Badger Meter

Fluid Management System

FMS-3 2.4 GHz RF High-End Software v4.2.1

FMS-UM-02186-EN-02 (February 2017)

User Manual

CONTENTS

INTRODUCTION

The Badger Meter® Fluid Management System has been designed to control and monitor the consumption and inventory balances of automotive fluid products with minimal installation and programming costs. Badger Meter has used its years of expertise in the automated meter reading market to develop a modular control system using RF communications.

The high end system hardware consists of one Master Keypad and at least one Dispense Keypad as well as at least one radio frequency (RF) electronic preset meter. The Master Keypad handles serial communication between the PC or a host server (ERP system) and RF communication to the Dispense Keypads in the system. The system verifies the operator's pin number and validates the work order number, fluid quantities and the valid hose/meter.

The Master Keypad can communicate with up to 36 Dispense Keypads that can be positioned to support the workflow of the facility the best way. Each Dispense Keypad can control up to 24 meters, for a total of 250 meters. The system supports up to 16 tanks and 16 fluids as a part of the system configuration. The system supports 250 unique operator IDs and pin numbers.

The system uses direct sequence spread spectrum RF technology to prevent communication problems with other equipment in the facility. The RF system will look for a clear channel for transmission to insure that there is reliable communications at all times. Communication distances are typically up to 100 meters, but can go up to 300 meters with unobstructed line-of-sight. A remote antenna is available for situations where multiple buildings are involved in the installation.

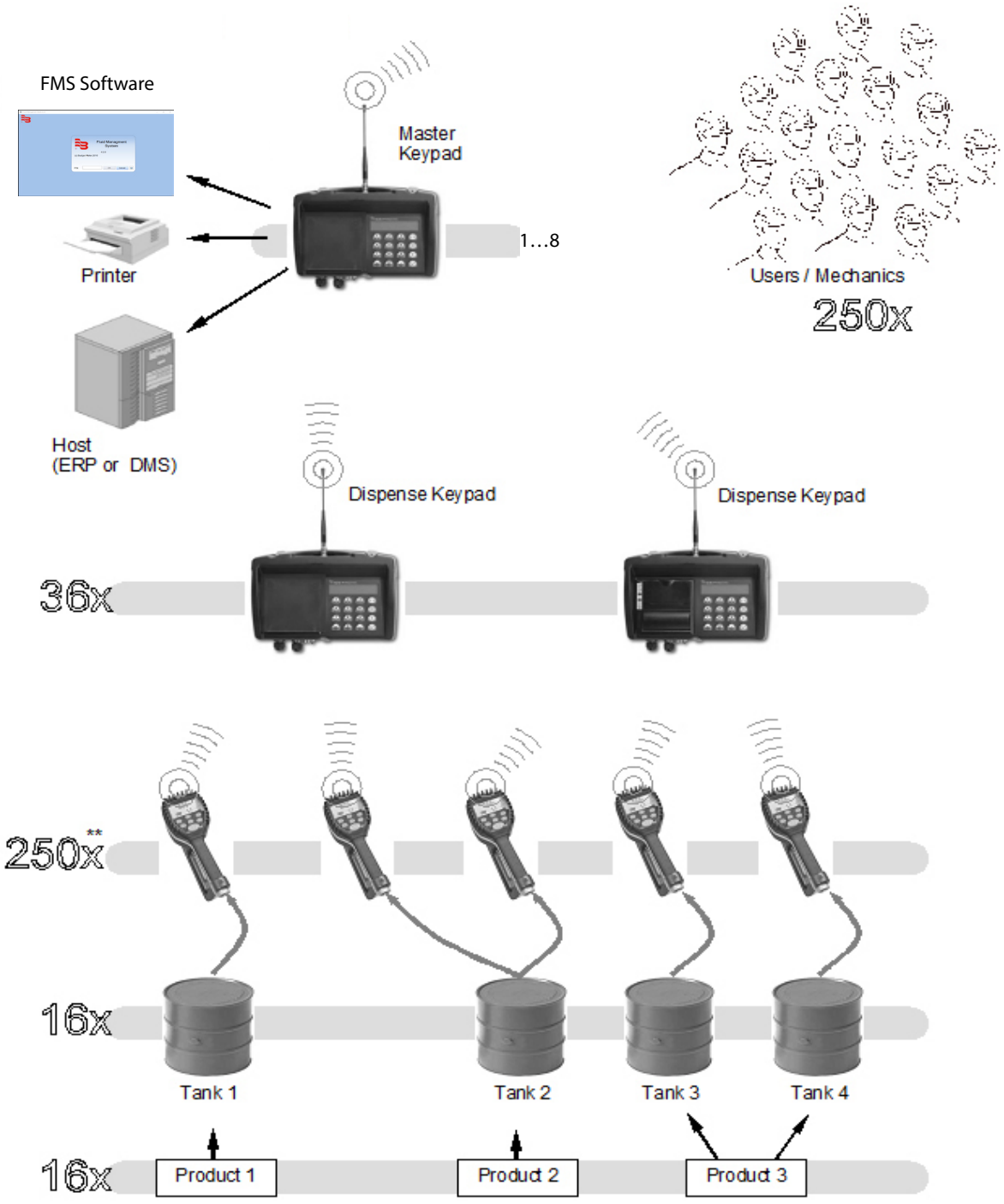
The PC is used to configure the system, maintain system data and enter work orders. The service desk would use the PC to enter a work order selecting the fluid and quantity required. The PC can stack as many work orders as required, limited only by the disk storage space of the PC. There is no need to predetermine where the work is going to occur. This allows the flexibility to service a vehicle at any open bay and select a meter when the work is going to be performed. When the work order is going to be performed, the service personnel simply enters their pin number, work order and hose that is going to be used at the Dispense Keypad.

There are a number of system utilization reports by user; fluid type, tank or meters available for the system's management.

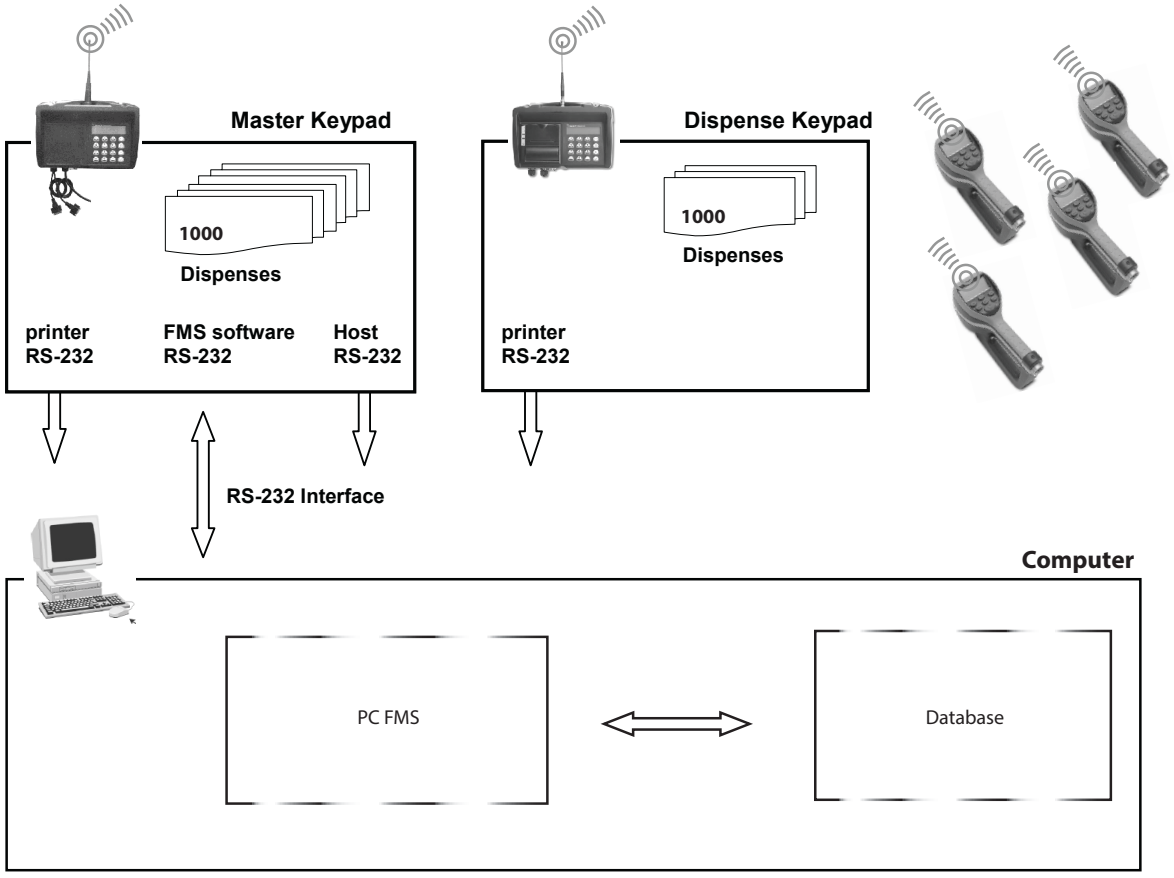
Optionally, the system can be connected with an ERP or DMS system via its RS232 interface. The real-time communication is based on an open interface protocol (ASCII-code) and can be easily adapted to local conditions.

A unique, patented feature of the system is that the RF meter's dispense trigger is locked until an authorization from the keypad is received. After the dispense batch is completed, the user can top off if more fluid is required, the actual dispensed amount is sent back to the keypad and the meter returns to the locked status. Additionally, the meter can be installed on portable dolly systems offering control and monitoring of high-cost lubrication products.

System Overview



System Composition and Dataflow



The main data streams:

- The FMS software stores the configuration data into the database.
- By using the *Initialize System* menu of the FMS software the configuration data is processed to the Master Keypad and finally via radio to all Dispense Keypads.
- The FMS records all dispenses in the database.

Specifications

Power Requirements	100…240V AC 50/60 Hz
RF Communications	2-way, 2.4…2.5 GHz Direct Sequence Spread Spectrum
RF Network	Self-healing Mesh Network
Operating Temperature	14…140° F (–10…60° C)
Internal Printer	Thermal printer Type FT190 (optional)
External Printer	Epson LX300 or similar (optional)

Certification

- Contains FCC ID: S4GEM35XB
- Contains IC: 8735A-EM35XB
- FCC CERTIFIED, PART 15, SUB-PART C
- CE0681 EC-R&TTE Certified

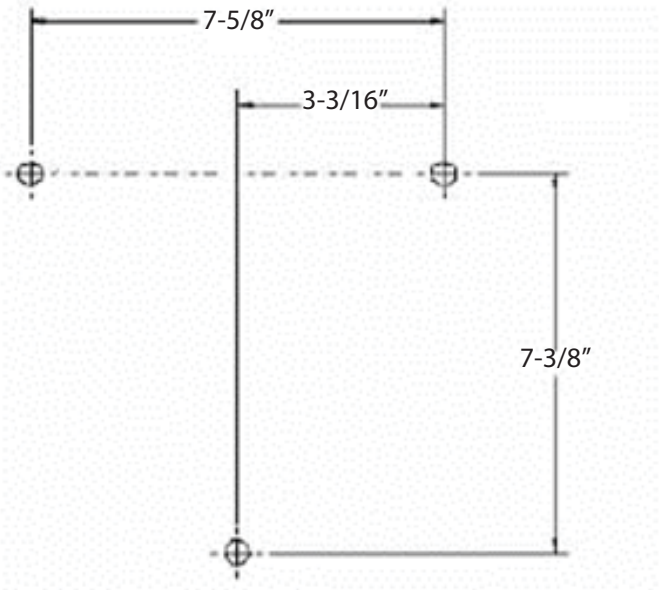
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

⚠WARNING

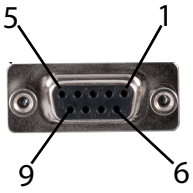
TO SATISFY FCC RF EXPOSURE REQUIREMENTS FOR MOBILE TRANSMITTING DEVICES, A SEPARATION DISTANCE OF 20 CM OR MORE SHOULD BE MAINTAINED BETWEEN THE ANTENNA OF THIS DEVICE AND PERSONS DURING OPERATION. TO ENSURE COMPLIANCE, OPERATIONS AT CLOSER DISTANCES THAN THIS ARE NOT RECOMMENDED.

WALL-MOUNTING THE KEYPAD

The keypad should be mounted upright with the antenna pointing upward, near a 120V AC electrical socket, to a structurally sound wall through the two holes on the top of the keypad casing. Height on the wall should be at eye level. Care should be taken to avoid mounting behind any steel objects (tool storage cabinets and metal chain linked fences) that may block the RF communication signal. Care should also be taken to avoid direct, significant heat sources.



Keypad Description



	Function	Signal Name	Pin
Received Data	Carries data from DCE to DTE	RxD	2
Transmitted Data	Carries data from DTE to DCE	TxD	3
Common Ground	—	GND	5

- PC functions as DTE (Data Terminal Equipment)
- Keypad functions as DCE (Data Communication Equipment)
- PC to Keypad connection is made using standard 9-pin male to 9-pin female serial port cable

	**Scroll**	Selects options on the active display.
	**Home**	Returns the display to the default screen.
	**Backspace**	Deletes one character to the left of the cursor each time it is pressed.
	**Enter**	Completes the current action then displays the next screen.
	**Space**	Adds a blank space to the right of the data just entered.
 	**Alphanumeric**	Enter numbers and alpha characters (letters). • To enter a number, press and release a key. • To enter a letter, press and hold the key until the letter you want displays, then release the key.

Operation Modes

The configuration of the system is generally done using the PC-based FMS Software. Only some special functions like the operation modes are set at the Master Keypad.

RF System with PC Operation Mode

In this mode the PC is used to configure the system entities and install the network. The PC will be used to enter work orders for processing and provide the queuing for future processing. When an operator processes a work order the PC will validate the work order number and provide the fluid and amount to be dispensed. The results of the dispense will then be stored on the PC.

RF System with Host Operation Mode

In this mode the PC is used to configure the system entities and install the network.

The host will be used to enter work orders for processing and provide the queuing for future processing. It will also store the dispense results that have been completed. Dispense results can be additionally stored on the PC. When an operator processes a work order the host will validate the work order number and provide the fluid and amount to be dispensed.

Standalone Mode

Work orders are validated; each entered work order is accepted by the system. Data is stored in the Master Keypad's memory.

NOTE: Each meter can only be associated to one Dispense Keypad. Only dispense and keypad supervisors can access each of the Dispense Keypads.

MASTER KEYPAD

The Master Keypad acts as the communications director for the RF communications. It handles all communications between the Dispense Keypads and the PC or Host. There are no operator menus associated with the Master Keypad—only supervisor menus for setting up the system or creating reports.

The remainder of this document shows only the actual display, not the entire keypad.

To gain access to the supervisor menus, the supervisor PIN has to be entered. The default PIN is 0001 at initial power-up.

System Version Screen

The standard screen shows the system date and software version number. The display will alternate between the standard screen and the *Enter Pin Number* screen. The *Enter Pin Number* screen is used to access the supervisor menus.

NOTE: An "N" displayed in the lower left corner of the system version screen indicates a Radio Network error. See *"Radio Status" on page 17* to check the source of the error.

Settings Overview / Supervisor Menus

The following changes can only be made at the Master Keypad in the setup mode. All other settings can be changed using the FMS software.

Enter PIN Number

To access the setup mode:

Enter the supervisor PIN number and press **Enter**.

The default PIN is 0001 at initial power-up.

Initialization (INI) Menu

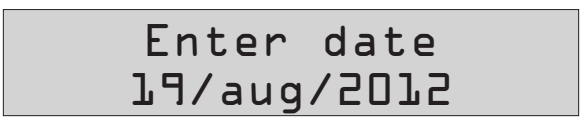
The *INI* menu is used to set the system's date and time.

