OPW
FUEL MANAGEMENT SYSTEMS

System2®

Terminal Controller - Automated Fueling System

Installation Manual

 Manual No. M41-00.10A

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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IMPORTANT

Before beginning the installation, please read this manual CAREFULLY. Installation errors on sites that distribute hazardous liquids can be extremely dangerous to installers and anyone else using the site.

1.0 Before You Begin

WARNING!

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

1.1 INSTALLATION CODES

Installation 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.

1.2 HAZARDOUS AREA DEFINITION

A fuel dispenser is a hazardous area as defined in the National Electrical Code. Do *not* mount Fuel Island Terminals (FITs), the Terminal Controller (TC), or any peripheral devices within or above the hazardous areas.

1.3 UNPACKING THE SYSTEM

Be sure to check the packaging carefully for any damage that might have occurred during shipping.

The cabinet and most components for each **SYSTEM2** unit are packed in one box. Power supplies, pedestals, and printers are packed separately.

Data Sheet

The Data Sheet lists details about your particular system, and is packed with this manual. *Store this sheet in a secure location* - you may need it when calling for service or information.

1.4 EXTERNAL DEVICE CONNECTION

Petro-Net uses RS485 communication, requiring twisted-pair wiring for proper operation. Twisted pair wiring is available from Petro Vend as part number 12-1029.

Or, you can make Petro-Net cable by twisting together two lengths of 18 AWG TFFN, THHN or THWN wire. Use about 10 twists per foot…this is the RS-485 standard.

Pull the Petro Net through a conduit.

1.5 DRILLING HOLES IN CABINETS

DO NOT drill holes in any cabinet! Aside from voiding your warranty and creating possibly dangerous conditions in flammable atmospheres, drilling can leave metal dust which may interfere with system circuitry.

Use the knockouts in the cabinets for attaching conduit, and the pre-threaded holes to mount pedestals.

NOTE
If you are using a Petro Vend OPT or C/OPT at your fueling island instead of a FIT, use the manuals for the OPT or C/OPT to install those devices, NOT the FIT section of this manual.

2.0 System Overview

2.1 FUEL ISLAND TERMINAL (FIT)

Up to 32 FITs can be installed at convenient outdoor locations. Each FIT has a programmable display to greet and guide a customer through the fueling process, a keypad for customer data entry, and card or key readers to restrict access. FIT specifications are given in the following table.

FUEL ISLAND TERMINAL	
Readers *(Each FIT can have one or two readers)*	Magnetic Stripe Card Motorized Magnetic Stripe Card Optical Card ChipKey
Display *(Each FIT can have one display)* Standard Optional	 1 row x 40 characters 2 rows x 16 characters
Cabinet Dimensions	15" H x 18" W x 11" D (38cm H x 46cm W x 28cm D)
Pedestal Dimensions	48" H x 14" W x 8" D (122cm H x 36cm W x 20cm D)
Power Requirements Standard Optional	 120 VAC, 50/60 Hz; 200 watts max. 240 VAC, 50/60 Hz; 200 watts max.
Operating Temperature Range *With optional heater. Heater is required if printer is installed, and suggested wherever temp drops below freezing.*	-40E F to 122E F (-40EC to 50E C)

2.2 TERMINAL CONTROLLER (TC)

The TC must be installed indoors! FITs connect to the Petro-Net junction box; the junction box is, in turn, connected to the TC with Petro-Net cable, part number 20-1443. TC specifications are listed in the table below.

Petro-Net uses the RS-485 communications protocol. Petro-Net requires twisted pair, 18 AWG (or greater), oil and gas resistant wiring (TFFN, THHN, or THWN). The Petro-Net wiring must be installed in rigid steel conduit to provide weatherproofing and to minimize electrical interference.

TERMINAL CONTROLLER	
Cabinet Dimensions	2" H x 10" W x 11" D (5cm H x 25cm W 28cm D)
Power Requirements Standard Optional	 120 VAC, 50/60 Hz; 50 watts max. 240 VAC, 50/60 Hz; 50 watts max.
Operating Temperature Range *(indoors only)*	32EF to 122EF (0EC to 50EC)
Operating Temperature Range for Peripheral Devices *(indoors only)*	40EF to 85EF (4EC to 29EC)
Serial Communication Ports	Petro-Net *(RS-485)* Printer *(proprietary)* Terminal *(RS-232)* Modem *(RS-232)* 3 Auxiliary Ports *(RS-232)*
Maximum Petro-Net Length	5000' (1524 m)

