

**EQUALIZER MODEL EQ30 PROGRAMMING MANUAL**

**MEASUREMENT TECHNOLOGY  
EQUALIZER MODEL EQ30**

**Retrofit Pump Computer**

**Programming Manual**

**Revision Four January 2000**

# EQUALIZER MODEL EQ30 PROGRAMMING MANUAL

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## 1.0 Description

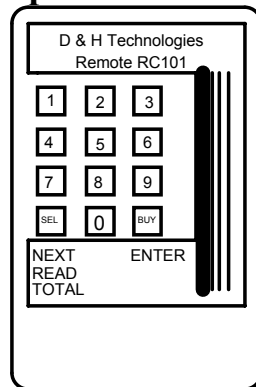
The Equalizer Model EQ30 is an electronic pump computer that has been designed for both OEM and retrofit applications. The device has been designed to be very flexible and it incorporates many advanced programmable features. This manual has been written to explain the operation of all of the features available on the EQ30.

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 Equalizer EQ30 boasts the following main features:

- \* Built-in ATC (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 low cost 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
- \* Supports SoftTop expansion options, allowing field upgrade for new expanded features by entering a custom "turn on code".
- \* Intrinsically safe design
- \* No standby battery needed, but retains totals and set up data for 20 years without power

## 2.0 Day To Day Operation



*Figure 1 Equalizer Remote Control*

Day to day operation of the EQ30 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.

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## 2.1 Reading Totalizers Without Security

Locate the optical receiver on the EQ30. 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**

*Figure 2 Totalizer Display*

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 EQ30 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.

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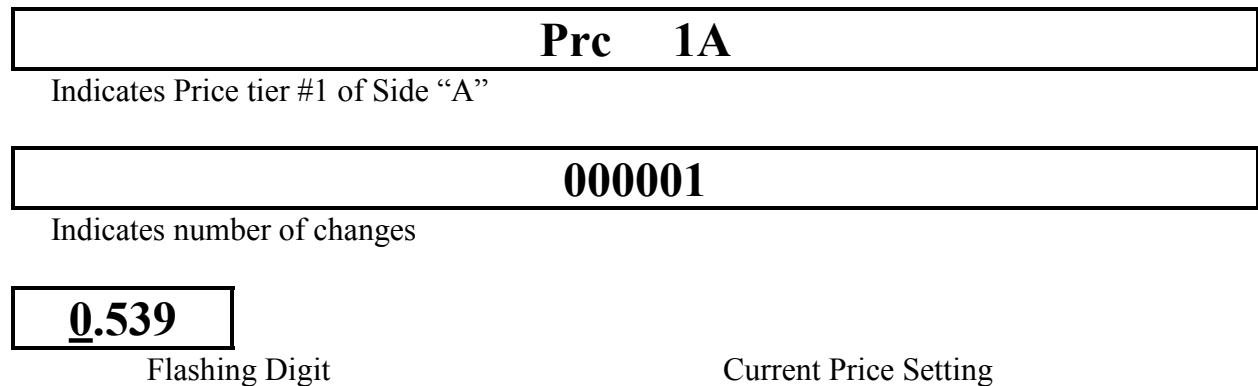
## 2.1.1 Reading Totalizers With Security

Locate the optical receiver on the EQ30. 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 cancel the code, and start entering over again. When the correct code has been entered the read totalizer session will be started. Refer to section 2.1 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 a "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:



*Figure 3 Price Set Display*

Pressing the "NEXT" key causes the price category to advance to the next available category. There are two categories available per side.

- Prc 1A = Side A normal (credit) price
- Prc 2A = Side A cash (discount) price (if two tier option enabled)

If the EQ30 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.

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## 2.2 Setting Prices (continued)

Then hit "NEXT" to advance to the next price category or press "ENTER" to end the price set session. If you make an error in entering the new price, press the "0" key until the cursor wraps around back to the first digit, then reenter the corrected price.

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 with out increasing the price change count. Only pressing the "ENTER" key AND changing one or more prices causes the counter to increase by one.

