



LAUREATE™ Counter Series

Instruments with Scalable Readout & Control

Signal Conditioners

Dual-channel pulse input

- Contact closures, AC, NPN or PNP transistors, digital logic to 1 MHz.
- For frequency, period, rate, time interval, stopwatch, phase angle, square root, up/down total, ratio, draw, A+B, A-B, A*B, A/B, A/B-1, batching, custom curves.

Process rate & total input

- 0-1 mA, 4-20 mA, 0-10 V analog.
- For rate, totalized rate, batch control, 1/rate, (time), custom curves.

Quadrature input

- Low-level differential or single-ended logic level. Count x1, x2 or x4 to 250 kHz plus zero channel.
- For position or speed.

Standard Features

- Six scalable LED digits
- 85-264 Vac or 90-300 Vdc power
- Isolated sensor excitation
- NEMA-4X, 1/8 DIN front panel
- Screw-terminal connectors

Ordering Options

Signal conditioner (isolated)

Relay outputs (isolated)

- Dual/quad 8 A, 250V mechanical
- Dual/quad 120 mA solid state

Analog outputs (isolated)

- 4-20 mA, 0-10 V or -10 to +10 V
- 16 bits, isolated & linearized

Serial data I/O (isolated)

- RS485, RS232
- Ethernet
- Ethernet-to-RS485 converter
- USB 2.0
- USB-to-RS485 converter
- Modbus or Laurel ASCII protocol

Power options

- 85-264 Vac or 90-300 Vdc
- 12-34 Vac or 10-48 Vdc



Laureate™ counters are low-cost solutions to a wide range of monitoring and control applications related to frequency, rate, timing, pulse or analog totalizing, batch control, position or speed.

Exceptional flexibility is provided by a choice of assemblies for display, power, signal inputs, analog outputs, relay outputs, and communications. The electronics and software provide exceptional performance and programmable features not available in similarly low-priced instruments.

FR Version: Dual-channel Counter, Timer, Ratemeter

Two channels accept PNP or NPN outputs, TTL or CMOS logic signals, magnetic pickups, contact closures, low level outputs from turbine flow meters, or AC line inputs up to 250 Vac. Inverse period is used to calculate frequency or rate up to six places. The basic version can measure two rates or totals (up or down) simultaneously, and perform timing operations.

The Extended version is capable of the above plus simultaneous rate and total for one channel, rate of one channel and total of the other, up/down counting with external control for count direction, square root of rate and total, phase angle, duty cycle, two-channel arithmetic functions (A+B, A-B, A*B, A/B, A/B-1), batch control, and linearization of nonlinear inputs.

VF Version: Process Totalizer

This version accepts 0-1 mA, 4-20 mA or 0-10 V analog inputs, which it can then totalize or display as rate. For example, the total in gallons or rate in gallons/minute may be displayed from a 4-20 mA flow meter signal. The Extended version adds batch control and custom curve linearization.

QD Version: Quadrature Input

Accurate position is displayed in engineering units from -999999 to +999999 by counting 1, 2 or 4 transitions from quadrature encoders at a combined rate to 250 kHz. Zero index error correction is standard. The Extended version can also display speed.

Isolated Excitation Power

An isolated 5, 10 or 24 Vdc output is standard and can eliminate the need for an external power supply.

Isolated Relay Output Options

Setpoint options for alarm and control: are dual or quad 8A Form C contact relays, and dual or quad optoisolated AC/DC 130 mA Form A solid state relays. The relays can each be latching or nonlatching, and operate in a hysteresis or band deviation mode.

Isolated Analog Output Option

Single or dual isolated 16-bit 4-20 mA, 0-10V, or $\pm 10V$ isolated analog outputs are available for transmission to other instruments or to a central control room. The output are linearized and scaled to the meter reading or to an internally stored value.

