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EVO™ 200 AND EVO™ 400 AUTOMATIC TANK GAUGES

PROGRAMMING GUIDE

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Contents

Introduction 1
FMS functions 1
Conventions used in this manual 2
Questions and concerns 3
Operating precautions 3
Open source software 4
Inspection of materials 4
Warranty information 4
Certified programmer or service person 4
Station owner or operator 4
Approvals 5
Definitions and acronyms 5
Related documentation 5
Getting Started 7
User Interfaces (UI) 7
LCD Touch Screen Interface 7
Web Browser Interface 7
Security Control 7
Connecting a PC or Laptop Computer 8
Connecting a PC to the Mini USB Port 8
Connecting a PC to the Ethernet Port 8
Configuring IP Settings for Communication 9
Obtain an IP Address Automatically 9
Use the Following IP Address 10
Check Status of Connection 10
Navigation and Setup 11
Console Navigation 11
Navigation Buttons 11
Quick Jump Menu (QJM) 11
Quick Jump Menu 12
Text Entry Screen 12
Number Entry Screen 12
Initial Console Configuration 13
Touch Screen Calibration 13
Console Registration Options 13
Printer Setup 13
Setup Menu 14

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Configuration Options 14
Date / Time Set 14
Network Parameters 14
IP Address Settings 15
Web Browser Interface 17
Navigating Applications Remotely 17
Accessing the Web Browser Interface 17
Making Changes to System Parameters 17
Password Prompting 18
Setup 18
Backup Setup Files 18
Download 18
Upload 19
Notifications 19
Programming the system 21
Preferences 21
Language Options 21
Regional Formats 21
Units 22
Configuring System ID 22
Programming 22
System ID 23
System Preferences 23
Date/Time 23
User Roles 23
Users 24
Address Book 24
Networking 24
Communications 25
Email 26
Printing 26
Low Voltage Inputs (Dry Contacts) 26
Relays 27
Fuel Management System 27
Dispenser Interface 27
One Touch Buttons 28
Logic Conditions 28
Notifications 28
Products 29
Tank Types 29
Tanks 30
Manifolds 31
Sensors 31
Compliance Tracking 32
Pumps 32

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Pump Group....32
TS-TPI Overview and Functionality....33
TS-TPI Overview....33
On-start leveling mode....33
Live Leveling....34
Priority mode....34
Alternating mode....34
Other TS-TPI functions....34
TPI Setup....35
Pump Groups....36
Alarms and Troubleshooting....37
System alarms....37
FMS alarms....38
Wire sensor alarms....41
TPI alarms....42
Appendix A: Standard Products Table....45
Appendix B: Standard Products Table....47

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Introduction

This manual provides programming and troubleshooting information for the EVO™ 200 and EVO™ 400 automatic tank gauges (ATGs) to installers, operators, and technicians. The fuel management systems (FMS) application in the EVO™ 200 and EVO™ 400 ATGs tie together the monitoring and alarm capabilities of the ATG with advanced technologies to supply tank and level data more accurately and efficiently. This manual also provides information about the EVO™ 200 and EVO™ 400 ATG interface, which is used to program the system and maintain all applications through both the front panel of the console and a web interface. Safety issues, troubleshooting information, warranty, service, and return policies are also covered and must be followed.

FMS functions

The main function of EVO™ 200 and EVO™ 400 ATGs is to represent levels for inventory and tank leak testing by monitoring probe inputs and performing calculations based on those inputs. The console, in conjunction with external fuel system equipment, may provide positive system shutdown, based on programmed rules.

Sites that use EVO™ 200 and EVO™ 400 ATGs have the ability to monitor and perform:

- Tank inventory monitoring.
- Tank leak detection.
- Leak detection sensor monitoring.
- Sump leak detection.

EVO™ 200 and EVO™ 400 ATGs also allow sites to generate and print:

- Inventory reports.
- Alarm History reports.
- Delivery reports.
- Tank Test reports.
- SCALD® Testing reports (when applicable).
- Regulatory reports.
- Sensor reports.
- Reconciliation reports (when applicable).

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Conventions used in this manual

This manual includes safety precautions and other important information presented in the following format:

NOTE: This provides helpful supplementary information.

IMPORTANT: This provides instructions to avoid damaging hardware or a potential hazard to the environment, for example: fuel leakage from equipment that could harm the environment.

⚠ **CAUTION**: This indicates a potentially hazardous situation that could result in minor or moderate injury if not avoided. This may also be used to alert against unsafe practices.

⚠ **WARNING**: This indicates a potentially hazardous situation that could result in severe injury or death if not avoided.

⚠ **DANGER**: This indicates an imminently hazardous situation that will result in death if not avoided.

This indicates an alarm has activated and provides details so you can correct the problem. You can custom program system hardware failure warnings, as well as leak detection sensor, line leak, and tank-related alarms. Events denoted below with an asterisk "*" are ones you must program:

- The red alarm light or yellow warning light flashes.
- The console annunciator alarm horn sounds.*
- Internal output relays for external alarm devices activate.*
- Alarm reports print automatically, either locally through direct interface or remotely through USB.*
- Alarm and test reports are sent to a specified e-mail address.*
- Reports are sent to remote location(s) through an internal data/fax modem.*

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Questions and concerns

In case of emergency, follow the procedures established by your facility. If you have questions or concerns about safety or need assistance, use the information below to contact Franklin Fueling Systems:

Web: franklinfueling.com
Telephone:
USA and Canada: +1.608.838.8786, +1.800.225.9787
USA Technical Support: 1.800.984.6266
UK: +44 (0) 1473.243300
Mexico: 001.800.738.7610
China: +86.10.8565.4566

Operating precautions

Franklin Fueling Systems (FFS) equipment is designed to be installed in areas where volatile liquids such as gasoline and diesel fuel are present. Working in such a hazardous environment presents a risk of severe injury or death if you do not follow standard industry practices and the instructions in this manual. Before you work with or install the equipment covered in this manual, or any related equipment, read this entire manual, particularly the following precautions:

IMPORTANT: To help prevent spillage from an underground storage tank, make sure the delivery equipment is well-maintained, that there is a proper connection, and that the fill adaptor is tight. Delivery personnel should inspect delivery elbows and hoses for damage and missing parts.

⚠ **CAUTION**: Use only original FFS parts. Substituting non-FFS parts could cause the device to fail, which could create a hazardous condition and/or harm the environment.

⚠ **WARNING**: Follow all codes that govern how you install and service this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on while you are installing or servicing this product. Refer to this manual (and documentation for related equipment) for complete installation and safety information.

⚠ **WARNING**: Before you enter a containment sump, check for the presence of hydrocarbon vapors. Inhaling these vapors can make you dizzy or unconscious, and if ignited, they can explode and cause serious injury or death. Containment sumps are designed to trap hazardous liquid spills and prevent environmental contamination, so they can accumulate dangerous amounts of hydrocarbon vapors. Check the atmosphere in the sump regularly while you are working in it. If vapors reach unsafe levels, exit the sump and ventilate it with fresh air before you resume working. Always have another person standing by for assistance.

⚠ **WARNING**: Follow all federal, state, and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A, and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, and/or environmental contamination.

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⚠ **WARNING**: Always secure the work area from moving vehicles. The equipment in this manual is usually mounted underground, so reduced visibility puts service personnel working on it in danger from moving vehicles that enter the work area. To help prevent this safety hazard, secure the area by using a service truck (or some other vehicle) to block access to the work area.

⚠ **WARNING**: Make sure all wiring enters the console's enclosure through the designated knockouts. There could be an explosion hazard if you use other openings.

⚠ **WARNING**: You must run wiring from probes or sensors to the FMS console in conduits that are separate from all other wiring. Otherwise, there is an explosion hazard.

⚠ **WARNING**: Substituting components could impair intrinsic safety. EVO™ 200 and EVO™ 400 ATGs are intrinsically safe for sensors installed in – Class I, Division 1, Group D – hazardous locations. Substitution of components could make the energy limiting circuitry in the system ineffective and could cause an explosion hazard. Repairs to EVO™ 200 and EVO™ 400 ATGs, or attached components, should only be performed by a qualified, factory-trained technician.

⚠ **DANGER**: Make sure you check the installation location for potential ignition sources such as flames, sparks, radio waves, ionizing radiation, and ultrasound sonic waves. If you identify any potential ignition sources, you must make sure safety measure are implemented.

Open source software

EVO™ 200 and EVO™ 400 ATGs implement open source software released under the General Public License (GPL) as well as other open source licenses. As a customer, you are entitled to receive a copy of the licensed source code used within our product, if so desired. Please contact our sales staff for more information.

Inspection of materials

Visually inspect all components for defects or damage prior to installation. If any defect or damage is found, do not use the product and contact FFS for further assistance.

Warranty information

See the *FFS Fuel Management Systems & Product Warranty Policy* for all warranty information.

Certified programmer or service person

Only an FFS certified programmer or service person is allowed to access both the user interface keypad and areas internal to the FMS console.

Station owner or operator

The station owner or operator of the FMS console is only allowed to access the user interface keypad. Access to areas internal to the console is strictly prohibited.

