

EL60 Programming Guide

by

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1 Description

The Eliminator Model EL60 is an electronic pump computer that has been designed for both OEM and retrofit applications. The device has been designed to be very flexible and it incorporates many advanced programmable features. This manual has been written to explain the operation of all of the features available on the EL60.

This manual describes the operation of a two sided unit. Simply ignore any references to "SIDE B" if the unit you are using is not equipped with two sides.

The Eliminator EL60 boasts the following main features:

- * Built-in ATC (Automatic Temperature Compensation) for gasoline, diesel and propane
- * Supports stand alone, card lock, and serial console communications
- * Can support 2 independent hoses with 2 different products
- * Programmable using infrared remote control
- * Large (1" high) back lighted LCD display
- * Built-in Electronic meter calibration
- * Optionally supports fail safe leak detection
- * Optionally supports EqualTalk infrared communication devices
- * Electronic Audit Trail with security codes
- * Intrinsically safe design
- * No standby battery needed, but retains totals and set up data for 200 years without power.

2 Day to Day Operation

Day to day operation of the EL60 requires that the operator be capable of reading totalizers and setting new prices. All access to information and programming is accomplished using the infrared remote control shown below in figure 1.

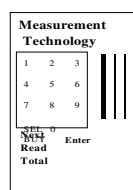


Figure 1

2.1 Reading Totalizers Without Security

Locate the optical receiver on the EL60. The receiver is located on the display with the green

power "ON" indicator light. The "ON" indicator light is located on side A of the pump if it is a dual unit.

Be sure that both pump handles are off, then point the remote control in the direction of the receiver and press the "READ TOTAL" button on the control. If either pump handle is "ON" when the "READ TOTAL" key is pressed, the message "ERROR 3" will be displayed, indicating that this feature is not available while a pump handle is "ON". If the handles are off the following display will appear:

000001

Read top and middle display as one number i.e. \$12,345.67

2345.67

Indicates side "A" dollar total

A dL

The bottom display describes the total type as follows:

"A dL" = side A dollars
"A uU" = side A Uncompensated Volume
"A CU" = side A Compensated Volume

If the EL60 is a dual, the above displays can also be shown for side B.

To access different totals simply press the "READ TOTAL" button repeatedly until the desired total is displayed. To end the totalizer read session at any time, press the "ENTER" key.

2.1.1 Reading Totalizers With Security

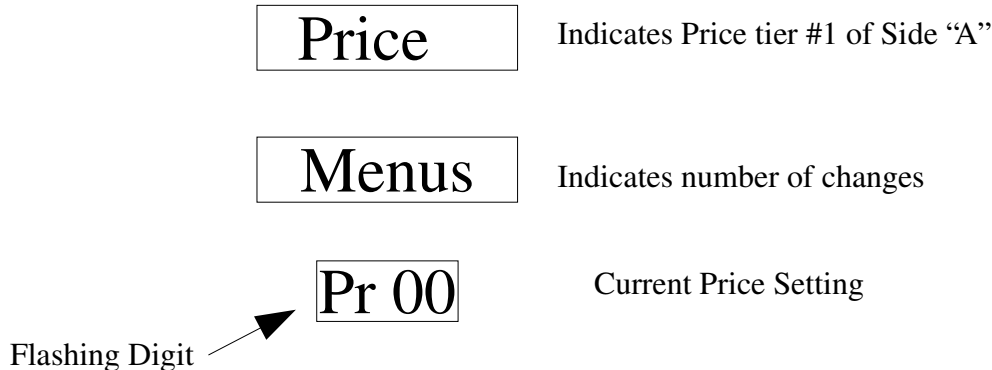
Locate the optical receiver on the EL60. The receiver is located on the display with the green power "ON" indicator light. The "ON" indicator light is located on side A of the pump if it is a dual unit.

Be sure that both pump handles are off, then point the remote control in the direction of the receiver and key in the read totalizer security code provided by the station manager. As each number is entered the display on the pump will show an "o" symbol on the display to indicate that a security code is being received. If you make a mistake in entering the security code press the "ENTER" key to backup and re-enter the code. When the correct code has been entered the read totalizer session will be started.

