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RED LION CONTROLS

INTERNATIONAL HEADQUARTERS
20 Willow Springs Circle, York, Pa. 17402, (717) 767-6511 FAX: (717) 764-0839
Web site- http://www.redlion-controls.com E-mail- sales@redlion-controls.com

EUROPEAN HEADQUARTERS
892 Plymouth Road, Slough, Berkshire SL1 4LP
ENGLAND +44 1753 696888 FAX: +44 1753 696339

MODEL IMP - APOLLO 4½-DIGIT DC INTELLIGENT METER FOR PROCESS INPUTS

- *40,000 COUNT MEASUREMENT RESOLUTION (Can be scaled to ±99,999 display)*
- *ACCEPTS STANDARD PROCESS SIGNAL CURRENTS (4 to 20 & 10 to 50 mA DC; Automatic Ranging)*
- *EASY, ONE-PASS SCALING*
- *STATE-OF-THE-ART DIGITAL ELECTRONICS FOR GREATER ACCURACY AND RELIABILITY*
- *FULL 6-DIGIT, HIGH VISIBILITY, 0.56" (14.2 mm) HIGH RED LED DISPLAY*
- *PROGRAMMABLE FRONT PANEL LOCK-OUT MENU*
- *TRANSDUCER EXCITATION SUPPLY (Optional)*
- *INTEGRATOR (Totalizer) AND LINEARIZER (Optional)*
- *PEAK/VALLEY MEMORY AND TARE (Re-zero) FUNCTION (Optional)*
- *DUAL ALARM RELAY OUTPUTS (Optional)*
- *BI-DIRECTIONAL SERIAL COMMUNICATIONS (Optional)*

- *4 to 20 mA or 0 to 10 VDC ANALOG OUTPUT (Optional)*
- *NEMA 4/IP65 SEALED METAL FRONT BEZEL*

CE

DESCRIPTION

The Apollo Intelligent Process Meter accepts standard process signals and precisely scales them into engineering units. One model covers any current range within 0 to 50 mA. A full 6-digit display accommodates nearly any engineering units and holds large totalization values. State-of-the-art digital circuitry virtually eliminates errors due to drift. A full complement of option packages are available to fulfill many process applications.

The indicator features a choice of two different scaling procedures which greatly simplifies initial set-up. English Style display prompts and front panel buttons aid the operator through set-up and operation. A front panel lock-out menu protects set-up data and operation modes from unauthorized personnel. Programmable digital filtering enhances the stability of the reading. Programmable remote input *"E1-CON"* pin can be utilized to control a variety of functions, such as totalizing, alarm control, display hold or tare operations. All set-up data is stored in E^2PROM, which will hold data for a minimum of 10 years without power.

An optional integrator *(totalizer)*/linearizer can be used to totalize or integrate signals up to a maximum display value of 999,999. It features independent scaling and a low signal cut-out to suit a variety of signal integration applications. Programmable remote input *"E2-CON"* pin is included with this option, and can control a variety of functions, such as totalizing, alarm control, display hold or tare operations, simultaneously with *"E1-CON"* pin. Additionally, nine slopes and offsets can easily be programmed with this option to linearize transducers with non-linear outputs, such as square law devices. Peak/valley *(max/min)* reading memory, display hold and a signal re-zeroing *(tare)* function are included with this option and they are easily recalled and controlled by either the front panel or a remote input. All readings are retained at power-down.

Optional dual relays with parallel solid state outputs are fully programmable to operate in a wide variety of modes to suit many control or alarm applications.

Optional 20 mA loop, bi-directional serial communications provides computer and printer interfacing to extend the capabilities of the indicator. More than one unit can be connected in the loop with other RLC products which have serial communications capabilities.

