

## Laurel Programmable Counters

### FUNCTIONS

- Rate, Frequency, Period
- Simultaneous Total & Rate
- Time Interval, Stopwatch
- Quadrature Position or Rate
- Ratio / Draw
- Batch Controller
- Analog Totalizer
- Phase Angle & Power Factor
- Duty Cycle

### FEATURES

- ±999,999 Display Span
- Scaling in Engineering Units
- Crystal Time Base Error <0.001%
- Sensor Excitation Output
- 1/8 DIN, NEMA-4X Front Panel

### OPTIONS

- Dual Relay Outputs
- Isolated Analog Outputs
- USB, RS-232 & RS-485 Data I/O
- Custom Curve Linearization
- Datalogging PC Software

Exceptional flexibility is provided by advanced programmable features and by modular architecture with a choice of main boards (basic or extended), signal conditioners (FR, VF or QD), power supplies, analog output, relay outputs, and serial data I/O.

The FR module provides two independently scalable frequency/pulse input channels. These channels can be combined arithmetically to display the sum or difference of two flows, the ratio of two rates, etc. As a counter, each channel may be independently set and scaled to count up to or down from a preset value. The displayed channel (A or B) is selected via front panel pushbutton. The totals are stored in non-volatile memory & retained in the absence of power.

### SPECIFICATIONS

<b>Display</b>	Six 14.2 mm (.56") high LED digits
<b>Conversion Technique</b>	
Frequency measurement technique	1/period
Rate	Gate time + 30 ms + 0-2 input periods
Gate time	Selectable 0 to 199.99 sec
Scale Factor	±10 <sup>-10</sup> to ±10 <sup>6</sup>
Isolation	250V RMS working, 2.3kV RMS test
<b>FR Signal Conditioner (2 channels)</b>	
Inputs	AC, pulses from NPN or PNP transistors, contact closures, magnetic pickups
Level	±12 mV min, 250 Vac max
Frequency	CH A: 0 Hz to 1 MHz; CH B: 0 Hz to 250 kHz
<b>VF Signal Conditioner</b>	
Inputs	0-10 V, 0-1 mA, 4-20 mA
Span error	< 0.015% of full scale ±1 count
Span tempco	< 0.003% of reading/°C
Zero tempco	< 0.001% of full scale/°C
<b>QD Signal Conditioner</b>	
Inputs	Quadrature encoders to 250 kHz
Polarity	Differential or single-ended
Error correction	Zero index (z-channel)
<b>Transducer Excitation Output (std)</b>	
Output	100 mA @ 5 V, 120 mA @ 10 V, 50 mA @ 24 V
Isolation	50 Vdc to meter ground
<b>Data Communications (opt)</b>	
Type	USB, RS-232, RS-485 (2- or 4-wire)
RS-485	Modbus RTU, Modbus ASCII, or Laurel ASCII
<b>Operating Temperature</b>	0°C to 55°C



### ORDERING INFORMATION

Example: L50010FR

<input type="checkbox"/> L	Laureate™ with plug-in screw terminal connectors		
<input type="checkbox"/> Main Board			
5	Meter with green LEDs		
6	Meter with red LEDs		
7	Extended, green LEDs		
8	Extended, red LEDs		
<input type="checkbox"/> Power			
0	85-264 Vac/90-300 Vdc		
1	10-48 Vdc/12-30 Vac		
<input type="checkbox"/> Setpoint Output			
0	None		
1	Dual 8 A relays (250 Vac/24 Vdc)		
2	Dual 130mA solid state relays (140 Vac/180 Vdc)		
<input type="checkbox"/> Analog Output			
0	None		
1	0-20 mA, 4-20 mA, 0-10 V, ±10 V		
<input type="checkbox"/> Digital Interface			
0	None	5	USB
1	RS-232 (Isolated)	6	USB to RS-485 Converter
2	RS-485 (Isolated)		
4	RS-485 Modbus (Isolated)		
<input type="checkbox"/> Input Type			
FR	Frequency		
With main boards 5 & 6: Scalable to ±999,999 for frequency, period, up/down total, interval, rate or square root of rate. With main boards 7 & 8: Above plus rate and total simultaneously, custom curve linearization, atio, draw, arithmetic functions (A*B, A/B, A/B-1, A+B, A-B), phase angle, stopwatch, batch counting.			
VF1	4-20 mA		
VF2	0-1 mA		
VF3	0-10 V		
With main boards 5 & 6: V-to-F converter for rate or square root of rate from differential pressure or target type flow meters. With main boards 7 & 8: Above plus rate and total simultaneously, linearization of nonlinear inputs, batch counting, 1/rate (time).			
QD	Quadrature		
With main boards 5 & 6: Scalable to ±999,999 for position from encoders.			
QDR	Quadrature Rate		
With main boards 7 & 8: Scalable to ±999,999 for position or rate from encoders.			

### ACCESSORIES

CBL01	RJ11 TO DB9 Cable to PC Com port
CBL02	USB to DB9 Adapter
CBL05	USB Cable to PC USB Port