

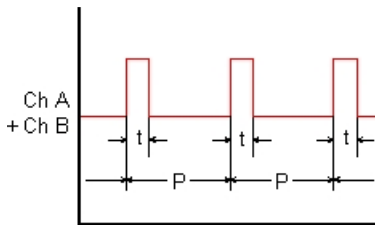


Features

- 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
- Transmits duty cycle with resolution of 1%, 0.1% or 0.01%.
- Transmits pulse width modulated (PWM) signal inputs in engineering units
- Frequencies from 0.005 Hz to 10 kHz
- Inputs from NPN or PNP proximity switches, contact closures, digital logic, magnetic pickups down to 12 mV, or AC inputs up to 250 Vac.
- Analog output resolution 0.0015% of span (16 bits), accuracy $\pm 0.02\%$ 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
- Custom curve linearization and rate from successive readings (optional)



Description



The Laureate duty cycle transmitter tracks ON or OFF period as a percentage from 0% to 100% of total period of repetitive pulse trains. In the illustration, duty cycle is $100 \times t/P$. The transmitter determines duty cycle by averaging an integral number of periods over a gate time, which is selectable from 10 ms to 199.99 s. The same signal is applied to Channels A and B. The unit divides the average pulse width by the period between pulses and expresses this ratio in percent. A resolution of 1%, 0.1% or 0.01% is selectable. By selecting leading or falling pulse edges, the ON or OFF duty cycle can be transmitted.

The dual-channel signal conditioner used for pulse detection accepts inputs from proximity switches with PNP or NPN output, TTL or CMOS logic, magnetic pickups, contact closures, and AC signals from 12 mV to 250 Vac. Jumper selections provide optimum operation for different sensor types and noise conditions.

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).

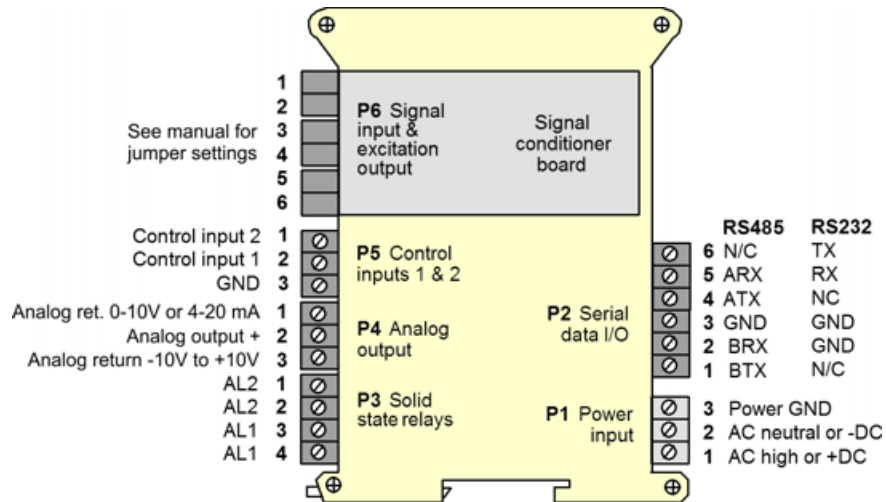
Standard features of Laureate transmitters include:

- 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.
- 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.

