

for

Class I, Division 2

Hazardous Location Installations

M00-20-0340-03

Pump Control Modules (PCM) for DIV2

Installation, Operation and Maintenance



NOTE: Before you use this guide, make sure you have the latest revision. Check the revision level of this document against the most current revision found at <http://www.opwglobal.com/opw-fms/tech-support/manuals-how-to-videos>. Download the latest revision if necessary.



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Contact OPW Fuel Management Systems

Visit us at <http://www.opwglobal.com/opw-fms>, or contact us at:

Call 1-877-OPW-TECH (877-679-8324)

For calls outside US and Canada, call +1-708-485-4200

Monday through Friday, 7 a.m. to 6 p.m., US CST

For technician registration, see

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Section 1 Important Safety Information

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

ONLY APPROVED, TRAINED TECHNICIANS ARE PERMITTED TO INSTALL OR DO SERVICING ON THE EQUIPMENT AND COMPONENTS DESCRIBED 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.

"Safety Warnings" on the next page

"Hazardous Areas" on page 7

"FCC Compliance" on page 10

"Electrostatic Sensitive Devices (ESD)" on page 11

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.

1.2 Hazardous Areas

Any fuel dispenser is a hazardous area as defined in the National Electrical Code. Installation must be in accordance with the following:

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

1.2.1 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.



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.

1.2.2 Installation Requirement

OPW 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.

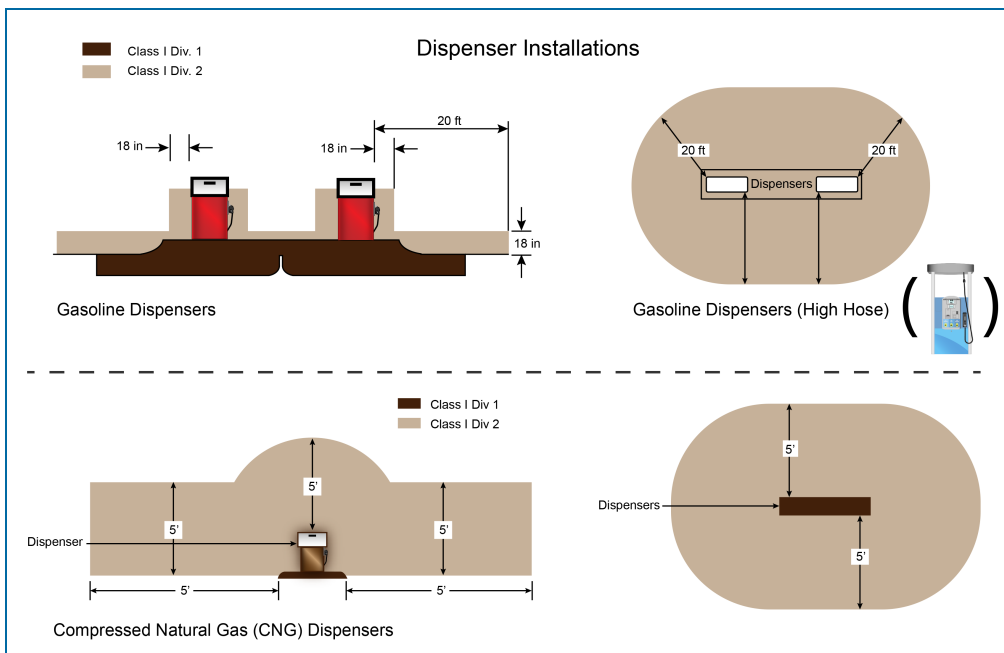


Figure 1-1 Dispenser Installations



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.

1.3 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, including interference that can cause undesired operation.

1.4 Electrostatic Sensitive Devices (ESD)

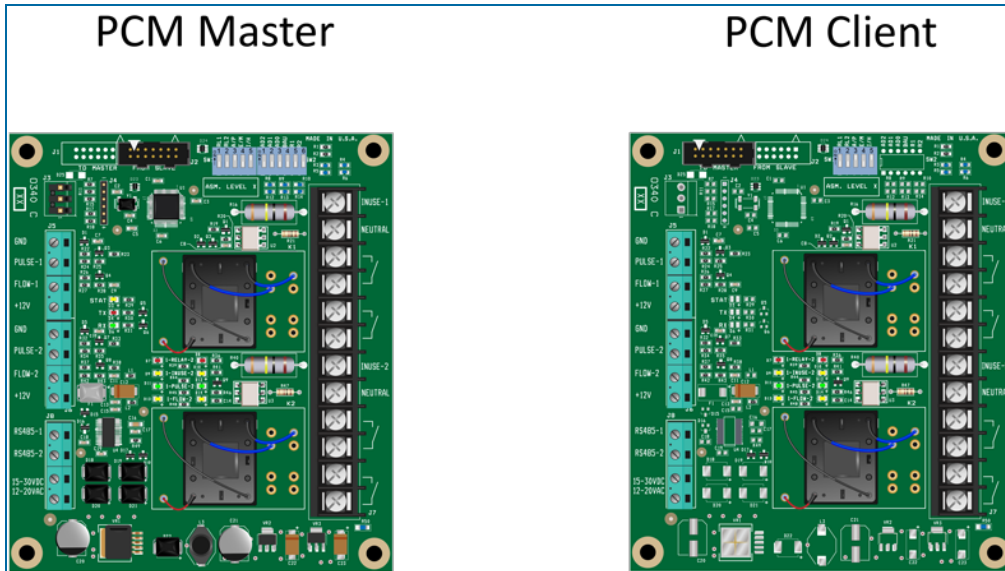
This product contains components that can be damaged by Electrostatic Discharge. See the instructions below to work safely with these components.



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 techniques.
- Use an ESD Field Service Kit with wrist strap, dissipative mat and grounding cord when possible.
- Do not stand on carpeted surfaces while working with Electrostatic Discharge Sensitive (ESDS) devices when possible.
- Never leave ESDS components/assemblies unattended.
- A new component to be installed 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.

Section 2 DIV2 PCM General Information



DANGER: To prevent the possibility of explosion or fire, **ONLY** use DIV2 compliant Pump Control Modules for DIV2 pedestal installations where equipment is installed in a Class I, Division 2 hazardous area). You must read, understand and obey all instructions and safety information in this manual to prevent dangerous conditions.



PV200 DIV2 installations can have two options for pump control:

- DIV2 compliant Pump Control Modules can be installed in the system's pedestal. This manual contains the information necessary to install and operate DIV2 compliant PCMs.
- Standard Pump Control Modules as part of a remote installation. Refer to M00-20-0340 PCM IOM for information on the installation and operation of standard PCMs.

The DIV2 Pump Control Modules use solid state relays to prevent the possibility of ignition when installed as part of a PV200 DIV2 system. DIV2 PCMs are only necessary for pedestal installed systems. Remote PCM enclosures (20-8225-PCM) are not required to use DIV2 PCMs since they are not installed in a Class 1, Division 2 hazardous location.

There are two (2) Pump Control Module (PCM) boards that can be used to transmit pulser and pump data from all connected pumps, and send that data to your site controller through RS485 twisted-pair wiring.

A Master board can control up to two (2) pumps (or up to four [4] pumps with an optional Client Board connected). It receives pulser and pump data from all connected pumps, and transmits the data to your site controller through RS485 twisted-pair wiring.

An optional Client board can control two (2) more pumps. The Master and Client boards must be connected with an OPW-FMS part number 20-1594 ribbon cable.

Two (2) Master/Client PCM pairs can be installed in a pedestal. The table below shows the possible configurations of pedestal installed PCM Master and Client boards.