Set System Time

To change or set the system time:

1. Select the *INI* menu and press **Enter**.
2. Use the numeric keys to set a 24-hour military time of day.
3. Press **Enter** to save the setting and advance.

Set System Date

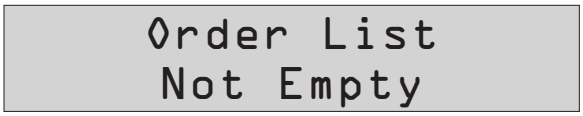


To change or set the system date:

1. Use the numeric keys to enter the two-digit day. The cursor automatically moves to the month.
2. Press **Scroll** to select a month.
3. Use the numeric keys to enter the four-digit year.
4. Press **Enter** to save the setting.

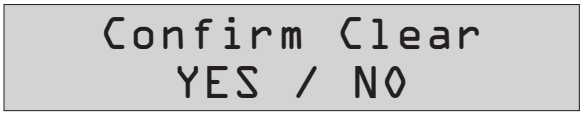
Configuration (CNF) Menu

The *CNF* menu is used to set the system's operation modes and archiving methods.



If you see the message "Order List Not Empty," you have to clear the transactions in the Master Keypad (CNF Menu).

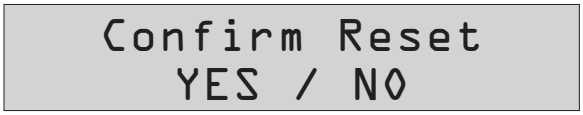
Press **Scroll** to move the cursor to either *YES* or *NO* and press **Enter**.



Press **Scroll** to move the cursor to either *YES* or *NO* and press **Enter**.

System Reset

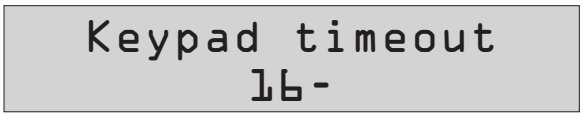
The *System Reset* allows a supervisor to reset all configuration parameters to default values.



1. Press **Scroll** to move the cursor to either *YES* or *NO*.
   a. If you select *YES*, the keypad asks you to Confirm Reset.
   b. If you select *NO*, the keypad advances.
2. Press **Enter**.

Keypad Timeout

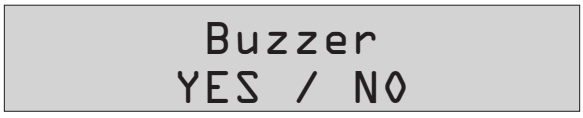
- Timeout parameter corresponds to the time it takes to validate after all dispense order data has been entered. If **Enter** is not pressed within the time allocated, the keypad display goes back to initial menu and the input data is erased.
- The Keypad Timeout is between zero to 255 seconds (0 = no timeout) and the default for this feature is 10 seconds.



1. Press **Backspace** to erase the current setting.
2. Type in the new setting.
3. Press **Enter** to advance.

Buzzer

This screen provides a user with the option to have a beep on every key entry. The default is YES.

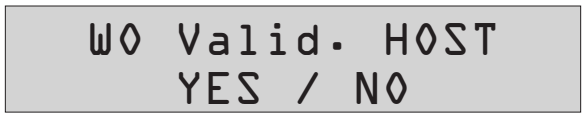


1. Press **Scroll** to move the cursor to *YES* or *NO*.
2. Press **Enter** to advance.

Work Order Validation

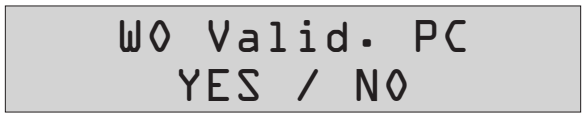
WO validation is used to define if a work order shall be validated by the system before processing it.

Host Validation (Host Operation Mode)
In this mode the work order number will be sent to the ERP (DMS) system. Only after validation from the system the meter will unlock. Afterwards the dispense data will be sent to the ERP system.



1. Press **Scroll** to move the cursor to either *YES* or *NO*.
2. Press **Enter**.

PC Validation (PC Operation Mode)
In this mode the work order number will be sent to the PC (FMS Software). Only after validation from the PC will the order number is accepted.



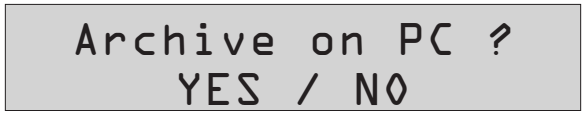
1. Press **Scroll** to move the cursor to either *YES* or *NO*.
2. Press **Enter**.

WO Archive (Printout or Storing of the Work Order /Dispense Results)

1. Press **Scroll** to move the cursor to *Mem* or *Print*.
2. Press **Enter**.

Mem	Data stored in an optional memory module.
Print	After each dispense, the data will be printed out on the external printer. Each line displays one dispense.

Archive on PC (Archive of the Work Orders/Dispenses)



1. Press **Scroll** to move the cursor to either *YES* or *NO*.
2. Press **Enter**.

All dispense results are stored on the PC (FMS Software). If the PC is currently not available, the data will be tagged as "not sent" in the memory of the master. The data will be sent as soon as the PC is connected again.

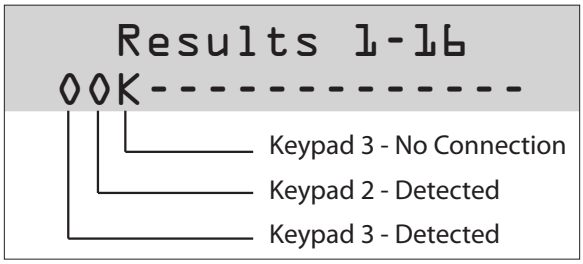
Test Communication (DK) Menu

The *DK* menu is used to check the communication amongst all keypads.

Press **Scroll** to move the cursor to either *YES* or *NO* and press **Enter**.

Three Dispense Keypads are set up in the following example. Each "–" (dash) stands for a Dispense Keypad.

Press **Enter** to begin the test.



NOTE: N=Network Error, T=Timeout

Three Dispense Keypads are set up in this example.

In the following examples, each "–" (dash) stands for a Dispense Keypad. Press **Enter** to display these results.

Reports (REP) Menu

- Connect a printer or a PC (Terminal program) to the serial printer port (RS232).
- Settings are 9600 Baud, Data Bits 8, Stop Bits 1, Parity ODD.
- Reports will automatically be stored in the data logger (RF memory) at the Master Keypad.

NOTE: To use this feature you must the select External Printer option in the *CNF* menu.

The *REP* menu is used to print reports to an external printer.

Press **Scroll** to move the cursor to the report you want to print and press **Enter**.

The options are:

INI	Initialization	**USR**	Sort list by user
CNF	Configuration	**PRO**	Sort list by product
WO	Sort list by work order	**HOS**	Sort list by hose (meter)
COM	Display the communication status of hoses/meters.	**TNK**	Sort list by tank

Radio (RAD) Menu

The *RAD* menu screens are:

- Address (ADR) toggles the display between the Radio Address and the Radio Prefix screens.
- Network (NWK) allows you to select the Radio Network.
- Power (PWR) displays the radio's transmit (Tx) output power.
- Status (STA) displays the Radio Network Status.
- Change Channel (CHA) allows you to select a different RF channel.

1. Press **Scroll** to move the cursor to *REP*.

2. Press **Scroll** two more times to move the cursor to the *RAD* selection.
3. Press **Enter** to display the *RAD* menu.

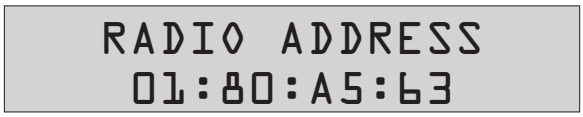
4. Press **Scroll** to move the cursor to the information you want to display.
5. Press **Home** to go back to the default screens.

Radio Address/Radio Prefix

Once you select *ADR*, you can press **Scroll** to toggle between the *Radio Address* and the *Radio Prefix* screens.

1. Press **Scroll** to move the cursor to *ADR*.

2. Press **Scroll** again to display the *Radio Prefix* screen.



3. Press **Enter** to display the *Radio Address* screen.
4. Press **Enter** to return to the selection screen.

Radio Network

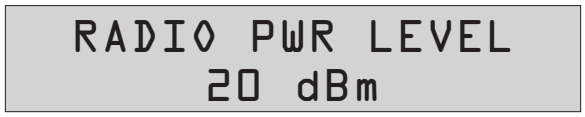
The *Radio Network* default is zero. You need to change this setting only if you have multiple RF FMS systems. All RF Meter/Hose *Radio Network* settings must match the Master Keypad and Dispense Keypad settings.

1. Press **Scroll** key to move the cursor to *NWK*.
2. Press **Enter** to display the *Radio Network* screen.

3. Press **Enter** to return to the selection screen.

Radio Power

1. Press **Scroll** to move the cursor to *PWR*.
2. Press **Enter** to display the *Radio Power Level* screen.



3. Press **Enter** to return to the selection screen.

Radio Status

The Radio Status options are:

- NWK CONNECTED – The network is connected and operational.
- SERIAL ERROR – There is a radio communication error on the serial bus between the keypad and the radio.

1. Press **Scroll** to move the cursor to *STA*.
2. Press **Enter** to display the *Radio Status* screen.

3. Press **Enter** to return to the selection screen.

Change Channel

The Change Channel option is used to select a different RF channel if the current channel is noisy.

1. Press **Scroll** to move the cursor to *CHA*.
2. Press **Enter** to display the *Radio Network* screen.

3. Press **Enter** to select a new channel.

4. The screen displays the radio command status.

DISPENSE KEYPAD

The Dispense Keypads are responsible for the communication with the RF meters. The user starts a work order from the keypad. After the dispense operation has been completed the keypad will receive the actual amount dispensed from the meter. The Dispense Keypad then sends the dispense results to the Master Keypad.

The system can handle up to 36 Dispense Keypads. Up to 24 meters can be assigned to each keypad but each meter can only be assigned to one Dispense Keypad.

System Version Screen

The standard screen shows the system software version number. The display will alternate between the standard screen and the *Enter Pin Number* screen. The *Enter Pin Number* screen is used to access the supervisor menus.

NOTE: An *N* displayed in the lower left corner of the system version screen indicates a Radio Network error. See *"Radio Status" on page 23* to check the source of the error.

NOTE: An *M* displayed in the lower left corner of the system version screen indicates that the Dispense Keypad has joined an RF network, but cannot currently contact the Master Keypad for WO authorization.

NOTE: An *O* displayed in the lower left corner of the system version screen indicates that the Dispense Keypad is in *System Override* mode. See *"System Override (SYS) Menu" on page 24* for details.

Enter a user PIN to start a work order or the supervisor PIN to enter the supervisor menus (the default PIN is 0001).

Settings Overview / Supervisor Menus

The following configuration options are only available at the Dispense Keypad.

The default value for the Supervisor PIN is 0001.

Configuration (CNF) Menu

The *CNF* menu is used to set the system's operation modes and archiving methods.

System Reset

Resets the system parameters to the original factory settings.

Mileage Type

Defines the unit for the *Free Alphanumeric* field (Defined in Global Keypad Settings)

Top Off Timer

Specifies the amount of time, how long user can make additional dispenses. Is the time allowed after a dispense is completed before the meter will automatically lockout and send the dispense results back. (Defined in Global Keypad Setting)

Internal Printer

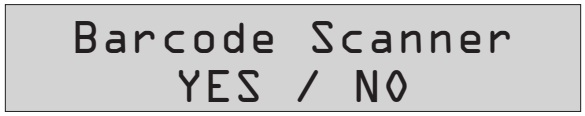
Enables the internal ticket printer. (Defined in Global Keypad Settings)

External Printer

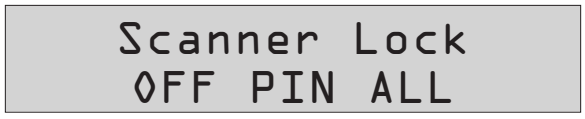
Enables the external report printer port. (Defined in Global Keypad Settings)

Barcode Scanner

This menu will define the external Printer port as a Barcode Reader Port (RS232), if the *External Printer* is enabled the *Barcode Scanner* menu will disappear.



Select *YES* to enable the Barcode Scanner.



OFF	Data can be entered with Keypad & Barcode Scanner
PIN	*PIN* has to entered by Barcode Scanner
All	All data has to be entered with Barcode Scanner

When *PIN* or *All* is selected you can choose an additional prefix character. The prefix character will not be displayed and cannot be entered on the keypad.

Choose the prefix, available characters are:
$ % &´ ( ) * +, - Space / : ; < = > ? @ [ ] ^ ` { | } ! ”

Defines the time, how long the scanned information will be shown on the display in units of 1/10 second. For example, 100 = 1 second.

We recommend the following barcode scanners:

- Wall mounted: Datalogic Magellan 1000i
- Handheld: Datalogic Gryphon 4100

The scanner has to be programmed according to our specification. Null modem adapter has to be used between the keypad serial port and the barcode scanner.

Buzzer

The buzzer beeps each time you press a button. You can turn off the sound. See Global Keypad Settings.

Auto Override

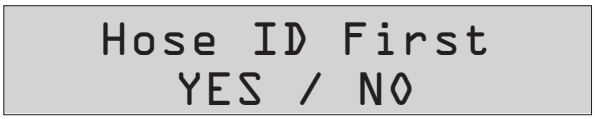
Activates the system *Auto Override* feature in all keypads so users can dispense WOs when the Master Keypad is not operational. No supervisor intervention is required. Available with v3.X firmware only. After five failed MK communication attempts, the *Auto Override* feature automatically puts the keypad in system override mode.

1. Press **Scroll** to move the cursor to either *YES* or *NO*.
2. Press **Enter**.

Batch Quantity Locked

With the Batch Quantity *Locked*, you cannot change the batch quantity that was entered on the work order. If the work order has a batch quantity of zero, you can change the batch quantity.

Hose ID First



Used for *HOST* communication option only.

Selected product ID will be sent to the HOST.

Delete Prepared WOs (MET) Menu

Work orders that have been entered at a keypad are stored until they are picked up by the appropriate meter (by pressing **RESET** at the meter). Meanwhile, the meter is locked for other dispenses.

The *MET* menu is used to delete prepared work orders and release the meter for new work orders.

1. Press **Scroll** to move the cursor to either *YES* or *NO*.
2. Press **Enter**.

3. Press **Enter**.

Reports (REP) Menu

- Connect a printer or a PC (Terminal program) to the serial printer port (RS232).
- Settings are 9600 Baud, Data Bits 8, Stop Bits 1, Parity ODD.
- Reports are automatically stored in the data logger (RF-memory) at the Master Keypad.

NOTE: To use this feature, you must the select External Printer option in the *CNF* menu.

The *REP* menu is used to print reports from an external printer.

Press **Scroll** to move the cursor to the report you want to print and press **Enter**.

The options are:

INI	Initialization	**USR**	Sort list by user
CNF	Configuration	**PRO**	Sort list by product
MET	Sort list by meter	**HOS**	Sort list by hose (meter)
WO	Sort list by work order	**TNK**	Sort list by tank

190 (Internal Ticket Printer) Menu

Use this menu to print the configuration and status reports from the internal printer FT 190 (optional).

NOTE: To use this feature, you must the select Internal Printer option in the *CNF* menu.

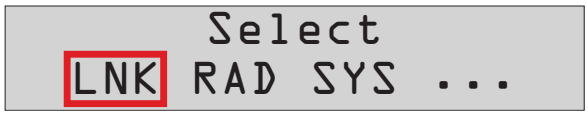
The *190* menu is used to print reports from an internal printer.

Press **Scroll** to move the cursor to the report you want to print and press **Enter**.

