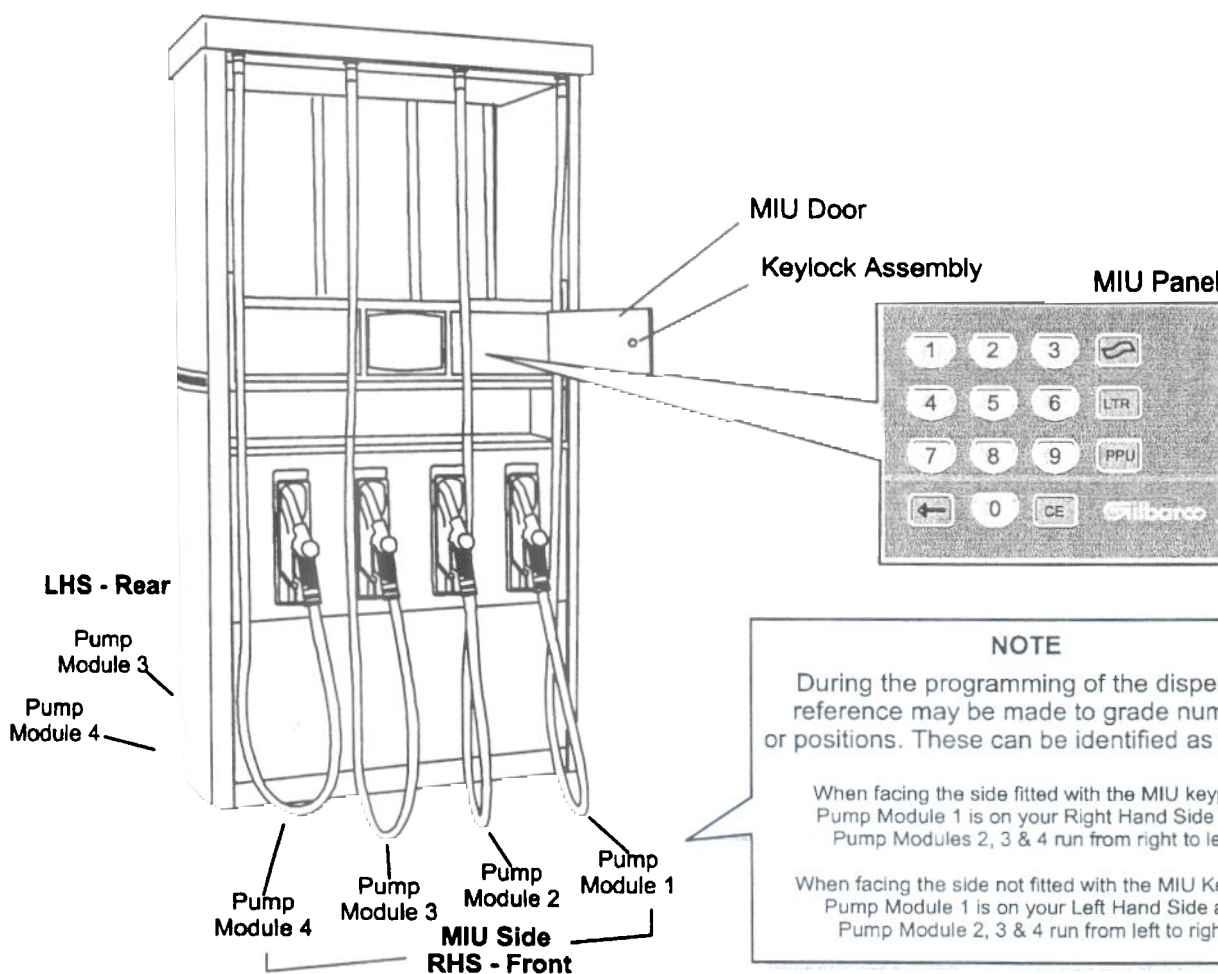


Epsilon Computer Description

The Gilbarco Epsilon computer consists of a single aluminium alloy casing fitted with Printed Circuit Boards controlling the mains supply to the dispenser components whilst also allowing it to communicate with 2-wire Control Consoles. The computer is the main control module for the dispenser and is located within the head of the dispenser behind the main display. It allows the dispenser to operate in Stand-Alone or Self-Service mode when connected to either T24, G-Site or other approved Self-Service control consoles.

