Precision Potentiometric Output
Ranges: 0-2 to 0-50 inches
Compact Size • OEM Applications

PT1A

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-2 to 0-50 inches
Output Signal Options..... voltage divider (potentiometer)
Accuracy.....± 0.25% to ±0.10% full stroke *see ordering information*
Repeatability..... ± 0.02% full stroke
Resolution .....essentially infinite
Measuring Cable ..... .019-in. dia. nylon-coated stainless steel
Enclosure Material..... glass-filled polycarbonate and black anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life .....*see ordering information*
Maximum Retraction Acceleration .....*see ordering information*
Weight..... 1 lb. max.

ELECTRICAL

Input Resistance Options .....500, 1K, 5K, 10K or bridge, *see ordering information*
Power Rating, Watt .....*see ordering information*
Recommended Maximum Input Voltage .....*see ordering information*
Output Signal Change Over Full Stroke Range.....94% ±4% of input voltage

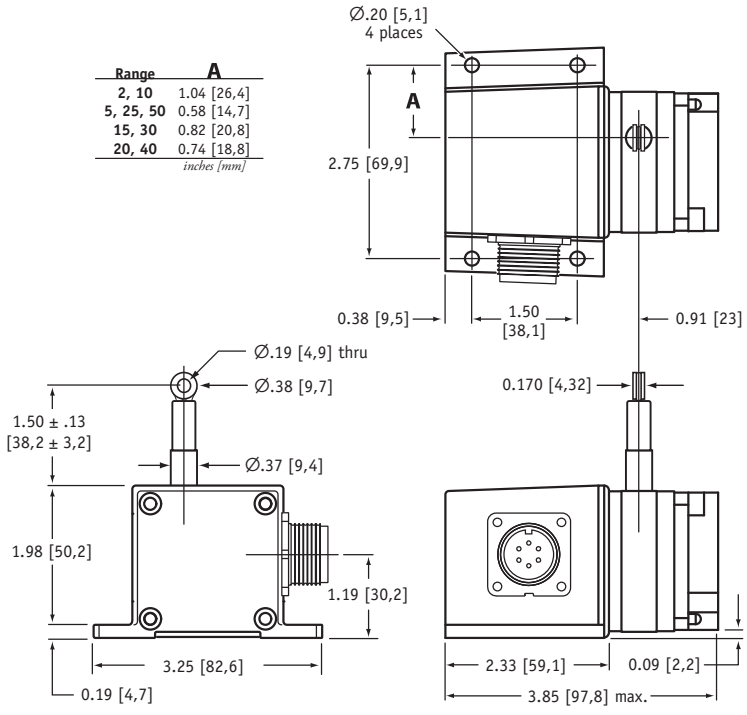
ENVIRONMENTAL

Enclosure ..... NEMA 4, IP 65
Operating Temperature .....0° to 200°F (-17° to 90°C)
Vibration..... up to 10 G's to 2000 Hz maximum

The PT1A is perfect where space and money are limited. The PT1A is part of Celesco's compact line of cable-extension transducers. Using a high cycle plastic-hybrid potentiometer, the PT1A provides a precision voltage divider position feedback signal for full-scale measurement ranges from 2 to 50 inches.

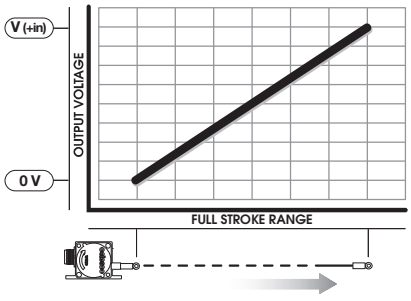
The PT1A has many features to offer including 500 to 10K ohm potentiometer selection, adjustable bridge circuit and multiple measuring cable exit options.

