INTRODUCTION / DESCRIPTION

This manual describes the installation of Durant models 5770X-48X. It is the duty of any good instruction manual to describe the product itself, and this is especially true for the Eclipse. This unit is extremely versatile, and a good understanding of what it can do will be immensely helpful to the installer in figuring out how to use it. Following the description, the installation section gives information about mounting, wiring and programming. An operator section of the manual follows installation. This manual ends with a lively discussion of diagnostics, and specifications.

The installer's intuition and counter experience will be definite advantages when dealing with the Eclipse; however, even experienced control electricians will find that this unit offers some interesting variations from "normal" counter functionality. For application specific assistance with any Durant counter, contact the Durant Applications Engineering Department at 800-540-9242 (U.S. and Canada) or 920-261-4070, or by FAX at 920-261-9079.

Description

Base Unit

The Eclipse base unit comes in two flavors: totalizer and count control. The totalizer has a six digit display. The display can be scaled to divide totalizer counts by 1, by 10, or by 100, which effectively converts the total to 6, 7, or 8 digits respectively. Depending upon the count input device(s) and programming, the totalizer can count up, or down, or both directions. If the display counts up to 999,999, the next count will cause it to roll over to zero, like the odometer in a car. If the display counts down to zero, the next count in will cause a rollunder to either 999,999, or to -1, depending upon how it is programmed. If the display continues to count down to -99,999, any further "negative" counts will be lost.

Another function of the totalizer base unit is to display rate. The ratemeter looks at how fast the pulses are coming in to the A count input (frequency), and calculates a rate to be displayed to the operator. For instance, if the totalizer is counting in inches, the ratemeter could display material speed in inches per second or feet per minute. If the totalizer is counting in gallons, the ratemeter could display flow rate in gallons per minute, etc. The ratemeter updates every one second plus the time it takes until the next pulse comes into the A input. If the pulse frequency slows to one or less every nine (9) seconds, the rate display goes to zero. Up to five digits may be displayed on the rate screen. If the Eclipse is set up in a quadrature count mode, a negative sign will appear on the rate display when the totalizer is counting down. The ratemeter can be programmed to not appear on the display for the operator.

The base unit also has three (3) control inputs that are programmable to either reset or program lockout. It is highly recommended to program one of them as a lockout and then activate it via a jumper to ground. Finally, the front panel keypad can be programmed to reset the total count.

DESCRIPTION cont.

The count control base unit has all the features of the totalizer plus some additional goodies. There are three count registers in the control: the main counter, the totalizer, and the batch counter. The main counter is six digits, bi-directional, and has two presets. It can be programmed to roll under either to 999,999, or to -1. The presets cannot be set to a negative number, and should not be set to the same number. The control houses two relays that are programmable by the installer to respond to any combination of presets and two control signals. The totalizer operates the same way as the stand alone totalizer version of the Eclipse, except that it can be hidden from the operator. The batch counter counts the number of batches (count cycles) of the main counter. The batch counter is six digits, has one preset, and counts up only. The batch counter and the ratemeter can also be hidden from the operator.

The base unit has three control inputs imaginatively named Input 1, Input 2, and Input 3. Each input is programmable to perform a specific function when electrically activated. There are ten possible functions to choose from, including reset, unlatch outputs, and program lockout. The front panel keypad also has a programmable reset capability. It is highly recommended that one of the control inputs be programmed to one of the lockout functions and then activated via a jumper wire to ground. Inadvertent operator entry into the program mode is the ultimate in operator confusion and installer frustration.

Much of the previously mentioned versatility of the Eclipse count control is due to the flexibility of the output relays. The unit contains two relays, each with one set of form C (normally open and normally closed) contacts. Each relay may be individually programmed, and because of the number of possibilities, the installer must think through relay behavior very carefully. First of all, relays can be programmed to either normal or reverse operation. Reverse operation is common in fluid batching applications, and as a typical feature of microprocessor-based counters, is usually well understood. However, the Eclipse allows the installer to select at which event(s) the relay will pick up and at which event(s) the relay will drop out. This means that the Eclipse relays will almost always be used in normal operation, even to do applications that previously required reversed relays. The installer will appreciate not having to deal with reverse (ON really means OFF) logic when programming the relays. The remainder of this description of relay operation will assume the relays are programmed for normal operation.

There are five events that can cause each relay to pick up (turn ON), or drop out (turn OFF). They are the two main counter presets (P1 and P2), the batch counter preset (Pb), a main counter reset either from the front panel or the control inputs, and the unlatch control input. A relay can pick up or drop out at any combination of these events. There are three modes of operation for the relays: pulsed, latched and follows. In pulsed mode, the installer programs one or more pick up events and a timeout. The relay turns ON at a pick up event, remains ON for the timeout period, and then turns OFF. In latched mode, the installer programs one or more pick up events and one or more drop out events. The relay turns ON at a pick up event and turns OFF at a drop out event. In follows mode, the installer selects either follows low or follows high and then assigns the relay to follow either P1 or P2. A follows low

relay turns ON when the main count is less than or equal to the assigned preset and turns OFF when the count is greater than the preset. A follows high relay turns ON when the main count is greater than or equal to the assigned preset and turns OFF when the count is less than the preset. The comparison is made each time a count pulse is entered, and when the main counter is reset. A comparison and output update can also be made at power up if the unit is programmed to do so. Reverse mode of operation is not available if the output is programmed to follows mode.

Analog Output Option Board

If the optional analog output board is installed in the Eclipse, the base unit will detect it and allow programming for the output assignment and range. In either base unit, the output can be programmed to follow the total count or the rate.

If the analog output is installed in a count control base unit, it may also be programmed to follow the main count or batch count. The output board has a 0-10V and a 4-20 mA output; however it is expected that the installer will use one or the other. Both outputs follow the assigned count or rate and both go from minimum value (0V and 4 mA) to maximum value (10V and 20 mA) over the same count or rate range.