Isolated Communication Options

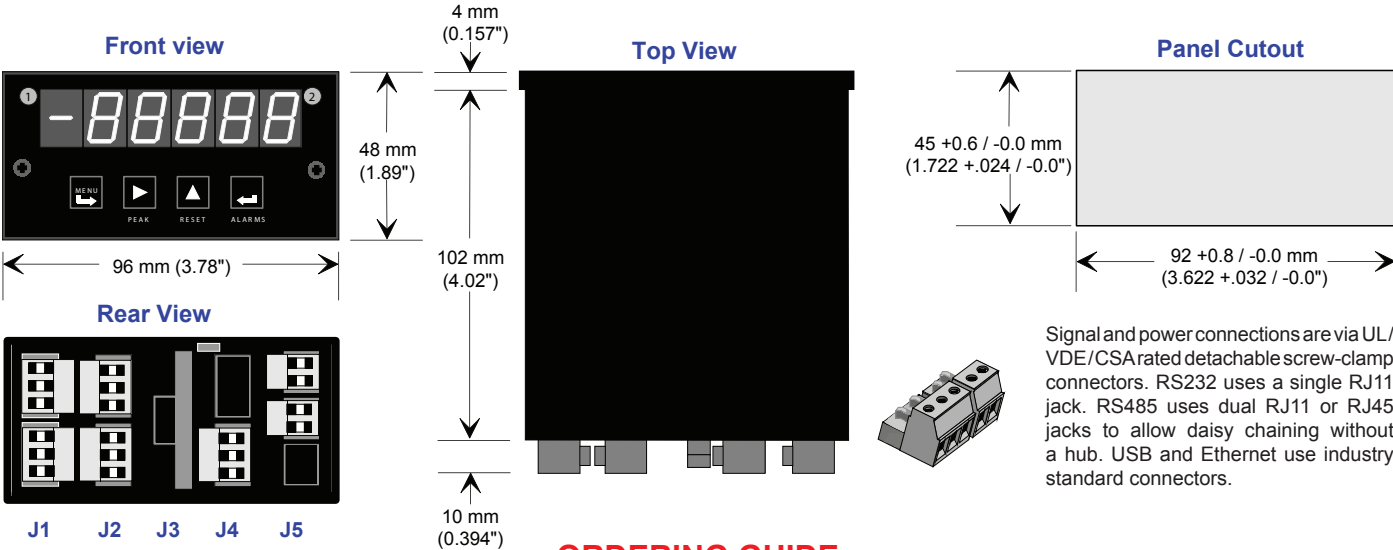
Ethernet, USB 2.0, RS485 or RS232, serial interface boards allow Laureates to communicate with computers, PLCs or printers. The Modbus protocol (RTU or ASCII) is fully supported, as is the simpler Laurel ASCII protocol.

Easy Setup

All Laureate meters can be programmed from the front panel or via Windows-based Instrument Setup Software on a PC.

