

Industry-specific

QAD SOLUTIONS

Manufacturing Applications

Technical Reference

QAD Mobile Field Service

QAD Mobile FS Overview
Installing QAD Mobile FS
Using QAD Mobile FS



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About This Guide

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This guide covers the installation, use, and administration of the QAD Mobile Field Service (FS) product. QAD Mobile FS lets field engineers or technicians access and enter service call information remotely from devices such as a personal digital assistant (PDA) or laptop. This information is automatically synchronized with your production MFG/PRO field service data. QAD Mobile FS remote access and updates let field personnel:

- Review and update assigned calls.
- Create new calls.
- Report call activity.
- Order spare parts.

Other MFG/PRO Documentation

- For an overview of new features and software updates, see the *Release Bulletin*.
- For MFG/PRO software installation instructions, refer to the appropriate installation guide for your system.
- For information on using MFG/PRO, refer to the *User Guides*. Information about Service/Support Management can be found in Volumes 8A and 8B.
- To view documents online in PDF format, see the *Documents on CD* and *Supplemental Documents on CD*. The CD-ROM media includes complete instructions for loading the documents on a Windows network server and making them accessible to client computers.

Note MFG/PRO installation guides are not included on a CD. Printed copies are packaged with your software. Electronic copies of the latest versions are available on the QAD Web site.

Online Help

MFG/PRO has an extensive online help system. Help is available for most fields found on a screen. Procedure help is available for most programs that update the database. Most inquiries, reports, and browses do not have procedure help.

For information on using the help system in the different MFG/PRO environments, refer to *User Guide Volume 1: Introduction* and *User Guide: QAD Desktop*.

QAD Web Site

The QAD Web site provides a wide variety of information about the company and its products. You can access the Web site at:

<http://www.qad.com>

For MFG/PRO users with a QAD Web account, product documentation is available for viewing or downloading at:

<http://support.qad.com/>

You can register for a QAD Web account by accessing the Web site and clicking the Accounts link at the top of the screen. Your customer ID number is required. Access to certain areas is dependent on the type of agreement you have with QAD.

Most user documentation is available in two formats:

- Portable document format (PDF). PDF files can be downloaded from the QAD Web site to your computer. You can view them with the free Adobe Acrobat Reader. A link for downloading this program is also available on the QAD Web site.
- HTML. You can view user documentation through your Web browser. The documents include search tools for easily locating topics of interest.

Features also include an online solution database to help MFG/PRO users answer questions about setting up and using the product. Additionally, the QAD Web site has information about training classes and other services that can help you learn about MFG/PRO.

Conventions

MFG/PRO is available in several interfaces: Desktop (Web browser), Windows, and character. To standardize presentation, the documentation uses the following conventions:

- MFG/PRO screen captures show the Desktop interface.
- References to keyboard commands are generic. For example, choose Go refers to:
 - The forward arrow in Desktop
 - F2 in the Windows interface
 - F1 in the character interface

In the character and Windows interfaces, the Progress status line at the bottom of a program window lists the main UI-specific keyboard commands used in that program. In Desktop, alternate commands are listed in the right-click context menu.

For complete keyboard command summaries for each MFG/PRO interface, refer to the appropriate chapters of *User Guide: QAD Desktop* and *User Guide Volume 1: Introduction*.

- Menu references

QAD Mobile Field Service is available for several MFG/PRO releases. Most of the features of MFG/PRO referenced in this guide are the same in each release. However, some menu items have changed.

In these cases, the first reference is the number in MFG/PRO eB2 followed by the menu reference in MFG/PRO eB2.1, as in the following example:

User Maintenance (36.3.18, 36.3.1 in MFG/PRO eB2.1)

This document uses the text or typographic conventions listed in the following table.

If you see:	It means:
monospaced text	A command or file name.
<i>italicized monospaced text</i>	A variable name for a value you enter as part of an operating system command; for example, <i>YourCDROMDir</i> .
indented command line	A long command that you enter as one line, although it appears in the text as two lines.

If you see:	It means:
Note	Alerts the reader to exceptions or special conditions.
Important	Alerts the reader to critical information.
Warning	Used in situations where you can overwrite or corrupt data, unless you follow the instructions.



Chapter 1

QAD Mobile FS Overview

QAD Mobile Field Service (QAD Mobile FS) is a set of programs to enable engineers and technicians to review and create data in the field using PDAs or laptops. This chapter summarizes the product deployment, installation, use, and administration.

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QAD Mobile Field Service Overview

This guide covers the installation, use, and administration of the QAD Mobile Field Service product (QAD Mobile FS). QAD Mobile FS lets field engineers or technicians access and enter service call information remotely from devices such as a personal digital assistant (PDA) or laptop.

QAD Mobile FS is a store-and-forward application. Users run the application on mobile devices independent of a connection to a central server. This requires periodic synchronization of the client and server data stores. QAD Mobile FS remote access and updates let field personnel:

- Review and update assigned calls.
- Create new calls.
- Report call activity.
- Order spare parts and parts to use for a call.

This book is divided into two sections: installation and user information. The installation section covers server and client installs. User information describes the use of the QAD Mobile FS application and details the data flow between MFG/PRO and QAD Mobile FS.

Installing QAD Mobile FS

QAD Mobile FS assumes a production installation of MFG/PRO and the QXtend Inbound product. For more information on these installations, see the installation guide for your MFG/PRO version and *Technical Reference: QXtend Inbound*. Additional components that must be installed are:

ODBC Driver. The ODBC driver exposes MFG/PRO APIs to enable access to MFG/PRO.

OneBridge Server. This product ensures the currency of the mobile application and provides the means of synchronizing programs and data between the host and the clients.

OneBridge Windows Client. QAD Mobile FS runs the OneBridge client to synchronize data from MFG/PRO to the client database. It is also used to transfer QDocs from the client to the OneBridge Server.

Deploying QAD Mobile FS

QAD Mobile FS is a set of field service programs installed to field devices. It requires the MFG/PRO Service/Support Management module (SSM) as the base application. SSM serves as the source of QAD Mobile FS data and the target for QAD Mobile FS updates.

Between the QAD Mobile FS field devices and the MFG/PRO SSM server is a synchronization server. The synchronization server delivers the QAD Mobile FS application and application updates to the field devices. It also synchronizes the MFG/PRO server and the field device data.

Note On a Windows platform, the MFG/PRO server and synchronization server could be installed on the same physical machine. However, since the OneBridge synchronization server only runs on Windows, two machines are required when MFG/PRO is running in a UNIX environment.

The software required to synchronize the data are OneBridge server, the Progress ODBC driver, and QAD’s QXtend Inbound. On the client, the OneBridge client and the QAD Mobile FS application are required. You also need the AppForge Crossfire Client on the Pocket PC.

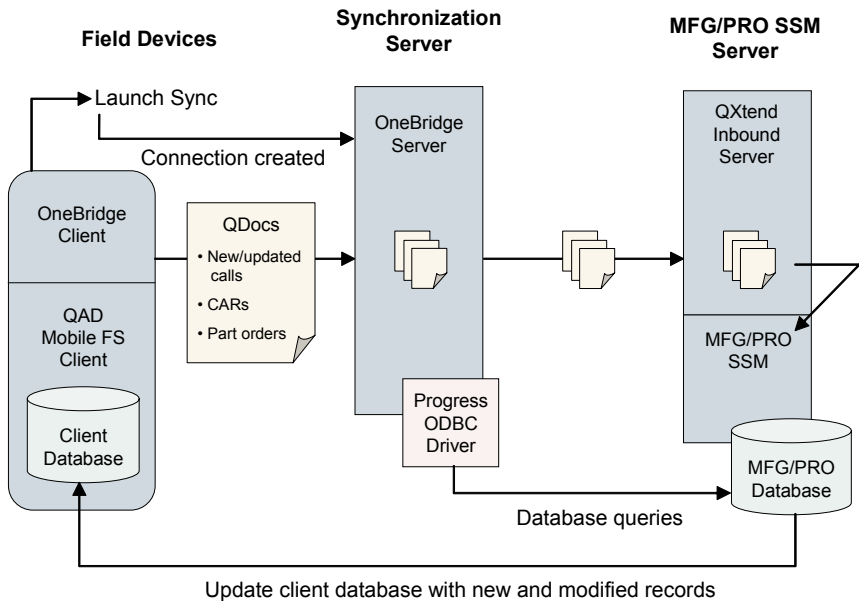


Fig. 1.1 QAD Mobile FS Architecture

During a synchronization, the QAD Mobile FS client on the device first generates data to be sent to MFG/PRO of any new or changed calls, call reports, or parts orders. This data is formatted as QDocs. The OneBridge server checks the directory on the mobile device for updated QDocs. When these are found, they are moved to a directory on the MFG/PRO server that QXtend Inbound has been configured to monitor. QXtend Inbound then updates the appropriate tables in the MFG/PRO database with changes made on the device.

OneBridge then runs SQL queries to identify MFG/PRO data needed for QAD Mobile FS client. OneBridge compares the MFG/PRO data with the client database based on previous sync history. It then rebuilds each table on the client with the data that should be there. The ODBC driver allows read access to MFG/PRO so that OneBridge can retrieve the data it needs to check for changes.

Note Because data is brought to MFG/PRO from the device first, data coming back from MFG/PRO in most cases will include changes from the device. However, it is possible that because of network traffic or bandwidth problems, not all the data will be updated in MFG/PRO before it is sent to the device. In this case it may be necessary to repeat the synchronization.

OneBridge

The OneBridge server is a third-party product that provides connectivity and synchronization between data servers—such as MFG/PRO SSM—and field devices—such as Pocket PC PDAs or laptops. The OneBridge server provides the following services for QAD Mobile FS:

- Establishing connectivity between devices and the SSM server
- Authenticating users during synchronization
- Moving QDocs from the device to a directory queue on the synchronization server
- Maintaining filters and selection criteria for SSM server data

The filtering ensures, for example, that field engineers only receive calls assigned to them, and that the call status on those calls is not closed, cancelled, or hold.

QDocs

Data sent from the field devices to the MFG/PRO server or other destinations is managed using the QAD QXtend Inbound product. QXtend Inbound provides a Web- and network-assured means of importing data to MFG/PRO from other applications. The data document that is imported is a proprietary, XML format called a QDoc. See *Technical Reference: QXtend Inbound* for more detailed information.

Four QDocs templates are required for QAD Mobile FS:

- maintainCall
- maintainMaterialOrder
- recordCallActivity
- mfgAuthentication

The actual QDoc file name is built from a three-digit number that uniquely identifies the device or engineer, plus a five-digit incremental number that identifies the QDoc. This numbering scheme ensures that all records imported from field devices are unique.

The QDocs in turn receive a response from MFG/PRO. These have the same file name, but have an extension of `.ok` for a successful transmission, `.err` for an error, or `.wrn` for a warning, depending on the processing result. The response documents are stored in the `\response` directory of the QXtend Inbound queue manager.

Client Components

Two client components are installed on the device: a QAD Mobile FS client and a OneBridge client. The components required to create the client database are included with the QAD Mobile FS client.

QAD Mobile FS runs the OneBridge client to synchronize data from MFG/PRO to the client database. It is also used to transfer QDocs from the client to the OneBridge Server.

Using QAD Mobile FS

The production MFG/PRO application serves as the source database and application for your service and support operations. Additional tables and several additional programs in MFG/PRO are required to support QAD Mobile FS. Each user must be configured in QAD Mobile User Maintenance (11.1.12).

You can use QAD Mobile FS from either a pocket PC (PDA) or laptop. The user interface is almost identical on both types of devices. The chapter on using QAD Mobile FS includes a description of the differences. See “Differences on Pocket PCs” on page 76.

Set Up QAD Mobile FS Data

▶ See “Define QAD Mobile FS Users in MFG/PRO” on page 55.

Before beginning synchronization with devices, each device user must be defined in MFG/PRO using QAD Mobile User Maintenance (11.1.12). Settings in this program are used to authenticate the device user and also determine how data is replicated and updated on the device.

Admin settings are also provided on the device. Before you can begin the synchronization process, you must define settings such as the Windows domain for log on.

Perform an Initial Synchronization

The initial synchronization validates user credentials and creates a local database on the device that contains records related to each engineer. After the initial sync, users can perform full or partial synchronizations to keep the device up-to-date and send data back to MFG/PRO. See “Perform Initial Full Sync” on page 65.

View and Update Calls

When calls are entered in Call Maintenance (11.1.1.1) in MFG/PRO, field personnel can launch QAD Mobile FS, synchronize with the server, and view a listing of the calls assigned to them and then drill down to see additional call detail. Calls of one line can also be created in the device.

The call listing is sorted by customer end user, service item, severity, and call ID number. The field engineer can make limited updates to existing calls on the device and create new calls if necessary. They can reassign the engineer and modify call status, service items, and work codes. However, they cannot add call lines or change the call ID. See “Creating and Updating Calls” on page 79.

Report Call Activity

After the field work is completed, the engineer records the activity on the call. Reporting includes labor hours, expenses, inventory and service parts, parts returned, and any relevant notes. The next time the field device is synchronized with the server, the call activity is reported back to MFG/PRO. See “Reporting Call Activity” on page 85.

Order Parts

Field engineers can also enter parts orders for required parts. When the device is synchronized with the server, the order is created in MFG/PRO. Service parts can be shipped to either the call end user address or to the field engineer; inventory parts can only be shipped to the field engineer. See “Ordering Parts” on page 91.

Synchronization Data Flow

Data may originate at either the SSM server or the field device. The synchronization process is initiated at the client device. It proceeds through the following steps:

- 1 Launch synchronization in the QAD Mobile FS application.
- 2 The user is authenticated.
The user must be a valid user on the sync server. They must also be a valid MFG/PRO user. The validation is done through the OneBridge software.
- 3 Send new or updated calls, call activity reports (CARs), and parts orders from the device to SSM.
Each record on the device is checked and sent or resent if one or more fields have changed on the record.

The import of data documents into MFG/PRO is accomplished using QAD's QXtend Inbound product.

4 Process records from device on the SSM server.

Record ID numbers are changed or accepted:

- Temporary ID numbers may be given to calls and parts orders created on the field device based on implementation setup. When these records are synchronized, they are given permanent ID numbers in SSM. If they are synchronized back to the device—for example, when the call remains assigned to the originating field engineer—the permanent ID appears on the device and cannot be modified.
- When permanent ID numbers are given on the device, these are accepted as is in SSM.

Time zones are entered:

- If multiple time zones (MTZ) is turned on in SSM, data is entered in the device end user's time zone and displays in that time zone on the device and in MFG/PRO after synchronization.

5 Send new and updated calls or orders from SSM to the device. CARs are not sent from SSM to the device.

The calls and orders to be synchronized are determined by the SQL queries in OneBridge. Conflicts in data are handled on a field-by-field basis. Static data is assumed to be more correct on the server and is, therefore, overwritten on the device. Transactional data related to service activity is assumed to be more reliable in the field device and this data is left on the device as is. The server will eventually be updated with the device data when the QDoc is processed.

The export of data documents from SSM is accomplished using the ODBC driver.

6 Update the device database.

Calls are deleted from the device database if:

- The status is cancel, complete, close, or hold.
- The call is reassigned to another engineer.

Calls are updated:

- With new calls originating in SSM assigned to the field engineer

- With new call information
- With the permanent call ID for calls originating on the device when temporary IDs are assigned
- With service item coverage information (if no service item change occurred on the device call)

Parts orders are deleted if:

- All quantities are consumed in call activity recording.
- The associated call is reassigned to another engineer.

Parts orders are updated:

- With new orders originating in SSM assigned to the field engineer
- With new order information
- With the permanent order ID for orders originating on the device when temporary IDs are assigned

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Section 1

Installing QAD Mobile FS

This section covers the QAD Mobile FS installation.

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QAD Mobile FS Requirements

This chapter provides system requirements and software prerequisites for the QAD Mobile FS server and clients:

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General Requirements

Before installing QAD Mobile, Progress, MFG/PRO, and QXtend Inbound must be installed correctly. The Progress install for each platform may include UNIX kernel changes and patches.

MFG/PRO Database Server

The database server contains Progress, MFG/PRO, and Progress Client Networking. The requirements listed are only for the incremental QAD Mobile FS requirements beyond those of Progress and MFG/PRO.