3.0 Component Installation

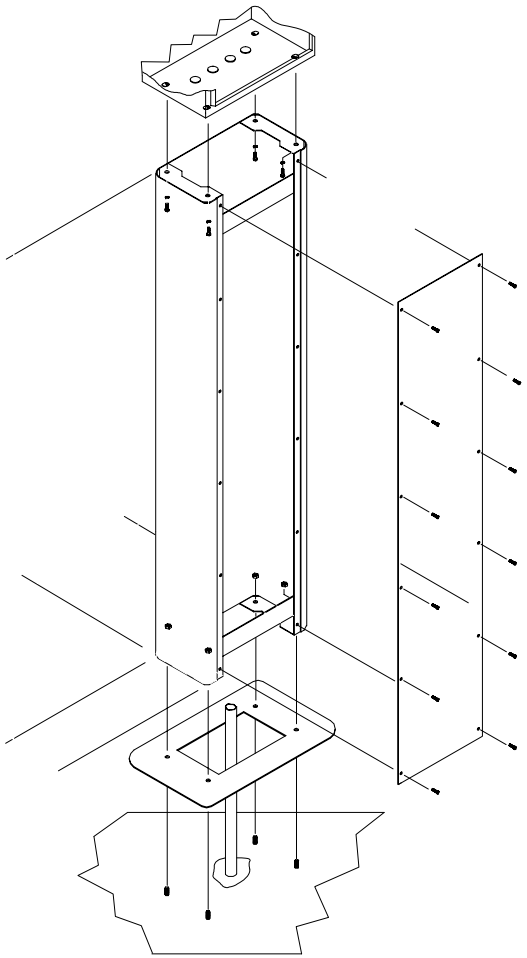

Figure 1 - FIT PEDESTAL INSTALLATION

3.1 FIT INSTALLATION

Up to 32 FITs can be connected to one Terminal Controller; a typical pedestal is shown in Figure 1.

3.1.1 Pedestal Assembly

Select a convenient location at or near a fuel island for each FIT. To meet safety requirements, the FITs must be installed to meet the following criteria:

(1) A minimum of 18 inches (46 cm) from the nearest *conventional* pump/dispenser.

(2) A minimum of 24 inches (61 cm) from the nearest *overhead* pump or dispenser.

(3) Out of direct sunlight, particularly in warmer areas.

Anchor each FIT pedestal to the concrete with 3/8" (1 cm) bolts (*not* provided). Be sure the *front* of the pedestal (the side with the relay board access cover) faces toward the user.

Mount each FIT cabinet, display side forward, onto its pedestal with the hardware provided.

3.1.2 FIT Conduit

Install rigid steel conduit from the FIT(s) to the Petro-Net junction box. This conduit will house five conductors: three 14 AWG power wires, and two 18 AWG Petro-Net wires (as a twisted pair). ***Only FIT power and Petro-Net wires can be in this conduit!***

If you are installing multiple FITs, conduit and wiring can either be daisy-chained (from one terminal to the next) or in a "Y" fashion (where all terminals connect back to one common point).

3.1.3 FIT Graphics Display Contrast

If you are having trouble reading the characters on the FIT graphics display, adjust potentiometer R5, located inside the FIT on the Display PC board. This PC board is mounted on the inside of the FIT door. The potentiometer is a small, square component in the upper-right area of the PC board.

The potentiometer is single-turn. Use a small screwdriver to either INCREASE contrast (turn clockwise) or DECREASE contrast (turn counterclockwise).

A “normal” contrast setting is obtained when R5 is centered.

3.2 TC INSTALLATION

The Terminal Controller MUST be installed indoors, in a dry, relatively clean environment. Install the TC within three feet of the Petro-Net junction box.

The TC should receive its power from the same circuit as the FITs, and be grounded to the same point as well.

TC Power Conduit

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

3.3 RECEIPT PRINTER INSTALLATION

See Figure 2 on the following page. The optional receipt printer is attached inside the FIT cabinet with two quick release hinges. To install the printer, do the following:

1. Remove the half of the hinges that are not attached to the printer chassis by squeezing the hinge clips.

2. Refer to Figure 2. Place the top hinge on the two studs in the FIT enclosure and secure with the two supplied #8-32 keps nuts. Tighten the nuts to 4 - 18 inch-pounds.

3. Place the bottom hinge on the studs in the enclosure, and attach it with the two remaining keps nuts. DO NOT completely tighten these nuts.

4. With the paper roll at the bottom, squeeze the bottom hinge clips on the printer, and place it on the bottom hinges. Swing the printer upward, squeeze the top hinge clips together, and push the printer onto the top hinges in the FIT.

5. Tighten the two bottom keps nuts to 4 - 18 inch-pounds. Test the hinge alignment by removing the assembly: press the hinge clips together, remove the printer, then put it back onto the hinges to see if everything slides easily.

6. Attach the 10-pin ribbon cables between the J2 connector on the PV267 printer board and the J8 connector on the PV269 FIT board.

7. The receipt guides and cutter retainer mount to the door pocket. Remove and discard the blank adaptor plate from the pocket. Mount the guides to the new slotted adaptor plate as shown in Figure 2.

