

Cable-Extension Position Transducer

CANbus • SAE J1939

Ranges: 0-2 to 0-60 inches

Industrial Grade

Specification Summary:

GENERAL

Full Stroke Ranges 0-2 to 0-60 inches
Electrical Interface CANbus SAE J1939
Protocol Proprietary B
Accuracy $\pm 0.25\%$ to $\pm 0.10\%$ full stroke
Repeatability $\pm 0.02\%$ full stroke
Resolution $\pm 0.003\%$ full stroke
Measuring Cable stainless steel, nylon-coated or thermoplastic
Enclosure Material powder-painted aluminum or stainless steel
Sensor plastic-hybrid precision potentiometer
Potentiometer Cycle Life *see ordering information*
Maximum Retraction Acceleration *see ordering information*
Weight, Aluminum (Stainless Steel) Enclosure 3 lbs. (6 lbs.), max.

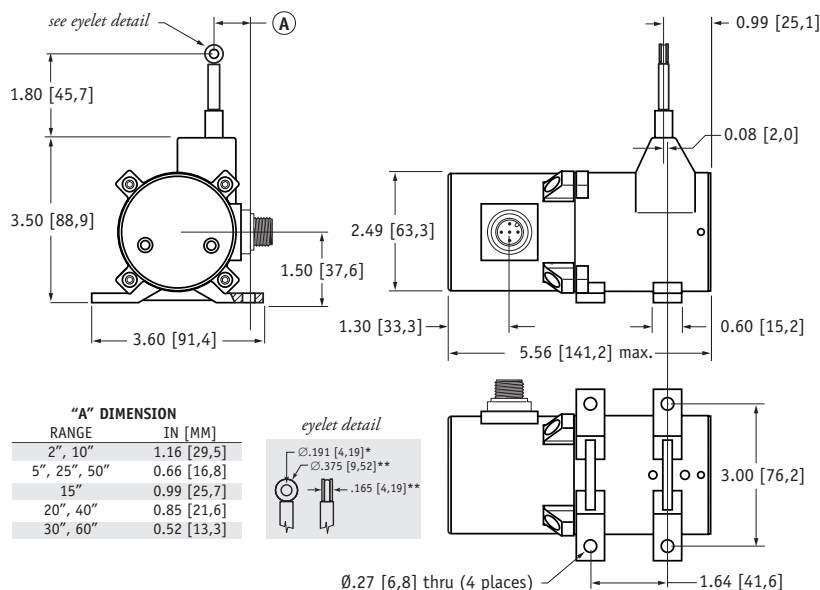
ELECTRICAL

Input Voltage 7 - 18 VDC
Input Current 60 mA max.
Baud Rate 125K, 250K, or 500K via DIP switches
Update Rate 10 ms. (20 ms. available—*contact factory*)

ENVIRONMENTAL

Environmental Suitability NEMA 4X/6, IP 67
Operating Temperature -40° to 185°F (-40° to 85°C)
Vibration up to 10 G's to 2000 Hz maximum

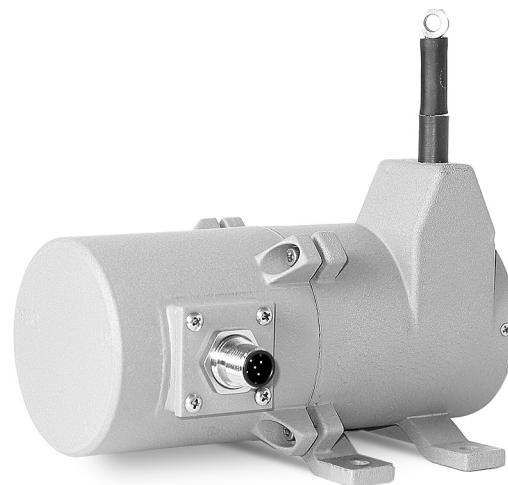
Outline Drawing



DIMENSIONS ARE IN INCHES [MM]
tolerances are ± 0.02 in. [$\pm 0,5$ mm] unless otherwise noted

* tolerance = $+0.005$ -0.001 [$+0.13$ -0.03]
** tolerance = $+0.005$ -0.005 [$+0.13$ -0.13]

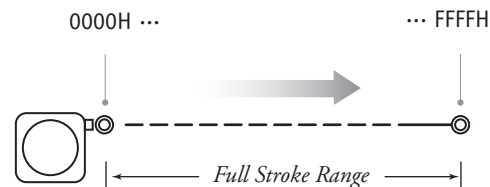
PT8CN



The PT8CN, using a high cycle plastic-hybrid potentiometer, communicates to your PLC via the CANbus SAE J1939 interface. Suitable for factory and harsh environment applications requiring linear position feedback in ranges up to 60".

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT8CN installs in minutes by simply mounting its body to a fixed surface and attaching its cable to the movable object. Perfect parallel alignment not required.