## 3.0 Inspection Modes

The EQ30 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 Status

To display ATC status, enter the standard security code of "00". As each number is entered the display on the pump will show a "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:

Indicates Side "A" is being viewed	<b>Side A</b>	after 2 seconds	<b>020.345</b>
			Current gross volume
	<b>-03.6 oC</b>		Indicates Product temperature
	<b>GAS</b>		Indicates VCF type is gasoline

*Figure 4 ATC Inspection Display*

For the first second after the code is entered, "SIDE A" is displayed on the display. Then the current probe temperature is displayed as shown above along with the current sale uncompensated volume and the fuel type.

Pressing the "NEXT" key causes "SIDE B" and "SIDE A" to be alternately displayed, Pressing the "ENTER" key ends the ATC inspection session.





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## 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:

- \* Software version, revision and serial number
- \* 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 propane)

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 held down or pressed a second time while the version data is being displayed, the unit will display side "A" ATC data. For the first .5 seconds of side "A" ATC display, the top display shows the side ID (side A), the middle display shows the gross volume, and the bottom display shows the fuel type. After .5 seconds the side ID, on the top display, is replaced by the side temperature data. If the inspection button is held down or pressed while the side temperature data is displayed, the opposite side data will be displayed.

Each subsequent press of the inspection button will toggle the side being displayed. If the side A or B data is allowed to be displayed for more than 3 seconds ( ie. the inspection button is released for more than 3 seconds) the next press of the inspection button will cause the inspection mode to be exited.

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## 3.2 Display Audit Trail

To display the audit counters enter the standard security code of "01". As each number is entered the display on the pump will show a "o" symbol on the display to indicate that a security code is being received. If you make a mistake in entering the "01" code press "ENTER" key to cancel the code, and start entering over again. When the "01" code has been entered the following display will appear:

<b>Conf A</b>	<b>CAL A</b>
Indicates configuration counter for side "A"	Indicates calibration counter for side "A"
<b>000003</b>	<b>000004</b>
# of changes counter	# of changes counter

*Figure 5 Audit Counter Inspection Display*

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

Conf A = Side A CONFIGURATION change counter  
CAL A = Side A CALIBRATION change counter

If the EQ30 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.

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## 4.0 Programming and Setup

All programming and setup information stored in the EQ30 can be changed by entering new data using the infrared remote control. There are three 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 # 2 is "ON")

All changes to meteorological parameters, protected by audit counters. For example the calibration factor of the meter.

3) Diagnostic Mode

Used to aid service personnel by providing internal readings etc.

If DIP switch #2 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 EQ30 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 01
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

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## General Programming Modes:

Mode	Function
0	Exit program mode
1	Set number of price tiers (one/two tier)
2	Set operating Mode (stand alone, Card Lock(s), Console(s))
3	Set pulse minimum period
4	Set pump link address
5	Set no flow timeout
6	Set delivery volume limit
7	Set delivery dollar limit
8	Set price set security code
9	Set general programming security code
10	Set audited programming security code
11	Set totalizer read security code
12	Set shaft encoder rotation direction
13	Set up leak detector option
14	Set Turbine Prestart Option (on/off)
18	Diagnostic Input and Output Monitor
19	Display software version and serial number

## Compressed Natural Gas (CNG) Functions:

20-29 Reserved

## Diagnostic Functions:

30	Reserved
31	Toggle Simulation Mode (On/Off)
32	Toggle Continuous Display Test

## Audited Side A Functions:

40	(audited) Set ATC Product Type (gas/diesel/propane/off)
41	(audited Calibration Event) Set Meter Calibration
42	(audited Calibration Event) Automatic Meter Calibration

## Audited Side B Functions:

50	(audited) Set ATC Product Type
51	(audited Calibration Event) Set Meter Calibration
52	(audited Calibration Event) Automatic Meter Calibration

## Audited Programming Functions:

60	(audited A+B) Set Rotations Per Unit (1,2,4)
61	(audited A+B) Set Hose Expansion Suppression
62	(audited A+B) Set Pulses per Unit
63	(audited A+B) Set Decimal Points
64	(audited A+B) Set ATC Country (US/CANADA)
65	(audited B) Set Unit Mode (Single/Twin 1 Product/Twin 2 Product/CNG)
66	(audited A+B) Reset all parameters to factory defaults.

