Cable-Extension Position Transducer

DeviceNET®

Ranges: 0-600 to 0-1700 inches

Industrial Grade

Extended Range PT9DN

Specification Summary:



GENERAL

Full Stroke Ranges ..... 0-600 to 0-1700 inches
Electrial Interface ..... CANbus ISO 11898
Protocol ..... DeviceNet Version 2.0
Accuracy ..... ± 0.10% full stroke
Repeatability ..... ± 0.02% full stroke
Resolution ..... ± 0.003% full stroke
Measuring Cable ..... non-coated and nylon-coated stainless steel
Enclosure Material ..... powder-painted aluminum or stainless steel
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... 250,000 cycles, min.
Maximum Retraction Acceleration ..... up to 1 G, see *ordering information*
Maximum Velocity ..... up to 60 inches per sec, see *ordering information*
Weight, Aluminum (Stainless Steel) Enclosure ..... 8 lbs. (16 lbs.), max.

ELECTRICAL

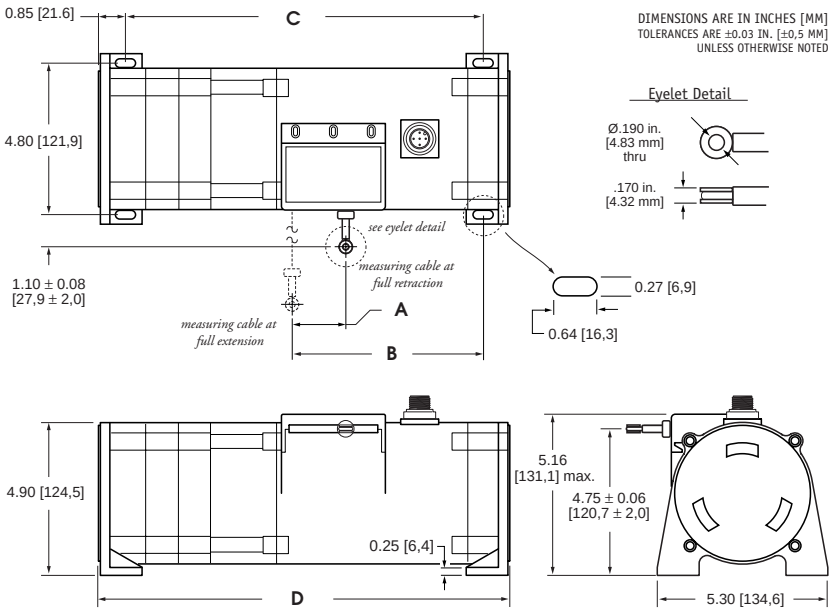
Input Voltage ..... Bus Powered
Input Current ..... 40 mA
Address Setting (Node ID) ..... 0..63 via DIP Switches or protocol
Baud Rate ..... 125K, 250K or 500K via DIP Switches or protocol
EDS file ..... available @ http://www.celesco.com/download

ENVIRONMENTAL

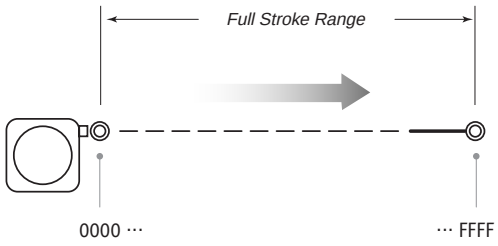
Environmental Suitability ..... NEMA 4/4X/6, IP 67/68
Operating Temperature ..... -40º to 200ºF
Vibration ..... up to 10 G's to 2000 Hz maximum

The PT9DN communicates via DeviceNET protocol with programmable controllers in factories and harsh environments requiring linear position measurements in ranges up to 140 ft.

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT9DN 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.



Electrical Output Signal:

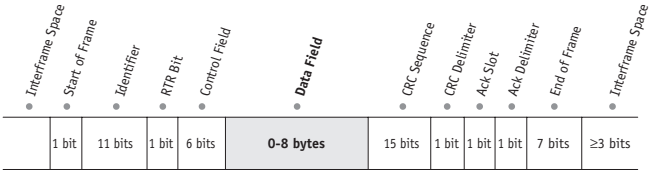


	range:	600 in.	800 in.	1000 in.	1200 in.	1500 in.	1700 in.
dimension	A	1.76 [44,7]	1.58 [40,1]	1.98 [50,2]	1.49 [37,8]	1.86 [47,2]	2.11 [53,6]
	B	4.52 ±0.08 [114,8 ±2,0]	5.46 ±0.08 [138,7 ±2,0]				
	C	10.50 ±0.08 [266,7 ±2,0]	11.24 ±0.08 [285,5 ±2,0]				
	D	12.03 ±0.08 [305,6 ±2,0]	12.97 ±0.08 [329,4 ±2,0]				

