

Cable-Extension Position Transducer

DeviceNET®

Ranges: 0-2 to 0-60 inches

Industrial Grade

PT8DN

Specification Summary:

GENERAL

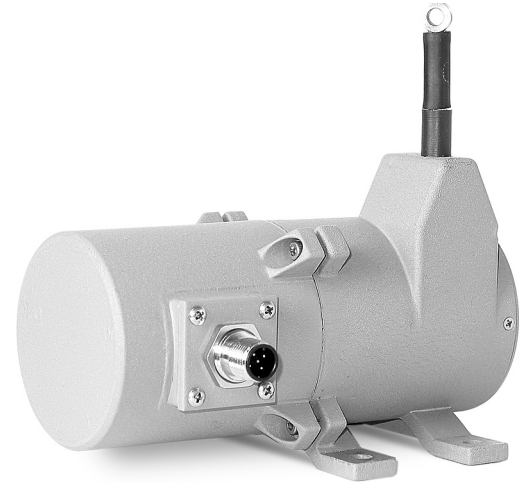
Full Stroke Ranges..... 0-2 to 0-60 inches
 Electrical Interface..... CANbus ISO 11898
 Protocol..... DeviceNET version 2.0
 Accuracy..... ± 0.25% to ± 0.10% full stroke
 Repeatability..... ± 0.02% full stroke
 Resolution..... ± 0.003% full stroke
 Measuring Cable..... stainless steel, nylon-coated or 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..... bus powered
 Input Current..... 40 mA
 Address Setting/Node ID..... 0...63 set via DIP switches—default setting: 63
 Baud Rate..... 125K, 250K or 500K set via DIP switches
 EDS File..... available @ <http://www.celesco.com/download>

ENVIRONMENTAL

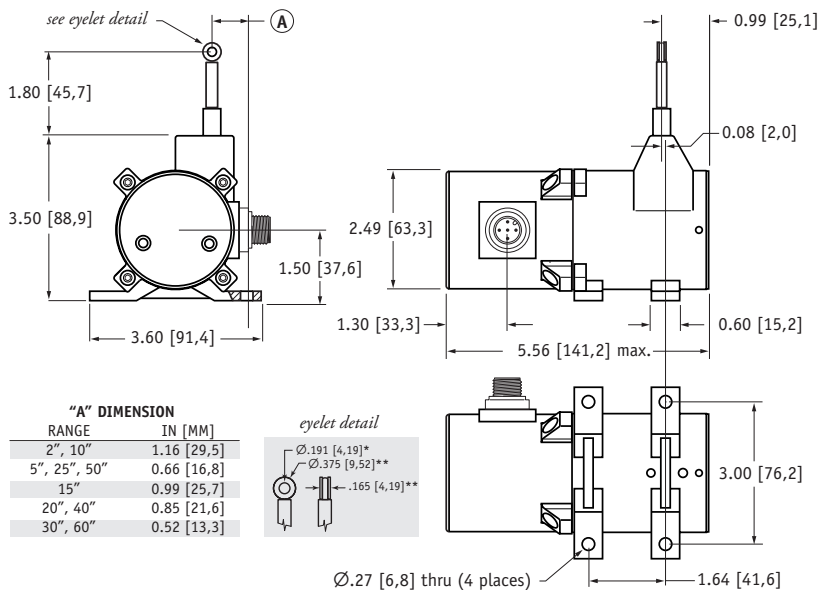
Environmental Suitability..... NEMA 4X/6, IP 67
 Operating Temperature..... -40° to 185°F (-40° to 85°C)
 Vibration..... up to 10 G's to 2000 Hz maximum



The PT8DN, using a high cycle plastic-hybrid potentiometer, communicates via DeviceNET protocol with programmable controllers in factories and harsh environments requiring linear position measurements in ranges up to 60”.

As a member of Celesco’s innovative family of NEMA 4 rated cable-extension transducers, the PT8DN installs in minutes by simply mounting it’s body to a fixed surface and attaching it’s cable to the movable object. Perfect parallel alignment not required.