SPECIFICATIONS

<p>Display Type Six 7-segment, 14.2 mm (.56") high LED digits plus LED indicators Display color Red or green Display range -999999 to 999999 Display scaling ± 999999 for zero & full scale</p> <p>Frequency Conversion Technique 1/period Update Gate time + 30 ms + 2 input periods Gate Time Selectable 0 to 199.99 sec Scale factor ± 10⁻¹⁰ to ± 10⁶</p> <p>FR Signal Conditioner Inputs AC, pulses from NPN or PNP transistors, contact closures, magnetic pickups Channel A frequency 0 Hz to 1 MHz Channel B frequency 0 Hz to 250 kHz Crystal time base calibration ± 2 ppm Span tempco ± 1 ppm/°C (typ) Long term drift ± 5 ppm/year</p> <p>VF Signal Conditioner</p>	<p>Inputs 0-10 V, 0-1 mA, 4-20 mA Span error 0.01% of full scale ± 1 count</p> <p>QD Signal Conditioner Inputs Quadrature encoders to 250 kHz Polarity Differential or single-ended Error correction Zero index (Z-channel)</p> <p>Contact Relay Options (isolated) Relay type 2 or 4 mechanical or solid state Rating, mechanical 8A at 250 Vac or 24 Vdc Rating, solid state 120 mA at 140 Vac or 180 Vdc</p> <p>Analog Output Options (isolated) Number of outputs 1 or 2 Output levels 0-10V, 0-20 mA, 4-20 mA Compliance 2 mA at 10V, 12V at 20 mA Scaling resolution 16 bits</p> <p>Serial Data I/O Options (isolated) Formats Ethernet, USB 2.0, RS485, RS232 Ethernet-to-RS485, Ethernet-to-USB Protocols Modbus (RTU or ASCII), Laurel ASCII Data rates 300 to 19,200 baud</p>	<p>Meter Isolation CMV, DC to 60 Hz 250 Vac working, 2.3 kV rms for 1 minute test</p> <p>Operating Power Voltage (std) 85-264 Vac or 90-300 Vdc Voltage (opt) 12-34 Vac or 10-48 Vdc Power frequency DC or 47-440 Hz</p> <p>Excitation Output (isolated) Output levels 120 mA @ 10 Vdc 100 mA @ 5 Vdc, 50 mA @ 24 Vdc</p> <p>Environmental Operating temperature 0°C to 60°C Storage temperature -40°C to 85°C Relative humidity 95% at 40°C, non-condensing Protection NEMA-4X when panel mounted</p> <p>Certifications ETL certifications UL Standard 61010-1, CAN/CSA Std. C22.2 No. 61010-1 EMI and safety CE Mark Hazardous material RoHS compliant</p>
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ORDERING GUIDE

One entry required per box. Configure a model number in this format: L50010FR

<p><input type="checkbox"/> L Laureate™ with plug-in screw screw terminal connectors</p> <p><input type="checkbox"/> Main Board</p> <p>5 Counter with green LED 6 Counter with red LED 7 Extended counter, green LED 8 Extended counter, red LED</p> <p><input type="checkbox"/> Power</p> <p>0 85-264 Vac, 95-300 Vdc 1 12-34 Vac, 10-48 Vdc</p> <p><input type="checkbox"/> Relay Output</p> <p>0 None 1 Two 8A contact relays 2 Two solid state relays 3 Four 8A contact relays 4 Four solid state relays</p> <p><input type="checkbox"/> Analog Output</p> <p>0 None 1 4-20 mA, 0-10V, ±10V 2 Dual 4-20 mA or 0-10V</p>	<p><input type="checkbox"/> Digital Interface</p> <p>0 None 1 RS232 with RJ11 2 RS485 with dual RJ11 4 RS485 with dual RJ45 5 USB 6 USB-to-RS485 converter 7 Ethernet 8 Ethernet-to-RS485 conv</p> <p><input type="checkbox"/> Input Type</p> <p>FR Frequency to tsyr With main boards 5 & 6: Scalable to ± 999,999 for frequency, rate, timing, up or down total, square root of rate. With main boards 7 & 8: Above plus rate and total simultaneously, arithmetic functions (A+B, A-BA*B, A/B, A/B-1), phase angle, duty cycle, up/down counting, batch control, custom curve linearization.</p>	<p>VF1 4-20 mA VF2 0-1 mA VF3 0-10 V VF4 Special ranges With main boards 5 & 6: V-to-F con-verter for rate, totalizing, and square root of rate from differential pressure flow meters. With main boards 7 & 8: Above plus</p> <p>linearization of nonlinear inputs, batch counting, 1/rate (time).</p> <p>QD Quadrature With main boards 5 & 6: Scalable to ±999,999 for position from shaft encoders. With main boards 7 & 8: Scalable to ±999,999 for rate or position from shaft encoders.</p>	<p><i>Your Dalec Applications Engineer</i></p>
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