The options are:

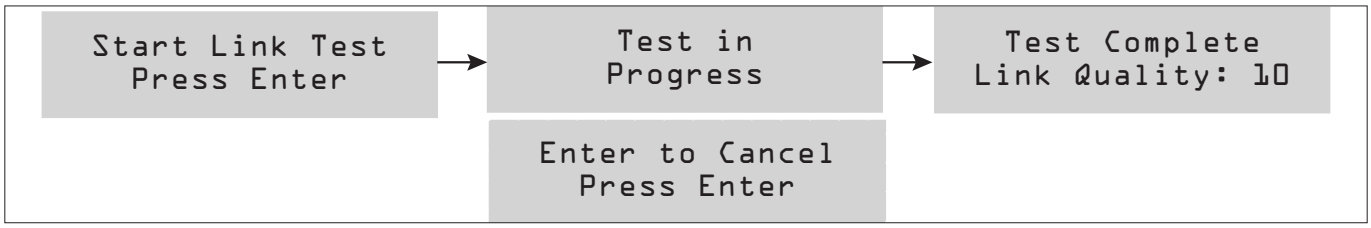
INI	Initialization	**MET**	Sort list by meter
CNF	Configuration	**WO**	Sort list by work order

RF Communication Test (LNK) Menu



The *LNK* menu is used to check the quality of the RF communication between the Master and Dispense Keypads.

The test performs a number of test communications and measures the quantity of lost transmissions. The *Link Quality 10* is the maximum you can achieve.



Radio (RAD) Menu

The *RAD* menu screens are:

- Address (ADR) toggles the display between the Radio Address and the Radio Prefix screens.
- Network (NWK) allows you to select the Radio Network.
- Power (PWR) displays the radio's transmit (Tx) output power.
- Status (STA) displays the Radio Network Status.
- Network Connect (CON) connects the keypad to a new Master Keypad network.

1. Press **Scroll** to move the cursor to *REP*.

2. Press **Scroll** two more times to move the cursor to the *RAD* selection.
3. Press **Enter** to display the *RAD* screen.

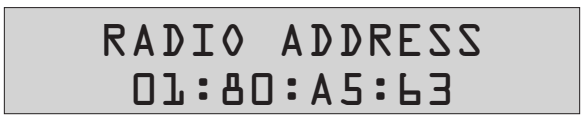
4. Press **Scroll** to move the cursor to the information you want to display.
5. Press **Home** to go back to the default screens.

Radio Address/Radio Prefix

Once you select *ADR*, you can press **Scroll** to toggle between the *Radio Address* and the *Radio Prefix* screens.

1. Press **Scroll** to move the cursor to *ADR*.

2. Press **Scroll** again to display the *Radio Prefix* screen.



3. Press **Enter** to display the *Radio Address* screen.
4. Press **Enter** to return to the selection screen.

Radio Network

The *Radio Network* default is zero. You need to change this setting only if you have multiple RF FMS systems. All RF Meter/Hose *Radio Network* settings must match the Master Keypad and Dispense Keypad settings.

1. Press **Scroll** to move the cursor to *NWK*.
2. Press **Enter** to display the *Radio Network* screen.

3. Press **Enter** to return to the selection screen.

Radio Power

1. Press **Scroll** to move the cursor to *PWR*.
2. Press **Enter** to display the *Radio Power Level* screen.

3. Press **Enter** to return to the selection screen.

Radio Status

The *Radio Status* options are:

NWK CONNECTED	The network is connected and operational.
SERIAL ERROR	There is a radio communication error on the serial bus between the keypad and the radio.
NWK DOWN	There is no network within the range of the Dispense Keypad.
NWK LOST	The network connection is currently unavailable.

1. Press **Scroll** to move the cursor to *STA*.
2. Press **Enter** to display the *Radio Status* screen.

3. Press **Enter** to return to the selection screen.

Network Connect (CON) Menu

The *Network Connect* forces the keypad to connect to a new Master Keypad network. This option is used when:

- Replacing the Master Keypad.
- Moving the Dispense Keypad if the Dispense Keypad does not automatically find the new network.

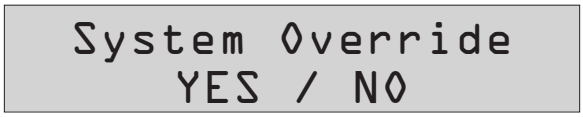
1. Press **Scroll** to move the cursor to *CON*.
2. Press **Enter** to display the *Radio Network* screen.

3. Press **Enter** to display the *Radio Status* screen.

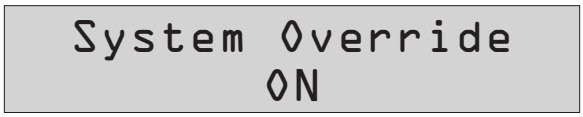
4. The screen displays the radio connection status (*NWK CONNECTED* or *NWK DOWN*).

System Override (SYS) Menu

The *System Override* Menu is used to override verification of the Master Keypad.

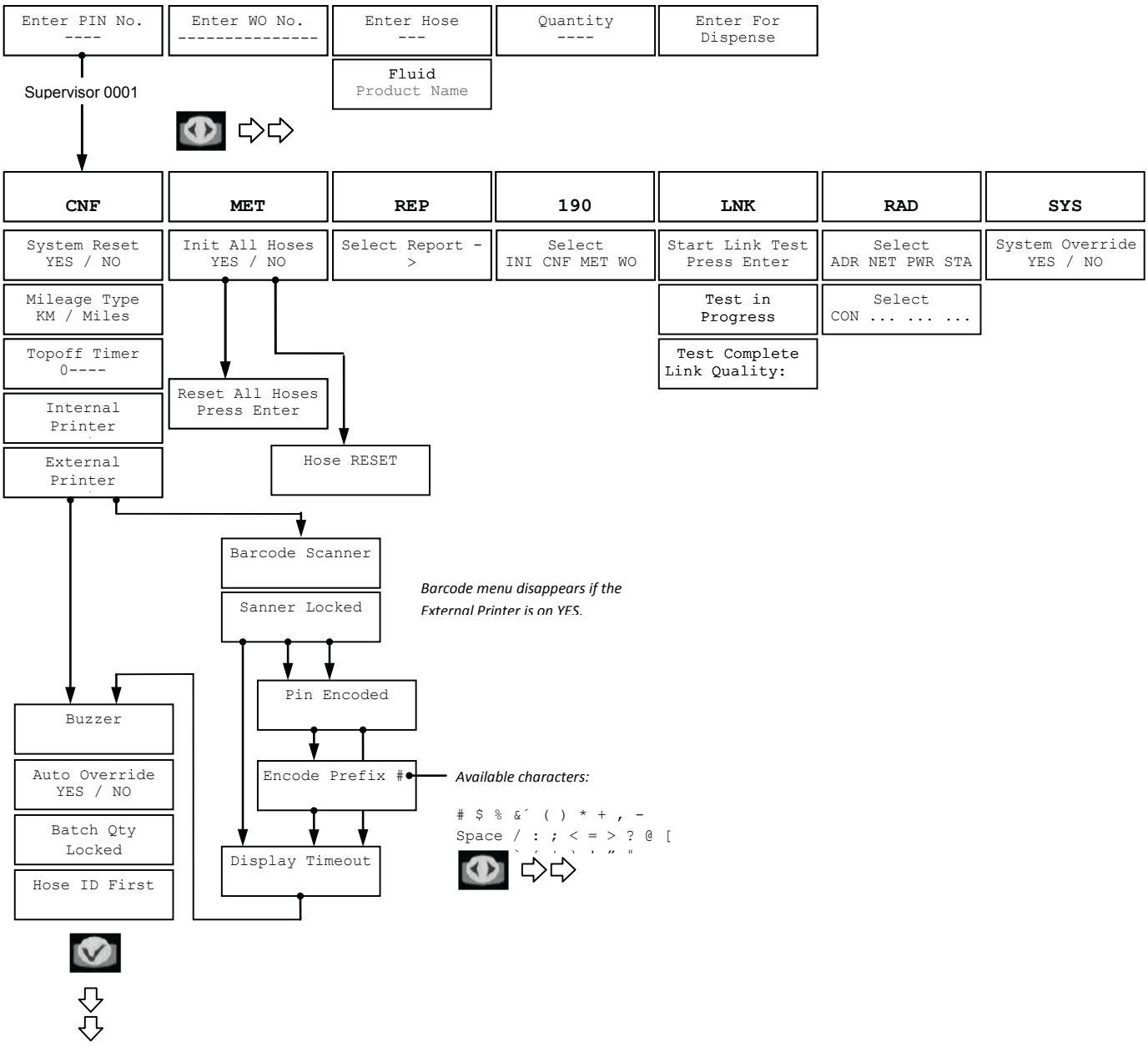


1. Press **Scroll** to move the cursor to *YES*.
2. Press **Enter**.

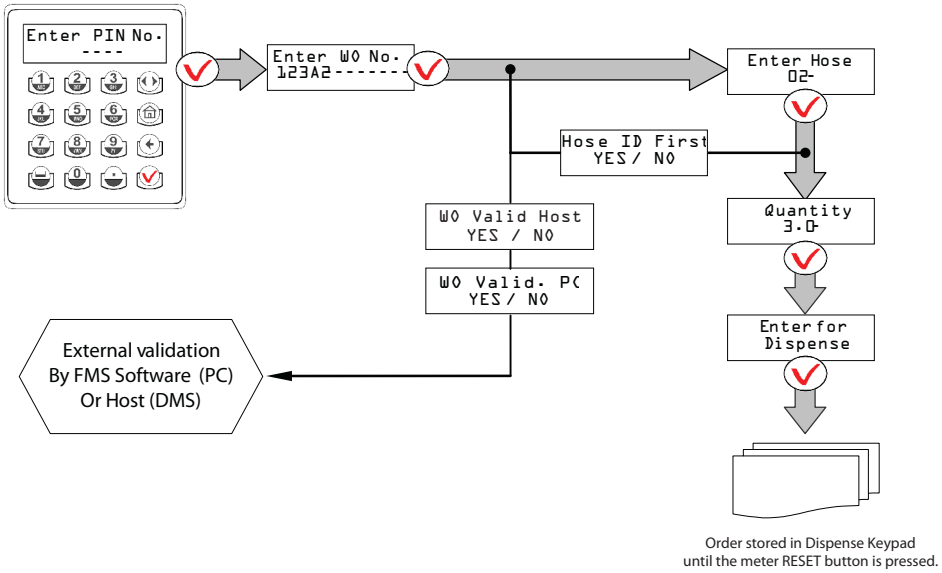


The screen verifies that *System Override* is On.

Dispense Keypad Menu Overview



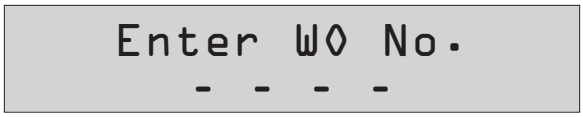
DISPENSE PROCESS



Starting a Work Order

1. Enter your PIN number and press **Enter**.

To start a work order, the mechanics or users must enter their PIN to access the system.



2. Enter an alphanumeric number (max. 16 characters) and press **Enter**.

In the operation modes *WO Validation HOST* or *WO Validation PC* (see *"Work Order Validation" on page 13*) the entered WO number will be compared with the numbers set in the system, which are defined in Global Keypad Settings.

Alphanumeric Keypad

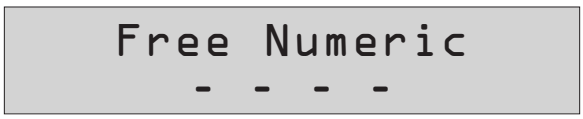
To change from the numeric to the letter keypad, press the equivalent key for at least 3 seconds until the desired letter is shown.

Additional Free Fields

These optional fields are only shown if they have been enabled (defined in Global Keypad Settings).

3. Enter alphanumeric characters and press **Enter**.

Can be used, for example, for the licences plate number.



4. Enter an alphanumeric number (max. 16 characters) and press **Enter**.

Can be used, for example, for the actual mileage.

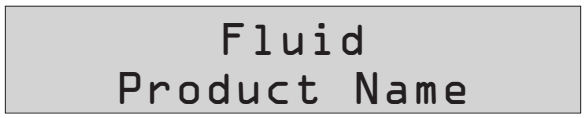
Meter Selection

Enter a preset meter (hose) ID for the product.

5. Enter a preset meter (hose) ID for the fluid product you want and press **Enter**.

- Only meters that are assigned to the current keypad can be selected.
- In the operation modes *WO Validation HOST* or *WO Validation PC* the system will check if the product you entered is assigned to this work order.

Display Fluid



6. The chosen fluid type is displayed for three seconds.

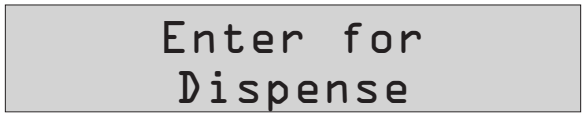
Product Quantity

7. Enter the quantity and press **Enter**.

   The quantity assigned to this WO is shown.

- The quantity can be chosen between 0.0…99.9 and 100…999 units of measure.
- The preselection can be made with one decimal place.
- For quantities more than 100 units of measure, the meter counts down toward zero.
- A quantity of 0.0 will deactivate the preselection on the RF meter. The RF meter will not latch and the user is required to hold the trigger in the open position to dispense fluid. The user must press **Reset** on the RF meter to complete the dispense operation and communicate the dispense order result to the keypad.

Dispense Confirmation



8. Press **Enter** to dispense the fluid.

   The work order is ready to be picked up by the RF meter (see *"RF Mode (Standard Pre-Selection Mode)" on page 29*).

EPM-3 RF METER

The meter is equipped with RF communications to communicate dispense authorization and result information. Once a work order has been set up, the operator simply pulls the trigger and the authorized amount of fluid for that meter will dispense. The valve will automatically shut off when the full quantity has been dispensed. A *Top Off* feature allows additional quantities to be dispensed and tracked after the valve closes. Upon completion of the dispense effort, the valve locks, prohibiting any unauthorized dispense.

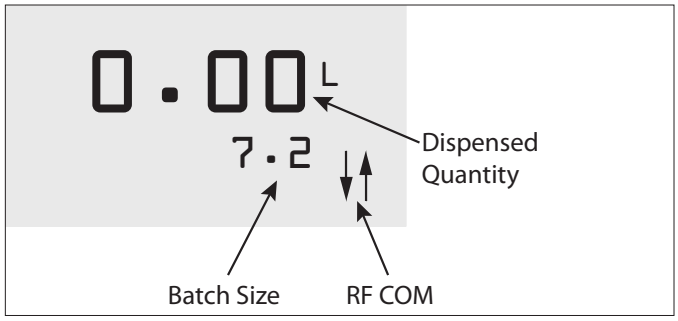
Key Description

The following keys (except for **Reset** and **Shut-Off**) are only active in the *Auto Mode* (or *Manual Mode*).

	0.1 1 10	Used to enter the dispense quantity to be used. In operational mode it shows the five latest dispensed amounts.
	TOTAL	Displays the accumulated total of fluid dispensed, as well as the resettable total when held for 3 seconds.
	AUTO	Enters and exits auto mode when RF communications are not available.
	RESET	• Accepts a dispense order from the keypad. • Clear the previously programmed batch and to reset the meter in normal operating mode (RF, manual or auto). • Resets the resettable total dispensed while pressing **Total**.
	○	**Shutoff** stops the flow manually through an electrical override.

