMS. QAD Warehousing sends the final contents of shippers, including containerization information, to the TMS. It then receives the shipping labels, freight charges, and tracking or PRO numbers that it stores in header records of the shipment.

Cancel Shipment (whtraxcx.p). The RF Cancel Shipment (3.9) uses this routine to send a void shipment message to the TMS should you need to cancel a shipment. QAD Warehousing first validates that this shipment was sent to TMS using the ship shipment routine message and RF Print Paperwork functions. Once validated, it sends a message to the TMS to cancel the shipment and receives a cancellation reply.

Truck Shipment (whtraxtx.p). The RF Ship Truck (3.5) uses this routine to process the EOD message. This message lets the system recalculate final freight charges and prorate truck level charges over individual shipments. Depending on the additional freight charges, the charges can be prorated over individual sales orders and loaded in its corresponding trailer charge when confirming orders.

For shipments belonging to a load, the system verifies that when users attempt to confirm a shipment, all other shipments for that same load are selected in the same transaction. If not selected, warnings or errors display, depending on Warehouse Transportation Control (4.15.2.24) settings. When communication problems occur, the system displays messages.

Setting Up Load Optimization

Use Load Optimization Setup Maint (4.15.2.1) to define default values for the Load Optimization field that displays in Order Warehouse Data Maint, SO Warehouse Data Maint, and DO Warehouse Data Maint. The ship-to addresses and items you define here sets the default for the Load Optimization field in these programs to Yes.

Key elements that define whether an order line should be processed for the TMS load optimization include:

- Ship-from site and warehouse
- Ship-to addresses
- Items
- Ship via carrier and service

The combination of these fields in an order line record determines the value of the load optimization as calculated by the TMS.

Use the following procedure to set up load optimization:

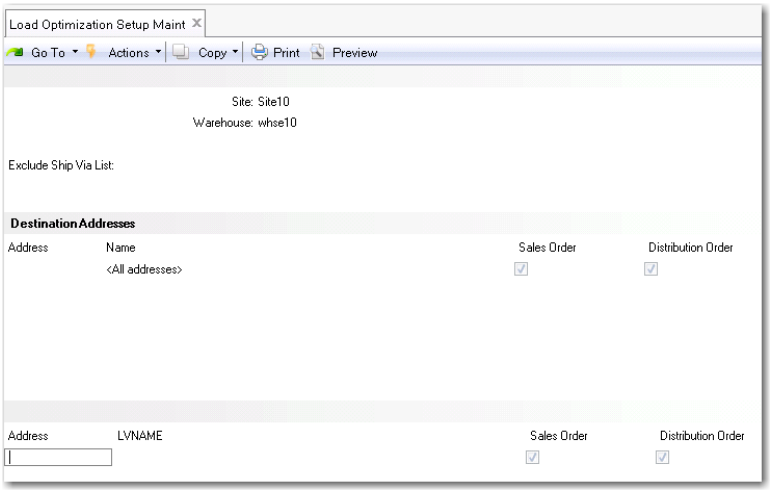
1. Enter the site and warehouse.
2. Specify carriers that should not be included in load optimization in the Exclude Ship Via List.
3. Select from a list of ship-to addresses to modify in the Destination Addresses frame or enter a new address.

   Note If Address is blank, all ship-to addresses go through load optimization.
4. Indicate whether sales orders or distribution orders for the ship-to address are included in load optimization, then cancel to display the Items frame.
5. Select from a list of items in the Items frame to modify a range of item numbers for which load optimization should apply or enter a new item range.

When you enter an item, the system sets the default for the Load Optimization field in QAD Warehousing SO or DO order maintenance programs to Yes. If Items is blank, all item numbers go through load optimization.

Note When you are in the Items or Addresses frame browse, you can press F3 to get a additional Add options and F5 to get additional Delete options.

Fig. 21.5
Load Optimization Setup Maint (4.15.2.1)



Exclude Ship Via List. Enter a list of carriers, separated by commas that should not be included in load optimization.

Address. Enter a ship-to address for order lines to include in load optimization. Entering the address here sets the Load Optimization field to Yes in Order Warehouse Data Maint, SO Warehouse Data Maint, and DO Warehouse Data Maint.

Sales Order. Indicate Yes to include sales orders for this ship-to address for load optimization.

Distribution Order. Indicate Yes to include distribution orders for this ship-to address for load optimization.

Item Number. Enter an item for which order lines will be included for load optimization via the TMS. The item must be defined within the QAD Warehousing Item Menu. Entering the item here sets the Load Optimization field to Yes in Order Warehouse Data Maint, SO Warehouse Data Maint, and DO Warehouse Data Maint.

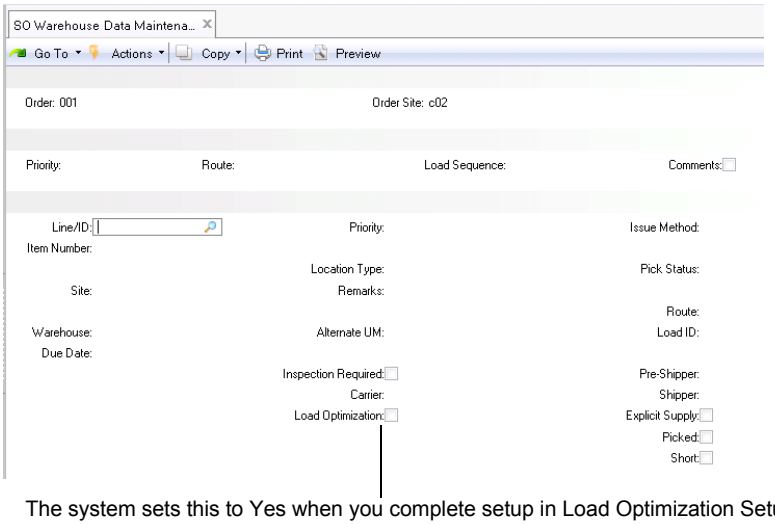
Load Optimization in Orders

When you setup loads through Load Optimization Setup Maint, the system sets a Load Optimization field to Yes for sales orders in SO Warehouse Data Maintenance (4.13.3) and for distribution orders in DO Warehouse Data Maintenance (4.13.6). You can overwrite the Load Optimization field, though, in the orders.

When Load Optimization is Yes in any of the order data maintenance programs, the system makes the order line eligible for load optimization through a TMS.

Note You can also use Order Warehouse Data Maint (4.13.1) if you specify the type or order first.

Fig. 21.6
SO Warehouse Data Maintenance (4.13.3)



Load Optimization. Indicate if this order line is to be processed through load optimization functions in the Wave Transportation menu (4.15.2). The load optimization module works in conjunction with the wave planning module, which means that only sales and distribution orders can be selected for load optimization processing.

No: This order line is not included in load optimization.

Yes: The order line is pre-processed by a TMS prior to start the picking process in QAD Warehousing. The TMS either consolidates orders into shipments to reduce overall shipping costs or optimizes the loads by calculating routes with drop-off sequences. The TMS sends the optimized or consolidated loads back to QAD Warehousing for further processing.

You set up default load optimization parameters in Load Optimization Setup Maint. When you specify a ship-to address or an item in Load Optimization Setup Maint, the system sets this field to Yes at order entry.

When Load Optimization is Yes and QAD Warehousing is enabled, warehouse staff cannot pick for the order using Picklist/Pre-Shipper - Automatic, Distrib Order Picklist Print, or Sales Order Packing List.

You cannot set this field to Yes for sequenced customer schedules. You cannot change the value of this field if the picking process has already started for the order line that was selected for load optimization.

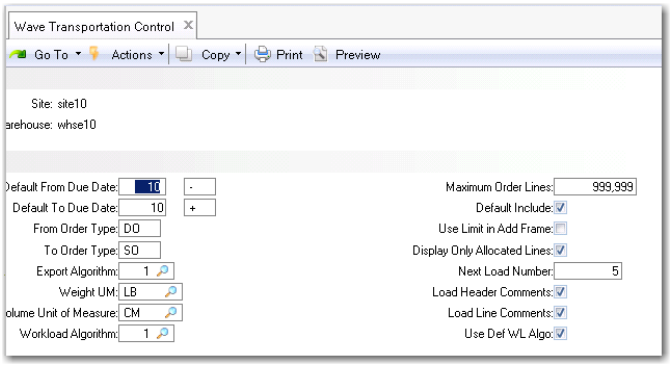
Setting Control File Parameters

Use Wave Transportation Control (4.15.2.24) to set defaults and parameters for load optimization. Set up defaults in the header for programs in the QAD Wave Transportation Menu.

If a TMS Integration Control local exit routine is defined for wave transportation functionality in Local Exit Routines Setup (4.23.10), additional fields in the TMS Integration frame let you set up parameters for communication between QAD Warehousing and the TMS, including parameters for messages between the two programs. The values that display in the additional frames depend upon the TMS.

See “Local Exit Routines Setup” on page 182.

Fig. 21.7
Wave Transportation Control (4.15.2.24)



Default From Due Date. Specify a number of days to add to or subtract from the current date when setting a default value for the Due Date field in Order Batch Selection.

Specify in terms of days from the due date; for example, specify 9 for 9 days from the due date.

Use the second entry field to specify a plus (+) or minus (-) to indicate past dates or future dates. Valid past dates include today's date minus 9,999 days. Valid future dates include today's date plus 9,999 days. Use negative numbers to indicate past due items for which you want picking completed.

When you enter -9999 here, the field is blank in Wave Selection. In this case, the system includes all due dates until the To Due Date value.

Default To Due Date. Specify the number of days to be add to or subtract from the current date when setting a default value for the To field in Order Batch Selection. Use the second entry field to specify a plus (+) or minus (-) to indicate past dates or future dates.

From Order Type/To. Enter a range of order types to:

- Use as the default when selecting orders for the selection in Order Batch Selection.
- Determine which order type to pick first when picking orders for a load.

Valid values are SO and DO. The default is SO. Select orders as follows:

- From SO To SO: Use sales order lines.
- From DO To DO: Use distribution order lines.
- From DO To SO: Use distribution orders and sales orders.

Note If you specify From SO To DO, the system cannot display the orders. The system searches for orders in alphabetical order and cannot find a sales order before a distribution order.

This field defaults to the Order Type field Order Batch Selection.

To Order Type. Enter the last order type in the range that begins with the From Order Type field. Valid values are SO and DO. The default is SO.

Export Algorithm. Specify the algorithm the system uses to select order lines to export data to the TMS for load optimization.

Weight UM. Enter the default unit of measure for the weight for the shipment.

Maximum Order Lines. Enter the maximum order lines for an order batch selection. This field defaults to the same-named field in Order Batch Selection.

The size of a selection depends on many things, such as the number of order lines per day, carriers, and work load capacity. With experience, you can learn the optimal size of the selections that streamlines the throughput of operations in your warehouse and set this field to achieve the optimal size.

Workload Algorithm. Specify the workload algorithm to use for calculations when you create a selection in Order Batch Selection. Currently only one algorithm is available:

Algorithm 1: Workload by WLG - dedicated location. The default program name for this algorithm is `whtm001.p`. This algorithm first considers a dedicated location for the item. If there are multiple dedicated locations, it only considers the first one found in the system. If no dedicated locations are found, the system looks for an item-location replenishment definition. If a definition exists, the algorithm uses this location. When multiple item-location replenishment definitions exist, the system only considers the first.

The system calculates the number of forecasted picks based on the rule:

1 order line = 1 pick

A pick occurs in a given WLG because the system links the item needed to a dedicated location and that location belongs to a WLG. If you use multiple dedicated locations for a given item, the algorithm supplies a correct result only if the different locations belong to the same WLG. The algorithm always looks for the first location dedicated for the item.

You can use the Workload by WLG Browse (4.11.12.15) to display workload data by the work location group. You can display data for users, including pending, active, and total tasks, and time to complete tasks for the WLG in both man-hours and estimated hours. In .NET UI, you can also use the browse chart designer to create various charts of the data.

Default Include. Indicate how to set the Inc field in the order selection display in Order Batch Selection.

No: Do not set the Inc field to Yes in the order batch display to automatically include the orders that match the defaults set in Order Batch Selection.

Yes: Set the Inc field to Yes in the order display to include all orders that match the defaults set in Order Batch Selection.

Use this field to streamline program execution if you typically include all selected orders when creating a selection.

Use Limit in Add Frame. When the system displays orders for a selection in Order Batch Selection, additional function keys can be used. One function lets you add more orders than originally selected. Indicate whether the system considers the setting of Def Max Order Lines when you add more orders.

No: The system does not take the maximum number of order lines into account when you add more orders.

Yes: The system considers the Def Max Order Lines you specify before you can add more orders.

Display Only Allocated Lines. Indicate whether the system selects only order lines with a general allocation when it selects orders for a load in Order Batch Selection.

No: The system selects all order lines for the load even if there is no general allocation.

Yes: The system selects only order lines with a general allocation for the load.

By default, the picking that takes place when you replenish has Auto Allocation set to Yes. This means that if the order line is not generally allocated before the system selects it in the load, it is generally allocated during the picking process.

Note This field does not apply to customer schedules since they do not work with general allocation on order lines.

Next Load Number. Specify the default number to use for the next load. This setting does not depend on the site/warehouse combination but is unique by domain.

Load Header Comments. Indicate Yes to set the default for Comments in the Load Maintenance header.

Load Line Comments. Indicate Yes to set the default for Comments at the line level in Load Maintenance.

Additional Wave Transportation Control File Frames

Other frames that display in Wave Transportation Control are specifically for interfacing with QAD TMS.

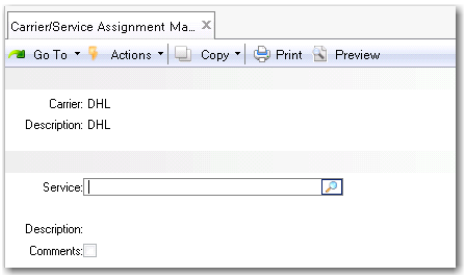
See “Setting Up a QAD TMS Interface”.

Specifying a Carrier

Use Carrier/Service Assignment Maint (4.15.2.13) to assign a carrier or shipping service to be considered for load optimization by a TMS. Typically, when the TMS analyzes your shipment information, it attempts to select the lowest cost carrier for shipments. It also considers lead time and the carrier you assign here for a particular shipment before selecting the best carrier or service to optimize the load.

You can optionally choose to enter values for the service or carrier to generalized codes for the `abs_shipvia` field once you enter either the carrier or service. Specify Yes at the system prompt to add values if you want either carrier or service values added to generalized codes.

Fig. 21.8
Carrier/Service Assignment Maint
(4.15.2.13)



Carrier. Specify a valid carrier defined in Carrier Maintenance to be considered for load optimization by the TMS.

Normally the carrier is defined in the TMS; however, depending on the setting you enter for generalized codes when prompted, you can create the carrier as a generalized code for the abs_shipvia field so that you can reference it in core system and QAD Warehousing data.

Service. Specify a valid carrier service to be considered for load optimization by the TMS.

Most TMSs distinguish a carrier from a service; for example, UPS is a carrier that offers different services, such as same day, next business day, and so on. The core system software and QAD Warehousing do not make this distinction—both use the `shipvia` field to reference either a carrier or a service. Use this field to make the distinction as the TMS can indicate that you need to send two shipments using two different services with the same carrier.

Comments. Optionally, add any comments about the carrier or carrier service.

Creating a Selection

Use Order Batch Selection (4.15.2.5) to select order lines that have Load Optimization set to Yes in DO Order Data Maint, SO Order Data Maint, or DO Order Data Maint for load optimization through a TMS.

Once you select the order lines, the system exports data about the order lines to the TMS using Order Batch Export/Load Import (4.15.2.7) and informs you of the transfer status. Order Batch Export/Load Import selects order lines and lets you make a workload capacity simulation to ensure you have enough capacity to fulfill the orders.

The system uses the default export algorithm that you specify in the Export Algorithm field in Wave Transportation Control to export order information from QAD Warehousing to the TMS.

The TMS optimizes all orders within a batch selection. The estimated shipment date is part of the information returned to QAD Warehousing from the TMS. When the estimated shipment date differs from the system shipment date, you can re-export orders to the TMS on a subsequent export only if you previously canceled or deleted the loads created for the date.

The system assigns a selection number when you leave the Selection field blank. It also sets the status of the selection to Pending. Other valid values for Status include:

- Exporting: QAD Warehousing export to the TMS is in progress for the orders in the selection.
- Error: The communication process has failed. If a result of the order batch export and load import, these are errors that occur during normal operations, not because of the export and import completion.
- Closed: Order selections for which the exporting process has successfully finalized.

Since the system exports only one selection at a time, Order Batch Selection displays a warning if you create a pending selection for a site and warehouse for which a pending selection already exists.

When the TMS fails to process orders, the system displays error information in Order Batch Export/Load Import. After exporting the orders in Order Batch Export/Load Import, the system displays an integration report.

The fields marked with an asterisk (*) have indexes. This lets you search the indexes and sort by different criteria, display additional information about the orders, add more orders matching the same criteria, and so on. For example, you select only orders for a specific carrier. You can search all orders for that carrier, then select orders that ship to a specific region of the country and add them to the wave.

Use the following procedure to create a selection:

1. Specify a selection number if you want to edit an existing selection or leave blank to create a new selection.

   If new, the system sets the Status field to Pending.

2. Specify the site and warehouse.

3. Specify criteria for the orders in this selection by entering ranges for the order due date, order type, ship-to, class, priority, carrier, and so on.

   Once you specify criteria for the orders to be included in the selection and press Go, the system displays orders that match the criteria in the Selection frame; however, you can still determine whether to include the order in the selection by moving to the Include field and toggling between Yes and No.

   Note You set the default for the Include field in the Default Include field in Wave Transportation Control.

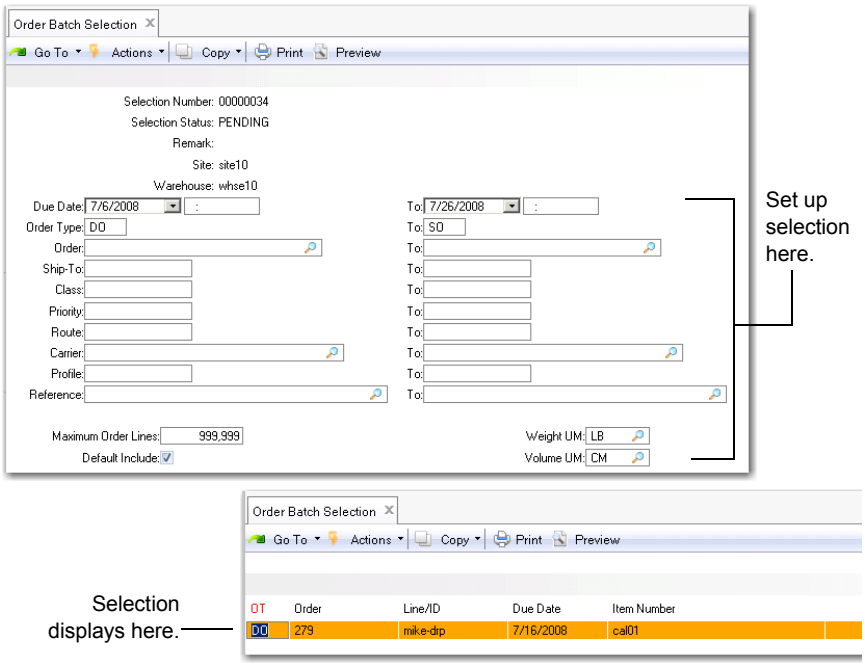
4. Review the orders in the Selection Frame. You can also use function keys to see details, remove or add orders; for example, press any of the following:
   - D to access the detailed information dates, quantities, weights, and volumes on order lines
   - F11 to selection criteria to remove order lines
   - F12 to select criteria to add new order lines to the selection

- W to launch workload calculation that you specify in Workload Algorithm in Wave Transportation Control

5 Once you have the orders for the selection press Go.

6 Specify Yes when the system prompts you to create the selection.

Fig. 21.9
Order Batch Selection (4.15.2.5)



Selection Number. Enter a selection number to edit an existing selection or leave blank to let the system create a new selection number. If you enter a value, the system displays data for that selection.

Remark. Optionally enter any remarks about the batch selection (maximum 40 characters). These display in reports within the Wave Transportation Menu.