Hardware Requirements

- 1 MB of free disk space
- High-speed 100 Mbps network card
- ISO9660 CD-ROM
- 2 disk controller channels (minimum)

Software Prerequisites

- Operating system patches.
- Progress 9.1D, Service Pack 5+, or Progress 9.1E, with Client Networking and SQL-92 Client Access. If you are using MFG/PRO eB2.1 SP4, you must have Progress OE10.
- MFG/PRO eB, Service Pack 4 or later; MFG/PRO eB2 at any service pack level up to Service Pack 11; or MFG/PRO eB2.1, Service Pack 3 or 4.
- QXtend Inbound version 1.2.1.6. This maintenance release of QXI includes some updates that are required by QAD Mobile FS 1.5.1.

Since the MFG/PRO database must allow Progress 4GL and SQL client access, you may need to change your database startup scripts. See “Update MFG/PRO” on page 30.

Upgrading MFG/PRO after Installing QAD Mobile

If you decide to upgrade your underlying version of MFG/PRO after installing QAD Mobile, you will need to take special steps to preserve the data set up in the MFG/PRO database. The exact steps you need to take vary depending on the specific upgrade path you choose. See “Upgrading MFG/PRO After Installing QAD Mobile FS” on page 50 for details. Before beginning such an upgrade, contact QAD Support for specific instructions relevant to your implementation.

Synchronization Server

The synchronization server is a Windows machine that contains the OneBridge server and the ODBC driver client. QXtend Inbound can reside either on this machine or the database server. However, QAD recommends it reside on the database server to have more direct access to the MFG/PRO code and database.

Important Review the QXtend Inbound and ODBC driver documentation for version-specific requirements.

Hardware Requirements

- Pentium III, 1 GHz minimum processor or higher server-class machine—faster processor (2 GHz recommended) is required for larger installations. Dual processors enhance performance.
- A server-class machine that supports industry standards for hard drive redundancy/fail-over with sufficient storage space.
- Memory: 512 MB for up to 250 users (1 GB recommended), 1 GB for 250–500 users, 2 GB for 500–1000 users.
- Application disk space: 3 GB for 100 users, 15 GB for 500 users, 30 GB for 1000 users.
- Data/log storage: 32–64 GB.
- TCP/IP LAN connection.

Supported Operating Systems

- Windows Server 2003
- Windows 2000 with Service Pack 2 or higher
- Windows NT Server 4.0 with Service Pack 6a or higher

Additional information is available from iAnywhere regarding fail-over/redundancy provision and layering/clustering of multiple synchronization servers and/or database sync adapters. A single machine with the above recommendations should support up to 1000 users with 10% concurrency.

Software Requirements

- OneBridge Mobile Data Suite 5.0.
- ODBC driver. QAD recommends the Progress SQL-92 ODBC driver for Progress Version 9, which must be purchased separately; Progress OpenEdge 10 ODBC driver ships with the OpenEdge 10 product.

Obtain OneBridge Mobile Data Suite 5.0

Perform the following steps to obtain OneBridge Mobile Data Suite 5.0:

- 1 Request a free, 30-day evaluation copy of OneBridge Mobile Data Suite from the following URL:
http://www.ianywhere.com/downloads/software/onebridge_eval.html
- 2 You will receive an e-mail containing important information necessary to install OneBridge Data Suite. Follow the instructions in the e-mail to download the OneBridge Mobile Data Suite installation package. Run Installation Wizard to save the OneBridge Mobile Data Suite CD files to a folder (*OMDSCDDir*).
- 3 You will also receive an e-mail from iAnywhere with a serial number and instructions to upgrade the trial version to a permanent license. After you install OneBridge server and client components, follow the instructions to perform the upgrade. For installing OneBridge server and client components, see “Install OneBridge Sync Server Files” on page 35 and “Install Client Components” on page 46.

Client Devices

There are two possible types of client devices:

- Pocket PC PDA
- Personal computer, such as a laptop

Hardware Requirements

PDA

- 624 MHz or faster processor
- 64 MB or RAM

The QAD Mobile FS application and database requires 3–4 MB in storage, and an additional 3–4 MB in resources when executing.

For supported Pocket PC devices, see the following Web sites:

- AppForge (<http://www.appforge.com>)
- iAnywhere (<http://www.ianywhere.com>)

Laptop

- Intel Pentium (or compatible) processor
- Minimum OS required disk space and memory

Software Requirements

PDA

- Pocket PC 2002 or Windows Mobile 2003/2005 operating system
- OneBridge Windows CE Client version 5.0
- QAD Mobile FS
- AppForge Crossfire Client 6.0 for Windows mobile-based Pocket PC devices (purchased separately)
- Microsoft ActiveSync (if installing from a connected PC)

You can download the latest ActiveSync version for no charge from the Microsoft download center:

<http://www.microsoft.com/windowsmobile/downloads/>

The AppForge Crossfire Client can be downloaded for a minimal charge per device from the AppForge, Inc. Web site:

<http://www.appforge.com>

To download the Crossfire Client, follow these steps:

- 1 Select Crossfire Client (Booster) from the Products category on the menu toolbar of the AppForge site.
- 2 Click the Download Crossfire Client files link on the page that displays.
- 3 Select the client for your Windows Mobile-based Pocket PC devices.
- 4 Fill in the required form to receive your client. Under Application Name, enter QAD Mobile Field Service.

Note At this time, QAD Mobile Field Service does not support other Crossfire Clients, such as Symbian or Palm OS, that are available from AppForge, Inc. Please contact QAD Services in your region for porting of the QAD Mobile FS application to Symbian or Palm OS, or if your device is not listed on the AppForge Web site.

Laptop

- Windows XP or Windows 2000 SP2+ operating system
- OneBridge Windows Client version 5.0
- QAD Mobile FS

Network Requirements

Set up your network to support Progress networking specifications. See the *Progress Networking Guide* for details. Minimum requirements for QAD Mobile FS are:

- 10 Megabit (Mb) Ethernet or faster network

Proper NFS access from the sync server to the QXtend Inbound server is also needed for file transfers. A single user must have administrative rights to run the OneBridge service on the synchronization server and access to the QXtend Inbound queue directory on the QXtend server.

Installing QAD Mobile FS Components

QAD Mobile FS is a set of programs to enable engineers and technicians to review and create data in the field using PDAs or laptops. This chapter describes installation of those components required to connect and synchronize the field devices with the MFG/PRO SSM server.

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Overview

▶ See page 53.

This chapter guides you through the steps required to install and configure QAD Mobile FS. After completing these steps, you must then set up data required by the application before you can sync the devices and begin to use the product. These additional steps are described in Chapter 4.

This chapter covers the following steps:

- Configure QXtend Inbound to recognize the QDocs needed to pass information from the device to MFG/PRO.
- Update MFG/PRO by loading schema and data files, compiling code, and loading field help.

Note Loading schema is not needed in MFG/PRO eB2 Service Pack 11.
- Install the required ODBC driver.
- Install the OneBridge Sync Server product.
- Install the required components on the client devices.

Install and Configure QXtend Inbound

- 1 Install QXtend Inbound following the QXtend Inbound installation instructions as detailed in *Technical Reference: QXtend Inbound*.
- 2 Access the QXtend Manager at:


```
http://hostname:tomcat_port/qxtendserver/
```
- 3 Use the QXtend Connection Pool Manager to set up a connection pool for QAD Mobile FS following the QXtend Inbound instructions.
- 4 Copy the following QXtend QDoc schemas and events file from the `\Server\QXtend\mfgpro_version` directory on the QAD Mobile FS CD into a folder on a PC that has browser access to the QXtend UI:
 - mfgAuthentication-eB2_1.xsd
 - authenticationType-eB2_1.xsd
 - utauth.xml

Note For both MFG/PRO eB2 and eB2.1, `mfgpro_version` is eB2.

- 5 From the QXtend Configuration Manager, choose Schemas and then choose Add to add mfgAuthentication as a custom schema. Enter the following values in the Add Schema screen:
 - Request Path: mfgAuthentication-eB2_1.xsd
 - Request Type Path: authenticationType-eB2_1.xsd
 - Response Path: Leave blank
 - Response Type Path: Leave blank
 - Events Path: utauth.xml
 - Direction: in
 - Route: UI API Adapter
 - Procedure: utauth.p
- 6 In the Configuration Manager screen, choose Receivers and set up an MFG/PRO receiver that supports the following QDocs:
 - maintainCall
 - maintainMaterialOrder
 - recordCallActivity
 - mfgAuthentication
- 7 Copy the following events files from the `\Server\QXtend\mfgpro_version` directory on the QAD Mobile FS CD to the `WEB-INF\events\mfgpro_version` folder within your QXtend Inbound install directory, overwriting the existing files:
 - fscarmt.xml
 - fscamt.xml
- 8 Use the QXtend Queue Manager to set up a queue for QAD Mobile FS. The `\requests` directory must be accessible by the user who starts the OneBridge service on the sync engine Windows server.
- 9 Restart the QXtend Inbound server.

Update MFG/PRO

You must complete two steps to configure MFG/PRO for use with QAD Mobile FS:

- Load schema and data files (not required for MFG/PRO eB2 SP11) and compile code.
- Load field help for the new MFG/PRO program.

Update MFG/PRO Databases

In the following steps, use Progress tools to load new schema and data files and compile installed code. Refer to the Progress documentation for details.

- 1 Modify any MFG/PRO database startup scripts to use the Progress `proserve` command instead of `_mprosrv`. This allows database access from the Progress ODBC driver. See your Progress Database documentation on how to improve performance of SQL clients by starting multiple servers to support SQL client access.
- 2 Skip this step if you are using MFG/PRO eB2, Service Pack 11.
Load the `QADMoblie.df` schema file from the `\MFGPRO\DBdef\mfgpro_version` directory on the QAD Mobile FS CD into your MFG/PRO production database (`qadddb`).
- 3 Load the `lbld_det.d`, `lbl_mstr.d`, and `pgmi_mst.d` data files from the `\MFGPRO\mfgpro_version\data` directory on the QAD Mobile FS CD into your MFG/PRO administration database (`qadadm`).
- 4 Load the remaining table `.d` data files from the `\MFGPRO\mfgpro_version\data` directory on the QAD Mobile FS CD into your MFG/PRO production database (`qadddb`).
- 5 Install and compile the programs from the `\MFGPRO\mfgpro_version\YourSP` directory on the QAD Mobile FS CD to a `\qadmobile` directory in your MFG/PRO `PROPATH`:
Note The `PROPATH` for QXtend Inbound connections must also include this new `\qadmobile` directory.

- 6 From the Progress SQL Explorer, connect to the MFG/PRO database and execute the following SQL command:

```
grant select on pub.mfsd_det to public; commit;
```

Load Field Help

Perform the following steps to add new procedure and field help to the MFG/PRO help database:

- 1 Log in to MFG/PRO.
- 2 Choose the Field Help Load (36.4.19) menu option.
- 3 Leave Field, Procedure, Status, and Text Type blank.
- 4 Complete the other fields:
 - Enter an appropriate two-letter code, such as US for US English.
 - In the Load File field, enter:


```
QADMobileInstallDir/MFGPRO/mfgpro_version/data/qadmobileFS.fhd
```
 - In the Skip loading help with lower status field, enter Yes.
- 5 Press Go to start the loading.
- 6 Exit Field Help Load when the load is finished.
- 7 Skip this step if you are using MFG/PRO eB2.1.

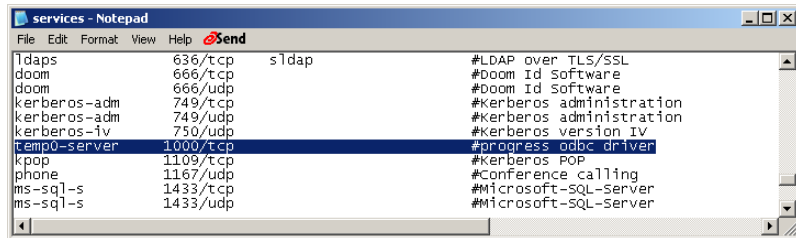
Update user profiles to access character-format help. For MFG/PRO eB2 and eB2.1, use User Maintenance (36.3.18, 36.3.1 in MFG/PRO eB2.1); for MFG/PRO eB, use User Interface Profile (36.20.4).

 - a Leave User ID blank; this updates the profile for all users who do not have individual profiles. Press Go.
 - b To set the profile for character-format help, ensure that WinHelp is cleared.
 - c Press Go to save the changes.

Install Progress ODBC Driver

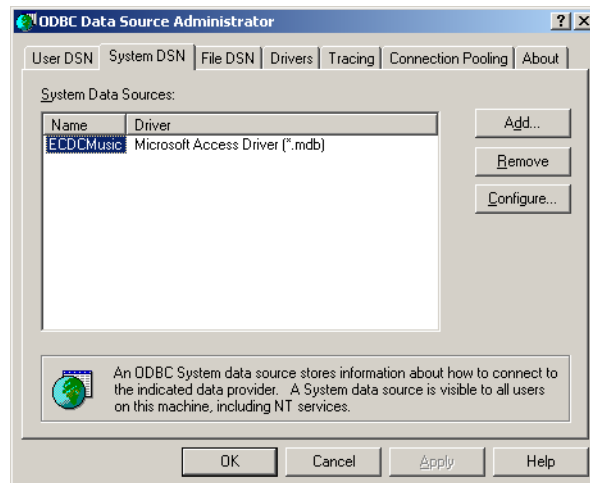
The Progress ODBC driver allows the MFG/PRO database to communicate with the field devices. The following steps assume that you are installing the Progress SQL-92 ODBC driver.

- 1 You can optionally add an entry for the ODBC driver to your services file, located at C:\winnt\system32\drivers\etc.

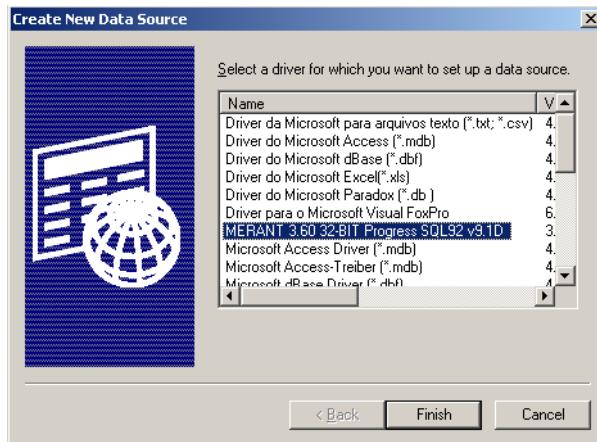


You can also reference the port number directly in step 4.

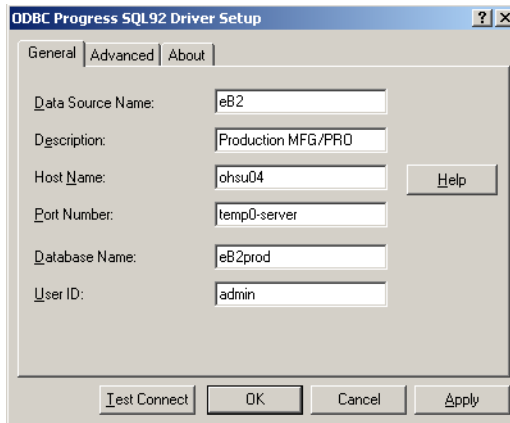
- 2 Open the Windows Control Panel and select Admin Tools. Launch the Data Sources program and select the System DSN tab.



- Click Add. In the Create a New Data Source screen, select the MERANT driver.



- Click Finish. Enter the values as shown in the following graphic and field descriptions.



Data Source Name. Enter a name to identify this connection record. This name can be used to distinguish connection records when using multiple MFG/PRO databases or to distinguish domains within an MFG/PRO eB2.1 database.

Description. Specify a description of the data source.

Host Name. Enter the server machine name where MFG/PRO is located.

Port Number. If you updated your `services` file in step 1, enter the service reference. Otherwise, enter the specific port number.

Database Name. Specify the physical MFG/PRO database you are connecting to.

