MAINTENANCE MODE

Global Electronics Module (GEM)

DRESSER Wayne

Maintenance Mode
Global Electronics Module

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Introduction

This manual describes how to operate the maintenance mode of a dispenser equipped with the Global Electronics Module (GEM).

1.1 Technical Support

Refer service problems to tech support.

Table 1-1 Technical Support Office Locations and Phone Numbers

Office Location	Phone Number and Hours of Operation
Wayne Technical Support Austin, TX	1-800-926-3737 24 hours/ 7 days
Northeastern Regional Service Office Salisbury, MD	410-546-6849 8:30AM- 5:00PM EST
Southeastern Regional Service Office Atlanta, GA	404-955-7982 8:30AM- 5:00PM EST
Central Regional Service Office Chicago, IL	312-693-7400 8:30AM- 5:00PM CST
South Central Regional Service Office Houston, TX	713-987-5440 8:30AM- 5:00PM CST
Western Regional Service Office Cypress, CA	714-952-1137 8:30AM- 5:00PM PST

San Ramon Service Office San Ramon, CA	510-328-0400 8:30AM- 5:00PM PST
Baltimore Service Office Baltimore, MD	410-536-9300 8:30AM- 5:00PM PST
Caribbean and Latin-America Service Office Austin, TX	(Voice) 512-388-8624 (FAX) 12-388-8643
Mid-East and Africa Service Office United Kingdom	(Voice) +44-1635-874884 (FAX) +44-1635-876633
Far-East Service Office Singapore	(Voice) +65-734-4431 (FAX) +65-737-0219

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Maintenance Mode Overview

2.1 General Description

You will need to access the maintenance mode in order to program functions and/or view statistics. This section explains the two ways that you can enter the maintenance mode as well as the tasks you can perform while in the maintenance mode. The function and statistics data appear in the money, volume, and unit price display windows.

2.1.1 Accessing the Maintenance Mode

Access the Maintenance Mode through one of the following interfaces:

- Service Terminal Program (STP)
- Infrared Interface

2.1.2 Performing Tasks Through the Maintenance Mode

Perform the following GEM Operations through the Maintenance Mode:

- Configuration setup and statistics viewing
- Diagnostics
- Remote download and upload of configuration templates and program code

2.2 Service Terminal Program

Use a laptop computer to access dispenser functions, statistics, and diagnostics. This interface can also be used to download and upload templates and codes. The communication is through an RS232 link. Although you perform the programming through the pump display, a description of the various functions and statistics appear on the laptop display.

2.3 Infrared Interface

The infrared interface is similar to a television remote control. It has 16 buttons. Use the infrared interface to access dispenser functions and diagnostics. This interface uses only the pump display for user feedback. There is no additional display.

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Programming GEM

3.1 Introduction

This section discusses how to enter the maintenance mode and what functions are available for GEM programming.

3.2 Infrared Interface

The infrared device communicates with the GEM via an infrared link. Access the maintenance mode by pressing one of the following keys:

ENTER	Field service engineer entry using field engineer password
1	Station manager entry using station manager password
2	Operator entry using operator password
CLEAR	Weights and Measures entry using weights and measures password

The maintenance mode asks you for a password twice before allowing access to the maintenance mode functions and statistics. A 10 second time-out is built into the password entry code. When the word PASS 1 appears on the sale display, you have 10 seconds to start entering the password. The timer restarts after you press a key. When you finish entering the password and press **ENTER**, PASS 2 appears in the sale display window, prompting you to enter the password again.

3.3 Service Terminal Program

If you are a field service engineer, you can use a laptop computer to run the service terminal program (STP). To run the STP, perform the following steps:

1. Remove the dispenser bezel.
2. Connect the RS232 cable to the RS232 connector J5 located on the computer board.
3. Start the STP to put the dispenser into maintenance mode.

You must enter your password twice to access the maintenance mode functions and statistics. When PASS 1 appears on the sale display, enter the field service engineer password and press ENTER. When PASS 2 appears in the sale display window, enter the password again, then press ENTER.

3.4 Maintenance Mode Display

When you enter the maintenance mode, the unit price display windows show "F - - ", the money display window shows the software version number, and the volume display window shows the date of the software version. This is the start of the function programming mode. To edit or view specific functions, enter any function number using the number keys and press **ENTER**. The corresponding number appears in the money display window.

To enter the statistics viewing mode press either the **UP** or **DOWN** arrow when the unit price is displaying "F - - ". When you enter the statistics viewing mode, the unit price display window shows "S - - ", the money display window shows the current transaction count for side A, and the volume display window shows the current transaction count for side B. To view specific statistics, enter any statistic number using the number keys and press **ENTER**. The corresponding number shows in the money display window.

3.5 Maintenance Mode Exit

There are two ways that you can exit the maintenance mode:

- Exit and Save Changes
- Quick Exit

3.5.1 Exit and Save Changes

Use **Function 00 - Exit Function** to exit the maintenance mode and save changes. When you are in the function, Enter 3 for the sub function, then press **ENTER** twice. See Section 3.8.1, "F00 - Exit Function" for more information on the Exit Function. If you entered maintenance mode using the infrared interface, the maintenance mode becomes inactive. If you entered maintenance mode using the Service Terminal Program, the maintenance becomes idle, but will still be active until you deactivate the maintenance mode switch by removing the cable from the interface or terminate the Service Terminal Program.

3.5.2 Quick Exit

If you use a Quick Exit, you will lose changes you have made. To perform a Quick Exit, do the following:

- If you used the Service Terminal Program to enter the maintenance mode, deactivate the maintenance mode switch input by removing the cable from the RS232 interface or terminate the Service Terminal Program.
- If you used the Infrared Interface, press the **CLEAR** key until the unit price display windows shows "F - - " or "S - -". Then press **ENTER** three times. This causes the maintenance mode task to immediately terminate.

3.6 Function or Statistic Entry Level

You must access all function and statistic data through sublevels before you can view or write any data. The initial display shows dashes on the money display, the volume display is blank, and the unit price display shows the function or statistic number. The function or statistic number is preceded by an **F** or an **S**. Functionality for this screen is defined as follows:

CLEAR	Returns control to initial screen.
ENTER	Opens the first sublevel to which you have access.
UP	Advances to the next function or statistic.
DOWN	Returns to the previous function or statistic.
#	Ignored.
NEXT	Advances to the next function or statistic.
NUMBER (1-9)	Goes to function or statistic number entered. If the number is beyond the range of the available functions or statistics, the maximum function or statistic is used.