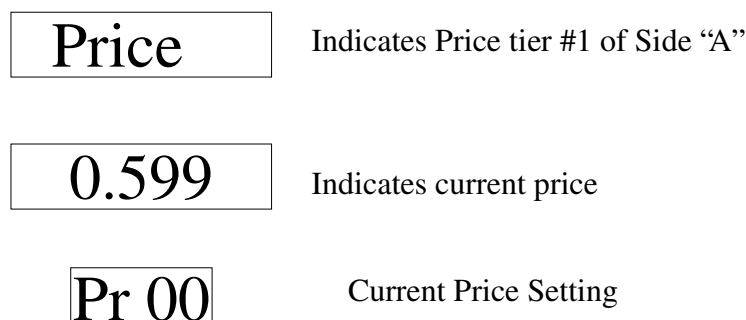
Refer to section 1.3 above for details

2.2 Setting Prices

Be sure that both pump handles are off, then point the remote control in the direction of the receiver and type in the price set security code provided by the station manager. As each number is entered the display on the pump will show aN "o" symbol on the display to indicate that a security code is being received. If you make a mistake in entering the security code press the "ENTER" key to cancel the code, and start entering over again. When the correct code has been entered the following display will appear:



Enter 26 for side A or 36 for side B. The display will now show the following There are two categories available per side.



If the EL60 is a dual the above displays can also be selected for side B. While the display for the desired price change is visible, key in the correct new price.

Press "ENTER" to end the price set session. If you make an error in entering the new price, hit enter and re-enter 26 or 36 to repeat the process.

Every time a new price is entered, after the "ENTER" key is pressed, the price change counter for changed price categories is increased by one. Thus management can keep track of all price changes. Note that you can change the prices as many times as you like while you are in the price set session without increasing the price change count. Only pressing the "ENTER" key AND changing one or more prices causes the counter to increase by one.

3 Inspection Modes

The EL60 has two inspection modes, one for inspecting ATC (Automatic Temperature Compensation) status and one for inspecting the calibration and configuration audit counters. These two inspection modes are required by Weights and Measures. The rest of Section 3 describes these modes in detail

3.1 Displaying ATC

To display ATC status, enter the standard security code of "00". As each number is entered the display on the pump will show an "o" symbol on the display to indicate that a security code is being received. If you make a mistake in entering the "00" code press the "ENTER" key to cancel the code, and start entering over again. When the "00" code has been entered the following display will appear:

020.345	Indicates current gross volume
GAS	Indicates VCF type is GAS
12.1	Shows current tempewrature

Side A information will display on side A displays only and side B information will display on only side B displays

Pressing the 00 causes "SIDE B" and "SIDE A" to be alternately displayed and then normal displays.

3.1.1 The INSPECTION Push Button

The Inspection push button is located on the left side of the side "A" front display. This switch is provided so that the ATC can be inspected without the need of a remote control transmitter. Using this switch the following data can be examined:

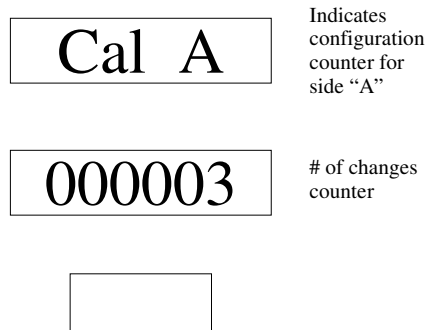
- * Product temperature for side A and B
- * Gross sale volume for side A and B
- * ATC correction factor type for side A and B (gasoline, diesel or appropriate correction table as requested.)

To display inspection data, press the inspection button while the pump is displaying normal sale data. This will cause the software version and revision number to be displayed on the top display and the unit serial number to be displayed on the middle display.

If the button is pressed a second time while the version data is being displayed, the unit will display side "A" ATC data. Each subsequent press of the inspection button will toggle the side being displayed.

3.2 Display Audit Trail

To display the audit counters enter the general or audit security code and press 29 for side A or 39 for side B.



Pressing the "NEXT" key causes the audit category to advance to the next available category. There are three categories available per side:

- Conf A = Side A CONFIGURATION change counter
- CAL A = Side A CALIBRATION change counter
- Price A = Side A PRICE change counters

If the EL60 is a dual, the above displays can also be selected for side B.

Pressing the "NEXT" key causes the four counter values to be displayed one after the other in round robin fashion. Pressing the "ENTER" key ends the audit counter inspection session.

4 Programming and Setup

All programming and setup information stored in the EL60 can be changed by entering new data using the infrared remote control. There are two categories of information:

- 1) General Programming
 General setup features that do not effect meteorological functions of the device.
 For example: the value of the no flow timeout.

- 2) Audited Programming (enabled if DIP switch # 1 is "ON")
 All changes to meteorological parameters, protected by audit counters.
 For example: the calibration factor of the meter.

If DIP switch #1 is in the "OFF/OPEN" position, audited programming using the remote control is disabled and these programming modes can only be accessed using the sealed switch located on the EL60 CPU board. Refer to section 4.2.

The end of section 4.0 contains a short form description of each programming function and the remainder of section 4 describes each function in detail.

