

VPT Series DIN-Rail Transmitters

Serial Output, Modbus or Custom ASCII Protocol

Selectable RS232 or RS485. Available for all popular industrial analog input signals, plus AC or pulse signals used for frequency, rate, total, time, or position. Exceptional accuracy at high update rates. Optional analog output. Optional dual relays for alarm or control.

Basic Features

- Isolated RS232 or RS485 serial port
- Modbus or Custom ASCII protocol
- 35 mm DIN rail mount
- Only 22.5 mm (0.89") thick
- Detachable screw clamp connectors
- All inputs and outputs mutually isolated
- Isolated sensor excitation output
- Easy setup using Windows software
- Exceptional accuracy
- Adaptive input noise filtering

Selectable Features

- Power input: (Specify at time of order)
 - 1) Worldwide 95-240V ac $\pm 10\%$
 - 2) Low voltage 10-30V ac or 10-48V dc
- Dual relay output
- Analog output
 - 1) 4-20 mA
 - 2) 0-20 mA
 - 3) 0-10V
- Signal conditioners:
 - 1) DC (includes process & strain)
 - 2) AC rms
 - 3) Load cell & microvolt
 - 4) Temperature (T/C & RTD)
 - 5) Dual channel pulse input for:
 - Frequency & rate
 - Counter & totalizer
 - Time & stopwatch
 - Phase angle
 - Duty cycle
 - Combinations of two channels (A+B, A-B, AxB, A/B, A/B-1)
 - 6) Process signal totalizer
 - 7) Quadrature (position & rate)

Serial Data Output

LCC's VPT Series transmitters send data as a serial digital signal. RS485 or RS232 signal levels are jumper selectable and can each be associated with either the Modbus protocol or Load Cell Central's simpler Custom ASCII protocol.

Modbus operation is fully compliant with the MODBUS Over Serial Line Specification V1.0 (2002) for 2-wire, half-duplex connection. This includes RTU or ASCII modes, addressing of up to 32 devices per RS485 line without a repeater, and up to 247 digital addresses. Modbus operation allows devices by different manufacturers to be connected in parallel and be addressed using the same protocol.

LCC's custom ASCII protocol allows up to 31 of our devices to be addressed on the same RS485 data line. It is simpler than the Modbus protocol and is recommended when all devices are VPIs or VPTs. It also allows use of our datalogging software VPI-LOG.

Easy Installation

The transmitters snap into a 35 mm DIN-rail. All electrical connections are via detachable screw clamp connectors. The units can be powered directly by 120V or 240V ac, or optionally by low voltage AC or DC. An isolated transducer excitation output is standard.

Counterparts to the VPI 1/8 DIN Meters

Load Cell Central's VPT transmitters utilize the same signal conditioner boards as the VPI 1/8 DIN digital panel meters, counters and timers, and they duplicate the input and signal processing capabilities of these instruments. This includes pulse rate meters, pulse totalizers, process signal totalizers, and instruments which combine pulse channels A and B: A+B, A-B, AxB, A/B, A/B-1.



High Accuracy

LCC's VPT Series transmitters maintain the full digital accuracy of the signal processing front end. For DC input signals (DC, process, strain, load cell), output accuracy is $\pm 0.01\% \pm 2$ counts of full scale input. For frequency, pulse rate or timing, output accuracy is better than $\pm 0.001\%$, as provided by a calibrated quartz crystal.

Output Options

Optional dual solid state relays can add alarm or control. Relay operating modes include actuation above or below the setpoint, latching or non-latching, hysteresis mode, and band deviation mode.

An isolated 4-20 mA, 0-20 mA or 0-10V analog output can drive an external device.

Electrical Isolation

All transmitter inputs and outputs are mutually isolated to eliminate ground loops. This includes power, signal in, serial I/O, transducer excitation, solid state relays, and analog output.

Easy Setup via a PC

The VPT transmitters are easily programmed via their serial port, which can be jumpered to RS232 and be connected directly to a PC COM port. The IS2 Windows based graphical Instrument Setup software can retrieve, edit, save, and download transmitter setup files. It recognizes VPT transmitter main boards and brings up only the appropriate menu choices.