Due Date/To. Enter a range of due dates for selecting orders to include for load optimization. Enter two-digit months, days, and years. You can also enter the time of day, based on a 24-hour clock; for example, enter July 4, 2006, 1:00 PM as 07/04/06 13:00.

The default values for Due Date and To are calculated based on entries in the Def From Due Date and Def To Due Date fields in Wave Transportation Control.

Enter the first time of day in a range of due times for orders you want to include for load optimization. Enter the date in 24-hour format; for example, enter 13:30 for 1:30 PM.

Order Type. Enter the order type or range of order types as follows:

From SO To SO: Use sales order lines for load optimization.

From DO To DO: Use distribution order lines for load optimization.

From DO To SO: Use distribution orders and sales orders for load optimization.

Note If you specify From SO To DO, the system cannot display the orders. The system searches for orders in alphabetical order and cannot find a sales order before a distribution order.

This field defaults from the same-named field in Wave Transportation Control.

Order. Enter a range of specific order numbers if you want to include lines from those orders only.

Max Order Lines. Enter a numeric value for the default maximum number of order lines to include in a single export for load optimization. This field defaults from the Def Max Order Lines field in Wave Transportation Control.

Include. Indicate how to set the Inc field in the wave order display. This field defaults from the Default Include field in Wave Transportation Control.

No: Do not set the Inc field to Yes in the order display to automatically include the orders that match the defaults set in the selection fields.

Yes: Set the Inc field to Yes in the order display to include all orders that match the defaults set in the selection fields.

Use this field to streamline program execution if you typically include all selected orders when creating a selection for export to the WeightUM.

Specify the weight unit of measure for the order that is exported to the TMS. If blank, the system uses the order UM for exporting. If you specify a value here, the system first converts to this UM, then exports.

VolumeUM. Specify the volume unit of measure for the order that is exported to the TMS. If blank, the system uses the order UM for exporting. If you specify a value here, the system first converts to this UM, then exports.

Exporting Data

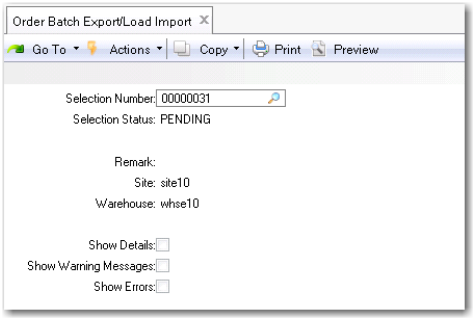
Use Order Batch Export/Load Import (4.15.2.7) to export/import data from and to a TMS. Order Batch Export/Load Import selects the batch order selection that you create in Order Batch Selection and uses local exit routines specified in Local Exit Routines Setup to create a batch shipment message to send to a TMS. It can also receive the answer from a TMS. The system exports one selection at a time.

When an order selection export starts, the system changes the status of the selection to Exporting to prevent updates in Order Batch Selection. You can view status messages about order selections being exported in Order Batch Export/Load Import.

If the export fails as a result of a communication problem or a time-out, the status of the selection is changed to Error so that the export can restart when communications are re-established. When this happens, some TMSs can send the previously calculated answer without going through a completion process again.

This program also imports a batch shipment response message from the TMS. As a result, it creates loads in the system. You can edit the system-created loads using Load Maintenance.

Fig. 21.10
Order Batch Export/Load Import (4.15.2.7)



Manually Creating/Editing a Load

Once the TMS receives shipment data from QAD Warehousing, it performs calculations on the load and determines the best routes, carriers, and so on for optimization. It creates the load and sends the load data to QAD Warehousing. Use Load Maintenance (4.15.2.17) to create, edit, or delete loads in the system.

Load Maintenance Frames

Load Maintenance consists of several frames. Enter general load settings in the header such as the ship-from site, and warehouse.

Note If the load type is parcel shipping, some fields, such as Master Bill, are not updateable.

Enter the type of load if this is a new load; arrival, departure, and ship dates; the status, and other data, such as the bill of lading.

Note Master Bill, ShipVia, FOB Point, Mode of Transport, and Vehicle ID are not editable for parcel shipping should not be editable; the system maintains these fields at the line level through bill of lading processing.

Use the Load Shipment Selection frame to define the different shipments contained in a load. Specify the drop-off sequence number for the load in the frame for full truck loads (FTL). The drop-off sequence and the shipment carrier ref uniquely identify a shipment detail record. Specify the ship-to address, then press Go.

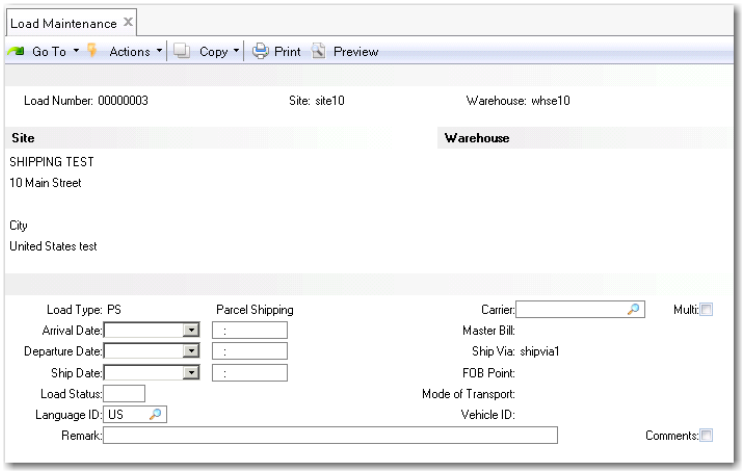
If you specified Yes to Auto Select in the header, the Automatic Selection frame displays after the Load Shipment Selection frame. Specify a range of selection numbers, orders, items, routes, or carriers to automatically select the shipments for a load.

The Shipment Detail frame contains the ship-to address and the order type, either SO or DO orders. The Type, ID, Shipping Group, and Inventory Movement Code fields are display only. They are populated from the pre-shipper or shipper once the picking for this load shipment starts and a pre-shipper/shipper in the system is created. You can update the Ship Via, FOB Point, Mode of Transport, and Vehicle ID fields only when you enter a PS load type. Otherwise, the value defaults from the load header and cannot be changed.

Use the Load Details frame to specify the selection number as established in Order Batch Selection. Order Batch Selection creates a selection number for the various order lines that have load optimization specified for them. You also specify the order, line, and item.

Use the Shipment Contents frame to identify the order lines associated with each shipment within a load. The order lines are the result of the TMS optimization processing and are used to guide the wave selection process for optimal picking and shipping.

Fig. 21.11
Load Maintenance (4.15.2.17), Header



Load Number. Specify a load number or leave blank to let the system assign a load number.

Load Type. Specify a load type for load optimization by the TMS. Valid values include:

TL: Truck load

LTL: Less than truck load

FTL: Full truck load

For truck load or less than a truck load, all shipments for a given load have the same ship-via service. For parcel shipping, all shipments for a given load can have different services and modes of transport, even though they have the same carrier.

A truck load or less than truck load type can belong to only one wave. For parcel shipping loads, the load can belong to different waves, but individual load shipments belong to one wave. To include orders for a load in a wave, set Include Load Optimization to Yes in Wave Selection.

Arrival Date. Enter the arrival date for the items to consider for load optimization.

Time. Enter the arrival time in hours and minutes. The arrival time is the time you expect the truck to arrive to the warehouse. Use these fields to determine when to pick for a wave. For example, if you add loads to a wave in Wave Selection, you can use these fields to select loads that arrive within the next two hours.

Departure Date. Enter the departure date for the items to consider for load optimization.

Time. Enter the arrival time in hours and minutes.

Ship Date. Enter the ship date for the items to consider for load optimization.

Time. Enter the ship time in hours and minutes.

Load Status. Enter the status of the load:

Blank: Open load

X: Cancelled

C: Closed. The system automatically closes a load when the last shipper linked to this load is confirmed.

Language ID. Specify a valid language as defined in Language Create.

Remark. Optionally, specify any remarks for the load.

Carrier. Enter a valid carrier defined in Carrier Maintenance for the load.

Multi. Indicate whether to enter multiple carriers.

Master Bill. Enter the bill of lading ID for this load.

FOB Point. Enter the free on board code. FOB terms of a sale identify when title passes from a seller to a buyer, and who pays shipping.

Mode of Transport. Enter the first mode of transport code for the load. If you use RF Ship Truck (3.5) option in combination with the process end of day (EOD) message sent from the TMS, the system populates this field automatically and creates an MBOL in Master Bill of Lading Maintenance.

Ship Via. Enter the ship via code for this load. Depending on the load type, ship via might have different values. For FTL and LTL load types, the ship via contains the service as defined in Carrier/Service Assignment Maint. For PS loads, the ship via contains the carrier as defined Carrier/Service Assignment Maint. Services for individual load shipments are entered at the load shipment level (ship via). The system validates the value against the values you defined in Carrier/Service Assignment Maint.

Vehicle ID. Enter the vehicle ID for this function to consider.

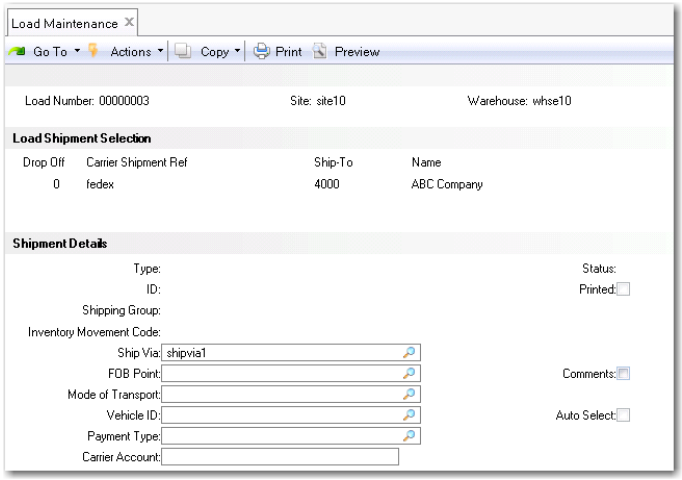
Comments. Optionally, enter any comments about the load.

Use the Load Shipment Selection frame to define the different shipments contained in a load. Specify the drop-off sequence number for the load in the frame. The drop-off sequence and the shipment carrier ref uniquely identify a shipment detail record.

If you specified Yes to Auto Select in the header, the Automatic Selection frame displays after the Load Shipment Selection frame. Specify a range of selection numbers, orders, items, routes, or carriers to automatically select the shipments for a load.

The shipment detail record contains the ship-to address and the order type, either SO or DO orders.

Fig. 21.12
Selection and Shipment Detail Frames



Drop Off. Specify the sequence number for dropping off the items in the load for shipping. The stop sequence, or drop-off point, is the order in which a truck stops for the different shipments. The drop-off sequence and the shipment carrier reference number uniquely identify a shipment detail record.

Carrier Shipment Ref. Specify the carrier reference ID for this load.

Ship-To. Specify the ship-to code for this load.

Payment. Specify the payment type if you manually create a load or edit the payment type if the value is from a TMS-created load.

If the TMS is set up for collection, use the payment type and carrier account information to inform carriers of the accounts that require shipment payment collection. The Payment Type and Carrier Account fields also display in:

- Pre-Shipper/Shipper Workbench (7.9.2)
- Sales Order Shipper Maintenance (7.9.8)
- DO Pre-Shipper/Shipper Maint (12.19.3)

When a TMS sends the payment type, QAD Warehousing verifies that pre-shippers or shippers created for this load shipment inherit the payment type value.

This field is validated against values specified in Generalized Codes Maintenance for the Valid entries abs_pay_type field.

Carrier Account. Specify the carrier account number if you manually create a load or edit the carrier account if the value is from a TMS-created load.

Comments. Optionally, add any detail comments about the shipments in the load.

Auto Select. Indicate Yes to automatically select pending order lines for the load that belong to pending selections that you create in Order Batch Selection. This is useful if you do not automatically export the orders to the TMS using Order Batch Export/Load Import. You can use the order selection process here to consolidate orders manually.

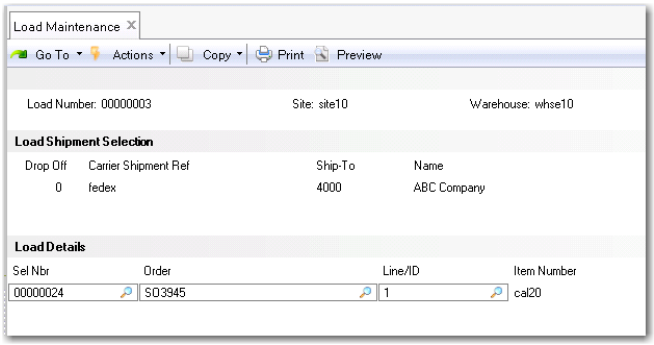
No: Do not automatically select pending orders for the pending-selection load.

Yes: Select orders marked for load optimization automatically for the pending-selection load. The Automatic Selection frame displays after the Load Shipment Selection frame. Specify a range of selection numbers, orders, items, routes, or carriers to automatically select the shipments for the load

Use the Load Details frame to specify the selection number as established in Order Batch Selection. Order Batch Selection creates a selection number for the various order lines that have load optimization specified for them. You also specify the order, line, and item.

Use the Shipment Contents frame to identify the order lines associated with each shipment within a load. The order lines are the result of the TMS optimization processing and are used to guide the wave selection process for optimal picking and shipping.

Fig. 21.13
Load Details Frame



Sel Nbr. Specify the selection number established by Order Batch Selection.

Order. Enter the order number for this load.

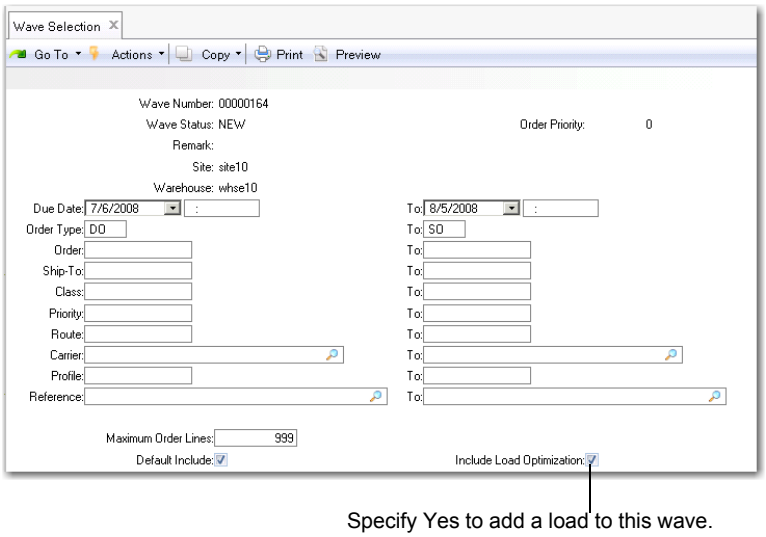
Line/ID. Enter the line number for this order. The system fills in the item, quantity, and UM for the order line.

Adding the Load to a Wave

You can specify to add loads to a wave in Wave Selection (4.15.3). Truck load (TL) or less than truck load (LTL) load types can belong to only one wave. For parcel shipping (PS) type loads, the load can belong to different waves, but the load lines belong to one wave.

See “Load Type” on page 424.

Fig. 21.14
Wave Selection, Load Optimization



You can use function keys in the Wave Selection frame to add loads to the current wave selection, display load summary data, or view line details. Also, the Order Line Detail frame in Wave Selection displays which lines are included in a load. You can select a load in the frame and view additional load details or deselect the load.

See Chapter 18, “Wave Planning,” on page 315.

Processing Shipments

Warehouse users process load-optimized orders in the same manner as they do other orders. They use batch picking to pick for orders in a wave, which can include the load-optimized orders.

When warehouse staff use the Print Paperwork (3.8) option, the system sends information to the TMS about shipper contents.

The system sends the ship shipment message to the TMS after it converts the pre-shipper to shipper and it prints the shipper.

QAD Warehousing then receives the shipping labels to be printed as well as freight charges from the TMS. You specify the printer in Warehouse Transportation Control.

The RF Ship Truck (3.5) option validates that a shipper was sent through the ship shipment message to the TMS.

When users use QAD Warehousing Container Move functions, users can load trucks in the reverse order as its drop-off sequence.

See “Container Move” on page 394.

Boosting the Priority of a Load

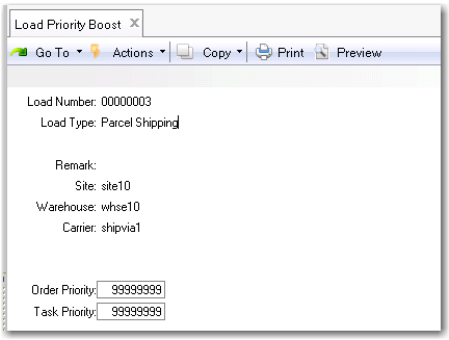
Use Load Priority Boost (4.15.2.20) to manually change the order or task priority of a load. When you boost the priority of a load, you boost the priority of all the orders or all tasks in the load. Since batch picking displays orders by descending priority, those orders display at the top of the list once you boost priority.

You assign task priority in the Priority field in Internal Routing Maintenance. If there is no internal routing defined for the movement, the task priority is set for transactions in the Priority field in Work Location Group Maintenance.

You define the order priority for a customer in Address Whse Detail Maint, which defaults to any order you create for the customer. You use Order Maintenance to view priority.

To change the order or task priority, specify the load number. The system displays the site, warehouse, and any remarks about the load. Change the priority by entering new values in the Order Priority or Task Priority field.

Fig. 21.15
Load Priority Boost (4.15.2.20)



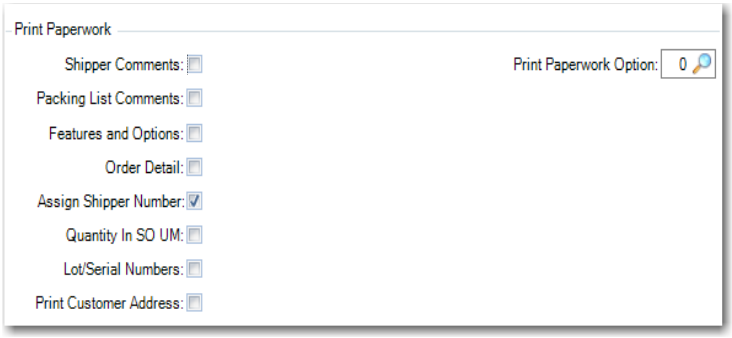
Printing Load Optimization Paperwork

You can use the RF Print Paperwork (3.8) option to send and process the ship shipment message generated through the Ship Shipment local exit routine. The system sends the final contents of a given shipper, including containerization information through the ship shipment message. As a result, QAD Warehousing receives shipping labels, freight charges, and tracking and/or PRO numbers for the shipment for processing.

The system marks shippers that were successfully processed for load optimization. If you need to modify the contents of a shipper before the shipper is confirmed, you can cancel the shipment. When you do, the system restarts the process by selecting the RF Print Paperwork and producing updated documentation and shipping labels for the shipment.

You set up print options for batch picking in the Print Paperwork frame of Batch Picking Control (4.15.24). You can set options to print shipper comments, details, addresses, and other options.

Fig. 21.16
Batch Picking Control (4.15.24), Print Paperwork Frame



Canceling a Shipment

Occasionally you may have to cancel a shipment because pallets do not fit into the truck or goods were damaged while preparing to ship. When cancelling a shipment, you must modify the shipper in the system before confirming the shipment. Typically, you modify shippers using any of the system sales or distribution order shipper maintenance programs. However, when the TMS interfaces are in place, you must send the void shipment message to the TMS because the shipment was previously rated by the TMS. Use the RF Cancel Shipment (3.9) option to send a void shipment message to the TMS and cancel the shipment.

1. In the RF, select Picking/Container (3).
2. Select Cancel Printing (9).
3. Enter the shipper number for the shipment you want to cancel in the N field, then press Go.

   The system sends the void shipment message to the TMS and cancels the shipment.

After the system exports shipment data to the TMS but before the shipment is actually voided, you cannot modify the shipper in the following programs:

- SO Container Maintenance (7.7.5)
- Pre-Shipper/Shipper Workbench (7.9.2)
- Sales Order Shipper Maintenance (7.9.8)

- DO Pre-Shipper/Shipper Maint (12.19.3)
- DO Container Maint (12.19.7)

System Administrators can use Shipper Export Status Update (4.15.2.26) to update the export status values that the system stores in the shipper and uses in the RF Print Paperwork (3.8) and RF Cancel Shipment (3.9) options. The system uses the status values to determine if a shipper exported to the TMS. Use this utility on an exceptional basis and only when you need to resynchronize data manually between QAD Warehousing and the TMS.

