



**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](mailto:sales@redlion-controls.com)

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

## MODEL IMD - APOLLO 4 1/2-DIGIT INTELLIGENT METER FOR DECADE VOLT/CURRENT INPUTS

- 40,000 COUNT MEASUREMENT RESOLUTION  
(can be scaled to  $\pm 99,999$  display)
- TWO MODELS TO CHOOSE FROM:  
IMD1 VOLTAGE METER (accepts  $\pm 2$  VDC to  $\pm 300$  VDC input)  
IMD2 CURRENT METER (accepts  $\pm 200$   $\mu$ A DC to  $\pm 2$  A DC input)
- MULTIPLE RANGES (user selectable)
- 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
- 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

### DESCRIPTION

The Apollo Intelligent Decade Volt and Current Meters accept a wide range of input signals and precisely scales them into engineering units. The IMD Volt Meter accepts inputs from  $\pm 2$  VDC to  $\pm 300$  VDC in one of four ranges. The IMD Current Meter accepts inputs from  $\pm 200$   $\mu$ A DC to  $\pm 2$  A DC in one of five ranges. 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.

Both models feature a choice of two different scaling procedures which greatly simplify 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 "EI-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<sup>2</sup>PROM, 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. Additionally, nine slopes and offsets can easily be programmed with this option to linearize transducers with non-linear outputs, such as square law devices. Optional programmable remote input "E2-CON" pin can be utilized to control a variety of functions, such as totalizing, alarm control, display hold or tare operations, simultaneously with "EI-CON" pin. 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 switch. 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, bidirectional 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.

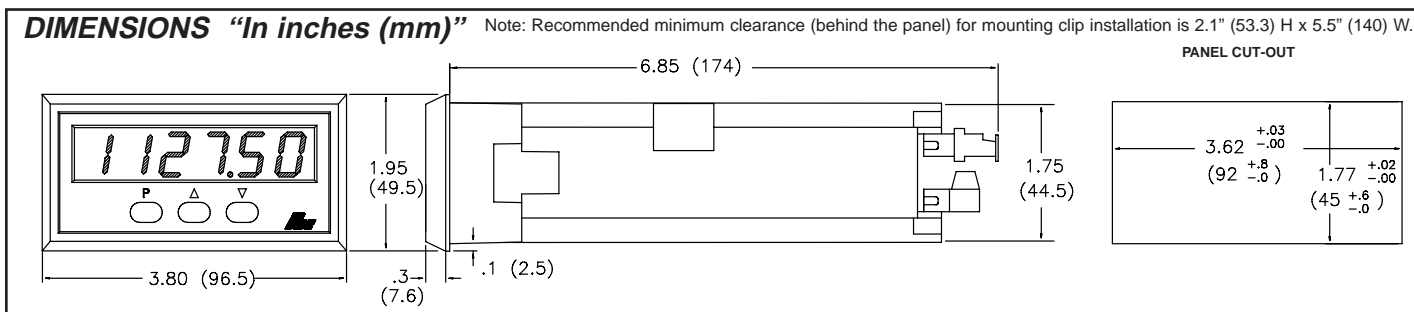
### SAFETY SUMMARY

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

- 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).
- POWER REQUIREMENTS:**  
**AC Power:** Switch Selectable 115/230 VAC,  $\pm 10\%$ , 50/60 Hz, 14 VA  
**DC Power:** 10 to 30 VDC, 9 Watts max., isolated to 300 Vp.
- 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.



## SPECIFICATIONS (Cont'd)

### 4. INPUT RANGE/RESOLUTION, ACCURACY, INPUT IMPEDANCE AND MAXIMUM INPUT LEVEL:

VOLTAGE	ACCURACY % OF FULL SCALE	R (ohms)	MAXIMUM INPUT
RANGES/RESOLUTION	FULL SCALE		
±2.0000 V/0.1 mVDC	0.025%	1 MEG	70 VDC
±20.000 V/1 mVDC	0.1%	1 MEG	300 VDC
±200.00 V/10 mVDC	0.1%	1 MEG	300 VDC
±300.0 V/100 mVDC	0.1%	1 MEG	300 VDC

CURRENT	ACCURACY % OF FULL SCALE	R (ohms)	MAXIMUM INPUT
RANGES/RESOLUTION	FULL SCALE		
±200.00 µA/10 nA DC	0.1%	1 K	2 mA DC
±2.0000 mA/0.1 µA DC	0.1%	100	20 mA DC
±20.000 mA/1 µA DC	0.025%	10	200 mA DC
±200.00 mA/10 µA DC	0.15%	1.0	1 A DC
±2.0000 A/0.1 mA DC	0.8%	0.1	5 A DC

On all current ranges, there is a 0.2 volt DC drop.

