Itron

Field Deployment Manager

System Overview

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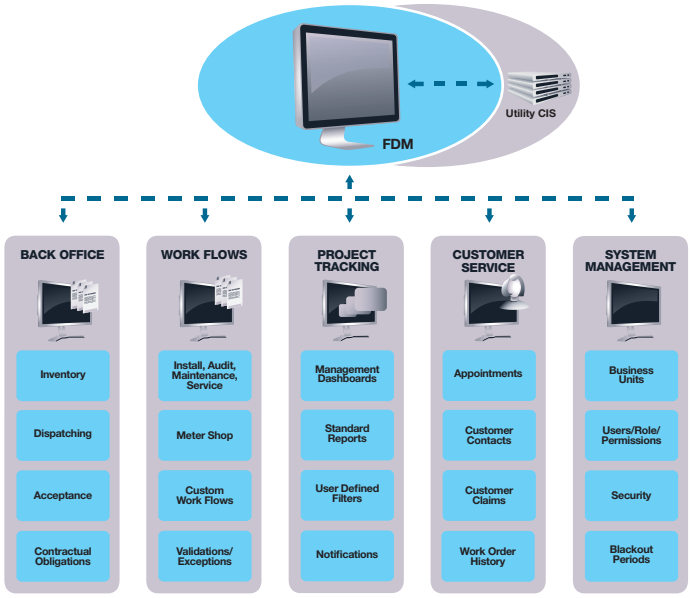
INTRODUCTION

Today, efficiency and accuracy are paramount concerns when deploying Itron smart metering systems. Itron has a long and successful history of providing installation management software in support of the utility industry.

Itron's latest solution, Field Deployment Manager (FDM), leverages Itron's decades of experience to deliver an end-to-end, next-generation installation management application for utility smart metering deployment and maintenance activities. FDM was designed and developed to support the safe and efficient deployment and maintenance of meters, endpoints and network equipment—ensuring operational efficiency for both back office and field worker productivity. FDM automates endpoint programming to ensure the appropriate parameters are set; electronically captures and validates installation data, reducing errors and costly site revisits; ensures endpoint network connectivity; captures field images and GPS coordinates; and creates work orders for service and quality audit work orders.



Field Deployment Manager Overview

FDM helps manage all aspects of an installation project, including:

- Project Tracking – Utilize enhanced project reporting including project installation dashboards, quality and customer claims dashboards, system notifications as well as standard and custom filters/reports
- Customer Service – Create fixed or windowed customer appointments, document customer contacts and track customer claims, and allow project team personnel to review work order history
- System Management – Set up user roles/permissions, network security and blackout periods managed within business units.
- Supports installation, audit, maintenance, service and meter shop work flows custom built for each utility ensuring utilities best business practices
- Ensures field service representatives' productivity, efficiency and quality
- Field validations and exception management made easy.
- Tracking inventory from the factory to the warehouse, within the warehouse, to the installers vehicle, and finally to the customer premise
- Endpoint installation acceptance and closure using an integrated interface to Itron's Field Collection System (FCS), MV-RS®, Premier Plus 4, ChoiceConnect® collection engine and OpenWay® collection engine
- Accurate project invoicing using an integrated interface to an Oracle accounting system to ensure certain contractual obligations are fulfilled
- Ensuring accuracy of data interfacing to your customer information system (CIS), allowing work order data download and upload, as well as work order data refresh

FDM optimizes the delivery and installation of meters and endpoints by managing not only the technology but the personnel as well—all while keeping management informed of how the project is progressing.

FDM is Itron's premier solution for managing the installation of endpoints, meters and network equipment in support of advanced metering reading (AMR) and advanced metering infrastructure (AMI) deployments. Whether used by company or subcontractor personnel, FDM streamlines the management, installation and delivery of equipment, while validating the accuracy of field work.

