



## 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
- Ratiometric mode for bridges and potentiometers
- Dual 120 mA solid state relays for alarm or control, isolated
- 5V, 10V or 24V dc transducer excitation output, isolated
- 200 mV, 2V, 20V, 200V, 300V & 600V DC voltage input ranges
- 2, 20, 200 mA and 5A DC current input ranges
- All ranges factory calibrated
- Digital span adjust from 0 to  $\pm 99,999$ , zero adjust from  $-99,999$  to  $+99,999$
- Analog output resolution 0.0015% of span (16 bits), accuracy  $\pm 0.02\%$  of span
- 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 4-20 mA output, process input transmitter provides zero and span adjustment for use with a wide range of industrial transducers. Six DC voltage and four DC current input ranges are jumper selectable. The two most sensitive voltage ranges, 200 mV and 2V, provide a high input impedance of 1 G $\Omega$  to minimize the load on the voltage signal.

The transmitter can be set to a ratio mode (or potentiometer follower mode) by making selections at the connector and in software. In this mode, the transmitter output tracks a ratio of the applied excitation voltage and is unaffected by changes in the excitation voltage. This capability is used for resistive bridge sensors and voltage dividers, such as potentiometers which track wiper position.

Fast read rate at up to 50 or 60 conversions per second while integrating the signal over a full power line cycle is provided by Concurrent Slope (Pat 5,262,780) analog-to-digital conversion. High read rate is ideal for peak or valley capture and for real-time computer interface and control. Digital signal filtering modes are selectable for stable readings in electrically noisy environments. The internal digital readings and analog output can be individually selected to be either unfiltered or filtered.

Digital signal filtering modes are selectable for stable readings in electrically noisy environments. The internal digital readings and analog output can be individually selected to be either unfiltered or filtered.

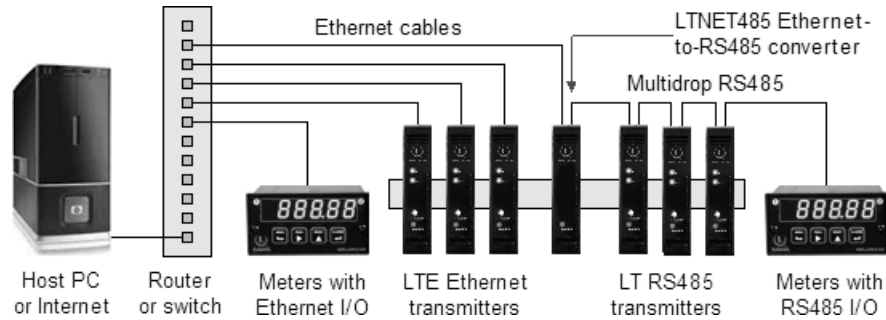
- An unfiltered selection updates after each conversion for fastest response, up to 60/sec, while integrating the input signal over a full power cycle. Fast read rate provides true peak and valley readings and aids in control applications.
- A batch average filter selection averages each 16 conversions for an update every 1/4 sec.
- An adaptive moving average filter selection provides a choice of 8 time constants from 80 ms to 9.6 s. When a significant change in signal level occurs, the filter adapts by briefly switching to the shortest time to follow the change, then reverts back to its selected time constant. Another choice is Auto, which provides an automatic time constant selection based on the signal noise characteristics.

