

Petro Vend® FSC3000 (Suncor) Installation, Operation and Maintenance

Part Number: M1700-SUN

Revision: 1.1



FSC3000 (Suncor)

DFS *Worldwide Brands*



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

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



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



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



OPW Fuel Management Systems is a part of Dover Fueling Solutions.

Copyright Information

© 2023 Dover Fueling Solutions. All rights reserved. DOVER, the DOVER D Design, DOVER FUELING SOLUTIONS, and other trademarks referenced herein are trademarks of Delaware Capital Formation, Inc./Dover Corporation, Dover Fueling Solutions UK Ltd. and their affiliated entities.

Contact OPW Fuel Management Systems

6900 Santa Fe Drive, Hodgkins, IL 60525, USA

Visit us at <https://www.doverfuelingsolutions.com/>.

Sales Support: (888) 679-3835 (7:30 a.m. to 4:00 p.m., US CST) • Email orders to: FMSorders@doverfs.com • Send billing inquiries to: Dbs_na_ar_inquiries@dovercorp.com

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



Table of Contents

Section 1 FSC3000 - SUNCOR	8
Section 1 System Equipment	9
1.1 FSC3000	9
1.2 Commercial Outdoor Payment Terminal (C/OPT)	11
1.2.1 Technical Specifications	11
1.3 Pump Control Terminal (PCT)	12
1.4 Connections	13
Section 3 Command Line Instructions	15
3.1 Single Command Instructions	15
Section 4 System Access	18
4.1 Open/Close	18
4.2 Hello/Bye	18
Section 5 System Time and Date	19
5.1 Time Commands	19
5.2 Daylight Savings Time	19
5.3 Time Change Commands	19
5.4 Date Commands	19
5.5 System ON/OFF Commands	20
5.6 Light ON/OFF Time Commands	20
Section 6 System Devices	21
6.1 FIT (C/OPT) Commands	21
6.1.1 Show Current FIT (C/OPT) Status	21
6.1.2 Configure FIT (C/OPT)	21
6.1.3 Install FIT	22
6.1.4 Remove FIT	22

6.2 PCT (PCM) Commands	22
6.2.1 Configure PCT	23
6.2.2 Install PCT	23
6.2.3 Remove PCT	23
6.3 PCT Position Commands	23
6.3.1 Configure PCT Position	23
6.4 Show Pump #	25
Section 7 Customer Messages	26
7.1 Receipts	26
7.1.1 About Receipts	26
7.1.2 Receipt Header	26
7.1.3 Receipt Trailer	26
7.2 Sample Receipt	26
7.3 Display Formatting Commands	27
7.3.1 Character Display Commands	31
7.3.2 Graphic Display Overview	31
7.3.3 Graphics Display Command Syntax	32
7.3.4 Graphics Display Picture Selection	32
7.3.5 Graphics Display Text Position	32
7.3.6 Graphics Display Font Selection	32
7.3.7 Time of Day in a Graphics Display	33
7.3.8 Inverting the Graphics Screen	33
7.3.9 Clearing the Graphics Screen	33
7.3.10 Cleaning the Screen	33
7.3.11 Graphics Display Prompts, Type Styles and Position Codes	34
7.3.12 Graphic Display Examples	36

7.4 Keyboard Commands	36
7.5 Local Message Commands	36
7.5.1 Format Local Messages	36
7.5.2 Show Local Messages	37
Section 8 System Parameters	38
8.1 System	38
8.2 Site ID	38
8.3 Fuel Types	39
8.4 Fueling Units	39
8.5 Passwords	40
8.6 Language	40
8.7 Echo	41
8.8 Version	41
8.9 GST (General Sales Tax)	42
Section 9 Transaction Data	43
9.1 Show or Print Summary by Transaction, Date, Time, Card, or Vehicle	43
9.2 Set Transaction	43
Section 10 System Totals	45
10.1 Showing or Printing Total Transactions by Date, Time, Card, or Vehicle	45
10.2 Showing or Printing Summary of Total Transactions by Date, Time, Card, or Vehicle	45
10.3 Midnight Totals	45
10.4 Day Totals	45
Section 11 Journal Printer	47
11.1 Lock Printer	47
11.2 Unlock Printer	47
Section 12 Network Commands	48

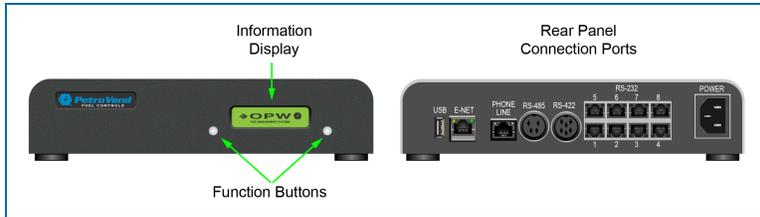
12.1 Host Commands	48
12.1.1 Set Host	48
12.1.2 Show Host	48
12.1.3 Set/Show IP	48
12.1.4 ISO Commands	49
12.1.5 Show ISO	49
12.1.6 Set ISO	50
12.2 Debugging Commands	51
12.2.1 Show/Print/Set Debug	51
12.2.2 Test Circuit	51
12.2.3 Monitor Host	51
12.3 Local Message Commands	51
12.3.1 Format Local Message	51
12.3.2 Show Local Message	52
Appendix A - Memory Management	53
Appendix B - USB Memory Key Operation	55
Warranty	58

Section 1 FSC3000 - SUNCOR

- The FSC3000 can control up to 12 C/OPTs (up to 32 fueling positions in mechanical pumps)
- On-site or remote access
- Automatic daily pump totals
- On-demand Pump, Product and Shift Totals
- Programmable customer messages and receipts
- Programmable Open/Close system times
- User configurable Login Timeout

Section 1 System Equipment

1.1 FSC3000



The FSC contains the software shown in the remaining instructions in this manual. This small, tabletop unit processes data supplied over Petro-Net from the PCTs, and OPTs. The FSC contains all card information and system configuration data.

The FSC manages the operations of the OPTs, the terminal or computer, the journal printer, and an optional modem.

The FSC must be installed indoors, and connected to one of the OPTs using twisted pair wiring and rigid steel conduit.

Install the FSC as described in the [M1700 FSC3000 Installation, Operation and Maintenance](#) manual. The M1700 manual also contains an illustration of the FSC board and descriptions of its status LEDs and switches.

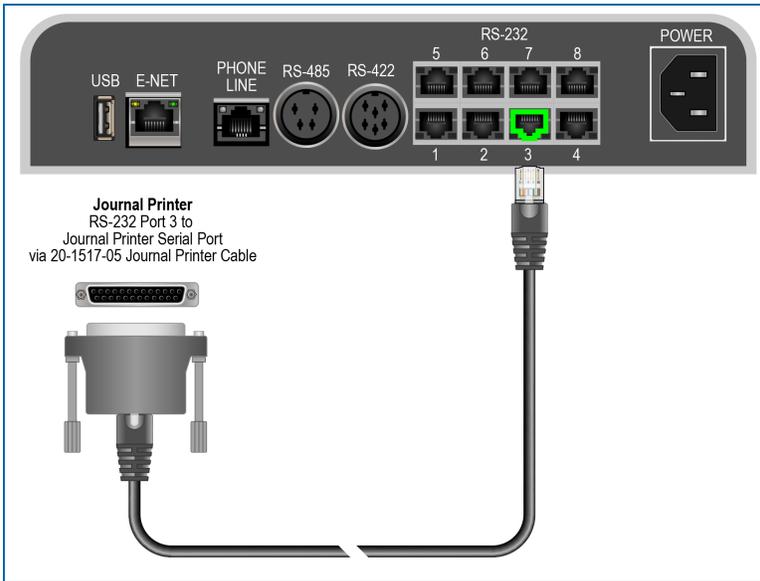
Before you can program the system, the FSC must be connected to a computer compatible with ASCII communications.

The FSC uses an optional internal modem or TCP/IP socket connection for remote operation. This gives you complete control from a remote terminal or computer over standard telephone lines or the Internet.

The FSC has a built-in battery to protect its data in case of an interruption or loss of AC power. The battery can be disconnected when a total clearing of data is required.

Journal Printer Connection

Connect the (optional) Journal Printer as shown below. See the Connections section for more information on connection changeovers from System2 to FSC3000.



Port 3: This is the connection port to an optional Journal Printer (OPW-FMS part number 20-7073). Transactions can be printed in real-time to this printer. Connect an RJ45 to DB25 M (OPW-FMS part number 20-1517-05) cable; RJ-45 connector into port 3 of the FSC and the DB25 M connector to the Journal Printer serial port.

FSC3000 Specifications

<i>FSC3000 Specifications</i>	
Power Requirements	85-240 VAC, 50/60 Hz; 25 watts maximum (See C/OPT specifications for terminal installation)
Operating Temperature Range	32° F - 122° F (0° C - 50° C) (See C/OPT specifications for terminal installation)
Enclosure Dimensions (H x W x D)	2.25" x 10" x 8.25" (5.7 cm x 25.4 cm x 21 cm)

1.2 Commercial Outdoor Payment Terminal (C/OPT)



The Commercial/outdoor Payment Terminal (Figure 3) a Petro Vend fueling terminal. The C/OPT works with your Petro Vend Fuel Site Controller (FSC) and Pump Control Terminal (PCT).

Refer to the C/OPT section of the [M1700 FSC3000 Installation, Operation and Maintenance](#) manual for full installation and operation instructions.

With optional Universal Pump Control (UPC) software, the FSC can authorize fueling transactions through a pump control console (such as used in a self service station). For pumps controlled by a UPC, refer to the UPC section of the [M1700 FSC3000 Installation, Operation and Maintenance](#) manual.