Field Deployment Manager automates the following tasks:

- Endpoint Programming facilitates the accurate programming of endpoints and ensures correct endpoint settings
- Endpoint/Meter/Network Component Installation electronically captures and validates installation data, captures field images and GPS coordinates, as well as ensuring network connectivity
- Quality Audit provides an audit process to measure the quality of the installation by linking the programming and installation data to the work order. The system automatically generates audit orders, ensuring field service representative training. The FSR audit compliance feature ensures that contractual obligations are met
- Maintenance Work orders are sent from the customers CIS to ensure ongoing system maintenance and optimization
- Service Work FDM can generate service work orders to ensure ongoing system maintenance and optimization
- Meter Shop epetitive work order designed to record endpoint/ meter information in an easy and efficient manner

Field Deployment Manager employs a state-of-the-art client-server architecture using a smart client interface. The solution supports a variety of hosting configurations using Internet Protocol (IP). The FDM software runs on Itron FC200 and FC300 handheld computers that utilize integrated SRead radios, or on customer supplied laptop equipment using Itron's 900 MHz Belt Clip Radio.

The Field Deployment Manager application can be hosted by Itron or it can reside in a utility's data center as part of a turnkey solution. An example of a hosted configuration is shown in figure 1 below.

BENEFITS OF FIELD DEPLOYMENT MANAGER

Field Deployment Manager provides numerous benefits for installation, dispatch and mobile workforce management. These benefits are described in the following sections.

Installation Management

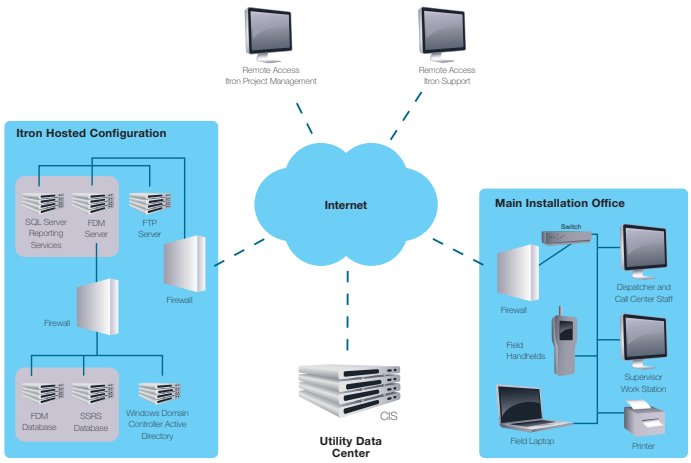


Figure 1: Field Deployment Manager system configuration

Field Deployment Manager was built upon Itron's decades of experience addressing the challenges faced by utilities in large-scale meter installation and maintenance projects. As such, FDM provides you with a host of benefits, including:

- Reduce errors and site revisits by electronically validating installation data. Assuming a service cost of $50 to revisit a meter, a utility installing 100,000 endpoints with a 5% error rate will spend $250,000 to fix mistakes that could possibly be reduced or avoided by using Field Deployment Manager
- Reduce lost inventory by tracking inventory events from the factory, to the warehouse or warehouses, within the warehouse, to the field service representatives' vehicle and finally installed at a customer's premise
- Effectively manage the progress, quality and productivity of endpoint and meter installation through quality control checks and extensive reporting capabilities, as well as system notifications. Quality audits can be manually or automatically generated by the Field Deployment Management application for both new and seasoned installation personnel
- In addition to standard reports, Field Deployment Manager provides support for each user to create and manage their own custom actionable filters, allowing for a dynamic and flexible reporting solution
- Manage across installation teams using Business Units to segment contractors or service departments in support of installation objectives. Aggregate installation data for management personnel across defined Business Units
- Rely on the latest software technology with Microsoft Windows Server 2008 R2, Microsoft SQL Server 2008 R2 and Active Directory for all system users
- To ensure proper training and contractual obligations the FSR Audit Compliance feature provides an overview of FSR audits, showing which FSRs are failing to meet contractual audit compliance rules (shown in figure 2 below)

Exception Management

An exception indicates a problem with a completed work order. Exceptions call your attention to issues you may want to address before exporting the affected work orders to the CIS. Some exceptions indicate problems that need correcting; others are primarily informational.