PCM Configurations	
To control up to two (2) pumps:	One (1) Master (Primary)
To control up to four (4) pumps:	One (1) Master (Primary) and Client
	Two (2) Masters (Primary and Secondary)
To control up to six (6) pumps:	Two (2) Masters (Primary and Secondary) and Client (connected to Primary or Secondary Master)
To control up to eight (8) pumps:	Two (2) Masters (Primary and Secondary) and two (2) Slaves (one connected to Primary Master, one connected to Secondary Master)

Electronic and mechanical pulsers are supported in one of two modes, passive or active. Pump activation can be sensed by voltage sense or handle activation.

Section 3 PCM Specifications

PCM Specifications for Installation in Outdoor Pedestals	
Power Requirements:	12-20 VAC 50/60 Hz, 0.5 A
Operating Temperature:	- 40° to 122° F (-40° to 50° C)
Relay Contact:	120-240 VAC 1.0 AMP MAX.
“In-Use” Detection:	Voltage Sense 120-240 V or Handle Sense
Communications:	RS-485 twisted-pair
Pulser:	
<ul style="list-style-type: none"> » Compatibility » Power Requirement » Rate » Channels » Mechanical Speed Limit » Electronic Speed Limit » Duty Cycle 	Mechanical (Contact) or Electronic (5-12 VDC) 12 VDC < 40mA max. per pulse 1:1 - 1,000:1, 1-pulse increments Single 6,000 pulses per minute 100,000 pulses per minute 50%

Section 4 PCM Installation

This section shows the procedures for PCM Installations. Topics in this section include:

Pedestal Installation

"DIV2 PCM Installation in the Pedestal" on the next page

"PCM Conduit Installation and Wiring" on page 22

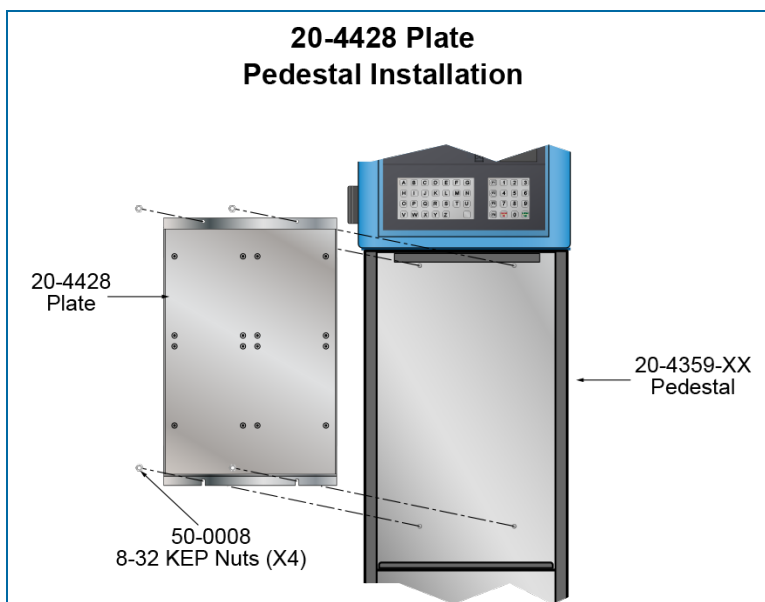
4.1 DIV2 PCM Installation in the Pedestal



DANGER: To prevent the possibility of electrical shock, de-energize the AC Power Supply before you do the PCM installation procedures shown below.



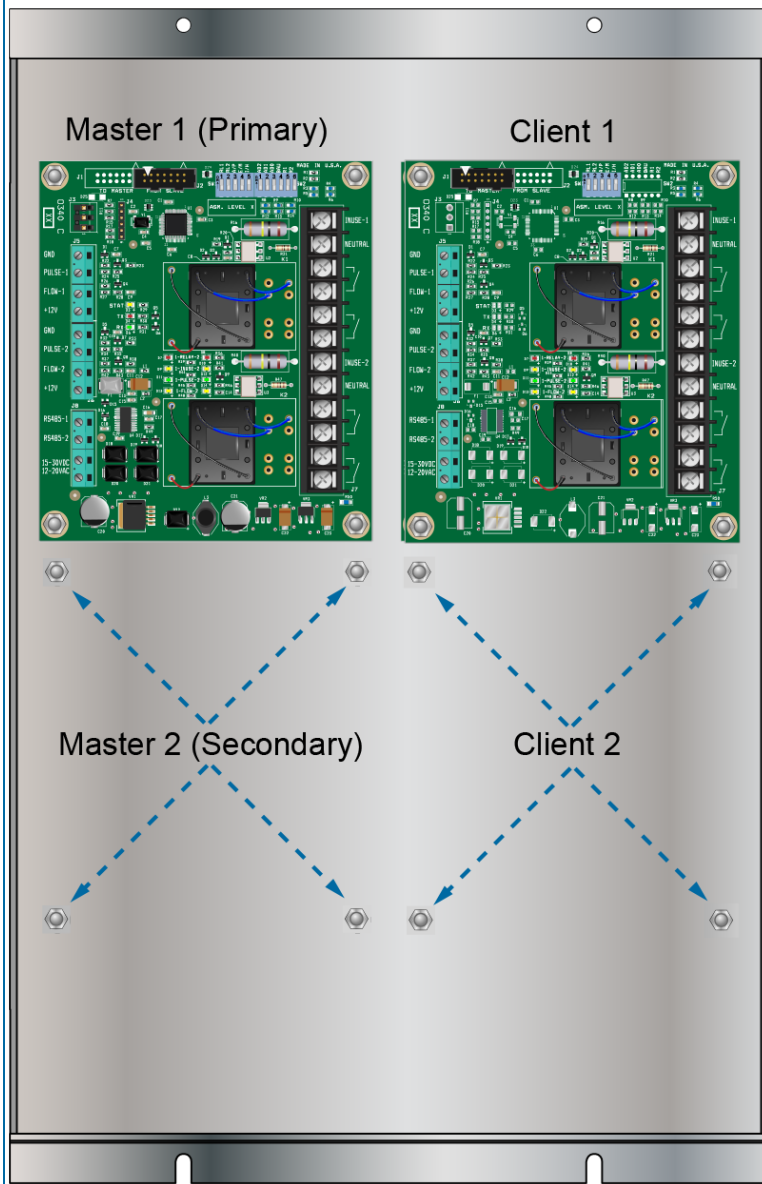
4.1.1 Install the 20-4428 Pedestal Pump Board Plate Assembly



- 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.

4.1.2 Install the PCM Boards

Installation of Master and Client to Board Plate Assembly (20-4428)





ATTENTION: Electrostatic Sensitive Device - To prevent damage from electrostatic discharge, obey the precautions in "[Electrostatic Sensitive Devices \(ESD\)](#)" on page 11 when it is necessary to move or touch these components.



NOTICE: There are four (4) sets of four studs on the 20-4428 Board Plate. Each of the studs has two (2) factory installed 50-0008 KEPS nuts. Do not remove these nuts. They have been installed to keep the back of the PCM boards from contact with the metal plate.



NOTE: The Primary Master board must be installed in the top left set of studs. The other PCM boards are optional. To control more than two (2) pumps it is necessary to add more boards. See the PCM Configurations Table in "[DIV2 PCM General Information](#)" on page 12.

4.1.2.1 20-4404-XX Master Kit

- Open the 20-4404-XX Master Kit component box.
- Remove the plastic parts bag and open it. Keep the parts inside the bag until they are needed.
- Carefully remove the 20-0340-01 PCM Master from its protective anti-static bag.
- Align the four (4) mounting holes of the board over the top left set of studs on the Board Plate and put the board on the studs (install an optional Secondary Master board on the bottom left set of studs).
- Remove the four (4) 50-0008 8-32 KEPS nuts from the parts bag, put them on the studs and tighten them.