1.2.1 Technical Specifications

<i>C/OPT Specifications</i>	
Power Requirements	120/240 VAC; 50/60 Hz; 250 watts max.
Operating Temperature Range	-40°F - 122°F (-40°C - 50°C)
Enclosure Dimensions (H x W x D)	15" x 18.5" x 11" (38 cm x 47 cm x 28 cm)
Graphics Display	(5" Monochrome)

1.3 Pump Control Terminal (PCT)

Pump Control Terminal (PCT)

The PCT gathers the data from the pumps and formats it for the FSC. The PCT can be mounted (Figure 4) in one of the following ways:

- Built into the C/OPT as a PC board (behind the C/OPT PC board).
- In the C/OPT on the back wall of the box.
- As a "remote PCT," in a separate indoor cabinet.

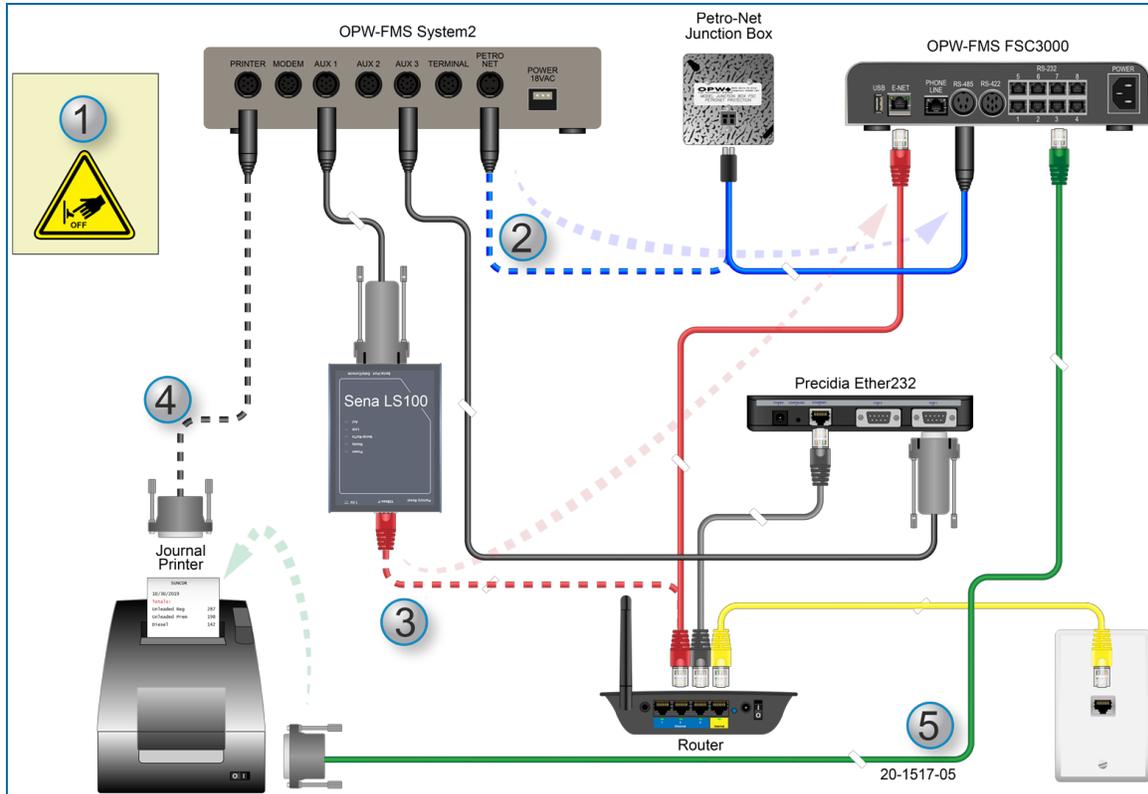
Refer to the PCT section of the [M1700 FSC3000 Installation, Operation and Maintenance](#) manual for more information about Pump Control Terminals.

1.4 Connections

Do the steps that follow to changeover your connections from a System2 Fuel Site Controller to an FSC3000 Fuel Site Controller.



IMPORTANT: It is recommended to upload all transactions from the System2 Fuel Site Controller before you reconfigure these connections.



NOTE: Connections that are shown as dashed lines in the illustration above are disconnected from a System2 component and re-connected or replaced by an FSC3000 component.

1. As a precaution, turn off all electrical power to the system before you continue with the next steps.
2. Disconnect the Petro-Net connection from the System2 and connect it to the RS-485 port in the FSC3000 (shown by a blue Petro-Net cable in the illustration [OPW-FMS part number 20-1443]).
3. Disconnect the Ethernet cable from the Ethernet port of your Sena LS100 and connect it to the Ethernet port of the FSC3000 (shown by a red Ethernet cable in the illustration above). The other end can remain connected to your router.

4. Disconnect the Journal Printer (optional) cable at the printer connection. You can keep the other end connected to the System2.
5. Use a 20-1517-05 (OPW-FMS part number - RJ45 to DB25 M) cable (shown by a green cable in the illustration above) to connect your Journal Printer (optional) to the #3 RS-232 port of the FSC3000 as shown in the illustration..

TIP: As a backup, you can keep the remaining cables of your System2 configuration connected.



- »» Serial connection between System2 and Sena LS100.
- »» Serial connection between System2 and Precidia Ether232.
- »» Ethernet connection between Precidia Ether232 and your router.

If it becomes necessary to re-connect your System2 components you can simply reverse the connections in the steps above back to their original positions.

Section 3 Command Line Instructions

Your system powers up in “command line” mode. This means you must issue commands at the “>” prompt.

To enter privileged mode, type `HELLO` at the “>” prompt, then enter the privileged password.

The most used commands are:

SHOW: Displays information from an FSC3000 data base on the screen of your terminal or PC. This command does not require privileged status.

PRINT: Sends data to your external journal printer to make a hard copy. Most (but not all) information can be printed, including all setup data (cards, fuel types, prices, etc.) and all transaction information (time, date, amount, price, cost, etc.). This command does not require privileged status.

SET (FORMAT and CONFIGURE work similarly): These commands are used to enter or change the setup data. These commands are privileged. Note that after a `FORMAT` or `CONFIGURE` command is used, one of the `DOWNLOAD` commands must be entered.

Other common commands include:

INSTALL/REMOVE: These commands activate and deactivate a device (such as a PCT). Privileged commands.

CLEAR: There are several `CLEAR` commands, which erase transactions from the system data base. Privileged command.

3.1 Single Command Instructions

SYSTEM ACCESS

- OPEN
- CLOSE
- CALL
- HELLO
- BYE

SYSTEM TIME COMMANDS

- TIME
- TIME CHANGE
- DATE
- SYSTEM ON TIME
- LIGHT ON TIME

SYSTEM DEVICE COMMANDS (Show/Print/Install/Remove/Configure/ Download)

- FIT # (C/OPT number)
- PCT #
- PCT #/POSITION #
- PUMP #

CUSTOMER MESSAGE COMMANDS (Show/Print/Format)

- RECEIPT BODY
- RECEIPT HEADER
- RECEIPT TRAILER
- RECEIPT BONUS POINTS
- DISPLAY (#...)
- KEYBOARD (#...)
- DATE
- LOCAL MESSAGES
- FORMAT NATIONAL

SYSTEM PARAMETERS COMMANDS (Show/Print/Set)

- SYSTEM
- SITE ID
- FUELTYPE (#...)
- FUELING UNITS
- PASSWORD
- LANGUAGE
- MENU
- ECHO
- BONUS POINTS
- RAM
- VERSIONS
- HOST
- IP

TRANSACTION DATA COMMANDS (Show/Print/Set/Clear*)

- TRANS
- TRANS DATE #... SEQUENCE #...

* Transactions cannot be CLEARED selectively. They can only be cleared all at once.

SYSTEM TOTALS (Show/Print/Set/Clear)

- TRANS DATE TIME CARD ACCOUNT VEHICLE
- TRANS DATE TIME CARD ACCOUNT VEHICLE SUMMARY
- MIDNIGHT
- DAY
- SHIFT
- PUMP #... TOTALS

- PCT #... TOTALS
- FUELTYPE (#...) TOTALS
- TANK (#...)

JOURNAL PRINTER (Show/Print/Set/Lock/Unlock)

- JOURNAL PRINTER
- PRINTER

NETWORK COMMANDS (Show/Print/Set/Format)

- HOST
- ISO
- DEBUG
- FORMAT MESSAGES
- IP
- FORMAT NATIONAL

Section 4 System Access

4.1 Open/Close

The **OPEN** and **CLOSE** commands give immediate access to pumps. Both commands are privileged, requiring the main password. When a **CLOSE** command is issued, all activities in progress (pumping, printing a receipt, etc.) complete normally, but no new activities are allowed to begin.

4.2 Hello/Bye

HELLO is used to access the privileged mode. You'll be prompted for the system password (see ["Passwords" on page 40](#)). The factory-set password is HELLO).

BYE exits the privileged mode.

You **MUST** enter the main password to enter Privileged mode. To return to Normal mode from the command line \$> prompt, type **BYE**.

Section 5 System Time and Date

5.1 Time Commands

The **SHOW TIME** or **SET TIME** command displays or sets the current time of day. The **SET TIME** command changes time as follows:

1. SET TIME (ENTER)
2. TIME (ENTER)
3. Enter the time in the format HH:MM AM or PM. For example, 12:57 PM. If PM is not specified, AM is assumed. Alternatively, you can enter as 24 hour (military) time, with or without the colon (HH:MM or HHMM).
4. Push (ENTER) to complete the entry; this sets seconds to zero. The new time and current (or default) date are displayed.

Push (ENTER) to leave the current time unchanged.

5.2 Daylight Savings Time

The **SET TIME CHANGE** command sets dates on which the internal clock moves ahead or back by one hour, to adjust for the change between daylight savings time and “standard” time.