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Approvals

All FMS models are UL and cUL listed 6L79 as Liquid Level Gauge / Leak Detection Systems. Third party approved leak detection — Pd (probability of detection) = 99.2 % for 0.1 or 0.2 gph leak tests (0.1 = annual precision test, 0.2 is the monthly regulatory compliance test).

NOTE: The static tank test does not support manifolded tanks.

NOTE: SCALD® is third-party approved for up to three manifolded tanks.

Definitions and acronyms

RS-232 – An IEEE standard for serial communication using a 9-pin connector.
RS-485 – An IEEE standard for serial communication using Shielded Twisted Pair or Unshielded Twisted Pair wiring. RJ-45 – An IEEE standard connector for use in communications with Shielded Twisted Pair wiring, usually data.
AST – Aboveground Storage Tank.
ATG – Automatic Tank Gauge.
DCE – Data Communication Equipment DIM – Dispenser Interface Module.
DTE – Data Terminal Equipment .
DW/DWT – Double Wall/Double Wall Tank.
FAST – Franklin Auto Setup Tool FMS – Fuel Management Systems IS – Intrinsically Safe.
LCD – Liquid Crystal Display.
NC – Normally Closed NO – Normally Open OTB – One Touch Button PC – Personal Computer.
QJM – Quick-Jump Menu.
RTD – Resistance Temperature Detectors .
STP – Submersible Turbine Pump TPI – Turbine Pump Interface.
URL – Uniform Resource Locator for the internet USB – Universal Serial Bus.
UST – Underground Storage Tank .
XML – eXtensible Markup Language.

Related documentation

The system installation and operation instructions, troubleshooting guide and console maintenance manual are provided for your use in separate documents. Detailed installation and testing instructions for each type of leak detection sensor are present in the relevant manual, and, likewise, the installation, testing, and programming of various upgrade kits and optional accessories are also contained in separate manuals, addenda, or in one of this document's appendices.

EVO™ 200 and EVO™ 400 Automatic Tank Gauges Installation Guide (part number 228180003)

EVO™ 200 and EVO™ 400 Automatic Tank Gauges Operation Guide (part number 228180016)

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Getting Started

After the Fuel Management System has been installed, typically your interaction with the system will be from the LCD display, on-board printer; or using a Web Browser to program and monitor the console. Remote operation can be performed from a PC, either attached directly through a network connection or wirelessly through an optional Wifi connection. All of the features of the console are available through these input / output devices. Also, the console may be set up to generate and send automated reports to email accounts or print reports at a programmed time.

Occasionally you may need console information, such as model and serial numbers. The model number is located on the face of the console. The serial number is located on the left side of the ATG. This label also shows the model number, voltage, manufacturer's address, a warning symbol and the unit's voltage specifications.

User Interfaces (UI)

LCD Touch Screen Interface

A color LCD touch screen is an optional feature with EVO™ 200 and EVO™ 400 ATGs. This bright display allows easy viewing in any lighting condition. Console functions are easily accessed through the LCD screen.

Web Browser Interface

EVO™ 200 and EVO™ 400 ATGs include three methods of establishing a network connection; an RJ-45 Ethernet port a TYPE-B Mini USB port or the optional Wifi connection. These three methods allow customers to directly or remotely interface with EVO™ 200 and EVO™ 400 ATGs using a PC and web browser. This means that console parameters can be modified and status/ alarm reports can be printed from virtually anywhere.

Security Control

EVO™ 200 and EVO™ 400 ATGs include customizable access roles that can be assigned to individual user to provide secure and control access to the ATGs. The Administrator access level will allow full access to all features of the EVO™ 200 and EVO™ 400 ATGs. Additional roles can be configured with preset or customizable access permissions. The customizable roles allow system administrators the ability to precisely control system access.

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Connecting a PC or Laptop Computer

To access the console using the Web Browser interface, connect a PC to the console through one of the available network connections: the Ethernet port, the mini USB port, or the optional Wifi. If the console is connected to a local network, you can perform this setup from any PC on that network by using a web browser.

The following instructions are written specifically for the Microsoft Windows® 7 operating system. For assistance with other operating systems, please contact FFS Technical Support.

Connecting a PC to the Mini USB Port

The network connection via the Mini USB port is designed to provide technicians easy access to the ATG. By default, the port is setup with DHCP enabled to allow EVO™ 200 and EVO™ 400 ATGs to assign IP addresses. This is generally the easiest way to connect to EVO™ 200 and EVO™ 400 ATGs.

1. Turn on power to the PC and EVO™ 200 or EVO™ 400 ATG.
2. Using a mini USB cable connect the Mini-B Type-B connector into the mini USB port on the EVO™ 200 or EVO™ 400 ATG.
3. Connect the Type-A USB connector a USB port on the PC
4. If your PC is setup to "Obtain an IP address automatically," you can open a browser and connect to the EVO™ 200 or EVO™ 400 ATG using https://192.168.171.171

Connecting a PC to the Ethernet Port

1. Using an Ethernet Crossover, 10 Base-T cable, plug the RJ-45 connector on one end of the cable into the Ethernet port of the console.
2. Plug the RJ-45 connector on the opposite end of the cable to the Network Interface Card of the computer.
3. Turn on and log into your PC.

NOTE: You may need to re-configure your TCP/IP settings to allow the computer to communicate with the console.

NOTE: Some modern laptops have automatically switching Network Interface Cards and as such, will require the use of a standard cat 6 cable instead of a crossover.

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Configuring IP Settings for Communication

Before attempting to modify any computer settings, contact the Information Technologies department of your business, if available. Some computer accounts may have restricted permissions to overcome before any changes are allowed to be made to TCP/ IP settings.

At the PC:

1. Power up the PC and log into your Windows® operating system.
2. Click Start, then select Control Panel.
3. There are (2) two views settings possible when using Windows® 7:
   - In Category View, click Network and Internet, then click View Network Status and tasks under Network and Sharing Center.
   - In Icon View, click Network and Sharing Center.
4. Click the Change adapter settings in the left hand column.
5. Click Local Area Connection and select Properties.
6. In the Local Area Connection Properties dialog box, under "This connection uses the following items," select Internet Protocol Version 4(TCP / IPv4) and click Properties.

There are various ways to configure a computer to communicate with EVO™ 200 and EVO™ 400 ATGs. These factors depend upon the user's computer knowledge and how the computer is currently configured.

To determine which method is best for your site, read the instructions in the following section carefully. Make detailed notes on the current configuration of the TCP/IP settings on the PC you are using. Read both the "Obtain an IP address automatically" and the "Use the following IP address" methods before making a choice between the two.

Obtain an IP Address Automatically

Computers commonly use this setting to obtain an IP address automatically.

1. If Obtain an IP address automatically is selected, it may be best to click the Alternate Configuration tab.
2. Select User Configured.
3. Enter an IP address. For simplicity, make the last segment of the IP one number different than the IP address of the console. Upon initial setup ONLY, the numbers used in the figure may be used to configure the TCP/ IP settings of your PC. After initial startup the programmed parameters should be verified through the touchscreen
4. Leave all other information blank and click OK.
5. Close the Local Area network for changes to take place.

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NOTE: The consoles default IP address is 192.168.168.168. If the PC is normally configured to acquire an IP address automatically, Alternate Configuration may be used, as mentioned above, to allow a connection to be enabled without the necessity of reconfiguring the computer each time it will be used to connect to this console.

Use the Following IP Address

1. If Use the following IP address is selected and the entry boxes contain any information, record this information for use when console programming is complete.
2. Enter an IP address. For simplicity, make the last segment of the IP one number different than the IP address of the console. Upon initial setup ONLY, the numbers used in the figure may be used to configure the TCP/ IP settings of your PC.
3. Leave the DNS information blank.

NOTE: The consoles default IP address is 192.168.168.168. If the PC is normally configured to Use the following IP address, make sure that all displayed information is recorded and kept prior to making any changes. It may be necessary to use this information to re-configure the console once programming is complete.

Check Status of Connection

1. Check the status of your connection by going to the Network Connections window.
2. If the connection status is disabled, enable it by right-clicking on the Local Area Connection and selecting Enable.
3. Verify link light is lit next to the Ethernet port and RX light is flashing.If technical difficulties arise, please contact Franklin Fueling Systems Technical Support before proceeding.

NOTE: More information on the Web Browser Interface is located [on page 31] of this manual.

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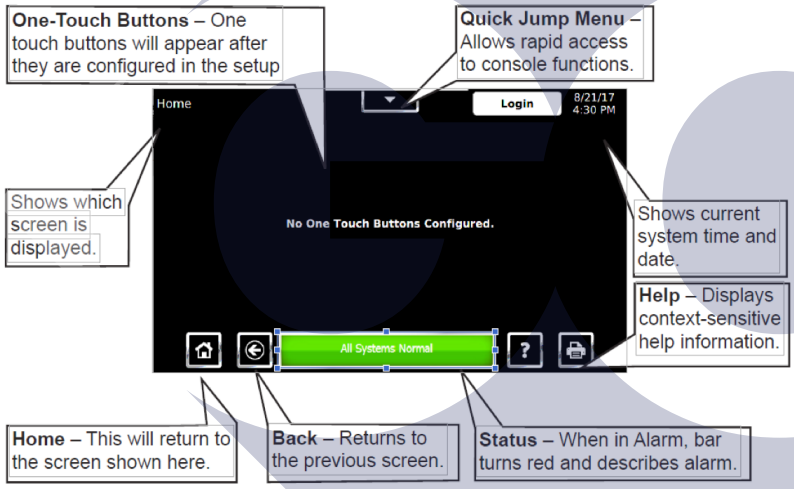
Navigation and Setup

Console Navigation

The operating system is designed for easy navigation. Applications allow the user to modify programming options by responding to on-screen commands. The following instructions show various operating system functions, so that issues can be corrected efficiently without interrupting dispensing or sales.