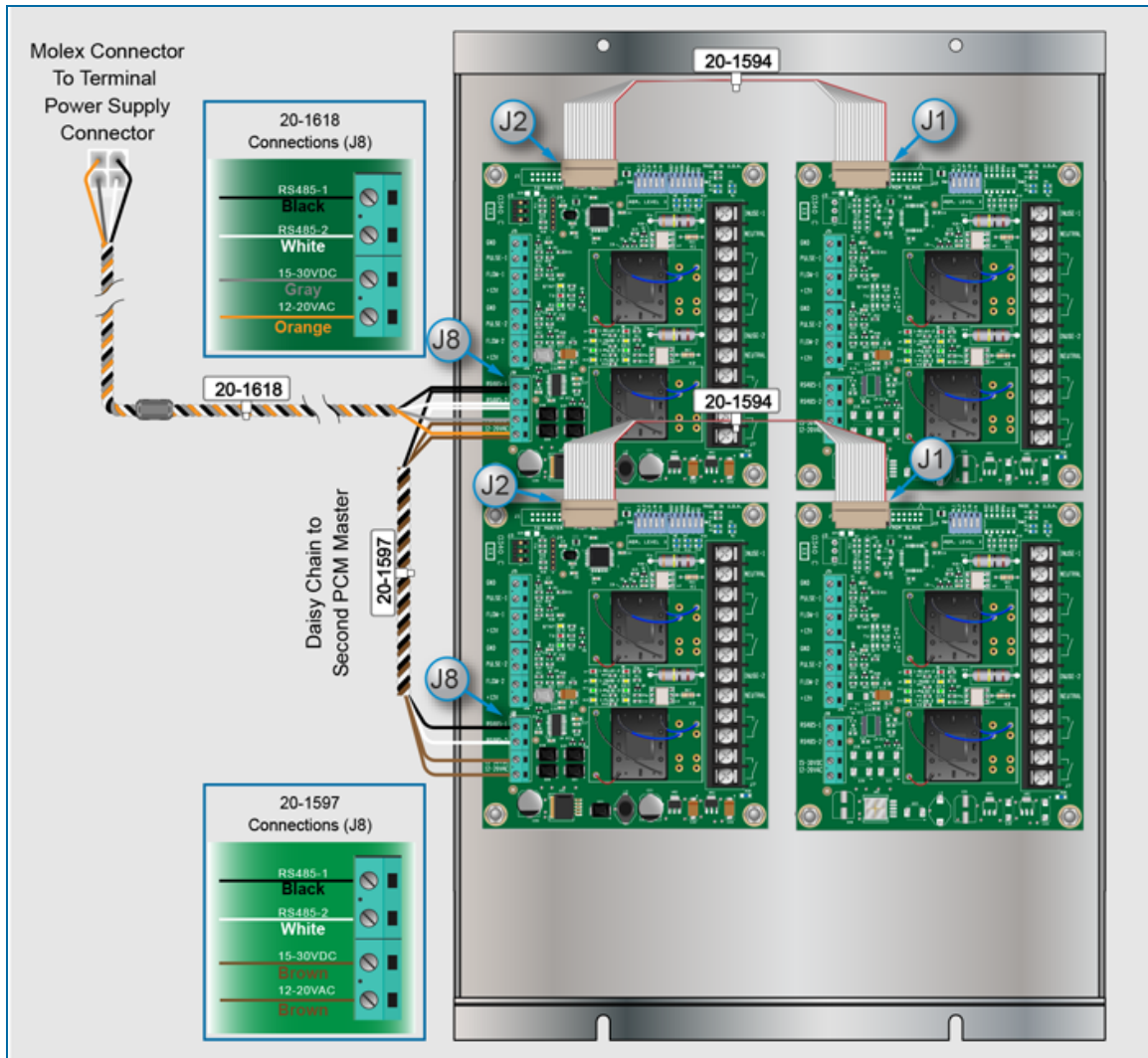
4.1.2.2 Optional 20-4405 Client Kit

- Open the 20-4405 Client Kit component box.
- Remove the plastic parts bag and open it. Keep the parts inside the bag until they are needed.
- Carefully remove the 20-0340-02 PCM Client from its protective anti-static bag.
- Align the four (4) mounting holes of the board over the top right set of studs on the Board Plate and put the board on the studs (install an optional Secondary Client board on the bottom right set of studs).
- Remove the four (4) 50-0008 8-32 KEPS nuts from the parts bag, put them on the studs and tighten them.

EDIT NOTE: ^^Need P/Ns related to DIV2

4.1.3 Install the PCM Wiring

4.1.3.1 PCM Wiring to an OPW-FMS PV200 DIV2 Terminal



NOTE: The illustration above shows the complete wiring when two (2) Master and two (2) Client boards are installed.

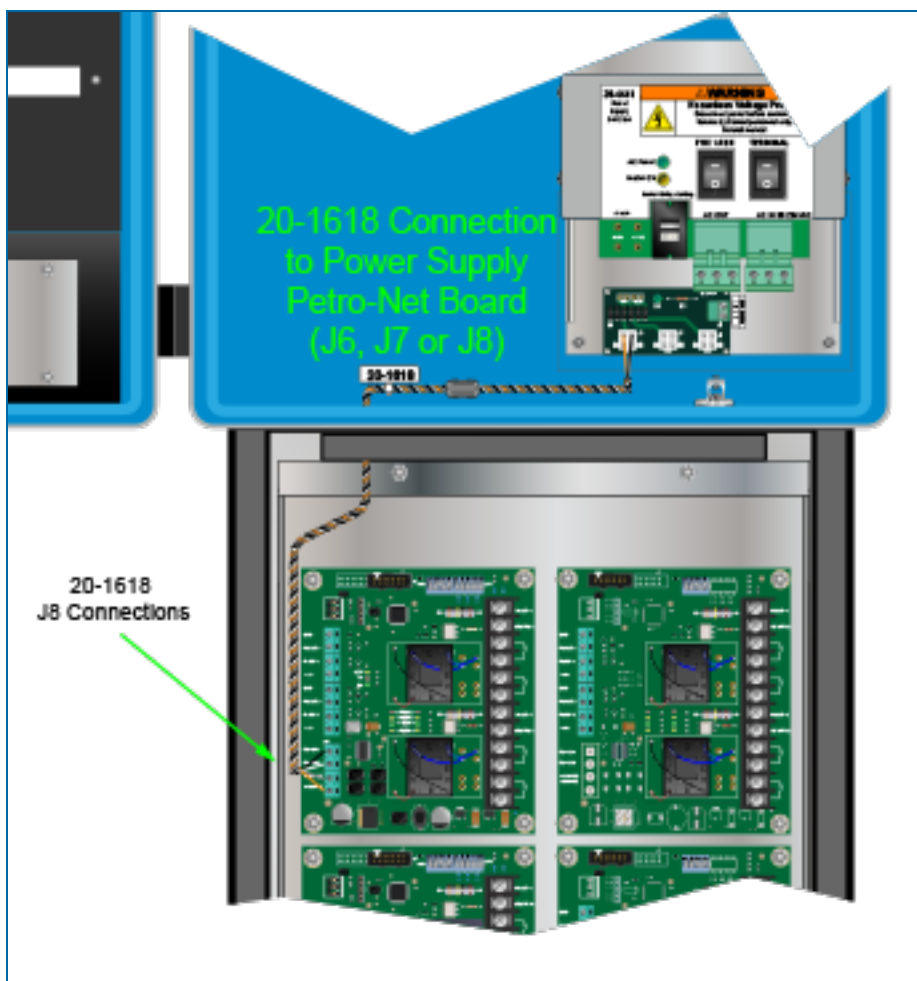
The electrical power and Petro-Net (RS485) communications are supplied to the PCMs from the terminal power supply's Petro-Net/Power Hub Board.