Viewing Load Optimization Data

The TMS sends important shipment information to QAD Warehousing, including:

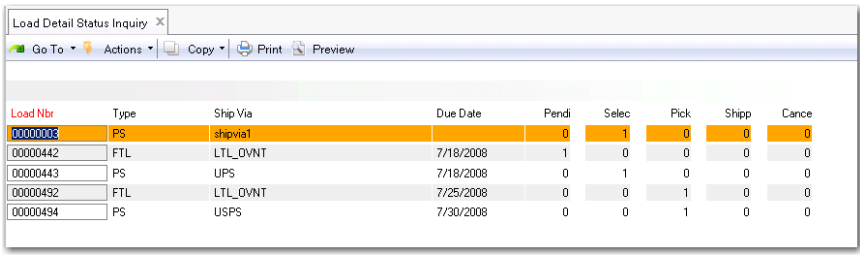
- Tracking Numbers: Shipment tracking numbers as well as URLs for shipment follow up on the web are sent to QAD Warehousing. Use the information to view the status of every shipment once it has left the physical warehouse.
- Cost and Charges: Shipment cost as calculated by the TMS and sent to QAD Warehousing. The ship shipment message sends a cost estimate that considers an isolated shipment. The end of data message sends final cost and considers all other shipments on the same truck of TL or LTL load type.

You can modify information received from TMS in Load Maintenance (4.15.2.17). Use the reports in Menu Transportation Menu (4.15.2) and in the Reports Menu (4.15.2.12) to view other data:

- After messages are exported and imported, the system reports the number of loads created or any errors received in Order Batch Export/Load Import (4.15.2.7).
- Use Order Batch Report (4.15.2.10) to review the status of an order batch selection. If errors display, use Transmission Log Inquiry (4.15.2.12.12) to review the integration errors. To view the loads created from a selection, use Load Shipments by Selection Rpt (4.15.2.12.4).
- Use the Shipper Charges Report (4.15.2.12.13) to analyze costs associated with shipping.

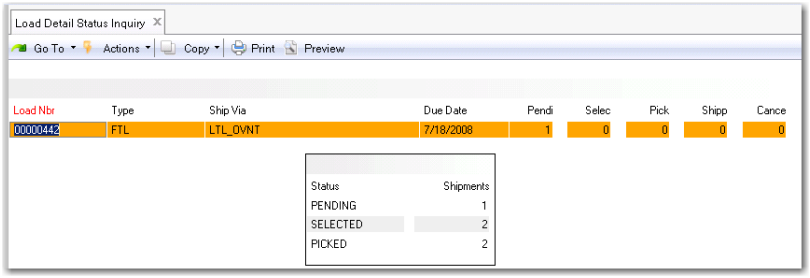
  As a result of exporting a shipment through the ship shipment message to the TMS, the system receives shipment information from the TMS which includes shipper charges. The system receives a total charge to send the shipment and details on how the total charge was calculated by the TMS. The details are linked to a charge code that is set in the TMS. Charge codes can include charges for fuel, mileage, and other shipping expenses.
- Use Load Detail Status Inquiry (4.15.2.12.7) to view status information, including pending, selected, picked, shipped, or cancelled loads. This inquiry provides you with several views to load data. You can select from a range of criteria and see load information for picked, pending, canceled loads, and so on.

Fig. 21.17
Load Detail Status Inquiry, Open Criteria



You can also view a summary of load information in Load Detail Status Inquiry. The system displays the number of pending, selected, and picked loads.

Fig. 21.18
Load Detail Status Inquiry, Summary



Deleting, Archiving, and Closing Load Data

Use Closed Order Batch Delete/Archive (4.15.2.22) to delete or archive closed order selections that were part of load optimization with the TMS. You specify closed order selections to delete/archive by a range of sites, warehouses, or selection numbers.

Use Closed Load Delete/Archive (4.15.2.23) to delete or archive loads. You specify closed loads to delete/archive by a range of sites, warehouses, or load numbers.

You can set the Delete field to No to display the data first. Once you view the data, you can set Delete to Yes to delete data. You must set both Delete and Archive to Yes to archive data. When both Delete and Archive are Yes and you press Go, the system displays the name of the archive file.

Note The system automatically closes a load when the last shipper linked to this load is confirmed.

Use the following programs to delete or archive transmission logs and shipper charges:

- Transmission Log Delete Archive (4.15.2.12.22)
- Shipper Charges Delete Archive (4.15.2.12.23)

Chapter 22

Cycle Counts and Physical Inventory

Inventory levels can be checked in a planned way by using the cycle counting option. As you monitor your warehouse over time, this option lets you adjust the cycle counting, making the most of the staff effort in maintaining accurate data. You can also conduct physical inventories in the warehouse, using system software and RF options. The following topics discuss how to conduct both cycle counts and physical inventories.

Overview 434
Describes how cycle counts and physical inventory can be used to maintain accurate inventory within warehouses.

Conducting Cycle and Opportunity Counts 434
Describes how to set up, generate, and confirm a cycle count.

Physical Inventory 438
Describes how physical inventory is calculated with a workflow addressing each step in the inventory process.

Overview

Both cycle counts and physical inventories help you maintain accurate inventory within your warehouse.

Cycle Count

Use QAD Warehousing cycle count features to:

- Generate cycle count transactions/task using Cycle Count Generation (4.8.12).
- Confirm or process cycle count tasks by RF devices or Movement Confirmation programs, with cycle count tags being automatically generated, if required.
- Initiate an inventory adjustment from an RF device by the Location Audit function.
- Set up automatic generation of recount transactions when cycle counts move out of preset boundaries.
- Define independent cycle counts and cycle recounts for greater flexibility.
- Set up automatic generation of cycle counts when inventory fails. This usually results from short picks. The system can automatically generate a task for somebody to inspect the inventory condition when a short pick occurs.
- Change the status of counted inventory. Once a cycle count has been automatically generated from failing inventory and that cycle count has been performed, any remaining inventory can be automatically available for further picking.
- Differentiate between true cycle counts and inventory adjustments by viewing the reason codes associated with transactions that are created for each type of cycle count.
- Generate cycle counts for empty locations. For example, during initial implementation when the warehouse is empty, you can generate cycle count tasks for every location in the warehouse, populating the database with inventory.

Physical Inventory

Physical Inventory enables you to count and compare actual, on-hand inventory balances with on-hand quantities recorded in the system. This can also be done with cycle counting.

See “Physical Inventory” on page 438.

Conducting Cycle and Opportunity Counts

Cycle counts and opportunity counts monitor stock levels. Cycle counting is used on a regular basis to maintain inventory accuracy. After completing the necessary setup, you can conduct cycle counts on the RF.

See page 435.

Unlike cycle counts, opportunity counts are triggered automatically by stock movements. Certain conditions—for example when stock is picked or transferred from a non-special storage location group—cause the system to check the opportunity count threshold for that item. If this is found to

be at or below the level set using the Opp Cnt Threshold field, the system initiates a cycle count. This allows cycle counts to be performed on an on-going basis, reducing the need to do a large cycle count all at once.

See “OPC Threshold” on page 84 for details.

Once a cycle count is initiated—either manually using Cycle Count Worksheet Print (3.13) or automatically from an opportunity count—a cycle count frame displays automatically on an RF, prompting the user to whom that transaction has been assigned to count the level of stock remaining in that location.

If stock is unavailable and a user must confirm a picking task with a lower quantity, you can specify that the system prompt to enter a pick fail, then prompt to conduct a count.

Setting Up Cycle Counts

To conduct a cycle count, set the fields shown in Table 22.1.

Table 22.1
Cycle Count Setup Fields

Field	Description	Program
Create Trans	Set this field to Yes to request a cycle count.	Cycle Count Worksheet Print (3.13)
ABC Class	Set this field to classify the value of items to be counted. The more valuable the item, the more frequent the count. So, items with class A are counted more frequently than B class, and so on.	Item Master Maintenance (1.4.1)
Opp Cnt Threshold	Specify the threshold that triggers an opportunity count during stock movement. If stock is found to be at or below the threshold level set in this field, the system initiates a cycle count.	Item Maintenance (4.4.7)
Count System Code	Set this field to RF to specify that the RF is the device where the system creates a cycle count request in the WLG.	Warehouse Maintenance (4.1.1)
Recount System Code	Set this field to RF to specify that the RF is the device where the system creates a cycle recount request in the WLG.	Warehouse Maintenance (4.1.1)
Opportunity Counts	Set this field to Yes so that the system requests that warehouse staff perform a cycle count.	Storage Location Group Maint (4.3.1)
OPC Frequency	Specify the frequency in days that you want to perform a count since the last count. The system checks the OPC frequency value for the location and specifies that a count be performed based on the last date and the frequency number you specify.	Storage Location Group Maint (4.3.1)
Count on Fail	Specify whether the system creates a cycle count task at the WLG level for the RF user when the user confirms with a lower quantity because stock was not available to pick for the specified quantity. If Yes, the user is prompted to enter a fail during picking.	Work Location Group Maintenance (4.3.9)

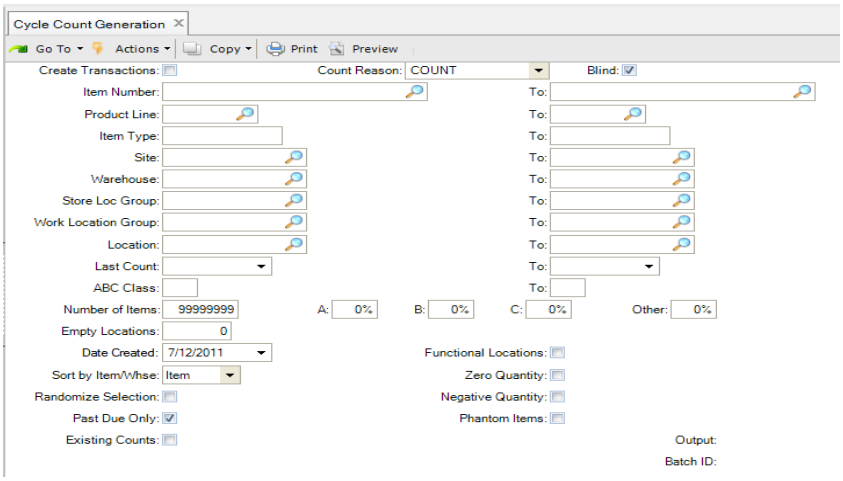
Generating a Cycle Count

Use Cycle Count Generation (4.8.12) either to:

- Create a report showing the items and locations that are counted, or
- Create cycle count transactions

Procedures to complete these tasks follow the figure for Cycle Count Generation.

Fig. 22.1
Cycle Count Generation (4.8.12)



To create a cycle count report or transactions:

1 Select Cycle Count Generation (4.8.12).

2 Complete the fields as follows:

Create Transactions. With this option set to No, a report is generated of the items and locations that are counted without transactions being created. With it set to Yes, transactions are created.

Note If the program is run with the Randomize Selection field set to Yes, items and locations selected need not match those of a previous run.

Count Reason. This value is attached to each transaction created, enabling cycle counts generated for a specific purpose—such as weekly random count—to be easily identified. This field defaults from Warehouse Management Control (4.24). See “Cycle Count Reason” on page 20.

Blind. Indicate whether the system displays the quantity that RF users have to count during the cycle count.

No (the default): The system does not display quantities to count during a cycle count.

Yes: The system displays quantities to count during a cycle count.

Selection Ranges. Item, PL, item type, site, warehouse, SLG, WLG, location, last count date, ABC class. To select empty locations, selection criteria that apply only to items are ignored.

Number of Items. Specify the number of different items to select.

Empty Locations. Specify the number of empty locations to select. Empty locations are those that have no inventory record associated with them, even ones with zero or negative on-hand quantity.

Date Created. Specify a date for cycle count transactions for the item/location that the system uses as criteria when selecting items/locations to count. The system skips any items/locations that it creates prior to this date when selecting locations to count. The default is today's date.

ABC Percentages. These function in the same manner as standard programs.

Sort by Item/Whse. Sorts the results by either item or warehouse.

Randomize Selection. If set to Yes, the identified number of items and/or empty locations are selected in a random order.

Past Due Only. Indicate whether to include only items that are passed their cycle count due date.

Existing Counts. Set to Yes to prevent the system from creating transactions for inventory that already has open cycle count transactions. Other transactions—for example, picks—are not relevant to the cycle count process.

Functional Locations. If set to No, only locations within storage location groups that are in functional internal routing groups are selected; for example dispatch locations are not selected. If set to Yes, locations from all storage location groups are selected.

Zero Quantity. This does not mean empty locations. Locations with zero on-hand inventory detail records are not considered empty. If this field is set to Yes, zero on-hand inventory detail records are included in the count; otherwise, they are not.

Negative Quantity. This does not mean empty locations. Locations with negative on-hand inventory detail records are not considered empty. If this field is set to Yes, negative on-hand inventory detail records are included in the count; otherwise, they are not.

Phantom Items. Indicates whether phantom items should be included.

3 Click Next, and then select the output destination for the cycle count.

Depending on what you selected in the Create Transactions field, the system either produces a cycle count report without creating transactions, or a report plus an actual cycle count.

Confirming a Cycle Count

You can confirm cycle count transactions using movement confirmation programs (4.8) or RDT.

With the movement confirmation programs, cycle count transactions are created with an expected quantity of zero so that the Expected In and Out inventory quantities are not automatically updated. If cycle count transactions are confirmed without first modifying them, they are confirmed as zero counts. That is, if each transaction is not manually modified to reflect the counted quantity, the on-hand quantity of each piece of counted inventory is set to zero.

Location Audit

From the RF, you can select Location Audit (1.4) to start a cycle count or a recount of a bin location. You can use functions in Location Audit to:

- Count the contents of a bin or pallet.
- View the stock you want to recount.
- Recount items that are not in the system yet.

After you select the Location Audit function, scan the location. The RF displays all pallets in the location. Select the pallet you want to audit. The RF displays item numbers and current quantities. Select the item you want recounted. If there are no pallets, the RF skips pallets and displays the items only. Once you select the item, the system creates a cycle count or a recount task.

Note You can also explode a pallet to view pallet contents. See "Exploding Pallets" on page 384.

Confirming a Cycle Count with an RF

RF screens identified with a system procedure code of AJ are supplied for confirming cycle counts. It is important that the tasks used to identify cycle counts and recounts are defined with a procedure code of AJ. Other tasks must *not* be defined with this procedure code; otherwise, for example, sales order picks would be processed as if they were cycle counts.

Physical Inventory

Physical Inventory enables you to count and compare actual, on-hand inventory balances with on-hand quantities recorded in the system. This can also be done with cycle counting. Warehouse staff can conduct a physical inventory through the RF device within the warehouse.

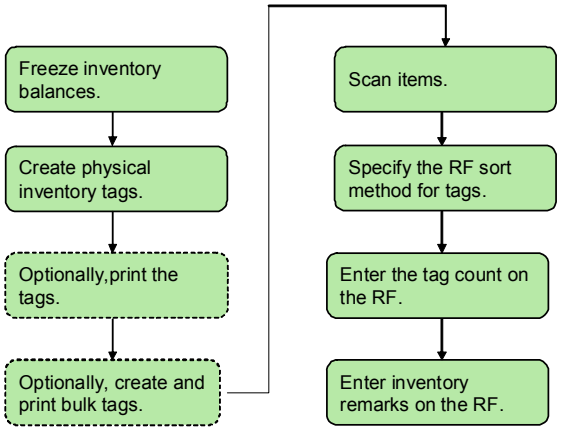
To perform a physical inventory count, first determine the items you want to count and the count frequency. Each item to be counted must have a system-generated count tag, used to record item count information.

Typically, users of QAD 2009 EE use the programs in the Inventory menu (3.16) to perform these tasks:

1. Delete the tags from the previous physical inventory.
2. Freeze inventory balances.
3. Create and print tags.
4. Enter initial tag counts.
5. Review results and enter recounts if necessary.
6. Void/zero count unused tags.
7. Update inventory balances.

Physical inventories through the RF device differ slightly. Warehouse staff count quantities in the warehouse and record them directly into the system using the RF device. The device provides electronic information on what to count; however, staff can optionally print tags through the RF device. Steps for RF-device-conducted physical inventories are shown in the following flowchart:

Fig. 22.2
Physical Inventory Flow



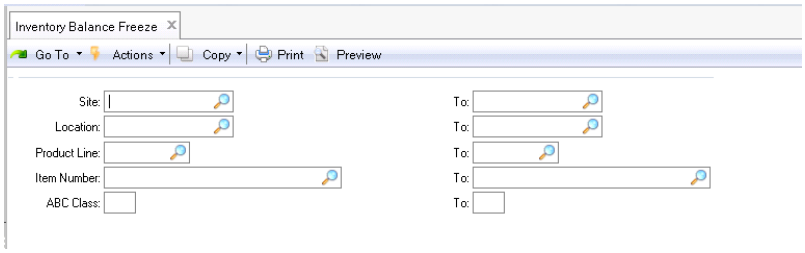
The following topics discuss each step.

Freezing Inventory Balances

Use QAD EE Freeze Inventory Balance Freeze (3.16.4) to freeze inventory. You must freeze inventory prior to entering item counts. When you freeze inventory, the system records the current quantity on-hand balance at each site/location in a separate field in the location detail record.

Note It is recommended that all outstanding inventory transactions be entered prior to freezing inventory balances. This includes transactions such as shipments, transfers, and receipts.

Fig. 22.3
Inventory Balance Freeze (3.16.4)



Select inventory to be frozen using one or more of the following criteria:

- Site
- Location
- Product Line
- Item Number
- ABC Class

Specify a single selection (site 10000) or a range (site 10000 to 20000). To select all items, leave the range blank.

Even though inventory balances have been frozen, you can still enter transactions that affect on-hand inventory balances. Because of difficulties that can arise when the system reconciles counts after freezing inventory quantities, you should suspend inventory transactions, especially during audited or year-end inventories. This ensures accurate evaluation of inventory and simplifies the audit processing.

Creating and Printing Tags

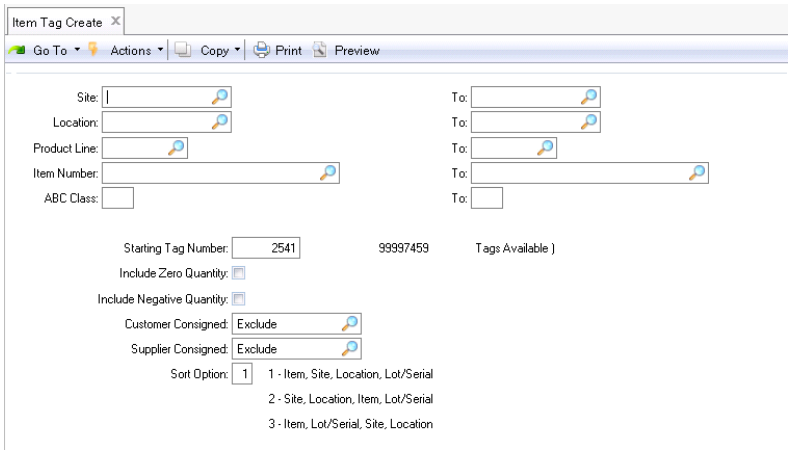
Use Item Tag Create (3.16.1) to create item tags. Optionally, use Tag Print (3.16.6) to print the tags. Printing tags is optional because the RF device displays the information needed for counting in real time.

When creating tags in Item Tag Create, you create them from existing Inventory balance records. The tags are used to verify and correct quantity balances.

You can create and print tags either before or after the inventory balance freeze. You should create a tag for each inventory item/site, location, and lot/serial number. If you enter inventory transactions after item tag records are created but before inventory balances are frozen, there may be inventory detail records without corresponding item tags, and vice versa. Use the reports in the Inventory menu (3.16) to locate discrepancies.

In Item Tag Create, you can select items by item number, site, product line, or ABC class. Enter no selection criteria to create tags for all items in your system.