The change occurs at 2:00 AM on the date specified.

5.3 Time Change Commands

The **SHOW TIME CHANGE** command displays change dates in the system. The **SET TIME CHANGE** command changes the dates as follows:

1. After issuing the command you are prompted:

ENTER DATE WHEN TIME IS MOVED BACK 1 HOUR:

2. Enter the “move-back” date in the format MMM DD YYYY (the year must be four digits). Press (ENTER). The following prompt appears:

ENTER DATE WHEN TIME IS MOVED AHEAD 1 HOUR:

3. Enter the “move ahead” date in the same way.

The word CHANGE can be abbreviated CH in these and other line commands.

5.4 Date Commands

The **SHOW DATE** or **SET DATE** command displays or sets the current date within the system's memory.

After issuing the command you are prompted to enter a date: ENTER DATE (MMM DD, YYYY) :

1. Enter the date in the indicated format (for example, type FEB 11, 2000 for February 11th, 2000).
2. Push (ENTER) to complete the entry; the new date is now displayed.

Push (ENTER) with no entry to leave the current date unchanged.

5.5 System ON/OFF Commands

The **SHOW SYS TIME** and **SET SYS TIME** commands display or set the time the system goes ON and OFF, and the time during which “transactions in progress” are allowed (the “receipts only” time).

The SET SYS TIME command lets you set the following four options (time for the first three is entered in the same format as for System Time - hh:mm).

SYSTEM ON TIME - specifies when SYSTEM2 goes active. When the system is on, it displays messages, and accepts card insertions or keypad entries.

SYSTEM OFF TIME - specifies when the system goes inactive. No new transactions are allowed to begin, but any in progress are allowed to finish.

RECEIPTS ONLY TIME - specifies when the system allows no new transactions to begin, but does allow “just completed” customers to get their receipts. This time would typically precede the `SYSTEM OFF TIME` by several minutes.

EXAMPLE: A gas station that dispenses fuel from 9:00 AM until 7:00 PM would have the `SYSTEM ON TIME` set to 9:00 AM, the `SYSTEM OFF TIME` set to 7:10 PM and the `RECEIPTS ONLY TIME` set to 7:00 PM.

TIME ADJUST - this feature allows a software adjustment to the internal time clock. In the event of a noticeable time drift, a number of seconds can be added to or subtracted from each day, until a proper hardware adjustment can be made.

5.6 Light ON/OFF Time Commands

The **SET LIGHT** command lets you set the SYSTEM2 to turn the “pocket” lights in the standard C/OPT ON and OFF at designated times.

After selecting this option, the following prompts appear:

ENTER LIGHT ON TIME:

ENTER LIGHT OFF TIME:

Enter time in the same format as for SYSTEM ON TIME.

Section 6 System Devices

6.1 FIT (C/OPT) Commands

"FIT" is equivalent to "C/OPT" in the screen prompts.

The **SHOW**, **PRINT**, **INSTALL**, **REMOVE** and **CONFIGURE FIT #** commands let you view, configure, install or remove FITs, and determine if the receipt printer will issue receipts, whether the keyboard is enabled or disabled, which PCTs to shut off when the emergency stop button is pressed, and reset the card reader error counter.

6.1.1 Show Current FIT (C/OPT) Status

Issue a **SHOW FIT** command with a FIT (C/OPT) number to see how that terminal is set up:

```
FIT INSTALLED
FIT INFO:
GRAPHICS PUSH_PULL v 11.01E
NO RECEIPTS
KEYBOARD ACCESS - ENABLED
PCTs TO SHUT OFF ON E-STOP: 1,2,3,4
CARD READER ERROR COUNTERS:
READER 1: 0 READER 2: 0
-- ACCESS TO ALL PUMPS
ALPHA ENTRIES ALLOWED FROM THIS FIT
```

Entries vary depending on current FIT (C/OPT) settings.

6.1.2 Configure FIT (C/OPT)

The **CONFIGURE FIT** command changes these settings. The following prompts appear one by one after using **CONFIGURE FIT #**:



NOTE: "#" is the number of the FIT (C/OPT) configured in the steps that follow. The number can be in a range from 1 to 12.

- **ISSUE RECEIPTS (Y/N) ?** - Enter Y to have the optional receipt printer issue a receipt (N is default). If you enter (Y) to the **ISSUE RECEIPTS?** prompt, two additional prompts appear...
 - **ENTER LIMIT TO RECEIVE RECEIPT IN DAYS (0..99)** - this is the number of days after a transaction that a customer can receive a receipt. Default is **NO LIMIT**.
 - **CLEAR RECEIPT COUNTER (Y/N) ?** - The receipt counter keeps a running total of all receipts issued to date. It can be used to keep track of the receipt paper and to indicate when the paper is running low.
- **KEYBOARD OPTIONS (Y/N) ?** - Default is N. Enter (Y) to display:

- **ENABLE KEYBOARD ACCESS (Y/N) ?** - Default is N. With this feature enabled, a customer can enter their card number on the C/OPT keyboard. The card reader is not disabled by enabling keyboard access.
- **SPECIFY PCTs TO SHUT OFF ON E-STOP (Y/N) ?** - Default is N (meaning ALL PCTs shut off upon E-STOP). If you enter (Y) to select which PCTs will be turned off, you'll see:
 - **ENTER PCTs TO SHUT OFF (#, #. .)** - Enter a range and push ENTER.
- If there are card reader errors logged, the next prompt you'll see is: **CLEAR CARD READER ERROR COUNTER (Y/N) ?** This prompt is only displayed if the error counter is greater than zero. This counter keeps a running total of bad reads by the card reader.

A “bad” read is one where the card reader cannot read a card correctly in three sequential attempts. Such a failure could indicate that the card reader needs cleaning or replacement. Enter (Y) to clear the counter. Enter (N) to keep the counter the same and to display the next prompt.

- **CHANGE FIT ACCESS TO PUMPS (Y/N) ?** Default is N. Enter (Y) to change which pumps can be activated by the specified C/OPT.
 - **ENTER VALID PUMPS (p1, p2, . .)** If you enter (N), all pumps will be accessible from this C/OPT. You will see ALL PUMPS ACCESSED if you choose (N).
- **CHANGE ALPHA ENTRY OPTION (Y/N) ? Y or N.** If Y, the following sub-prompt also appears:
 - **DOES THIS FIT ALLOW ALPHA ENTRIES (Y/N) ? Y or N.** To allow alphabetical entries at C/OPT means C/OPT user can enter letters on the numeric keypad by pressing a number key one, two or three times to activate the letter. The keypad is like a telephone keypad:

EXAMPLE: to enter the letter "N" push the “6” key twice.

Enter the **DOWNLOAD** command after C/OPT configuration.

6.1.3 Install FIT

This command activates the specified C/OPT, establishing a communication link between the installed C/OPT and the FSC. C/OPT #1 is automatically installed on power-up.

6.1.4 Remove FIT

This stops the FSC from communicating with the specified C/OPT.

6.2 PCT (PCM) Commands

You can **SHOW**, **PRINT**, **INSTALL**, **REMOVE**, or **CONFIGURE** a PCT (PCM) #. Each C/OPT has a PCT board to control pump operations. This board, in the C/OPT or in a remote cabinet, must be uniquely numbered.

PCT number is set with DIP switch #5 on each PV-268 board. See the [M1700 FSC3000 Installation, Operation and Maintenance](#) manual for details. If the FSC is equipped with UPC (Universal Pump Controller) software, it can authorize fueling transactions via a pump control console (a self service station). Pumps controlled by UPC software do not require a PCT.

6.2.1 Configure PCT



NOTE: "#" is the number of the PCT/PCM configured in the steps that follow. The PCT position range can be from 1 to 8. The PCMs can be in a range from 1 to 4. You can have up to eight PCMs installed for a total of up to 32 pump positions.

The **CONFIG PCT #** command (a number is required) first asks if a UPC will be substituted for the specified PCT. Push N.



NOTE: To reconfigure an installed PCT as a UPC, you must first remove the PCT using the command **REMOVE PCT #!**

When the FSC3000 is "cold started" (with no setup information in the data base), PCT #1 is automatically installed as not a UPC. A cold start is required: (1) when the FSC is first installed or (2) if both the system power and backup battery fail.

6.2.2 Install PCT

The **INSTALL PCT** command activates the PCT, creating a link between the installed PCT and FSC. There is a PCT for each C/OPT. This command does not install all positions for a PCT.



NOTE: Make sure that pumps are installed before the PCT (PCMs) is installed.

After installing pump positions, the PCT(s) themselves must also be installed. A PCT can be configured and kept inoperative by not installing it. At power-up, PCT #1 is automatically installed.

6.2.3 Remove PCT

The **REMOVE PCT** command ends FSC-to-PCT communication to the specified PCT and deactivates all positions in the specified PCT. All programmed settings remain intact - you can re-install the "removed" PCT without having to reconfigure it.

6.3 PCT Position Commands

You can **SHOW**, **PRINT**, **INSTALL**, **REMOVE**, or **CONFIGURE** a position within a PCT#. These commands configure or show individual positions within a PCT. PCT positions can be viewed, printed, installed, removed or configured. Each PCT can control up to eight pumps, located at positions #1 - #8.

6.3.1 Configure PCT Position



NOTE: The PCT position range can be from 1 to 8. The PCMs can be in a range from 1 to 4.

After issuing **CONFIG PCT # POS #**, a pump number and pulses per unit **MUST** be specified for each position:

- **Pump #** - This is the pump number the customer sees (example: 'USE PUMP #12'). This number is only a label. It does not have to match the PCT position. Pump numbers can be assigned to more than one position on the same PCT. When a customer selects this pump, all the associated positions are activated. For example, say pump number "2" is assigned to positions #1 and #2. A customer with a large saddle-tank could speed fueling by putting Position 1's pump into one of the tanks and the Position 2 pump into the other tank.

