Petro Vend FSC3000 Installation Manual

Part Number: M1700

Revision: 16

FSC3000

IMPORTANT: Before you use this manual, make sure you have the most recent revision. Look at the revision of this document to make sure it agrees with the most current revision found in the FMS Technical Library. Download the latest revision if necessary.

All references to other manuals and instructions in this manual can be found in the FMS Technical Library. Make sure you have the most recent revision.

READ CAREFULLY: OPW Fuel Management Systems and Dover Fueling Solutions cannot be held responsible for installations, configurations or use of its products that does not comply with the most recent documentation available.

NOTE: It will be necessary to have Single Sign-On (SSO) credentials to get access to manuals, instructions, software updates and other important assets. Speak with your FMS sales representative or contact FMS Customer Service at 1-888-679-3835 (1-888-OPW-FUEL) for information. Once you have been approved for SSO credentials go to the FMS Technical Library to find the most recent revisions of all manuals and instructions.

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ISO 9001:2015-Certified Quality Management System

For installation wiring reference, fuel control field wiring diagrams for the equipment that follows that includes Bennett, Fill-Rite, Wayne and other products, go to the OPW Fuel Management Systems FMS Technical Library (login required). Scan or click the QR code below or go to:

https://dover.sharepoint.com/sites/DFS-SSO/FMS%20Technical%20Library/Forms/AllItems.aspx?e=2%3AGGSaiz&at=9&isAscending=true&viewid=e7cd12e5%2D80bc%2D41f8%2D831a%2Df457da7903c3

> **NOTE:** A Technician login is required to access the Technician Portal. For technician registration, go to the Technician Registration page at http://www.opwglobal.com/opw-fms/tech-support/technician-registration.

- Bennett 3800 Duo-2
- Bennett 3800 Single
- Bennett Mechanical
- Fill-Rite
- Gasboy 9100 Dispenser
- Gasboy 9100 Duo-1 Pump
- Gasboy 9100 Duo-2 Pump
- Gasboy 9800 Dispenser
- Gasboy Pump
- Gasboy 9850KX
- Wayne Reliance Dual Dispenser

- Wayne Reliance Duo-2
- Wayne Reliance Single Dispenser
- Wayne Reliance Single Pump
- Wayne Select Dual
- Wayne Select Duo-2
- Wayne Select Single Duo-1 Pump
- Wayne Select Single

Table of Contents

Section 1 Important Safety Information

You must read and understand all safety information in this manual.

> **IMPORTANT:** ONLY APPROVED, TRAINED TECHNICIANS ARE PERMITTED TO INSTALL OR DO SERVICING ON THE EQUIPMENT AND COMPONENTS SHOWN IN THE PROCEDURES IN THIS MANUAL.

For your protection, obey all safety panels, warnings and instructions where they occur.

Read the safety and compliance information completely in the sections that follow before you begin installation.

> **DANGER:** To prevent the possibility of explosion or fire, do not use electrical or battery operated power tools in or near the Hazardous Area! Only use pneumatic or hand tools.

1.1 Safety Warnings

This manual contains many important Safety Alerts. There can be a risk of injury or damage to property if you do not obey these alerts. The panels below show the types of safety warnings that can be seen and how each is specified.

DANGER: Indicates an immediately hazardous condition that, if not prevented, will result in death or serious injury.

WARNING: Indicates a possibly hazardous condition that, if not prevented, could result in death or serious injury.

CAUTION: Indicates a possibly hazardous situation that, if not prevented, could result in minor or moderate injury.

NOTICE: Indicates important information not related to hazards. A condition that, if not prevented, can result in property damage.

SAFETY INSTRUCTIONS: Indicates instructions and procedures related to safety or gives the location of safety equipment.

1.2 Information Panels

NOTE: This panel gives more information about an instruction or procedure.

IMPORTANT: This panel contains special information that is important and must be read and obeyed.

REMINDER: This panel shows information that has been given before in the manual that is important to show again.

TIP: A step or procedure that is recommended to make another step or procedure easier.

INFORMATION: This panel shows references to more information in other sources.

READ CAREFULLY: This panel points to information that must be fully read and understood before doing the procedure(s) that comes after.

1.3 Hazardous Areas

A fuel dispenser is a hazardous area as specified in the National Electrical Code. The installation must agree with the codes that follow:

- National Electrical Code (NFPA No. 70)
- Motor Fuel Dispensing Facilities and Repair Garages Code (NFPA No. 30A)

1.3.1 NFPA/NEC – Class I, Div. 1 & Div. 2

The Class I, Division 1 and Class I, Division 2 hazardous areas are specified below:

> **Class I locations**. Class I locations: Where flammable gases or vapors are or can be in the air in quantities sufficient to cause explosive or ignitable mixtures. Class I locations include:
>
> - **Class I, Division 1**. A Class I, Division 1 location is a location where:
>   - There can be concentrations of flammable vapors during normal operation.
>   - There can be concentrations of flammable vapors during repair or maintenance operations or when the leakage of liquid fuel can occur.
>   - A release of concentrations of flammable vapors can occur as a result of equipment failure, incorrect operation or unsatisfactory procedures that could also cause a failure of electrical equipment.
>
> - **Class I, Division 2**. A Class I, Division 2 location is a location where:
>   - An accidental failure or incorrect operation of vapor containment system equipment or containers that can release hazardous vapors from flammable liquids or gases.
>   - A failure or incorrect operation of positive mechanical ventilation precautions result in the release of hazardous concentrations of flammable gases or vapors.
>   - Concentrations of flammable gases or vapors can occasionally flow from a containment or ventilation system to an adjacent Class I, Division 1 location. This flow of gases or vapors must be prevented by sufficient positive-pressure ventilation from a source of clean air. Sufficient precautions to prevent ventilation failure must be installed.

DANGER: To prevent the possibility of explosion or fire, do not use electrical or battery operated power tools in or near the Hazardous Area! Only use pneumatic or hand tools.

WARNING: To prevent possible fire or explosion, do not mount your system site controller or any other electrical part of the system, including printers and modems, within or above the defined "hazardous" areas.

IMPORTANT: It is the installer's responsibility to know and obey all local codes.

OPW Fuel Management System's fuel control systems are listed for use in a non-classified area. All of the equipment must be installed outside of the hazardous areas.

NOTE: Local codes can dictate specific installation requirements. Installation is subject to approval by the local authority that has jurisdiction at the site.

1.3.2 Installation Requirement

OPW-FMS Terminals are designed to be installed above the hazardous area when using the terminal's associated pedestal.

The pedestal can be mounted in the hazardous area but a seal-off must be the first fitting for all conduits that go into the area.

IMPORTANT: All unused knockout holes that have been removed must be sealed.

Dispenser Installations
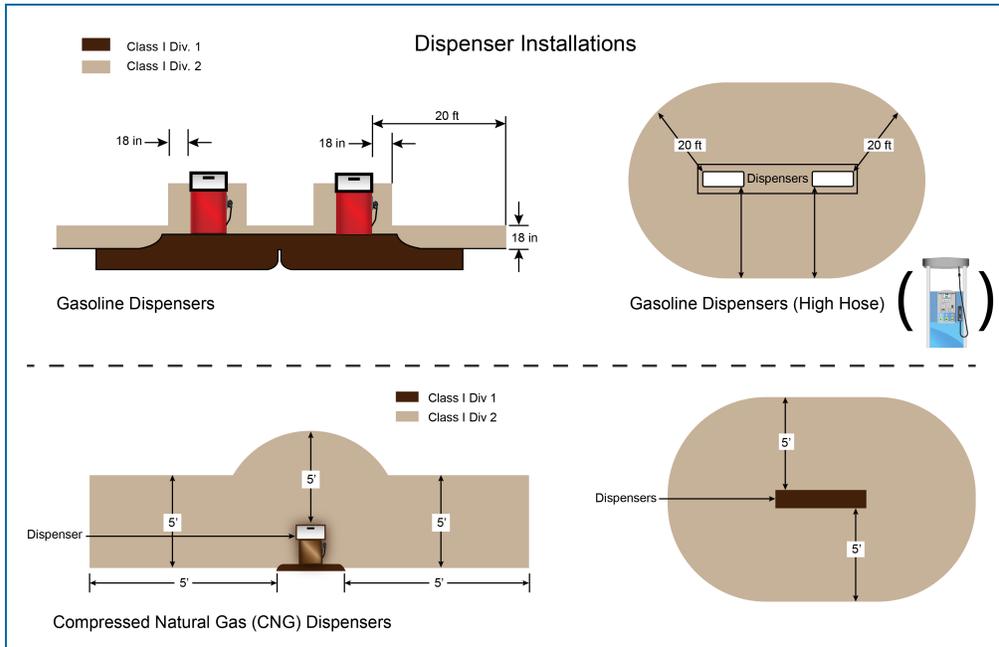
Dispenser Installations

> **WARNING:** Knockouts and installation hardware are provided for all cabinetry. Do **NOT** drill holes in the enclosures. This would violate the safety listing of the system.

> **CAUTION:** Be sure to wear all required personal protective equipment (PPE). This includes safety glasses, hardhat, safety shoes and reflective vest.
>
> Barricade the work area before installation.
>
> Be sure to obey all applicable Lockout/Tagout (LOTO) procedures before installation.
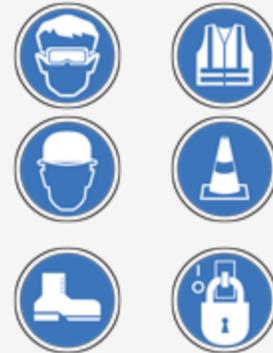
IMPORTANT: It is recommended to do a check of the electrical system with a multimeter to make sure all connections are de-energized before you proceed with the installation.

1.4 Installer Safety

CAUTION: Incorrect installation can cause a risk of injury to installers and users of this equipment. Incorrect installation can result in environmental contamination or equipment damage. Read these instructions carefully!

Refer to the National Electrical Code (NFPA No. 70) and the Motor Fuel Dispensing Facilities and Repair Garages Code (NFPA No. 30A) to make sure your installation is correct.

Installers must obey the instructions in this document to complete a safe installation.

For installations outside the United States, make sure that the installation obeys all applicable local codes.

The installer must know and obey all applicable local codes in the country or county where this unit is installed.

NOTE: Local codes can specify special installation requirements. Installation is subject to approval by the local authority with jurisdiction at the site.

1.5 Electrostatic Sensitive Devices (ESD)

This product contains components that can be damaged by Electrostatic Discharge. See the instructions below to work safely with these components.

ATTENTION: Electrostatic Sensitive Device -   To prevent damage from electrostatic discharge, obey the precautions below when it is necessary to move or touch electrostatic sensitive devices.

- Use correct grounding methods.

- Use an ESD Field Service Kit with wrist strap, dissipative mat and grounding cord when possible.

- When possible, do not stand on carpeted surfaces while you do work with Electrostatic Discharge Sensitive (ESDS) devices.

- Do not keep ESDS components/assemblies where there is a risk of damage.

- A new component should be kept in its anti-static package as long as possible before installation.

- Only touch ESDS components by the edges. Do not touch any of the circuitry.

1.6 FCC Compliance

This system complies with Part 15 of the Federal Communications Commission (FCC) Rules & Regulations. Operation is applicable to these conditions:

- This device must not cause harmful interference.

- This device must accept interference received. This includes interference that can cause undesired operation.

1.7 Applicable Warnings, Battery Safety

NOTE: Only certified OPW-FMS technicians are authorized to install and program this system. This is necessary for warranty registration.

1.7.1 Internal Coin Cell Battery Safety

DANGER: The coin cell battery can explode if it is used incorrectly. Do not recharge, disassemble or discard this battery in fire. Replace the SIMM coin cell battery with Panasonic or Matsushita Electric Part Number CR-3032Panasonic or Matsushita Electric Part Number CR-2450 or equivalent ONLY. There can be a risk of fire or explosion if an incorrect battery is used.

To avoid possible explosion or fire, do not replace the lithium battery with a type that is not compatible.

The battery used in this device can present a risk of fire or chemical burn if used incorrectly. Do not disassemble, heat above 100°C or incinerate.

Discard a used, replaced battery immediately. Keep away from children. Do not disassemble and do not discard in fire.

The inside of the console contains high-voltage circuitry; ONLY certified technicians should be permitted access to the console.

INFORMATION: For more safety information on the Panasonic CR-3032 CR2450 coin cell Lithium battery used in this device, refer to the Panasonic Product Safety Data Sheet.

Section 2 FSC3000 Controller

The Fuel Site Controller (FSC) contains the site configuration that manages card and pump processes to and from the Fuel Island Terminals (FITs) and Pump Control Terminals (PCTs). The FSC communicates to the FITs and PCT 24/7 through a two-wire RS485 communication circuit (i.e., Petro-Net™).

The FSC verifies the card data, collects all fuel transaction data and stores local proprietary card flies. The FSC3000 is equipped with the released PCI (Payment Card Industry) Security Standards application software (a requirement by most credit card and fleet card processors, which assures merchants and their customers that the FSC3000 Multi-trucking System does not store sensitive credit card data).

2.1 PV380 DigiServe & PV384 Lantronix Boards

Older models of the FSC3000 contain the DigiServe main board. Models manufactured after March, 2022 contain the Lantronix main board.
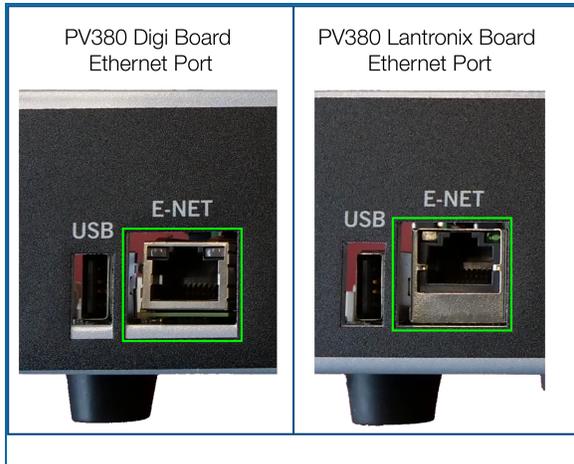
To find the type of board that is installed in your FSC3000, look at the Ethernet port on the back panel. The image above shows the differences between the ports.
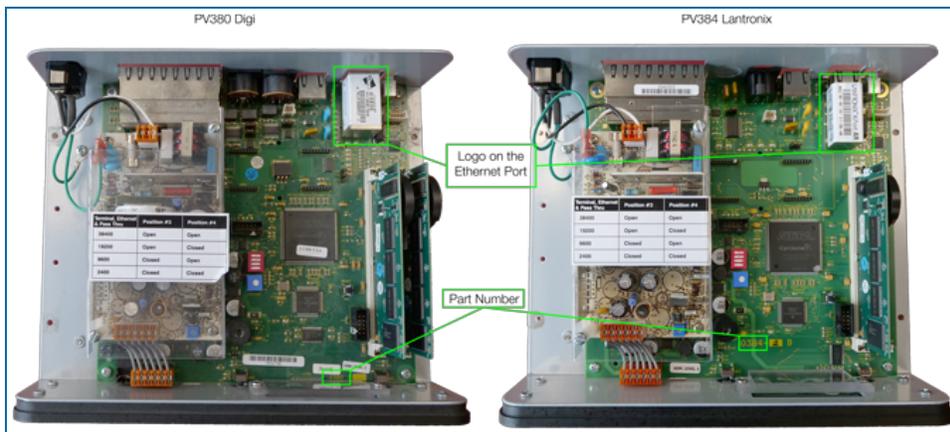
Another way to see what board is installed in your unit is to remove the cover and look for the part number printed on the board. Alternatively, you can look for the Digi or Lantronix logo on the Ethernet port label. See the image above.

You will need the correct PC software for the type of main board in your unit to configure the IP Address of the FSC3000 Fuel Site Controller's network adaptor.

To find the correct software download, go to the FMS Technical Library. Then, go to the *FSC3000 Product Entry* to find the software download you need. For the PV384 Lantronix board files, look for the file "Lantronix Device Finder." For the PV380 Digi board you will need the "Digi Device Discovery" download.

For the PV384 Lantronix board you will need to download the Lantronix Device Finder ZIP file. When you open the file, look for the pdf Lantronix Device Installer for instructions on how to configure the IP Address of the FSC3000 Fuel Site Controller's network adapter.

For the PV380 Digi board, see for instructions on how to configure the IP Address of the FSC3000 Fuel Site Controller's network adaptor.

2.2 Technical Specifications

The FSC3000 Fuel Site Controller can be contained in its own remote/desktop enclosure or installed inside a FIT. See below for additional information of a remote FSC and an integrated FSC.

2.2.1 Remote vs. Integrated FSC3000
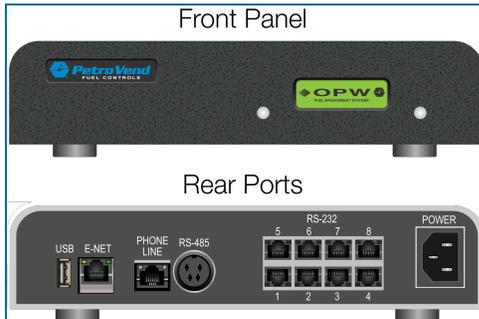
FSC3000 Remote Enclosure
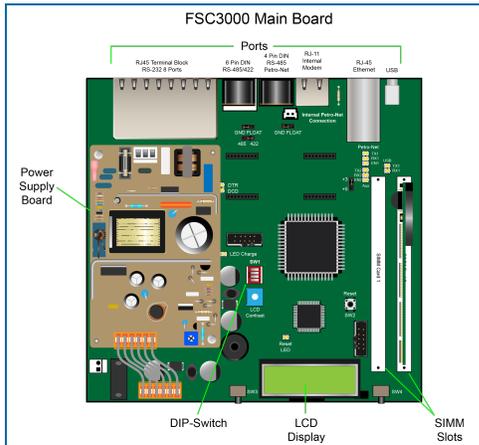
FSC3000 Board (Integrated)

Remote vs. Integrated FSC3000 Specifications		
	Remote FSC3000	**Integrated FSC3000**
Cabinet Dimensions (H x W x D)	2.25" x 10" x 8.25" (5.7 cm x 25.4 cm x 21 cm)	See specific FIT specifications
Power Requirements	85-240 VAC, 50/60 Hz; 25 watts maximum	See specific FIT specifications
Operating Temperature Range	32°F - 122°F (0°C - 50°C)	See specific FIT specifications
One (1) DIN (RS-485) Petro-Net Max. Length	5,000' (1,524 m)	5,000' (1,524 m)

2.3 Components & Diagrams

2.3.1 Main Board Components
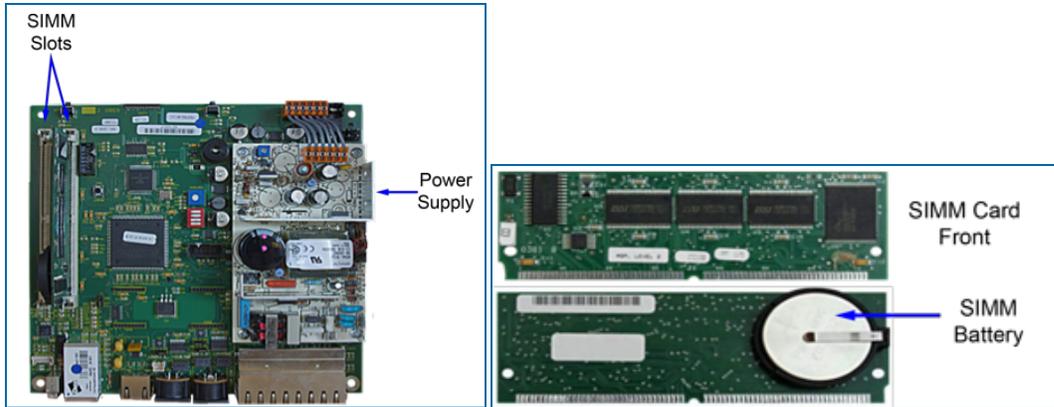
Components of the FSC3000 Main Board

The **power supply** supplies 12 VDC to the main board. This lets the main board run logic and communication circuit devices. The **main board** contains all communication circuits for a back-office PC, Petro-Net communication to the FITs and PCMs, and Ethernet communication. The main board also manages fleet network host modem, journal printer, pass-thru port communications and USB key operation.