Note: Any individual range may be recalibrated (scaled) to 0.025% accuracy with appropriate calibration equipment.

5. **PROGRAMMABLE DISPLAY READING RANGE:** -99999 to 999999
6. **READING RATE:** 2.5 readings/second
7. **RESPONSE TIME:** 2 seconds to settle for step input (*increases with programmable digital filtering*)
8. **TOTALIZER:** Front panel button for input/total display select programmable time-base, scale factor (0.001 to 100.000) and low-end cut-out. Response Time = 0.2 sec. max.
9. **E1-CON AND E2-CON:** External remote inputs which allow activation of various functions (reset total, peak indicator mode, trigger mode, etc.).  
 $V_{IL} = 0.8 V_{MAX}$ ;  $V_{IH} = 2.0 V_{MIN}$ ; Response Time = 0.2 sec. max.
10. **NORMAL MODE REJECTION:** 35 dB @ 50/60 Hz (*may be improved by programmable digital filtering*)
11. **COMMON MODE REJECTION:** 120 dB, DC to 50/60 Hz
12. **ENVIRONMENTAL CONDITIONS:**

**Operating Temperature Range:** 0 to 50°C

**Storage Temperature Range:** -40 to 80°C

**Operating and Storage humidity:**

85% max (non-condensing) from 0 to 50°C

**Span Temperature Coeff.:**  $\frac{\text{Volt Meter}}{50 \text{ ppm}/^\circ\text{C}}$   $\frac{\text{Current Meter}}{80 \text{ ppm}/^\circ\text{C}}$

**Zero Temperature Coeff.:**  $1 \mu\text{V}/^\circ\text{C}$   $1 \mu\text{V}/^\circ\text{C}$

**Altitude:** Up to 2000 meters

13. **EXCITATION (Optional):** 18 VDC @ 60 mA max.
14. **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:**  $V_{MAX} = 30 \text{ VDC}$ ,  
 $V_{SAT} = 1 V_{MAX}$  at 20 mA.  
*Note: This will allow up to 28 units max. in each loop.*  
**SI - Input Diode Rating:**  $V_F = 1.25 V_{TYP}$ ;  $1.5 V_{MAX}$   
*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.)*
15. **ALARMS (Optional):**  
**Solid State:** Two, isolated, sinking open collector NPN transistors acting in parallel with relays.  $I_{max}$ : 100 mA @  $V_{SAT} = 1 \text{ V}$ .  $V_{MAX}$ : 30 VDC.  
**Relays:**  
**Type:** Form C (2)  
**Max. Rating:** 5 Amps @ 115/240 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.*)
16. **ANALOG OUTPUT (Optional):**  
**4 to 20 mA:** Digital scaling and offsetting within 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 0 to 10 VDC range  
**Accuracy:**  $\pm(0.1\% \text{ of reading} + 35 \text{ mV})$   
**Resolution:** 12 bits  
**Min. Load Resistance:** 10 Ω (*1 mA max.*)

17. **LINEARIZER/PEAK/VALLEY/TARE (Optional):**  
9-segment multiple slope scaling for non-linear inputs. Peak and Valley recording. Signal re-zero (*tare*).
18. **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<sup>1</sup>  
ENV 50141 - Radio-frequency conducted electromagnetic field<sup>2</sup>  
EN 61000-4-2 - Electrostatic discharge (ESD)<sup>3</sup>  
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.
19. **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).
20. **CONNECTION:** Removable terminal blocks.
21. **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 with a programmable time base and scaling coefficient. The integrator/totalizer may be reset via a remote input, 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 (shifts, days, etc.) since these values are stored at power-down. Optional E2-CON input 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 externally or by the front panel. This feature can quickly compensate for small shifts or drifts in the input signal or to re-zero every operation, such as batching.

