LAUREL ELECTRONICS, INC.

Ethernet & 4-20 mA Output Transmitter & Totalizer for 0-1 mA, 4-20 mA or 0-10V Signals

Standard Features

- **Ethernet Serial Data I/O, Modbus TCP or Laurel ASCII protocol**
- **4-20 mA or 0-10V transmitter output, 16 bits, jumper selectable, isolated**
- **Dual 120 mA solid state relays for alarm or control, isolated**
- **5V, 10V or 24V dc transducer excitation output, isolated**
- **0-1 mA, 4-20 mA or 0-10V process signal input, isolated**
- **Converts signal input to a scaled rate or totalized rate**
- **Selectable square root for differential flow**
- **Analog output resolution 0.0015% of span (16 bits), accuracy ±0.02% of span**
- **Digital span adjust from 0 to ±99,999, zero adjust from -99,999 to +99,999**
- **Output accuracy maintained for narrow or wide spans**
- **Universal 85-264 Vac / 90-300 Vdc or 10-48 Vdc / 12-32 Vac power**
- **Power over Ethernet (PoE) jumper selectable with 10-48 Vdc supply**

Description

The Laureate process signal input transmitter and totalizer accepts 0-1 mA, 4-20 mA or 0-10V signals from flow meters and other transducers, such as watt meters, to track rate or totalized rate.

- **With a Standard Main Board,** the transmitter output can track rate (such as gallons per minute or watts) or totalized rate (such as gallons or kilowatt hours) whether the transducer output is linear or requires square root extraction (differential pressure flow transducers).
- **With an Extended Main Board,** the transmitter can also perform custom curve linearization (provided by a curvilinear spline fit with up to 180 data points), display 1/ rate (such as the time it takes a conveyor to pass through an oven), and perform batch control for repetitive fill operations. Such applications typically make use of optional dual solid state relays, which are available as options. External reset of totals is provided by a special connector.

The signal conditioner board of the transmitter converts the full-scale 0-1 mA, 4-20 mA or 0-10 V analog signal to a frequency of 10 kHz to 110 kHz. This frequency is determined by measuring period over a selected gate time (from 10 ms to 200 s) and taking the inverse of period. At the lowest frequency of 10 kHz and the minimum gate time of 10 ms, the transmitter is capable of 25 updates per second. Scaling is done mathematically. Totals are stored in nonvolatile memory in case of power loss.

Standard features of Laureate LTE transmitters include:

- **Ethernet I/O, isolated.** Supported protocols are Modbus RTU and ASCII (tunneled via Modbus TCP) and Laurel ASCII. The latter is simpler than the Modbus protocol and is recommended when all devices are Laureates. Note that RS232 or RS485 data I/O in lieu of Ethernet is provided by our LT Series transmitters.
- **4-20 mA, 0-20 mA or 0-10V analog transmitter output,** isolated, jumper-selectable and user scalable. All selections provide 16-bit (0.0015%) resolution of output span and 0.02% output accuracy of a reading from -99,999 to +99,999 counts that is also transmitted digitally. Output isolation from signal and power grounds eliminates potential ground loop problems. The supply can drive 20 mA into a 500 ohm (or lower) load for 10V compliance, or 10V into a 5K ohm (or higher) load for 2 mA compliance.
- **Dual solid state relays,** isolated. Available for local alarm or control. Rated 120 mA at 130 Vac or 180 Vdc.
- **Transducer excitation output,** isolated. User selectable 5V@100 mA, 10V@120 mA or 24V@50 mA.
- **Universal 85-264 Vac power.** Low-voltage 10-48 Vdc or 12-32 Vac power is optional.

Discovery and configuration of Laureate Ethernet Nodes is easily achieved with Laurel's Node Manager Software, and the discovered transmitters can then be programmed using Laurel's Instrument Setup Software. Both softwares run on a PC under MS Windows and can be downloaded at no charge.