Fig. 22.4
Item Tag Create (3.16.1)

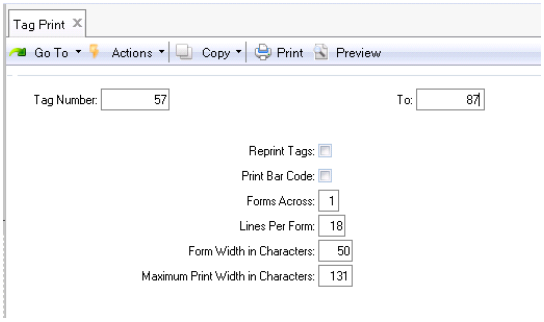


When using Tag Print, you can print on standard size forms, any number of forms across. The default form is set at 3-by-5-inch card stock.

After creating count tags, use Tag Print (3.16.6) to print both types of tags. You can print tags on most standard-size forms. Default forms are set to print on 3 x 5 inch card stock. You can optionally print the tag number in bar code format if your system is formatted to do so.

In the event of errors, delete incorrect tags using Tag Delete/Archive (3.16.23), then re-create and print new ones.

Fig. 22.5
Tag Print
(3.16.6)

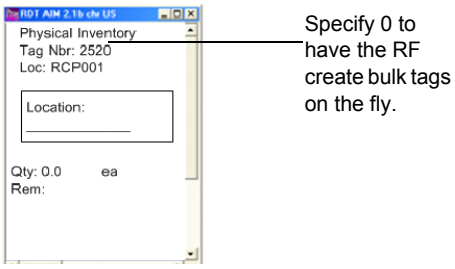


Creating and Printing Bulk Tags

Use Bulk Tag Create (3.16.2) to create bulk tags and Tag Print (3.16.6) to print them. Creating and printing bulk tags is optional because the system creates them on-the-fly from the RF when you specify 0 (zero) in the tag number field within the RF Tag Count Entry (1.11) option; see Figure 22.6.

When you specify 0, the system creates a bulk tag and uses the next available number for tags.

Fig. 22.6
RF Tag Count Entry, Tag Number Field



Scanning Items

When warehouse staff scan locations, the system creates item information for the new bulk tag. Only tags not counted are automatically available with the sort method.

Since the RF physical inventory function can be used for both count and recount options, if warehouse staff scan an already counted tag, the system considers this a recount.

See “Setting Up RF Sorting Method” on page 442.

For an item tag, you need to:

- Scan the location.
- Scan the item number.
- Enter the quantity counted.
- Optionally, enter a remark or reason code.

For a bulk tag, you need to enter the same information, and:

- Lot/serial information

- Reference (pallet number)

The item description is displayed as soon as the item is identified. For an item tag, it is displayed immediately. For a bulk tag, it is displayed after the item is scanned.

The system validates the following:

- The location must be a valid location (bulk tag) or the same as the item tag location.
- The item must be a valid item (bulk tag) or the same as the item tag part number.
- The remark can be validated if there is a corresponding generalized code entry. An F2 help function is available to help select a reason code from a predefined list on the RF device.

All counted quantities are done in the item base UM. All scanned fields support the barcode prefix function of QAD Warehousing.

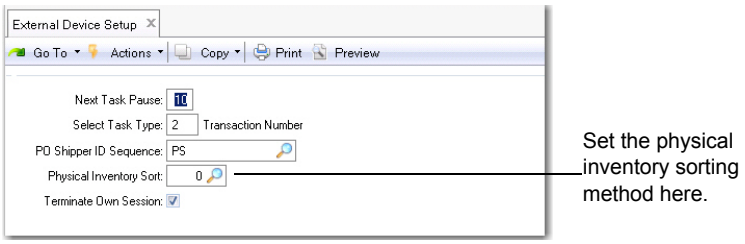
Setting Up RF Sorting Method

Specify the RF sorting method for the tags by setting the Physical Inventory Sort field in External Device Setup (4.23.22)

For all sorting methods, the system considers the site/warehouse and work location group users enter when they log in to the RF.

Note The system does not consider the user-work location group assignment.

Fig. 22.7
External Device Setup
(4.23.22)



Physical Inventory Sort. Specify the tag-sorting method that the RF device uses during a physical inventory.

0 (the default): Sort by travel sequence: The system uses the last location scanned with any other RF function, or if it is the first action after login, the system uses the location entered in the RF login screen. This is the default setup if no entry exists in Generalized Codes Maintenance (36.2.13).

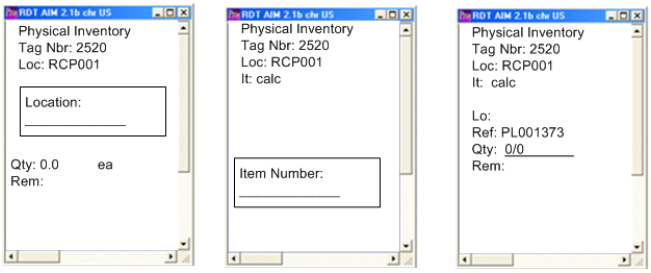
1: Sort by location name: The system uses locations by alphabetical order, starting with the first alphabetical location.Travel sequence is not considered.

2: Sort by count number: The systems sorts by the count number.

Enter Tag Counts on the RF

Once the tags are created, warehouse staff can use RF Tag Count Entry (1.11) to count items. The RF device presents a tag number to count according to the specified sort method, and staff can either confirm the tag or select another tag by scanning a different tag. The system prompts staff to scan the location, item number, and quantity; see Figure 22.8.

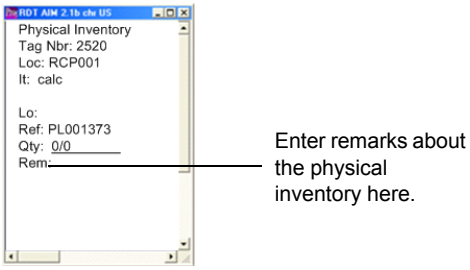
Fig. 22.8
RF Tag Count Entry (1.11)



Entering Remarks on the RF

Once the system validates the quantity, the RF device prompts staff to enter a remark about the inventory.

Fig. 22.9
RF Remark Field



The Remark field can be left blank only if it is not defined in Generalized Codes Maintenance (36.2.13).

You can create values in Generalized Codes Maintenance for the `PhysicalInvRmks` field. When you do, staff must enter one of the predefined values for the field. For example, you can set numerical values that represent the time the tag is counted:

1: The first time the tag is counted: this is the first user count.

2: The first time the tag is recounted.

3: The second time the tag is recounted.

Once generalized codes are established, staff can press F2 on the RF device and receive help. If the generalized codes are defined, the RF device prompts systematically for an existing value in the remark field.

Chapter 23

Quality Inspection

The following topics describe the steps involved in setting up quality inspection and managing quality controls with sampling using features of QAD Warehousing:

About Quality Inspection 446
Outlines quality inspection standards and how they are executed.

Inspection Flows 446
Examines the flow of inventory through a warehouse.

Quality Algorithms 447
Details the decisions made by quality algorithms.

Quality Inspection Parameters 447
Lists the levels at which inspection frequency, logical fields, and sample quantities are defined and illustrates the Item-Warehouse Maintenance (4.4.11) Inspection Data frame.

Quality Inspection Internal Routings 449
Lists and describes the transaction types which are used with the Quality Inspection module, describes the internal routing and algorithm definitions, and discusses inspection tags.

Quality Inspection 452
Lists and describes how to use the options on the Quality/Inspection Menu (4.19).

Inspected Inventory Report 454
Describes the functions of the Inspected Inventory Report (4.19.6), including details on Failed Inspections Inquiry (4.19.10) and Inspection Status Change Maintenance (4.19.13).

Inspection History Maintenance 455
Illustrates Inspection History Maintenance (4.19.17).

RDT Quality Inspection 456
Describes the RDT and RF Quality Inspection (rf.5.1) frame and the Fail and Returned Quantity field functions.

Using the .NET UI to View Inspection Data 457
Describes .NET UI browse collections that show inspection data.

About Quality Inspection

QAD Warehousing supports quality inspection with sample control, change of inventory status, and creation of warehouse transaction.

The principle of the Quality Inspection module is similar to the shortage clearance algorithms.

During a receipt, the quality algorithms are started. These determine if an inspection is required based on different criteria such as the receipt frequency, various field values at different levels, and more. For instance, an inspection takes place depending on the number of receipts from a given supplier and/or a given item, or if the previous receipt failed.

If the quality algorithm returns a sample quantity to be inspected, a transaction or movement is created from the source location to an inspection area. After inspection, either by computer or by RDT, the sample is sent back to the inventory area, using a standard put-away algorithm.

You must activate the Quality/Inspection module by setting the Active field to Yes in Quality/Inspection Control (4.19.24). If the Active field is set to No, the system displays an error when you attempt to access programs within the Quality/Inspection menu (4.19).

Inspection Flows

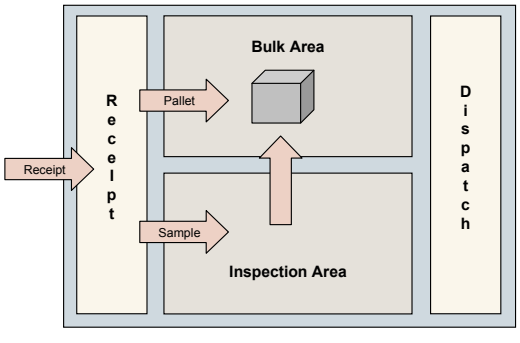
This section examines the flow of inspected inventory throughout the warehouse.

Example You have a receipt area (docking area), an inspection area, and a main storage area (bulk area). Because the Quality Inspection module is based on internal routings, other areas and combinations can be defined, and so different movements are possible.

In Figure 23.1, you receive a full pallet. The inspection algorithm identifies that an inspection is required and looks for an internal routing for the corresponding transaction type. The algorithm also calculates what quantity to control, and this sample quantity follows the quality inspection internal routing. The remaining items on the pallet continue the normal flow according to the receipt internal routing, and move to the Bulk Area.

See “Quality Inspection Internal Routings” on page 449.

Fig. 23.1
Inspection Flows



After inspection has taken place, depending on the results (pass or fail) and depending on the destructive property of the test to perform on the item, the sample is sent back to inventory following another internal routing and using a put-away algorithm. If the algorithm is the merge with same reference algorithm, this means that the sample goes back on its original pallet. Of course, any other algorithm can be used for that movement.

Quality Algorithms

The objective of a quality algorithm is to decide whether an inspection is required, to create an inspection tag, fill in the inspection history table, and also create the transactions to move the sample to an inspection area, based upon an internal routing.

Quality algorithms are defined for the algorithm type QA. Like other types of algorithms, quality algorithms are assigned to a combination of site, warehouse, item or item type, address code (supplier), and transaction type.

Quality inspection algorithms are listed in Chapter 8.

See Table 8.7, “Quality Inspection Algorithms,” on page 134.

Quality Inspection Parameters

The inspection frequency, logical fields, and sample quantities are defined at different levels:

- Item Maintenance (4.4.7)
- Item-Site Maintenance (4.4.9)
- Item-Warehouse Maintenance (4.4.11)
- Supplier-Item Maintenance (4.4.13)

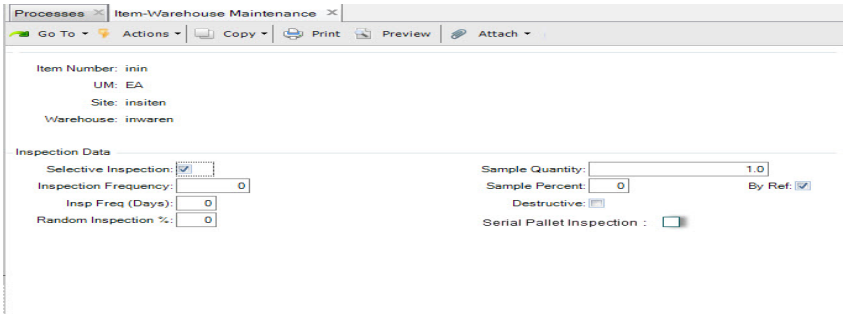
Item and item-site levels are not effective levels. They define the default values for the next levels. The two effective levels for Quality Inspection fields are the item-warehouse level and the supplier-item level.

The main level is the supplier-item level, which means that if a record exists for a given item and a given supplier, quality inspection fields are used from this level. In any other case, the item-warehouse values are used. Note that this level is a mandatory level. If item-warehouse level is not defined, no put-away or picking of the item in the corresponding warehouse is possible.

See “Item-Site Maintenance” on page 89.

An example Item-Warehouse Maintenance screen is shown in Figure 23.2.

Fig. 23.2
Item-Warehouse Maintenance (4.4.11), Inspection Data



Following is a definition of all the fields that must be reviewed prior to implementing the Quality Inspection module. These fields remain the same across all levels.

Selective Inspection. Indicate whether an inspection is to be performed.

Inspection Frequency. The value in this field determines the frequency at which inspections must take place (specific to algorithm 9) during receipt. For example, an inspection takes place every X receipts, X being the inspection frequency.

Note The inspection frequency counts the number of receipts. If you receive three pallets during a purchase order receipt, the system considers that as three receipts. The inspection frequency field must take that into account.

Inspection Freq (Days). This frequency is a number of days. It tells algorithms 1 and 2 that an inspection takes place if there was no inspection in the previous X days, X being the inspection frequency in days.

Random Inspection %. Specify a percentage of the quantity to be inspected using algorithm 10. In this case, inspection is based on a random % defined at the item/warehouse or item/supplier level. This percentage can be dynamically changed based on the results of the inspection.

Sample Quantity. Specify the quantity (in the item's base UM) of the item to inspect. Depending on the internal routing definition, the sample goes to an inspection area.

Sample %. Specify a percentage of the quantity being received to be inspected. The system rounds the result if the percentage of the received quantity is not an integer.

Note If 3 pallets are received at the same time and the inspection frequency is set that an inspection occurs at every receipt, each pallet is considered and not the entire receipt quantity as a whole.

Destructive. Indicate if the test applied to the sample is a destructive test.

Yes: The sample must be issued using an unplanned issue.

No: When the inspection does not fail, the system generates a new transaction based on a new internal routing to put the sample back in stock.

Serial Pallet Inspection. Specify whether a full pallet is inspected or individual serial items on the pallet are inspected.

Yes: The system inspects the full pallet and generates a transaction for pallet items. You must set Selective Inspection to Yes for pallet items for a full pallet inspection.

When one or more than one pallet is received at the same time, the system considers each pallet for inspection and not each serial item.

The system can generate transactions for pallet items, depending on how you set the Sample Quantity and Sample Percentage fields in Item-Site Maintenance and Multi-Level Item Maintenance,

No: Inspections must be carried out on individual serial items on the pallet rather than inspecting the full pallet. The system generates a transaction for each individual serial item on the pallet according to how you set the Sample Quantity and Sample Percentage fields.

When receiving different items on the pallets, this field has no impact on inspections.

Quality Inspection Internal Routings

Several transaction types are used with the Quality Inspection module to define the internal routings required to send the sample to an inspection area and return it to the main inventory area after inspection.

Table 23.1 lists the first set of transaction types.

Table 23.1
QA Inspection Transaction Types

Transaction Type	Description
INSP-UNP	Transaction type for quality inspection from an unplanned receipt
INSP-PO	Transaction type for quality inspection from a purchase order receipt
INSP-DO	Transaction type for quality inspection from a distribution order receipt
INSP-WO	Transaction type for quality inspection from a work order receipt
INSP-WH	Transaction type for quality inspection from an inter-warehouse receipt

The second set of transaction types is more specifically for the movement of inventory after the inspection has taken place. Table 23.2 lists these transaction types.

Table 23.2
QA Post-Inspection Transactions

Transaction Type	Description
BACK-UNP	Transaction type for a sample return after inspection from an unplanned receipt
BACK-PO	Transaction type for a sample return after inspection a purchase order receipt
BACK-DO	Transaction type for a sample return after inspection from a distribution order receipt
BACK-WO	Transaction type for a sample return after inspection from a work order receipt
BACK-WH	Transaction type for a sample return after inspection from an inter-warehouse receipt

Example

Assume you make a purchase order receipt:

- The movement to put the stock from the receipt area to the main inventory area uses a RCT-PO transaction type.
- The movement to move the sample from the receipt area to an inspection area uses a INSP-PO transaction type.
- The movement to put the sample in the main inventory area after inspection uses a BACK-PO transaction type.

Internal Routing Definition

This section describes in detail the different inventory movements and internal routings that are required.

Based upon the example shown in Figure 23.1 on page 446, if you have a Receipt internal routing group, a Bulk internal routing group, and an Inspection internal routing group, you would define the receipt movement for the purchase order as follows:

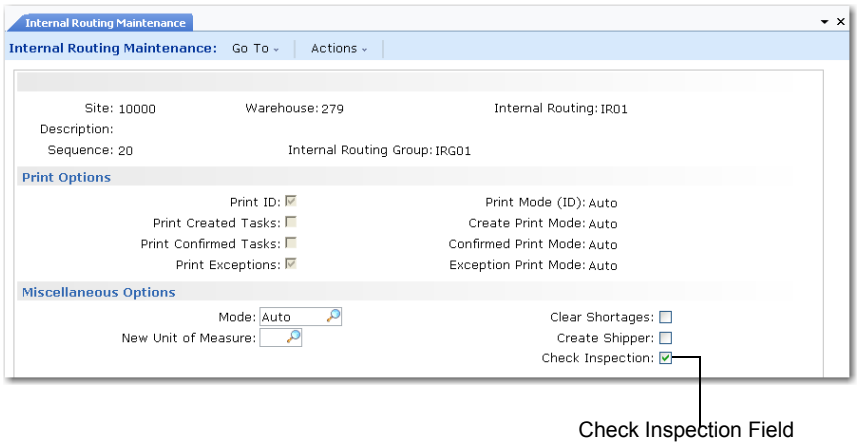
- Internal Routing RCT-PO
  - Step 10: Receipt
  - Step 20: Bulk

If an inspection is to take place, you must inform the system that it has to check whether a quality algorithm must be started. A field on the internal routing definition of the main receipt movement does this. In this example, on step 20 of the internal routing for RCT-PO, the Check Inspection field must be set to Yes.

See “Internal Routing Maintenance” on page 48.

Figure 23.3 shows the Check Inspection field.

Fig. 23.3
Internal Routing Maintenance (4.2.5)



The Quality Inspection algorithm is started to determine whether the inspection must take place and the sample quantity considered.

To move the sample, the system needs another internal routing:

- Internal Routing INSP-PO
  - Step 10: Receipt

- Step 20: Inspection

The sample follows the internal routing steps and a transaction is created to move the sample to the inspection area (internal routing group). If the quantity being received does not go completely to the inspection area, then the remaining quantity continues to follow the RCT-PO internal routing.

After inspection, if the test was not a destructive test, the sample goes to the main inventory area (Bulk IRG). The internal routing to define is, for instance:

- Internal Routing BACK-PO
  - Step 10: Inspect
  - Step 20: Bulk

Algorithm Definition

All movements need to be able to find the most suitable location for the movement's destination. For the inspection movement, you need to find a location in the inspection area. For the return movement after inspection, you need to find a suitable location in the bulk area.

If, for instance, the inspection internal routing group is a functional area, a location-find algorithm is defined for transaction type INSP-PO in order to find a suitable location in the inspection area.

If the Bulk internal routing group is defined as a non-functional internal routing group, then a put-away algorithm is defined for transaction type BACK-PO in order to find a suitable location in the bulk area for the sample's return movement after inspection.

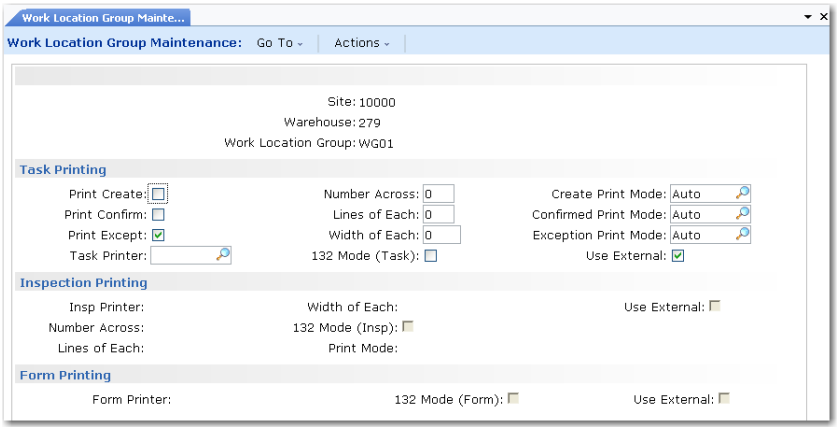
Inspection Tag

Each sample is assigned a sample ID. That sample is linked to the original inventory. This means that if you make a receipt of 100 EA and the quality inspection algorithm sends 10 EA into the Inspection area, the sample is linked to the 90 EA in the Bulk area. The main reason is that it is possible to change the status of the received stock during the inspection and to release the status after inspection. This is only possible if you know what stock is related to the sample.