Factory Security Codes:

Inspect ATC	Security Code 00
Inspect Audit counters	Security Code 321 or 456
Inspect Totalizers	Security Code 02 (enable "read total key")
Set Price	Security Code 123
General Programming access	Security Code 321
Audited Programming access	Security Code 456

General Programming Modes:

Mode Function

<i>Mode</i>	<i>Parameter</i>	<i>Options</i>
00	Inspection Displays	
01	Set No Flow Time Out	00 -99
02	Set Hose Expansion	00-30
03	Set Price Security Code	Up to 6 digits
04	Set General Security Code	Up to 6 digits
05	Set Audit Security Code	Up to 6 digits
06	Set Totals Security Code	Up to 6 digits
07	Toggle Continuous Display Test	

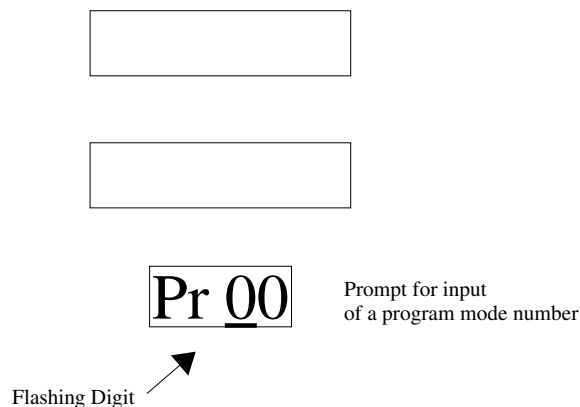
<i>Mode</i>	<i>Parameter</i>	<i>Options</i>
08	Diagnostic Input and Output Monitor	
09	Reset All to Factory Defaults	
10	Set Sale Decimal Points	0 to 6
11	Set Price Decimal Points	0 to 6
12	Tell Version	
14	Setup of Operation Mode	Stand alone,POS,Console
15	Console Pulses Per Unit	1,10,100,1000
16	Console Pulse Width	1,2,4,8,32
17	Set Address	00 - 32
18	Set Hose Count	00 - 55
	<i>SIDE A HOSE ONLY</i>	
20	ATC Function	Off,Gas,Diesel
21	Slow Down Point (Preset)	10 - 990
22	Auto Calibrate	
23	Set Display Mode	Price,Commercial, Bulk
24	Change Pulser Direction	CW,CCW
25	Set Volume Decimal Point	0 -6
26	Set Price	
27	Set Turbine Preset	ON,OFF
28	Adjust Temperature Offset	-0.9 -0.9
29	View Audit Counters Side A	
	<i>SIDE B HOSE ONLY</i>	
30	ATC Function	Off,Gas,Diesel
31	Slow Down Point (Preset)	10 - 990
32	Auto Calibrate	
33	Set Display Mode	Price,Commercial, Bulk
34	Change Pulser Direction	CW,CCW
35	Set Volume Decimal Point	0 -6
36	Set Price	
37	Set Turbine Preset	ON,OFF
38	Adjust Temperature Offset	-0.9 -0.9
39	View Audit Counters Side B	

4.1 Protective Security Codes and Sealing

All programming information is protected from accidental or malicious changes by security codes. All changes that can effect the meteorological accuracy of the devices cause event counters to be incremented so that unauthorized changes can be detected.

4.2 General Programming Access

To enter general programming mode, you must enter the general access security code. This mode allows access to functions 0 to 39 as described in sections 4.1.1 through 4.1.11. The factory set general programming access code is "321". As each number is entered the display will show an "o" symbol to indicate that a security code is being received". If you make a mistake in entering the code press the "ENTER" key to cancel the code, and start entering over again. When the code has been correctly entered the following display will appear:



To select a desired program function simply key in the desired programming code number.

The remainder of section 4.1 describes each of the general programming functions in detail. All functions shown in **bold face type** are the standard factory settings for each function.

4.2.1 No Flow Timeout

Purpose: Allows set up of timer that will stop the pump if no flow is started after a preset time after the pump is turned on.

To Program: Enter general programming function "01", the display will show the current setup as:

no Flo

nn Where "nn" is a number between 0 and 99

seconds

If the number "nn" is set to zero (factory default) the no flow timeout feature is off. The number entered is approximately equal to the number of seconds of time before shut down after reset. The sale must reach at least one full unit before the timeout expires or the pump will stop and the display will flash "NO FLOW".

Key in the desired amount of time before the pump will shut down if no flow is detected. Press "ENTER" when the correct time in seconds is displayed.

4.2.2 Hose Expansion Suppression

Purpose: Allows set up of amount of suppression allowed at start up before any display is registered on the pump.