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## 4.0.1 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.

## 4.1 General Programming Mode

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 a "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:

<b>Pr 00</b>	
Flashing Digit	Prompt for input of a program mode number

*Figure 6 General Program Mode Display*

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.

### 4.1.1 Number of Price Tiers and Non Compute Mode

*Purpose:* Allows one price, no price, or cash/credit pricing to be used

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

**"Single Price" if one price mode is enabled**  
"2 Tier Price" if cash/credit price mode is enabled  
"non Price" if non compute mode is enabled

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

In order to use the two tier price feature the EQ30 must be equipped with optional two tier price switches. This option is available as a special order at extra cost. In non compute mode, the sale price and total \$ sale displays are blanked out.

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## 4.1.2 Operating Mode

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

*To Program:* Enter general programming function "02", 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  
"Gil Console" if the pump is controlled by a GILBARCO serial interface console  
"Tok Console" if the pump is controlled by a TOKHEIM serial interface console  
"Kra Console" if the pump is controlled by a KRAUS serial interface console  
"dant Console" if the pump is controlled by a DANTRONIX serial interface console  
"PrnConsole" if the pump is connected to a printer or dumb terminal

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

## 4.1.3 Console Pulser Setup

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

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

"PennY .008 s" for a penny pulser with .008 second pulse width  
"PennY .004 S" for a penny pulser with .004 second pulse width  
"PennY .002 S" for a penny pulser with .002 second pulse width  
"PennY .001 S" for a penny pulser with .001 second pulse width  
"Vol .128 S" for a volume pulser with .128 second pulse width  
"Vol .032 S" for a volume pulser with .032 second pulse width  
**"Vol .008 S" for a volume pulser with .008 second pulse width**  
"Vol .004 S" for a volume pulser with .004 second pulse width  
"Vol .002 S" for a volume pulser with .002 second pulse width  
"Vol .001 S" for a volume pulser with .001 second pulse width

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

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## 4.1.4 Communication Link Address

*Purpose:* Allows set up of pump address for serial console type communications

*To Program:* Enter general programming function "04", the display will show the current setup as:

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

If a value of "00" is entered the pump will be taken "off line". Any other number will be the pumps address on the serial communications line. In the event that the pump is a two hose unit the EQ30 will appear as two devices on the line, Side "A" will be the ID of the value entered while side "B" will be the ID of the value entered plus one. For example, if the entered number was "03", then side "A" will become pump "3" and side "B" will become pump "4".

Key in the desired pump number. Press "ENTER" when the correct number is displayed.

## 4.1.5 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 "05", 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 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 suppression amount is displayed.

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## 4.1.6 Sale Volume Limit

*Purpose:* Allows set up of volume that will stop the pump anytime the preset volume limit is reached on a single sale. The factory default setting is 999.000 units.

*To Program:* Enter general programming function "06", the display will show the current setup as:

VL Stop  
000.000

The current volume limit is not displayed, instead it is set to zeros. Key in the desired amount of volume you wish the EQUALIZER to stop at. The maximum volume allowed is 999.000 units. Press "ENTER" when the correct volume limit amount is displayed.

## 4.1.7 Sale Dollar Limit

*Purpose:* Allows set up of dollar amount that will stop the pump anytime the preset dollar limit is reached on as single sale. The factory default setting is \$999.00.

*To Program:* Enter general programming function "07", the display will show the current setup as:

dL Stop  
0000.00

The current dollar limit is not displayed, instead it is set to zeros. Key in the desired amount of sale dollar amount you wish the EQUALIZER to stop at. The maximum sale allowed is \$999.00. Press "ENTER" when the correct dollar limit is displayed.



