

# Cable-Extension Position Transducer

CANbus • SAE J1939

Ranges: 0-600 to 0-1700 inches

Industrial Grade

<Extended Range>

# PT9CN

## Specification Summary:

### GENERAL

Full Stroke Range Options—on this datasheet ..... 0-600 to 0-1700 inches  
 Electrical Signal Interface ..... CANbus SAE J1939  
 Protocol ..... Proprietary B  
 Accuracy .....  $\pm 0.10\%$  full stroke  
 Repeatability .....  $\pm 0.02\%$  full stroke  
 Resolution .....  $\pm 0.003\%$  full stroke  
 Measuring Cable Options ..... nylon-coated stainless steel or thermoplastic  
 Enclosure Material ..... powder-painted aluminum or stainless steel  
 Sensor ..... plastic-hybrid precision potentiometer  
 Potentiometer Cycle Life ..... 250,000, min. —before signal degradation can occur  
 Maximum Retraction Acceleration ..... see ordering information  
 Maximum Velocity ..... see ordering information  
 Weight, Aluminum (Stainless Steel) Enclosure ..... 14 lbs. (28 lbs.) max.

### ELECTRICAL

Input Voltage ..... 7 - 18 VDC  
 Input Current ..... 60 mA max.  
 Address Setting/Node ID ..... 0...63 set via DIP switches  
 Baud Rate ..... 125K, 250K or 500K set via DIP switches

### ENVIRONMENTAL

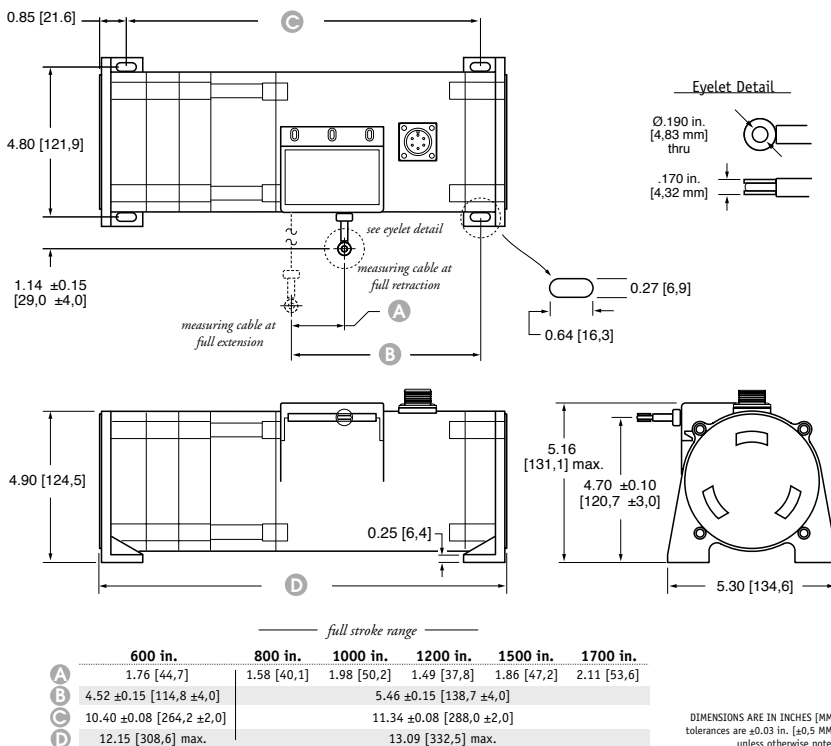
Enclosure ..... NEMA 4/4X/6, IP 67  
 Operating Temperature ..... -40° to 200°F (-40° to 90°C)  
 Vibration ..... up to 10 G's to 2000 Hz maximum



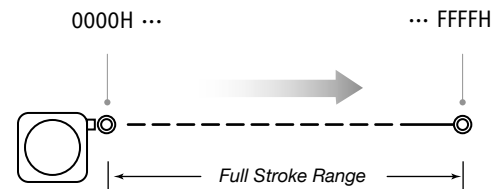
The PT9CN communicates linear position feedback via the CANbus SAE J1939 interface. The PT9CN has been designed for factory and harsh environment applications requiring full stroke ranges up to 1700".

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT9CN 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.

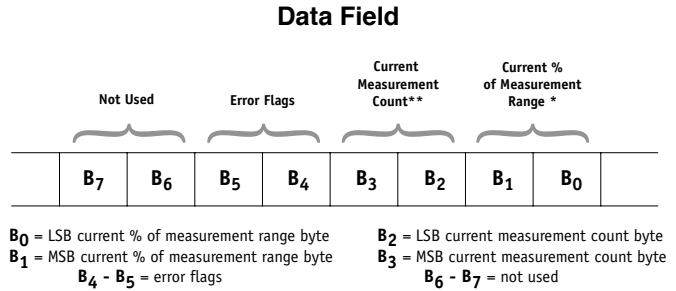
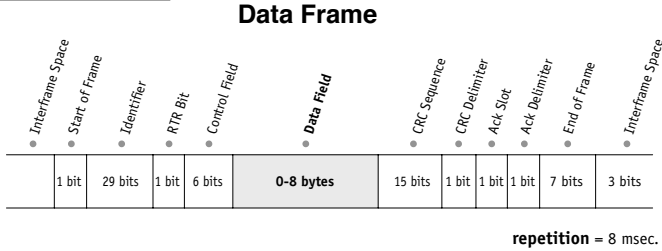
## Outline Drawing



## Output Signal



**I/O Format:**



**\*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 **0000H** at the beginning of the stroke and ends at **03E8H**.