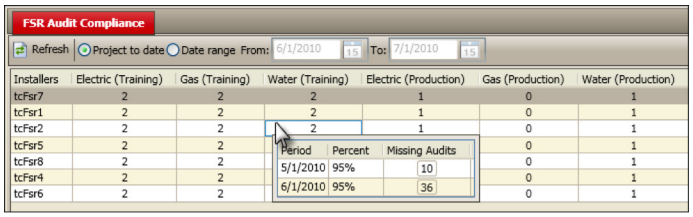


Figure 2: FSR Audit and Compliance screen

- FDM allows you to categorize and establish a severity to the work order exception. Each exception is categorized as a Safety, Billing, or Site Condition exception and is assigned one of six severity levels ranging from Ignore to High. You can also specify whether individual exceptions disqualify the orders from being exported, included on an invoice, or marked for revenue recognition
- A key to the success of any project is the ability to manage field exceptions in a quick, easy and efficient manner. Use the standard FDM work order list to easily locate work orders with exceptions (figure 3). Touching a number in the Active Primary Exceptions column of the filtered work order list with the mouse pointer displays a tool tip listing all the exceptions for the work order

Dispatching and Dashboards

Field Deployment Manager's dispatching features and dashboards keep your project on track and key stakeholders informed of progress.

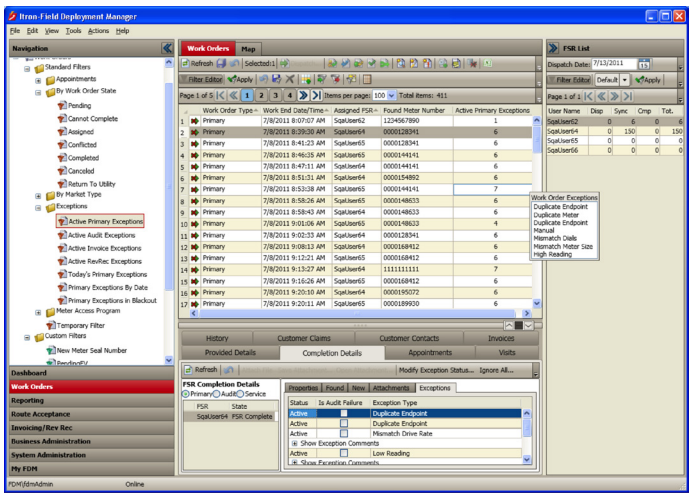
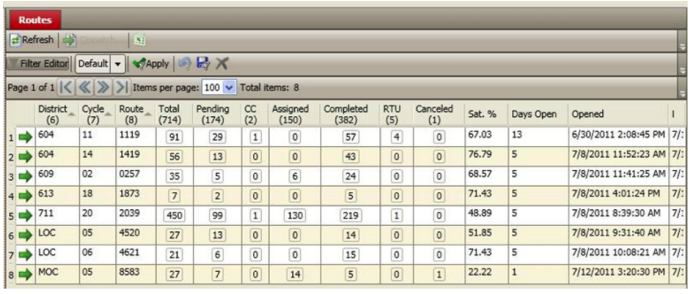


Figure 3: Field Deployment Manager Exception Work Orders

» Using a specialized dispatch interface (figure 4 below) FDM provides emphasis on route closure and district closure. Work is broken down by route based on Pending, Can't Complete, Assigned, Completed, Returned and Cancelled work orders. Dynamic hyperlinks allow the user to quickly drill into pending work orders in order to easily dispatch those work orders to close the route. Additionally work orders can be filtered using defined project elements including utility unique data elements

» Support installation teams to optimize project resources (share vehicles) and promote a safe deployment environment through the use of FDM's crew dispatch feature.

» Electronically manage defined exceptions such as black-out



	District (6)	Cycle (7)	Route (8)	Total (714)	Pending (174)	CC (2)	Assigned (150)	Completed (382)	RTU (5)	Canceled (1)	Sat. %	Days Open	Opened	I
1	604	11	1119	91	29	1	0	57	4	0	67.03	13	6/30/2011 2:08:45 PM	7/:
2	604	14	1419	56	13	0	0	43	0	0	76.79	5	7/8/2011 11:52:23 AM	7/:
3	609	02	0257	35	5	0	6	24	0	0	68.57	5	7/8/2011 11:41:25 AM	7/:
4	613	18	1873	7	2	0	0	5	0	0	71.43	5	7/8/2011 4:01:24 PM	7/:
5	711	20	2039	450	99	1	130	219	1	0	48.89	5	7/8/2011 8:39:30 AM	7/:
6	LOC	05	4520	27	13	0	0	14	0	0	51.85	5	7/8/2011 9:31:40 AM	7/:
7	LOC	06	4621	21	6	0	0	15	0	0	71.43	5	7/8/2011 10:08:21 AM	7/:
8	MOC	05	8583	27	7	0	14	5	0	1	22.22	1	7/12/2011 3:20:30 PM	7/:

Figure 4: Field Deployment Manager route dispatch interface

periods and installer permissions to ensure the right work is dispatched to the right person at the right time

» Utilize FDM mapping component (figure 5) to dispatch work orders from a map for optimized deployment and maintenance activities. Minimize dispatching efforts to organize and dispatch route cleanup activities. FDM uses OpenStreetMap, an Internet standard, in its Map view

Project Dashboard

The Project Dashboard provides quick, at-a-glance summaries and breakdowns of project installation progress to plan, route saturation, pending and completed work orders, exceptions,

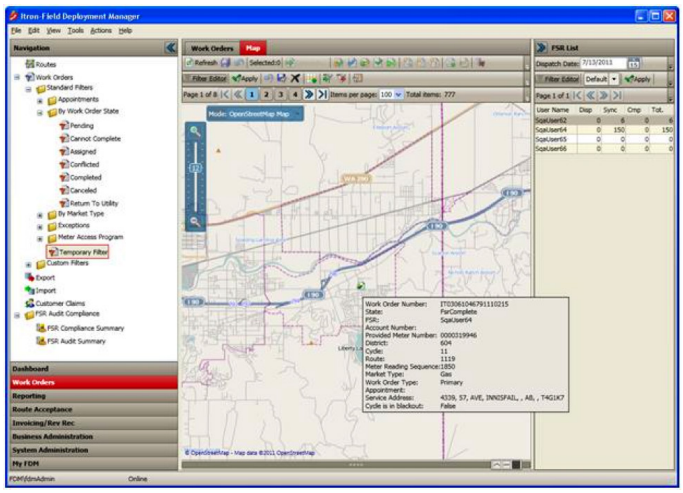


Figure 5: Field Deployment Manager map

audit status and customer claims. Information displayed in the Dashboard's graphs and tables pertains to one or more business units.

» FDM provides the ability to determine how your project is progressing to plan. FDM allows you to define meter/endpoint deployment plans for your business unit that spell out the total numbers of installers required and the total numbers of work orders to be completed week-by-week over the course of the project. The system uses this information primarily in the Dashboard domain's Installation graphs, which automatically compare the installation project plan numbers to actual numbers of completed work orders

» With the click of a button users can view how the installation project is progressing to plan for the entire project to date, rolling thirty days, last six months, or cumulative view or non-cumulative view

» Field Deployment Manager also provides a dashboard interface to reflect project objectives. This includes Installation Metrics (Schedule), Breakdown by District, Quality Audit Statistics, Customer Claims and Open Exceptions requiring closure

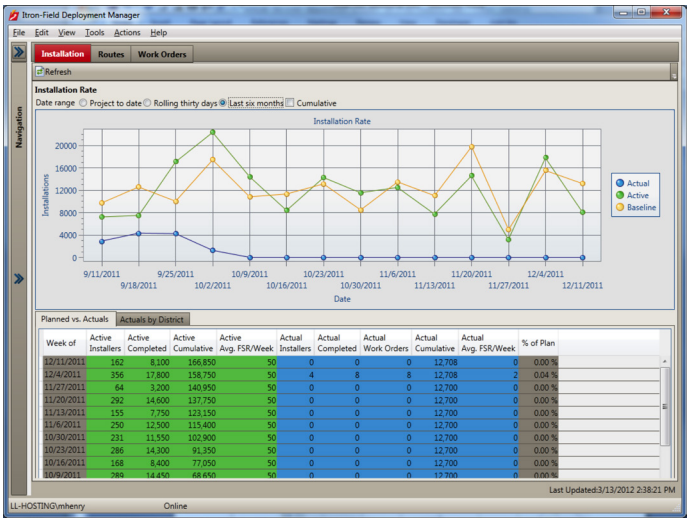


Figure 7: Installation statistics

Additional Items

» Use FDM's built-in appointment scheduler to schedule appointments (figure 6) and manage customer interactions. Use FDM's Appointment Slots section listing the number of existing fixed and windowed appointments and their times for

the selected date in the current business unit. Use this information to help you decide the time at which to schedule the new appointment