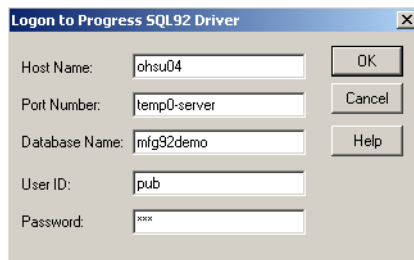
User ID. Specify a user that has administrative rights to your MFG/PRO database. On UNIX, this is typically the root user.

- 5 Click the Advanced tab and modify the following field.

Default Isolation Level. Select READ UNCOMMITTED to prevent record locking during synchronization.

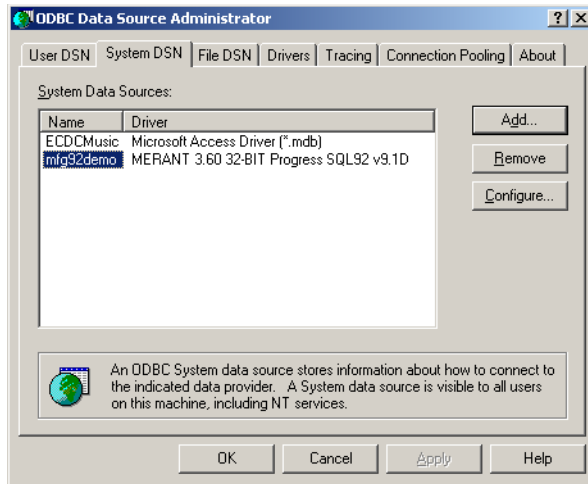
- 6 Make sure the MFG/PRO source database is running.

- 7 Choose Test Connect. The log-in screen displays with the connection information displayed.



- 8 Leave the password blank and click OK. A message indicates the connection status.

- 9 Click OK to display the ODBC Database Administration console.



Install OneBridge Sync Server

The user account that starts the OneBridge service should have full administrative access to the sync engine server and the QXtend \requests directory.

Note QAD provides a serial number for OneBridge. This license allows you to use the required OneBridge Mobile Data Suite components.

Install OneBridge Sync Server Files

- 1 Run `OMDSCDDir\Server\Setup.exe` to install the Sync Server, where `OMDSCDDir` is the folder where you saved the OneBridge Mobile Data Suite 5.0 CD files. See “Obtain OneBridge Mobile Data Suite 5.0” on page 22.
- 2 Review and accept the defaults for each of the prompts to install the server. Note the installation directory; you specify it during other installation and configuration steps.

Note The Notes/Exchange Adapters and Listeners are not needed for QAD Mobile. You do not need to run any of the Sync Wizards during the OneBridge server installation. The configuration data supplied with QAD Mobile FS provides the required information.

Important Do not start the OneBridge service when prompted at the end of the installation.

- 3 Optionally install the Client Deployment Wizard if you intend to use Pocket PC 2002 or Windows Mobile 2003/2005 devices.
- 4 Run `setup.exe` from the `\Server\language` directory on the QAD Mobile FS CD. Accept the default directory locations. The install directory should be the OneBridge server directory; for example:

```
C:\Program Files\Extended Systems\OneBridge Sync Server
```

Note If prompted to keep existing DLLs, answer No to `DBAdapter.dll` and `DBhelper.dll` so that they are replaced. Answer Yes to keep all other DLLs with the version on your server.

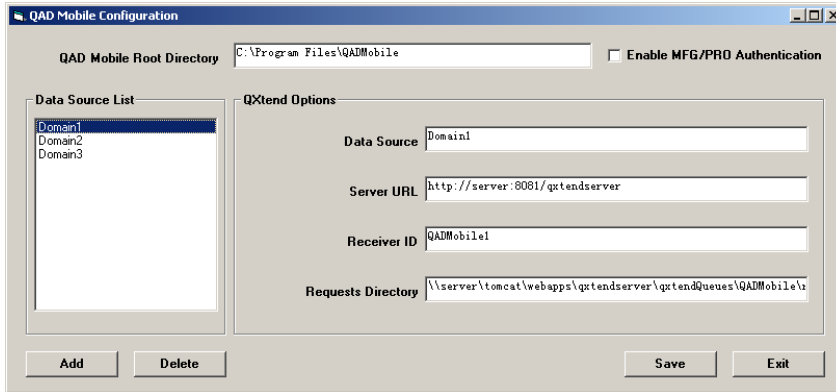
- 5 If you are using MFG/PRO eB2 or eB2.1, skip this step; QDocs for MFG/PRO eB2 and eB2.1 are installed by default.

If you are using an MFG/PRO eB database, copy the following files from `\Server\QXtend\eB` on the QAD Mobile FS CD to `c:\Program Files\QADMobile\QDocs\Template`, overwriting the existing files:

- `maintainCall.xml`
- `maintainCallFull.xml`
- `maintainMaterialOrder.xml`
- `maintainMaterialOrderFull.xml`
- `recordCallActivity.xml`
- `recordCallActivityFull.xml`

Set Up the Authentication Configuration

- 1 From the OneBridge server installation `\bin` directory, run `QADMobilityConfig.exe` to set up the authentication configuration. The QAD Mobile Configuration console displays.



- 2 Click Add to create a new data source.

Enter your environment settings using the following field descriptions:

QAD Mobile Root Directory. Enter the root directory where QAD Mobile is installed.

Data Source. For MFG/PRO eB2, enter the database name you will configure in the OneBridge database adapter later; for MFG/PRO eB2.1, enter the MFG/PRO domain name.

Server URL. Enter the QXtend Inbound server URL.

Note Do not include `\services\QdocWebService`.

Receiver ID. Enter the Receiver ID set up in QXtend Inbound.

Requests Directory. Enter the requests directory set up in QXtend Inbound.

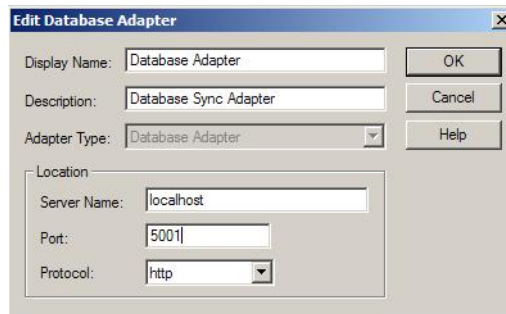
See *Technical Reference: QXtend Inbound* for detailed information on configuring QXtend Inbound.

Click Save to save the settings and the data source name appears in the Data Source List. You can select a data source from the list to modify its settings. To delete a data source, select it from the list and click Delete.

- 3 Enable MFG/PRO Authentication if you want.

Configure OneBridge Sync Server

- 1 Launch OneBridge Sync Admin and select `QADMobiledFS.xcf` on the QAD Mobile FS CD as the configuration file from the More Files... option. The OneBridge Sync Admin screen displays.
- 2 Right-click Database Adapters|Database Adapter under the Connect Configuration|General folder and select Configure to configure the Database Adapter. Answer Yes when prompted to start the OneBridge service.



Note If you installed the OneBridge sync server using a port other than the default 5001, you must first change the Database Adapter to use your new port also. To do this, enter your port number for the adapter and then continue with the MFG/PRO database updates.

- 3 Right-click MFGPRO under Database Adapter and select Configure to configure the database adapter for your MFG/PRO database. The Database window displays.

- 4 Edit the database connection to point to the MFG/PRO database.
 - a In the Display Name field, enter the same database or domain name you entered as data source in the QAD Mobile Configuration console when you set up the authentication configuration.
 - b Add the ODBC administration user ID used to connect the ODBC driver to the Connection String:

```
Provider=MSDASQL.1;Password="";Persist Security Info=True;User ID=<userID>;Data Source=<dataSource>
```

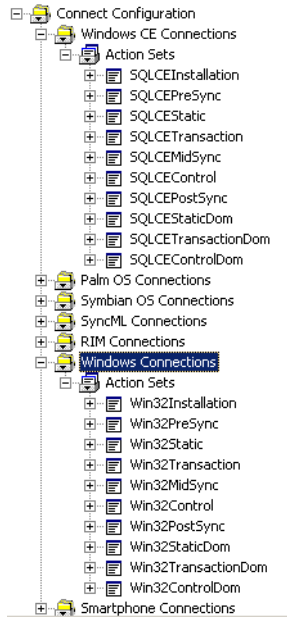
- c Specify the ODBC administration user ID in the User Name field in the administration section at the bottom of the screen.

Note When leaving the Database Adapter dialog, answer No when prompted to check the System Variable Table. Answer Yes when prompted to force a full synchronization.

- 5 If you are configuring the sync server to synchronize with multiple MFG/PRO databases, right-click Database Adapter and select New| Database Connection to add a database connection and repeat step 4 to configure it for each MFG/PRO database.

6 Expand the Action Sets folder to view action sets.

For Windows Mobile-based devices, action sets are located under the Connect Configuration|Windows CE Connection|Action Sets folder; for laptops, action sets are located under the Connect Configuration|Windows Connection|Action Sets folder in the configuration tree.

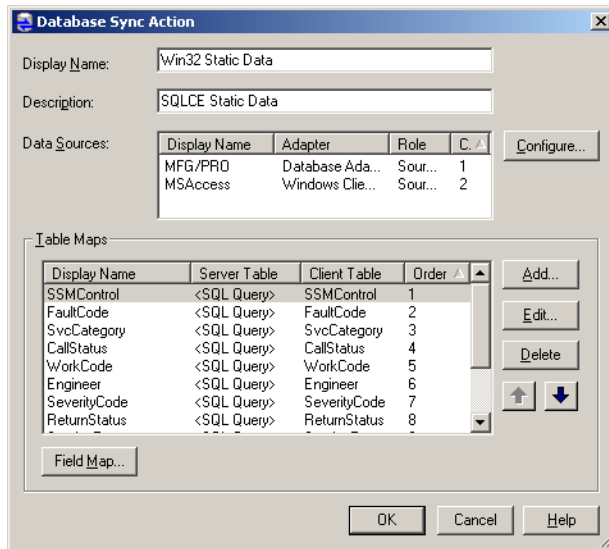


7 Edit database sync actions under these action sets.

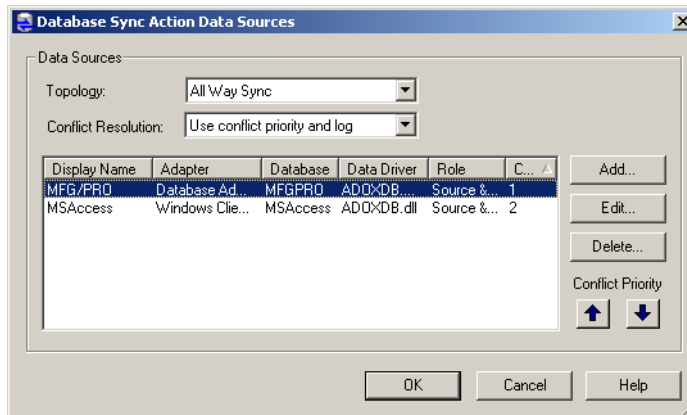
MFG/PRO Release	Mobile Device Action Sets	Laptop Action Sets
MFG/PRO eB, eB2	SQLCEStatic SQLCETransaction SQLCEControl	Win32Static Win32Transaction Win32Control
MFG/PRO eB2.1	SQLCEStaticDom SQLCETransactionDom SQLCEControlDom	Win32StaticDom Win32TransactionDom Win32ControlDom

To Edit a database sync action:

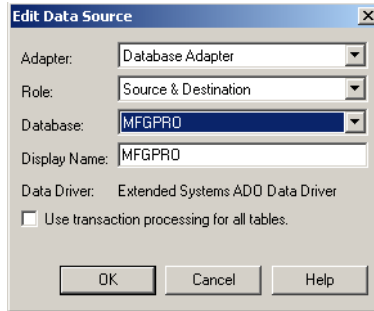
- a Right-click the database sync action under the action set and select Configure.
- b The Database Sync Action window displays. Click the Configure button.



- c The Database Sync Action Data Source window displays. Select the database adapter and click Edit.



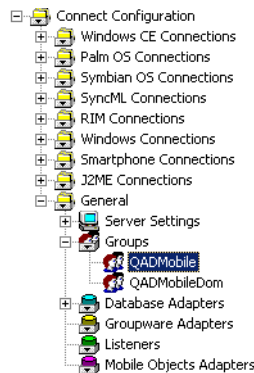
- d The Edit Data Source window displays. Change the Display Name to the data source you configured for the MFG/PRO database in the previous steps. Click OK when finished.



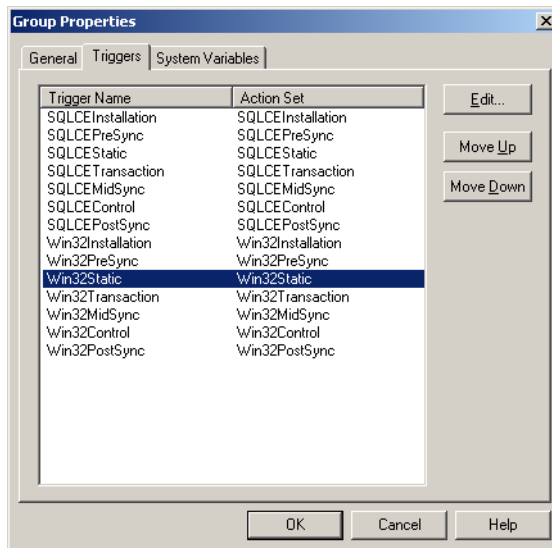
- e Repeat steps a through d for each action you need to configure.
- 8 If you are configuring the sync server to synchronize with multiple MFG/PRO databases, duplicate the following action sets and repeat step 7 to edit the new action sets. To duplicate an action set, click it and select Duplicate. A copy of the action set appears at the bottom.

MFG/PRO Release	Mobile Device Action Sets	Laptop Action Sets
MFG/PRO eB, eB2	SQLCEStatic SQLCETransaction SQLCEControl	Win32Static Win32Transaction Win32Control
MFG/PRO eB2.1	SQLCEStaticDom SQLCETransactionDom SQLCEControlDom	Win32StaticDom Win32TransactionDom Win32ControlDom

- 9 Expand the Connect Configuration|General|Groups folder to view user groups. For MFG/PRO eB or eB2, the group is QADMoblie; for MFG/PRO eB2.1, the group is QADMoblieDom.



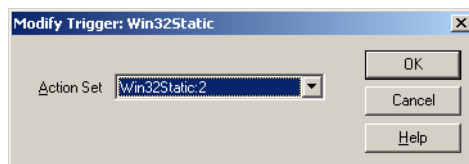
- 10 If you are configuring the sync server to synchronize with multiple MFG/PRO databases, create a group for each MFG/PRO database by right-clicking the existing group and selecting Duplicate. The new group appears at the bottom.
- 11 Configure the new groups you created.
 - a Right-click the group and select Configure.
 - b The Group Properties window displays. Click on the Triggers tab to display triggers.



- c Modify the following triggers to hold the new action sets.

Mobile Devices	Laptops
SQLCEStatic	Win32Static
SQLCETransaction	Win32Transaction
SQLCEControl	Win32Control

To modify a trigger, select the trigger and click Edit; then select the correct action set in the Modify Trigger window. Click OK to save.

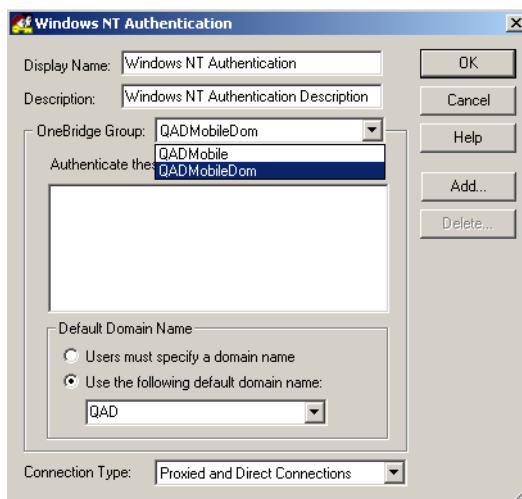


d Repeat steps a through c for each group you created.

