QAD Adaptive Applications

Enterprise Edition

User Guide

QAD Production Execution

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QAD Enterprise Edition
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Change Summary

Change Summary

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

Date/Version	Description	Reference
October/v4.0	First release	--

Chapter 1

Overview

This chapter discusses the following installation topics for QAD Production Execution:

Introduction 2

Benefits 3

Transaction and Programs

Introduction

QAD Production Execution is a QAD solution that provides integrated shop floor operation capabilities. Activities related to production orders, equipment, and operators are brought together in a touch-friendly HMI. The solution can scale from manual production and labor reporting, up to automated reporting from PLCs that are connected to QAD QMS and EAM for end-to-end operational control.

QAD Production Execution is an extension of QAD Adaptive ERP capabilities to fulfill the need to bridge the gap between Planning and Operations. This extension is a solution focused on the following concepts:

- **Collaborative**. It provides an immediate connection between QAD Adaptive ERP and QAD Production Execution for released production orders.
    - Users can release production orders with dynamically updated priorities.
    - Provides users with real-time knowledge of the progress against orders.
    - Users can process material transactions at the pace of production.
    - Provides users with real-time knowledge of shop floor inventory, WIP, and finished goods status.
- **Connected**. It provides a direct connection to the equipment for order progress and process evaluation:
    - Provides integrated operator, equipment, and order evaluation.
    - Provides integrated equipment performance and downtime root cause information.
- **Configurable**. It provides operational centric capabilities that are adapted to diverse manufacturing setups:
    - Provides plant to plant/equipment to equipment information.
    - Provides conditional access based on role and scope of authority.
- **Contextual**. It provides a visual and focused shop floor level interface:
    - Provides users with limited views depending on their scope of responsibility for equipment and orders.
    - Provides users with specific item and work center information and settings that are associated with the work at hand.

Benefits

QAD Production Execution provides full shop floor capabilities focused on operational execution of manufacturing processes, association of operators with equipment, equipment operation and monitoring and automated as well as manual data capture. All of this is essential for a business to achieve the following:

- Better operational decision making with shared awareness of real-time active statuses
- Improved equipment utilization and optimized production processes by having full traceability of production related transactions including historical data
- Expanded operational reach thanks to collaboration between operational, quality and planning

functions
- Access to core operational capability across plants and processes
- Minimizing use of paper

Production Execution Audience

Defining Manufacturing SME & System Admin:

- **Manufacturing Subject Matter Expert.** A person who possesses an in-depth knowledge about manufacturing and shop floor operations. This individual(s) is generally the person who conducts plant tours and can explain in detail how each process on the Shop Floor functions. The SME should be a person who can take decisions as to how Production Execution should be configured to match the process of the shop floor.

System Administrator. An expert that will work during the implementation phase of Production Execution to help setting up the product to fulfill the business process requirement. If there is additional setup or configuration required Post Go-Live then this should be the go-to individual(s) to lead the effort.

Advanced Technology Links

Data Lake

- All “Events” in PE are captured in the Cassandra Data Lake that is a core component of the QAD Enterprise Platform
- Capture of significant Event into the Data Lake enables organizations to retain a rich historical view of everything without overloading the transactional ERP database
- Event-related data becomes a foundation for Machine Learning
- Information in the Data Lake unlocks new ways of approaching Traceability

Industrial Internet of Things

The Industrial Internet of Things (IIoT) is enabled by Production Execution’s ability to connect with PLC through the foundational component Ignition. Ignition has a cross-platform OPC UA server with an open, pluggable driver system which supports Modbus TCP, UDP, TCP/IP, Allen-Bradley, Siemens, Omron, and more.

QAD Production Execution takes advantage of several core Ignition capabilities:

- HMI (Human Machine Interface)
- Architectural flexibility
- Offline capability

Integration with Other QAD Solutions

QAD Production Orders

- Production Resources setup
- Production Orders and its important elements

QAD QMS

- Document management
- Training validation

QAD EAM

- Maintenance of Work Orders

QAD Serialization

- Packing Requests
- Create and manage Serial IDs and Lot numbers
- Label Printing

QAD Automation Solutions

- Component Replenishment Requests
- Packaging Requests
- Label Printing Services
- Data Collection

Chapter 2

Using QAD Production Execution

This chapter discusses the following topics:

Shop Floor Operator Interaction

The following section will go into great detail how an Operator may utilize PE. It is recommended this section is to be understood fully by the Manufacturing SME. QAD commonly recommends a “Train the Trainer” approach and this section will be a great reference as the Operators are being trained in PE.

This section covers the functionality available to Operators using PE to report shop floor activity. Note that an Operator is likely to have a more limited view than a supervisor. While an Operator performs duties at a Work Center, a Supervisor generally has a view that covers many Work Centers.

From an Operator’s perspective, some of the benefits that can be expected are:

- Order details easily found (Due Date, Quantities, Item Number, etc)
- Predefined check lists/process steps during setup, production or teardown
- Access to key shop floor documents (ISO, SOP, Quality, Work Instructions)
- Supervisor managed order priorities,
- Create requests for maintenance, quality and materials,

The following subsections will explain in detail what can be found on the Operator Tabs in PE.

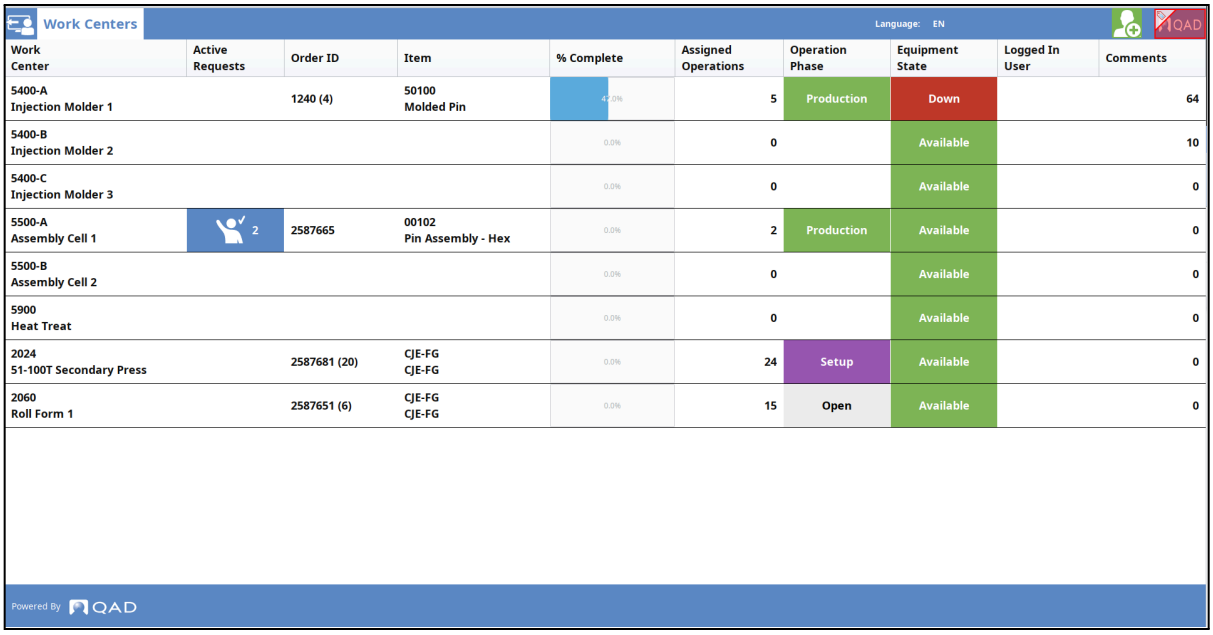
Work Centers Kiosk View (Optional)

The Work Centers Kiosk View is a view that lists all of the Work Centers that the terminal has been configured to display. If the terminal has been configured to a single Work Center, the Kiosk View will not display because there is only a single option.

The Kiosk View displays high-level information about the Work Centers and the Active Production Order at the Work Center.

Each row represents a work center and detailed information that is related to this work center. From this screen users are able to:

- View which operators have logged into each of these work centers,
- View Production Orders released to each of these work centers:
    - View Item to be produced at the work center,
    - View completion progress of the current Production Order,
    - Drill down for detailed information regarding the Production Order,
    - Drill down for more information on inventory,
- View availability of equipment at the work center
    - Drill down for more information on the equipment,
- Drill down to create specific requests per requirement (e.g. material, maintenance, supervisor, quality, fork truck),
- Drill down to view all comments added at Work Centers.



The Work Centers Tab contains the following information:

Work Center. Displays the Work Center ID. Usually the list of Work Centers for a Kiosk view is created for all work centers that are connected to this computer and the user has access to.

Active Requests. Displays if there are any active requests for the respective work center. This is represented by an icon () with the number of requests on its right side. Production Execution standard product includes following request types (see Request Types Table for details):

- Supervisor
- Quality
- Fork truck
- Material
- Maintenance

Order ID. The Production Order displayed will either be the active Production Order or the next Production Order to be worked, if one isn't active.

Item. Displays the Item that is assigned to the Production Order.

%Complete. Displays what percentage of the Production Order has been completed.

Assigned Operations. Displays the number of Production Orders that have an Operation at this Work Center.

Operation Phase. Displays the current phase of a Production Order. Operation phases are user defined. The following operational phases are an example of how a customer might set this up:

- Open
- Setup

- Setup Completed
- Production
- Teardown
- Order Completed
- Paused
- Stopped

Equipment State. Displays the current state of the machine at the related Work Center. Equipment States can be set up per customer requirement. The following equipment states are an example of how a customer might set this up:

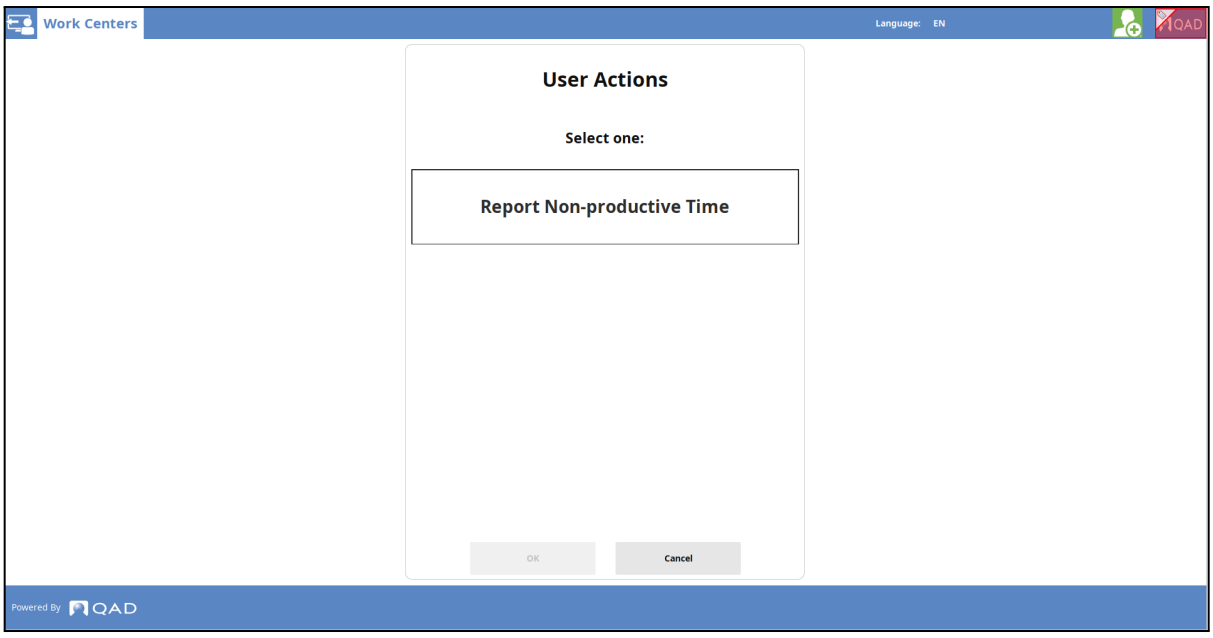
- Available
- Down
- Idle

Logged in User. Displays the user login of the employee that is currently logged in at the Work Center.

Comments. Displays the number of comments that have been added at the respective Work Center. Click the Comments field to the right of the Work Center to view comments associated with that Work Center. Note that viewing comments can be a roles-based permission, so it is possible to click the link and not get a response from PE. For further information see the Comments section.

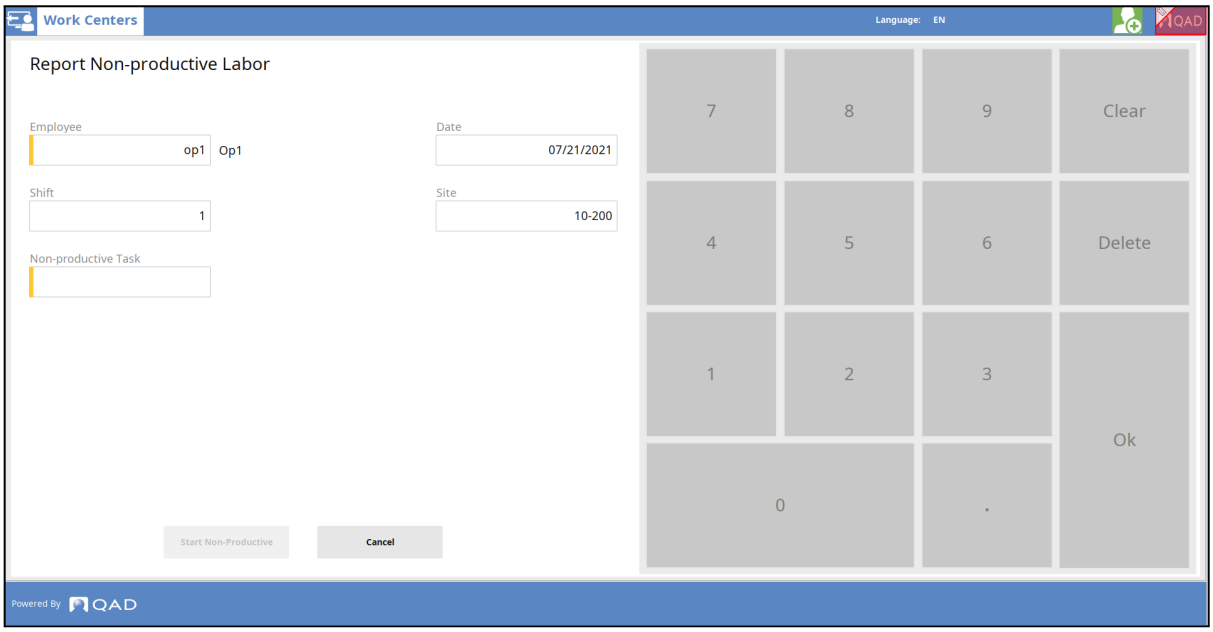
Work Center View - Report Non-Productive Time

Report Non Productive time is represented by this icon in the Work Center view (). Operator can report a Non Productive time accordingly to the respected reason (eg. meeting, fire drill). For further information about the reason code see reason code setup section.



Report for Non productive Time contains this field:

Report Non-productive time. Function for operator to report their Non-productive time



Report for Non productive Labor contains this field:

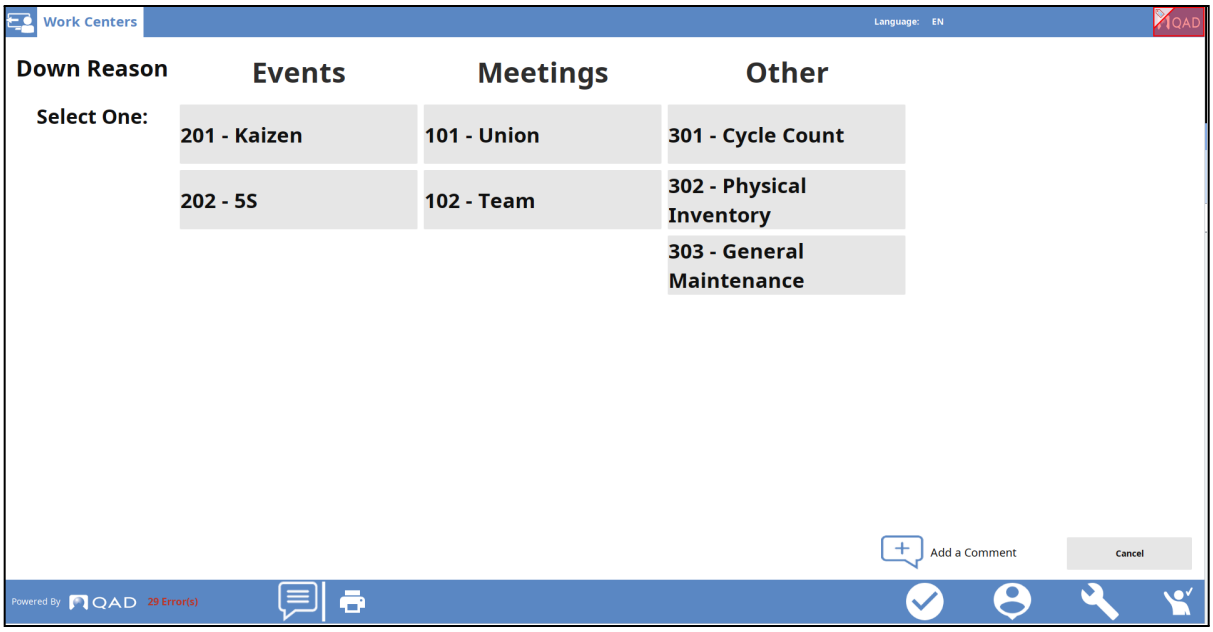
Employee. Enter employee code.

Date. Enter date. This date will reflect as an effective date in the QAD.

Site. Enter site code.

Shift. Input working shift.

Non-Productive Task. Select the non-productive task. Non-Productive Task will display the reason code that has been setup. Please refer to the reason code setup section for further information.



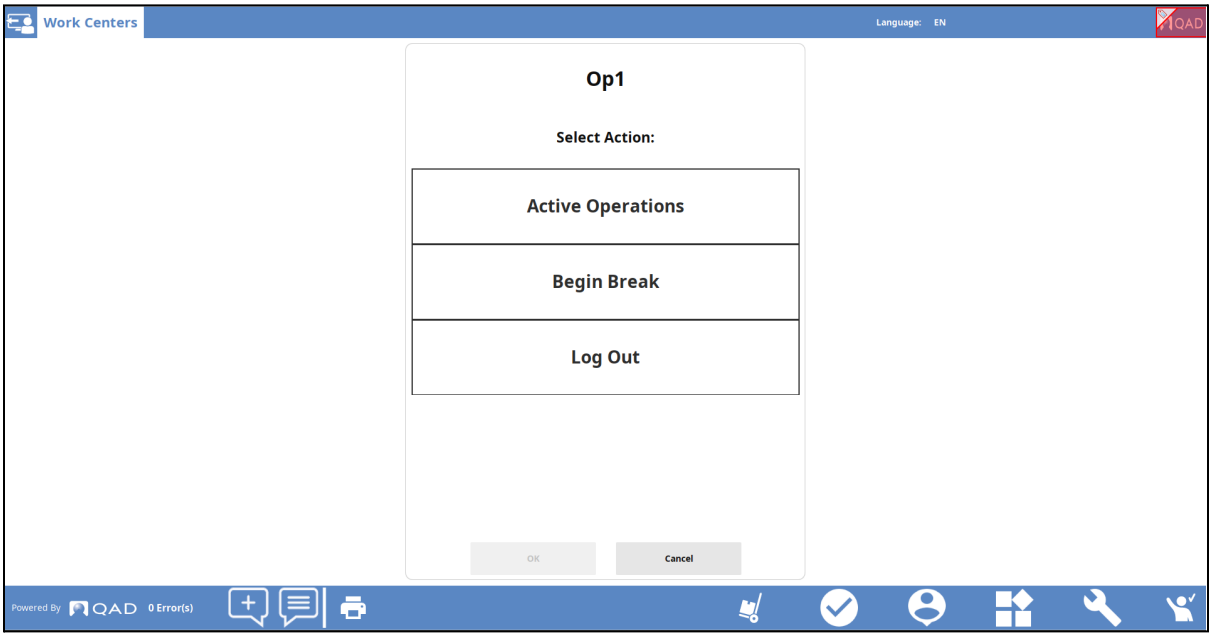
Work Centers Information Bar

An Operator can view details for a specific Work Center by either selecting a row from the Kiosk View or selecting the Work Center from the Overview screen.

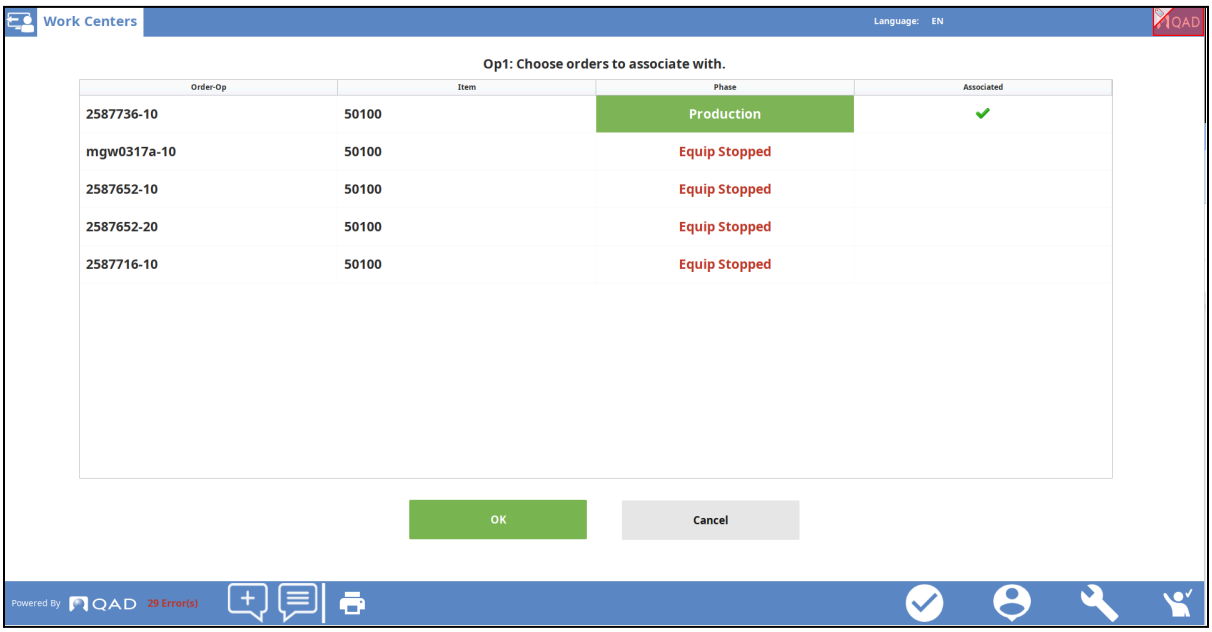
The upper section of the screen display high level information like:

- Equipment state
- Work Center ID
- Work Center Name
- Operator ID -- if the down arrow is toggled, a list of all the employees logged into this Work Center will be displayed. From there, it is possible to log in/out of the Work Center ,to start/end a brea and to choose an order for the operator to be associated with. For further information see work center information bar - operator ID.
- The Person Icon; this is the button that will prompt the user to log into the Work Center.

Work Center Information Bar - Operator ID



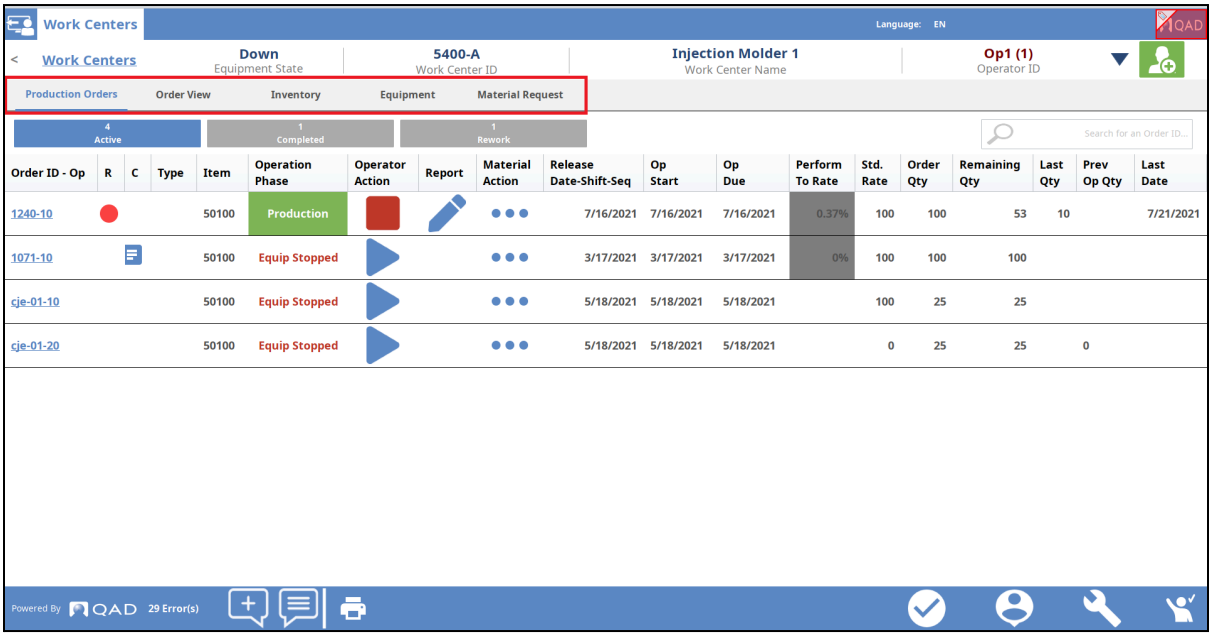
Active Operations. This is a feature that was covered by production options to calculate the labor. Before working on an order, the operator has to specify which order he was working on by clicking the associated column.



Begin Break. By choosing this option the system will start to count the duration of the operator break period. If the break period has ended, operators need to check back in to PE by clicking "Return from Break".

Log Out. When the shift is done the Operator can choose this option to log out from the work center.

Work Center Sub Tabs



The Work Center Sub Tabs are primarily used by the Operator:

- **Production Orders**. A browse that displays the Production Orders that have been released to the work center.
- **Order View**. Displays detailed information about specific Production Orders.

- **Material Request**. Displays the components that are required to produce finished goods at this work center. Material replenishment requests can be made from this screen. (optional tab during configuration)
- **Inventory**. Displays the inventory (Backflush, Scrap and Receipt Locations) configured to the work center. (optional tab during configuration)
- **Equipment**. The Equipment Tab has a number of different uses. (optional tab during configuration)
    1. Initiate Equipment State changes. A common example is initiating an equipment down event as something has gone wrong at the Work Center
    2. Displays real-time list of traceability events that occurred at the Work Center
    3. Allows a user to modify a pie chart to review up vs. downtime at the Work Center, using the time interval of their choice.
    4. Perform bulk material issuing of components to a Production Order. This creates an entry in the event log for tracking when a specific lot of material has been issued to the work center. This can be used for bulk items like resin, glues, solder paste, etc.
    5. View Alarms that are specific to this Work Center, as well as tracking equipment state history

Production Orders Tab

The Production Orders tab displays the Production Orders that have been released to the work center. There are a number of actions that a user can take against a Production Order, such as:

- Change the operation phase of a Production Orders,
- Report production against an order, including quantities good, scrapped, or rejected,
- Request a label print for produced items,
- Issue material against a Production Order.