» FDM also allows you to record and manage all contact with customers, such as phone calls and letters, as well as record/manage customer complaints and claims, which helps ensure secure and effective communications with customers

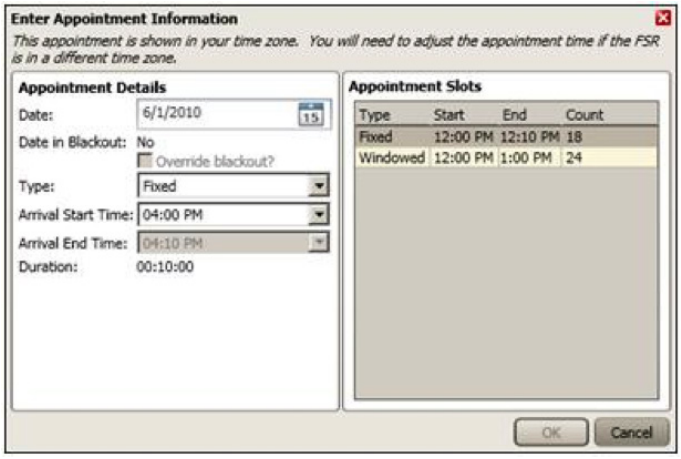


Figure 6: Appointment Scheduling interface

» FDM lets you schedule blackout periods for times when you do not want work orders to be dispatched, such as during holidays or meter reading periods

» In a utility-hosted environment, Active Directory users can use their Active Directory user name and password in order to gain access to FDM

» The My FDM domain lets you configure your personal FDM settings to suit your preferences

» To ensure accurate project invoicing from Itron, FDM is tightly integrated to the accounting system, which defines the elements of work order and/or route completion tasks that FDM can invoice against (as specified by the project's contractual requirements). FDM also determines which data is saved within invoice snapshots at the time of invoicing for validation

» Before returning work orders that could not be completed back to the utility for processing, FDM will ensure that all efforts have been made to complete the work order before allowing the operator the ability to return the work back to the utility for further action using FDM's Meter Access Program (MAP)

» Visualize field efforts completed and history (figure 8) of every work order in the system. Field Deployment Manager can display the chronological history of all work performed on work orders (who, what, when) in an optimized interface

» Establish system configured automatic imports and exports

» FDM notifications automatically deliver timely, critical information to subscribers through e-mail messages and emailed reports. FDM allows the user to specify which notifications the system will generate and deliver for your project

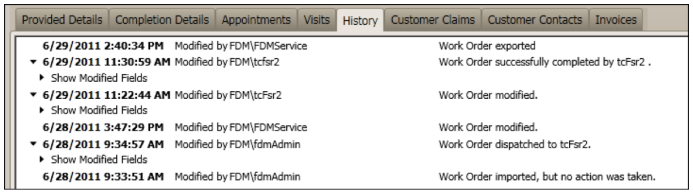


Figure 8: Activity history

Inventory Management

The single largest investment for every deployment project is the inventory scheduled to be installed. Errors in data supporting inventory transactions can occur at every handoff in a project. To help manage these transactions and keep constant track of all assigned inventory, FDM validates and records all inventory transactions as they occur and provides easy to use filters and notifications of inventory activity. FDM tracks inventory events upon shipment from the factory, to the warehouse or warehouses, within the warehouse, to the field service representatives' vehicle and finally installed at a customer's premise. FDM will also track inventory being returned to the manufacturer for repair or replacement.

» The FDM inventory module adds extensive inventory management capabilities to FDM's standard work order support functions. The inventory module is intended for use on laptop computers with Bluetooth barcode scanners running the FDM server client application in an inventory warehouse. The inventory module lets you manage all aspects of your business units' inventory items, locations, and movements

» When warehouse workers record the transfer of a consumable item such as an endpoint or meter to a vehicle, the FDM server sends this information to the mobile application on an FSR's handheld or laptop. Having the inventory record on the handheld ensures that only valid inventory items are installed at a customer premise, thus reducing costly revisits. When the FDM mobile application records the installation of a meter, endpoint, or other consumable item, it changes the item's status from Available to Installed. When it synchronizes with the server, it passes this information back to the FDM server

» The relationship between Utility, subcontractor, and Itron can vary across projects. Because of this, FDM has been architected to be flexible allowing each project to define how inventory is optimally managed

Serialized and Non-Serialized

FDM supports both serialized and non-serialized inventory items.

