OPW

FUEL MANAGEMENT SYSTEMS

K800®

Automated Fueling System

Installation Manual

OPW Fuel Management Systems -
System and Replacement Parts Warranty Statement
Effective September 1, 2002

System and Replacement Parts 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. 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 service 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.)

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*.

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.

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.

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Precautions

Warning

This manual contains important warnings. You must heed these warnings to ensure the safe and effective operation of the K800 Automated Fueling System. Failure to comply with these warnings may create hazardous conditions and/or damage the K800 system.

Codes

Installations must be in accordance with the National Electrical Code (NFPA No.70) and the Automotive and Marine Service Station Code (NFPA No. 30A). The installer is responsible to investigate and follow any applicable local codes.

Hazardous Area Definition

A fuel dispenser is a hazardous area as defined in the National Electrical Code.

Do not mount the K800 Fuel Island Terminal within a hazardous area. Do not mount the Fuel Site Controller or any peripheral devices within or above a hazardous area.

External Devices

All peripheral equipment connected to the K800 system must be UL and CSA listed and have an RS-232C standard interface.

Caution

The plug-in transformers for the K800 FSC are NOT compatible with the transformers in the Petro Vend System2 FSC. Using the wrong transformer will cause severe damage to the unit:

- K800 transformers have a 12 VAC output

- System2 transformers have a 18 VAC output

The voltage rating for the FSC is on the serial number label on the bottom of the FSC chassis.

System Specifications

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Table 1: K800 Fuel Island Terminal (FIT) Specifications

Power Requirements	120 VAC, 60 Hz, 100W 220 - 240 VAC, 50 Hz
Dimensions	12" H x 13" W x 10" D (30.5cm H x 33cm W x 25.4cm D)
Ambient Temperature Rating	-40E F to 110E F (-40E C to 43E C)
Stored Transactions	10,000 cards or keys, 1800 transactions
Pump Control	0.75 HP, 120/240 VAC
PULSER • Compatibility • Power supply • Rate • Speed • Duty cycle	Contact 12 VDC electronic 12 VDC, 40 mA max per pulser 1:1 to 1000:1, in one-pulse increments MECHANICAL: 6,000 pulses per minute ELECTRONIC: 100,000 pulses per minute 50%

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Table 2: K800 Fuel Site Controller (FSC) Specifications

Dimensions	2" H x 9" W x 11" D (5cm H x 23cm W 28cm D)
Power Requirements	120 VAC, 60 Hz or 220 - 240 VAC, 50 Hz 30W
Port Communication Protocols • P-NET • PRINTER • MODEM • TERMINAL	RS-485/9600 baud/5000 ft. max RS-232/2400 baud/6 ft. max 212A/224A/96 RS-232 (WYSE 50 emulation)
Ambient Temperature Rating	32E to 122E F (0E to 38E C)

Fuel Island Terminal

Overview

Figure 1 is an internal view of the K800 Fuel Island Terminal.

Card or key reader

PC board, see *Figure 14* on *page 21*

Keyboard
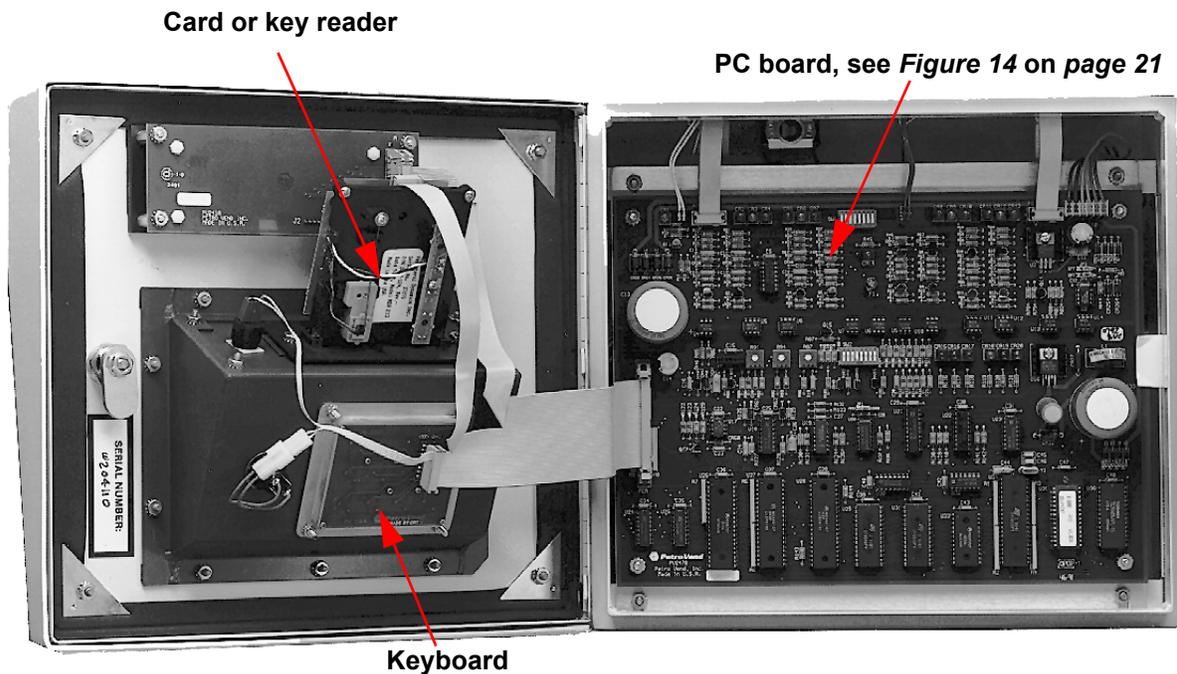
Figure 1: Inside the K800 FIT

Warning

Do not drill holes into the K800 FIT cabinet(s). Aside from violating cabinet integrity and voiding your warranty, drilling holes can leave metallic dust and fragments that can interfere with K800 circuitry.

Threaded holes are provided to mount the pedestal, and knockouts are provided to connect the conduit.

Petro-Net Length

The MAXIMUM TOTAL length of Petro-Net at each site is 5,000 feet. This is NOT per device. This is TOTAL of all FITs, PCTs and other devices.

EXAMPLE: A site contains two FITs, a remote PCT and a junction box. Each FIT is 1,000 feet from the junction box. The remote PCT is 100 feet from the junction box. The TOTAL length of Petro-Net in this example is 2,100 feet.

FIT Preparation

Up to four FITs can be installed per outdoor location.

1. Remove the PV247 circuit board and heater plate assembly from each FIT before mounting the cabinet.

2. Disconnect the flat cable from the door at the PV247 board.

3. Disconnect the flat cable(s) from the pump relay board (under the PV247 board).

4. Disconnect the power, heater and Petro-Net connectors to the PV247 board.

5. Unscrew the four heater plate mounting nuts, but do not remove the PV247 board from the heater plate!

6. Remove the PV247 board and heater plate assembly, and store it in a safe place. The board/plate assembly will not be replaced until after the FIT is wired.

Warnings

- **The K800 FIT contains sensitive electronic circuitry. Rigid steel conduit is required to prevent electrical interference on the power and Petro-Net communication wires to the FIT. Aluminum or PVC conduit does NOT provide the necessary shielding and will void the K800 warranty.**

- **Supply K800 FIT power from a dedicated circuit. Use only type RH, TW, RFH-2 conductors or their equivalent per National Electrical Code ANSI/NFPA 70.**

- **DO NOT supply power to the FIT from existing power wires at the island.**

- **Run the conduit for the K800 FIT power wires directly to the circuit breaker box. DO NOT run this conduit into the wiring trough.**

- **DO NOT use the K800 FIT as a wiring junction box.**
- **Stub all conduit to the bottom of the FIT cabinet.**