Each PCT position records its own transaction; in this example, two transactions would be recorded (one for each pump). Multiple pump use in this way is not possible when using UPC software.

- **Pulses Per Unit** - Specifies the number of pulses per "unit" of fuel. A unit is typically gallons, liters or quarts. The prompted unit is the one related to the fuel type just entered. Default value is 100.

Optional PCT Position Entries

The following optional PCT items have defaults that should work for most systems. Push ENTER to skip past an optional item and enter the default value. To change a default, enter your new value at the prompt.

- **Max Fuel Per Transaction** - The most fuel that can be dispensed for a transaction using this pump. Default is 10 units.
- **Enable/Disable Pump Sentry Feature** - This option deactivates the pump if three "zero quantity" transactions appear consecutively. This may indicate pump or pulser trouble. You'll first see PUMP SENTRY OPTIONS (Y/N)?. Enter (Y) to enable the sentry. If you enter (Y), you'll next see ENABLE PUMP SENTRY (Y/N)?; push (Y) or (N) as appropriate. Default is disabled. A PREMATURE BUSY error does NOT increment the Pump Sentry counter.
- **Max Time For Fueling** - The time limit, in minutes, given the user to fuel. Default is five minutes. Time is measured from when the pump is first activated to when power is removed from the pump. To deactivate this feature, enter 0.
- **Max Time For Pump Handle** - Maximum time, in seconds, allowed between pump activation and handle retrieval. Default is 60. Enter "0" to deactivate.
- **Max Time For First Pulse** - Maximum time, in seconds, allowed to detect the first fueling pulse from handle retrieval. Pump power is removed when the time is reached. Default is 60. Enter 0 to deactivate.
- **Max Time Between Pulses** - Maximum time, in seconds, allowed between fueling pulses. Pump power is removed when this time is reached. Default is 60. To deactivate, enter 0.
- **Fuel type Code #** - A number from 1 to 16 that represents the type of fuel this position will dispense.
- **Tank #** - The tank number from which product will be drawn. A PCT position with the same fuel type as the tank from which product is drawn must be defined. Default tank number is the position number.
- **Clear Pump Totals** - Clear running pump totals; default is no.
- **Totalizer Value** - Set a number to match the totalizer counter on the pump face; tracks the amount of fuel actually dispensed by the pump and as seen by the FSC. Default is "0". For UPC-equipped systems, the last four prompts are repeated for up to four hoses.

You must enter the **DOWNLOAD** command (either directly, or via the (G) command in the System Devices menu) after configuring a PCT.

6.4 Show Pump

Enter a valid pump number after the SHOW PUMP command to display that pump's particulars:

```
P> SHOW PUMP 1
```

```
PCT 1 POSITION 1 PUMP #1
FUELTYPE CODE 1: SUPER UNLEADED
TANK#: 1
PULSES PER LITRE: 100
ABSOLUTE MAX QUANTITY: 1500 LITRE
PUMP INACTIVE
TOTALS: 61.7
TOTALIZER: 61.7 LITRE
PUMP SENTRY: DISABLED
GALLON-TO-LITRE CONVERSION: DISABLED
*** PUMP TIMEOUTS ***
TOTAL FUELING TIMEOUT (MIN): 10
PUMP HANDLE TIME-OUT (SEC): 60
FIRST PULSE TIME-OUT (SEC): 60
MISSING PULSE TIME-OUT (SEC): 120
```

Section 7 Customer Messages

This section explains how to format printed receipts (body, header, trailer, and bonus points), how to set up messages and prompts on the various types of C/OPT displays, and how to change the response from a keyboard input (for example, "(Y)" or "N").

Display and Receipt Languages. C/OPT messages and receipt data appear in either French or English. On optical cards, the language selection is coded in the card. Magnetic cards require the customer to choose a language at the start of the transaction. at the beginning of transaction.

Language for receipt is the same as for transaction. It is saved in the transaction record therefore there are two types of receipt - English and French.

7.1 Receipts

7.1.1 About Receipts

There are three (3) parts to a receipt:

- Header
- Body
- Trailer

7.1.2 Receipt Header

The Receipt Header is the message printed at the top of the receipt. You can show, print, or format a header.

To format a header, enter up to 4 lines. Each line can contain up to 11 characters. You can specify red or black print for each line. If you don't need all 4 lines, push ENTER to skip lines.

The header and trailer/bonus points messages are printed in expanded format unless you specify otherwise. The receipt body fields can be set in any order. Current date & time are automatically printed on each receipt. Receipt size is fixed - make sure the programmed number of receipt body lines will fit onto the receipt.

7.1.3 Receipt Trailer

The receipt trailer programs a message to print at the end of each receipt.

The format is the same as for the header.

7.2 Sample Receipt

The illustration below shows a receipt that uses pre-printed header lines (typeface one), and footer lines (also typeface one).

```
HEADER ROW 1
HEADER ROW 2
HEADER ROW 3
HEADER ROW 4

CARD #: 1
TRANS #: 12
MISC: 123456789012
ODOM: 130445
PUMP#: 6
PRODUCT: PREMIUM
QUANTITY: 10.7

TRAILER ROW 1
TRAILER ROW 2
TRAILER ROW 3
TRAILER ROW 4
```

The illustration below shows a receipt that uses two pre-printed header rows and two custom header rows and a one-row trailer.

```
PRE-PRINTED ROW
PRE-PRINTED ROW

USER-CREATED ROW
USER-CREATED ROW

CARD #: 1
TRANS #: 12
MISC: 123456789012
ODOM: 130445
PUMP#: 6
PRODUCT: PREMIUM
QUANTITY: 10.7

THANK YOU!
```

7.3 Display Formatting Commands

The **FORMAT DISPLAY #** command defines prompts that appear on the C/OPT display.

The C/OPT display guides customers through the fueling process with a series of prompts. The system generates default prompts for certain events.

Punctuation: In addition to numbers and letters, you may include most characters such as `!`, `?` and `\$` in the C/OPT display prompts.

 **NOTE:** You **MUST** issue a **DOWNLOAD** command after altering a prompt, in order for it to be visible.

Beep. Add the `}` (right curly bracket) character to any C/OPT prompt to have an audible tone to sound at the C/OPT when the prompt is displayed. The curly bracket itself does not appear.

The C/OPT messages in the table below are the default messages.

If changing the default message, remember that only the text is changed, not any function. For example, 'INSERT CARD' can be changed to 'PUT IN CARD' but not to 'ENTER CURRENT TIME'.

<i>Code</i>	<i>C/OPT Display Prompt</i>
1	SYSTEM OUT OF SERVICE
2	READING CARD
3	REMOVE CARD
4	INCORRECT READING
5	CHECK CARD ORIENTATION
6	INSERT CARD FOR RECEIPT
7	INSERT CARD FOR RECEIPT
8	INSERT/REMOVE CARD
9	INSERT/REMOVE CARD
10	SYSTEM CLOSED
11	PLEASE WAIT
12	PRINTING RECEIPT
13	TAKE RECEIPT
14	PRINTER ERROR
15	ISSUE RECEIPT?:
16	ENTER PUMP #:}
17	IN USE, RE-ENTER:
18	INVALID, RE-ENTER:
19	PUMP HANDLE? RE-ENTER:
20	FAULTY PUMP, RE-ENTER:
21	UNAUTHZED, RE-ENTER:
22	RESTRICTED, RE-ENTER:
23	USE PUMP
24	INSERT 2ND CARD
25	INCORRECT CARD
26	ENTER CARD #
27	(blank)
28	(blank)
29	(blank)
30	(blank)
31	(blank)
32	(blank)
33	(blank)

<i>Code</i>	<i>C/OPT Display Prompt</i>
34	ERROR, PLEASE RE-ENTER
35	NOT IN CARD FILE
36	CARD EXPIRED
37	CARD RECORD EXPIRED
38	CARD INVALIDATED
39	3 BAD PIN ENTRIES
40	ALLOCATION EXCEEDED
41	{blank}
42	NEED ALPHA READER
43	(blank)
44	(blank)
45	(blank)
46	HOST AUTH FAILURE
47	(blank)
48	JOURNAL ERR -GET MGR
49	SYS BUSY -BUFFER FULL
50	(blank)
51	(blank)
52	SELECT LANGUAGE
53	ENTER ODOMETER:
54	ENTER MISCELLANEOUS:
55	ENTER UNIT NUMBER:
56	ENTER DRIVER NUMBER:
57	ENTER TRAILER NUMBER:
58	ENTER TRACTOR HUB ODOMETER:
59	ENTER TRAILER HUB ODOMETER:
60	ENTER TRIP NUMBER:
61	ENTER DRIVERS LICENSE NUMBER
62	ENTER LICENSE PROVINCE/STATE
63	ENTER PURCHASE ORDER NUMBER:
64	ENTER P.I.N. NUMBER:
65	ENTER TRAILER HOURS:
66	REFER 0 or N = NO

Code	C/OPT Display Prompt
67	ENTER CONTROL #
68	(blank)
69	(blank)
70	(blank)

7.3.1 Character Display Commands

Enter a FORMAT DISPLAY command, then enter the number of the C/ OPT prompt you want to edit. After entering the prompt number, the current prompt and two vertical lines appear.

7.3.2 Graphic Display Overview

Pictures and text (in multiple styles) can be placed on one or more lines of the display. The current time can also be displayed with any prompt.

Up to 80 characters can be displayed. To combine pictures with text, add “control characters” (on a computer, CTRL characters display as ^) to text prompts. In addition to defining pictures, these characters also allow you to:

- Position text on the display
- Select a text style
- Show the current time
- Clear the picture from the display.