NOTE: *When the door is open, the receipt guides appear close together. The guides and cutter retainer are self-aligning, however, and DO NOT need adjustment.*

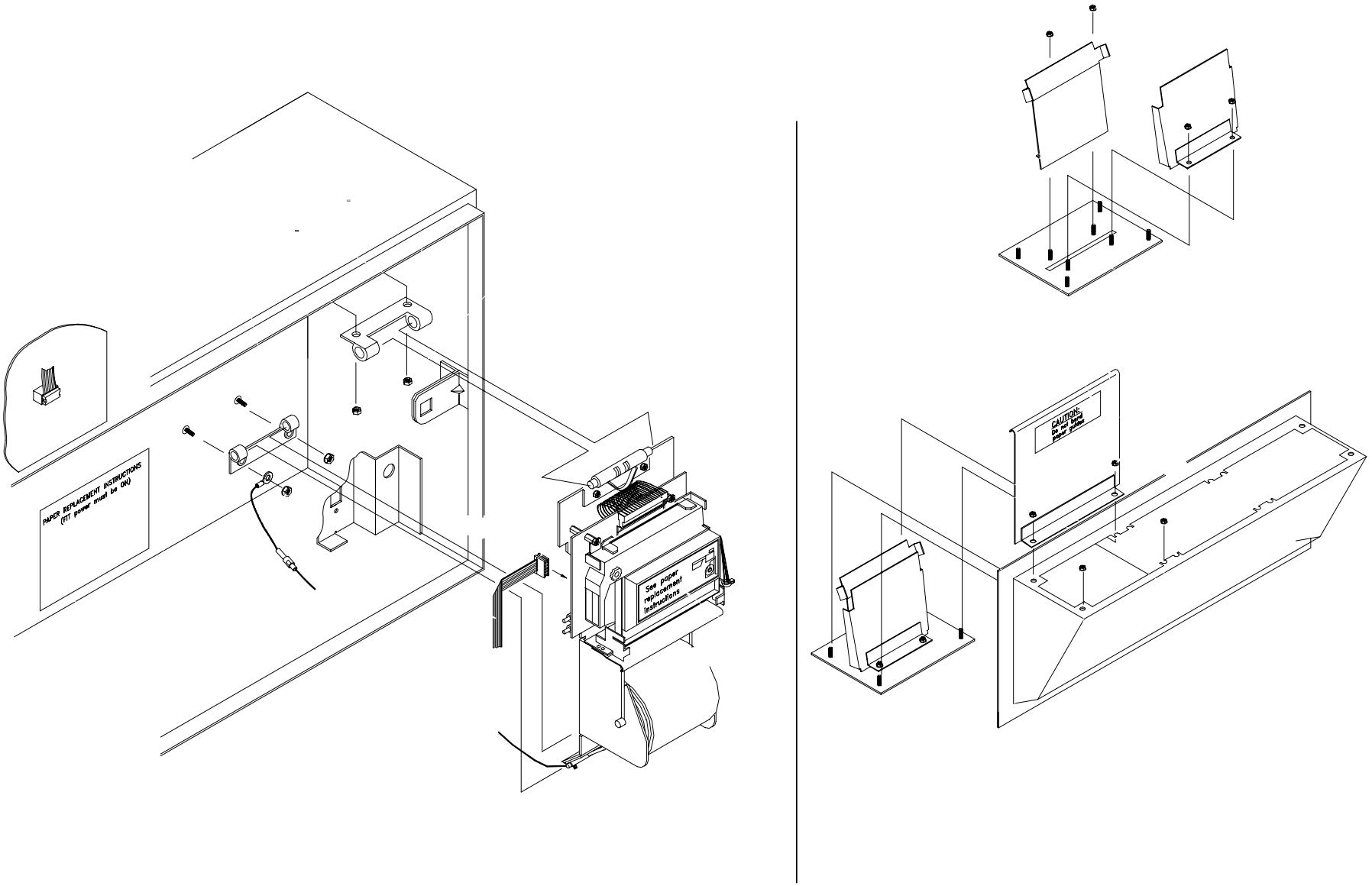

Figure 2 - Receipt Printer Installation

4.0 Wiring

4.1 FIT POWER WIRING

For each FIT, pull three #14 AWG power and ground wires through conduit from the circuit breaker panel. See Figure 3.

When planning an installation, remember that the total length of Petro-Net wiring within an installation cannot exceed 5,000 feet.

4.2 PETRO-NET WIRING

Petro-Net uses RS-485 protocol, which requires twisted-pair cable to operate properly. Each twisted pair conductor must be 18 AWG or greater, oil and gas resistant TFFN, THHN, or THWN wire MUST BE USED.

1. Twisted-pair is available from Petro-Vend as part number 12-1029. Or you can make twisted pair by simply twisting together two wires (of the required gauge and type) with approximately ten twists per foot.

2. Run the twisted-pair through conduit from the Petro-Net junction box to the FIT. *DO NOT run Petro-Net wiring in the same trough as pump power wiring!*

3. Connect the twisted pair wires to pins #1 (left) and #2 (right) of the junction box cover (pins 3 and 4 remain unconnected).

4. Install the cover on the junction box, then connect the other end of the twisted-pair to the Petro-Net terminals in the FIT(s). Be sure that the left terminal of each device is *not* crossed to the right terminal of another device.