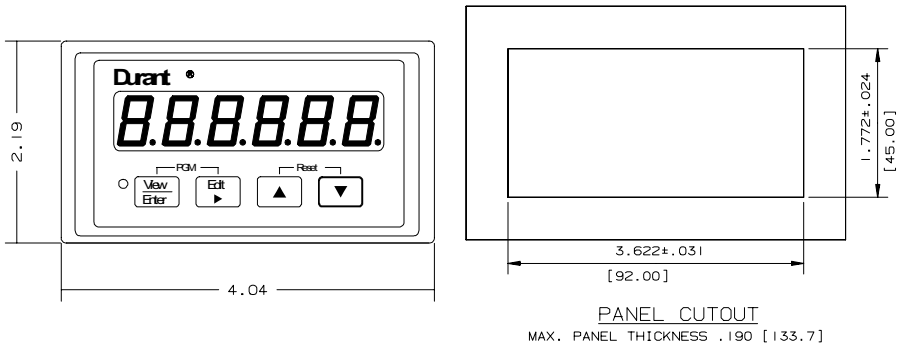
RS 485 Serial Communications Option Board

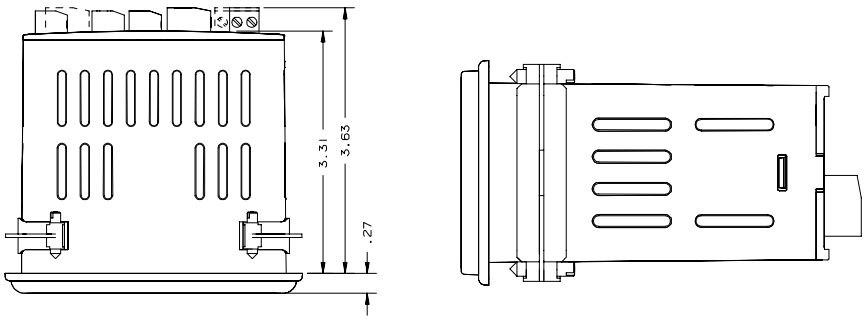
The optional RS 485 serial communication board allows a host device to download and read function code programming selections and to read status information such as count, rate, and preset values.

This manual does not contain information on the serial communication protocol or the serial command list. That information is contained in the 57700 serial specification and is obtainable by contacting the Durant Literature Department at 800-540-9242 (U.S. and Canada), or 920-261-4070, or by FAX at 920-261-9097.

MOUNTING

Mounting





Mounting clips and screws shown in installed positions.

Mounting Instructions

1. Slide mounting gasket (not shown) over unit body until adhesive surface makes contact with the front bezel.

2. Slide unit into cutout in panel.

3. Attach mounting clips and screws.

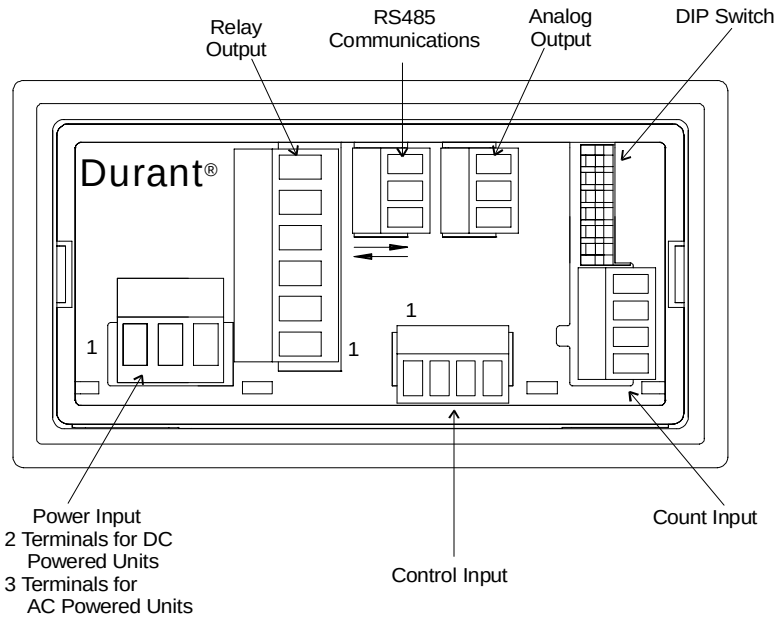
4. Tighten screws until unit is firmly in place. DO NOT OVERTIGHTEN screws to the point of squeezing the gasket out from behind the bezel.

WIRING AND DIP SWITCHES

All wiring to the counter is done to rear terminal, de-pluggable connectors. Up to six headers accept the wired connectors on the counter. All units have at least three headers, power input, count input and control input. The relay output header is installed in the count control base unit. Any combination of two additional circuit boards with headers may be installed. These option boards are RS 485 serial communications and analog output. The option boards occupy specific locations in the counter and are not interchangeable. All boards are keyed to prevent installation in the wrong location.

Disconnect all power before wiring terminals. A safety hazard exists if this precaution is not observed. Treat all control and count inputs as hazardous since they may carry line voltage.

Rear Terminal Layout



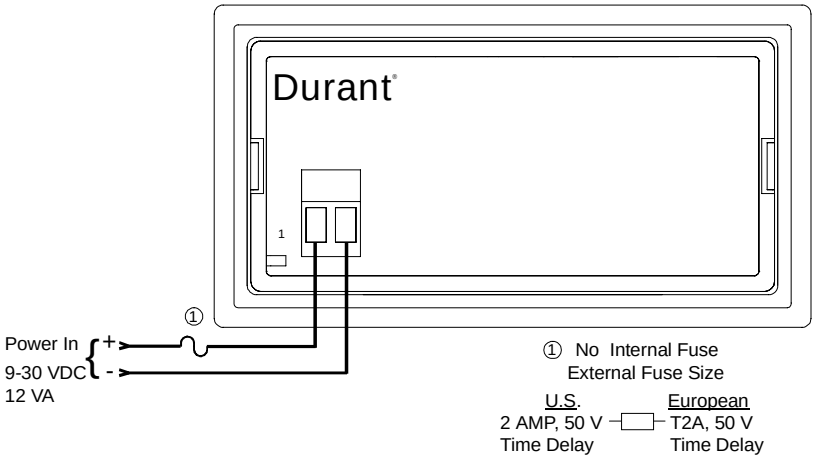
Terminal Connector Ratings

AC or DC Power Input / Relay Output: 10A, 250VAC;
Wire size: 12-24AWG (3.1mm^2 - 0.24mm^2), 600V.
RS485 / Analog Output / Count Input / Control Input: 8A, 125VAC;
Wire size: 16-28AWG (1.3mm^2 - 0.1mm^2), 300V.