Refer to ["Graphics Display Prompts, Type Styles and Position Codes" on page 34](#) for the lists of control codes.

Refer to ["Graphic Display Examples" on page 36](#) to see examples of prompts with pictures.

The graphics codes described in this section can also be added to the keyboard responses and to the individual messages generated by the messaging feature. See ["Keyboard Commands" on page 36](#) for more information.

Graphic prompts are limited to 80 text characters, each control character is equal to two text characters. Use the following prompt as an example:

```
 `^1^Z ENTER CARD
```

This prompt consumes 18 characters: two for `^1' (the code that displays picture #1), two for `^Z', (the code that selects the font), and twelve for the text ENTER CARD (including three spaces).

7.3.3 Graphics Display Command Syntax

Editing the text portion of a Graphics Display is like editing a standard one or two line display. After you issue a `FORMAT DISPLAY #` command, enter prompt `#` to edit.

The text prompt for editing the Graphics Display is like a double version of the 1 x 40 display. When specifying the display number, you are shown the current prompt and two vertical lines spaced 40 characters apart.

The first 40 characters of the display prompt are shown on one line, in the space underneath the two vertical lines; the second 40 characters of the prompt (if applicable) are shown on a second line.

Enter the new prompt and push ENTER to complete the entry for the first line. Enter a second line for the prompt if desired. To format another, re-enter the command.

7.3.4 Graphics Display Picture Selection

Pictures are defined within the text prompt.

To associate a picture with a display prompt, simply add the control character for that picture to the display prompt text.

Place the picture control character before the prompt text. Only one `pix` ENTER can be connected to a message. You can tie the same picture to as many display prompts as desired.

Picture control codes, and C/OPT prompts typically attached to each picture, are shown in ["Graphics Display Prompts, Type Styles and Position Codes" on page 34](#).

7.3.5 Graphics Display Text Position

To specify where on the display your text will go, insert one or more "position codes" in your prompt. There are 12-15 "lines" on the display; each of the lines has a position code. See the table in ["Graphics Display Prompts, Type Styles and Position Codes" on page 34](#).

The position code must be a CAPITAL letter and must be placed before the text. For example:

```
^C THIS IS ON LINE THREE
```

The `^C` in the above prompt specifies the text will appear on line three. If no position control character is specified, the text begins on the first (top) line of the display.

7.3.6 Graphics Display Font Selection

Your text messages can be displayed in one of the four type styles (shown in ["Graphics Display Prompts, Type Styles and Position Codes" on page 34](#)) listed below. The control character that defines the font is shown below as well:

- San-serif, Small, (40 characters per line) (`^V`).
- San-serif, Large (20 characters per line), International character set (`^X`).
- Serif, 20, Large (20 characters per line) (`^Y`)
- Sans-serif, Large (20 characters per line) Standard character set (`^Z`)

Serifs are the small "tails" on type. The top line below is a serif type style, while the bottom is sans-serif:

This is a Serif Font (Times New Roman)
This is a San Serif Font (Arial)

All type styles use fixed-width characters (in other words, an "I" takes up as much room as a "W").



NOTE: Only one style type can be used per message.

If you do not specify a style, the last style you specified is used. If you do not specify any styles for any prompts, Style 1 is used.

7.3.7 Time of Day in a Graphics Display

To show current time in a prompt, insert control character '^T' at the end of any display prompt. The time is always displayed in the top right corner of the display. It appears in the current typeface.

7.3.8 Inverting the Graphics Screen

C/OPT VERSION 1.01: Use ^M to invert the image on the graphics screen (white becomes black, and black becomes white). Use ^N to restore the display to normal.

C/OPT VERSION 1.02A OR HIGHER: Use ^P to invert the image on the graphics screen (white becomes black, and black becomes white). Use ^Q to restore the display to normal.

7.3.9 Clearing the Graphics Screen

Insert '^0' (control zero) before the prompt text to clear the screen before displaying a prompt.

This command is typically used with two-part messages; insert the command after the first part of the message to “erase” the screen for the second part.

A Graphics Display picture remains on the screen until one of the following occurs:

- Another C/OPT prompt with a picture is displayed OR...
- A C/OPT prompt with the “clear screen” control code is displayed.

7.3.10 Cleaning the Screen

The Graphics Display has a thin anti-glare coating.



IMPORTANT: DO NOT use harsh detergents or any petroleum-based solvents to clean the display!

7.3.11 Graphics Display Prompts, Type Styles and Position Codes

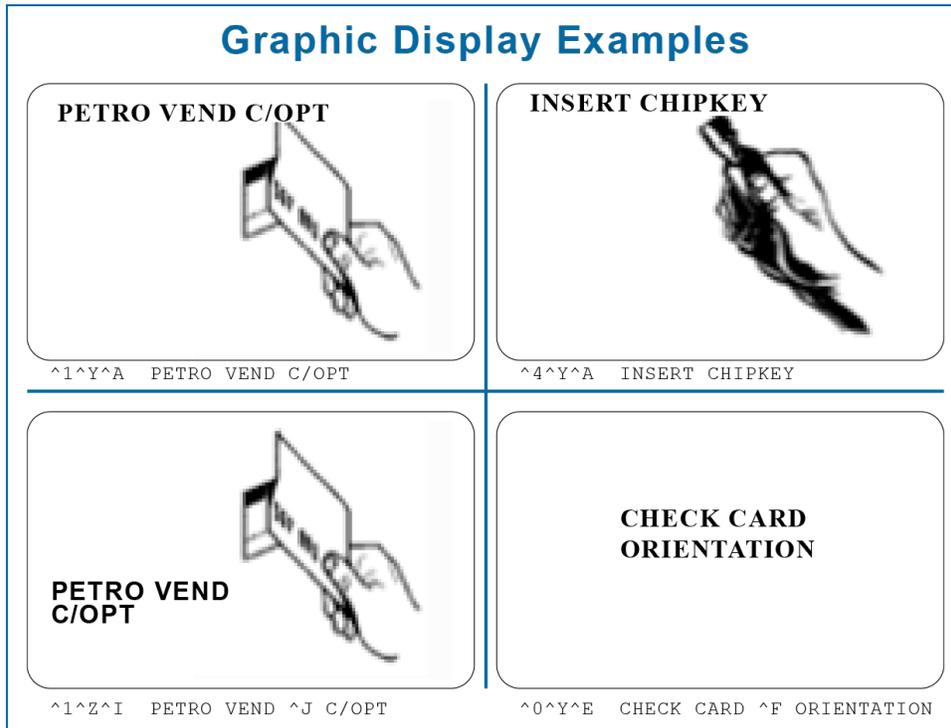
The chart below shows:

- Position control codes (^A through ^L in C/OPT version 1.01, ^A through ^O C/OPT 1.02A and over) specify where on the display the line of text appears; codes apply to all type styles.
- The available type styles, with their matching control code (^V, ^X, ^Y, ^Z).
- The Graphic Display Prompts and their numeric control codes.

EXAMPLE: To have the prompt INSERT CARD appear at the bottom of the display (perhaps under a picture), enter: ^LINSERT CARD.

Code	C/OPT Ver. 1.01	C/OPT Ver. 1.02A and up	CODE	Graphic
^A		Position on Line 1		
^B		Position on Line 2	^1	
^C		Position on Line 3		
^D		Position on Line 4		
^E		Position on Line 5		
^F		Position on Line 6	^2	
^G		Position on Line 7		
^H		Position on Line 8		
^I		Position on Line 9		
^J		Position on Line 10	^3	 Optical Card
^K		Position on Line 11		
^L		Position on Line 12		
^M	Invert Display	Position on Line 13	^4	 ChipKey
^N	Restore Display	Position on Line 14		
^O	N/A	Position on Line 15	^5	 Keypad Entry
^P	N/A	Invert Display		
^Q	N/A	Restore Display	^6	 Odometer Entry
^T	Insert Current Time			
^V	Sm. Sans-Serif Font ! # \$ % & () * + , - . / 0 1 2 3 4 5 6 7 8 9 : < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [\] ^ _ " ' ;		^7	 Pump Selection
^X	Lg. Sans-Serif Font Int. ! # \$ % & ¡ ú * + , - . / 0 1 2 3 4 5 6 7 8 9 : ñ = ö ? ü A B C D E F G H I J K L M N O P Q R S T U V W X Y Z ä ß ç i É Ê á ó		^8	 Transaction Receipt
^Y	Lg. Serif Font ! # \$ % & () * + , - . / 0 1 2 3 4 5 6 7 8 9 : < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [\] ^ _ " ' ;		^9	 Wait
^Z	Large Sans-Serif Font Std. ! # \$ % & () * + , - . / 0 1 2 3 4 5 6 7 8 9 : < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [\] ^ _ " ' ;		^:	
^0	Clear Display			

7.3.12 Graphic Display Examples



7.4 Keyboard Commands

The **FORMAT KEYBOARD #** command changes the response that the customer sees when pressing the [YES] and [NO] keys. The response up to eight characters. The actual function of the two keys cannot be changed.

The default response is the key's label - "YES" or "NO". To change the [NO] key's response, enter 1 when prompted for KEYBOARD NUMBER.

To change the [YES] key's response, enter 2 when prompted for a keyboard number. Enter a DOWNLOAD command to enable your changes.

7.5 Local Message Commands

7.5.1 Format Local Messages

This allows the site manager to put up a message on the C/OPT graphics screen. This message can also be printed on the receipt printer. Two local messages can be put in your FSC, one for each language.

Local message commands are also accessible through ["Network Commands" on page 48](#).

Control codes can be embedded in the text body to give the following display/print options as shown in the table below.