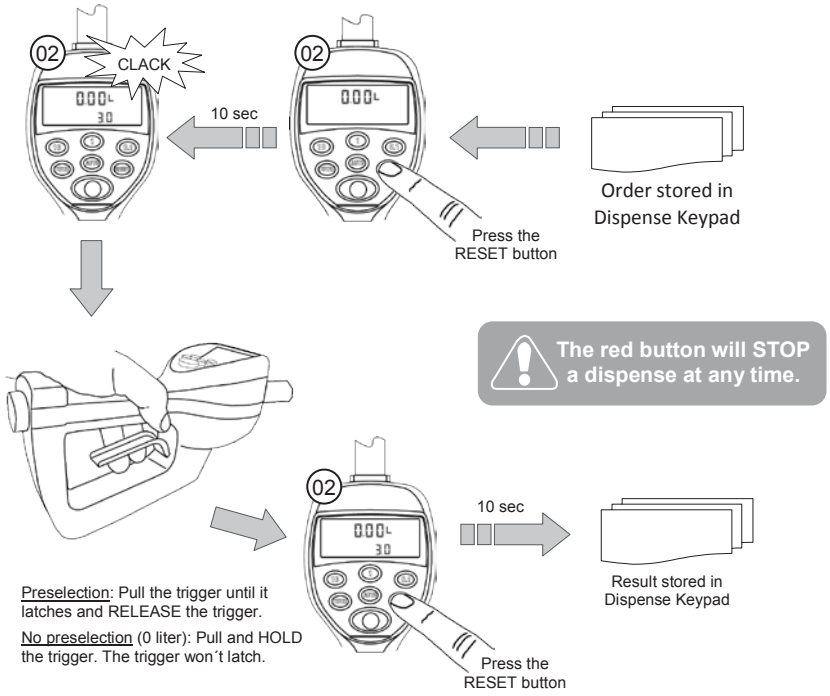
RF Mode (Standard Pre-Selection Mode)

Work Order Validation via the Dispense Keypad



When the battery pack is attached to the meter, the meter will automatically enter the RF mode. The trigger is in a locked-out position and no oil can be dispensed until a dispense order is received by the meter.

1. Press **Reset** on the meter to enable it to receive a dispense order provided by the Dispense Keypad. The trigger will unlock.
2. Pull the trigger to begin the dispensing of fluid. The valve will automatically lock in place, even though the trigger will fall back to the closed position. The flow will automatically shut off when the programmed amount has been dispensed.
3. To top off, pull the trigger to dispense fluid and release when the desired amount has been reached.
4. Press **Reset** when finished. The total quantity will be transmitted to the keypad and the meter will return to a locked-out position. The meter is now ready to receive the next dispense order from the keypad.



AUTO Mode (Autonomous)

IMPORTANT

This function allows unauthorized dispenses. The dispense information will not be associated to any mechanic or operator.

- The total dispensed quantity is stored under the general work order number (999999).
- The *AUTO* sign at the display's lower left corner indicates the manual mode.

Enter the Auto Mode

To enter the *Auto Mode*:

1. Press and hold **Total**.
2. Press the following buttons one after the other: **10**, **1**, **0.1**, **Auto**.

NOTE: You can use this same button sequence to return to *RF Mode*.

The solenoid unlocks and the meter may be used as a normal preselection meter.

3. Press **Auto** to enter the preselection.

Reset to Standard Mode

To return the meter to the standard preselection mode, press **Reset** and start a communication with the assigned dispense keypad (see *"Network Connect (CON) Menu" on page 24* and *"RF Mode (Standard Pre-Selection Mode)" on page 29*.

If the communication was successful (no "F02" error code) the meter will lockout and fall back in the preselection mode. The total quantity, which has been dispensed during the *Auto Mode*, will be automatically transmitted to the Master Keypad. It will be assigned to *Misc. WO-Number* (default 999999), with the user named as "???". The dispense result will be marked with the *Status 16* for manual dispense.

Electrical Override

In case of an emergency or to interrupt a batch, the meter is equipped with an electrical override. This option automatically closes the valve in the meter, stopping the flow immediately. The display will begin to flash because the meter does not sense any flow. Batching can be continued after an override, even if the meter is in the middle of a programmed batch and the display continues to flash.

1. Press **Shutoff** to activate the electrical override. This button can only be used when the valve is open.
2. Press **Reset** to cue up the next batch and stop the display from flashing.

Changing the Battery

When the batteries need changing, a progression of warnings appears on the meter screen.

First Warning
The Low Battery icon appears in the lower left corner of the display. That means the batteries are low and need to be changed when the icon appears.

Second Warning
The Battery icon flashes. The battery power is too low and meter functions are disabled.

The battery compartment is located in the lower case on the backside of the trigger guard.

1. Position the unit face down.
2. Unscrew the two screws. Remove the battery door to expose the batteries.
3. Replace the old batteries with 4 AA alkaline batteries.

   NOTE: Battery polarity markings are inside battery compartment.
4. Dispose of used batteries properly, according to local regulations.

   NOTE: Changing the batteries does not affect any of the programmed values or totals.

Programming the EPM-3 RF Meter

The units of measurement and scale factor can be changed. For instructions, see the *EPM-3 RF Meter Installation and Operation Manual*.

INSTALLING THE FMS SOFTWARE

Use the FMS Software for the system configuration. Only some special functions, like the operation modes, are set at the Master Keypad.

The software sets work orders and assigns a product and a quantity to it.

All dispense results are collected and saved in a work order list (*W.O. Report*). Several filters are available to select information. The results can be exported to a semicolon separated value (CSV) file format.

System Requirements

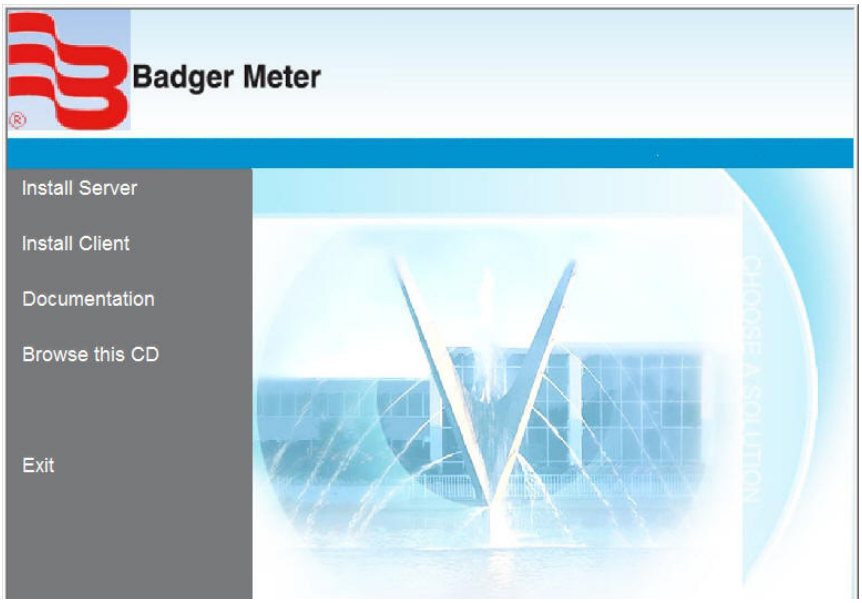
Windows® 7, Server 2012 or higher, 64 and 32-bit compatible

FMS Software Description

Before beginning the installation, please be sure your Windows user profile has the appropriate rights to install the software properly.

1. Insert the setup CD ROM into your CD ROM drive.
2. If the Installer does not launch itself after a short period, open it manually by double clicking on your CD Drive in your *My Computer* folder.
3. Select the *AutoMenu.exe* file.

The installer menu appears:

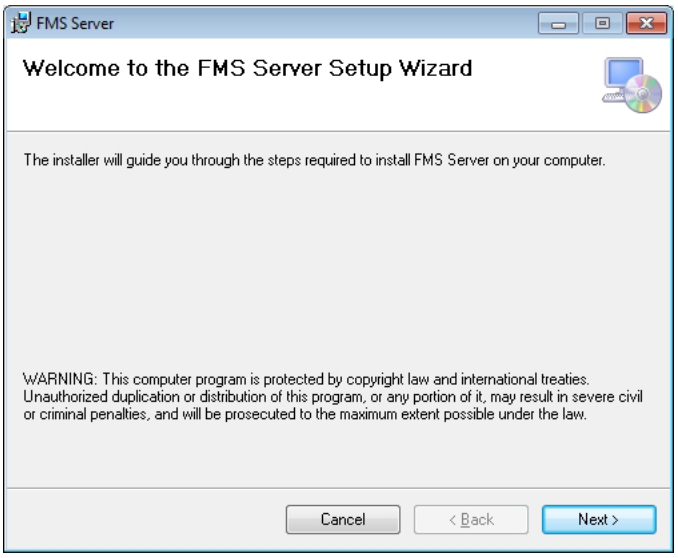


The installer menu provides several options:

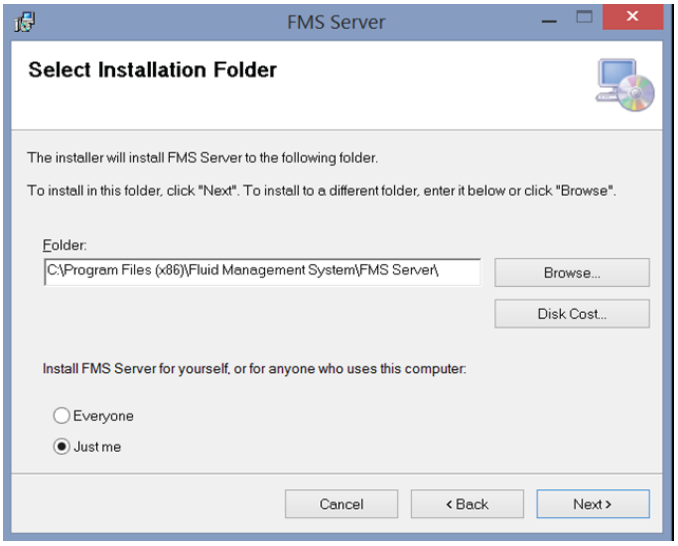
- *Install Server* installs the server and all server components. This will be the location where all the master keypad is plugged in, data is stored and where the client machine will go to access and update work orders, tank levels, etc.
- *Install Client* installs the client and all client components. This will have to be installed on every machine you would like to run the software on
- Exit closes the installer

Installing the FMS Server

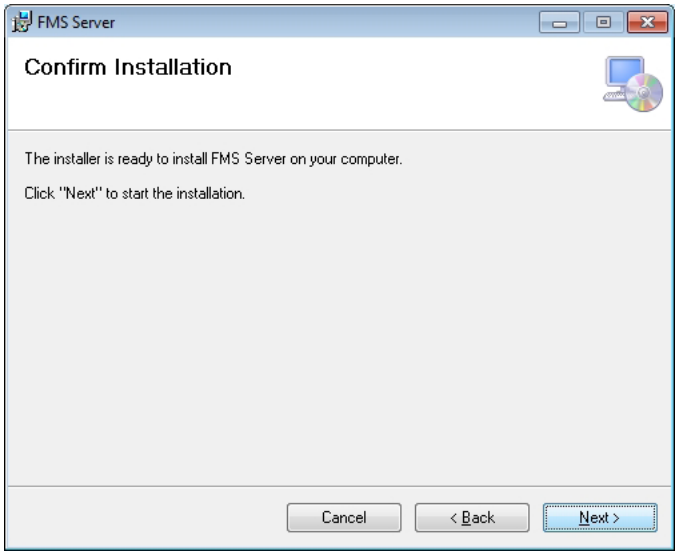
After the prerequisites are installed, the FMS Server Setup Wizard appears:



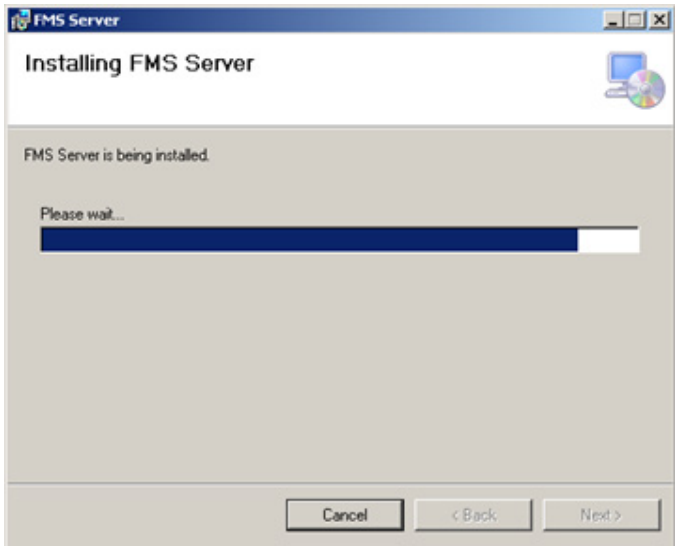
1. Click **Next**.



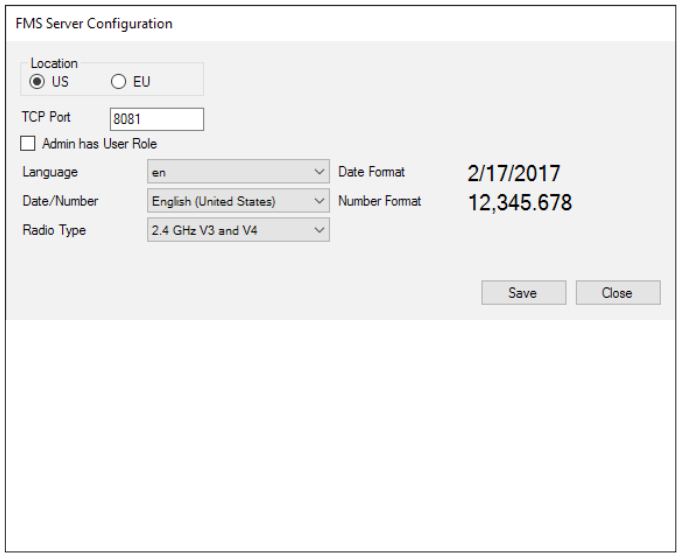
2. Select the installation folder you want the Server installed to.
   The default folder is highly recommended.
3. Click **Next**.



4. Click **Next** to confirm the installation.



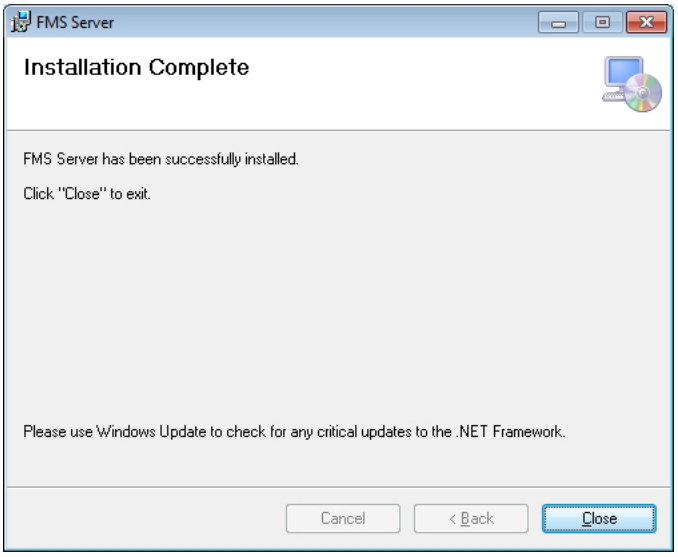
During the installation, a screen similar to this one displays, showing the installation progress.



Before the installation is complete, a screen similar to this one displays.

Location	US or Europe—sets the default units to US units or Liters. For older systems, it specifies part of the Hose and Dispense Keypad addresses
TCP Port	The port the server listens on for client connections. The client needs to use the same port
Admin has User Role	Not recommended—allows the admin to create pending work orders
Language	Selects the language. English and German currently available
Date/Time	Selects the date/time
Radio Type	Specify the type of radio and firmware version to be used
Date Format	Specify format for date
Number Format	Specify format for numbers
Save	Saves the values to the config file
Close	Continues without saving

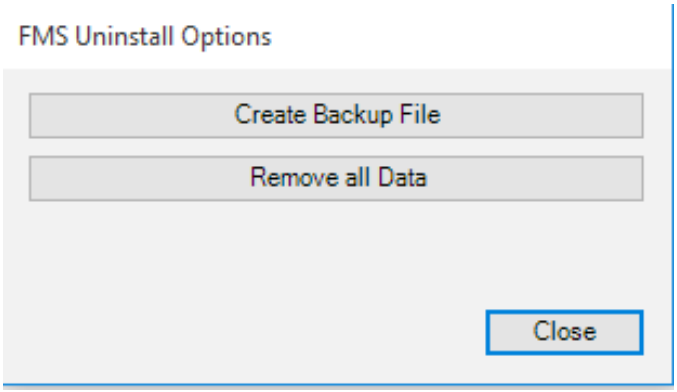
5. Click **Save** to save the values to the config file.



