

Laureate™ Dual-Channel Totalizer

With two independently scalable channels & presets



Standard Counter

- Independent, scalable totals for Channels A & B.
- Totals stored in non-volatile memory.
- Inputs from NPN or PNP proximity switches, contact closures, digital logic, magnetic pickups down to 12 mV, or AC inputs up to 250 Vac.
- Up counting from zero to preset value using positive scale factor.
- Down counting from preset to zero using negative scale factor.
- Data rates up to 1 MHz.
- Isolated 5, 10 or 24 Vdc excitation supply to power sensors.
- Green or red LED display.
- Choice of isolated plug-in options for control and computer interface: [dual relays](#), [4-20 mA & 0-10 V analog output](#), [RS-232/485 I/O](#), [parallel BCD output](#), [low voltage AC & DC power](#).
- [NEMA 4X, 1/8 DIN case](#).
- Certified to UL 3101-1, CAN/CSA-C22.2, EN 61010-1 (CE Mark).

Extended Counter

All capabilities of the Standard Counter, plus:

- Channel A total and Channel B rate simultaneously.
 - Up/down counting on Channel A, using Channel B to control count direction.
 - Counting on Channel A, using Channel B to inhibit counting.
 - Arithmetic functions A+B, A-B, A*B, A/B
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Description



The Laureate dual-channel up or down totalizer is a basic operating mode of the Laureate counter with the FR dual-channel signal conditioner board.

Each channel (A or B) may be independently set up and scaled to count up from zero (or other value) to a preset limit, or to count down from a preset value to zero (or other limit). Countdown operation is set up by entering a negative scale factor.

The six-digit counter display is capable of displaying any value from -999,999 to 999,999 with programmable decimal point. Scaling allows direct readout in engineering units, such as gallons or cubic feet based on counts from a turbine flowmeter, or the count of cans based on the count of six-packs. The displayed channel (A or B) is selected via a front panel pushbutton. The totals are stored in non-volatile memory so as to be retained in the absence of power.

The minimum recommended complementary option for the Laureate totalizer is the dual setpoint controller output board, which is available with either 10 A relays or AC/DC solid state relays.

Extended Counter Capabilities

An optional Extended counter version provides capabilities beyond those of the standard counter:

- **Rate and total simultaneously.** Channel A can display total while Channel B displays rate. The selection of A or B for display is via a front panel pushbutton. This mode is ideal for flow applications.
- **Up/down counting.** Channel A can serve as an up/down counter, where the count direction is dynamically changed by applying a signal to Channel B. For instance, Channel A can count and scale pulses from a turbine flowmeter, while Channel B inputs the direction of flow. This allows total volume to be tracked in case of reversible flow.
- **Totalizing with external inhibit.** Totalizing by Channel A can be temporarily inhibited by applying a signal to Channel B. For instance, 60 Hz AC pulses can be counted by Channel A and be scaled to display elapsed hours. A signal can be applied to Channel B to start or stop pulse counting when a process is in operation.
- **Custom curve linearization.** Exceptionally accurate custom curve linearization is achievable, for example to linearize the low end of turbine flowmeters. For setup, up to 240 data points can be input into a spreadsheet or text file by the user. The computer then calculates spline fit segments, which are downloaded into the meter via RS-232. The linearized rate can then be totalized by the Extended counter.
- **Arithmetic functions.** The Extended counter makes arithmetic functions available, namely $A+B$, $A-B$, $A*B$, A/B and $A/B-1$. These solve many applications. For instance, $A+B$ allows two input flows to be summed for total volume, while $A-B$ allows outflow to be subtracted from inflow for net volume. A/B allows the mixing of ingredients in a specified ratio. By monitoring and alarming the A/B volume ratio, ingredient B can be added to A until the proper ratio is achieved.

Universal Signal Conditioner

The dual-channel signal conditioner accepts inputs from proximity switches with PNP or NPN output, TTL or CMOS logic, magnetic pickups, contact closures, low-level outputs from turbine flow meters down to 12 mV, and high-level AC line inputs up to 250 Vac. Jumper selections provide optimum operation for different sensor types and noise conditions.



