

### PC-QD Process Counter for Quadrature Encoders

**The Series PC-QD 1/8 DIN Process Counter is designed for process automation counting or totalizing applications.** The PC-QD is a quadrature meter that accepts the A & B quadrature signals from linear encoders or shaft encoders to provide a highly accurate, scaled display of position, length, or angle in engineering units, such as ft, cm or degrees. The A & B quadrature signals are 90° out of phase, and their phase relationship determines whether up counts (+) or down counts (-) are counted. The PC-QD meter totalizes the counts and then scales the total for display and control. A zero index signal, or Z signal, may be added as a third input to the A & B signals.

Use of the optional extended counter can convert the quadrature meter from scaled position to scaled rate. For example, it can display the speed of a moving slab in ft/sec. Simultaneous display of position and rate will require two meters. The display and control output update rate for position or rate is normally set to a maximum of 25/s, as determined by a user programmable gate time.

The PC-QD can count one, two or four transitions at a maximum combined rate of 250 kHz and be mathematically scaled for display in engineering units from -999,999 to +999,999. The quadrature board has input circuitry which may be jumpered for either single-ended input signals or for balanced line driver signals. Anti-jitter circuitry eliminates errors produced by vibration of the encoder. In the event of a power failure, the latest total may be stored in non-volatile memory and can be used as the starting point for counting when power resumes. Power fail save or zero index capabilities are selections available in the menu programming.

#### Features

- *Bright, red ( $\pm 999,999$ ) 6-digit LED display*
- *Accepts low-level differential or single-ended 5V logic level outputs from quadrature encoders*
- *Quadrature count x1, x2 or x4*
- *Combined encoder pulse rate to 250 kHz*
- *Update rate selectable to 25/sec*
- *Isolated transducer power output of 5, 10 or 24 VDC, eliminates need for an additional power supply reducing installation costs*
- *Universal power range of 85-264 VAC / 90-300 VDC or 10-48 VDC / 12-32 VAC power eliminates need to purchase country specific models.*
- *When panel mounted, NEMA 4X (IP65) front cover protection keeps fluids out; enables installation in environments exposed to wash-downs.*
- *Variety of output and communication options:*
  - *Choice of 2 relays or 2 solid state relays*
  - *Analog signal option provides: 4-20 mA, 0-20mA, 0-10V or -10V to +10V outputs*
  - *Serial data communication of either USB, RS485 or RS232*
- *Optional Extended Counter: all capabilities of Standard counter, plus ability to program scaled rate of the encoders signal versus standard models position.*



If provided by the encoder, a zero index pulse is interpreted by the meter as indicating a zero reference for an integral number of revolutions of a rotary shaft encoder or the home position of a linear encoder. It is used by the meter for initializing and to correct for any cumulative pulse count errors. Special circuitry corrects for width of the zero index pulse.

The PC-QD's offer Universal AC or DC power selections which enables flexibility with usage in various power situations. Optional 8 A contact or 120 mA solid state relay outputs, plus an analog process signal output with 4 user-selectable current or voltage ranges are available. To provide a higher level of communication and integration into a system's network, several communication protocols such as RS-232, RS-485 and even USB options are available. Units come standard with an isolated excitation output to power transducers, eliminating need for additional power supply.

## PC-QD Specifications

<b>Input Details (Differential or Single-ended Quadrature)</b>	Max Pulse Rate: 250 kHz at x1, 125 kHz at x2, 62.5 kHz at x4; Differential high threshold: +200 mV; Differential low threshold: -200 mV; Differential common mode: $\pm 7$ V; Single-ended high voltage: 2.5 V to 10 V; Single-ended low voltage: -1 V to +1 V
<b>Display Range</b>	Zero Adjust -999999 to +999999; Span Adjust 0 to 999999 * Exponential notation beyond 999999; 12 digits transmitted with communication options
<b>Accuracy</b>	Base Models: No error contributed by meter; Extended Models: in Rate Mode: Calibrated to $\pm 2$ ppm
<b>Scaling Function</b>	6 digits with decimal point adjustment
<b>Display Update Time</b>	3.5/s at 60 Hz, 3/s at 50 Hz
<b>Relay Output (Optional)</b>	Mechanical Relays: 8 A @ 250 V ac or 24 V dc; SSR: 120 mA @ 140 V ac or 180 V dc
<b>Analog Signal Output (Optional)</b>	Jumper Selectable: 4-20 mA, 0-20 mA, 0-10 V, -10 V to 10 V
<b>Communication (Optional)</b>	RS-232, RS-485, USB
<b>Power Requirement</b>	85-264 V ac / 95-300 V dc; Optional 10-48 V dc / 12-34 V ac
<b>Sensor Excitation (Isolated)</b>	5 Vdc $\pm 5\%$ , 100 mA; 10 V dc $\pm 5\%$ , 120 mA; or 24 V dc $\pm 5\%$ , 50 mA
<b>Ambient Temperature</b>	32-131°F (0-55°C)
<b>Dimensions</b>	1.89 x 3.78 x 4 in. (48 x 96 x 102 mm) 1/8 DIN. Panel Cutout: 1.77 x 3.62 in. (45 x 92 mm); Max. Panel Thickness: 0.18" (4.5 mm)
<b>Product Weight</b>	7.4 oz (210 g)
<b>Package Weight</b>	15.9 oz (450 g)
<b>Approvals</b>	CE & RoHS
<b>Warranty</b>	1 year

## Ordering Details

Series	Input	Input Power	Relay Output	Analog Output	Comm.
<b>PC</b>	<b>-XXX</b>	<b>-X</b>	<b>X</b>	<b>X</b>	<b>CX</b>
	<p><b>-QDB:</b> Max Pulse Rate: 250 kHz, Diff. high/low thresholds: +/-200 mV; Diff. common mode: <math>\pm 7</math> V; Single-ended high voltage: 2.5 V to 10 V; Single-ended low voltage: -1 V to +1 V</p> <p><b>-QDE:</b> same as QDB with Extended Features</p>	<p><b>0</b> = 85 - 264 V ac or 95 - 300 V dc</p> <p><b>1</b> = 12 - 34 V ac or 10 - 48 V dc</p>	<p><b>R</b> = Relay Output Two 8A Form C contact relays</p> <p><b>S</b> = SSR Output Two 120 mA solid state relays</p> <p><b>0</b> = No Output</p>	<p><b>A</b> = 4-20 mA, 0-20 mA 0-10 V, -10 to +10 V</p> <p><b>0</b> = No Output</p>	<p><b>C1</b> = RS-232</p> <p><b>C2</b> = RS-485</p> <p><b>C5</b> = USB</p> <p><b>C0</b> = No Comm. Output</p>

Ex: PC-QDB-0RAC1 Counter totalizer for quadrature encoders, standard high voltage power, relay contact outputs, analog output and RS-232 communication.