This manual contains all the procedures required by the Manager or Operator on dispensers fitted with the Epsilon computer module. Every function in this manual is available to the Manager, however some functions can only be used when the computer is in Manager mode. This mode is protected by a four digit passcode, set by the Manager. The Operator functions are available to both Manager and Operator and do not require the dispenser to be in Manager mode.

To use any of the programming functions contained in this manual, access to the "Manager Interface Unit" is required. This is located within the computer housing on one side only and is accessible by opening one of the access doors, secured by a keylock assembly with a manager key designed to prevent unauthorised access to the MIU. Marconi recommend that wherever possible, the Self-Service console should be used for the majority of functions available via the MIU, i.e. Setting Prices and Sales Limits, etc. Because the MIU is present on one side only its location can also be used to determine both the side of the dispenser and the grade numbers for use in programming, see the note below.



Manager Interface Module (MIU)

The Manager Interface Unit is used to select options available under Manager and Operator level operation and is used for entering the information required by the pump in order for it to operate correctly, such as pump number, grade prices etc.

Engineer mode is an extension of the Manager Mode, which is protected by a numerical passcode entered using the Manager Interface Unit (MIU).

The default passcode is 0000, this can be changed to any four digit number, thus preventing unauthorised access to Manager level operation of the pump.

Whilst the pump is in Manager mode , a time-out facility is in operation. The pump automatically reverts to customer level if the MIU panel is idle for approximately 5 minutes. This prevents the pump from being inadvertently left in Manager mode. If the time-out function resets the pump to customer level, the Manager passcode must be re-entered before any further programming can be carried out.

Installation Procedure

When configuring a Gilbarco pump fitted with the Epsilon Computer, it is advisable to follow the procedure outlined below

- **Perform a 'Cold Start'**

This resets ALL the pump data to the Factory Settings, giving the Engineer a starting point from which the Installation Engineer can set the pump configuration.

- **Enter Manager Mode**

This is protected by a four digit security code which prevents unauthorised access to some of the data contained within the pump electronics.

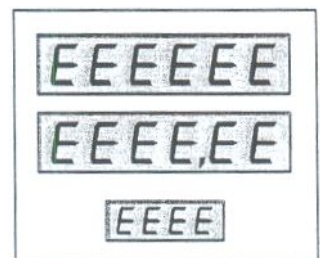
- **Enter Install Mode**

- **Set Pump Configuration**

This is the main set up routine that should be used by the installation engineer to configure the pump to work in conjunction with other pumps on the same forecourt along with any Control Consoles that may also be installed.

If, when programming a pump, invalid information is entered, the pump will indicate the error by filling all the displays with 'E's

After approximately 2 seconds the display will return to its previous status.



Cold Start

Performing a 'Cold Start' on a Gilbarco pump results in all the pump values being reset to their default factory set values. This gives the Service Personnel a starting point from which to configure the pump.

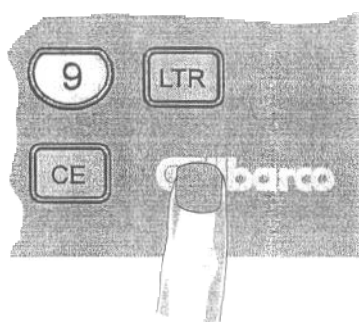
WARNING

Performing a 'Cold Start' procedure clears the computer memory of ALL its data. If the pump has been used previous to this 'Cold Start' being performed, make a note of all the pump data, i.e. Volume Totals, Sales Totals, PPU's, etc. BEFORE performing a 'Cold Start' !!