NOTE: The Login button allows users who have appropriate credentials to log into the system.

Navigation Buttons

There are many ways to navigate the applications of the EVO™ 200 and EVO™ 400 ATGs. Listed below are buttons that will help you navigate the functions of the console.

Quick Jump Menu (QJM)

The Quick Jump Menu was developed to simplify system navigation. From the Quick Jump Menu you can access sections of the EVO™ 200 and EVO™ 400 ATGs with a few quick selections. When the Quick Jump Menu button is selected, it will bring you to three tabs Each tab will allow access to different information:

- Applications - Tanks, Manifolds, Sensors, Conditions, Pumps, Reports, Compliance, Alarms
- System-Configuration, System Information, Reboot System, Factory Defaults, Erase Archives
- Tools- Calibrate Touchscreen

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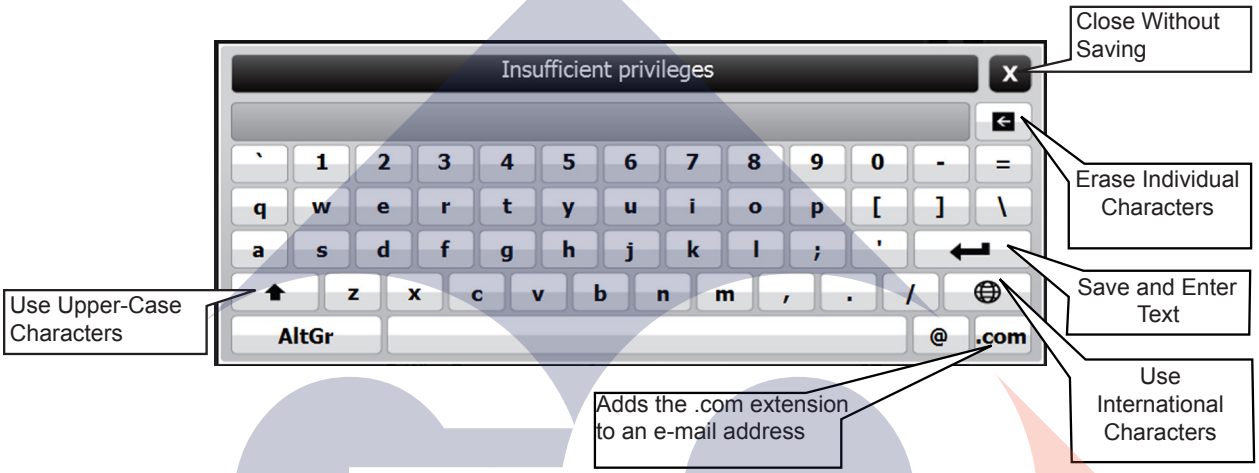
Quick Jump Menu

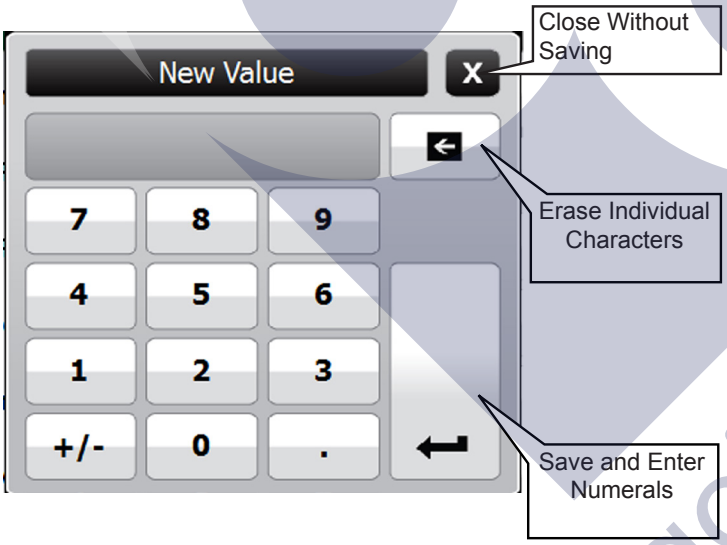
NOTE: Your console will display some selections depending upon installed equipment and user access privileges.

Selecting the icon will take you to the summary screen for that item and allow you to access more detailed information.

Text Entry Screen



Number Entry Screen



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Initial Console Configuration

Initial setup must be completed before the console can be used. This section will show how to set custom parameters by navigating through the programming options to set up an EVO™ 200 or EVO™ 400 ATG for the first time.

Touch Screen Calibration

Calibrating the touch screen will enable the console to better recognize the area that you "touch," so that you can accurately enter in information. The LCD touch screen is calibrated at the factory when a system is built but it may be necessary to re-calibrate occasionally. To calibrate the touch-screen function of the display, you must first access the calibration application.

1. From any screen, click Quick Jump>Tools > Calibrate Touchscreen.
2. The console will ask if you are sure that you want to proceed, answer Yes.
3. Follow the on-screen instructions to complete the calibration process.

Console Registration Options

Each console is custom ordered and built to each customer's specifications. That means that all of the software options needed for your site are installed and tested. Before programming, check the software options and verify that your purchased options are present.

Pressing QJM > System Tab > System Information Icon > Software Options Tab will give you the option to view specific details about the system:

- Identification – View to locate the System Serial Number, Ethernet Address (not the same as IP address), Controller Serial number and Date/Time of manufacture.
- Software Options – Displays the current installed software options.
- About - Provides contact information for Franklin Fueling Systems

Printer Setup

EVO™ 200 and EVO™ 400 ATGs support printing through the USB port or through a network connection. The following instructions describe the process to detect all available printer and select a driver:

1. Connect any USB printer to an EVO™ 200 or EVO™ 400 ATG or connect the EVO™ 200 or EVO™ 400 ATG to the network where the target printer resides.
2. From the Web interface navigate to Settings/Printers
3. Click on the "Search for printers" button
4. Wait for the system to locate the available printers.
5. Locate the desired printer from the list of available printers and click "Search" in the driver column.

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Setup Menu

From any screen select QJM > System > Configuration.

Configuration Options

Using the options in this menu, you can change:

- System ID
- System Preferences
- Date/Time
- User Roles
- Users
- Address Book
- Networking
- Communications
- Email
- Printing
- Diagnostics
- Low Voltage Inputs
- Relays
- Fuel Management Systems
- Dispenser Interface
- One-Touch Buttons
- Logic Conditions
- Notifications

Date / Time Set

To set the date and time, select QJM> System>Configuration>Date/Time. Select the appropriate Time Zone from the list. The NTP Server connection information can be entered in the NTP Servers section. When finished, confirm your selection by pressing the confirm button. It is important to enter the date and time information correctly to ensure reports and alarms can be accurately tracked.

Network Parameters

To communicate with your network equipment (i.e. router, switch, hub, etc.) you will need to modify the network parameters. Select QJM>System>Configuration. Scroll down to Networking and select Ethernet Port. Select IPV4 and enter the settings.

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IP Address Settings

Method-Select Manual for manual IP Entry or Automatic (DHCP) to obtain a valid IP address automatically.

- Address – This is a logical (electronic) address, like a street address, that the console uses to route information. This address will have to match your network, if connected to a network, in order to 'talk' to a remote communication device, or your PC.
- Netmask – Masking is a way to diversify the use of multiple subnets. The mask must match that of the network the console is connected to. Masks are used in networking to create "sub-networks" within a whole, like slicing and apple. You have separate slices that may be in different locations, but they are still from the same apple. Administrators use this to make separate networks, to maximize bandwidth or capacity of medium resources (cables or fiber). Therefore, when your network uses static IP addressing (assigned by an administrator), this mask must match the Network Mask of the router port that it is attached to. If the network uses a DHCP server (automatically assigns IP addresses) then the mask should meet the specifications set by your administrator.
- Gateway – The Gateway is the logical address to the nearest router port, commonly the one that is connected to the console. Consult your administrator for details on this and other network parameters.
- DNS Server Address – The domain name system (DNS) is the way that internet domain names are located and translated into Internet Protocol addresses. A domain name is a meaningful and easy-to-remember tag for an internet address (used for e-mail functions).
- DHCP Server - Dynamic Host Configuration Protocol (DHCP) is a network protocol that enables a server to automatically assign an IP address to a computer from a defined range of numbers (i.e., a scope) configured for a given network. See the configuration section for more details.

NOTE: To help prevent network errors, do not connect a DHCP server enabled device on a network that has a DHCP server.

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Web Browser Interface

Navigating Applications Remotely

The Web Browser Interface offers several ways to navigate through applications:

- Easy-to-read web pages that use hyperlink text (words or characters that, when clicked, take you to another page) to move through the menus.
- Text and drop boxes and buttons allow inputs to be made efficiently,
- On-screen prompts automatically pop-up instructions to verify each step.