The **SIMM** card contains the application program for the operattion of all ordered options (i.e., card/transaction memory, fleet networks, DPC, etc.) The SIMM card also contains a backup **battery** to maintain all data in memory in the event of a power loss. Remove the battery-insulating strip to activate a SIMM memory module. Gently remove the yellow strip at this time. It is recommended that the SIMM module be reseated.

2.3.2 Parts Listings & Accessories Exploded View

FSC3000 Parts List		
Item No.	Part Number	Description
1	75-2037	FSC3000 Internal Modem
2	R20-0380	FSC3000 Main Board
3	R20-0381-03*	FSC3000 SIMM Module (*requires configuration)
4	20-1517-05	FSC3000 Printer Cable
5	20-1613	RJ45 to RJ45 Ethernet Cable
6	20-1517-01	Network Modem Cable
7	20-1520-01	PC/CRT Cable
8	75-0108	USB Key
9	20-4089	Display Assy. External FSC3000
10	75-2059	Bluetooth M-7EM

FSC3000 Parts List		
Item No.	Part Number	Description
11	20-4089-01	Internal FSC3000 Display
12	20-7073	Journal Printer with Cable
13	20-7078	Network Modem
14	75-2047	Indoor Wireless Modem

IMPORTANT:
Remove this tag!

Or
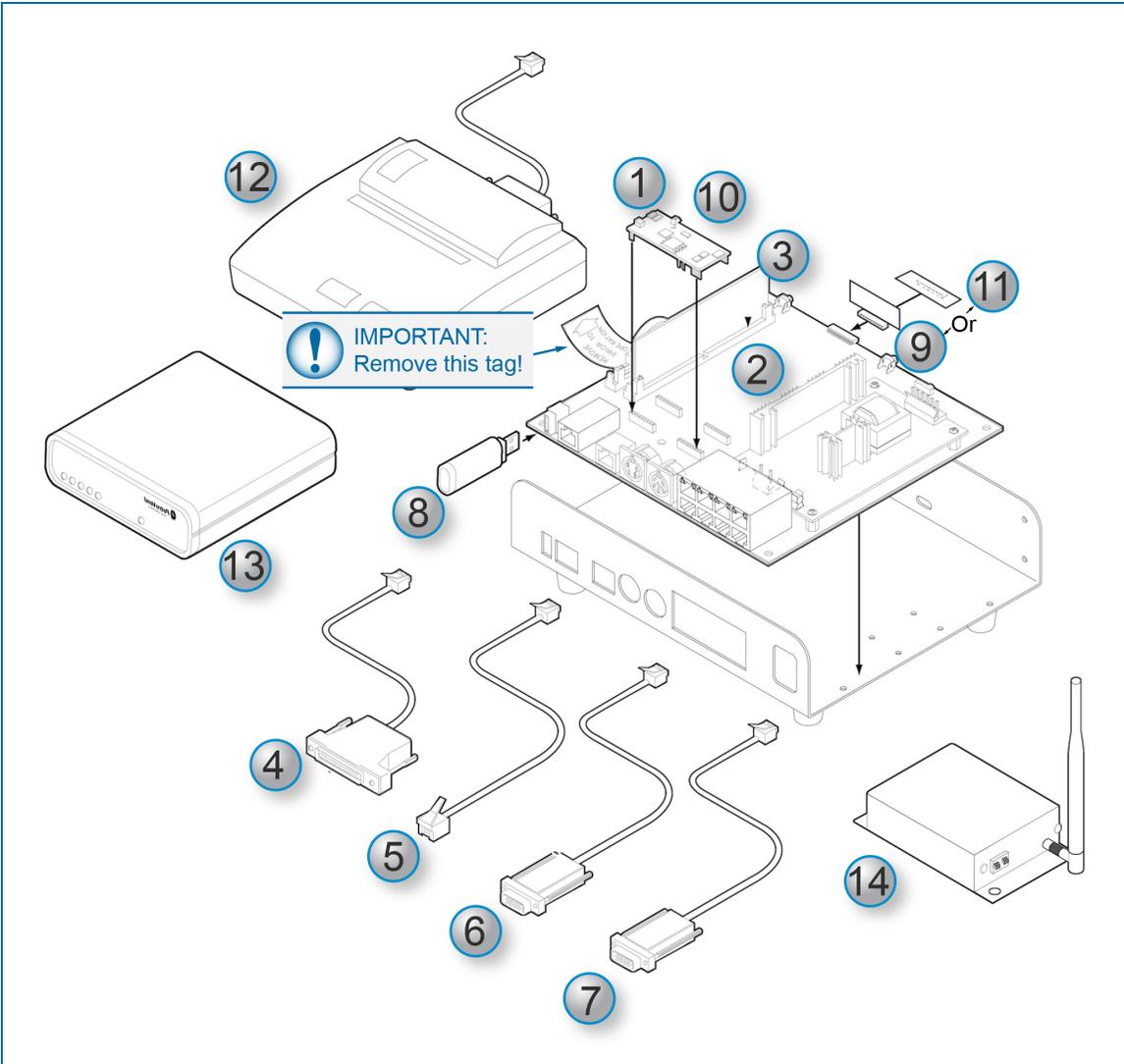
2.3.3 System Wiring Schematics

Typical System Installation Diagram with Electronic Pump Control
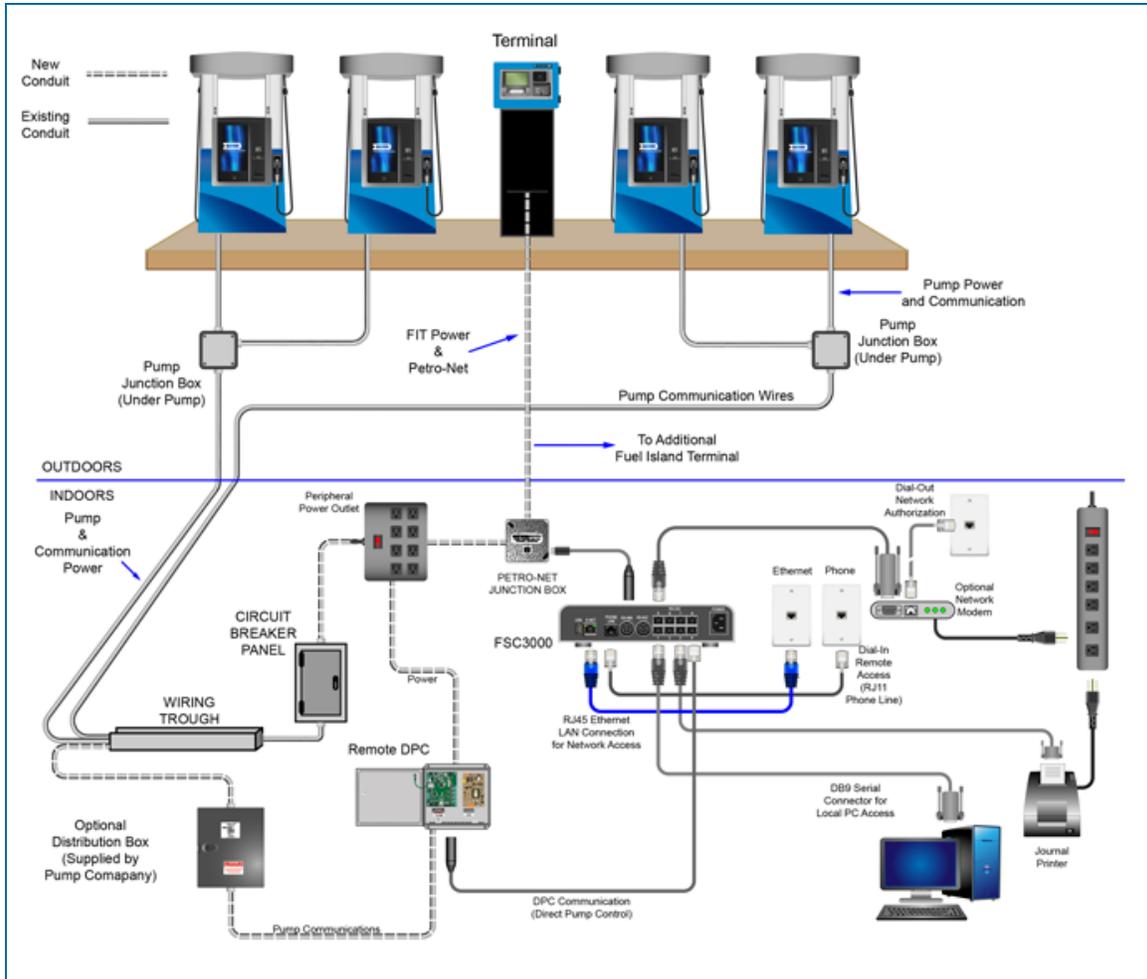
Typical System Installation Diagram with Mechanical Pump Control
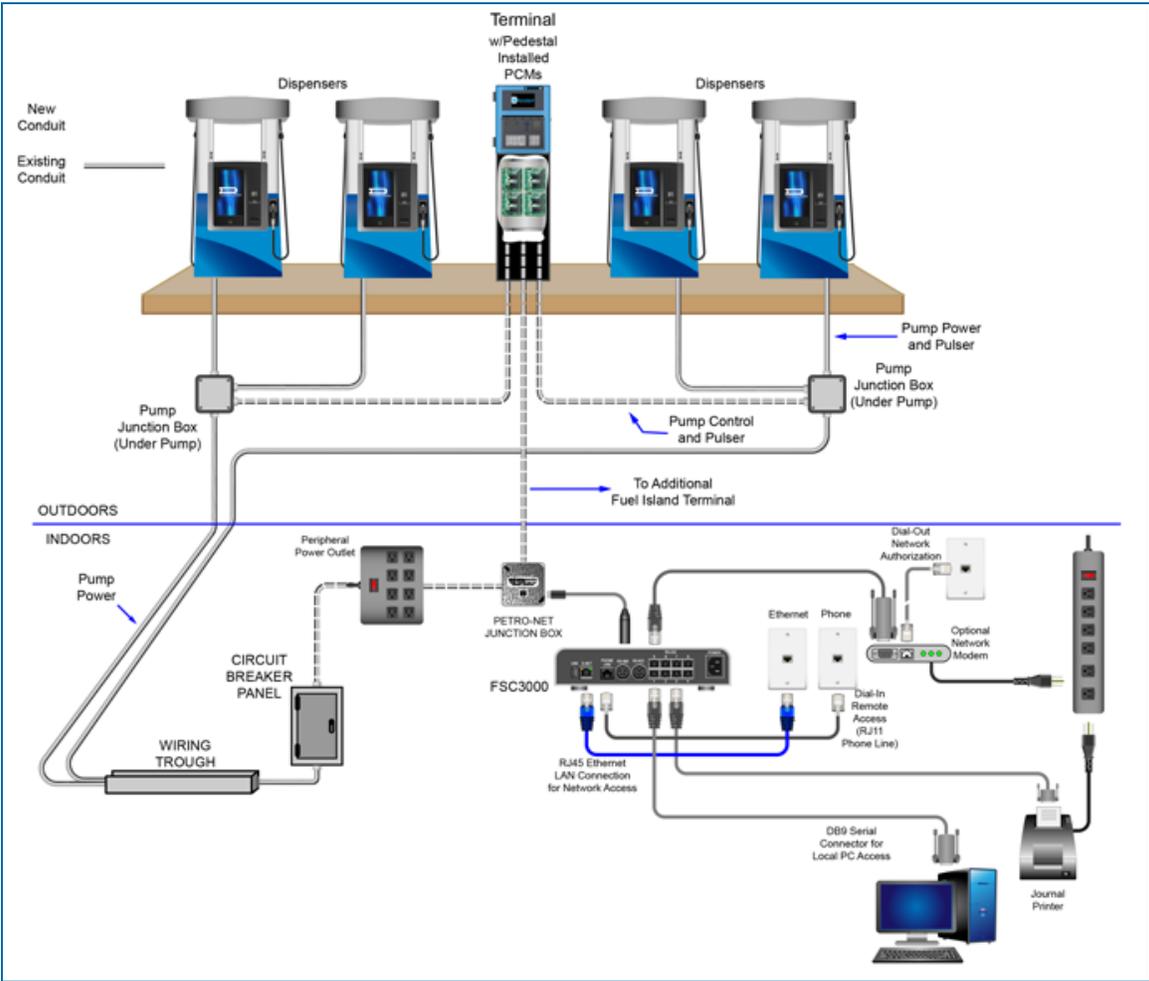
2.4 Ports

2.4.1 USB Key

P/N 75-0150
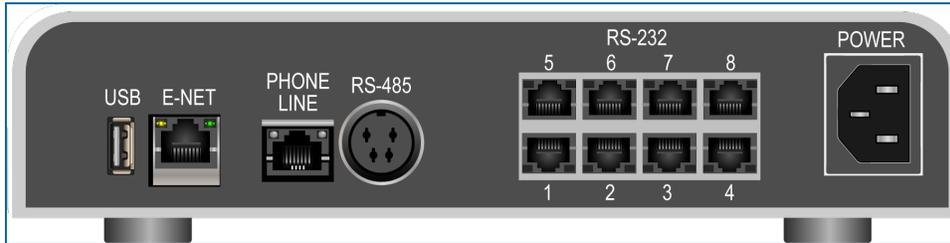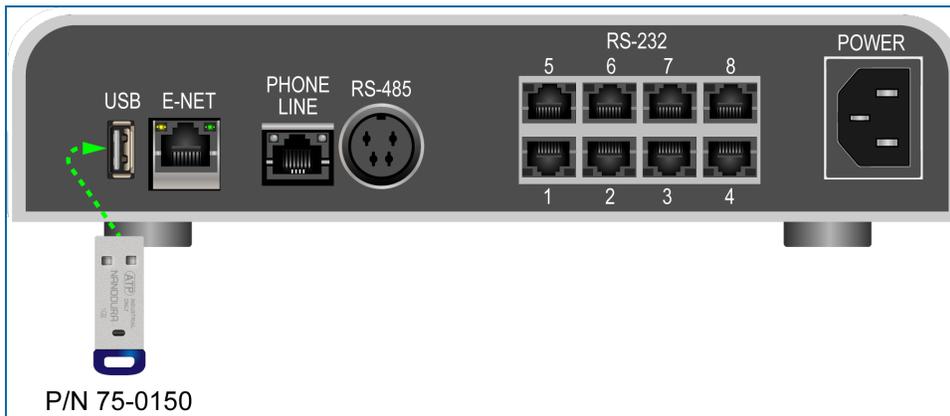
- The USB Key port will allow fuel transactions to be written to the supplied USB key.

- Ideal for using with integrated systems that do not have a PC connection to the FSC for retrieving transaction data. The USB key can then be removed from the FSC3000 and plugged into a PC. The stored transaction data could then be imported into the optional Phoenix software package used to generate reports.

- Also, if the FSC3000 has the optional card update feature, card updates can also be transferred through the USB key.

2.4.2 Ethernet
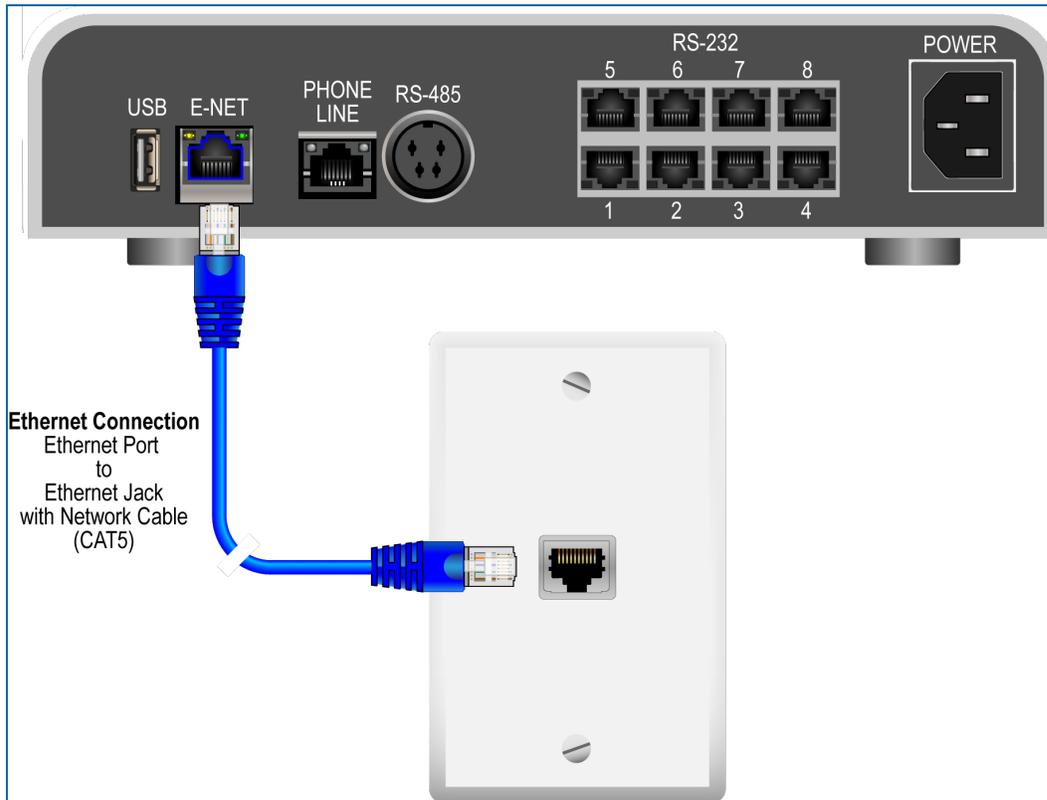
- The Ethernet port allows a remote PC connection to the FSC3000 using your company's local area network.