» FDM inventory items can be consumable—those that get installed or used up, such as endpoints, meters and leak detectors—or non-consumable, such as tools used to perform installations or maintenance. Consumable items can be serialized

(items with serial numbers, such as meters and endpoints) or non-serialized, which includes items that are typically provided in bulk, such as door hangers and screws. Non-consumable items can be serialized, such as handhelds and scanners, or non-serialized, such as screwdrivers and other tools

Dashboard Integration

To facilitate communication to project stakeholders, FDM provides inventory statistics for each warehouse location via standard or custom filters. The filter will summarize inventory by location and part number/description. Summary statistics are displayed by inventory location, for example: Quarantine, Pending, Field, RMA, and so on, with totals for each Business Unit.

Figure 9: Serialized and non-serialized inventory items

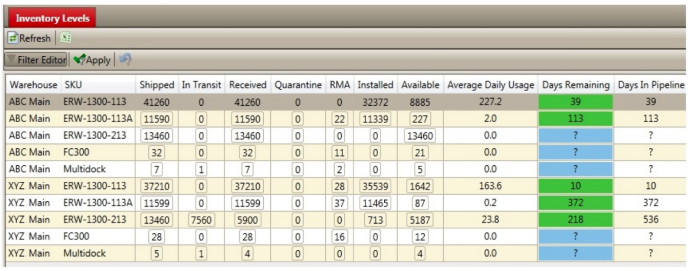
Inventory Levels

The Inventory Levels node (figure 10) provides a single, comprehensive overview of the quantities of all inventory items in your business unit, broken down by location and SKU number. Custom filters can be created showing only those items of interest and the result of the filter can be exported to a .CSV file.

» The inventory levels display also shows the average daily usage of the item installed and the quantity of the item available. Based on the quantity of the inventory item available and the average daily usage over the past 30 days, the Days Remaining values are color-coded to provide an at-a-glance indication of the overall status of inventory item levels at each physical location

Advanced Power Filters

FDM comes with a set of standard work order filters that are designed to meet the most common list-filtering needs. Some FDM filter lists can contain large numbers of items that would be difficult to manage without some way to limit them to the items you want. FDM provides an assortment of standard filters and provides the user the ability to create custom filters for this purpose.



Warehouse	SKU	Shipped	In Transit	Received	Quarantine	RMA	Installed	Available	Average Daily Usage	Days Remaining	Days In Pipeline
ABC Main	ERW-1300-113	41260	0	41260	0	0	32372	8885	227.2	39	39
ABC Main	ERW-1300-113A	11590	0	11590	0	22	11339	227	2.0	113	113
ABC Main	ERW-1300-213	13460	0	13460	0	0	0	13460	0.0	?	?
ABC Main	FC300	32	0	32	0	11	0	21	0.0	?	?
ABC Main	Multidock	7	1	7	0	2	0	5	0.0	?	?
XYZ Main	ERW-1300-113	37210	0	37210	0	28	35539	1642	163.6	10	10
XYZ Main	ERW-1300-113A	11599	0	11599	0	37	11465	87	0.2	372	372
XYZ Main	ERW-1300-213	13460	7560	5900	0	0	713	5187	23.8	218	536
XYZ Main	FC300	28	0	28	0	16	0	12	0.0	?	?
XYZ Main	Multidock	5	1	4	0	0	0	4	0.0	?	?