Not all application functions, like Network Configurations, are available at all levels. To access these options, you need to be logged in at a high enough User Role.

Accessing the Web Browser Interface

IMPORTANT: Enter "https://" before you enter an IP address.

1. To access the console using a computer, open a web browsing application.
2. Type the IP address (default is "https://192.168.168.168") into the address bar of the browser window. To access the console using a remote PC, setup communications per Section 2 of this manual. When using a PC to access console applications through a direct or network connection, the EVO™ 200 or EVO™ 400 ATG incorporates a XML (eXtensible Markup Language) based access method. If the console is equipped with an optional LCD screen, the connection settings may be modified using the touch screen function of the console.

Making Changes to System Parameters

1. Go to: Settings>Configuration.
2. To make any changes on a settings page, click the appropriate menu section and edit the section as needed.
3. Once the preferred selections have been altered, click the confirmation option Save in the upper right hand corner.
4. You must have administrative access to make setup changes.

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Password Prompting

When connected to an EVO™ 200 or EVO™ 400 ATG, you will be prompted for a user name and Password entry. Enter the applicable information relative to your user access level. Once you have entered the information, you will be logged into the system. This can be confirmed in the upper-right hand corner of the Configuration screen.

When you've finished configuring your programming options, keep system security in mind and, to prevent unauthorized personnel from gaining access to console configurations, lower the access level to Guest. To do this from the Web Browser Interface, click the box in the upper right hand corner that lists the current User access level. This will log the user out of the system and prompt any future users with a User and Password entry.

Setup

The programming options for the Web Browser Interface are identical to the LCD interface; however, they are represented differently due to their respective graphical interfaces. Use the programming tables in Section 3 as a reference in programming your console with a web browser.

Backup Setup Files

Download

Backup allows you to download the setup file and store it on any PC connected to the console. This file can be uploaded to the console to recover lost settings or copy settings from one site to another.

1. Open a web browsing application, type the IP address (the default IP address is https://192.168.168.168) into the address bar of the browser window.
2. The console will navigate to the Home Status page which is customizable in the programming. The default Home Page is FMS Tank Status.
3. Select Settings>Configuration
4. To download a site configuration, click Download. A File Download dialog box may appear, and, if it does, select Save to open an explorer window. (You may need to temporarily disable any pop-up blocker)
5. Select a location to save the configuration file. Then, type the File Name under where you want to save it. Use something that identifies the file with the site and represents the date saved. Click Save.

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Upload

1. When required, the backup configuration file will need to be reloaded onto the console to restore a previous setup. When uploading, it is important to remember that network parameters may be affected by the change, rendering it unreachable from a remote location. If the downloaded file contains an IP address different from the one currently in use, someone will need to locally reprogram the correct address into the console in order to communicate remotely.
2. Open a web browsing application, type the IP address (the default IP Address is 192.168.168.168) into the address bar of the browser window. The console will navigate to the Home Status page which is customizable in the programming. The default Home Page is FMS Tank Status.
3. Select Settings>Configuration.
4. To upload a configuration file, click Upload. You will be asked to select the file. Select the file that you wish to upload.

Notifications

Rules can be used to generate the DIM reports.

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Intentionally Blank

Programming the system

To program the system parameters, select QJM > System>Configuration, and then choose System Preferences.

Preferences

Use the Preference tables on the following pages to select the menu options to be changed.

Language Options

- English
- English-United Kingdom
- Spanish: Castilian
- Russian
- French
- Chinese -China
- Arabic
- Hebrew
- LTR
- RTL

Regional Formats

- English-United States
- English-Canada
- English-United Kingdom
- Spanish; Castilian-Mexico
- Spanish Castilian-Spain
- French-Canada
- French-France
- Russian-Russian Federation
- Arabic-Saudi Arabia Hebrew-Israel
- Chinese-China

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Units

Select Units and chose the desired parameters for each section:

- Temperature: Centigrade, Fahrenheit
- Pressure: Pascal, Bar, Pounds per square inch, Inches of Water, Inches of Mercury
- Length: Millimeters, Centimeters, Meters, Inches
- Volume: Liters, Gallons Imperial, Gallons
- Flow: Liters/Hour, Cubic Centimeters/Second, Cubic Feet/Hour, Gallons/Minute, Gallons/Hour
- Mass: Kilograms, Grams, Pounds

Configuring System ID

Select QJM>System>Configuration. Select System ID. You should have the following items ready before beginning console programming:

- Site location information to setup Site ID
- Communications parameters for external equipment to match console settings
- Wiring diagrams of site if necessary; to identify sensor and/or probe location
- Manufacturers Tank Charts for “special” tank correction tables
- Probe stickers with gradient and RTD location for “special” probes. (TSP-LL2 Probes Only)

To make a modification, select the parameter that you want to change. Type the new setting in using the characters available. When finished, press enter to confirm the change. Once changes are complete select the save button. When Confirmation is displayed, press Yes to save and apply, or No to exit without saving—you may press cancel to continue making changes. Changes will not be applied until you return to the main menu.

Refer to the programming tables on the following pages for a more descriptive representation of each option including the submenus of each menu item. The console will update the menus as additional data or information is required during programming.

NOTE: Some features may not be available unless they were purchased with your ATG.

Programming

To begin programming the ATG, type the appropriate IP address into the Address Tool Bar.

IMPORTANT: Click the "+" next to the right of the parameter title to configure parameters.

IMPORTANT: Be sure to type "https://" before the IP address. The example shown is the default IP address of the console when it leaves the factory. If the IP address has already been changed, adjust accordingly.

1. Navigate to SETTINGS>Configuration.
2. Under Configuration you will see several choices:

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- Expand - Expand all menu items in the setup programming menu.
- Collapse - Collapse all menu items in the setup programming menu to show only main menu items.
- Drag and drop - Move or Copy-option allows the user to move or copy setup parameters from one programming section to another.
- Download - Download a copy of the setup file from the ATG to a computer.
- Upload - Upload a setup file from a computer to a connected ATG.
- Merge - Merge a section of the setup file to another location.

3. To expand one section of the programming menu, select that section. All menu items for that section expand.
4. To download setup parameters to a section, click the checkbox to the left of the section. The Download option appears.
5. Make changes as needed.
6. Choose Save to write the programming to your ATG or Revert to return to the default values.

System ID

- Site Name: Physical name of site.
- ID Lines: These lines should contain the physical address of the site and any other identification information required. This information will be included in the header of reports and to identify the site.

System Preferences

- Language: Select the desired system language.
- Regional Formats: Select the desired system regional format.
- Units: Select the desired system units of measurement Temperature, Pressure, Length, Volume, Flow, Mass

Date/Time

- Time Zone: Enter time zone
- NTP Server: Network Time Protocol (NTP) is a networking protocol for clock synchronization. Enter the IP address for NPT. If NPT is programmed, your ability to set date and time will be suspended until the NPT server is removed.

NOTE: To set the date and time, go to Settings>Date and Time.

User Roles

- (+/-): The plus and minus buttons allow you to add or remove roles.
- Name: Enter desired user name.
- Permissions:
  - Minimal: limits what the user can view and change.

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- Maximum: No limits what the user can view and change.
- Custom: Provides a list of specific permissions allowing an administrator to choose specific access and functions for any role.

Users

The system contain one default user (admin) that has full access to the system.

- Name: Enter desired user name. (Admin requires a password but not a name.)
- Password: Enter a password for the user.
- Role: Select user role
- Preferences: Preferences are selected for each user (admin/ User 1,2,3…)
- Language: Select the desired language for the user.
- Regional Formats: Select the desired format for the user.
- Home Web Page: Select a home screen that would be applicable for the user.
- Units: Select the desired units of measurement Temperature, Pressure, Length, Volume, Flow, Mass for the user.

Address Book

- Name: Enter name of the contact
- Email Address: Enter the email address of the contact

Networking

- Ethernet 1
  - IPv4:
    - Method: Method of IP addressing select Manual or Automatic DHCP
    - Address: Assigned IP address
    - Netmask: The mask must match that of the network the console is connected to.
    - Gateway: logical address to the nearest router port.
    - DNS Servers: The domain name system (DNS) is the way that internet domain names are located and translated into Internet Protocol addresses.
    - Search Domains: URL address of site.
    - DHCP Server: Select Enabled or Disabled
      - DHCP Server:
        - Start: 100
        - limit: 50
        - Lease Time: 60 min
- Wi-Fi:
  - Enabled: Yes/ No
  - Mode: Select Access Point for direct connection or infrastructure for network connection.

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- SSID: Enter SSID password for the Wireless Local Area Network (WLAN)
- Broadcast SSID: Select yes so all users within its range can see the network on their PC or other device.
- Channel: select SSID broadcast channel.
- Security: Select none or WPA2-Personal
- Encryption: Select TKIP or AES
- Passphrase: Enter passphrase
- IPv4:
  - Address: 192.168.170.170
  - Netmask: 255.255.255.0
  - DHCP Server: Enabled
  - DHCP Server:
    - Start: 100
    - Limit: 50
    - Lease Time: 60 min

- USB:
- Enabled: Yes
  - IPv4:
    - Address: 192.168.171.171
    - Netmask: 255.255.255.0
    - DHCP Server: Enabled
    - DHCP Server:
      - Start: 100
      - Limit: 50
      - Lease Time: 60 min

Communications

- Serial Ports:
  - COMM 1
    - Baud Rate: Select Baud Rate
    - Data Bits: Select number of Data Bits
    - Parity: Select Parity parameter
    - Stop Bits: Select number of Stop Bits
- Protocols:
  - Assign a port number for access to the Veeder-Root protocol
- Web Service
  - Enabled: Enable the Web Service functionality
  - Protocol: Select protocols HTTPS or HTTPS+HTTP
  - Password: Set Password if required.