To 'Cold Start' the pump, carry out the following procedure

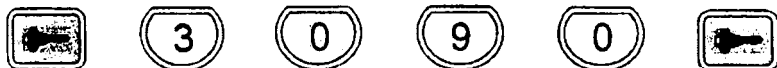
Check all required pulsers, nozzle switches and gas detect switches are installed and correctly connected.

Press the 'G' of the Gilbarco logo on the MIU panel.

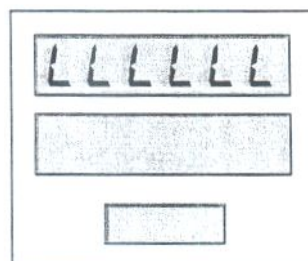


Square MIU panel

Then press the following keys in the order shown

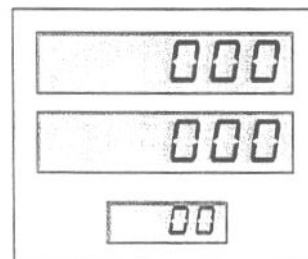


This results in the pump performing a 'Cold Start', the top display shows a series of 'L's and sets all the pump values to their default settings.



The pump may take approximately 15 seconds to complete the cold start operation - during this time the pump will not respond to key presses.

The Cold Start is complete when the display shows a series of '0's

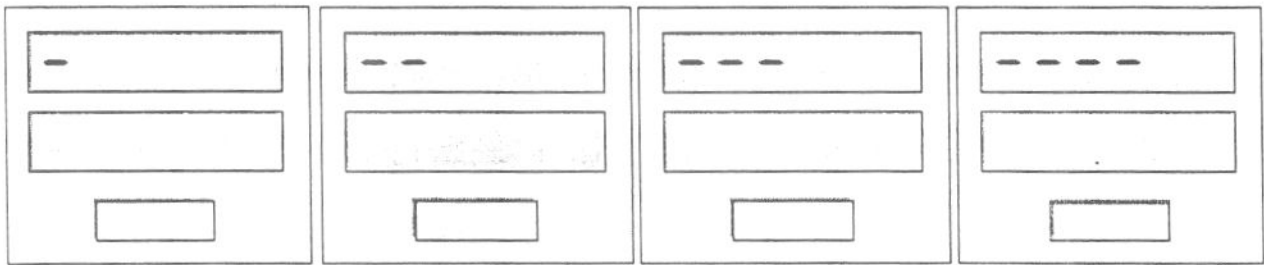


Entering Manager Mode

Before any Manager functions can be accessed the pump must be set to Manager Mode. This is done by entering the following key sequence



(If a different code has been set, enter the appropriate passcode – default Manager passcode = 0,0,0,0)

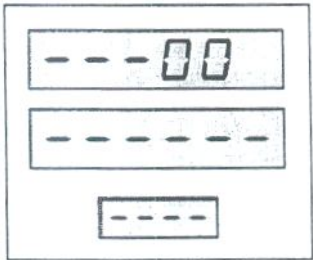


As the code is entered the middle segment of the digits on the upper display moves from left to right across the display.

When the sequence is complete, the pump will show the default Manager Mode display

'- - - 00'

NOTE: If the display shown on the pump does not match the display shown here, contact your Gilbarco Distributor to obtain the appropriate documentation



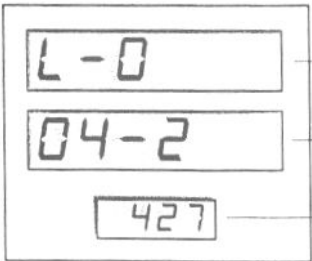
Changing Service Level

Pumps can be used as either Self-Service or Stand-Alone (attended service) pumps. The required operating mode is selected by setting the service level within the pump, service level '1' sets the pump in Stand-Alone mode, service level '0' sets the pump to Self-Service operation.

Default = '0' - Self-Service mode.