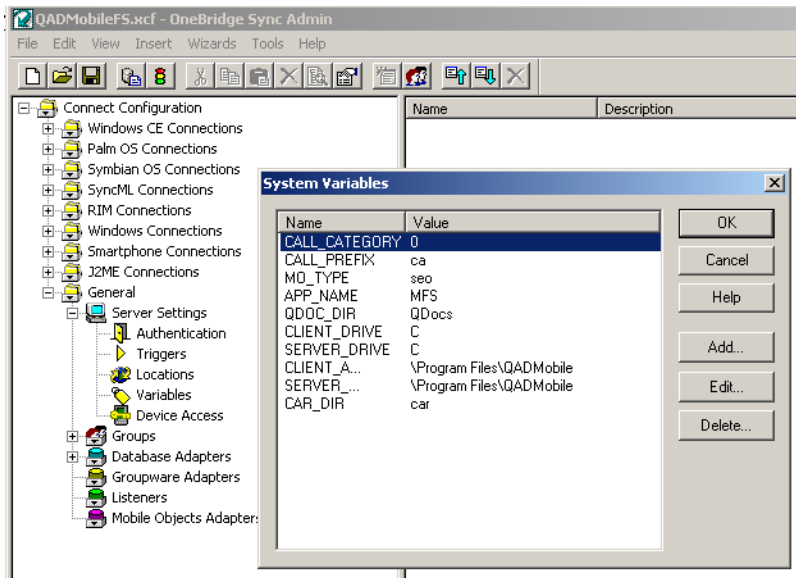
- 12 Right-click Authentication on the configuration tree, select New, and then click Windows NT Authentication.

The Windows NT Authentication window displays. Select a user group and click Add to set up authentication for sync users.

If you are using MFG/PRO eB or eB2, select QADMobile in the OneBridge Group drop-down list; if you are using MFG/PRO eB2.1, select QADMobileDom.



- 13 Double-click Variables under the Connect Configuration|General|Server Settings folder and verify the variables.



- `SERVER_APP_PATH` should be the QAD Mobile FS file location on the server to hold user files transferred back and forth.
- `SERVER_DRIVE` should be the drive location where QAD Mobile FS was installed.
- `CLIENT_APP_PATH` should be the QAD Mobile FS file location on the client where the application is installed.
- `CLIENT_DRIVE` should be the drive location for the Windows QAD Mobile FS client.

Note These values are set during installation and typically do not need to be changed.

- 14 Restart the OneBridge service using File|Restart Service.
- 15 If you are using mobile devices, run the Client Deployment Wizard to create a deployment executable. This file is then copied to a laptop and used to install required updates on client devices, as described in “Install on Device from a Laptop” on page 47.

See the OneBridge documentation for details about using the Client Deployment Wizard.

Install Client Components

The steps you take to install components on your devices depend on whether you are using laptops or PDAs. Choose the appropriate section.

Install Client Components on Laptops

Install the OneBridge Client on a Laptop

- 1 Run `OMDSCDDir\Clients\Windows\Setup.exe` to install the OneBridge Windows Client, where `OMDSCDDir` is the folder where you saved the OneBridge Mobile Data Suite 5.0 CD files. See “Obtain OneBridge Mobile Data Suite 5.0” on page 22.
- 2 When prompted for database synchronization, click Yes. Accept all the other default values to complete the installation.
- 3 From the start menu, choose Programs|OneBridge Windows Client|Windows Client.
- 4 Select Server on the Settings menu. Enter `SyncServerName` and `PortNumber`. Choose Close.
- 5 Select Connect to accept the public key and retrieve an action list from the server. Enter your credentials when prompted.
- 6 For clients using the Dutch OS only, copy `ADOXDB.dll` in the OneBridge folder on the QAD Mobile FS CD to:

```
C:\Program Files\Extended Systems\OneBridge Windows Client
```

Note Do this after installing OneBridge on the client PC.
- 7 Choose Options|Exit.

Install the QAD Mobile FS Client on a Laptop

- 1 Copy `QADMobileFS.CAB`, `setup.exe`, and `SETUP.LST` from the `WinClient\language` directory on the QAD Mobile FS CD to a temporary working directory on the laptop.
- 2 From the working directory, execute `setup.exe`.

Note Answer Yes when prompted to keep more current DLLs on your laptop.

- 3 Extract the files to C:\Program Files\QADMobile\MFS.
- 4 Continue with the activities described in “Set Up Client Devices” on page 62.

Install Client Components on Pocket PC Devices

You can install components on a pocket PC device in two ways:

- Use ActiveSync to connect to a laptop and install from the laptop to the device. This method assumes you created a deployment executable as described in step 15 on page 45.
- Use the device to download files from an intranet or Internet site and install them locally.

QAD recommends the first approach because it is the most straightforward. However, the other approach is documented in case it is needed.

Install on Device from a Laptop

Prior to running these steps, make sure ActiveSync is working on the client device. Then, connect the client device to a local PC that is connected to the company network and make sure ActiveSync establishes a connection with the device. The following steps involve installing several components to a working directory on the PC, then copying them to the device.

Install the OneBridge Client

- 1 Make sure that you completed step 15 on page 45 to create an executable with the Client Deployment Wizard and that you downloaded it from the server to a working directory on your local PC. These steps assume the executable is named `setup.exe`.
- 2 From the working directory on your local PC, launch `setup.exe` to install the OneBridge client files on the device. Enter credentials of the user associated with the device and follow the prompts to complete the installation.

- 3 From the start menu on the device, choose OneBridge.
- 4 Choose Server on the Settings menu. Accept the default values for the server and port number. Choose Close.
- 5 Choose Connect to accept the public key and retrieve an action list from the server. Enter your credentials when prompted.
- 6 Choose Options|Exit.

Install the QAD Mobile FS Client

- 1 Copy `setup.exe` from the `WinCEClient\Language\OS` directory on the QAD Mobile FS CD to a working directory on the PC.
Note For both Windows Mobile 2003 and 2005, `OS` is `WindowsMobile`.
- 2 From the PC working directory, launch `setup.exe`.
- 3 Accept the license agreement and click Finish to complete the installation.
- 4 Continue with the activities described in “Set Up Client Devices” on page 62.

Install on Device from the Server

Complete these steps if your device cannot connect to a PC. These steps assume that a CD image is available on an intranet or Internet site.

To begin, copy the following files to the `My Documents` folder on the device:

```
WinCEClient\us\CABFiles\SplitRecord.ARM.CAB
```

```
WinCEClient\us\CABFiles\QADMobileFS.ARM.CAB
```

In addition, if your device is using the Windows Mobile 2003/2005 operating system, you must copy an additional file:

```
WinCEClient\us\CABFiles\msvbpc.armv4.cab
```

Then follow the steps below to install the two clients.

Install OneBridge Client

- 1 Locate `setup.ARM.CAB` on the device using File Explorer and execute it.
- 2 From the start menu, choose OneBridge.
- 3 Select Server on the Settings menu. Enter *SyncServerName* and *PortNumber*.
- 4 Select Connect to accept the public key and retrieve an action list from the server. Enter your credentials when prompted.
- 5 Click OK on the log screen.
- 6 Choose Options|Exit.

Install the QAD Mobile FS Client

- 1 Execute `SplitRecord.Arm.CAB` and `QADMobileFS.ARM.CAB` on the device from `My Documents`.
- 2 If you have a Windows Mobile 2003/2005 device, also execute `msvbpcc.armV4.cab` from `My Documents`.
- 3 Continue with the activities described in “Set Up Client Devices” on page 62.

Important On a pocket PC, make sure you have already installed the AppForge Pocket PC/Windows Mobile Crossfire Client, as described in “PDA” on page 23.

Complete the Setup

Continue with the steps outlined in the next chapter to set up data required before you can sync the devices.

Upgrading MFG/PRO After Installing QAD Mobile FS

When you install QAD Mobile FS 1.5.1, updates to your database schema may be applied, depending on the release and service pack of your underlying MFG/PRO system. If you later upgrade your MFG/PRO system, you may need to take additional steps to preserve your QAD Mobile data. The steps differ for different upgrade paths.

If you are upgrading to MFG/PRO eB2 Service Pack 10 or below, no additional steps are required. However, when you dump/load data to a new database, you must apply the `QADMobiledf` to the target database.

If your upgrade target release is MFG/PRO eB2, Service Pack 11, you must use the following steps to convert the QAD Mobile FS data.

Note You can use Progress tools to dump data from a table, drop the table, and load new schema and data files. Refer to the Progress documentation for details.

- 1 Dump data from the `mfsd_det` table in your MFG/PRO production database (`qaddb`) into `mfsd_det.d` using the `dump.sh` utility.
 - a Copy the conversion utility files from the `/MFGPRO/Conversion` directory on the QAD Mobile FS CD to a temporary directory on the UNIX MFG/PRO data server and unset the read-only attribute of the `dump.pf` and `load.pf` files.
 - b Use a text editor to open the `dump.pf` file.
 - c Replace `<MFGPRODatabaseConnectionParameters>` with your MFG/PRO database connection parameters and save the file. Use the sample parameters provided in this configuration file.
 - d Use a text editor to open the `dump.sh` file.
 - e Replace `<ProgressInstallDir>` with your Progress installation directory path and save the file.
 - f Execute the `dump.sh` program.
 - g Check `dump.log` for errors. The log file is in the directory from which `dump.sh` was launched.

- 2 Use Progress tools to load the `delta_QADMoblie.df` delta schema file into your MFG/PRO production database (qaddb) to drop the `mfsd_det` table and the `pt_svc_group` index.
- 3 Load the data you dumped in step 1 (`mfsd_det.d`) back into the `mfsd_det` table using the `load.sh` utility.
 - a Use a text editor to open the `load.pf` file under the temporary directory you created in step 1.
 - b Replace `<MFGPRODatabaseConnectionParameters>` with your MFG/PRO database connection parameters and save the file. Use the sample parameters provided in this configuration file.
 - c Use a text editor to open the `load.sh` file.
 - d Replace `<ProgressInstallDir>` with the Progress installation directory path and save the file.
 - e Execute the `load.sh` program.
 - f Check `load.log` for errors. The log file is in the directory from which `load.sh` was launched.



Chapter 4

Setting Up QAD Mobile FS

Before you can begin to use QAD Mobile FS, you must complete some setup steps in MFG/PRO as well as on the mobile device. This chapter covers those steps.

Set Up SSM Data in MFG/PRO **54**

Set Up Client Devices **62**

Perform Initial Full Sync **65**

Develop Engineer Report **67**

Set Up SSM Data in MFG/PRO

Before you can use QAD Mobile FS, you must set up all of the required data to support call tracking in the Service/Support Management (SSM) module. This includes data such as call statuses, types, queues, work codes, severity codes, and default call information.

Setting up call defaults helps to reduce data entry errors and ensure that the synchronization is error free. See the Setting Up Call Defaults section in *MFG/PRO eB2 User Guide Volume 8A: Service/Support Management* for details. You must also define the end users you plan to support and the types of service coverage you offer.

To help streamline the synchronization of item data between MFG/PRO and the remote devices, you can associate service groups with items in Service Item Maintenance (11.3.7). You can then specify a range of service groups in QAD Mobile User Maintenance (11.1.12) to limit records to synchronize.

There are several steps to setting up users in MFG/PRO:

- 1** Define remote users as MFG/PRO users in User Maintenance (36.3.18, 36.3.1 in MFG/PRO eB2.1).
This step is required if you are using MFG/PRO authentication. For ease of administration, you should use the same user IDs as those defined for the synchronization server.
- 2** Define the remote users as employees in Employee Maintenance (2.17.1).
- 3** Define the remote users as engineers in the Service/Support Management (SSM) module using Engineer Maintenance (11.13.1).
- 4** Optionally, move inventory in each engineer's site and location to be available for assigned calls using functions on the Inventory Control menu (3).
- 5** Optionally, associate the engineer with end users that they will regularly support by specifying their ID as the Engineer Code field of the Service Office Detail frame of End User Address Maintenance (11.9.1).

- 6 Define data required for the remote users in QAD Mobile User Maintenance (11.1.12). See the next section for details.

Define QAD Mobile FS Users in MFG/PRO

When you configure MFG/PRO, a new program is installed that lets you define the users that will access MFG/PRO from remote devices and specify settings that manage how information is updated on their devices.

The screenshot shows the 'QAD Mobile User Maintenance' window for 'domain1 (FRF)'. It contains the following fields and options:

- Single Sign-On For Sync Engine:
- Prioritize Call Header On Client:
- Nonexisting End User:
- Nonexisting Item:
- Print System Comment On Invoice/Reports:
- Generate Doc IDs On Client:
- Sync Engine User ID: PKH
- MFG/PRO Domain: domain1
- User Detail section:
 - Engineer: [text input field]
 - Site: [text input field]
 - Engineer Unique ID: [text input field]
 - Location: [text input field]
 - Call/MO Unique Prefix: [text input field]
 - Start Service Group: [text input field]
 - End Service Group: [text input field]

Fig. 4.1
QAD Mobile User
Maintenance
(11.1.12)

Note If you are using MFG/PRO eB2, the MFG/PRO Domain field will not display.

Use QAD Mobile User Maintenance (11.1.12) to:

- Specify settings that determine how information is updated on remote devices. For MFG/PRO eB2, these settings apply to all users; for MFG/PRO eB2.1, you can choose to apply these settings to users in all domains or the current domain.
- Create records for individual users that access MFG/PRO through mobile devices. The program lets you link a remote user ID with an engineer defined in MFG/PRO and specify values that determine how MFG/PRO records are replicated on the device. In MFG/PRO eB2.1, the program lets you specify an MFG/PRO domain with which the engineer synchronizes data with through the sync engine user ID.

You must also create a record in QAD Mobile User Maintenance for the user ID that created your MFG/PRO database. In most cases, this user is root on UNIX systems or some other administrator user ID. This ID is needed if you plan to edit any of the field mappings in OneBridge, since OneBridge uses this user to evaluate certain values used in the synchronization queries.

When users attempt to sync from a remote device, a configuration option lets two sets of authentications take place: one for the sync engine and one for MFG/PRO. To streamline synchronization, you can define the same IDs in the sync engine and in MFG/PRO User Maintenance (36.3.18, 36.3.1 in MFG/PRO eB2.1). You can then use the Single Sign-On for Sync Engine option to authenticate users. However, for this feature to work correctly, you must ensure that the IDs set up for the sync engine and those created in User Maintenance in MFG/PRO are exactly the same.

You also define whether data at the call header or call line level determines what displays on remote devices.

Other values defined in this program affect which item and inventory records are available on a specific engineer's device:

- The domain in MFG/PRO eB2.1 restricts all data access to a specified domain.
- The site and location determine the inventory detail records (Id_det) available during call activity recording for service item usage and returns as well as the records listed on the Inventory List screen.
- The start and end service group filter the items (pt_mstr) replicated from the item master that can be selected for a call or for a parts order.

In addition to these records, the following item data is also available on the device:

- Installed base records belonging to an end user on a call sent to the device
- Installed base records belonging to an end user whose primary engineer is the engineer associated with the device
- Items that do not match the service group but that are on a call or parts order sent to the device

Installed base records can be accessed when creating or updating a call, when returning an item while recording call activity, and when viewing the Installed Base Item List.

Configure General Sync Settings

Use the following field definitions to help you as you set up your users:

Single Sign-On For Sync Engine. Indicate how you want the system to authenticate users when they attempt to synchronize data with MFG/PRO from remote devices.

No: The remote user may be prompted twice for credentials: first for MFG/PRO and then for the sync engine.

Yes: The remote user is prompted for one set of credentials only. The system uses those credentials to also validate against the sync engine.

The setting defined here sets the default for each remote user. Individual users can modify the default setting in the Admin|Settings screen, but this will only be retained for the next synchronization executed.

Important If you specify Yes and you have enabled MFG/PRO authentication in QAD Mobile FS, you must establish procedures to ensure that exactly the same IDs are set up in MFG/PRO User Maintenance and in the synchronization engine.

Even if you specify No to Single Sign-On, it is possible for the user to be prompted for credentials only once. To do this, the user must save the sync engine credentials on the device. In this case, the second prompt for credentials does not display.

This setting applies to all records you define in this program. It defaults to No until you create a record for a user. Then it defaults to the value for the first detail record. If you change the value for this field, the system prompts you to update all currently defined records with the new value. If you respond No, none of the records are updated.

Prioritize Call Header on Client. Indicate whether you want values associated with the call header or the call line to determine the work code and status displayed on the mobile device and updated in MFG/PRO.