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Email

- Enabled: Yes if Data authentication (if required).
- Server: Enter the Server'sURL
- Port: Enter Port address of SMTP.
- Sender host name: enter your smtp host address (Address of sender (console)).
- Full sender name: From" Address (your_from@address.com)
- From Address: Enter IP address of SMTP Host.
- Return address: Enter return address
- Connection Security: Select none, STARTTLS or SSL/TLS
- Authentication: Select none, Plain password, or CRAM-MD5
- Maximum Queue Size: Maximum size of queue in Megabytes.
- Retry Timeout: Time, in seconds, the console will wait before trying to resend the message.
- Enable Debugging: Select Yes if you want more status information in the Messages file.

Printing

- Printer# (See the printer section for additional details.
    - Name: Enter printer name
    - URI: Enter URI if required
    - Make: Select printer manufacturer
    - Model/Driver: Select the specific model and driver for the make.
        - General:
            - Media Size: Select Letter size
            - Double-Sided Printing: chose off, long edge or short edge
            - Media Source: Set source
            - Resolution: Set resolution
            - Color Mode: Select color mode
            - Printout Quality: chose default, draft, normal or high

Low Voltage Inputs (Dry Contacts)

- Name: Enter desired channel name.
- Input #: Select channel
- Enabled: Yes, if channel is used.
- Active State: High will activate channel when voltage is present. Low will activate channel with no voltage present.

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Relays

- Name: Given name of channel.
- Relay #: Channel selected
- Enabled: Yes, if channel is used.

Fuel Management System

- Compensation Temperature: The temperature you use to calculate the net volume.
- Ullage Percent: Percent of tank level used to calculate empty space.
- Delivery Delay: Time in minutes after delivery when increase is reported.
- Low Product Limits By: Select between Level, Volume or percentage.
- High Product Limits By: Select between Level, Volume or percentage.
- Development Mode: Select Yes only if you are working with FFS Technical Support or an FFS Field Engineer.
- Static Tank Testing:
    - Region: Other
    - Monthly Leak Test Threshold: Static leak tolerance for testing tanks.
    - Yearly Leak Test Threshold: Static leak tolerance for testing tanks.
    - Confidence: Leak testing confidence. Choose between 90, 95, 97.5, 99 %
    - Alarm On Precision Leak Test Failure: Choose Yes or No.
    - Minimum Leak Test Time: Minimum amount of time 0-8 used to test.
    - Maximum Leak Test Time: Maximum amount of time 1-8 used to test.

Dispenser Interface

NOTE: For additional information, see "Dispenser Interface Programming" in the next chapter.

- Start Fueling Points At 0 or 1: Choose a starting point.
- Precision:
    - Volume Precision: The number of digits to the right of the decimal point reported by the dispensers.
    - Dispense Volume Gross: Select the units to measure dispenser volume.
- Grades:
    - Grade 1:
        - Name: Enter given name of grade
        - First Tank: The tank that is associated with the grade.
        - Blending Ratio: Select blending ratio if using a blended product.
- Fueling Points:
    - Fueling Point [#]:
        - Name: Enter given name of fueling point.

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- Meters:
    - Meter 1:
        - Name: Enter given name of meter
        - Grade: Select grade number.
        - Meter Position: Enter meter position.

One Touch Buttons

- One Touch Button [#]:
    - Name: Define the name of the OTB. The button's functionality is configured under either the Logic Conditions or Notifications parameter.

Logic Conditions

- New Condition Group:
    - Name: Name the Condition Group.
    - Enabled: Choose Yes or No.
        - Conditions:
            - Condition [#]:
                - Name: Name the condition.
                - Description: Describe the condition.
                - Type: Logic
                - Input:
                    - Input Type: Choose the type of input.
                    - Device Type: Choose the device.
                    - Event Priority: Choose the prioprity of the event.
                    - Event Code: Choose the code of the event.
                    - Invert Input: Choose Yes or No.
        - Outputs:
            - Condition Output:
                - Invert Input: Choose Yes or No.
                - Input Condition: Choose the condition for the input.
                - Type: Choose the type of output.

Notifications

- Notification [#]:
    - Name: Enter description of notification.
    - Enabled: Choose Yes to enable the notification.
    - Events:
        - Event:
            - Event Type: Select Event type that triggers action (New Alarm Occurred; Alarm Status Changed; Application Event; Scheduled).

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        - Device: Select device that will created the notification condition.
        - Event Priority: Chose the notification priority type (Any, Alarm, Warning, Notice).
        - Event Code: Chose the event code that triggers the notification.
    - Actions:
        - Action:
            - Action Type: Action that will occur upon event. (Email, Report or sound)
            - Content: What e-mail format is used
            - Content Type: E-mail Template Text/ HTML.
            - Recipients: Chose number of recipents.
                - Recipient:
                    - Address: Select address.
    - Report:
        - Report Type: Select report needed.
        - Report Device: Select device depending or report type.
        - Report Action: Select email or print.
        - Use Default Printer: Yes, if using default printer.
    - Sound:
        - Frequency: Enter Freq of sound.
        - On Duration: Enter time in millisecond
        - Off Duration: Enter time in millisecond
        - Number of Cycles: Enter number of cycles.

Products

- Name: Enter name of product.
- Color: Assigns colors to grades for identification in the touch-screen interface.
- Standard product: Select Yes or no.
    - If No, enter:
        - Compensation Type: As defined by the fuel provider.
        - API Gravity: As defined by the fuel provider.
        - API Alpha: As defined by the fuel provider.
        - API Density: As defined by the fuel provider.
- Type: Choose appropriate product type.

Tank Types

- Name: Enter name of tank.
- Capacity: Enter volume of tank.
- Shape: Physical shape of the tank. Select horizontal cylinder, vertical cylinder or rectangular

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- Diameter: Diameter of tank.
- End Type: Type of the end of the tank. Select cylinder one domed end or two domed ends.

Tanks

- Tank [#]
  - Name Tank: Enter name of tank
  - Tank Type: Select tank type
  - Siphon Manifolded: Choose Yes or No
  - Product: Select type of product in tank.
  - Delivery Threshold: The amount of volume increase in a tank that causes a delivery to be reported.
  - Monthly Compliance: Choose Yes if the tank's Static Tank Test or SCALD® Tank Test result (when applicable) should appear on the Compliance page or regulatory report for monthly compliance.
  - Annual Compliance: Choose Yes if the tank's Static Tank Test result (when applicable) should appear on the Compliance page or regulatory report for annual compliance
  - Probe:
    - Probe Type: Select probe type LL2, LL3, or FLEX
    - Probe Ratio: Ratio of float movement in proportion to product level. 1:7-9 for use with Moorman gauge interface.
    - Water Float: Choose Enabled if a water float is present.
    - Water Offset: Used for compensation of tank tilt. (See Appendix xx: Calculating Tank Tilt).
    - Product Offset: Used for compensation of tank tilt. (See Appendix xx: Calculating Tank Tilt).
    - Float Type: Type of float(s) used on probe.
    - Channel #: Channel used for the probe in tank.
  - SCALD®:
    - Enable: Yes, enables SCALD® tank testing.
    - Qualify: Required percent full to run SCALD® test is 14%.
    - Test Confidence: SCALD® testing confidence. Choose between 90, 95, 97.5, 99 %.
  - Limits:
    - High High (Limit/Volume/percentage) Limit: The Limit/Volume/percentage that will trigger the High high Product alarm.
    - High (Limit/Volume/percentage) limit: The Limit/Volume/percentage that will trigger the Low Product alarm.
    - High Water (Limit/Volume/percentage) Limit: The Limit/Volume/percentage that will trigger the High water alarm.
    - High Water Warning (Limit/Volume/percentage) Limit: The Limit/Volume/

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percentage that will trigger the High water warning.

- Low limit (Limit/Volume/percentage) Limit: The Limit/Volume/percentage that will trigger the Low Product alarm.
- Low low (Limit/Volume/percentage) Limit: The Limit/Volume/percentage that will trigger the Low low Product alarm.
- Enable Temperature Alarm Limits: Select yes to set temperature limits.
- High Product Temperature Limit: Set high temperature limit.
- Low Product Temperature Limit: Set low temperature limit.

Manifolds

NOTE: You use this parameter only when two or more tanks are siphoned together.

- Manifold 1
  - Name: Enter the name of the manifold.
  - Product: Select Number of product in tanks..
  - Delivery Threshold: Amount of increase to detect delivery.
  - Monthly Compliance: Select Yes if this manifold is to appear on the Compliance page and in the Regulatory report
  - Members:
    - Tank [#] Select tank that is part of the same manifold.
    - Tank [#] Select tank that is part of the same manifold.
  - Limits:
    - Low limit (Limit/Volume/percentage) Limit: The volume that will trigger the Low Product alarm.
    - Low low (Limit/Volume/percentage) Limit: The volume that will trigger the Low low Product alarm.
  - SCALD®:
    - Enable: Yes, enables SCALD® tank testing.
    - Qualify: Required percent full to run SCALD® test is 14%.
    - Test Confidence: SCALD® testing confidence. Choose between 90, 95, 97.5, 99 %.