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 **B<sub>0</sub>** and **B<sub>1</sub>** of the data field. **B<sub>0</sub>** is the **LSB** (least significant byte) and **B<sub>1</sub>** is the **MSB** (most significant byte).

The **CMC** starts at **0000H** with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at **FFFFH**. This holds true for all ranges.

**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 **OFF2 Hex** (4082 Decimal) then,

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

**Setting the Address Setting (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** (= 2<sup>0</sup>) and ending with switch number **6** (= 2<sup>5</sup>).

DIP-1 (2 <sup>0</sup> )	DIP-2 (2 <sup>1</sup> )	DIP-3 (2 <sup>2</sup> )	DIP-4 (2 <sup>3</sup> )	DIP-5 (2 <sup>4</sup> )	DIP-6 (2 <sup>5</sup> )	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**

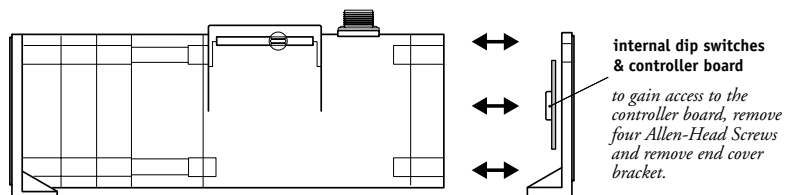
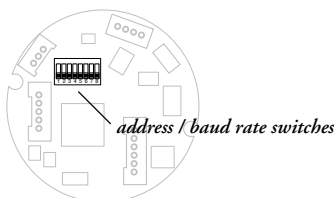
The transmission baud rate may be either factory preset at the time of order or set manually at the time of installation.

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.

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



**CANBus Controller Board and DIP Switch Location**



**Ordering Information:**

**Model Number:**

**PT9CN** -      -      -      - **J** -      -      -      -     

*order code:*                      **R**                      **A**                      **B**                      **C**                      **D**                      **E**                      **F**

Sample Model Number:

**PT9CN - 1200 - AL - FR - J - 500 - 32 - SC5**

- R** range: 1200 inches
- A** enclosure: aluminum
- B** cable exit: front (horizontal)
- C** interface: CANbus SAE J1939
- D** baud rate: 500 k bits/sec.
- E** node ID: 32 decimal
- F** electrical connection: 5-meter cordset with straight plug

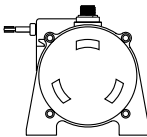
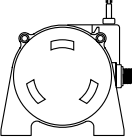
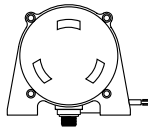
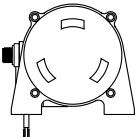
**Full Stroke Range:**

<b>R</b> <i>order code:</i>	<b>600</b>	<b>800</b>	<b>1000</b>	<b>1200</b>	<b>1500</b>	<b>1700</b>
full stroke range, min:	600 in.	800 in.	1000 in.	1200 in.	1500 in.	1700 in.
cable tension (30%):	25 oz.	25 oz.	24 oz.	24 oz.	23 oz.	23 oz.
measuring cable:	.034-in. dia. nylon-coated stainless	.024-in. dia. nylon-coated stainless	.024-in. dia. nylon-coated stainless	.019-in. dia. nylon-coated stainless	.015-in. dia. non-coated stainless	.015-in. dia. non-coated stainless

**Enclosure Material:**

<b>A</b> <i>order code:</i>	<b>AL</b>	<b>SS</b>
enclosure material:	powder-painted aluminum	303 stainless steel
max. acceleration:	1G	.33G
max. velocity:	60 inches/sec.	20 inches/sec.

**Cable Exit:**

<b>B</b> <i>order code:</i>	<b>FR</b> front	<b>UP</b> top	<b>BK</b> back	<b>DN</b> down
				

**Baud Rate:**

<b>D</b> <i>order code:</i>	<b>125</b>	<b>250</b>	<b>500</b>
	125 kbaud	250 kbaud	500 kbaud

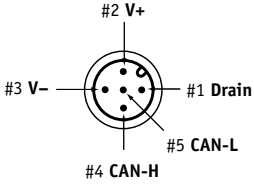


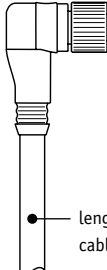
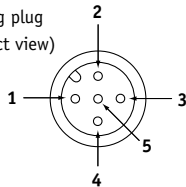
**Node ID:**

<b>E</b> <i>order code:</i>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	...	<b>61</b>	<b>62</b>	<b>63</b>
	select address (0 - 63 Decimal)							

**Ordering Information:**

**Electrical Connection:**

① *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																		
 <p>#2 V+ #3 V- #1 Drain #5 CAN-L #4 CAN-H connector (contact view)</p>	 <p>0.16" - 0.32" OD Cable (THIN)</p>	 <p>length: 16ft [5M] cable: Thin</p>	 <p>length: 16ft [5M] cable: Thin</p>																		
	 <p>mating plug (contact view)</p>	<table border="1"> <thead> <tr> <th>pin</th> <th>signal</th> <th>wire color</th> </tr> </thead> <tbody> <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> </tbody> </table>	pin	signal	wire color	1	drain	brown	2	V+	white	3	V-	blue	4	Can-H	black	5	Can-L	grey	
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version: 1.0 last updated: March 30, 2005