To Program: Enter audited programming function "02". The display will show the current set up as:

"Supres" on the top display

"nn" on the middle display, where nn is the suppression value in 1000ths of a unit

Key in the desired amount of suppression required in thousandths of a unit. The maximum suppression allowed is 30 thousands of a unit. Press "ENTER" when the correct suppression amount is displayed. This applies only if the decimal is on the 3rd position of the volume display. If used in the bulk mode or lower resolution modes then the suppression amount should be set to '00'

Even though the suppressed value is not shown, it is recorded in the volume dispensed and will display once the amount of suppression is reached.

4.2.3 Setup of Operation Mode

Purpose: Allows set up of stand alone, card lock or console operation to be made.

To Program: Enter general programming function "14". The display will show the current setup as:

"Stand Alone" if the pump is not to be controlled by a card lock or console

"Penny Console" if the pump is controlled by a "hardwired" console or card lock system

"Volume Console" if the pump is controlled by a "hardwired" console or card lock system

"Print Terminal" if the pump is controlled by a serial interface device

"Dnet POS" if the pump is controlled by a KRAUS serial interface console

Press the "NEXT" key to cycle through the available control options, press "ENTER" when the desired option is displayed.

4.2.4 Set Price Security Code

Purpose: Allows set up of a customized security number up to six digits long to allow access to the price setting function.

To Program: Enter general programming function "03", the display will show the current set up as:

"Price SEC/CodE"

The current security code WILL NOT be displayed. If you make a mistake in entering the code press the "ENTER" key and re-enter function "03", to cancel the code, and start entering over again. When the code has been correctly entered, press the "ENTER" key. Note that the security code can be any sequence of numbers desired except for the factory reserved codes of "00" and "01". Therefore codes starting with "00" or "01" are not allowed. Also note that leading zeros in a security code are not allowed. For example if the code "000789" is entered, the access code will not become "789". To set the code "789", key in "789" not "000789".

Once a new code has been entered, you must remember its value or you will not be allowed access to the secured feature.

4.2.5 General Programming Security Code

Purpose: Allows set up of a customized security number up to six digits long to allow access to the general programming function.

To Program: Enter general programming function "04". The display will show the current set up as:

"ProG SEC/CodE"

The current security code WILL NOT be displayed. If you make a mistake in entering the code press the "ENTER" key and reenter function "04". To cancel the code and start entering over again. When the code has been correctly entered, press the "ENTER" key. Note that the security code can be any sequence of numbers desired except for the factory reserved codes of "00" or the same numbers as a different already installed code. Therefore codes starting with "00" or "01" are not allowed. Also note that leading zeros in a security code are not allowed. For example if the code "000789" is entered, the access code will not become "789". To set the code "789", key in "789" not "000789".

****CAUTION****

Once a new code has been entered, you must remember its value or you will not be allowed access to the secured feature.

4.2.6 Totalizer Read Security Code

Purpose: Allows set up of a customized security number up to six digits long to allow access to the totalizer read function.

To Program: Enter general programming function "06". The display will show the current set up as:

"totals SEC/CodE"

The current security code WILL NOT be displayed. If you make a mistake in entering the code press the "ENTER" key and re-enter function "06" to cancel the code, and start entering over again. When the code has been correctly entered, press the "ENTER" key. Note that the security code can be any sequence of numbers desired except for the factory reserved codes of "00" and "01". Therefore codes starting with "00" or "01" are not allowed. Also note that leading zeros in a security code are not allowed. For example if the code "000789" is entered, the access code will not become "789". To set the code "789", key in "789" not "000789". Note that the code "02" is used to DISABLE the totalizer security feature and allow access to the totalizers by pressing the "read total" key WITHOUT A SECURITY CODE.

4.2.7 Continuous Display Test

Purpose: To test display for segments that are not working properly

To Program: Enter general security code and programming function "07". The display will count through the numbers in each display and also the decimal points. This test verifies the functioning of each display element.

4.2.8 Diagnostic Input and Output Monitor

Purpose: To test the control functions of the register.

To Program: Enter general programming code and programming function "08". The display will show status of the various input and output switches.

4.2.9 Display Software Version and Serial Number

Purpose: Allows display of the software and revision level and the display of the "electronic" serial number of the device.

To View: Enter general programming function "12". The display will show the current set up as:

"head"
6 digit software version number

4.2.10 Console/Cardlock Pulses per Unit

Purpose: Allows set up of the number of pulses given to a console or card lock per unit of volume.