Outline Drawing



dimensions are in inches [mm], tolerances are 0.03 inches [0,8 mm]

Output Signal



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Ordering Information:

Model Number:

PT1A - _____ - _____ - _____ - _____ - _____

order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ

Sample Model Number:

PT1A - 30 - UP - 500 - MC4 - SG

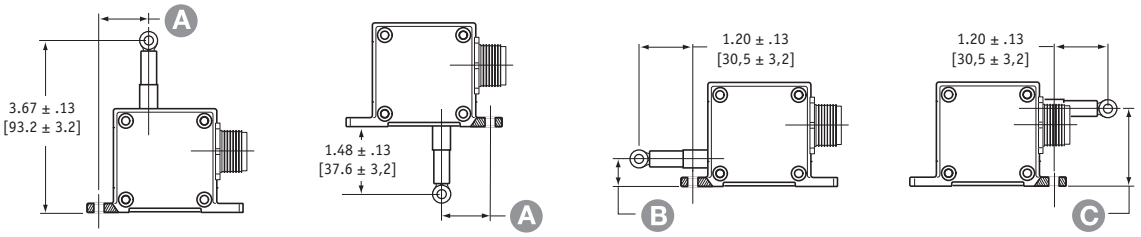
Ⓡ	range:	30 inches
Ⓐ	measuring cable exit:	up
Ⓑ	output signal:	500-ohm pot.
Ⓒ	electrical connection:	4-pin micro connector
Ⓓ	cable guide:	spring-loaded guide

Full Stroke Range:

Ⓡ order code:	2	5	10	15	20	25	30	40	50
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.
accuracy (% of f.s.):	0.25%		0.15%				0.10%		
potentiometer cycle life:	2,500,000 cycles		500,000 cycles				250,000 cycles		
cable tension (20%):	12 oz.	5 oz.	12 oz.	9 oz.	6 oz.	5 oz.	9 oz.	6 oz.	5 oz.
maximum cable acceleration:	11 G's	3 G's	11 G's	5 G's	4 G's	3 G's	5 G's	4 G's	3 G's

Cable Exit:

Ⓐ order code:	UP	DN	FR	BK
direction:	up	down	front	back



measurement range —	2	5	10	15	20	25	30	40	50
A	1.04 in. 26,4 mm	0.58 in. 14,7 mm	1.04 in. 26,4 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm
B	0.75 in. 19,1 mm	0.29 in. 6,1 mm	0.75 in. 19,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm
C	1.43 in. 36,3 mm	1.89 in. 48,0 mm	1.43 in. 36,3 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm

Output Signals:

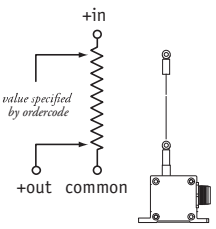
Ⓑ order code:	500	1K	5K	10K	AB
	500 ohm*	1000 ohm*	5000 ohm*	10,000 ohm*	adjustable bridge (0...30 mV/V)

*tolerance = ±10%

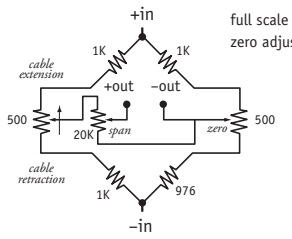
max. input voltage and power rating, options: 500, 1K, 5K, 10K

	2-inch, 5-inch range	10-inch to 50-inch range
500-ohms:	20 V AC/DC (1 W)	30 V AC/DC (2 W)
1K to 10K-ohms:	30 V AC/DC (1 W)	30 V AC/DC (2 W)

circuit options: 500, 1K, 5K, 10K



circuit option: AB (adjustable bridge)



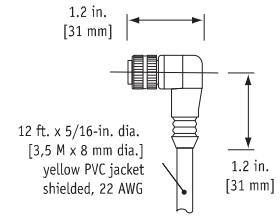
full scale output: adjustable from 0 to 30mV/V
zero adjust: to 50% of full stroke

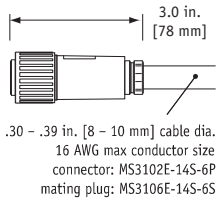
Ordering Information (cont.)