An optional 4 to 20 mA or 0 to 10 VDC re-transmitted analog output can be scaled by the user to interface with a host of recorders, indicators and controllers. The indicator has several built-in diagnostic functions to alert operators of any malfunction. Extensive testing of noise interference mechanisms and full burn-in makes the indicator extremely reliable in industrial environments. The die-cast front bezel meets NEMA 4/IP65 requirements for washdown applications. Plug-in style terminal blocks simplify installation wiring and change-outs.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

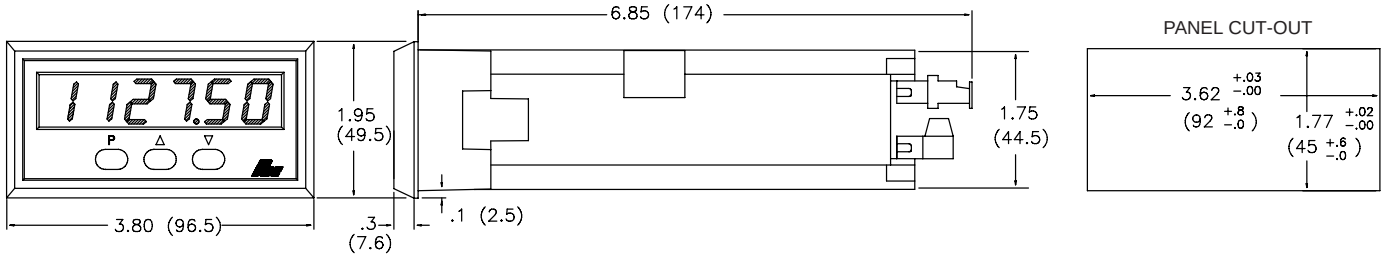
Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so, can be potentially harmful to persons or equipment in the event of a fault to the unit.

SPECIFICATIONS

1. **DISPLAY:** 6-digit, 0.56" *(14.2 mm)* High LED, minus sign displayed for negative values. "Flashing" display for totalizer overflow. "....." displayed for input display out of range. *"OLOLOL"* displayed for input display overload and *"ULULUL"* for underload *(negative overload)*.
2. **POWER REQUIREMENTS:**
   A.C. Power: Switch Selectable 115/230 VAC, ±10%, 50/60 Hz, 14 VA
   D.C. Power: 10 to 30 VDC, 9 watts max., isolated to 300 Vp.
3. **CONTROLS:** Three front panel push buttons for modifying alarm values and indicator set-up. Two external inputs for disabling the front panel and controlling programmable functions.

DIMENSIONS "In inches (mm)"

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.3) H x 5.5" (140) W.



SPECIFICATIONS (Cont'd)