Output Signal

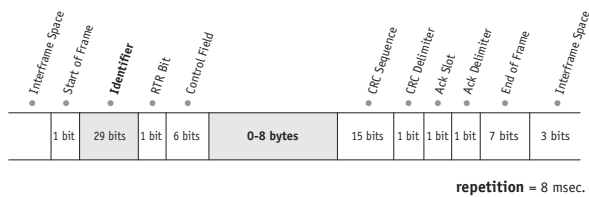


Celesco Transducer Products, Inc.
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

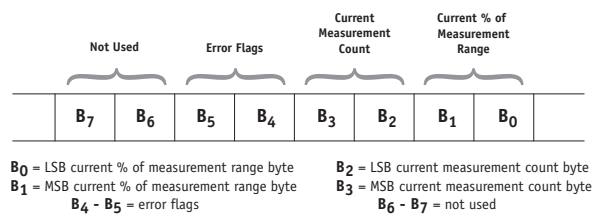
celesco
celesco.com • info@celesco.com

I/O Format

Data Frame



Data Field



Identifier

	Message Priority			Future Use		J1939 Reference Proprietary B								Data Field Type*						Not Used		Node ID**					
Example –	1	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1
Identifier Bit No. –	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
Hex Value –	0			F		F		F		F		F		5		3		3		3		F		F		F	

*Sensor field data can be factory set to customer specific value.

**Customer defined, set via Dips 1-6. Bit values shown for example only, see Address Setting below.

Setting the Address (Node ID) and Baud Rate

Address Setting (Node ID)

The Address Setting (Node ID) is set via 6 switches located on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

The DIP switch settings are binary starting with switch number 1 (= 2⁰) and ending with switch number 6 (= 2⁵).

Baud Rate

The transmission baud rate may be either factory preset at the time of order or set manually at the time of installation.

The baud rate can be set using switches 7 & 8 on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

address setting:

DIP-1 (2 ⁰)	DIP-2 (2 ¹)	DIP-3 (2 ²)	DIP-4 (2 ³)	DIP-5 (2 ⁴)	DIP-6 (2 ⁵)	address (decimal)
0	0	0	0	0	0	0
1	0	0	0	0	0	1
0	1	0	0	0	0	2
...	...	...	...	...	...	...
1	1	1	1	1	1	63

baud rate setting:

DIP-7	DIP-8	baud rate
0	0	125k
1	0	250k
0	1	500k
1	1	125k



Current % of Measurement Range

The Current % of Measurement Range is a 2-byte value that expresses the current linear position as a percentage of the entire full stroke range. Resolution is .1 % of the full stroke measurement range.

This value starts at 0x0000 at the beginning of the stroke and ends at 0x03E8.

Example:	Hex	Decimal	Percent
	0000	0000	0.0%
	0001	0001	0.1%
	0002	0002	0.2%
	...	...	...
	03E8	1000	100.0%

Current Measurement Count

The Current Measurement Count (CMC) is the output data that indicates the present position of the measuring cable.

The CMC is a 16-bit value that occupies bytes B₀ and B₁ of the data field. B₀ is the LSB (least significant byte) and B₁ is the MSB (most significant byte).

The CMC starts at 0x0000 with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at 0xFFFF. This holds true for all ranges.

Error Flags

0x55 (yellow LED on controller board) indicates that the sensor has begun to travel beyond the calibrated range of the internal position potentiometer.

0xAA (red LED on controller board) indicates that the sensor has moved well beyond the calibrated range of the internal position potentiometer.

If either error flag occurs within the full stroke range of the sensor, the unit should be returned to the factory for repair and recalibration.

Converting CMC to Inches

If required, the CMC can easily be converted a linear measurement expressed in inches instead of just counts.

This is accomplished by first dividing the CMC by 65,535 (total counts over the range) and then multiplying that value by the FSR:

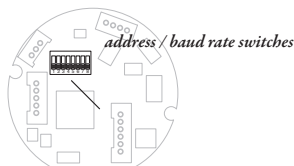
$$\left(\frac{\text{CMC}}{65,535} \right) \times \text{FSR}$$

Example:

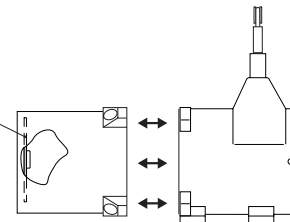
If the full stroke range is 30 inches and the current position is 0x0FF2 (4082 Decimal) then,

$$\left(\frac{4082}{65,535} \right) \times 30.00 \text{ inches} = 1.87 \text{ inches}$$

CANbus Controller Board and DIP Switch Location



internal dip switches & controller board



to gain access to the controller board, remove four Allen-Head Screws and remove rear cover.