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## 4.1.8 Price Set 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 "08", the display will show the current set up as:

"Price SEC/CodE"

The current security code WILL NOT be displayed. If you key in a new code, 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 and re-enter function "08", 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".

**\*\*\*\*CAUTION\*\*\*\***

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



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## 4.1.9 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 "09", the display will show the current set up as:

"ProG SEC/CodE"

The current security code WILL NOT be displayed. If you key in a new code, as each number is entered the display on the pump will show a "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 and reenter function "08", 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".

**\*\*\*\*CAUTION\*\*\*\***

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

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## 4.1.10 Audited Programming Security Code

*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 "09", the display will show the current set up as:

"Audit SEC/CodE"

The current security code WILL NOT be displayed. If you key in a new code, 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 and reenter function "08", 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".

**\*\*\*\*CAUTION\*\*\*\***

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

## 4.1.11 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 "11", the display will show the current set up as:

"totals SEC/CodE"

The current security code WILL NOT be displayed. If you key in a new code, as each number is entered the display on the pump will show a "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 and reenter function "11", 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.

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### 4.1.12 Set Shaft Encoder Direction

*Purpose:* Allows set up of EQ30 for pump meters that turn clockwise or counter clockwise

*To Program:* Enter general programming function "12", the display will show the current setup as:

**"Enc.dr ccl" shaft encoder turns counter clockwise**

" Enc.dr cl" shaft encoder turns clockwise

Press the "NEXT" key to select "cl" or "ccl", press "ENTER" when the desired option is displayed.

"Clockwise" shaft encoder direction means that the encoder turns in a clockwise direction when viewed looking at the encoder with the base of the EQ30 facing you.

### 4.1.13 Enable Leak Dectector Option

*Purpose:* Allows the EQUALIZER to be equipped with a fuel leak detector cable that will automatically shut off the pump and display a leak fault message if a fuel leak occurs.

*To Program:* Enter general programming function "13", the display will show the current set up as:

**"SPILL OFF" if the leak detector option is OFF**

"SPILL ON" if the leak detector option is enabled

Press the "NEXT" key to cycle through the ON/OFF options, press "ENTER" when the desired option setting is displayed.

### 4.1.14 Set Turbine Prestart Option Mode

*Purpose:* Allows the EQUALIZER to start the pump before the solenoid valve opens so that the line becomes pressurized. This option may be required if the EQUALIZER is installed in a dispenser with a submersible pump to prevent false leak detector operation.

**\*\*\*\*CAUTION\*\*\*\***

**DO NOT ENABLE THIS OPTION ON A SUCTION PUMP**

*To Program:* Enter general programming function "14", the display will show the current set up as:

**"PrEStArt OFF" if the option is OFF**

"PrEStArt ON" if the option is enabled

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Press the "NEXT" key to cycle through the ON/OFF options, press "ENTER" when the desired option setting is displayed.

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### **4.1.15 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 "19", the display will show the current set up as:

"Ver.1.00" on the top display to indicate version 1 revision 00

"nnnnnn" on the middle display where "nnnnnn" is a unique six digit serial number

### **4.2 Audited Programming Mode**

In audited programming mode, the operator has full access to all programmable features of the EQ30 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 EQUALIZER unit. This button can be accessed by opening the case of the equalizer 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 a "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 #2 to the OFF/OPEN" position, when the correct security code has been entered, an error #1 message will be displayed. If the remote access is enabled, (DIP switch #2 is "ON") when the code has been correctly entered the following display will appear:

Flashing digit

**Pr 00**

Prompt for input of a program mode number

*Figure 7 Audited Program Mode Display*

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

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### **4.2.1 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 "40", 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  
"Side A Prop." if Propane 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 "50", and follow the above sequence as for SIDE "A".

### **4.2.2 Meter 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":* Enter audited programming function "41", the display will show the current setup as:

"CAL A nnnn" where nnnn is the current calibration constant

Press the "1" to start a "FAST FORWARD" advance of the calibration value. The value will increment through the full positive range of + 12.75%, then go negative to - 12.75% and it will continue to cycle at high speed. When the displayed value is close to the required value press the "2" key to enter "SLOW FORWARD" mode. The display will now advance slowly. Press the "3" key to stop the sequence. With the advance stopped, pressing the "3" will advance the count one increment for each press of the key. When the exact calibration value required is displayed, press the "ENTER" key.