- Remove the 20-1618 cable and 20-1597 cable from the Master Kit component parts bag.

- Prepare each of the wires of the two cables so that the wires are connected to the four (4) terminals of the J8 block of the Primary (top) Master board as follows:
 - Twist the bare black wire of the 20-1618 cable together with the bare black wire of one end of the 20-1597 cable. Connect this pair to the RS485-1 terminal.
 - Twist the bare white wire of the 20-1618 cable together with the bare white wire of the same end of the 20-1597 cable. Connect this pair to the RS485-2 terminal.
 - Twist the bare gray wire of the 20-1618 cable together with the bare end of one of the brown wires of the same end of the 20-1597 cable. Connect this pair to the 15-30VDC terminal.
 - Twist the bare orange wire of the 20-1618 cable together with the bare end of the remaining brown wire of the same end of the 20-1597 cable. Connect this pair to the 12-20VAC terminal.
- Connect the other ends of the 20-1597 cable to the J8 Terminal Block of the Secondary Master (installed below the Primary Master) in the same configuration as above.



NOTE: The polarity of the Brown wires is not important.



Put the Molex connector end of the 20-1618 cable through an open knockout hole in the bottom of the terminal. Connect the end to an available connector of the Petro-Net board (J6, J7 or J8).

The Client boards communicate data to the Masters through the 14-Pin ribbon cables supplied in the 20-4405 Client Kits.

Remove the two (2) 20-1594 Client Ribbon Cables from both of the Client Kit component parts bags.

Connect one end of one of the ribbon cables to the J2 connector of the Primary Master and the other end to the J1 connector of its Client board (installed to the right of the Primary Master).

Connect one end of the other ribbon cable to the J2 connector of the secondary Master and the other end to the J1 connector of its Client board (installed to the right of the Secondary Master).

4.2 PCM Conduit Installation and Wiring



IMPORTANT: All PCM kits are supplied with noise suppressors that must be installed across each solenoid valve and/or motor contactor of the pump/dispenser. If the noise suppressors are not correctly installed it can cause irregular system operation because of the electrical noise from the coils in these devices.



IMPORTANT: All wiring and conduit runs must conform to the National Electric Code (NFPA No. 70), Code for Motor Fuel Dispensing Facilities and Repair Garages (NFPA No. 30A) and all national, state and local codes.

All wiring to the system must be installed in threaded, rigid metal conduit and have the required sealoffs.



IMPORTANT:

- » Do not connect pumps, canopy lights, snack machines, coolers, etc. to the breaker that supplies power to the PCM.
- » Pump control and pulser wiring must be in conduits that are separate from PCM power and RS-485 wiring.
- » Pump control and pulser wiring can share a conduit, if the pulser wiring is shielded. Pulser cables must be gas and oil resistant (UL style 2567 or equivalent).
- » Shielded pulser cable is available from OPW Fuel Management Systems as part number 12-1025 (two-conductor) or 12-1026 (four-conductor).



WARNING: Shielded cable is NOT vapor tight! To prevent the possibility of fire or explosion, conduit seal fittings must be used to prevent the flow of fumes from a hazardous area. Strip the cable jacket back so approximately three inches of jacketed cable goes through the seal-off. The stripped section **MUST** be in the sealed-off area. Refer to the National Electric Code Section 501.15(C).

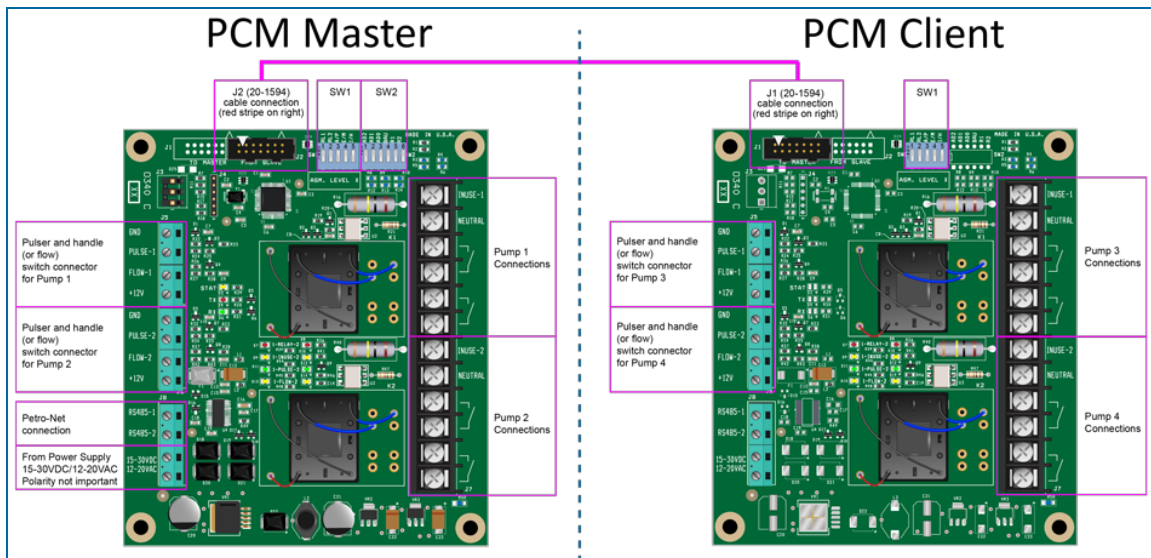


PCM Wiring and Conduit Specifications*		
Type	Wire	Conduit
Power - Pedestal Installation	20-1618 from terminal power supply to J8 terminal block of Primary Master PCM. Optional : 20-1597 from J8 terminal block of Primary Master PCM to J8 terminal block of Secondary Master PCM	N/A
Petro-Net (RS-485)	Minimum #18 AWG Twisted Pair (OPW-FMS p/n 20-1029) Or use THHN, THWN - make with approximately 10 twists for each foot. Maximum distance 5000 feet total with all equipment and devices.	Install separate conduit.
Pump / Dispenser Control	Six (6) wires. Must meet pump manufacturer's specifications.	Separate conduit
Pulser	Shielded, 600 V, UL 2567 or equivalent rating. Wire requirements are for each fueling point (2-sided fuel pumps have 2 fueling points).	Can be in the same conduit with Control wiring only if the cable voltage insulation rating is 600 V.



