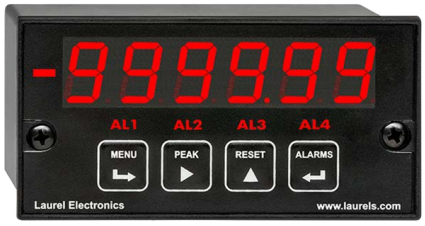
LAUREL ELECTRONICS
MEASUREMENT & CONTROL INSTRUMENTS

Laureate™ Serial Input 6-Digit Panel Meter & Remote Display



Features

- **Accepts RS232, RS485 or USB streaming data.**
- **Able to extract readings embedded in ASCII data strings.**
- **Receives readings in the form of Modbus RTU or TCP commands.**
- **Displays 6-digit numeric readings with any decimal point.**
- **Optional 2 or 4 relays driven by received data.**
- **Optional isolated analog output driven by received data.**
- **Universal 85-264 Vac / 90-300 Vdc or 10-48 Vdc / 12-32 Vac power.**
- **Same appearance as 1/8 DIN Laureate panel meters and counters.**
- **-X extended operating temperature from -40°C to +70°C.**

Description

Laureate™ Remote Displays (or Serial Input Meters) are slave displays which accept the RS232, RS485, USB or Ethernet data from computers, programmable controllers, Laureate instruments, or other devices with a serial data output. They can also provide relay closures and an analog output based on the received readings. They blend in with 1/8 DIN Laureate digital panel meters, counters and timers to provide a numeric display from -999,999 to +999,999.

Serial streaming data can be received in the form of RS232, RS485 or USB at rates up to 9600 baud. Streaming data can be provided by Laureate meters, counters or transmitters programmed for the Custom ASCII protocol in continuous mode, or by other instruments, like weighing scales from different manufacturers. Readings can be extracted from streaming ASCII strings that contain multiple data values and non-numeric characters, such as Start and Stop characters. Any number of characters between the Start character and the data can be masked Off. Up to 8 display characters (including sign and decimal point) can be masked On. Any number of characters between the last displayed character and the Stop character can be masked Off.

Laureate meters, counters and timers allow their display to be duplicated in streaming mode by a Laureate Remote Display, which can be used to display multiple parameters collected by the same counter. While a Laureate counter can only display one selected parameter at a time (such as rate A), it can transmit multiple parameters (such as rate A, rate B, ratio A/B and peak). The Remote Display can be set up to display any serially transmitted item, and an indicator light shows which item has been chosen for display.

Commands using the Modbus or Custom ASCII protocol can be used to download specific readings into the Remote Display using RS232, RS485, USB or Ethernet TCP/IP communications. These readings can be displayed, be converted into a scaled analog output, and/or be used to control relays, depending on configuration of the remote display.

An optional isolated analog output board allows the Remote Display to serve as a highly accurate 16-bit digital-to-analog converter and transmitter.