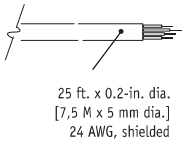
Electrical Connection:

Ⓒ order code:

MC4	M6	C25
4-pin micro-connector with 12 ft [3.5 M] cordset	6-pin plastic connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded







4-pin mating plug and cord set:

pin	color code	standard	bridge
1	RED-BLK TR.	+IN	+IN
2	RED-WHT TR.	COMMON	-IN
3	RED	+OUT	+OUT
4	GREEN	-	-OUT

6-pin mating plug:

pin	standard	bridge
A	+IN	+IN
B	COMMON	-IN
C	+OUT	-OUT
D	-	+OUT

25-ft. cable:

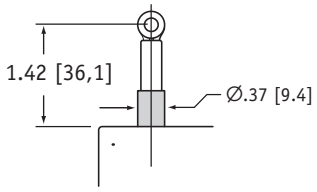
color code	standard	bridge
RED	+IN	+IN
BLACK	COMMON	-IN
GREEN	+OUT	+OUT
WHITE	-	-OUT

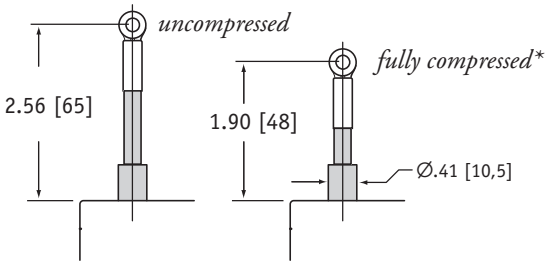
Cable Guide:

Ⓓ order code:

blank	SG
standard cable guide	spring-loaded guide

cable-guide cushions impact from accidental free release





**note: start of full stroke range begins at full compression point (except 2-inch and 5-inch ranges).*

0/4...20 mA Output
Ranges: 0-2 to 0-50 inches
Compact Size • OEM Applications

PT1MA

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-2 to 0-50 inches
Output Signal Options ..... 4...20 mA (2-wire) and 0...20 mA (3-wire)
Accuracy ..... ± 0.28% to ±0.15% full stroke *see ordering information*
Repeatability ..... ± 0.05% full stroke
Resolution ..... essentially infinite
Measuring Cable ..... .019-in. dia. nylon-coated stainless steel
Enclosure Material ..... glass-filled polycarbonate and black anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 1 lb. max.

ELECTRICAL

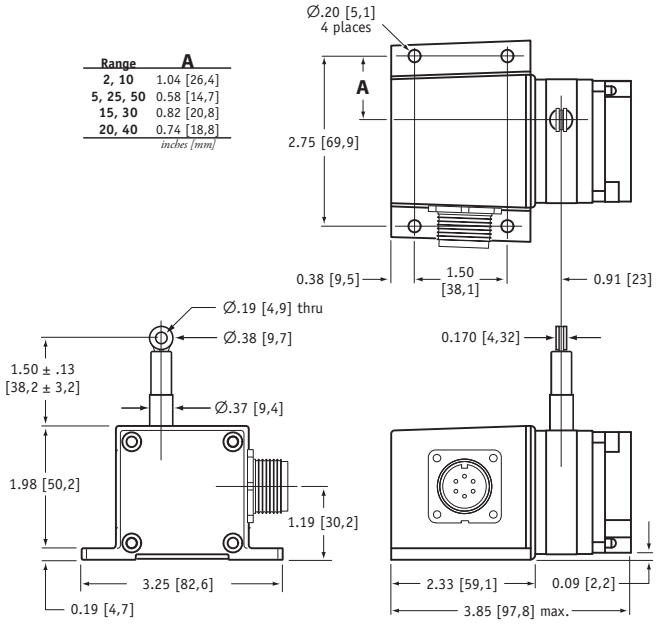
Input Voltage ..... *see ordering information*
Input Current ..... 20 mA max.
Maximum Loop Resistance (Load) ..... (loop supply voltage - 8)/0.020
Circuit Protection ..... 38 mA max.
Impedance ..... 100M ohms@100 VDC, min.
Output Signal Adjustment
  Zero Adjustment ..... from factory set zero to 50% of full stroke range
  Span Adjustment ..... to 50% of factory set span
Thermal Effects
  Zero ..... 0.01% f.s./°F, max.
  Span ..... 0.01% f.s./°F, max.