When you begin to enter numbers, the non-numeric keys have the following functionality:

CLEAR	Backspace key if there is numeric input, otherwise returns control to initial screen.
ENTER	Accepts any numeric input already entered, otherwise opens the first sublevel to which you have access.
UP	Ignored when numeric input has been entered, otherwise advances to next function or statistic.
DOWN	Ignored when numeric input has been entered, otherwise returns to previous function or statistic.
#	Ignored.
NEXT	Ignored when numeric input has been entered, otherwise advances to next function or statistic.

NOTE: If you press the CLEAR key before you enter numeric data, the system will not accept the numeric data, because it has returned to the initial screen.

3.7 Sub Entry Level

When you enter the sub entry level, the unit price display shows the function/statistic number in the two left-most digits and the sub level number in the two right-most digits separated with a decimal point. The **F** or **S** no longer appear. The following list shows functionality provided at this level. Not all functionality is available depending on user access.

CLEAR	Returns control to the function or statistic entry level screen.
ENTER	Returns control to the function or statistic entry level screen.
UP	Increases the value of the displayed parameter; value rolls over when the maximum value is reached.
DOWN	Decreases the value of the displayed parameter; value rolls over when the minimum value is reached.
#	Clears the money display and allows you to enter a new value for the given parameter. Out of range values are ignored.
NEXT	Advances to the next sub function or sub-statistic within the current function or statistic.

If you enter numeric data without first pressing the # key, the system goes to the sub function or sub-statistic of the corresponding number that you entered. If the number is beyond the range of available subfunctions or substatistics, the maximum sub function or sub-statistic is used.

When you begin to enter numbers (preceded by the # key or not), the non-numeric keys have the following functionality.

CLEAR	Backspace key if there is numeric input, otherwise returns control to initial screen.
ENTER	Accepts any numeric input already entered.
UP	Ignored when numeric input has been entered, otherwise returns control to the sub entry level.
DOWN	Ignored when numeric input has been entered, otherwise returns control to the sub entry level.
#	Ignored when numeric input has been entered, otherwise returns control to sub entry level.
NEXT	Ignored when numeric input has been entered, otherwise returns control to the sub entry level.

3.8 Function List

The template controls access to functions and subfunctions. The template contains an access level table that determines what functions each user has access to. Access levels are as follows:

- Read and Write
- Read only
- No access

3.8.1 F00 - Exit Function

Use this function to select one of three maintenance mode exits.

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Exit Option, 1 through 3

1 = Do not exit and do not save changes

2 = Exit, but do not save changes

3 = Exit and save changes

3.8.2 F01 - Filling Modes

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Filling Mode, 1 through 4

1 = Serial Mode, dispenser controlled by site controller via serial link

2 = Stand Alone Mode, dispenser not supervised by a site controller

3 = Serial W&M Mode, same as #1 but volume decimal point format forced to .xxx volume units

4 = Stand Alone W&M Mode, same as #2 but volume decimal point format forced to .xxx units

3.8.3 F02 - Clock Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Time in the format HH.MM

.01 Date in the format MM.DD

.02 Year in the format YY.YY

NOTE: System does not update automatically for Daylight Savings Time.

3.8.4 F03 - Set Side A Unit Prices

NOTE: These functions are not part of the template data.

Sub-function numbers are in the format:

.0N Set credit prices

.1N Set cash prices

N Logical nozzle number 1-8

3.8.5 F04 - Set Side B Unit Prices

NOTE: These functions are not part of the template data.

Sub-function numbers are in the format:

.0N Set credit prices

.1N Set cash prices

N Logical nozzle number 1-8

3.8.6 F05 - Set Side A Fueling Point Address

.00 Fueling Point Address, 0 through 98, where 0 = None Assigned

3.8.7 F06- Set Side B Fueling Point Address

.00 Fueling Point Address, 0 through 98, where 0 = None Assigned

3.8.8 F07 - Dispenser Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Maximum logical nozzle number for each side, 1-8

.01 Dispenser geometry, 1 = single sided, 2 = double sided

.02 Maximum blend error allowed, 1-5 (units of %)

.03 First check set for blending if liters, 2-200 (units of 1/10 Liters)

.04 First check set for blending if gallons, 5-50 (units of 1/10 Gallons)

.05 Variable product nozzle orientation

NOTE: For any physical nozzle that has more than 1 logical nozzle assigned to it (variable product), this function allows the user to set the orientation of the unit price displays and switches. For example, Unit Price Display 1 and Switch 1 are oriented from the left to the right on Side A and from the left to the right on Side B.

1 = Side A Left-Right and Side B Left-Right
2 = Side A Left-Right and Side B Right-Left
3 = Side A Right-Left and Side B Left-Right
4 = Side A Right-Left and Side B Right-Left

.06 Wayne Integrated Pulser (WIP) Type

1 = WIP MUX Board
2 = Phase 2 WIP

.07 Stop button configuration

1 = Stop Both Sides
2 = Stop Side

3.8.9 F08- Side A Dispenser Type Configuration Part #1

Sub-function numbers are in the format: '.XN' where X = the selected configuration parameters and N = the logical nozzle number 1-8 as follows:

.0N Physical nozzle number assignment, 0-8, 0 = None assigned

.1N Product type assignment, 1 = Non-blend, 2 = blend

.2N Unit Price display assignment, 0-8, 0 = None assigned

.3N Primary meter number assignment, 0-8, 0 = None assigned

.4N Secondary meter number assignment, 0-8, 0 = None assigned

.5N Primary valve number assignment 0-8, 0 = None assigned

.6N Primary valve type, 1-3

1 = On/Off
2 = Fast/Slow
3 = Proportional

.7N Secondary valve number assignment, 0-8, 0 = None assigned

.8N Secondary valve type, 1-3

.9N Third valve number assignment, 0-8, 0 = None assigned

3.8.10 F09 - Side B Dispenser Type Configuration Part #1

Sub-function numbers are in the format: '.XN' where X = the selected configuration parameters and N = the logical nozzle number 1-8 as follows:

.0N Physical nozzle number assignment, 0-8, 0 = None assigned

.1N Product type assignment, 1 = Non-blend, 2 = blend

.2N Unit Price display assignment, 0-8, 0 = None assigned

.3N Primary meter number assignment, 0-8, 0 = None assigned

.4N Secondary meter number assignment, 0-8, 0 = None assigned

.5N Primary valve number assignment 0-8, 0 = None assigned

.6N Primary valve type, 1-3

1 = On/Off
2 = Fast/Slow
3 = Proportional

.7N Secondary valve number assignment, 0-8, 0 = None assigned

.8N Secondary valve type, 1-3

.9N Third valve number assignment, 0-8, 0 = None assigned

3.8.11 F10 - Side A Dispenser type Configuration Part #2

Sub-function numbers are in the format: '.XN' where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Octane number assignment, 00-99, 00 = None assigned

.1N Product select button input number assignment, 0-8, 0 = None assigned

.2N Push-to-Start button input number assignment, 0-8, 0 = None assigned

.3N Vapor recovery system enabled, 1 = Yes, 2 = No

.4N Beep annunciator in a series of six beeps on physical nozzle lift, 1 = Yes, 2 = No

3.8.12 F11 - Side B Dispenser Type Configuration Part #2

Sub-function numbers are in the format: '.XN' where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Octane number assignment, 00-99, 00 = None assigned

.1N Product select button input number assignment, 0-8, 0 = None assigned

.2N Push-to-Start button input number assignment, 0-8, 0 = None assigned

.3N Vapor recovery system enabled, 1 = Yes, 2 = No

.4N Beep annunciator in a series of six beeps on physical nozzle lift, 1 = Yes, 2 = No

3.8.13 F12 - Side A Pump Assignments

Sub-function numbers are in the format: '.XN' where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Primary pump assignment, 0-8, 0 = None assigned

.1N Secondary pump assignment, 0-8, 0 = None assigned

3.8.14 F13 - Side B Pump Assignments

Sub-function numbers are in the format: '.XN' where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Primary pump assignment, 0-8, 0 = None assigned

.1N Secondary pump assignment, 0-8, 0 = None assigned

3.8.15 F14 - Dispenser Display Configuration (both sides)

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Number of unit price displays per side, 0-8, 0 = None supported

.01 Display mode after sale paid

1 = Money is actual, volume is actual, unit price is actual
2 = Money is zeros, volume is zeros, unit price is actual
3 = Money is zeros, volume is zeros, unit price is blanks
4 = Money and Volume actual, Unit Price blank

.02 Money display digits right of decimal point, 0-4

.03 Volume display digits right of decimal point, 0-4

.04 Unit Price display digits right of decimal point, 0-4

.05 Flash unit price display when selected after 8 - blanks - 0

1 = No Flash,
2 = Flash until flow
3 = flash always

.06 Suppress display of leading zeros in normal mode

1 = Yes
2 = No

.07 Totals and Totalizers Amount display digits right of the decimal point, 0-4

.08 Totals and Totalizers Volume display digits right of the decimal point, 0-4

3.8.16 F15 - Dispenser Annunciator Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Beep annunciator on any button push

1 = Yes
2 = No

.01 Beep annunciator on physical nozzle lift

1 = Yes
2 = No

.02 Repeat annunciator beep if physical nozzle out and Push-to-start (or grade select) NOT satisfied

1 = Yes
2 = No

.03 Beep annunciator once for each eights, blanks, and zeros

1 = Yes
2 = No

3.8.17 F16 - WIP Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Measurement mode

1 = Liters
2 = Gallons
3 = Imperial Gallons

.01 WIP reverse pulse hysteresis, 1-64

.02 Reverse pulse Limit (after hysteresis) on an "in use" WIP, 1-99

.03 Reverse pulse Limit (after hysteresis) on an idle/unused WIP 1-255

3.8.18 F17 - Dispenser Limits Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Maximum number of pulse errors on an "in use" WIP (in a transaction), 1-99

.01 Maximum number of pulse errors on an idle/unused WIP, 1-99

.02 Maximum number of display errors/filling, 0-99, where 0 = disabled

.03 Stop for "no flow" or "flow lost" time limit (0 - 1000 seconds)

.04 Maximum number of consecutive no flow events w/out error, 0-10, 0 = disabled

.05 Maximum number of flow lost events w/out error, 0-10, 0 = disabled

.06 Maximum number of unfinished fillings, 0-10, 0 = Feature disabled

.07 Maximum filling amount/filling, 1-6 digits

.08 Maximum volume amount/filling, 1-6 digits

3.8.19 F18 - Blend Ratio Configuration

Sub-function numbers are in the format: 'SN' where S = the Side number (1=A, 2=B) and N = the logical nozzle number 1-8.

SN. Blend ratio (the allowed range for data is 0-101 with 101 = Disabled.)

3.8.20 F19 - Volume Unit Specific Configuration

Sub-function numbers in the format '.VX' where V= volume unit selection (1= liters, 2=gallons) and X = the selected configuration parameters defined a follows.

.10 Suppressed volume @ start of filling, 1-9 cl.

.11 Maximum volume for selection of new product, 1-9 cl.

.12 Suppress overflow of preset limit, 0-99 cl.

.13 Preset/Prepay slow down volume delta. 5-399 cl.

.14 Forward pulse limit on idle/unused WIP. 1-99 cl.

.20 Suppressed volume @ start of filling, 1-99 (units of 1/1000 Gallons)

.21 Maximum volume for selection of new product, 1-99 (units of 1/1000 Gallons)

.22 Suppress overflow of preset limit, 0-99 (units of 1/1000 Gallons)

.23 Preset/Prepay slow down volume delta. 2-999 (units of 1/1000 Gallons)

.24 Forward pulse limit on idle/unused WIP. 1-999 (units of 1/1000 Gallons)

3.8.21 F20 - Dispenser Serial Link Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Protocol

0 = Off link
1 = RS-485 DART
2 = RS485 Standard DART
3 = LON
4 = US current loop
5 = Ljungman current loop
6 = Ferranti

NOTE: "4 = US current loop" is the only protocol currently supported.

.01 Baud rate

1 = 4800
2 = 9600
3 = 19200
4 = 38400

.02 Reserved

.03 Reserved

.04 Reserved

3.8.22 F21 - Miscellaneous Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Pump Motor ON configuration

1 = ON at end of display test
2 = ON at start of display test
3 = ON at product selection

.01 Lock on filling mode configuration

1 = Access to filling mode configuration restricted
2 = Access allowed.