No: The call line values display on the device. When changes are made on the device, only the call line in MFG/PRO is changed.

Yes: The call header values display on the device. When changes are made on the device, the call line value is updated in MFG/PRO and the call header value is updated as well.

Note You cannot use a device to change the status of a call or call line to the close status as defined in Call Management Control. Calls can only be closed in MFG/PRO.

This setting is typically set to Yes only when you normally create calls with a single line item. When Prioritize Call Header on Client is Yes and two call lines have different statuses, the call list on the device displays the call header status for both lines.

This setting applies to all records you define in this program. It defaults to No until you create a record for a user. Then it defaults to the value for the first detail record. If you change the value for this field, the system prompts you to update all currently defined records with the new value. If you respond No, none of the records are updated.

Nonexisting End User. Indicate whether end user IDs are validated during call entry on a QAD Mobile FS device:

No: The end user ID entered on a call in QAD Mobile must exist on the client.

Yes: The mobile user can enter the ID of an end user that does not already exist on their device. When the device is synchronized, this end user record must exist in MFG/PRO or an error is generated.

Note See “Understanding Synchronized Data” on page 66 for a description of which end user records exist on the device.

Setting this field to Yes lets your remote engineer create a call for an end user for whom they have not previously provided service. This might be useful in an emergency when the regular engineer is not available.

Nonexisting Item. Indicate whether item numbers are validated during data entry on a QAD Mobile FS device:

No: The item number entered on a call or parts order in QAD Mobile must exist on the client.

Yes: The mobile user can enter an item number that does not exist on their device. For parts orders, this item must exist in MFG/PRO or an error is generated during synchronization. For calls, if the item does not exist, it is treated like a memo item in MFG/PRO when the data is synchronized.

Note See “Understanding Synchronized Data” on page 66 for a description of which item records exist on the device.

Print System Comment on Invoices/Reports. Indicate how you want the system to display comments that are automatically generated when a call is created on a QAD Mobile device. Call comments are always associated with the call header.

No: The generated comment is placed on its own page and marked to be included on internal reports only.

Yes: The generated comment is placed on the first page of comments along with the other notes. By default these print on both internal and external invoices and reports.

Note Each time the device is synchronized, any new comments created on the device create a new page of comments in MFG/PRO.

Generate Doc IDs on Client. Indicate whether you want to generate temporary or permanent record IDs on the device for calls and parts orders.

No: Temporary record IDs are created on the client for new calls and parts orders. These are prefixed with three asterisks (***). New calls must be synchronized with the server to receive a permanent ID before activity can be recorded for them.

Yes: Permanent IDs are created on the client. The IDs are created using the value of Call/MO Unique Prefix entered in this program and the next sequential number maintained on the device.

When this field is Yes, you can update activity reports for a new call created on the device and not yet synchronized with your production database.

If you are using MFG/PRO eB2.1, when you change the sync settings and press Go, the system prompts you to determine how to apply the new sync settings.

Apply the settings to all domains?

Enter Yes to apply the new sync settings to all domains.

Enter No and the system prompts you whether to apply the sync settings to the current domain.

Yes: The new sync settings are applied to the current domain.

No: Changes to the sync settings are not applied or saved.

Configure Sync Settings for Individual Users

Use the following field definitions to create records for individual users that access MFG/PRO through mobile devices:

Sync Engine User ID. Enter the ID that a field service engineer uses when connecting to the synchronization server. This value must be defined for the OneBridge server.

This field does not have to be the same as the MFG/PRO user ID for the engineer as defined in MFG/PRO User Maintenance, if used. However, if Single Sign-On for Sync Engine is Yes, the users defined for the synchronization engine should be the same as MFG/PRO user IDs or errors may occur during synchronization.

Note Each user can determine during synchronization if single sign-on is to be used.

MFG/PRO Domain. Enter the code identifying an active domain that a field engineer synchronizes with from remote devices through this sync engine user ID. The domain name displays next to the code.

Engineer code, site, location, and start/end service group you enter in the User Detail frame must be defined in this domain. Engineer unique ID and Call/MO unique prefix you define in the User Detail frame are also associated with the domain.

If you change the domain for an existing sync engine user ID and confirm the update, all entries in the User Detail frame are cleared and you must re-enter the user detail information.

A domain represents a business operation with a single currency and chart of accounts. Each database can have one or more domains. Each domain can include one or more entities, one of which is designated as the primary entity.

Note This field does not display if you are using MFG/PRO eB2.

Engineer. Enter the engineer code—defined in Engineer Maintenance (11.13.1)—associated with this QAD Mobile user ID. The system uses this value to determine which calls and parts orders should be returned for a particular sync engine user ID and how calls and orders should be created in MFG/PRO.

Site and location default from the engineer record if they are defined. You can delete a record when your cursor is in this field.

Engineer Unique ID. Enter a unique ID (1–3 alphanumeric characters) to associate with call reports created for this engineer. The system uses this ID as a prefix for call activity reports and QDocs. The prefix ensures that record values coming from many devices are unique when created in MFG/PRO. This value and Call/MO Unique Prefix display in the Unique Prefix field in the Settings page on the Admin menu on the mobile device.

▶ See page 64.

Call/MO Unique Prefix. Enter a unique prefix (1–3 alphanumeric characters) to associate with calls and parts orders created for this engineer when Generate Doc IDs on Client is Yes. The system uses this ID as a prefix for calls and parts orders, similar to the Engineer Unique ID. The prefix ensures that record values coming from many devices are unique when created in MFG/PRO. This value displays in the mobile device on the Settings page on the Admin menu.

Site/Location. Optionally, enter the site and location from which this engineer normally obtains parts and supplies used in completing call activity. Site must be defined in Site Maintenance (1.1.13) and location defined in Location Maintenance (1.1.18). These fields default from the site and location associated with the engineer in Engineer Maintenance.

The list of inventory records available for usage or return in CAR and the Inventory List screen on the device are based on inventory detail records at the site and location. If site or location is blank, no inventory data displays on the engineer's mobile device for the activity recording screens.

Note The list of items that displays in the Call screen, Parts Order screen, and in the drop-down for the Item field in Call Activity on the mobile device is based on records from the MFG/PRO item master, filtered by service group, not by site and location.

Start and End Service Group. Enter a range of service group values for limiting item data to be synchronized with the mobile device for this engineer. Associate service groups with items in Service Item Maintenance (11.3.7).

This field can be left blank. If specified, it is validated against values defined in Generalized Codes Maintenance for field `pt_svc_group`.

Only item master records with a non-blank service group that falls within the range defined by start and end service group are synchronized with the device. Use this to prevent overloading the storage space on the device.

The list of items that displays in the Call screen, Parts Order screen, and in the drop-down for the Item field in Call Activity on the mobile device is based on records from the MFG/PRO item master, filtered by service group. The item lists that display in Call Activity for parts and returns and the Inventory List screen are based on inventory detail records at the engineer site and location.

Suppress QAD Mobile API Warnings in MFG/PRO

You can specify in Service Management Control (11.24) in MFG/PRO whether you want the system to suppress some less important QAD Mobile API warning messages returned by MFG/PRO to QXtend and displayed in the QXtend Queue Manager. Suppressing these warnings may help you to identify more important warning messages.

Set Suppress API Warnings to Yes to suppress QAD Mobile API warning messages that are considered not important.

Set Up Client Devices

QAD Mobile FS administration includes a page of control settings. You may need to define the Windows Domain setting before you can synchronize with the MFG/PRO database. The other settings in the Admin page are populated after synchronization.

From the QAD Mobile FS main menu page, select Admin from the menu. A submenu displays. Select Settings. The Settings page displays.

The screenshot shows a web-based settings interface for QAD Mobile FS. The window title is "QADMobileFS" and there is a "Save" button in the top left. The main content area is titled "Settings" and contains several configuration fields:

- Next Activity Report ID:** 8
- Next Call/ MO ID:** 15
- Next QDoc ID:** 8
- MFG/ PRO Domain:** st92bmfq
- Engineer:** ewj
- Unique Prefix:** mqv / MGv
- Site:** 12000
- Location:** 100
- Single Sign-On For Sync Engine**
- Sync Windows Domain:** qad

Fig. 4.2
QAD Mobile FS
Settings

Next Activity Report ID. Specify the value the device uses to create the numeric portion of the next activity report ID, combined with first portion of the string displayed for Unique Prefix (before the /). This value is incremented each time a CAR is created. In general, set this during implementation and leave it unchanged. It can be modified later if needed.

Next Call/MO ID. Specify the value the device uses to create the next call or parts order ID.

This value is incremented each time a call or parts order is created. Set this during implementation; if you reset it after this, you must specify a number greater than the last used value.

How call and parts order IDs are generated depends on the value of Generate Doc IDs on Client in QAD Mobile User Maintenance. If this is No, the number is preceded by three asterisks (***) and leading zeroes in the call or parts order ID fields to show that the value is temporary. If this is Yes, the Call/MO Unique Prefix is prefixed to the number. This value displays in the Unique Prefix field, after the /.

▶ See “Generate Doc IDs on Client” on page 59.

Next QDoc ID. Specify the value the device uses to create the next QDoc ID.

QDoc ID is a five-digit incremental number that identifies the QDoc. This value defaults to 00000 the first time you generate a QDoc on the client device and is not initialized after you recreate the client database. This ensures the uniqueness of all records imported from the client device.

Note If you specify an ID that results in a duplicate QDoc, the QDoc generated earlier will be overwritten.

MFG/PRO Domain. Displays the value of the MFG/PRO Domain you synchronize data with as defined in MFG/PRO QAD Mobile User Maintenance following the initial synchronization.

This field displays only if the local QAD Mobile FS database you created supports MFG/PRO domains. See step 3 of “Recreating the Device Database” on page 65 for details.

Engineer. Displays the value of the engineer defined in MFG/PRO QAD Mobile User Maintenance following the initial synchronization.

Unique Prefix. Displays the value of the Engineer Unique ID field followed by the Call/MO Unique Prefix as defined in QAD Mobile User Maintenance.

- The system uses Engineer Unique ID when creating CAR IDs and for naming QDocs to ensure uniqueness of records from multiple devices.
- The system uses CALL/MO Unique Prefix for calls and parts orders when Generate Doc IDs on Client is Yes.

Site, Location. Displays the values defined in QAD Mobile User Maintenance following the initial synchronization.

Single Sign-On For Sync Engine. Indicate how you want the system to authenticate your user ID during the next synchronization. This field defaults from MFG/PRO QAD Mobile User Maintenance. You can change it in the Admin change, but it will be reset to the MFG/PRO default after the synchronization.

Sync Windows Domain. If your network uses domain names, specify the domain that identifies the administrative group that your device belongs to. Depending on your network administration, the domain name can also be defined on the server so that it is not needed on the client.

Perform Initial Full Sync

- 1 From the Start menu, choose Programs|QADMoblie|QADMoblie FS.
- 2 Perform an initial full sync to set up the client data. The initial sync creates the required database on the client device.
- 3 Enter the MFG/PRO user credentials. Since this is the first synchronization for this user, the system prompts for sync server credentials. You may be prompted more than once to enter the user ID. After the initial sync, the credentials can be stored on the client if the single sign-on option is selected and the prompt no longer displays.
- 4 If prompted for Database Adapter credentials, leave the fields blank and choose OK.
- 5 The synchronization process begins. See “Synchronizing QAD Mobile FS” on page 76 for more information.

Recreating the Device Database

The Admin menu provides an option to Create DB. This option should rarely if ever be needed. It is provided in the event that the client database is corrupted for some reason and needs to be recreated.

Warning This function completely overwrites the local QAD Mobile FS database.

To execute this function, follow these steps.

- 1 Select Create DB from the Admin menu.

When you select the Create DB option, an informational message displays.

Option should only be performed after first consulting with your system administrator. Some data will not be recoverable after resynchronizing with MFG/PRO such as call activity reports

Click Ok to continue.

- 2 A confirmation message displays.

Overwrite database *QADMoblieFSInstall\dir\QADMoblieFS.mdb?*

Note On a PDA, the database extension is `.sdf`.

Choose Yes.

Overwriting the database is not allowed if you have data on the device that has not been synchronized. In this case, a message displays informing you that the database cannot be recreated.

Changes have been made in the QAD Mobile client that have not been synchronized back to MFG/PRO. Database recreation not allowed

3 Another confirmation message displays.

Do you want the database to support MFG/PRO domains?

Choose Yes if you are using MFG/PRO eB2.1.

Understanding Synchronized Data

Your MFG/PRO database may include a large number of records. Each engineer typically interacts with only a subset of the items, end users, and calls that exist in MFG/PRO. QAD Mobile FS has been designed to enhance performance and streamline data entry by presenting only the information that the engineer needs to have on the device.

To accomplish this, records are synchronized to the device only when they meet certain criteria. Table 4.1 lists some of the data types that can be displayed in lookups and screens in QAD Mobile FS and the criteria used for selecting relevant records.

▶ See page 58.

Note Because the records on the device are a subset of all records in MFG/PRO, engineers may need to be able to enter items and end users that do not exist on their device. This is controlled by settings in QAD Mobile User Maintenance. See “Nonexisting End User” on page 58 and “Nonexisting Item” on page 58.

Table 4.1
Data Selected for Synchronization

Data Type	Records Selected
Item Master Records	Items on any call line in MFG/PRO with the engineer’s ID in the Assigned field Items on any material order in MFG/PRO associated with one of the call lines selected by the previous criteria Items belonging to a service group within the range specified for the engineer in QAD Mobile User Maintenance
Inventory Detail	Records in the site and location specified for the engineer in QAD Mobile User Maintenance
End Users	End user records where the engineer is designated as Primary in End User Address Maintenance (11.9.1) (full sync only) End user records associated with a call line that the engineer is assigned to (quick sync and full sync)
Installed Base Item Detail	Items and any associated installed base structure associated with any of the end users replicated to the device

Develop Engineer Report

As part of your service engagements with end users, your engineers may want to leave a statement of work or generate some other kind of report to be left at the end user site.

If you are using laptops as your mobile devices, these reports can be generated using standard Microsoft Access features. The QAD Mobile FS database includes a set of sample queries for generating a statement of work. A sample HTML page based on these queries is also provided in:

```
QADMobileInstallDir\WinClient\LanguageDir\SOW
Print\sow.htm
```

You can install this HTML file on the PC desktop. When an engineer needs to print the statement, clicking the document icon displays the report in a browser. It can be printed using the browser print functions.

You can use this sample as provided or tailor it for your own requirements using features of Microsoft Access.

The background of the page is a grayscale image of several interlocking gears. The gears are of different sizes and are arranged in a way that they appear to be part of a larger mechanical system. The lighting creates soft shadows and highlights, giving the gears a three-dimensional appearance. The overall tone is professional and technical.

Section 2

Using QAD Mobile FS

This section describes how to configure and use the QAD Mobile FS application.

Using QAD Mobile FS 71

Using QAD Mobile FS

This chapter covers the use of QAD Mobile FS on field devices:

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<i>Synchronizing QAD Mobile FS</i>	76
<i>Creating and Updating Calls</i>	79
<i>Reporting Call Activity</i>	85
<i>Ordering Parts</i>	91
<i>Viewing Inventory</i>	96
<i>Viewing Installed Base Details</i>	97

Overview

The focal component of QAD Mobile FS is the device interface. This chapter explains how to use the QAD Mobile FS product on a field device, and details the process flows that occur under each sequence of device interfaces.

There are six basic scenarios in QAD Mobile FS:

- Synchronizing QAD Mobile FS
- Reviewing, creating, and updating calls
- Reporting call activity
- Ordering parts
- Viewing inventory and installed base items
- Administering QAD Mobile FS

The administration functions are discussed in “Set Up Client Devices” on page 62. This chapter discusses the functions that are used on a daily basis.

▶ See “Define QAD Mobile FS Users in MFG/PRO” on page 55.

The information that displays on your device is affected by general settings and settings associated with your user ID in QAD Mobile User Maintenance (11.1.12) in MFG/PRO. These settings affect the following aspects of a call:

- Whether you see status and work code details related to the call header or call lines
- Whether you can enter item and end user IDs that do not exist in the device database
- Whether temporary or permanent IDs are given to new calls and parts orders
- How various item lists on the device are generated

Features of the User Interface

The QAD Mobile FS user interface is designed to be easy to use and navigate. This section provides some details on special features that will help maximize your effectiveness in finding information and entering data.