ENVIRONMENTAL

Enclosure ..... NEMA 4, IP 65
Operating Temperature ..... 0° to 200°F (-17° to 90°C)
Vibration ..... up to 10 G's to 2000 Hz maximum

EMC COMPLIANCE PER DIRECTIVE 89/336/EEC

Emission/Immunity EN50081-2/EN50082-2

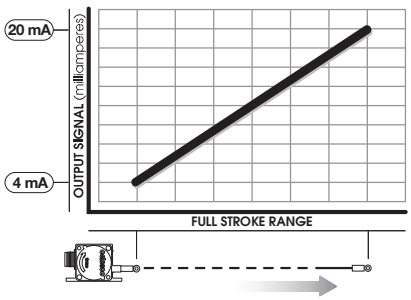


dimensions are in inches [mm], tolerances are 0.03 inches [0,8 mm]

The PT1MA adds 4...20 mA position feedback signal to Celesco's compact line of cable-extension transducers. The PT1MA is available with full stroke ranges from as little as 2 inches on up to 50 inches with adjustable zero and span settings to precisely match the full scale output to your exact measurement range.

The PT1MA offers several options including forward and reverse 0...20 and 4...20 mA output signals, alternate measuring cable exits and a couple different electrical connection options.

Output Signal



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Ordering Information:

Model Number:

PT1MA - ____ - ____ - ____ - ____ - ____

order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ

Sample Model Number:

PT1MA - 30 - UP - 420E - MC4 - SG

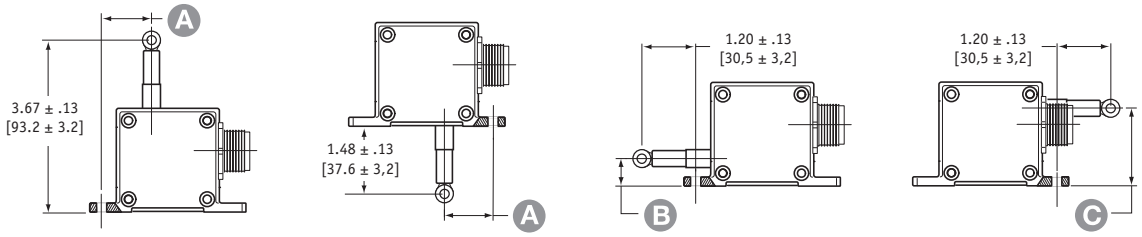
Ⓡ	range:	30 inches
Ⓐ	measuring cable exit:	up
Ⓑ	output signal:	4...20mA
Ⓒ	electrical connection:	4-pin micro connector
Ⓓ	cable guide:	spring-loaded guide

Full Stroke Range:

Ⓡ order code:	2	5	10	15	20	25	30	40	50
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.
accuracy (% of f.s.):	0.28%		0.18%				0.15%		
potentiometer cycle life:	2,500,000 cycles		500,000 cycles				250,000 cycles		
cable tension (20%):	12 oz.	5 oz.	12 oz.	9 oz.	6 oz.	5 oz.	9 oz.	6 oz.	5 oz.
maximum cable acceleration:	11 G's	3 G's	11 G's	5 G's	4 G's	3 G's	5 G's	4 G's	3 G's

Cable Exit:

Ⓐ order code:	UP	DN	FR	BK
direction:	up	down	front	back



measurement range	2	5	10	15	20	25	30	40	50
A	1.04 in. 26,4 mm	0.58 in. 14,7 mm	1.04 in. 26,4 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm
B	0.75 in. 19,1 mm	0.29 in. 6,1 mm	0.75 in. 19,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm
C	1.43 in. 36,3 mm	1.89 in. 48,0 mm	1.43 in. 36,3 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm

Output Signals:

Ⓑ order code:	420E	420R	020E	020R
output signal options:	4...20 mA (4 ▲ 20)	20...4 mA (20 ▼ 4)	0...20 mA (0 ▲ 20)	20...0 mA (20 ▼ 0)
sensitivity:	16 mA/full stroke ±0.25%		20 mA/full stroke ±0.25%	
wiring configuration:	2 – wire		3 – wire	
input voltage:	8 – 34 vdc		14 – 29 vdc	

example:

ordercode = **420E** = 4...20 mA

4 mA = 

20 mA = 

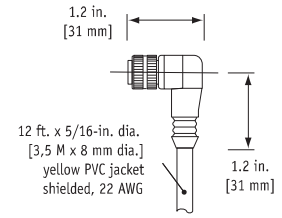
Ordering Information (cont.)

Electrical Connection:

order code:

MC4

4-pin micro-connector
with 12 ft [3.5 M] cordset



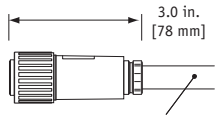
4-pin mating plug and cordset:

contact view

pin	color code	2-wire	3-wire
1	RED-BLK TR.	8...34 vdc	14...29 vdc
2	RED-WHT TR.	4...20 mA	common
3	RED	-	0...20 mA
4	GREEN	-	-

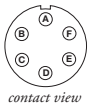
M6

6-pin plastic connector
with mating plug



.30 – .39 in. [8 – 10 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

6-pin mating plug:



contact view

pin	2-wire	3-wire
A	8...34 vdc	14...29 vdc
B	4...20 mA	common
C	-	0...20 mA
D	-	-

C25

25-ft. instrumentation cable
24 AWG, shielded

25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

25-ft. cable:

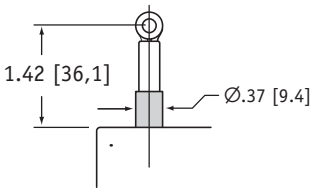
color code	2-wire	3-wire
RED	8...34 vdc	14...29 vdc
BLACK	4...20 mA	common
WHITE	-	-
GREEN	-	0...20 mA

Cable Guide:

order code:

blank

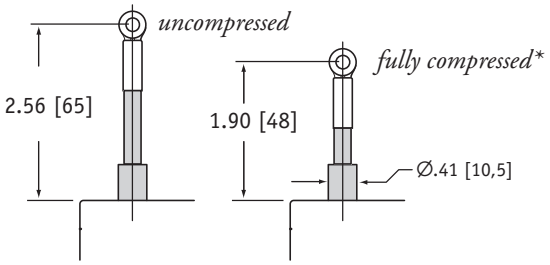
standard cable guide



SG

spring-loaded guide

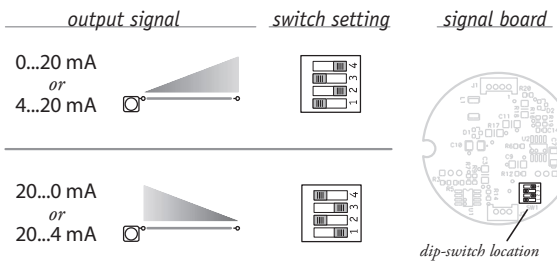
cable-guide cushions impact from accidental free release

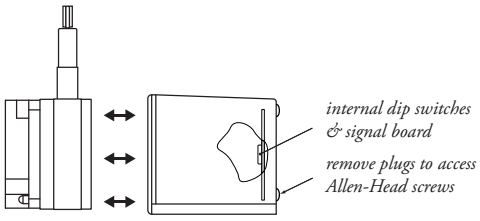


**note: start of full stroke range begins at full compression point (except 2-inch and 5-inch ranges).*

Output Signal Selection:

The output signal direction can be reversed at any time by simply changing the dip-switch settings found on the internal signal board. After the settings have been changed, adjustment of the Zero and Span trimpots will be required to precisely match signal values to the beginning and end points of the stroke.