.02 Standalone indication enabled (show four digits right of decimal point)

1 = Yes
2 = No

.03 Blank or dash unselected unit price displays on product selection

1 = Blank
2 = Dash

.04 Product change allowed after fuelling started

1 = product change allowed after fuelling started
2 = product change not allowed after fuelling started

.05 Electro-mechanical totalizer configuration

1 = Each side has it's own electro-mechanical totalizers per meter
2 = One electro-mechanical totalizer per meter shared by both sides

3.8.23 F22 - Sales Amount Calculation

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Denomination ratio between Money display and Unit Price display

1 = 1/1
2 = 10/1
3 = 100/1
4 = 1/10
5 = 1/100

.01 Count by ones or fives in least significant digit of Money display

1 = Ones
2 = Fives

.02 Volume digits to the right of the decimal point used in amount calculation 0-5, where 5 = use volume decimal point as defined in function 18.5

.03 Money preset configuration. As the unit price increases, the system reaches a point when certain preset money amounts cannot be set due to the resolution of the metering system and/or the configured resolution of the volume used for the money calculation. Program this sub-function to give the desired result when this occurs.

0 = Calculate the closest volume from the money and the unit price and show the actual money amount at the end of the sale.

1 = Calculate the closest volume from the money and the unit price but show the preset money amount at the end of sale as long as the sale hasn't reached the maximum overrun volume.

2 = Calculate a volume amount that will ensure a money amount that is greater than or equal to the preset amount and show the preset money amount at the end of the sale as long as the sale hasn't reach the maximum overrun volume.

3.8.24 F23 - Miscellaneous Timers

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Display test time (total test time - also known as valve on delay), 2-24 (units of 1/2 Sec)

.01 Minimum time between fillings, 0-20 (units of 1/2 Sec), where 0 = disabled

.02 Stop for offline error, 0-30 (seconds), where 0 = disabled

.03 Maximum time allowed for filling, 0-60 (minutes), where 0 = disabled

.04 Time from unit price change until next start of sale, 0-15 (seconds)

3.8.25 F24 - Local Preset Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Operation Mode

1 = Money amount only entry
2 = Volume amount only entry
3 = Default to money, toggle by button
4 = Default to volume, toggle by button

.01 Preset entry required before filling start

1 = Yes
2 = No

.02 FILL mode display

1 = Show dashes during filling
2 = Show 'FILL' during filling

.03 Preset entry time-out, 0-60 (units of seconds)

.04 Soft key #1 function configuration, 0-9

0 = Disabled
1 = Select Money Pre-set
2 = Select Volume Pre-set
3 = Toggle between Money or Volume Pre-set
4 = Select FILL Mode
5 = Select Pre-set Value #1
6 = Select Pre-set Value #2
7 = Select Pre-set Value #3
8 = Clear Key
9 = Enter Key

.05 Soft key #2 function configuration, 0-9 (See .04 for definitions of configuration items.)

.06 Soft key #3 function configuration, 0-9 (See .04 for definitions of configuration items.)

.07 Soft key #4 function configuration,.0-9 (See .04 for definitions of configuration items.)

.08 First digit entry point for money preset, 1-6

.09 First digit entry point for volume preset, 1-6

3.8.26 F25 - Local Preset By Button Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 Preset button #1 operation mode

1 = Money
2 = Volume

.01 Preset button #2 operation mode

1 = Money
2 = Volume

.02 Preset button #3 operation mode

1 = Money
2 = Volume

.03 Preset button #1 money/volume limit, 0-999999

.04 Preset button #2 money/volume limit, 0-999999

.05 Preset button #3 money/volume limit, 0-999999

3.8.27 F26 - VAP Configuration

Sub-function numbers are in the format '.0X' where X = the selected configuration parameters defined as follows:

.00 ORVR control

1 = Enabled
2 = Disabled

3.8.28 F27 - Side A Dispenser Configuration

.00 Button input for Local Authorize function, 0-8, where 0 = not supported

3.8.29 F28 - Side B Dispenser Configuration

.00 Button input for Local Authorize function, 0-8, where 0 = not supported

3.8.30 F29 - Side A Liter Flow Rate Configuration

.0N Maximum slow flow rate, 3-50 (units of 1/10 Liters/min.)

.1N Minimum slow flow rate, 0-50 (units of 1/10 Liters/min.), 0 = no minimum

.2N Maximum fast flow rate, 10-180 (units of Liters/min.)

.3N Minimum fast flow rate, 0-180 (units of Liters/min.), 0 = no minimum

N Logical nozzle

3.8.31 F30 - Side B Liter Flow Rate Configuration

.0N Maximum slow flow rate, 3-50 (units of 1/10 Liters/min.)

.1N Minimum slow flow rate, 0-50 (units of 1/10 Liters/min.), 0 = no minimum

.2N Maximum fast flow rate, 10-180 (units of Liters/min.)

.3N Minimum fast flow rate, 0-180 (units of Liters/min.), 0 = no minimum

N Logical nozzle

3.8.32 F31 - Side A Gallon Flow Rate Configuration

.0N Maximum slow flow rate, 1-10 (units of 1/10 Gallons/min.)

.1N Minimum slow flow rate, 0-10 (units of 1/10 Gallons/min.), 0 = no minimum

.2N Maximum fast flow rate, 3-48 (units of Gallons/min.)

.3N Minimum fast flow rate, 03-48 (units of Gallons/min.), 0 = no minimum

N Logical nozzle

3.8.33 F32 - Side B Gallon Flow Rate Configuration

.0N Maximum slow flow rate, 1-10 (units of 1/10 Gallons/min.)

.1N Minimum slow flow rate, 0-10 (units of 1/10 Gallons/min.), 0 = no minimum

.2N Maximum fast flow rate, 3-48 (units of Gallons/min.)

.3N Minimum fast flow rate, 03-48 (units of Gallons/min.), 0 = no minimum

N Logical nozzle

3.8.34 F33 - Password Change

Dashes appear in the money display window, and the word PASS appears on the volume display. When you begin editing, the money display goes blank and dashes appear instead of the regular entries. Enter the new password twice. The sub-function numbers are defined as follows:

.00 Service Engineer Password, maximum of 6 characters (Use numbers only)

.01 Station Manager Password, maximum of 6 characters (Use numbers only)

.02 Station Operator Password, maximum of 6 characters (Use numbers only)

.03 Weights and Measures Password, maximum of 6 characters (Use numbers only)

3.8.35 F34 - Diagnostics

These functions provide a way to test various parts of the hardware, including all switches, displays, beeper and Vapor recovery. Other motors and valves are not available for security and safely reasons. When a test is invoked, press **CLEAR** or **ENTER** to end the test.