Operation Phases

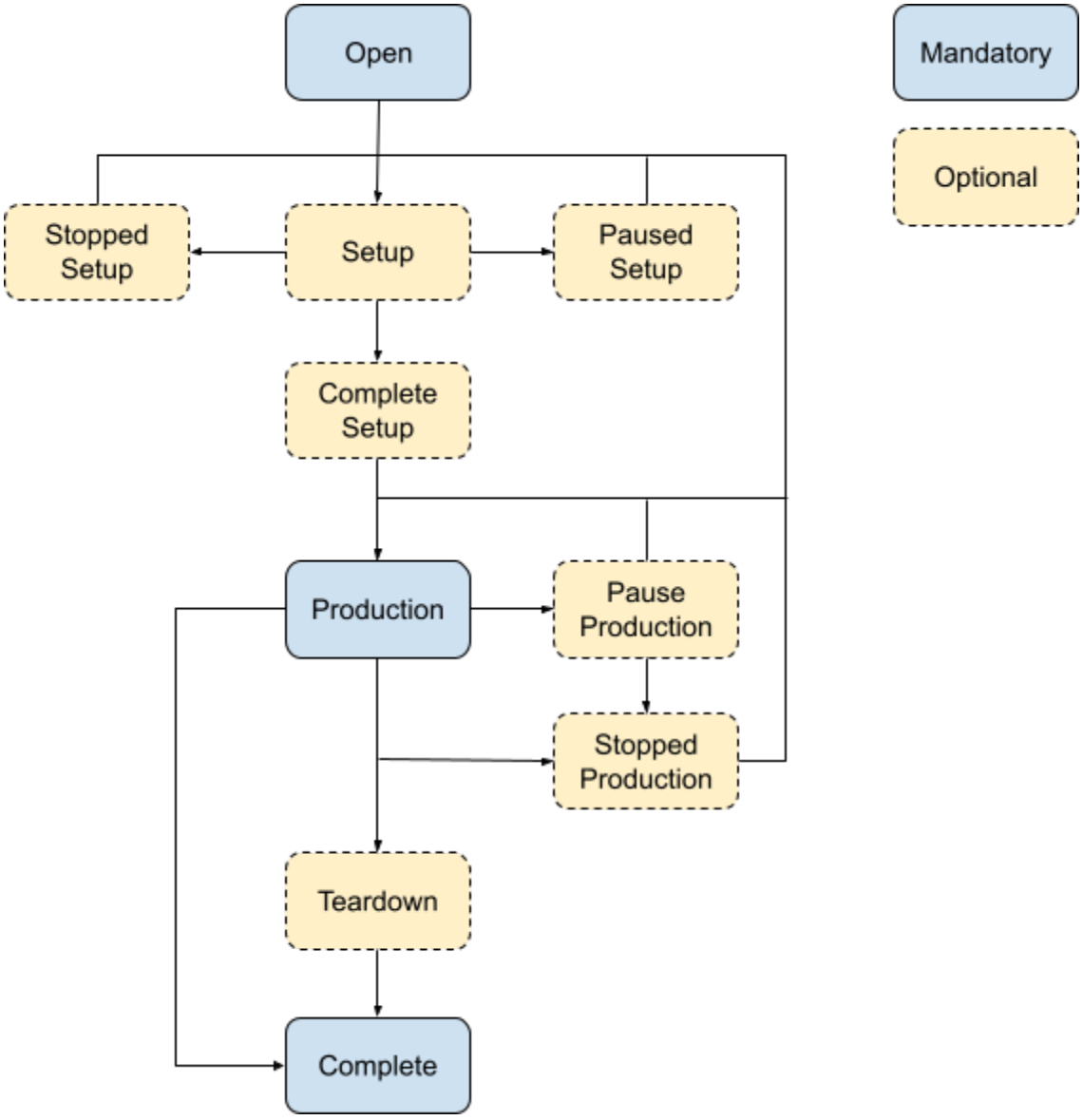
As Production Orders are released from the ERP and created in PE, they will be assigned an Operation Phase. The Operation Phase provides a status of the Order at a specific Work Center. All of the Work Centers in the Routing will have a record for the Production Order and will be provided a default Operation Phase, this is a configuration but it is common to use “Open”. Each unique Operation Phase is given a unique color for quick user recognition.

Below is a list of recommended Operation Phases:

- Open – The Production Order has been released from the ERP but no action has been taken against the Order at the Operation; grey color
- Setup – The Equipment at this operation is being set up for the next Production Orders; purple color
- Paused – Anytime the user needs to pause production (this could pause labor accruing if desired); yellow color
- Stopped - Anytime the user needs to stop production (this could pause labor accruing if desired);
- Setup Completed – The Setup has been successfully completed and it is ready to start production; purple color

- Production – The Production Order is currently running at this Work Center; green color
- Teardown – All production is completed for this Production Order and the next upcoming Production Orders will need a change of equipment changeover,
- Order Completed - All work related to this Production Order is complete and the Production Orders can be closed; no color

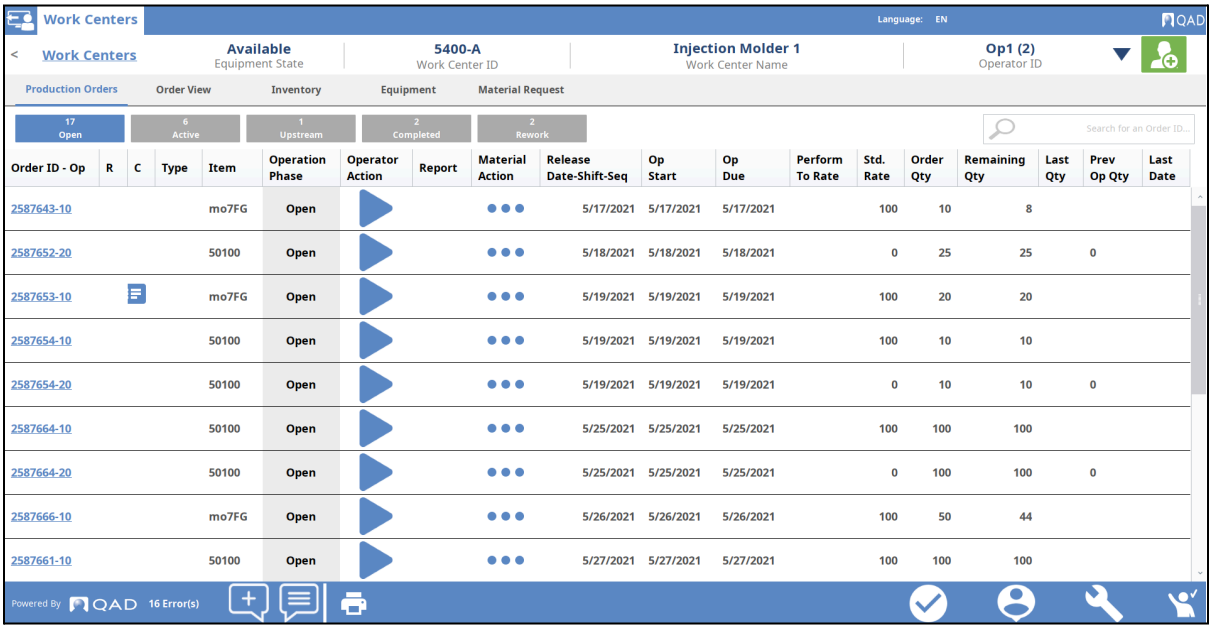
The following graphic displays an example how operation phases may flow:



Production Order Filters

When viewing the Production Orders Tab, a number of conditional filters labeled “Open, Active, Complete, and more” can be seen at the top of the list. These filters are a quick way to view specific Production Orders that have a given Operation Phase. The conditions of which Operation Phases will be displayed in the respective filters is a customer configuration. If there are no records in the filter, then the button will not display. The following Production Order filters are included in the standard product:

- Open – will generally include most Operation Phases, but excludes any Production Orders with the Operation Phase of Complete.
- Active – will generally filter to only include Production Orders with the Operation Phase of Production or Set Up
- Upstream – will display Production Orders that have had been acted on at the preceding operation
- Past Due – will only display the Production Orders that their due date is past,
- Completed – will only display the Production Orders that had been marked as successfully completed



The Production Orders Tab contains the following fields:

Order ID - Op. Displays the Production Order ID and Operation. Select this cell to navigate to the Order View screen and view information related to this Production Order.

R (Rework). If operator reported reject quantity then a  icon will be displayed to inform the operator that a rework operation exists and needs to be reported.

C (Comment). If an order has a comment, a  icon will be displayed.

Type. Displays the ERP Order Type of the Production Order. The options are:

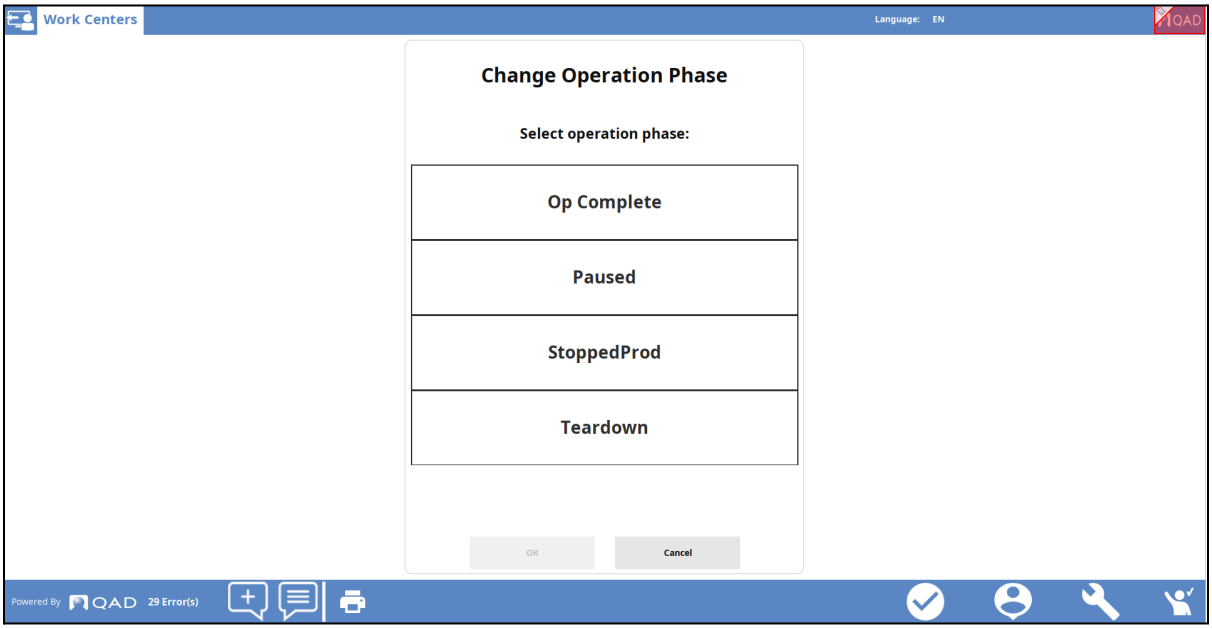
- Blank – discrete work order
- S – scheduled order
- C – cumulative order
- R – rework order

Item. Displays the Item Number assigned to the Production Order.

Operational Phase. Displays the current status of this Production Order at this Operation. Please check the operational phases section for further details.

Operator Action. Select this button to initiate a change of operational phase to the Production Orders. Each Operation Phase can display either a Stop or Play Button, this is a customer configuration. After selecting either the Operator Action, the Operation will be able to select the next Operation Phase.

> **Note**: There are a number of customer configurations around the Operation Phases that can be set up in the PE App.



Report. Select the Pencil Button to report production against the Production Order at the work center. When the Report Production screen is displayed (see Report Production Screen), the user can enter values for good, scrapped, and/or rejected.

Material Action. Select the ••• icon to make a request for either Label Printing or the Issuing of Material. It is expected that more actions will be added for future releases of PE. For more detail see “Material Action” Section.

Perform to Rate. Displays Production Performance Rate based on the calculation below. This calculation is updated each time the operator reports production. Only productive time will be used in the calculation (earned hours). Any time from Setup or Paused operational phase is not considered.

```
Performance to Rate = ((Actual Production/Standard Hourly
Production Rate)/Earned Hours) x 100
```

Where

```
Actual Production = Qty Good + Qty Scrapped
```

Standard Rate. Displays the standard hourly production rate that was previously defined in Routing Maintenance (14.13.1).

Order Qty. Displays the original quantity on the order.

Remaining Qty. Displays the open production quantity against the Production Orders.

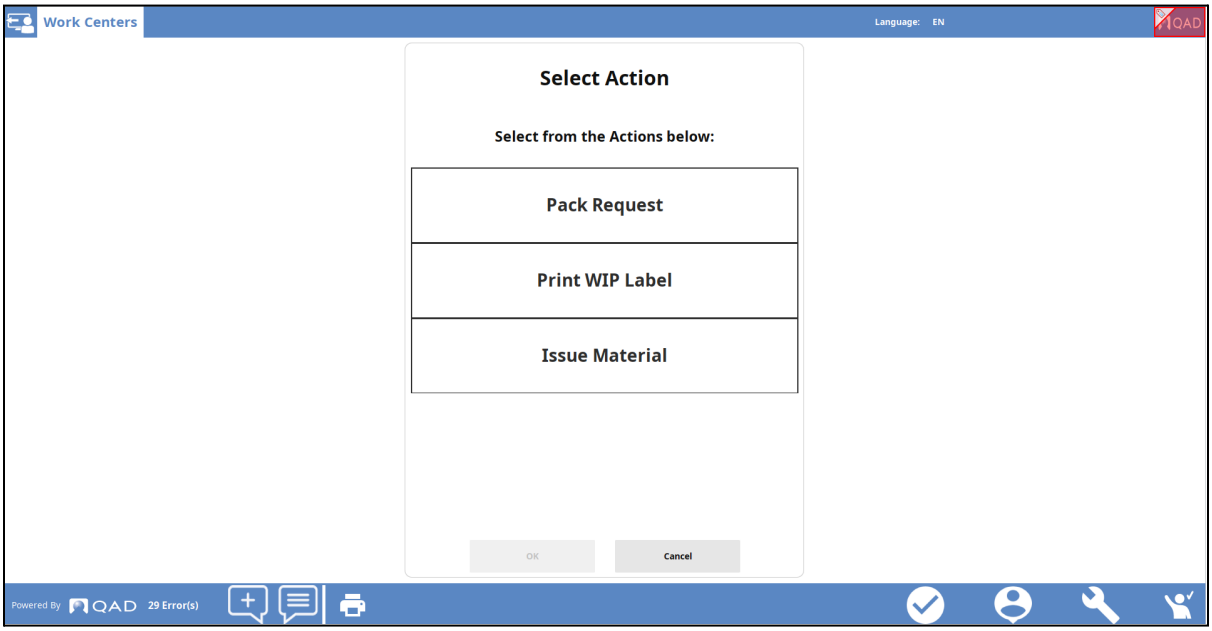
Last Qty. Displays the total quantity reported during the last production transaction.

Last Date. Displays the date of the last production transaction.

Additional Production Orders Tab Functionality

Material Action

The Material Action Button allows a user to perform various actions related to the Production Order. When the Material Action button is selected, the "Select Action" window will be displayed and this is where a user can select an option. See screenshot below.



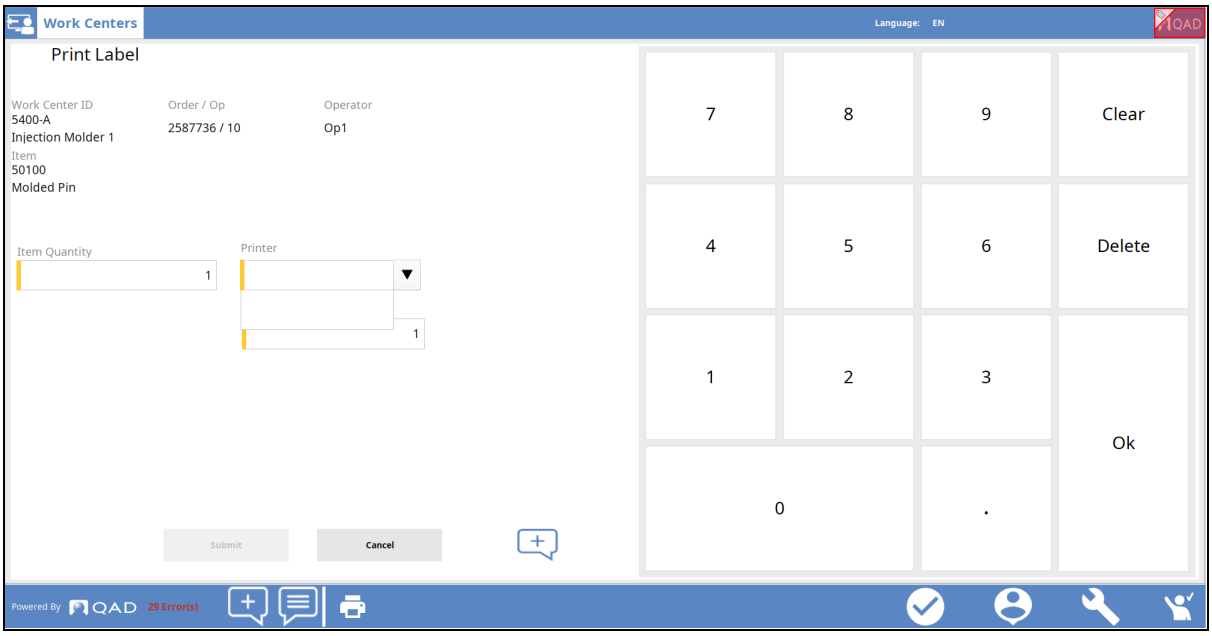
There are currently only options for Issue Material or Print WIP Label. It is likely that future releases will contain additional options (e.g. Pack Request).

Pack Request (NOT COMPLETE)-- request empty pack

Print WIP Label allows users to print loose production labels. The purpose of this label is so that Shop operators can track the movement of WIP visually on the shop floor.

Print WIP Label

Print WIP Label allows users to print loose production labels. The purpose of this label is so that Shop operators can track the movement of WIP visually on the shop floor.



The Print WIP Label Screen contains the following fields:

Work Center ID. Displays the Work Center ID at which production is to be reported.

Order/Op. Displays the Production Order ID and operation number against which production is to be reported.

Operator. Displays the Employee ID of the operator who is reporting production.

Item. Displays the Item Number assigned to the Production Order.

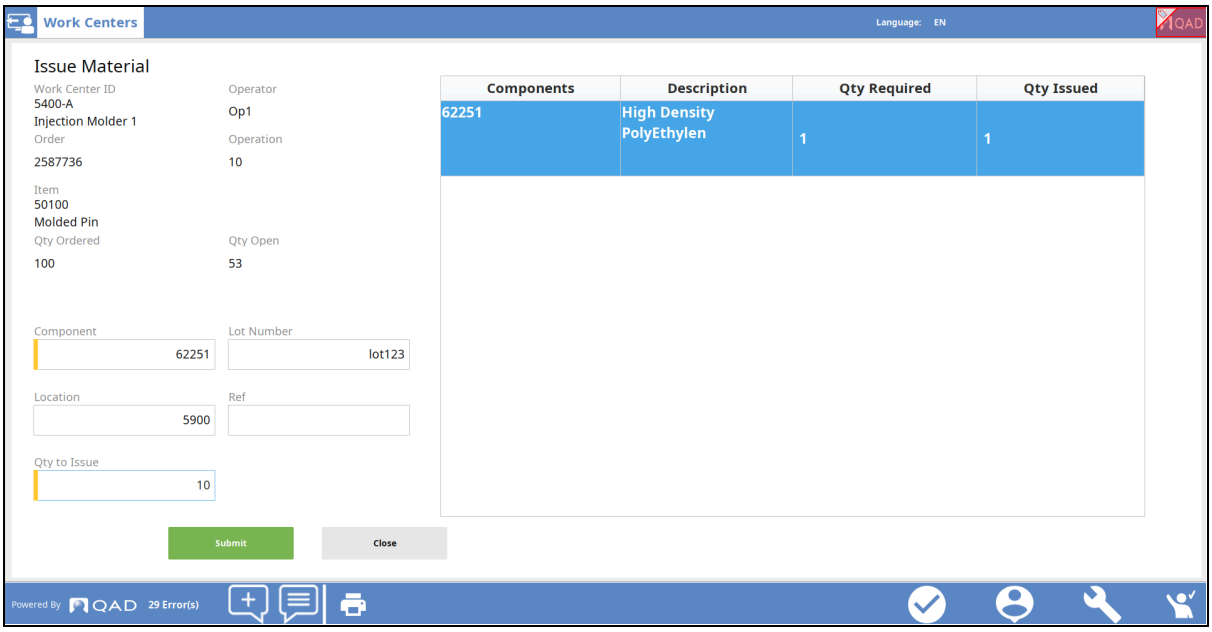
Item Quantity. Enter the quantity of the produced items.

Printer. Enter the printer that will be used.

Number of Labels. Enter how many labels that will be printed

Issue Material

If the Issue Material Button is selected, the user will be prompted to issue a specific Component to the Production Order. All materials that exist in the Production Order Bill of Material will be displayed. PE will display the inventory information (eg. stock availability) for the material.



The Issue Material Action Screen contains the following fields:

Component. Defaults to <Select From Table> because it is expected the user will select a record from the list on the right side of the screen. The records displayed here will be a list of all the components on the BOM for the Finished Good and Operation.

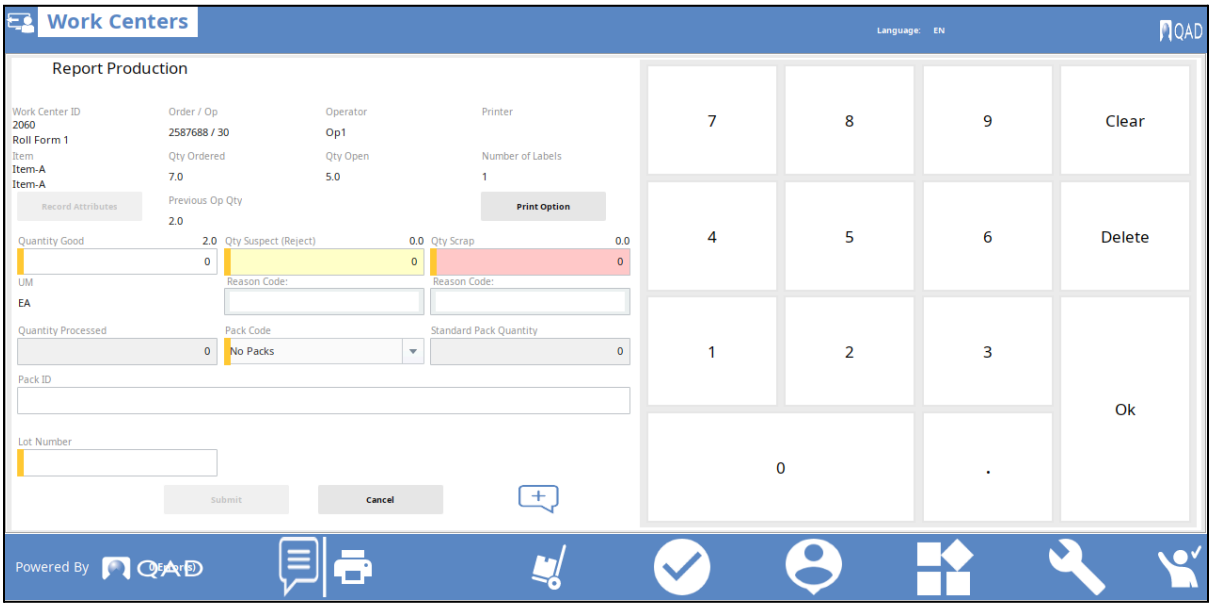
Lot Number. This is an optional field that can be used to track issued lot numbers, even if that lot is not tracked in the ERP.

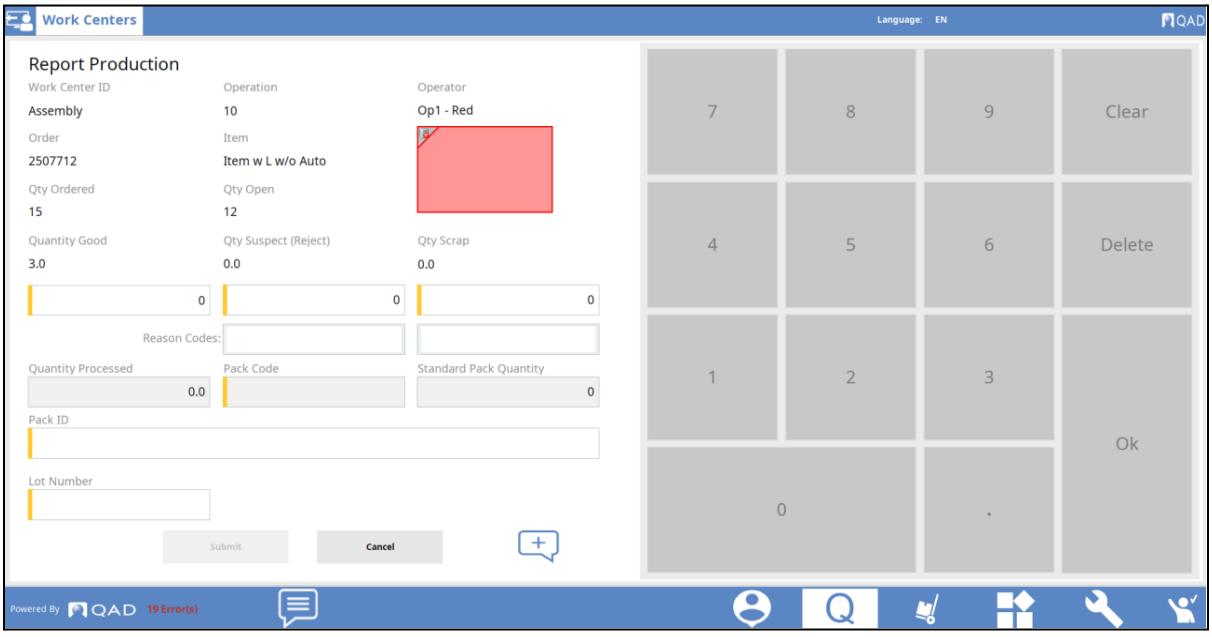
Location. Location which provides materials to be issued.

Ref. This is an optional field that can be used to track issued inventory ref numbers.

Qty to Issue. This is a required field that will indicate the quantity that is being issued.

Production Reporting Screen





The Report Production Tab contains the following fields:

Note: All of the fields with the yellow-left indicator in this screen are fields that are required to complete the transaction.

Work Center ID. Displays the Work Center ID at which production is to be reported.

Order. Displays the Production Order ID against which production is to be reported.

Op. Displays the Operation Number against which production is to be reported.

Operator. Displays the Employee ID of the operator who is reporting production.

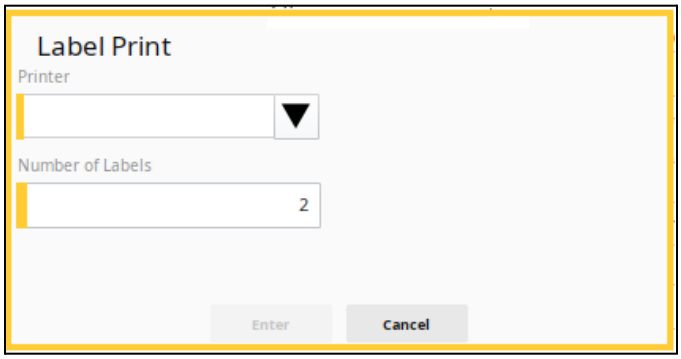
Item. Displays the Item Number assigned to the Production Order.

Qty Ordered. Displays total quantity that is on the Order.

Qty Open. Displays open quantities against the Production Order at this Operation.

Number of Labels. Display how many labels that will be printed.

