



## Features

- 4-20 mA, 0-20 mA, 0-10V or -10V to +10V transmitter output, 16 bits, isolated
- RS232 or RS485 serial data output, Modbus or Laurel ASCII protocol, isolated
- Dual 120 mA solid state relays for alarm or control, isolated
- $\pm 0.2$ ,  $\pm 2$ ,  $\pm 20$ ,  $\pm 200$ ,  $\pm 300V$  and  $\pm 600V$  voltage input ranges
- $\pm 2$ ,  $\pm 20$ ,  $\pm 200$  mA and  $\pm 5A$  current input ranges
- Analog output resolution 0.0015% of span (16 bits), accuracy  $\pm 0.02\%$  of span
- All input ranges user selectable and factory calibrated
- 5V, 10V or 24V dc transducer excitation output, isolated
- Universal 85-264 Vac / 90-300 Vdc or 10-48 Vdc / 12-32 Vac power
- Custom curve linearization and rate from successive readings (optional)



## Description

**Laureate DC input transmitters** provides six voltage input ranges and four current input ranges, all factory calibrated and jumper selectable. The 200.00 mV and 2.0000 V ranges provide a high input impedance of 1 G $\Omega$  to minimize the load on the voltage signal. A 5.000A range measures the IR drop across a built-in 10 m $\Omega$  current shunt. The transmitters can also easily be scaled in software for use with external shunts.

**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.

- **An unfiltered** selection 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. An Auto setting selects the time constant selection based on signal noise.

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

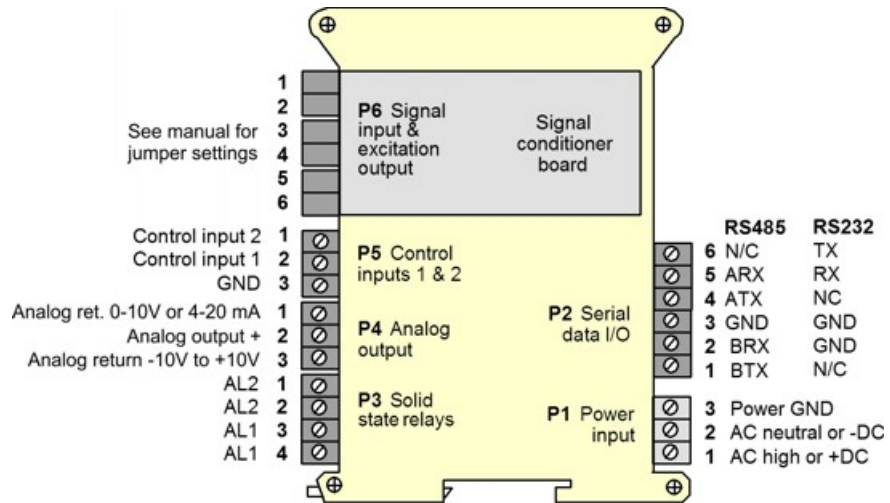
**Standard features of Laureate LT transmitters include:**

- **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. It also allows use of Laurel Datalogging Software.
- **Dual solid state relays**, isolated. Available for local alarm or control. Rated 120 mA at 130 Vac or 170 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.