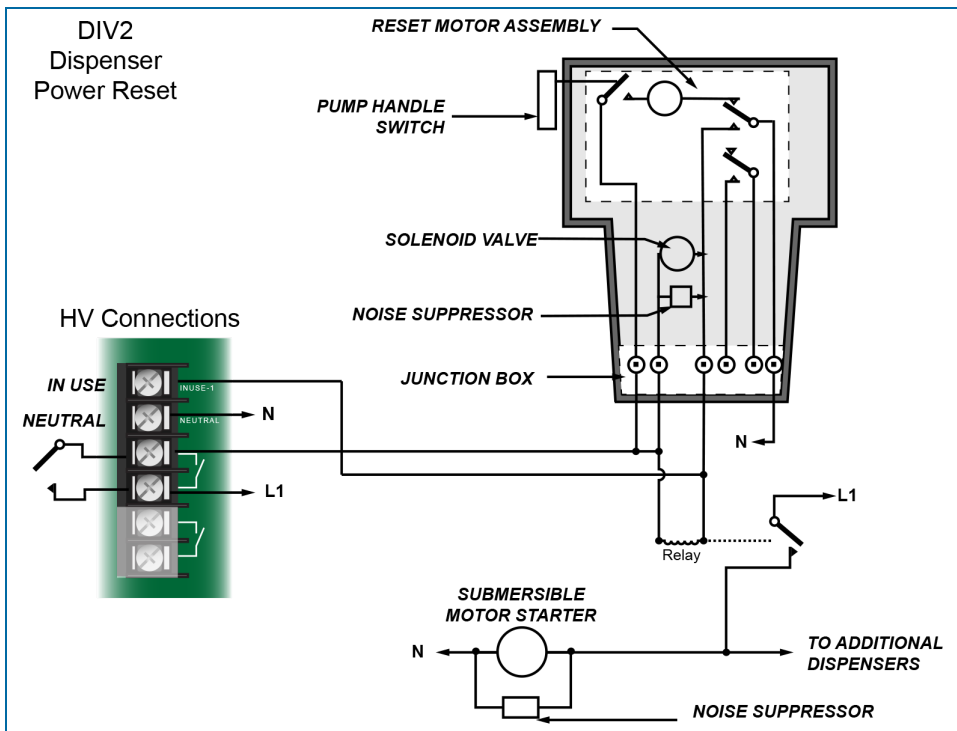
IMPORTANT: *All wiring must be rated oil and gas resistant for wet locations.

4.2.1 DIV2 PCM Board Terminal Identification



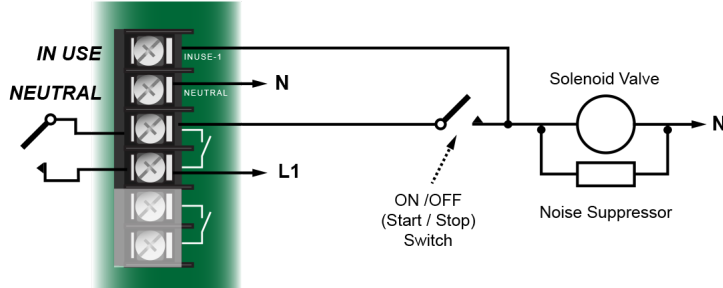
4.2.2 PCM Connections

Low-voltage Connections	High-voltage Connections
Gnd – Ground for pulser and flow switch	In-Use – Feedback from solenoid or motor
Pulse – Pulser input	Neutral – Neutral return for In-Use signal
Flow – Flow switch or pump handle input	Relay Contacts – Reset control
+12 V – Supply for pulser	Relay Contacts – Motor control



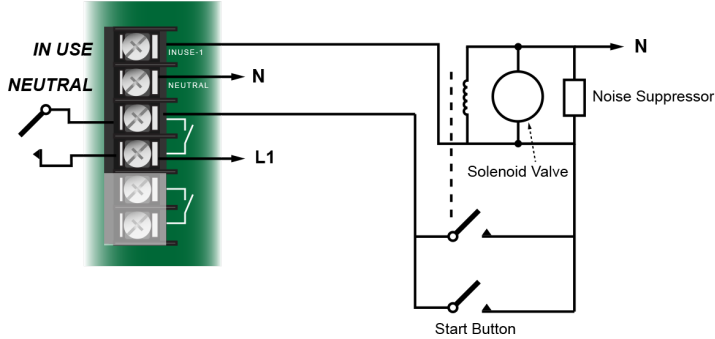
Typical Wiring: Lube Reel with ON / OFF (Start / Stop) Switch

PCM Terminal Block
HV Connections



Typical Wiring: Lube Reel with Start Button

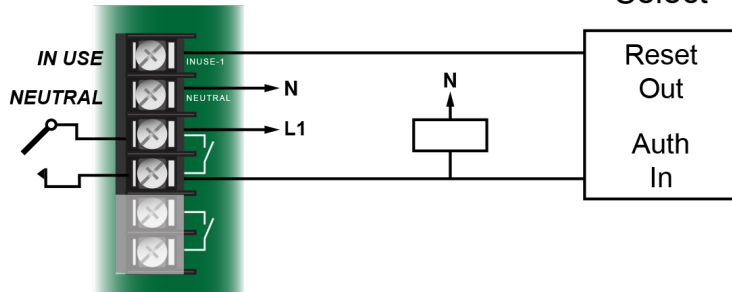
PCM Terminal Block
HV Connections



Wayne Select Dispenser Connections

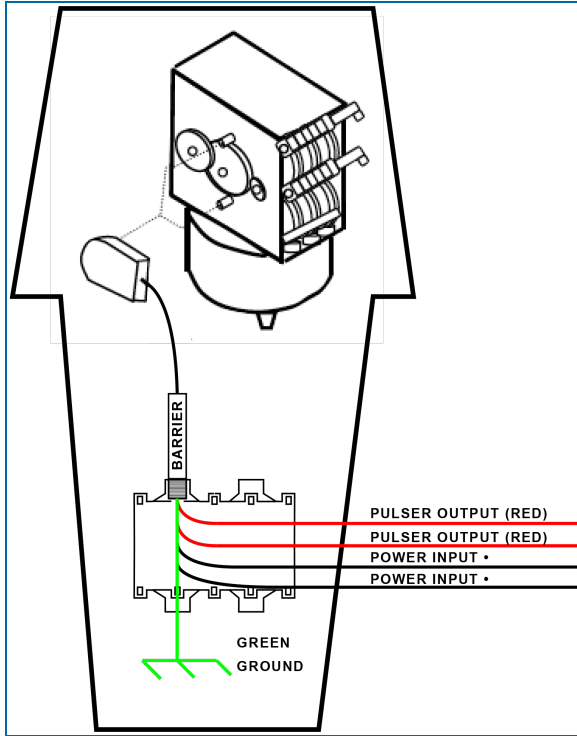
PCM Terminal Block
HV Connections

Wayne
Select



4.2.3 Pulsar Wiring

OPW-FMS Model 500 and Model 800-F

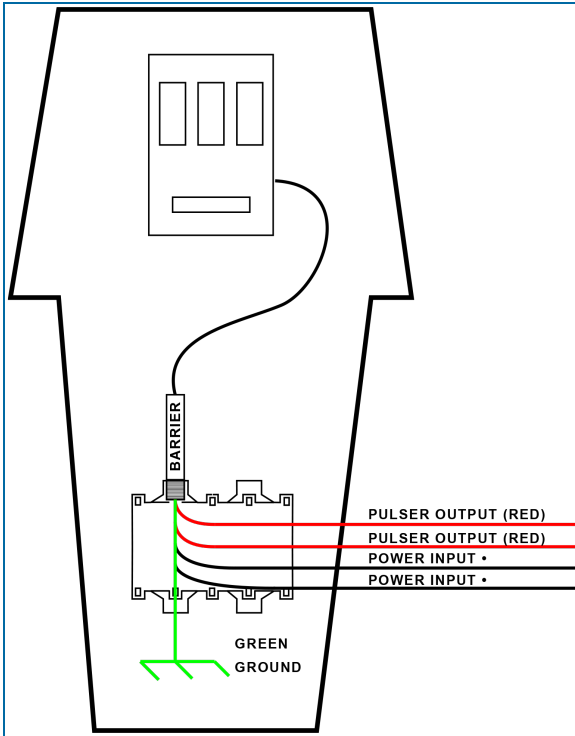


Model 500 Pulsar Wiring

Pulsar Type (P/N)	Black Wire	Black Wire	White Wire	Orange Wire	Red Wire	Red Wire	Green Wire
110 VAC (4000500)	110 VAC Hot	N/A	Neutral	N/A	Pulse Output	Pulse Output	Ground
12 VDC (4000500-12)	DC Ground	N/A	N/A	+12 VDC	Pulse Output	Pulse Output	Ground