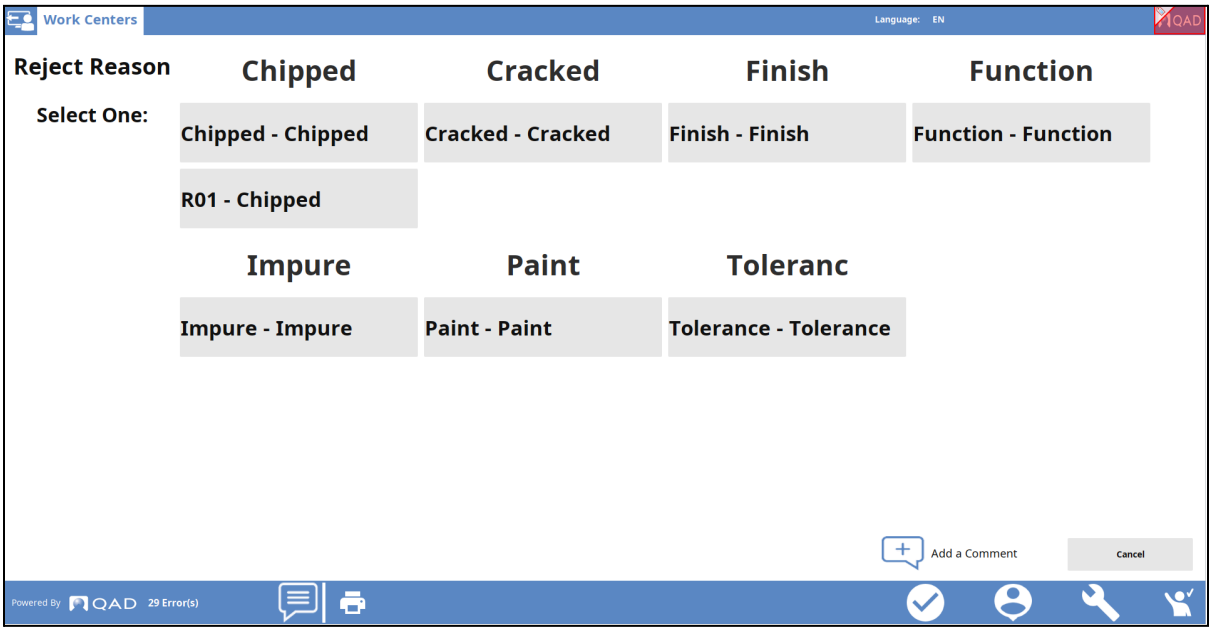
Print Option. Define which printer to be used and how many labels that will be printed.



Qty Good. Enter the total quantity that has been produced as good.

Qty Suspect (Reject). Enter the total quantity that has been rejected. If a non-zero quantity is entered in this field, then the user is required to enter a reason code for the rejection. Example of prompt below:

> **Note**: Users can define if reject quantity reporting is allowed or not at certain work centers. For further details please refer to the work center setup. Reject quantity can also be received as a reject operation or transferred to scrap location. Please refer to production option 34 for further details.

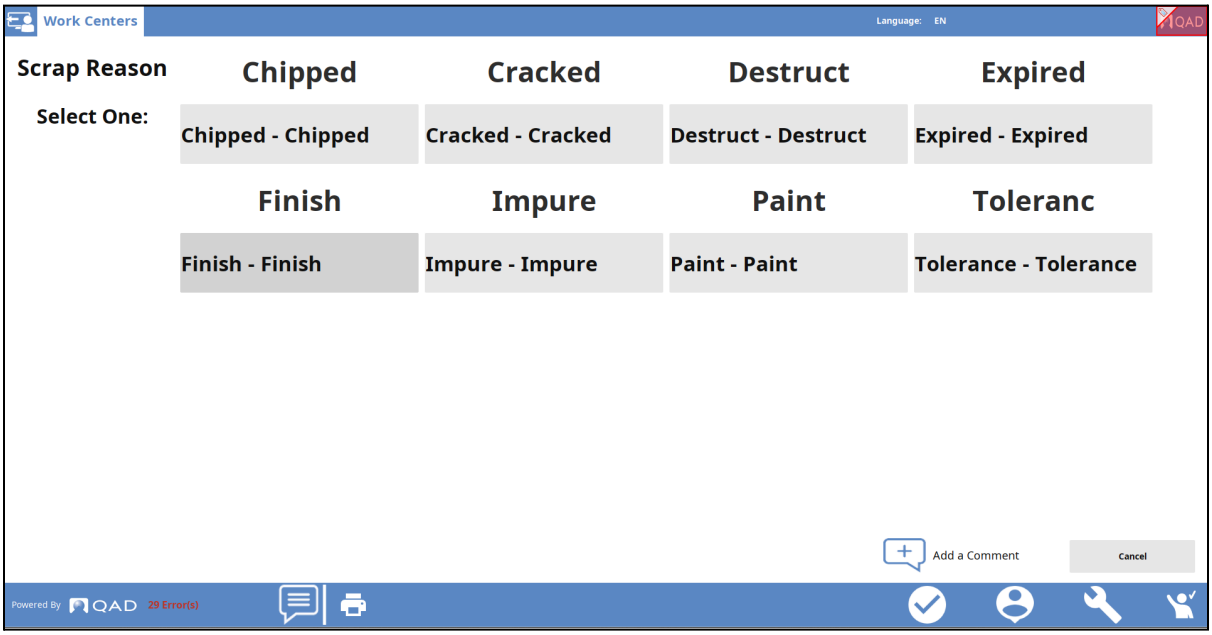


Reason Code. Select a Reason Code from the prompt.

Note: The reason codes are user defined and are set up in Production Execution Apps. If there is only a single Reason Code configured, then it will not require a prompt and will instead take the value and place it in the field.

Qty Scrap. Input the total qty scrapped during production. If a non-zero quantity is entered in this field, the user must enter a reason code for the rejection. Example of the prompt below:

Note: Users can define if scrap quantity reporting is allowed or not at certain work centers. For further details please refer to the work center setup.



Reason Code. Select a valid reason for the item(s) to be scrapped.

Note: The reason codes are user defined and are set up in Production Execution Apps. If there is only a single Reason Code configured, then it will not require a prompt and will instead take the value and place it in the field.

Qty Processed. Displays the total quantity processed during production. This field is a total of the good, reject and scrap quantities reported during this transaction.

Pack Code. Displays the default Pack Code for the Item based on the Item Packaging set up (see Item Packaging Maintenance program 13.14.7).

Note: This field is displayed only when the operation is the last operation in the routing and enabled for serialized items.

Standard Pack Quantity. Displays the standard pack quantity based on the packaging setup (see Packaging Structure Maintenance program 13.14.4).

Note: This field is displayed only when the operation is the last operation in the routing and enabled for serialized items.

Pack ID. Enter or scan a serial number of the Pack Code that the produced items are to be packed

in.

> **Note**: This field is displayed only when the operation is the last operation in the routing and enabled for serialized items.

Lot Number. Enter the Lot Number for the produced items, if needed. This field will only be available if the item is lot controlled

> **Note**: This field will display a default value for Lot Number if the item is set up for Auto-Lots in Item Inventory Data or Item-Site Inventory Data.

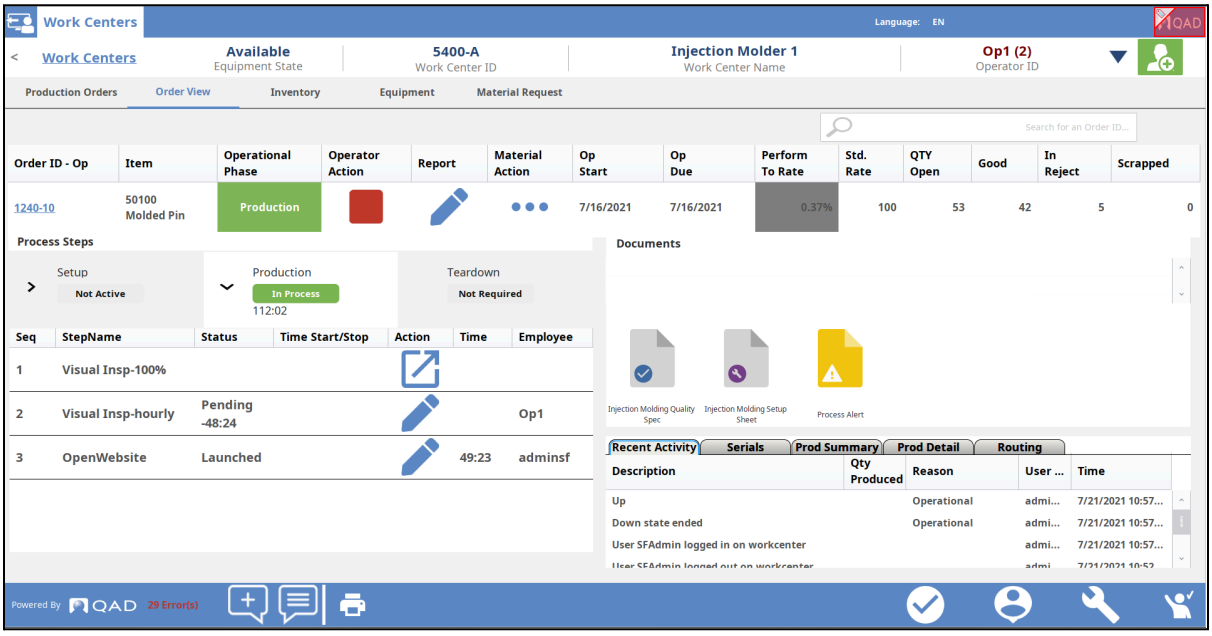
Submit. Click the submit button to confirm the transaction.

Cancel. Click the cancel button to exit the transaction without committing and to return to the Production Order Tab.

Order View

The Order View displays more detailed information on a specific order. Everything in the Tab will be specific to the selected Production Order. All of the action that can be done in the Production Orders Tab can also be completed in the Orders Tab. The Order Tab has some additional features such as;

- Require a set of Process Steps to be completed as the Operation Phase is being changed. (This is a customer configuration) See Process Steps Detail for more information
- Display a large image of the Finished Good that is being produced.
- (This is a customer configuration)
- Open documents that are linked to the Work Center and Item Number. This can be managed by QAD QMS CEBOS. See Item Documents for more information.



The Order View Tab contains the following fields:

Order ID - Op. Displays the Production Order ID and Operation. Select this cell to navigate to the Order View screen and view information related to this Production Order.

Type. Displays the ERP Order Type of the Production Order.

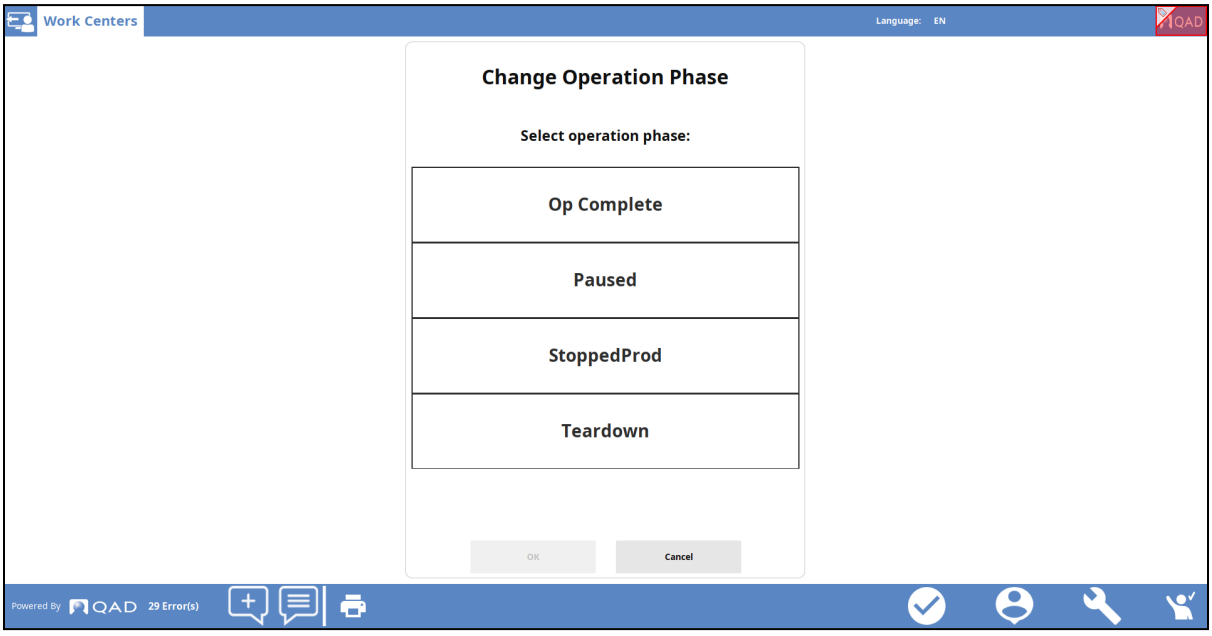
- Blank – discrete work order
- S – scheduled order
- C – cumulative order
- R – rework order

Item. Displays the Item Number assigned to the Production Order.

Operational Phase. Displays the current status of this Production Order at this Operation.

Operator Action. Select this button to initiate a change of operational phase to the Production Order. Each Operation Phase can display either a Stop or Play Button, this is a customer configuration. After selecting either the Operator Action, the Operation will be able to select the next Operation Phase.

> **Note**: There are a number of customer configurations around the Operation Phases that can be set up in the PE App.



Report. Select the Pencil Button to report production against the Production Order at this work center. When the Report Production screen is displayed (see Report Production Screen), the user can enter values for good, scrapped, and/or rejected.

Material Action. Select the ••• icon to make a request for either Label Printing or the Issuing of Material. It is expected that more actions will be added for future releases of PE. For more detail see "Material Action" Section.

Due Date. The Due Date will be displayed from the Production Order.

Perform to Rate. Displays the Production Performance Rate based on the calculation below. This calculation is updated each time the operator reports production. Only productive time will be used in the calculation (earned hours). Any time from Setup or Paused operational phase is not considered.

```
Performance to Rate = ((Actual Production/Standard Hourly
Production Rate)/Earned Hours) x 100
```

Where

```
Actual Production = Qty Good + Qty Scrapped
```

Standard Rate. Displays the standard hourly production rate, defined in Routing Maintenance (14.13.1).

Qty Open. Displays the open quantity against the Production Order.

Good. Displays the total number of items that have been produced and reported as good.

In Reject. Displays the total number of items that have been reported as rejected during the production of this order.

Scrapped. Displays the total number of items that have been reported as scrapped during the production of this order.

Process Steps

Process Steps are an optional feature. The Manufacturing SME should decide which, if any, Work Centers will use Process Steps. For any potential Work Centers that will be requiring Process Steps, then a System Administrator will need to assign the Process Steps layout, set up the various Steps and define the various rules.

With Process Steps, an important consideration is whether the traceability and control that comes with Process Steps adds any real value. If a value does exist then the Manufacturing SME will need to define a list of Process Steps and associated rules. The remainder of this section will explain how Process Steps operate and the various configurations that exist. setup process steps for each record methods and put a screenshot of PE

Questions and Answers related to Process Steps:

What are Process Steps? They are a series of steps that are to be completed before certain actions can be taken against the Production Order. This could be processes required for setup, for periodic quality inspection or for teardown.

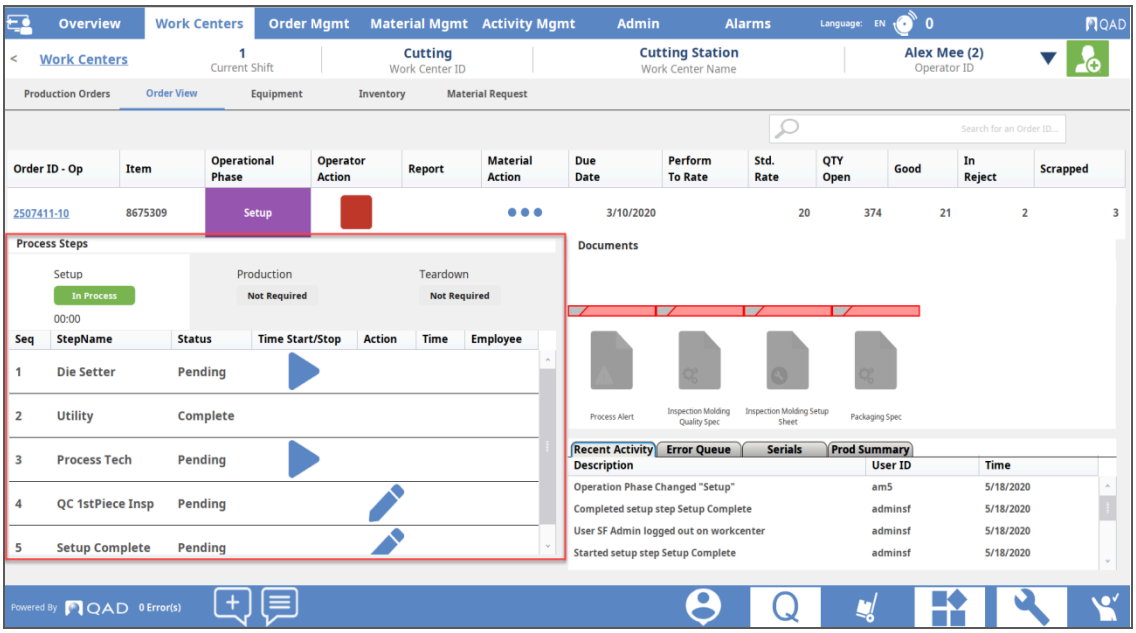
When do Process Steps enable? They are created based on the Operation Phase. As a Production Order enters an Operation Phase with Process Steps configured it will then enable each of the related Process Steps.

What Rules can be configured? Mandatory vs Optional, the titles and sequence of Steps, prerequisite steps, timer tracking the status of an individual Process Step, associated actions such as opening

documents or filling out a check list.

Where will the Process Steps display? The Order View will have a specific screen layout that reserves a section of the screen to display and manage Process Steps.

When setting up Process Steps, it's critical that the subject matter expert actively engage their local administrator and their PE consultant.



The Process Steps Section contains the following fields:

Seq. The integer value in this field indicates the order in which the Process Steps should be performed.

Step Name. Displays the name of each process step.

Status. Displays whether the process step is pending or completed

Time Start/Stop. Select this button to indicate when the Process Step is being worked on. Not all Process Steps need be time-bound

Action. If there is a required action to be taken there will be a pencil icon to select

Time. This will display the total time the process step has taken

Employee. Displays Employee ID of the operator who is performing the process step

Documents

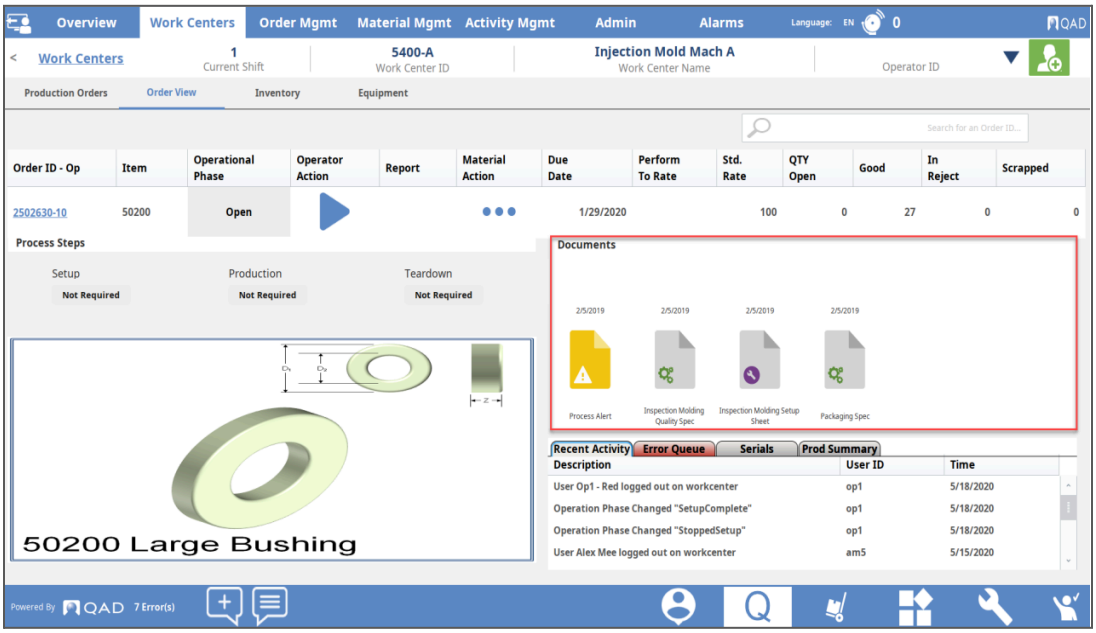
The Order View Tab – Document Banner Section is where the operator will find documents in support of the production of this item at this Work Center. The documents might include: part drawings, work instructions, part specs, packaging specs, setup/teardown instructions, etc. The Document Banner is configured by the customer to present pertinent information to the operator related to this part and this Work Center. These documents are for reference and can be opened at any time. If a customer has QMS

and PE Integration in scope, it is possible to use QMS to manage the documents.

A System Administrator should set up and maintain the document files and document configuration. To add and remove documents, a System Administrator will need to be given FTP Access at the Operating System level of the server. This does not mean the user will have access to other directories on the OS, but instead will only be given rights to access the PE Documents directory. It is likely the System Administrator will be updating this Document directory in the following circumstances:

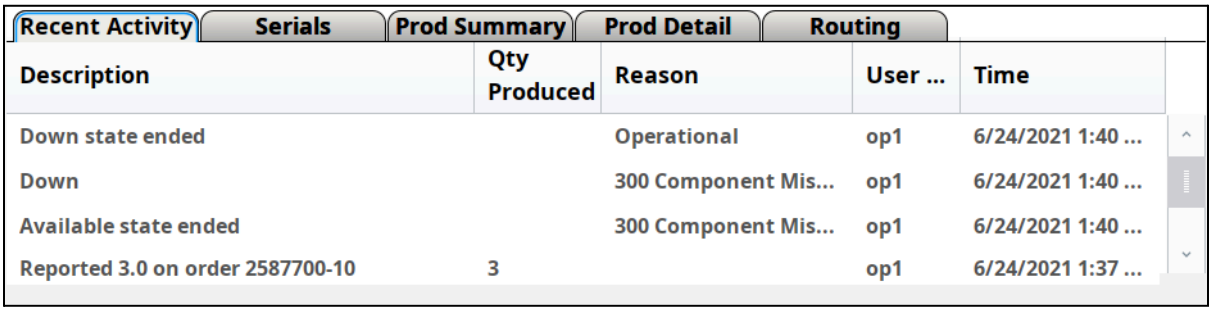
- Not all documents were gathered before Go-Live,
- Updating documents to a newer version,
- Adding new types of documents as requirements dictate.

See the screenshot below for reference.



Recent Activity

The Activity Section located below the Document Banner contains a lot of useful information. The "Recent Activity" Tab provides a way to scroll through events that have impacted this specific Production Order or Work Center and to review traceability details.



Recent Activity Subtab contains following columns:

Description. Displays description of the specific activity performed at the work center

Qty Produced. Displays quantity produced.

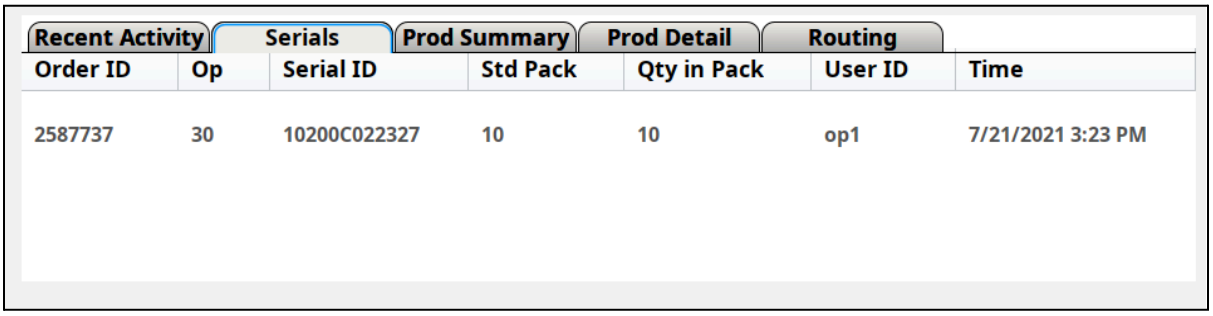
Reason. Displays reason code when equipment state is changed.

User ID. Displays the User ID of the operator that performed the activity

Time. Displays a timestamp for when the record was created

Serials Subtab

The Serial Subtab will display a list of all the Serials that were generated for this Production Order. This Tab will only display records if it is the final milestone Operation of the Production Order and Serialization is set up for the Item Number.



Serials Subtab contains following columns:

Order ID. Displays the Production Order ID

Op. Displays the Operation of the Production Order

Serial ID. Displays a list of all the Serial IDs created against this Production Order

Std Pack. Displays standard pack quantity according to the item's packaging setup (see Packaging Structure Maintenance program 13.14.4).

Qty in Pack. Displays the quantity of the item number contained in the Pack

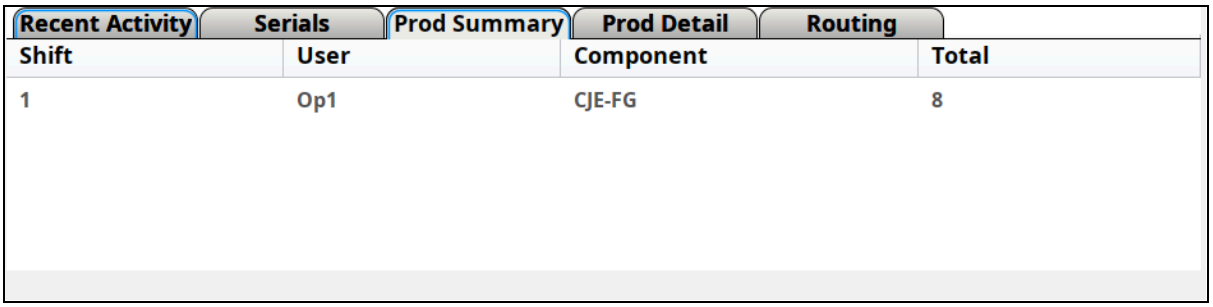
User ID. Displays the User ID of the operator who performed the serialized transaction

Time. Displays a timestamp of when the Serial ID was created

Options. Select this button in order to reprint the label for Serial ID

Prod Summary Subtab

The Prod Summary Subtab will display a list of all the Production Reporting that has occurred against this Production Order.



Production Summary Subtab contains the following fields:

Shift. Displays the shift number during which production was reported.

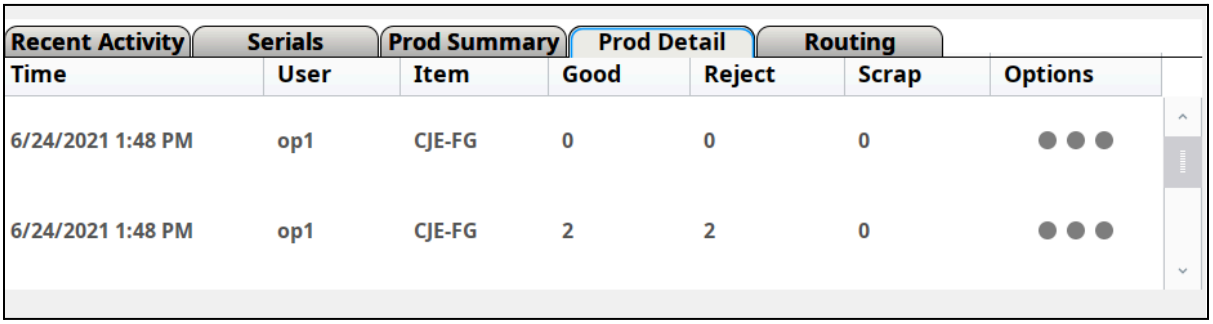
User. Displays the user name of the operator who reported production.

Component. Displays the component description that had been reported against production.

Total. Displays the total quantity of the item number that was reported against production.

