



Features

- 4-20 mA, 0-20 mA, 0-10V or -10V to +10V transmitter output, 16 bits, isolated
- Ratiometric mode for bridges and potentiometers
- RS232 or RS485 serial data output, Modbus or Laurel ASCII protocol, isolated
- Dual 120 mA solid state relays for alarm or control, 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 ±99,999, zero adjust from -99,999 to +99,999
- Analog output resolution 0.0015% of span (16 bits), accuracy ±0.02% of span
- 5V, 10V or 24V dc transducer excitation output, isolated
- Universal 85-264 Vac / 90-300 Vdc or 10-48 Vdc / 12-32 Vac power



Description

The Laureate 4-20 mA and RS232/RS485 output, process signal 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 GΩ 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 rates at up to 50 or 60 conversions per second while integrating the signal over a full power line cycle are 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.

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- 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 transmitters include:

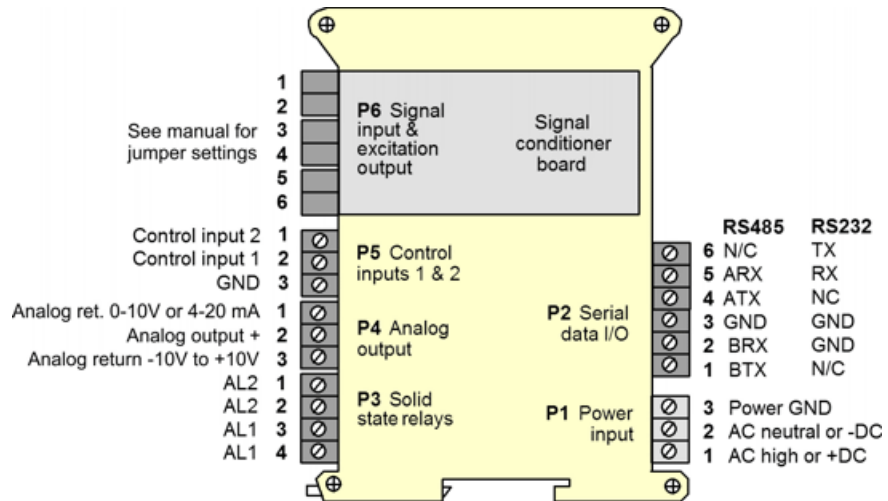
- 4-20 mA, 0-10V or -10V to +10V analog transmitter output, isolated, jumper-selectable and user scalable. All selections provide 16-bit (0.0015%) resolution of output span and 0.02% output accuracy of a reading from -99,999 to +99,999 counts that is also transmitted digitally. Output isolation from signal and power grounds eliminates potential ground loop problems.
- Serial communications output, isolated. User selectable RS232 or RS485, half or full duplex. Three protocols are user selectable: Modbus RTU, Modbus ASCII, or Laurel ASCII. Modbus operation is fully compliant with Modbus Over Serial Line Specification V1.0 (2002). The Laurel ASCII protocol allows up to 31 Laureate devices to be addressed on the same RS485 data line. It is simpler than the Modbus protocol and is recommended when all devices are Laureates.
- Dual solid state relays, isolated. Available for local alarm or control. Rated 120 mA at 130 Vac or 170 Vdc.
- Universal 85-264 Vac power. Low-voltage 10-48 Vdc or 12-32 Vac power is optional.

Easy Transmitter programming is via Laurel's Instrument Setup Software, which runs on a PC under MS Windows. This software can be downloaded from our website at no charge. The required transmitter-to-PC interface cable is available from Laurel (P/N CBL04).