FIT Pedestal & Cabinet Installation
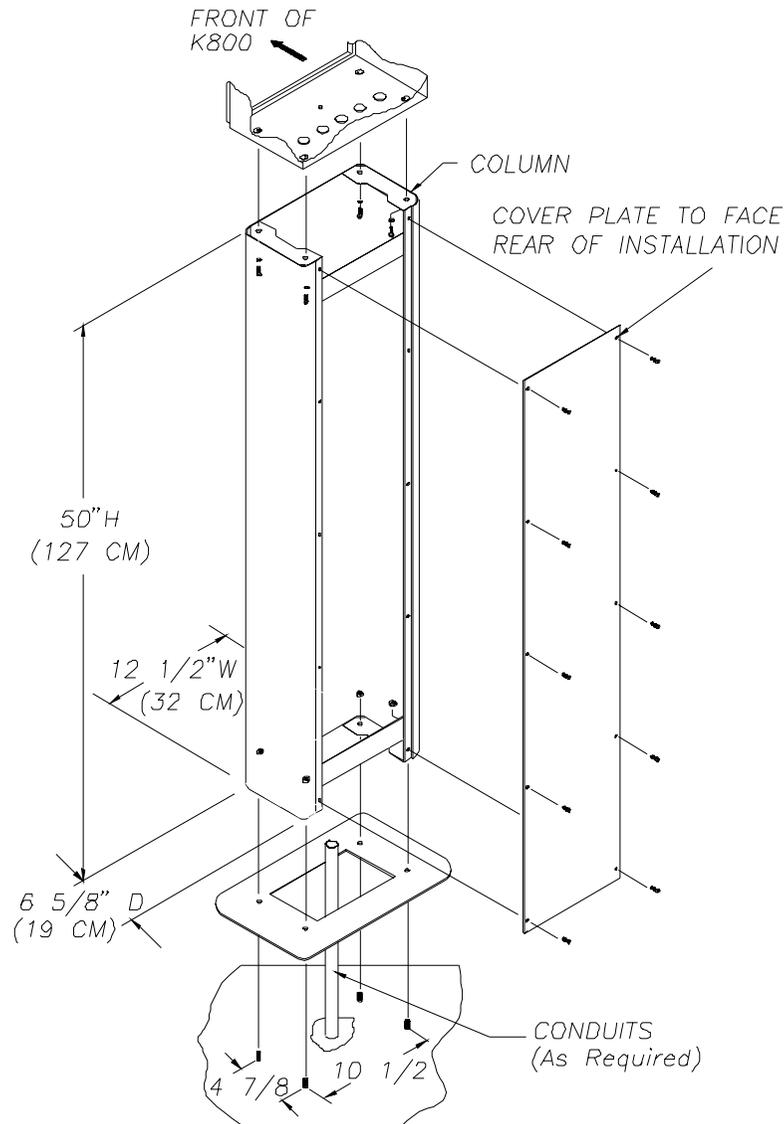
Figure 2: K800 Pedestal Assembly & Installation

1. See *Figure 2*. Select a location at or near the fuel island for the FIT. Each FIT must be installed at least 18" from the nearest conventional pump or dispenser or at least 24" away from the nearest overhead pump or dispenser. Shield the FIT from direct sunlight, particularly in warmer climates.

2. When mounting the FIT pedestal with anchors, use the base plate as a template. If needed, use washers to level the plate on uneven ground.

3. Use anchor bolts (or equivalent) with threading to match supplied nuts to mount each FIT pedestal to the concrete.

4. Mount the FIT cabinet directly to the pedestal using the installation kit (#20-4101) supplied with each unit.

System Conduit

Figure 3 shows a typical K800 conduit layout. Not all sites have all indicated components.
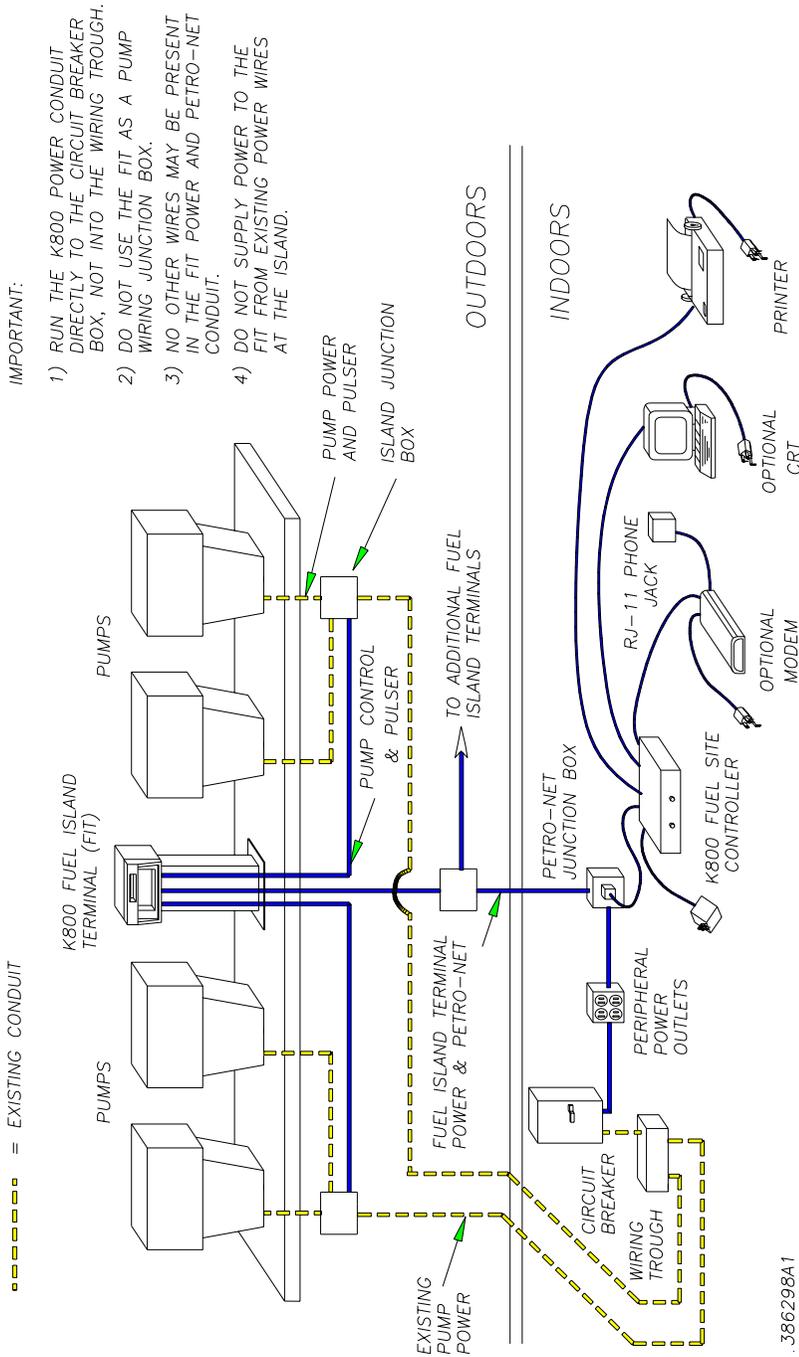
Figure 3: K800 Site Conduit Concept

Pump Conduit

Install rigid steel conduit(s) from the island junction box(es) to the K800 FIT(s). If your site has no island junction box, install individual conduit from each pump junction box.

The conduit must be large enough for line-voltage pump control wires and low-voltage shielded pulser wires.

FIT Power & Petro-Net Conduit

Install conduit from the FIT to the Petro-Net junction box. The Petro Net junction box must be located within three feet of the Fuel Site Controller.

If you are installing more than one FIT, the conduit and wiring may be connected in a daisy chain fashion (from one terminal to the next) or in a "Y" fashion (all terminals connect back to one common point).

Place only FIT power and Petro-Net wires in this conduit.

Power Conduit

Install conduit from the Petro-Net junction box directly to the circuit breaker panel. Do not run this conduit through the wiring trough.

To power the FSC and peripheral equipment, install an outlet box in this conduit run. This makes sure all K800 components are powered by the same circuit, which is a requirement in some areas.