Working with Lists

Most screens in QAD Mobile FS provide lists for selecting records. The following lists share common features, described here.

- Call List
- Parts Order List
- Call Activity List
- Inventory List
- End User List
- Installed Base List
- End User Lookup
- Item Lookup
- Parts Grid in Call Activity
- Return Grid in Call Activity

Figure 5.1 illustrates a typical list.

Click a column to sort by it

Currently selected row

Enter search text

Active sort column

End User	Item	Severity	Call	Call Line	Service Type	Next Date	Status
	n1	A	gxw1	1	ct1	4/25/2005	open
Commerce Bank	FL4800	A	ca100061	1	SC-1	8/9/2005	new
Commerce Bank	FL4800	C	ca1361	1	BILLABLE	11/5/2003	open
Commerce Bank	testitem-001	A	ca100059	1	ct1	8/9/2005	new
JZW's Customer 1 End U	jzwitem1	A	gxw3	1	ct1	4/26/2005	open
JZW's Customer 1 End U	jzwitem1	A	q1	1	ct1	4/27/2005	open
JZW's Customer 1 End U	jzwitem1	A	test	1	ct1	4/27/2005	open
Monterey Credit Union		A	ca100044	1	ct1	6/29/2005	open
Monterey Credit Union		A	ca100055	1	ct1	7/28/2005	open
Monterey Credit Union	22-100	A	ca1904	1	ct1	2/23/2004	Accepted
Monterey Credit Union	f3	A	ca100026	1	ct1	6/2/2005	open
Monterey Credit Union	FL4800	A	ca100019	1	ct1	3/17/2005	open
Monterey Credit Union	FL4800	A	ca100020	1	ct1	3/17/2005	open
Monterey Credit Union	FL4800	A	ca100021	1	ct1	3/17/2005	open
Monterey Credit Union	FL4800	A	ca100060	1	ct1	8/9/2005	new
Monterey Credit Union	FL4800	A	ca2261	1	ct1	9/16/2004	assigned
Monterey Credit Union	FL4820	A	ca1340	1	ct1	10/7/2003	pending

Fig. 5.1 Using Lists

Sorting

Most lists have Search and In fields. The drop-down list associated with the field labeled In lets you select the column for data sorting. The first time you select a column heading, sort is in ascending order. Selecting the same heading again sorts in descending order.

You can also click in the header of any column to sort the rows based on the values of that column. The column displayed in the In field is updated to reflect the active sort.

Searching

Any text you enter in the Search field acts on the currently active sort column. Entering text in the Search field repositions the list at the record starting with that text value. The Arrow in the left column indicates the active row.

You can also search for records that contain a value by preceding the value with a wildcard (*). For example, entering *cr finds Monterey Credit Union and Creative Studios.

Resizing Columns

To resize a column, select the boundary on either side of the column heading and drag it until the column is the width you want.

Using Lookups

Some fields have a lookup icon. Clicking this icon displays a list with similar features to other lists. You can search and sort to find an appropriate record.

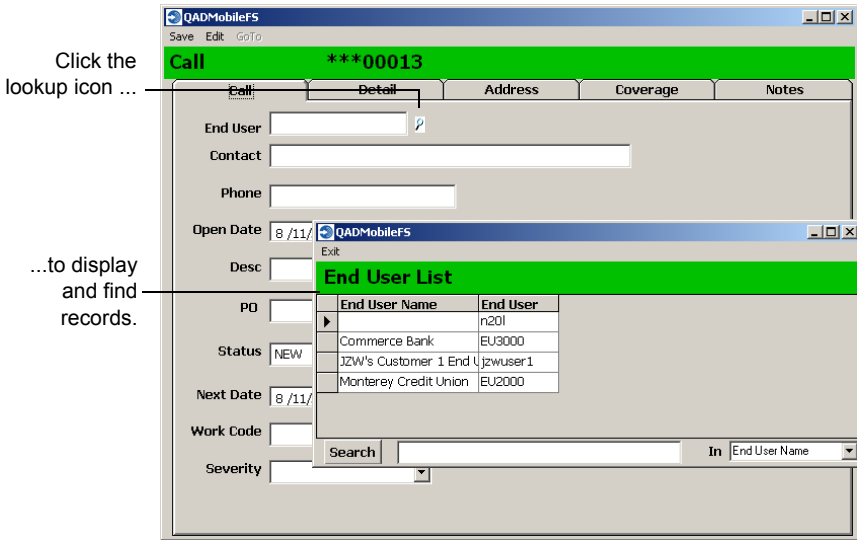


Fig. 5.2 Using Lookups

Working with Dates

Date fields include a drop-down list icon. Clicking the icon displays a calendar for selecting dates. You can also use the up and down arrows on the keyboard to increment the value in date fields.

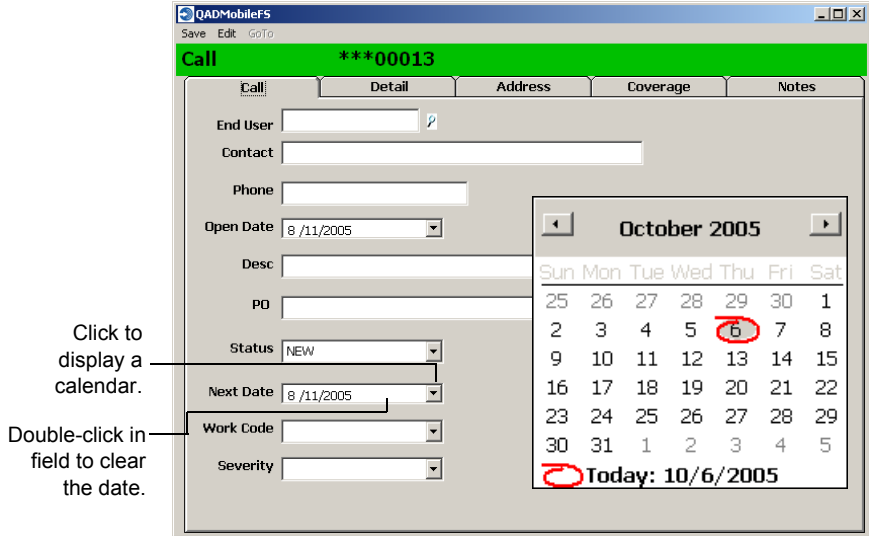


Fig. 5.3 Using Calendars

To clear a value from a date field, type a question mark (?) in the field or double-click in the field.

Differences on Pocket PCs

This chapter illustrates using QAD Mobile FS on a laptop. When using a pocket PC, most of the functions are identical. However, a few variations exist because of limitations imposed by the smaller display area on the pocket device. The following list details these differences:

- The Synchronize label cannot be used to initiate synchronization; you must use the button.
- You cannot click in column headings to sort lists; use the In drop-down list instead. Sorting only occurs in ascending order.
- When you search in a list on a pocket device, the list is rebuilt starting at the first record that matches your sort criteria. You cannot scroll up to previous records.
- In lists, you cannot use the wildcard (*) to search for records containing a value.
- To clear a date field, display the calendar and click on an area in the calendar that does not display a date value. Double-clicking or entering a question mark does not clear the field.
- Because of smaller display area on pocket PCs, Call Activity labor and expense screens have a different format. Instead of fields displayed in horizontal grids, fields are arranged in vertical columns with Add, Update, and Delete buttons. In some cases, fields such as description are not accessible from the PDA.
- The Current Time button is not available from the Call Activity screen.

Synchronizing QAD Mobile FS

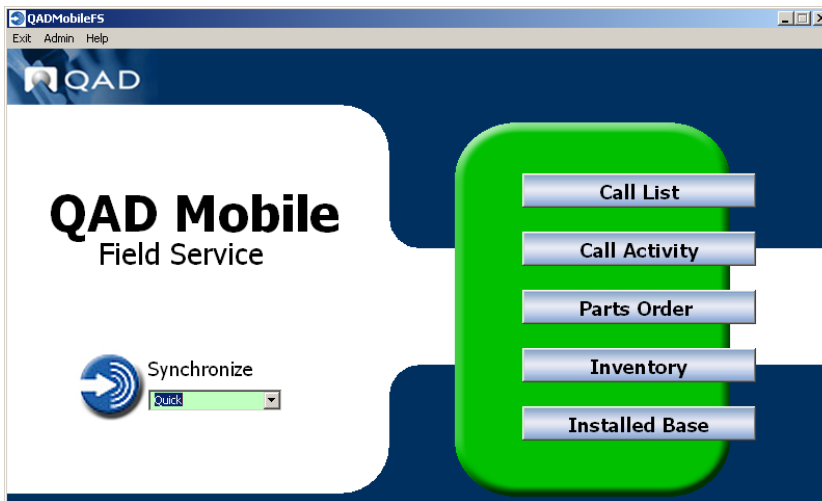
Synchronization is the process of transferring new and changed data from the field device to MFG/PRO, and transferring new and changed data from MFG/PRO to the field device. If application code or data changes have occurred, these are queued in the OneBridge application on the synchronization server and are also transferred to the remote device.

Synchronization should be done before the field engineer schedules the next period of work. The process requires that the device have network, USB, or wireless access to the synchronization server.

Both full and partial synchronization are supported. During a full synchronization, all data required on the device is updated. This includes static data that does not change frequently, such as work codes, severity codes, and end user data. The partial (quick) synchronization only updates transaction data such as calls, parts orders, and call reports. After an initial full synchronization, you can use the quick sync on a regular basis to see the calls assigned to you and the status of items you have ordered. You may want to do a full sync over weekends.

Follow these steps to complete a synchronization:

- 1 On the device, click the QAD Mobile FS icon. The Main QAD Mobile FS menu displays.
- 2 Select full or quick in the drop-down list:
 - Full synchronization updates all data on the device, including static data that does not change frequently.
 - Quick synchronization updates only the transaction data changes since the last synchronization.
- 3 Click the Synchronize label or the button to begin the process.

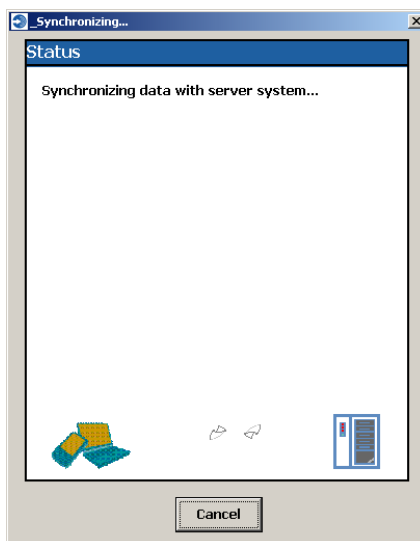


- 4 The server log-in screen displays.



- 5 Enter your user ID and password; then click OK.

The user is authenticated on the server and the synchronization process starts. See “Synchronization Data Flow” on page 13 for more detail.



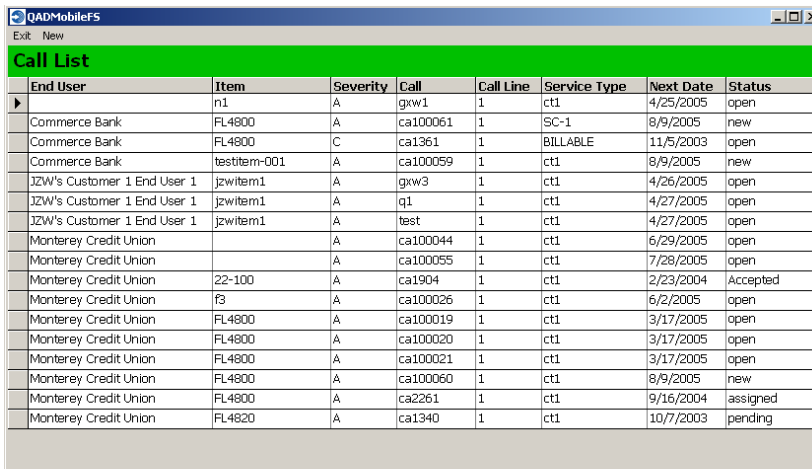
The process can take 1 to 5 minutes or more depending on the amount of data to transfer and the number of concurrent users on the synchronization server. After synchronization is complete, a status screen displays indicating success or failure.

Creating and Updating Calls

The outstanding call list lets field engineers review a listing of all call lines currently assigned to them and obtain detailed information about each line. This includes the end user address, service coverage detail, call information, item detail, and call comments (notes). Some data fields can be updated for an existing call; others are display only.

You can also create new calls on the device. When creating a new call, you can create only a single call line. This is unlike a call created in MFG/PRO, which can include multiple call lines with different detail information. When these calls are synchronized from MFG/PRO onto the device, only lines assigned to your engineer code display.

- 1 From the QAD Mobile FS main menu, click Call List. The list of calls assigned to the field engineer displays by call line.



End User	Item	Severity	Call	Call Line	Service Type	Next Date	Status
	n1	A	gww1	1	ct1	4/25/2005	open
Commerce Bank	FL4800	A	ca100061	1	SC-1	8/9/2005	new
Commerce Bank	FL4800	C	ca1361	1	BILLABLE	11/5/2003	open
Commerce Bank	testitem-001	A	ca100059	1	ct1	8/9/2005	new
JZW's Customer 1 End User 1	jzwitem1	A	gww3	1	ct1	4/26/2005	open
JZW's Customer 1 End User 1	jzwitem1	A	q1	1	ct1	4/27/2005	open
JZW's Customer 1 End User 1	jzwitem1	A	test	1	ct1	4/27/2005	open
Monterey Credit Union		A	ca100044	1	ct1	6/29/2005	open
Monterey Credit Union		A	ca100055	1	ct1	7/28/2005	open
Monterey Credit Union	22-100	A	ca1904	1	ct1	2/23/2004	Accepted
Monterey Credit Union	f3	A	ca100026	1	ct1	6/2/2005	open
Monterey Credit Union	FL4800	A	ca100019	1	ct1	3/17/2005	open
Monterey Credit Union	FL4800	A	ca100020	1	ct1	3/17/2005	open
Monterey Credit Union	FL4800	A	ca100021	1	ct1	3/17/2005	open
Monterey Credit Union	FL4800	A	ca100060	1	ct1	8/9/2005	new
Monterey Credit Union	FL4800	A	ca2261	1	ct1	9/16/2004	assigned
Monterey Credit Union	FL4820	A	ca1340	1	ct1	10/7/2003	pending

- 2 Select a call line from the list to access the call line information or choose New Call from the menu to create a new single-line call. Detail tabs appear at the top of the screen. Which fields you can edit depend on whether you are creating a new call or editing an existing one. The following screen illustrates editing an existing call. See “Reporting Call Activity” on page 85 for information on reporting call activity from this form.

The screenshot shows a web browser window titled 'QADMobileFS' with a menu bar containing 'Save', 'Edit', and 'GoTo'. Below the menu bar is a green header bar with the text 'Call' and 'ca1361'. The main content area is a form with several tabs: 'Call', 'Detail', 'Address', 'Coverage', and 'Notes'. The 'Call' tab is selected. The form contains the following fields:

- End User: EU3000
- Contact: Joe Smith
- Phone: 800-525-9191
- Open Date: 11/3/2003
- Desc: Call entered from mobile device
- PD: abc123
- Status: NEW
- Next Date: 11/5/2003
- Work Code: tech
- Severity: C

When you create a new call, the system generates either a temporary or permanent ID based on the setting of Generate Doc IDs on Client in QAD Mobile User Maintenance.

- If this is No, the call is assigned a temporary number starting with three asterisks (***) and followed by the five-digit sequence specified in the Admin Settings field Next Call/MO ID. After a call has been synchronized, it receives a permanent ID from MFG/PRO.
- If this is Yes, it is given a permanent ID prefixed with the value of Call/MO Unique Prefix defined in QAD Mobile User Maintenance in MFG/PRO.

▶ See “Call/MO Unique Prefix” on page 61.

You can record activity for calls only when they have a permanent ID.

- 3 For a new call, update the following fields; they are display only for an existing call:

End User. Enter an end user ID or select an end user to associate with the call from the lookup. End users display sorted by name. Use the search and sort features to find the record you want.