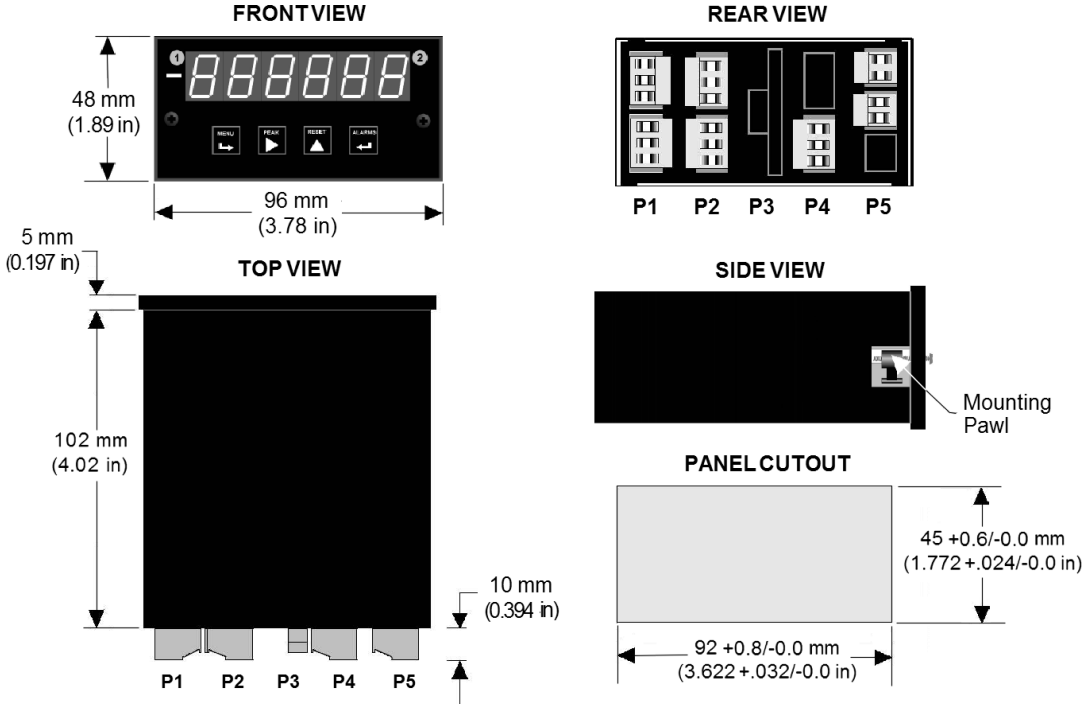
An optional relay output board with 2 or 4 relays can add remote alarm or control capability. The relays can be 8A contact relays or opto-isolated 120 mA AC/DC solid state relays. The relays can respond to the transmitted values or to any of 8 serially transmitted control characters. The control characters can be generated by a Laureate meter, counter or timer, thereby assuring that the local and remote alarm points are identical.

Specifications

Display	
Readout Range Indicators	6 LED digits, 7-segment, 14.2 mm (.56"), red or green -999999 to +999999 Four LED lamps
Power	
Voltage, standard Voltage, optional Power frequency Power consumption (typical, base meter) Power isolation	85-264 Vac or 90-300 Vdc 12-32 Vac or 10-48 Vdc DC or 47-63 Hz 1.2W @ 120 Vac, 1.5W @ 240 Vac, 1.3W @ 10 Vdc, 1.4W @ 20 Vdc, 1.55W @ 30 Vdc, 1.8W @ 40 Vdc, 2.15W @ 48 Vdc 250V rms working, 2.3 kV rms per 1 min test