Sensors

- Sensor [#]:
  - Name: Name the sensor. Use a descriptive naming convention to help identify the location of the sensor.
  - Sensor: Type of Sensor
  - Channel #: Channel used for the sensor.
  - Monthly Compliance: Select Yes if this sensor is to appear on the Compliance page and in the Regulatory report

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Compliance Tracking

- Enable Notifications: Yes, Allows the system to notify user about compliance warnings and alarms.
- Assessment Time: Determines the time that the system will assess the compliance status.

Pumps

NOTE: For more information, see the "TS-TPI Overview and Functionality" chapter.

- Pump [#]:
  - Name: Given name of pump.
  - Connection Type: Relay or Smart controller.
  - Relay/ controller type: Select controller type or relay channel.
  - Controller address: Input address of smart controller if using connection type Smart Controller.
  - Is Grouped: Put Pumps located in similar products into the same group for Leveling or Priority mode.
  - Tank: The tank number (where this Pump is located).
  - Inlet Height: The height of the Pump Motor Assembly off of the bottom of the tank in inches
  - External Hooks:
    - Hook [#]:
      - Type: Input type that will have control over activating and deactivating this Pump.
      - Input: Input channel that will have control over activating and deactivating this Pump.

Pump Group

- Name: Name given to pump group.
- Mode: Select the mode you want leveling, priority or none
- Enable Call For Help: Select yes if you want both pumps to run during periods of high demand.
  - Group Members: Put Pumps located in similar products into the same group.
  - External Hooks:
    - Hook 1: Input type that will have control over activating and deactivating this Pump.
    - Input: Input channel that will have control over activating and deactivating this Pump.

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TS-TPI Overview and Functionality

Tank fuel management can be achieved using an EVO™ 200 or EVO™ 400 ATG and an FE Petro Turbine Pump Controller (STP- SCI, SCIII, EcoVFC or MagVFC) through Turbine Pump Interface (TPI). Refer to Tech Update TB1010-04 for connecting to an STP-SCIII controller.

Tank Fuel Management looks at percent (%) full volume of individual tanks and gives priority to the submersible pump needed to control tank inventories. Additional features and benefits of the Tank Fuel Management system include:

- Tank Overfill Protection
- Dry Tank Indication
- Automatic pump controller reset
- Clogged Intake Indication
- Pump in Water Indication.
- Use of additional pumps in the same group when de- mand increases

Tank Fuel Management can be used to keep tank levels similar, eliminating the need for a syphon system. Tank Fuel Management can also be used to pump down one tank to a user defined level, and then switch over to the other tank for fuel dispensing. In either case, there must be at least one submersible pump in each tank.

TS-TPI Overview

The TS-TPI programming function allows the controllers to be grouped together and programmed for specific fuel management options. These options are: On-start leveling, Live Leveling, Priority, or Alternating. There is also the option to answer Yes or No to Enable Call for Help.

On-start leveling mode

This mode is intended to maintain an equal level of fuel in each tank by giving top priority to pump controllers associated with the tank containing the most fuel. This forces the pump in the tank with the highest level of fuel to activate with the next activation of a dispenser switch.

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NOTE: Leveling is achieved using level as percentage volume full. The tank gauge looks at levels in a tank as % full and attempts to keep that number equal between all tanks in LEVELING mode. If tanks are different sizes, the levels in tanks may not be equal, but the % full will be similar.

Live Leveling

Live Leveling provides the same functionality as the On-start leveling. In this mode, the ATG does not wait for the next active dispenser switch before it switches from one pump to the other. It will continuously evaluate which pump should be operating based on percent full. This is helpful at extremely busy sites that may go hours with continuous fueling.

Priority mode

Priority mode tries to pump down one tank before switching to other tank(s). After choosing PRIORITY mode, the technician programs the RESERVE setting. The reserve level is input as a percent full in the tank. When the RESERVE level is reached for that tank, priority will switch to the pump in the other tank.

NOTE: If both tanks are below RESERVE level the ATG will automatically use Leveling until tanks receive a delivery of fuel or reach Dry Tank Indication Levels

NOTE: In both Leveling and Priority modes, the ATG chooses which pump will take priority. Because of this, the pump controllers should be set to Master- Slave, not Master-Slave / Alternating Circuit. If the pump controllers are configured for Master- Slave /Alternating Circuit, the pumps will not turn on in a predicable manner. Tanks that are in Leveling or Priority mode are monitored and tested as separate tanks and should NOT be siphoned.

Alternating mode

Alternating mode alternates pumps with each new dispenser signal without considering tank volume.

Other TS-TPI functions

Other TS-TPI functions include:

- Overfill Protection: When either LEVELING or PRIORITY mode is chosen, if a tank level rises above its high level limit, it becomes the priority tank regardless of the leveling mode. If the level in that tank reaches the high-high limit, all pumps in the group are shut down except for the pump in the tank with the high-high alarm. In-line check valves used to prevent overfill conditions in manifolded tanks, such as those used with Red Jacket submersible pumps, are not required or recommended.

NOTE: The Overfill Protection feature will work correctly ONLY when the high and high-high level alarms are programmed correctly. Failure to set high and high-high level alarms will result in a loss of overfill protection.

- Dry Tank Indication: TS-TPI programming enables the user to enter a PUMP HEIGHT measurement (default is 5”). This is the distance between the bottom of the pump motor to the bottom of the tank. When the pump controller indicates an Under - Load condition and

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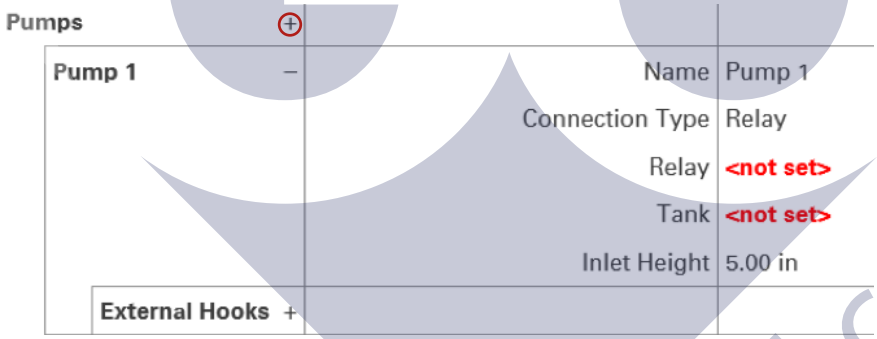
the product level is within 3” of the programmed PUMP HEIGHT measurement, an alarm on the tank gauge will indicate DRY TANK. When a delivery is made, the pump controller will automatically be reset.

NOTE: Because the TS-TPI resets the pump controller after a delivery is made, the Auto Restart feature on the pump controller must be disabled.

- Clogged Intake Indication: The combination of a pump controller Under-load condition and a tank level that is at least 3” greater than the programmed PUMP HEIGHT measurement will cause a CLOGGED INTAKE indication. Because the tank gauge is able to confirm that there is fuel in the tank, this alarm indicates a motor intake that is being blocked by a foreign object. Hence the pump stops and start for 3 times to try to remove the foreign object.
- Pump in Water Indication: If the tank gauge records a water level that is within 2” of the programmed PUMP HEIGHT measurement, the pump will become disabled. The tank gauge will indicate a PUMP IN WATER alarm.

TPI Setup

1. Navigate to: Settings>Configuration>Fuel Management Systems>Pumps.
2. Click "+" once for each Pump to be installed.



NOTE: To use TPI, you must use FE Petro Smart Controllers.

3. Set Connection Type to Smart Controller, and then choose the appropriate Controller Type.
4. Select the appropriate Controller Address. Start at 1. The Addressing dip switch settings on the controller must match what you chose.
5. If the Pump is a stand alone controller, set Grouped to No. If the Pump is a member of a Leveling, Priority or Alternating Group, answer Yes.
6. Select the Tank where the Pump is located.
7. If the Pump is not Grouped there will be a menu option in the Pump section for External Hooks. Click "+" to identify the location of the Pump Dispenser Signal (Hook signal). This turns on the Pump when a dispense is requested. Add External Hooks as needed.

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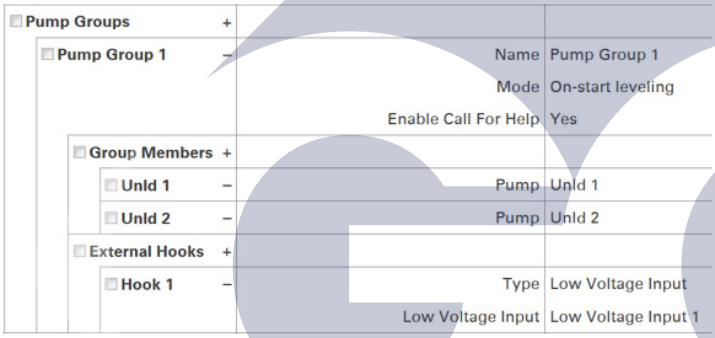
8. Inlet Height is the approximate distance from the bottom of the Pump motor assembly (PMA) to the bottom of the tank. This measurement is used as a baseline for associated Pump alarms. Adjust this measurement as needed.