To select the service level, set the pump to Manager Mode then use the following procedure

Press the PPU pad on the MIU panel, the display will show



Level = Self-Serve

Fuelling Pos. = 4
Pump Nozzle = 2

PPU = 427

Enter the required service level '0' = Self-Service, '1' = Stand-Alone - by pressing the appropriate numerical keypad followed by the PPU pad.

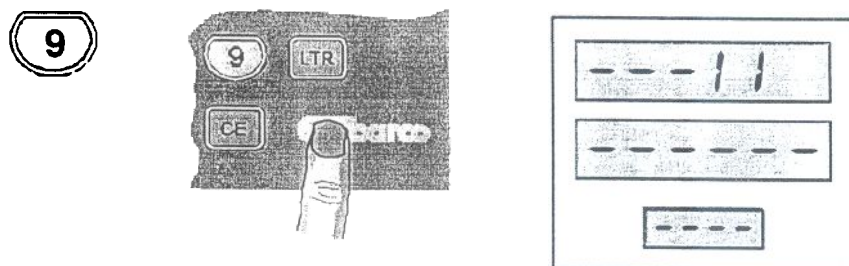
Install Mode

Setting the pump configuration is only possible whilst the pump is in 'Install' mode, this is an 'Engineer mode' available whilst the pump is in Manager Mode and uses the hidden 'Engineer' key under the Gilbarco logo. Before setting the pump configuration, it is important to establish: how many 2-wire loops are used in the installation, which 2-wire loop each pump is connected to, which type of self-service system is to be used and the number of pumps on each loop.

The procedure used to configure the pump uses a combination of key presses and nozzle removal. When the pump is cold started, the software scans the pump to establish the location of any pulsers. Whilst in 'Install' mode, each nozzle must be removed from its holster and replaced. The software registers the nozzle switching, compares it to the location of the pulsers and creates a 'map' of the pump configuration. Using this information the computer can determine how many grades are being dispensed, the flow rate of each grade and whether it is a single sided or double-sided pump.

Entering Install Mode

To set the pump to 'Install' mode, set the pump to Manager mode, then press the '9' key followed by the Engineer key (*hidden key*)



The digits '11', on the top display, flash to indicate that the pump is now in 'Install' mode.

Note: If 'Install' mode has not been selected, the computer will operate in 'View Only' mode, where the following functions are available for viewing but changes cannot be made to the configuration.

Pump Configuration

The Pump Configuration is a combination of the following information,

- a) Display address and decimal point settings.
- b) The number nozzles fitted to the pump/dispenser.
- c) Pump/dispenser 'Offset' number, which is used internally when operating with a Self-Service system.
- d) The Pump Number for each side of the pump/dispenser.
- e) Grade Priority Numbers
- f) 2-Wire Protocol Selection

a) Display Decimal Point Setting

Check the current default position and type of decimal points and change if required, as detailed below, for the 2 different types of main display boards.

Main display with one PPU display

Set using links. Refer to *"Display Address & Decimal Point Links"*.

Proceed to **"b) Setting Number of Nozzles"**.

Main display fitted with Multiple PPU displays

1. If pump software is Version 3 or later:

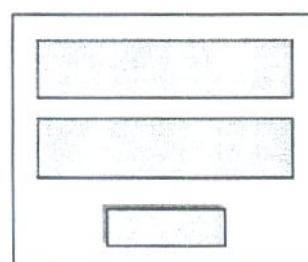
If the default setting is not as required, refer to "Set Decimal Points" in Engineer Guide sheet pages.


Proceed to "Setting Number of Nozzles".

2. If pump software prior to Version 3:


Ensure the pump in "Install" mode, use the following procedure:

Press '0' pad followed by the Engineer key (*hidden key*) . . .




If the current settings are correct, press  and proceed with "Setting Number of Nozzles".