- When using the PCI-compliant application, the Ethernet connection is not allowed for the Admin user account.

Network Connecting via Ethernet

Ethernet connect allows you to connect to the FSC3000 through the site's network. Connect network cable (not provided) into network jack. Refer to FSC3000 Ethernet Port Setup section for configuring the Ethernet port.

> **NOTE:** Maximum cable distance of 300 feet (100 m).

2.4.3 Phone Line
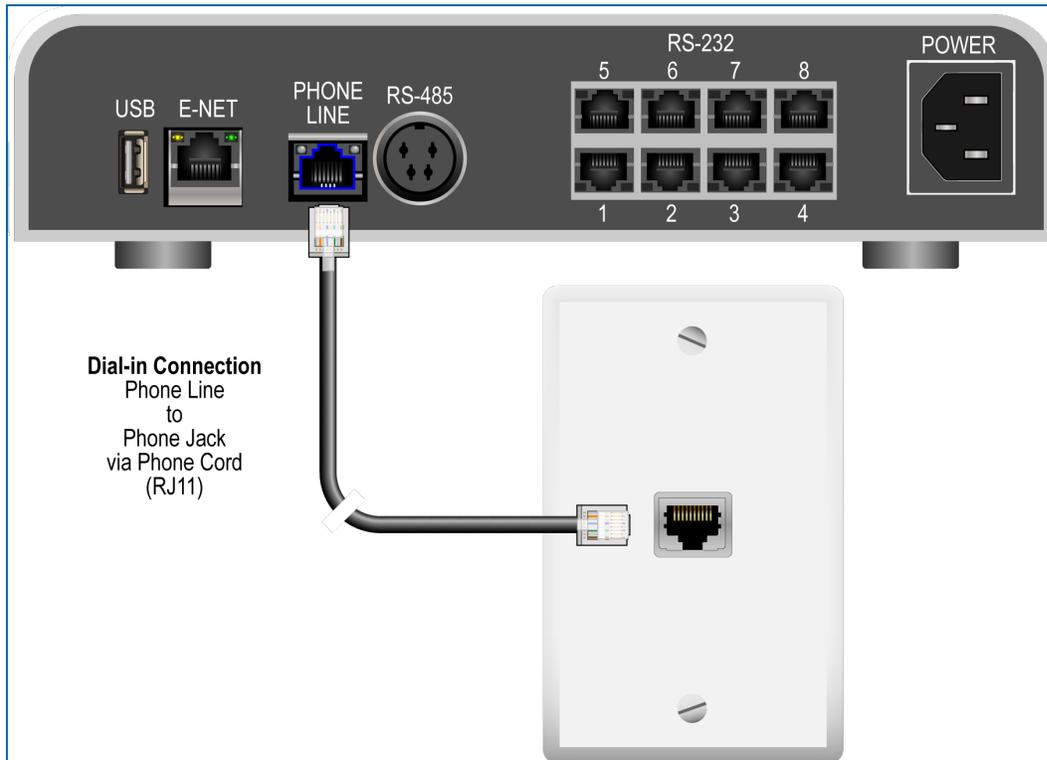
- RJ-11 Phone Line connection only used when the FSC3000 is equipped with an optional internal dial in modem.
- Can only be used with an analog phone line.

Connecting via Dial-in Modem

A Dial-In modem allows remote access by Phone Line. Connect Phone cord into the Phone Line port and connect to phone jack. Dial-In modem only supports analog Phone Lines.

2.4.4 RS-485

FSC3000 Petro-Net Connection (RS-485 port)
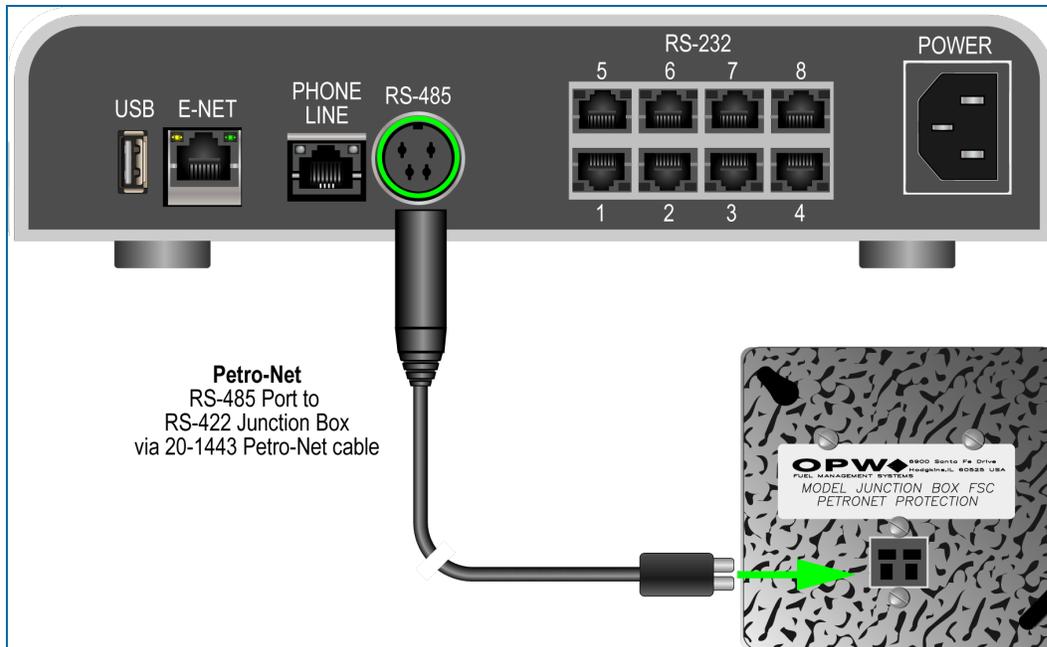
- RS-485 port connects to the supplied junction box cover. This is the communication to all Fuel Island Terminals and Pump Control Terminals. The supplied cable (P/N 20-1443) connects the J-box to the FSC3000. This is also referred to as the Petro-Net communication.

Connect FSC Petro-Net cable from FSC3000 RS-485 port to 4x4 Petro-Net junction box cover.

Description	Part #
FSC Petro-Net™ Cable	20-1443
RS-422 Junction Box cover	20-8035

2.4.5 RS-232

PC Direct-Connect Serial Communication to FSC
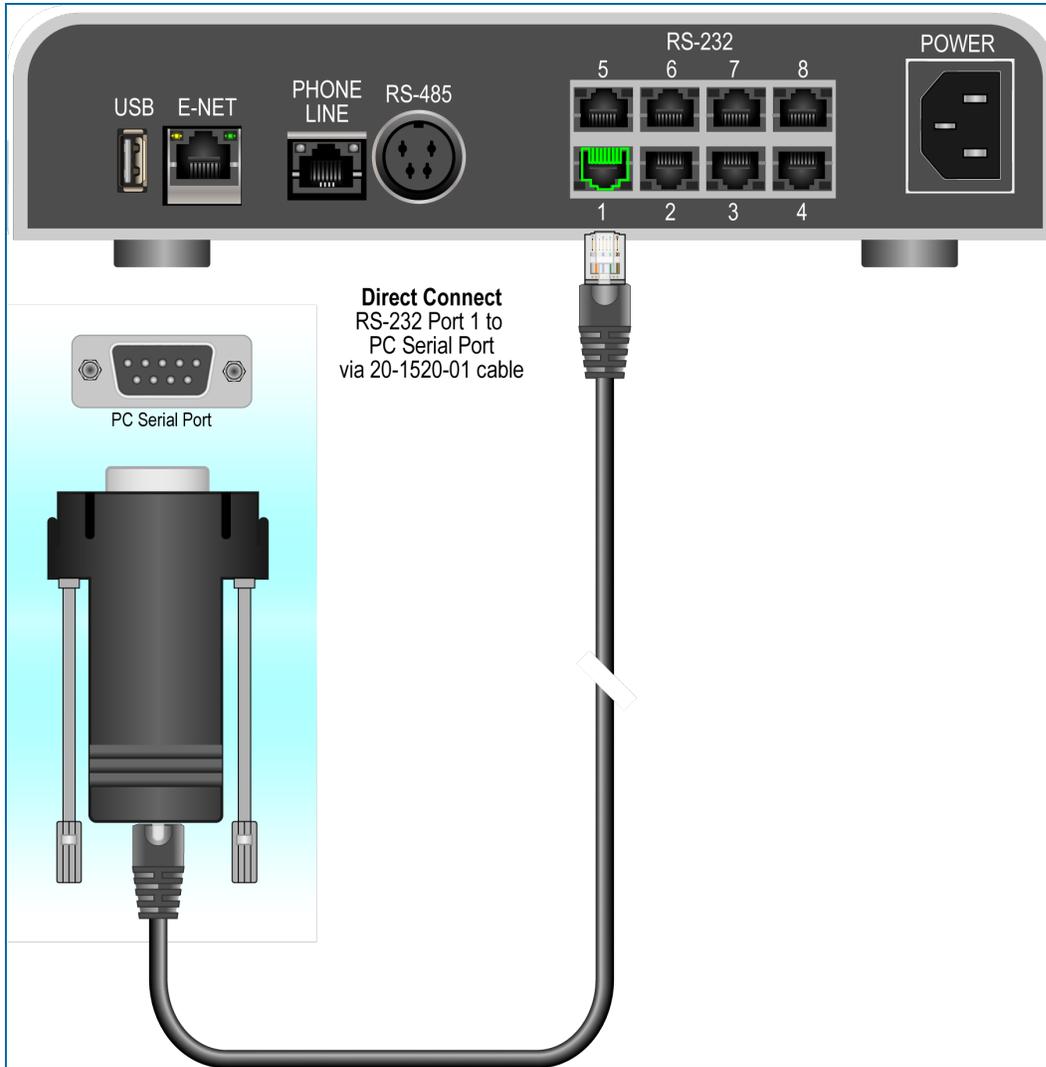
Direct Connect allows you to access the FSC3000 by serial port. If your PC lacks a serial port and you are planning on using a USB-to-Serial adapter, please call OPW for the latest recommended USB-to-Serial adapters. Connect 20-1520-01 cable RJ-45 connector into port 1 and the other side into a serial port.

- **Port 1**: Is the direct serial connection port to an onsite PC. The PC must be within 50 feet (15.2 m) and use the cable connection (P/N: 20-1520-01).

> **NOTE:** Port 1 can be connected to a serial port on the IP Gateway or a Cell Modem to provide inbound access. The maximum cable distance is 50 feet (15 m).

FSC3000 Journal Printer Connection (RS-232 port 3)

Journal Printer
RS-232 Port 3 to
Journal Printer Serial Port
20-1517-05 Journal Printer Cable
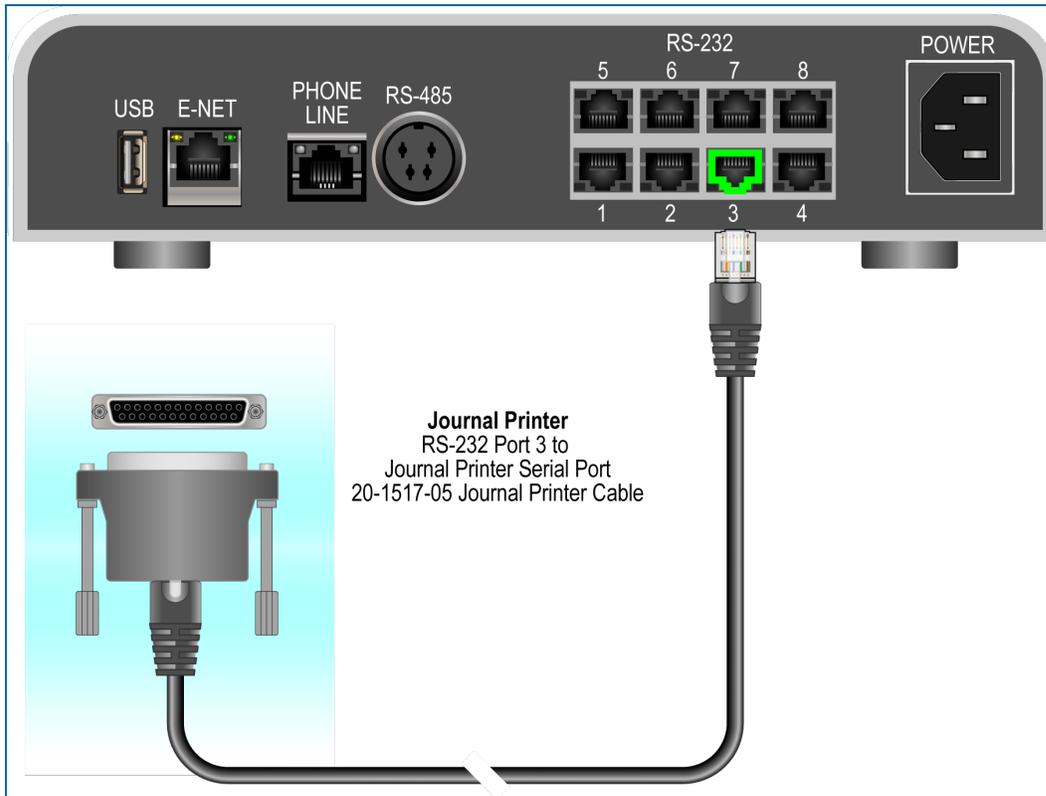
- **Port 3**: Connects to the optional journal printer with the cable connection (P/N: 20-1517-05). All transactions will be printed in real time to this printer.

All fueling transactions are printed real-time to the Journal printer. Midnight totals print at 12:00 a.m. each day. System log will print monthly when enabled.

Connect Journal printer into port 3.

Refer to Journal Printer Configuration section for setup of Journal printer parameters.

Description	Part #
Journal Printer Cable	20-1517-05
Journal Printer (Includes 20-1517-05)	20-7073

DPC Interface Connection (RS-232 port 4)

The FSC3000 supports direct pump control for Gilbarco and Wayne pumps. Refer to DPC Installation and Configuration sections for more information.

- **Port 4**: Is used to connect the FSC3000 to the DPC communication interface.

FSC3000 Host (Network) IP Gateway Connection (RS-232 port 5/6)

The FSC3000 supports a variety of networks. The system can support up to two (2) network IP Gateways (Dual Host). Second host port is optional

Connect Host IP Gateway to port 5 for single-host IP Gateway installation. Optional second-host IP Gateway connection will be in port 6.

- **Port 5**: Is used to connect the primary host fleet network IP Gateway.

- **Port 6**: Is used to connect secondary host fleet IP Gateway.

IP Gateways provide a secure connection to the fleet card networks via the Internet. There are two different Gateways:

Gateway	Part Number	Instructions	Networks
Abierto Gateway	20-6013	M00-20-6013	Paymentech, NBS, EFS and others
Micronode Gateway	20-6019-NS	M00-20-6019	Buypass

Gateway Connections:
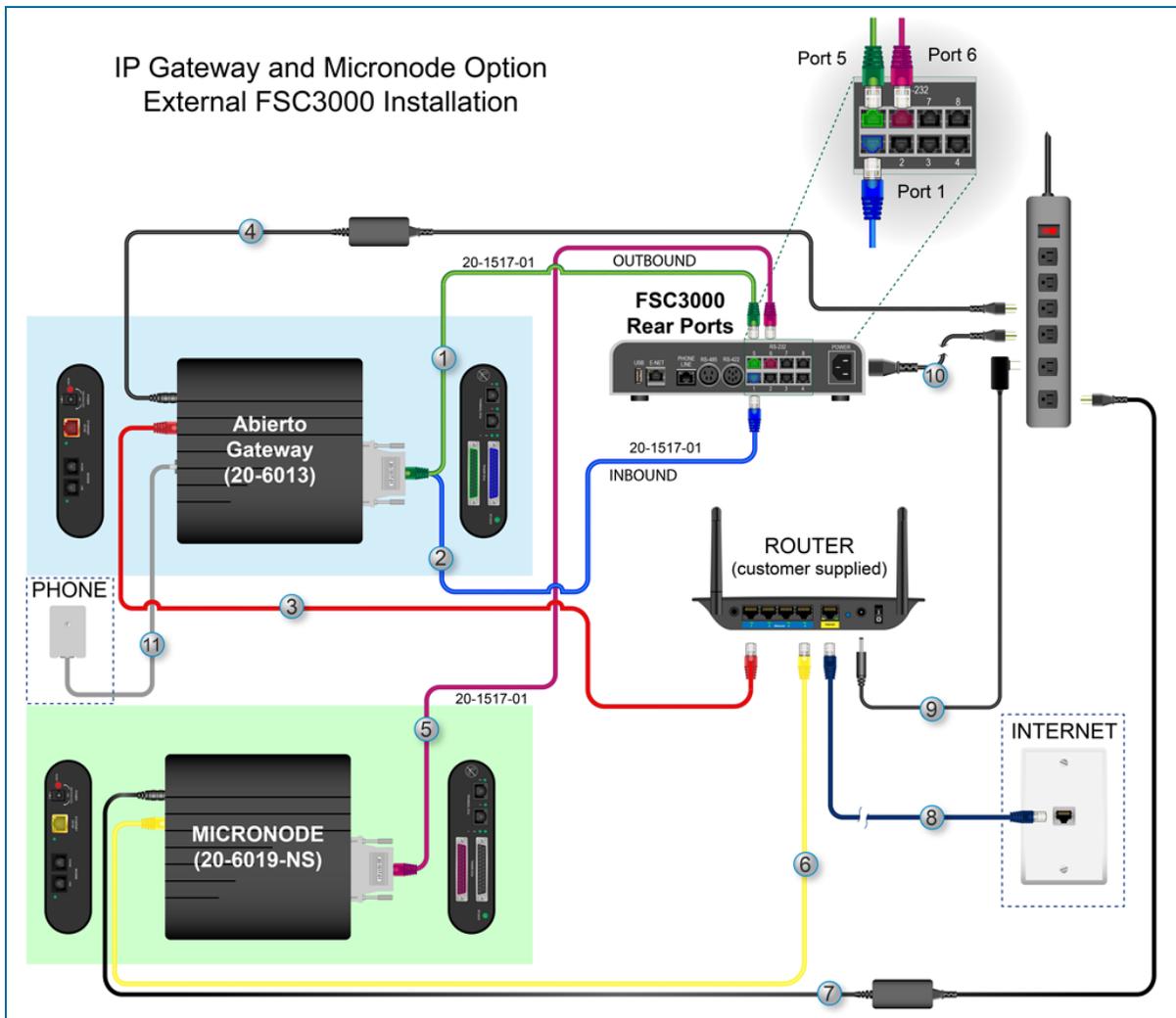
IP Gateway (Abierto - p/n 20-6013)

1. Serial port 1 on the Gateway is the connection to the card host. Use the supplied 20-1517-01 cable to connect this port to FSC3000 serial port 5, the primary authorization port (green cable in the illustration).