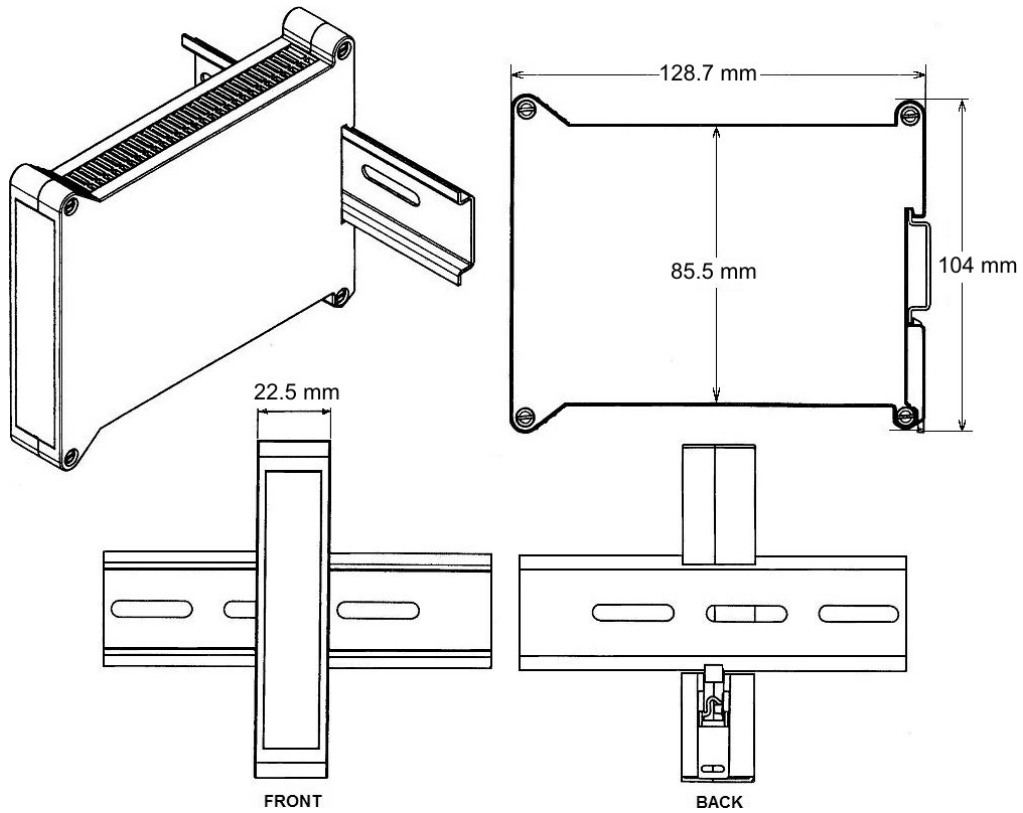
## Specifications

Analog Input	Range	Resolution	Accuracy	Input Ohms
DC Voltage	200.00 mV	10 $\mu$ V	$\pm 0.01\%$ FS $\pm 2$ counts	1 G $\Omega$
	2.0000 V	100 $\mu$ V		1 G $\Omega$
	20.000 V	1 mV		10 M $\Omega$
	200.00 V	10 mV		10 M $\Omega$
	600.0 V*	100 mV		10 M $\Omega$
* not ETL approved				
DC Current	2.0000 mA	0.1 $\mu$ A	$\pm 0.01\%$ FS $\pm 2$ counts	100 $\Omega$
	20.000 mA	1 $\mu$ A		10 $\Omega$
	200.00 mA	10 $\mu$ A		1 $\Omega$
	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	4-20 mA, 0-20 mA, 0-10 Vdc, -10 to +10Vdc (user selectable)			
Compliance at 20 mA	10V ( 0-500 $\Omega$ load )			
Compliance at 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			
<b>Serial Data Output (standard)</b>				
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 with no repeater			
<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>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			
<b>Environmental</b>				
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



## Ordering Guide

Create a model a model number in this format: **LT20DCV1, CBL04**

<b>Transmitter Type</b>	<b>LT</b> 4-20 mA & RS232/RS485 output 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>DC Volts</b> <b>DCV1</b> ± 200.00 mV <b>DCV2</b> ± 2.0000 <b>DCV3</b> ± 20.000 V <b>DCV4</b> ± 200.00 V <b>DCV5</b> ± 600.0 V  <b>DC Amps</b> <b>DCA1</b> ± 2.0000 mA <b>DCA2</b> ± 20.000 mA <b>DCA3</b> ± 200.00 mA <b>DCA4</b> ± 5.000 A  <b>Note:</b> The same DC signal conditioner can be user configured for DC Volts or DC Amps, and for process, strain or potentiometer follower signals. It is precalibrated in EEPROM for all DC Volt and DC Amp ranges listed.
<b>Accessories</b>	<b>CBL04</b> RS232 cable, 7ft. Connects RS232 screw terminals of LT transmitter to DB9 port of PC. <b>CBL02</b> USB-to-RS232 adapter cable. Combination of CBL02 and CBL04 connects transmitter RS232 terminals to PC USB port.