

## MODEL IMD - INTELLIGENT DECADE METER

- 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)
- 40,000 COUNT MEASUREMENT RESOLUTION  
(Can be scaled to  $\pm 99,999$  display)
- MULTIPLE RANGES (user selectable)
- EASY, ONE-PASS SCALING
- FULL 6-DIGIT, HIGH VISIBILITY, 0.56" (14.2 mm) HIGH RED LED DISPLAY
- INTEGRATOR (Totalizer) AND LINEARIZER (Optional)
- PEAK/VALLEY MEMORY AND TARE (Re-zero) FUNCTION (Optional)



### Product Features

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 "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 non-volatile E<sup>2</sup>PROM.

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.

### OPTIONS

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 the "E1-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.

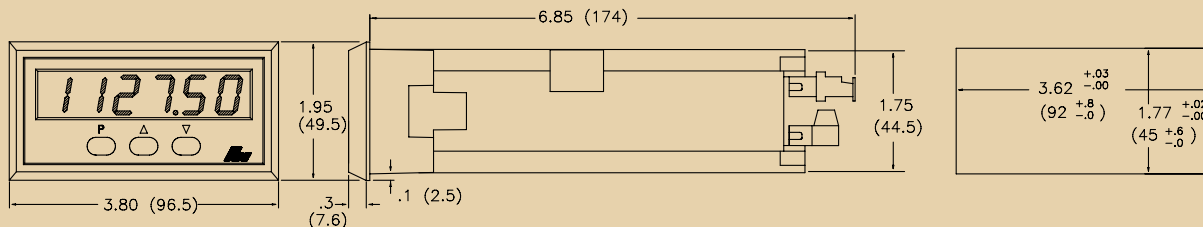
An optional 4 to 20 mA or 0 to 10 VDC re-transmitted analog output can be scaled by the user to interface with a host of recorders, indicators and controllers.



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### DIMENSIONS "In inches (mm)"



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## General 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:**  
**A.C. Power:** Switch Selectable 115/230 VAC,  $\pm 10\%$ , 50/60 Hz, 14 VA
- CONTROLS:** Three front panel push buttons for modifying alarm values and indicator set-up. External Program Disable input locks out programming and enables "Quick" Programming access. One or two programmable inputs are also available.
- 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.
- ENVIRONMENTAL CONDITIONS:**  
**Operating Temperature Range:** 0° to 50°C  
**Storage Temperature Range:** -40° to 80°C  
**Operating and Storage Humidity:** 85% max. relative humidity (non-condensing) from 0 to 50°C.  

	<u>Volt Meter</u>	<u>Current Meter</u>
<b>Span Temperature Coeff.:</b>	50 ppm/°C	80 ppm/°C
<b>Zero Temperature Coeff.:</b>	1 $\mu\text{V}/^\circ\text{C}$	1 $\mu\text{V}/^\circ\text{C}$

  
**Altitude:** Up to 2000 meters.
- EXCITATION (Optional):** 18 VDC @ 60 mA max.
- LINEARIZER/PEAK/VALLEY/TARE (Optional):**  
9-segment multiple slope scaling for non-linear inputs. Peak and Valley recording. Signal re-zero (tare).
- CERTIFICATIONS AND COMPLIANCES:**  
**SAFETY**  
EN 61010-1, IEC 1010-1  
**ELECTROMAGNETIC COMPATIBILITY**  
Immunity to EN 50082-2  
Emissions to EN 50081-2
- 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).
- CONNECTION:** Removable terminal blocks
- WEIGHT:** 1.2 lbs (0.54 Kg)

## Input Specifications

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

VOLTAGE RANGES/ RESOLUTION	ACCURACY % OF FULL SCALE	R (ohms)	MAXIMUM INPUT
$\pm 2.0000$ V/0.1 mV DC	0.025%	1 MEG	70 VDC
$\pm 20.000$ V/1 mV DC	0.1%	1 MEG	300 VDC
$\pm 200.00$ V/10 mV DC	0.1%	1 MEG	300 VDC
$\pm 300.0$ V/100 mV DC	0.1%	1 MEG	300 VDC
CURRENT RANGES/ RESOLUTION	ACCURACY % OF FULL SCALE	R (ohms)	MAXIMUM INPUT
$\pm 200.00$ $\mu\text{A}$ /10 nA DC	0.1%	1 K	2 mA DC
$\pm 2.0000$ mA/0.1 $\mu\text{A}$ DC	0.1%	100	20 mA DC
$\pm 20.000$ mA/1 $\mu\text{A}$ DC	0.025%	10	200 mA DC
$\pm 200.00$ mA/10 $\mu\text{A}$ DC	0.15%	1.0	1 A DC
$\pm 2.0000$ 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.

- PROGRAMMABLE DISPLAY READING RANGE:** -99999 to +999999
- READING RATE:** 2.5 readings/second
- RESPONSE TIME:** 1.5 sec max. settling time for a step input to within 99% of final value (increases with programmable digital filtering)
- 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.
- NORMAL MODE REJECTION:** 35 dB at 50/60 Hz (may be improved by programmable digital filtering)
- COMMON MODE REJECTION:** 120 dB, DC to 50/60 Hz

## MODEL IMD - INTELLIGENT DECADE METER

### Output Specifications

#### 1. 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:  $V_F = 1.25 V_{TYP}$ ;  $1.5 V_{MAX}$

*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.)*

#### 2. 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.)

#### 3. 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  $\Omega$  max. loop impedance)

**0 to 10 VDC:** Digital scaling and offsetting within a 0 to 10 VDC range

**Accuracy:**  $\pm(0.1\%$  of reading +35 mV)

**Resolution:** 12 bits

**Min. Load Resistance:** 10 K $\Omega$  (1 mA max.)

### Ordering Information

MODEL NO.	DESCRIPTION	+18 VDC EXCITATION	TOTALIZER/ LINEARIZER/ PEAK/VALLEY TARE/E2CON	DUAL ALARMS	SERIAL OUTPUT	ANALOG OUTPUT	PART NUMBERS
							115/230 VAC
IMD1	Intelligent Meter For Decade Voltage Inputs	NO	NO	NO	NO	NO	IMD10060
		YES	NO	NO	NO	NO	IMD10160
		YES	NO	YES	NO	NO	IMD10162
		YES	YES	NO	NO	NO	IMD13160
		YES	YES	NO	YES	NO	IMD13161
		YES	YES	YES	NO	NO	IMD13162
		YES	YES	NO	NO	4 to 20 mA	IMD13163
		YES	YES	YES	YES	4 to 20 mA	IMD13167
IMD2	Intelligent Meter For Decade Current Inputs	NO	NO	NO	NO	NO	IMD20060
		YES	NO	NO	NO	NO	IMD20160
		YES	NO	YES	NO	NO	IMD20162
		YES	YES	NO	NO	NO	IMD23160
		YES	YES	NO	YES	NO	IMD23161
		YES	YES	YES	NO	NO	IMD23162
		YES	YES	NO	NO	4 to 20 mA	IMD23163
		YES	YES	YES	YES	4 to 20 mA	IMD23167
	YES	YES	YES	YES	0 to 10 VDC	IMD23169	