To change the default settings, press the following keys:

 : Set cash DP position

LTR : Set dot/comma

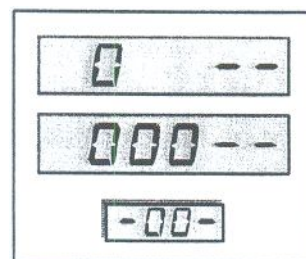
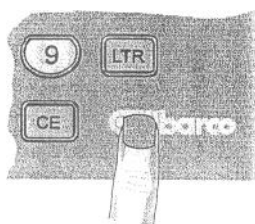
PPU : Set PPU DP position

When settings are correct, press  and proceed with "Setting Number of Nozzles".

□ Setting Number of Nozzles

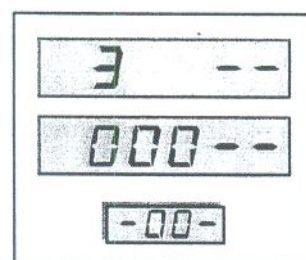
To set the number of nozzles fitted to the pump, the pump must be in 'Install' mode.

Press '0' pad followed by the Engineer's key (*hidden key*)



Remove and replace all the nozzles on the pump in turn. As each nozzle is removed, the number shown in the top display increments showing the number of nozzles fitted to that side of the pump*.

This example indicates that three nozzles are fitted to the left hand side of the pump.



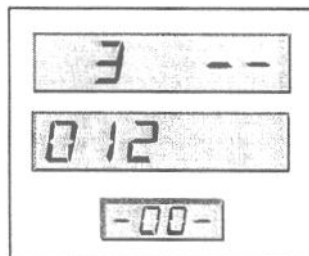
Note * : Setting the number of nozzles is a 'Once Only' operation and subsequent changes cannot be made. If the same nozzle is removed twice whilst in this mode, it will automatically initiate the Pump Number setting procedure.

□ Set Pump Offset (2-Wire Pumps only)

If necessary, use the Numerical keys to enter the required number. The digits scroll to the left as they are entered...

The second and third digits of the middle display represents the 2-wire 'pump offset' number, this is the number of pumps fitted to the previous loops of the Self-Service system. Refer to the chart below to establish what these digits should be. Other numbers may be used depending on the Self-Service Control System installed.

Offset	Controller
000	1 st loop – Any system
012	2 nd loop – T24
016	2 nd loop – G-Site



(The example shows that the pump is connected to the second loop of a T24 System)

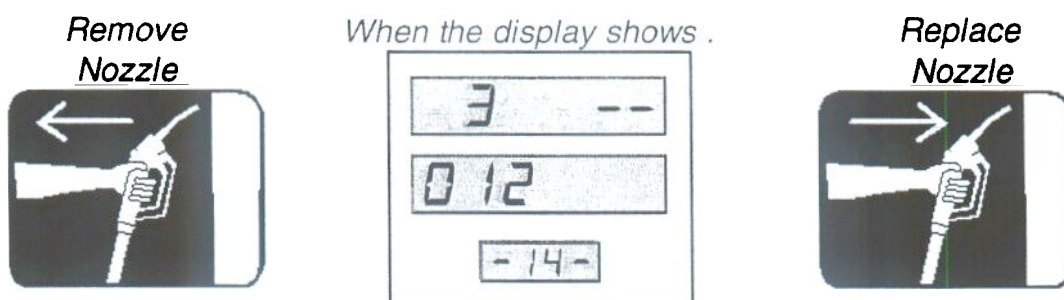
□ Setting Pump Numbers

The numbering system employed by Epsilon computer is not restricted to adjoining numbers, the second side of the pump need not be the number adjacent to that of side 1. Each side is set independently of the other. For example, if one side of the pump is set to 4, the second side will not automatically become 3 or 5, and must be set in its own right.


The only restriction is that for a 2-Wire system both sides of the pump must be connected to the same 2-wire loop and must be logical with the loop to which they are connected (i.e. *Pump 17 cannot exist on loop 1*), therefore the numbers must be part of the same loop and logical to that loop. If the pump number is set to '00' the pump will be disabled.