4. **SIGNAL INPUT RANGE:** 0 to 50 mA DC *(4 to 20 mA, 10 to 50 mA)*
5. **INPUT IMPEDANCE:** 10 Ω, 0.2 VDC @ 20 mA
   Max. Input Current: 200 mA DC (continuous)
6. **ACCURACY AND RESOLUTION:**
   Resolution: 1/40,000
   Accuracy: ±(0.02% of full scale + 1 digit)
7. **PROGRAMMABLE DISPLAY READING RANGE:** -99999 to +999999
8. **READING RATE:** 2.5 readings/second
9. **RESPONSE TIME:** 2 seconds to settle for step input *(increases with programmable digital filtering)*
10. **NORMAL MODE REJECTION:** 40 dB at 50/60 Hz *(may be improved by programmable digital filtering)*
11. **COMMON MODE REJECTION:** 120 dB, DC to 50/60 Hz
12. **TOTALIZER/LINEARIZER:** Front panel button for input/total display select. External totalizer reset/enable. Programmable time-base, scale factor (0.001-100.000) and low-end cut-out. 9-segment multiple slope scaling for non-linear inputs. Response Time = 0.2 sec max.
13. **E1-CON & E2-CON:** External remote inputs that allow activation of various functions *(reset total, peak indicator mode, alarm control, etc.)*
    V_{IL} = 0.8 V_{MAX}; V_{IH} = 2.0 V_{MIN}; Response Time = 0.2 sec max.
14. **ENVIRONMENTAL CONDITIONS:**
    Operating Temperature Range: 0º to 50ºC
    Storage Temperature Range: -40º to 80ºC
    Span Temperature Coeff.: 100 ppm/ºC max; 40 ppm/ºC typ.
    Zero Temperature Coeff.: 1 µV/ºC
    Operating and Storage Humidity: 85% max. relative humidity (non-condensing) from 0 to 50ºC.
    Altitude: Up to 2000 meters.
15. **EXCITATION (Optional):** Regulated 18 VDC @ 60 mA max.
16. **SERIAL COMMUNICATIONS (Optional):**
    Type: Bi-directional 20 mA current loop, 20 mA source provided on transmit loop. *(Powers up to 7 units in a loop with internal current source.)*
    Baud Rate: programmable 300 to 2400
    Maximum address: 99 *(Actual number in a single loop is limited by serial hardware specifications.)*
    Data Format: 10 bit frame, Odd parity *(one start bit, 7 data bit, one odd parity bit, and one stop bit.)*
    Serial Hardware Specifications:
    SO - Output Transistor Rating: V_{MAX} = 30 VDC,
    V_{SAT} = 1 V_{MAX} at 20 mA.
    Note: This will allow up to 28 units max. in each loop.
    SI - Input Diode Rating: VF = 1.25 V_{TYP}; 1.5 V_{MAX}
    Note: The compliance voltage rating of the source must be greater than the sum of the voltage drops around the loop. (Typically a 30 VDC powered source would be capable of operating between 18 and 22 units in a loop.)
17. **ALARMS (Optional):**
    Solid State: Two, isolated, sinking open collector NPN transistors acting in parallel with relays.
    I_{MAX}: 100 mA. V_{SAT} = 1 V @ 100 mA. **V_{MAX}** = 30 VDC.
    Relays:
    Type: Form C (2)
    Max. Rating: 5 Amps @ 120/240 VAC or 28 VDC *(resistive load)*, 1/8 hp @ 120 VAC *(inductive load)*.
    Relay Life Expectancy: 100,000 cycles at max. rating. *(As load level decreases, life expectancy increases.)*
18. **ANALOG OUTPUT (Optional):**
    4 to 20 mA: Digital scaling and offsetting within a 4 to 20 mA range
    Accuracy: 0.1% of full scale
    Resolution: 12 bits
    Compliance Voltage: 10 VDC *(500 Ω max. loop impedance)*
    0 to 10 VDC: Digital scaling and offsetting within a 0 to 10 VDC range
    Accuracy: ±(0.1% of reading +35 mV)
    Resolution: 12 bits
    Min. Load Resistance: 10 KΩ (1 mA max.)
19. **PEAK/VALLEY/TARE (Optional):**
    Peak and Valley recording. Signal re-zero *(tare)*.
20. **CERTIFICATIONS AND COMPLIANCES**:
    EMC EMISSIONS:
    Meets EN 50081-2: Industrial Environment.
    CISPR 11 Radiated and conducted emissions
    EMC IMMUNITY:
    Meets EN 50082-2: Industrial Environment.
    ENV 50140 - Radio-frequency radiated electromagnetic field [1]
    ENV 50141 - Radio-frequency conducted electromagnetic field [2]
    EN 61000-4-2 - Electrostatic discharge (ESD)[3]
    EN 61000-4-4 - Electrical fast transient/burst (EFT)
    Notes:
    1. Unit mounted in a metal panel connected to earth ground (protective earth) with rear cover providing at least 10 dB of shielding effectiveness.
    a. When units are mounted in a metal panel without a rear cover, the process signal can vary as much as 2% from the stated accuracy specification, and the 4 to 20 mA analog output option can vary as much as 16% from the stated accuracy specification.
    2. One ferrite suppression core (Steward #28-B2025-0A0) placed on the 20 mA serial communications cable at the unit for EMI frequencies above 40 MHz.
    3. Metal bezel of unit connected with ground lead from rear bezel screw to metal mounting panel.
    Refer to the EMC Compliance Installation section of the manual for additional information.
21. **CONSTRUCTION:** Die-cast metal front bezel that meets NEMA 4/IP65 requirements for indoor use when properly installed. Installation Category II, Pollution Degree 2. Case body is black, high impact plastic (panel gasket and mounting clips included).
22. **CONNECTION:** Removable terminal blocks
23. **WEIGHT:** 1.2 lbs (0.54 Kg)

EXCITATION OPTION

The excitation option provides a regulated excitation voltage *(18 VDC, 60 mA)* that can be used to power the transducer.