Prod Detail Subtab

This prod detail subtab has a similar function with the Prod Summary subtab. The difference is in the prod detail subtab PE will display detailed information about the good, reject and scrap quantity reporting.



Production Detail Subtab contains the following fields:

Time. Displays a timestamp for when the record was created

User. Displays the user name of the operator who reported production.

Item. Displays the item that had been reported against production.

Good. Displays the total quantity that was reported as good.

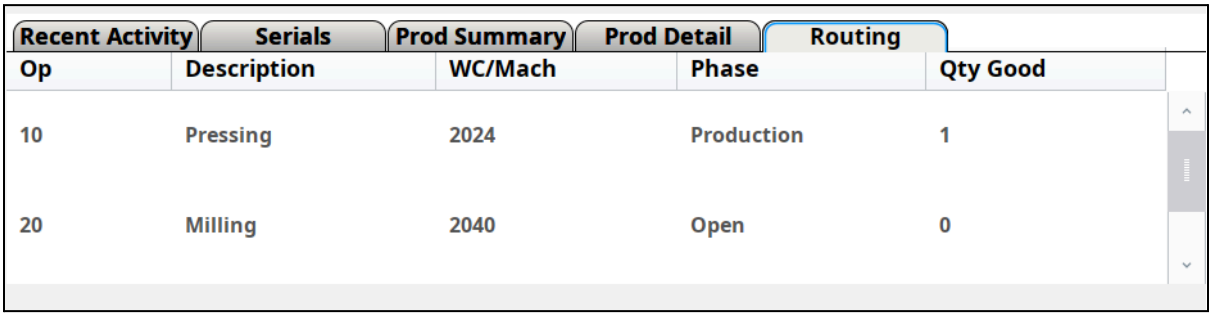
Reject. Displays the total quantity that was reported as rejected.

Scrap. Displays the total quantity that was reported as scrap.

Options.

Routing Subtab

Routing subtab will display all operations for the Production Order and the responsible work center.



Production Detail Subtab contains the following fields:

Op. Displays the Operation of the Production Order

Description. Displays the description of the operation.

Item. Displays the Work Center ID at which production is to be reported.

Phase.Displays the current phase for each operation.

Qty Good. Displays the total quantity that was reported as good.

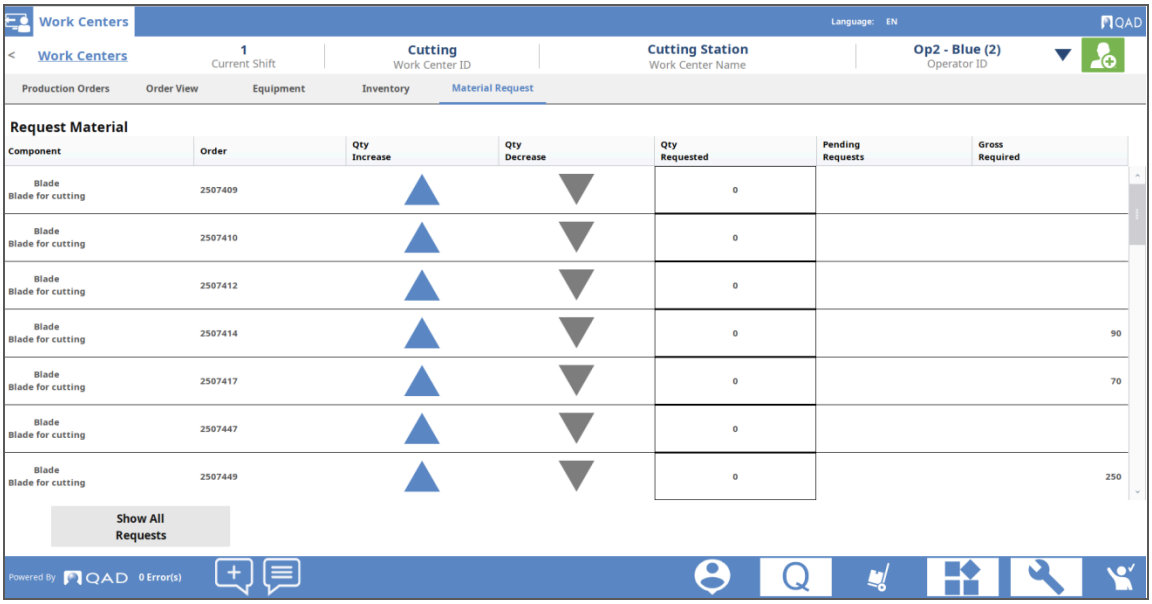
Material Request

(only applicable if AS and PE Integration is in scope)

The Material Request screen displays a list of the components that are on the bill of material for this production item and operation. It is possible that multiple Production Orders of different Finished Good Item Number will be active at the Work Center. In this case it will be important to notice which order number the components go against before submitting a request.

The main function of this tab is to allow the operator to input a request to have necessary components delivered to the Work Station. This is typically used for unexpected material shortages and is generally not the main driver for component inventory replenishment. From this screen users can perform the following actions:

- Create a material request for its specified quantity
- Cancel a pending material request
- View the status of any open Material Requests



The Material Request Tab contains the following fields:

Component. Displays the component item number and description.

Order. Displays the Production Order number needing that component.

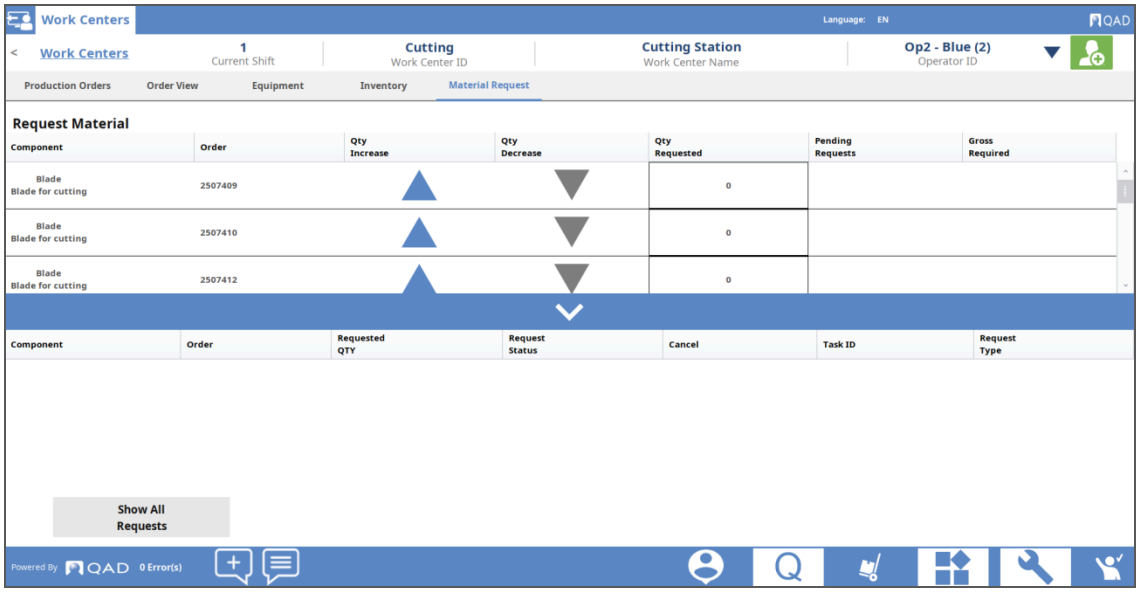
Qty Increase. Select the qty increase blue arrow to increment the component quantity to be requested. Each button press represents one unit or pack for the component being requested. The Qty Requested field will display the current quantity requested. Once the quantity has been specified, the user needs to press the submit button to create a material request.

Qty Decrease. Select the qty decrease blue arrow to decrement the component quantity to be requested. Each button press represents one unit or pack for the component being requested. The Qty Requested field will display the current quantity requested. Once the quantity has been specified, the user needs to press the submit button to create a material request.

Qty Requested. Displays the quantity of the component being requested. Once the quantity has been specified, the user needs to press the submit button to create a material request.

Pending Requests. Displays the number of active material requests. Select a certain pending request icon to view its details.

Gross Required. Displays the gross requirement for this component on the Production Order.



The "Show All Requests" Subtab contains the following fields:

Component. Displays the component item number and description.

Order. Displays the Production Order number that the component is required for.

Requested Qty. Displays the quantity of the component requested.

Request Status. Displays the status of the active material request.

Cancel. Select this button to cancel the pending request. This will cancel the AS Transaction.

Task ID. Displays the AS Task ID that was generated to fulfill the request.

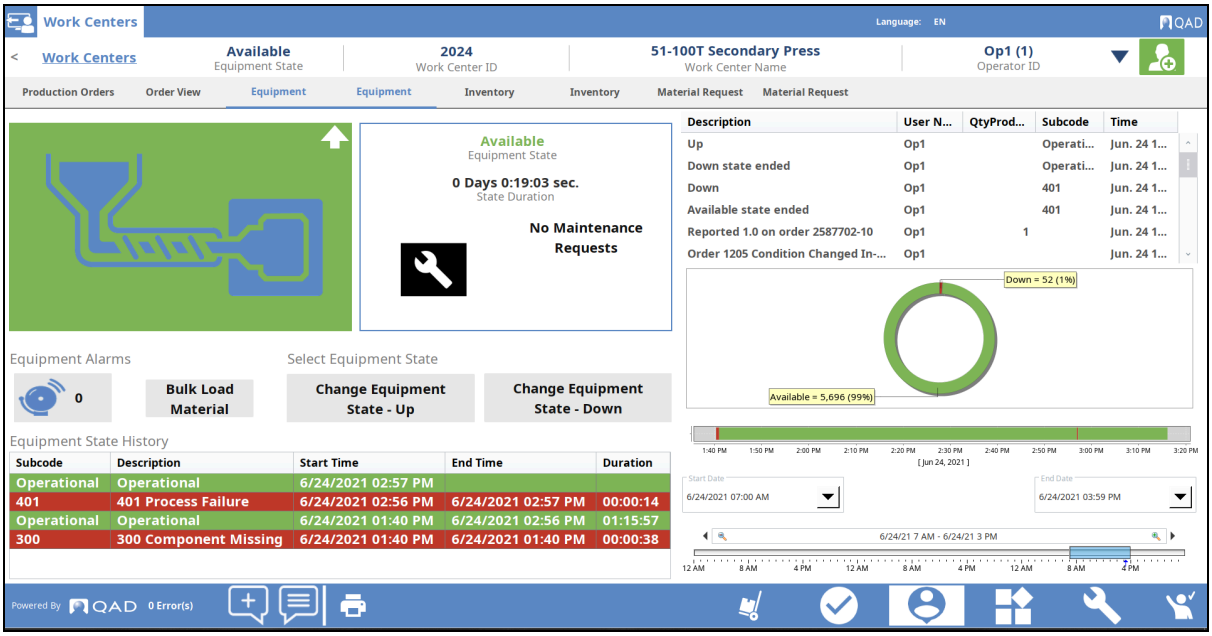
Request Type. Displays the type of request and its time in the format hh:mm. Request Types included in Production Execution are:

- Setup – a request generated automatically to fulfill material demand for the released Production Order at the Work Center.
- Ad-Hoc – a manual request of material submitted by the operator at the Work Center

Equipment View

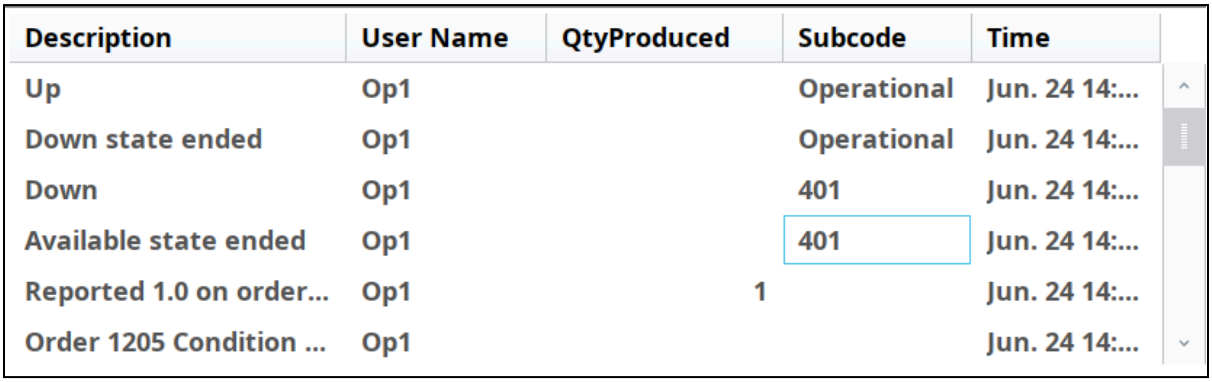
The Equipment screen shows detailed information about the equipment at the work center. This screen displays the current status of the machine and any historical events logged against the machine. Users can initiate work center up or down events in response to the status of the equipment. From this screen, users can perform the following actions:

- Initiate Down Event of the equipment,
- Return equipment to its full availability,
- Drill down to view all equipment alarms,
- Load Material to the Work Center.



The Equipment Tab can be divided by sections:

- Work Center History window,
- Equipment State History window,
- Equipment action buttons.



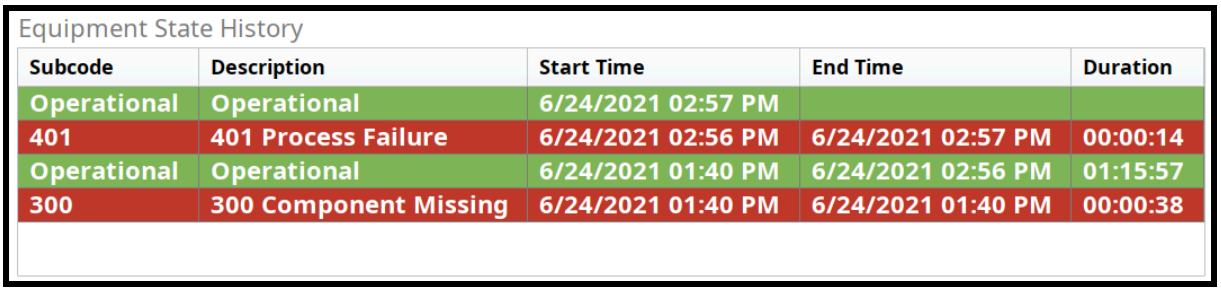
The Work Center History section contains the following fields:

Description. Displays the description of any event reported against the work center.

User Name. Displays the User ID of the employee who initiated the event.

Qty Produced. Displays the quantity of the item produced per event.

Time. Displays the time that the event occurred.



The Equipment State History section contains the following fields:

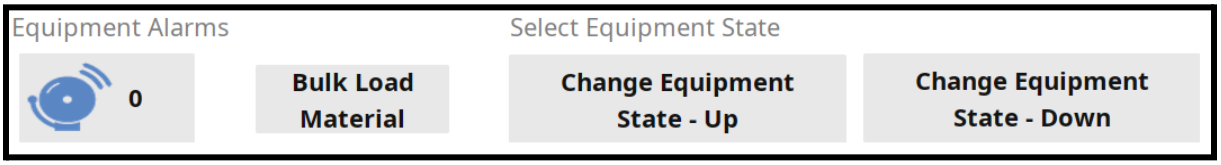
Subcode. Displays the subcode of reason code for the equipment state change event.

Description. Displays the description of the subcode of reason code for the equipment state change event.

Start Time. Displays the time that the event was initiated.

End Time. Displays the time that the event finished.

Duration. Displays the amount of time that the event took.



The Equipment Action buttons lets the user to perform the following tasks:

Equipment Alarms. Click the equipment alarm button to view all alarms that are associated with equipment in this environment. From this screen the alarms can be acknowledged or shelved. See below for Equipment Alarms section.

Bulk Load Material. Click this button to register the part number, quantity and lot number of a bulk item that has been issued to this Work Center. See below for Bulk Load Material section.

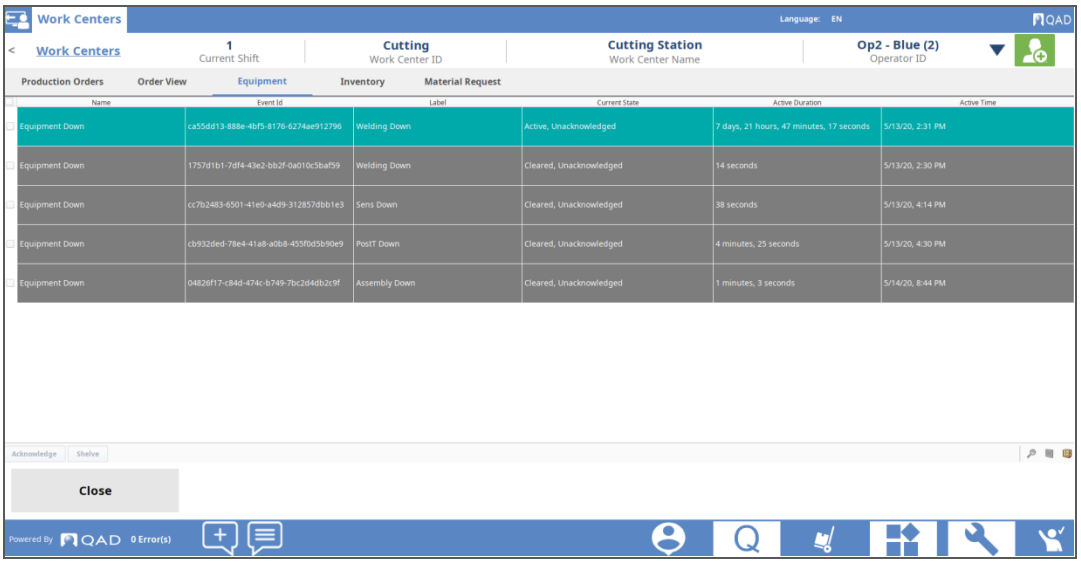
> **Note**: This feature is optional depending on the customer's requirements. For further information please refer to Production Option 69.

Change Equipment State. Click the Change Equipment State Up/Down buttons to toggle the equipment state between available and down. A down event will put the operation into a stopped phase. Users can specify the reason for the Down Event. Reasons are divided by their nature (power lost, machine maintenance, etc.) and further detail is provided by the subreasons. Reasons are customer defined and can be configured from PE Apps.

For more details about this, see below for Change Equipment State section.

Equipment Alarms

The Equipment alarm tab allows viewing all alarms that have been triggered by/for equipment in this environment. This Tab will show a list of all the Equipment Down Events that have occurred. Users can acknowledge or shelve the alarms.



The Equipment Alarms Tab contains the following fields:

Name. Displays a short description of the alarm event that was triggered.

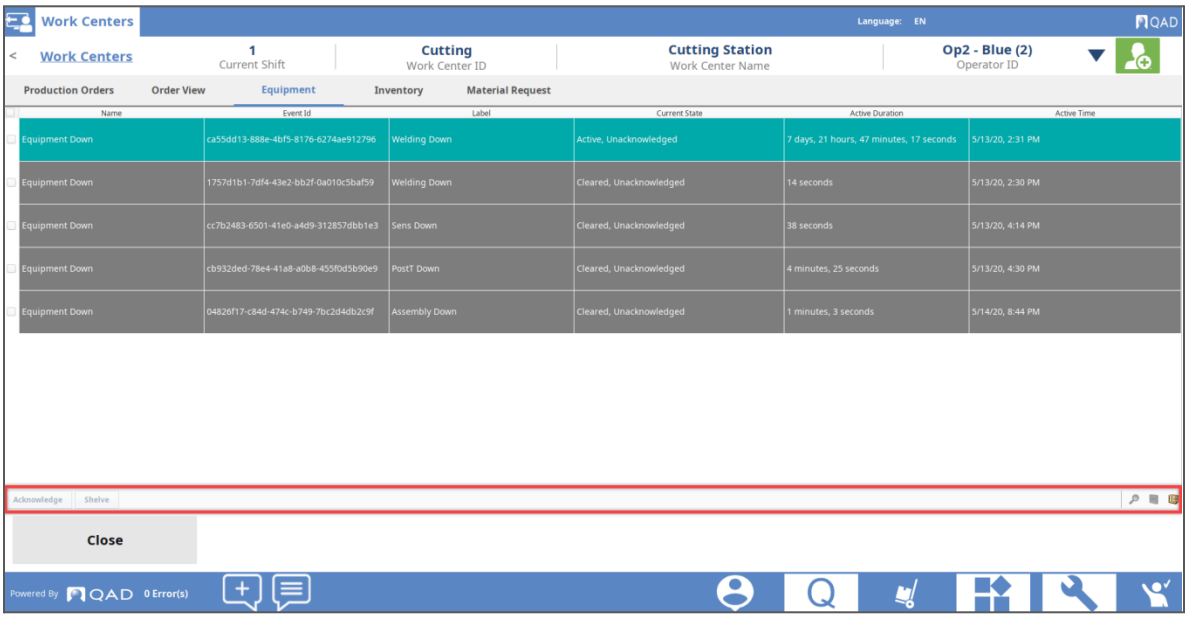
Event ID. Displays the ID associated with the event alarm.

Label. Displays the Work Center ID where the event alarm occurred.

Current State. Displays the current state of the alarm and its acknowledgement state. For example, “Active, Unacknowledged” means the alarm is currently in the active state and the alarm has not been acknowledged by selecting the Acknowledge button.

Active Duration. Displays the amount of time that the alarm has been active.

Active Time. Displays the date and time when the alarm occurred.



Acknowledge. Select the acknowledge button to confirm the alarm has been recognized. One or

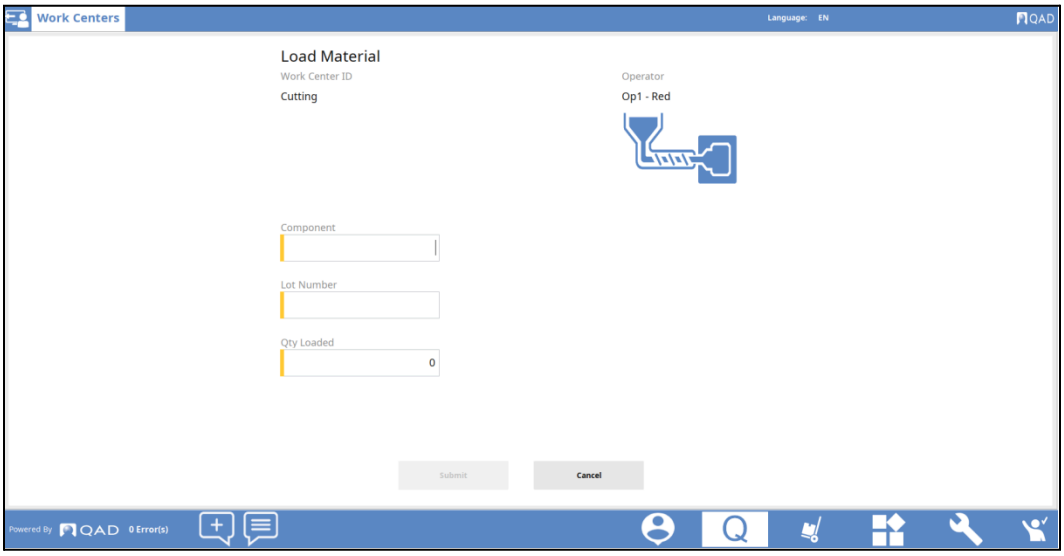
more alarms can be submitted at the same time.

Shelve. The Shelve button is used to postpone a chosen alarm for a specified period of time. This action can be performed for one or more alarms and is activated after choosing alarms from the list. Once the alarm has been postponed it can be easily reversed or changed.
The possible period of times that an alarm can be shelved are:

- 5 minutes,
- 15 minutes,
- 30 minutes,
- 1 hour,
- 2 hours,
- 4 hours.

Bulk Load Material

The bulk load material section lets the user record bulk inventory (e.g., resin, glue, solder paste) issued to the work center. From this tab users can specify which component will be loaded into the equipment, its quantity and lot number. Once this action is submitted, the detailed bulk material issue information is written to the event history log.



The Load Material section contains the following fields:

Component. Enter the component number that has been issued to the Work Center.

Lot Number. Enter the component lot number if the component is lot controlled.

Qty Loaded. Enter the quantity of the component that was issued.

Change Equipment State

The Equipment States are user defined. Each State will be linked either to an “Up” or “Down” state and related Reason Codes need to be set up.

The Change Equipment State section consists of two actions that can be performed:

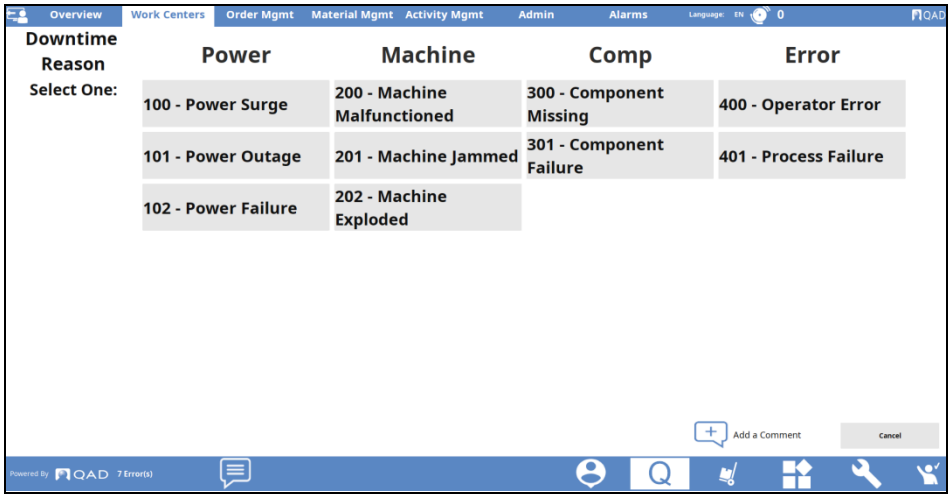
- **Change Equipment State - UP**: This button is used when the Equipment needs to change to a State that is considered “Up”. When the Equipment at the Work Center is changed to this State, the icons will turn to green and the arrow will point upwards.
- **Change Equipment State - DOWN**: This button is used when the Equipment needs to change to a State that is considered “Down”. When the Equipment at the Work Center is changed to this State, the icons will turn to red and the arrow will point downwards.

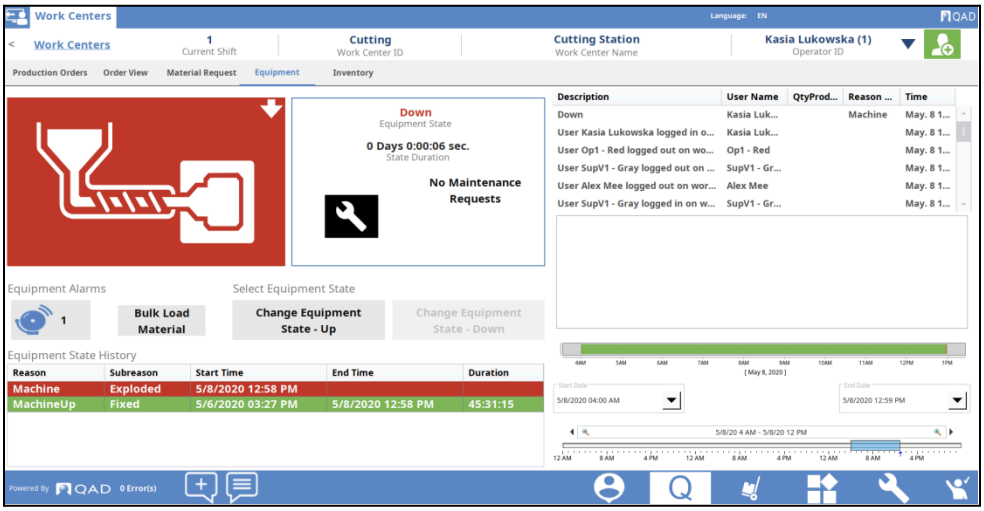
The Equipment States will need to have at minimum a single Reason Code corresponding with each State. If a customer desires, they can set up a list of Reason Codes for the user to select from. This is also a customer configuration that permits a great deal of flexibility.