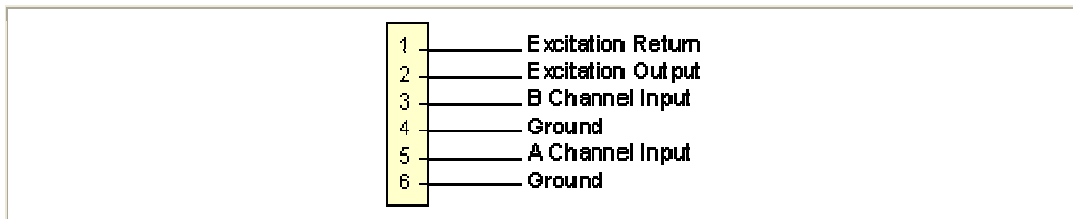
A built-in isolated 5, 10, or 24 Vdc excitation supply can power proximity switches and other sensors, and eliminate the need for an external power supply.

Other Features and Options

Plug-in [isolated analog output](#), [dual setpoint controller](#), [RS232/485 serial data I/O](#), or [parallel BCD output](#) boards can upgrade the Laureate totalizer from a stand-alone monitor to system interface and control. The ability of the Laureate totalizer to output an isolated 4-20 mA signal which tracks a total may be unique among totalizers. The [1/8 DIN case](#) of Laureate meters and counters meets NEMA 4X (IP-65) standards from the front for high pressure wash-down when panel mounted.

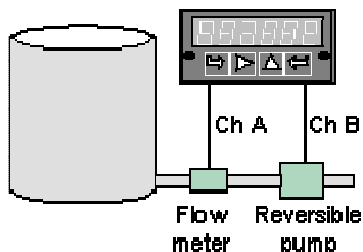
Specifications

Display	
Readout	6 digits, 7-segment, 14.2 mm (.56")
Color	Red or green LED
Range	-999999 to +999999, XXXXEX scientific notation beyond 999999
Indicators	Four LED lamps
Inputs	
Types	AC, pulses from NPN, PNP transistors, contact closures, magnetic pickups
Signal ground	Common ground for channels A & B
Channel A Frequency	0 Hz to 1 MHz
Channel B Frequency	0 Hz to 250 kHz
Selectable Hysteresis	-12 to +12 mV, +30 to +60 mV, -30 to -20 mV, -150 to +150 mV, +350 to +600 mV, -600 to -350 mV, -1.15 to +1.15 V, +1.25 to +2.1 V, -2.1 to -1.25 V
Rolloff Filter	Selectable: 1 MHz, 30 kHz, 250 Hz
Debounce Time	Selectable: 0, 3, 50 ms
Power	
Voltage, std.	85-264 Vac and 90-370 Vdc
Voltage, opt.	8-28 Vac and 9-37 Vdc
Frequency	DC or 49-440 Hz
Power isolation	Safety-rated to 250 Vac, meter ground to earth ground, DC to 60 Hz, 4.2 kVp per High Voltage Test
Excitation Output	
5 Vdc	5 Vdc \pm 5%, 100 mA max
10 Vdc	10 Vdc \pm 5%, 120 mA max
24 Vdc	24 Vdc \pm 5%, 50 mA max
Output isolation	50 Vdc to meter ground
Environmental	
Operating Temperature	0°C to 55°C -40°C to 85°C
Storage Temperature	95% at 40°C, non-condensing
Relative Humidity	NEMA-4X (IP-65) when panel mounted
Protection	
Electrical Connections	



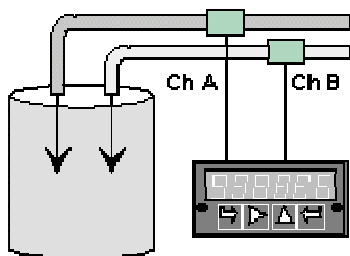
Typical Applications

Up/Down Totalizing



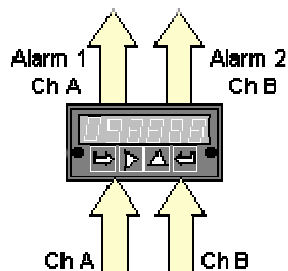
Up/down totalizing is provided by a mode of the Extended counter where pulses are either added or subtracted on Channel A based on a direction input on Channel B. The counter can also be programmed so that counting by Channel A is inhibited by an input on Channel B.

Combining Two Totals



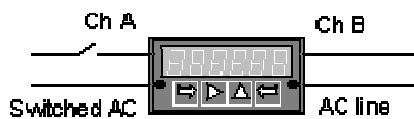
A+B, A-B and A/B arithmetic functions are available with the Extended counter. A+B sums both totals, while A-B subtracts the outflow total from inflow total. The A/B ratio applied to total helps assure the proper mixing of components.