Note If Nonexisting End User is Yes in QAD Mobile User Maintenance, the field is not validated; you can enter an ID that does not exist on your device.

▶ See “Nonexisting End User” on page 58.

Contact and Phone. Specify the individual at the end user address to contact regarding this call and a phone number where this individual can be reached.

Open Date. This defaults to the current system date, but you can modify it, for example, when you are recording a call taken on an earlier date. The system uses the call open date to determine valid coverage sources (warranty or contract), price lists, and service BOMs and routings. This field is required.

Desc. Enter a brief description of the call to display on reports and inquiries.

- 4 For a new or existing call, modify values for the following fields:

PO Number. This field is required if the end user associated with the call requires a PO number. If so, you must enter a valid customer PO number.

Status. Select a valid status code from the drop-down list. If you select a status that equates with cancel or hold in MFG/PRO, this call is removed from the device during the next synchronization. You cannot change the status to the close or complete status. For a new call, status defaults to the call open status, as defined in MFG/PRO in Call Management Control (11.1.24).

Note The setting of Prioritize Call Header on Client in QAD Mobile User Maintenance determines whether this field value reflects the call header or the call line.

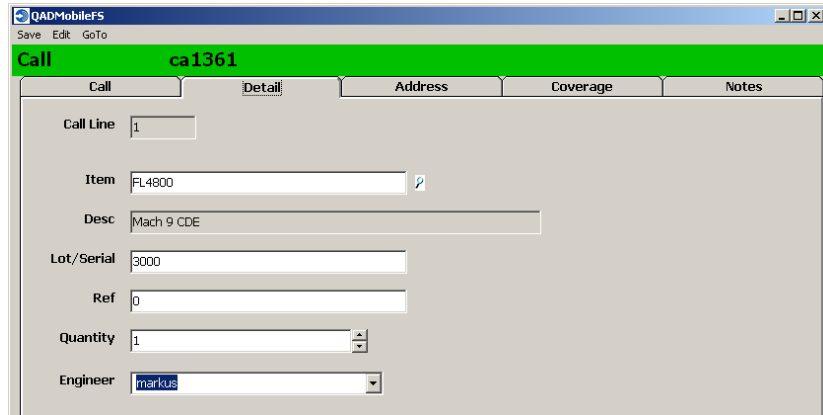
Next Date. Enter the next service date. Click the drop-down to display a calendar for selecting dates. To clear the field, enter a question mark (?) or double-click in it.

Work Code. The work code records the type of work performed and how the work is billed. Select a valid work code from the list. Work Codes are defined in Work Code Maintenance (11.21.1).

Note The setting of Prioritize Call Header on Client in QAD Mobile User Maintenance determines whether this field value reflects the call header or the call line.

Severity. Select a valid severity code from the drop-down list. Severity codes are defined as generalized codes in Generalized Codes Maintenance (36.2.13) for field ca_severity.

- Click the Detail tab to view call line information. Item and quantity can be modified only when a call activity report is not associated with the call line on the device and the call status is not hold or cancel.



The screenshot shows a software window titled 'QADMobileFS' with a menu bar containing 'Save', 'Edit', and 'GoTo'. Below the menu bar is a green header bar with the text 'Call ca1361'. Underneath is a tabbed interface with five tabs: 'Call', 'Detail', 'Address', 'Coverage', and 'Notes'. The 'Detail' tab is active. The form contains the following fields:

- Call Line: 1
- Item: FL4900 (with a lookup icon)
- Desc: Mach 9 CDE
- Lot/Serial: 3000
- Ref: 0
- Quantity: 1 (with a dropdown arrow)
- Engineer: markus (with a dropdown arrow)

Item. Enter an item number or select a valid item from the lookup.

The lookup lets you toggle between viewing items in the end user's installed base and item master records.

- If you display items, the lookup shows the item master records on your device. This is created when you sync the device based on information associated with your record in QAD Mobile User Maintenance (11.1.12).
- If you display installed base items, you initially see all the top-level items in the end user's installed base. If an item has been added to the installed base with a product structure, selecting it from the lookup displays all of the lower-level items in the structure. You can select either the parent item or a lower-level item for this call line detail.

Note If Nonexisting Item is Yes in QAD Mobile User Maintenance, the field is not validated; you can also enter an item number that does not exist on your device.

- Complete the call line detail by filling in the remaining fields.

Quantity. Enter or scroll to the quantity required. For a serial-number controlled item, quantity must be 1.

Engineer. For existing and new calls, this field displays your field engineer code by default. If you change this value, the call is reassigned during the next synchronization and deleted from your device. To leave blank, select the blank value from the list.

- 7 Click the Address tab to view the end-user address information.

The screenshot shows the QAD Mobile FS application window with the 'Address' tab selected. The call ID is 'ca1361'. The form contains the following fields:

Call	Detail	Address	Coverage	Notes
End User	EU3000			
Name	Commerce Bank			
Address	2515 East Church Street			
City	Key Largo			
State	FL	Post	33037	
Country	usa			
Contact	Joe Smith			
Phone	800-525-9191			

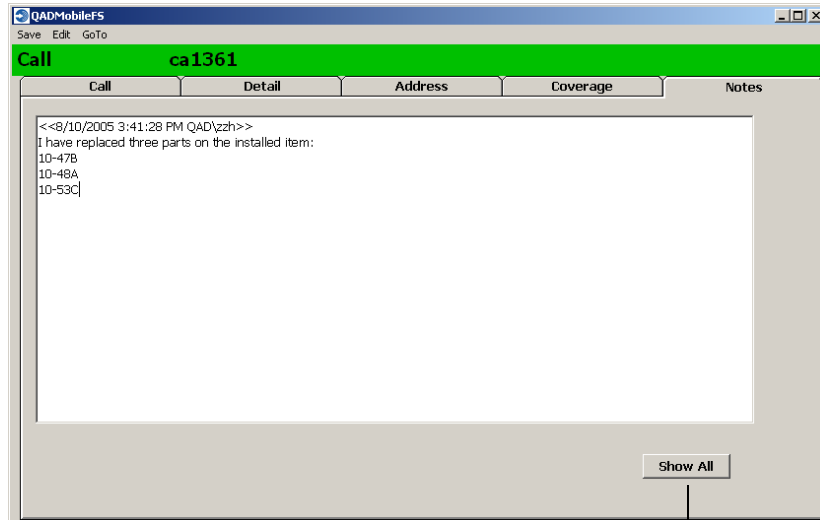
- 8 For existing calls, click the Coverage tab to review contract or warranty details.

The screenshot shows the QAD Mobile FS application window with the 'Coverage' tab selected. The call ID is 'ca1361'. The form contains the following fields:

Call	Detail	Address	Coverage	Notes
Item	FL4800			
Desc	Mach 9 CDE			
Lot/Serial	3000			
Contract	1014			
Start	7/1/2003	End	5/30/2004	
Service	BILLABLE			
Desc	Contract Type-Full Charge			
Install	2/26/2004	Warranty	2/26/2004	

For a new call, this tab is blank until after synchronization occurs.

- 9 Click the Notes tab to enter new comments or review existing comments for this call. You cannot modify comments that have been synchronized.



Button label changes from Show All to Update

- For unsynchronized calls, enter new comments as needed.
- For synchronized calls, any existing comments display. Click the Update button to add new comments. After you save the comments, they can no longer be modified.

Any new comments are added as a new page in MFG/PRO when the call is synchronized.

Note When you click Update, its label changes to Show All. After entering your comments, click Show All to view any pre-existing comments in addition to any comments you just entered.

If you are creating a new call, the system automatically adds a comment indicating that the call was generated from QAD Mobile FS and places it at the beginning of other comments or on its own page depending on the setting of Print System Comments on Invoices/Reports in QAD Mobile User Maintenance.

- 10 Choose Save to save and exit the call line. You return to the call list.

- To cancel call updates or to delete a call, choose the Edit menu from any call screen. Choose Cancel to cancel or Delete to delete the call. Only unsynchronized calls can be deleted. You can cancel updates to both synchronized and unsynchronized calls.

Note You can also cancel by clicking on the window close button and responding Yes when prompted to cancel changes.

Reporting Call Activity

You can access call reporting from the main menu by clicking Call Activity and selecting a call line to report against. You can also choose Call Activity from the GoTo menu in the call maintenance screens. The following instructions assume that you started from the main menu, which displays all calls. The GoTo option displays only the current call line, but uses the same screens for modifications.

Note Synchronized call activity reports (CARs) are view-only: no changes are allowed.

- From the QAD Mobile FS main menu, click Call Activity. At the top of the pane, a list of call lines currently assigned to you displays.
- Select a call line from the Call List. If any activity reports exist for the line, they display in the lower Report List.

QADMobileFS							
Call List							
End User	Item	Severity	Call	Call Line	Service Type	Next Date	Status
	n1	A	gxw1	1	ct1	4/25/2005	open
Commerce Bank	FL4800	A	ca100061	1	SC-1	8/9/2005	new
Commerce Bank	FL4800	C	ca1361	1	BILLABLE	11/5/2003	open
Commerce Bank	testitem-001	A	ca100059	1	ct1	8/9/2005	new
JZW's Customer 1	jzwitem1	A	gxw3	1	ct1	4/26/2005	open
JZW's Customer 1	jzwitem1	A	q1	1	ct1	4/27/2005	open
JZW's Customer 1	jzwitem1	A	test	1	ct1	4/27/2005	open
Monterey Credit Un		A	ca100044	1	ct1	6/29/2005	open
Monterey Credit Un		A	ca100055	1	ct1	7/28/2005	open
Monterey Credit Un	22-100	A	ca1904	1	ct1	2/23/2004	Accept
Monterey Credit Un	B3	A	ca100026	1	ct1	6/2/2005	open
Monterey Credit Un	FL4800	A	ca100019	1	ct1	3/17/2005	CONF
Report List							
Report	Report Date	Synchronized					

Call activity cannot be reported against calls with a cancel or hold status. It is also not allowed if the call's end user requires a purchase order number and none has been specified.

▶ See page 59.

You can only report activity for new, unsynchronized calls created on the device when Generate Doc IDs on Client is Yes in QAD Mobile User Maintenance.

The report number is generated from the Next Activity Report ID field, defined in the Settings form on the Admin menu combined with the Engineer Unique ID value defined in QAD Mobile User Maintenance in MFG/PRO.

- 3 Select a call line and then either select an existing call report from the list to edit or choose Call Activity Report from the New menu to create a new report. The Labor tab displays.

QADMobileFS
Save Edit

Call Activity ca100059

Report zzh00001 Call Line 1

Labor		Expense	Parts	Return	Fault	Notes	
Date	Std Op	Work Code	Category	Start Time	End Time	Duration	Description
* 9/10/2005	300	TECH	083-1	3:55:00 PM	9:00:00 PM	5.5	

Current Time Update Duration

Date. This field defaults to the system date; change it to the correct date when the labor activity occurred if necessary. Click the drop-down to display a calendar for selecting dates. To clear the field, enter a question mark (?) or double-click in it.

Std Op. Optionally specify a standard operation code defined with Service Std Operation Maint (11.19.21) in MFG/PRO. If specified, the system displays the associated service category and description.

After you record a line, you can change the operation only by deleting the line and reentering it.

Work Code. This field defaults from the selected call line; you can change it if needed. Work code affects coverage and pricing.

Category. Select a labor service category from the drop-down list. For standard operations and operations in service routings, the service category defaults from the operation.

Start Time and End Time. Specify the time of day you began and finished the work. These values default to 12 AM. Click Current Time to update a field with the current time.

Duration. Manually enter the number of hours worked or click Update Duration to populate this field based on the start and end times entered.

Description. Specify a brief description of this operation to print on the customer invoice. Description defaults from a standard operation if specified.

4 Click Expense to enter expenses for the call.

The screenshot shows the QADMobileFS application window. At the top, there's a title bar with 'QADMobileFS' and window controls. Below that is a menu bar with 'Save' and 'Edit'. The main header area is green and contains 'Call Activity' and 'ca100059'. Below the header, there's a 'Report' section with 'zzh00001' and 'Call Line 1'. The main content area has several tabs: 'Labor', 'Expense', 'Parts', 'Return', 'Fault', and 'Notes'. The 'Expense' tab is active, showing a table with the following data:

Date	Std Op	Work Code	Category	Quantity	Cost	Description
* 8/10/2005	00001	TECH	ahh-exp1	1	10.00	Parking

The Expense tab is similar to the Labor tab and the fields are the same, except that for expenses you enter a quantity and cost.

Quantity. Enter the number of units of the service category that you used. This defaults from the standard operation, if one is specified.

Cost. Specify the cost of 1 unit of the service category.

5 Click the Parts tab to enter the items used for this call line.

Call Activity					
Report		Call Line			
zzh00001		1			
Labor	Expense	Parts	Return	Fault	Notes
Item	Quantity	Lot/Serial	Site	Location	Item Description
44-100	0		10000	12000	CONTROL UNIT, HOME USE
▶ 44-100	1	51	10000	12000	CONTROL UNIT, HOME USE
*					

Order	Item	Lot/Serial	Quantity	UM	Item Description
	22-110		8	EA	CORD,POWER,EUROPE,WEST
	44-100		30	ea	CONTROL UNIT, HOME USE
	44-100	50	1	ea	CONTROL UNIT, HOME USE
	44-100	51	1	ea	CONTROL UNIT, HOME USE
	44-100	52	1	ea	CONTROL UNIT, HOME USE
	44-100	53	1	ea	CONTROL UNIT, HOME USE
	44-100	54	1	ea	CONTROL UNIT, HOME USE
	44-100	55	1	ea	CONTROL UNIT, HOME USE
	44-100	56	1	ea	CONTROL UNIT, HOME USE
	44-100	57	1	ea	CONTROL UNIT, HOME USE
	44-100	58	1	ea	CONTROL UNIT, HOME USE
	44-100	59	1	ea	CONTROL UNIT, HOME USE
	44-100	60	1	ea	CONTROL UNIT, HOME USE

The bottom grid displays:

- Inventory detail records for items found in the site and location associated with your record in QAD Mobile User Maintenance
- Inventory detail for items ordered on parts orders for the call line. Items from parts orders display a value in the Order column.

When you select a row in the bottom grid, it is added to the top grid with a quantity of 0, unless only a single item exists; then quantity defaults to 1. You can then edit quantity, site, and location in the upper grid. Quantity can be greater than the quantity available.

You can also click the Item field in the upper grid on the blank line to open a drop-down list of all item master records on your device. Select an item and then update quantity, lot/serial, site, and location.

Note If Nonexisting Item is Yes in QAD Mobile User Maintenance, the field is not validated; you can also enter an item number that does not exist on your device.

6 Click the Return tab to enter information on returned items.

The screenshot shows the 'Call Activity' screen for call 'ca100059'. The 'Return' tab is active. The top grid is empty, and the bottom grid displays the following data:

Order	Item	Lot/Serial	Ref	Quantity	Item Description
	22-110			8	CORD,POWER,EUROPE,...
	44-100			30	CONTROL UNIT, HOME U...
	44-100	50		1	CONTROL UNIT, HOME U...
	44-100	51		1	CONTROL UNIT, HOME U...
	44-100	52		1	CONTROL UNIT, HOME U...
	44-100	53		1	CONTROL UNIT, HOME U...
	44-100	54		1	CONTROL UNIT, HOME U...
	44-100	55		1	CONTROL UNIT, HOME U...

The bottom grid displays items that are available to be returned for this call, including:

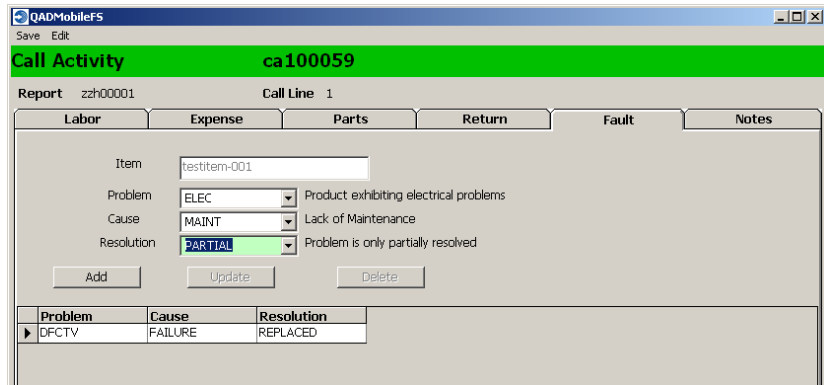
- Inventory detail records found in the site and location associated with your record in QAD Mobile User Maintenance.
- Items ordered on parts orders for the call line. Items from parts orders display a value in the Order column
- Items in the end-user's installed base. These display with <ISB> in the Order column.