TOTALIZER/LINEARIZER/PEAK/VALLEY/TARE/ E2-CON OPTION

The major feature of this option is its integrator/totalizer *(accumulator)*. The integrator simply totals *(adds)* input readings along with a programmable time base and scaling coefficient. The integrator/totalizer may be reset via a remote input *(E2-CON)*, by the front panel or through the serial communications loop. Alarms may be programmed to trigger from totalizer values, for example to signal total flow thresholds for batching operations. A programmable low signal level disable feature completes the integrator/totalizer features. At loss of power to the indicator, the contents of the totalizer are saved.

The linearizer feature is a series of programmable scaling points that are used to construct linear segments to linearize the input signal. The most common application would be to interface with square law devices *(generally, flow transducers)*. A maximum of nine segments are available and using nine segments for a square law device would reduce linearity errors to 0.35%.

The other features of this option are peak and valley detection and a re-zero *(tare)* function. The indicator will record the lowest reading *(valley)* and the highest reading *(peak)*, automatically, for later recall. This information is valuable when monitoring the limits of the process over any length of time which can span over shifts, days, etc. *(These values are stored at power-down)*. A remote input *(E1-CON or E2-CON pin)* can be programmed to reset or engage the unit into a peak reading indicator. Additionally, the peak and valley can be viewed and reset from the front panel, if so programmed, and viewed and reset through the serial communication option.

The re-zero *(tare)* function can also be controlled via a remote input or by the front panel. This feature can quickly compensate for small shifts or drifts in the input signal or can re-zero every operation, such as batching.

ISOLATED ALARM OPTION

The alarm option consists of an additional printed circuit board with 9 connections. Six of these are for the two Form-C relays and the other three are for the two open collector transistors, which act in parallel with the relays. The two alarms are completely independent with programmable values, hysteresis *(deadband)*, high or low acting, auto or manual reset, triggering from input or total and they can be made to track each other, if desirable. If the alarms are programmed to latch *(manual reset)*, then they can be reset either by the front panel or a remote input. The alarms can be made to trigger from either the integrator/totalizer or the input display, to actuate external alarms, control valves, etc.

Alarm #1 can be programmed to track Alarm #2 by enabling alarm tracking. This is useful in alarm set-ups where a pre-warning control activates before a second alarm shuts off the process. Changing the shut-off trip value *(alarm #2)* automatically changes the pre-warn value *(alarm #1)* an equal amount. Alarm and hysteresis values can be modified through the optional serial communications to provide automatic control.

ISOLATED SERIAL COMMUNICATIONS OPTION

The serial communication option is a half-duplex, two-way 20 mA loop that can connect to a variety of printers, computers, terminals and controllers to suit many data-polling or automatic operation applications. The indicator responds to a host of commands, including change alarm value, reset totalizer and transmit input signal. Two loops are required for all hook-ups; a transmit *(out-going data)* loop and a receive *(in-coming data)* loop. Since the indicator monitors the receive loop for a busy signal *(current interrupted)* while transmitting, the receive loop must be connected even if the indicator is transmitting only, such as to a printer. A built-in 20 mA source is provided in the transmit loop. Additionally, multiple units and other Red Lion Controls instruments can be serially addressed, with a maximum address capability of 99 units. *(Note: There are serial hardware limitations which restrict this to a lower number of units per serial loop.)*

PROGRAMMABLE FUNCTIONS

Programming of the IMP is divided into modular steps. Each module is a short sequence of data entries. The front panel buttons *"UP"* and *"DOWN", (shown as "arrows" on the front panel)* are used to change the data and set-ups, while the *"P"* button is used to ***save*** or ***enter*** the data. After pressing *"P"* which gains entry into the programming mode, the programming modules are identified by the message *"Pro"* and a number in the display. *"UP"* and *"DOWN"* are used to select the desired programming module and *"P"* is used to enter it. All of the subsequent programming steps follow the same procedure. The rear terminal labeled *"PGM. DIS."* must be ungrounded to gain access to programming. The following table lists the programming steps.