9. Complete the Pump programming for all Pumps.

Pump Groups

If two or more Pumps are configured within a Group for Leveling, Priority, or Alternating functionality, click "+" for each Pump Group, and configure the group as needed. Give a name to the Pump Group, select the desired mode, identify the pumps, or members of the group, and identify the external hooks (dispenser hook signals) associated with that group.

In the example below, Pump 1 and Pump 2 are located in Unleaded Tank 1 and Unleaded Tank 2. The Pump Group is configured to level these two tanks in On-start leveling mode.



Complete the programming for all pump groups.

NOTE: All DIP switch settings for the FE Petro controllers should be set as stand alone controllers, with the exception of the addressing. All controllers need to have a unique address that is not set to 0. Note that the SCIII must be placed in slave mode for TPI to function.

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Alarms and Troubleshooting

For all alarms conditions, the troubleshooting steps provided in this chapter are suggested actions to take in the event of an alarm. Follow all site policy procedures set by local governing agencies in the case of a spill, leak, or malfunction. If the steps provided by this manual or the site policy are followed and the system still requires additional support, contact Franklin Fueling Systems Technical Services. Alarms are listed in sections for System Alarms, VRM Alarms, FMS Alarms, SCM Alarms, Wire Sensor Alarms, LLD Alarms, TPI Alarms, Printer Alarms and Miscellaneous Alarms.

System alarms

Displayed Alarm/Warning	Device	Description	Recommended Actions
Invalid Configuration	None	The configuration that has been loaded is not valid.	Verify the file type of the configuration which is being uploaded
Invalid Registration	None	The registration that is loaded is not valid.	If you have upgraded the site before, use the upgrade tool to restore the former registration. If you have not upgraded the site before, contact FFS Technical Services for support.
Power Supply Input Alarm	None	An input on the Power Supply has been configured as an alarm and is active.	Check the programming and voltage inputs for the specified Low Voltage Input channel on the Power Supply module.
Printer Module Number Mismatch	Slot	Printer Modules detected does not match the number programmed.	Check that the number of Printer Modules installed matches the number programmed under System Configuration > Modules Expected. If problem persists, contact FFS Technical Support.
Probe Setup Error	None	Programming errors made during setup of the Probe Module.	Verify Probe Module programming parameters. If the condition still exists, contact Franklin Fueling Systems' Technical Support for help on this issue.
Set Date and Time	None	System detected an issue with the date and time	Check and set the system date and time.
System Setup Error	None	There is an error in the Setup configuration.	Inspect the System setup configuration for possible errors.

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FMS alarms

Displayed Alarm/Warning	Device	Description	Recommended Actions
Alpha volume correction error	Tank	This error is caused by a programming mistake in the Special Products section.	Verify Special Product Alpha volume correction program parameters. Contact FFS Technical Support.
Annual Compliance Alarm	Any	The device listed has gone out of compliance	Pass a test or clear the alarm on the device.
Annual Compliance Warning	Any	The device listed has 7 days before it will go into a compliance alarm	Pass a test or clear the alarm on the device.
API volume correction error	Tank	This error is caused by a programming mistake in the Special Products section.	Verify Special Product API volume correction program parameters. Contact FFS Technical Support.
Correction table error	Tank	Level and Volume mismatch detected in Correction table programming.	Verify that all levels and volumes are entered accurately into the Correction Table programming.
Density float error	Tank	A communication error has occurred involving the density float.	Verify programming and contact FFS Technical Services for support.
Density error	Tank	The density of the product is not within specifications.	Enter setup and verify the information under density in the probe programming.
Float height error	Tank	This error could indicate that the wrong float type is installed or that a programming error has occurred.	Review probe programming for proper float type, number of floats in the tank. (This would be an idea time to clean the probe and floats).
Float Missing	Tank	Probe detects a lesser number of floats than programmed.	Review probe programming for correct number of floats. If correct then inspect probe shaft, floats, and float magnets. With the probes out of the tank, this would be an idea time to clean the probe and floats. If pressures meets requirements specified, contact FFS Technical Support.
FMS configuration error	None	Conflicts exist within FMS Application programming.	Verify FMS setting are correct in accordance with the site specifications.
High product level	Tank	Product level exceeded High limit set. Possible close to tank overfill condition	Acquire an accurate product level. If actual product level in tank does not match the consoles displayed current level, verify programming is correct.
High high product level	Tank	Product level exceeded High High limit set. Possible tank overfill condition.	Acquire an accurate product level. If actual product level in tank does not match the consoles displayed current level, verify programming is correct.
High product volume	Tank	The specified tank has reached the programmed High Product Volume.	Check product volume and compare to the programmed High Volume alarm Limit in the setup menu. Acquire an accurate product level and compare to the ATG. If levels differ, verify programming is correct. If alarm persists, contact FFS Technical Support.
High High product volume	Tank	The specified tank has reached the programmed High High Product Volume.	Check product volume and compare to the programmed High High Volume alarm Limit in the setup menu. Get an accurate product volume and compare to the ATG. If levels differ, verify programming is correct. If alarm persists, contact FFS Technical Support.

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FMS alarms (continued)

Displayed Alarm/Warning	Device	Description	Recommended Actions
High water level	Tank	Water level exceeded High limit set.	Verify programmed level. If water is too high consult you local site policy procedures for corrective actions.
High Water/Phase Sep	Tank	Water/Phase Separation has exceeded the High Limit set.	Remove Water/Phase Separated product form the tank.
Level error	Tank	Product level exceeds tank diameter due to an error in console of programming.	Verify tank, offset, and probe programming.
Low low product volume	Tank/ Manifold	Product volume below Low Low limit. The tank or manifold specified may be near empty.	Acquire an accurate product volume, and if does not match the consoles displayed current volume, verify programming.
Mag installation error	Sensor	The specified TSP-DMS has an installation error	Check the installation of the TSP-DMS, the sensor must be plumb. If installation is correct, then try to relearn the sensor. If the problem persist, the sensor may need to be replaced
Mag product alarm	Sensor	The specified TSP-DMS has detected product.	Inspect the sump for the presence of product.
Mag sensor configuration error	Sensor	An error has been detected in the configuration of the specified TSP-DMS.	Enter into the setup and inspect the TSP-DMS setup.
Mag sensor data error	Sensor	There is an error with the reported data from the specified TSP-DMS	Inspect wire connections at the Mag sensor. If the problem persists, contact FFS Technical Services for support.
Mag sensor float height error	Sensor	The float height has exceeded the limits as learned.	Inspect wire connections at the Mag sensor. If the problem persists, contact FFS Technical Services for support.
Mag sensor float missing	Sensor	The specified TSP-DMS is not reporting the level information for one or more float.	Inspect the Mag sensor for damage and redo the connections. If the Problem persists, contact FFS Technical Services.
Mag sensor missing	Sensor	The console is not receiving any information from the specified TSP-DMS.	Inspect wire connections at the Mag sensor. If the problem persists, contact FFS Technical Services.
Mag sensor not learned error	Sensor	The specified TSP-DMS was not properly learned.	Enter into the Control > Mag Sensor screen and have the console learn the sensor.
Mag sensor synchronization error	Sensor	The console is receiving incomplete or improperly timed data from the specified	Inspect wire connections at the Mag sensor. If the problem persists, contact FFS Technical Services.
Mag water alarm	Sensor	The specified TSP-DMS has detected water.	Inspect the sump for water.
Mag water warning	Sensor	The TSP-DMS has detected water above the preset limit.	Inspect the sump for water.
Manifold Delivery Detected	Tank	A delivery has been detected on the specified manifold.	This is not an alarm and should only be a concern if there was not a delivery to the site at the specified date and time.
Manifold Gross Leak Detected	Tank	A leak in the specified manifolded tanks has been detected via a SCALD® test. Suspect possible leak.	Review Tank Leak Test History and programming. Refer to Tank Testing in the Operation Guide.