For each sample, the system prints an inspection tag. There is a special printer dedicated to the inspection tag printing, defined like any other printer at the work location group level, at the warehouse level, and at the Warehouse Control level. The effective level is the work location group level; other levels are used as default values.

Figure 23.4 illustrates the frame in Work Location Group Maintenance (4.3.9) where all printers are defined.

Fig. 23.4
Work Location Group Maintenance (4.3.9), Printing



The inspection tag contains the sample ID information, the item to inspect, and other useful information. Based on the inspection tag, people control the sample, enter the test results, and initiate the return movement from the inspection area, if the inspection did not fail and the test is not a destructive test.

Quality Inspection

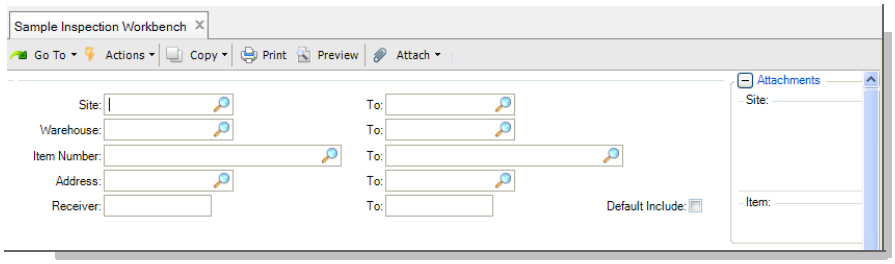
Quality Inspection is made using the options on the Quality/Inspection Menu (4.19).

- Sample Inspection Maintenance (4.19.1) lets you enter the inspection results and generate the transaction to move the stock from the inspection area to the main storage area for a given sample ID.
- Sample Inspection Workbench (4.19.4) lets you enter the inspection results and generate the transaction to move the stock from the inspection area to the main storage area on a workbench type of program where you can browse and select among different samples IDs.
- Inspected Inventory Report (4.19.6) lists, for a given sample ID, all inventory records related to the sample as well as their inventory status.
- Failed Inspections Inquiry (4.19.10) lists all samples for which the inspection failed. With the sample ID, you can find the corresponding inventory using Inspected Inventory Report (4.19.6).
- Inspection Status Change Maintenance (4.19.13) lets you define the inspection status depending on the original status and the release status—the status after inspection if it does not fail—from the inspection status.
- Inspection History Maintenance (4.19.17) lets you modify or delete any inspection history record.
- Inspection History Delete/Archive (4.19.23) is a standard procedure to delete/archive all inspection history records.
- Quality/Inspection Control (4.19.24) defines defaults for other Quality Inspection programs and activates the Quality/Inspection module.

Sample Inspection Workbench

This program is the main program to enter inspection results. It is an interactive program that lets you select the sample group to inspect and enter the inspection results.The first frame lets you select a range of samples.

Fig. 23.5
Sample Inspection Workbench (4.19.4)



Note Samples display only if the sample has reached its destination location, the inspection location. If you have any open transaction for the sample, inspection results cannot be entered.

You can select a sample from the resulting list to view its details.

Sample Inspection Maintenance (4.19.1) works the same as Sample Inspection Workbench, with the exception that you introduce the sample ID directly for which you enter the inspection results.

Enter details of the inspection status (Fail or Pass) and also additional information regarding the generation of return transactions and the quantity to be returned.

Note The Create Transaction field defaults from Quality/Inspection Control (4.19.24). The return quantity depends on the test. If some pieces are destroyed during the test, the return quantity is different than the sample quantity. If the return quantity is always the same as the sample quantity, the Return Quantity prompt can be skipped by setting the Update Quantity field in Quality/Inspection Control to No.

Fig. 23.6
Quality/Inspection Control (4.19.24)

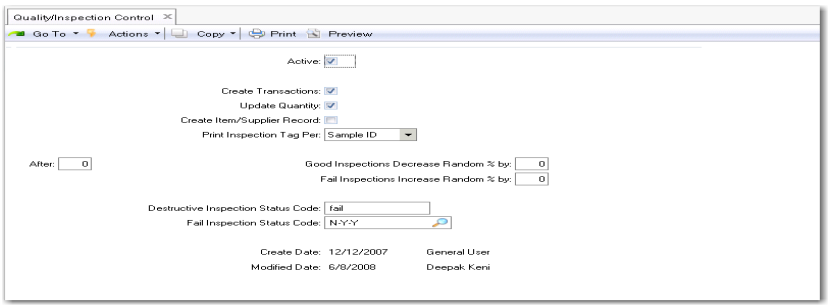


Table 23.3 lists the different actions that are performed depending on the test results.

Table 23.3
Inspection Results

Destructive Test	Inspection Failed	Create Transaction	Actions
No	No	Yes	• The sample is inspected. • A return transaction is created. • The release status is updated.
No	No	No	• The sample is inspected. • No transaction is created; the sample stays in the inspection area. • The release status is updated.
Yes	Yes/No	Yes/No	• The sample is inspected • No transaction is created; the sample stays in the inspection area and must be unplanned issue. • The release status is updated if the inspection does not fail.

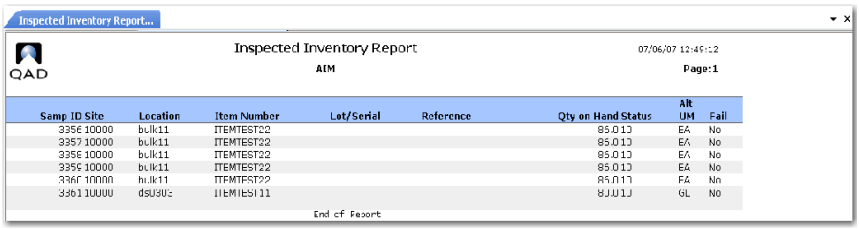
Note If an inspection fails, the sample stays in the inspection area. The warehouse staff must perform an action in order to handle the inventory related to the sample. If the test is a destructive test, the warehouse staff must create an unplanned issue transaction. The sample does not automatically disappear from the system.

Inspected Inventory Report

The Inspected Inventory Report (4.19.6) lists all inventory records related to a sample. It is useful for displaying details of sample locations and their corresponding statuses; for example, the report could be used for displaying the location of samples within a group. The Failed Inspections Inquiry (4.19.10) provides the same functionality; however, it only displays samples that have failed.

An example Inspected Inventory Report is shown in Figure 23.7.

Fig. 23.7
Inspected Inventory Report (4.19.6)

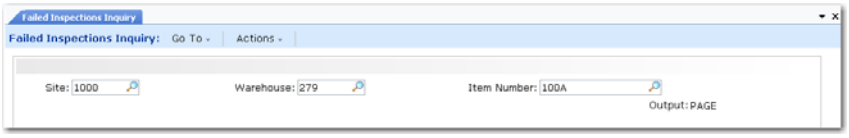


Failed Inspections Inquiry

The Failed Inspections Inquiry lists all sample IDs identified as bad (inspection failed).

Figure 23.8 shows an example Failed Inspections Inquiry screen.

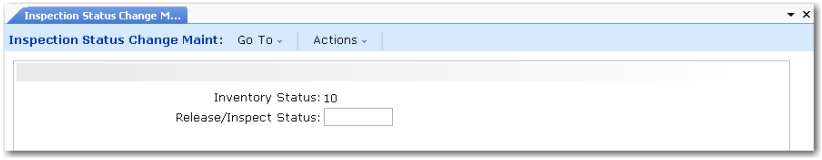
Fig. 23.8
Failed Inspections Inquiry (4.19.10)



Inspection Status Change Maintenance

While a sample is in the inspection area waiting inspection results, the inventory related to the sample can become physically blocked. This can be achieved by changing the inventory status. Change Inspection Status Maintenance lets you define the new status of this inventory, based on its original status.

Fig. 23.9
Inspection Status Change Maintenance (4.19.13)

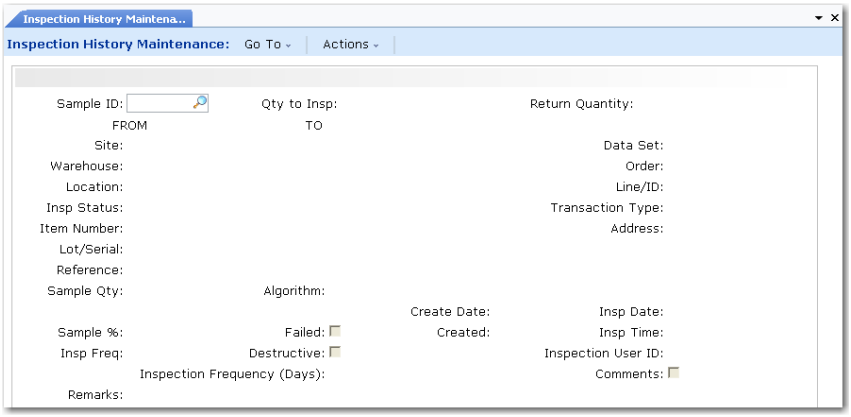


Similarly, after a successful inspection is performed, the status needs to be changed. The release status is used as the new status. Again, the release status is based on the current inventory status.

Inspection History Maintenance

Figure 23.10 illustrates Inspection History Maintenance (4.19.17).

Fig. 23.10
Inspection History Maintenance (4.19.17)



You can maintain inspection records or delete them if necessary.

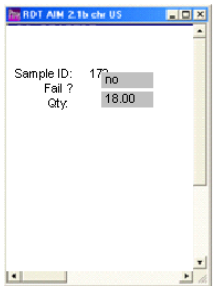
You can use Inspection Workfile Delete/Archive (4.25.10) to delete stranded inspection records. The utility optionally deletes or archives obsolete inspection workfile records. The system creates the records during receipt processing when the Quality/Inspection module is active.

RDT Quality Inspection

The Radio Data Terminal (RDT) or Radio Frequency (RF) Quality Inspection frame (rf.5.1) lets you maintain and enter sample details during inspection.

The user must enter a valid sample ID. This can be done using the RDT/RF integrated keyboard or alternatively if a barcode scanner is attached and barcodes are being printed on the inspection tags, the user can scan the inspection tag corresponding to the sample, and the relevant information is entered automatically in the appropriate fields.

Fig. 23.11
RDT and RF Quality Inspection



The RDT screen works the same way as Sample Inspection Maintenance (4.19.1), but the screen is simplified.

The user is requested to enter the sample ID, reading the inspection tag, (scanning it if a barcode is printed on it).

The Fail field and the Returned Quantity field function in a similar manner to the non-RDT frames:

Fail. The Fail field is the result of the sample quality inspection. Depending upon the value of this field, the sample inventory and the corresponding parent inventory statuses are changed accordingly.

Example If the Fail field is set to Yes, the sample inventory and the corresponding parent inventory status is FAILED, irrespective of location.

The new inventory status comes from Inspection Status Change Maintenance (4.19.13).

Qty. This value is the remaining sample quantity after inspection has taken place. This is the quantity of inventory that is returned to the parent pallet.

Example 10 EA is taken from the parent pallet as a sample. 2 EA of 10 EA have been destroyed during quality inspection. Therefore, a quantity of 8 EA is returned to the original parent pallet.

This field can be modified only if the Quality/Inspection Control settings permit.

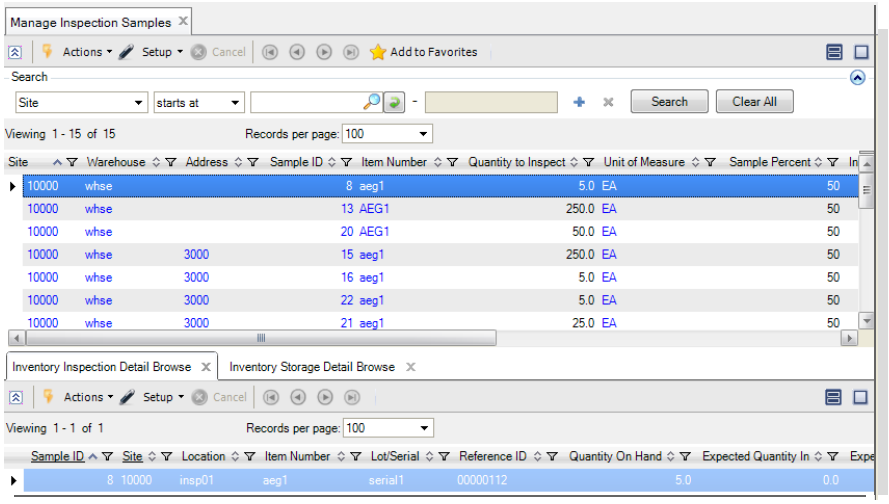
Using the .NET UI to View Inspection Data

You can use a browse collection in the .NET UI to view inspection data. You can use Manage Inspection Samples to view all inspection samples, pending confirmation. The browse contains other supporting browses.

In the main browse, the Ready to Inspect field indicates whether staff moved material to the inspection area or not; that is, it shows whether the inspection warehouse transaction is confirmed or not. In the Inventory Inspection Detail Browse child browse, you can see the inventory details for material to be inspected. In the Inventory Storage Detail Browse child browse, you can see he inventory linked to an inspection sample that is already in the storage area.

You can right-click on the sample ID field in the main browse to access Sample Inspection Maintenance where you can enter the inspection results for a given sample ID directly into the maintenance program.

Fig. 23.12.
Manage Inspection Samples



Chapter 24

Messages and Alerts

The following topics describe QAD Warehousing messaging and alert functionality:

Overview 460
Describes some of the functions of messages within QAD Warehousing.

Messaging Menu 461
Presents a list of programs within the QAD Warehousing Messaging Menu (4.22).

Creating and Sending Messages 461
Provides instructions for creating and sending messages to the RF device from QAD Warehousing software.

Deleting and Archiving Messages 462
Describes QAD Warehousing functions that let you delete or archive messages sent to the RF device.

Reading Messages 463
Provides a procedure for reading messages sent to users on the RF device.

Alerts 463
Provides instructions to subscribe, view content for, customize, and send alerts.

Overview

QAD Warehousing provides both messaging and alert functionality to aid in communication among users of QAD Warehousing, either on the system or the RF device.

Messages

Warehouse staff can use the RF device to receive messages sent to warehouse staff from QAD Warehousing users. Information in the messages and notifications can help warehouse staff:

- Avoid or resolve warehouse issues.
- Increase warehouse productivity.
- Eliminate time-consuming communication that occurs during decision making by speeding reaction time.
- Send either a message or instruction to a given user or notification, warning of a potential issue.

Staff send messages from system terminals, using the Messaging Menu (4.22) in QAD Warehousing. The target message recipient can be valid QAD EE users on a single RF device or a group of RF devices. RF devices receive the messages and return a receipt notification of the message; however, RF users cannot send messages to QAD Warehousing. Once the system sends a message, the RF device displays a blinking or beeping asterisk in the right upper corner. This indicates that there is one message to read. The RF user can then use the F11 function key to read the message. Once the message is read, RF users mark the message as read. QAD Warehousing users on a system terminal can then verify that the message was read.

Target messages sent to RF devices are defined by the following:

- Unique QAD user as defined in User Maintenance (36.3.1)
- User group as defined in Warehouse Group Maintenance (4.11.3.5)

The system retains the messages for later review.

Alerts

Warehouse supervisors or managers can use alerts to get notifications of potential issues before they become critical or to send automated information to customers or suppliers about their orders or shipments.

Alerts and messages are two different types of notifications. You create and send messages through QAD Warehousing programs in the Messaging Menu; however, you set up the sending of e-mails, which act as the alerts using QAD workflow software.

Users receive the alerts in their mailbox or at a QAD 2010 EE e-mail inbox.The RF device cannot receive alerts.

Users activate alerts by subscribing to them. Once a subscription exists, the system sends automated information to them. Recipients can be customers, suppliers, or warehouse staff.

For more information, see “Alerts” on page 463.

Messaging Menu

The following table lists the programs in the messaging menu.

Table 24.1
Messaging Menu

Menu Number	Program	Name
4.22.1	Whse Message Maintenance	whmsmt.p
4.22.2	Whse Message Browse	whbr290.p
4.22.3	Whse Message Report	whmsrp.p
4.22.13	Whse Message Detail Inquiry	whmsiq.p
4.22.23	Whse Message Delete/Archive	whmsup.p

Creating and Sending Messages

Use Whse Message Maintenance (4.22.1) to create and send a message to RF users. The RF users are notified of the message on the RF device and once the message is read and acknowledged, the system marks the message as read. To read the message from within QAD Warehousing, use Whse Message Report (4.22.3).

The system retains the messages for later review. Use Whse Message Browse to view messages by the number assigned to them by QAD Warehousing, along with the QAD ID of the sender and recipient, the date and time the message was sent, and the message subject. Additionally, the sender can check whether the message was read. Unread messages do not have the reader's date and time stamp attached to them.

Figure 24.1 depicts messages that the system created and sent to the RF device as seen in Whse Message Report. In the list, the first three messages are unread because the reader's date and time do not display. Message number 6 is read, as are Messages 10, 11, and so on. Message number 9 was sent to a group of users because there are three readers; however, reader aeg did not read the message yet because the date and time for the reader do not display.

Use Whse Message Detail Inquiry (4.23.13) to view the actual content of messages sent to users on the RF device.

Fig. 24.1
Whse Message Report (4.22.3), Sample Messages

```
whmsrp.p 3+                                  4.22.3 Whse Message Report                                  Date: 07/21/10
Page:    1                                         DOM1 USD DB NY                                      Time: 02:30:14

 Msg Nbr To       Sender    Date      Time     Message Subject                              Reader     Date      Time
-------- -------- --------- --------- -------- -------------------------------------------- ---------- --------- --------
       3 10114usr mfg       06/22/10  05:24    Test                                         10114usr
       4 10114usr mfg       06/22/10  05:43    test                                         10114usr
       5 mqa      mfg       06/23/10  05:41    Test 23                                      mqa
       6 mfg      mfg       07/08/10  01:37    Test subject                                 mfg        07/08/10  01:44
       9 anna     mfg       07/08/10  01:41    anna's subject                               aeg
                                                                                             mfg        07/08/10  01:44
                                                                                             mqa        07/08/10  08:34
      10 pll      pll       07/08/10  08:36    new messag                                   pll        07/13/10  02:36
      11 mqa      pll       07/08/10  08:54    long message with long title                 mqa        07/08/10  08:54
      12 mfg      xpr       07/09/10  07:25    poi                                          mfg        07/13/10  07:47
      13 pll      pll       07/13/10  07:27    message to phil                              pll        07/13/10  07:28
      14 pll      pll       07/13/10  07:29    poipoi                                       pll        07/13/10  07:38
      15 pll      pll       07/13/10  07:42    poipoi                                       pll        07/13/10  08:40
      16 mfg      pll       07/13/10  07:46                                                 mfg        07/15/10  10:41
      17 pll      pll       07/13/10  08:07                                                 pll        07/13/10  08:40
      19 PLL      pll       07/13/10  08:38                                                 PLL        07/13/10  08:40
      20 PLL      pll       07/13/10  08:39                                                 PLL        07/13/10  08:39
      21 mfg      mfg       07/14/10  00:49                                                 mfg        07/14/10  01:13
```

Reader's Date and Time stamp display only when the RF user acknowledges, then reads the message.

Message Procedure

1 Enter a valid QAD user ID or group of IDs in the To field.

2 Enter a subject for the message; then press Return.

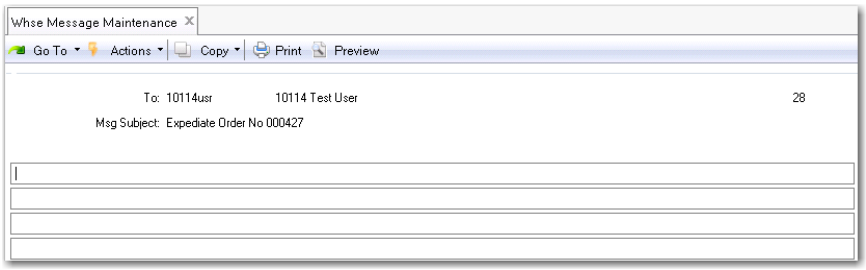
3 Enter text for the message; then press Return.