## 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.
- **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.



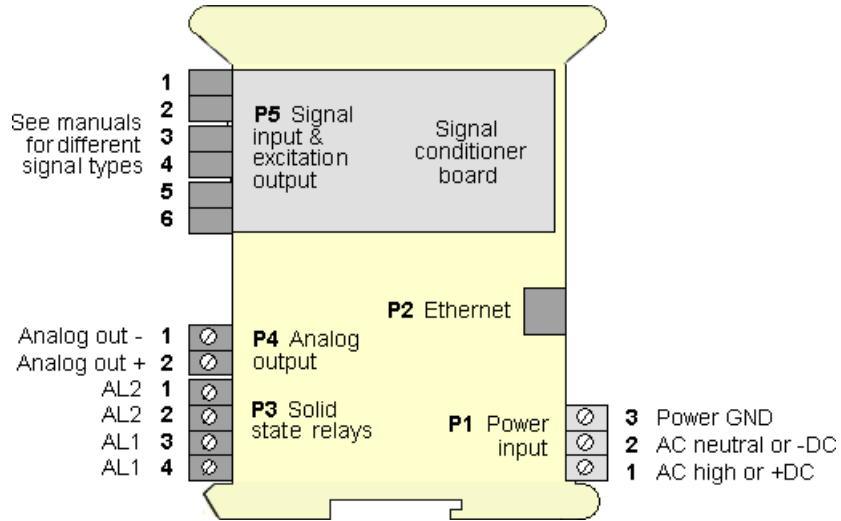


## Specifications

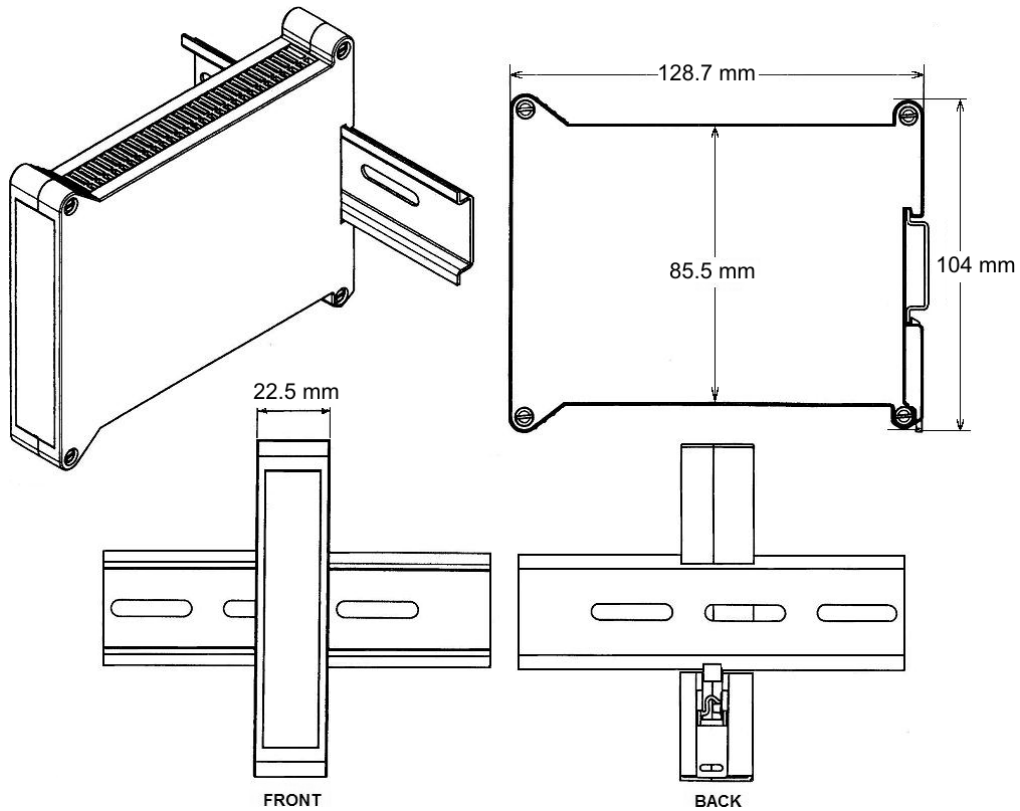
Analog Input	Range	Resolution	Accuracy	Input Ohms
DC Voltage	$\pm 200.00$ mV	10 $\mu$ V	$\pm 0.01\%$ FS $\pm 2$ counts	1 G $\Omega$
	$\pm 2.0000$ V	100 $\mu$ V		1 G $\Omega$
	$\pm 20.000$ V	1 mV		10 M $\Omega$
	$\pm 200.00$ V	10 mV		10 M $\Omega$
	$\pm 600.0$ V	100 mV		10 M $\Omega$
DC Current	$\pm 2.0000$ mA	0.1 $\mu$ A	$\pm 0.01\%$ FS $\pm 2$ counts	100 $\Omega$
	$\pm 20.000$ mA	1 $\mu$ A		10 $\Omega$
	$\pm 200.00$ mA	10 $\mu$ A		1 $\Omega$
	$\pm 5.000$ A	1 mA	$\pm 0.1\%$ FS $\pm 2$ counts	0.01 $\Omega$
Input Resolution	16 bits (65,536 steps)			
Update Rate, Max	50/sec at 50 Hz, 60/sec at 60 Hz			
Max applied voltage	600 Vac for 20, 200 & 600 V ranges, 125 Vac other ranges			
Over-current protection	25x for 2 mA, 8x for 20 mA, 2.5x for 200 mA, 1x for 5 A			
<b>Analog Output (standard)</b>				
Output Levels	0-20 mA or 0-10 Vdc (selectable)			
Compliance, 4-20 mA	10V (0-500 $\Omega$ load)			
Compliance, 0-10V	2 mA (5 k $\Omega$ load)			
Output Resolution	16 bits (65,536 steps)			
Output Accuracy	0.02% of output span plus conversion accuracy			
Output Isolation	250V rms working, 2.3 kV rms per 1 minute test			
Step response time	50 ms			
<b>Dual Relay Output (standard)</b>				
Relay Type	Two solid state relays, SPST, normally open, Form A			
Load Rating	120 mA at 140 Vac or 180 Vdc			
<b>Transducer Excitation Output (standard)</b>				
Output Levels	5V@100 mA, 10V@120 mA, 24V@50 mA (jumper selectable)			
Output Isolation	50V from signal ground			
<b>Serial Data Output (standard)</b>				
Type	10/100Base-T Ethernet per IEEE 802.3			
Data Rates	300, 600, 1200, 2400, 4800, 9600, 19200 baud			
Output Isolation	250V rms working, 2.3 kV rms per 1 min test			
Serial Protocols	Modbus TCP, Modbus RTU, Modbus ASCII, Laurel ASCII			
Modbus Compliance	Modbus over Serial Line Specification V1.0 (2002)			
Digital Addresses	247 for Modbus, 31 for Laurel ASCII			
<b>Power Input</b>				
Standard Power	85-264 Vac or 90-300 Vdc			
Low Power Option	10-48 Vdc or 12-32 Vac			
Power Frequency	DC or 47-63 Hz			
Power Isolation	250V rms working, 2.3 kV rms per 1 min test			
Power Consumption	2W typical, 3W with max excitation output			
<b>Mechanical</b>				
Dimensions	129 x 104 x 22.5 mm case			
Mounting	35 mm rail per DIN EN 50022			
Electrical Connections	Plug-in screw-clamp connectors			