Ordering Information:

Model Number:

PT8CN - _____
 order code: **R** **A** **B** **C** **D** **J** **F** **G** **H**

Sample Model Number:

PT8CN - 50 - AL - N34 - T1 - CG - J - 500 - 32 - SC5

R range: 50 inches
A enclosure: aluminum
B measuring cable: .034 nylon-coated stainless
C measuring cable tension: standard
D cable guide: standard
J interface: CANbus SAE J1939
F baud rate: 500 k bits/sec.
G node ID: 32 decimal
H electrical connection: 5-meter cordset with straight plug

Full Stroke Range:

R order code:	2	5	10	15	20	25	30	40	50	60
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50	60
accuracy (% of f.s.):	0.25%	0.25%	0.15%	0.15%	0.15%	0.15%	0.15%	0.10%	0.10%	0.10%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

*—1 cycle is defined as the travel of the measuring cable from full retraction to full extension and back to full retraction

Enclosure Material:

A order code:	AL	SS	316
	powder-painted aluminum	303 stainless steel	316 stainless steel

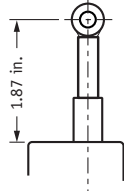
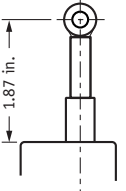
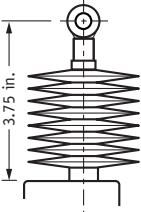
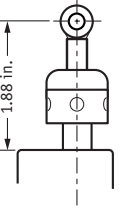
Measuring Cable:

B order code:	N34	S47	V62
	Ø.034-inch nylon-coated stainless steel available in all ranges	Ø.047-inch stainless steel 5, 15, 20, 25, 30-inch ranges only	Ø.062-inch thermoplastic all ranges up to 30 inches only

Measuring Cable Tension:

C order code:	T1	T2	T3
cable tension (±30%)	standard tension	medium tension	high tension
2, 10-inch ranges:	39 oz. [35 G max. acceleration]	65 oz. [53 G max. acceleration]	116 oz. [100 G max. acceleration]
15-inch range:	26 oz. [13 G max. acceleration]	43 oz. [23 G max. acceleration]	77 oz. [40 G max. acceleration]
20, 40-inch ranges:	20 oz. [10 G max. acceleration]	33 oz. [16 G max. acceleration]	60 oz. [32 G max. acceleration]
5, 25, 50-inch ranges:	16 oz. [6 G max. acceleration]	26 oz. [11 G max. acceleration]	47 oz. [19 G max. acceleration]
30, 60-inch ranges:	13 oz. [4 G max. acceleration]	22 oz. [8 G max. acceleration]	40 oz. [13 G max. acceleration]

Cable Guide:

D order code:	CG	SS	CB*	BR
	standard cable guide	stainless steel cable guide	polyurethane cable bellows	integral cable brush
				

*note: all ranges up to 25 inches only

Ordering Information (cont.)

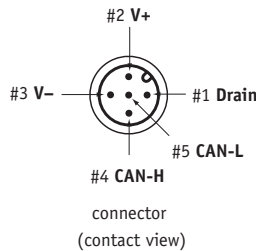
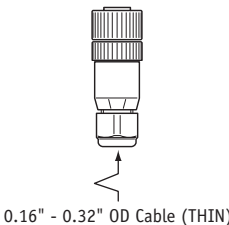
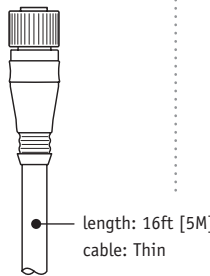
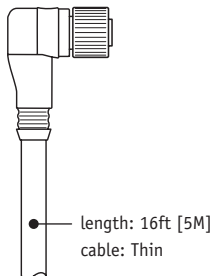
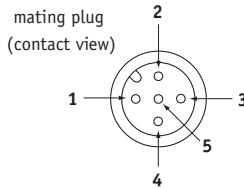
Baud Rate:

F order code:	125	250	500
	125 kbaud	250 kbaud	500 kbaud

Node ID:

G order code:	0	1	2	...	62	63
	select address (0 - 63 Decimal)					

Electrical Connection:

 order code:	blank	MC5	SC5	NC5																		
	5-pin micro-connector <i>(no mating plug supplied)</i>	5-pin micro-connector w/ mating plug	5-pin micro-connector and 5 meter length cordset w/straight mating plug	5-pin micro-connector and 5 meter length cordset w/90° mating plug																		
																						
			<table><tr><td>pin</td><td>signal</td><td>wire color</td></tr><tr><td>1</td><td>drain</td><td>brown</td></tr><tr><td>2</td><td>V+</td><td>white</td></tr><tr><td>3</td><td>V-</td><td>blue</td></tr><tr><td>4</td><td>Can-H</td><td>black</td></tr><tr><td>5</td><td>Can-L</td><td>grey</td></tr></table>	pin	signal	wire color	1	drain	brown	2	V+	white	3	V-	blue	4	Can-H	black	5	Can-L	grey	
pin	signal	wire color																				
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