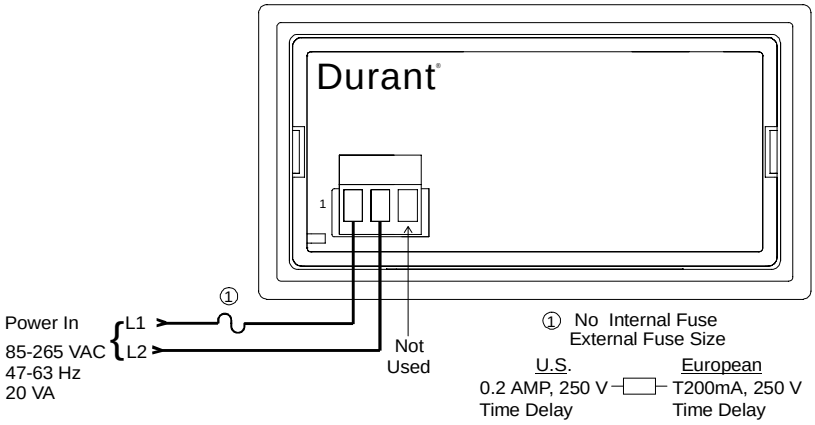
WIRING cont.

Wiring and DIP Switches

DC Power Input (for DC powered models 57700-48X)

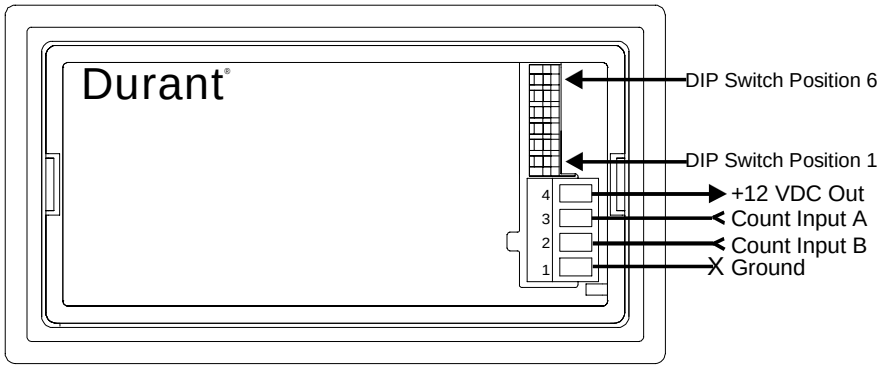


AC Power Input (for AC powered models 57701-48X)



WIRING cont.

Count Input



Sensor Power Out

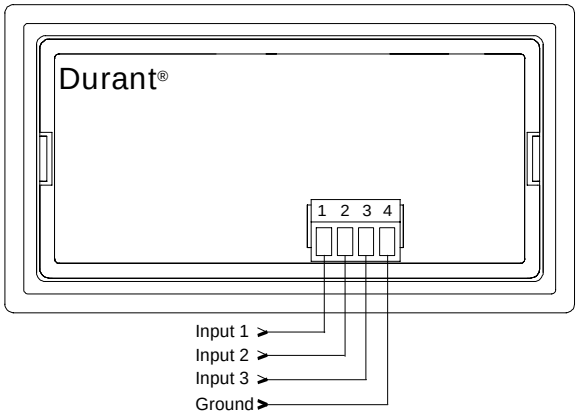
12 VDC +/- 12%, 75 mA max, short circuit protected

Dip Switch Settings

A Single Ended Input	6	A Mag Pickup
A Fast Response (>200 Hz)	5	A Slow response (<200 Hz)
A Sourcing (PNP) Input	4	A Sinking (NPN) Input
B Single Ended Input	3	B Mag Pickup
B Fast Response (>200 Hz)	2	B Slow Response (<200 Hz)
B Sourcing (PNP) Input	1	B Sinking (NPN) Input

WIRING cont.

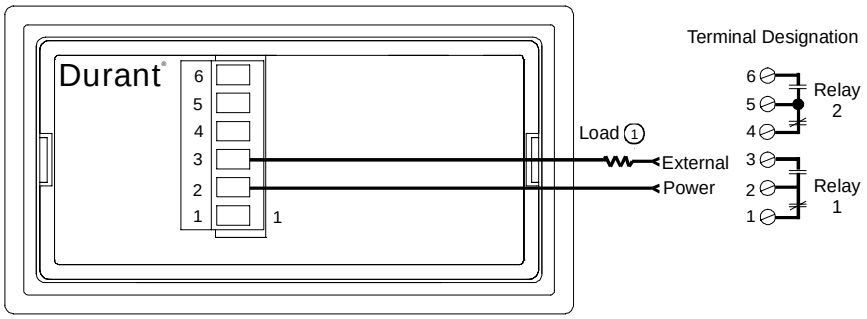
Control Inputs



Control inputs require current sinking (NPN) sensors or contact closures to ground. Internal pullup resistance:
4.75k Ω to +5 VDC.

Max. Voltage:
28 VDC

Relay Output Option Board
Typical Wiring



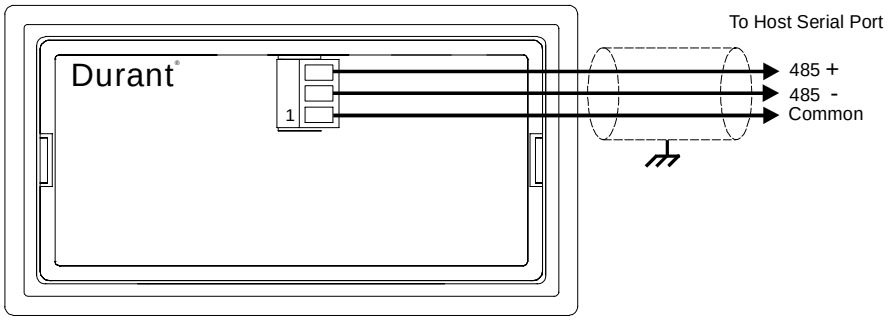
Contact Ratings

5 A @250 VAC or 30 VDC maximum

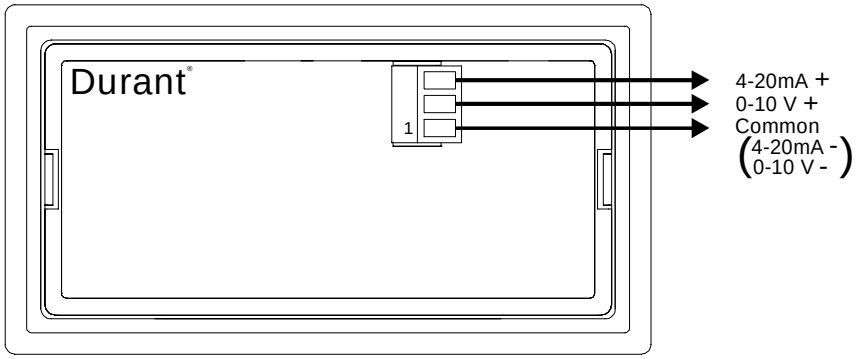
(1) An RC surge suppressor is recommended across all inductive loads.