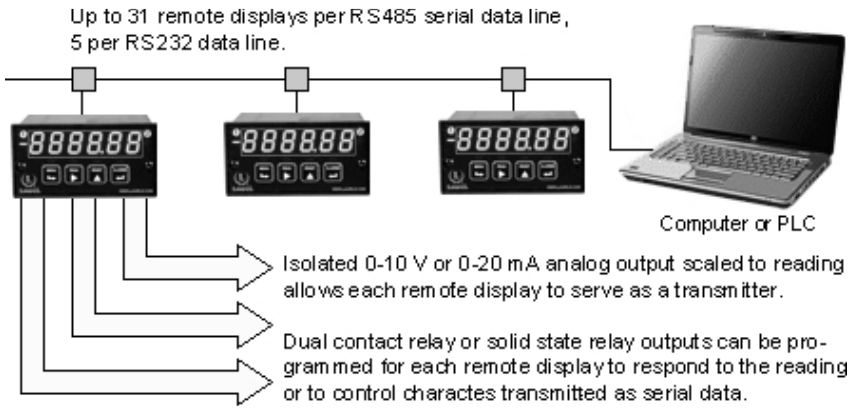
Serial Interface (one required)	
Board Selections	Ethernet, Ethernet-to-RS485 converter, USB, USB-to-RS485 converter, RS485 (dual RJ11), RS485 Modbus (dual RJ45), RS232.
Protocols	Modbus RTU, Modbus ASCII, Laurel ASCII protocol
Data Rates	300 to 19200 baud
Digital Addresses	247 (Modbus), 31 (Laurel ASCII),
Isolation	250V rms working, 2.3 kV rms per 1 min test
Analog Output (optional)	
Output Levels	4-20 mA, 0-20 mA, 0-10V, -10 to +10V
Current compliance	2 mA at 10V (> 5 kΩ load)
Voltage compliance	12V at 20 mA (< 600Ω load)
Scaling	Zero and full scale adjustable from -99999 to +99999
Resolution	16 bits (0.0015% of full scale)
Isolation	250V rms working, 2.3 kV rms per 1 min test
Relay Outputs (optional)	
Relay Types	2 Form C contact relays or 4 Form A contact relays (NO) 2 or 4 Form A, AC/DC solid state relays (NO)
Current Ratings	8A at 250 Vac or 24 Vdc for contact relays 120 mA at 140 Vac or 180 Vdc for solid state relays
Output common	Isolated commons for dual relays or each pair of quad relays
Isolation	250V rms working, 2.3 kV rms per 1 min test
Environmental	
Operating Temp.	0°C to 55°C standard, -40°C to 70°C with -X option
Storage Temp.	-40°C to 85°C
Relative Humidity	95% at 40°C, non-condensing
Protection	NEMA-4X (IP-65) when panel mounted

Mechanical



Application Examples

Remote Displays Driven by a Computer



Remote Displays Augmenting a Laureate Counter

The display of a Laureate counter can be augmented by up to three slave displays to show up to four parameters simultaneously: Items #1, #2, #3 and peak rate (if rate was one of the selected items). All four parameters can also be displayed at a remote location.

Ordering Guide

Create a model number in this format: **L50001-X, CASE1**

Main Board	**L5** Green LEDs **L6** Red LEDs
Power	**0** Isolated 85-264 Vac **1** Isolated 12-32 Vac or 10-48 Vdc
Relay Output (isolated)	**0** None **1** Two 8A Contact Relays **2** Two 120 mA Solid State Relays **3** Four 8A Contact Relays **4** Four 120 mA Solid State Relays
Analog Output (isolated)	**0** None **1** Single isolated 4-20 mA, 0-20 mA, 0-10 V, -10 to +10V **2** Dual isolated 4-20 mA, 0-20 mA, 0-10V
Digital Interface (isolated)	**0** None **1** RS232 **2** RS485 (dual RJ11 connectors) **4** RS485 Modbus (dual RJ45 connectors) **5** USB **7** Ethernet
	Note: Laureate Remote Displays can display digital data received via RS-232 or RS-485 from any source. They can also provide alarms and an isolated analog output scaled to the display.
Add-on Options	**-X** Extended operating temperature -40°C to 70°C **CBL01** RJ11-to-DB9 cable. RJ11 to DB9. Connects RS232 ports of meter and PC. **CBL02** USB-to-DB9 adapter cable. Combination of CBL02 and CBL01 connects meter RS232 port to PC USB port. **CBL03-1** 6-wire data cable, RJ11 to RJ11, 1 ft. Used to daisy chain meters via RS485. **CBL03-7** 6-wire data cable, RJ11 to RJ11, 7 ft. Used to daisy chain meters via RS485. **CBL05** USB cable, A-B. Connects USB ports of meter and PC. **CBL06** USB to RS485 adapter cable, half duplex, RJ11 to USB. Connects meter RS485 port to PC USB port. **CASE1** Benchtop laboratory case for one 1/8 DIN meter **CASE2** Benchtop laboratory case for two 1/8 DIN meters **IPC** Splash-proof cover **BOX1** NEMA-4 Enclosure **BOX2** NEMA-4 enclosure plus IPC **BL** Blank Lens without button pads **NL** Meter lens without button pads or Laurel logo