To Program: Enter audited programming function "15". The display will show the current set up as:

"1000 PPU" for 1000 pulses per unit of volume.
" 100 PPU" for 100 pulses per unit of volume.
" **10 PPU**" for **10 pulses per unit of volume.**
" 1 PPU" for 1 pulse per unit of volume.

Press the "NEXT" key to cycle through the available pulse per unit options. Press "ENTER" when the desired option is displayed.

4.2.11 Console/Cardlock Pulse Width

Purpose: Allows set up of pulser type when "Penny Console" operating mode is selected.

To Program: Enter general programming function "16". The display will show the current setup as:

"Pulser	1 S" for a pulser with .001 second pulse width
"Pulser	2 S" for a pulser with .002 second pulse width
"Pulser	4 S" for a pulser with .004 second pulse width
"Pulser	8 S" for a pulser with .008 second pulse width
"Pulser	32 S" for a pulser with .032 second pulse width

Press the "NEXT" key to cycle through the available pulse options, press "ENTER" when the desired option is displayed.

4.2.12 Set Pump Address

Purpose: To set the address of the register when in serial communications mode.

To Program: Enter general programming function "17". The display will show the current address. Enter a value between 0 and 24. If the unit is programmed as 00 then the serial communications are turned off.

To program side "B": Set section 18 for the correct number of hoses and Side "B" will be given Side "A" address plus 1, so if Side "A" is 03 then Side "B" will be 04.

4.2.13 Hose Count

Purpose: To set up the register for use with a serial protocol Point of Sale or a console.

To Program: Set number to the number of hoses on pump.

This section should be set to 00 when not in serial communications mode.

4.2.14 Set Display Mode

Purpose: Changes what information is shown on the displays.

In Price mode, top display shows total sale amount, middle shows volume amount, and bottom display shows price per unit of volume.

In Commercial mode, top display shows nothing, middle display shows volume amount and bottom display shows nothing.

In Bulk mode, top display shows gross or uncompensated units, middle display shows compensated or net volume and bottom display shows temperature.

To Program: Enter general programming function "23". Display will show current setting. To change setting, press "SEL" key until required setting is displayed, press "ENTER" key to exit.

Side "B": Enter general programming function "33". Follow instructions for side "A".

4.2.15 Change Pulser Direction

Purpose: Allows the register to be used on meters that have an output shaft that turns clockwise or counter-clockwise.

To Program: Enter general Programming function "24". Display will show current selection. Press sel key to toggle between CW and CCW, press "ENTER" when selection is made.

Side "B": Enter general programming function "34". Follow side "A" in instructions.

4.2.16 Turbine Prestart

Purpose: The motor outputs can be programmed to turn on 2 seconds before the reset cycle finishes to pre-pressurize the piping when submersible pumps are used. This stops leak detector options

from causing an alarm.

To program: Enter general programming function "27". Display will show either "P restart on" or "P restart off". Press the "SEL" key to toggle between on and off. Press "ENTER" when appropriate selection is made.

CAUTION: DO NOT ENABLE THIS OPTION WHEN A SUCTION PUMP IS USED

Side "B": Enter general programming function "37" and follow instructions for side "A"

CAUTION: DO NOT ENABLE THIS OPTION WHEN A SUCTION PUMP IS USED

4.3 Audited Programming Mode

In audited programming mode the operator has full access to all programmable features of the EL60 including the features accessible in the general programming mode. In addition the operator can access features that are sealed by Weights and Measures. These features cause "event counters" or "audit counters" to be updated every time an "audited" feature is changed. The remainder of section 4.2 describes each of these features in detail.

There are two ways of entering the audited programming mode. If you know the security code, and the feature has been enabled, you can enter the mode by remote control by following the procedure described in the next paragraph. If you do not know the code you can enter this mode by pressing the "PROGRAM" button located on the CPU board on the EL6.0 unit. This button can be accessed by opening the case of the Eliminator to expose the switch. This method of access is provided in the event that the audit security code has been lost or if remote control access is disabled by setting DIP switch #2 to the "OFF/OPEN" position.

To enter audited programming mode, you must enter the audited access security code. This mode allows access to functions 0 to 66 as described in sections 4.1.1 through 4.2.9. The factory set audited programming access code is "456". As each number is entered the display on the pump will show an "o" symbol on the display to indicate that a security code is being received. If you make a mistake in entering the code press the "ENTER" key to cancel the code and start entering over again. If the remote control access to the audited program mode has been disabled by setting DIP switch #1 to the "OFF/OPEN" position the unit will ignore all attempts to enter the auditing code. If the remote access is enabled, (DIP switch #1 is "ON") when the code has been correctly entered the following display will appear:

Pr 00

Prompt for input
of a program mode number

Flashing Digit

4.3.1 Set Security Code For Audit

Purpose: Allows set up of a customized security number up to six digits to allow access to the audited programming function.