*To Program Side "B":* Enter audited programming function "51", and follow the above sequence as for SIDE "A".

**Note:** *When in this mode, pressing the #4 key will reset the factor to zero.*

## EQUALIZER MODEL EQ30 PROGRAMMING MANUAL

### 4.2.2.1 Automatic Calibration

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

*To Program Side "A":*

- 1) Using mode "41" (51 for side B) reset the calibration factor to "0000"
- 2) Dispense exactly 20.000 liters into a test can the display may show more or less than 20.000 liters.
- 3) Now enter audited programming function "42", the EQ30 will compute the correction factor needed and display it as:

"CAL A nnnn" where nnnn is the new calibration constant

The new calibration factor will be automatically entered when the "ENTER" key is pressed. There are two possible error messages during automatic calibration. "Error 5" will be displayed if the calibration factor was not set to "0000" when the auto-calibrate mode was started. "Error 6" will be displayed if the meter is too far out of calibration for the auto-calibrate function to work. The displayed value must be within +/- 12.75 of 20.000 liters for the function to work.

*To Program Side "B":* Enter audited programming function "52", and follow the above sequence as for SIDE "A".

### 4.2.3 Meter Rotations per Unit

*Purpose:* Allows set up of meter type and encoder type used in the pump

*To Program:* Enter audited programming function "60", the display will show the current set up as:

- "512Pt 4 turn" 512 edge per turn encoder, meter turns 4 turns per unit.**
- "512Pt 2 turn" 512 edge per turn encoder, meter turns 2 turns per unit.
- "512Pt 1 turn" 512 edge per turn encoder, meter turns 1 turns per unit.
- "500Pt 4 turn" 500 edge per turn encoder, meter turns 4 turns per unit.
- "500Pt 2 turn" 500 edge per turn encoder, meter turns 2 turns per unit.
- "500Pt 1 turn" 500 edge per turn encoder, meter turns 1 turns per unit.
- "GAL Lt4 turn" Imperial gallons to liters, 512 edge encoder, 4 turns.
- "USG Lt4 turn" US gallons to liters, 512 edge encoder, 4 turns.
- "Cust. turn" If a custom pulser is being used (consult factory)

Press the "NEXT" key to cycle through the available encoder/meter options, press "ENTER" when the desired option is displayed. If the "cust. turn" option is selected the memory in the

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EQ30 must be ordered with a customized calibration factor. Custom calibration factors can be programmed into the unit at a nominal charge per unit.

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### **4.2.4 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 "61", 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.

### **4.2.5 Console/Card Lock Pulser Output**

*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 "62", 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.

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## 4.2.6 Display Decimal Places

*Purpose:* Allows set up of the number of decimal places used in the sale dollar, volume and price per unit display.

*To Program:* Enter audited programming function "63", the display will show the current set up as:

"Cur dP n" where "n" is the # of digits to the left of the decimal point on the Currency  
"Vol dP n" where "n" is the # of digits to the left of the decimal point on the Volume  
"PPU dP n" where "n" is the # of digits to the left of the decimal point on the Price

The factory default decimal placement is:

nnnn.nn	currency decimal point	= 4
nnn.nnn	volume decimal point	= 3
n.nnn	price per unit decimal point	= 1

Use the number keys to enter the new number of digits desired to the left of the decimal point. Press the "NEXT" key to advance to the volume decimal place selection, press "ENTER" when the desired settings have been made.

## 4.2.7 Temperature Compensation Country Selection

*Purpose:* Allows set up of the correct set of tables for temperature compensation in CANADA or the USA.

*To Program:* Enter audited programming function "64", the display will show the current setup as:

OPTION NOT AVAILABLE AS OF THIS PRINTING, TABLES ARE FOR CANADA ONLY

## 4.2.8 Setup of Unit Mode

*Purpose:* Allows set up of the number of hoses and products on the pump.