4 When you press return, the system prompts you to send the message. Accept Yes.

The system informs you that the message was sent to the user.

If you respond to the prompt with No, the system prompts you again to verify that you want to exit without sending the message. If you select No, the system returns you to the Text window to update the message.

Fig. 24.2
Whse Message Maintenance (4.22.1)



To. Enter a valid QAD user ID or group of IDs as defined in User Maintenance (36.4.1)

Msg Subject. Enter a short text description for the message subject.

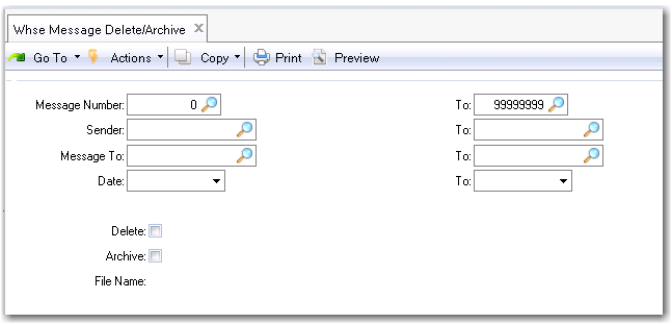
Deleting and Archiving Messages

Use Whse Message Delete/Archive to:

- Delete messages sent from QAD Warehousing to one or more users of the RF device.
- Archive messages.

When you set Archive to Yes, the system supplies the name of the file with archived messages in the File Name field. You must set both Delete and Archive to Yes for the name to display.

Fig. 24.3
Whse Message Delete/Archive (4.22.23)



Message Number. Enter the first system-assigned message number in a range to display. To view message numbers, senders/recipients, message dates, and message subjects, use Whse Message Browse.

Sender. Enter the first valid QAD EE user ID for the sender in a range for this function to consider.

Message To. Enter the first valid QAD EE user ID for the recipient in a range for this function to consider.

Date. Enter the first date in a range for the date that the message was sent to RF user/users.

Delete. Indicate Yes to delete messages from the system.

Archive. Indicate Yes to archive messages. When Yes, the system creates a file to store the archived messages and displays the name in the File Name field.

Reading Messages

RF users can use the RF Read Messages (6) option to view messages sent to them by QAD EE users from within QAD Warehousing. RF users cannot send messages to QAD Warehousing.

When the message is sent, an asterisk (*) displays in the upper right corner of the RF screen. The RF user must select the F11 function key to acknowledge receipt.

The user can then access the RF Read Messages option to view the message. The RF lists any unread messages by sender, date, and time, in ascending order by date. Unread messages have an asterisk (*) next to them.

Once RF users read the message, they can end the message program.

Alerts

Alerts are an important part of communication within the warehouse, among several warehouses in a distributed site, or among customers and suppliers. Examples of alert notifications include the following:

- Wave, automatic, or kanban replenishment failure
- Shipment receipt, sent, or verification
- Missed, late, double, or short shipments
- Order change
- Low inventory levels
- Algorithm failure
- Picking is short or repicking failure
- Inspection or cycle count task creation or sample failure
- Cross-docking task creation
- Security: which staff member is performing which task

Currently, three customizable alerts come with QAD Warehousing:

- Shipment notification (when item is sent)

- Task creation (when pick or short are created)
- Sample Inspection Fail (when an item is rejected from inspection area)

You must:

- Participate in a role to activate, access data for, and customize alerts; see “Role Participation”
- Subscribe to alerts; see “Alert Subscriptions”
- Subscribe to the system to activate sending e-mails; see“Email Subscriptions”

Role Participation

To receive or customize alerts, you must sign up as a role participant in the QAD Workflow module. The embedded internal workflow module lets you forward or route work items to another role or person in the organization for completion or validation. It serves as a built-in automated approval process that can be applied to any record or document created in the system by forwarding work to the appropriate role. It must be specifically enabled before it can be used.

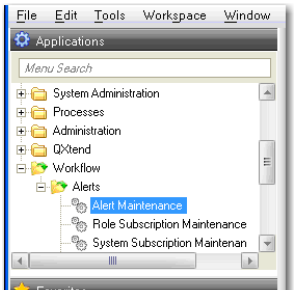
The workflow is a generic function that can be started from the Tools menu of an individual screen. The user must have a role that has been given access to create workflows in Role Permissions Maintain (36.3.6.5) in order to initiate a workflow.

For more information on workflow, see *QAD System Administration User Guide*.

Alert Customizing

You customize the three standard alerts in Alert Maintenance. You access Alert Maintenance in the Workflow module. See Figure 24.4.

Fig. 24.4
Alert Maintenance, Menu Screen



Use the following procedure once you launch Alert Maintenance:

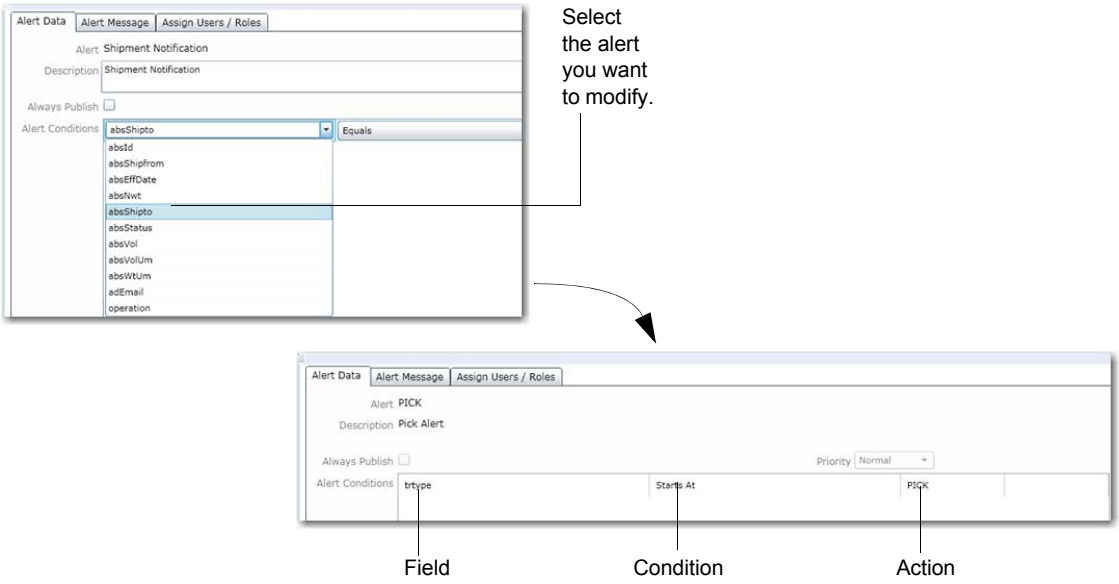
1. In Alert Maintenance, enter `QAD WMS` in the Application Field.
2. Enter one of the three alert types in Event field; for example, enter TaskCreation.
3. From the drop-down list, select the alert you want to modify, then press Edit; see Figure 24.5.
   The system displays three tabs:
   - Alert Data
   - Alert Messages
   - Assign User/Roles

Alert data displays.

4 Change the description, create an alert condition, or select other tabs to customize the alert for your needs.

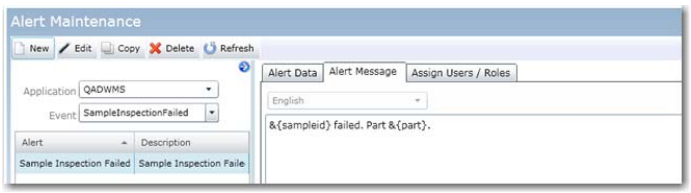
In the Alert Data frame, the first column depicts the field, the second column depicts the condition, and the third column depicts a description of the action; see Figure 24.5.

Fig. 24.5
Alert Maintenance, Selection Screen



Example You want to modify the task creation alert for picking. You enter SampleInspectionFailed as the Event in Alert Maintenance, then select SampleInspectionFailed Alert. You select the Alert Message tab, then modify the message. Alert messages show you the QAD EE and Warehousing fields extracted to display data. for example, {part} is the item number for the failed part; see Figure 24.6.

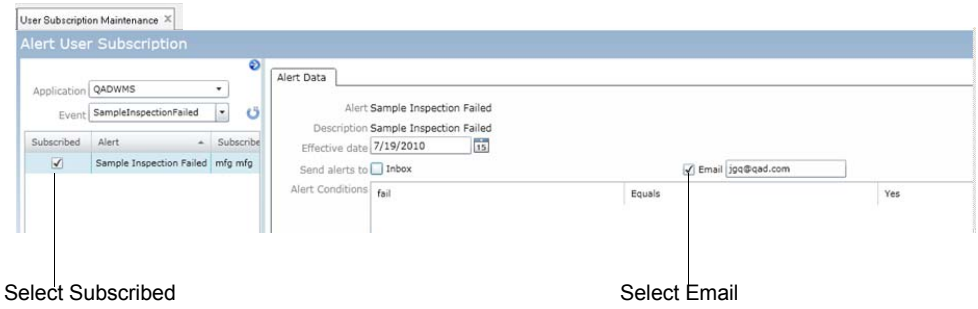
Fig. 24.6
Alert Maintenance, Example



Alert Subscriptions

Use Alert User Subscription Maintenance to subscribe for alerts. User Subscription Maintenance is under the Alert Menu in the Workflow module. You must select the Subscribed and Email options.

Fig. 24.7
Alert User Subscription

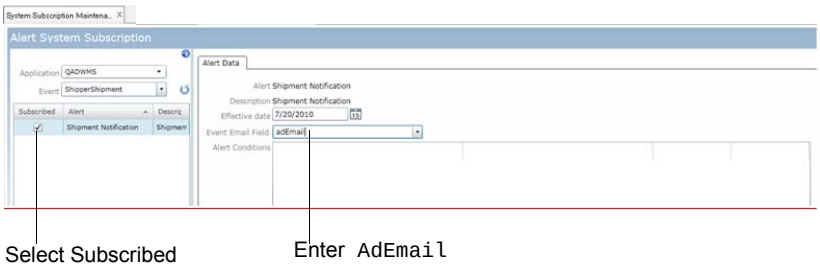


Email Subscriptions

For shipper shipment alerts, you can send automatic e-mails to all customers. To do this, use System Subscription Maintenance. System Subscription Maintenance is under the Alert Menu in the Workflow module.

You select Subscribed, then enter `AdEmail` in the Event Email Field field.

Fig. 24.8
System Subscription



Section 3

Reference

This section includes supplementary reference information for QAD Warehousing.

Menu Listing ***469***
Lists all programs included with Warehousing.

Print Examples ***483***
Gives examples of one printed document per transaction type.

QAD TMS ***489***
Discusses QAD TMS and how to set it up.

Glossary ***475***

Appendix A

Menu Listing

The following topics includes a listing of all programs included as part of QAD Warehousing:

Standard Warehouse Menus 470
Lists standard warehouse menus, their program names, and menu numbers.

Warehousing .NET UI Browse Collections 481
Lists QAD Warehousing .NET UI browse collections, their elements, and the browse collection location.

Warehousing .NET UI Menu Collections 481
Lists QAD Warehousing menu collections.

RF Warehouse Menus 481
Lists RF menus and menu numbers.

Standard Warehouse Menus

Table A.1
Standard Warehouse Menus

Menu	Menu Label	Program Name
4.1	Warehouse Menu...	
4.1.1	Warehouse Maintenance	whwhmt.p
4.1.2	Warehouse Browse	whbr001.p
4.1.3	Warehouse Report	whwhrp.p
4.1.5	Whse Master List Maintenance	whwhlsmt.p
4.1.6	Whse Master List Browse	whbr002.p
4.1.7	Whse Master List Report	whwhlsrp.p
4.1.13	Inventory Acct Synchronization	whacsync.p
4.1.24	Warehouse Control	whwhpm.p
4.2	Routings Menu...	
4.2.1	Internal Routing Group Maint	whirgpmt.p
4.2.2	Internal Routing Group Browse	whbr026.p
4.2.3	Internal Routing Group Report	whirgprp.p
4.2.5	Internal Routing Maintenance	whirmt.p
4.2.6	Internal Routing Browse	whbr003.p
4.2.7	Internal Routing Report	whirrp.p
4.2.9	Int Routing Assignment Maint	whirasmt.p
4.2.10	Int Routing Assignment Browse	whbr027.p
4.2.11	Int Routing Assignment Report	whirasrp.p
4.2.13	External Routing Maintenance	whermt.p
4.2.14	External Routing Browse	whbr004.p
4.2.15	External Routing Report	wherrp.p
4.2.17	Ext Routing Assignment Maint	wherasmt.p
4.2.18	Ext Routing Assignment Browse	whbr203.p
4.2.19	Ext Routing Assignment Report	wherasrp.p
4.2.21	Inter-Work Location Group Maint	whinwlmt.p
4.2.22	Inter-Work Location Group Browse	whbr023.p
4.2.23	Inter-Work Location Group Report	whlgmrp.p
4.3	Location Menu...	
4.3.1	Storage Location Group Maint	whslgmt.p
4.3.2	Storage Location Group Browse	whbr034.p
4.3.3	Storage Location Group Report	whslrp.p
4.3.5	Storage Loc Group List Maint	whsllsmt.p
4.3.6	Storage Loc Group List Browse	whbr006.p
4.3.7	Storage Loc Group List Report	whsllsrp.p
4.3.9	Work Location Group Maintenance	whwlgmt.p
4.3.10	Work Location Group Browse	whbr005.p

Table A.1 — *Standard Warehouse Menus* — (Page 1 of 11)

Menu	Menu Label	Program Name
4.3.11	Work Location Group Report	whwlrp.p
4.3.13	Warehouse Location Maint	whlomt.p
4.3.14	Warehouse Location Browse	whbr007.p
4.3.15	Warehouse Location Report	whbr007.p
4.3.17	Location Reports Menu...	
4.3.17.1	Location By SLG Inquiry	whlosliq.p
4.3.17.2	Location By WLG Inquiry	whlowliq.p
4.3.17.4	Dedicated Location Inquiry	whlodeiq.p
4.3.17.13	Location Full % Report	whlofurp.p
4.3.19	Location Forecast Menu...	
4.3.19.1	Location Forecast Build	whfcrcgn.p
4.3.19.2	Location Forecast Maintenance	whfcrcmt.p
4.3.19.3	Location Forecast Order Inquiry	whfciq01.p
4.3.19.4	Location Forecast Inventory Inq	whfciq02.p
4.3.19.5	Location Forecast Report	whfcrcrp.p
4.3.19.24	Location Forecast Control	whfcpm.p
4.3.21	Mass Location Maintenance	whlomamt.p
4.3.22	Check Digit Generation	whlomamt.p
4.3.23	Hold Menu...	
4.3.23.1	Hold Maintenance	whichomt.p
4.3.23.2	Hold Browse	whbr008.p
4.3.23.3	Hold Report	whichorp.p
4.3.23.23	Expired Hold Delete/Archive	whichoup.p
4.4	Item Menu...	
4.4.1	Item-Storage Loc Group Maint	whppslmt.p
4.4.2	Item-Storage Loc Group Browse	whbr030.p
4.4.3	Item-Storage Loc Group Report	whppslrp.p
4.4.5	Multi-Level Item Maintenance	whppmt.p
4.4.6	Multi-Level Item Inquiry	whppiq.p
4.4.7	Item Maintenance	whppptmt.p
4.4.8	Item Inquiry	whppptiq.p
4.4.9	Item-Site Maintenance	whppsimt.p
4.4.10	Item-Site Inquiry	whppsiiq.p
4.4.11	Item-Warehouse Maintenance	whppwhmt.p
4.4.12	Item-Warehouse Inquiry	whppwhiq.p
4.4.13	Supplier Item Inspection Maintenance	whppvpmt.p
4.4.14	Supplier Item Inspection Browse	whbr009.p
4.4.15	Supplier Item Inspection Report	whppvprp.p
4.4.17	Customer Item Status Maintenance	whppcimt.p
4.4.18	Customer Item Status Browse	whbr042.p

Table A.1 — *Standard Warehouse Menus* — (Page 2 of 11)

Menu	Menu Label	Program Name
4.4.19	Customer Item Status Report	whcmicrp.p
4.4.21	Item-Warehouse Browse	whbr014.p
4.5	Sizing Menu...	
4.5.1	Alternate Unit of Measure Maint	whummt.p
4.5.2	Alternate Unit of Measure Browse	whbr010.p
4.5.3	Alternate Unit of Measure Report	whumrp.p
4.5.5	UM Group Maintenance	whppugmt.p
4.5.6	UM Group Browse	whbr011.p
4.5.7	UM Group by Item Number Inquiry	whppupiq.p
4.5.8	UM Group Report	whppugrp.p
4.5.10	UM Conversion Generation	whppugen.p
4.5.12	Base UM Check Report	whppburp.p
4.6	Algorithm Menu...	
4.6.1	Algorithm Type Maintenance	whaltymt.p
4.6.2	Algorithm Type Browse	whbr044.p
4.6.3	Algorithm Type Report	whaltyrp.p
4.6.5	Algorithm Master Maintenance	whalmmt.p
4.6.6	Algorithm Master Browse	whbr043.p
4.6.7	Algorithm Master Report	whalrp.p
4.6.9	Algorithm Assignment Maintenance	whalasmt.p
4.6.10	Algorithm Assignment Browse	whbr045.p
4.6.11	Algorithm Assignment Report	whalasrp.p
4.6.13	Put Away/Loc Find Simulation	whpasim.p
4.6.15	Picking Simulation	whpksim.p
4.7	Engine Menu...	
4.7.1	Transaction Type Maintenance	whtrttmt.p
4.7.2	Transaction Type Browse	whbr054.p
4.7.3	Transaction Type Report	whtrwtrp.p
4.7.5	Warehouse Trans Type Maintenance	whtrwtmt.p
4.7.6	Warehouse Trans Type Browse	whbr055.p
4.7.7	Warehouse Trans Type Report	whwttmrp.p
4.7.9	Engine Processor – Order Display	whenpord.p
4.7.10	Engine Processor – Date Display	whenpdte.p
4.7.11	Engine Processor – LotSerial/Ref	whenplrf.p
4.7.13	Engine Workfile by Order Maint	whenmt01.p
4.7.14	Engine Workfile by Date Maint	whenmt02.p
4.7.15	Engine Workfile Browse	whbr012.p
4.7.16	Engine Workfile Report	whenrp.p
4.7.18	Failed Engine WorkFile Report	whenfarp.p
4.7.21	Engine History Menu...	