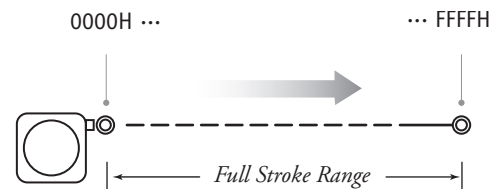
Outline Drawing



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

* tolerance = +.005 -.001 [+13 -.03]
 ** tolerance = +.005 -.005 [+13 -.13]

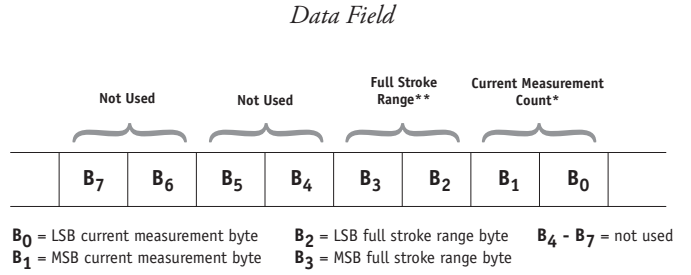
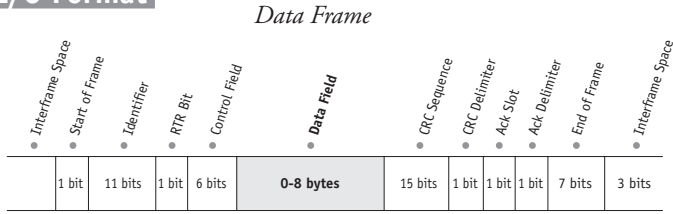
Output Signal



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



***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 the first two 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 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.

****Full Stroke Range**

The **Full Stroke Range (FSR)** is a 16-bit value in the data field that expresses the full range of the sensor in inches. This value can be used to convert the actual count to units of measurement should the application require it.

The full stroke measurement range occupies the second two bytes (B₂ and B₃) of the data field.

B₂ is the LSB (least significant byte) and B₃ is the MSB (most significant byte).

This value is expressed in inches.

Example:

| Hex Value | Decimal Equivalent | Full Stroke Range |
|-----------|--------------------|-------------------|
| 001E | 30 | 30 inches |

Converting CMC to Inches

If required, the CMC can easily be converted to 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,

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

Address Setting (Node ID), Baud Rate and Bus Termination Settings

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).

| 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

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.

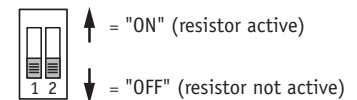
| DIP-7 | DIP-8 | baud rate |
|-------|-------|-----------|
| 0 | 0 | 125k |
| 1 | 0 | 250k |
| 0 | 1 | 500k |
| 1 | 1 | 125k |



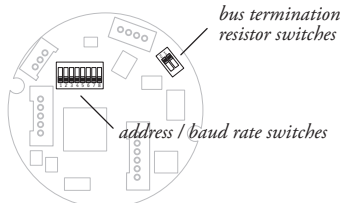
Bus Termination

The setting of the internal bus termination resistor may be specified upon order or manually changed by the end user at the time of installation.

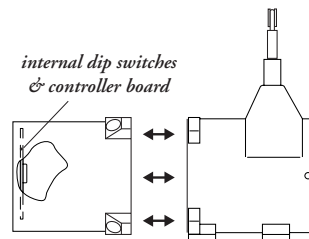
The bus termination resistor is activated setting switches 1 & 2 on the 2-pole DIP switch (located on the internal DeviceNET controller board) to the "ON" position.



DeviceNET Controller Board and DIP Switch Location



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



Ordering Information:

Model Number:

PT8DN - - - - - - - -
order code: **R** **A** **B** **C** **D** **E** **F** **G**

Sample Model Number:

PT8DN - 50 - AL - N34 - T1 - CG - 500 - TR - SC5

- R** range: 50 inches
- A** enclosure: aluminum
- B** measuring cable: .034 nylon-coated stainless
- C** measuring cable tension: standard
- D** cable guide: standard
- E** baud rate: 500 k bits/sec.
- F** terminating resistor: yes
- G** electrical connection: 5-meter cordset with straight plug

Full Stroke Range:

| R <i>order code:</i> | 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 x 10 ⁶ | 2.5 x 10 ⁶ | 5 x 10 ⁵ | 5 x 10 ⁵ | 5 x 10 ⁵ | 5 x 10 ⁵ | 5 x 10 ⁵ | 2.5 x 10 ⁵ | 2.5 x 10 ⁵ | 2.5 x 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 <i>order code:</i> | AL | SS | 316 |
|-----------------------------|-------------------------|---------------------|---------------------|
| | powder-painted aluminum | 303 stainless steel | 316 stainless steel |