<i>CTRL Code</i>	<i>What Code Does in C/OPT Display</i>
^ V	Date in YY-MM-DD format.
^ W	Time in HH:MM format.
^ X	Three-character site code.
^ Y	Do NOT display this part of mes- sage, from first ^ Y to next ^Y.
^ Z	Do NOT print this part of message, from first ^ Z to next ^Z.

7.5.2 Show Local Messages

Shows the messages for both languages.



NOTE: The National Message is configured from the Command-Line using the **FORMAT NATIONAL** command. It can be displayed using the **SHOW NATIONAL** command.

Section 8 System Parameters

8.1 System

The **SHOW SYSTEM** or **PRINT SYSTEM** commands displays the following current system information (this is a read-only function; SET SYSTEM is not applicable):

- FSC Software Version - for example: 9.00a.
- Checksums - Results of an FSC program check.
- Display Type (["Graphic Display Overview" on page 31](#)):
- Date and Time - As set with System Times (["System Time and Date" on page 19](#)).
- System State - ON, OFF or RECEIPTS ONLY (["System ON/OFF Commands" on page 20](#)).
- Installed OPTs - as set with System Devices (["System Devices" on page 21](#)).
- Status of each C/OPT - RUNNING or DOWN
- Number of receipts issued to date per C/OPT
- Receipt Printer Errors - paper jams, outs, etc.
- Installed PCTs - as set with System Devices (["PCT \(PCM\) Commands" on page 22](#)).
- Installed Positions - as set with System Devices (["PCT Position Commands" on page 23](#)).
- Pump Sentry Alarm - a position number in parentheses shows a pump automatically put out of service by the system.
- Low Tanks - Tanks that are below their programmed low levels.
- Power Failures - Dates and times of the last four power failures.
- Battery Condition - The condition of the backup battery in the FSC.

8.2 Site ID



NOTE: If you are upgrading an existing System2 FSC to a FSC3000, enter the same Site Name and 3-digit Host Site Code to match what is currently programmed in the System2.

If you are installing a new site, contact Suncor for Site Code information.

Use the **SET SITE** command to enter a 12-character code to give a site a unique name. The system defaults a site "name" of "XXXXXXXXXXXX". This code can be printed on receipts, and is used during backup and restore operations with an external computer.

Your site ID must be EXACTLY 12 characters long. It can contain spaces, though the first character cannot be a space.

After being prompted for the 12 character site name, you will be prompted for a 3-character Host Site Code. This MUST be configured before trying to process cards.

8.3 Fuel Types

Fuel units (gallons, litres, etc), prices, and names can be set for up to 99 different products. Each product is assigned a code number, which is assigned during PCT configuration. Fueltype data can be assigned individually to each pump or hose.

To see the default fueltypes, issue the SHOW FULETYPES command. The screen below comes into view.

To continue, push the RETURN (ENTER) key as prompted.

To change a fuel type:

```
P>set fueltype 1

-----
| # | Name (Lang 1)      | Name (Lang 2)      | U | Price | Host |
|---|-----|-----|---|-----|-----|
| 1 | SUPER UNLEADED    | SUPER SANS PLOMB  | L | 0.000 | 01 |
|---|-----|-----|---|-----|-----|
1:  SUPER UNLEADED          --PRICE PER LITRE:0.000
   SUPER SANS PLOMB

Fueling Unit codes:
  1: LITRE
  2: LITRE
  3: ENTRY
Enter Fueling Unit code (1-3): 1
Change price (Y/N)? y
  Enter price per LITRE: 2.459
Change product name (Y/N)? y
  Enter Fueltype 1
  Language 1: SUPER UNLEADED
  Language 2: SUPER SANS PLOMB
Change host product code (Y/N)? y
  Enter host product code: 01
```

Issue the **SET FUELTYPE #** command, where '#' is the code number (1-99). The first prompt is:

ENTER FUELING UNIT CODE (1-3): (See below for more information on Fueling Units).

The next prompt is:

CHANGE PRICE (Y/N)? To keep the price the same, push ENTER. If you want to change price per unit, enter (Y) to show the next prompt.

ENTER PRICE PER X (where X is the unit selected above). Price can be specified to a tenth of a cent; (for example, '\$1.059'). Push ENTER to go to the next prompt.

CHANGE PRODUCT NAME (Y/N)? To keep the name the same, push ENTER. To change it, push (Y) to display the next prompt. If your system has been set up for dual language (See ["Language" on the next page](#)), type the fueltype names for both languages.

Push ENTER to complete the process for that fueltype. Repeat this procedure for more fueltypes as necessary.

8.4 Fueling Units

Three different unit-of-measure labels can be connected to product types (previous section). All are simply labels - no conversion is done.

The default labels, and their "Fueling Unit Codes", are:

(1) litre (2) liter (3) quart

The numbers 1, 2, or 3 are entered in the FUELING UNIT CODES prompt during a SET FUELTYPES procedure ("[Fuel Types](#)" on the previous page). To change the default labels, enter SET FUELING UNITS. You are prompted for each of the three labels (to keep one the same, just push ENTER. Maximum length of each label is 10 characters.

ENTER FUELING UNIT 1:

ENTER FUELING UNIT 2:

ENTER FUELING UNIT 3:

8.5 Passwords

There are three (3) modes of operation for the SUNCOR FSC3000:

- Normal
- Privileged
- Remote

Some applications also use a "remote" password.



NOTE: The factory-set Privileged password is HELLO. The factory-set modem password for Petro Canada is SERVIC.

- Normal - Most SHOW and PRINT commands can be executed in Normal mode. The screen prompt is >. The normal mode is the default mode. This mode does not have to be enabled. No password is required. In this mode, you can print and display all system, card and transaction data.
- Privileged - Most SET or FORMAT commands require privileged access. The screen prompt is P>Enable and disable Privileged mode with SET PASSWORD. To configure the FSC, the system must be in the privileged mode. See "[System Access](#)" on page 18.
- Remote - The initial password required when accessing via modem or TCP/IP connections.



NOTE: Passwords do not have to be changed for The FSC to operate. SET PASSWORD is also used to change the Remote pass-word if necessary.

To change any or all passwords:

1. Enter SET PASSWORD. The system prompts you first for the Privileged-mode password.
2. Enter up to six characters for the main password (or push ENTER- ENTER to retain the old password). Entries are NOT case-sensitive. The system will then prompt you for a Modem password.
3. Enter a new Modem password, or push ENTER to retain the old pass- word and move to the next prompt.
4. Enter Privileged Mode Time-Out Period: type number of minutes and push ENTER.

8.6 Language

This feature allows the FSC to be "bi-lingual" to a certain degree - to display or print in two languages.

Use SET LANGUAGE to turn the Dual Language ON or OFF. A Language Type is programmed into each card record. When the card is read, the C/ OPT display language changes to the programmed language. Receipts also print out in the specified language.



NOTE: Any prompt displayed BEFORE a card or key is inserted into the C/OPT should NOT be defined for a second language.

8.7 Echo

During programming, the FSC sends back (echoes) every character it receives from the terminal if echo is enabled. Echo must be ON in order for you to see the characters as you type them into the terminal.

Echo is typically disabled with the SET ECHO command only when interfacing to an external computer.

8.8 Version

The SHOW or PRINT VERSION command displays the current software version (for example, 22.01B). This information is also included in the Show System display.

This is a read-only function: there is no SET VERSION command.

```
P>set host
Enter Primary HOST IP Address
(format ###.###.###.###): 10.35.7.41
Enter Primary HOST Port #
(format ###): 80

PROGRAM 'HOST DOWN' MODE (Y/N)? y
ENTER HOST AUTHORIZATION TIME-OUT: (secs): 15
MAX QUANTITY IF 'HOST DOWN' AUTH ALLOWED: 500
PROGRAM TRANSACTION CAPTURE OPTION (Y/N)? y
SEND TRANSACTIONS TO HOST (Y/N)? y

HOST SERIAL PORT: NOT Active_yet
Primary IP Address: 10.35.7.41
Primary IP Port: 80

HOST Authorization Time-Out (secs): 15
MAX quantity if "HOST DOWN" auths allowed: 500
Send transactions to host
LAST POLL DATE & TIME: JAN 01,2010 12:00 AM
CIRCUIT TEST: JAN 01,2010 12:00 AM NO TEST
No NATIONAL message
P>show host

HOST SERIAL PORT: NOT Active_yet
Primary IP Address: 10.35.7.41
Primary IP Port: 80

HOST Authorization Time-Out (secs): 15
MAX quantity if "HOST DOWN" auths allowed: 500
Send transactions to host
LAST POLL DATE & TIME: JAN 01,2010 12:00 AM
CIRCUIT TEST: JAN 01,2010 12:00 AM NO TEST
No NATIONAL message
SHOW HOST ERROR MESSAGES (Y/N)? y
** NONE **
P>
```

```
P> SET HOST
Enter Primary HOST IP Address
(format ###.###.###.###):
Enter Primary HOST Port #
(format ###):
PROGRAM 'HOST DOWN' MODE (Y/N): Y
ENTER HOST AUTHORIZATION TIMEOUT: (SEC) 15
MAX QUANTITY IF 'HOST DOWN' AUTH ALLOWED: 500
PROGRAM TRANSACTION CAPTURE OPTION (Y/N)? y
SEND TRANSACTIONS TO HOST (Y/N): y
```

```

P> SHOW HOST

HOST SERIAL PORT:
Primary IP Address: ###.###.###.###
Primary IP Port: ####

HOST AUTHORIZATION TIMEOUT (SECS): 15
MAX QUANTITY IF HOST DOWN AUTHS ALLOWED: 500
SEND TRANSACTIONS TO HOST
LATE POLL DATE & TIME: OCT 20 2000 12:00 AM
CIRCUIT TEST: AUG 15 2000 9:04 AM NO TEST
NO NATIONAL MESSAGE
P>

```

If the host does not respond in the programmed period of time, you can set the system to fuel anyway, up to the pre-programmed MQF.