Table A.1 — *Standard Warehouse Menus* — (Page 3 of 11)

Menu	Menu Label	Program Name
4.7.21.1	Engine History Inquiry	whenhiq.p
4.7.21.2	Engine History by Order Inquiry	whenh2iq.p
4.7.21.3	Engine History by Date Inquiry	whenh3iq.p
4.7.21.4	Engine History Report	whenhrp.p
4.7.21.23	Engine History Delete/Archive	whenup.p
4.7.24	Engine Control	whenpm.p
4.8	Process Menu...	
4.8.1	Movement Conf by Transaction	whtrcf11.p
4.8.2	Movement Conf by Location	whtrcf12.p
4.8.3	Movement Conf by Order	whtrcf13.p
4.8.5	Movement Confirmation Processor	whtrcfp1.p
4.8.7	Movement Confirmation Workbench	whtrcf04.p
4.8.9	Movement Confirmation and Inq	whtrcf01.p
4.8.12	Cycle Count Generation	whicccgn.p
4.8.13	Transaction Maintenance	whtrmt.p
4.8.14	Transaction Inquiry	whtriq.p
4.8.15	Transaction Detail Maintenance	whtrdtmt.p
4.8.16	Inventory Detail Maintenance	whicldmt.p
4.8.17	Inventory Detail Inquiry	whiciq01.p
4.8.23	Transaction Hist Delete/Archive	whtrup.p
4.9	Reports Menu...	
4.9.1	Warehouse Transaction Inquiry	whtriq.p
4.9.2	Transaction History Inquiry	whthiq.p
4.9.4	Transaction Inquiry Menu...	
4.9.4.1	Transaction by Type Inquiry	whtriq10.p
4.9.4.2	Transactions by Item Inquiry	whtriq01.p
4.9.4.3	Transactions by Reference Inq	whtriq08.p
4.9.4.4	Transactions by Location Inquiry	whtriq04.p
4.9.4.5	Transactions by To Location Inq	whtriq05.p
4.9.4.6	Transactions by Bulk Pick Inq	whtriq02.p
4.9.4.7	Transactions by Order Inquiry	whtriq03.p
4.9.6	Warehouse Transaction Report	whtrrp02.p
4.9.7	Transaction History Report	whtrrp01.p
4.9.9	Transaction Browse Menu...	
4.9.9.1	Transaction by Pre-Shipper Browse	whbr232.p
4.9.9.2	Transactions by Wave Browse	whbr231.p
4.9.9.4	Put Away Transactions Browse	whbr421.p
4.9.9.5	Picking Transactions Browse	whbr427.p
4.9.9.13	Transactions History Browse	whbr257.p
4.9.12	Std Transaction by Ref Inquiry	whicref.p

Table A.1 — *Standard Warehouse Menus* — (Page 4 of 11)

Menu	Menu Label	Program Name
4.9.13	Inventory Detail Inquiry	whiciq01.p
4.9.14	Inventory Detail Report	whicrp01.p
4.9.15	Reference Summary Inquiry	whicpliq.p
4.9.16	Referenced Detail Inquiry	whiciq02.p
4.9.17	Reference History Detail Inquiry	whiciq03.p
4.9.18	Allocated Inventory Report	whicrp02.p
4.9.19	Inventory Detail By SLG Browse	whbr233.p
4.11	Labor Management Menu...	
4.11.1	Labor Management Setup Menu...	
4.11.1.1	Task Maintenance	whlmtkmt.p
4.11.1.2	Task Browse	whbr101.p
4.11.1.3	Task Report	whlmtkrp.p
4.11.1.5	Alternate Task Maintenance	whlmatmt.p
4.11.1.6	Alternate Task Browse	whbr100.p
4.11.1.7	Alternate Task Report	whlmatrp.p
4.11.1.9	Task Assignment Maintenance	whlmtamt.p
4.11.1.10	Task Assignment Browse	whbr102.p
4.11.1.11	Task Assignment Report	whlmtarp.p
4.11.1.13	Task Time Maintenance	whlmttmt.p
4.11.1.14	Task Time Browse	whbr103.p
4.11.1.15	Task Time Report	whlmttrp.p
4.11.1.17	Task Time Update	whlmstmt.p
4.11.3	Labor Management User Menu...	
4.11.3.1	User Warehouse Data Maintenance	whlmusmt.p
4.11.3.2	User Warehouse Data Browse	whbr104.p
4.11.3.3	User Warehouse Data Report	whlmusrp.p
4.11.3.5	Warehouse Group Maintenance	whsyugmt.p
4.11.3.6	Warehouse Group Inquiry	whsyugiq.p
4.11.3.7	Warehouse Group Report	whsyugrp.p
4.11.3.9	Warehouse Calendar Maintenance	whlmcamt.p
4.11.3.10	Warehouse Calendar Browse	whbr106.p
4.11.3.11	Warehouse Calendar Report	whlmcarp.p
4.11.3.13	User Work Location Group Maint	whsyuwmt.p
4.11.3.14	User Work Location Group Browse	whbr105.p
4.11.3.15	User Work Location Group Report	whsyuwrp.p
4.11.5	Transaction Priority Update	whlmtaup.p
4.11.6	Transaction Priority Workbench	whlmtmgr.p
4.11.7	Transaction Priority Boost	whtrprbo.p
4.11.8	Pre-Shipper Priority Boost	whwaprbo.p
4.11.9	Wave Priority Boost	whwaprbo.p

Table A.1 — *Standard Warehouse Menus* — (Page 5 of 11)

Menu	Menu Label	Program Name
4.11.10	Load Priority Boost	whtmldpr.p
4.11.12	Labor Management Reports Menu...	
4.11.12.1	Next Task Inquiry	whlmiq01.p
4.11.12.2	Pending Tasks Inquiry	whlmiq02.p
4.11.12.3	Task by Completion Time Inquiry	whlmiq03.p
4.11.12.4	Task by Completion Date Inquiry	whlmiq04.p
4.11.12.7	Performance by Task Report	whlmrp02.p
4.11.12.8	Performance by User Report	whlmrp03.p
4.11.12.10	Productivity by User Report	whlmrp05.p
4.11.12.12	Closed Transactions by User Rpt	whlmrp04.p
4.11.12.13	Task Load Report	whlmrp01.p
4.11.12.15	Workload by WLG Browse	whbr256,p
4.11.12.17	Tasks by User and Date Inquiry	whlmiq05.p
4.11.12.18	Tasks by User and Date Report	whlmrp06.p
4.11.12.19	Tasks by Group and Date Inquiry	whlmiq06.p
4.11.12.20	Tasks by Group and Date Report	whlmrp07.p
4.11.13	Labor Management Engine	whlmpren.p
4.11.15	Labor Management Workbench	whlmtkwk.p
4.11.24	Labor Management Control	whlmcmt.p
4.13	Order Management Menu...	
4.13.1	Order Warehouse Data Maintenance	whommt.p
4.13.3	SO Warehouse Data Maintenance	whomsomt.p
4.13.4	PO Warehouse Data Maintenance	whompomt.p
4.13.5	IR Warehouse Data Maintenance	whomirmt.p
4.13.6	DO Warehouse Data Maintenance	whomdomt.p
4.13.7	WO Issues Whse Data Maintenance	whomwimt.p
4.13.8	WO Receipts Whse Data Maint	whomwrmt.p
4.13.10	Allocated Order Warehouse Report	whomrp02.p
4.13.12	Order Detail Report	whomrp01.p
4.13.13	Address Whse Detail Maintenance	whadddmt.p
4.13.14	Address Whse Detail Browse	whbr051.p
4.13.15	Address Whse Detail Report	whaddrrp.p
4.13.19	Inbound Order Warehouse Browse	whbr424.p
4.13.20	Inbound ASN Warehouse Browse	whbr422.p
4.13.21	Work Order Browse	whbr425.p
4.13.22	Work Center Whse Browse	whbr429.p
4.13.24	Order Management Control	whompm.p
4.14	Bulk Picking Menu...	
4.14.1	Bulk Pick Order Selection	whbpsel.p
4.14.2	Bulk Picking Order Deselection	whbpschg.p

Table A.1 — *Standard Warehouse Menus* — (Page 6 of 11)

Menu	Menu Label	Program Name
4.14.4	Bulk Picking Selection Approval	whbpapp.p
4.14.3	BP Pre-Shipper/Shipper Inquiry	whbppsiq.p
4.14.6	Bulk Pick Maintenance	whbpmt.p
4.14.7	Bulk Picking Inquiry	whbpiq.p
4.14.8	Bulk Picking Report	whbprp.p
4.14.10	Bulk Pick Print	whbprp01.p
4.14.12	Multiple Bulk Pick Print	whbprp02.p
4.14.13	Bulk Pick Transaction Inquiry	whbppoiq.p
4.14.15	Bulk Pick by SLG Inquiry	whbpsliq.p
4.14.16	Bulk Pick by WLG Inquiry	whbpwliq.p
4.14.18	Bulk Picking Shipping Menu...	
4.14.18.1	Bulk Picking Pre-Shipper Inquiry	whbpp1iq.p
4.14.18.2	Bulk Picking Pre-Shipper Report	whbpp1rp.p
4.14.18.4	Bulk Picking Pre-Shipper Print	whbppsrp.p
4.14.18.6	Multiple Bulk Pre-Shipper Print	whbpp2rp.p
4.14.18.8	Bulk Pre-Shipper Label Print	whbps2rp.p
4.14.18.10	Bulk Picking Shipping Forecast	whbpfcs1.p
4.14.18.12	Bulk Picking Pre-Shipper Reprint	whbpphrp.p
4.14.18.13	Bulk Pre-Shipper/Shipper Inquiry	whbppsiq.p
4.14.18.15	Bulk Pre-Shipper/Shipper Labels	whbpslrp.p
4.14.21.	Bulk Picking History Menu...	
4.14.21.1	Bulk History Inquiry	whbphsiq.p
4.14.21.2	Bulk History Pre-Shipper Inquiry	whbph1iq.p
4.14.21.3	Bulk History Shipper Inquiry	whbph2iq.p
4.14.21.4	Bulk History Report	whbphsrp.p
4.14.21.23	Bulk History Delete/Archive	whbphsup.p
4.14.23	Empty Bulk Pick Delete/Archive	whbpup.p
4.14.24	Bulk Picking Control	whbppm.p
4.15	Wave Planning/Batch Picking Menu...	
4.15.1	Wave Planning Setup Menu...	
4.15.1.1	Lane Maintenance	whlanemt.p
4.15.1.2	Lane Browse	whbr201.p
4.15.1.3	Lane Report	whlanerp.p
4.15.1.5	Lane Group Maintenance	whlagpmt.p
4.15.1.6	Lane Group Inquiry	whlagpiq.p
4.15.1.7	Lane Group Report	whlagprp.p
4.15.1.9	Workload Group Maintenance	whlogpmt.p
4.15.1.10	Workload Group Inquiry	whlogpiq.p
4.15.1.11	Workload Group Report	whlogprp.p
4.15.1.13	Lane Group Assignment	whlaasmt.p

Table A.1 — *Standard Warehouse Menus* — (Page 7 of 11)

Menu	Menu Label	Program Name
4.15.1.14	Lane Group Assignment Inquiry	whlaasiq.p
4.15.1.15	Lane Group Assignment Report	whlaasrp.p
4.15.1.24	Wave Planning Control	whwaplpm.p
4.15.2.1	Load Optimization Setup	whtmlsmt.p
4.15.2.2	Load Optimization Inquiry	whtmlsiq.p
4.15.2.3	Load Optimization Setup Report	whtmlsrp.p
4.15.2.5	Order Batch Selection	whtmbsmt.p
4.15.2.7	Order Batch Export/Load Import	whtmbsex.p
4.15.2.9	Order Batch Inquiry	whtmbsiq.p
4.15.2.10	Order Batch Report	whtmbsrp.p
4.15.2.12	Reports Menu...	
4.15.2.12.1	Load Shipments by Order Report	whtmldr1.p
4.15.2.12.2	Load Shipments by Item Report	whtmldr2.p
4.15.2.12.3	Load Shipments by Ship-To Report	whtmldr3.p
4.15.2.12.4	Load Shipments by Selection Rpt	whtmldr4.p
4.15.2.12.7	Load Detail Status Inquiry	whtmstiq.p
4.15.2.12.12	Transmission Log Inquiry	whtmlgiq.p
4.15.2.12.13	Shipper Charges Report	whtmchrp.p
4.15.2.12.15	Shipper/Container Tracking Inq	whtmiq01.p
4.15.2.12.16	Carrier Tracking Numbers Inquiry	whtmiq02.p
4.15.2.12.22	Transmission Log Delete/Archive	whtmlgup.p
4.15.2.12.23	Charges/Tracking Delete/Archive	whtmtrup.p
4.15.2.13	Carrier/Service Assignment Maint	whtmssmt.p
4.15.2.14	Carrier/Service Assignment Inq	whtmssiq.p
4.15.2.15	Carrier/Service Assignment Rpt	whtmssrp.p
4.15.2.17	Load Maintenance	whtmldmt.p
4.15.2.18	Load Inquiry	whtmldiq.p
4.15.2.19	Load Report	whtmldrp.p
4.15.2.20	Load Priority Boost	whtmldpr.p
4.15.2.22	Closed Order Batch Delete/Archive	whtmbsup.p
4.15.2.23	Closed Load Delete/Archive	whtmldup.p
4.15.2.24	Wave Transportation Control	whtmpm.p
4.15.3	Wave Selection	whwavemt.p
4.15.4	Reports Menu...	
4.15.4.1	Order Whse Detail Status Inquiry	whomstiq.p
4.15.4.3	Wave Status Inquiry	whwastat.p
4.15.4.4	Wave Detail Report	whwaverp.p
4.15.4.5	Wave Open Order Inquiry	whwaooiq.p
4.15.4.6	Wave Unprocessed Orders Inquiry	whwauniq.p
4.15.4.8	Wave Task Inquiry	whwataiq.p

Table A.1 — *Standard Warehouse Menus* — (Page 8 of 11)

Menu	Menu Label	Program Name
4.15.4.10	Open Wave Browse	whbr230.p
4.15.4.11	Wave Progress Browse	whbr255.p
4.15.6	Wave Replenishment	whwarpmt.p
4.15.8	Wave Release	whwaremt.p
4.15.9	Wave Release Groups Creation	whwargmt.p
4.15.10	Wave Release Groups Activation	whwargac.p
4.15.11	Wave Release Groups Inquiry	whwargiq.p
4.15.13	Wave Open Order Report	whwaoprp.p
4.15.14	Wave Pre-Shipper Workbench	whwapsmt.p
4.15.15	Wave Priority Boost	whwaprbo.p
4.15.17	Wave Close	whwaclmt.p
4.15.18	Wave Close Batch/Report	whwaclrp.p
4.15.20	Utility Menu ...	
4.15.20.1	Wave Planning Orders Initialize	whwainit.p
4.15.20.3	SO Container/Shipper ID Inquiry	whabsiq.p
4.15.20.4	Wave With Blank AbsID Report	whwaut01.p
4.15.20.13	Batch Picking Crash Recovery	whcrabpk.p
4.15.20.23	DO Shipper Delete/Archive	whsdodel.p
4.15.23	Closed Wave Delete/Archive	whwaclup.p
4.15.24	Batch Picking Control	whbbpkpm.p
4.16	Replenishment Menu...	
4.16.1	Replenishment List Maintenance	whrpgrmt.p
4.16.2	Replenishment List Browse	whbr013.p
4.16.3	Replenishment List Report	whrpgrrp.p
4.16.5	Replenishment Location Maint	whrplimt.p
4.16.6	Replenishment Location Browse	whbr150.p
4.16.7	Replenishment Location Report	whrplirp.p
4.16.9	Replenishment SLG Maintenance	whrpsimt.p
4.16.10	Replenishment SLG Browse	whbr151.p
4.16.11	Replenishment SLG Report	whrpsirp.p
4.16.13	Replenishment Request	whrpreq.p
4.16.15	On Line Replenishment	whrpolmt.p
4.17	Receipts/Transfers/Issues Menu...	
4.17.1	Warehouse Transfer By Reference	whtrbref.p
4.17.2	Warehouse Transfer - Ref Split	whtrrspl.p
4.17.4	Warehouse Transfer - Single Item	whtrbite.p
4.17.8	Reference Management	whicrfwb.p
4.17.9	Reference Generation	whprigen.p
4.17.12	Optimization Transfer	whtropt.p
4.17.13	Unplanned Issue Request	whicunis.p

Table A.1 — *Standard Warehouse Menus* — (Page 9 of 11)

Menu	Menu Label	Program Name
4.17.17	Logistic UM Pallet Create/Transfer	whtrpllg.p
4.17.18	Distr Order Pallet Create/Transfer	whtrplld.p
4.17.20	Multi-Item Pallet Create/Transfer	whtrplcn.p
4.19	Inspection Menu...	
4.19.1	Sample Inspection Maintenance	whqasin.p
4.19.2	Sample Inspection Browse	whbr160.p
4.19.3	Sample Inspection Report	whqasrp.p
4.19.4	Sample Inspection Workbench	whqasmt.p
4.19.5	Sample Inspec Evaluation Report	whqaevrp.p
4.19.6	Inspected Inventory Report	whqainrp.p
4.19.10	Failed Inspections Inquiry	whqafaiq.p
4.19.13	Inspection Status Change Maint	whqastmt.p
4.19.14	Inspection Status Change Browse	whbr161.p
4.19.15	Inspection Status Change Report	whqastrp.p
4.19.17	Inspection History Maintenance	whqainmt.p
4.19.23	Inspection Hist Delete/Archive	whqaup.p
4.19.24	Inspection Control	whqapm.p
4.21	Printing Menu...	
4.21.1	Printing Setup Menu...	
4.21.1.1	Print Banner Mantenance	whprbnmt.p
4.21.1.2	Print Banner Browse	whbr216.p
4.21.1.3	Print Banner Report	whprbnrp.p
4.21.1.5	Print Label Mantenance	whprlbmt.p
4.21.1.6	Print Label Browse	whbr217.p
4.21.1.7	Print Label Report	whprlbrp.p
4.21.3	Print Template Load	whprtmld.p
4.21.4	Print Template Inquiry	whprtmiq.p
4.21.5	Print Template Report	whprtmrp.p
4.21.7	Print Request Maintenance	whprmt.p
4.21.9	User Printer Maintenance	whprusmt.p
4.21.10	User Printer Inquiry	whprusiq.p
4.21.12	Transaction/ID Reprint	whprrprp.p
4.22	Messaging Menu...	
4.22.1	Whse Message Maintenance	whmsmt.p
4.22.2	Whse Message Browse	whbr290.p
4.22.3	Whse Message Report	whmsrp.p
4.22.13	Whse Message Detail Inquiry	whmsiq.p
4.22.23	Whse Message Delete/Archive	whmsup.p
4.23	Warehouse System Admin Menu...	
4.23.1	Sequence Definition Maintenance	whseqmt.p

Table A.1 — *Standard Warehouse Menus* — (Page 10 of 11)

Menu	Menu Label	Program Name
4.23.2	Sequence Definition Inquiry	whseqiq.p
4.23.3	Sequence Definition Report	whseqrp.p
4.23.4	Sequence Current Values Inquiry	whsqiq01.p
4.23.6	Program X-Reference Maintenance	whexecmt.p
4.23.7	Program X-Reference Inquiry	whexeciq.p
4.23.8	Program X-Reference Report	whexecrp.p
4.23.10	Local Exit Routines Setup	whsylxpm.p
4.23.12	Verbosity Menu...	
4.23.12.1	Verbosity Inquiry	whsyvbiq.p
4.23.12.3	Verbosity Report	whsyvbrp.p
4.23.12.23	Verbosity Delete/Archive	whsyvbup.p
4.23.13	Warehouse Security Maintenance	whwhsemt.p
4.23.14	Warehouse Security Browse	whbr040.p
4.23.15	Warehouse Security Report	whwhserp.p
4.23.17	Barcode Prefix Maintenance	whprefmt.p
4.23.18	Barcode Prefix Inquiry	whprefiq.p
4.23.19	Barcode Prefix Report	whprefrp.p
4.23.20	EAN/UCC Barcode Testing	whbctest.p
4.23.22	External Device Setup	whtrpm.p
4.23.24	Warehouse Control Tables Report	whsypmrp.p
4.24	Warehouse Management Control	whsypm.p
4.25	Miscellaneous Utilities	
4.25.1	Rebuild Invent Master Records	whutinw1.p
4.25.2	Recalculate Location Full %	whutfull.p
4.25.3	Rebalance Expected In/Out Qty	whutldex.p
4.25.4	Container Creation Utility	whutabmt.p
4.25.5	Populate Order Whse Maint Tables	whominit.p
4.25.6	Incomplete Hanging Tasks Report	whtrrp03.p
4.25.7	Hanging lad_det Report (No Task)	whutlad1.p
4.25.8	Persistent Procedure Inquiry	whsyppiq.p
4.25.9	External Device Session Inquiry	whexseiq.p
4.25.10	Inspection Workfile Delete/Archive	whqawfup.p
4.25.11	Delete Planned Order Whse Tables	whomwout.p
4.25.12	Delete Task List Workfile Records	whlmaimw.p
4.25.13	Recalculate User Task Times	whlmusup.p
4.25.14	Populate Item-Site Location	whutptil.p

Table A.1 — *Standard Warehouse Menus* — (Page 11 of 11)

Warehousing .NET UI Browse Collections

Table A.2
Warehousing Browse Collections

Browse Collection Name	Elements	Location
Manage Inbound ASN	Inbound ASN Detail Browse	Order Management Menu
Manage Inspection Samples	Inventory Inspection Detail Browse	Inspection Menu
	Inventory Storage Detail Browse	
Manage Work Centers	Work Order Operations	Order Management Menu
	Put Away Transactions	
	Inventory Detail by SLG Browse	
	Picking Transactions Browse	
Manage Work Orders	Work Order Bill Browse	Order Management Menu
	Put Away Transactions Browse	
	Picking Transactions Browse	
	Inventory Detail by SLG Browse	

Warehousing .NET UI Menu Collections

Table A.3
Warehousing Browse Collections

Menu Collection Name	Elements	Location
Warehousing Manufacturing	Manage Work Orders Browse Collection	Warehousing Menu
	Manage Work Centers Browse Collection	
Warehousing Receipts	Manage Inbound ASN Browse Collection	Warehousing Menu
	Manage Inbound ASN Browse Collection	
	Manage Inspection Samples Browse Collection	
	Put Away Transactions Browse	

RF Warehouse Menus

Table A.4
Radio Frequency Menus

Menu	Menu Label	Program Name
1	Work	
1.1	Next Task	whextaut.p
1.2	Select Task	whextman.p
1.3	Transfer	whexotf.p
1.4	Location Audit	whexaud.p
1.5	Kanban Scan	whexkan.p
1.6	Eng Activation	whexeng.p

Menu	Menu Label	Program Name
1.7	Preship Sel Task	whextmas.p
1.8	Receipts	whexprc.p
1.9	Shipments	whexexs.p
1.10	On-Line SO Pick	whtst.p
1.11	Tag Count Entry	whrfphin.p
1.12	Pallet Build	whexplc.p
1.13	Pallet Split	whexpgs.p
1.14	Order Sel Task	whextmao.p
1.15	Wave Sel Task	whextmaw.p
1.16	BulkPick Sel Task	whextmab.p
1.17	Receiver Sel Task	whextmar.p
2	Printing...	
2.1	Change Printers	whrfprmt.p
2.2	Reprint	whrfprrp.p
3	Picking/Container...	
3.1	BP Pick SO/DO	whexbpk1.p
3.2	BP Pick All	whexbpk2.p
3.3	Container Build	whrfcons.p
3.4	Container Move	whexltr.p
3.5	Ship Truck	whrfshtr.p
3.6	Pallet Explosion	whrfpaex.p
3.7	Item Move	whrftrbx.p
3.8	Print Paperwork	whrfprpr.p
3.9	Cancel Shipment	whrfcnsh.p
3.10	Pallet Transfer	whrftrpr.p
4	Inspection	whexinmt.p
5	Inquiries Menu....	
5.1	Item Inv Inq	whexpii.p
5.2	Loc Inv Inq	whexlii.p
5.3	Ref Inv Inq	whexrii.p
5.4	Lot Inv Inq	whexsii.p
5.5	Daily Prod	whexdpi.p
5.6	Preshipper Inq	whexpsi.p
5.7	Item Master Inq	whexpiq.p
5.8	Loc Master Inq	whexliq.p
5.9	Sto Loc Gp Inq	whexsiq.p
5.10	Address Inq	whexaiq.p
6	Read Messages	whexrms.p

Appendix B

Print Examples

When you set print flavor codes to code A, the system uses a default, fixed print format. This section provides one example of a printed document per transaction type.