System Wiring

Figure 4 shows where to connect FIT power, Petro-Net and pump wiring.
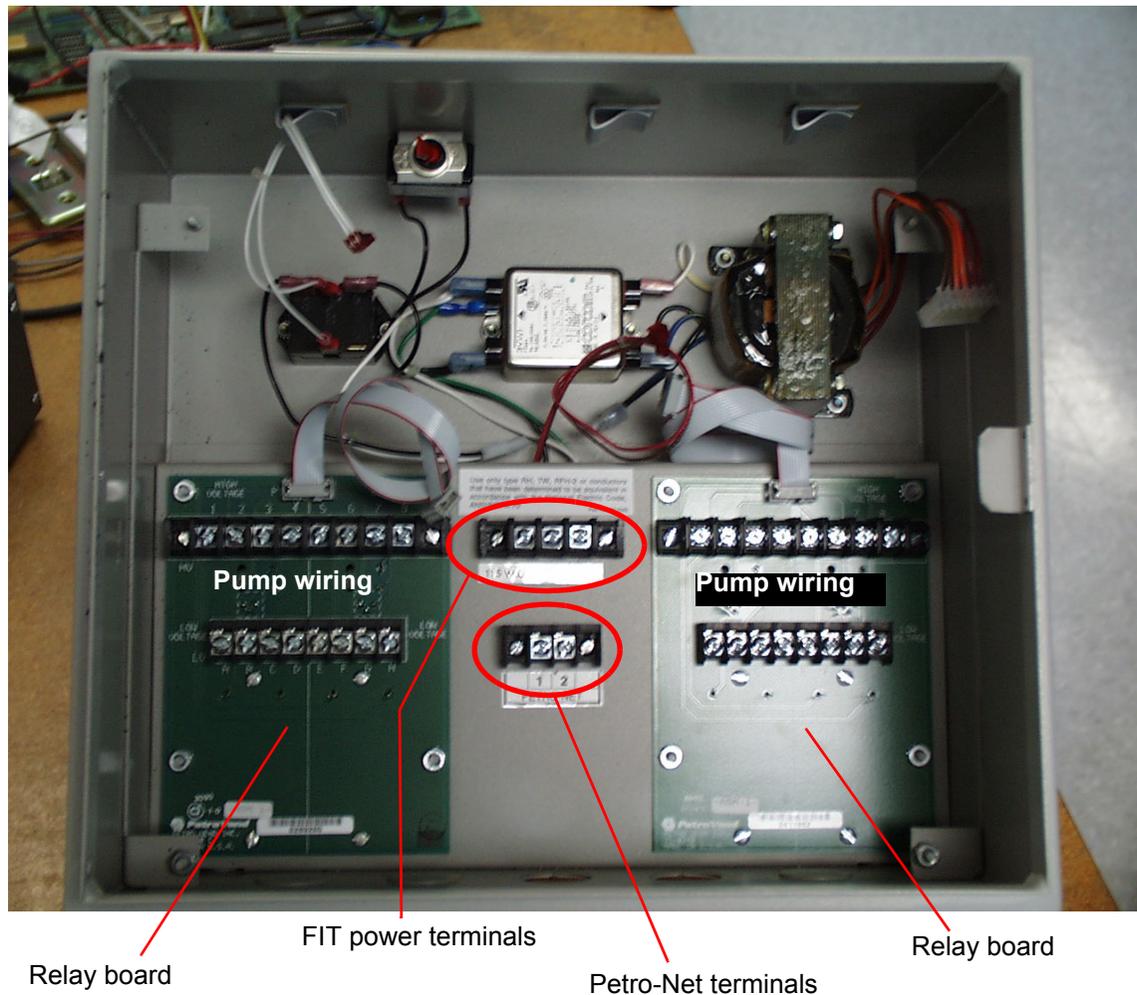
Figure 4: FIT Terminals & Relay Boards

Wiring Step by Step

1. Pull three #14 AWG power and ground wires from the circuit breaker panel and two #18 AWG (minimum) twisted-pair wires from the Petro-Net junction box to the Fuel Island Terminal(s).

2. Connect one end of the Petro-Net wires to the junction box cover, then screw the cover to the junction box.

3. Connect the other end of the Petro Net to the PETRO NET terminals in the FIT(s).

Note

Petro-Net uses RS-485 communication which requires a twisted pair wire for proper operation. Twisted pair wire is available from Petro Vend (part# 12-1029). You can also make twisted-pair simply by twisting standard TFFN, THHN or THWN wire together, with about 10 twists per foot.

If you make your twisted-pair remember that you must twist the wire before pulling it through the conduits.

Warning

The ground wire in the K800 FIT(s) must be properly installed for the operation of the noise suppression circuitry. Do not rely on the conduit to provide the ground.

The ground wire MUST originate at the circuit breaker/ service panel.

4. Connect the two line voltage supply wires and the ground wire from a dedicated circuit breaker to the power input terminal block in each FIT.

5. If peripheral power outlets were installed in this conduit run, tap into the power and ground wires to power these outlets.

Fuel Island Terminal

Petro Net

Power

| 1 | 2 |

| L1 | N | G |

Circuit Breaker

GND

NEUTRAL

L1

To additional FITs

No connection

| 1 | 2 | 3 | 4 |

Petro Net Junction Box
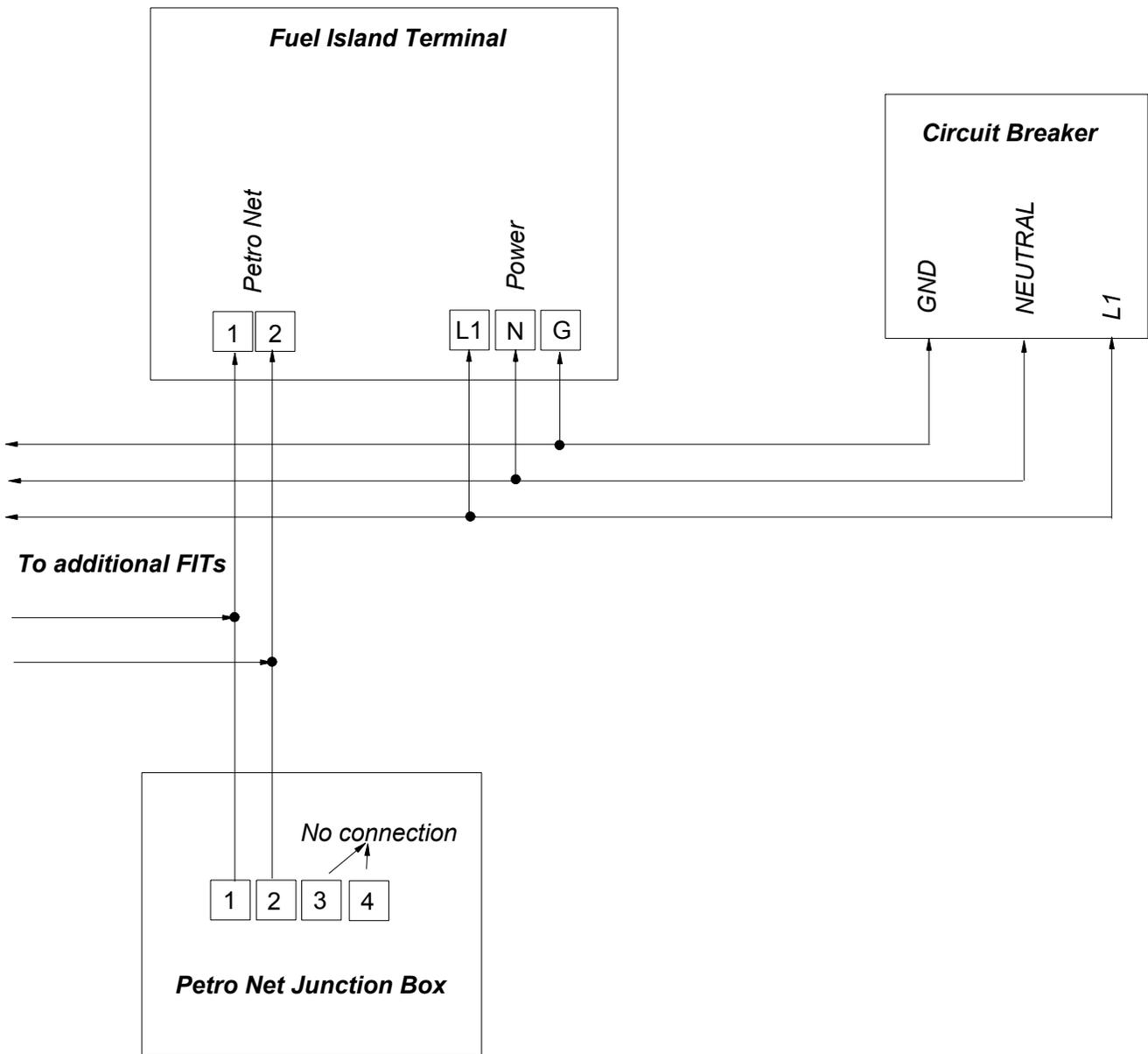
Figure 5: FIT Wiring Overview