2. Inbound Access to the FSC for remote configuration or transaction polling (ex. Phoenix) can be provided through the second serial port on the IP Gateway (Abierto version only). This eliminates the

need for an Ethernet connection directly to the FSC3000. To make this connection, connect another 20-1517-01 cable from serial port 2 on the IP Gateway to port 1 on the FSC3000 (blue cable in the illustration).

3. Connect a standard Ethernet cable (not supplied) from the Ethernet port on the Gateway to an Ethernet access point at the fuel site, typically an Ethernet router (red cable in the illustration).

4. Plug the Gateway power supply into an outlet and into the Gateway's power input.

IP Gateway (Micronode p/n 20-2019-NS)

To use a second Gateway:

5. Connect a 20-1517-01 cable from the second Gateway to FSC3000 serial port 6, the secondary authorization port (violet cable in the illustration).

6. Connect a second Ethernet cable (not supplied) from the second Gateway to another Ethernet access point (yellow cable in the illustration).

7. Plug the Gateway power supply into an outlet and into the Gateway's power input.

Other Connections:

8. Make sure your Access Point/Router is connected to the internet (navy cable in the illustration).

9. Make sure your Access Point/Router power cable is connected to an outlet.

10. Make sure the FSC3000 power cable is connected to an outlet.

11. The Abierto Gateway can use a dial-up phone line as a backup if the Internet connection is down. To use this feature, plug a phone cord from the Gateway into an analog phone line (gray cable in the illustration).

Cellular Options

FMS Part Number 20-7500-EXT-T - External Cellular Option (AT&T)

FMS Part Number 20-7500-EXT-V - External Cellular Option (Verizon)

The External option is for remote installations where the FSC3000 is located in an office.

The External Cellular Option kit includes:

20-7500-EXT-T and 20-7500-EXT-V		
Part Number	**Description**	**Qty**
20-1617 / 20-1618	Cellular Wireless Cellular Modem: 20-1617 for AT&T *or* 20-1618 for Verizon	1
75-2062	Cellular 4G Blade Antenna	2
07-3017	Power Supply	1
20-1519-01	CABLE RJ45 TO DB9M (DTE)	1

> **NOTE:** Inbound serial communication parameters: 38400,7,E,1

> **NOTE:** Part Numbers in **Green Bold** text in the component list above are availabe as replacement items. See the newest Fuel Control Price List for order information and pricing.

FSC3000 External Connections: Inbound/Outbound with Cellular Modem and IP Gateway
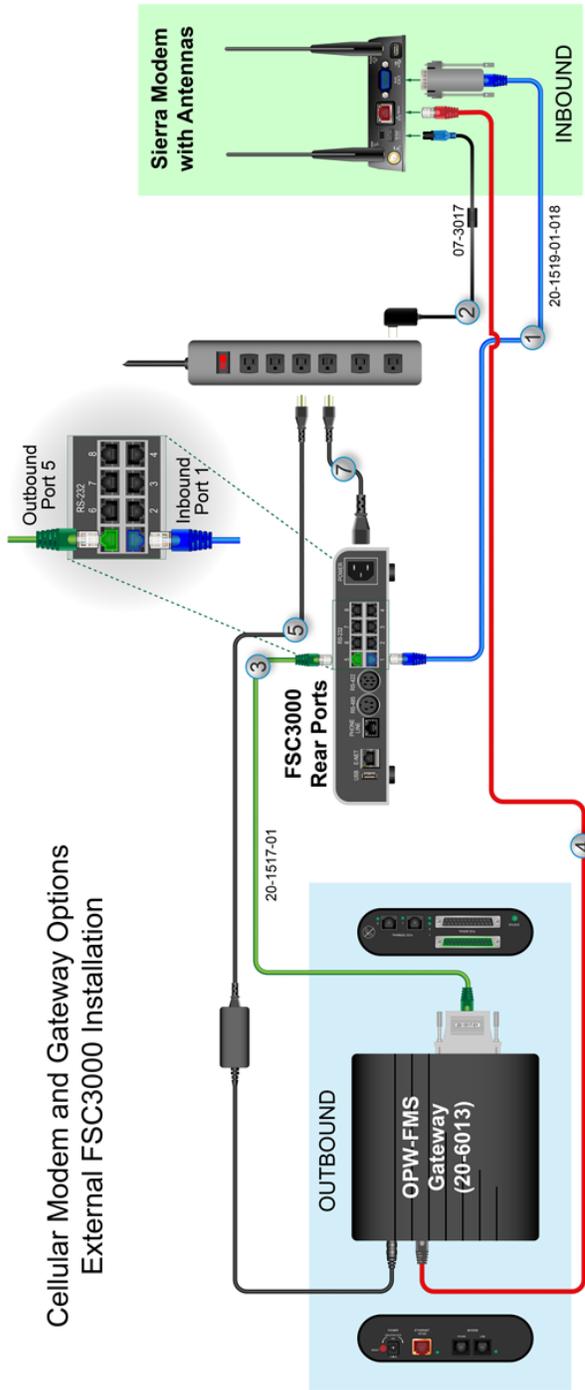
Inbound Connection: FSC3000 and Cellular Modem

> **NOTE:** The colors of the cables in the illustration are used to show the routing of the wires only.

Connect the two (2) supplied blade antennas to the Cellular and Diversity coaxial connectors on the Cellular Modem before you connect the wiring.

1. P/N 20-1519-01-018:

   - Connect the **DB9 Male connector end** to the **RS232 Port** of the Cellular Modem.

   - Connect one end of the **CAT5e Patch Cable** to the RJ45 socket side of the Connector and the other end to the FSC3000 RS232 Port #1.

2. Cellular AC-12VDC Power Supply P/N 07-3017:

   - Connect the 4-Pin clip connector plug to the DC Power socket of the Cellular Modem.

   - Connect the AC Adapter end to an AC power outlet.

Outbound Connection: FSC3000 and IP Gateway

3. P/N 20-1517-01:

   - Connect the DB25 end of the cable to the POS Serial Port 1 of the IP Gateway.

   - Connect the RJ45 end of the cable to the FSC3000 RS232 Port #5.

4. CAT5 cable (not supplied):

   - Connect one end of the cable to the Ethernet port of the IP Gateway.

   - Connect the other end of the cable to the Cellular Modem Ethernet port.

5. Power Cable (supplied):

   - Connect the barrel end plug of the cable to the Power jack of the IP Gateway. Push the end into the socket and turn 90° clockwise to lock the plug.

   - Connect the AC Adapter end to an AC power outlet.

6. Be sure your Network Router power is connected to an AC power outlet.

Host (Network) IP Gateway Testing

The Abierto Gateway also provides inbound communication, eliminating the need for a second Ethernet connection.

1. Testing the Network Card Authorization - Configure the FSC3000 to communicate on "dial" to the processor as if you were to use a new OPW modem and phone line.

2. Power ON and wait for the "status" light to flash green (approximately once every second).

3. Configure the router to "port forward" any traffic for port 8002 to the IP address of the Gateway Converter.

4. Run a test transaction for each processor at the site. If the FSC3000 fails to process cards, make note of the error received and call OPW Tech Support at 877.697.8324 for assistance.

5. Test the Inbound connection to the OPW FSC3000 using the external IP address for the site and port 8002 (Abierto only).

Future Media Price Sign (RS-232 port 7)

The FSC3000 has the ability to interface to a Future Media price sign. If purchased, plug a 20-1519-01 cable from port 7 on the FSC3000 to the PriceVision® control unit.

Port 7: Is used to connect to an optional Price Sign interface. The Price Sign option will allow the FSC300 to interface with the Future Media Price Vision Displays that use Price Vision protocol with version 1.07. Using this option allows the FSC3000 to send current pricing to the display.
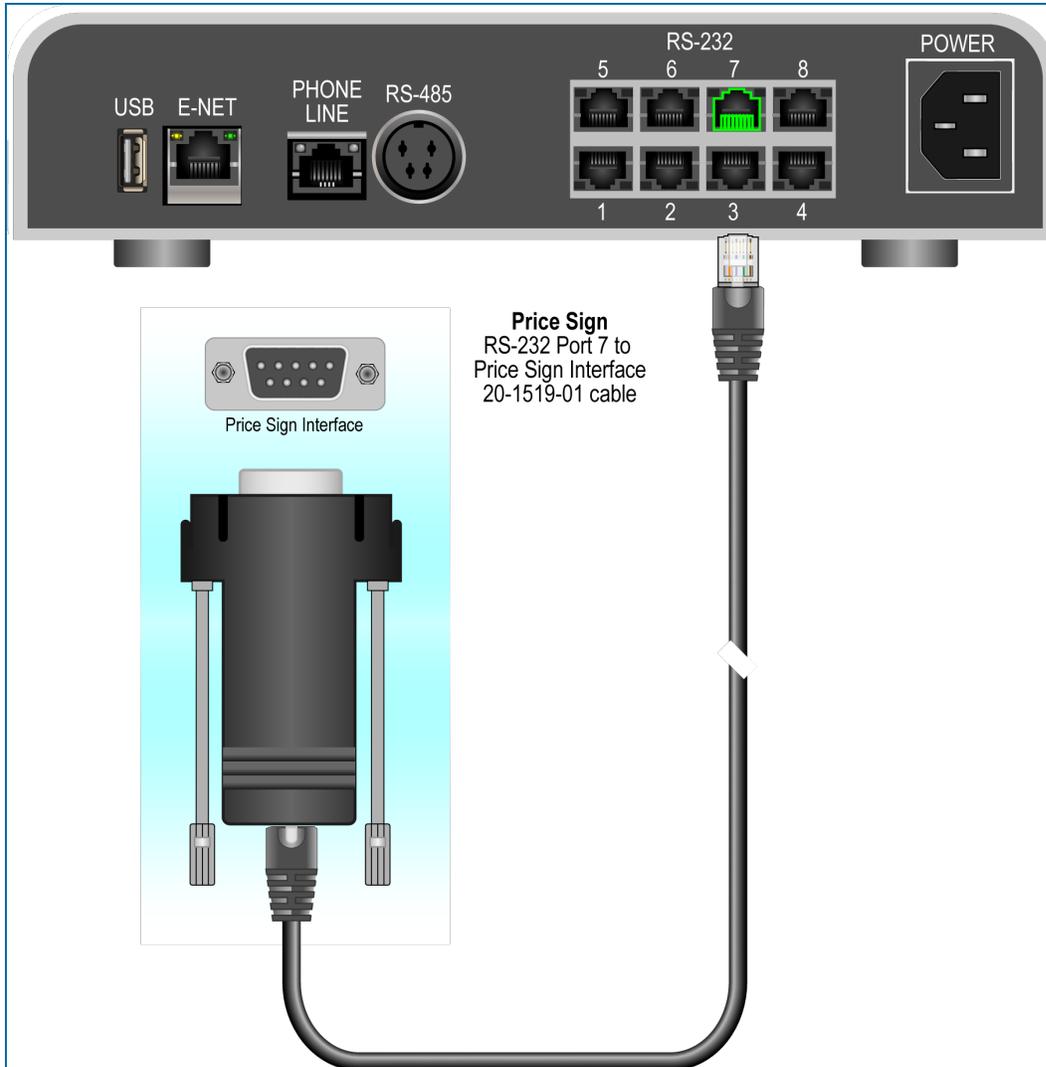
Pass-Thru Connection (RS-232 port 8)

The FSC3000 supports a Pass-thru Connection that allows you to utilize the single-access connection like the modem to access a second device, eliminating the need for the device to have its own phone line,

Ethernet, etc., connecting hardware.

- **Port 8**: Allows a secondary device such as an OPW Automatic Tank Gauge to be communicated with a PC through the FSC3000 Pass-Thru serial port. This eliminates the need for an additional PC connection to the Tank Gauge for sites using the optional Phoenix™ software, polling both the FSC3000 fuel transactions and ATG data for performing site reconciliation.

    - Communication parameters for the ATG connected to the Pass-Thru port must match the FSC3000 communication parameters.

2.5 Installation

2.5.1 Integrated FSC3000 Communication Conduit

Follow the instructions below if the FSC3000 is to be installed in one of the FITs.

> **NOTE:** If the installation is for a Remote FSC3000, see <u>"Remote FSC3000" on the next page</u>.
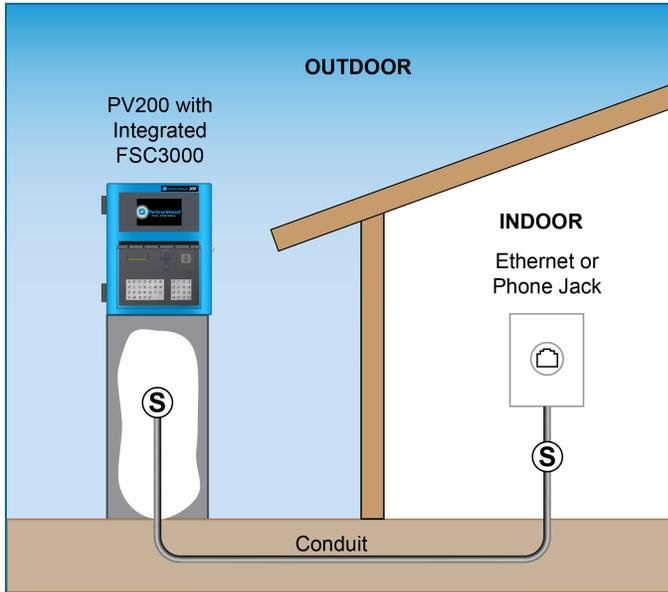
This conduit is required when you use a FIT with an integrated FSC3000 controller. This conduit will provide access for a phone line or Ethernet connection [300' (91.4 m) max.], or Serial Cable [50' (15.2 m) max.] to access the FSC3000.

Wires	*Wire Requirements*
Serial Cable	50' (15.2 m)
Phone-Line	N/A
Ethernet Cable	300' (91.4 m) may be extended with repeaters

> **NOTE:** This conduit is not required when using stand-alone FSC3000 or wireless communications.

2.5.2 Remote FSC3000

The remote FSC3000 must be placed in an office-like environment. The FSC3000 Petro-Net junction box should be mounted within 6' (1.8 m) of the FSC3000 controller.

2.5.3 SIMM Activation

The FSC3000 contains a SIMM memory module that must be activated by removing the battery-insulating strip. Gently remove the yellow strip at this time. It is recommended that the SIMM module be reseated.

2.5.4 Wireless Radio Modem Installation

Wireless radio modems can be installed to eliminate the need for a hard-wired Petro-Net connection from the FIT(s) at the fuel island to the FSC3000 located in a building.

They can also be used to connect between FITs at different fuel islands.

See OPW Manual M00-20-7074 for complete information on the suitability and installation of these modems.

> **NOTE:** Currently, wireless Petro-Net™ is not supported on OPW AVI-enabled systems.

2.5.5 Additional System Options

Prior to Configuration, Startup and Testing, per your specific system parameters, install any applicable FITs or pump control options purchased with your system. Refer to the applicable documentation for the terminal that you will install.

2.6 Physical Configuration

2.6.1 FSC3000 Access Connections – Baud Rate Setting

Set connection baud rate to desired connection rate (default 38400). Unless needed, it is recommended that the FSC3000 access baud rate be set to 38400 for maximum ARTWare™ performance.

> **NOTE:** When using pass-thru port-connected devices, the FSC3000 access baud rate must be the same as the device that is being connected to the pass-thru port. If possible, set the device to the highest setting the FSC3000 supports.

FSC Access Baud Rates - Switch 1, Positions 1-4
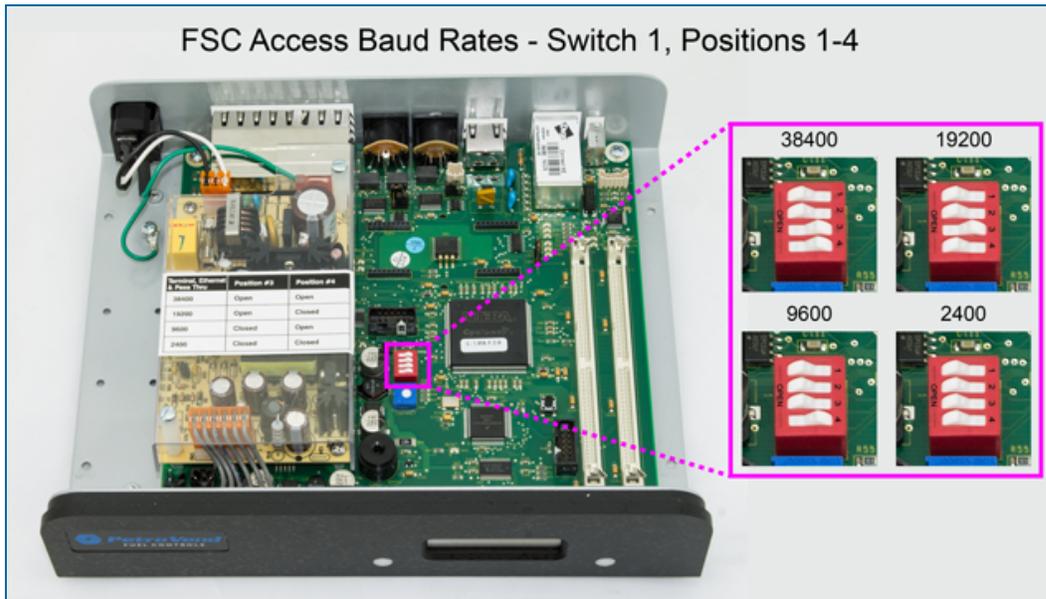
2.6.2 Direct-Connect Serial Communication to PC

Set the communication parameters as follows:

- Baud Rate: Up to 38400
- Data Bits: 7
- Parity: Even
- Stop: 1

2.6.3 PC Connection via Dial-In

This method uses the optional internal modem you remotely connect to the FSC3000 via an analog phone line.