"Pro 0" - RETURN TO MEASUREMENT MODE

"Pro 1" - SCALE UNIT BY APPLYING SIGNAL

- "dECPNt" - Enter decimal point for scaled display
- "round" - Enter rounding factor and trailing zeros for scaled display
- "SCALE" - *
- "dSP 1" - Enter display reading for scaling point #1
- "INP 1" - Apply signal level for scaling point #1
- "dSP 2" - Enter display reading for scaling point #2
- "INP 2" - Apply signal level for scaling point #2
- "SEGt" - *

"Pro 2" - SCALE UNIT BY KEY-IN SIGNAL LEVEL

- "dECPNt" - Enter decimal point for scaled display
- "round" - Enter rounding factor and trailing zeros for scaled display
- "SCALE" - *
- "dSP 1" - Enter display reading for scaling point #1
- "INP 1" - Enter signal level for scaling point #1
- "dSP 2" - Enter display reading for scaling point #2
- "INP 2" - Enter signal level for scaling point #2
- "SEGt" - *

"Pro 3" - PROGRAM FUNCTIONS ACCESSIBLE WITH FRONT PANEL LOCKOUT ENGAGED

- "dSP AL" - Enable display alarms
- "ENt AL" - Enable enter alarms †
- "dSPHYS" - Enable display hysteresis
- "ENtHYS" - Enable enter hysteresis †
- "rSt AL" - Enable reset latched alarms
- "dSPbUF" - Enable display of peak/valley readings
- "rStbUF" - Enable reset of peak/valley readings †
- "SELdSP" - Enable switching display between input and total
- "rSttOt" - Enable reset total
- "tArE" - Enable re-zero *(tare)* of input signal

"Pro 4" - PROGRAM DIGITAL FILTERING AND REMOTE INPUT FUNCTION

- "FILtEr" - Enter level of digital filtering
  - "0" - no digital filtering
  - "1" - normal filtering
  - "2" - increased filtering
  - "3" - maximum filtering
- "E1-CON" - Enter function of remote input
  - "0" - re-zero input
  - "1" - reset total
  - "2" - reset and gate totalizer
  - "3" - gate totalizer
  - "4" - display hold
  - "5" - reset peak/valley
  - "6" - reset peak and start peak indication
  - "7" - reset valley and start valley indication
  - "8" - reset latched alarms
  - "9" - reset all alarms
  - "10" - toggle display between input and total
  - "11" - re-zero input and totalize the tared values
  - "12" - display hold with tare
  - "13" - instrument reading synchronization
  - "14" - print request
- "E2-CON" - Same function as "E1-CON"

"Pro 5" - PROGRAM TOTALIZER

- "dECPNt" - Enter decimal point for totalization
- "tbASE" - Enter time base
  - "0" - second
  - "1" - minute
  - "2" - hour
- "SCLFAC" - Enter multiplying scale factor
- "Lo-cut" - Enter low-signal cut out

"Pro 6" - PROGRAM ALARMS

- "trAc" - Enable alarm value tracking
- "dISP" - Enable display alarm annunciators
- "LAtC-1" - Enable alarm #1 latching
- "ASN-1" - Enter alarm #1 trigger source *(input or total)*
- "AL-1" - Enter alarm #1 value
- "HYS-1" - Enter hysteresis value for alarm #1
- "Act-1" - Enter alarm #1 action *(high or low)*
- "LAtC-2" - Enable alarm #2 latching
- "ASN-2" - Enter alarm #2 trigger source *(input or total)*
- "AL-2" - Enter alarm #2 value
- "HYS-2" - Enter hysteresis value for alarm #2
- "Act-2" - Enter alarm #2 action *(high or low)*

"Pro 7" - PROGRAM SERIAL COMMUNICATIONS

- "bAud" - Enter baud rate
- "AddrES" - Enter loop address number *(0-99)*
- "Print" - Enter print function, or "P" command function through Serial Option
  - "0" - input
  - "1" - input, peak/valley, and tare
  - "2" - input and alarms
  - "3" - input, peak/valley, alarms, hysteresis, and tare
  - "4" - total
  - "5" - input, total
  - "6" - input, total, peak/valley, and tare
  - "7" - total and alarms
  - "8" - input, total and alarms
  - "9" - input, total, peak/valley, alarms
- "FULL" - Enable full or abbreviated transmission