WIRING cont.

RS 485 Communication Option Board



Analog Output Option Board



Output Ratings

4-20 mA into 750 Ω (Ohms) maximum
0-10 V into 2500 Ω (Ohms) minimum

A switch shall be included in the building installation:

- It shall be in close proximity to the equipment and within easy reach of the operator.
- It shall be marked as the disconnecting device for the equipment.
- Switches and circuit breakers in Europe must comply with IEC 947.

PROGRAMMING

Programming defines the Eclipse's personality. It will be necessary for the installer to program the unit to fit the requirements of the application. Programming in the Eclipse is done with function codes. Each function code has a number and a field of values. The installer selects a particular value for a function code to enable a specific type of behavior in the unit. For instance, if function code 10 is set to a value of 1, the main counter autorecycles when the count is equal to preset 1. If function code 10 is set to a value of 2, the main counter autorecycles when the count is equal to preset 2.

There are 33 function codes; however, some function codes are mutually exclusive and the setting for one function code may enable or disable other function codes. Function codes that have been disabled will not show in the function code list when the installer programs the unit. Furthermore, function codes that are specific to the count control base unit and the optional RS 485 serial communications and analog output boards will only show in the function code list if they are appropriate to the hardware set.

Count and Rate Scaling

Several of the function codes determine the arithmetic that the unit applies to raw count input pulses in order to display counts and rates in engineering units that are meaningful to the operator. This arithmetic is called scaling. The Eclipse allows scaling by two methods: the traditional absolute scale factor mode and the calculate mode.

Using the absolute scale factor mode, the installer must calculate the count and rate scalers by using the following formulae:

$$\text{Count Scale Factor} = \frac{\text{C D P F}}{\text{P P I}},$$

where C D P F = Count Decimal Point Factor, and is taken from the table below:

Displayed Count Decimal Point	C D P F
XXXXXX	1
XXXXX.X	10
XXXX.XX	100
XXX.XXX	1000
XX.XXXX	10000

PPI = Pulses Per Item; the number of count input pulses per unit (inch, foot, gallon, etc.) of displayed count. Double, or quadruple this number if the count mode is quadrature X2, or X4, respectively.

Example: A flowmeter delivers 25 pulses per gallon and the operator must read the count in gallons and tenths (XXXXX.X)

$$\text{Count Scale Factor} = \frac{10}{25} = 0.40000$$

$$\text{Rate Scale Factor} = \frac{\text{NOS X RDPF}}{\text{PPI}},$$

where NOS = Number of Seconds in the displayed rate time unit (per second = 1, per minute = 60, etc.).

R D P F = Rate Decimal Point Factor, and is taken from the table below:

Displayed Rate Decimal Point	R D P F
XXXXX	1
XXXX.X	10
XXX.XX	100
XX.XXX	1000
X.XXXX	10000

PPI - Pulses Per Item; the number of count input pulses per unit of displayed rate. Double, or quadruple this number if the count mode is quadrature X2, or X4 respectively.

Example: An encoder puts out 600 pulses per foot and the operator must read material speed in feet and tenths per minute (XXXX.X).

$$\text{Rate Scale Factor} = \frac{60 \text{ X } 10}{600} = 1.000$$

To program the Eclipse for traditional scaling, the installer would set function code (FC) 0 to a value of 2. Then set FCs 2 and 4 to the absolute count and rate scale factors and set FCs 3 and 5 to set the count decimal point and rate decimal point respectively.

If the installer sets function code 0 to a value of 0 or 1, the Eclipse will be in the calculate mode for scaling. This means that the installer must enter values for PPI (FC 1), CDPF (FC 3), RDPF (FC 5), and NOS (FC 6). The unit will use the count and rate scale factor formulae to calculate the scalers. This is especially useful when the operator must change scale factors and is likely to know the PPI value. With FC 0 set to 1, the operator can change the PPI value without going into the program mode, and the count and rate scale factors will be calculated by the Eclipse. The traditional absolute method of scaling is only likely to be used when there is potential for unacceptable round off in the calculation or when the count and rate displays must be scaled to different engineering units, such as counting in inches and displaying rate in feet per minute.

The topic of scaling also is an example of mutually exclusive function codes in the function code list. By selecting calculate mode, FCs 2 and 4 do not appear on the display to the installer, but FC 6 does appear. By selecting absolute mode, FCs 2 and 4 appear on the display, but FC 6 does not.

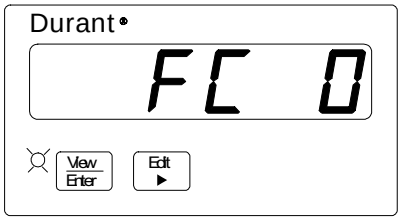
Entering the Program Mode

Note: It is recommended that upon installation, one of the control inputs be programmed to one of the Lock Functions, and then activated via a jumper to ground to prevent inadvertent operator entry into the program mode. If the program mode must be accessed after installation, remove the jumper wire and follow the procedure below.

Caution: Entry into the program mode will cause both relays, if installed, to turn OFF, and will cause the analog output, if installed, to go to its minimum values (4 mA and 0V).

To enter the program mode,

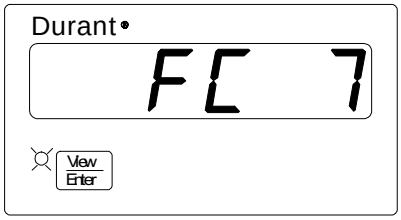
1. Press the View/Enter and ▶ keys simultaneously.



The program LED will turn ON, and the display will show FC 0 (function code 0) for one second. The display will then show the value selected for FC 0.