to gain access to the signal board, remove the two Allen-Head Screws and remove rear cover.

version: **8.0** last updated: **May 21, 2013**

0...5, 0...10, –5...+5, –10...+10 VDC Output Options
Ranges: 0-2 to 0-50 inches
Compact Size • OEM Applications

PT1DC

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-2 to 0-50 inches
Output Signal Options ..... 0...5, 0...10, -5...+5, -10...+10 VDC
Accuracy ..... ± 0.28% to ±0.15% full stroke *see ordering information*
Repeatability ..... ± 0.05% full stroke
Resolution ..... essentially infinite
Measuring Cable ..... .019-in. dia. nylon-coated stainless steel
Enclosure Material ..... glass-filled polycarbonate and black anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 1 lb. max.

ELECTRICAL

Input ..... 14.5-40 VDC (10.5-40 VDC for 0...5 and -5...+5 volt output)
Input Current ..... 10 mA maximum
Output Impedence ..... 1000 ohms
Maximum Load ..... 5000 ohms
Zero and Span Adjustment ..... *see ordering information*

ENVIRONMENTAL

Enclosure ..... NEMA 4, IP 65
Operating Temperature ..... 0º to 200ºF (-17º to 90ºC)
Vibration ..... up to 10 G's to 2000 Hz maximum

EMC COMPLIENCE PER DIRECTIVE 89/336/EEC

Emission/Immunity ..... EN50081-2 / EN50082-2

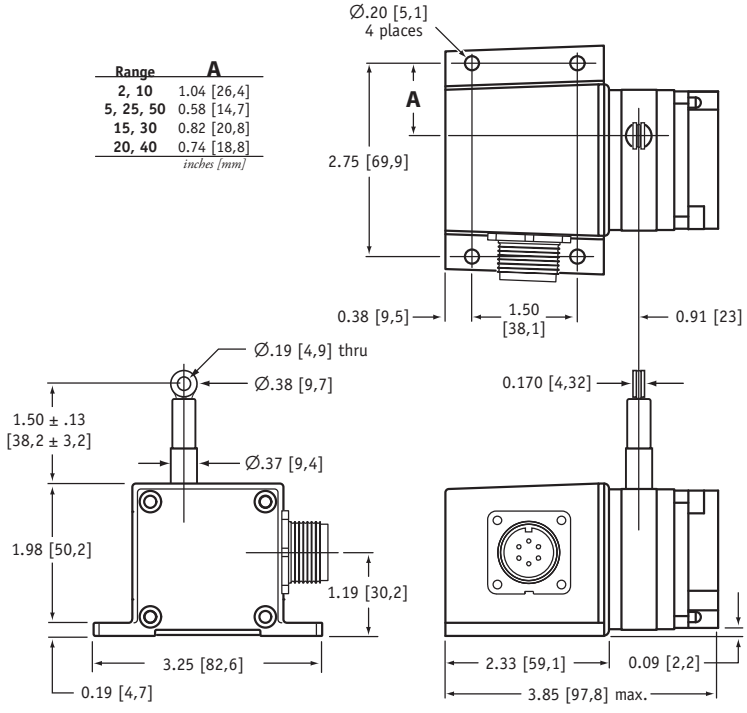
The PT1DC can operate from an unregulated 14.5 to 40 VDC power supply while providing an output signal that is proportional to the linear movement of it's measuring cable. The PT1DC has a maximum measurement range up to 50" and has 4 output signal options to choose from: 0...10, 0...5, -10...+10 and -5...+5 Vdc.

Just like the rest of the PT1 series, the PT1DC also offers several options including forward and reverse output signals, zero and span adjustments and alternate measuring cable exits.