When the installation is complete, a screen similar to this one displays.

6. Click **Close** to exit the installer.

Uninstalling the FMS Server

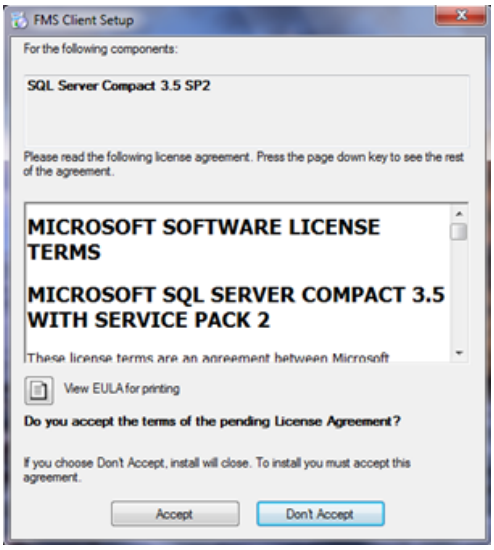


If you choose to uninstall the FMS Server, you have these options:

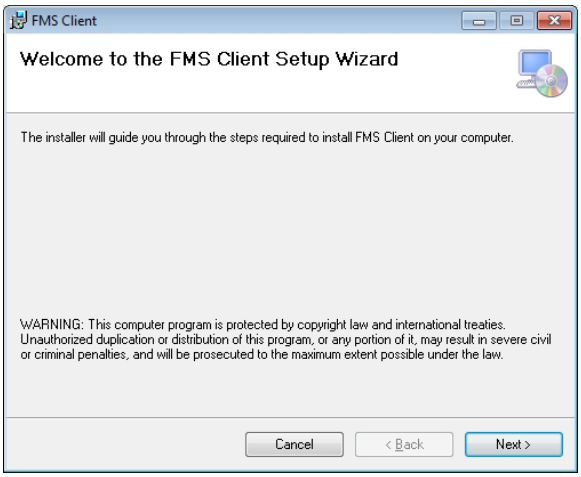
Create Backup File	Opens a folder browser window; select a location to save the data in the database
Remove all Data	Asks for verification; if Yes, deletes the data directory; there is no Undo; the Create Backup Files becomes unavailable

Installing the FMS Client

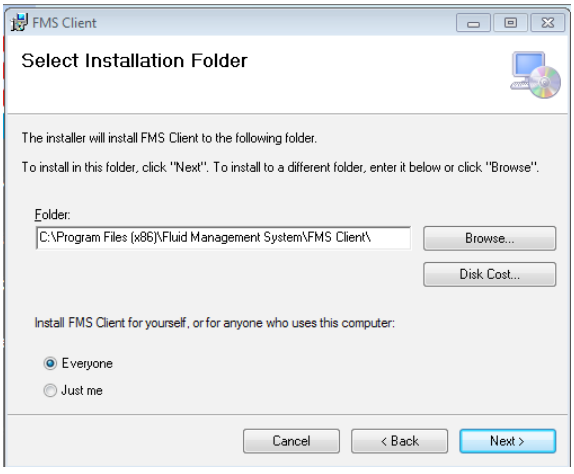
1. Select **Install Client**.
   The Client installs the SQL Compact Edition if it is not installed.
2. Click **Accept**.



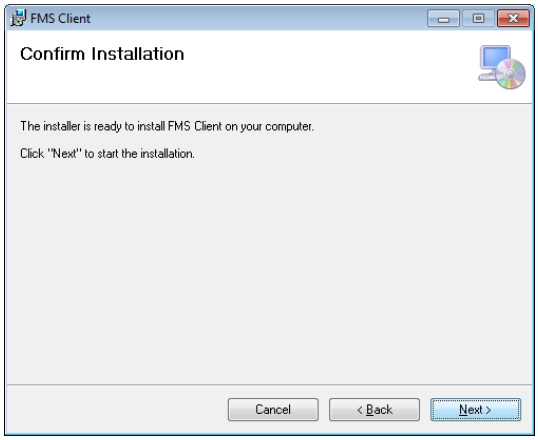
After the prerequisites are installed, the FMS Client Setup Wizard screen appears:



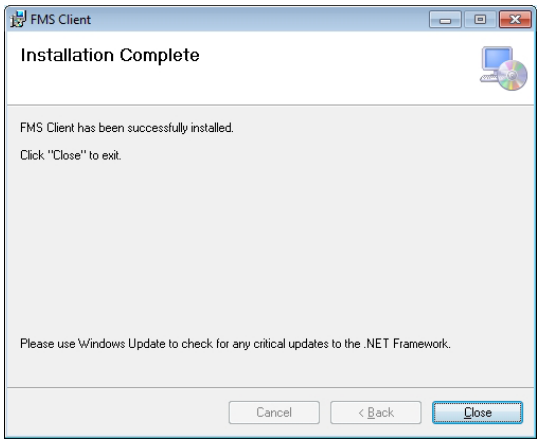
1. Click **Next**.



2. Select the installation folder you want the Client installed to. The default folder is highly recommended.
3. Click **Next**.



4. Click **Next** to confirm the installation.



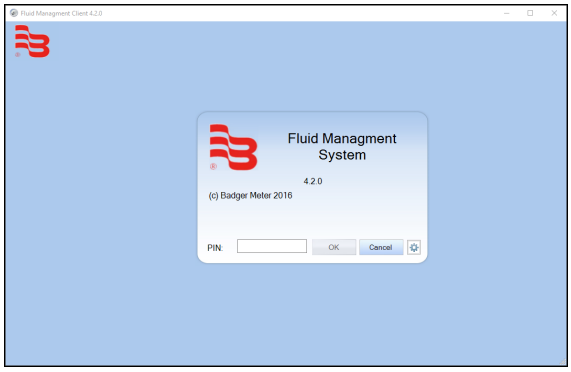
When the installation is complete, a screen similar to this one displays.

5. Click **Close** to exit the installer.

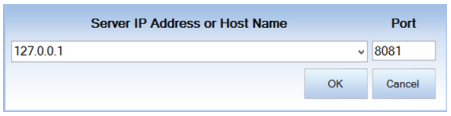
LAUNCHING THE FMS SOFTWARE

To launch the software, click on the FMS Client icon on your desktop

The screen below displays only if there is an issue with the network connection.



You must enter the IP address where the server resides.



1. Enter the IP address of the FMS server.

   For the Client installed on the server, the IP address should be 127.0.0.1.

   For the Client not installed on the server, enter the IP address or host name assigned to the server. The IP addresses of the last successful connections are saved in the drop down menu.

2. Enter the *Port*. The *Port* is the TCP port to connect to. Make sure that the *Port* listed matches the port selected on the server. The default port is 8081. If another application is using the default port, change the port on this screen and the server to an open port. Make sure you have chosen the same port in both places.
3. Click **OK** to attempt a connection or click **Cancel** to close the application.

FMS System Configuration

If there are multiple servers that the system can connect to, click the **Gear Icon** and choose the correct IP address or type in the host name. The currently connected IP address displays in the window.

4. Enter the 4-digit system password and click **OK**.

   The system admin password is initially set to 0000.

   Click the gear icon to open the *Server IP Address or Host Name* window.

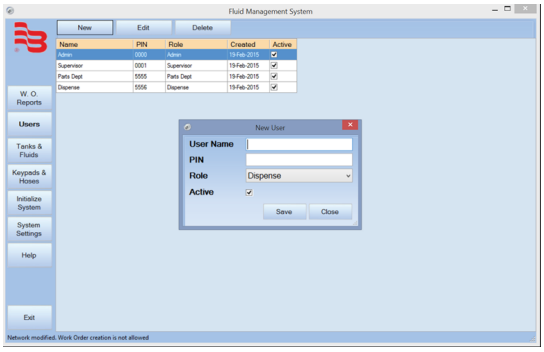
Status Bar

The bar across the bottom of the screen is the status bar that alerts you when the network is modified and work orders cannot be created, or that there are work orders open and the network cannot be modified. The status bar does not show network modification notices to users assigned as Parts Department.

USING THE FMS SOFTWARE

Setting Up New Users

To add a new user:



1. Click **New**. The screen displays the *New User* window.
2. Enter a user name, new PIN (cannot duplicate any currently used pin number) and assign a role.

PINs are four numeric digits and must be unique for each user.

To set up a user with multiple roles, create a user and pin number for each role.

3. Click **Save.**

New User Roles

The choices for role selection are System Admin, Supervisor, Parts Dept and Dispense. These choices allow the user to do the following:

System Admin	Make changes to all levels of the software, from the PC only.
Supervisor	Make changes at the keypad only. This user may not be created, deleted or deactivated, only the PIN and name can be changed.
Parts Dept	Enter work orders at the PC.
Dispense	Enter a work order id at dispense keypad to complete dispense.

Active or Inactive Users

Only users who have an *Active* status are allowed to access their respective duties. At least one active Admin, Parts Department and Dispense user are required.

To make a user active or inactive:

1. Select the user's name.
2. Click **Edit**.
3. Check the **Active** box.
4. Click **Save**.

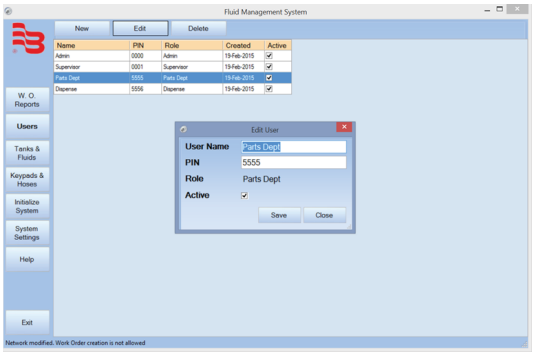
NOTE: Users with multiple roles will require a unique password for each role.

Deleting a User

To delete a user:

1. Select the user's name. Multiple users can be selected at one time.
2. Click **Delete** in the top left corner.
3. Confirm your request to delete the user. If there was a problem deleting a user, an error message will display.

Edit User



1. To edit user settings, select the user and click **Edit**.
2. In the *Edit User* window, make changes to the pin, name and active state. The role of the user cannot be changed.
3. Click **Save** to save changes.

When there are pending work orders, Admin and Parts Department users can be created and modified, but Supervisor and Dispense users cannot be changed or modified. Changes to the Supervisor or Dispense users or adding a Dispense user requires an INIT and will block the creation of any pending work orders.

Setting Up Tanks and Fluids

To set up tanks and fluids, click **Tanks & Fluids** on the left side of the screen.

NOTE: **Add Tank**, **Edit** and **Delete** buttons are disabled when there are pending work orders.

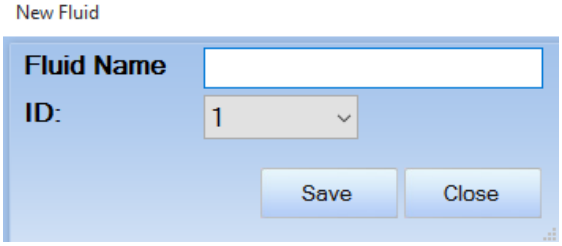
Using the software, you can track and monitor tank levels based off work orders. To track this, you first need to add a tank and its corresponding fluid.

Creating a New Fluid

You must create the fluids before tanks can be created.

To create a fluid:

1. Click **Add Fluid**.
2. Enter the Fluid Name.
3. Adjust the ID if needed.
4. Click **Save** to save changes and close the *Add Fluids* window, or click **Close** to close the window without saving the changes.



Fluids must be assigned to a valid tank before they can be used in work orders.

Adding a Tank

When you first add a tank, you can ignore the last three fields on the *New Tank* screen. These fields populate if you associate a tank sensor with the new tank, then return to the *Edit Tank* screen.

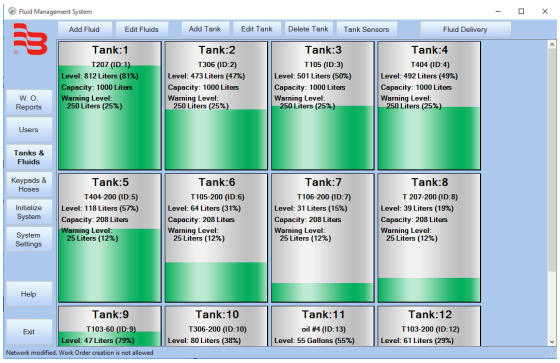
These are the fields on the *Add Tank* screen:

Tank ID	Automatically displays the next available sequential ID number. You can also select available tank IDs from the drop-down menu.
Units	Sets the units of measurement that you use to track the tank level. The choices are US Gallons, Liters, Pints and Quarts.
Fluid	Sets the type of fluid in the tank. Select fluids from the drop-down menu.
Capacity	Sets the total amount of fluid that may be stored in that tank. Enter a numeric value that corresponds to the capacity of the tank (the value is in the units you previously identified).
Level	Sets the current level of fluid in the tank.
Warning Level	Sets the fluid level at which you would like a warning message emailed to a particular person. A warning message appears on any running client screen when a completed work order brings the tank level down to, or below, the warning level setpoint. To use this feature, click the check box and enter either a nominal value or percentage (the other value with self-propagate after you enter the first value).
Auto Email	Brings up a screen to specify email settings for the warning message. When the tank reaches the specified Warning Level, this email is sent to the email recipient. Multiple recipients can be defined. Enter a semicolon (;) between each email address. **NOTE:** This is not a required field. This option will not run if email settings are not activated. See *"Email Settings" on page 53*.
Use Sensor	Associates a tank with a tank sensor. See *"Setting Up Tank Sensors" on page 46*.
Tank Sensor Name	Name of sensor associated with this tank. See *"Setting Up Tank Sensors" on page 46*.
Last Update	Time the sensor was last updated. See *"Setting Up Tank Sensors" on page 46*.

To add a tank:

1. Click on the **Add Tank** button.
2. Chose the tank ID from the drop down menu.
3. In the *Units* field, select a unit of measure from the drop-down menu. These are the units that are displayed in the fluid levels and capacity.
4. In the *Fluid* field, select a fluid from the drop-down menu.
5. In the *Capacity* field, enter the total number of units (gallons, liters, pints or quarts) of fluid that may be stored in the tank.
6. In the *Warning Level* field, enter the fluid level at which to trigger a low fluid warning message.
7. To specify the email setting for the warning message when the fluid reaches the low level point, check the box next to *Auto Email*.
8. Enter the email address of the recipient in the *Email Address* line. Separate multiple addresses with a semicolon.
9. Enter the email address that will appear as the sender in the *From* line.
10. Enter a subject in the *Subject* line.
11. Type a message that will appear with the tank information in the *Message* box. (This is optional.)
12. Check the **Use Sensor** box to associate the tank with a tank sensor. The tank sensor name and time it was last updated displays.
13. Click **Save** to close this screen and return to the *Add Tank* screen.

Tanks and Fluid Delivery



After the tank and fluid(s) are set up, the software displays a graphical representation of the tank level, including:

- The Tank ID
- The fluid type and ID
- The fluid level in units and percentage

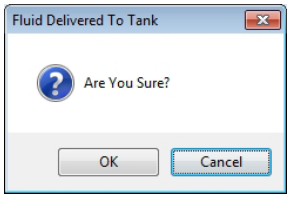
To change the information, click **Edit**. Change the appropriate settings, then click **Save**.

To track when fluid is added to the tank, click on **Fluid Delivery** or double-click the tank.

You can edit the amount of fluid added and the units in which it was added (gallons, liters, pints, and quarts).