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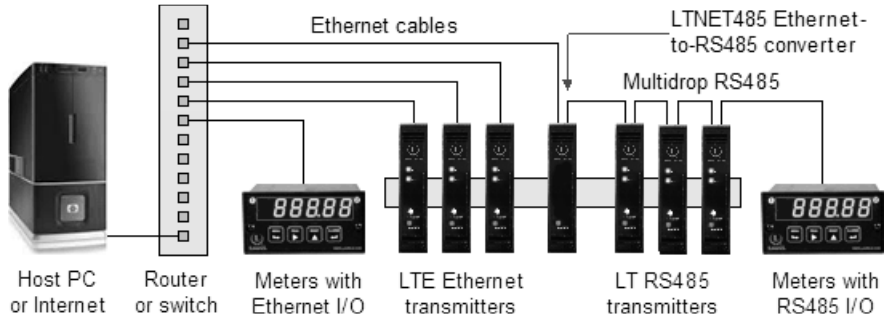
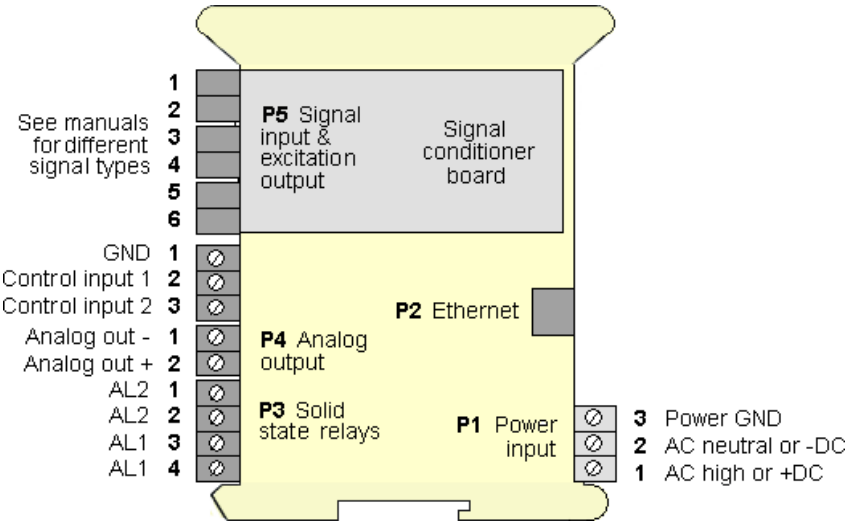