Set the communication parameters as follows:

- Baud Rate: Up to 38400

- Data Bits: 7
- Parity: Even
- Stop: 1

2.6.4 PC Connection via Built-in Ethernet Adapter

The LED status lights indicate the following:

LED Light Behaviors		
Network Link Status Top-Left (yellow)	OFF: No Link Has Been Detected	Link Status (Integrity) Network Activity (Diagnostic)
	ON: Link Has Been Detected	
Serial Port/Network Activity Top-Right (green)	OFF: Serial Channel is Idle	
	BLINKING: Serial Data is Transmitted or Received	

2.7 Startup & Test

2.7.1 Cold-Start

Once the FSC3000 has been configured for the site-specific components and operating parameters, the entire system operation must be tested. Begin, by cold-starting your FSC3000.

NOTICE: Double-check the wiring before applying power to the system components. Applying line voltage to low-voltage inputs will damage the system.

The FSC3000 performs a COLD START the first time it powers up. This initializes the system and sets all the parameters to their default values. One of the defaults is to enable FIT 1 and PCT 1 positions 1 and 2 for testing. The FSC3000 must then be configured with the site-specific information using ARTWare™ or Command-Line programming.

Cold starting the FSC3000 forces all of the system parameters to be reset to factory defaults.

NOTICE: All card records and transaction data will be erased! Be sure this is the desired outcome before executing this procedure.

1. Remove the power cord from the back of the FSC3000.
2. Press and hold both front panel buttons while simultaneously plugging the power cord back into the FSC3000.
3. Wait for a beep, then release the buttons.
4. Verify the system displays 'COLD START' and check for proper operation.

2.7.2 Software Configuration

ARTWare™

ARTWare is a Windows PC-based configuration utility that simplifies the programming of the FSC3000. ARTWare can be used in an online or off-line mode. In the online mode, changes to the configuration are made immediately. In the off-line mode, changes will be downloaded to the FSC3000 when a connection is established.

ARTWare also creates backup data files for the configuration parameters, which are useful if the FSC3000 ever needs to be restored, and supports a direct serial-wired connection, a remote modem connection or an Ethernet connection.

For more information about ARTWare refer to the M3034 ARTWare Fuel Control Software Reference Guide.

Command-Line Configuration

You can also program the FSC3000 using the Command-Line Configuration Guide. Use HyperTerminal or another terminal emulation program to establish communication with the FSC3000. Next, type in the desired

commands. For more information refer to the M00-051.00 Command-Line Configuration Guide.

2.7.3 FSC3000 Ethernet Port Setup

Before connecting to the FSC via its Ethernet adapter for card management and polling, you must configure the Ethernet device.

Connecting the FSC to the Network

1. Before attempting to run the configuration utility, connect the FSC to the network using a standard CAT5 network cable.

2. Remove the FSC power cable.

3. Connect one end of the cable to the device that provides an entry point into the network.

4. Connect the other end to the port label "E-NET" on the back of the FSC.

5. Plug the FSC power cable into the controller.

Configuring the FSC IP Address

ARTWare contains the software needed to configure the IP address of the Fuel Site Controller's network adapter. ARTWare can be downloaded from theFMS Technical Library at ARTWare Download.

See "PV380 DigiServe & PV384 Lantronix Boards" on page 21 for information on what main board is installed in your FSC3000.

Instructions for IP address configuration with the PV384 Lantronix board can be found in the Lantronix Device Finder file.

Instructions for IP address configuration with the PV380 Digi board are as follows:

1. Download the Digi Device Discovery file.

2. In this folder is the program called "digiserve.exe".

3. Run this application to configure the device's IP address.
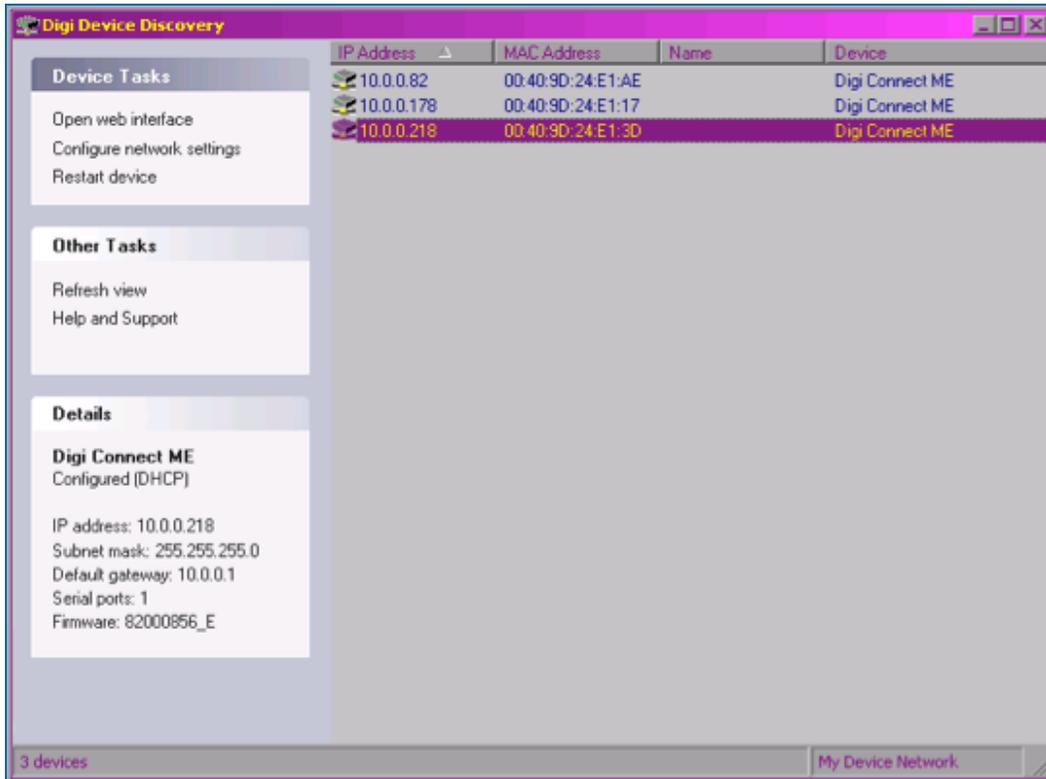
NOTE: If an error occurs when attempting to run the application, the machine may not have all the files necessary to run the program. In this case, you can run an installation program to install the application. The install can be found in the folder called "Full Install" under the current "Digi" folder.

4. Run the digiserve.exe application. You will see the window shown here.

5. If the device is not seen, click the [Refresh View] link in the "Other Tasks" section every couple of seconds until the device appears in the list.

6. Once the Digi Device Discovery program identifies the device, you can choose to configure the device to have a static IP address or to automatically obtain an address from the DHCP server.

7. With the Digi device selected, click the [Configure network settings] option in the [Device Tasks] section of the program to configure the IP address.

NOTE: Because the OPW applications used to configure and manage the FSC require that a specific IP address and port number be entered, OPW recommends configuring the FSC to a static IP, or the DHCP server should be configured to always assign the same IP address to the MAC Address shown.

> **IMPORTANT:** The FSC3000's network port setting is set to 2101 during manufacturing. It might have been changed during the FSC3000's network setup. Make sure the port settings match.

USB Memory Key Operation

A USB memory key can be inserted into the USB port on the FSC3000. The key can be used for two purposes:

- It will store transaction data in a format that can be imported into Phoenix™.

- It will process a card update file created by Phoenix. (This is an optional feature.)

FSC3000 USB Key Setup

The FSC3000 must be set up to function with the USB key using ARTWare, or set manually by using the *[Set Journal]* command.

The default Phoenix site ID is 000. This setting disables the USB key from recording transactions.

Set the Phoenix site ID to the desired number. This number will be stored with each transaction record and imported into Phoenix™ for reporting purposes. Each site should have a unique number to identify where the transaction took place.

USB Key Card Update Operation

The FSC3000 detects when a key is inserted and displays the message *[USB Key Inserted]*. The FSC3000 checks to see if the key contains a card update file with a matching site ID. If so, the message *[Processing Card Updates]* will be seen while the FSC is updating the positive card file.

When complete, the card update file is deleted and the display will show *[Card Update Complete – Remove Key]*.

The Key must then be removed. It can be reinserted, or a different key can be inserted to begin storing transaction data.

USB Key Transaction Recording Operation

The FSC3000 detects when a key is inserted and displays the message *[USB Key Inserted]*. If no card update file is present on the key, the FSC3000 will use the key to store transactions. If there is an existing transaction file, new transactions will be appended to the file. If no transaction file exists, one will be created. In either case, the message *[USB Key Logging Transactions]* will be displayed.

Removing a USB Key with Recorded Transactions

> **IMPORTANT:** Never remove the USB key without following these steps first; corrupted data could result.

1. Press one of the function buttons on the FSC3000 until the *[USB Key Inserted]* message is displayed.

2. Press the function key one more time to display the message *[Log All Transactions Now?]*.

3. Press the **<No>** (Left) function button to select. The message *[Remove Key?]* is displayed.

4. Select **<Yes>** and wait while the system writes the end-of-file marker to the key. The message *[Please Remove Key]* will be displayed and three beeps will be heard.

> **NOTE:** Transactions may still take place while the key is removed. The system will store these transactions in the main system buffer until a new key is inserted.

Using a USB Key with Phoenix

When using Phoenix with the USB key features of the FSC3000, perform the following steps.

Initial Setup

1. Open Phoenix and select *[Utilities]* from the menu and then select **[Options]**.

2. Click on the **[File Locations]** tab.

3. In the [Active Database] frame, click on the text box that shows the **[Default Database Path]**.

4. With the text selected, right click on the text and select **[Copy]**.

5. Open a Windows Explorer window and paste the copied text into the Address bar at the top of the window and press **<Enter>**. Or, locate the data folder as shown in the *[Default Database Path]*.

6. Once the Phoenix data folder is found, right-click on the Data folder itself and select *[Copy]* from the menu.

7. Right-click on the PC Desktop and select *[Paste Shortcut]* from the menu. This now provides a direct access path to the Phoenix data folder for the following operations.

Importing Transactions from the USB Key into Phoenix

1. Using the USB key from the FSC, plug it into the PC, and open a Windows Explorer window to the USB key.

2. Locate the file named: *[K2500.trn]*.

3. Right-click on the file and select *[Cut]* from the menu.

4. Open the shortcut to the Data folder that was created above.

5. From the *[Edit]* menu, select *[Paste]*.

> **NOTE:** If Windows prompts to overwrite this file, answer <No> and follow the steps below. Otherwise, skip ahead.

6. Open Phoenix and from the *[Utilities>Transactions]* menu select *[Import Poll File]*.

7. Once the existing poll file is imported you can start again from step 1.

8. If an error occurs during the import process you must resolve these before moving the new poll file from the key. If not, fueling data may be lost!

9. Open Phoenix and from the *[Utilities>Transactions]* menu select [Import Poll File].

10. You can now return the USB key to the FSC.

NOTE: This is an optional feature on the FSC3000.

1. Select the [Update Cards] option from the *[Utilities]* menu. After the update files are created and the *[Update Cards]* dialog box appears allowing you to select the site for update, click *[Cancel]*.

2. Connect the USB key you want use for card updates to your PC.

3. Open the shortcut (created above) to the data and locate the *[CUxxx]* file associated to the site you expect to update, where [xxx] is the FSC3000's Phoenix site ID.

NOTE: This Site ID must match the Site ID programmed into the FSC3000.

4. Right-click on the desired *[CUxxx]* file and select *[Cut]* from the menu.

5. Open a Windows Explorer window to the USB key and select *[Paste]* from the *[Edit]* menu.

6. Once the file is copied, remove the USB key and place it in the FSC to perform the update card.

Journal Printer Setup

Menu Option	Setting	Menu Option	Setting
Page length for tractor	11" (28 cm)	Parity	Even
Skip over perforation	Off	Data length	7-bit
Auto tear off	Off	Parallel I/F mode	Off
Auto line feed	Off	Packet mode	Off
Print direction	UNI-D	Character table	Italic
Software	ESC/p	International character set	USA
0 slash	On	Manual feed wait time	1.5 seconds
High speed draft	Off	Buzzer	Off
I/F mode	Serial	Auto CR	Off
Auto I/F wait time	10 seconds	IBM character table	Table 1
Baud rate	1200	N/A	N/A

System Testing

Once the FSC3000 has been configured for the site-specific components and operating parameters, the entire system operation must be tested.

FSC3000 Testing Checklist	✔
Verify all connection methods to be utilized by site are functional (direct, modem, Bluetooth®, etc.)	
Verify all FITs, PCMs, UPCs are communicating on Petro-Net	
Verify all FSC3000 options required are enabled - (Networks, DPC, transaction/card limits, etc.)	
Verify card buffer is set up to customer needs	
Verify Journal Printer print transactions	
Verify Printer has required information	
Verify system allows/disallows fueling when printer is off	
Verify USB records transaction	
Verify system allows/disallows fueling when USB is removed	
Verify if device is installed on Pass-Thru port it is accessible	
Verify if equipped, Price Sign shows correct price	
Network-enabled systems	
Verify network card can authorize pump	
Verify transaction is recorded correctly	
Verify with network transaction is captured correctly	
Phoenix-equipped systems	
Verify Phoenix™ can connect to FSC3000	
Verify FSC3000 transaction string is set correctly for polling	
Verify Phoenix™ tables match FSC3000 tables (i.e., products, restrictions, etc.)	
Verify Card update process works	
Verify Polling works	
Verify if Phoenix™ has reconciliation and equipped ATG can be polled (i.e., Pass-Thru, direct, etc.)	

Section 3 Pump Control

The FSC3000 fuel control system has two(2) primary methods to control fuel dispensers.

- **Pump Control Module (PCM)**: This is a mechanical dispenser control solution that uses a stand-alone board. PCMs can be installed in a terminal pedestal and can use up to two (2) pairs of Master/Client board combinations or can be installed in a remote enclosure that contains one Master and one Client. Refer to the M00-20-0340 Pump Control Module and M00-20-0340-03 DIV2 (for Class I, Division 2 Hazardous Location installations) PCM manuals for information on the installation, operation and maintenance of PCMs.

- **Direct Pump Control (DPC)**: This is an electronic dispenser control solution that lets the FSC3000 directly control electronic dispensers through the manufacturer's dispenser protocol. The FSC3000 can communicate directly with Wayne, Gilbarco and Gasboy® dispensers. Refer to "Direct Pump Control (DPC)" on the next page for information.

  - Dispenser Terminal Control (DTC): This electronic control method uses the dispenser's built-in card terminal as an alternative to a fuel island terminal. This method emulates the fuel island terminal for each fueling position connected to the system. **DTC control must use DPC electronic pump control to operate and uses the same conduit wiring**. Refer to "Dispenser Terminal Control (DTC)" on page 69 for information

3.1 Direct Pump Control (DPC)
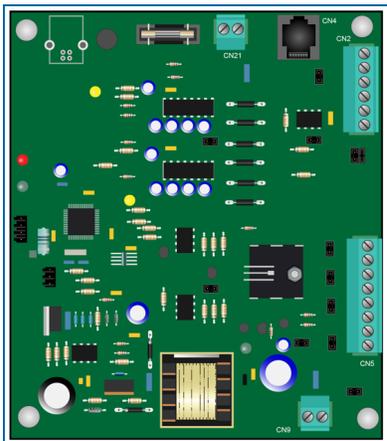
Illustration of a DPC Board

3.1.1 Wayne and Gilbarco

Wayne dispensers can connect directly to the DPC interface board or the Wayne Data Distribution Box can be used. Up to eight (8) dispensers can be connected to control a maximum of 16 fueling points (if the dispensers are double-sided), or eight (8) fueling points for single-sided dispensers, or any combination.

Gilbarco dispensers can connect directly to the interface board, or the Gilbarco Universal Distribution Box can be used. Up to eight (8) dispensers can be connected directly to the interface board to control a maximum of 16 fueling points (eight [8] double-sided), or eight (8) fueling points for 16 single-sided dispensers, or any combination.

3.1.2 Gasboy

Gasboy dispensers use an RS-232 to RS-485 converter board for isolation and the correct interface. The dispensers all wire in a 2-wire multi-drop configuration. Up to 16 fueling points can be controlled. This can be any combination of single- and double-sided dispensers.

3.1.3 DPC Technical Specifications

DPC Technical Specifications	
20-8225 Cabinet Dimensions [H x W x D]	10" x 12.5" x 5.69" (25.4 x 32 cm x 14.4 cm)
Power Requirements	115/230 VAC; 50/60 Hz; 1.0/0.06 A
Operating Temperature Range	-40°F - 122°F (-40°C - 50°C)
Dispenser Brands Supported	Gilbarco, Wayne and Gasboy

3.1.4 DPC Installation

Parts Required			
Part #	Part Description	Remote DPC	Pedestal DPC
20-8225-DPC	Remote DPC for Gibarco/Wayne	Yes	No
20-0612	DPC Interface	Yes	Yes
12-3004	Cable RJ45 to RJ45 Stranded 10-15 Ft.	Yes	Yes
20-1618	Cable, PCM Master (Power Cable [C/OPT or FIT500])	No	Yes

3.1.5 DPC Pump Control (Electronic Control) Conduit Requirements

Conduit should be run from the FIT pedestal or Remote DPC to the pump junction box. This conduit should only contain the Pump Control wires with the exception noted below. Wires required are per dispenser; if conduit is running to two double-sided fuel pumps then two times the wire is required as shown below.