.01 **Switch test.** The money display shows 4 dashes until a switch is activated. A description of the activated switch and side (1 or 2) is displayed on the money display. For example, nozzle switch 3 on side 2 is displayed as 2n3 as long as the switch is depressed (n=nozzle, S=Stop switch, b = bitbus, P = preset). When the nozzle is deactivated the display reverts to dashes.

.02 **Display test.** A "walking segment" test is performed in which each segment of the display is turned on and off. Each digit of the display is tested at the same time.

.03 **Vapor Recovery** subsystem test, Side A

.04 **Vapor Recovery** subsystem test, Side B

These subfunctions simulate a flow rate to the vapor recovery system, which turns on the recovery motor accordingly. At least one nozzle on the specified side must have WayneVac enabled for the motor to turn on. The volume display shows the simulated flowrate. The money display shows actual RPM as measured by GEM. The **UP** key increases the simulated flowrate. The **DOWN** key decreases the flowrate.

Simulated flow rates:

Off
Low (7.0 GPM)
Medium (8.5 GPM)
High (10.0 GPM)

3.8.36 F96 - Upload Flash Memory Programming

This function requires the service terminal, *NOT* the remote control.

This function has no subfunctions. Press **ENTER** to transmit the FLASH program data. The service terminal program requests a filename to upload the data to. Select the file to begin the program upload.

When the FLASH program upload finishes, the GEM goes back to function entry mode where you may access other functions.

3.8.37 F97 - Upload Dispenser Configuration Templates

This function requires the service terminal, *NOT* the remote control.

This function has no subfunctions. Press **ENTER** to transmit the FLASH template data. The service terminal program requests a filename to upload the data to. Select the file to begin the template upload.

When the FLASH template upload is complete, the GEM will go back to function entry mode where you can access other functions.

3.8.38 F98 - Download Flash Memory Programming

This function requires the service terminal, *NOT* the remote control.

This function has no subfunctions. Complete the following steps to use the service terminal:

1. Enter PASS 1.
2. Enter PASS 2.
3. Enter Function.
4. Enter Verification Code.
5. Select the file.

The service terminal program requests a filename to download. You can browse various directories for the desired file. Select the correct file to start the program download. If you cannot find the file or if the there is a bad CRC, the download aborts.

It is important that you do not interrupt the download for any reason. If this happens, you will have to load the FLASH via bootstrap mode. See Appendix B, "Miscellaneous GEM Functions" for a description of bootstrap mode.

When the download is complete, the software executes a warm start which is just like a power cycle. If the laptop is still connected and the laptop program is still running, the GEM will re-enter maintenance mode prompting for the passwords to be entered. At this point you can terminate the laptop program and disconnect the laptop.

The FLASH memory programming that is being downloaded contains a default template. If the template that is currently in the FLASH is compatible with the new version of program code, the template data is preserved. If the template data that is currently in the flash is not compatible with the new version of program code, the template data will be overwritten with the default template.

3.8.39 F99 - Download dispenser Configuration Template

This function has no subfunctions. Press **ENTER** to download a verification code and display the word PASS. Enter 42 for the verification code. The program on the laptop requests a filename to download. You can browse various directories for the desired file. Select the correct file to start the program download. If you cannot find the file or if the there is a bad CRC, the download aborts.

If the template download is interrupted, restart the service terminal and reload the template.

When the download is complete, the software executes a warm start which is just like a power cycle. If the laptop is still connected and the laptop program is still running, the GEM will re-enter maintenance mode prompting for the passwords to be entered. At this point you can terminate the laptop program and disconnect the laptop.

After downloading a new template into the FLASH, a cold start must be done to transfer the new template from the FLASH to the RAM.

3.9 Statistics List

The template controls access to statistics and sub-statistics. The template contains an access level table that determines what functions each user has access to. Access levels are as follows:

- Read and Write
- Read only
- No access

The following is a comprehensive list of defined statistics:

3.9.1 S01 - Side A Totals by Logical Nozzle

Sub-statistic numbers in the format '.TN'

T = totals type:

1 = Volume
2 = Total Money
3 = Credit

4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 (0 = None Assigned)

The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the money display. Leading zeros appear as blanks.

3.9.2 S02 - Side B Totals by Logical Nozzle

Sub-statistic numbers in the format '.TN'

T = totals type:

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 (0 = None Assigned)

The least significant six (6) digits of the data value appear in the volume display with higher order non-zero digits of the data value, if present, shown on the money display. Leading zeros appear as blanks.

3.9.3 S03 - Side A Error/Event Counter Totals

The money display is in the form of dashes and sub-statistic displays on the unit price display in the range 1-99 representing the set of error/events detectable by the program. The allowed range for the counter value is 0-255.

NOTE: See Appendix A, "Error Codes" for a list of error codes.

3.9.4 S04 - Side B Error/Event Counter Totals

The money display is in the form of dashes and sub-statistic displays on the unit price display in the range 1-99 representing the set of error/events detectable by the program. The allowed range for the counter value is 0-255.

3.9.5 S05 - Side A Meter Volume Totals

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

3.9.6 S06 - Side B Meter Volume Totals

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

3.9.7 S07- S10: RESERVED

3.9.8 S11 - Side A Totalizers by Logical Nozzle

Sub-statistic numbers in the format '.TN':

T = Totals type

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 where 0 = None Assigned

The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

3.9.9 S12 - Side B Totalizers by Logical Nozzle

Sub-statistic numbers in the format '.TN':

T = Totals type

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 where 0 = None Assigned

The least significant six (6) digits of the data value appear on the volume display. The higher order non-zero digits of the data value, if present, appear on the money display. Leading zeros appear as blanks.

3.9.10 S13 - Side A Error/Event Counter Totalizers

The money display shows dashes and the volume display shows the statistic data. The unit price display shows the statistic and sub-statistic numbers in the format '14.XX' where '.XX' is in the range 0-99 representing the set of error/events detectable by the program. The allowed range for the counter value is 0-999.

See Appendix A, "Error Codes" for a list of error codes.