RESET INTERLOCK ——————   ——— PULSER

PUMP HANDLE SWITCH ——

PUMP MOTOR ——

PV240
HIGH VOLTAGE
TERMINAL BLOCK

CURRENT
SENSE ——
CONTACTS

AUXILLARY ——
CONTACTS

| 1 | $\Rightarrow L_1$
| 2 |
| 3 |
| 4 |

$L_2 \Leftarrow *$

PV240
LOW VOLTAGE
TERMINAL BLOCK

PULSER COM ◁—— | A |
PULSER SIG ◁—— | B |
PULSER PWR ◁—— | C |
EARTH GND —— | D |

CABLE
SHIELD

◉ = FIELD CONNECTION

* CONNECT PUMP MOTOR TO
  NEUTRAL INSTEAD OF L_2
  FOR A 120V. PUMP MOTOR
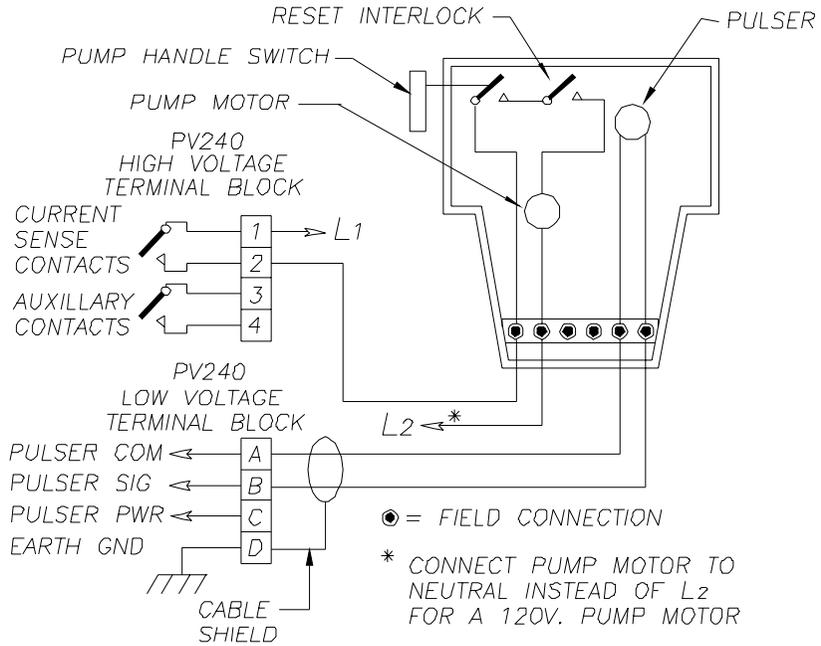
Figure 6: Typical Pump Control Wiring -- Self-Contained

RESET MOTOR ASSEMBLY ——   ——— PULSER

PUMP HANDLE
SWITCH ——

PV240
HIGH VOLTAGE
TERMINAL BLOCK

CURRENT
SENSE ——
CONTACTS

AUXILLARY ——
CONTACTS

| 1 | $* \Rightarrow L_2$
| 2 |
| 3 | $\Rightarrow L_1$
| 4 |

PUMP
MOTOR

PV240
LOW VOLTAGE
TERMINAL BLOCK

$N \Leftarrow$

PULSER COM ◁—— | A |
PULSER SIG ◁—— | B |
PULSER PWR ◁—— | C |
EARTH GND —— | D |

CABLE
SHIELD

◉ = FIELD CONNECTION

* CONNECT TERMINAL 1 TO
  NEUTRAL INSTEAD OF L_2
  FOR A 120V. PUMP MOTOR
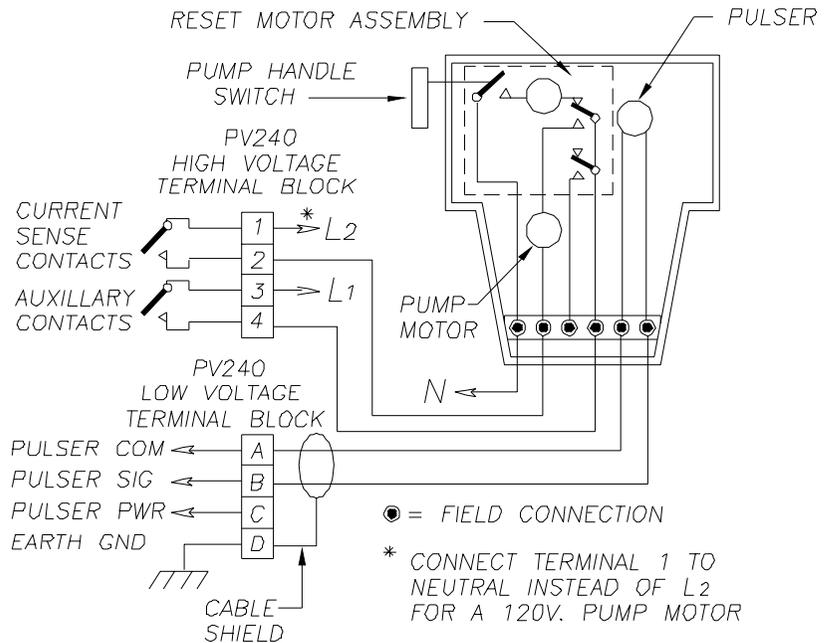
Figure 7: Typical Pump Control Wiring - Self-Contained/Power Reset
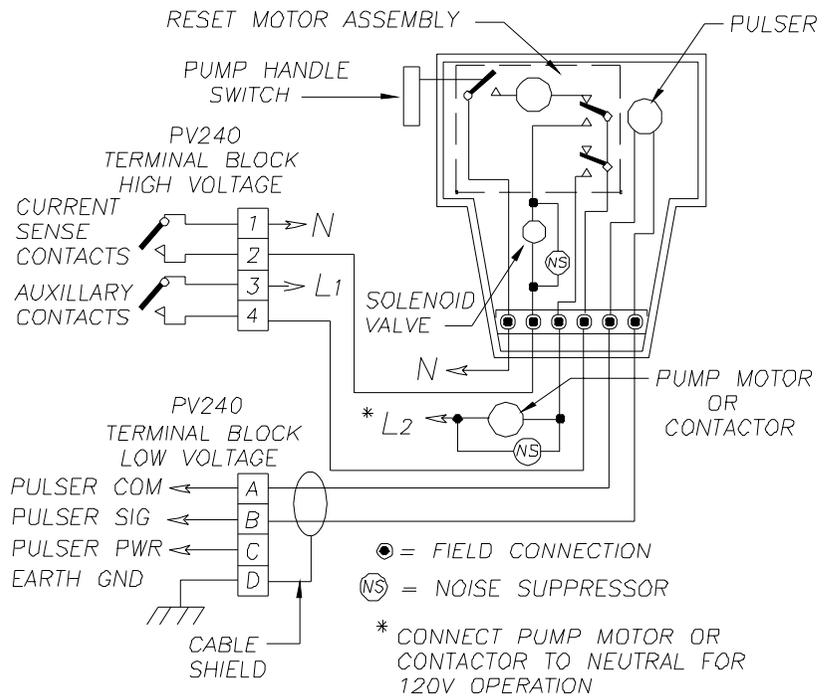
Figure 8: Typical Dispenser Control Wiring

Pump Control Wiring

See *Figure 6*, *Figure 7*, or *Figure 8* to determine the number of line voltage control wires that will be needed for each pump.