To set the pump number, ensure the pump is in 'Pump Configuration' part of the 'Install' mode, remove any nozzle from the first side of the pump that is to be set. Whilst the nozzle is out of the holster, the value shown on the lower display will increase or decrease at 1 second intervals. When the correct number is displayed, replace the nozzle. If the display is changing in the wrong direction, replace the nozzle then remove it again, the display will change in the opposite direction, see *Note below*.*

For example, to set the pump number to 14:



Repeat this procedure for the opposite side of the pump, if required.

Press the  to complete this part of the configuration procedure and return to the Install Mode.

- * The direction that the value changes is toggled between an increasing value or a decreasing value each time the nozzle is removed for the purpose of setting the pump number. If the previous removal of a nozzle caused the value to increase, then the next time a nozzle is removed to set the same pump number, the value will decrease and vice versa.

□ Configuration of Grade Priorities

The connection of the pipes to each pump will determine which grade of fuel is dispensed from which hose. For instance, some pumps may have the unleaded fuel connected to the left-hand hose and some pumps may have the unleaded fuel connected to the right-hand hose (as viewed from the “front” of the pump). It depends on where the underground pipes have been located under the pump.

Thus each pump has to be programmed to indicate which hose has been connected to which grade of fuel.

The grade number to be programmed into each hose position depends on which grades are available at the pump. It is not as simple as programming “1” for Leaded, “2” for Unleaded, “3” for Diesel etc.

The Grade Priority number is determined by the position of the pump’s grade in the console’s grade list and is derived in the following manner.

Column 1	Column 2	Column 3
Grade listed at Console	Hose pair dispensing product	Grade Priority number
UNLEADED		
LEADED		
DIESEL		
LPG		
PULP		
GRADE 6		
GRADE 7		
GRADE 8		

Draw a line through the rows of grades not being dispensed at the pump.

In column 2, write the Pump Module number which dispenses the grade shown in column 1 (“1”, “2”, “3” or “4” if a 4 product pump).

(Pump Module number 1 is on the right-hand side looking at the front of the pump. The front of the pump is the side with the MIU keypad).

In column 3, number the boxes from the top to the bottom in numerical order as follows:

1, 2, 3 and 4 for 4 product pumps

1, 2 and 3 for 3 product pumps

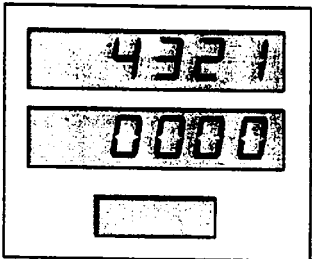
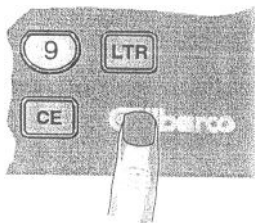
1 and 2 for 2 product pumps

(see example on next page)

For Example

Column 1	Column 2	Column 3
Grade listed at Console	Hose pair dispensing product module position	Grade Priority number
UNLEADED	2	1
LEADED	1	2
DIESEL	4	3
LPG		
PULP	3	4
GRADE 6		
GRADE 7		
GRADE 8		

While in Install Mode, enter the following sequence.




On the front of the pump the top line of the display will show '4321' (Pump Module numbers).

The second line of the display will show '0000' (the default grade priority numbers).

Lift the right-hand hose. The existing grade priority number will flash. Key in the new grade priority number and replace the hose.

Repeat this procedure for each hose in turn. For the above example, the displays will show:

4321 (Pump Module numbers)
3412 (new grade priority numbers)

Press the  to complete Grade Priority configuration and return to Install Mode. .

2-Wire Protocol Selection

The Enterprise pump/dispenser can communicate with Consoles and Pump Controllers using a selection of Marconi communications protocols, ie., Corporate 2-Wire, Protocol 1 and Protocol 2.