Figure 10: Inventory Levels list

» The custom work order filter editor provides single condition, multiple condition and multiple-group condition statements for identifying only those work orders you need to manage. The result of these filters can be worked immediately or exported to a .CSV file for your simple reporting needs

» A list filter lets you limit the display of items in the list to those that meet criteria or conditions you specify and allows you to save these modified filters as custom filters for future use

» Custom filters are specific to each user account, so custom filters you create do not appear on the filter lists of other FDM users. However, a custom filter created by one user can be exported and used by another user

» You can add or delete work order list columns to show virtually any combination of available work order data fields in any sequence you wish. When you save a custom work order list filter, the system saves the displayed columns with it so only those columns are displayed whenever you apply the filter

» Many FDM contents panes include an Export to .CSV File button. This button lets you export the list as currently filtered and sorted to a comma-separated values (.CSV) file (also called a comma-delimited plain-text file) that can be imported into other applications, including Microsoft® Excel®

Mobile Workforce Management

The Field Deployment Manager application supports utility-defined work flows to support best practices in deployment management using Itron FC200/ FC300 handhelds or utility provided laptop equipment attached to Itron's Belt Clip Radio.

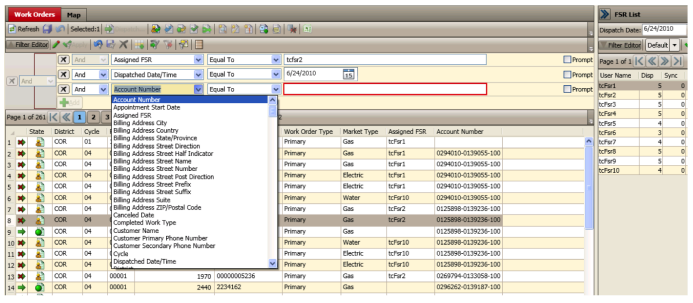


Figure 11: Filters list

When using an FC200 or FC300 with an integrated SRead radio (or a utility provided laptop connected to Itron's Belt Clip Radio), activities are easily managed through a series of custom Work Order screens (figure 12).

The FDM Mobile application provides a number of benefits, including:

» Collect Itron ERT readings and programming parameters from Itron ERT's directly to the work order for validation and exception management

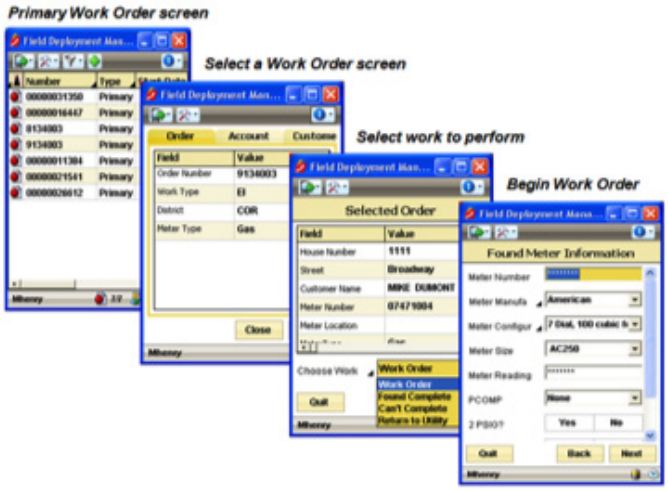


Figure 12: Mobile work order screens

» Capture GPS coordinates, scan bar codes and collect images at each job site using Itron's FC300 handheld computer without the need to carry separate equipment

» Minimize manual data entry and reduce record keeping errors involved with paper processing. With Field Deployment Manager all aspects of work can be completed and communicated electronically including work related to the installation, quality audit, maintenance or service work performed in the field

» Verify endpoint operational accuracy as part of every work order. FDM enables confirmation that equipment is operating to specification and the integrity of network communications before leaving the job site

» Verify installer productivity using Field Deployment Manager. Track and manage productivity for all field work completed by each installer

» FDM supports the optional inclusion of Field Originated Work Orders, Found Completes,Can't Complete and Return to Utility activities in the field where work is already completed or cannot be completed

» FDM ensures data integrity as all data is stored and encrypted on the mobile device using each user's credentials in a SQL CE database

FC300 Handheld Computer

Itron's latest mobile solution, the FC300 (figure 13), is available for utility use in support of Field Deployment Manager. The FC300 offers a comprehensive solution to support installation and deployment activities.

Please refer to theFC300 specification sheet for additional information about the FC300 mobile computing device.