Use SHOW HOST to display the programmed parameters. It also displays the National Message if configured. This message can be entered using the "FORMAT NATIONAL" command. See the NOTE under "[Show Local Messages](#)" on page 37 for more information.

SET IP: Use this command to configure if remote access to the FSC is through a DHCP provided IP or a user configured STATIC IP.

If DHCP setup is used (this is default), the Port used to connect to the FSC always defaults to "10001."

8.9 GST (General Sales Tax)



NOTE: These commands can only be issued in Command Line mode. They do not appear in any menu.

The GST commands are privileged commands, used to define or view the rate for the general sales tax in percent, AND view or change the tax number.

```

P>show gst
GST = 6.542%
GST NUMBER: 104168083

P>set gst
CHANGE GST VALUE (Y/N)? y
--ENTER GST VALUE (#.###)%: 6.543
CHANGE GST NUMBER (Y/N)? y
--ENTER GST NUMBER: 104168083
GST = 6.543%
GST NUMBER: 104168083

```

Section 9 Transaction Data

9.1 Show or Print Summary by Transaction, Date, Time, Card, or Vehicle

The **SHOW/PRINT TRANS [date time card account vehicle] SUMMARY** command displays the product and pump totals.

```
P>SHOW TRANS SUMMARY
-Allow wrap around
-Save unauthz'd users also
-Transaction buffer Size: 500
-NEXT TRANSACTION NUMBER: 1

*** PRODUCT TOTALS ***
UNLEADED : 46.080 GALLON TOT: $46.08
PREMIUM : 35.840 GALLON TOT: $35.84
REGULAR : 34.900 GALLON TOT: $34.90
TRANSACTIONS: 9      GRAND TOTAL: $116.82
AVERAGE: $12.98

*** PUMP TOTALS ***

QUANTITIES FOR PCT 1:
POS 1: 1  POS 2: 2  POS 3: 3  POS 4: X  POS
-----
 46.080   35.840   34.900   0.000
TRANSACTIONS: 9      GRAND TOTAL: 116.82
AVERAGE: 12.980

P>
```

The **SHOW/PRINT TRANS#** command is quick method of displaying transaction data. You are prompted only for the transaction number.

9.2 Set Transaction

The **SET TRANS** command specifies how the transaction buffer is to be configured. The first prompt is:

```
SET WRAP AROUND OPTIONS (Y/N)?
```

If wraparound is enabled, and the transaction buffer is full, the FSC overwrites (erases) the older transactions when new transactions are received.

When wraparound is disabled, transactions can not be overwritten; no fueling is allowed if the buffer is full. If you enter (Y), you will be prompted again:

```
ENABLE WRAP AROUND ?
```

Push (Y) to confirm.



IMPORTANT: Do not enable wraparound unless you are certain that transaction data will not be accidentally destroyed.

The next prompt is:

```
RE-DEFINE TRANSACTION ?
```

Enter (Y) to redefine transactions and display:

TRANS=UNAUTHZ'D USERS ALSO ?

If you enter (Y), the system processes an unauthorized attempt to use the system as a transaction and logs the event in the transaction buffer.

Entering (N) causes the system to ignore any unauthorized users and events; only cases where a pump was activated by the FSC are recorded.

The third SET TRANS prompt is:

SPECIFY DISPLAYED FIELDS ?

This lets you tell the system which fields to display when a SHOW TRANSACTION or PRINT TRANSACTION command is issued. Choose from the following fields:

- ACCOUNT, DRIVER, VEHICLE
- DATE & TIME?
- TRANS #?
- CARD #1?
- CARD #2?
- FUELTYPE?
- PUMP #?
- QUANTITY?
- PRICE?
- TOTAL?
- ODOMETER?
- DISTANCE PER UNIT?
- MISCELLANEOUS?
- RECEIPT STATUS?
- ACCOUNT #?

There must be at least one transaction recorded in your system in order to show all the selected data fields. The last SET TRANS option (displayed after the account number prompt) is:

COMPUTER FORMAT CHECK DATA IN HEADER ?

When transferring data to an external system in the computer format, an optional data check can be prefixed to the transaction header to provide greater data integrity. The data check includes: (1) the number of records and (2) the sum of the quantities for records.

Push (Y) to enable or (N) to disable the data check.

Section 10 System Totals

10.1 Showing or Printing Total Transactions by Date, Time, Card, or Vehicle

This version of SHOW TRANS or PRINT TRANS lets you print and show the completed transactions that stored in the FSC data base. This function is similar to the SHOW/PRINT TRANS command explained in ["Transaction Data" on page 43](#).

10.2 Showing or Printing Summary of Total Transactions by Date, Time, Card, or Vehicle

This command displays only product totals, without listing all the transactions. This function is very similar to the SHOW/PRINT TRANS SUM- MARY command in ["Transaction Data" on page 43](#).

10.3 Midnight Totals

The **MIDNIGHT** commands summarize totals for a day. The following data is logged in the FSC journal at 12:00 AM - midnight:

- Daily transaction totals for each POS position of each PCT
- Daily product totals
- Daily transaction records

On the Midnight screen, when a POS position is installed, the pump number is indicated next to the POS number. If one or more of the eight POS positions is not installed, the position is indicated with an 'X'.

Use **SHOW MIDNIGHT TOTALS** to display the data for any of the preceding eight days. When you enter the command, you are prompted to specify which day. For example,

```
1: JAN 27, 2000
2: JAN 28, 2000
3: JAN 29, 2000
4: JAN 30, 2000
5: JAN 31, 2000
6: FEB 1, 2000
7: FEB 2, 2000
8: FEB 3, 2000 -- ACTIVE
```

ENTER CHOICE:

Enter [1] -[8] to select the day, or ENTER to exit.

The current date is the 'ACTIVE' date. Note that the data are stored in a "wrap-around" buffer. This means that as new data are recorded, old data are erased. In the above list, when data for February 4 is recorded, data for January 27 will no longer be available for display.

10.4 Day Totals

The **SHOW DAY** or **PRINT DAY** commands display or print the following information for the specified day:

- Amount of each product dispensed
- Number of transactions
- Grand total of product dispensed
- Total dollar amount
- Dollar value of average transaction for the specified day.

Section 11 Journal Printer

Set, Show or Print Journal Printer Configuration

Connect your journal printer to the PRINTER port on the back of the FSC (RS-232 port #3) to make a hard copy of all transaction data, providing added protection against data loss. See ["Connections" on page 13](#) for more information on how to changeover your connections from a System2 Fuel Site controller to an FSC3000 Fuel Site Controller.

The printer records the transaction, pump and product numbers, the date and time, the first card number, the product quantity and dollar total.

The **SHOW JOURNAL** and **PRINT JOURNAL** commands display current printer configuration.

Use the privileged **SET JOURNAL** command to specify the system will operate with an external printer. If so, you can also specify which of the following items will be printed:

- Driver or Vehicle names. Odometer entry. Miscellaneous entry.
- Second card if used.

The Petro Canada version prompt sequence goes as follows (answering [Y] to all prompts):

```
OFFICE JOURNAL (Y/N) Y
JOURNAL ERROR OPTION (Y/N)
-- ENABLE AUTH ON JOURNAL ERROR (Y/N)
```

The JOURNAL ERROR OPTION specifies if the system should authorize fueling when the printer is not operating. The printer may “block” if an error, such as a paper outage, occurs. After fixing the error, unblock the communication with the SET PRINTER command.

11.1 Lock Printer

The **LOCK PRINTER** command lets you turn OFF the logging function for the printer, useful for when multiple PRINT commands are executed.

If you want to print several items (for example, several types of transaction data) you can keep the printouts together by issuing the LOCK PRINTER command. No “incoming” items will be printed until you turn OFF the LOCK.

11.2 Unlock Printer

The **UNLOCK PRINTER** command returns the printer to its normal logging function. Any transactions that were locked out are printed when the printer is unlocked. If no command is generated for 10 minutes while the printer is locked, the system exits the privileged mode and unlocks the printer.

Section 12 Network Commands

12.1 Host Commands



NOTE: Before you configure host parameters, contact Suncor or Petro-Canada for "Outbound/Inbound" IP's and Port Information.

12.1.1 Set Host

Use the **SET HOST** command to configure different setting related to host processing. The first setup prompt allows you to define the IP address that the FSC will connect to process cards. The second prompt asks for the IP Port # that will be used as part of the connection. This command also defines a timeout period and a Maximum Quantity to Fuel (MQF) if authorization fails to come in from the host computer. If the host does not respond in the programmed period of time, you can set the system to fuel anyway, up to the pre-programmed MQF.

12.1.2 Show Host

The **SHOW HOST** command shows programmed parameters. It also displays the National Message which was configured separately from the command line using the **FORMAT NATIONAL** command.

12.1.3 Set/Show IP

To set Static IP:

```
P>SET IP
Disable DHCP and set Static IP for CAP LAN Port (Y/N)? y

Enter CAP IP Address:
(format "###.###.###.###"): 192.168.123.6

Enter CAP IP Port# (format "####"): 7777

DHCP Disabled

CAP IP Static Address: 192.168.123.6
CAP IP PORT: 7777

Reconfiguring LAN Port..... Configured
P>SH IP

DHCP Disabled

CAP IP Static Address: 192.168.123.6
CAP IP PORT: 7777

P>
```

To enable DHCP:

```
P>SET IP

Enable CAP LAN Port for DHCP IP assignment (Y/N)? y

DHCP Enabled
```

```

Reconfiguring LAN Port..... Configured
P>
P>SH IP

    DHCP Enabled
P>

```

12.1.4 ISO Commands

ISO Table Layout

The Process Type, Card Type, and Prompt Strings are supplied by Petro Canada.