PV240 Pump Relay Board

PULSER COMMON — A — White — **Pulser**

PULSER SIGNAL — B — Black

PULSER POWER — C

EARTH GROUND — D — Cable Shield
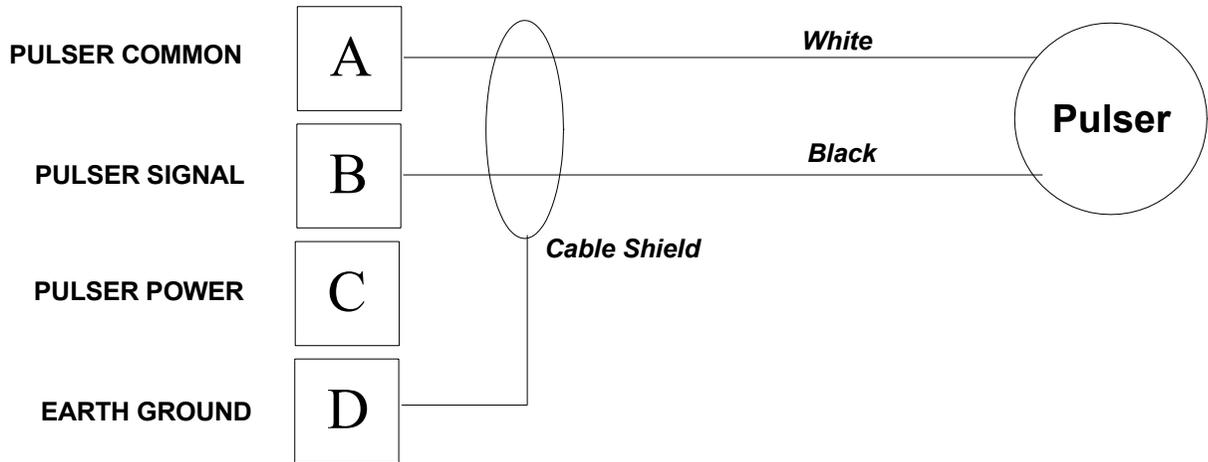
Figure 9: Pulser Wiring -- Veeder-Root 1871

PV240 Pump Relay Board

PULSER COMMON — A — White — **Pulser**

PULSER SIGNAL — B — Black

PULSER POWER — C — Red

EARTH GROUND — D — Cable Shield
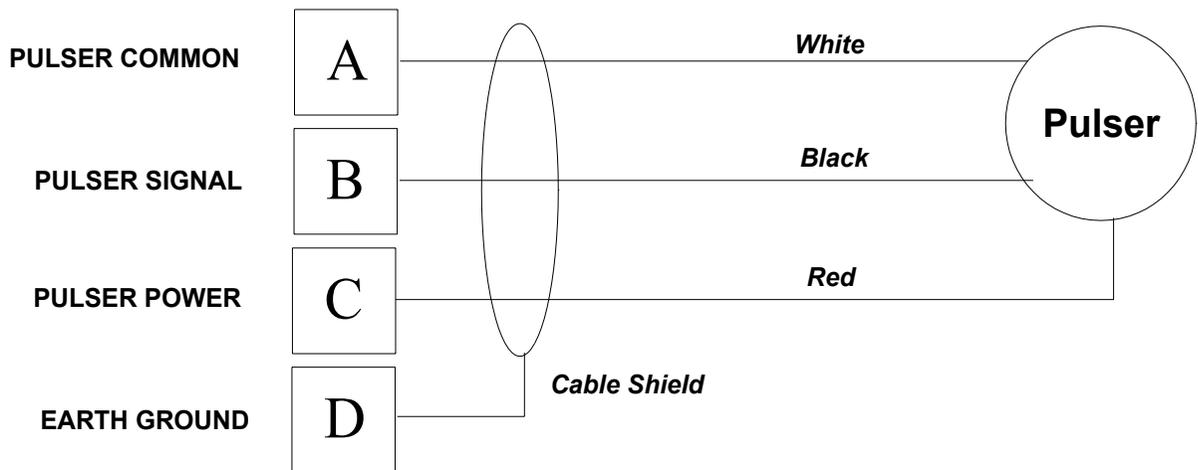
Figure 10: Pulser Wiring -- Veeder-Root 767191

Pulser Control Wiring

Use *Figure 9* and *Figure 10* on *page 16* to help you determine the number of low voltage pulser wires that will be needed for each pump. The figures show two common pulsers and their wiring schemes.

Warning

Use ONLY UL type 2567 shielded Teflon cable for the low-voltage pulser wiring! This cable is resistant to petrochemicals and is completely shielded for noise immunity. Type 2567 cable is available from Petro Vend with either two conductors (part# 12-1025) or four conductors (part# 12-1026).

**Using other types of cable voids your system warranty and might cause erratic readings.**
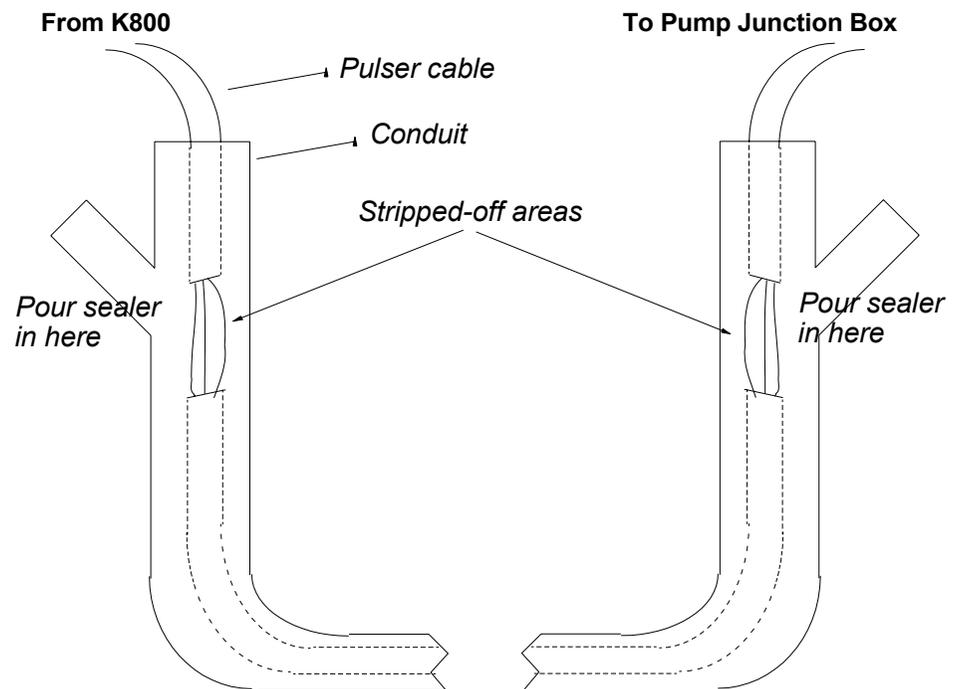
Figure 11: Pulser Seal-Off Concept

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┌─────────────────────────────────────────────┐
│          PV240 Pump Relay Board               │
│                                               │
│                     ┊                         │
│    HIGH Voltage Pump Power Connections        │
│                     ┊                         │
│   ┌─┐ ┌─┐ ┌─┐ ┌─┐  ┊  ┌─┐ ┌─┐ ┌─┐ ┌─┐        │
│   │1│ │2│ │3│ │4│  ┊  │5│ │6│ │7│ │8│        │
│   └─┘ └─┘ └─┘ └─┘  ┊  └─┘ └─┘ └─┘ └─┘        │
│                     ┊                         │
│                     ┊                         │
│   ┌─┐ ┌─┐ ┌─┐ ┌─┐  ┊  ┌─┐ ┌─┐ ┌─┐ ┌─┐        │
│   │A│ │B│ │C│ │D│  ┊  │E│ │F│ │G│ │H│        │
│   └─┘ └─┘ └─┘ └─┘  ┊  └─┘ └─┘ └─┘ └─┘        │
│                     ┊                         │
│     LOW Voltage Pulser Connections            │
│                     ┊                         │
│                     ┊                         │
│       Pump #1       ┊       Pump #2           │
│                     ┊                         │
└─────────────────────────────────────────────┘
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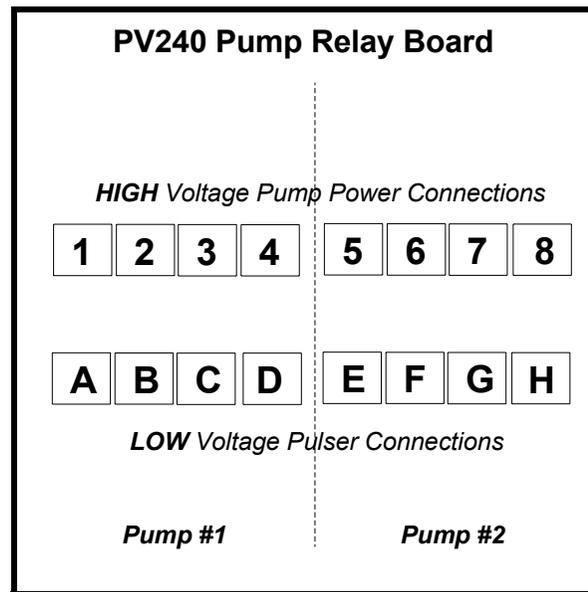
Figure 12: Pump Relay Board Wiring

Warning

DO NOT connect line voltage to low voltage terminals A - H. Permanent damage will result.