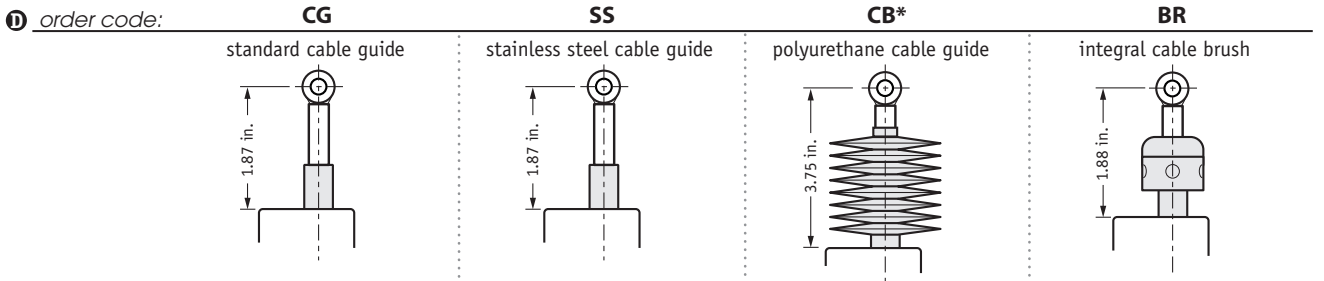
Measuring Cable:

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

Measuring Cable Tension:

| G <i>order code:</i> | | T1 | T2 | T3 |
|---|-----------------|-----------------------------|-----------------------------|-----------------------------|
| | | standard tension | medium tension | high tension |
| <i>full stroke range cable tension specifications</i> | 2, 10-inch: | 39 oz. | 65 oz. | 116 oz. |
| | 15-inch: | 26 oz. | 43 oz. | 77 oz. |
| | 20, 40-inch: | 20 oz. | 33 oz. | 60 oz. |
| | 5, 25, 50-inch: | 16 oz. | 26 oz. | 47 oz. |
| | 30, 60-inch: | 13 oz. | 22 oz. | 40 oz. |
| | | tension tolerance: ± 30% | | |
| | | <i>maximum acceleration</i> | <i>maximum acceleration</i> | <i>maximum acceleration</i> |
| aluminum enclosure: | | 15 g | 25 g | 40 g |
| stainless steel enclosure: | | 6 g | 12 g | 18 g |

Cable Guide:



*note: all ranges up to 25 inches only

Ordering Information (cont.)

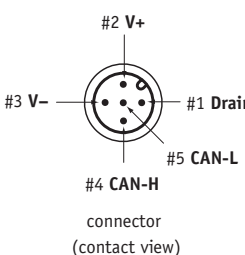
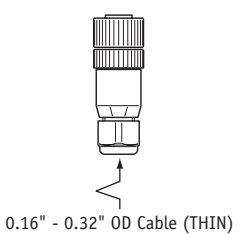
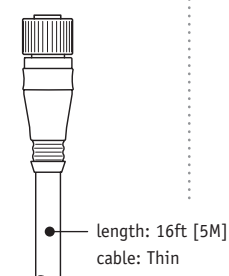
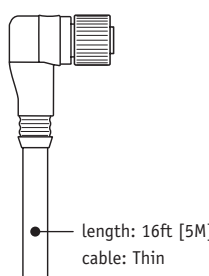
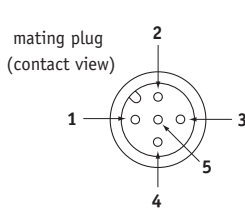
Baud Rate:

| | | | |
|----------------------|------------|------------|------------|
| Ⓜ order code: | 125 | 250 | 500 |
| | 125 kbaud | 250 kbaud | 500 kbaud |

Terminating Resistor:

| | | |
|----------------------|----------------------|-------------------------|
| Ⓜ order code: | TR | NR |
| | terminating resistor | no terminating resistor |

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 | | | | | | | | | | | | | | | | | | |
| |  <p>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 | |
| pin | signal | wire color | | | | | | | | | | | | | | | | | | | | |
| 1 | drain | brown | | | | | | | | | | | | | | | | | | | | |
| 2 | V+ | white | | | | | | | | | | | | | | | | | | | | |
| 3 | V- | blue | | | | | | | | | | | | | | | | | | | | |
| 4 | Can-H | black | | | | | | | | | | | | | | | | | | | | |
| 5 | Can-L | grey | | | | | | | | | | | | | | | | | | | | |

version: 4.0 last updated: April 29, 2009