To Program: Enter general programming function "05", the display will show the current set up as:

"Audit SEC/CodE"

The current security code WILL NOT be displayed. If you make a mistake in entering the code press the "ENTER" key and re-enter function "05" to cancel the code and start entering over again. When the code has been correctly entered press the "ENTER" key. Note that the security code can be any sequence of numbers desired except for the factory reserved codes of "00" and "01". Therefore codes starting with "00" or "01" are not allowed. Also note that leading zeros in a security code are not allowed. For example if the code "000789" is entered, the access code will not become "789". To set the code "789", key in "789" not "000789".

To select a desired program function simply key in the desired programming code number.

4.3.2 Reset all to Factory Defaults

Purpose: Allows reset of all programmable features to factory settings.

To Program: Enter audited programming function "09". This will reset all setup information back to factory settings. Once in this mode, enter the audit security code and hit "ENTER". This will complete the reset and return the unit to normal operating mode. Hit "ENTER" without entering a code and the unit will return to normal operating mode with no changes.

CAUTION: ALL SETTINGS INCLUDING CALIBRATION WILL BE RESET

4.3.3 Set Decimal Points for Sale Amount

Purpose: Sets the decimal position in the sale amount display for the proper currency

To Program: Enter Auditing programming code and section "10". Enter a number between 0 and 6.

This setting applies to both sides if the register is setup as a dual.

4.3.4 Set Decimal Points for Price

Purpose: Sets the decimal position in the price display for the proper currency

To Program: Enter Auditing programming code and section "11", Enter a number between 0 and 4.

This setting applies to both sides if the register is setup as a dual.

4.3.5 Temperature Compensation Setup

Purpose: Allows set up of the type of fuel being dispensed so that the correct volume correction factor can be used for temperature compensation.

To Program Side "A": Enter audited programming function "20". The display will show the current set up as:

"Side A OFF" if ATC is turned off
"Side A GAS" if Gasoline fuel is selected
"Side A DIESEL" if Diesel fuel is selected

Press the "NEXT" key to cycle through the available ATC options. Press "ENTER" when the desired option is displayed.

To Program Side "B": Enter audited programming function "30", and follow the above sequence as for SIDE "A".

4.3.6 Preset Slowdown Point

Purpose: To set the point at which the fast flow solenoid shuts off during a preset sale. The value is based on the last 3 digits in the sale display. This is to compensate for different opening and closing speeds of solenoid valves.

To program: Enter the audit programming function "21". The display will show 'Preset slo' followed by 3 numbers.; The first 2 are changeable. The 3rd is set. The digits can be from 01 – 99, thus setting the slow down point from 10 to 990 units before the preset shutoff point. Press enter after you have entered the appropriate slow down point which works best with the larger fast flow valve.

Side "B": Enter the audited programming function "31" for side "B" operation. Follow with previous instructions.

4.3.7 Automatic Calibration

Purpose: Allows set up of the electronic calibration value needed to correct for small errors in the mechanical calibration of the meter.

To Program Side "A":

1) Dispense a known amount into an approved calibration device. The display may have no relevance to the actual amount dispensed. Ignore the display.

Once the test device is filled, turn off the handle.

Next enter audited programming function "22". Display will prompt to enter the audited programming code again, after a valid code is entered you will be prompted to enter the volume from the test measure. Enter the value as read off the calibration device. Press enter. The EL6.0 will compute the correction factor needed and display it as:

Pulses in main display and the number of pulses

Followed by Cal factor main display and number in the middle.

Unit will return to audit programming mode.

Hit enter to return to dispensing mode.

NOTE: THE NUMBER OF DECIMALS SHOWN ON THE VOLUME DISPLAY HAS TO BE SET BEFORE YOU CALIBRATE.

To Program Side "B":

Calibration is the same as side "A" only enter programming section "32" and complete the steps.

NOTE: THE NUMBER OF DECIMALS SHOWN ON THE VOLUME DISPLAY HAS TO BE SET BEFORE YOU CALIBRATE.

4.3.8 Set Volume Decimal Point

Purpose: Allows setup of display resolution based on the flow rate of the meter that is connected. As the flow rate increases the amount of display resolution shown can be lessened. For example:

Flow rate: 0 – 115 lpm	display 2 decimal position
115 – 500 lpm	display 1 decimal position
500 – 1350 lpm	display 0 decimal position

To Program: Enter audited programming function "25". The display will show the existing setting. Enter a new setting from 0 – 6 and press enter to exit.

For Side B enter function "35". Set as per side "A".