Wires (per fueling point)	Wire Requirements
Pump Control*	Two wires - must meet pump manufacturer's specification for the controlled pump.
*NOTE: When using manufacturer's D-Box, only two wires need to be pulled to the D-Box for all pumps.	
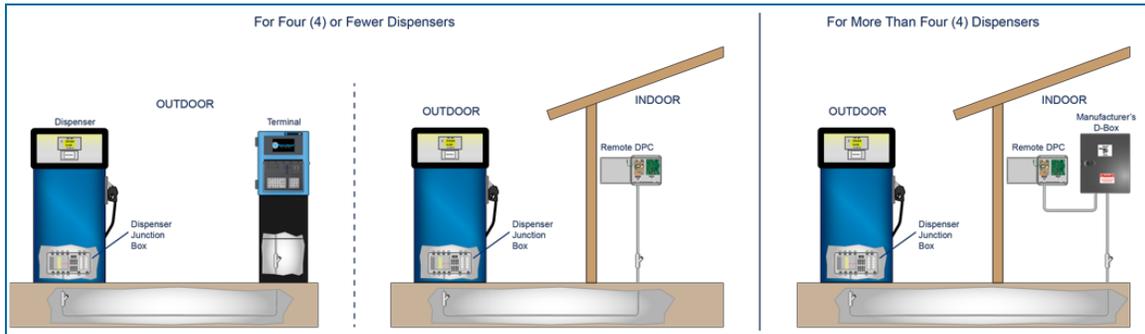
Depending on your specific site installation requirements and brand of dispenser, please refer to the applicable DPC installation instructions.

3.1.6 DPC Interface in a Remote Enclosure (for Wayne and Gilbarco)
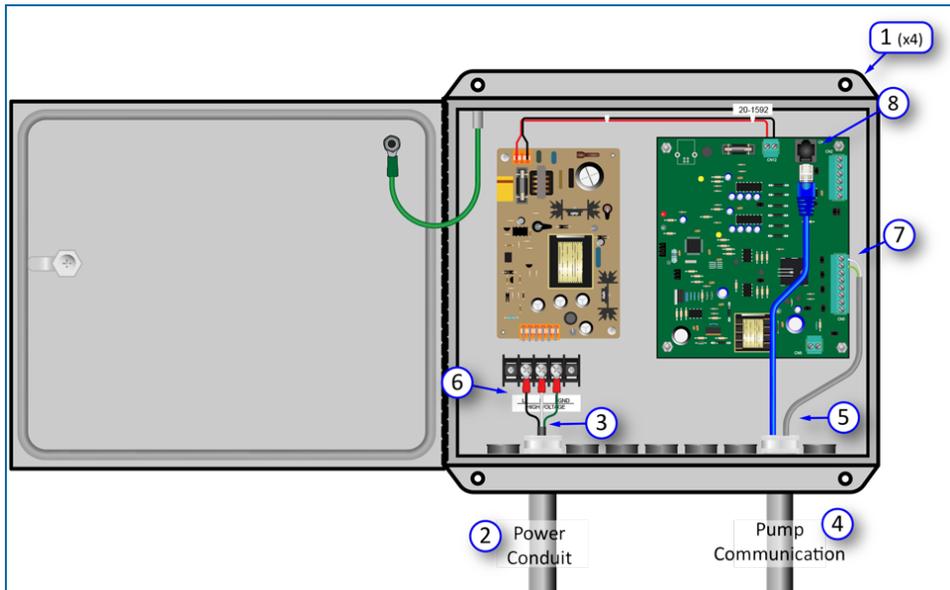
> **NOTE:** The 20-8225-DPC assembly includes all internal wiring for the power supply and the DPC interface board. Refer to the instructions that follow to install and connect external power and communication wiring.

> **DANGER:** To avoid the possibility of explosion, fire or electrical shock, de-energize the system before you do this procedure.

1. Install the enclosure on a wall with four (4) fasteners (not supplied). The enclosure must be no further than 50' (15.24 m) from the FSC3000 controller.

2. Install 1/2" or 3/4" rigid steel conduit for the DPC Power Supply.

3. Pull three (3) 14-AWG wires from the breaker panel.

4. Install 1/2" or 3/4" rigid steel conduit for pump communication.

5. Pull wires from each dispenser and Ethernet connection from the FSC.

NOTE: For more than four (4) pump loops use the manufacturer's distribution box. Pump communication conduit is not required if the manufacturer's distribution box is located near the remote DPC enclosure.

6. Attach Line, Neutral and Ground wires from the breaker panel to the power-connection block.
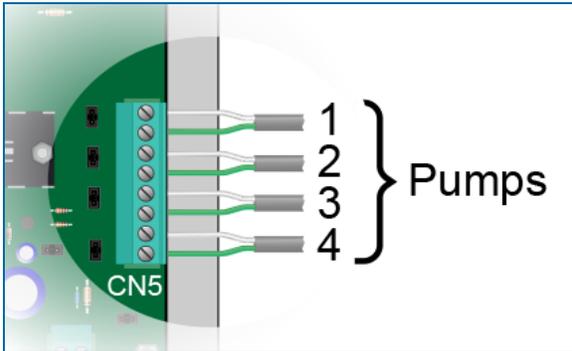
7. Attach pump communication wires to each pump loop on CN5. See the illustration above for up to four (4) pumps connected directly to connector CN5 of the DPC board. For more than four (4) pump loops use the manufacturer's distribution box (see below for connections to Wayne and Gilbarco distribution boxes).

8. Connect the RJ45 connector to CN4.

3.1.6.1 Wayne Data Distribution Box Connection to DPC Board
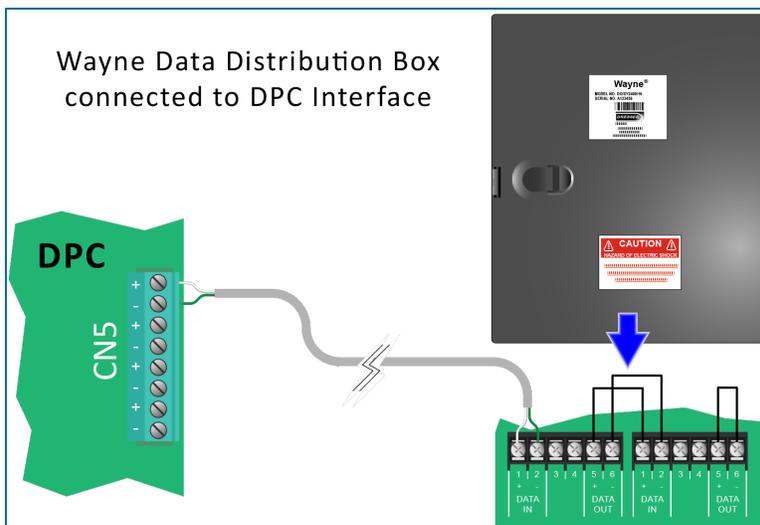
Wayne Data Distribution Box connected to DPC interface.

3.1.6.2 Gilbarco D-Box Connection to DPC Board

Gilbarco Universal Distribution Box
connected to DPC Interface

P/N 20-1689
Universal D-Box
Interface Cable
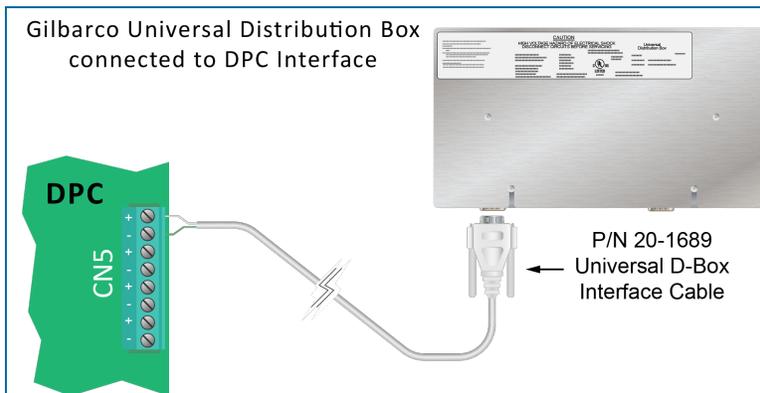
Gilbarco Universal Distribution Box connected to DPC interface. Make sure that the Gilbarco is setup for current loop.
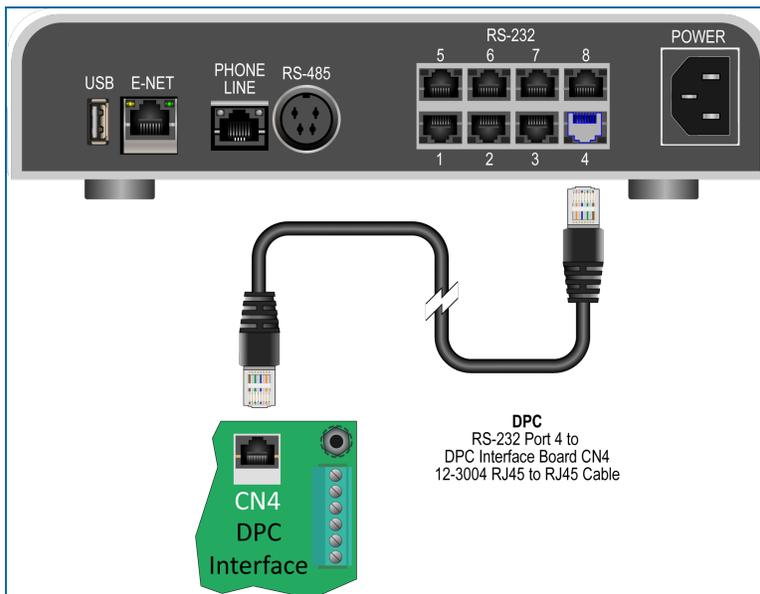
- Connect the cable (P/N "12-3004" on page 56) from CN 4 of the DPC Interface to Port 4 on the FSC3000 controller.

NOTE: The cable can be extended up to 50" (15.2 m).

3.1.7 Install a DPC Interface in a Terminal Pedestal (for Wayne and Gil-barco)

FMS Part Number 20-4419-DPC

⚠️ **DANGER:** To prevent the possibility of electrical shock, de-energize the AC Power Supply before you do the installation procedure shown below. ⚡

A DPC board can also be installed in a terminal pedestal when an FSC3000 is installed in the terminal.

3.1.7.1 20-4428 Board Plate Assembly Installation

You will first need to install a 20-4428 Pedestal Board Plate.

**20-4428 Plate
Pedestal Installation**

20-4428
Plate

20-4359-XX
Pedestal

50-0008
8-32 KEP Nuts (X4)
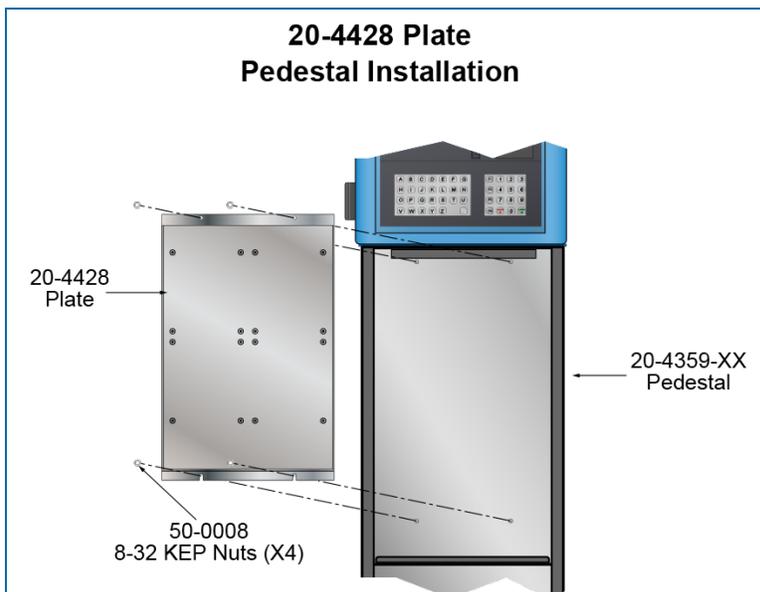
📝 **NOTE:** The illustrations show installation with a PV200 terminal. Installation with a PV100 and PV300E are the same.

- Remove the four (4) 50-0008 8-32 KEPS nuts from the studs on the inner back wall of the pedestal.
- Align the holes of the 20-4428 Plate with the studs to put the plate in its correct position. The holes at the bottom of the plate are slotted for easier installation.
- Put the 50-0008 nuts back on the studs and tighten them to complete the installation of the plate.

3.1.7.2 Pedestal Mount DPC Kit Installation (FMS P/N 20-4419-DPC)

Part #	Part Description
20-0612	Electronic Pump Handle Monitor Assembly
20-1618	Cable, PCM Master
12-3004	Cable, RJ45 to RJ45
54-0439	DPC Jumper Setup Label
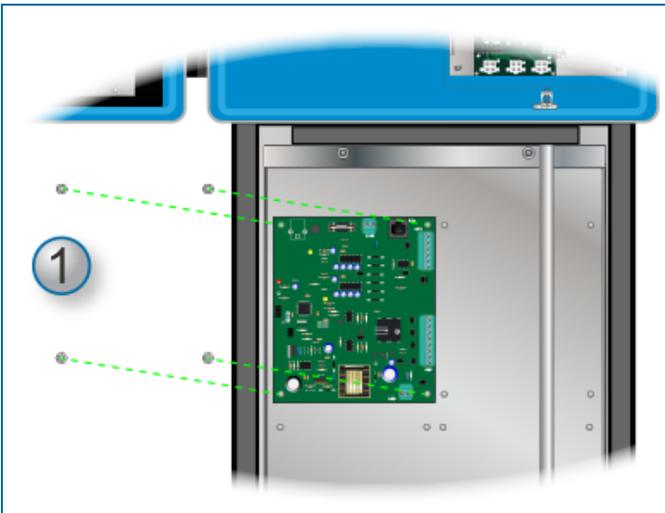
1. Install the DPC Interface Board.

   - Remove the four (4) top 8-32 KEPS nuts from the top left set of studs of the Pedestal Board Plate.
   - Align the 20-0612 board with the studs.
   - Put the 8-32 KEPS nuts back on the studs and tighten them.
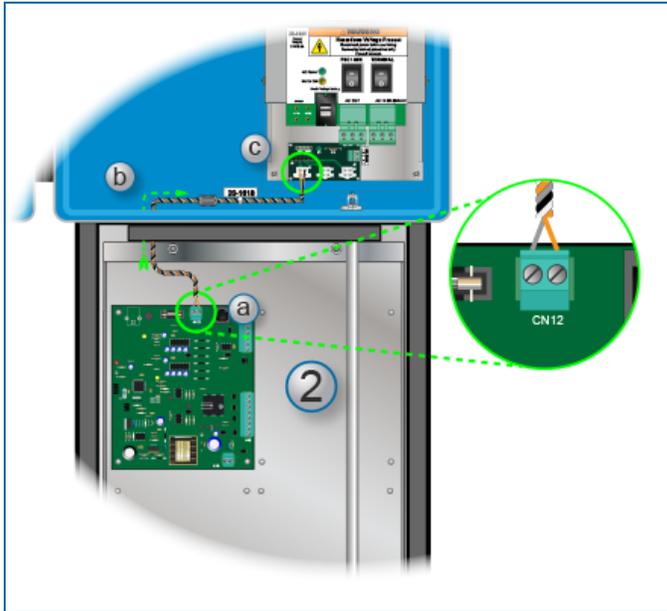
2. Prepare and install the 20-1618 Power Cable.

    a. Remove the connector from CN12 of the DPC interface board. Attach the gray and orange wires from the power supply cable (P/N: 20-1618) to the connector. Put the assembled connector back on to CN12 of the DPC interface.

> **NOTE:** Connect the Gray wire to one terminal screw and the orange to the other. Polarity is not important.

    b. Put the Molex connector end of the 20-1618 cable through an open knockout hole in the bottom of the terminal.

    c. For PV200 installation, connect the Molex end to an available connector of the Petro-Net Power board (J6, J7 or J8) (for PV300E installations, connect the Molex connector to the PCM plug on the front of the power supply assembly. See the illustration below).

FSC3000 Ports
(Top View)

Back

Front

This illustration shows the ports
as they are seen from
the top of the FSC3000.
Port 4 is the one on the left of
the back row of RS-232 ports.
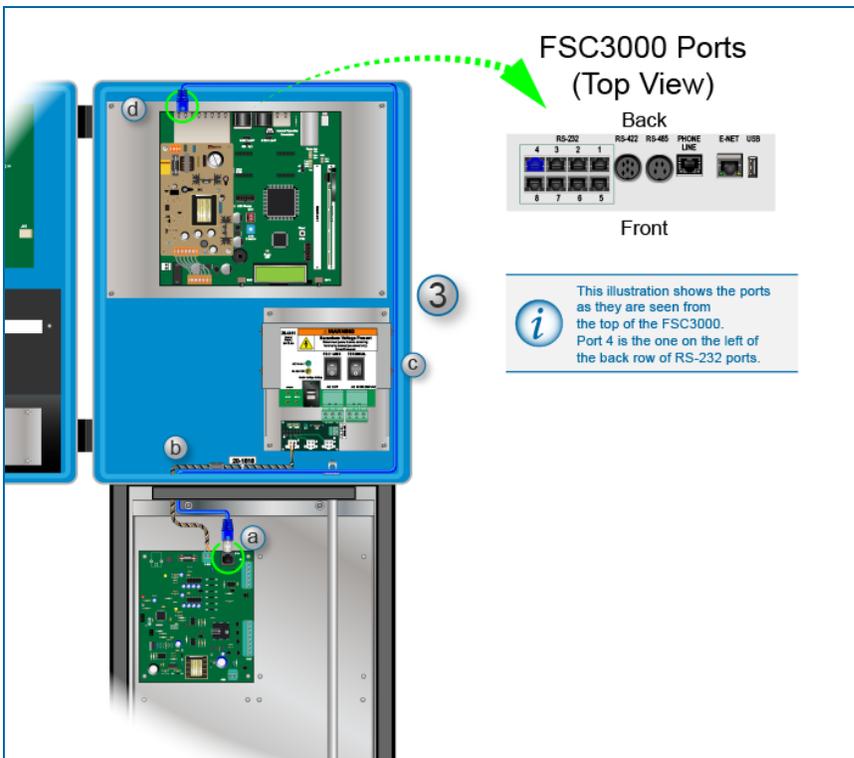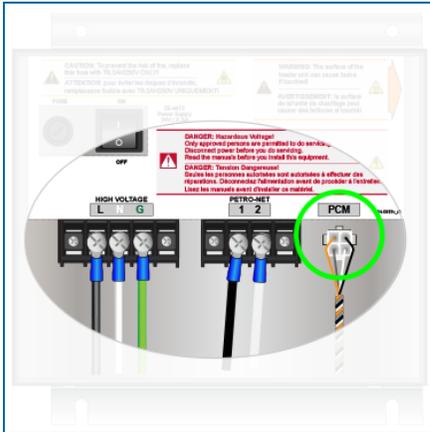
3. Connect the 12-3004 RJ45 Cable:

   a. Connect one end of the cable to the CN4 Connector of the DPC interface board.

   b. Put the other end of the cable through an open knockout hole in the bottom of the terminal.

   c. The routing of the cable should be around the inside of the terminal so it is out of the way of internal components.

   d. Connect the other end to RS-232 Port 4 of the FSC.