## ISOLATED ALARM OPTION

The alarm option consists of an additional printed circuit board with 9 terminals. Six of these terminals 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 programmed 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 set 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 when tracking is programmed. 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 (*outgoing 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 hardware limitations which restrict this to a lower number of units per serial loop.)

## 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 voltage 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.

## IMD DECADE VOLT METER TOTALIZER EXAMPLE

A transducer with a 0 to 10 VDC output that corresponds to 0-100.0 amps is used to monitor the current of a high capacity pump used in a chemical production facility. In addition to indicating pump current, an indication of pump activity is required for lubrication and maintenance purposes. Pump current increases with low viscosity fluids and taken with total time of operation is proportional to pump wear. The amount of pump activity is therefore related to the totalized pump current between maintenance intervals. The Intelligent Decade Volt Meter with excitation voltage, totalizer and alarm options is used to satisfy this application.

The  $\pm 20$  VDC range is selected to accept the 0 to 10 VDC pump current signal. The 0 to 10 VDC signal is easily scaled into a readout of 0-100.0 amps.

The built-in 18 VDC excitation voltage is used to power the transducer. The optional totalizer is scaled to read directly in amp-hours and Alarm #1 is programmed to trigger at 10,000 amp-hours to inform personnel with visual indication that maintenance is due. Alarm #2 is programmed to trigger when the pump current exceeds 15% over maximum (115.0 amps) indicating an overload. In order to assure correct totalization between maintenance intervals, the front panel is "locked out" to protect the totalizer value and other programmed data from accidental or unauthorized modification. After maintenance, the totalizer is reset to zero by a remote input to restart the process.

## PROGRAMMABLE FUNCTIONS

Programming of the IMD 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 disconnected from ground 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

- "FILtr" - 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 (Reset/Hold)
  - "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 indicator
- "7" - reset valley and start valley indicator
- "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, hysteresis, and tare
- "FULL" - Enable complete or abbreviated printing

#### "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.

## IMD DECADE VOLT METER TOTALIZER EXAMPLE (Cont'd)

### BASIC PROGRAMMING STEPS

"Pro 1"....."dECPNt" - 0.0  
 "round" - 0.1  
 "SCALE" - YES  
 "dSP 1" - 0.0  
 "INP 1" -Apply 0.000 VDC  
 "dSP 2" - 100.0  
 "INP 2" -Apply 10.000 VDC  
 "SEGt" - 1  
  
 "Pro 3"....."dSP AL" - YES  
 "ENt AL" - NO  
 "dSPHYS" - NO  
 "dSPbUF" - NO  
 "SELdSP" - YES  
 "rSttOt" - NO  
 "tARE" - NO  
  
 "Pro 4"....."FILtr" - 1 (normal)  
 "E1-CON" - 1 (rst. total)

D.T.D.P. = Desired Total Decimal Point  
 0  
 0.0  
 0.00  
 0.000  
 0.0000

P.D.D.P. = Process Display Decimal Point  
 0  
 0.0  
 0.00  
 0.000  
 0.0000

$$S.F. = \frac{100.0}{100.0} \times \left[ \frac{3600^{**}}{3600} \right]^* \times \frac{10}{10}$$

$$S.F. = 1 \times 1 \times 1$$

$$S.F. = 1.000$$

\* 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 3600 (program select value = 2) which equals time base in hours (3600 sec.).

### TOTALIZER SET-UP

With an average signal input which gives a display of 100.0 amps for a 1 hour time period, the following formula applies.