*To Program:* Enter audited programming function "65", the display will show the current set up as:

"2 hoSE 2 Prod" for 2 hoses and 2 products  
"2 hoSE 1 Prod" for 2 hoses and 1 product  
**"1 hoSE 1 Prod" for 1 hose and 1 product**

Press the "NEXT" key to cycle through the available number of hoses and products options, press "ENTER" when the desired option is displayed.

Note that unless the EQ30 was purchased as a two hose unit, the two hose selection options can not be used.

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### 4.2.9 Reset All To Factory Defaults

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

*To Program:* Enter audited programming function "66". This will clear all set up information back to factory settings.

### 4.3 Diagnostics Functions

The EQ30 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 EQ30 processor.

#### 4.3.1 Input/Output Monitor

*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
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### 4.3.1 Input/Output Monitor (continued)

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 dynamically displayed. Press "ENTER" to exit this function.

### 4.3.2 Sale Simulation

*Purpose:* Allows simulation of sale for demonstration purposes.

*To Program:* Enter general programming function "31", the unit will toggle into or out of simulation mode. To toggle simulation mode the displayed sale amount must be zeroed. Simulated sales are not added to the totalizers.

### 4.3.3 Display Test

*Purpose:* Allows exercise of all display segments so that bad or shorted segments on the display can be found.

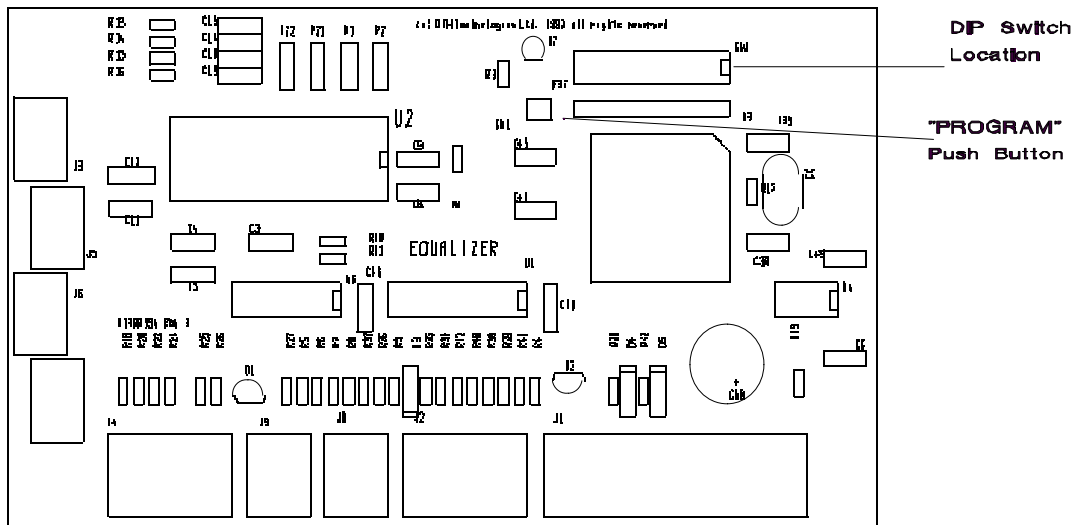
*To Program:* Enter general programming function "32", the unit display incrementing numbers on every digit of the display. Press "ENTER" to exit this function. Press any other key to toggle continuous or freeze cycle.

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## 5.0 DIP Switch and Jumper Settings

The EQ30 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 can not be set by the remote control.