Up or Down Counting with Preset



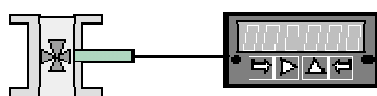
A single Laureate dual-channel counter will handle two repetitive fill operations by counting from zero up to a preset, or down from a preset to zero. A dual setpoint relay board is required.

Machine ON Time and Utilization



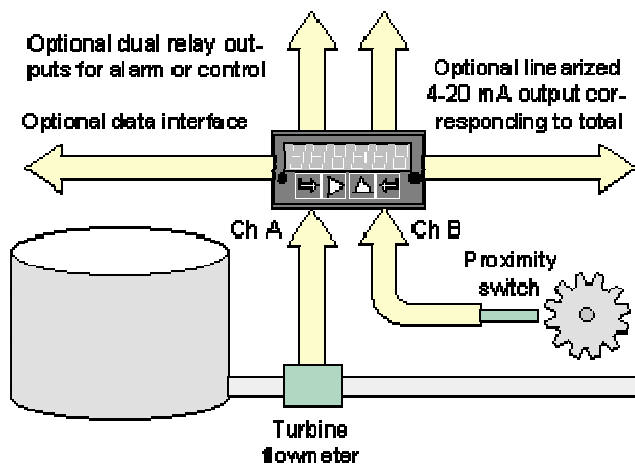
An easy way to measure the ON time of machines is to count AC line cycles and scale the total to hours. To display machine utilization or duty cycle in percent, use the Extended counter. Connect Channel A to switched AC and Channel B to the AC line, and have the counter display the A/B ratio with a 100 multiplier.

Total and Rate Simultaneously



The Extended version of the Laureate dual channel counter can display scaled rate or total for the same channel at the push of a button, and alarm both the rate and total. The Extended version can also do curve linearization, thereby extending the working range and accuracy of flow transducers.

System-level Capabilities



The Laureate dual channel totalizer can independently scale, display and alarm two totals, and the totals plus alarm data can be transmitted via RS-232 or RS-485. The displayed totals can also be transmitted as isolated parallel BCD and isolated 4-20 mA analog output. The Extended version can further display and transmit arithmetic combinations of the two totals.

Ordering Guide

Laureate™ Dual-Channel Totalizer

Create a model number in this format: **L80101FR**. This example calls out a Laureate counter with an extended main board with red LEDs, 85-264 Vac & 90-370 Vdc power, dual 10 A contact relays, no second output, RS-232 serial output, and a dual-channel frequency signal conditioner. Includes plug-in screw terminals.

Main Board	<input type="checkbox"/>	L5 Standard Main Board, Green LEDs.	\$220
	<input type="checkbox"/>	L6 Standard Main Board, Red LEDs.	\$220
	<input type="checkbox"/>	L7 Extended Main Board, Green LEDs.	\$260
	<input type="checkbox"/>	L8 Extended Main Board, Red LEDs.	\$260
	Note: The Standard Main Board handles up or down totalizing as well as frequency, rate, period, square root of rate, and A-to-B time interval. The Extended Main Board handles the above plus simultaneous rate and total, stopwatch, arithmetic functions, phase, batching, and custom curve linearization.		
Power	<input type="checkbox"/>	0 Isolated 85-264 Vac & 90-370 Vdc	NC
	<input type="checkbox"/>	1 Isolated 8-28 Vac & 9-37 Vdc.	\$30
Setpoint Output	<input type="checkbox"/>	0 None.	NC
	<input type="checkbox"/>	1 Dual 10A Contact Relays.	\$80
	<input type="checkbox"/>	2 Isolated Dual Solid State Relays.	\$55
Second Output	<input type="checkbox"/>	0 None.	NC
	<input type="checkbox"/>	1 Isolated 0-20 mA & 0-10 V.	\$90
	<input type="checkbox"/>	2 Batch Relay. Only used with pulse-input batching operation.	\$50
Digital Interface	<input type="checkbox"/>	0 None.	NC
	<input type="checkbox"/>	1 Isolated RS-232.	\$60
	<input type="checkbox"/>	2 Isolated RS-485.	\$80
	<input type="checkbox"/>	3 Isolated Parallel BCD Output.	\$105

Input Type	<input checked="" type="checkbox"/> FR Dual-Channel Pulse Input Signal Conditioner.		NC
Add-on Options	<input type="checkbox"/> EB Extra Bright Red LED Display.	<input type="checkbox"/> Unselected.	\$30
	<input type="checkbox"/> BL Blank Lens without Button Pads.	<input type="checkbox"/> Unselected.	NC