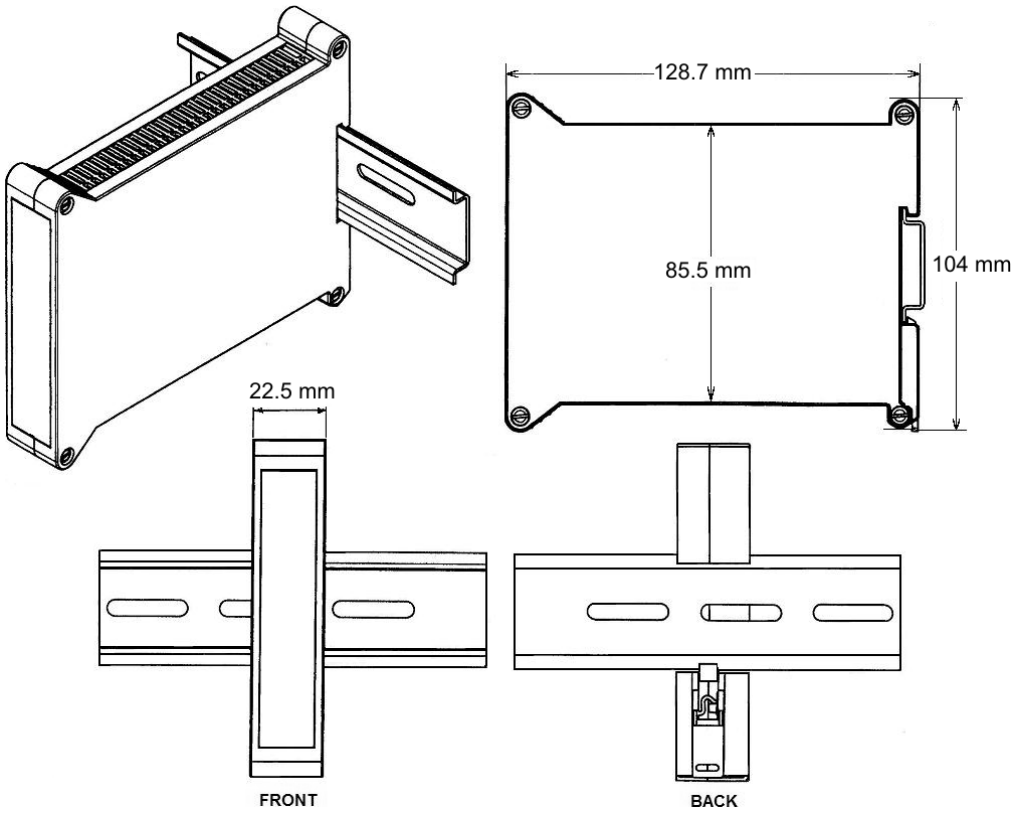
Specifications

Analog Input	0-1 mA	4-20 mA	0-10 V
Input resistance Max current or voltage	1.00 kΩ 35 mA	50 Ω 70 mA	1.01 MΩ 600 V
Input Resolution Span Tempco Zero Tempco Accuracy at 25¿½°C Read Rate	6 digits ±0.0025% R/°C ±0.0005 FS/°C ±0.005% FS ± 1 count 25/sec (typical)		
Analog Output			
Output Levels Compliance, 4-20 mA Compliance, 0-10V Output Resolution Output Accuracy Output Update Rate Output Isolation	4-20 mA and 0-10 Vdc (selectable) 10V (0-500Ω load) 2 mA (5 kΩ load) 16 bits (65,536 steps) 0.02% of output span 25/sec 250V rms working, 2.3 kV rms per 1 minute test		
Transducer Excitation Output (standard)			
Jumper Selection 1 Jumper Selection 2 Jumper Selection 3	10V @ 60 mA, isolated to 50V from signal ground 5V @ 50 mA, isolated to 50V from signal ground 15V @ 60 mA, non-isolated		
Dual Relay Output (optional)			
Relay Type Load Rating	Two solid state relays, SPST, normally open, Form A 120 mA at 140 Vac or 180 Vdc		
Serial Communications (standard)			
Type Data Rates Output Isolation Serial Protocols Modbus Compliance Digital Addresses	10/100Base-T Ethernet per IEEE 802.3 300, 600, 1200, 2400, 4800, 9600, 19200 baud 250V rms working, 2.3 kV rms per 1 min test Modbus TCP, Modbus RTU, Modbus ASCII, Laurel ASCII Modbus over Serial Line Specification V1.0 (2002) 247 for Modbus, 31 for Laurel ASCII		
Power Input			
Standard Power Low Power Option Power Frequency Power Isolation Power Consumption	85-264 Vac or 90-300 Vdc 10-48 Vdc or 12-32 Vac DC or 47-63 Hz 250V rms working, 2.3 kV rms per 1 min test 2W typical, 3W with max excitation output		
Mechanical			
Dimensions Mounting Electrical Connections	129 x 104 x 22.5 mm case 35 mm rail per DIN EN 50022 Plug-in screw-clamp connectors		
Environmental			
Operating Temperature Storage Temperature Relative Humidity Cooling Required	0°C to 55°C -40°C to 85°C 95% at 40°C, non-condensing Mount transmitters with ventilation holes at top and bottom. Leave 6 mm (1/4") between transmitters, or force air with a fan.		

Pinout



Mechanical



Ordering Guide

Create a model a model number in this format: **LTE60VF1**

Transmitter Type	**LTE** Laureate Ethernet & 4-20 mA Transmitter
Main Board	**6** Standard Main Board **8** Extended Main Board
	With Standard Main Board: Rate, square root of rate, or totalized rate from differential pressure flow transducers with a DC output. *With Extended Main Board:* Above plus linearization of nonlinear inputs, batch operation, 1/rate (time).
Power	**0** Isolated 85-264 Vac or 90-300 Vdc **1** Isolated 12-32 Vac or 10-48 Vdc
Input Type	**VF1** V-to-F Converter, 4-20 mA **VF2** V-to-F Converter, 0-1 mA **VF3** V-to-F Converter, 0-10V
	Specify min input, min reading; max input, max reading.