EQUALIZER CPU BOARD



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## 5.1 Jumper Settings In Explosion Proof Housing

The equalizer has three field settable jumpers inside the explosion proof box (JP4, JP5 and JP1) for selecting console communications. In addition to jumper settings, the EQ30 must be software configured. There are three options as shown below:

### TO SELECT KRAUS SERIAL COMMUNICATIONS

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

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

### TO SELECT PENNY/VOLUME PULSER

JP4 \*-\* \* (shunt 2&3)  
JP5 \*-\* \* (shunt 1&2)  
JP1 \*-\* \* (shunt 1&2)

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

### TO SELECT GILBARCO/TOKHEIM or DANTRONIX CURRENT LOOP

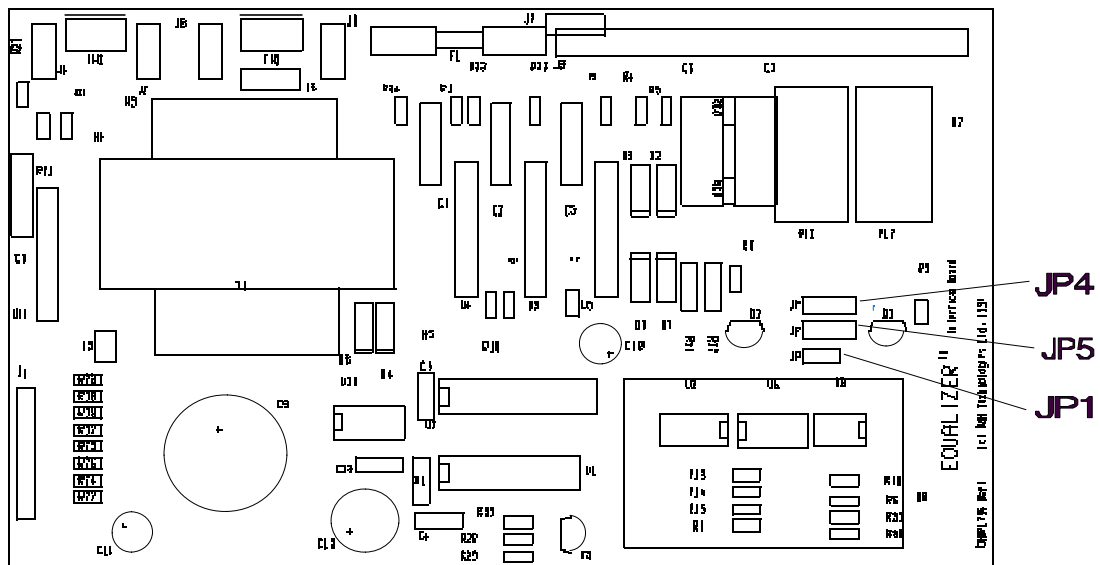
JP4 \* \* \* (no shunt installed)  
JP5 \*-\* \* (shunt 1&2)  
JP1 \* \* (no shunt installed)

Wiring:       #11 = Loop (-)  
              #12 = Loop (+)  
              #13 = Not used

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

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## Interface/Power Supply Board



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## 5.2 DIP Switch Settings on Processor Board

The EQ30 has a ten 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	Factory inspect switch (leave OFF/OPEN)
2	OFF to disable remote entry to audited program features
3	OFF if PIONEER CONTROL, ON if D&H REMOTE CONTROL
4-8	Not used (leave OFF/OPEN)
9-10	Factory test of 2nd Tier function (leave OFF/OPEN)

## 6.0 Feature Upgrade using SoftTop

OPTION NOT AVAILABLE AS OF THIS PRINTING

## 7.0 Batch Communications using EqualTalk Option

OPTION NOT AVAILABLE AS OF THIS PRINTING

## 8.0 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 3" Indicates requested feature not available with pump handle "ON"
- "Error 4" Can not run simulation with sale outstanding
- "Error 5" Can not run autocalibration with calibration factor not initially set to "0000"
- "Error 6" Can not calibrate, new calibration factor is greater than +/- 12.75%

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
Probe Short	An ATC temperature probe has failed short
PULSEr Erro	Pulser has failed
no FLo StoP	The pump has stopped due to a no flow timeout
Adc FAIL	The hardware on the unit has failed
Spill Stop	The pump has stopped due to a leak being detected
Spill FAULT	The leak detector cable has failed or is disconnected
FAULt nn	The unit has failed, "nn" is a reporting code

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