DeviceNET®
Ranges: 0-75 to 0-550 inches
Industrial Grade

PT9DN

Specification Summary:

GENERAL

Full Stroke Range Options–*on this datasheet* ..... 0-75 to 0-550 inches
Electrical Signal 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 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 ..... 8 lbs. (16 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

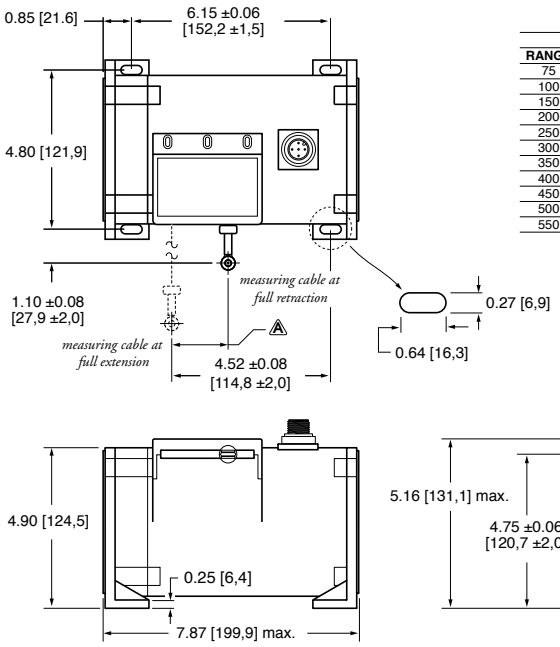
Enclosure ..... NEMA 4/4X/6, IP 67
Operating Temperature ..... -40° to 200°F (-40° to 90°C)
Vibration ..... up to 10 G's to 2000 Hz maximum



The PT9DN communicates via DeviceNET protocol with programmable controllers in factories and harsh environments requiring linear position measurements in ranges up to 550".

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.

Fig. 1 – Outline Drawing (26 oz. cable tension only)

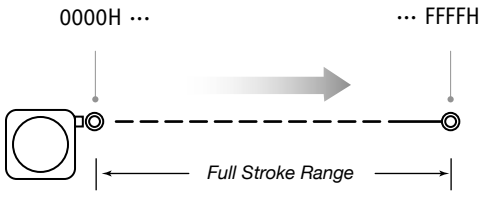


"A" DIMENSION

	MEASURING CABLE DIAMETER		
RANGE	**0.034 in.**	**0.047 in.**	**0.062 in.**
75	0.22	0.29	0.37
100	0.29	0.39	0.49
150	0.44	0.59	0.73
200	0.58	0.79	0.98
250	0.73	0.98	1.22
300	0.88	1.18	1.47
350	1.02	1.38	1.71
400	1.17	1.57	1.96
450	1.31	1.77	N/A
500	1.46	1.97	N/A
550	1.61	N/A	N/A

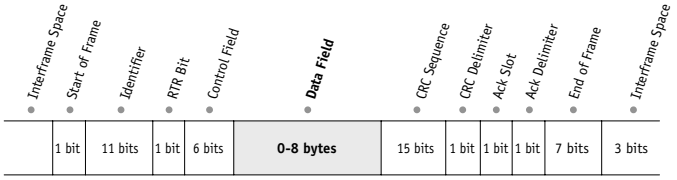
DIMENSIONS ARE IN INCHES (MM)
TOLERANCES ARE 0.03 IN. (0.5 MM) UNLESS OTHERWISE NOTED

Output Signal

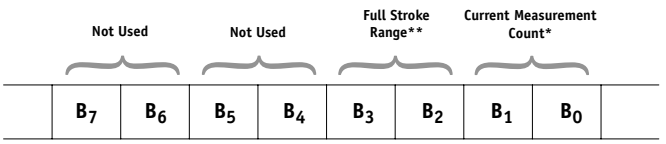


I/O Format:

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 LSB (least significant byte) and B_1 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 **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 LSB (least significant byte) and B_3 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** (= 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



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.

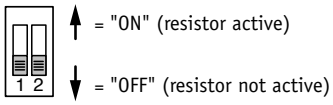
DIP-7	DIP-8	baud rate
0	0	125k
1	0	250k
0	1	500k
1	1	125k



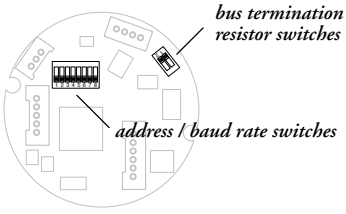
Bus Termination

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.

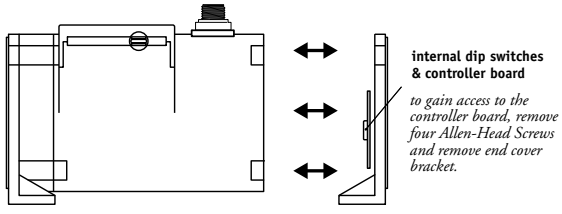


DeviceNET Controller Board and DIP Switch Location



Caution! Do Not Remove Spring-Side End Cover

removing spring-side end cover could cause spring to become unseated and permanently damaged.