When you select a row in the bottom grid, it is added to the top grid with a quantity of 0, unless only a single item exists; then quantity defaults to 1. You can then edit quantity, site, and location in the upper grid. Quantity must be a positive, numeric value and can be greater than the quantity available.

You can also click the Item field in the upper grid on the blank line to open a drop-down list of all item master records on your device. Select an item and then update quantity, status, lot/serial, and reference. The return status is a required field.

Note If Nonexisting Item is Yes in QAD Mobile User Maintenance, the field is not validated; you can also enter an item number that does not exist on your device.

- Click the Fault tab to enter codes reflecting the specific failure and resolution for the item on the call line.

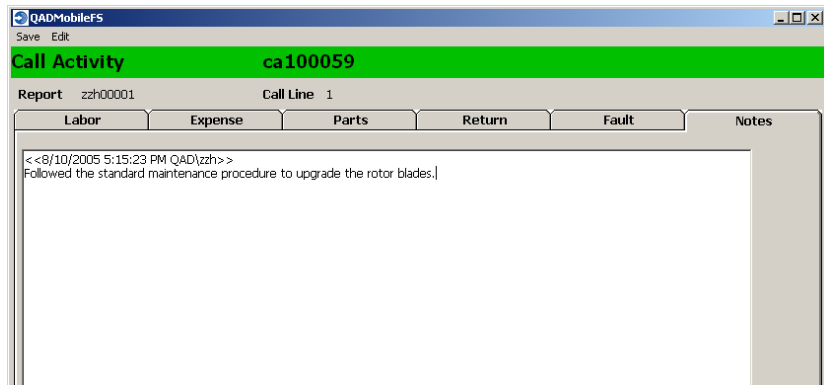


The item associated with the call line displays and cannot be edited. Select the Problem, Cause, and Resolution codes from the lists. This enables the Add button.

Click Add to add the fault codes to the item, as shown in the screen example. You can add multiple sets of fault codes for an item.

To modify or remove a set of fault codes, select a row in the lower grid and click Update or Delete.

- Click the Notes tab to enter comments for the call.



These update the same comment records that are updated in the Call screen.

- 9 Choose Save to save and exit the CAR and return to the call list. You are prompted with the following message:

Is activity for this report complete?

If you choose Yes, the call line status will be set to the complete or close status depending on how you set the Close on Recording field value in Call Management Control (11.1.24). If all lines on the call are closed or complete, the call status is also changed after synchronization and the call is removed from the device database. These calls will no longer display on the device.

- 10 To cancel CAR updates or to delete a CAR, choose the Edit menu from any CAR screen. Choose Cancel to cancel or Delete to delete the activity report.

Note You can also cancel by clicking on the window close button and responding Yes when prompted to cancel changes.

Ordering Parts

Parts can be ordered to complete activity for an SSM call. You can also order parts without referencing a call to replenish your general service inventory.

Note You can order parts only for calls that have been synchronized with MFG/PRO. A call created on the device and not yet synchronized is not available for selection.

When you create a new parts order, the system generates either a temporary or permanent ID based on the setting of Generate Doc IDs on Client in QAD Mobile User Maintenance.

- If this is No, the parts order is assigned a temporary number starting with three asterisks (***) and followed by the five-digit sequence specified in the Admin Settings field Next Call/MO ID. After an order has been synchronized, it receives a permanent ID from MFG/PRO.
- If this is Yes, it is given a permanent ID prefixed with the value of Call/MO Unique Prefix defined in QAD Mobile User Maintenance in MFG/PRO.

♦ See “Define QAD Mobile FS Users in MFG/PRO” on page 55.

Parts orders can also be created on the MFG/PRO server; these are received on the device with permanent IDs. After a parts order is synchronized, you can no longer update the order data.

If Nonexisting Item is Yes in QAD Mobile User Maintenance, you can order any item. Otherwise, items ordered on the device must exist in the device database. These items are synchronized from the MFG/PRO item master based on the range of service groups associated with your record in QAD Mobile User Maintenance.

For items not associated with calls, the delivery must be to the engineer. Items associated with calls can be delivered to the end user or the engineer.

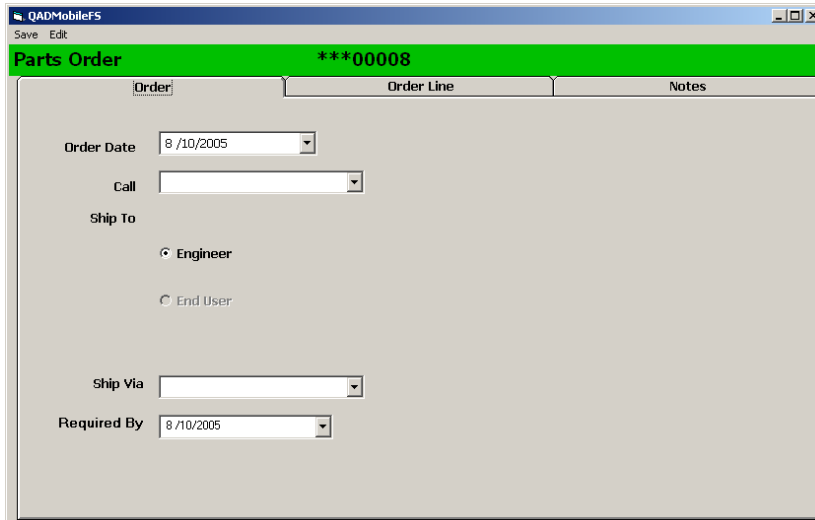
- 1 From the QAD Mobile FS main menu, click Parts Order. The list of existing orders displays.

Parts Order	Call	Order Date	Required Date	Last Ship Date
mo1364	ca1364	11/13/2003	11/13/2003	11/13/2003
mo1404	ca1404	11/18/2003	11/18/2003	11/19/2003
MO5116	ca1336	10/7/2003	10/10/2003	
MO5127		10/16/2003	10/16/2003	
MO5253		10/24/2003	10/24/2003	
MO5254		10/24/2003	10/24/2003	
MO5255		10/24/2003	10/24/2003	
MO5260		10/28/2003	10/28/2003	
MO5261		10/24/2003	10/24/2003	
MO5266		10/28/2003	10/28/2003	
MO5478		11/19/2003	11/19/2003	
MO5479		11/19/2003	11/19/2003	
MO5480		11/19/2003	11/19/2003	
MO5999		2/20/2004	2/22/2004	
MO6000		2/22/2004	2/22/2004	
MO6001		2/22/2004	2/22/2004	
MO6041		3/8/2004	3/8/2004	
MO6043		3/8/2004	3/8/2004	
MO6133		3/8/2004	3/8/2004	
MO6145		3/8/2004	3/8/2004	

Three types of orders may appear:

- Orders entered in or synchronized from MFG/PRO. The parts order has been confirmed; the order ID is permanent, as indicated by the order prefix, such as MO038789. You cannot update data on these orders.
- Device orders for confirmed calls.
- Device orders for items not associated with a call.

- 2 Click an existing order to view or update it. To create a new order, choose New from the menu. The order header displays.
- 3 The parts order screen displays. Detail tabs appear at the top of the screen.



The screenshot shows the 'Parts Order' screen in the QAD Mobile FS application. The window title is 'QADMobileFS' and the menu bar shows 'Save Edit'. The header is green with 'Parts Order' and '***00008'. Below the header are three tabs: 'Order', 'Order Line', and 'Notes'. The 'Order' tab is active and contains the following fields:

- Order Date:** 8/10/2005
- Call:** (empty)
- Ship To:**
 - Engineer
 - End User
- Ship Via:** (empty)
- Required By:** 8/10/2005

Order Date. Enter the date this order was created. This defaults to today's date. Click the drop-down to display a calendar for selecting dates. To clear the field, enter a question mark (?) or double-click in it.

Call. Optional. Open the list to select from available calls.

Ship-To. Select the ship-to location, either End User or Engineer. End User is not available for orders without a call.

Ship Via. Select the shipping method from the drop-down list.

Required By. Enter the date by which the item is needed. Click the drop-down to display a calendar for selecting dates. To clear the field, enter a question mark (?) or double-click in it.

4 Click the Order Line tab to enter item detail.

Item	UM	Quantity	Item Description

Call Line. If this order is related to a call, specify the line on the call for which this item is required. When only one line exists on the call, the line number defaults; otherwise, you must select the line from the drop-down list.

Item. Select the item you want to order from the lookup, which displays all item master records on your device.

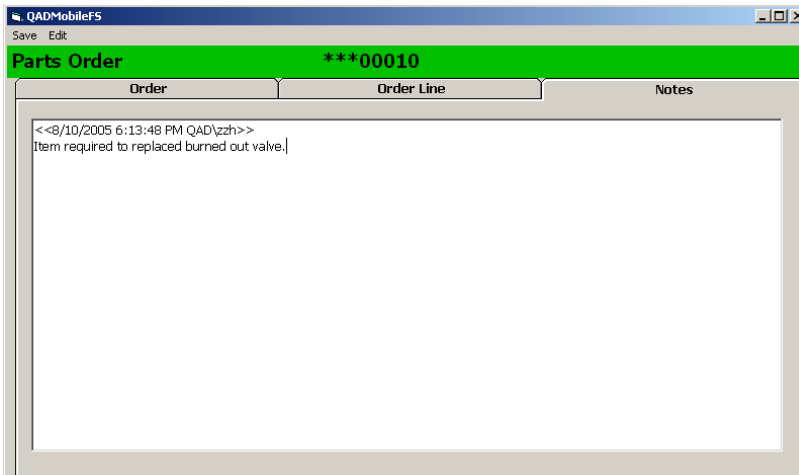
Note If Nonexisting Item is Yes in QAD Mobile User Maintenance, you can order any item, regardless of whether it exists in the device database.

Quantity. Specify how many of the item you need.

Click Add to add the item to the order. To modify an item or delete an item from the order, select the item from the order list and choose Update or Delete.

Important The lines on the order are not saved until you choose Save.

- 5 Click the Notes tab to enter comments on the order.



The screenshot shows a mobile application window titled "QADMobileFS". Below the title bar is a menu with "Save" and "Edit" options. The main header is green and displays "Parts Order" and "***00010". Below the header is a tabbed interface with three tabs: "Order", "Order Line", and "Notes". The "Notes" tab is currently selected, showing a text input area with the following content: "<<8/10/2005 6:13:48 PM QAD\zzh>>" and "[Item required to replaced burned out valve.]".

- 6 Choose Save to save the parts order and exit to the order list.
- 7 To delete a device parts order, return to the parts order list, select the order, and choose Edit|Delete from the menu. You are asked to confirm the delete. The order, all order lines, and any order comments are deleted.

You cannot delete an order that has been synchronized.

Viewing Inventory

Each device contains an item inventory from MFG/PRO in the local database. The records that you view in this screen are synchronized from MFG/PRO based on the inventory detail associated with the site and location specified for your user record in QAD Mobile User Maintenance.

- 1 From the QAD Mobile FS main menu, click Inventory. The list of items displays.

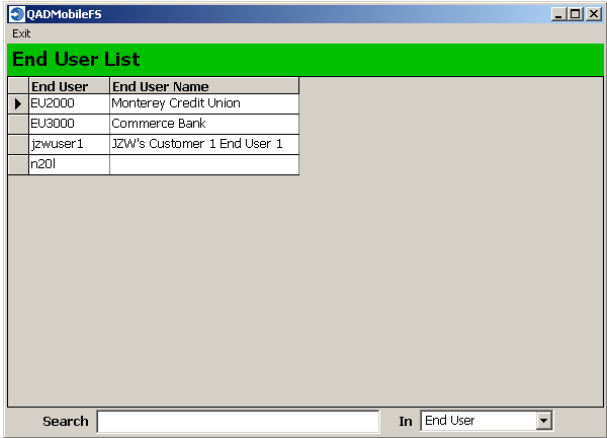
Item	Description	Lot/Serial	Ref	Quantity	UM	Lot/Serial Control
22-100	CORD,POWER,UK	*	*	-1	ea	
22-110	CORD,POWER,EUROPE,WEST	*	*	8	EA	
44-100	CONTROL UNIT, HOME USE	*	*	30	ea	
44-100	CONTROL UNIT, HOME USE	50	*	1	ea	
44-100	CONTROL UNIT, HOME USE	51	*	1	ea	
44-100	CONTROL UNIT, HOME USE	52	*	1	ea	
44-100	CONTROL UNIT, HOME USE	53	*	1	ea	
44-100	CONTROL UNIT, HOME USE	54	*	1	ea	
44-100	CONTROL UNIT, HOME USE	55	*	1	ea	
44-100	CONTROL UNIT, HOME USE	56	*	1	ea	
44-100	CONTROL UNIT, HOME USE	57	*	1	ea	
44-100	CONTROL UNIT, HOME USE	58	*	1	ea	
44-100	CONTROL UNIT, HOME USE	59	*	1	ea	
44-100	CONTROL UNIT, HOME USE	60	*	1	ea	
44-100	CONTROL UNIT, HOME USE	61	*	1	ea	
44-100	CONTROL UNIT, HOME USE	62	*	1	ea	
44-100	CONTROL UNIT, HOME USE	63	*	1	ea	
44-100	CONTROL UNIT, HOME USE	F101	*	1	ea	
44-100	CONTROL UNIT, HOME USE	F102	*	1	ea	
44-100	CONTROL UNIT, HOME USE	F103	*	1	ea	

Scroll across to view item detail. Scroll down to view additional items.

Viewing Installed Base Details

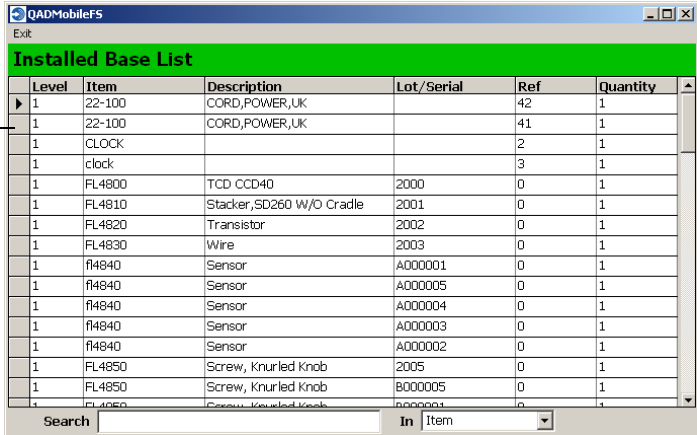
You can use QAD Mobile FS to view the items that have been purchased or installed by the end users you service. If the end item sold to the user was added to the end user’s installed base with subcomponents, you can view this configuration detail also.

- 1 From the QAD Mobile FS main menu, click Installed Base. The list of end users displays.



- 2 Select an end user to display the associated items.

Indicates level in the installed base product structure



The level column indicates the level in the installed base product structure that you are viewing. Level 1 items are top-level or parent items.

If an item has components in the installed base, selecting it displays details about them.

- 3 Click an item with subcomponents to display its details.

Level	Item	Description	Lot/Serial	Ref	Quantity
1	FL4800	TCD CCD40	2000	0	1
.2	22-110	CORD,POWER,EUROPE,WEST		10	3
.2	44-110	CONTROL UNIT, AUTO		3	1
.2	44-110	CONTROL UNIT, AUTO		4	1
.2	44-110	CONTROL UNIT, AUTO		5	1
.2	44-110	CONTROL UNIT, AUTO		6	1
.2	44-110	CONTROL UNIT, AUTO		7	1
.2	44-110	CONTROL UNIT, AUTO		8	1
.2	444		mfs1	0	1
.2	444		mfs3	0	1
.2	444		mfs5	0	1

Search In Item

Level 2 items are immediately below the parent.

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