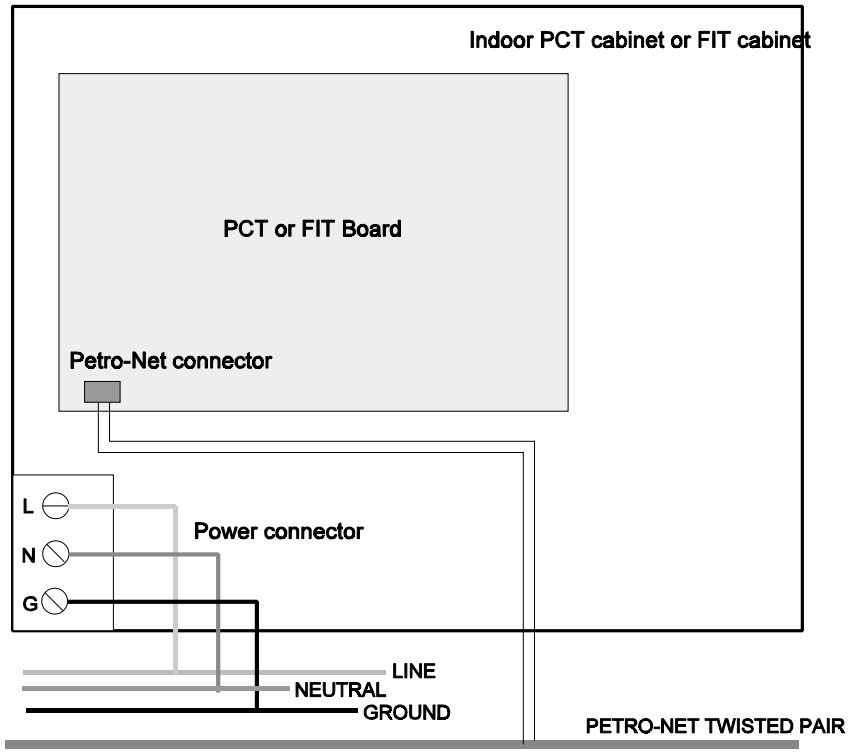

Figure 3 - FIT OR INDOOR PCT WIRING

4.3 SYSTEM POWER WIRING

Connect the FIT(s) and the Terminal Controller to the same electrical circuit. Connect the line voltage supply wires and the ground wire from a dedicated circuit breaker to the power input terminal block in each FIT.

All ground wires must originate at the service panel.

WARNING!

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

4.4 TC-TO-FIT WIRING

To connect the TC to the FIT(s), plug the Petro-Net DIN connector into the "PN" socket on the TC (see Figure 4). Plug the other end of this cable into the Petro-Net junction box.

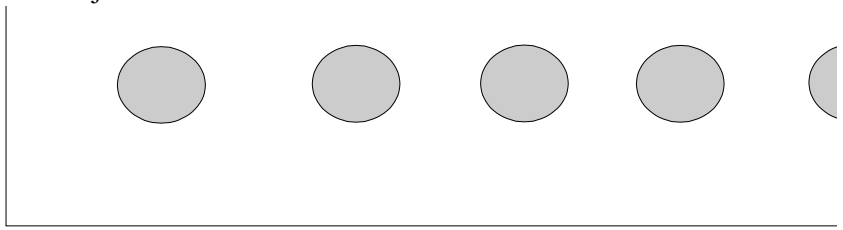

Figure 4 - FSC Rear Panel

4.5 TC-TO-HOST WIRING

Connect the TC to your host computer by plugging one end of the supplied *20-1444* cable into the PTR socket (see Figure 4). Plug the other end (the RS-232 end) of this cable into the serial port of your host computer. A “gender changer” (part number *75-2007*) is included if needed.