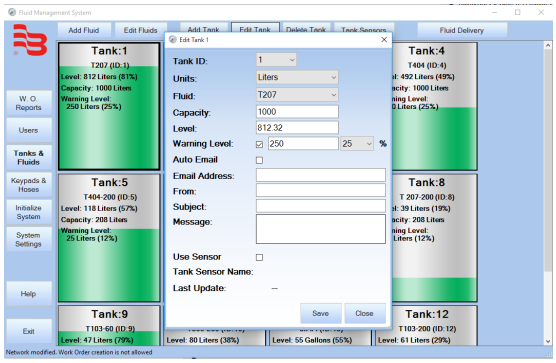
After entering the information, click **Save** to save your changes.

You will be asked to verify your changes.



When the verification screen appears, click **OK**.

Editing a Tank

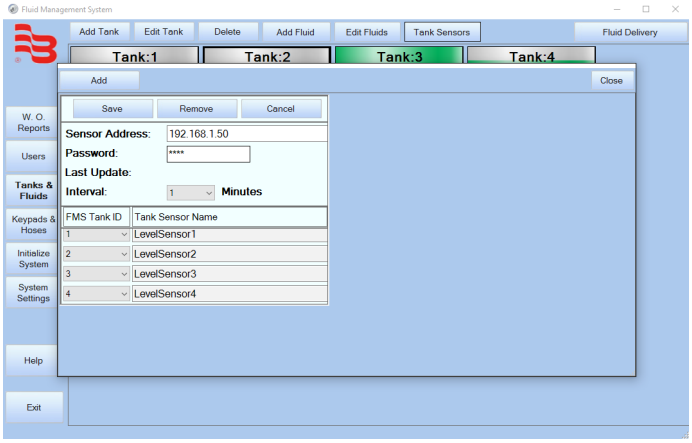


To edit a tank, select the tank and click **Edit**. Then make changes following the steps listed in *"Setting Up Tanks and Fluids" on page 41*.

Deleting a Tank

To delete a tank, select the tank you would like to delete and click **Delete**. The hoses that are attached to that tank change the Tank ID to 0 in the network tree. Hoses with a Tank ID of 0 do not appear on the Initialization screen until they are configured with a valid Tank ID.

Tank Sensors



A tank sensor box is an add-on network device that has four tank sensors. The tank sensor boxes are accessible in the FMS client under the *Tank Sensors* tab. The maximum number of tank sensors allowed is equal to the maximum number of tanks. Each tank may be assigned to one sensor only.

NOTE: An existing tank ID may be assigned to one box in one sensor position only. A tank must be created before the tank ID is created. See *"Adding a Tank" on page 41*.

When a tank sensor is associated with a tank, the tank sensor box reports:

- The tank level in %
- The number of units in liters or gallons
- The tank capacity

How the Tank Sensor Box Works

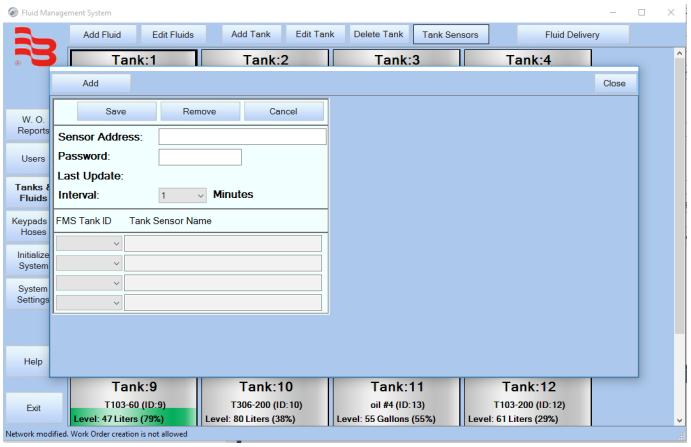
The FMS server polls the tank sensor box and reads the html page to get the tank levels. The *Tank Name* is the key for locating the information on the page. The FMS server automatically generates the tank names.

The IP address or host name, as well as the password of the tank sensor box is entered in FMS with up to four tanks to monitor. The data record for the tank sensor box is saved to the database and the server tries to contact it. If contact is successful, it logs in, sets the tank names and gets an initial read. The server polls for the levels using the specified interval. If a tank assigned to the tank sensor box has a warning level in use, the warning appears once and, if configured, the warning email is sent once. If the tank level moves back up above the warning level then moves below it again, the warning is issued again.

- A Stop/Start button allows the user to activate or deactivate the sensor monitor. This state does not persist and the sensor monitor starts again on the next server start or restart.
- The Edit and Start/Stop buttons are visible when *not* in edit mode.
- Tanks-sensors do not require initialization and do not affect the *init* state of the system.
- When tank levels and capacities are updated from the tank sensor box, the units are converted to the units in the tanks. A 100 G tank will show 400 Qts when the tank is in Qts.
- Tank sensor data is imported and exported with the setup and all export options. On Import, the tank sensor monitors are started.
- Tank names are sent to the box when they are edited and saved.
- Tank level updates are logged on each check-in as debug to keep the log file from growing too fast.
- Dispenses from a tank with a sensor do not update the tank level—the sensor updates the values.

Setting Up Tank Sensors

For more detailed information, refer to the user manual that came with your tank sensor box.



These are the fields on the *Tank Sensors* screen:

Sensor Address	Each SmartBox must have a unique IP Address or host name
Password	Password for configuring the tank sensor boxes
Last Update	Displays the last time the tank sensor box was was polled
Interval	Selects the minutes between update requests

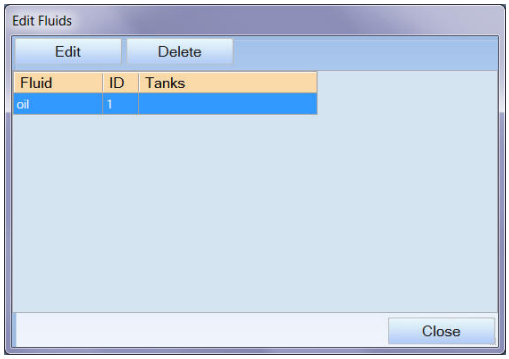
To set up a tank sensor:

1. Click the **Tank Sensors** tab.
2. Click **Add**.
3. Select a tank from the *Tank ID* pull-down menu. The *Tank Sensor Name* field is automatically assigned.
4. Click **Save** to save the changes, **Cancel** to discard the changes, or **Remove** to delete the tank-sensor association..

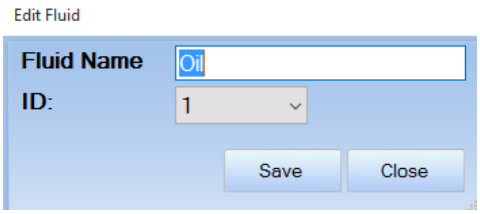
Editing a Fluid

Use this feature to edit names and ID numbers of fluids or to delete a fluid. This feature is used with the host settings to match fluid IDs to the Host Protocol Configuration product IDs. To edit a fluid:

1. Click **Edit Fluid**. The window below opens.



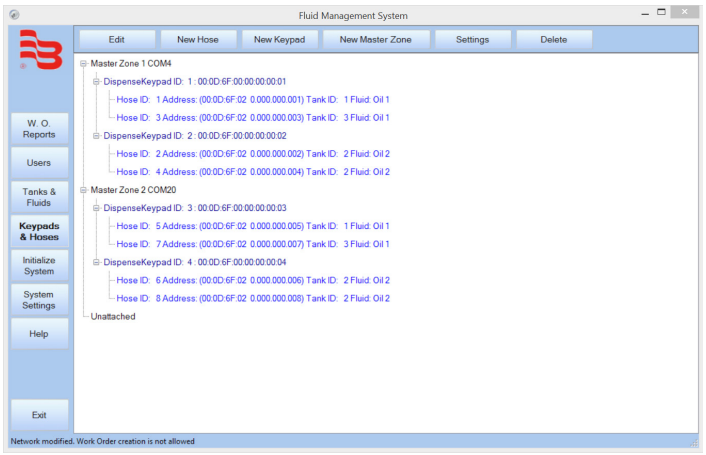
2. Select the fluid you would like to edit, then click **Edit**. The window below opens.
   a. To delete a fluid, select the fluid you would like to delete, then click **Delete**.



3. Update the *Fluid Name* and *ID*.
4. Click **Save** to save changes, or **Close** to exit without saving.
5. Click **Close** to exit the *Edit Fluids* window and return to the Tanks screen.

Setting Up Keypads and Hoses

Adding keypads and hoses builds out your entire system and sends work orders to the appropriate stations. Click **Keypads & Hoses** to display the screen below. The screen shows the current system tree set up.

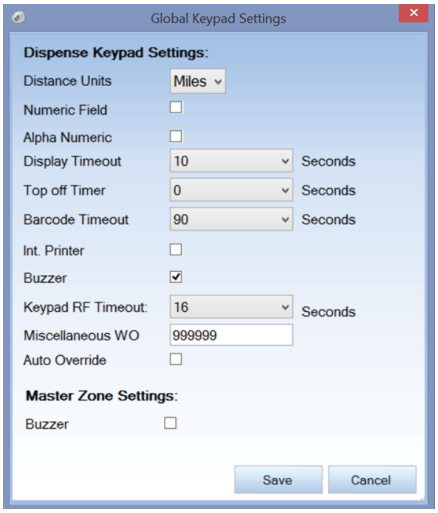


Global Keypad Settings

Make sure your Global Keypad Settings are configured correctly.

To change the Global Keypad Settings:

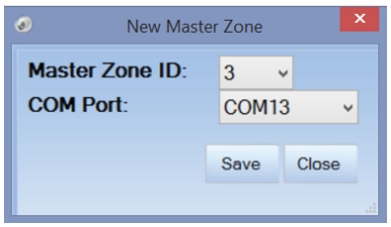
1. Click the **Settings**.



Dispense Keypad	
Distance Units	Specifies the units (miles or kilometers) of odometer readings for each WO.
Numeric	Requests that mileage be tracked.
Alpha Numeric	Requests that the car registration number be tracked. This enables the system users to enter the car registration number in the Pending WO and save it to the Completed WO.
Display Timeout	Sets the amount of time (in seconds) a PIN will be able to sit idle before timing out and forcing the user to log back in.
Top off Timer	Sets the time that the user is allowed to keep the meter open after the allotted amount of fluid has been dispensed (in seconds).
Barcode Timeout	The amount of time in increments of 10 ms to display the entered parameter on the screen after the barcode scanner input is entered. A value of 100 will equal 1000 ms or 1s of display time. This timeout is only used when the barcode scanner feature is selected on the keypad.
Int. Printer	If you have an optional internal printer connected to the keypad, select the checkbox next to the *Int. Printer* field.
Buzzer	Activates the key click buzzer.
Keypad RF Timeout	Sets the amount of time (in seconds) the keypad will wait for a work order validation response from the software
Miscellaneous WO	A configurable numeric input that allows the user to define what number a miscellaneous work order gets. This is used in the event any fluid needs to be dispensed independent of a system work order. The miscellaneous work order number, along with the user ID number, will be in the work order report. To change the number, highlight the number, press delete, and enter a new number.
Auto Override	Activates *System Auto Override* feature in all keypads so users can dispense WOs when the Master Keypad is not operational. No supervisor intervention is required. Available with v3.X and v4.X firmware only.
Master Zone Settings	
Buzzer	Activates the key click buzzer.

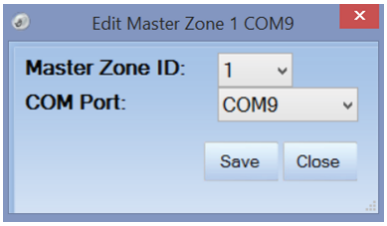
2. Change the appropriate settings.
3. Click **Save** to save your changes or **Cancel** to discard the changes and return to the *Main* screen. Any saved changes take immediate effect.

Adding a Master Zone



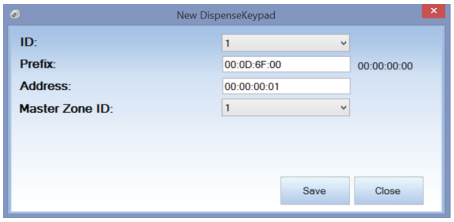
1. From the *Keypad and Hoses* screen, click **New Master Zone**.
2. Select the *Master Zone ID* from the drop-down menu. The options are 1…8.
3. Select the serial port that the master is plugged into from the *COM Port* from the drop-down menu.
4. Click **Save** to save changes, or **Close** to exit and discard the changes.

Edit a Master Zone



1. Select the Master Zone you would like to edit in the *Keypads and Hoses* screen.
2. Click **Edit**.
3. In the *Edit Master Zone* screen, select the new *Master Zone ID* and *COM Port* from the drop-down menus.
4. Click **Save** to save changes, or **Close** to exit and discard the changes.

Adding a Dispense Keypad

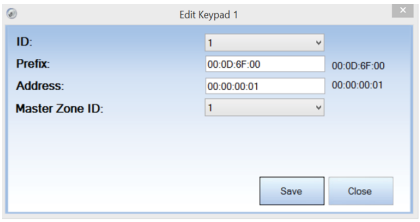


1. From the *Keypad and Hoses* screen, click **New Keypad**.
2. The prefix is pre-filled with the number to the right of the box, if the numbers do not match, double click the text box to reset the number to the default
3. Enter the Dispense Keypad address found on the back of the keypad. Use only the last 8 characters as shown here:

4. Select the *Master Zone ID* that the new keypad will be added to from the drop-down menu.
5. Click **Save**. The new keypad appears on the *Keypad and Hoses* screen, and the *New Keypad* screen resets for another new keypad.
6. When you have finished adding keypads, click **Close**.

NOTE: Dispense keypads that are not associated to a master zone do not appear on the Initialization screen.

Edit a Keypad



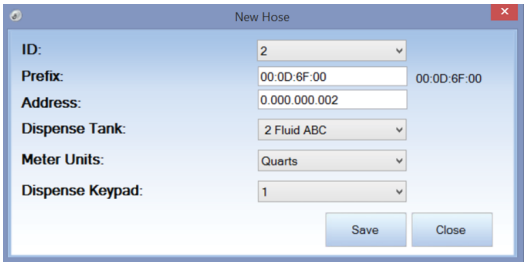
1. Select the keypad you would like to edit.
2. Click **Edit**.
3. In the *Edit Keypad* screen, make any changes necessary following the steps listed in *"Adding a Dispense Keypad"*.
4. Click **Save** to save changes or click **Close** to exit the screen without saving changes.

To delete a keypad, select the keypad you would like to delete, then click **Delete**.

Adding Hoses

After adding a keypad, you can add hoses associated with it. You can also enter hoses not associated with any keypad. You can drag and drop hoses to a keypad or between keypads in the system tree.

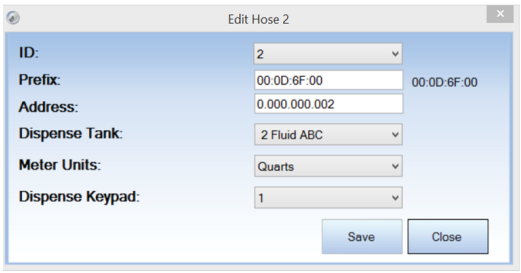
To add hoses:



1. Click **New Hose**.
2. Enter the hose *ID*, this is found on a tag on the meter.
3. Enter the hose *Address*. This is found on the hose meter.
4. Enter the *Tank* the fluid will be dispensed from.
5. Enter the dispenser *Units* of measure of the meter.
6. Enter the dispense keypad the hose is attached to. To leave the hose unassigned, select the empty entry in the drop down list. The hose must be assigned before it can be used.
7. Click **Save**. The new hose will appear on the *Keypad and Hoses* system tree under the assigned keypad, and the *New Hose* screen will reset for another new hose.
8. Click **Close**.