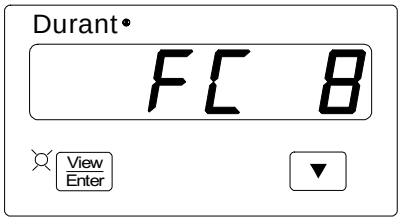
To scroll through the active function code list,

1. Press and hold the View/Enter key;



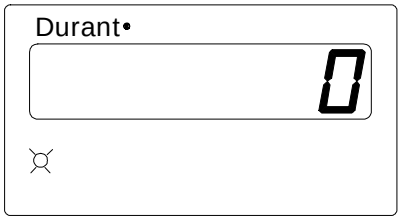
the display will show a function code number as long as View/Enter is held,

2. While holding View/Enter, press either ▲ or ▼,



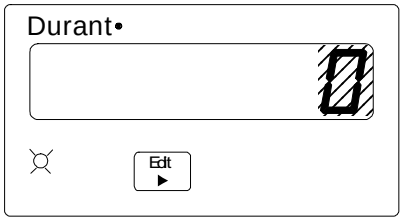
the display ascends numerically to the next FC in the list each time ▼ is pressed, and descends each time the ▲ key is pressed,

3. Release the View/Enter key to display the value for the FC.



To change the value of a function code,

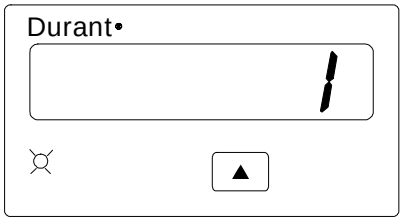
1. Press the [▶] key,



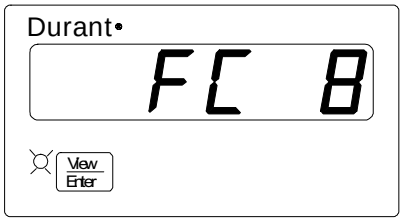
Indicates flashing portion of display.

the most significant digit of the value will flash,

2. Use the [▲] or [▼] key to change the value of the flashing digit,



3. Press the [View Enter] key to enter the new value and display the FC number.



To exit the program mode, press the [View Enter] and [▶] keys simultaneously.

The Function Code List

The following list contains all possible function codes (FCs) for the Eclipse in numeric order. Not all FCs will be viewable in the program mode since some are mutually exclusive dependent upon program selections already made, and many are dependent upon the type of base unit and the presence of an option board installed in the unit. The Eclipse will only show those FCs appropriate for its present configuration. Those values indicated with an asterisk (*) are the default values.

FUNCTION CODES cont.

FC#	Function	Value Range	Value Description
0	Scaling Mode	0*	Calculate mode; PPI entry in program mode only.
		1	Calculate mode; PPI entry in run or program mode only.
		2	Absolute scale factor mode.
1	PPI	0.10 to 9999.99 1.00*	Pulses Per Item. Any value of PPI that causes the count scale factor to be outside the range of 0.00010 to 10.00000 or the rate scale factor to be outside the range of 0.001 to 9999 will not be accepted.
2	Count Scaler	0.00001 to 9.99999 1.00000*	Absolute count scale factor
3	CDP	0*	Count decimal point XXXXXX
		1	XXXXX.X
		2	XXXX.XX
		3	XXX.XXX
		4	XX.XXXX
4	Rate Scaler	0.001 to 9999 60.00*	Absolute rate scale factor.
5	RDP	0*	Rate decimal point XXXXXX
		1	XXXX.X
		2	XXX.XX
		3	XX.XXX
		4	X.XXXX
6	NOS	1 to 99,999 60*	Number of seconds in rate time unit (per second = 1, per minute = 60, etc.)
7	Count Mode	0*	A - Add / B - Subtract
		1	A - Add / B - Add
		2	A - Add / B - Count Inhibit
		3	Quadrature X1
		4	Quadrature X2
		5	Quadrature X4
8	Batch Counter	0*	No batch counter or batch preset
		1	Non-presettable batch counter
		2	Presettable batch counter

FUNCTION CODES cont.

9	Reset Mode	0*	Main counter resets to zero
		1	Main counter resets to preset 2; preset 2 count coincidence value is zero
10	Autorecycle Main Counter	0*	No autorecycle
		1	Autorecycle at preset 1 coincidence
		2	Autorecycle at preset 2 coincidence
		3	Autorecycle at preset 1 and preset 2 coincidence
11	Rollunder	0*	Count rollunder to 999,999
		1	Count rollunder to -1
14	Rate Display	0*	Rate is not displayed
		1	Rate is displayed
16	Totalizer Display	0*	Total is not displayed
		1	Total ÷ 1 is displayed
		2	Total ÷ 10 is displayed
		3	Total ÷ 100 is displayed
			For totalizer base unit, option 0 is not available and option 1 is the default value.
20	Control Inputs	ABC	Control input functions. ABC values
		000*	from table below:

Input 1 A	Input 2 B	Input 3 C	
0	0	0	Disabled
1	1	1	Reset Totalizer
2	2	2	Lock All
3	3	3	Lock Program
4	4	4	Lock Program and P1
5	5	5	Reset Main Counter
6	6	6	Reset Batch Counter
7	7	7	Reset All Counters
8	8	8	Unlatch
9	9	9	Bypass P1

For totalizer base unit, options 3 to 9 are not available. All reset inputs, and the unlatch input are momentary (edge triggered). All lock inputs, and the bypass P1 input are maintained (level sensitive).

23	Keypad Reset	0*	Disabled
		1	Reset Totalizer
		2	Reset Main Counter
		3	Reset Batch Counter
		4	Reset Displayed Counter
		5	Reset all Counters
			For totalizer base unit, options 2 to 5 are not available.
			All reset selections are momentary (edge triggered).
30	Relay 1 Mode	0*	Disabled
		1	Normal, latched mode
		2	Reverse, latched mode
		3	Normal, pulsed mode
		4	Reverse, pulsed mode
		5	Follows, low mode
		6	Follows, high mode
31	Relay 1 Timeout	0.01 to 99.99	Pulsed mode timeout (seconds)
		1.00*	for relay 1
32	Relay 1 Events	ABCDE	Relay 1 pick up and drop out events.
		00000*	ABCDE values from table below:

P1 A	P2 B	Pb C	Unlatch D	Reset Count E	
0	0	0	0	0	No Action
1	1	1	1	1	Pick Up
2	2	2	2	2	Drop Out