5.0 System Setup

5.1 FIT CONFIGURATION

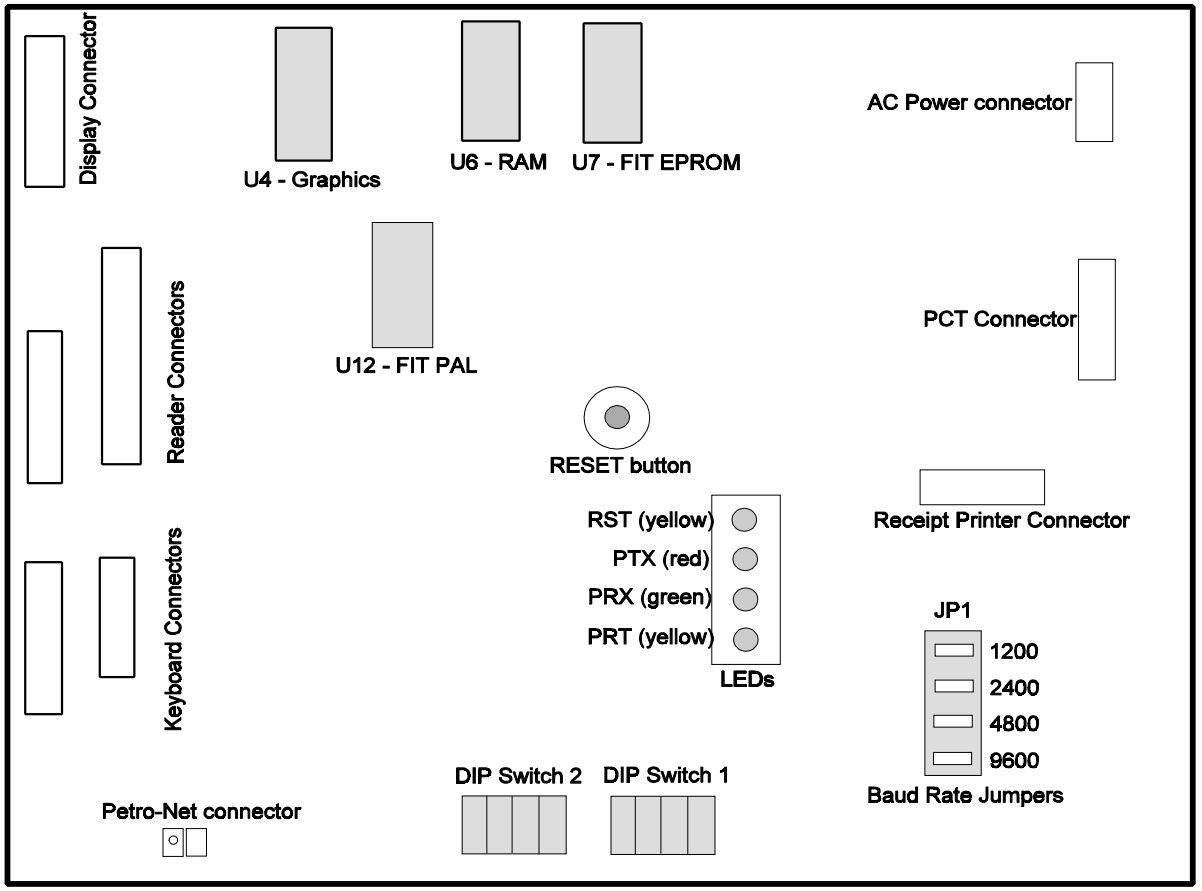

Figure 5 - FIT PC BOARD OVERVIEW (PV269)

5.1.1 FIT DIP Switches

Refer to Figure 5 on Page 10 for switch location on the FIT PV269 board.

Switch #1, Position 1 is used with all four positions of **Switch 2** to set the 32 possible FIT addresses as follows:

FIT #	Switch # 2, Position:				Switch #1 Position #1
	#1	#2	#3	#4	
1	OPEN	OPEN	OPEN	OPEN	OPEN
2	OPEN	OPEN	OPEN	OPEN	CLOSED
3	OPEN	OPEN	OPEN	CLOSED	OPEN
4	OPEN	OPEN	OPEN	CLOSED	CLOSED
5	OPEN	OPEN	CLOSED	OPEN	OPEN
6	OPEN	OPEN	CLOSED	OPEN	CLOSED
7	OPEN	OPEN	CLOSED	CLOSED	OPEN
8	OPEN	OPEN	CLOSED	CLOSED	CLOSED
9	OPEN	CLOSED	OPEN	OPEN	OPEN
10	OPEN	CLOSED	OPEN	OPEN	CLOSED
11	OPEN	CLOSED	OPEN	CLOSED	OPEN
12	OPEN	CLOSED	OPEN	CLOSED	CLOSED
13	OPEN	CLOSED	CLOSED	OPEN	OPEN
14	OPEN	CLOSED	CLOSED	OPEN	CLOSED
15	OPEN	CLOSED	CLOSED	CLOSED	OPEN
16	OPEN	CLOSED	CLOSED	CLOSED	CLOSED
17	CLOSED	OPEN	OPEN	OPEN	OPEN
18	CLOSED	OPEN	OPEN	OPEN	CLOSED
19	CLOSED	OPEN	OPEN	CLOSED	OPEN
20	CLOSED	OPEN	OPEN	CLOSED	CLOSED
21	CLOSED	OPEN	CLOSED	OPEN	OPEN
22	CLOSED	OPEN	CLOSED	OPEN	CLOSED
23	CLOSED	OPEN	CLOSED	CLOSED	OPEN
24	CLOSED	OPEN	CLOSED	CLOSED	CLOSED
25	CLOSED	CLOSED	OPEN	OPEN	OPEN
26	CLOSED	CLOSED	OPEN	OPEN	CLOSED
27	CLOSED	CLOSED	OPEN	CLOSED	OPEN
28	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
29	CLOSED	CLOSED	CLOSED	OPEN	OPEN
30	CLOSED	CLOSED	CLOSED	OPEN	CLOSED
31	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
32	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED

Switch #1, Positions 2-4 select FIT display type as follows:

Display Type	Position #2	Position #3	Position #4
1 x 40	OPEN	OPEN	CLOSED
2 x 16	OPEN	CLOSED	CLOSED
Graphics	CLOSED	CLOSED	CLOSED

5.1.2 FIT Board LEDs

The following table defines the FIT board's LEDs.