Ordering Information:

Model Number:

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

Sample Model Number:

PT9DN - 200 - AL - N34 - 26 - FR - 500 - TR - SC5

Ⓡ	range:	200 inches
Ⓐ	enclosure	aluminum
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓒ	measuring cable tension:	26 oz.
Ⓓ	cable exit:	front (horizontal)
Ⓔ	baud rate:	500 k bits/sec.
Ⓕ	terminating resistor:	yes
Ⓖ	electrical connection:	5-meter cordset with straight plug

Full Stroke Range:

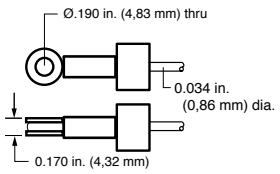
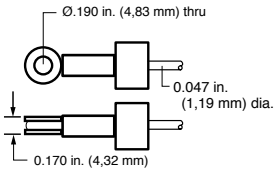
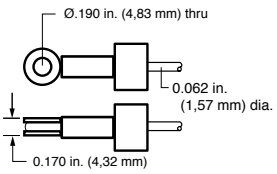
Ⓡ *order code:*	**75**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450***	**500***	**550***
full stroke range, min:	75 in.	100 in.	150 in.	200 in.	250 in.	300 in.	350 in.	400 in.	450 in.	500 in.	550 in.

** – 42 oz. cable tension strongly recommended*

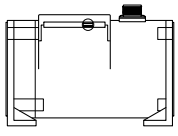
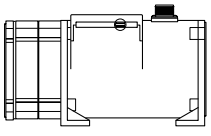
Enclosure Material:

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

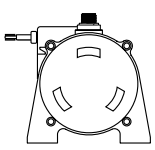
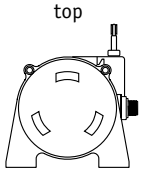
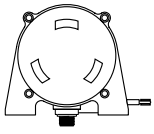
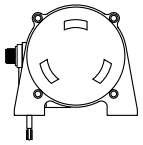
Enclosure Material and Measuring Cable Tension:

Ⓑ *order code:*	**N34**	**S47**	**V62**
	.034 nylon-coated stainless steel *available in all ranges*	.047 stainless steel *all ranges up to 500 inches*	.062 thermoplastic *all ranges up to 400 inches*
			

Measuring Cable Tension:

Ⓒ *order code:*	**26**		**42**	
tension (30%):	26 oz.		42 oz.	
enclosure material:	*aluminum*	*stainless steel*	*aluminum*	*stainless steel*
max. acceleration:	1 G	.33 G	5 G	2 G
max. velocity:	60 inches/sec	20 inches/sec	200 inches/sec	80 inches/sec
		standard housing *see fig 1.*		dual-spring housing *see fig 2.*

Cable Exit:

Ⓓ *order code:*	**FR**	**UP**	**BK**	**DN**
	front	top	back	down
				

Ordering Information:

Baud Rate:

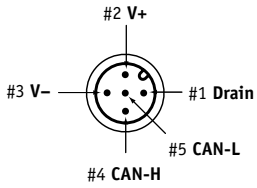
E order code:	125	250	500
	125 kbaud	250 kbaud	500 kbaud

Terminating Resistor:

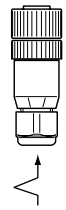
F order code:	TR	NR
	terminating resistor	no terminating resistor

Electrical Connection:

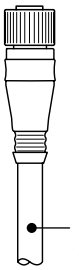
G order code:	blank	MC5	SC5	NC5
	5-pin micro-connector *(no mating plug supplied)*	5-pin micro-connector w/ mating plug	5-pin micro-connector and 5 meter length cordset w/straight mating plug	5-pin micro-connector and 5 meter length cordset w/90° mating plug



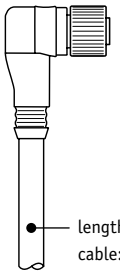
male receptacle
(contact view)



0.16" - 0.32" OD Cable (THIN)

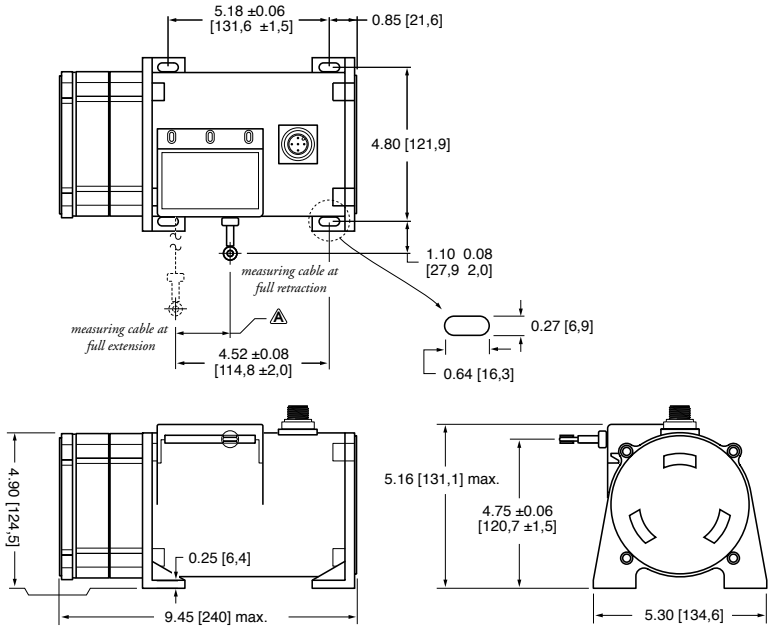


length: 16ft [5M]
cable: Thin



length: 16ft [5M]
cable: Thin

Fig. 2 – Outline Drawing (42 oz. cable tension only)



version: **2.0** last updated: **February 1, 2005**

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