Outline Drawing

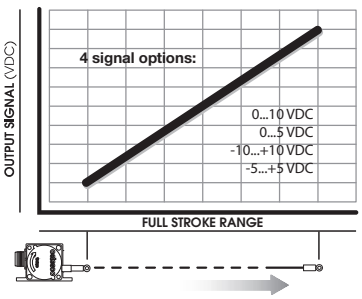
Range	A
2, 10	1.04 [26,4]
5, 25, 50	0.58 [14,7]
15, 30	0.82 [20,8]
20, 40	0.74 [18,8]

inches [mm]



dimensions are in inches [mm], tolerances are 0.03 inches [0,8 mm]

Output Signal



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Ordering Information:

Model Number:

PT1DC - ____ Ⓡ - ____ Ⓐ - ____ Ⓑ - ____ Ⓒ - ____ Ⓓ

order code:

Sample Model Number:

PT1DC - 30 - UP - Z10 - MC4 - SC

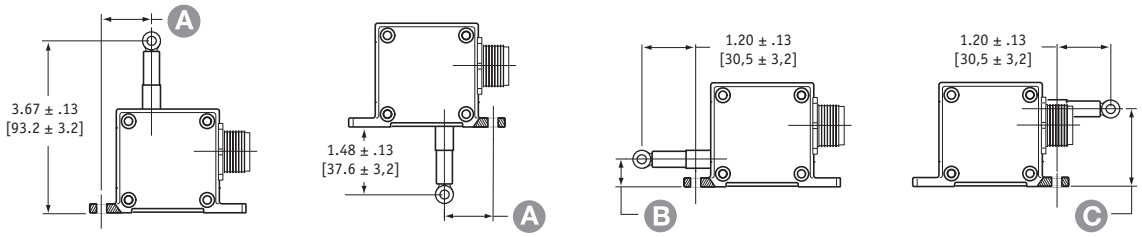
Ⓡ	range:	30 inches
Ⓐ	measuring cable exit:	up
Ⓑ	output signal:	0...10 VDC
Ⓒ	electrical connection:	4-pin micro connector
Ⓓ	cable guide:	spring-loaded guide

Full Stroke Range:

Ⓡ *order code:*	2	5	10	15	20	25	30	40	50
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.
accuracy (% of f.s.):	0.28%		0.18%				0.15%		
potentiometer cycle life:	2,500,000 cycles		500,000 cycles				250,000 cycles		
cable tension (20%):	12 oz.	5 oz.	12 oz.	9 oz.	6 oz.	5 oz.	9 oz.	6 oz.	5 oz.
maximum cable acceleration:	11 G's	3 G's	11 G's	5 G's	4 G's	3 G's	5 G's	4 G's	3 G's

Cable Exit:

Ⓐ *order code:*	UP	DN	FR	BK
direction:	up	down	front	back



measurement range	2	5	10	15	20	25	30	40	50
Ⓐ	1.04 in. 26,4 mm	0.58 in. 14,7 mm	1.04 in. 26,4 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm
Ⓑ	0.75 in. 19,1 mm	0.29 in. 6,1 mm	0.75 in. 19,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm
Ⓒ	1.43 in. 36,3 mm	1.89 in. 48,0 mm	1.43 in. 36,3 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm

Output Signals:

Ⓑ *order code:*	Z10	10Z	Z5	5Z	M0P0	P0M0	M5P5	P5M5
output signal options:	0...10 VDC	10...0 VDC	0...5 VDC	5...0 VDC	-10...+10 VDC	+10...-10 VDC	-5...+5 VDC	+5...-5 VDC
input voltage:	14.5 – 40 vdc		10.5 – 40 vdc		14.5 – 40 vdc		10.5 – 40 vdc	
span adjustment:	from 100% to 50% of full stroke range				from 100% to 75% of full stroke range			
zero adjustment:	from factory set zero to 50% of full stroke range				from factory set zero to 25% of full stroke range			

example:

ordercode = **Z10** = 0...10 VDC

0 vdc =

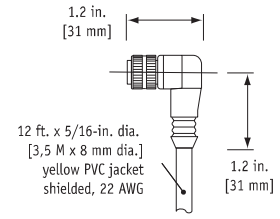
10 vdc =

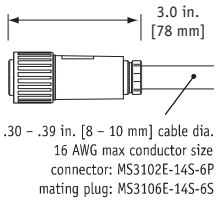
Ordering Information (cont.)