Connecting the Wires

Refer to *Figure 12* and *Table 3* on *page 19* to connect the pump control and pulser wires. The pulser shield wire should be cut off and insulated in the pump junction box. The other end must be connected to terminal D or H in the FIT.

Noise Suppressors

Two noise suppressors are supplied with your K800 system. These devices suppress the electrical noise from solenoid valves and contactors that could otherwise cause erratic system operation.

Install suppressors as close to the noise source as possible, as shown in *Figure 8* on *page 15*. One suppressor is supplied for each hose position. Additional suppressors are available from Petro Vend.

The suppressors, Petro Vend part number 02-4002, are made by Potter. The Potter part number for the suppressor is 4908-0003.

In *Table 3* the HIGH-VOLTAGE (line voltage) terminals are shaded.

Table 3: Relay Board Connections Map

| Relay Board Contacts	Function
1 - 2	**PUMP 1 LINE VOLTAGE current sense**
3 - 4	**PUMP 1 LINE VOLTAGE auxiliary contacts**
5 - 6	**PUMP 2 LINE VOLTAGE current sense**
7 - 8	**PUMP 2 LINE VOLTAGE auxiliary contacts**
A	**PUMP 1 low-voltage pulser common**
B	**PUMP 1 low-voltage pulser signal**
C	**PUMP 1 12-volt pulser power**
D	**PUMP 1 cable shield**
E	**PUMP 2 low-voltage pulser common**
F	**PUMP 2 low-voltage pulser signal**
G	**PUMP 2 12-volt pulser power**
H	**PUMP 2 cable shield**
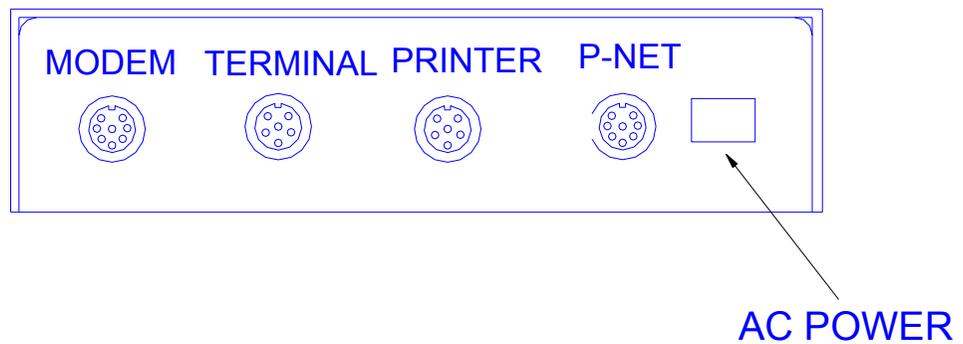
Figure 13: K800 Fuel Site Controller Rear Panel

Reinstalling the FIT Board

Reinstall the FIT board/heater plate assemblies. Secure with the four original nuts. Plug in the power, heater and Petro-Net cables, the flat cable from the pump board(s) and the flat cable from the door.

Caution

Remove power from the FSC and all peripherals before connecting the peripheral cables.

Connecting Petro-Net to the FSC

Plug the round DIN connector end of the Petro-Net cable into the PETRO NET socket on the FSC (*Figure 13* on *page 19*). Plug the other end of this cable into the Petro-Net junction box.

Connecting Peripherals to the FSC

1. Plug the DIN connector ends of the printer, CRT and modem cables into their matching sockets on the FSC. The modem draws 20W at 115VAC.

2. Plug the printer DB-25 connector into the socket for the peripheral device. The printer cable is permanently attached to the printer. The printer, an Epson made for Petro Vend, draws 120W at 115VAC.

Note

The CRT and modem cables look alike - observe the labels on the DB-25 connectors.

System Configuration

FIT Configuration

Use *Figure 14* to locate the switches and LEDs referenced in this section.
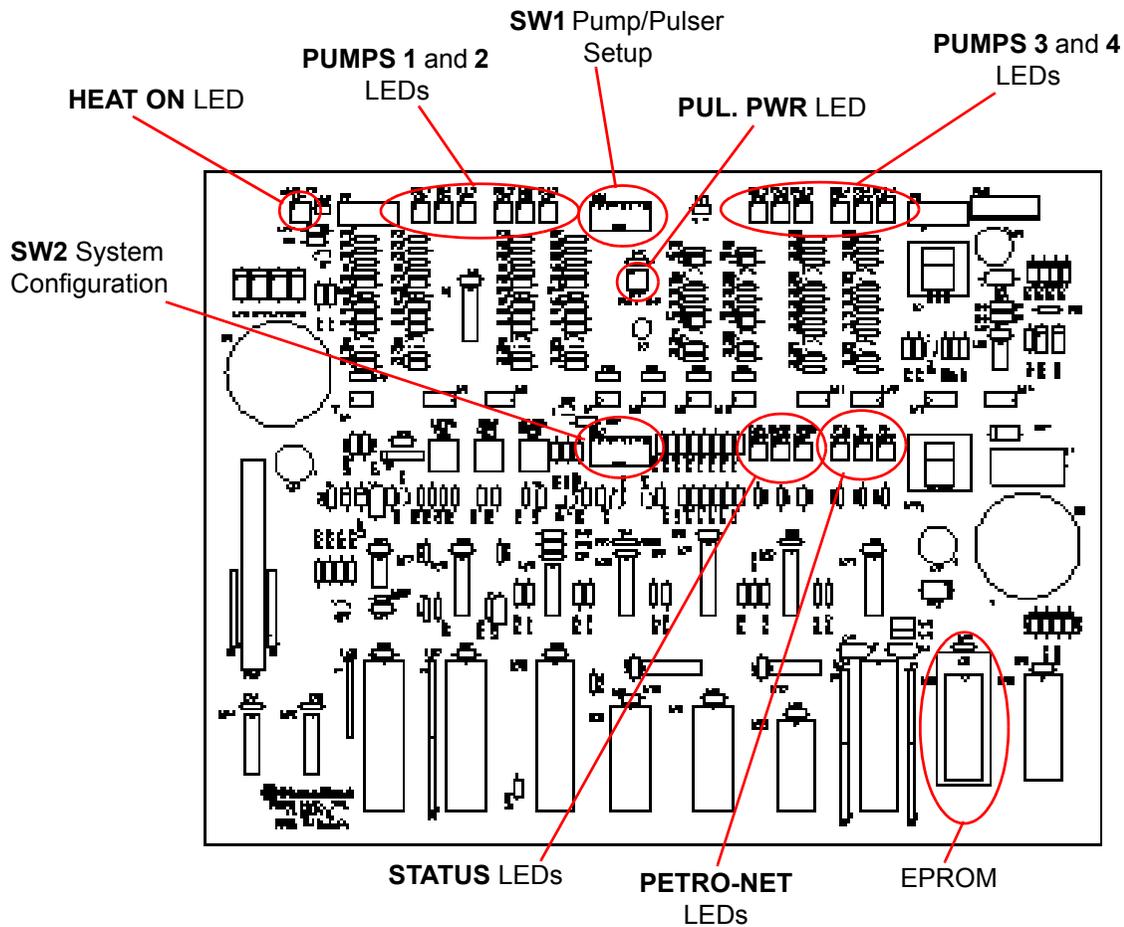

Figure 14: K800 Fuel Island Terminal PC Board

Use *Table 4* and *Table 5* on *page 23* to set pump mode, pulser type and configure your system. *Table 6* on *page 23* shows how to use the LEDs on the FIT board to diagnose your K800 system during operation.

Defining Pump Mode

See *Table 4* on *page 22*. The power relay for each pump can be activated by the K800 ("normal operation") or in can be manually overridden (bypassing K800 control). Positions 1-4 in SW 1 set pump mode.

Table 4: FIT Switch SW1 - Pump Mode and Pulser Type Configuration

Position	Affects:	Switch Setting
1	**PUMP 1** • Normal operation • Manual override	 • OPEN • CLOSED
2	**PUMP 2** • Normal operation • Manual override	 • OPEN • CLOSED
3	**PUMP 3** • Normal operation • Manual override	 • OPEN • CLOSED
4	**PUMP 4** • Normal operation • Manual override	 • OPEN • CLOSED
5	**PULSER 1** • Active • Passive	 • OPEN • CLOSED
6	**PULSER 2** • Active • Passive	 • OPEN • CLOSED
7	**PULSER 3** • Active • Passive	 • OPEN • CLOSED
8	**PULSER 4** • Active • Passive	 • OPEN • CLOSED

Defining Pulser Type

See *Table 4*. Pulsers can be either *active* (they supply a voltage) or *passive* (they do not supply a voltage). Positions 5-8 in SW1 set pulser type.