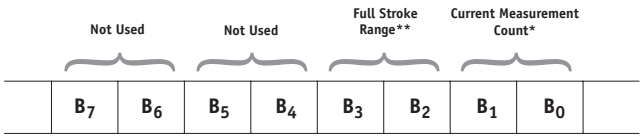
celesco

I/O Format

Data Frame



Data Field



B_0 = LSB current measurement byte
B_1 = MSB current measurement byte
B_2 = LSB full stroke range byte
B_3 = MSB full stroke range byte
B_4 - B_7 = not used

***Current Measurement Count**

The **C**urrent **M**easurement **C**ount (**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 (B_0 and B_1) of the data field. B_0 is the MSB (most significant byte) and B_1 is the LSB (least 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 **F**ull **S**troke **R**ange **(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 (B_2 and B_3) of the data field.

B_2 is the MSB (most significant byte) and B_3 is the LSB (least 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 a linear measurement expressed in inches instead of just counts.

This is accomplished by first dividing the CMC by 65,536 (total counts over the range) and then multiplying that value by the FSR:

$$\left(\frac{\text{CMC}}{65{,}536}\right) \times \text{FSR}$$

Example:

If the full stroke range is **30 inches** and the current position is **OFF2 Hex** (4082 Decimal) then,

$$\left(\frac{4082}{65{,}536}\right) \times 30.00 \text{ inches} = 1.87 \text{ inches}$$

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** (= 2^0) and ending with switch number **6** (= 2^5).

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



= "0"
= "1"

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



= "0"
= "1"

Bus Termination

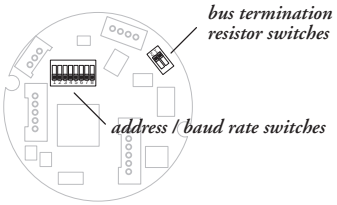
The setting of the internal bus termination resistor may be specified upon order or manually changed by the end user at the time of installation.

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.

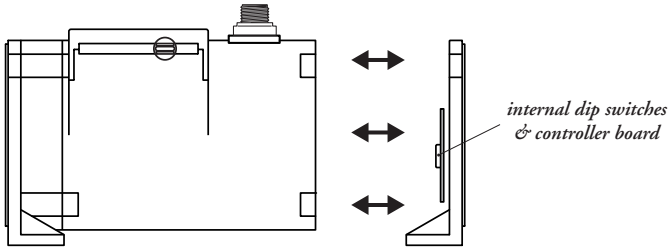


= "ON" (resistor active)
= "OFF" (resistor not active)

DeviceNET Controller Board and DIP Switch Location



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



Ordering Information

PT9DN - _____ - ___ - ___ - ___ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Sample Model Number:

PT9DN - 800 - AL - FR - 500 - RY - SC5

Ⓡ	range:	800 inches
Ⓐ	enclosure	aluminum
Ⓑ	cable exit:	front (horizontal)
Ⓒ	baud rate:	500 k bits/sec.
Ⓓ	terminating resistor:	yes
Ⓔ	electrical connection:	5-meter cordset with straight plug

Full Stroke Range:

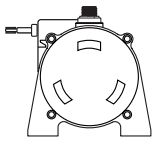
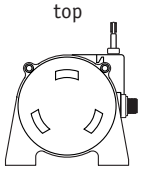
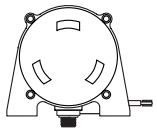
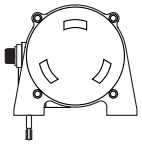
Ⓡ order code:	600	800	1000	1200	1500	1700
full stroke range, min:	600 in.	800 in.	1000 in.	1200 in.	1500 in.	1700 in.
cable tension (±30%):	25 oz.	25 oz.	24 oz.	24 oz.	23 oz.	23 oz.
measuring cable:	Ø.034 nylon-coated stainless	Ø.024 nylon-coated stainless	Ø.024 nylon-coated stainless	Ø.019 nylon-coated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

Enclosure Material:

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

Cable Exit:

Ⓑ order code:

FR	UP	BK	DN
front	top	back	down
			

Baud Rate:

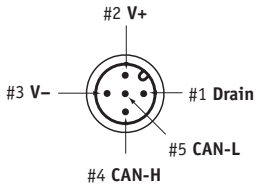
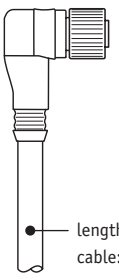
Ⓒ order code:	125	250	500
	125 kbaud	250 kbaud	500 kbaud

Terminating Resistor:

Ⓓ order code:	TR	NR
	terminating resistor	no terminating resistor

Electrical Connection:

Ⓔ ordercode:

blank	MC5	SC5	NC5
5-pin micro-connector *(no mating plug supplied)*	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
 male receptacle (contact view)	 0.16" - 0.32" OD Cable (THIN)	 length: 16ft [5M] cable: Thin	 length: 16ft [5M] cable: Thin

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