Pulse outputs (red wires) will pulse any voltage from 5 to 170 VAC or VDC

N/A = Not applicable for this version



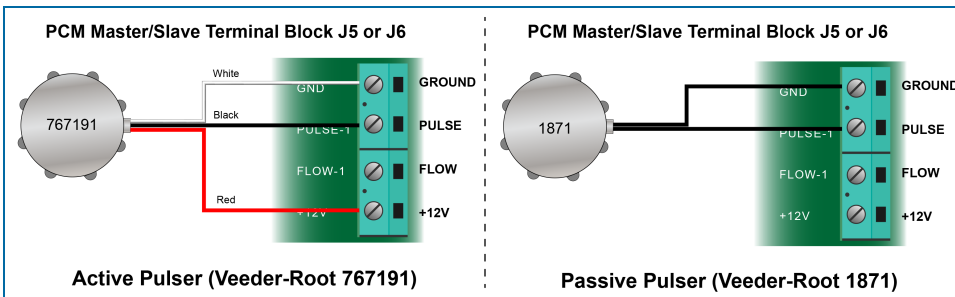
Model 800-F Wiring

Pulsar Type (P/N)	Black Wire	Black Wire	White Wire	Orange Wire	Violet Wire	Red Wire	Red Wire	Green Wire
110 VAC (4000800- F)	110 VAC Hot	N/A	Neutral	N/A	N/A	Pulse Output	Pulse Output	Ground
12 VDC (4000800- F-12)	DC Ground	N/A	N/A	+12 VDC	N/A	Pulse Output	Pulse Output	Ground