Defining FIT Identity

Use SW2 (for location see *Figure 14* on *page 21*) to set FIT number, reader type, keypad usability, ChipKey encoding, pulser type as seen by K800 and test mode.

Table 5: FIT Switch SW2 - System Configuration

SW	FIT Setting	Switch Setting
1 - 2	**Define FIT Number** • FIT 1 • FIT 2 • FIT 3 • FIT 4	• OPEN-OPEN • OPEN-CLOSED • CLOSED-OPEN • CLOSED-CLOSED
3-4	**Reader Type** • Magnetic card • Optical card • ChipKey	• OPEN-CLOSED • CLOSED-OPEN • CLOSED-CLOSED
5	**Keypad Access** • Disabled • Enabled	• OPEN • CLOSED
6	**ChipKey Encoder** • Enabled • Disabled	• CLOSED • OPEN
7	**Pulser Type** • Mechanical • Electronic	• OPEN • CLOSED
8	**Test Mode** • ON • OFF	• CLOSED • OPEN

Using FIT LEDs to Analyze K800 Operation

By watching the LEDs on the FIT PC board you can tell what's going on with each pump, see Petro-Net activity, and diagnose CPU and memory for good operation. Use *Table 6* to see what each LED does.

Table 6: FIT Board LED Functions

| LED Group	LED Label	Function
PUMPS	• **REL1**, **REL2**, **REL3**, **REL4** (red) • **CS1**, **CS2**, **CS3**, **CS4** (amber) • **PUL1**, **PUL2**, **PUL3**, **PUL4** (green)	• Pump relay ON pump 1-4 • Current sense pump 1-4 • Pulser ON pumps 1-4
STATUS	• **STAT** - Red • **DIAG1** - Red • **DIAG2** - Red	• CPU OK (when on) • EPROM error • RAM or Petro-Net error
PETRO-NET	• **RTS** - Amber • **TX** - Red • **RX** - Green	• Request to send data • Transmitting data • Receiving data
OTHERS	• **Heat ON** • **Pul. Pwr.**	• FIT heater ON • Pulser receiving power

FSC Configuration
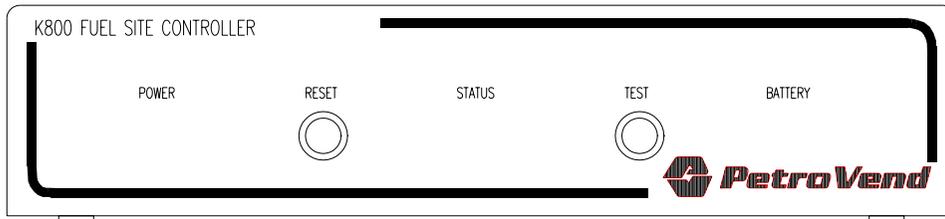
Figure 15: K800 FSC Front Panel

Note

*You must connect the battery to the BATT connector on the FSC board (Figure 16) before configuration.*
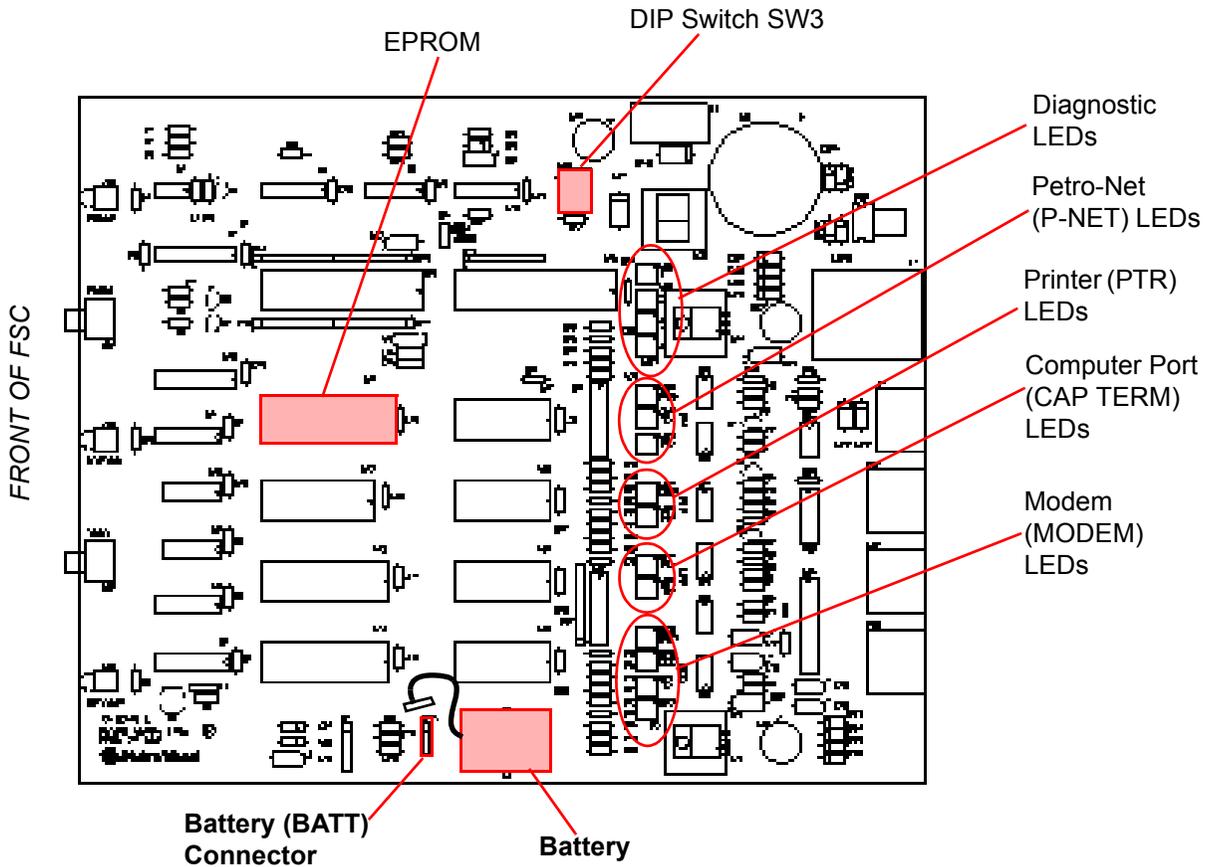
Figure 16: K800 Fuel Site Controller Board

1. Remove the FSC cover.

2. Locate SW3 on the FSC board.

3. Set the switches on SW3 as shown in *Table 7*.

FSC Board DIP Switch

Table 7: FSC Switch Settings (SW3)

Position	Function	Switch Setting
1	**Printer** • Attached • NOT attached	OPEN (OFF) CLOSED (ON)
2	**Printer Buffer Mode (*see note below*)** • System lockup • Printer bypass	OPEN (OFF) CLOSED (ON)
3	**Baud Rate** • 1200 • 2400	OPEN (OFF) CLOSED (ON)
4	**Test Mode** ON OFF (normal operation)	CLOSED (ON) OPEN (OFF)

Position 1 - Printer/No Printer

OPEN position 1 if there IS a printer attached to your K800 FSC. CLOSE position 1 if there is NO printer attached.

Position 2 - Printer Buffer Mode

When a printer is defined, the K800 "buffers" up to 200 transactions whenever the printer is unavailable (out of paper, off-line, jammed, off, etc.).

If the buffer is not exceeded, the stored transactions are printed and transferred to the main transaction memory when the printer becomes available. However, if the buffer fills before the printer becomes available, you can choose one of two options: SYSTEM LOCKUP, or PRINTER BYPASS.

*   **System Lockup** - No new transactions are allowed until the printer is available; although this option may prevent customers from obtaining fuel, transactions are always printed.

*   **Printer Bypass** - Each new transaction sends the oldest print buffer transaction to the main memory without it being printed. Some transactions may not be printed with this option, but customers are always allowed to fuel.

Position 3 - Baud Rate

Set this to match your modem baud rate. For 1200 baud modems, set OPEN. For 2400 baud modems, set CLOSED.

Position 4 - K800 Test Mode Enable

4. OPEN for normal operation. CLOSE to enable a test mode for factory troubleshooting only.

FSC Board LEDs

Use the LEDs on the K800 FSC board to view the status of various functions and do simple troubleshooting on the communication ports..