There is an additional configuration that can be set up to automatically take all Production Orders at the Work Center to an “Equipment Down” Operation Phase whenever the Equipment goes into a Down State.

All changes of the equipment state can be seen in the Equipment State History section with event related data.

Reasons can be created per customer business requirements in PE Apps. An example of a set of Down Event reasons and subreasons can be seen below:

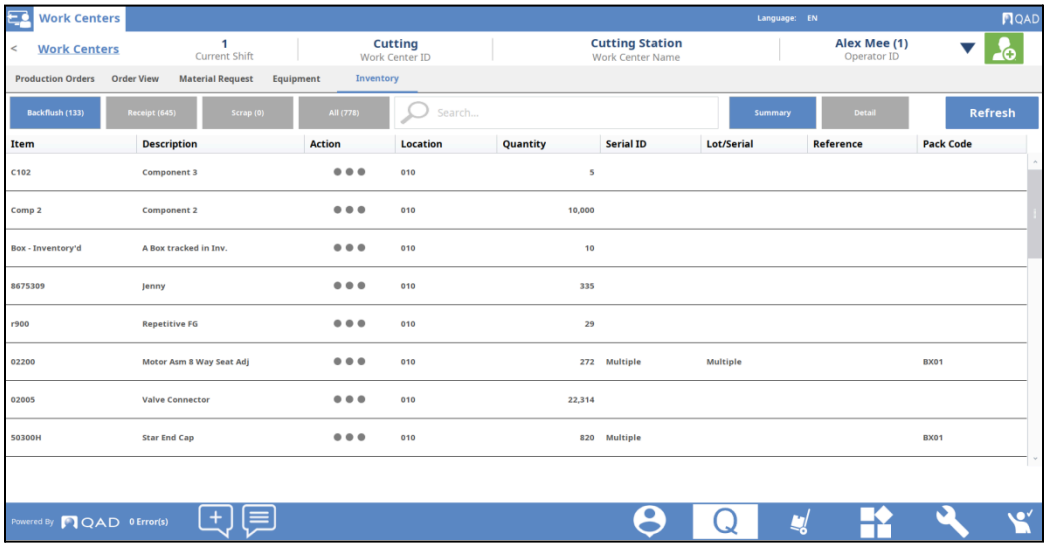




Inventory

The Inventory screen displays the inventory balances at the Backflush, Scrap and Receipt Locations configured to the Work Center. This Tab has a tab for each of the three locations that can be set up against the Work Center. In addition, there is a toggle that the user can select to switch between either a summer or detail view. The difference will be explained later. Lastly, this Tab provides the ability to perform certain actions against the inventory records. Some of the actions permitted consist of the following:

- Create a request for transfer of material,
- Pack inventory with an attached Serial ID,
- Remove materials from the current work center location.



The Inventory Tab contains the following fields:

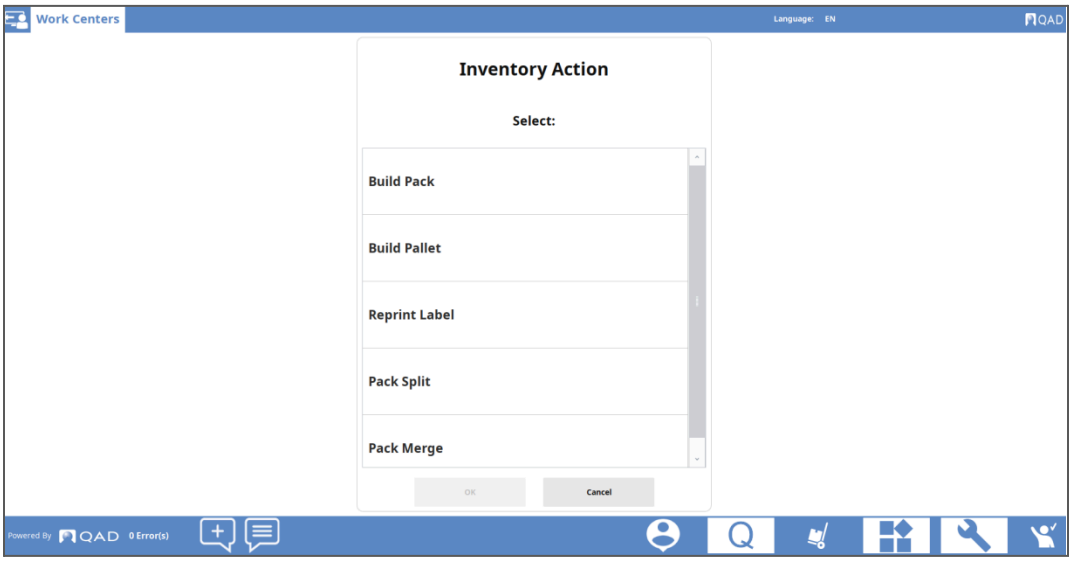
Item. Displays the item number of the raw material or finished good that is located at the work center.

Description. Displays the description of the Item.

Action. Select the Action Ellipses to perform an action against the material at the work center. The following actions are included in standard product:

- Build pack,
- Build pallet,
- Reprint label,
- Pack split,
- Pack merge.

Note: If any action can be performed against inventory the Action Ellipses will be displayed in a blue color. Otherwise this button will be a grey color, indicating there are no actions to be performed.



Location. Displays the work center location.

Quantity. Displays the item quantity that is located at the work center.

Serial ID. Displays the serial ID associated with the item located at the work center. Use top-right toggle to filter inventory by either its summary or detail. If the view is displayed by its summary, then "Multiple" Serial ID reference is displayed. Otherwise Serial ID detail is displayed.

Lot/Serial. Displays the lot/serial associated with the item located at the work center.

Reference. Displays reference information associated with the item located at the work center.

Pack Code. Displays Pack Code information associated with that item.

The message can be slightly tailored but certain aspects would require additional development effort that is not considered standard. A customer should consult with the implementation team if this is desired.

A brief explanation of what can be modified is:

- Customers can remove variables,
- Customers can reorder variables,
- Hard-Coded text can be rewritten.

Adding new variables, creating calculations or building new logic will be considered customizations.

Here is an example of an automated message:

"Quality Request created by Operator John Doe at Work Center 5400-A. Production Order 2502598 is in a Production Phase and the Equipment is in a Down – Machine Failure State."

- Variable
- Hard-Coded Text

If a request has been activated, the icon will appear with a white background. See the Quality icon below.

Select this icon to prompt for Comment Overview section, where all comments can be viewed at the terminal (see Comment Overview).

When there is an issue sending information up to the ERP, a new record will be stored here. By selecting the Error Alert box, the user will be presented with a list of all the errors at this Work Center. Details about the error can be seen if a record is selected. The PE Administration Tab titled Equipment Alarms will also display any potential error the ERP is having retrieving or reporting good data.

Displays the Work Center linked to the Comment. This is a non-editable field.

This will default to the "Active Employee". If the Employee Name needs to be modified, there is a drop down which will display a list of possible Employee Names.

Once the record is removed from this screen, a traceability record will remain in the PE Data Lake.

It is possible to restrict the visibility of comments to certain roles.

Shop Floor Supervisor Role

This section about the Supervisor Role will be of utmost importance to the Manufacturing SME. The Supervisor role will generally be given permissions to everything in PE with the exception of the Admin Tab which is reserved for the System Administrator. The Supervisor may periodically access the Operator roles, but their main functions are likely to be conducted in the various Supervisor Tabs. The Supervisor Tabs include: Order Management, Material Management and Activity Management. All of the data in these tabs will be contextual to what is expected from a supervisor. This means the information does not pertain to only a single Work Center, (in contrast to the Operator Tabs), but instead will display information related to all the Work Centers within their scope of responsibility.

It is recommended the Supervisor Role be given access to the following PE tabs:

- Overview. Displays the shop floor layout with work centers and related information. Each layout can be configured to display only those work centers relevant to each supervisor.
- Work Centers. Displays a list of all the Production Orders that have an ERP Order Status of Released and have an attached routing that goes through the given Work Center. This is the Work Center Tab that is most used by the Operators.
- Order Management. Contains functions relevant for a Supervisor to strategically manage Production Orders as well as view real-time, big picture information about the Shop Floor.
- Material Management. Displays the aggregate view of all the Material Requests that have occurred at a specific terminal mapping. Purely informational.
- Activity Management. Displays all information related to Work Center Requests, Break Time, and Employee Logins. At this level the user is able to manage data related to those activities.

As the Manufacturing SME reads this section, it is advisable to think in terms of the various scopes of responsibility that exist between different Supervisors. In some environments, supervisors will be segmented into only focusing on specific regions of the shop floor and this may impact the way PE is used on a supervisor to supervisor basis.

Overview

The Overview screen provides a visual representation of the plant. In addition, a user can view summary data about each Work Center at a glance. The Overview screen can be created with minor effort from within Production Execution. It is assumed that each customer will tailor this screen to their own shop floor. The layout is set up in a PE Administrator Tab (see Overview Tab – Admin Interaction).

There are two ways we can display the overview screen:

- Default Overview Screen
- Global Equipment Overview Screen

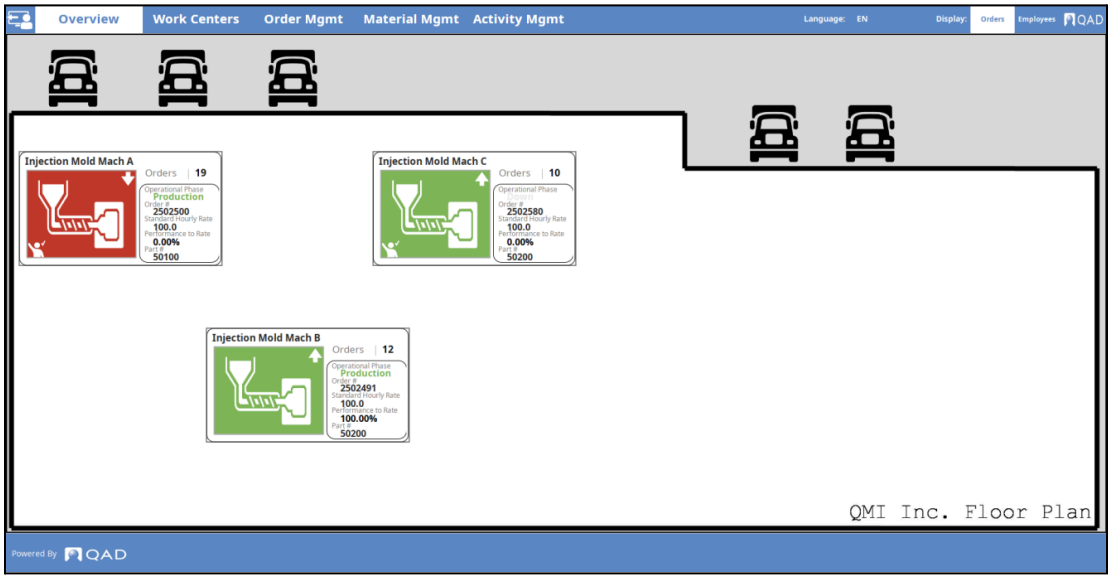
Below will describe those two views separately.

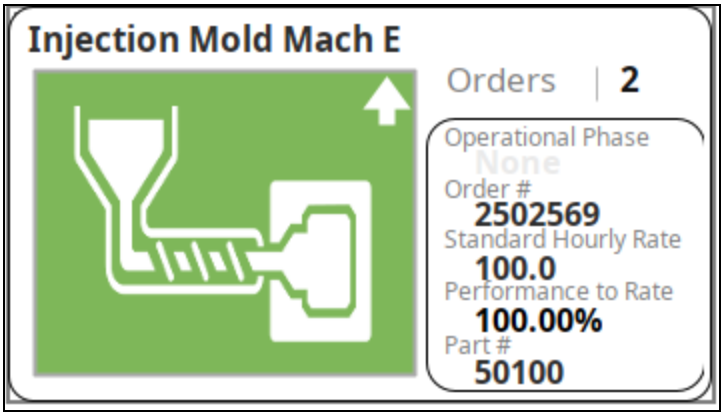
Note: This can be achieved by setting up correct Production Options (Number: 32), for more details of the Production Option see PE Production Options.

Default Overview Screen

Each window in the Overview Tab represents a work center and contextual information about the Production Orders at the Work Center. Each Work Center will always have a single Production Order that is considered the "Active Order".

This is the Order that was most recently reported against. In the Overview Tab, the detailed information in the window will be related to the Active Order. Additionally, the green or red colors seen in the image below will represent whether the equipment at the Work Center is in a state of Running or Down.





The following information can be found in the window for each Work Center:

Orders. Displays the number of Production Orders released at the Work Center.

Operational Phase. Displays the current phase of the active Production Order. Operational phases can be set up per customer requirement.

Standard Hourly Rate. Displays the standard hourly production rate that is defined in the ERP's Routing Maintenance (14.13.1).

Performance to Rate. Displays Production Performance Rate based on the calculation below.

```
Performance to Rate = ((Actual Production/Standard Hourly
Production Rate)/Earned Hours) x 100
```

Where: (either option equation can be applied)

```
Actual Production = Qty Good + Qty Scrapped,
```

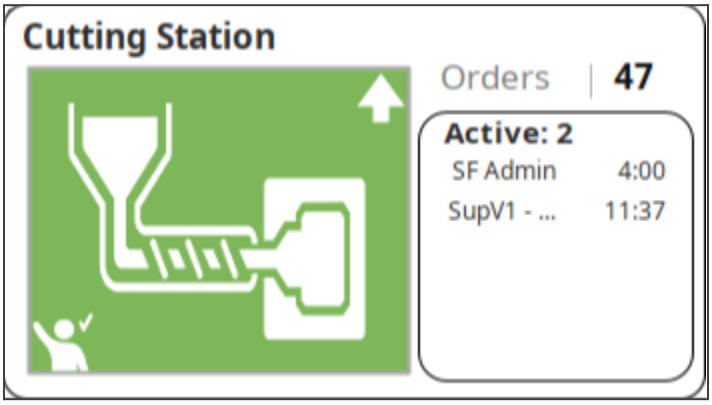
or

```
Actual Production = Qty Good
```

This calculation is updated each time the operator reports production.

Part #. Displays the item number on the Production Order.

Notice there is a toggle in the upper right corner of the Overview screen. If this Employee toggle is selected then each Work Center will display information related to Employees working at the Work Center.



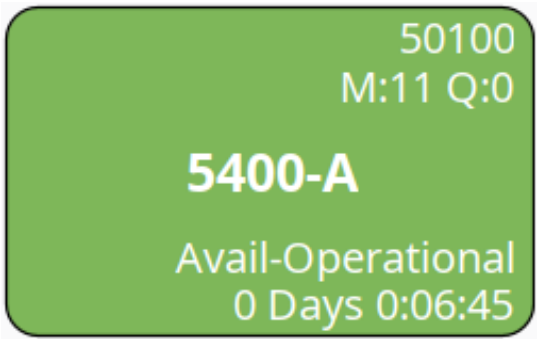
The following information can be found in the window for each Work Center:

Orders. Displays the number of Production Orders released at the Work Center.

Active. Displays the number of Employees that are currently logged in at the Work Center along with the duration of logged in.

Global Equipment Overview Screen

On this screen there are options for Equipment, Non-Prod and Employee buttons. If the Equipment button is selected then it will display information about Equipment in each Work Center.



The following information can be found in the window for each Work Center:

Part #. Displays the item number at the Work Center.

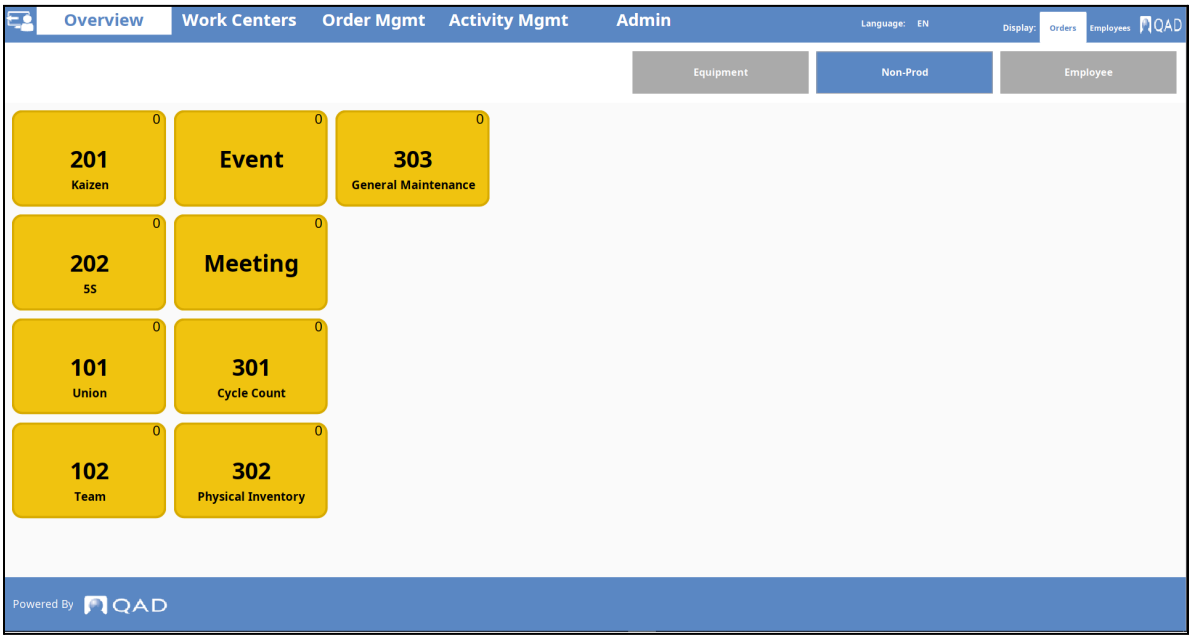
M. Displays how much the material request was made.

Q. Displays how much the quality request was made.

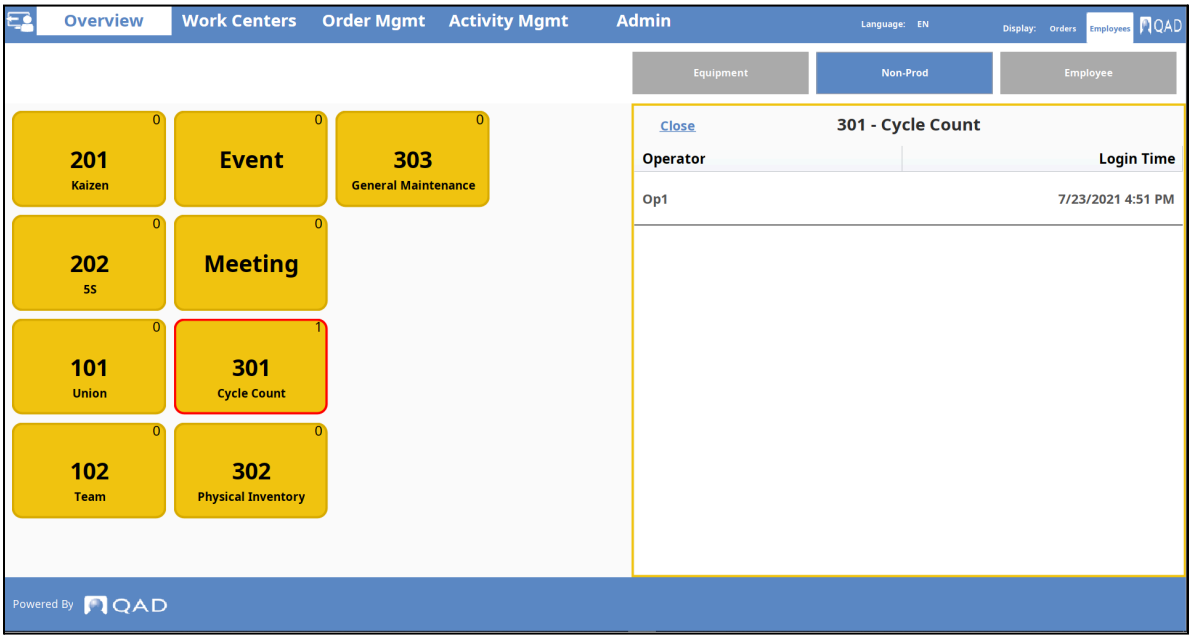
Equipment State. Displays the equipment status.

Duration. Displays the duration of the equipment status in days and time stamp (HH:MM:SS)

Notice there is a toggle Non-Prod in the upper right corner of the Overview screen, if this Non-Prod toggle is selected then it will display information about the reason code of Non Productive working for Operator.



We can select one of the reason codes of Non Productive and will display the detail of information about Operator and Login Time.



Shop Floor Supervisor: Order Mgmt

The Order Management Tab functions to provide a Supervisor the ability to strategically manage

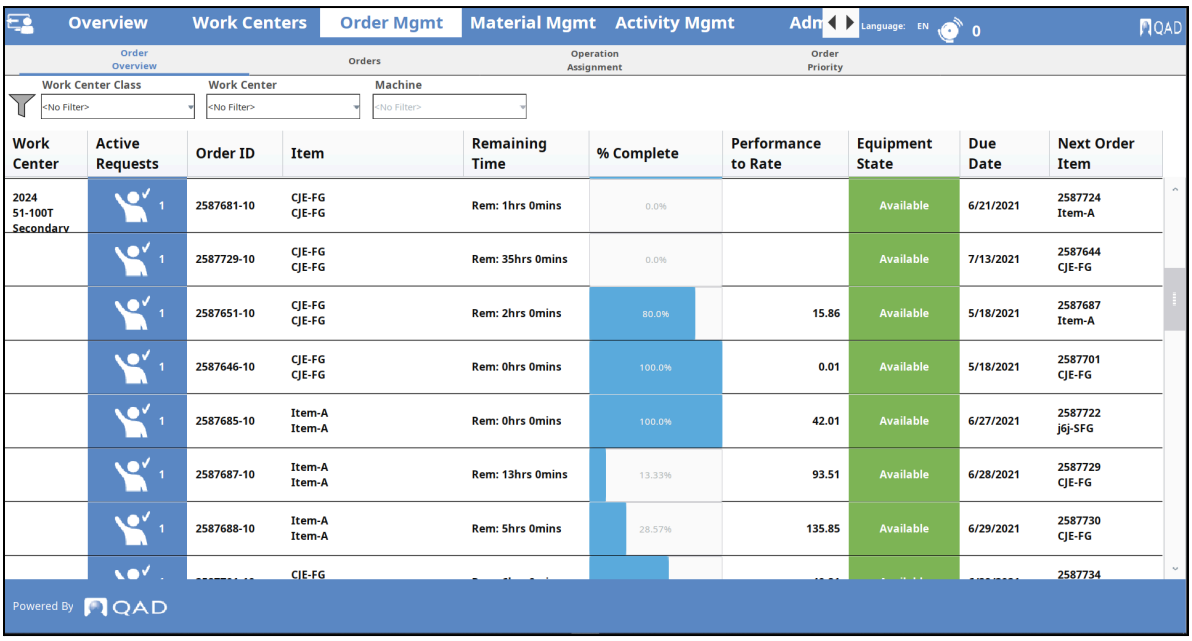
Production Orders as well as view real-time, big picture information about the shop floor.

There are three sub-tabs underneath the Orders Tab. The following will explain the three sub-tabs:

- **Order Overview**. This tab will show the overview of the Work Center Class, Work Center and Machine.
- **Orders**. This tab will show all of the Production Orders that exist in PE. The first view of this Tab shows a high-level view of the Orders, but a drop down list can be selected to view more granular information about each Operation. This Tab will also function to handle Order Reconciliation and the Closing of Production Orders. More on this later.
- **Operation Assignment**. This tab permits the Supervisor to schedule Production Orders at the Operation level. After scheduling of the Operation takes place, the routing of the Production Order will be modified.
- **Order Priority**. This tab allows the setting of a priority for Production Orders, with the option of setting a more granular priority at a given Operation. The priorities given will modify the sorting from top to bottom that the Operator will see on their "home-page", the Production Orders Tab under the Work Center View.

Order Overview

The Order Overview screen will display all Production Order data that we can choose based on Work Center Class and/or Work Center and/or Machine.



This screen also displays the following information:

Work Center. Displays the Work Center ID is created for all Work Centers that are connected to this computer and the user has access to.

Active Request. Displays if there are any active requests for the respective Work Center. This is represented by an icon with the number of request on its right side: 

Order ID. The Production Order displayed will either be the active Production Order or the next Production Order to be worked, if one isn't active

Item. Displays the Item that is assigned to the Production Order.

Remaining Time. Displays the open production quantity against the Performance to Rate.

% Complete. Displays what percentage of the Production Order has been completed.

Performance to Rate. Displays Production Performance Rate based on the calculation below.

```
Performance to Rate = ((Actual Production/Standard Hourly
Production Rate)/Earned Hours) x 100
```

Where: (either option equation can be applied)

```
Actual Production = Qty Good + Qty Scrapped, or

Actual Production = Qty Good
```

This calculation is updated each time the operator reports production.

Equipment State. Displays the current state of the machine at the related Work Center. Equipment States can be set up per customer requirement. The following equipment states are an example of how a customer might set this up:

- Available
- Down
- Idle

Due Date. Displays the Production Order due date. Following format is used: mm/dd/yyyy.

Next Order Item. Display others of the Production Order in the same Work Center.

Orders

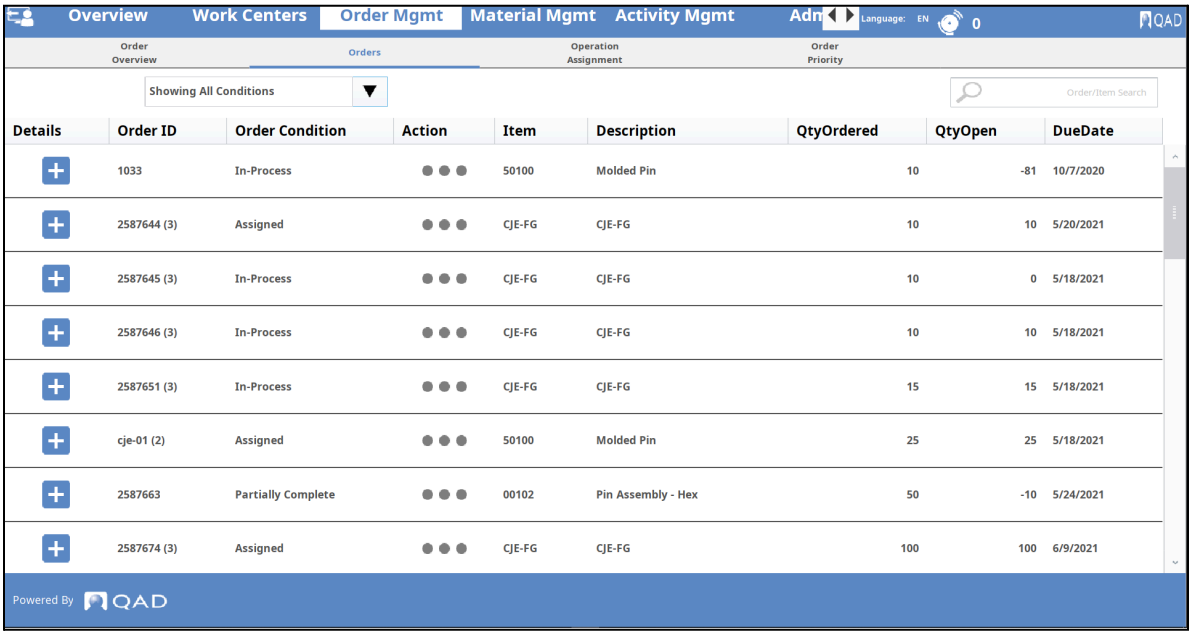
The Orders tab is the one stop shop to see the statuses of all Production Orders at each Work Center. Upon entry to the screen, a high level view with information about the overall Production Order will be displayed, we will call this the Order View. Useful information can be found here such as: the Order Condition, Total Quantity of the Order vs Total Quantity that is Open, and the Due Date of the Order.