3.1.8 Install a DPC Interface for Gasboy®

Part #	Part Description	Qty
51-0357	Universal Mounting Plate	1
50-0008	8-32 KEPS Nuts	4
75-2036	Isolated Converter (RS-232 to RS 422/485)	1
20-1519-04	RJ45 to DB9 Cable Assembly	1
07-3004	Power Supply	1
50-2144	1" x 1" Self-lock Adhesive Fasteners	4
20-1618	CABLE PCM MASTER	1
12-1015	Power Cable	1

3.1.8.1 Remote DPC Interface for Gasboy Installation
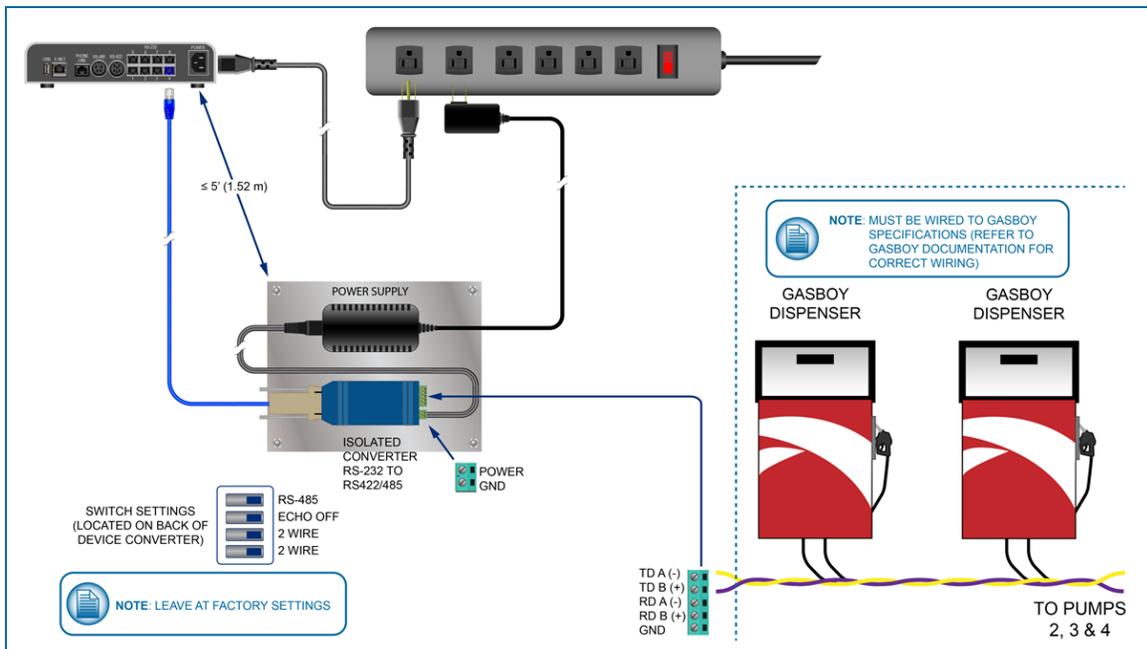
1. Attach the power supply (07-3004) and isolated converter (75-2036) to the mounting plate (51-0357) with the four (4) 1-inch self-lock adhesive fasteners (50-2144).

2. Install the mounting plate with power supply and converter attached within 5' (1.52 m) of the FSC3000.

3. Plug the serial cable (P/N: 20-1519-04) into the isolated converter 9-pin port and then into Port 4 of the FSC3000.

4. Install the pump communication wiring to the converter as shown in the illustration above.

> **IMPORTANT:** Polarity is important, refer to Gasboy documentation for correct wiring specifications.

5. Make sure that the isolated switch settings are set as shown in the diagram above (Keep the factory settings).

6. Plug in the power supply.

3.1.8.2 DPC Interface for Gasboy Pedestal Installation

51-0357 Universal Mounting Plate Installation

You will first need to install a 20-4428 Pedestal Board Plate.

See for information on how to install the Board Plate in the pedestal.
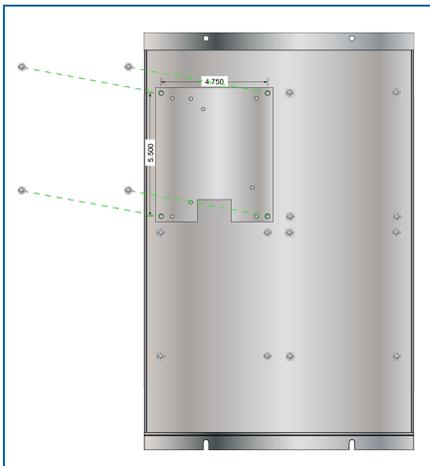
- Remove the four (4) top 8-32 KEPS nuts from the top left set of studs of the Pedestal Board Plate.
- Align the 51-0357 Universal Mounting Plate with the studs.
- Put the 8-32 KEPS nuts back on the studs and tighten them.

Install the DPC Interface

1. Attach the Isolated Converter (75-2036) to the mounting plate (51-0357) with two (2) of the 1-inch self-lock adhesive fasteners (50-2144).

2. Attach the gray and orange wires from the power supply cable (P/N: 20-1618) to the Power and ground terminals of the isolated converter as shown in the illustration.

3. Put the Molex connector end of the 20-1618 cable through an open knockout hole in the bottom of the terminal.

4. For PV200 installation, connect the Molex end to an available connector of the Petro-Net Power board (J6, J7 or J8) (for PV300E installations, connect the Molex connector to the PCM plug on the front of the power supply assembly. See the illustration below).
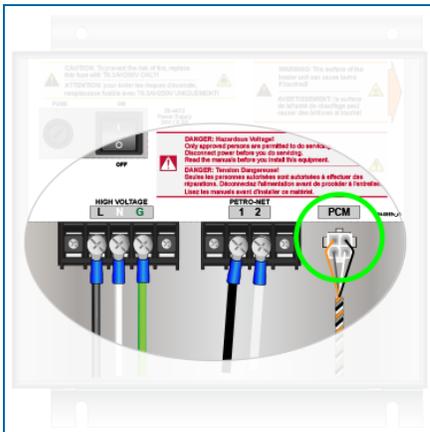
5. Connect the 20-1519-04 RJ45 to DB9 Cable Assembly:

   - Connect the DB9 connector of the assembly to the DB9 connector of the Isolated Converter.

   - Connect one end of the RJ45 cable to the RJ45 connector of the RJ45 to DB9 connector.

- Put the other end of the cable through an open knockout hole in the bottom of the terminal.

- The routing of the cable should be around the inside of the terminal so it is out of the way of internal components.

6. Connect the other end to RS-232 Port 4 of the FSC.

> **ⓘ INFORMATION:** The illustration above shows the ports as they are seen from the top of the FSC3000. Port 4 is the one on the left of the back row of RS-232 ports.

7. Install the pump communication wiring to the converter as shown in the illustration "Remote DPC Interface for Gasboy Installation" on page 64.

3.1.9 Physical Configuration

Set up jumpers to match the pump type to be connected. See the Wayne/Gilbarco Jumper Settings illustrations below.

When a jumper is set as "ON" this means the jumper will tie both pins together.

When "OFF," the jumper should be set on one pin.

Some jumpers have three pins; when the jumper says "Pins 1-2" this means the jumper should be set on Pins 1 and 2 of the 3-pin jumper.

On 3-pin jumpers the board is labeled to indicate which pin is number one.

3.1.9.1 DPC Interface Jumper Setup (for Wayne and Gilbarco)

Gilbarco/Wayne DPC 54-0493, Rev. 1
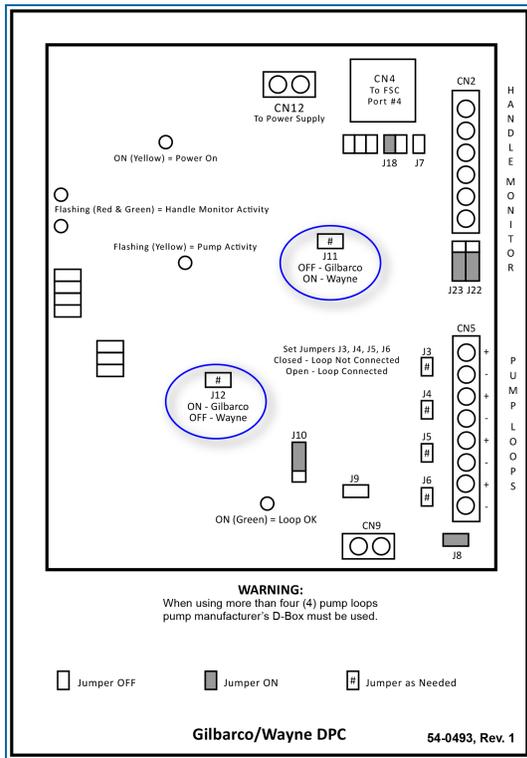
3.1.10 Software Configuration

DPC configuration was completed during installation.

3.1.11 Testing

There is no preliminary testing that can be done with the DPC. The DPC will only be able to be verified when configuration of the FSC3000 is complete.

3.2 Dispenser Terminal Control (DTC)

DTC (Dispenser Terminal Control) utilizes the dispenser's built-in card terminal in lieu of a fuel island terminal and will emulate the fuel island terminal for each fueling position connected to the system. DTC control requires DPC electronic pump control to function and uses the same conduit wiring.

3.2.1 Technical Specifications

Cabinet Dimensions: 10" H x 12.5" W x 5.7" D (25.4 cm x 31.8 cm x 14.5 cm)

Power Requirements: 115/230 VAC; 50/60 Hz; 1.0/0.06 A

Operating Temperature Range: -40ºF to 122ºF (-40ºC to 50ºC)

3.2.2 Terminal Types

DTC can communicate with the Wayne CAT or Gilbarco CRIND. The DTC interface utilizes a second remote PCM enclosure.

DTC is an upgrade option to DPC (direct pump control). However, it is only available for remote FSC3000 applications and cannot be pedestal-mounted.

Depending upon the type of dispenser (Wayne/Gilbarco/Gasboy), installation may vary. Wayne DTC and Gilbarco DTC require additional hardware and are installed in a separate enclosures.

> **NOTE:** If you have an iXPay terminal for EMV (in the newer Helix dispensers) you can only communicate through Ethernet. The Jade boards of these terminals do not have RS485/RS232 capability.

3.2.2.1 Wayne CAT (Card Authorization Terminal)

The DTC board has RS-485 ports to communicate directly to the Wayne CATs. Up to 12 fueling points can be controlled. This can be six (6) dual-sided dispensers, 12 single-sided dispensers, or any combination thereof.

3.2.2.2 Gilbarco CRIND (Card Reader in Dispenser)

In addition to the DTC board, Gilbarco requires a second Electronic Handle Monitor (EHM) board to provide the isolation and to convert the RS-232 output from the DTC board into the current-loop communication required by the CRINDs.

CRINDs can connect directly to the Electronic Handle Monitor board or the Gilbarco distribution box. If connecting directly to the interface board, up to eight (8) dispensers can be connected and a maximum of 12 fueling points can be controlled. For example, the system can control six (6) dual-sided dispensers (12 fueling points), eight (8) single-sided dispensers (8 fueling points), or a combination thereof, such as four (4) dual-sided and four (4) single-sided dispensers (12 fueling points).

If the distribution box is used, then a maximum of 12 fueling points may be connected. This can be six (6) double-sided dispensers, 12 single-sided dispensers, or any combination thereof.

3.2.3 Diagrams

3.2.3.1 Wayne DTC
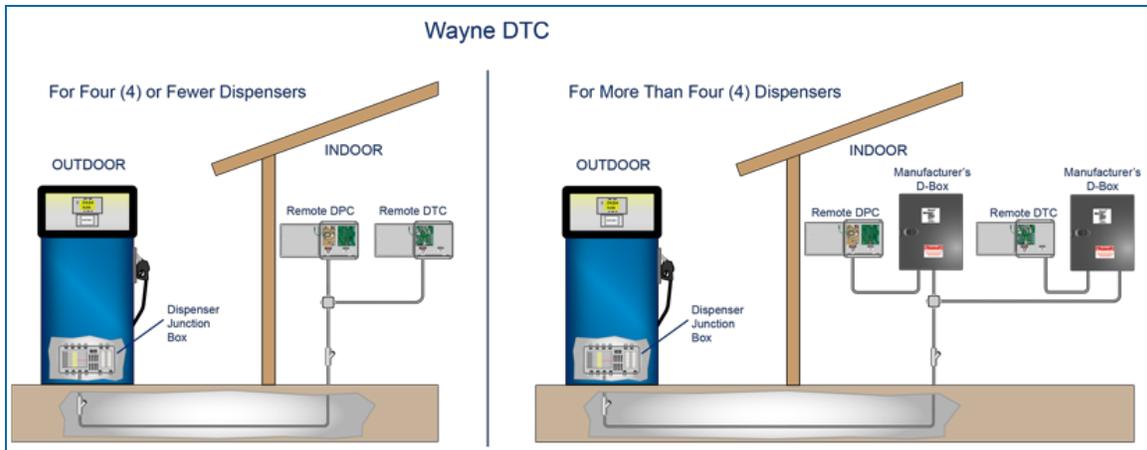
3.2.3.2 Gilbarco DTC

3.2.3.3 Gilbarco Secure Prompts DTC

Gilbarco, Secure Prompts DTC

For Four (4) or Fewer Dispensers — OUTDOOR / INDOOR — Remote DPC-DTC, Dispenser Junction Box

For More Than Four (4) Dispensers — OUTDOOR / INDOOR — Remote DPC, Manufacturer's D-Box, Dispenser Junction Box
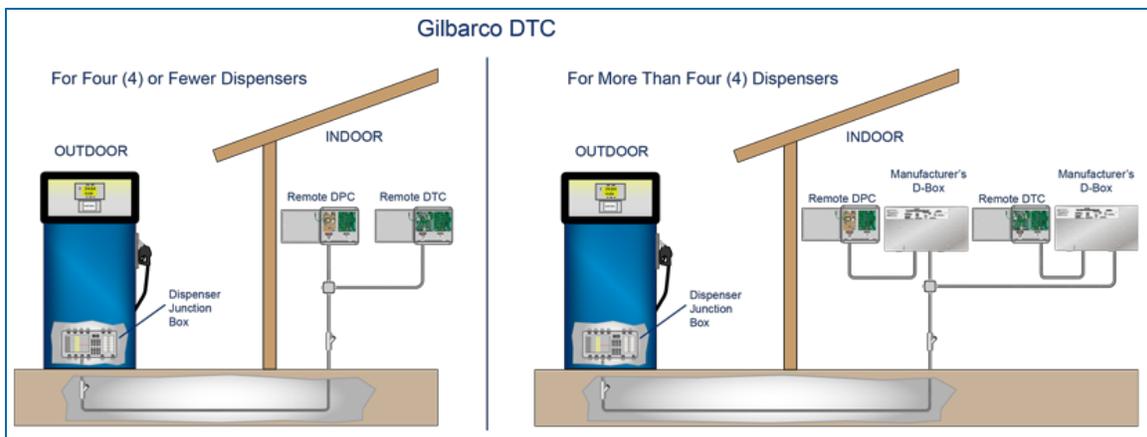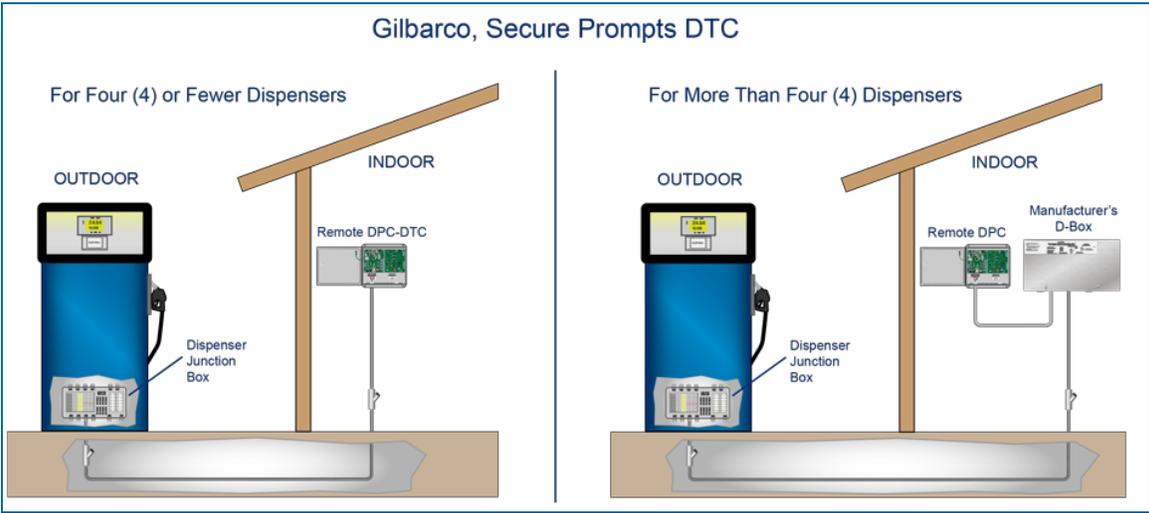
3.2.4 DTC Installation

3.2.4.1 DTC Remote Enclosure Installation
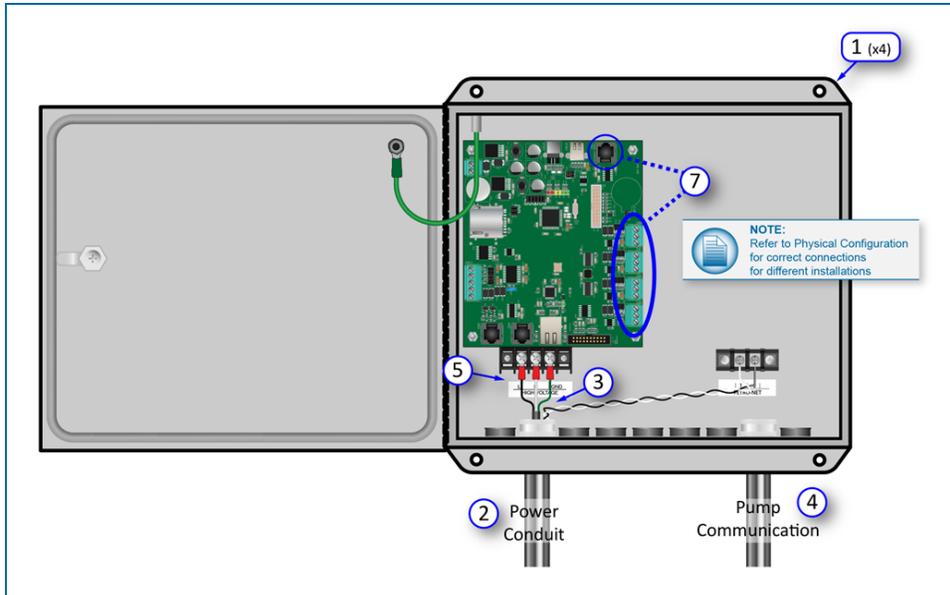
1. Install the enclosure on a wall with four (4) fasteners (not supplied). The enclosure must be no further than 50' (15.24 m) from the FSC3000 controller.