34	Relay 1 Follows	0*	Relay 1 follows P1
		1	Relay 1 follows P2
35	Relay 1 Follows Test	0*	Relay 1 not tested at power up
		1	Relay 1 tested at power up
40	Relay 2 Mode	0*	Disabled
		1	Normal, latched mode
		2	Reverse, latched mode
		3	Normal, pulsed mode
		4	Reverse, pulsed mode
		5	Follows, low mode
		6	Follows, high mode
41	Relay 2 Timeout	0.01 to 99.99	Pulsed mode timeout (seconds)
		1.00*	for relay 2

42	Relay 2 Events	ABCDE 00000*	Relay 2 pickup and drop out events. ABCDE values from table below:

P1 A	P2 B	Pb C	Unlatch D	Reset Count E	
0	0	0	0	0	No Action
1	1	1	1	1	Pick Up
2	2	2	2	2	Drop Out

44	Relay 2 Follows	0*	Relay 2 follows P1
		1	Relay 2 follows P2
45	Relay 2 Follows Test	0*	Relay 2 not tested at power up
		1	Relay 2 tested at power up
50	Load Defaults	0*	Default value for FC 50
		1	Load default values for all FCs
		2	Load default run mode values
60	Serial Address	00 to 99 00*	Unit serial address for RS 485 communications.
61	RS 485 Baud Rate	0	1200 Baud
		1	2400 Baud
		2	4800 Baud
		3	9600 Baud
		4*	19.2 k Baud
62	RS 485 Parity	0*	No parity
		1	Odd parity
		2	Even parity
70	Analog Assignment	0*	Analog output follows rate.
		1	Analog output follows displayed total. For a totalizer base unit, options 2 and 3 are not available.
		2	Analog output follows main count.
		3	Analog output follows batch count.
71	Analog Offset	000000*	Displayed value for minimum analog output.
		-99,999 to 99,999	Range for offset when FC 70 = 0
		0 to 999,999	Range for offset when FC 70 = 1, 2, FC 11 = 0, FC 70 = 3
		-99,999 to 999,999	Range for offset when FC 70 = 1, 2 and FC 11 = 1

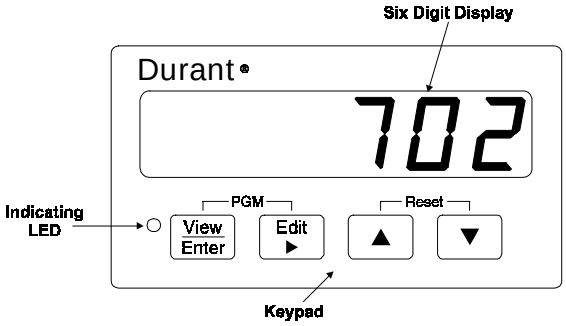
72	Analog Full Scale	999,999*	Displayed value for maximum analog output
		-99,999 to 99,999	Range for full scale when FC 70 = 0
		0 to 999,999	Range for full scale when FC 70 = 1, 2; FC 11 = 0, FC 70 = 3
		-99,999 to 999,999	Range for full scale when FC 70 = 1, 2 and FC 11 = 1

RUN MODE

This is the operator's section of this instruction manual. Once the installer has wiring and programmed the counter to do a specific job, it is up to the operator to deal with the counter on a day-by-day basis. There are three things that the operator might be expected to do with this counter:

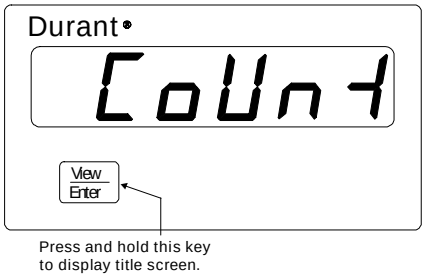
1. View count and rate values.
2. Change preset values.
3. Reset the count.

Typically all operator functions are performed on the front panel of the counter. The front panel features of interest to the operator are a six digit LED display, a keypad containing four keys, and an indicating LED.



The six digit LED display, which will be referred to simply as "the display", is where the operator views count, rate, and presets. The keypad consists of the four keys that the operator pokes to change the display and to enter presets. The indicating LED turns ON only when the counter has been put in the program mode. This mode is normally NOT an operator function and the installer usually has taken steps to insure that the operator cannot enter the program mode. Therefore, this LED is normally OFF.

With no keys pressed, the display will always show a number. Depending upon the type of counter and how it is programmed, the displayed number is a value for one of up to eight viewable items. To find out what the number represents, press and hold the View/Enter key. A title screen will appear on the display showing the name of the item.



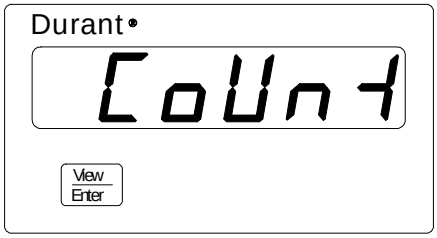
When the View/Enter key is released, the display goes back to the value for that item. The title screens are described below. All counters will have at least one viewable item, but up to eight viewable items are possible.

Title Screen	Viewable Item
CoUnt	The main counter
P1	Preset 1 of the main counter
P2	Preset 2 of the main counter
bAtCH	The batch counter
Pb	The batch preset
toTAL	The totalizer counter
rAtE	The ratemeter
CPP1	Count pulses per item for scaling

The operator can change which item is being displayed by using the keypad to scroll up or down through the list of viewable items. Those items in the list that are not appropriate for the counter's type or programming will not appear on the display.

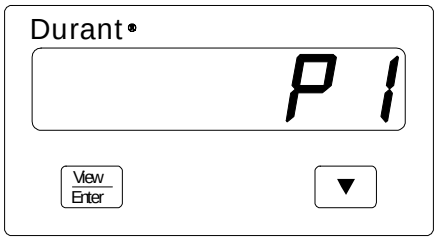
To change which item is displayed,

1. Press and hold the View/Enter key,



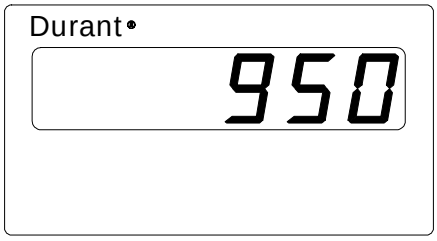
the title screen will appear on the display.

2. While holding View/Enter, press either the ▲ or ▼ key,



a new title screen will appear on the display each time ▲ or ▼ is pressed.

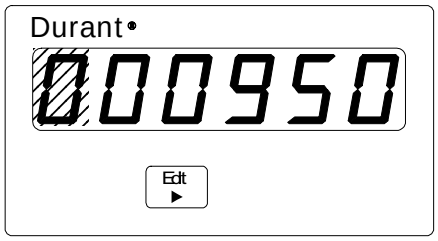
3. When the title screen for the desired item is reached, release all keys to display the value for that item.