NOTE: If a hose is added without an assigned dispense keypad, it appears under *Unattached Hoses*. Hoses not assigned to a dispense keypad do not appear on the Initialization screen.

Edit a Hose



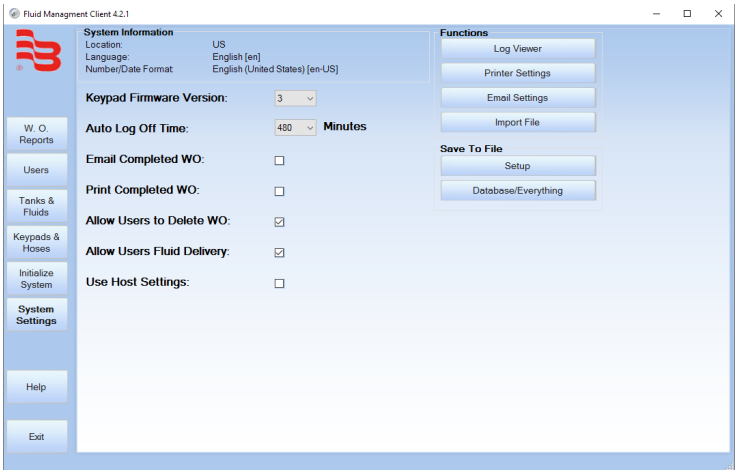
1. Select the hose you would like to edit.
2. Click **Edit**.
3. In the *Edit Hose* screen, make any changes following the same steps listed in *"Adding Hoses"*.
4. Click **Save** to save changes or click **Close** to exit the screen without saving changes.

Use these steps to assign unattached hoses to a keyboard as well.

To delete a hose, select it on the left and click **Delete**.

System Settings

To change system settings, click **System Settings** on the left side.

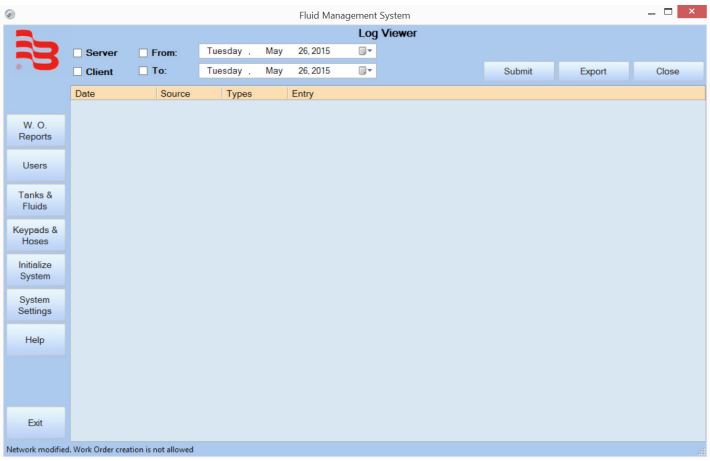


Location	Location is set as a factory default and cannot be changed by the user
Language	Spedifies the display language
Number/Date Format	Specifies the format for Numbers and Date/Time
Firmware Version	Select the firmware version your Master and Dispense Keypads are using. Version 1x can support 99 meters, version 2x and version 3x for 2.4 GHz radios can support up to 250 meters
Auto Log Off	Sets how long (in minutes) the PC user will be able to sit idle before timing out and forcing the user to log back in
Email Completed WO	Emails Work Orders upon completion. See *"Email Settings" on page 53* to change settings
Print Completed WO	Prints Work Orders upon completion
Allow Users to Delete WOs	Allows dispense users to delete work orders
Allow Users Fluid Delivery	Allows dispense users to enter a fluid delivery
Use Host Settings	Enables host settings

Functions Options

Log Viewer

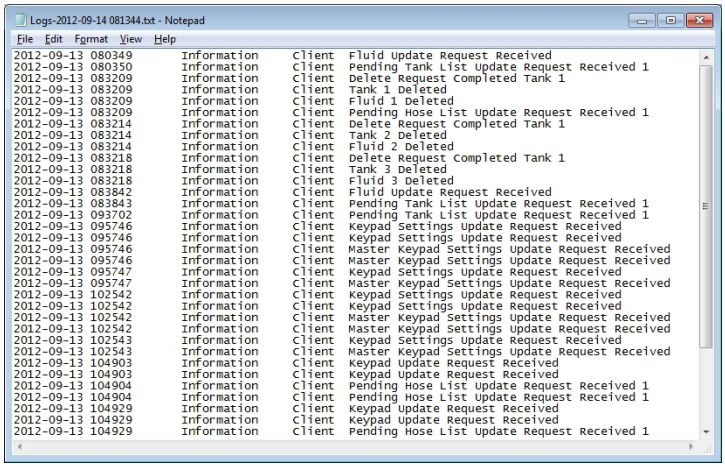
Use the Log Viewer to display system activity logs based on the parameters you choose.



1. From the *System Settings* screen, click **Log Viewer**.
2. Check the boxes next to the options you want to display. The options are:

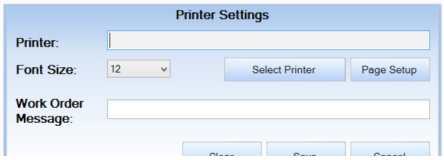
- Server
- Client
- Date Range

3. Click **Submit**.



4. Click **Export** to save the file.

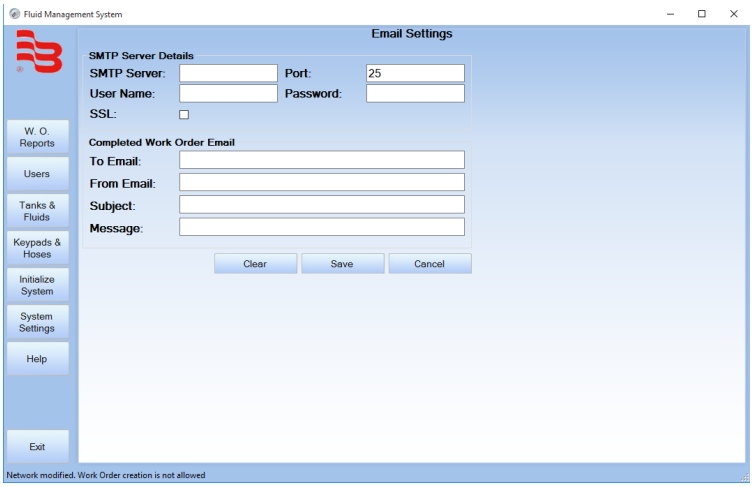
Printer Settings



1. From the *System Settings* screen, click **Printer Settings**.
2. Click **Select Printer** and chose a printer.
3. Click **Page Setup** to set up paper formatting information.
4. Enter text that you want to appear on the printout into the *Work Order Message* box.
5. Click **Save** to save your changes and exit the printer settings. .

Email Settings

To configure the software to send an email on the completion of a work order or when the fluid level of a tank has reached its warning level, enter the SMTP settings for your email server. Contact your local system administrator for information on your email server.



1. From the *System Settings* screen, click **Email Settings**.
2. Enter the *SMTP Server, Port, User Name* and *Password*.
   a. To send emails over SSL, click the checkbox. The email server must be configured to use the SSL function. Contact your local system administrator for information.
3. Enter the email address of the recipient.
4. Enter your email address in the *From* line.
5. Enter the subject in the *Subject* line.
6. Enter the work order message you would like to have in the email in the *WO Message* line.
7. Click **Save** to save your settings.

Save to File Options

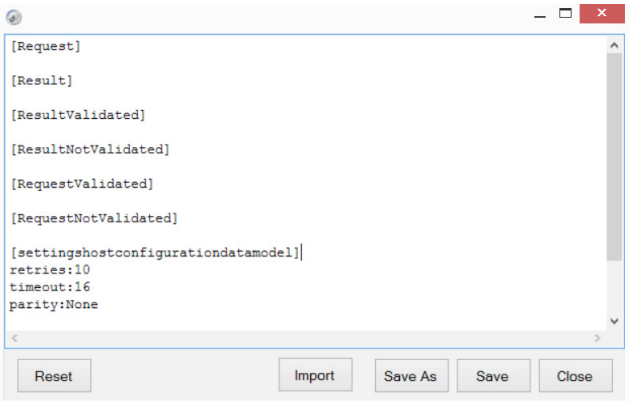
The FMS Software lets you set up and save pending work orders, completed work orders, and everything in the database. To use this option, click on the corresponding buttons under *Save to File*. Browse to the destination folder or file, and click **OK**.

It is highly recommended that you save your system configuration using the *Save to File* function.

View Host File

When the *Use Host Settings* feature is enabled, the **View Host File** button appears on the screen.

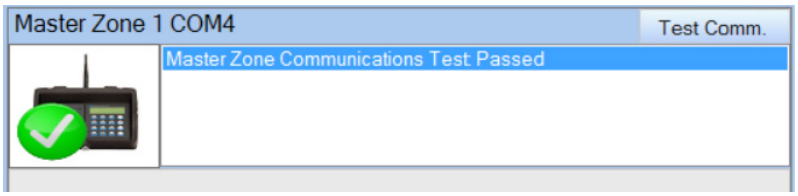
Click **View Host File** to open the host file editor in a new window.



Reset	Reverts to the current settings, any unsaved changes are lost.
Import	Reads a file into the window.
Save As	Saves the contents of the screen to a file.
Save	Imports the contents of the window to the server and creates or updates the host settings file.
Close	Closes the window.

INITIALIZE SYSTEM

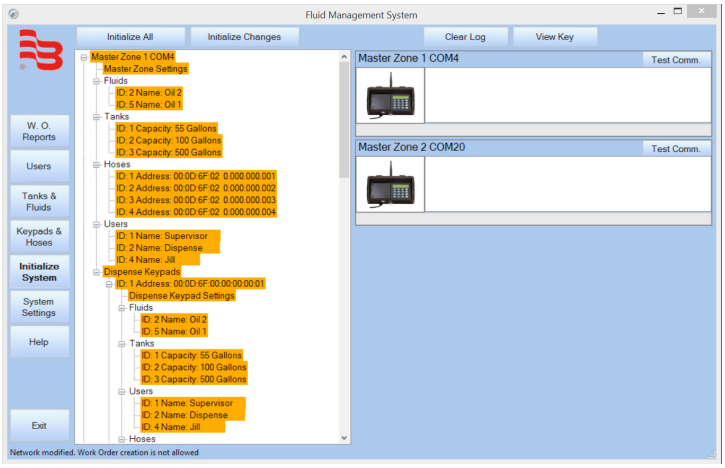
Test Comm Option



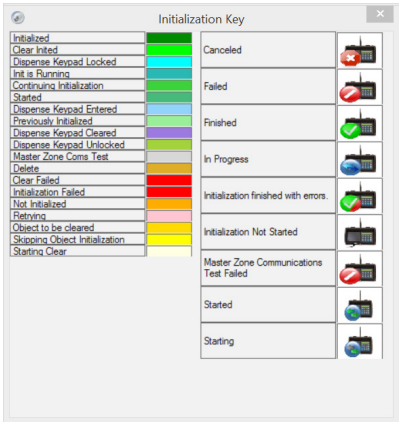
The *Test Comm* option checks that the serial cable is connected to the Master Keypad and the correct communication port has been selected.

1. To test the serial communication between the Master Keypad and PC, click **Test Comm**.
2. Upon completion, a *Test Passed* screen displays.

After the system is configured you will need to initialize the system before using. The first time you click the *Initialize System* option, you will see this screen:

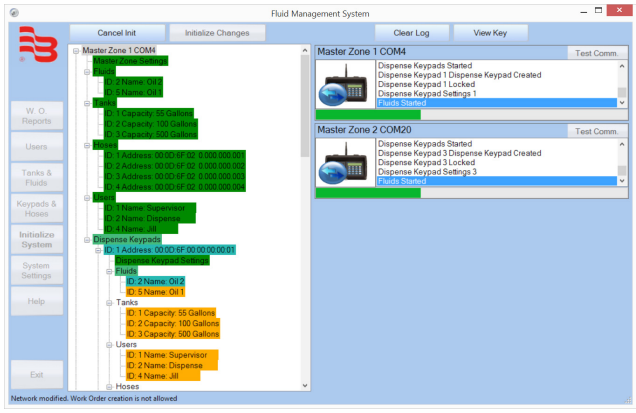


All items highlighted are color-coded to indicate their initiation status. To view the meaning of the colors and symbols, click **View Key**. The key opens in a new window.

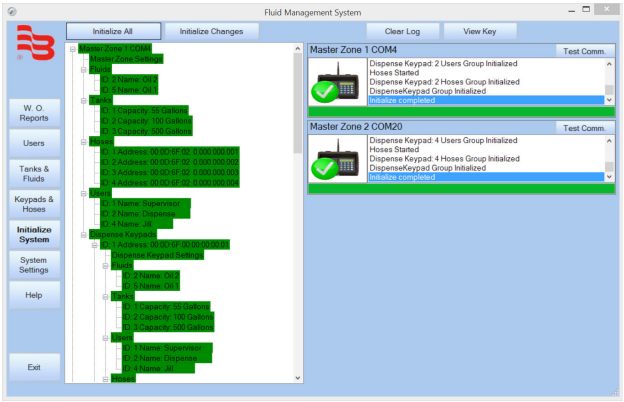


Initialize All

1. Click **Initialize All** to initialize all parts of the system. Use this option for the first initialization. You are reminded that information currently saved on the keypads will be erased.
2. Click **OK** to continue, or **Cancel** to exit the window and return to the previous screen. The initialization process may take several minutes.

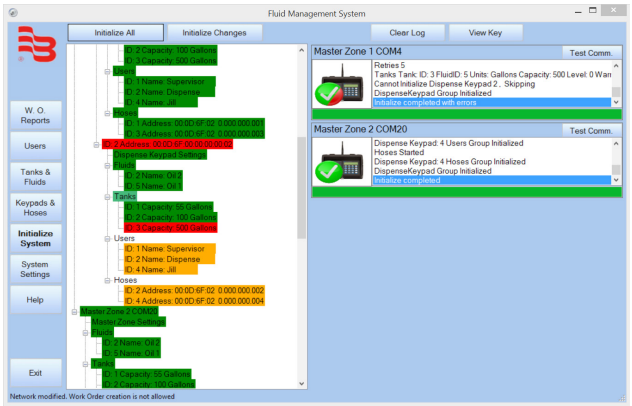


3. During initialization, a status bar for each Master Zone advances showing the initialization progress, and the highlighted items change colors in the tree indicating the status of the initialization.
4. Upon completion, a *Request Completed* screen displays. After the system is initialized once, any new changes made to the system configuration need to be initialized before the system can be used. Changes cannot be made to the system if there are pending work orders.



Initialize Changes

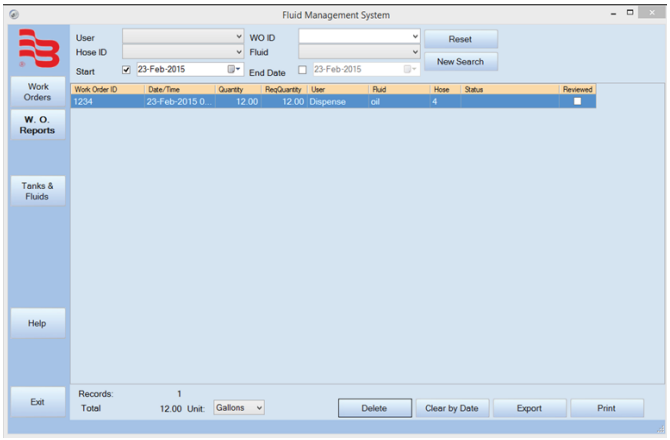
Click **Initialize Changes** to initialize only the changes made since the last initialization.



Any items highlighted in red after the initialization process is completed did not initialize properly. All custom settings initiated by the supervisor user are erased.

The log of all Master Keypad communications during an initialization or communications test is on the right side of the screen. Click **Clear Log** to clear this log.