4.3.9 Adjust Temperature Offset

Purpose: Temperature probes may have to be calibrated in the field by trained service personnel. This function allows them to adjust the temperature by up to +/- 0.9 Degrees Celcius.

To Program: SIDE "A"

Enter Audited programming function "29". The display will show the current offset amount if any. The offset can be changed by using the SEL button to scroll through the available settings.

SIDE "B"

Enter programming function "39" and follow the same steps.

4.4 Diagnostics Settings

The EL60 is equipped with a number of functions for the purpose of system trouble shooting. They allow testing of the display and monitoring of all input and output signals to the EL60 processor.

4.4.1 Input/Output

Purpose: Allows display of all processor input and output lines and pulser status.

To Program: Enter programming function "18". This will cause the following display to appear:

Top Display					
Digit	Digit	Digit	Digit	Digit	Digit
1	2	3	4	5	6
AUTH.A	AUTH.B	HANDLE B	HANDLE A	ENC.B	ENC.A

Middle Display					
Digit	Digit	Digit	Digit	Digit	Digit
1	2	3	4	5	6
MOTOR A	MOTOR B	SOLE.N.A	SOLE.N.B	2TIER B	2TIER A

Bottom Display			
Digit	Digit	Digit	Digit
1	2	3	4
ENCODER A	ERRORS	ENCODER B	ERRORS

For the digits:

AUTH. =Authorize input
HANDLE = Handle switch input
MOTOR = Motor output
SOLEN. = Solenoid output
2TIER = Two tier switch input

Each digit shows the state "ON" as a "1" and "OFF" as a "0".

The "ENC" digits show the state of the two shaft encoder channel inputs as "0" to "3" for the four possible states of the encoder input.

The ENCODER ERROR digits show the current number of shaft encoder "errors" that have occurred since the last reset. The pump will shut down if this count reaches 50. An error will occur every time the unit detects a reverse or false pulse. The count will be set "50" if the pulser travels too far in reverse.

While in this mode the state of each input and output line will be displayed as the changes occur. Press "ENTER" to exit this function.

5 DIP Switch and Jumper Settings

The EL60 is equipped with a number of switches and jumpers to further customize the unit to various installations. The jumpers in the explosion proof box determine the function of the communications output wiring. The DIP switch limits the power of the remote control and selects other features that cannot be set by the remote control.

5.1 Jumper Settings In Explosion Proof Housing

The Eliminator has three field settable jumpers inside the explosion proof box (JP4, JP5 and JP1) for selecting console communications. In addition to jumper settings, the EL60 must be software configured. There are two options as shown below:

TO SELECT KRAUS SERIAL COMMUNICATIONS

JP4 *-* * (shunt 1&2)
JP5 * *-* (shunt 2&3)
JP1* * (no shunt installed)
J15 * _* (shunt installed)

J16 *_* (shunt installed)

Wiring:	red	#11	= DCC
	black	#12	= TTP (Serial input to pump)
	yellow	# 1	= TTC (Serial output from pump)

TO SELECT PENNY/VOLUME PULSER

JP4 *-*- (shunt 2&3)
 JP5 *-* * (shunt 1&2)
 JP1 *-* (shunt 1&2)
 J15 * * (shunt removed)
 J16 * * (shunt removed)

Wiring:	red	#11	= Pulser output SIDE A
	black and yellow	#1 and #12	= + 12 V pulser power
	yellow	#13	= Pulser output SIDE B

The factory default jumper setting is PENNY/VOLUME PULSER OUTPUT.

5.2 DIP Switch Settings on Processor Board

The EL60 has a two position DIP switch located on the processor board. The processor board is located inside the plastic housing on the back of the side A front display. This housing can be sealed by Weights and Measures to prevent tampering.

The switch selects the following functions:

Switch #	Description
1	OFF to disable remote entry to audited program features
2	Future use

Once the switch is turned off the entry of the audited security code will do nothing. The display will not acknowledge entry of a valid code

Error Codes And Displays

During data entry or program mode selection, the following error codes may be displayed:

- "Error 1" Indicates selected program step invalid or disabled
- "Error 2" Indicates selected program step number requires Audit security code
- "Error 005" Indicates no product was dispensed before using the automatic calibration feature.

In addition to error codes, the unit may display fault conditions it detects while in normal operation.

Probe OPEN	An ATC temperature probe has failed open
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Probe Short	An ATC temperature probe has failed short
PULSEr Reverse	Pulser reversed or programming is opposite
PULSEr Fault	Pulser has failed
no FLo StoP	The pump has stopped due to a no flow timeout
Combus error	The communications have been disrupted between the control, power supply and the display

The power led indicator on the main display will signal if there are any faults. If it starts flashing, the display has lost contact with the processor unit. This requires power be reset to the EL6.0 to return to normal operating mode.