Pulse outputs (red wires) will pulse any voltage from 5 to 170 VAC or VDC

N/A = Not applicable for this version

Veeder-Root 767191 Active and 1871 Passive Pulsers

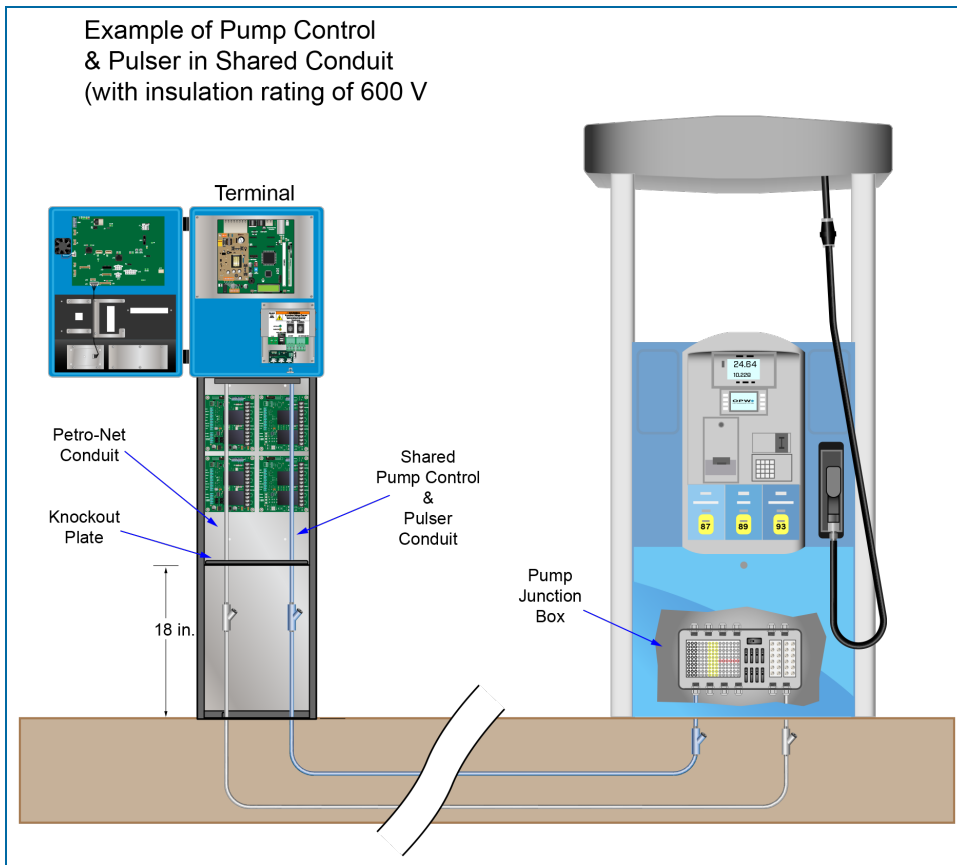


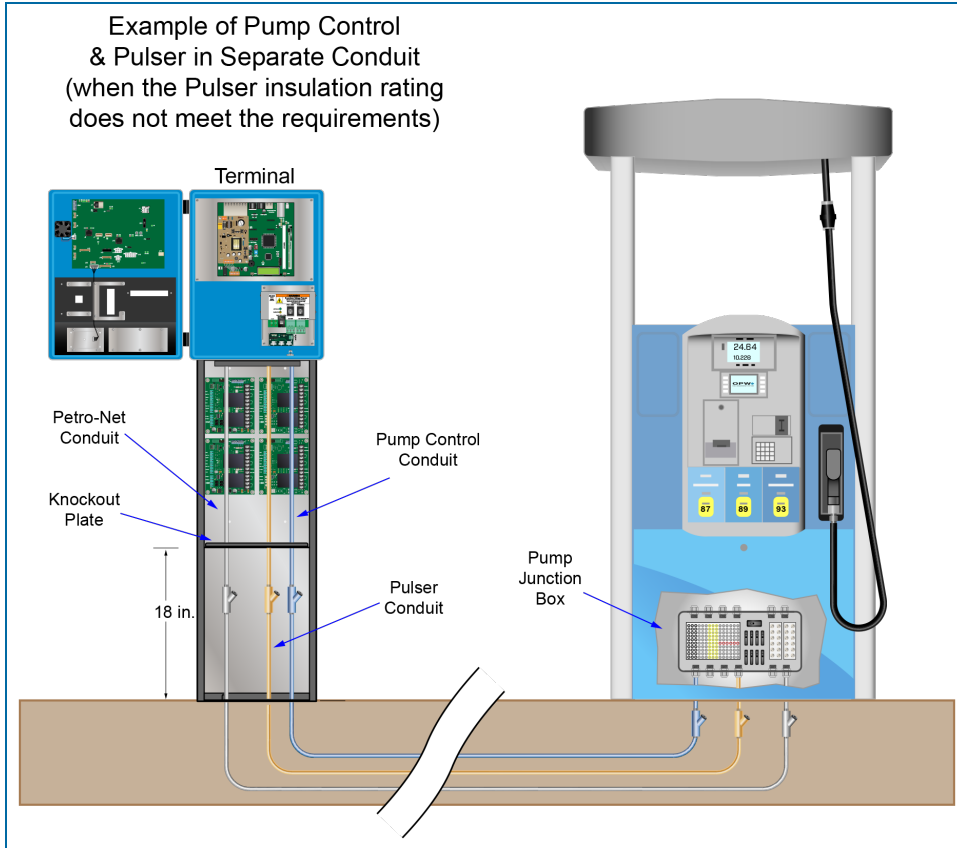
4.2.4 Conduit Installation Examples

Pedestal Installed PCMs

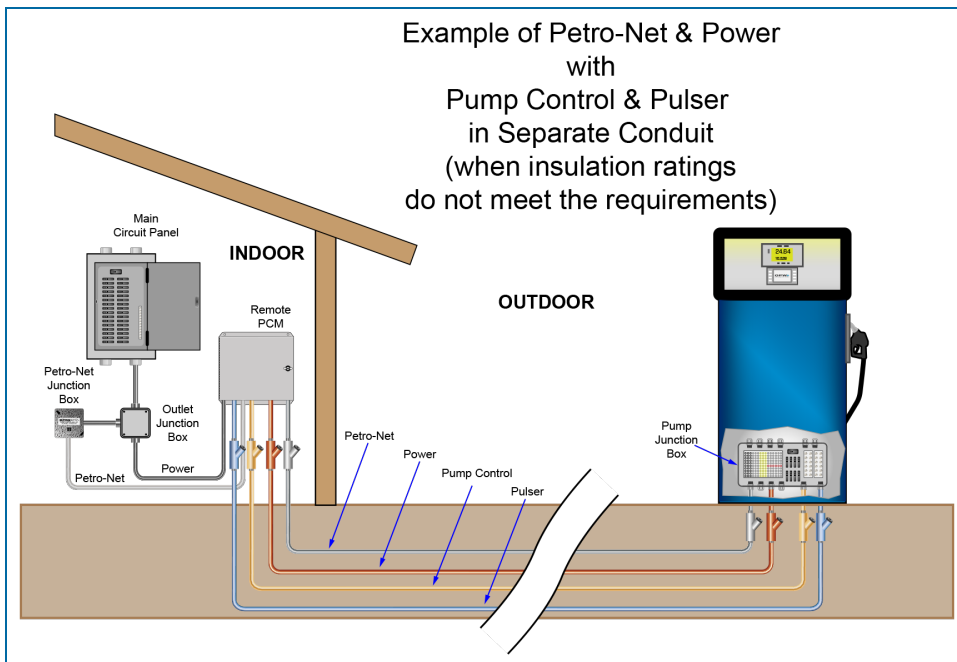
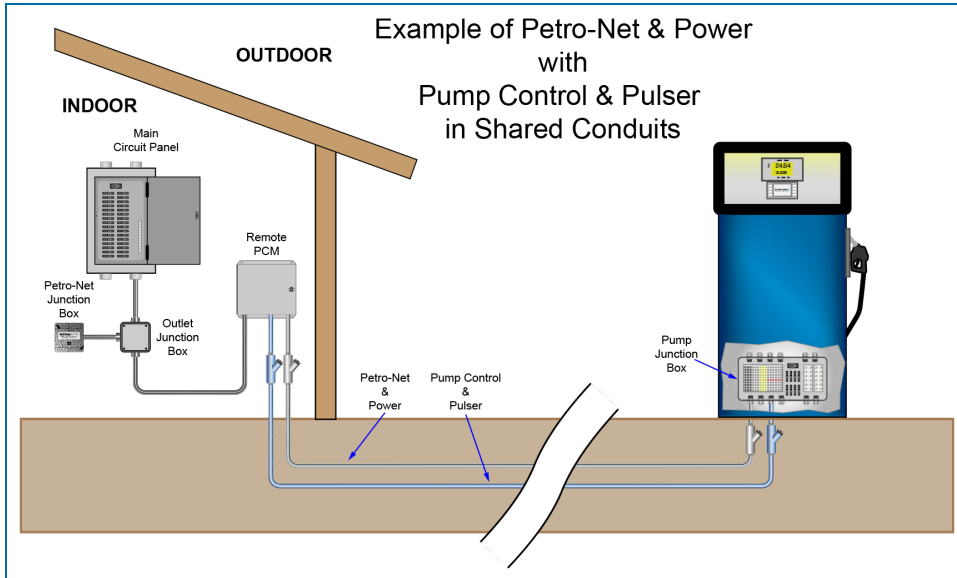


REMINDER: Pedestal installed PCMs get power from the Terminal Power Supply. Refer to the terminal installation manual for information about power supply conduit installation. Petro-Net wiring must be in separate conduit from Pump / Dispenser Control and Pulsar wiring.





Remote PCMs



Section 5 PCM Configuration

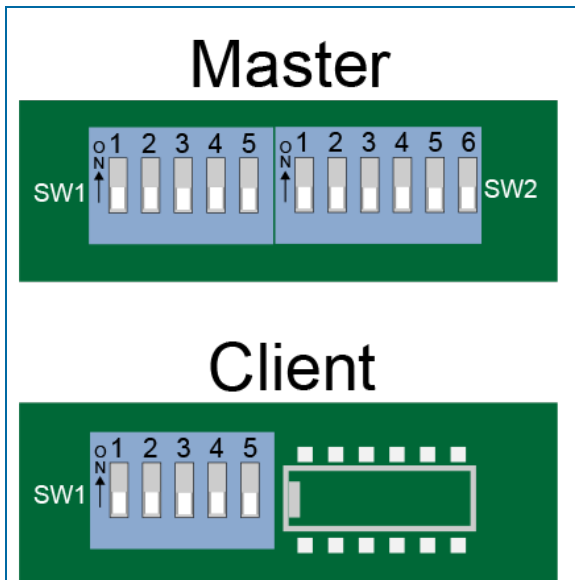


DANGER: To prevent the possibility of electrical shock, de-energize the AC Power Supply before you do the PCM installation procedures shown below.



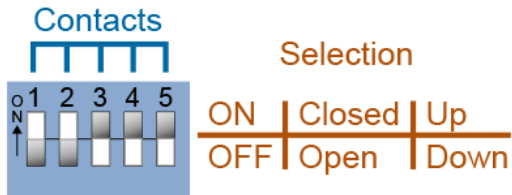
ATTENTION: Electrostatic Sensitive Device - To prevent damage from electrostatic discharge, obey the precautions in "[Electrostatic Sensitive Devices \(ESD\)](#)" on page 11 when it is necessary to move or touch these components.

5.1 DIP-Switch Configuration



Master boards have two DIP-Switch blocks. One is a five-contact switch and the other is a six-contact switch. Client boards only have the five-contact switch.

Switch - Slider



Switch - Rocker



NOTE: The illustration above shows two possible types of DIP-Switch blocks that can be installed on PCM boards. On the illustration, the two switches are set to the same configuration with contacts 1 and 2 in the **ON/CLOSED** position and contacts 3-4-5 in the **OFF/OPEN** position.



TIP: You can use a pen or pencil point to make it easier to move the sliders or push the rocker switches.

5.1.1 Switch # 1 Contacts 1-5 (Master/Client Boards)

Switch Contact	Desc	Pump Number		Desc.	SW Contact Selection (Open/Closed)
		Master	Client		
1	Operation Mode	1	3	Normal Operation	OFF/OPEN
				Manual Override	ON/CLOSED
2	Operation Mode	2	4	Normal Operation	OFF/OPEN
				Manual Override	ON/CLOSED

Switch Contact	Desc	Pump Number		Desc.	SW Contact Selection (Open/Closed)
		Master	Client		
3	Pulser Type	1 and 2	3 and 4	Active	OFF/OPEN
				Passive	ON/CLOSED
4	Pulser Filter	1 and 2	3 and 4	Electronic	OFF/OPEN
				Mechanical	ON/CLOSED
5	In-Use Sense	1 and 2	3 and 4	Voltage Sense	OFF/OPEN
				Handle Sense	ON/CLOSED

Operation Mode (SW1, Contacts 1-2): There are two (2) operation modes:

- During *Normal Operation* relays are energized by the Fuel Site Controller (FSC).
- During *Manual Override* relays are energized by the PCM. The pumps can operate without FSC control.

Pulser Type (SW 1 Contact 3): Set this Contact to agree with the electrical output of the connected pulser. There are two types of pulsers that can be used with PCMs:

- *Active Pulsers* supply a low-voltage signal to the PCM board.
- *Passive Pulsers* contain switch contacts or have “open collector” transistor outputs.