Table 8: FSC Board LED Functions

Group	LED - Color	When on...
DIAGNOSTIC	**1** - Red **2** - Red **3** - Red **4** - Red	Printer is OFFLINE Print buffer is full Main system RAM is full COMM error, reset the system
PETRO-NET	**RTS** - Amber **TX** - Red **RX** - Green	Flashes when data requested to send Flashes when data is sent Flashes when data received
PRINTER port	**DTR** - Amber **TX** - Red	Printer is online Flashes when data sent to printer
CAP TERMINAL port	**TX** - Red **RX** - Green	Flashes when data sent Flashes when data received
MODEM port	**DTR** - Amber **DCD** - Amber **TX** - Red **RX** - Green	Modem enabled Modem has responded Data sent from MODEM port Data received in MODEM port

CAP Terminal Configuration

This section explains how to re-enter Petro Vend specific parameters into the CRT terminals shipped with your K800 from Petro Vend.

Occasionally, terminals lose factory configuration data during shipping. This can occur if the battery is old, or if the battery is removed from the unit. Communication with the terminal is impossible if the Petro Vend configuration settings are lost.

The following applies for a Link MC5 terminal and an Opus II terminal, although the configuration values apply to most terminals used today.

Sherwood terminals, shipped with some K800 systems, use the same configuration as the Link terminals.

Link or Sherwood Terminal Configuration

1. Turn the terminal ON.

2. Press the [SHIFT] key and the [SETUP] key simultaneously.

3. Use the space bar to toggle through the various setup screens, and the arrow keys to move around within a particular screen. The following parameters must be configured in order for the terminal to operate with Petro Vend equipment..

Table 9: LINK or Sherwood Terminal Parameters

Function	Parameter	Setting
DISPLAY	**Background**	Dark
	Columns	80
	Data lines	25
	Display pages	1
	Status Lines	Standard
	Scrolling	Jump
	Auto-Wrap	OFF
	Refresh Rate	78 Hz
	Cursor	Blink block
	Screen Type	15 minutes
	Attr. Type	Character
GENERAL	**Enhancement**	OFF
	Received CR	Carriage Return
	Margin bell	OFF
	Block terminal	US/CR
	Send ACK	OFF

Table 9: LINK or Sherwood Terminal Parameters (Continued)

Function	Parameter	Setting
COMMUNICATION	**Communication mode** **Data rate** **Data bits/stop bits** **Parity** **Rcv data stall** **XMIT** **Interface**	Full duplex Same as Petro-Net 7/1 Even None None RS-232C
KEYBOARD	**Language** **XMIT data** **Key Click** **Repeat** **Return key** **Enter key** **Shift/Backspace key**	Intl (non-English) ASCII ON ON Carriage return (CR) Carriage return (CR) Delete

Opus Terminal Configuration

Table 10: Opus Terminal Parameters

GROUP	Parameter	Setting
A	**STATUS** **SCREEN SAVER** **KEYCLICK** **SCRL** **CURSOR**	ON ON ON JUMP BLINK LN
B	**MODEM BAUD RATE** **DATA BITS** **STOP BITS** **PARITY** **XMIT**	Same as Petro-Net rate 7 1 EVEN UNLIM
C	**AUX** **DATA BITS** **STOP BITS** **PARITY** **XMIT**	1200 7 1 EVEN UNLIM
D	**LINE** **AUTO PG** **AUTOSCRL** **RET/ENTER** **WORDSTAR**	24 OFF ON CR/CR OFF
E	**UNPROT** **PROT** **NL** **CR** **BLK END**	NORMAL NORM ON CR US/CR
F	MODEM CTL AUX CTL CRN MODE COMM	BOTH NONE 80 FDX ON-LINE
G	EMUL ENHANCE KB REFRESH KBR	WY50 ON SELECT COUNTRY 60 LOW

System Startup

This section describes hardware startup and initialization. A Quick-Start procedure for using the K800 appears on *Page 33*.

FIT Start-Up

1. Turn on the power switch in each FIT. The status LEDs (*Figure 14* on *page 21*) on each FIT PC board should each flash once in sequence to signal the startup.

2. The first LED (the red "STAT" LED) should begin flashing rapidly to indicate that the FIT software is running correctly.

3. The FIT display should briefly show the message `K800 SYSTEM by Petro Vend`, followed by the message `SYSTEM OFF`.

FSC Start-Up

1. Connect and power up the printer, terminal and modem.

2. Plug the battery cable into the BATT connector on the FSC board (*Figure 16* on *page 24*).

3. Plug the FSC power transformer into the AC wall socket and into the FSC power connector. The four diagnostic LEDs on the FSC board should each flash once in sequence to signal the startup.

4. The FSC performs a series of self-tests. If an error is encountered, the status light (located on the front panel of the FSC) flashes an error code which is explained in *Table 11*.

Table 11: FSC Board LED Error Codes

# of Flashes	Problem	Solution
1	EPROM error	Check that EPROM is installed correctly - no bent pins, socket screw is CLOSED.
2	System RAM error	Check RAM chips are installed correctly - no bent pins.
3	Hardware error	Replace FSC board
4	Banked RAM error	Check RAM chips for proper insertion - no bent pins.

Table 11: FSC Board LED Error Codes (Continued)

# of Flashes	Problem	Solution
5	Battery is not connected	Connect battery, see *Figure 16* on *page 24*.
6	Cold start needed	See *Cold Start* on page 32.
7	Cool start needed	See *Cool Start* on page 32.

Note

For the FIRST power-up, the 6-flash error (Cold Start Needed) always appears, indicating that a cold start is necessary. If multiple errors occur, the system stops and flashes only that code.

There are three types of startup that the FSC can perform when powered up or reset - Cold, Cool, and Warm.

Cold Start

You must do a *cold start* when the FSC is powered up for the first time. The cold start clears RAM, sets all system parameters to default values, resets the card/key and account files, and clears the transaction memory.

1. Press and hold the **TEST** button on the FSC front panel.

2. Press and release the **RESET** button. The status LEDs should flash in sequence.

3. Continue holding the **TEST** button until the **STATUS** light begins flashing rapidly.

Cool Start

A *cool start* is needed after changing the FSC EPROM. The EPROM is where the K800 firmware resides. A cool start is the same as a cold start, except that the card/key and account memory is not altered. The procedure to initiate a cool start is the same as for a cold start.

Warm Start

A *warm start* is a normal system recovery after a power failure or after the **RESET** button has been pressed. No K800 memory is altered and no operator intervention is needed.

After startup, the terminal displays `Enter password` and the printer prints a transaction heading.

The default password is the numeric portion of the serial number, on a label on the bottom of the FSC.

1. Enter the 6-digit password. You should see the MAIN MENU.

2. Verify the FSC is communicating with the FIT(s) by checking each FIT display for the message `Insert Card/Key`. If this messages does not appear, double check the Petro-Net wiring.

3. After confirming proper operation, replace the cover on the FSC.

This completes the installation of the K800 system. Refer to your *K800 Operator's Manual* for programming instructions.

Quick-Start and Test

This section helps you get the K800 "up and running" quickly. For detailed information on any of the steps or procedures described here, refer to the *K800 Operator's Manual*.

1. Confirm all parts of the K800 system are powered up and functioning properly.

2. The K800 Main Menu should be on your terminal.

3. Select SYSTEM SETUP from the Main Menu.

4. Set the current time and date, then return to the Main Menu.

5. Select SITE CONFIGURATION from the Main Menu.

6. Select FUEL ISLAND TERMINAL to check the status of the FITs (this also checks communication, and reader type).

*   *The Status for each FIT should be RUNNING.*

7. Exit the FUEL ISLAND TERMINAL submenu.

8. Enter the SITE CONFIGURATION submenu, and select PUMPS.

9. Configure all pumps connected to the FITs.

10. Return to the Main Menu, and select CARD/KEY/ACCOUNT FILES.

11. Select EDIT USER FILE, and enter 0001 for a card/key number.

*   *"0001" should be one of the three test cards supplied with your system.*

12. Program card 0001 to be Valid and Single. Leave the remaining fields at their default settings.

13. Return to the Main Menu. Using the TEST card/key, activate each pump connected to the system, and pump product into a vehicle or test

can. Check the printer's printout for the correct date, time, pump number, and quantity dispensed.

This completes the Quick-Start & Test. For complete information on the functions described here, see the K800 Operator's Manual.

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