PV269 FIT BOARD LEDS		
Label	**Color**	**Function**
CR2	Yellow	Reset
CR3	Red	RS-485 Petro-Net Transmit
CR4	Green	RS-485 Petro-Net Receive
CR5	Yellow	RS-485 Petro-Net TX Enable

5.1.3 Receipt Printer Board Setup and Test

Position #1 of the four-position DIP switch (see Figure 6) determines the printer format. The table below shows possible format settings. Positions 2, 3 and 4 are *not* used - leave them "OPEN".

PV267 RECEIPT PRINTER BOARD SWITCH		
Position	**Status**	**Function**
1	OPEN	USA format
	CLOSED	UK format
2	OPEN	*not* used
3	OPEN	*not* used
4	OPEN	*not* used

NOTE: *The USA format uses the dollar sign ("$") to indicate product prices and totals. The UK format uses the pound/sterling sign ("£") for these values.*

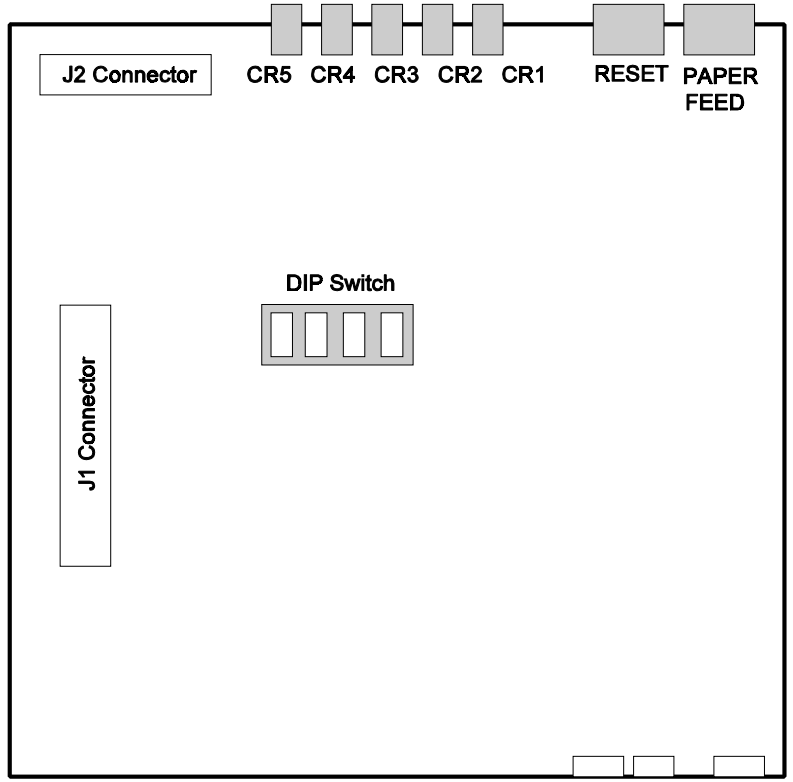

Figure 3 - RECEIPT PRINTER BOARD (PV267)

Printer Switches

The paper FEED/CUT switch has two functions. When you press and hold the switch, paper is advanced through the printing mechanism as long as the switch is pressed. When you press and immediately release the switch, the paper cutter is activated.

The printer RESET switch resets the printer. If the printer jams (indicated by CR2 flashing), press the printer reset button after correcting the cause of the jam (clearing an obstacle from the mechanism, freeing the paper or ribbon, etc.).

Printer Test

To test the printer, press *both* the paper feed/cut switch and the printer reset switch *simultaneously*. Release the reset switch and hold the paper feed/cut switch until the printing begins. When the printer is properly installed and functioning, it prints a message with: (1) the current printer software version, (2) samples of the three font sizes in both red and black print, (3) the format selections for DIP switch position #1, and (4) the selected currency symbol. When the test is completed, the receipt is cut.

5.1.4 Receipt Printer Board LEDs

The table below describes the LEDs used on the printer board, located underneath the receipt printer in the FIT enclosure.

PV267 RECEIPT PRINTER BOARD LEDS		
Label	**Color**	**Function**
CR5	Green	RXD
CR4	Red	TXD
CR3	Yellow	DTR
CR2	Yellow	Error
CR1	Yellow	Reset

RESET (CR1) - flashes continuously if the program for the printer microcontroller is disrupted or if the microcontroller has failed.

ERROR (CR2) - indicates an error with a flashing sequence. The LED flashes once, twice, or three times, pauses, and then repeats the sequence. CR2 flashes once when the printer motor is jammed, twice when paper is low (or out), and three times when the printer cutter is jammed.

5.1.5 Baud Rate

The default baud rate is 9600; this rate does *not* need to be changed.

To change the FIT baud rate, change the JMP1 jumpers on *all* FIT boards to the corresponding sets of terminals. See Figure 5 for the FIT board jumper locations. The TC and FITs must be set at 9600 baud.

5.2 TERMINAL CONTROLLER CONFIGURATION

5.2.1 TC Baud Rate

As mentioned earlier, the default Petro-Net baud rate is 9600; this rate does *not* need to be changed.

The TC and all FITs must be set to 9600 baud. To change FIT baud rate, change the JMP1 jumpers on *all* FIT boards for 9600 (see previous section).