Environmental	
Operating Temperature	0°C to 55°C
Storage Temperature	-40°C to 85°C
Relative Humidity	95% at 40°C, non-condensing
Cooling Required	Mount transmitters with ventilation holes at top and bottom. Leave 6 mm (1/4") between transmitters, or force air with a fan.

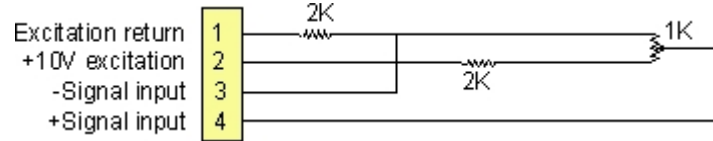
**Pinout**



**Mechanical**



## Potentiometer Follower Application



In potentiometric (or potentiometer follower) applications, the signal from a sliding contact voltage divider can be converted to engineering units such as position, level or percentage. By operating in a ratiometric mode, the transmitter removes any effects caused by variations in the excitation supply.

For use with a 1 kΩ potentiometer, the recommended applied excitation voltage is 10V. A 2 kΩ resistor should be placed in series with the excitation output and excitation return leads. This will allow the transmitter's 2V scale with a high input impedance of 1 GΩ to be used.

## Ordering Guide

Create a model a model number in this format: **LTE20P**

<b>Transmitter Type</b>	<b>LTE</b> Laureate 4-20 mA & Ethernet Transmitter
<b>Main Board</b>	<b>2</b> Standard Main Board <b>4</b> Extended Main Board <b>Note:</b> Extended allows custom curve linearization and rate from successive readings.
<b>Power</b>	<b>0</b> Isolated 85-264 Vac or 90-300 Vdc <b>1</b> Isolated 12-32 Vac or 10-48 Vdc
<b>Signal Input</b>	<b>Process Signals</b> (e.g., 4-20 mA, 0-5V) <b>P</b> Field scalable. Default scaling is 0-200V in = 4-20 mA out <b>P1</b> Custom Scaling. Specify min input, min output; max input, max output <b>Note:</b> The same DC signal conditioner can be user configured for process, strain or potentiometer follower signals, as well as DC Volts or DC Amps. It is precalibrated in EEPROM for all DC Volt and DC Amp ranges listed for DC transmitters.