Belt Clip Radio Support

The Belt Clip Radio is an ideal solution for utilities that already utilize laptop equipment in the field or for those with in-house operations (such as a meter shop) where the lightweight, easy-to-use Belt Clip Radio is a practical fit. The Belt Clip Radio is a low cost radio for use with Itron's ChoiceConnect™ solutions that utilizes a two-way 900 MHz radio for communicating with electric, gas and water

Figure 13: FC300 handheld computer

endpoints using Itron's Field Deployment Manager application.

The Zigbee Belt Clip radio can be used with an FC300 or customer supplied laptop computer with FDM to communicate to OpenWay endpoints.

Field activities such as endpoint installation, programming, field investigations, unlocking and resetting devices can be a time consuming process. With FDM, the Belt Clip Radio coupled with a customer supplied laptop computer (figure 14) or FC300, streamlines field activities to help make field workers more productive and efficient in their daily tasks. The Belt Clip Radio is lightweight and portable and is designed to handle the rigors of a field environment, providing a reliable hardware platform to help ensure a successful endpoint deployment and maintenance activities.

CONCLUSION

Field Deployment Manager is designed to support both large and small smart metering deployments and maintenance activities. It is built upon Itron's decades of experience in installation and work order software. As with all of Itron's products, Field Deployment Manager is supported by Itron's well-known service organization.

The Field Deployment Manager application is designed to support in excess of 5,000,000 work orders. FDM enables management of multiple installation teams made up of contractors or utility personnel. FDM provides an audit process to accurately track the quality of the installation by linking program, installation and inventory data to the work order.

Itron has implemented a common user interface model to ensure that each and every action is optimized for ease of use and efficiency to scale across business units and across millions of meters, endpoints and network devices.

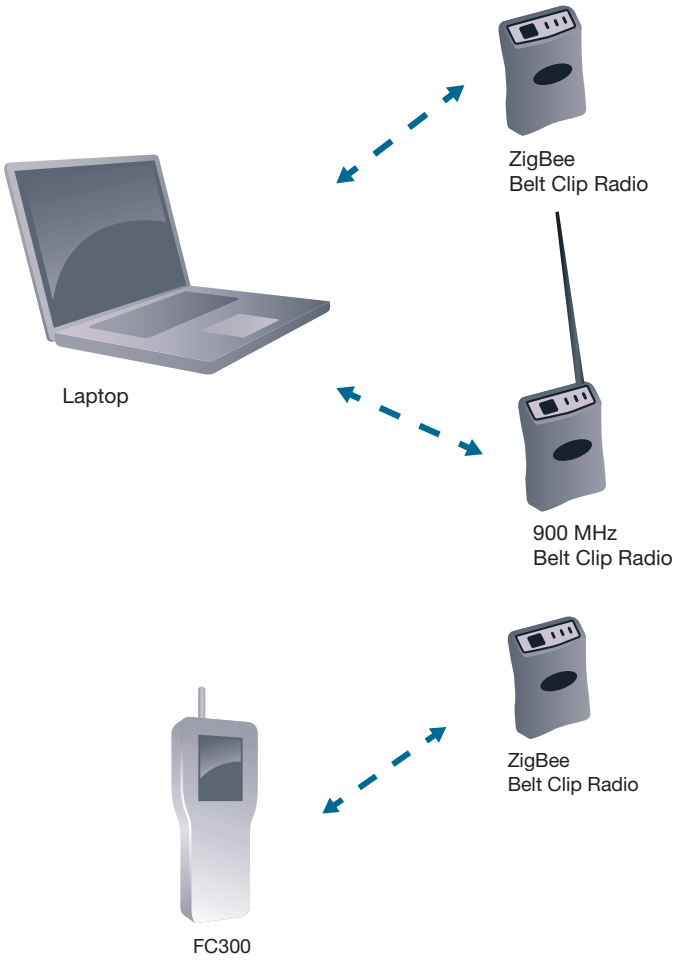


Figure 14: Belt Clip Radio Setup

Itron is a global technology company. We build solutions that help utilities measure, monitor and manage energy and water. Our broad product portfolio includes electricity, gas, water and thermal energy measurement and control technology; communications systems; software; and professional services. With thousands of employees supporting nearly 8,000 utilities in more than 100 countries, Itron empowers utilities to responsibly and efficiently manage energy and water resources.

Join us in creating a more resourceful world; start here: **www.itron.com**

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