5.2.2 TC Board LEDs

The following table describes the TC LEDs.

PV271 FSC BOARD LEDS		
Label	**Color**	**Function**
CR31	Yellow	Reset
CR23	Red	RS-485 Petro-Net Transmit
CR22	Green	RS-485 Petro-Net Receive
CR24	Yellow	RS-485 Petro-Net TX Enable
CR81	Red	RS-232 Terminal Transmit
CR86	Green	RS-232 Terminal Receive
CR36	Red	RS-232 AUX 3 Transmit
CR38	Green	RS-232 AUX 3 Receive
CR32	Red	RS-232 Printer Transmit
CR37	Green	RS-232 Printer Receive
CR80	Red	RS-232 Modem Transmit
CR85	Green	RS-232 Modem Receive
CR35	Red	RS-232 AUX 1 Transmit
CR40	Green	RS-232 AUX 1 Receive
CR41	Red	RS-232 AUX 2 Transmit
CR39	Green	RS-232 AUX 2 Receive

6.0 Start-Up & System Tests

6.1 POWERING UP SYSTEM 2

To power up **SYSTEM2**:

1. Turn ON the power switch for each FIT.

2. Plug the Terminal Controller's power transformer into one of the peripheral power outlets (or an AC socket served by the same circuit breaker as the FITS).

If the FIT is OK, its display shows the following series of messages:

TESTING RAM
VERSION ##.##
DISPLAY TYPE
RECEIPT LENGTH
TESTING READERS
READER1 TYPE
READER2 TYPE
TESTING EPROM
TESTING EPROM
DOWNLOAD ...

The last message indicates that the FIT is running.

NOTE: If the **DOWNLOAD** message does not appear, turn the system OFF and check the installation wiring.

When the TC is first powered up, the front-panel STATUS display shows "0" for about 90 seconds. During this time, the controller is counting the number of installed FITs communicating with the TC. The display switches to "1" when the system goes on-line.

The blinking dot in the lower-left corner of the STATUS display indicates that Petro-Net is active.

6.2 TEST MODE

To enable FIT test mode:

1. During powerup, wait until you see the message TESTING EPROM on the FIT display, and then:

2. Press and hold the [ENTER] key on the FIT keypad. The FIT display should now read **SYSTEM 2: TEST.**

To exit test mode, reset the FIT board. The tests are described on the following page.

The following System 2 components are checked in test mode:

- Keyboard
- Emergency Stop button
- DIP switches SW1 and SW2
- Display
- Pocket lights
- Card reader
- Receipt printer
- Petronet

6.2.1 Keyboard Test

This test checks whether the physical key operation is OK. When enabled, press each key on the keypad at least once. You should hear a beep each time you press a key - for numeric keys, the corresponding digit will appear on the FIT display.

When finished, press the [ENTER] key to end the keyboard test and begin the Emergency Stop test.

6.2.2 Emergency Stop Button Test

This test checks the E-stop circuitry. When functional. press the E-STOP button. If the circuit is functional, you'll hear a beep, and the display will indicate that "E-STOP is ON". Hit any key to end this test and begin the DIP Switch test.

6.2.3 DIP Switch Test

This test reads the current DIP switch settings and shows them on the display. Before you begin this test, write down the positions of the DIP switches so you can return them to their original positions at the end of the test. To run the test, set all switches OPEN. Confirm the display shows this. Now, close each switch one at a time. Confirm the display echoes this. Finally, return all switches to their original positions.

6.2.4 Display Test

This test puts a solid pattern on the LCD display - any "errors" in the pattern indicate a defective LCD display.

6.2.5 Light Test

This test checks the pocket lights in the FIT. The display tells you when the lights should be ON and when they should be OFF. Hit any key to exit the test.

6.2.6 Card Reader Test

Insert the appropriate test card into each reader - if the readers are functioning properly, data on the card will appear on the display.

6.2.7 Receipt Printer Test

When activated, this test sends a pattern to the receipt printer. If the printer is functional, the pattern prints out.

6.2.8 Petro-Net Test

This test checks the Petro-Net Local Area Network (LAN). When activated, a sample message is sent over the Petro-Net at the baud rate set by the jumpers on the FIT (see Page 14).

7.0 Troubleshooting & Maintenance

7.1 TROUBLESHOOTING

The following are some common FIT error messages, and suggested corrections.

PROBLEM	POSSIBLE FIX
No FIT display messages	*Adjust Viewing Angle potentiometer on inside top of FIT display PC board.*
SYSTEM DOWN **message at FIT**	*1. FIT not installed properly.*
	2. Petro-Net wiring problem.
	3. Communication set improperly (baud rate, word size, etc.). See Page 14.
	4. FIT board malfunction: run COMM test to check board.
SYSTEM DOWN **at *all* FITs**	*1. FIT board malfunction, run COMM test for each FIT board.*
	2. TC board malfunction (if all FIT boards pass COMM test, replace TC board).
Printer ERROR LED Flashing	*Possible error determined by number of flashes:* *1 flash - paper jammed* *2 flashes - paper low or gone* *3 flashes - paper cutter jammed*
INCORRECT READING **message on FIT**	*1. Reader head dirty; clean with supplied cleaning card (additional cards available from Petro Vend).*
	2. Card is warped or cracked; replace
	3. Reader head defective; replace.
No communication between TC and PC	*1. Be sure computer cable is connected to PTR port on TC.*
	2. Communication parameters (baud, word size) not set properly.