"Pro 8" - PROGRAM RE-TRANSMITTED ANALOG OUTPUT

- "ASIN" - Select source of analog output *(input or total)*
- "AN-Lo" - Enter 4 mA or 0 VDC display value
- "AN-HI" - Enter 20 mA or 10 VDC display value

"Pro 9" - SERVICE OPERATIONS (Protected by access code)

* - *Entire sequence for this modular step is not shown (see manual for further details).*

† - *This sequence may be subject to being locked-out due to other programmed sequences.*

ISOLATED RE-TRANSMITTED ANALOG OUTPUT OPTION

4 to 20 mA

The re-transmitted analog output option transmits a digitally programmable 4 to 20 mA current to drive chart recorders, remote indicators and controllers. The compliance is 10 VDC. Non-standard current ranges within the 4 to 20 mA range can be supported by calculating the slope and intercept of the display/output and calculating the required display values at 4 and 20 mA.

0 to 10 VDC

The re-transmitted analog output option transmits a digitally programmable 0 to 10 VDC output signal to drive chart recorders, remote indicators and controllers. Non-standard current ranges within the 0 to 10 VDC range can be supported by calculating the slope and intercept of the display/output and calculating the required display values to 0 VDC and 10 VDC.

TOTALIZER EXAMPLE

A milk producer requires that the flow rate of a pump be monitored in 10ths of gallons per minute. Also, a running total of the number of gallons that has been pumped is needed for accounting/storage purposes. The IMP meets all of these needs. A flow sensor with a 4-20 mA output that corresponds to 0 to 175 gallons per minute is used. The input is scaled to read in tenths of gallons per minute and the totalizer will display gallons. The following programming steps are performed.

BASIC SCALING

"Pro 2".....“dECPNt” - 0.0
“round” - 0.1
“dSP 1” - 0.0
“INP 1” - 4.000
“dSP 2” - 175.0
“INP 2” - 20.000

TOTALIZER SET-UP

With an average input of 175.0 gallons, the totalizer is to display in gallons per minute. The following formula applies:

$$S.F. = \frac{D.T.}{P.D.} \times \left[\frac{T.B.}{Time}\right]^{*} \times \frac{D.T.D.P.}{I.D.D.P.}$$

S.F. = Programmable Scale Factor
D.T. = Desired Total Value For A Fixed Time Duration
T.B. = Programmable Time Base

T.B. =	If Program Select Number Chosen Is:		Enter In Formula
	“0” for sec.	=	“1”
	“1” for min.	=	“60”
	“2” for hr.	=	“3600”

I.D. = Input Display Value
Time = Actual Time Period In Seconds

D.T.D.P. =	Desired Total Decimal Point	Enter In Formula
	0	1
	0.0	10
	0.00	100
	0.000	1000
	0.0000	10000

I.D.D.P. =	Input Display Decimal Point	Enter In Formula
	0	1
	0.0	10
	0.00	100
	0.000	1000
	0.0000	10000

$$S.F. = \frac{175}{175.0} \times \left[\frac{60^{**}}{60}\right]^{*} \times \frac{1}{10}$$

S.F. = 1 x 1 x 0.1
S.F. = 0.1

"Pro 5".....“dECPNt” - 0
“tbASE” - 1
“SCLFAC” - 0.100
“Lo-cut” - 0.00

* *This value is normally 1, but can be used as a coarse scale factor of 60 or 3600.*

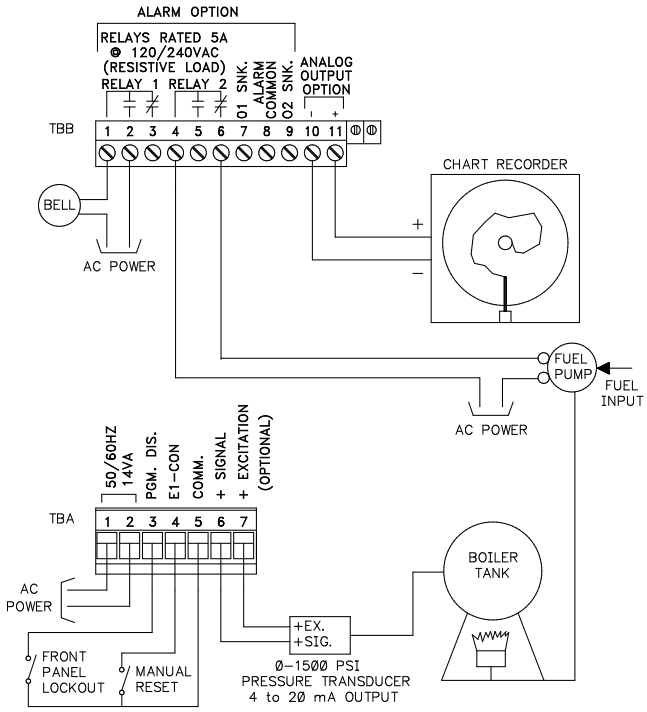
** *Since the time period is in minutes, the selected T.B. is 60 (program select value = 1) which equals time base in minutes (60 sec.).*