The Order View also contains a column for Actions. The Actions column currently has two functions:

- Order Reconciliation. This action will take the user into a production reporting prompt that allows the user to input a negative or positive number. The number entered will adjust the total reported quantity good.
- Close a Production Order. This action will take the order and change the Order Condition to "Closed". By changing the Order Condition to Closed, no more actions can be taken on the order and ERP will now have the ability to change the Order Status to Closed.

This Orders Tab also has the ability to see the status at the Work Center level. This can be accomplished by selecting the plus sign to the left of each Order. This will drill down the specific Order selected and display information related to all the Operations. We will call this the Operation View.

The Operation View will show useful information about the Operation Phases of each step in the routing. It will also show the percentage that is completed at all operations in the routing. Finally, it will display the Status of the Equipment.



Details	Order ID	Order Condition	Action	Item	Description	QtyOrdered	QtyOpen	DueDate
+	1033	In-Process	● ● ●	50100	Molded Pin	10	-81	10/7/2020
+	2587644 (3)	Assigned	● ● ●	CJE-FG	CJE-FG	10	10	5/20/2021
+	2587645 (3)	In-Process	● ● ●	CJE-FG	CJE-FG	10	0	5/18/2021
+	2587646 (3)	In-Process	● ● ●	CJE-FG	CJE-FG	10	10	5/18/2021
+	2587651 (3)	In-Process	● ● ●	CJE-FG	CJE-FG	15	15	5/18/2021
+	cje-01 (2)	Assigned	● ● ●	50100	Molded Pin	25	25	5/18/2021
+	2587663	Partially Complete	● ● ●	00102	Pin Assembly - Hex	50	-10	5/24/2021
+	2587674 (3)	Assigned	● ● ●	CJE-FG	CJE-FG	100	100	6/9/2021

The Orders Tab contains the following columns:

Details. Click the plus sign in the first column to drill down to the operational details for the Production Order.

Order ID. Displays the Production Order number.

Order Condition. Displays the Production Order condition.

Action. Select Action dots to perform an action (see Production Order Actions for further details). This feature is active only when the Production Order is in "Complete" condition. The following actions are included in standard product:

- Close order,
- Adjust reported quantity.

Item. Displays the item number produced by the Production Order.

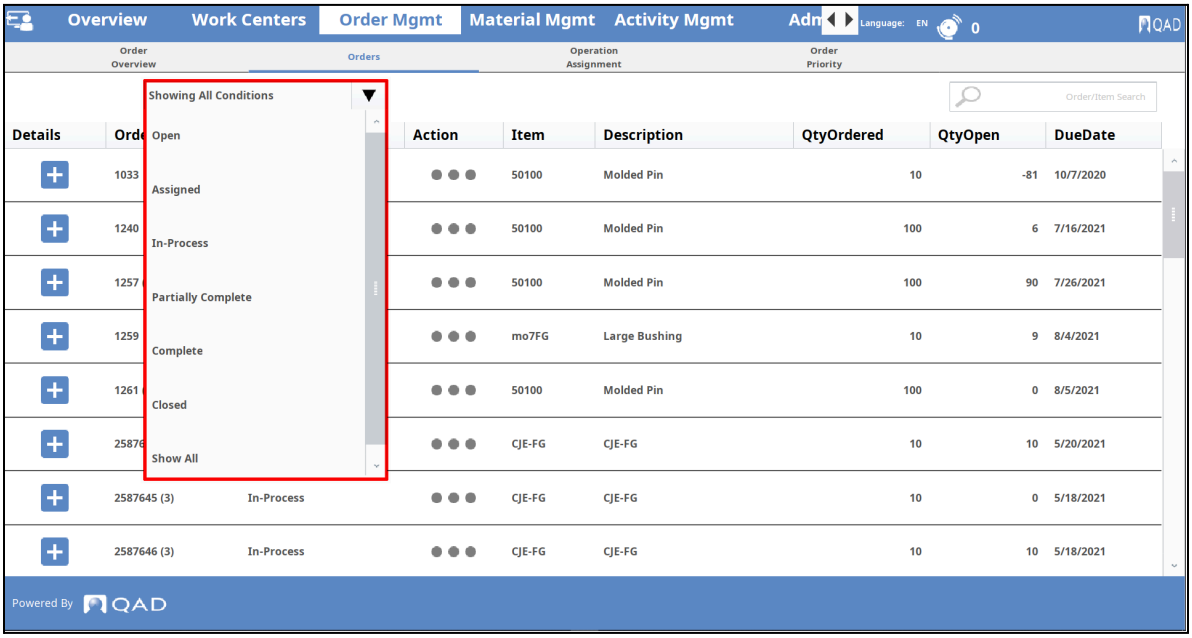
Description. Displays the description of the item number produced by the Production Order.

Qty Ordered. Displays the total quantity that was ordered.

Qty Open. Displays the quantity that remains open.

Due Date. Displays the Production Order due date. Following format is used: mm/dd/yyyy.

We can use the Showing All Conditions function to perform filtering based on the Order Condition that can be selected such as Open, Assigned, In-Process, Partially Completed, Complete, Closed and Show All.

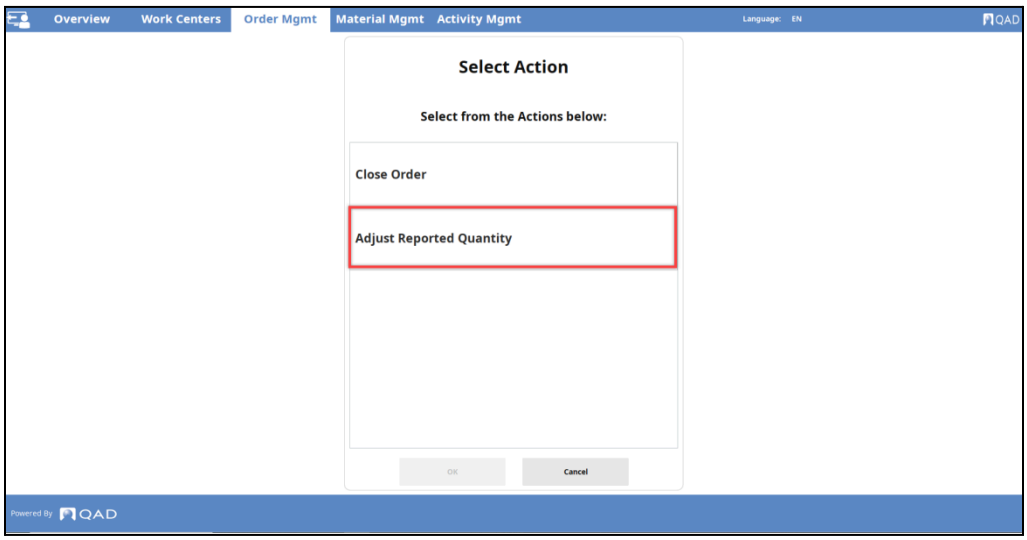


Production Order Actions

The following will describe how to perform the function under the Actions button:

Adjusting the Reported Quantity:

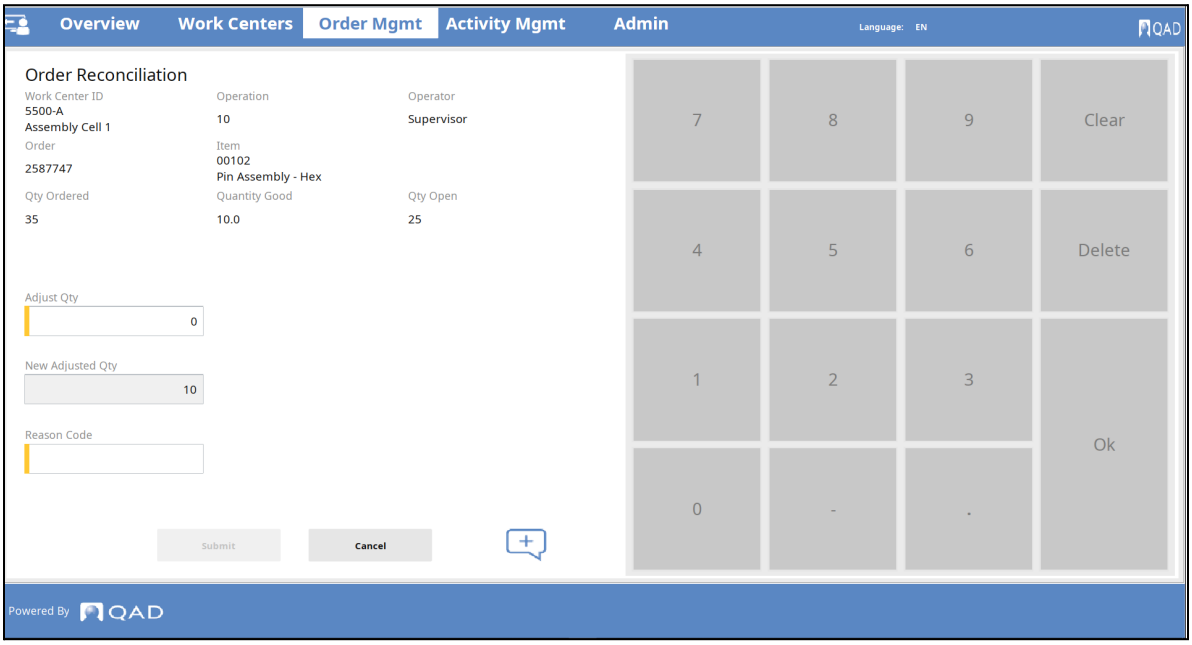
1. The Order Condition must be “Completed”. By having the Condition equal to “Completed”, we know that the Operators are done reporting their production.
2. Click the blue ellipses action icon of the Order ID.
3. After the prompt is displayed, select the option to Adjust Reported Quantity and hit OK.



A new prompt “Order Reconciliation” will be displayed that looks similar to the Production Reporting Screen (see Order Reconciliation). The user can see useful details about this Order ID at the top. The user will need to enter a positive or negative number to adjust the total quantity reported in the “Adjust

Qty" field. The field "New Adjusted Qty" will then display the difference between what was already reported and what is in the field above, "Adjust Qty". Finally, the user will need to input a Reason Code to explain why the Adjustment is taking place and then select OK once finished.

Order Reconciliation



The Order Reconciliation tab contains the following fields:

Note: All fields with a yellow left border are mandatory for this transaction.

Work Center ID. Displays the Work Center ID at which the quantity is to be adjusted.

Operation. Displays the operation number against which the production quantity is to be adjusted.

Operator. Displays the user ID of the supervisor who is adjusting the reported quantity.

Order. Displays the Production Order number which is being adjusted.

Item. Displays the item number assigned to Production Order against which the quantity is to be adjusted.

Qty Ordered. Displays the total quantity that was required to be produced against the Production Order.

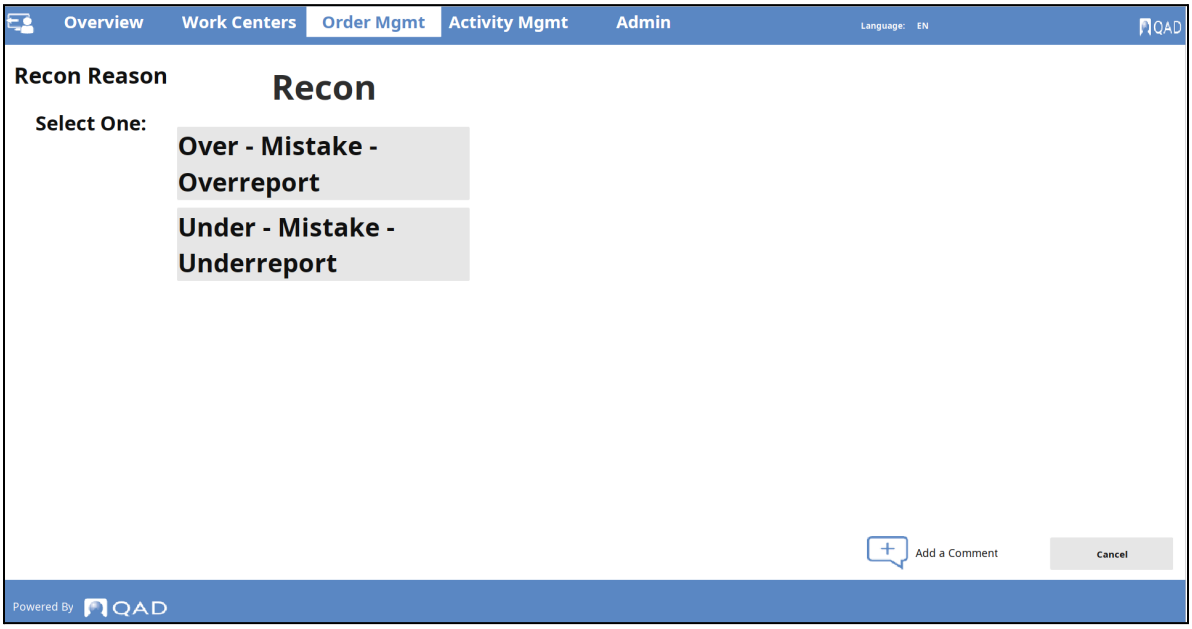
Qty Open. Displays the remaining open quantity against the Production Order.

Qty Good. Displays the total quantity of the item that was reported as good.

Adjust Qty. Enter the positive or negative adjustment quantity to correct the overall total reported against this Production Order. If a non-zero value is entered in this field, the user must enter a reason code for the adjustment. If multiple reason codes are possible, they will be displayed in a pop-up window for supervisor selection.

New Adjusted Qty. Displays the new order total produced after factoring in the adjustment

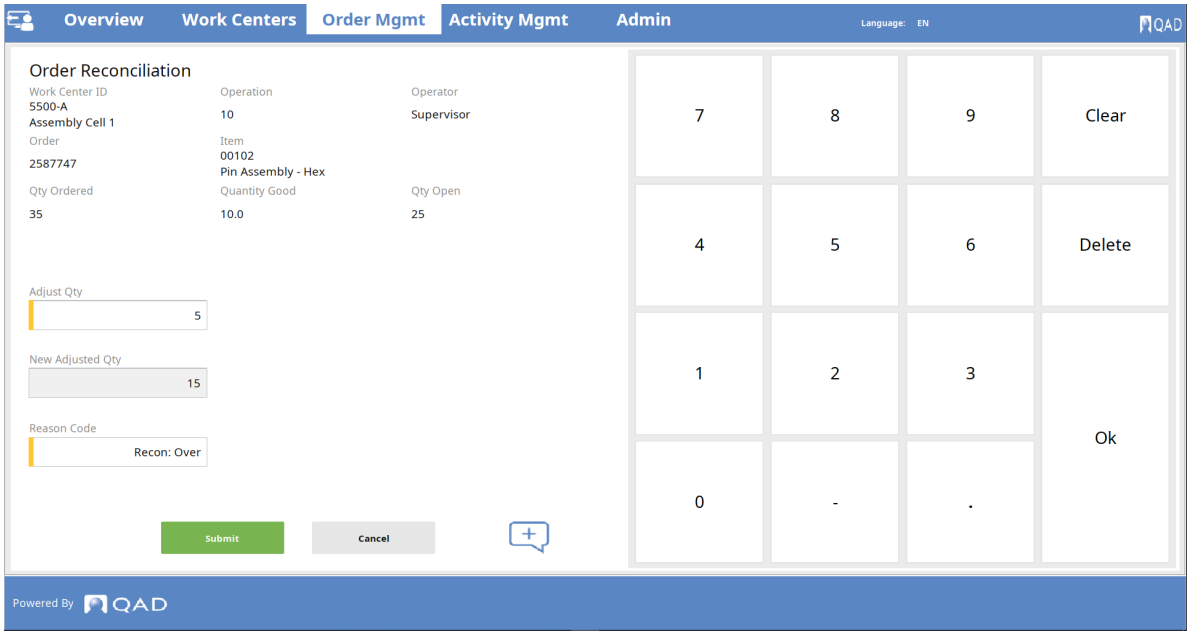
quantity.



Reconciliation Reason. Select from the list of available reason codes.

Note: The reason codes are set up at Production Execution Apps level and can be created per customer requirements. The screenshot above with its reason codes is only an example.

Note: There is also the option to input a comment by selecting the icon. This will bring the user to a prompt that allows for free form text (see Comments section). The entered comment will then be associated with this reason.



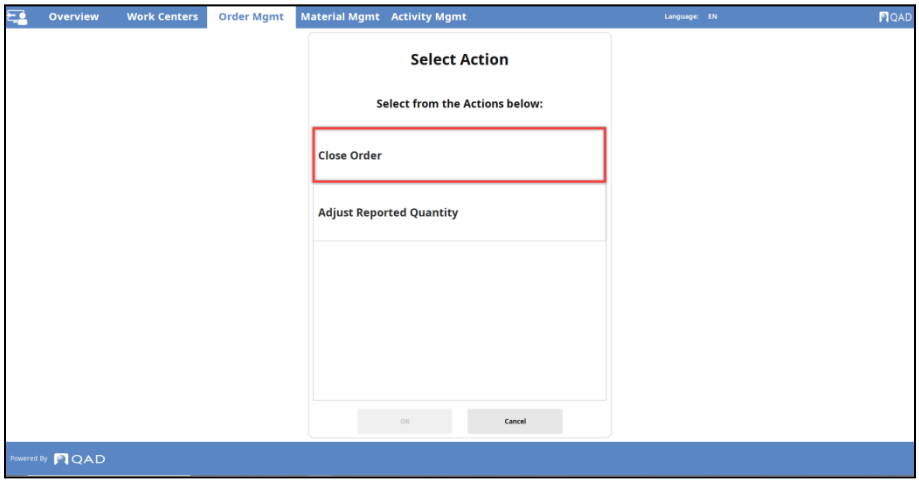
Submit. Click the submit button to confirm the adjustment.

Cancel. Click the cancel button to end the transaction and to return to the Production Order tab without committing.

Note: There is also the option to input a comment by selecting the icon. This will bring the user to a prompt that allows for free form text (see Comments section). The entered comment will then be associated with this order.

Closing an Order:

1. The Order Condition must be "Completed". By having the Condition equal to "Completed", we know that the Operators are done reporting their production.
2. Click the blue ellipses action icon of the Order ID.
3. Select the Close Order option from the prompt and hit OK. This will then take the Order Condition from Complete to Closed. Forcing the Condition to be Closed in PE is an optional step that is configurable. If there is little value in having an additional step to Close the order then this can be toggled off.



Operations View

This Operation View is for display purposes only. A user is able to view detailed information at each operation in a Production Orders routing. In the screenshot below, all the Operations (operation 10, 20 and 30) have been completed for respectively 99.5%, 90.8% and 90% of production for this Order. It would appear there has been an issue at Operation 20 as the Operation Phase is "Equipment Down". This may have something to do with the 9.1% missing.

Operation Assignment

Some customers have schedulers who manage shop floor activity at a detailed level. Others have schedulers who create and release Production Orders, while relying on shop floor supervisors to determine which Work Centers/Machines will process each Production Order. Operation Assignment provides the flexibility for properly configured items to remain unassigned until the appropriate shop floor resource makes that determination.

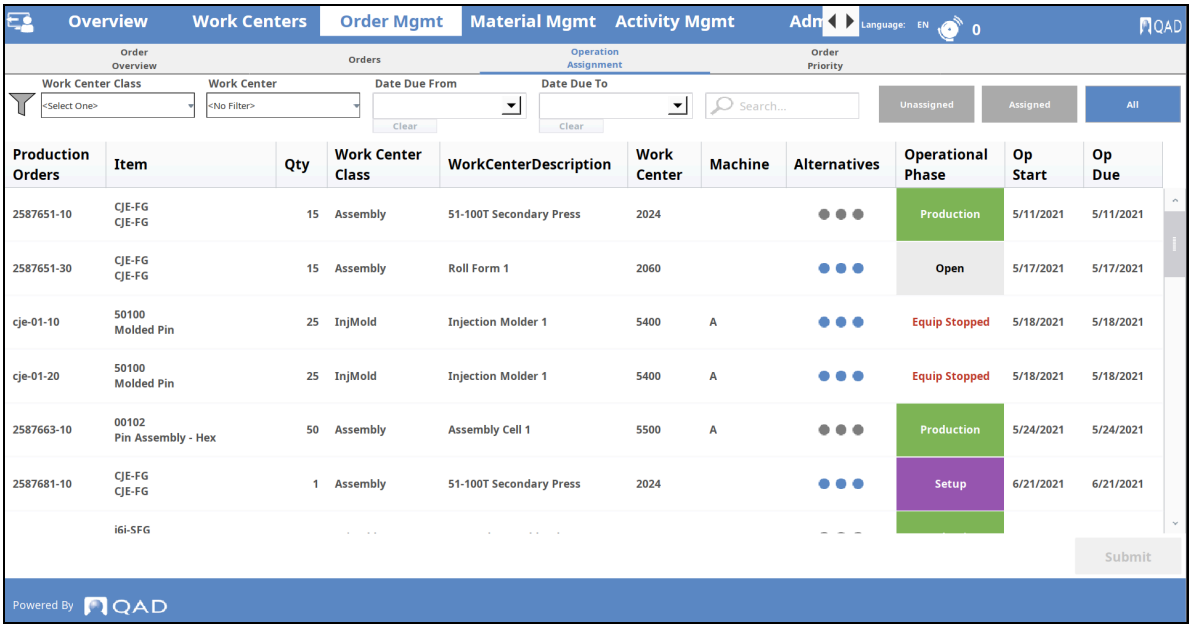
If Operation Assignment is being utilized by the customer, they will configure the routings for the affected parts in the ERP a bit differently than is normal. Rather than assigning a Work Center and Machine to a given operation, they will assign the proper Work Center, but with a Machine code of "9999." This tells PE that the routing step configured in this way has been released as "Unassigned" and it will be the responsibility of shop floor personnel to specify the Machine where the work will be performed, based on the current workload and priorities.

The benefit of using Operation Assignment is that an ERP Planner can Release Orders to a generic "Unassigned" Work Center and postpone the assignment to a specific Work Center when it is closer to being ready for work. The Planner may not have a clear picture in a Job Shop environment of the exact Work Center that will perform the work; this functionality will allow a supervisor or shop floor scheduler to make the decision instead.

The following describes the operation assignment. There are three toggled view that will be explained (All View, Unassigned View, & Assigned View):

All View

The All View displays an entire list of all the records for both Assigned and Unassigned. All the available actions in the Assigned and Unassigned tabs are possible in the All View.



The Operation Assignment Tab contains the following columns:

Production Orders. Displays the Production Order number and operation reference.

Item. Displays the item number on the Production Order.

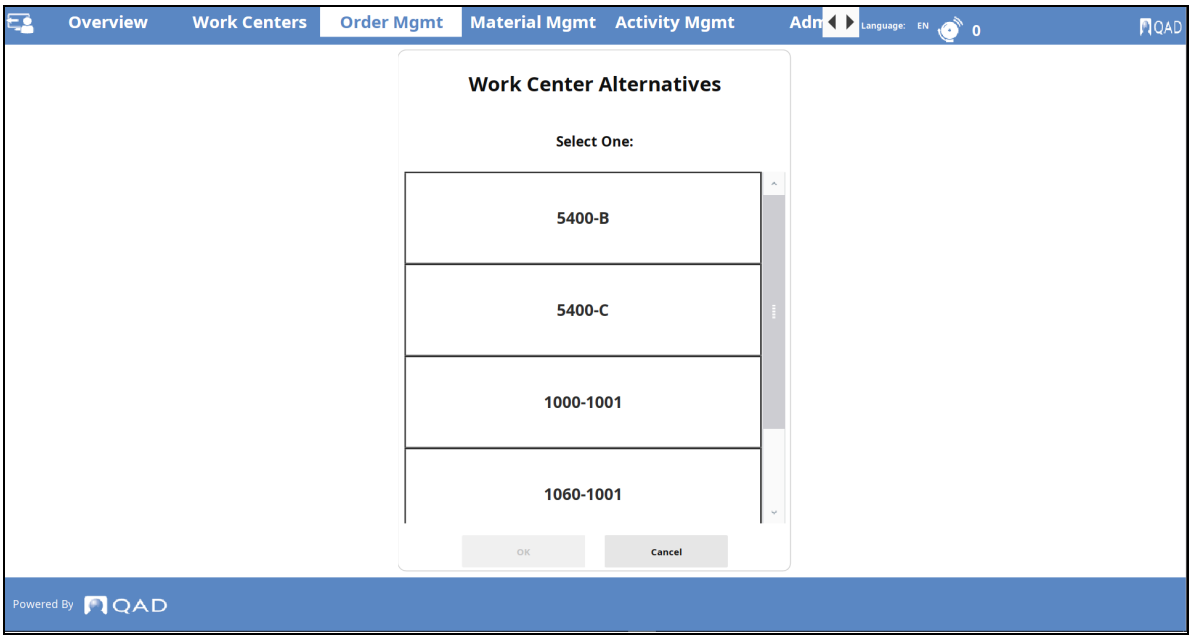
Qty. Displays total quantity on the Production Order.

Work Center Class. Displays the Work Center Class.

Work Center. Displays the Work Center description.

Machine. Displays the Machine description.

Alternatives. Displays the list of Work Centers that share the same Work Center Class. Click the Alternatives action dots to either schedule an unassigned order or to reschedule an assigned order at the Work Center. Following is an example of the Select Alternative Screen:



Operational Phase. Displays the operational phase of the Production Order.

Date Due. Displays the Production Order due date. Following format is used as standard: mm/dd/yyyy.

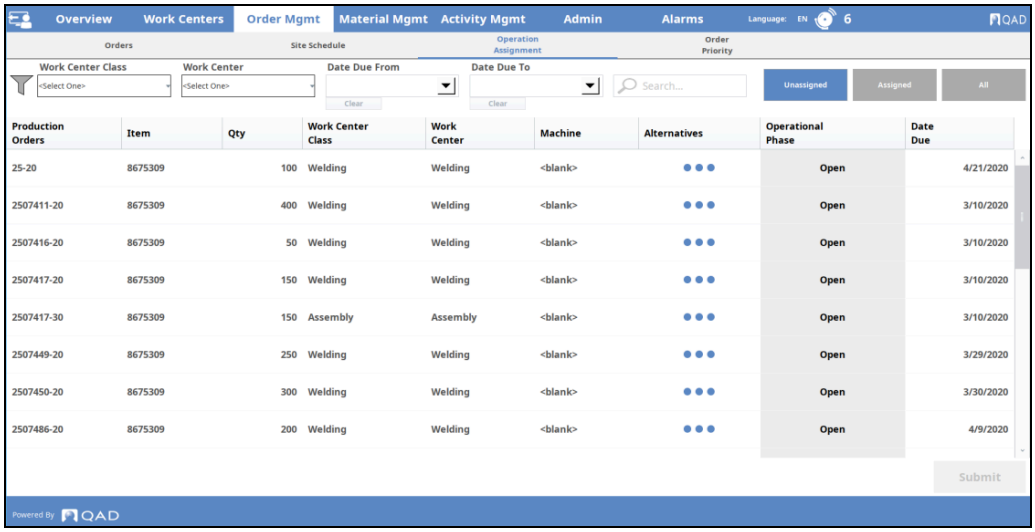
Unassigned View:

When the user enters the Operation Assignment screen it will default to the Unassigned View. This can be confirmed by noticing the Unassigned toggle is blue in the top right corner. The three toggles on the top right of the screen are predefined filters that are a quick way to focus only on desired results. Filters at the top can narrow down the results even further. In addition, there is a free form search that will make finding a specific Order ID very quick and easy.