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FMS alarms (continued)

Displayed Alarm/Warning	Device	Description	Recommended Actions
Manifold Leak Detected	Tank	A leak in the specified manifolded tanks has been detected via a SCALD® test. Suspect possible leak	Review Tank Leak Test History and programming. Refer to Tank Testing in the Operation Guide.
Manifold low product volume	Tank	The specified manifold has reached the programmed Low Product Volume	Check product volume and compare to the programmed Low Volume alarm Limit in the setup menu. Acquire an accurate product volume and compare to the ATG. If levels differ, verify programming is correct. If alarm persists, contact FFS Technical Services for support.
Manifold low low product volume	Tank	The specified manifold has reached the programmed Low Low Product Volume	Check product volume and compare to the programmed Low Low Volume alarm Limit in the setup menu. Acquire an accurate product volume and compare to the ATG. If levels differ, verify programming is correct. If alarm persists, contact FFS Technical Services for support.
Manifold Leak Detected	Tank	A leak in the specified manifolded tanks has been detected via a SCALD® test. Suspect possible leak.	Review Tank Leak Test History and programming. Refer to Tank Testing in the Operation Guide.
Manifold Theft Detected	Tank	The specified manifold has entered Sentinel Mode and detects product leaving the tank that exceeds the programmed theft limits.	Verify programming and accurate level / volume readings.
Monthly Compliance Alarm	Any	The device listed has gone out of compliance	Pass a test or clear the alarm on the device.
Monthly Compliance Warning	Any	The device listed has 7 days before it will go into a compliance alarm.	Pass a test or clear the alarm on the device.
Net error	Tank	Product net levels exceed tank diameter	Verify tank, product offset and probe programming
No data available	System	A communication issue has occurred between the probe and the console	Check for proper probe programming at the console and inspect wire connections at the probe. If the problem persists, contact FFS Technical Services for support.
No probe detected	Tank	The Console is not receiving any communication from the probe.	Check for proper probe programming at the console and inspect wire connections at the probe. If the problem persists, contact FFS Technical Services for support.
Probe synchronization error	Tank	Communication between the probe and the Console is either incomplete or ill timed.	Check for proper probe programming at the console and inspect wire connections at the probe. If the problem persists, contact FFS Technical Services for support.
Product volume error	Tank	The Product Volume as reported by the probe has exceeded the limits of the tank.	Check for proper probe and tank programming at the console. If programming is correct, inspect the probe to ensure that the float is not stuck in the riser or is otherwise obstructed.
RTD table error	Tank	RTD distance error; Special Probe programming error.	Verify correct RTD programming. If issue still exists, inspect wiring to probe.If the condition still exists, contact Franklin Fueling Systems' Technical Services for support.
System memory error	System	The system has detected a low memory situation.	Contact FFS Technical Services for support.

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FMS alarms (continued)

Displayed Alarm/Warning	Device	Description	Recommended Actions
Tank Gross Leak Detected	Tank	Tank Gross leak test detected tank. Suspect possible leak.	Review tank leak test history and programming. Refer to Tank Testing in the Operation instructions.
Tank Leak Detected	Tank	Tank leak detected. Suspect possible leak.	Review tank leak test history and programming. Refer to Tank Testing in the Operation instructions.
Tank Product Density High Limit Exceeded	Tank	The Product Density exceeds the programmed high limit.	Verify programming if correct this alarm may be an indication of improper density of the fuel.
Tank Product Density Low Limit Exceeded	Tank	The Product Density has exceeded the programmed low limit.	Verify programming if correct this alarm may be an indication of improper density of the fuel.
Tank SCALD® Leak Detected	Tank	SCALD® leak test detected tank leak. Suspect possible leak.	Review Tank Leak Test History and programming. Refer Tank Testing in the Operation instructions
Tank Delivery Detected	Tank	A delivery has been detected on the specified tank.	This is not an alarm and should only be a concern if there was not a delivery to the site at the specified date and time.
Tank Water/Phase Sep Float Disabled	Tank	The Phase Separation Water Float has been disabled in setup	Verify Phase Separation Water Float level and enable the float in setup.
Tank Theft Detected	Tank	Product used in Sentinel Mode exceeds theft limit set. Suspect theft, and then verify theft limit in programming.	Verify theft limit in programming. Also obtain an accurate product level and compare to inventory.
Temperature error	Tank	Special Probe RTD temperature error detected.	Verify correct RTD table programming. If problem still exists, suspect wiring or faulty probe.
Ullage error	Tank	Ullage reported has exceeded tank capacity.	Check for proper probe and tank programming at the console. If programming is correct, inspect the probe to ensure that the float is not stuck in the riser or obstructed. Bring the probe inside and wire directly to the gauge to eliminate possible problems with the field wiring.
Unstable probe	Tank	LL Liquid Level probes can send FFSsistent data back to console.	Check for proper probe programming at the console and inspect wire connections at the probe. If the problem persists, contact FFS Technical Services for support.
Water volume error	Tank	Water volume has exceeded tank capacity.	Check for proper probe and tank programming at the console. If programming is correct, inspect the probe to ensure that the colored water float is on the bottom.

Wire sensor alarms

Displayed Alarm/ Warning	Device	Description	Recommended Actions
SN2 Sensor On	ChannelSN2	Sensor shows alarm status.	Inspect location for presence of liquid. In the case of a leak, follow site policy procedures. If no liquid is present, and alarm still exists, sensor may be tripped on error. Check wiring continuity from sensor to console. Test sensor at console, trip sensor on purpose. Verify console terminal wiring. If issue still exists, inspect wiring to sensor. Contact FFS Technical Support.
SN2 Fuse Blown	ChannelSN2	2-Wire Sensor Module fuse blown due to unknown causes.	The fuses on the Sensor boards are not serviceable. The module must be replaced if the fuse is blown.

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TPI alarms

Displayed Alarm/Warning	Device	Description	Recommended Actions
Capacitor Failing	TPI	The STP controller is reporting a capacitor failure.	Refer to the applicable Smart controller Installation guide for details.
Clogged Intake	TPI	The STP controller has reported a dry run condition but the associated tank shows a product level above the intake.	Ensure proper programming of the TPI and calibration of the Smart Controller. If correct, check for an obstruction on the PMA.
Communication Failure	TPI	Communication from the TPI to the STP controller has failed. The Console is seeing the controller but the controller is not responding to commands.	Verify all wiring connections. Call FFS Technical Services Department for support
Controller Type Error	TPI	The programmed controller type does not match what the console is detecting.	Verify proper programming of the TPI as well as the Smart controller type and address.
Dry Tank	TPI	The STP Controller has reported a dry run condition and the tank level is at or below the programmed intake.	Ensure proper programming of the TPI and calibration of the Smart Controller. If correct, add fuel.
Extended Run	TPI	The STP controller is reporting an extended run condition.	Refer to the applicable Smart Controller Installation guide for details.
Hardware Fault	TPI	The STP controller is reporting is reporting a hardware fault condition.	Refer to the applicable Smart Controller Installation guide for details.
High Temperature	TPI	The STP controller is reporting a high temperature condition.	Refer to the applicable Smart Controller Installation guide for details.
Locked Rotor	TPI	The STP controller is reporting a locked rotor rating.	Refer to the applicable Smart Controller Installation guide for details.
Not Calibrated	TPI	The STP controller is reporting that it has not been calibrated.	Refer to the applicable Smart Controller Installation guide for details.
Open Circuit	TPI	The STP controller is reporting an open circuit condition.	Refer to the applicable Smart Controller Installation guide for details.
Over Speed	TPI	The STP controller is reporting an over speed condition.	Refer to the applicable Smart Controller Installation guide for details.
Over Voltage	TPI	The STP controller is reporting an over voltage condition	Refer to the applicable Smart Controller Installation guide for details.
Pump Communication Fail	TPI	Communication from the TPI to the STP controller has failed.	Check all wiring connections and ensure that there is power supplied to the Smart Controller.
Pump In Water	TPI	The water level has risen to within 3 inches of the programmed intake level.	Ensure proper programming of the TPI and calibration of the Smart Controller. If correct, have water removed from the tank
Relay Fault	TPI	The STP controller is reporting a relay fault error.	Refer to the applicable Smart Controller Installation guide for details.
Short Circuit	TPI	The STP controller is reporting a short circuit condition.	Refer to the applicable Smart Controller Installation guide for details.
Unbalanced Load	TPI	The STP controller is reporting an unbalanced load condition.	Refer to the applicable Smart Controller Installation guide for details.

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TPI alarms (continued)

Displayed Alarm/Warning	Device	Description	Recommended Actions
Relay Fault	TPI	The STP controller is reporting a relay fault error.	Refer to the applicable Smart Controller Installation guide for details.
Short Circuit	TPI	The STP controller is reporting a short circuit condition.	Refer to the applicable Smart Controller Installation guide for details.
Unbalanced Load	TPI	The STP controller is reporting an unbalanced load condition.	Refer to the applicable Smart Controller Installation guide for details.
Unbalanced Voltage	TPI	The STP controller is reporting an unbalanced voltage condition.	Refer to the applicable Smart Controller Installation guide for details.
Under Voltage	TPI	The STP controller is reporting a voltage level under 200VAC.	Refer to the applicable Smart Controller Installation guide for details.
Under Load	TPI	The STP controller is reporting an underload condition.	Refer to the applicable Smart Controller Installation guide for details.
Unknown Fault	TPI	The STP controller is reporting an unknown fault code.	Check fault condition on Smart controller and contact FFS Technical Services for more information.

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Appendix A: Standard Products Table

Product Name	API Gravity (6B Compensation)
Leaded Regular	63.5
Unleaded Regular	63.5
Unleaded Plus	62.8
Unleaded Extra	62.8
Unleaded Super	51.3
Diesel	32.8
Kerosene	41.8
#2 Fuel Oil	32.8
Ethanol	46.1
LPG	146.0

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Appendix B: Standard Products Table

Tank Size in Gallons	Typical - Tank Leak Test Times (to Finish)
4,000	2.0 hours
6,000	3.0 hours
8,000	4.0 hours
10,000	5.0 hours
12,000	6.0 hours
15,000	7.5 hours
20,000	8.0 hours

NOTE: Tank sizes are at half capacity.

NOTE: The Leak Threshold value is one half of the Leak Test value.

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