The values for main count, total count, batch count, and rate cannot be edited by the operator. The values for the other four viewable items typically can be changed by the operator. Those items are preset 1, preset 2, batch preset, and count pulses per item. The installer normally determines which of these items can be viewed by the operator and also which of these items can be edited by the operator and programs the unit appropriately. If an item is programmed to view only, it will not respond to the editing key sequence below.

To change the value of a preset or pulses per item (example - change preset 1 from 950 to 870):

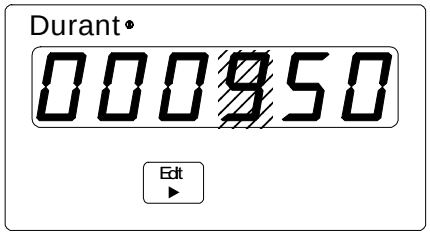
1. Press the Edit ▶ key,



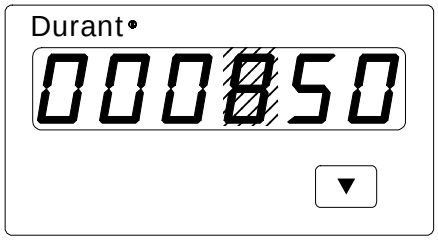
Indicates flashing digit.

the left-most digit (MSD) begins to flash. The preset is edited one digit at a time by selecting a digit (flash) and changing the value of that digit.

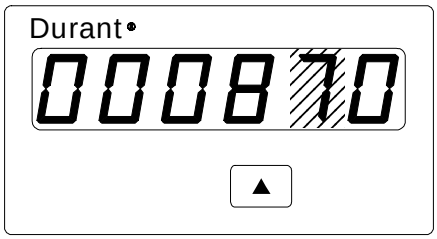
2. Press the Edit ▶ key until a digit that must be changed is flashing. The flash moves one digit to the right each time the Edit ▶ key is poked.



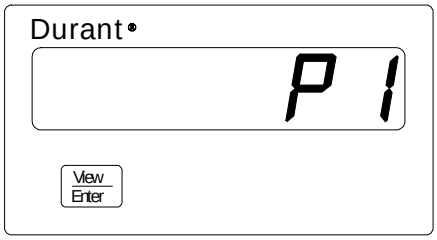
3. Press the ▲ or ▼ key to change the value of the flashing digit.



4. Repeat steps 2 and 3 until all digits are changed to the new preset value.



5. Press the View Enter key to enter the new value for the preset and display the title screen.

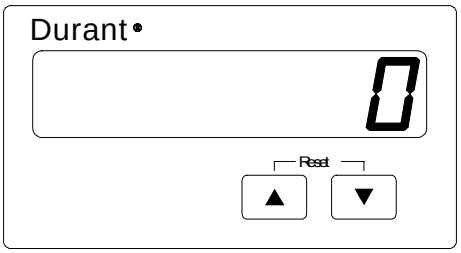


The operator may have to reset the counter from time to time. The installer probably considered this and programmed the unit to allow the operator one of the following options for the front panel keypad reset.

1. No counter reset
2. Totalizer count reset
3. Main counter reset
4. Batch counter reset
5. Displayed counter reset
6. Reset all counters

The reset function only works when a value is on the display (in other words, don't be pushing on the View Enter key), and only when preset editing is NOT underway (no flashing digits).

To reset the counter, press the ▲ and ▼ keys at the same time.



The display may or may not go to zero (or possibly the preset 2 value). That depends upon which value is being displayed, and which counter is programmed to reset via the keypad.

DIAGNOSTICS

Self Diagnostics and Error Messages

Each time power is applied to the Eclipse, it performs a series of internal diagnostic tests. A lamp test (all display segments on) is conducted while these tests are in progress. If a failure occurs, an error message will appear on the display. Additionally, once the unit is up and running, an out of range message (flashing OL or -OL) may appear on the rate display indicating that the calculated rate is greater than 99,999, or less than -99,999 respectively.

The diagnostic tests are checksum calculations of internal memory, to verify that data stored in memory during manufacture or at power down is still there at power up. Programming, calibration, and run mode data is stored in non-volatile memory (NOVRAM and EEPROM). A failure in the programming section of memory results in the displayed error message PrG. An error in the calibration section of memory results in a CAL error message, and a bad checksum in run data is indicated by Errun. For each of these errors, the associated data is set to default values. The error message remains on the display until a key is pressed. At that time, the unit will continue to perform the remaining tests and then go into run mode. However, the defaulted program, calibration, and run data must be restored to the user's settings before the unit is put back into operation. NOTE: the calibration diagnostic test determines the validity of data stored in memory only. THERE IS NO DIAGNOSTIC TEST TO DETERMINE THAT THIS UNIT REQUIRES CALIBRATION! The final checksum test is performed on ROM. If a failure occurs, the display will read Err. This type of failure is non-recoverable and the unit should be returned to the factory for repair.

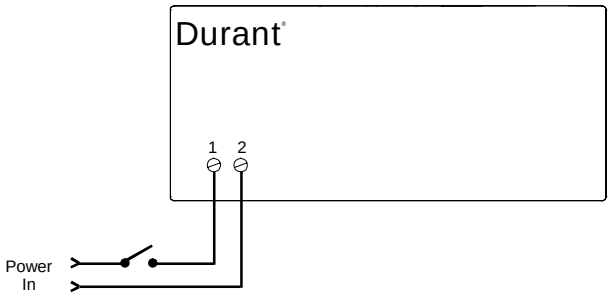
Keyboard Diagnostic Mode

The keyboard diagnostics allows the user to test each of the front panel keys, the display, and the analog and relay outputs if present in the unit.

Caution: performing the keyboard diagnostic tests will turn ON the analog and relay outputs if they are installed in the unit. Remove power from the counter and disconnect any output that should not activate its load during the diagnostic tests.