3.9.11 S14 - Side B Error/Event Counter Totalizers

The money display shows dashes and the volume display shows the statistic data. The unit price display shows the statistic and sub-statistic numbers in the format '14.XX' where '.XX' is in the range 0-99 representing the set of error/events detectable by the program. The allowed range for the counter value is 0-999.

See Appendix A, "Error Codes" for a list of error codes.

3.9.12 S15 - Side A Meter Volume Totalizers

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. The higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

3.9.13 S16 - Side B Meter Volume Totalizers

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. The higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

3.9.14 S17 - S20: RESERVED

3.9.15 S21 - Side A Error/Event Log

Sub-statistic numbers in the format '.XX' with the range 01-50 representing the set of error/events records maintained by the program, with the record in sub-statistic 01 being the most recent. Display error log data by using the two (2) data 'pages' shown in an alternating sequence at a 1 second per page.

NOTE: See Appendix A, "Error Codes" for a list of error codes.

Page 1 has the following format:

```
  .HH.MM
CC.DD.NN
```

where:

HH = hour

MM = minute

CC = error code

DD = device number

NN = logical nozzle number

Page 1 has the event time on the Money display in the format HH.MM. The volume display has data in the format CC.DD.NN where CC = the error/event code in the range 1-99, DD = the device number associated with the error/event and NN = the logical nozzle 0-8 selected at detection of the event (0 = none selected).

Page 2 has the following format:

```
MM.DD.YY
       C
```

where:

MM = month

DD = day

YY = year

C = filling count

Page 2 shows the event date on the Money display in the format MM.DD.YY and the filling count for the side on the volume display.

3.9.16 S22 - Side B Error/Event Log

Sub-statistic numbers in the format '.XX' with the range 01-50 representing the set of error/events records maintained by the program, with the record in sub-statistic 01 being the most recent View statistic data on the two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page.

NOTE: See Appendix A, "Error Codes" for a list of error codes.

Page 1 has the following format:

```
   .HH.MM
CC.DD.NN
```

where:

HH = hour

MM = minute

CC = error code

DD = device number

NN = logical nozzle number

Page 1 has the event time on the Money display in the format HH.MM. The volume display data is in the format CC.DD.NN where CC = the error/event code in the range 1-99, DD = the device number associated with the error/event and NN = the logical nozzle 0-8 selected at detection of the event (0 = none selected).

Page 2 has the following format:

```
MM.DD.YY
         C
```

where:

MM = month

DD = day

YY = year

C = filling count

Page 2 shows the event date on the Money display in the format MM.DD.YY and the filling count for the side on the volume display.

3.9.17 S23 - Side A Transaction History Log

Sub-statistic numbers in the format '.XX' with the range 01-10 representing the set of transaction records maintained by the program. The record displayed in sub-statistic 01 is the most recent and 10 is the oldest. View statistic data on the two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page. Page 1 has the transaction amount on the money display. The volume display has the transaction volume. Page 2 shows the unit price on the money display and volume display has the transaction volume.

3.9.18 S24 - Side B Transaction History Log

Sub-statistic numbers in the format '.XX' with the range 01-10 representing the set of transaction records maintained by the program. The record displayed in sub-statistic 01 is the most recent and 10 is the oldest. Display of statistic data is accomplished by the use of two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page. Page 1 has the transaction amount on the money display. The volume display has the transaction volume. Page 2 shows the unit price on the money display and volume display has the transaction volume.

3.9.19 S25 - Total Number of Power Cycles

The money display is blank and the power cycle counter value appears on the volume display. Sub-statistic numbers are displayed in the format '0X' where X = the selected configuration parameter defined as follows:

0. Number of Power Cycles
1. Number of Software Resets
2. Number of Cold Start Power Cycles

3.9.20 S26 - Reset history

This statistic provides information for a software engineer to aid in troubleshooting.

Shows the date, time, reason, and return location for the last 50 resets. Sub-statistic numbers in the format '.XX' with the range 01-50 representing the set of reset event records maintained by the program. The record displayed in sub-statistic 01 is the most recent and 50 is the oldest.

View statistic data on the two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page. Page 1 shows the event time on the Money display in the format HH.MM. The volume display has data in the format TT.FFFF where TT = the trap id, FFFF = the value of the trap flag register, (TFR) at detection of the reset.

Page 2 shows the event date on the Money display in the format MM.DD.YY and the return address as SS.OOOO where SS is the hex code segment, and OOOO is the hex offset into the code segment. The return address can be used to determine the PC contents when the trap occurred. This can be especially helpful for unexpected traps such as illegal instructions, odd word fetches, etc.

3.10 Weights and Measures Mode

If you enter the maintenance mode through a weights and measures entry, a special weights and measures mode version of the maintenance mode automatically starts. This special mode is designed to make it as easy as possible to display the blend ratio change event logs and volume metering change event logs required by Weights and Measures.

If the dispenser is configured as a blender, you enter the View Blend Ratios mode first. After you finish viewing the blend ratio or if the dispenser is not configured as a blender, the View Volume Metering Unit Change Counters mode begins.

NOTE: The weights and measures mode is side specific. It shows the blend ratio logs and volume metering unit logs for the side that you are facing when using the infrared device.

3.10.1 View Blend Ratios Mode

When you enter this mode, the sale display contains the words **bLEnd rAtioS** and the current blend ratios for all the blended products are displayed in the current price display for a maximum of 20 seconds. If you don't press any other buttons within 20 seconds, or if you press the **CLEAR** button, the system enters the View Volume Metering Unit Change Counters mode.

If you press **ENTER** or **NEXT**, the system enters the View blend Ratio Change Counters mode.

3.10.2 View Blend Ratio Change Counters Mode

In this mode, the following sequence repeats every 20 seconds for every blended product. When all products finish displaying, the system enters the View Volume Metering Unit Change Counters mode.

- The corresponding unit price display contains **Pr n** where **n** is the product number, also known as the logical nozzle number.
- The money display contains the current counter value showing how many times this product's blend ratio has changed.
- The volume display contains the current blend ratio

If you press one of the following keys while you are in this mode, the corresponding action occurs:

CLEAR	The system enters the View Volume Metering Unit Change Counters mode.
ENTER	The system enters the View Blend Ratio Change Event Logs mode.
NEXT	The next product's change counter data in the sequence is displayed, unless you are viewing the last product's change counter. Otherwise the system enters the View Volume Metering Unit Change Counters mode.