Some foreign pump controllers use Corporate 2-Wire, early Consoles and Datapump Controllers use Protocol 1, and later Consoles use Protocol 2.

To select the protocol used by the Enterprise, the pump must be in Install Mode.


Press '1' '0' followed by the Engineer key (*hidden key*)...




The number in the top line of the display will show the current selected protocol.


0	Corporate 2-Wire
1	UK 2-Wire (not available)
2	Australian Protocol 2
3	Australian Protocol 1

- NOTE:**
- 1. On cold start, the default protocol is Australian Protocol 2.
 - 2. If Corporate 2-Wire selected, Grade Priority Configuration is disabled.

Press the  pad on the MIU to step through the protocols until the required number is displayed.

Press the  pad to save the selection and return to the Install Mode.

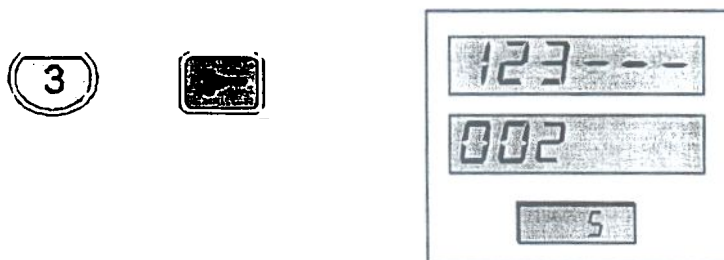
This completes the minimum Pump Configuration to enable the pump to operate in Self-Serve.

Press the  pad to exit to normal Operator Mode.

Viewing Nozzle and Pulsar Detection

This option lets the Engineer view the configuration of the pump with regard to the nozzles and pulsers. Each side displays information relating to that side of the pump and is displayed as follows

With the pump in Manager mode, press the '3' pad followed by the  pad, the display will look something like this




The top panel shows the location of any nozzles fitted to the pump, a hyphen '-' indicates that there is no nozzle attached to the corresponding hydraulic module, a 'digit' indicates that a nozzle exists.

The middle panel indicates where pulsers were detected within the hydraulic modules and the type of the nozzles fitted to the modules. Where the display shows a 'P' a pulser was detected within the corresponding module, otherwise there was no pulser detected. The number alternating with the pulser detection indicates the type of that particular nozzle, the possibilities are listed in the table below . . .

The lower panel indicates (by an S character) whether the module position has been detected as Monoblock Ultra High Flow which has a pulser fitted to both sides of the module but no hose fitted on the other side.

Value	Nozzle Type
0	Standard Flow (may be up to 80 l/m)
1	RESERVED
2	Ultra High Flow Nozzle (120 l/m)
3	RESERVED
4	RESERVED

Press the  pad to exit this function.

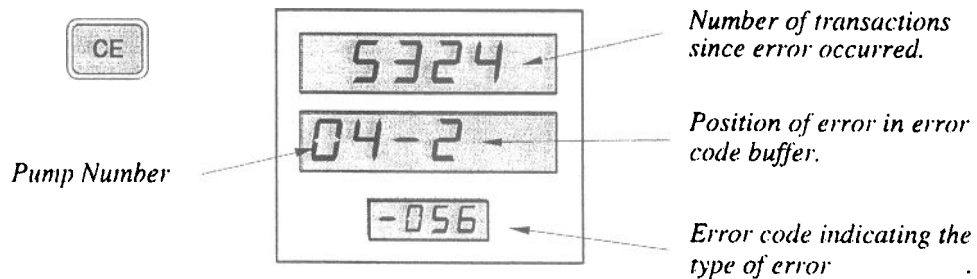
Hint:

Refer to 'OPERATOR', 'MANAGER' and 'ENGINEER' guide sheet pages for reminders on all programming features and timers.

Error Code Buffer

The Error Code Buffer contains a list of errors that may have occurred on the pump. The buffer contains 10 positions, the most recent error being positioned at **0**, the earliest being positioned at **9**. The display shows how many transactions have taken place between the errors occurring, and an error code that indicates the type of error.