Transaction Create, Flavor A, Print Procedure Code TF

```
     Warehouse Task – 123

                          Site: 1000
                     Warehouse: RAW
         Storage Location Group: STORES
            Work Location Group: UPPER
                  From Location: ST0101 To: ST0305

                    Item Number: 10-1001
                     Lot/Serial:
                      Reference: R9810023
                   Alternate UM: PL

                       Quantity: 10.0 EA

                      Create By: Jon Miller
                             At: 06/19/98 13:00:22
```

Transaction Confirm, Flavor A, Print Procedure Code TF

```
     Confirmed Task – 123-1

                          Site: 1000
                     Warehouse: RAW
         Storage Location Group: STORES
            Work Location Group: UPPER
                  From Location: ST0101 To: ST0305

                    Item Number: 10-1001
                     Lot/Serial:
                      Reference: R9810023
                   Alternate UM: PL

                       Quantity: 10.0 EA

                   Confirmed By: Jon Miller
                             At: 06/19/98 13:14:30
```

Transaction Create, Flavor A, Print Procedure Code PK

```
     Warehouse Task – 123

                          Site: 1000
                     Warehouse: RAW
   From Storage Location Group: STORES   To: DISPATCH
      From Work Location Group: UPPER    To: DISPATCH

                 From Location: ST0101   To: SHIP01

                   Item Number: 10-1001
                    Lot/Serial:
                     Reference: R9810023
                  Alternate UM: PL

                      Quantity: 10.0 EA

                 Issuing Order: (SO) SO4444/3

                    Created By: Jon Miller
                            At: 06/22/98 09:58:00
```

Simple Template

```
     ~BANNER~

   Transaction Number: ~TRNBR~ (~TYPE~)
   Site: ~SITE~ ~SITEDS~
   Location: ~LOC~ ~LOCDS~
   Item Number: ~PART~ ~PARTDS~
   Lot/Serial: ~SERIAL~
   Reference: ~REF~

   Quantity: ~QTY_CHG~ ~UM~
```

Simple Template Result

```
     Identification


    Transaction Number: 123 (RCT-PO)
    Site: JONSITE Jon Miller’s Site
    Location: RC01 Receipt’s Dock 1
    Item Number: 100101 Box of Things
    Lot/Serial:
    Reference:


    Quantity: 10 EA
```

JetForm Template

```
^COMMENT ^JOB id01.mdf -z/usr/jetform/mdf/send/inge2_00000039.fx
″
^REFORMAT NO
″
^GLOBAL LAB-PROPERTY
″
Property
″
^GLOBAL LAB-SPEC
″
Specification
″
^GLOBAL LAB-UNIT
Unit
^GLOBAL PAGE
@$PAGE
^GLOBAL LOT-COUNT
0
^GLOBAL TOTAL-LOTS
1
^GLOBAL FORM-TITLE
~BANNER~
^DEFINE signature_file /usr/jetform/sig/
^DEFINE idlogo_file    /usr/jetform/pcx/
^GLOBAL EFF-DATE
~EFFDATE~
^GLOBAL ORD-NBR
~NBR~
^GLOBAL QTY
~QTY_CHG~ ~UM~
^GLOBAL PART
~PART~
^GLOBAL ADDR-CODE
~ADDR~
^GLOBAL PT-DESC1
~PARTDS1~
^GLOBAL LOT
~SERIAL~
^GLOBAL UM
(~UM~)
^GLOBAL REFERENCE
~REF~
^GLOBAL DATE-MAN
~DATE~
^graph @:idlogo_file
^position absolute 15.00 23.70 cm
^graph @:signature_file
```

JetForm Template Result

If the JetForm Template example was used to send output to an printer that is defined with an initialization value of a UNIX script or other operating system, the following output would be sent to that script as input. This script would then redirect the data to the JetForm software.

```
^COMMENT ^JOB id01.mdf -z/usr/jetform/mdf/send/inge2_00000039.fx
″
^REFORMAT NO
″
^GLOBAL LAB-PROPERTY
″
Property
″
^GLOBAL LAB-SPEC
″
Specification
″
^GLOBAL LAB-UNIT
″
Unit
″
^GLOBAL PAGE
@$PAGE
^GLOBAL LOT-COUNT
0
^GLOBAL TOTAL-LOTS
1
^GLOBAL FORM-TITLE
Identification
^DEFINE signature_file /usr/jetform/sig/
^DEFINE idlogo_file    /usr/jetform/pcx/
^GLOBAL EFF-DATE
06/21/98
^GLOBAL ORD-NBR
PO1234
^GLOBAL QTY
100 EA
^GLOBAL PART
100101
^GLOBAL ADDR-CODE
VEND001
^GLOBAL PT-DESC1
Box of Things
^GLOBAL LOT

^GLOBAL UM
(EA)
^GLOBAL REFERENCE

^GLOBAL DATE-MAN
06/21/98
^graph @:idlogo_file
^position absolute 15.00 23.70 cm
^graph @:signature_file
```

Appendix C

QAD TMS

QAD Transportation Management (TMS) is a system-provided TMS that can be set up to operate with QAD Warehousing. Other third-party TMSs can also be used with QAD Warehousing. This appendix provides more information on synchronizing QAS TMS with QAD Warehousing.

Overview 490
Describes the interface between Warehousing and TMS and lists and describes various functions.

Setting Up a QAD TMS Interface 491
Describes how to set up the QAD TMS interface with workflows.

Overview

QAD Warehousing interfaces with QAD TMS to determine the cost, lead time, and carrier for delivery of a particular order. This is currently achieved via messages sent by QAD Warehousing through local exit routines and the response/reply to those messages sent by QAD TMS.

QAD TMS comprises various components. Different components reply to QAD Warehousing, depending upon the QAD Warehousing message that was sent. TMS returns the following:

- Freight quotes
- Cost, lead time and carrier for each order
- Compliance check
- Rate information

See “Setting Up Local Exit Routines” on page 412.

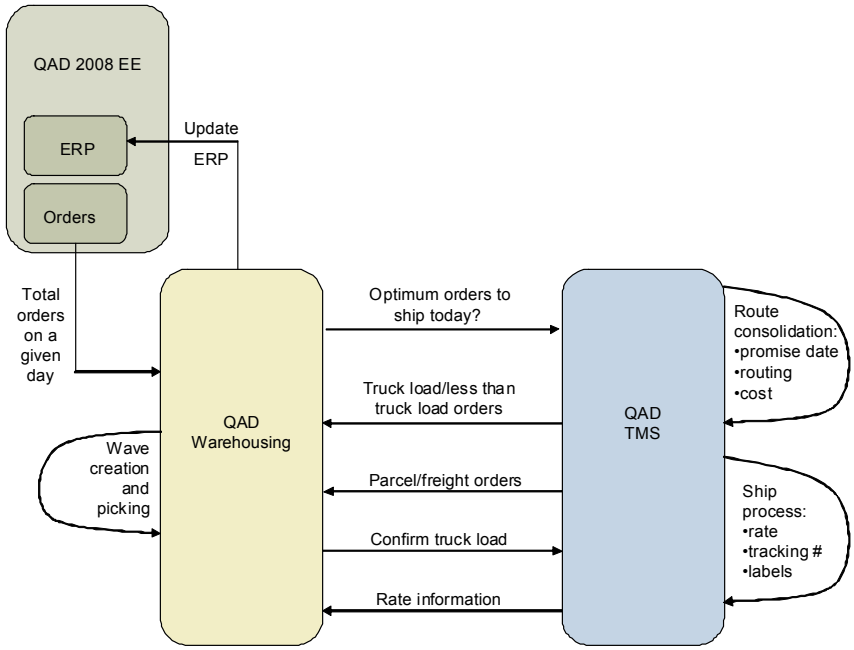
The following table lists the various steps in a typical QAD Warehousing flow and the corresponding QAD TMS function that occurs for each of the QAD Warehousing steps within the process.

Table C.1
QAD Warehousing-QAD TMS Interaction

Step	QAD Warehousing/ RF Functions	QAD TMS Functions
1	Order batch picking	**Rate Shopping:** Check carrier rates and routing guide for best cost, lead time, or delivery window.
	Load maintenance Wave selection	**Vehicle Route Sequencing:** Perform order consolidation, route optimization, and drop off sequencing. **Compliance:** Denied party screening, embargoed country, and export license control
2	Print paperwork	**Manifest Shipment/Print Labels:** Calculate freight charges, produce carrier labels, create tracking and PRO numbers.
3	Cancel shipment	Delete shipment.
4	Ship truck	**Carrier(s) End of Day (EOD) Report/Transmission:** • Recalculate charges based on full truck details. Prorate truck level charges over shipments. • Carrier PLD Transmission

The following graphic depicts the QAD Warehousing and QAD TMS interface.

Fig. C.1
QAD Warehousing-QAD TMS Interface



Setting Up a QAD TMS Interface

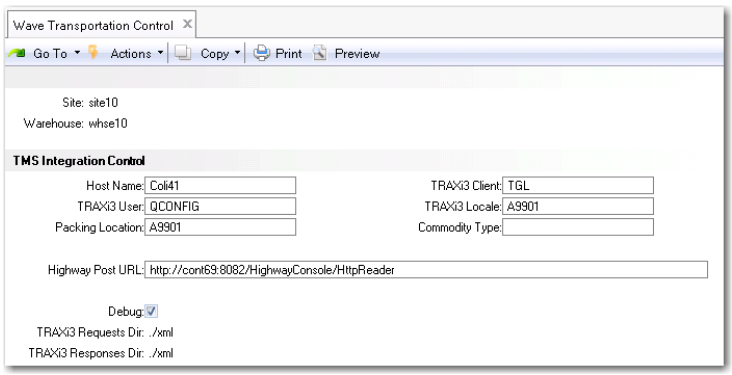
If you use the QAD TMS, you need to set up QAD Warehousing so that it can communicate with QAD TMS. To do this, use the TMS Integration and Messages frames in Wave Transportation Control (4.15.2.24).

Note Other TMSs may require different setup steps. Consult the documentation for the TMS for setup information.

To set up QAD TMS for QAD Warehousing communication:

- Specify the TMS Integration Control (whtraxpx.p) routine in Local Exit Routine Setup (4.23.10)
- Set parameters in the TMS Integration frame in Wave Transportation Control (4.15.2.24); see Figure C.2.

Fig. C.2
TMS Integration Frame



Host Name. Specify the machine from which a request was made. Specify the machine from which a request was made. This is part of the envelope of the XML messages QAD Warehousing sends to QAD TMS. It indicates the origin of the message.

TRAXi3 User. Indicate a valid QAD TMS user (formerly TRAXi3) who processes requests.

Packing Location. Specify the default packing location. The packing location groups a set of shipper carrier accounts for a shipping-point origin.

TRAXi3 Client. Specify a valid TMS client that stores the shipments.

TRAXi3 Locale. Specify the default local printer to use as the destination printer when printing labels and other documents from the TMS.

Commodity Type. Specify a valid TRAX classification group.

Highway Post URL. Specify the URL where the highway component is installed. Highway is the communication system QAD TMS uses. Consult your QAD TMS documentation for specifics about this field.

Debug. Indicate whether the system generates files with messages sent to/from the TMS.

No: Do not generate files with messages.

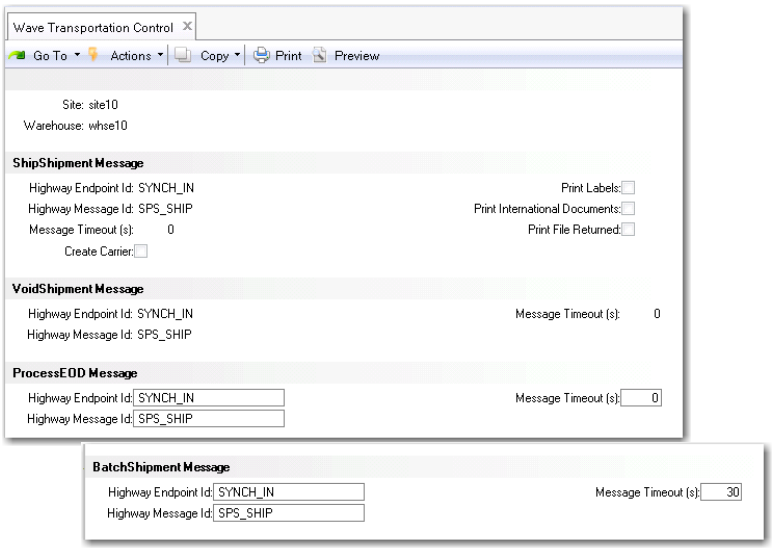
Yes: The system generates physical files with messages that are sent and received to/from the TMS.

Setting Up Messages

Fields in the four separate message frames correspond to the messages that local exit routines generate for load optimization. You set up some TMS-specific information in the frames.

See“Local Exit Routines Setup” on page 182.

Fig. C.3
Message Frames



Highway Endpoint Id. Specify a valid TMS endpoint ID.

Highway Message Id. Specify a valid TMS identifier of messages.

Message Timeout(s). Specify the number of seconds the system waits for an answer from the TMS for this type message.

Highway Endpoint Id. Specify a valid TMS endpoint ID.

Highway Message Id. Specify a valid TMS identifier of messages.

Message Timeout(s). Specify the number of seconds the system waits for an answer from the TMS for this type message.

Create Carrier. Indicate whether the system creates a carrier when a carrier is not specified in Carrier Service Assn Maint

No: The system does not create a carrier.

Yes: Normally TMS sends the carrier and service in the ship shipment message. The system now creates a record with the ship shipment information from the TMS so that the system can process the end of day (EOD) message.

Print Labels. Indicate whether the system prints labels when the TMS sends a successful rating. Specify the printer in the TMS Locale field.

No: Do not print labels when TMS sends the rating.

Yes: TMS rates the shipment; that is, returns shipment charges, indicating that the TMS processed the shipment data correctly and returns shipment labels you can print.

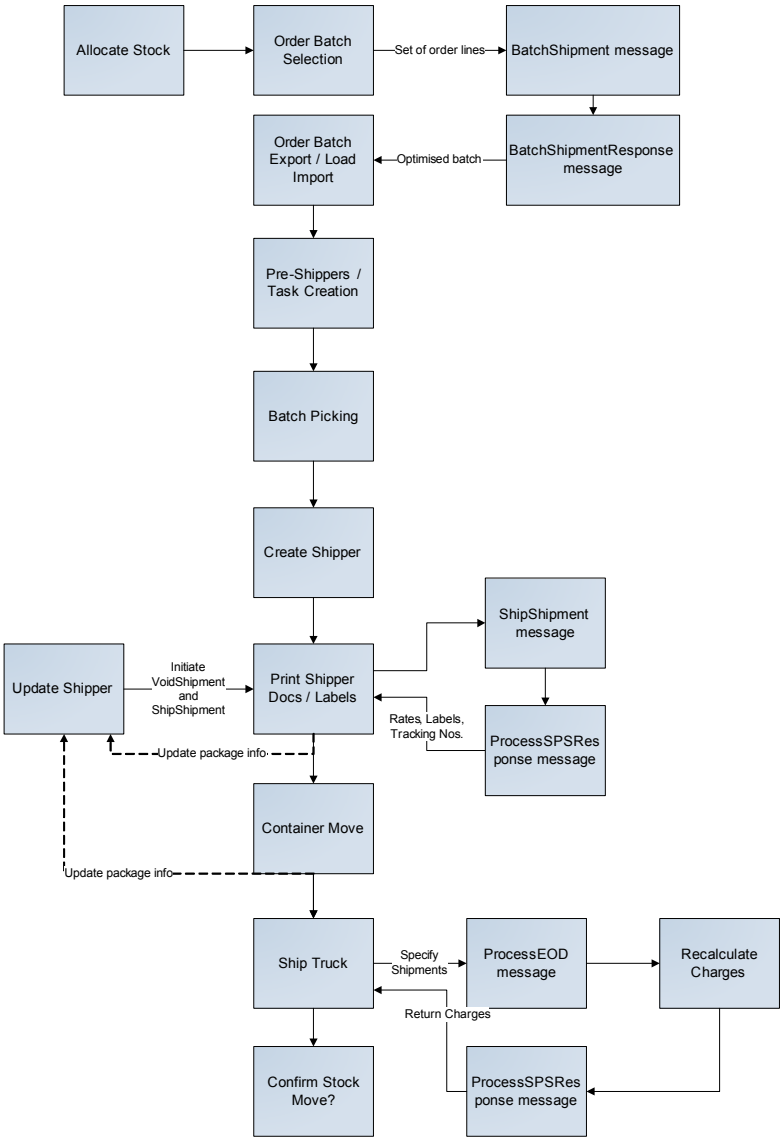
See “TRAXi3 Locale” on page 492.

Print International Documents. Indicate whether the system prints international documents the TMS sends a successful rating. Specify the printer in the TMS Locale field.

Print File Returned. Indicate whether the system returns printed documents embedded in the TMS response.

The following graphic depicts the messaging and other functions involved in QAD Warehousing and QAD TMS processing.

Fig. C.4
Messaging Processing



Product Information Resources

QAD offers a number of online resources to help you get more information about using QAD products.

QAD Forums (community.qad.com)
Ask questions and share information with other members of the user community, including QAD experts.

QAD Knowledgebase (knowledgebase.qad.com)*
Search for answers, tips, or solutions related to any QAD product or topic.

QAD Document Library (documentlibrary.qad.com)
Get browser-based access to user guides, release notes, training guides, and so on; use powerful search features to find the document you want, then read online, or download and print PDF.

QAD Learning Center (learning.qad.com)*
Visit QAD's one-stop destination for all courses and training materials.

*Log-in required

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