3.10.3 View Blend Ratio Change Event Logs Mode

In this mode, the following sequence repeats every 20 seconds for the last ten event logs for the selected product. When all ten event logs are finished displaying, control returns to the previous mode.

The corresponding unit price display contains bC n where n is the blend change event number (1-10) where 1 is the last blend change event and 10 is the oldest stored change event.

The sale display alternates every two seconds between the following pages:

The money display displays either LOCAL or SErIAL depending on whether the blend ratio change came from local programming or from the serial link to the site controller and the volume display contains the blend ratio that it was changed to with this event.

The money display contains the date of the event in the form of mm.dd.yy where "mm" is the month, "dd" is the day, "yy" is the year. The volume display contains the time of the event in the form of hh.mm where hh is the hour (0-23) and mm is the minute (0-59).

If you press one of the following keys while in this mode, the corresponding action is taken:

CLEAR	The system exits the View Blend Ratio Change Event Logs mode and returns control to the View Blend Ratio Change Counters log.
ENTER	The system exits the View Blend Ratio Change Event Logs mode and returns control to the View Blend Ratio Change Counters log.
NEXT	The next blend change event displays. If you are viewing event 10, it will wrap around and show event 1.
UP	The next blend change event displays. If you are viewing event 10, it will wrap around and show event 1.
DOWN	The previous blend change event displays. If you are viewing event 10, it will wrap around and show event 1.

3.10.4 View Volume Metering Unit Change Counters Mode

In this mode, the following items display for 20 seconds

1. Unit price displays contain **Unit** (for volume metering unit)
2. Money price display contains the current counter value showing how many times the volume metering unit was displayed
3. Volume display contains the current volume metering unit described as follows:
   - **LItErs** Liters volume unit
   - **US GAL** U.S. Gallons volume unit
   - **IP GAL** Imperial Gallons volume unit

If you press one of the following keys while in this mode, the corresponding action happens:

CLEAR	The system exits the weights and measures mode.
ENTER	The system enters the View Volume Metering Unit Change Event Logs mode.
NEXT	The system exits the weights and measures mode.

3.10.5 View Volume Metering Unit Change Event Logs Mode

In this mode, the following sequence repeats every 20 seconds for the last ten event logs for the volume metering unit changes. When all ten event logs have finished displaying, control returns to the previous mode.

1. The corresponding unit price display contains UC n where n is the unit change event number 1-10; 1 is the last unit change event and 10 is the oldest stored change event.
2. The sale display alternates every two seconds between the following two pages:
   a. The money display is blank and the volume display contains the metering unit that was changed to with this event described as follows:
      - **LItErs**Liters volume unit
      - US GALU.S. Gallons volume unit
      - **IP GAL**Imperial Gallons volume unit
   b. The money display contains the date of the event - mm.dd.yy where mm is the month, dd is the day, yy is the year. The volume display contains the time of the event in the form of hh.mm where hh is the hour (0-23) and mm is the minute (0-59).

If you press one of the following keys while in this mode, the corresponding action happens:

CLEAR	The system enters the weights and measurements mode.
ENTER	The system enters the weights and measurements mode.
NEXT	The next volume metering unit change event displays. If you are viewing event 10, it wraps around to show event 10
UP	The next volume metering unit change event displays. If you are viewing event 10, it wraps around to show event 10
DOWN	The next volume metering unit change event displays. If you are viewing event 10, it will wrap around to show event 10.

A

Error Codes

A.1 Error Codes

The following table lists the GEM error codes:

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GEM Error Codes

Error Code	Description	Error Code	Description
1	Flash Program CRC Error	51	Jitter Limit reached on an "Idle" WIP
2	Flash Template CRC Error	52	Jitter Limit reached on an "Illegal" WIP
3	Reserved	53	Reverse Flow Limit reached on an "In Transaction" WIP
4	Reserved	54	Reverse Flow Limit reached on an "Idle" WIP
5	RAM Error Log CRC Error	55	Reverse Flow Limit reached on an "Illegal" WIP
6	RAM Function Programming CRC Error	56	Forward Flow Limit reached on an "Idle" WIP
7	RAM Unit Prices CRC Error	57	Forward Flow Limit reached on an "Illegal" WIP
8	RAM Statistics CRC Error	58	Communications lost to an "In Transaction" WIP
9	RAM Event Logs CRC Error	59	Communications lost to an "Idle" WIP
10	RAM Totals CRC Error	60	Reserved

GEM Error Codes

Error Code	Description	Error Code	Description
11	RAM Totalizers CRC Error	61	Received a volume from a WIP that was less than the previously received volume
12	RAM Electro-Mechanical Totalizers CRC Error	62	Reserved
13	Identi-Prom Read Error - Device #s 0=Display, 1=CPU	63	Reserved
14	Reserved	64	WipMux has done a reset
15	Maximum Filling Limit reached (Function 17.06 or 17.07)	65	WipMux has done a Watchdog reset
16	Suppress OverFlow Limit reached (Function 19.12 or 19.22)	66	WIP Calibration Volume different from GEM or Unknown
17	Reserved	67	Reserved
18	Reserved	68	Reserved
19	Reserved	69	Reserved
20	'n' Consecutive Display Read Back Error Device #s: 0=Sales, 1=Unit Price, 2=Preset	70	Timeout Limit reached for No Flow (Function 17.02)
21	Reserved	71	'n' Consecutive No Flow Timeouts (Function 17.03)
22	Reserved	72	Timeout Limit reached for Flow Lost (Function 17.02)
23	Reserved	73	'n' Consecutive Flow Loss Timeouts (Function 17.04)
24	Reserved	74	Sale Terminated before Preset Limit reached (Unfinished Filling)
25	Sale cannot start - zero Unit Price	75	'n' Consecutive Unfinished Fillings
26	Sale cannot start - no Unit Price downloaded	76	Reserved
27	Sale cannot start - Unit Price changed (Function 23.04)	77	Reserved
28	Sale cannot start - need Preset Entry (Function 24.01)	78	Reserved
29	Reserved	79	Reserved
30	No communications with POS Timeout (Function 23.02)	80	Mail Buffer Memory Pool exhausted (Internal Error)
31	Reserved	81	Reserved
32	Reserved	82	Reserved
33	Sale aborted because Stop Button pushed	83	Reserved
34	Reserved	84	Reserved
35	Blend Ratio out of tolerance (Function 7.02)	85	Reserved
36	Reserved	86	Reserved
37	Reserved	87	Reserved
38	Reserved	88	Reserved
39	Reserved	89	Reserved
40	Reserved	90	Reserved
41	Reserved	91	Reserved