The Unassigned Production Orders will not be displayed on any terminal on the shop floor because it has not yet been determined where the work will be performed.

Note: A Phantom Work Center is a Work Center that has been set up in the ERP, but in the PE Configuration it was decided that this Work Center/Machine combination will be identified as "Unassigned".

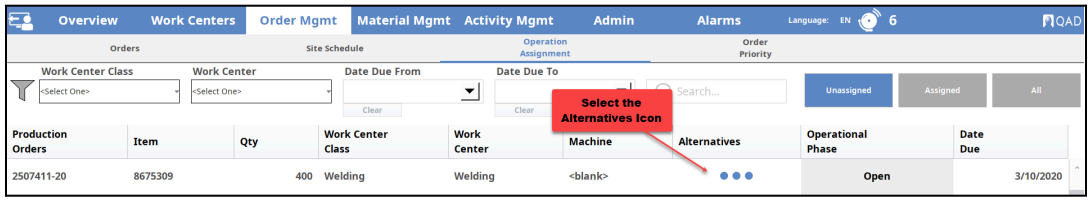
The Unassigned results will not be displayed on any terminal on the shop floor because these results are in a bit of a limbo state waiting to be Assigned.

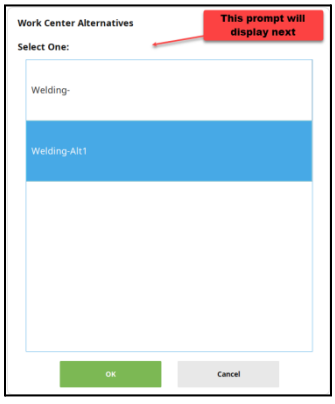


Scheduling an Unassigned Operation

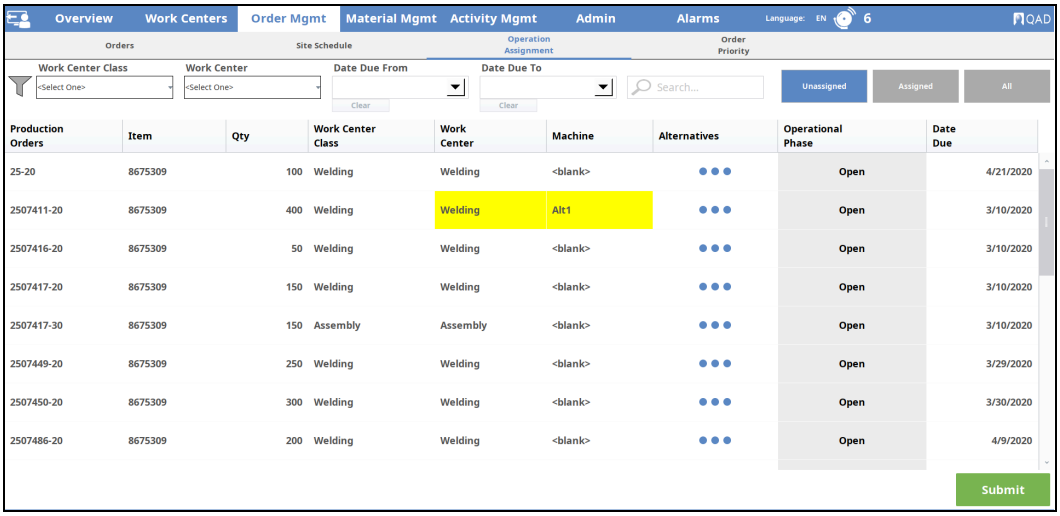
1. Be sure the Unassigned toggle is selected and then find the record you want to schedule.
2. Select the alternatives ellipses button to be prompted with a list of all the allowed Work Center/Machines that can perform the work.

   The list of alternatives is a list of the Work Center/Machines that share the same Work Center Class. The Work Center Class is a required set up that needs to be completed during the initial set up of PE.





3. Select the desired Work Center/Machine and confirm with the OK button. Once completed, the record will be highlighted in yellow and the Submit Button at the bottom of the screen will become enabled. At this point, the supervisor or shop floor scheduler can confirm the change by selecting the Submit Buttons or he/she can continue scheduling other Operations.

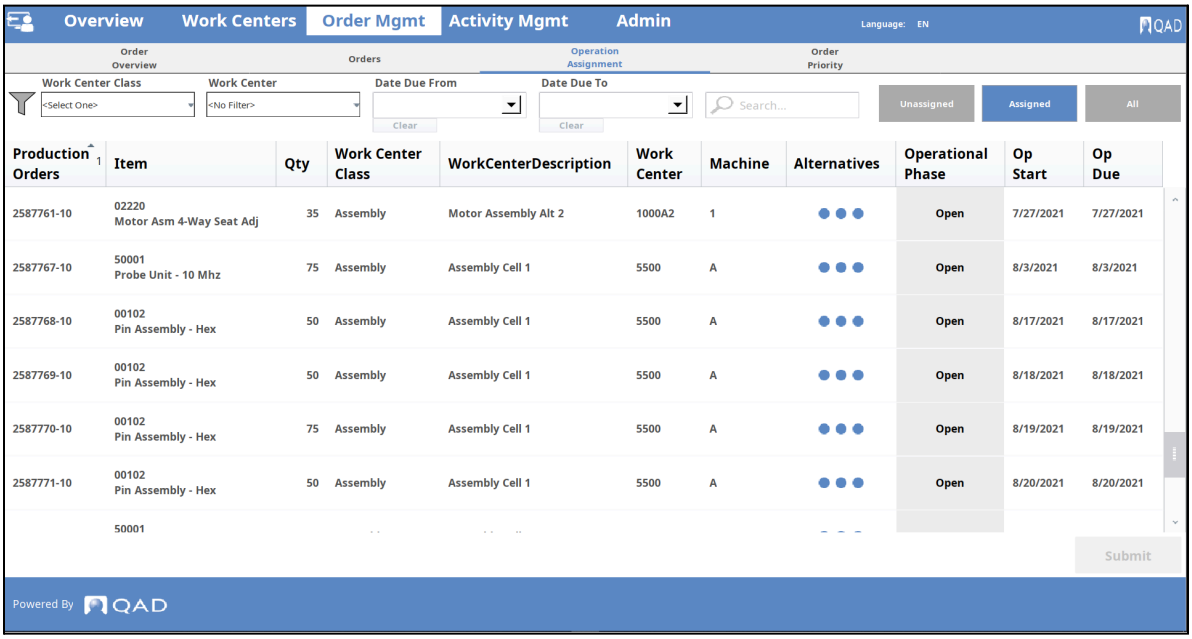


4. The modified records will now display in the Assigned view and for the Operators at the terminals of these Work Centers.

Assigned View

The Assigned toggle is the opposite of the Unassigned toggle. It will display all the Order IDs with Operations that have been assigned to a real Work Center. The records in this Assigned toggle will be displayed at the appropriate terminal for the Work Center/Machine.

The Assigned view has the ability to reschedule Operations to a different Work Center/Machine. This feature is useful if the scheduler originally selected the wrong Work Center/Machine, or if a Work Center/Machine goes down and the active Production Orders must be redistributed across other available Work Center/Machines.



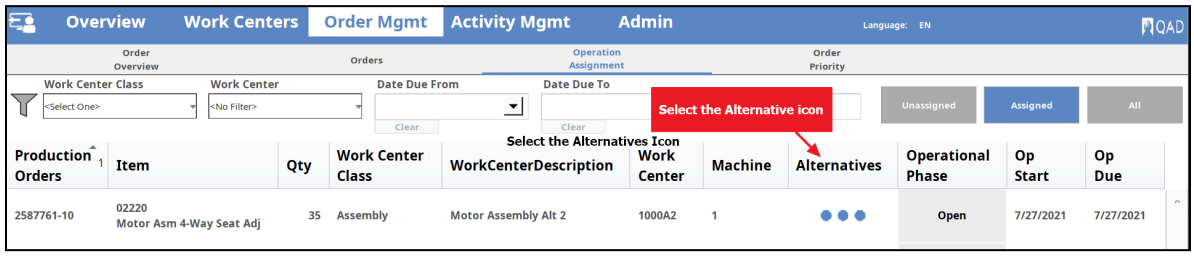
Rescheduling an Assigned Operation

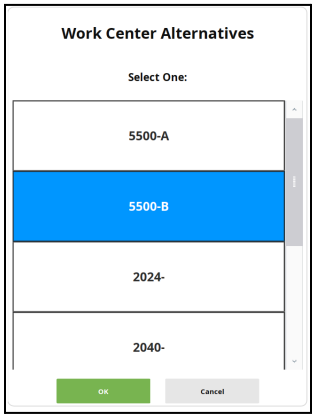
1. Be sure the Assigned toggle is selected and then find the record you want to reschedule.

   NOTE: There is a configuration to determine which Operation Phases allow rescheduling This is a prerequisite configuration that needs to be completed during the initial setup of PE. It is common to inhibit the Operation Phase of Production from rescheduling because Operators may still be working on the Order. Common Operation Phases to permit rescheduling could be Paused or Stopped.

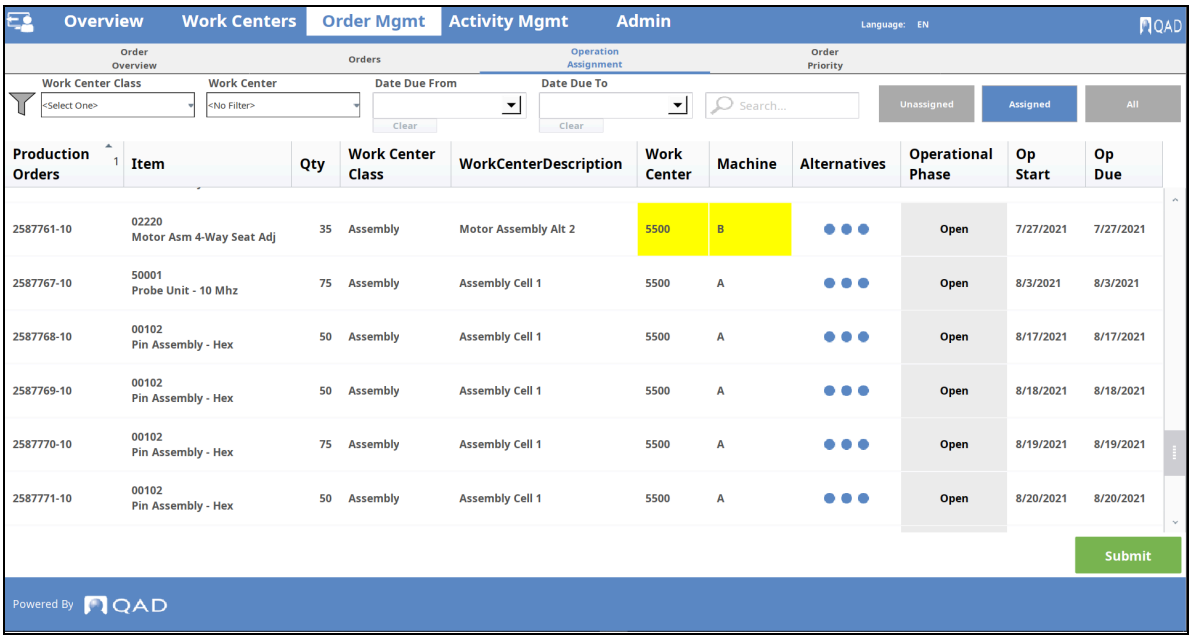
2. Select the alternatives ellipses button to be prompted with a list of all the allowed Work Center/Machines that can perform the work.

   The list of alternatives is a list of the Work Center/Machines that share the same Work Center Class. The Work Center Class is a required set up that needs to be completed during the initial set up of PE.





3. Select the desired Work Center/Machine and confirm with the OK button. Once completed, the record will be highlighted in yellow and the Submit Button at the bottom of the screen will become enabled. At this point, the supervisor or shop floor scheduler can confirm the change by selecting the Submit Buttons or he/she can continue scheduling other Operations.



4. The modified records will be updated. The records could be displayed in either the Unassigned or the Assigned Views depending on which Work Centers they were rescheduled to. Assuming the Operation of this Order ID is still scheduled to an assigned work center the Operators at the Work Center will be able to see that Order ID.

Order Priority

The Order Priority functions as a method of determining the ideal priority of either an Order or an Orders Operations. Setting the priority will impact the sorting of Order IDs on the Production Orders Tab of the Work Center. The individual determining the priority of the Orders should be someone who has close to real time knowledge of what needs to be completed on a daily or weekly schedule.

As the priorities are arranged and submitted, the sequence of orders on the Production Orders Tab of the Work Center will be modified. The idea is the Operators know to work from the top of the list throughout the day. If the Operators deviate from the suggested sorting there is no hard validation to stop them. The standard PE offering does not limit the Operator's ability to report production as this is the most critical function of our solution. Simply put, the Order Priority Tab is a communication tool to inform the Operator of the preferred production sequence for the active Production Orders.

There is a hierarchy of precedence that the sorting of Order IDs at a Work Center will take. The initial sorting will be based on a prerequisite setup that is to be completed during the initial set up of PE. This requires associating a sequence value to each one of the Operation Phases per Work Center Class.

Example:

1. Production, 2. Stopped, 3. Set up, 4. Open. The Order IDs will display top to bottom by the numerical value given to each Operational Phase.

Note: If no sequence values were given to the Operation Phases, then the Order IDs will display based on Due Date.

The next level in the hierarchy of precedence is the Order ID level. This is controlled in this Order Priority Tab. All Order IDs are defaulted to "N/A" and as the Supervisor is giving priorities to the Order IDs this will then resort to the Order IDs at the Work Centers for the Operators. If two Order IDs are given the same priority rank then it will be sorted by the sequence value given to the Operation Phases.

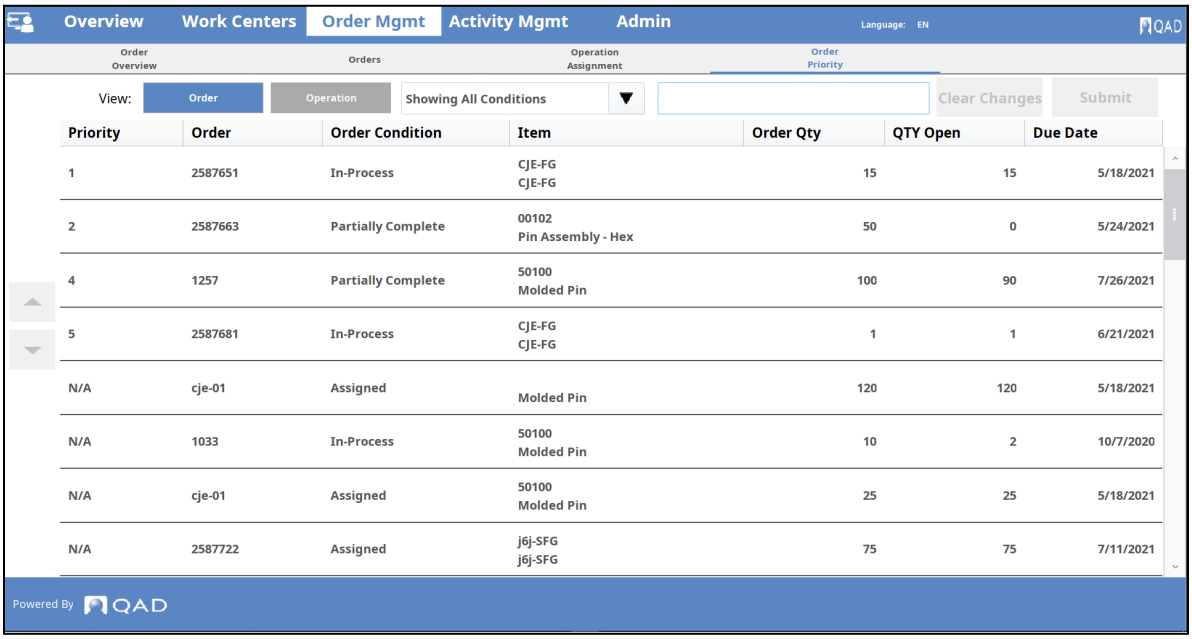
The final level of the hierarchy of precedence is the Operation level. This is also controlled in this Order Priority Tab. The Operation priority ranks are defaulted to the value that the Order ID has but a Supervisor can override this at the Operation level to give it a higher or lower rank. This is the most specific priority rank and will override all other ranks before it.

Order View

The Order View is the default view as the screen is selected. This is where the priorities are given to the entire Order and will become the default for all the Operations in the Order. This will trump the sequence priority given to the Operation Phases.

It is possible that the Order View is all that is used and the Operation View is determined to be too specific. That is perfectly okay, both the Order and Operation View can be used independently.

There could be multiple approaches to using this Order View priority. Some environments may determine all Order IDs will be given a priority each day as this will communicate to the Operators what to work on throughout the day. Another approach could be to leave the default priority the system uses, (Due Date), and only give a priority value to the Order if there is some urgency to finish a specific Order.



The Order Priority Tab with Order View contains the following columns:

Priority. Displays current Production Order priority. All Production Orders have the defaulted priority N/A.

Order ID. Displays the Production Order number.

Order Condition. Displays the current state of the Production Order.

Item. Displays the item number assigned to the Production Order.

Order Qty. Displays the total quantity of the item number to be built against the Production Order.

Qty Open. Displays the quantity of the item number that remains open.

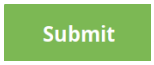
Due Date. Displays the Production Order due date. Following format is used: mm/dd/yyyy.

Assigning an Order Priority

There are three methods of assigning an Order Priority:

1. Click on the priority cell (N/A) of the record that needs to be modified and type in a new priority value,
2. Drag and Drop the entire row up or down as desired,
3. Use the Up and Down Arrows to the left of the screen to change the priority value.

As the records are modified the priority cell will be highlighted in blue to indicate a change has been made.

Continue making changes as desired and when complete, click the 

button to confirm the changes.

If mistakes have been made and it is desirable to undo the recent changes, select the 

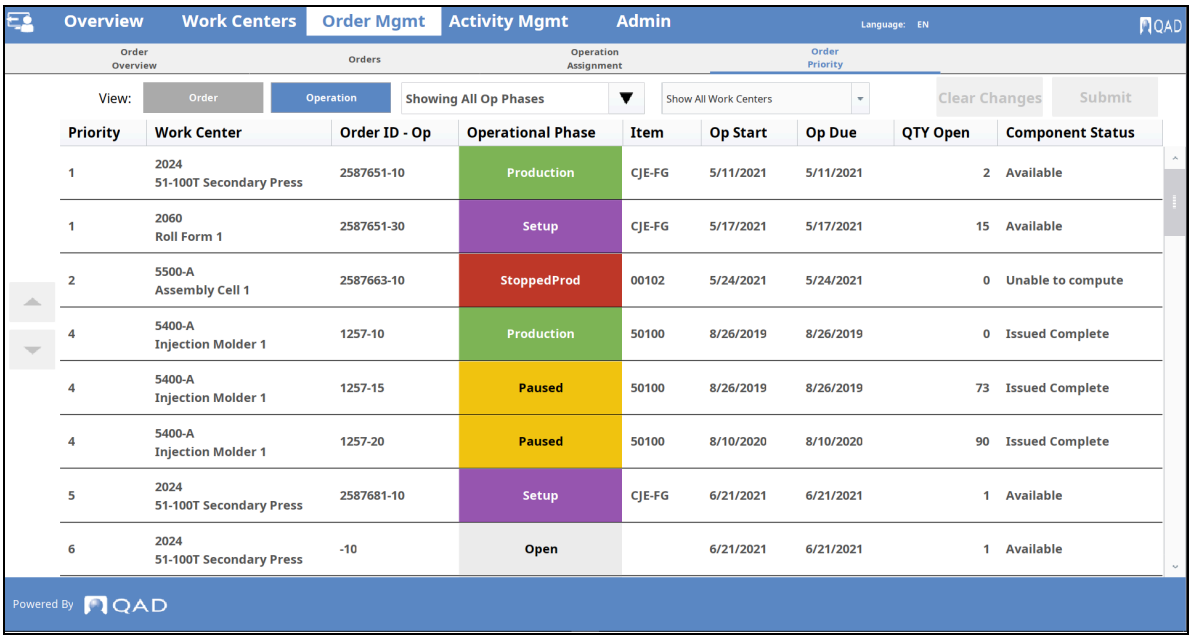
button.

The drill down labeled “Showing All Conditions” is there to help narrow the results. By selecting this drill down a list of the possible Order Conditions will be displayed. Select which Conditions to be displayed. If a specific Order ID or Item needs to be found, type the value in the free form text labeled “Order/Item Search”.

Operation View

The Operation View is the most granular method of defining priorities. This will trump all priorities given before it.

The priorities of the Operation are always defaulted to the values of the Order but once the Operation priority is modified the Order priority will no longer have an effect on the Operation priority.



The Order Priority Tab with Operations View contains the following columns:

Priority. Displays the current Production Order priority. All Production Orders have the default priority N/A.

Work Center. Displays the Work Center description.

Order ID-Op. Displays the Production Order number and operation reference.

Operational Phase. Displays the current phase of the Production Order. Operational phases can be set up per customer requirement.

Item. Displays the item number assigned to the Production Order.

Due Date. Displays the Production Order due date. Following format is used: mm/dd/yyyy.

Qty Open. Displays the quantity of the item number that remains open.

Component Status. Displays the status of the components that are necessary to produce the Item Number on this Production Order. This is information only. The current Component status can be one of the following:

- Available
- No Component
- Shortage
- Issued complete
- Projected shortage

Assigning an Operation Priority

There are three methods of assigning an Operation Priority: (same as the method from the Order Priority)

1. Click on the priority cell (N/A) of the record that needs to be modified and type in a new priority

value.

2. Drag and Drop the entire row up or down as desired.
3. Use the Up and Down Arrows to the left of the screen to change the priority value

As the records are modified the priority cell will be highlighted in blue to determine a change has been made. Continue making modifications as desired and once complete, select the Submit button to confirm the changes. If mistakes have been made and it is desirable to undo the recent changes, select the Clear Changes button.

Shop Floor Supervisor: Material Mgmt

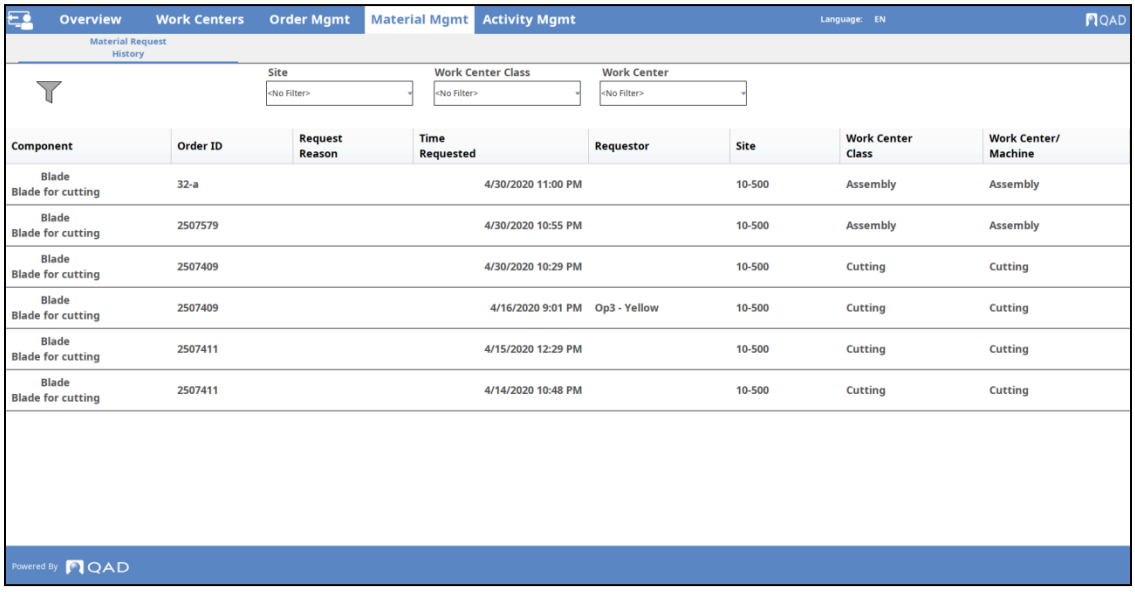
The Material Mgmt function provides an aggregate view of all the Material Requests that have occurred, linked to a specific terminal mapping. Currently this is for information only and there is only one Tab for Material Mgmt. The future roadmap for Production Execution will likely include more functionality in this area. This section will usually be accessible only by a supervisor.

Material Request History

The Material Request History Tab is a display only tab that shows the aggregate of all the Material Requests that have occurred, linked to a specific terminal mapping. Recall that the terminal mapping is a required step when initially setting up PE. The terminal mapping is defined by PC Name which Work Centers are accessible.

This Material Request History Tab will show a Supervisor which Work Centers are requesting material. Other interesting information can be found in this tab such as: the request Reason Code, the time stamp when it was requested, and the individual who initiated the material request.

Users can filter the requests by Site, Work Center Class, and Work Center.



The Material Request History tab contains the following columns:

Component. Displays the component description associated with the material request.

Order ID. Displays the Production Order number associated with the material request. Request Reason. Displays the request reason for the material request.

Time Requested. Displays the date and time the material request was made.

Requestor. Displays the user who created the material request.

Site. Displays the site associated with the material request.

Work Center Class. Displays the Work Center Class associated with the material request.

Work Center/Machine. Displays the work center associated with the material request.

Shop Floor Supervisor: Activity Mgmt

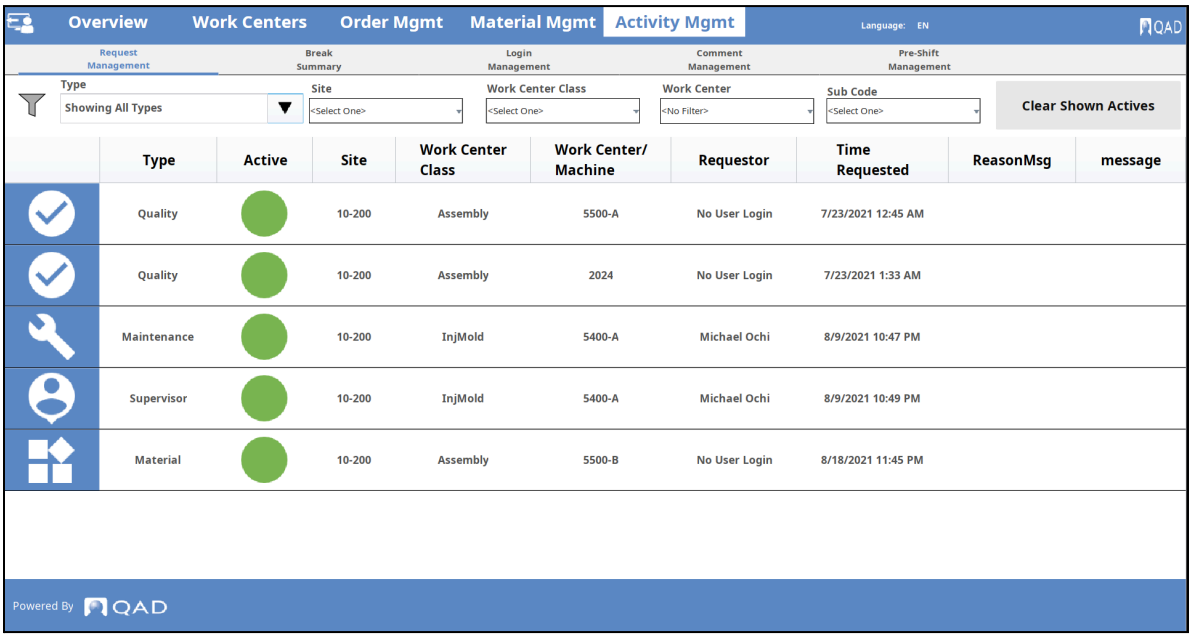
The Activity Mgmt functions will usually be accessible only by a supervisor. The Activity Management functions are related to the management of Work Center Requests, Break Time, and Employee Logins. At this level, the user is able to manage data related to those activities.