1. Press the CE pad on the MIU. The display shows



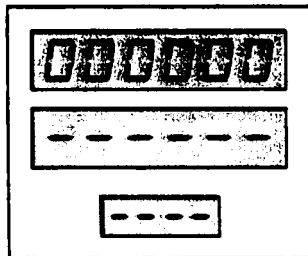
- a) The upper display shows the number of transactions dispensed since the displayed error was detected.
- b) The middle display shows the position of this error within the Error Code Buffer, where 0 is the most recent.
- c) The 3 digits of the lower display shows the Error Code, this indicates the type of error that occurred.

Pseudo-Errors

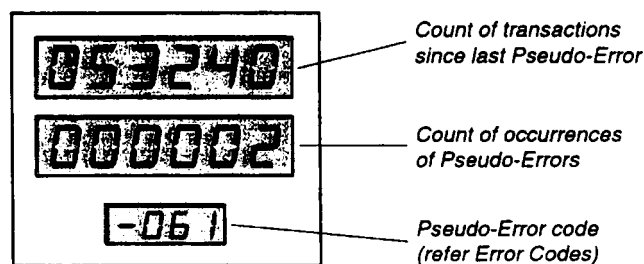
Some fault conditions that are not permanent are recorded in the 'Pseudo-Error Buffer'. The Pseudo-Error Buffer can be examined while the Error Buffer is being displayed by pressing '1' on the MIU.

While viewing the Pseudo-Error Buffer, the 'CE' key steps through the entries.

Unlike the Error Buffer which displays errors in order of occurrence, Pseudo-Errors are displayed by error number. Only those Pseudo-Errors which have occurred are displayed. If no Pseudo-Errors have occurred, the display is...



For those Pseudo-Errors that have occurred, the format is:



Display Test

If a numerical pad on the MIU is pressed whilst the pump is set at customer level, the display will show the selected number at all positions on the display for approximately 2 seconds, after which the display returns to its previous status.

Error Code Buffer (Continued)

Should an error occur, the information contained within the Error Buffer will help the Service Personnel remedy the current problem and prevent any similar problems arising in the future.

The Error codes are as follows

Error Code	Description
0(n)	Etote error on module (n)
07	Etote assembly communication error
1(n)	Pulser count error on module (n)
2(n)	Reverse flow on hydraulics module (n)
3(n)	Pulser power supply circuit on hydraulics module (n)
40	Transaction display error
41	Incomplete main display update or GMI pulses not all output on power fail
45	GMI board has reported an error – either fuelling point
46	GMI Volume pulse accumulation on either fuelling point has exceeded 5 litres
47	GMI Cash pulse accumulation on either fuelling point has exceeded 500 cash units
50	Database value out of range – corrected
51	Restore data checksum failed
52	EEPROM device check reports failure
53	Too many writes to EEPROM
54	Software variable set to default value after memory corruption
55	Invalid parameter passed to database in a call from software task
56	The claim and release database functions incorrectly used by software
57	Volume total or pulse count for a delivery has been corrupted
60	Incorrect gas detector valve configuration setting or faulty wiring
6(n)	Gas detected during delivery on hydraulics module (n)
7(n)	Blend error
71	Oil Level error or oil pulse error
8(n)	Vapour recovery hose leak on module (n)
90	Communications error (Device Busy ie. More than 10 buffers in use)
95	Background EPROM check reports failure
96	Multitasking executive error
97	Software stack overflow
98	Software execution boundary violation
99	Watchdog timeout (failure)
101-125	Stack overflow for task nnn (normally error 97 for undefined task)
140	EPSIF Task watchdog timeout
141	Buffer overrun (more than 384 bytes in one message)
150	Neuron active sensing timeout
160	Two-wire communications protocol error

*Note: Error codes apply to a range of HARDWARE configurations.
NOT ALL CODES APPLICABLE TO ONE SYSTEM.*