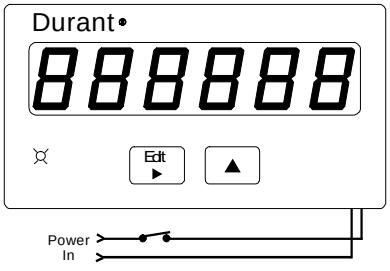
To enter the keyboard diagnostic mode,

1. Turn power to the unit OFF.



2. If any control input is programmed to a lock function, remove the jumper wire from that input to ground.

3. While holding down both the Edit ▶ and ▲ keys, turn unit power ON. After 1.5 seconds, the unit will be in the diagnostic mode with all LED segments and the program LED ON. Release the Edit ▶ and ▲ keys at this time. If present, both relays will be OFF, and the analog output will be at minimum values (4 mA and 0V).



DIAGNOSTICS cont.

There are four keyboard diagnostic tests, one for each key. The tests are performed by pressing each key. The unit's response is maintained as long as the key is held.

Test Key		Unit Response
View/Enter	View / Enter	Display shows software revision number
Edit/Right Arrow	Edit ▶	All display segments and the program LED will turn OFF, and the analog output will go to maximum values (20 mA and 10V).
Up Arrow	▲	Each display digit will turn ON, one at a time, and relay 2 will turn ON.
Down Arrow	▼	Each display segment of all digits will turn ON, one segment at a time, and relay 1 will turn ON.

To exit the keyboard diagnostic mode, turn unit power off.

SPECIFICATIONS

MECHANICAL

Cutout Dimensions: 3.62” W x 1.77” H (92mm x 45mm) DIN standard
Outline Dimensions: 4.04” W x 2.19” H x 3.87” D (103mm x 56mm x 98mm)
3.60” (92mm) maximum depth in panel
Enclosure: Plastic with polyester front label
Connectors: Up to six de-pluggable terminal blocks

INPUT POWER

AC Powered Models (57701-4XX)
Input Power: 85-265 VAC, 47-63 Hz, 20 VA
External Fuse: 0.2A, 250 VAC, Time Delay (T200mA, 250V)
Isolation Dielectric Strength: 2300 VAC

DC Powered Models (57700-4XX)
Input Power: 9-30 VDC, 12 VA
External Fuse: 2.0A, 50 VDC, Time Delay (T2A, 50V)
Reverse Voltage Protection: Yes
Isolation Dielectric Strength: 2300 VAC to signal inputs and relays, 500 VAC to RS 485 and analog outputs

HUMAN INTERFACE

Display: +6, -5 digits
Type: .56” high, seven segment, red LED

DATA RETENTION

Memory Type: EEPROM, no batteries required
Duration: 100 years

COUNT SIGNAL INPUT

Sensor Type: Sink or source, DIP switch selectable
Input Impedance: 4.75 k ohms to +5 VDC or 34.9 k Ohms to ground
Threshholds: High 3.5 to 28 VDC, low 0 to 1.9 VDC, for single ended signals
Magnetic Pickup Range: 200 mV p-p to 65 VRMS into 34.9 k Ohms
Slow Response: 200 Hz max. (DIP switch 2 and/or 5 ON)
Fast Response:

Count Mode	A or B	A and B
Add/Add, Add/Subtract, Add w/Inh	8250/8250	3000/3000
Quad X1, Quad X2		3250
Quad X4		2000

CONTROL INPUTS

Sensor Type: Sink only
Input Impedance: 4.75 k ohms to +5 VDC
Threshholds: High 3.5 to 28 VDC, low 0 to 1.9 VDC
Response: 25 msec maximum (5V signal)

SPECIFICATIONS cont.

ACCESSORY POWER OUTPUT

Voltage:	12 VDC +/- 12%
Current:	75 mA max.
Protection:	Short circuit protected

RELAY OUTPUTS (count control base unit only)

Number of relays:	2
Contact type:	1 set form C per relay
Contact rating:	5A, 250 VAC or 30 VDC
Isolation dielectric strength:	2300 VAC

OPTIONAL OUTPUTS

Analog Retransmission

Output signals:	4-20 mA (<750 Ω) and 0-10 V (>2500 Ω)
Accuracy:	0.13% full scale and 100 PPM /°C (and 0.07% full scale change over 4-20 mA load ranges
Isolation dielectric strength:	2300 VAC to signal inputs, relays, and AC power inputs, 500 VAC to analog outputs and DC power inputs

RS 485 Serial Communications

Baud Rate:	1200, 2400, 4800, 9600, or 19,200, programmable
Parity:	Even, odd, or no parity
Address Range:	00 to 99 decimal
Protocol:	Opto 22® compatible
Isolation Dielectric Strength:	2300 VAC to signal inputs, relays, and AC power inputs, 500 VAC to analog outputs and DC power inputs

ENVIRONMENTAL

Operating Environment:		Indoor use to 2000 meters
Temperature:	Operating:	0 to 50°C
	Storage:	-20 to 70°C
Humidity:	0 to 85% RH, non-condensing	
Vibration:	2.5 g's, 30 to 200 Hz	
Shock:	30 g's, 11 msec half sinewave	
EMC:	Immunity to EN 50082-2 (Heavy Industrial)	
	Emissions to EN 50081-2 (Heavy Industrial)	
Front Panel:	NEMA 4X when mounted with gasket provided	
Agency Approval:	UL, cUL listed, CE compliant	
	CE EMC immunity and emissions requirements were met using shielded wiring on the RS-485, analog output, and pulse input/ power lines. The shields were connected to earth ground at the Eclipse end of the shields.	
Polution Degree 2	Overvoltage category II	

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This equipment is capable of generating radio frequency energy. If not installed and used in accordance with the instructions, this unit may interfere with radio communications.

Durant
901 S. 12th Street
Watertown, WI 53094
800-540-9242 • 920-261-4070
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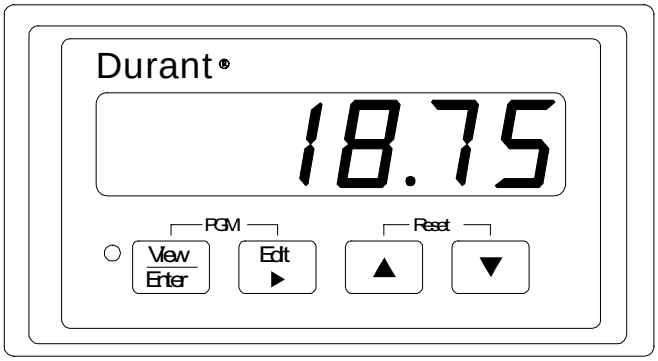
Installation and Operation
Manual Number 57700-980-04

Eclipse Series Totalizers and Counters

Models: 5770X-48X - Totalizers/Counters

CE



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