7.2 ROUTINE MAINTENANCE

7.2.1 Receipt Printer

This section describes how to replace the receipt printer paper roll and the ribbon cartridge. For additional information on the printer, its control board, status LEDs, and switches, refer to Page 6.

WARNING!

Exercise caution when near the paper cutter. Do not use your fingers to remove paper near the cutter.

PAPER REPLACEMENT

Power to the FIT must be ON to remove and reload paper.

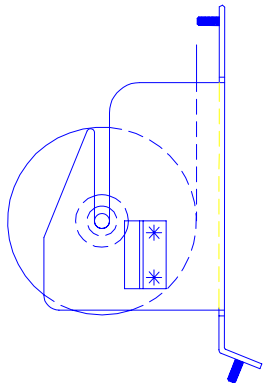

Figure 3 - Paper Roll Orientation

To remove the low paper roll, lift the paper roll up from the paper holder and cut the paper away from the printing mechanism. Note where the paper enters the mechanism (Figure 7). This is where you will feed the new paper.

Press and hold the paper feed/cut switch for several seconds to advance the remaining paper through the printing mechanism. If the paper does *not* advance completely through the mechanism, use a screwdriver (or other probe) to remove the remaining paper.

Remove the spindle from the old roll and place it into the new roll. Carefully slide the new paper roll back onto the paper holder. Be careful not to damage the "paper out" sensor mounted on the right side of the paper holder.

Feed the end of the paper into the printer.

Press and hold the paper feed/cut switch to move the paper through the printer. Be sure the paper is loaded between the cutter bar assembly. The paper should be curving down as it feeds through the assembly. Press the paper feed/cut switch momentarily to cut off any excess paper.

RIBBON CARTRIDGE REPLACEMENT

Power to the FIT must be ON. Press and hold the paper feed/cut switch to advance the paper about two inches (5 cm) through the printing mechanism. This will prevent the paper from slipping out of the printing mechanism when you move the cutter assembly.

The cutter assembly is attached to the printer mechanism by hinges. (Note the illustration on the printer.) Gently swing the cutter assembly toward you to reveal the ribbon cartridge underneath.

The word "LIFT" and an arrow indicating which side are inscribed on the printer cartridge. Gently pull on this side first to release the cartridge. Remove the cartridge.

Before installing the new printer cartridge, tighten its ribbon with the adjustment wheel on the cartridge. The ribbon should be as tight as possible in order to fit into the narrow slot of the printer.

Gently snap the new ribbon cartridge into place. Be sure that the ribbon is properly positioned in its slot. (If the ribbon is noticeably visible after you install the cartridge, remove the cartridge and tighten the ribbon.)

Swing the cutter mechanism back into place.

PRINTER TEST

To test the printer, press *both* the paper feed/cut switch and the printer reset switch *simultaneously*. Release the reset switch and hold the paper feed/cut switch until the printing begins.

When the printer is properly installed and functioning, it prints a message with:

(1) the current printer software version
(2) samples of the three font sizes in both red and black print
(3) the format selections for DIP switch position #1
(4) the selected currency symbol.

When the test is completed, the receipt is cut.

7.2.2 Cleaning the FIT Display

The FIT Graphics Display has a thin anti-glare coating. DO NOT use harsh detergents or any petroleum-based solvents to clean the display!

The following products are safe for use on the FIT graphics display panel:

1. **AR Kleener - Anti-Reflective**

Shield Lens Care Products
Golden Valley, MN
(612) 542-8276

AR Kleener is available nationwide at Sunglass Hut stores

2. **Diamond Glaze Anti-Reflective Cleaner**

Diamond Glaze, Inc.
St. Paul, MN
(800) 322-6644
(612) 227-5560

Call the manufacturers listed for distributors in your area; both are widely available in eyeglass stores or optometry clinics.

7.2.3 Cleaning the Card Reader

Both magnetic and optical readers should be cleaned at a *minimum once a month*, though once a week cleaning is strongly suggested. Clean the reader more often for busy sites, or whenever performance begins to suffer (numerous bad reads, etc.).

REQUIRED PARTS

- Cleaning card (dry "blotter" card for optical readers, "pre-moistened" cards for magnetic readers).

- Isopropyl alcohol (for unmoistened blotter cards only, and only for use in magnetic readers)

Do not use alcohol in an optical reader!

PROCEDURE

1. System power should be ON.

2. - MAGNETIC HEAD: If dry cleaning cards are used, apply a little isopropyl alcohol to the card, and immediately insert the card into the reader.

   - OPTICAL READER: Insert the DRY cleaning card into the reader.

3. Withdraw the card, and throw it away.

Both dry and wet cards should only be used once.

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