6 Appendix A

6.1 Notes on Serial communications

Serial communications allow direct control of the register by an external computer or serial console. This allows for remote price change capability and remote totals reading. Control of the register through authorizations and presets whether prepay or postpay. Data integrity is substantially better than manual control and more precision can be allowed over the control and monitoring of the dispensers.

The data that is communicated between the control device and the register is absolute and does not rely on any mechanical switching or control.

6.1.1 Hookup

Programming of the register has to be done in a few different sections to accommodate this mode.

Section 14 has to be set to "Dnet"

Section 17 gets set to the required address of the register in the communications loop.

Section 18 has to be set to the number of hoses in the dispenser.

For example if the dispenser is a single unit then this is set to 01

If the unit is a dual then this number is set to 02

When the number is 02 the unit automatically sets the address for the second side as address side A + 1

Make sure that this is set to 01 for a single as the unit will respond as a dual if not. The next pump will not be able to communicate if there are two or more units with the same address.

Sections 15 and 16 are not needed in this application so the programming in these sections does not matter

Jumpers on the power supply also have to be changed for this mode

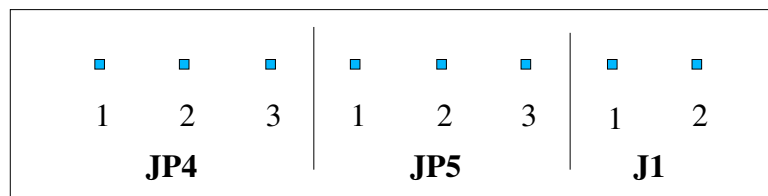
Jumper JP4 has to be put on position 1 and 2

Jumper JP5 has to be put on Position 2 and 3

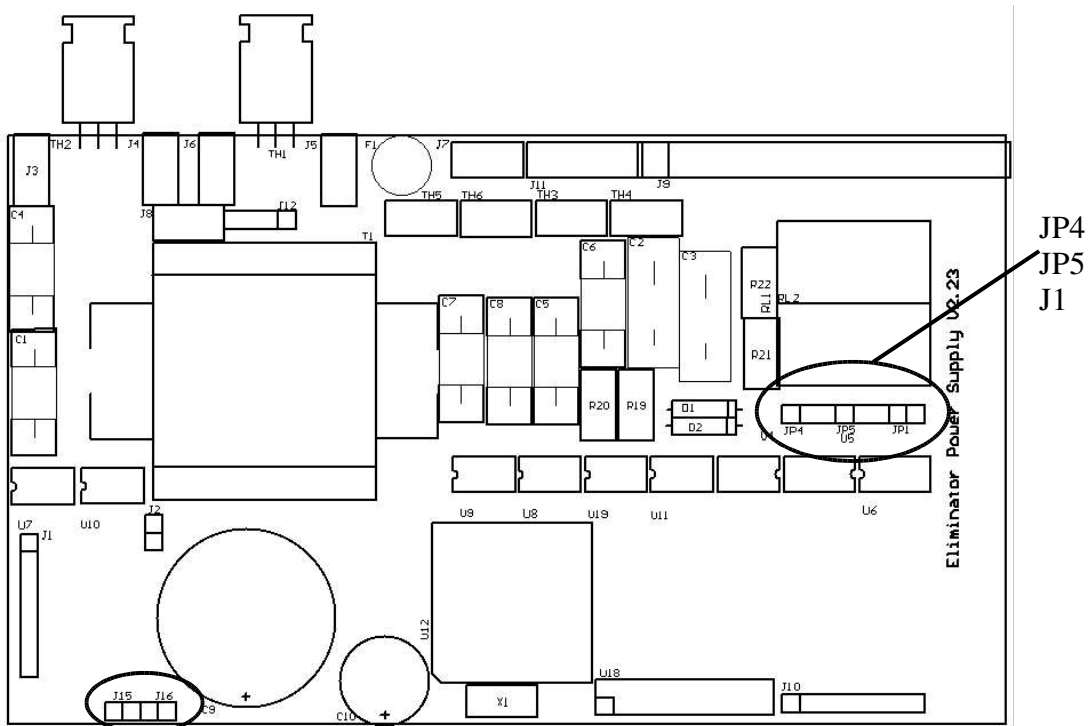
Jumper J1 has to be removed

Jumper J15 has to be put on

Jumper J16 has to be put on



Jumper settings and position



J15 and J16

Power Supply Layout

These jumpers have to be set correctly before any communications will take place.

As well all programming from the computer control or console has to be done before any communications will occur.