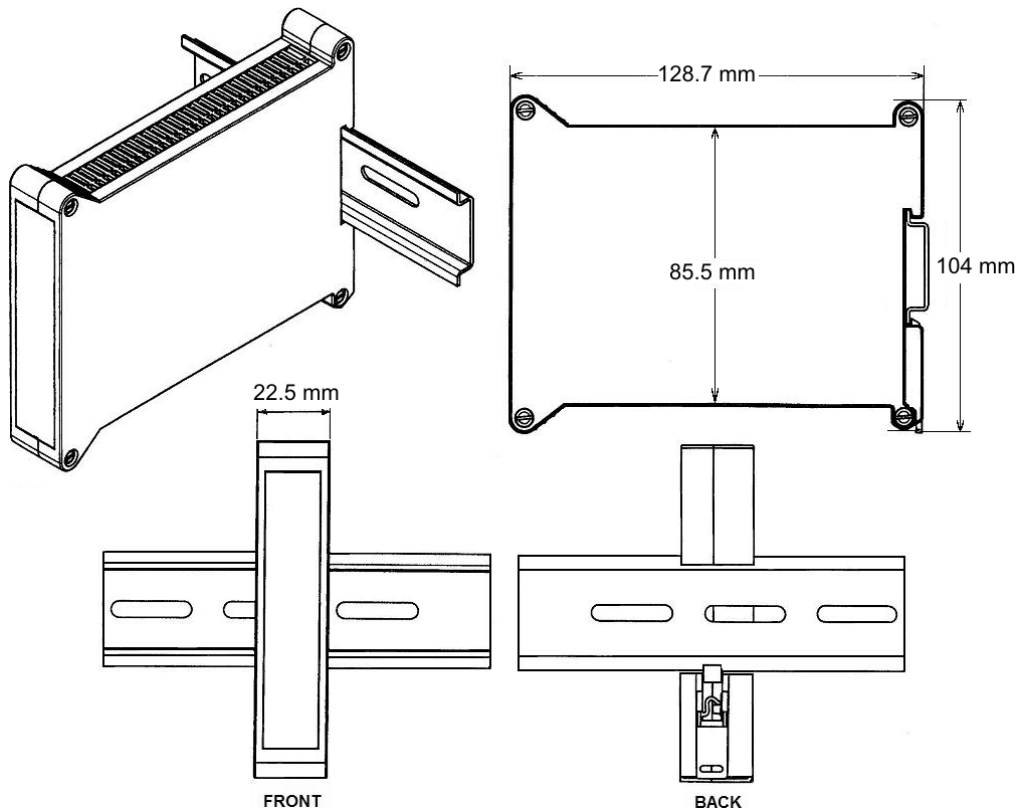
Specifications

Duty Cycle Mode	
Transmitter item	ON or OFF period as a percent of total period
Frequency Range	0.005 Hz to 50 kHz
Input Accuracy	0.01%, 0.005 Hz to 500 Hz; 0.1% at 5 kHz; 1% at 50 kHz
Update Rate	
Conversion Interval	Gate time + 30 ms + 0-2 signal periods
Gate Time	Selectable 10 ms to 199.99 s
Time Before Zero Output	Selectable 10 ms to 199.99 s
Pulse Input	
Types	AC, pulses from NPN, PNP transistors, contact closures, magnetic pickups
Grounding	Common ground for channels A & B.
Minimum Signal	Nine ranges from (-12 to +12 mV) to (+1.25 to +2.1V)
Maximum Signal	250 Vac
Noise Filter	1 MHz, 30 kHz, 250 Hz (selectable)
Contact Debounce	0, 3, 50 ms (selectable)
Analog Output (standard)	
Output Levels	4-20 mA, 0-20 mA, 0-10 Vdc, -10 to +10Vdc (user selectable)
Compliance at 20 mA	10V (0-500Ω load)
Compliance at 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
Serial Communications (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 with no repeater
Sensor Excitation Output (standard)	
Output Levels	5V@100 mA, 10V@120 mA, 24V@50 mA (jumper selectable)
Output Isolation	50V from signal ground
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
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



Application Example

Duty Cycle and Elapsed Time of a Laser	
<p>Duty Cycle Elapsed Time</p>	<p>Duty cycle can be used to indicate the On time of a pulsed laser in relation to total time. Laureate counters and transmitters can also measure elapsed time, the number of pulses, average width in μs, the number of pulses, and total energy applied.</p>

Ordering Guide

Create a model a model number in this format: **LT80FR, CBL04**

Transmitter Type	LT Laureate 4-20 mA & RS232/RS485 Transmitter
Main Board	8 Extended Main Board (required for duty cycle function)
Power	0 Isolated 85-264 Vac or 90-300 Vdc 1 Isolated 12-32 Vac or 10-48 Vdc
Input Type	FR Dual-Channel Frequency
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.