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

S.F. = Programmable Scale Factor  
 D.T. = Desired Total 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"

P.D. = Process Display Value  
 Time = Actual Time Period In Seconds

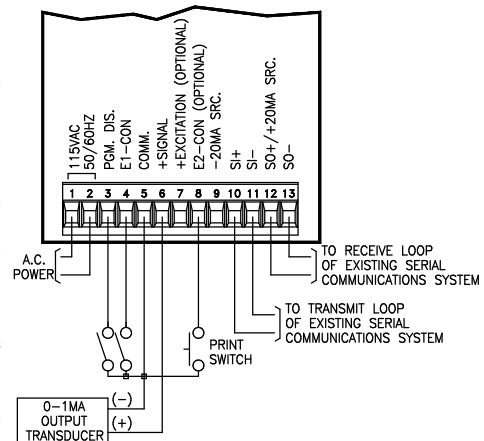
"Pro 5"....."dECPNt" - 0.0  
 "tbASE" - 2  
 "SCLFAC" - 1.000  
 "Lo-cut" - 0.0  
  
 "Pro 6"....."trAC" - NO  
 "dISP" - NO  
 "LAtC-1" - NO  
 "ASN-1" - tOtAL  
 "AL-1" - 9999.9  
 "HYS-1" - 0.1  
 "Act-1" - HI  
 "LAtC-2" - NO  
 "ASN-2" - InPUt  
 "AL-2" - 115.0  
 "HYS-2" - 1.0  
 "Act-2" - HI

## IMD DECADE CURRENT METER APPLICATION EXAMPLE

A manufacturing company is in the process of modernizing and updating their control panels for a more efficient operation. In order to monitor various processes which are being performed, several "old style" analog panel meters are currently being used for display purposes. These meters receive their input from transducers which output 0 to 1 mA. Operators must be very close to the indicator in order to determine exactly where the needle is. Usually a multiplier must be used to obtain final reading. This causes an otherwise simple procedure, such as interpretation of the indicators' reading to be time consuming and difficult.

The company would like to replace these analog meters with new solid state digital meters capable of operating with the transducers that are currently being used, and is looking for a way to store daily peak readings for later evaluation. Also, future plans call for the linking of these indicators with an existing control system so input and/or peak value may be read from a remote computer terminal if so desired. The Apollo IMD Decade Current Meter with serial communication and totalizer options is suited perfectly for this application.

The ±2 mA range is selected to accept the 0 to 1 mA transducer signal. This signal can easily be scaled to provide virtually any readout with several selectable decimal point positions, and it can be changed in minutes for different applications. The large bright LED display is quickly and easily read. The serial communications option is programmed to match the baud rate of the existing system, and input or peak readings may be viewed and/or reset by either the front panel or from a remote terminal.



### ORDERING INFORMATION

MODEL NO	DESCRIPTION	+18 VDC EXCITATION	TOTALIZER/ LINEARIZER/ PEAK/VALLEY TARE/E2CON	DUAL ALARMS	SERIAL OUTPUT	4 to 20 mA ANALOG OUTPUT	0 to 10 VDC ANALOG OUTPUT	PART NUMBERS FOR AVAILABLE SUPPLY VOLTAGES	
								*10 to 30 VDC	115/230 VAC
IMD1	Intelligent Meter For Decade Voltage Inputs	NO	NO	NO	NO	NO	NO	IMD10030	IMD10060
		YES	NO	NO	NO	NO	NO	IMD10130	IMD10160
		YES	NO	YES	NO	NO	NO	IMD10132	IMD10162
		YES	YES	NO	NO	NO	NO	IMD13130	IMD13160
		YES	YES	NO	YES	NO	NO	IMD13131	IMD13161
		YES	YES	YES	NO	NO	NO	IMD13132	IMD13162
		YES	YES	NO	NO	YES	NO	IMD13133	IMD13163
		YES	YES	YES	YES	YES	YES	IMD13137	IMD13167
IMD2	Intelligent Meter For Decade Current Inputs	NO	NO	NO	NO	NO	NO	IMD20030	IMD20060
		YES	NO	NO	NO	NO	NO	IMD20130	IMD20160
		YES	NO	YES	NO	NO	NO	IMD20132	IMD20162
		YES	YES	NO	NO	NO	NO	IMD23130	IMD23160
		YES	YES	NO	YES	NO	NO	IMD23131	IMD23161
		YES	YES	YES	NO	NO	NO	IMD23132	IMD23162
		YES	YES	NO	NO	YES	NO	IMD23133	IMD23163
		YES	YES	YES	YES	YES	YES	IMD23137	IMD23167
		YES	YES	YES	YES	NO	YES	IMD23139	IMD23169

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 units have not been specified for EMC.