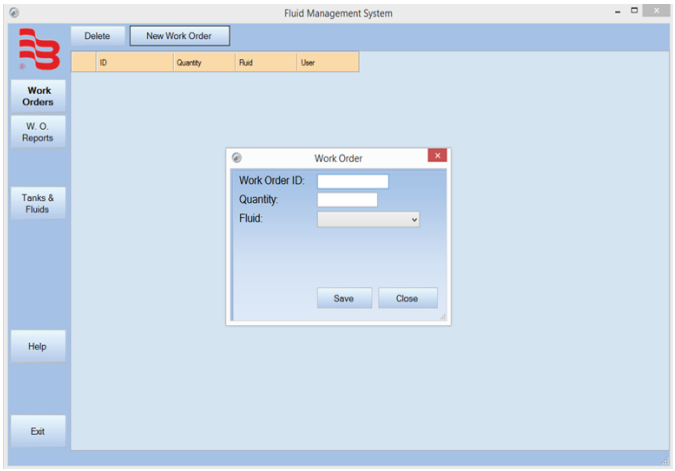
PARTS DEPARTMENT USER MENU



The parts department user can enter work orders, view work order reports and enter a fluid delivery, if enabled.

Upon login, the screen to the left displays:

Creating a Pending Work Order



To enter a new work order:

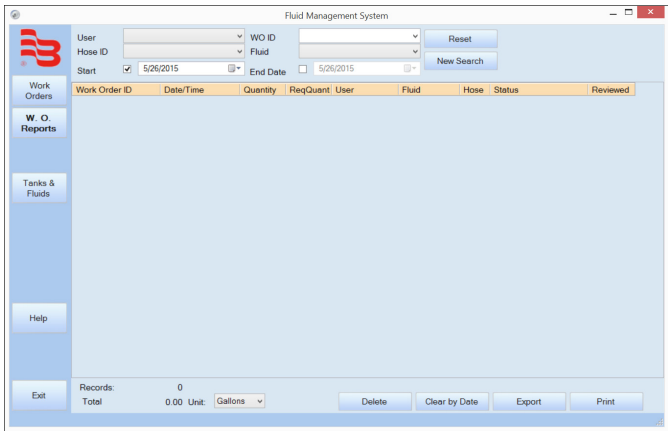
1. Click **Work Orders**. The *Work Order* window appears.
2. Enter a work order number in the *Work Order ID* field.
3. Enter a *Quantity* and type of *Fluid* to be dispensed in the respective fields. The fluid must be assigned to a valid tank.
4. Click **Save**. The screen resets for a new work order entry. An invalid work order message appears if the order is not valid.
5. Click **Close**.

NOTE: A zero quantity can be entered and the dispense user can select the quantity at the keypad.

Work Orders are stored on the PC until requested by a dispense user.

To delete a work order, select the work order you wish to delete, then click **Delete**.

Work Order Reports



To see if a work order has been completed by another user, click **W.O. REPORTS**. If no work orders have been completed, the screen to the left displays.

The default view shows all work orders that have been completed on that day. If there are no records for today's date, a no records found message displays.

The columns across the top show:

- The work order ID number assigned
- The date and time the fluid was dispensed
- The quantity of fluid actually dispensed
- The quantity that was preset on the work order
- The user that dispensed the fluid
- The type of fluid dispensed
- The hose the fluid was dispensed from
- The status of the hardware used during the dispense
- If the work order has been reviewed

All columns are resizeable and sortable. The column that the report is sorted by will display a triangle. A triangle pointing up shows the records in ascending order, and a triangle pointing down shows the records in descending order.

The bar across the bottom of the screen displays *RECORDS*. The total displayed is the total number of records in that report.

Locating a Work Order

To locate a specific work order, you may search by user, work order ID, hose ID, fluid type and date range.

The user, work ID, hose ID, fluid type and date range search options are drop down menu boxes that list unique values in the database. The work order ID box also allows you to type in an ID. If you are using the date range in your search, you must enable the start date, the end date, or both by clicking **Enable**. The default date range is today's date. To change the date, click the appropriate date in the drop down menu. Neither date may be in the future, and if you are using both date options, the start date must be before the end date. After choosing your search criteria from the drop down menus, click **New Search**. The screen will display all results that match your search criteria.

If no records are found that match your criteria, a no records found message displays

To clear the search criteria, click **Reset**. Clicking **Reset** only clears the search criteria, it does not clear the report.

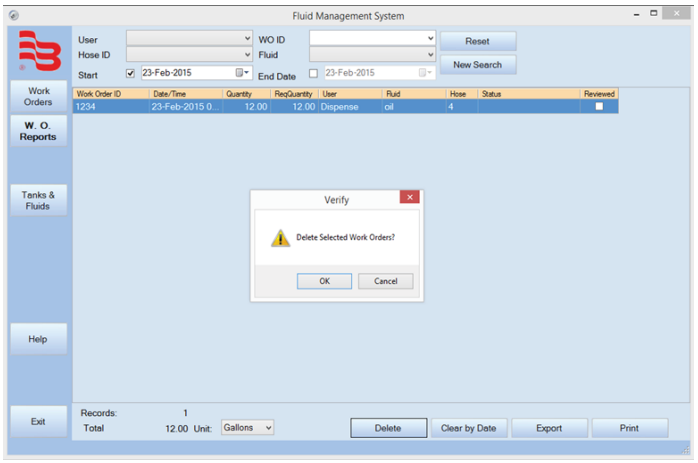
Reviewing a Work Order

To mark a work order as reviewed, check the box below *Reviewed* and press **Enter**.

Changing the Unit of Measure

At the bottom of the screen, there are total fluid numbers and records counts. This will sum the total volume of fluid that has been dispensed for the records currently appearing on the search in the units specified. You may change the unit that the fluid is summed in by selecting the drop-down menu next to *Unit* and choosing from Liters, Gallons, Pints and Quarts. The total that is displayed will change to match the unit measurement. Each additional work order will be added to the total, and the volume will be converted to the specified unit measurement.

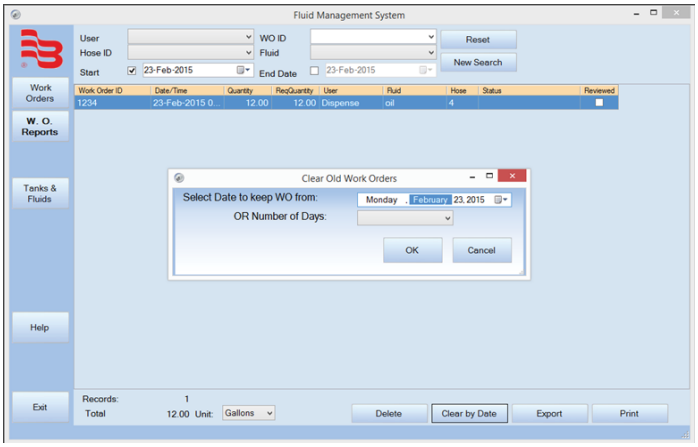
Deleting Old Work Orders



To delete old work orders:

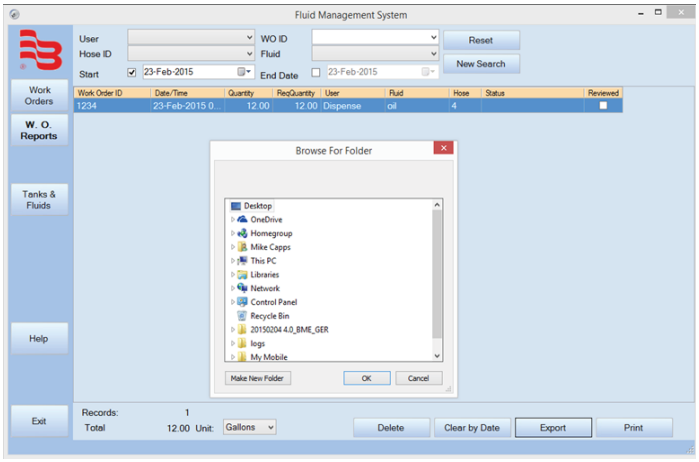
1. Select work orders to delete.
2. Click **Delete**.
3. On the pop-up screen, click **OK** to confirm.

OR



1. Click **Clear By Date**.
2. On the pop-up screen, select either the date you would like to keep work orders from (everything on and after February 23rd, 2015) or the number of days (everything from 3 days ago and after) and click **OK**.
3. When asked to confirm the deletion, click **OK**. *A Request Completed* screen displays.

Exporting Work Orders to a CSV File



To export the data in the current report to a semicolon-separated value (CSV) file:

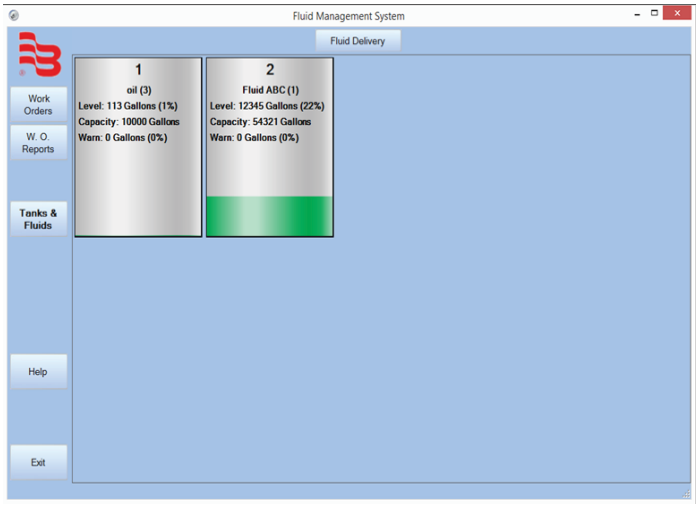
1. Click **Export**.
2. Select the folder/location that you would like to save the file to and click **OK**.
3. When the *Request Completed* screen displays, click **OK** to return to the *Work Order Reports* screen.

Print a Report

To print the displayed report, click **Print**. The widths of the columns will be printed as they appear on the screen and the report will be printed with the same headers. The report will not print if the printer is not configured. Microsoft XPS document writer is not recommended.

Tanks and Fluids

Viewing Tank Status



To view the status of tanks in your system:

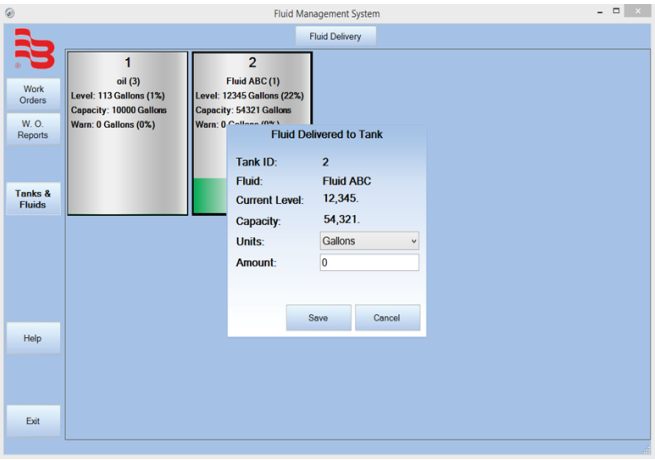
1. Click **Tanks & Fluids**.
2. View the current status and information.

The information displayed on the tank icons includes:

- The tank ID on line one
- Type of fluid in that tank and ID on the second line
- Current level of the tank, capacity, and warn
- Tank levels are shown in colors; gray is the empty portion, green is the current level, and yellow indicates the level when it is below the set warning level
- Percent values indicate the percentage of the tank that is filled at that fluid level

Adding Fluid to a Tank

If this feature is enabled, you can add fluid upon delivery.



To add fluid to a tank:

1. Double-click on the tank or select the tank and click on **Fluid Delivery**.
2. Select the unit of measure the fluid will be delivered in (gallons, quarts, liters, or pints).
3. Enter the amount (in the selected units) of fluid that is being delivered.
4. Click **Save** to save your changes or click **Cancel** to discard your changes.
5. Click **OK** on the verification screen to proceed, or click **Cancel** to edit.

TROUBLESHOOTING

Dispense Keypad Error Messages

These error messages can be displayed by the Dispense Keypad. The associated action to reset the system is listed behind.

Message	Messages at the Dispense Keypad
Hose active hit hose reset	The selected meter currently has a dispense order in waiting to be processed, complete the active order. Press **RESET**.
WO refused	The entered work order number is not valid and has been refused by host or FMS software.
Master is down	The master does not respond to a request from the Dispense Keypad
PC is down	The FMS software (KPS) is not responding to the Master Keypad. Only if WO validation PC is activated.
HOST is down	The HOST (DMS) is not responding to the Master Keypad. Only if "WO Validation HOST" is activated. Press **RESET**.
Host or PC is occupied	Master keypad is occupied by another job. Press **RESET**.
Wrong hose for fluid	The meter selected is not a valid meter for the fluid assigned for this WO.
↑↓	RF communication is in progress, please wait (10 sec).

Meter Error Codes

The meter has several Error Codes that may display. These provide indication, at the meter, that there is an error in communication between the meter and keypad.

Message	Messages at the Meter
F01	The meter radio is not working.
	To clear the error, press the **Reset** button on the meter.
F02	The meter is not configured to a keypad.
	To clear the error code, press the **Reset** button on the meter.
	Verify that the meter radio address is configured properly.
F03	System busy.
	To clear the error, press the **Reset** button on the meter.
F08	Meter lost connection to network.
	Out of range—network connection lost.
	Keypad not powered.
	Meter moved out of range of keypad.
F09	Meter not connected to a network.
	First time being powered up.
	Network selected is not available.
SF0 (Scale Factor 0)	The Scale Factor setting for the meter is set to 0.000.
	To input a valid Scale Factor for the meter follow the instructions in the Change Factory Settings section of this manual.
All other Error Codes	Are for factory purposes only.
	To clear the meter, press **Reset**.

Press **Reset** once more at the meter.

WORKSHEETS

Tank ID	Units	Fluid	Capacity	Level
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Maximum: 16 Tanks

Tank volume format: 00000.000

Keypad ID	Address xx . xx . xx . xx			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Maximum: 36 Dispense Keypads

RF-Keypad address is an 8-digit number.

Meter ID	Address x . xxx . xxx . xxx	Tank	Unit	Keypad
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Maximum: 250 Meters/Hose

Meter/ Hose address is a 10-digit number.

User ID	Name User	PIN ID	Role
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
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42			
43			
44			
45			

The user field is alphanumeric with a maximum of 16 characters.

The user PIN ID is a 4-digit number.

Number of Users Allowed:

- Supervisor – 1
- Dispense Users – 249
- Parts Department – 250
- Admin – 100

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The Americas | Badger Meter | 4545 West Brown Deer Rd | PO Box 245036 | Milwaukee, WI 53224-9536 | 800-876-3837 | 414-355-0400
México | Badger Meter de las Americas, S.A. de C.V. | Pedro Luis Ogazón N°32 | Esq. Angelina N°24 | Colonia Guadalupe Inn | CP 01050 | México, DF | México | +52-55-5662-0882
Europe, Middle East and Africa | Badger Meter Europa GmbH | Nurtinger Str 76 | 72639 Neuffen | Germany | +49-7025-9208-0
Europe, Middle East Branch Office | Badger Meter Europe | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
Czech Republic | Badger Meter Czech Republic s.r.o. | Mařikova 2082/26 | 621 00 Brno, Czech Republic | +420-5-41420411
Slovakia | Badger Meter Slovakia s.r.o. | Racianska 109/B | 831 02 Bratislava, Slovakia | +421-2-44 63 83 01
Asia Pacific | Badger Meter | 80 Marine Parade Rd | 21-06 Parkway Parade | Singapore 449269 | +65-63464836
China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412
Switzerland | Badger Meter Swiss AG | Mittelholzerstrasse 8 | 3006 Bern | Switzerland | +41-31-932 01 11