12.1.5 Show ISO

Displays the 20 entries in the ISO table.

```
P>show iso
```

```

C - Card Number      # - don't care digit
I - ISO #            X - don't care digit or field separator
M - Month            = - must be field separator
Y - Year             0-9 - must be specified digit
O - Odom Entry       L - Language flag
m - Misc Entry       > - don't check length to the end

ISO #1:      PETRO CAN      Card Type: 35   Process Type: P
Format:      IIIIIICCCCCCCCCC=YMML350##m#####
ISO Range:   7069-7069
Prompt String: /P12N4
ALPHA Entries NOT REQUIRED at FIT
HOST Down Auths ALLOWED
  Offline Prompt String: NONE
  Max Quantity Allowed When Host Down: 1
  Products Allowed When Host Down (1-16): YYYYYYYYYYYYYYYY
ALLOW Track1 if BAD Read on Track2

ISO #2:      BVD T-CHEK    Card Type: 90   Process Type: C
Format:      IIIIIICCCCCCCCCC=YMM>
ISO Range:   600296-600296
Prompt String: /P14C1
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

ISO #3:      COMDATA      Card Type: 91   Process Type: C
Format:      IIIIIICCCCCCCCCC=>
ISO Range:   560017-560017
Prompt String: /P03C06
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

ISO #4:      COMDATA MC   Card Type: 92   Process Type: C
Format:      IIIIIICCCCCCCCCC=>
ISO Range:   556735-556736
Prompt String: /P03C06
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

```

```

ISO #5:      EFS 708      Card Type: 93   Process Type: C
Format:      IIIIIICCCCCCCCCCCC=>
ISO Range:   708305-708305
Prompt String: /P14C01
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

ISO #6:      EFS 707      Card Type: 94   Process Type: C
Format:      IIIIIICCCCCCCCCCCC=>
ISO Range:   707152-707152
Prompt String: /P14C01
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

ISO #7:      FLEET ONE   Card Type: 95   Process Type: C
Format:      IIIIIICCCCCCCCCCCC=>
ISO Range:   501486-501486
Prompt String: NONE
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

ISO #8:      WEX         Card Type: 96   Process Type: C
Format:      IIIIIICCCCCCCCCCCC=>
ISO Range:   690046-690046
Prompt String: NONE
ALPHA Entries REQUIRED at FIT
HOST Down Auths NOT ALLOWED
DO NOT allow Track1 Reads

ISO #9:      INVALID
ISO #10:     INVALID
ISO #11:     INVALID
ISO #12:     INVALID
ISO #13:     INVALID
ISO #14:     INVALID
ISO #15:     INVALID
ISO #16:     INVALID
ISO #17:     INVALID
ISO #18:     INVALID
ISO #19:     INVALID
ISO #20:     INVALID

```

12.1.6 Set ISO

This command indicates the card layout for a card number with a particular ISO #, in this example, ISO #1.

```
P> SET ISO
```

- Format legend and first table entry appears. See ISO Table Layout under ["ISO Commands" on the previous page](#). The SET ISO prompting is as follows:

```

ISO #1:      PETRO CAN      Card Type: 35      Process Type: P
Format:      IIIICCCCCCCCCCCCC=YYMML35O##m#####
ISO Range: 7069-7069
Prompt String: /P12N4
ALPHA Entries NOT REQUIRED at FIT
HOST Down Auths ALLOWED
  Offline Prompt String: NONE
  Max Quantity Allowed When Host Down: 1
  Products Allowed When Host Down (1-16): YYYYYYYYYYYYYYYY
ALLOW Track1 if BAD Read on Track2

--Modify this ISO (Y/N/X)? y

Enter CARD name: PETRO CAN
Enter CARD type code: 35
Enter Process type: P
Enter ISO Card format: IIIICCCCCCCCCCCCC=YYMML35O##m#####
Enter ISO # Range (Minimim value): 7069
Enter ISO # Range (Maximim value): 7069
Enter Prompt String: /P12N4
Does this ISO require ALPHA entries at FIT (Y/N)? N
Allow 'HOST DOWN' Authorizations (Y/N)? y
  Enter Offline Prompt String:
  Delete (Y/N)? N
  Enter Max Quantity allowed to fuel when host is down (1-99999):
100
  Specify valid products (1 thru 16) when host is down (Format
'YNNYN...'):
  ->YYYYNNYYYYNNNNYY
  Allow Track1 if BAD Read on Track2 (Y/N)? N
  ---VALID (Y/N)? y

```

12.2 Debugging Commands

12.2.1 Show/Print/Set Debug

Use the Show/Print/Set Debug commands to debug the host port on the FSC, and display the last poll date and time along with TEST CIRCUIT results. SHOW DEBUG displays the last poll date and time for the circuit test results.

12.2.2 Test Circuit

Use to confirm that communication packets make it to the host computer and back.

12.2.3 Monitor Host

This command displays the incoming and outgoing communication via the FSC TERMINAL port. TEST CIRCUIT and MONITOR HOST can also be used together.

12.3 Local Message Commands

12.3.1 Format Local Message

The FORMAT LOCAL MESSAGE command lets you create a message for displaying on the C/OPT graphics screen. This message can also be printed onto the receipt printer. Two local messages can be stored in the FSC, one for each language.

12.3.2 Show Local Message

Shows the messages for both languages. These commands are also available through ["Customer Messages" on page 26](#).

Appendix A - Memory Management

The SIMM card on the FSC3000 main board contains flash memory. This is where the firmware application is stored. The SIMM card also contains the battery-backed static RAM that holds the system configuration data, positive card file and transaction backup.

The firmware application controls the information that is written to and stored in the static RAM. Different versions of firmware can have different maps of where some data is stored in the static RAM. The version number and revision code show if the map has changed. If the map has changed, the system will automatically do a “Cold Start” the first time the new version executes. A Cold Start initializes all parameters back to their default values. It also erases the positive card file and all stored transactions.

If the memory map does not change, the system will do a “Warm Start” (it will use the stored data as-is). A Warm Start also occurs every time the system reboots after a power failure.

FSC3000 firmware numbering:

The initial Suncor FSC3000 version is 9.01A where:

9	Identifies the main branch of code (9=Suncor)
01	Identifies the memory map level – When this number changes, a Cold Start is necessary because variables have changed locations in memory
A	Identifies the revision of the firmware that uses the current map level. When this letter changes, no Cold Start is required

Download New Firmware into the FSC3000

ARTWare is the tool used to download the firmware application to the SIMM card. (For more information about ARTWare, see the M3034 ARTWare Reference Guide.)

Before you download a new firmware version, it is recommended to:

- Backup the system configuration data with the ARTWare utility.
- Backup the local card file using Phoenix SQL (if applicable).
- Make sure transactions have been polled by Phoenix or other polling program.

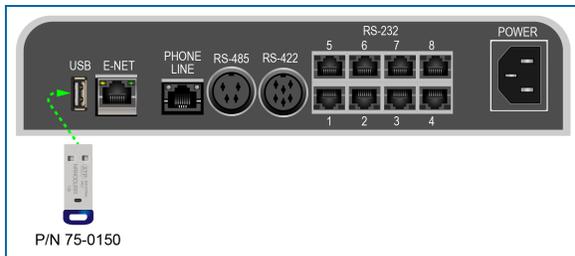
To download a new firmware version:

1. Save the .abs firmware file to an easy to find location (like the desktop).
2. Open the **ARTWare** utility.
3. If a database was made for this site before, click **File > Open Database** and select the applicable database in the *File Explorer* list that comes up.
4. Click **Connection** and select **Connect**. Enter your remote password (for remote connections) and click **Connect** in the prompt window.
5. Click **Online**,, select **Read > Site Settings** and select **Yes** at the warning prompt to update the database with current information.
6. Click **Online**, select **Upgrade** and browse to the location where you saved the .abs firmware file.
7. Select the correct .abs file in the *File Explorer* list and click **Open**.

8. Click **Start**. A progress window will open.
9. Wait for the application to upload. You will see the progress bar move. This can take several minutes.
10. When the upload is complete, click **Done** to close the box.

After a successful upgrade, ARTWare will automatically disconnect and the FSC3000 will restart.

Appendix B - USB Memory Key Operation



A USB memory key can be inserted into the USB port on the FSC3000. The key can be used to store transaction data.

FSC3000 USB Key Setup

The FSC3000 must be set manually by using the **Set Journal** command. See "[Journal Printer](#)" on page 47 for more information.

After you answer Y (Yes) to the three prompts, the following USB prompt will come into view:

```
** USB KEY **  
Enter Phoenix Site ID (000 - 998): XXX
```

Enter the 3-character Host Site Code that was set up in "[Site ID](#)" on page 38.

USB Key Transaction Recording Operation

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

Removing a USB Key with Recorded Transactions



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

1. Press one of the function buttons on the FSC3000 until the **USB Key Inserted** message is displayed.
2. Press the function key one more time to display the message **Log All Transactions Now?**.
3. Press the **<No>** (Left) function button to select. The message **Remove Key?** is displayed.
4. Select **<Yes>** and wait while the system writes the end-of-file marker to the key. The message **Please Remove Key** will be displayed and three beeps will be heard.



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

Revisions

<i>Revision #</i>	<i>ECO</i>	<i>Effective</i>	<i>Software Version</i>	<i>Key Changes</i>
0	1752	6/12/2020	NA	Initial Release
1	1874	3/8/2021		Typo corrections, note to upload transactions before disconnect, clarification on # of PCMs and pump positions, note to access IP info from customer.
1.1	GD	3/5/2023		Update external hyperlinks and internal cross-references, style elements, table styles, brand elements.



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.