GEM Error Codes

Error Code	Description	Error Code	Description
42	Vapor Recovery Motor on when should be off	92	Reserved
43	Vapor Recovery Motor off when should be on	93	Reserved
44	Reserved	94	Reserved
45	Cannot maintain desired speed on Vapor Recovery Motor	95	Reserved
46	Vapor Recovery Motor turning wrong direction	96	Reserved
47	Illegal Sensor States from Vapor Recovery System	97	Reserved
48	Reserved	98	Reserved
49	Reserved	99	Hardware/Software mismatch - device #s: 0=No Proportional Hardware, 1=No Vapor Recovery Hardware
50	Jitter Limit reached on an "In Transaction" WIP		

B

Miscellaneous GEM Functions

B.1 Bootstrap Mode

If the executable code in the GEM flash gets corrupted, the only way to reload the flash is using the bootstrap mode of the GEM pump computer's microprocessor. Flash data can be corrupted if something causes an interruption of a flash download (function 98) such as a power failure.

B.2 Downloading Flash Memory Programming Via Bootstrap Mode

1. Turn off power to the pump computer board.
2. With the Service Terminal Program installed, connect a laptop PC to the GEM pump computer.

   IMPORTANT: Do not start the Service Terminal Program yet.
3. On the GEM pump computer board, short across the bootstrap jumper pads **S8**.
4. While keeping **S8** shorted, apply power to the pump computer board keeping **S8** shorted for approximately 2 seconds after applying power.
5. Remove the short across **S8**.
6. On the laptop, start the Service Terminal Program.

   When the program starts, it should display a small window with the message "**Entering GEM Bootstrap**". If this window does not display, be sure the cable is connected properly and repeat steps 1-6, ensuring a good short across **S8**.
7. Click on the **OK** button in the small window.

The Service Terminal Program should request a filename to be downloaded. The Service Terminal Program will allow the user to browse the various directories for the desired file. When the file is selected, the CRC of the file is checked and if everything is OK, the program download will start. If the file cannot be found or has a bad CRC, the download will be aborted.

8. Upon completion of the template download, the GEM will go back to the function entry mode where other functions may be accessed or the Service Terminal Program can be terminated at this point and the laptop disconnected.

NOTE: When downloading flash memory programming via bootstrap mode, the default template is automatically loaded in the flash. The proper template (based on the dispenser type) will have to be loaded via function 99 after loading the flash memory via the bootstrap mode.

B.3 Performing a Cold Start

Perform a cold start to reset all statistical values and to load the template data from the flash into the RAM:

1. Turn off power to the pump computer board.
2. On the GEM pump computer board, short across the cold start jumper pads **S12**.
3. While keeping **S12** shorted, apply power to the pump computer board, keeping **S12** shorted until the word **COLd** displays in the volume display.
4. Remove the short across **S12**. The cold start procedure is now complete.

B.4 GEM Data Dump

To help diagnose problems at a site, the GEM pump computer can dump function programming and statistical data through the Service Terminal Program to a file on the laptop. This file can then be sent to Wayne for analysis.

The GEM data dump is accessed by a special button on the Service Terminal Program called "**GEM DATA DUMP**". This button is active only if maintenance mode has been entered and the current state shown in the unit price displays is "**F—**". The display on the Service Terminal program will show "**ENTER FUNCTION**". If the maintenance mode is in this state, then selecting the **GEM DATA DUMP** button causes the Service Terminal Program to request a filename to which to upload the GEM data. When the file is selected, the data dump is started.

Upon completion of the data dump, the GEM will go back to function entry mode where other functions may be accessed.

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Warranty and Limitation of Remedy and Liability

Seller warrants that new products and parts of its own design and manufacture when shipped, will be of good quality and will be free from defects in material and workmanship and will conform to applicable specifications. Work, when performed by Seller, will meet applicable work requirements. No warranty is made with respect to used or rebuilt equipment and with respect to products not manufactured by Seller, Seller's only obligation shall be to assign to Buyer, at the time of sale, whatever warranty Seller has received from the manufacturer. Items such as but not limited to lamps, electric motors, hoses, nozzles, hose swivels and safety impact valves are included in the category referred to in the previous sentence. Seller's recommendations with respect to the operation of Seller's equipment are advisory only and are not warranted. All claims under this warranty must be made in writing immediately upon discovery and, in any event, with twelve (12) months from date of installation, if a product is involved, or from completion of the applicable work, if work is involved, or fifteen (15) months from date of invoice (whichever shall occur first). (Provided however, that with respect to the Decade 1000 electronic cash register, receipts/totals printer, and any other printers or printing mechanisms, all claims must be made in writing within ninety (90) days from date of installation.) Defective and nonconforming items must be held for Seller's inspection and returned to the original f.o.b. point upon request. Seller's warranty on service parts, whether new or reconditioned, is ninety (90) days from the date of installation, or twelve (12) months from date of invoice, whichever first occurs. THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESSED, IMPLIED AND STATUTORY, INCLUDING WITHOUT LIMITATIONS, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

Upon Buyer's submission of a claim as provided above and its substantiation, Seller shall, at its option either (I) repair or replace its product or work at the original f.o.b. point or location of purchase products and/or parts or (II) refund an equitable portion of the purchase price.

The foregoing is Seller's only obligation and Buyer's exclusive remedy for breach of warranty and, except for gross negligence, willful misconduct and remedies permitted under the performance inspection and acceptance and the patents clauses hereof, the foregoing is Buyer's exclusive remedy against Seller for all claims arising hereunder or relating hereto whether such claims are based on breach of contract, tort (including negligence and strict liability) or other theories, Buyer's failure to submit a claim as provided above shall specifically waive all claims for damages or other relief, including but not limited to claims based on latent defects. In no event shall buyer be entitled to incidental or consequential damages. Any action by buyer arising hereunder or relating hereto, whether based on breach of contract, tort (including negligence and strict liability) or other theories, must be commenced within one (1) year after the cause of action accrues or shall be barred.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

DRESSER Wayne

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