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VPT Series Transmitter Specifications

Transmitter Output

Signal levels RS232 or RS485
 Protocols Modbus or LCC's Custom ASCII
 Modbus compliance V1.0 (2002)
 Modbus modes RTU or ASCII, 2-wire
 Baud rates 300 to 19200 baud
 Serial connector 3-position screw clamp
 Output accuracy Same as digital reading
 Isolation 250V rms, 2.3 kV rms for 1 min

Power Input

Standard 95-240V ac $\pm 10\%$ or 90-300V dc
 Low voltage option 12-30V ac or 10-48V dc
 Power frequency DC or 47-63 Hz
 Isolation 250V rms, 2.3 kV rms for 1 min

Excitation Output (std)

Isolated 120 mA @ 10V, 50 mA @ 5V
 Non-isolated 60 mA @ 15V

Relay Outputs (option)

Relay type Dual solid state
 Relay rating 120 mA at 135V ac / 170V dc
 Isolation 250V rms, 2.3 kV rms for 1 min

Analog Output (option)

Output signals 4-20 mA, 0-20 mA, 0-10V
 Compliance, 20 mA 10V (0-500 ohm load)

Compliance, 10V 2 mA (5 kOhm load)
 Output resolution 12 bits (1 part in 4096)
 Output accuracy $\pm 0.05\%$ of FS digital reading
 Isolation 250V rms, 2.3 kV rms for 1 min

Case

Dimensions 120 x 101 x 22.5 mm
 Mounting 35 mm rail per DIN EN 50022
 Connectors Detachable screw clamp plugs

Environmental

Operating temperature 0°C to 70°C
 Storage temperature -40°C to 85°C

DC Signal Conditioner (DC, process, strain)

FS ranges 200 mV, 2V, 20V, 200V, 300V
 600V, 2 mA, 20 mA, 200 mA, 5A
 Input accuracy $\pm 0.01\%$ of FS ± 2 counts

AC rms Signal Conditioner

FS ranges 200 mV, 2V, 20V, 200V, 300V
 600V, 2 mA, 20 mA, 200 mA, 5A
 Input accuracy $\pm 0.15\%$ of FS ± 2 counts

Load Cell & Microvolt Signal Conditioner

FS ranges 20, 50 100, 250, 500 mV
 Input accuracy $\pm 0.01\%$ of FS ± 2 counts

Temperature Signal Conditioner

Thermocouple types J, K, T, E, N, R, S
 RTD types Pt 100, DIN or ANSI alpha
 Resolution 1° or 0.1°, °C or °F (0.01° RTD)
 Thermocouple error at 25°C, max 0.5°C
 RTD error at 25°C, max 0.1°C

Signal Conditioner (dual pulse inputs)

Inputs AC, magnetic pickups, pulses from
 NPN or PNP transistors, contact closures
 Channel A frequency 0 Hz to 1 MHz
 Channel B frequency 0 Hz to 250 kHz
 Crystal time base accuracy ± 2 ppm
 Span tempco, typical ± 1 ppm/°C
 Frequency technique 1/period
 Update rate Gate time +30 ms +1 period
 Gate time 0 to 199.99 sec (selectable)

Signal Conditioner (process totalizing)

Inputs 4-20 mA, 0-1 mA, 0-10V
 Span error 0.015% of FS ± 1 count
 Span tempco 0.003% of reading/°C
 Zero tempco 0.001% of FS/°C

Signal Conditioner (quadrature inputs)

Input types Differential or single-ended
 Transitions monitored x1, x2 or x4
 Max transitions / sec 250k
 Error correction Zero index (Z-channel)

Network Operation of Digital Panel Meters, Counters, Timers, Remote Displays and Transmitters



Serial communications capability allows our panel meters, counters, timers, remote displays and transmitters to be multidropped from an RS485 data line to a computer or PLC.

The Modbus protocol or LCC's simpler Custom ASCII protocol are user selectable. With Modbus, devices by different manufacturers can be addressed on the same RS485 data line.

All VPTs also offer an optional dual relay output and isolated analog output, which can be scaled to the reading. These outputs can be part of plant-wide distributed processing systems.

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