IMPORTANT: This is applicable to the pulsers for both pump positions connected to the PCM. Both pulsers **must** be of the same type.

Pulser Filter (SW 1 Contact 4): Set this Contact to agree with the type of pulser that is connected. Mechanical pulsers cannot count as fast and make more electrical noise. Set the Pulser Filter to Mechanical to filter the input signal.

- *Electronic Pulsers* typically have shutter wheels and optical detectors.
- *Mechanical Pulsers* have switches that open and close with each pulse.



IMPORTANT: This is applicable to the pulsers for both pump positions connected to the PCM. Both pulsers **must** be of the same type.

In-Use Sense (SW 1 Contact 5): This Contact is set to how the pump is wired to tell the PCM that the pump is “authorized.” The PCM can be set for two types of “in-use” sense:

- *Voltage Sense* is the most common method as it uses a line-voltage return wire from the solenoid valve (or pump motor) wired to the “in-use” terminal on the high-voltage side of the PCM.

- *Handle Sense* is the alternative method that uses a contact-closure input wired to the “Flow” terminal on the low-voltage side of the PCM.



IMPORTANT: This is applicable to the pulsers for both pump positions connected to the PCM. Both pulsers **must** be of the same type.

5.1.2 Switch # 2 Contacts 1-6 (Master Board)

Address (SW 2 Contacts 1-3): Set the device *Address* (device number) of the PCM board with these contacts. Each PCM Master/Client pair must have a different device number so that the Site Controller can identify and control it.

Contact 1	Contact 2	Contact 3	PCM Address #
OFF/OPEN	OFF/OPEN	OFF/OPEN	1
OFF/OPEN	OFF/OPEN	ON/CLOSED	2
OFF/OPEN	ON/CLOSED	OFF/OPEN	3
OFF/OPEN	ON/CLOSED	ON/CLOSED	4
ON/CLOSED	OFF/OPEN	OFF/OPEN	5
ON/CLOSED	OFF/OPEN	ON/CLOSED	6
ON/CLOSED	ON/CLOSED	OFF/OPEN	7
ON/CLOSED	ON/CLOSED	ON/CLOSED	8

Baud Rate (SW 2 Contacts 4 & 5): These contacts let you set the Petro-Net *Baud Rate*.



IMPORTANT: All devices on Petro-Net must be set to the same baud rate.

Factory (SW 2 Contact 6): These contacts are for *Factory* use only and must be set to "OFF/OPEN.."



NOTE: The contact configurations shown below are for Master PCM boards (20-4404-XX) with Software Version 1.07G or higher.

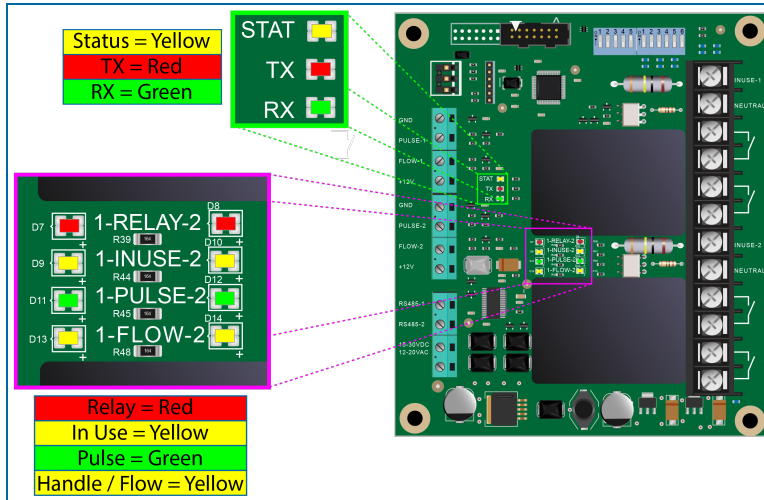
Contact Number	Baud Rate			Test Mode
	9600	2400	1200	
4	OFF/OPEN	OFF/OPEN	ON/CLOSED	ON/CLOSED
5	OFF/OPEN	ON/CLOSED	OFF/OPEN	ON/CLOSED
6	Must be set to OFF/OPEN (Used for bulk plant application)			



NOTE: The contact configurations shown below are for Master PCM boards (20-4404-XX) with Software Versions BEFORE 1.07G.

Contact Number	Description	SW Contact Selection
4	Baud Rate	6900 OFF/OPEN
		1200 PCM Part #20-44-01 thru 20-4404-04 2400 PCM Part #20-44-05 thru 20-4404-08 ON/CLOSED
5	Must be set to OFF/OPEN	OFF/OPEN
6	Must be set to OFF/OPEN	OFF/OPEN

5.2 PCMLEDs



The LEDs in the list below are on Master and Client boards and show the operation status for the connected pumps or dispensers.

- RELAY: When this LED is ON, the relay is energized.
- IN USE: When this LED is ON, the pump is operated with voltage sense feedback. When it is OFF, the pump is not in operation or it is operated by a handle switch.
- PULSE: When this LED FLASHES, pulses are received.
- FLOW: When this LED is ON, the flow switch OR the handle switch is in operation.

The LEDs in the list below are on the Master board only. They show data transmission and diagnostic status.

- TX: When this LED FLASHES, data is transmitted by the board.
- RX: When this LED FLASHES, data is received by the board.
- STAT: When this LED FLASHES, the PCM is in correct operation. This LED is also used by OPW technicians during board diagnostics in test mode.

Section 6 PCM Diagnostics



WARNING: SHOCK HAZARD! ONLY APPROVED, TRAINED TECHNICIANS ARE PERMITTED TO DO THIS TEST! There will be high voltages in the system when it is energized. Be very careful when you do the procedures in this section when the protective cover is removed to get access to the PCM switch blocks. It is recommended to use a non-conductive (wooden or plastic) stylus to make adjustments to the DIP-Switch contacts when the system is energized. **DO NOT TOUCH WIRING OR TERMINALS.**



This test will use the **Manual Override** Operation Mode to make sure that the PCM is correctly connected to the pumps.

1. Remove the pedestal cover to get access to the PCMs. Make sure that system is energized.



REMINDER: Switch Contact 1 controls the relay for the first connected pump (monitor the left row of operation status LEDs). Switch Contact 2 controls the relay for the second connected pump (monitor the right row of operation status LEDs).

2. Set **Switch Contact 1** to the **ON/CLOSED** position to put the Relay in **Manual Override** Operation Mode. Listen for the relay to click "ON." Look to make sure the **RELAY** LED light comes on (refer to "PCM LEDs" on page 36).
3. Start the pump/dispenser. When the reset cycle is complete and the pump motor (or solenoid valve) comes on, look to make sure that the yellow **IN-USE** or **FLOW** LED comes on.
4. Dispense product and monitor the green **PULSE** LED. It should flash as product is dispensed. If a flow switch is installed, make sure the yellow FLOW LED comes on at the same time.
5. Set the **Switch Contact 1** to the **OFF/OPEN** position to put the relay back in **Normal** Operation Mode.

Do the steps above again for Switch Contact 2.

Do the steps above again for Switch Contacts 1 and 2 for all Master and Client boards in the system to.

Revisions M00-20-340-03

Revision #	ECO	Effective	Software Version	Key Changes
0	1674	12/18/2019	NA	Initial Release
1	TBD	TBD		Rename Slave to Client



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.



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Dover Fueling Solutions Global Locations

Corporate Headquarters
3814 Jarrett Way
Austin, Texas 78728
United States
Phone: +1 512 388 8311
www.doverfuelingsolutions.com

North America

Richardson, TX, USA
Hodgkins, IL, USA
Brighton, Ontario, CAN

Latin America

Rio de Janeiro, Brazil

Midlothian, UK
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