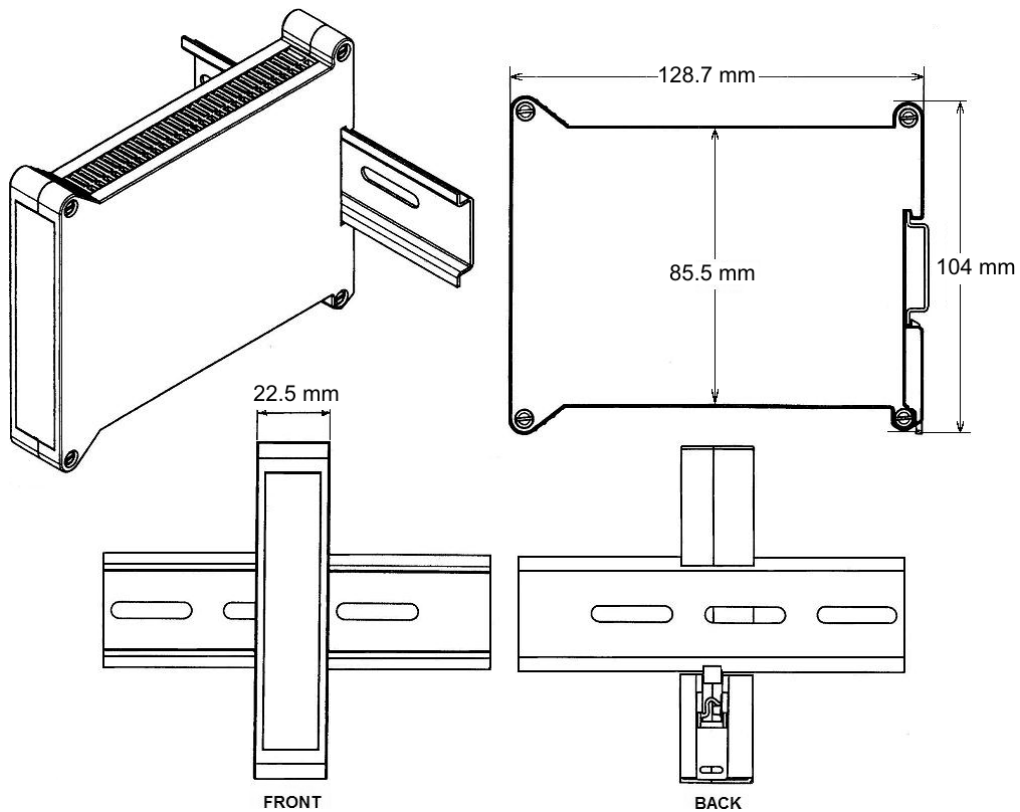
Specifications

Analog Input	Range	Resolution	Accuracy	Input Ohms
DC Voltage	± 200.00 mV	10 µV	± 0.01% FS ± 2 counts	1 GΩ
	± 2.0000 V	100 µV		1 GΩ
	± 20.000 V	1 mV		10 MΩ
	± 200.00 V	10 mV		10 MΩ
	± 600.0 V	100 mV		10 MΩ
DC Current	± 2.0000 mA	0.1 µA	± 0.01% FS ± 2 counts	100 Ω
	± 20.000 mA	1 µA		10 Ω
	± 200.00 mA	10 µA		1 Ω
	± 5.000 A	1 mA	± 0.1% FS ± 2 counts	0.01 Ω
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			
Analog Output (standard)				
Output Levels	4-20 mA, 0-20 mA, 0-10 Vdc, -10 to +10Vdc (user selectable)			
Compliance, 4-20 mA	10V (0-500Ω load)			
Compliance, 0-10V	2 mA (5 kΩ 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			
Dual Relay Output (standard)				
Relay Type	Two solid state relays, SPST, normally open, Form A			
Load Rating	120 mA at 140 Vac or 180 Vdc			
Transducer Excitation Output (standard)				
Output Levels	5V@100 mA, 10V@120 mA, 24V@50 mA (jumper selectable)			
Output Isolation	50V from signal ground			
Serial Data Output (standard)				
Signal Types	RS232 or RS485 (half or full duplex)			
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 RTU, Modbus ASCII, Laurel ASCII			
Modbus Modes	RTU or ASCII			
Modbus Compliance	Modbus over Serial Line Specification V1.0 (2002)			
Digital Addressing	247 Modbus addresses. Up to 32 devices on an RS485 line w/o a repeater.			
Power Input				
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			
Mechanical				
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.			

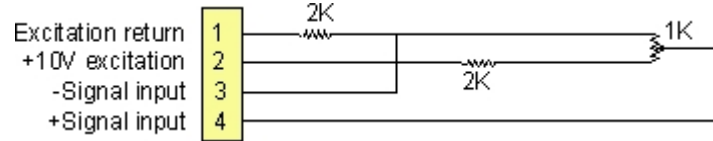
Pinout



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: **LT20P, CBL04**

Transmitter Type	LT Laureate 4-20 mA & RS232/RS485 output transmitter
Main Board	2 Standard Main Board 4 Extended Main Board Note: Extended allows custom curve linearization and rate from successive readings.
Power	0 85-264 Vac or 90-300 Vdc 1 12-32 Vac or 10-48 Vdc
Signal Input	Process Signals (e.g., 4-20 mA, 0-5V) P Field scalable. Default scaling is 0-200V in = 4-20 mA out P1 Custom Scaling. Specify min input, min output; max input, max output Note: 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.
Accessories	CBL04 RS232 cable, 7ft. Connects RS232 screw terminals of LT transmitter to DB9 port of PC. CBL02 USB to RS232 adapter cable. Combination of CBL02 and CBL04 connects transmitter RS232 terminals to PC USB port.