2. Install 1/2" or 3/4" rigid steel conduit for the DTC Power Supply.

3. Pull three (3) 14-AWG wires from the breaker panel. Pull Petro-Net™ wires.

4. Install 1/2" or 3/4" rigid steel conduit for pump communication and pull wires from each dispenser.

> **NOTE:** For more than four (4) pump loops use the manufacturer's distribution box. Pump communication conduit is not required if the manufacturer's distribution box is located near the remote DPC enclosure.

5. Connect Line, Neutral and Ground wires from the breaker panel to the power-connection block.

6. Connect Petro-Net wires to the Petro-Net block.

> **IMPORTANT:** Maintain polarity throughout all Petro-Net connections in your system.

7. Connect pump communication:

- For Wayne CAT installation: Each applicable pump loop on CN5/6/7/8 (refer to Physical Configuration for correct connections for different installations).

- For Gilbarco CRIND installation: RJ45 cable between the CN4 port of the DPC board to the CN3 (COM3) port of the DTC board (refer to Physical Configuration for correct connections for different installations).

3.2.5 Physical Configuration

3.2.5.1 Wayne CAT-specific

Gilbarco/Wayne/Gasboy DTC   54-0495, Rev. X
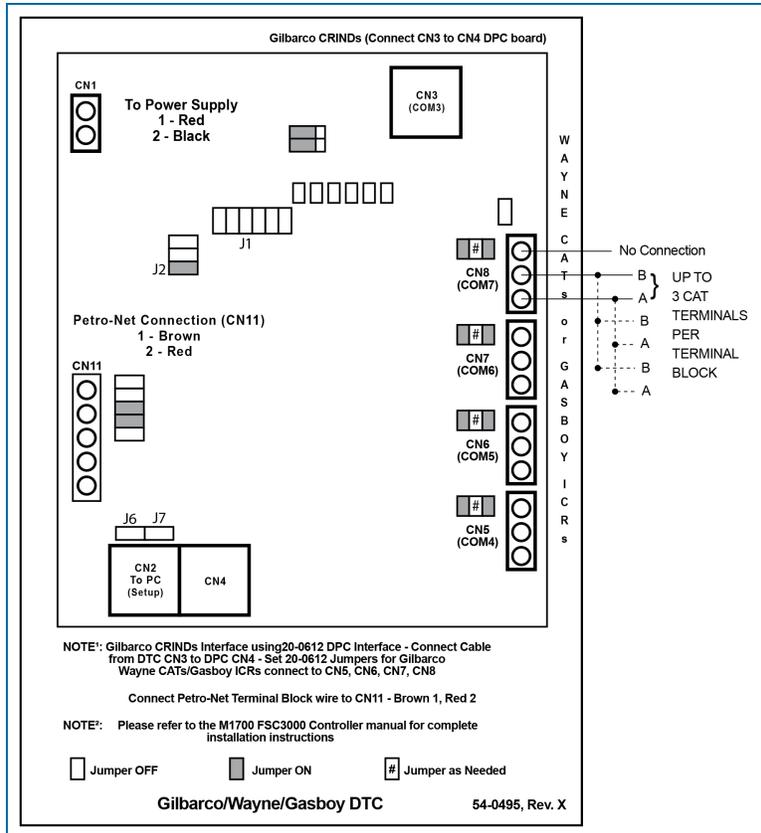
Attach CAT communications wires to terminal blocks CN5 through CN8. For best performance, connect each dispenser to its own terminal block. If there are (up to)12 CAT dispensers, connect a maximum of 3 dispensers to each terminal block.

Make sure the jumpers are set according to the diagram as shown above. The jumpers marked with "#" connect termination resistors on the dispenser communication lines. Install these jumpers only if you experience COMM errors with the dispensers.

3.2.5.2 Gilbarco CRIND-specific
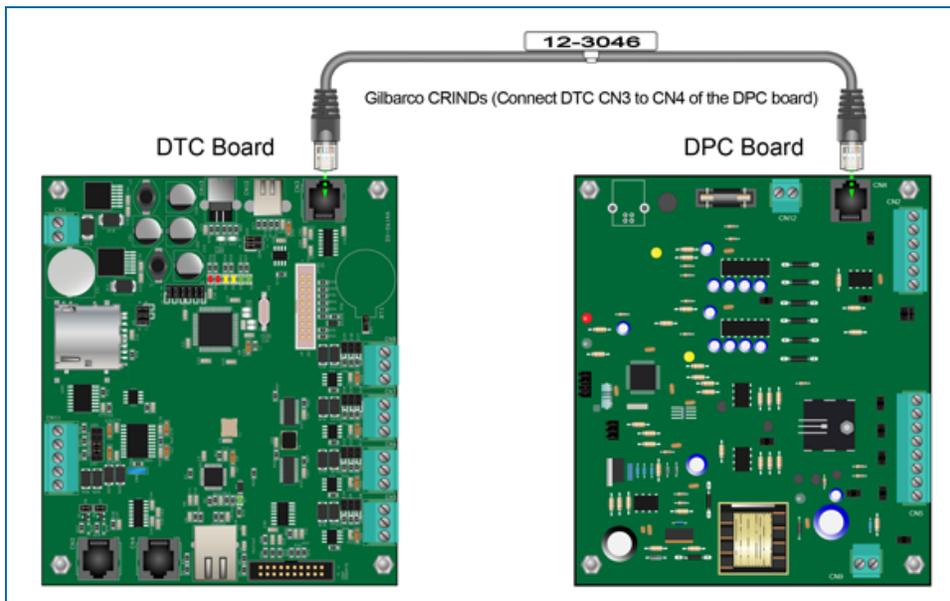
Direct connect to CRIND loops. Connect the 12-3046 RJ45 cable from the CN3 port of the DTC board to CN4 of the DPC board.

Attach the CRIND communication loop wires to terminal blocks CN5 of the DPC board. If connecting more than four (4) dispensers, connect loop one (1) to the Gilbarco D-Box using the supplied cable as shown below.
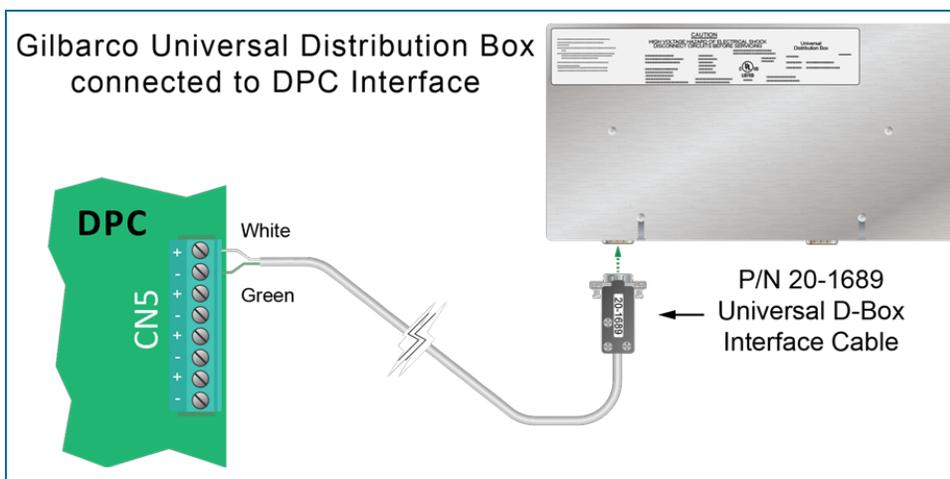
Connect the Gilbarco Universal distribution box (D-Box) to DPC interface with the 20-1689 interface cable.

> **IMPORTANT:** Make sure that the the Gilbarco D-Box is set up for current loop.

3.2.6 Software Configuration

For DTC software configuration, please refer to the M3041 Dispenser Terminal Control Software Configuration Guide.

Section 4 Maintenance & Troubleshooting

Though the FSC3000-based card systems are designed for years of trouble-free use, you should perform the following routine maintenance items at the intervals shown to maximize their service life.

4.1 FSC3000 (Remote Only) Maintenance

Make sure FSC cables are secure and FSC3000 has adequate ventilation.

4.2 Fuel Island Terminal Maintenance

Cabinet and Door

Wipe down terminals with warm water, a mild detergent (dish soap) and a non-abrasive cloth. DO NOT powerwash or even use a garden hose to rinse off the system! You can apply a retail car wax to protect the finish of the Terminal cabinet and pedestal.

Display

Do not use harsh detergents or any kind of petroleum-based cleaner on the display. Recommended cleaners:

AR Kleener, Diamond Glaze Anti-Reflective Cleaner.

Keypad

Wipe down terminals with warm water, a mild detergent (dish soap) and a non-abrasive cloth. If Keypad is damaged, replace it.

Door Locks

Lubricate door locks every six months, or as needed. Use graphite or molybdenum disulfide ("Moly-B") dry lubricant. DO NOT apply too much lubricant.

Card Readers

- **Magnetic Card**: Magnetic card readers contain magnetic heads like those on a tape recorder. Depending on usage and environment (dusty), you should clean the heads daily or every other day to reduce the number of bad reads. The heads require periodic replacement.

- **ChipKey**: ChipKey readers are a non-maintenance reader. When not reading ChipKeys always verify with multiple ChipKeys – then replace the reader, if needed.

- **Proximity**: Proximity readers are a non-maintenance reader. When not reading cards always verify with multiple cards – then replace reader if needed.

Receipt Printer

Inspect receipt printer paper supply as needed. Verify Printer is printing on a routine basis.

Heaters

For units equipped with heaters, it is recommended to verify that they are working when cold weather arrives.

4.3 Remote Enclosures

Cabinet and Door

For outside units, wipe down the cabinets with warm water, a mild detergent (dish soap) and a nonabrasive cloth. DO NOT power-wash or even use a garden hose to rinse off the system! It is allowable to apply a retail car wax to protect the finish of the cabinet.

Door Locks

For Outside units, lubricate door locks every six months or as needed. Use graphite or molybdenum disulfide ("Moly-B") dry lubricant. DO NOT apply too much lubricant.

4.4 Journal Printer

Preventive Maintenance

Because printers generate paper dust and ink droplets in everyday operations, periodic cleaning and adjustments are required to maintain good performance and increase their life cycle. We recommend cleaning the journal printer every six months for optimal performance. To maintain a dot-matrix printer, please refer to the following procedures:

Equipment Needed:

- Safety goggles
- Protective gloves
- Cotton cleaning swabs
- Duster can (HFC-134a)
- Isopropyl or denatured alcohol
- Moist wipes
- Dry cloth or paper towels

The following procedure is suggested every six months:

1. Turn off power switch and unplug the printer.
2. Remove top dust cover, printer ribbon and paper from guides.
3. From a safe distance, use the compressed-air can to remove dust particles form inside the printer area.
4. Physically move the print head to the center of the rail.
5. Moisten the cotton swab with the alcohol and clean the rail on both sides.
6. Dry the rail with a dry towel or cloth.
7. Moisten the towel and clean the rubber roller while manually turning the knob in one direction.
8. Dry the rubber roller completely before securing the printer ribbon and paper.
9. Add the dust cover, apply power and conduct the self-test.

Appendix A - Pump Control Test Checklist

Pump Control (PCM, DPC)	Pump Control 1 Position Number							
	1	2	3	4	5	6	7	8
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	Pump Control 2 Position Number							
	1	2	3	4	5	6	7	8
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	Pump Control 3 Position Number							
	1	2	3	4	5	6	7	8
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	Pump Control 4 Position Number							
	1	2	3	4	5	6	7	8
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	*Pump Control 5 Position Number*							
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	*Pump Control 6 Position Number*							
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	Pump Control 7 Position Number							
	1	2	3	4	5	6	7	8
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Pump Control (PCM, DPC)	Pump Control 8 Position Number							
	1	2	3	4	5	6	7	8
Write down associated pump number								
Verify the correct pump turns on								
Verify pump timers are set up as required								
Verify maximum quantity is set up as required - Using card with no quantity restriction setup verifies pump turns off when maximum quantity is reached.								
Verify pump records the correct amount								
Verify Product restriction is set up properly Set up test card for each product restriction and verify card can only turn on proper pump(s)								
Verify Quantity restriction is set up properly Set up test card for each quantity restriction and verify card can only pump the restricted quantity								
Verify if pump is equipped with OPW AVI nozzle reader that pump can be authorized with tag								

Revisions

Revision #	Approve	Effective	Software Version	Key Changes
0	NA	NA		Initial release
1	NA	NA		NA
2	NA	8/1/10		NA
3	NA	9/24/10		NA
4	NA	4/29/11		NA
5	NA	1/5/12		NA
6	559	12/6/13		DTC, DPC Install update
7	580	2/28/14		DPC, DTC general update
8	754	8/10/15		Reconfigure/reorganize sections for clarity, employ ANSI standards for safety communication, improve graphic elements, removed obsolete connection methods.
9	785	11/10/15		Replaced 2 illustrations showing Gilbarco/Wayne jumper settings with facsimile of the door label 54-0493 highlighting the correct jumper positions for both.
10	989	6/10/16		Support for S00601: PCM 107G
11	1114	2/1/17		Add missing illustration for Dispenser Power Reset in Section 5
12	1240	10/4/17		Update Parts Required table (Section 5.4.2) to correct part numbers and Oracle descriptions. Update P/N references in DPC Remote Install step 11 and Pedestal Install step 6.
13	1768	7/8/20		Change all instances of "Slave" in text and images to "Client"
14	1934	8/10/21		Remove discontinued FIT sections, update Gateway and Cellular wiring in Ports section, update Pump Control section to reflect current offerings in Oracle.

Revision #	Approve	Effective	Software Version	Key Changes
15	2023	3/30/22		Add info for PV380 & PV384 boards.
15.1	2023	4/6/22		Add link to above change to Startup and Test section
16	GD	6/29/23		Update info pages, links, cross references, page layouts, branding

NOTE: It is possible that older software versions might not support all features

Warranty

OPW Fuel Management Systems warrants that all OPW Tank Gauge and Petro Vend Fuel Control systems supplied by OPW Fuel Management Systems to the Original Purchaser will be free from defects in material and/or workmanship under normal use and service for a period of 12 months from the date of installation or 15 months from the date of shipment from OPW. Additionally, OPW Fuel Management Systems warrants that all upgrades and replacement parts (new and remanufactured) supplied by OPW Fuel Management Systems will be free from defects in material and workmanship under normal use and serviced for a period of 90 days from the date of installation or for the remainder of the system's original warranty, whichever is greater, as set forth in the first sentence of this statement. The foregoing warranties will not extend to goods subjected to misuse, neglect, accident, or improper installation or maintenance or which have been altered or repaired by anyone other than OPW Fuel Management Systems or its authorized representative. The buyer's acceptance of delivery of the goods constitutes acceptance of the foregoing warranties and remedies, and all conditions and limitations thereof.

If a claim is made within the warranted time period that any equipment and/or remanufactured part is defective in material or workmanship under normal use and service, such equipment and/or remanufactured part shall be returned to OPW Fuel Management Systems, freight prepaid. If such equipment or remanufactured part is found by OPW Fuel Management Systems in its sole judgment to be defective in material or workmanship under normal use and service, OPW Fuel Management Systems shall, at its sole option, repair or replace such equipment and/or remanufactured part (excluding, in all instances, fuses, ink cartridges, batteries, other consumable items, etc.) OPW Fuel Management Systems shall not be held responsible for data loss or retrieval on returned products.

The warranties, as set forth above, are made expressly in lieu of all other warranties, either expressed or implied (including, without limitation, warranties of merchantability and fitness for any particular purpose and of all other obligations or liabilities on OPW Fuel Management Systems' part.) Further, OPW Fuel Management Systems neither assumes, nor authorizes any other person to assume for it, any other liability in connection with the sale of the systems, or any new/replacement part that has been subject to any damage from any act of nature or any force majeure. Any terms proposed by the Original Purchaser either orally or in writing are expressly rejected. The terms and conditions expressed in this document may only be changed upon the express written consent of OPW Fuel Management Systems.

The term "Original Purchaser" as used in these warranties shall be deemed to mean the authorized OPW Fuel Management Systems' distributor to which the system or any new/replacement part was originally sold. These warranties may be assigned by the original purchaser to any of its customers who purchase any OPW Fuel Management Systems' systems or new/replacement parts. This document shall be governed by and construed in accordance with the law of the State of Illinois. OPW Fuel Management Systems and Original Purchaser agree that any legal action or proceeding under or with respect to this document may ONLY be brought in the courts of the State of Illinois, or the United States District Court having jurisdiction in the City of Hodgkins, Illinois. Original Purchaser expressly consents to personal jurisdiction in any of the above-mentioned forums and agrees to waive all defenses based on improper venue or inconvenient form should an action be brought therein.

The sole liability of OPW Fuel Management Systems, for any breach of warranty, shall be as set forth above. OPW Fuel Management Systems does not warrant against damage caused by accident, abuse, faulty or improper installation or operation. In no event shall manufacturer's liability on any claim for damages arising out of the manufacture, sale, delivery or use of the goods exceed the original purchase price of the goods. In no event shall OPW Fuel Management Systems be liable for any direct, indirect, incidental or consequential damage or loss of product.

TERMS

Ex-works our factory, Hodgkins, Illinois, USA
Installation not included.
All trade names are registered. Patents pending.
Subject to engineering improvement and/or other changes.