Request Management

The Request Management Tab is for the Supervisor to see all the active requests for the Work Centers that fall within his/her responsibility. The supervisor will only see requests that are from the Work Centers that belong to his/her Terminal Mapping. Recall that this was configured during the initial set up of PE.

From this Tab the Supervisor can easily see all active requests and determine what actions may be necessary. For example, if there is a request that has been active for a long time, it may be necessary to follow up to make sure there isn't a larger issue at hand.

If, at the end of the day or shift, there are still pending requests that should not be active, the Supervisor can clear all requests with the click of a button. Users can filter the requests by its Type, Site, Work Center Class, and Work Center.



The Request Management tab contains the following columns:

Type. Displays the Request type.

Quality. A request for quality inspection for items at this specific Work Center and on this Production Order.

Supervisor. A request for an action to be performed by the supervisor/team lead at this Work Center.

Fork truck. A request for transferring materials using a Fork Truck at this specific Work Center location.

Materials. A request for replenishment of materials at the Work Center.

Maintenance. A request for maintenance on the equipment at the Work Center.

Active. Displays whether the request is activated or not. Green represents an active request and grey represents a deactivated request.

Site. Displays the site associated with the material request.

Work Center Class. Displays the Work Center Class associated with the material request.

Work Center/Machine. Displays the Work Center and the Machine associated with the material request.

Requestor. Displays the User ID of the employee who created the material request.

Time Requested. Displays the date and time the material request was made. Time format is mm/dd/yyyy hh:mm.

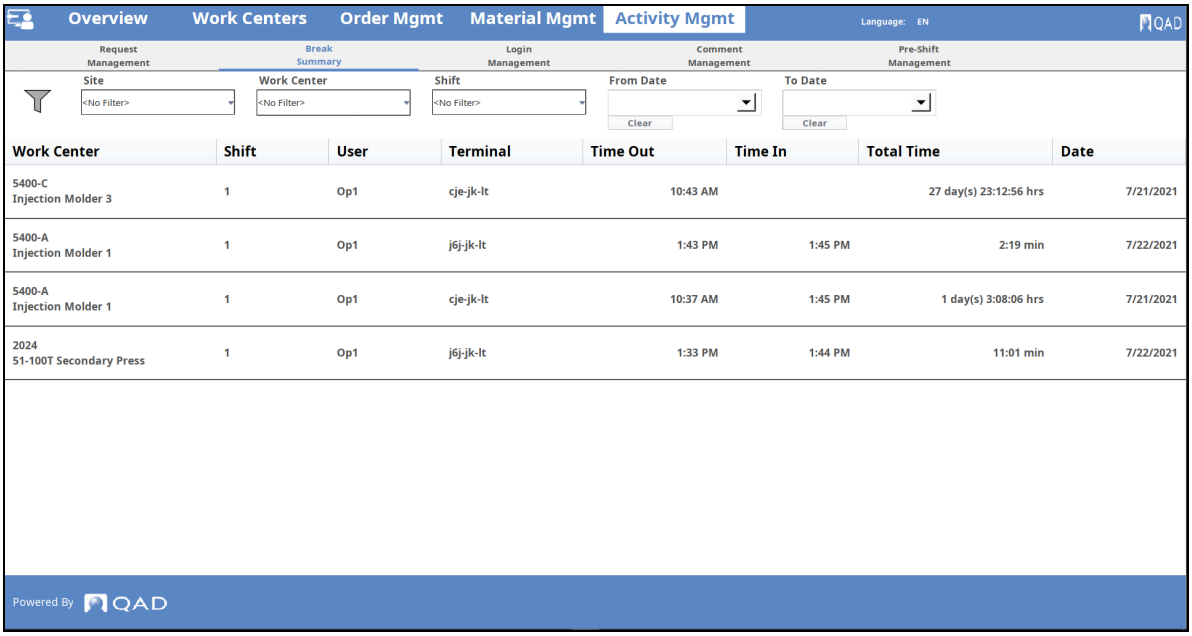
ReasonMsg. Displays the type of reason message associated with the material request.

Message. Displays the message associated with the material request.

Break Management

The Break Management Tab is for the Supervisor to see all the breaks that employees have taken. It includes information such as; time stamps when they occurred, break duration and which shift it was on. Break records include the terminal at which the break was initiated/ended. A Supervisor can manage employee breaks by updating the records accordingly.

For example, if a user forgets to log in after ending his break, a Supervisor can find the record and modify the time stamps as needed. The process to modify a break record is simple, the Supervisor will select the row in this table and will find a new prompt that will permit the editing of time stamps, duration and date. Users can filter the break records by Site, Work Center, Shift and Dates (From Date and To Date).



The Break Summary tab contains the following columns:

Work Center. Displays the Work Center associated with the break record.

Shift. Displays the shift associated with the break record.

User. Displays the user who took the break.

Terminal. Displays the terminal used to log the break.

Time Out. Displays the time the user logged out for the break.

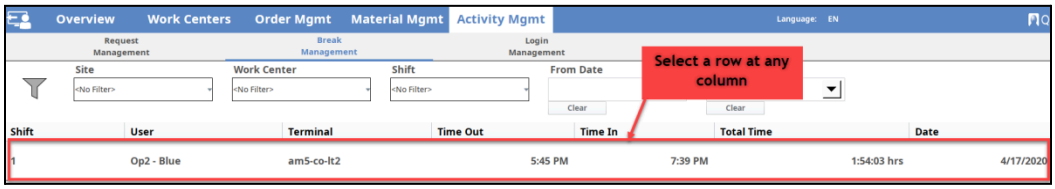
Time In. Displays the time the user logged in from the break.

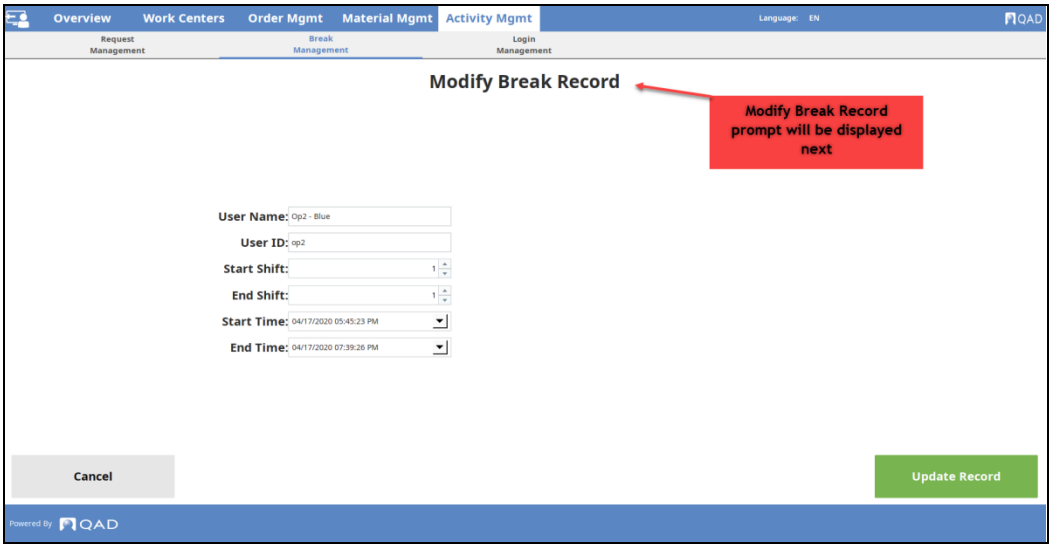
Total Time. Displays the total length of time on break.

Date. Displays the date the break was taken. Following date format is used: mm/dd/yyyy.

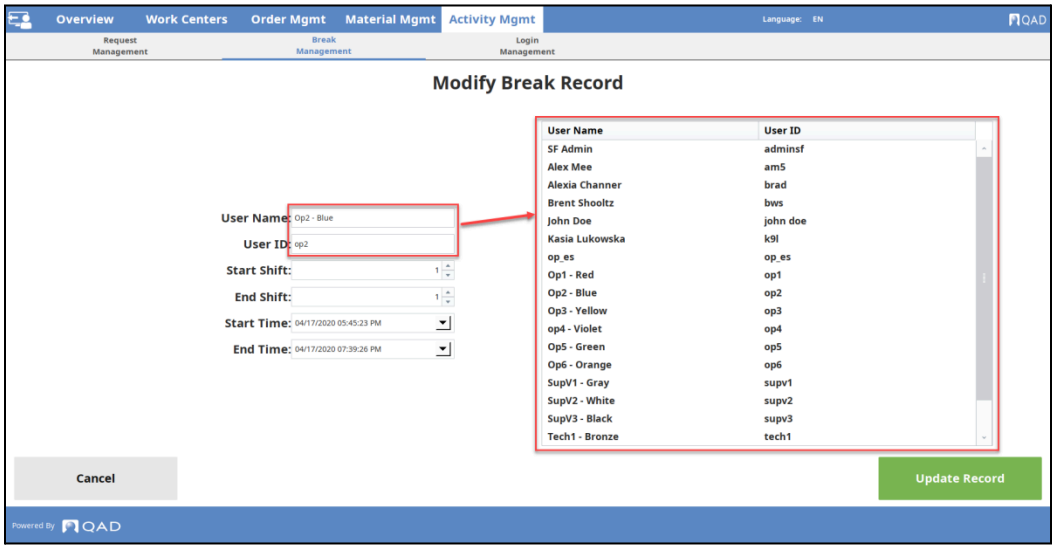
Modifying Break Record:

1. Select the break record row to be modified.

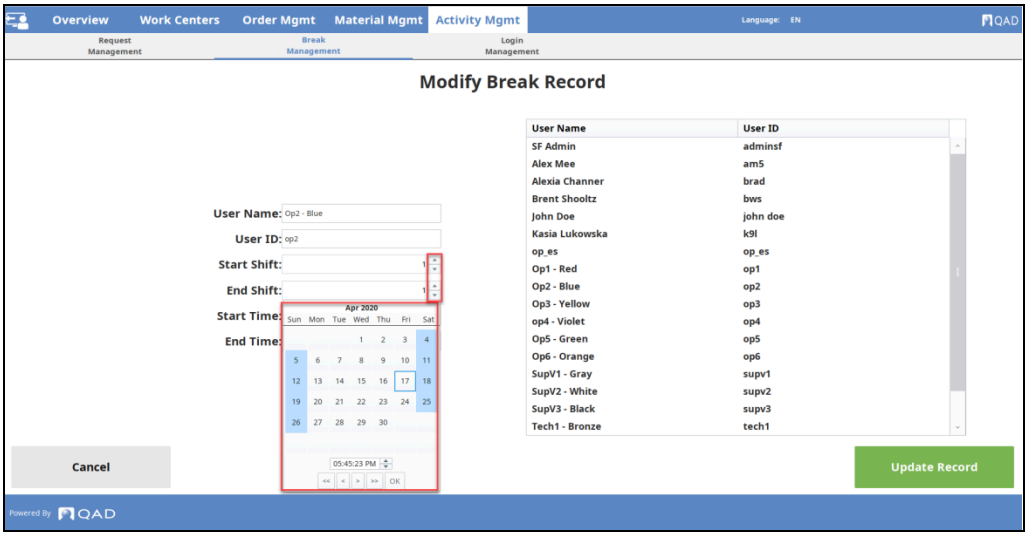




2. The Start Time and End Time default from the original Break Time entries, but these can be modified by selecting the cell and editing the records. If the User Name and ID are to be changed, select one of those fields to open the User Browse.



3. Next, use either the up and down arrows or manually enter the number of the shift to be changed. Finally, use the drop down arrow in the Start and End Time fields to open the calendar view to modify the posting.



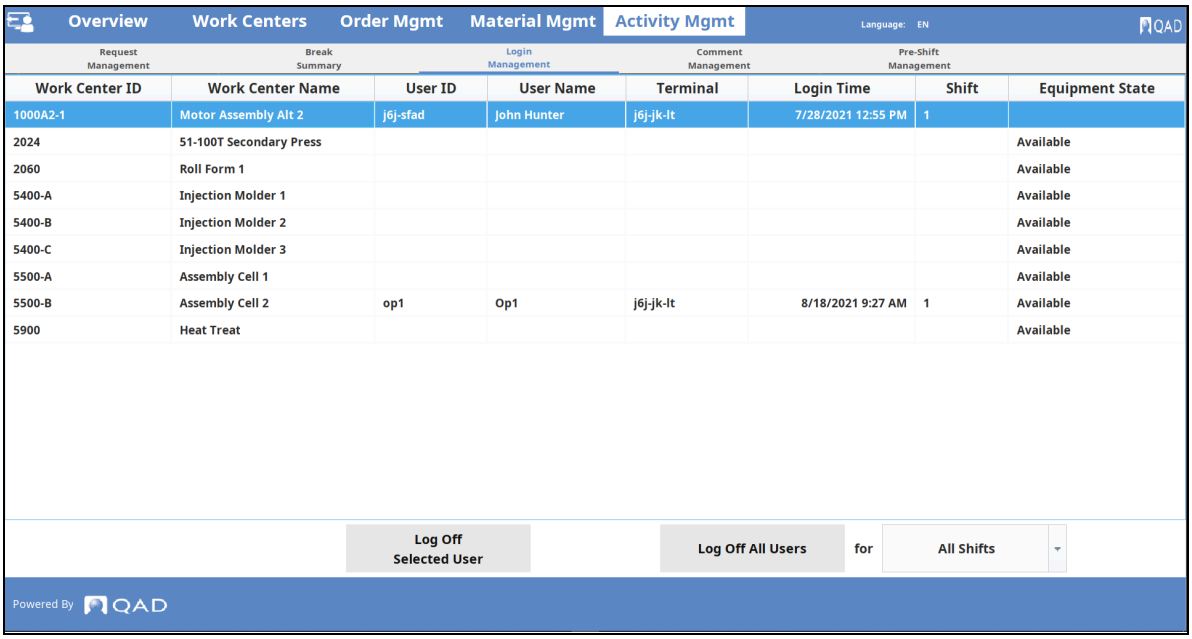
4. Select the desired User Name and ID, Shift and Time frames and confirm with the “Update Record” button. Once completed, the modified record will be updated and displayed in the Break Management tab.

Login Management

The Login Management Tab is for the Supervisor to see and manage all employees that are logged into PE at the plant. The view will display a row for each Employee that is logged into a Work Center. A supervisor can also see in this Tab the Equipment State of the Work Center. This is helpful because if the Equipment State is “Down”, a Supervisor can see if Operators are accruing wasteful downtime labor.

The main function of this Tab is to provide the Supervisor the ability to log off a desired Employee. This can be accomplished by two methods:

1. Highlight the record and select the “Log off Selected User” button.
2. Modify the Shift button at the bottom and then select the “Log Off” button to log out all the employees based on the selected shift criteria.



The Login Management tab contains the following columns:

Work Center ID. Displays the Work Center ID at which the user is logged in.

Work Center Name. Displays the Work Center description at which the user is logged in.

User ID. Displays the ID of the user who is logged in at the work center and from which terminal.

User Name. Displays the name of the user who is logged in at the work center and from which terminal.

Terminal. Displays the terminal at which the user is currently logged in.

Login Time. Displays the time the user logged in at the work center. Following is the date format used: mm/dd/yyyy hh:mm.

Shift. Displays the shift associated with the login record.

Equipment State. Displays the current state of the equipment at the work. States can be set up per customer requirement. The following equipment states are included in the standard system:

- Available
- Down
- Idle

There are two log off options:

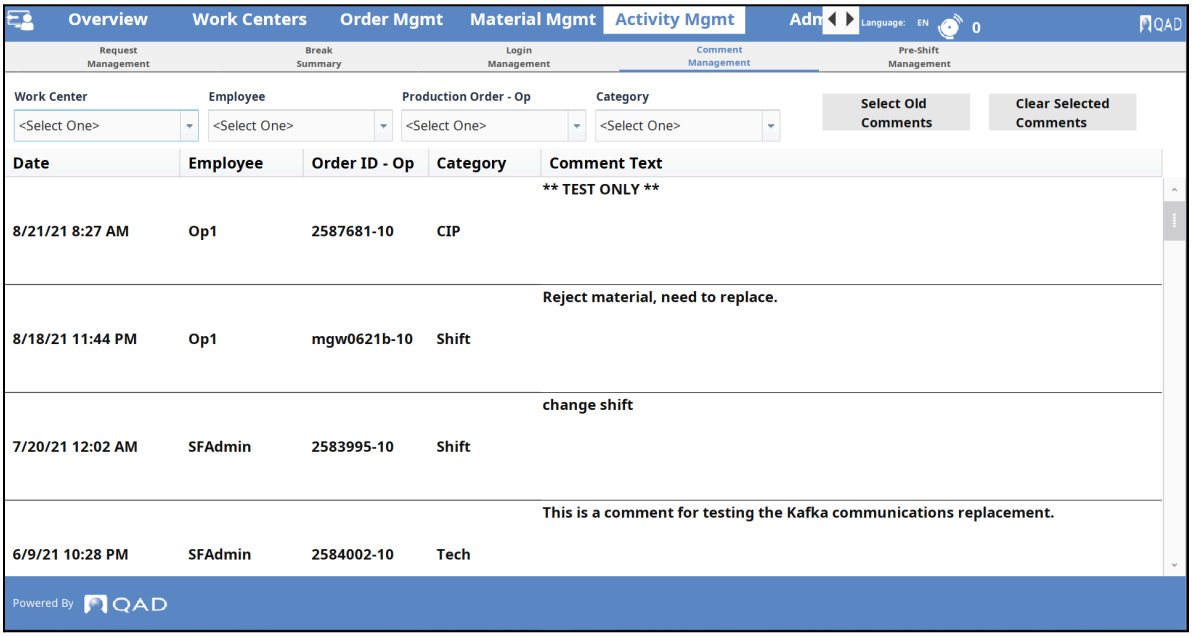
- Log Off Selected User, will log off according to the selected user.
- Log Off All Users, will log off based on a specific Shift or all Shifts.

Comment Management

The Comment Management Tab is for the Supervisor to see all the comments that employees have submitted. It includes information such as; time stamps when they submit the comment, Employee ID,

Order ID and Operation, Category of comment and Comment Text.

Users can filter the data by Work Center, Employee, Production Order & Operation and Category.



The Comment Management tab contains the following columns:

Date. Displays the timestamp of the comment submitted.

Employee. Displays the Employee ID who submitted the comment.

Order ID - Op. Displays the Order ID and Operation of the comment submitted.

Category. Displays the Category of the comment submitted.

Comment Text. Displays the Comment Text of the comment submitted

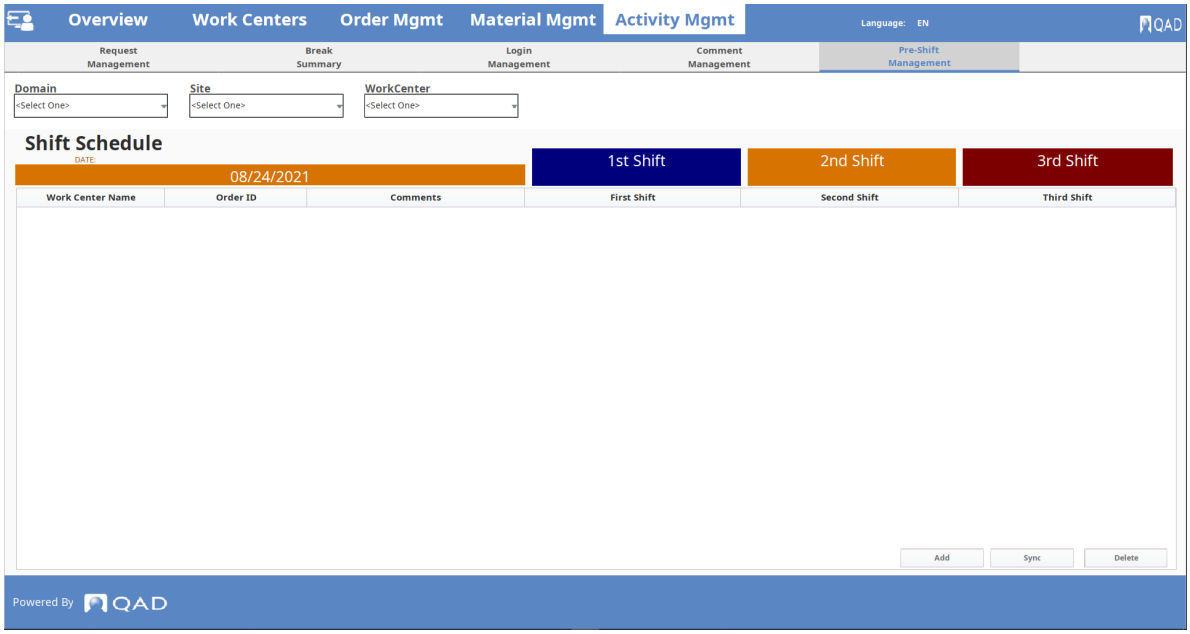
There are two buttons to use:

Select Old Comments.

Clear Selected Comments. Select some comments then select this button to clear the selected comments.

Pre-Shift Management

The Pre-Shift Management Tab is for the Supervisor to see all the comments that employees have submitted per Shift, users can filter the data by Domain, Site and Work Center.



The Pre-Shift Management tab contains the following columns:

Work Center Name. Displays the work center name of the comment submitted.

Order ID. Displays the Order ID of the comment submitted.

Comments. Displays the Comment Text of the comment submitted

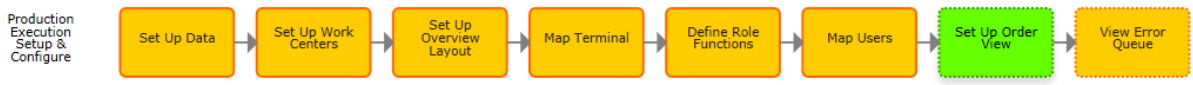
First Shift.

Second Shift.

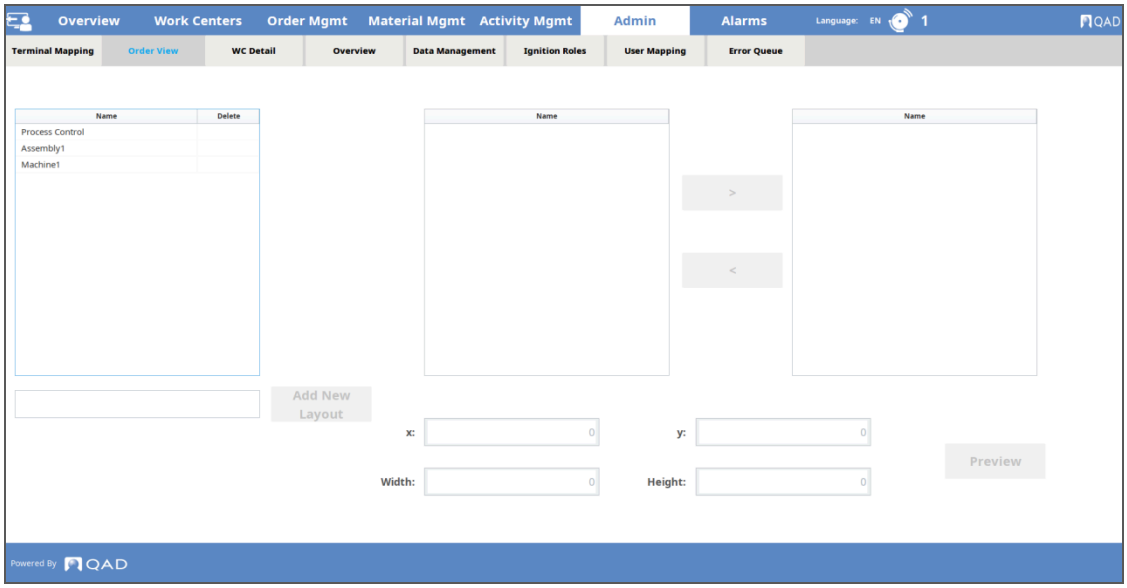
Third Shift.

Optional Set up Data at Production Execution

Setting Up Order View



The Order View Tab is where the order view screen template can be modified. This should be defined by someone with a strong knowledge of PE. It is used to determine how a user will visualize Production Order data. Bear in mind that any Order View screens created will not be visible until linked in WC Detail.(see WC Detail for Order View layout assignment and Order View for access created plant floor layout).



The Order View Tab contains the following fields:

Name. Enter the Name of this new Order View set up

Delete. Use this if an existing configuration needs to be deleted

Add New Layout. Use this to create a new Layout for the new Order View

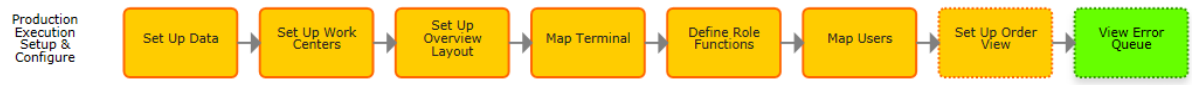
X. This will determine the X-Axis of the Layout

Y. This will determine the Y-Axis of the Layout

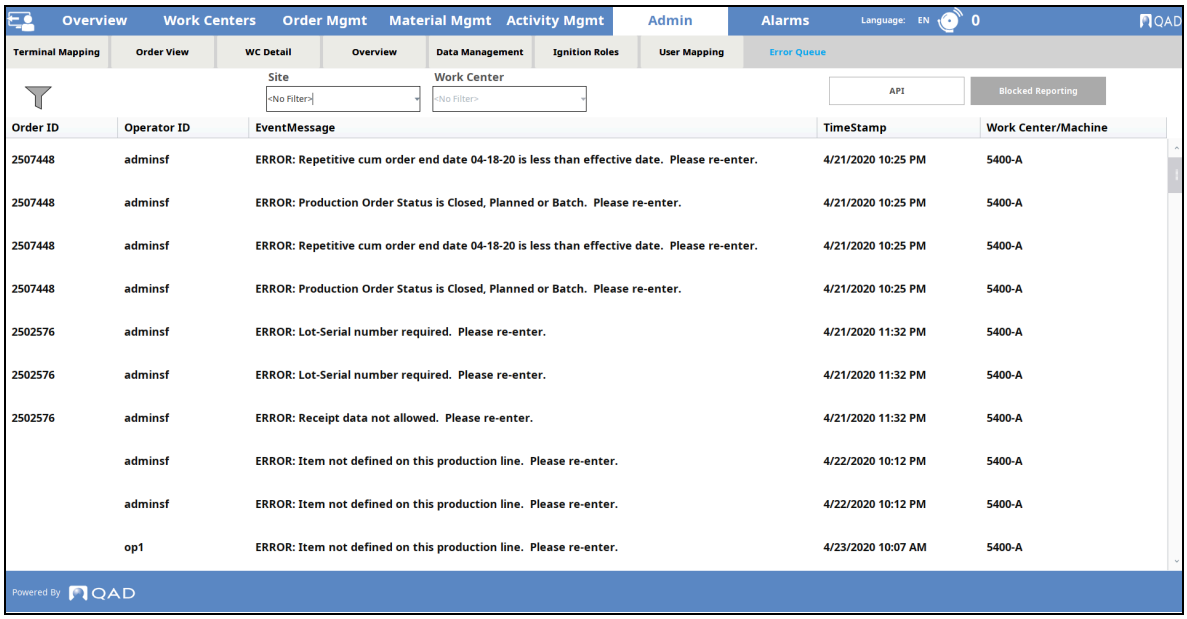
Width. This will determine the width of the component on the X-Axis

Height. This will determine the width of the component on the Y-Axis

View Error Queue



The Error Queue function is to display a list of any and all errors that occur in PE and is for reference only.



The Error Queue Tab contains the following fields:

API. This toggle will display a list of all the errors that come through from the API processing.

Blocked Reporting. This toggle will display a list of all errors that came during reporting production.