The totalizer will accumulate up to 99999.9 gallons.

PRESSURE MONITORING EXAMPLE

An IMP indicator is installed as a monitoring device for pressure levels within an industrial boiler. A pressure transducer with a range of 0-1500 PSI and a corresponding 4-20 mA output is selected. The maximum allowable pressure of the boiler is 1200 PSI, and at which time a pressure relief valve will operate (this makes the system inherently safe). In addition, when the relief valve trips, fuel delivery to the boiler must be stopped. The relay option of the indicator is employed to turn off the fuel at 1200 PSI. To provide for fail safe operation, operator intervention is required to reset the latched relay in order to re-start the boiler. The indicator's other output is used to signal operators with a warning bell when high pressures exist *(1100 PSI)*, so that they may take action to prevent boiler shut-down. The alarm/set point values are made to track, so changing the cut-off alarm changes the other an equal amount. Additionally, the indicator is programmed to provide a display alarm in both cases. Key switches are installed in the panel to lock-out the front panel from operators and to provide the means to reset the latched relay to re-start the boiler. The linearizer/totalizer option is specified to integrate the average boiler pressure over discrete time periods *(i.e. overnight, during peak use, start-up, etc)*. Peak pressures are automatically stored with this option. Programming module #5 *(Pro 5)* is used to set up the integrator. The re-transmitted analog output is also specified to drive a chart recorder with 4-20 mA for a hard copy of pressure profiles for later evaluation.

Scaling of the indicator is done by programming module #1 *(Pro 1)*. For dSP 1, 0 PSI is keyed-in. For INP 1, the transmitter is powered and connected to the indicator and the boiler is at 0 PSI. The indicator then measures the output from the transmitter. For dSP 2, 1000 PSI is keyed-in. Prior to INP 2, the boiler is fired and brought to 1000 PSI as checked by a reference pressure gage. Once stabilized, the indicator is allowed to measure the output of the transducer for INP 2. Since there are no span/zero interactions, scaling is complete.



ORDERING INFORMATION

MODEL NO	DESCRIPTION	+18 VDC EXCITATION	TOTALIZER/ LINEARIZER/ PEAK/VALLEY TARE/E2CON	DUAL ALARMS	SERIAL OUTPUT	ANALOG OUTPUT	PART NUMBERS FOR AVAILABLE SUPPLY VOLTAGES	
							*10 to 30 VDC	115/230 VAC
IMP	Intelligent Process Meter with 0-50 mA DC Signal Input (4-20 mA DC 10-50 mA DC)	NO	NO	NO	NO	NO	IMP20030	IMP20060
		YES	NO	NO	NO	NO	IMP20130	IMP20160
		YES	NO	YES	NO	NO	IMP20132	IMP20162
		YES	YES	NO	NO	NO	IMP23130	IMP23160
		YES	YES	NO	YES	NO	IMP23131	IMP23161
		YES	YES	YES	NO	NO	IMP23132	IMP23162
		YES	YES	NO	NO	4 to 20 mA	IMP23133	IMP23163
		YES	YES	YES	YES	4 to 20 mA	IMP23137	IMP23167
		YES	YES	YES	YES	0 to 10 VDC	IMP23139	IMP23169

For more information on Pricing, Enclosures & Panel Mount Kits refer to the RLC Catalog or contact your local RLC distributor.

**Note: The 10 to 30 VDC Versions of the IMP have not yet been specified for EMC.*