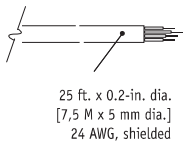
Electrical Connection:

C order code:

MC4	M6	C25
4-pin micro-connector with 12 ft [3.5 M] cordset	6-pin plastic connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded







4-pin mating plug and cord set:

contact view

pin	color code	signals
1	RED-BLK TR.	input voltage
2	RED-WHT TR.	output signal
3	RED	common

6-pin mating plug:

contact view

pin	signals
A	input voltage
B	output signal
C	common

25-ft. cable:

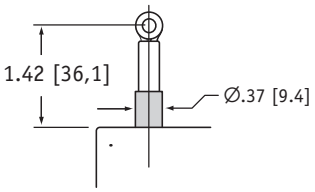
color code	standard
RED	input voltage
BLACK	common
GREEN	output signal

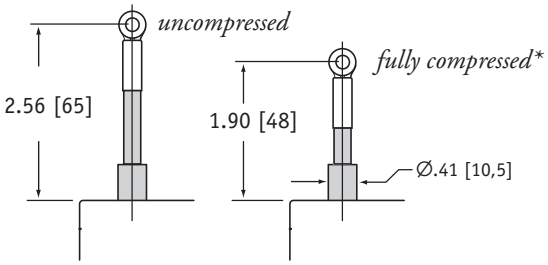
Cable Guide:

D order code:

blank	SG
standard cable guide	spring-loaded guide

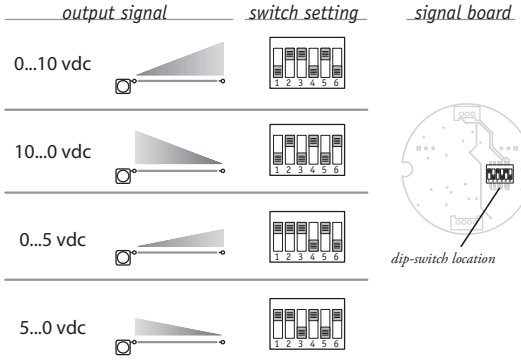
cable-guide cushions impact from accidental free release



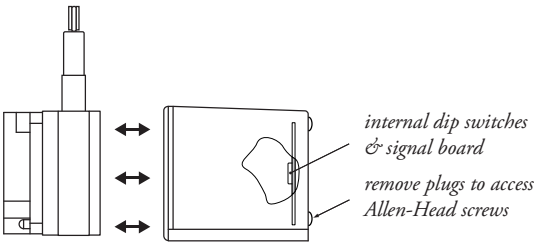


**note: start of full stroke range begins at full compression point (except 2-inch and 5-inch ranges).*

Output Signal Selection (does not apply to -5...+5 & -10...+10 vdc options)



The output signal direction can be reversed at any time by simply changing the dip-switch settings found on the internal signal board. After the settings have been changed, adjustment of the Zero and Span trimpots will be required to precisely match signal values to the beginning and end points of the stroke.



to gain access to the signal board, remove the two Allen-Head Screws and remove rear cover.

Incremental Encoder Output
Ranges: 0-25, 0-50 in. • 0-625, 0-1250 mm
Compact Size • OEM Applications

PT1E

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-25 to 0-50 inches
Output Signal ..... incremental encoder (quadrature)
Accuracy ..... 0.04% full stroke *contact factory for higher accuracy*
Repeatability ..... ± 0.02% full stroke
Resolution Options ..... 25 to 1250 pulses per inch
Measuring Cable Options ..... .019-in. dia. nylon-coated stainless steel
Enclosure Material ..... glass-filled polycarbonate and black anodized aluminum
Sensor ..... optical encoder
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 1 lb. max.

ELECTRICAL

Input Voltage ..... *see ordering information*
Input Current ..... *see ordering information*

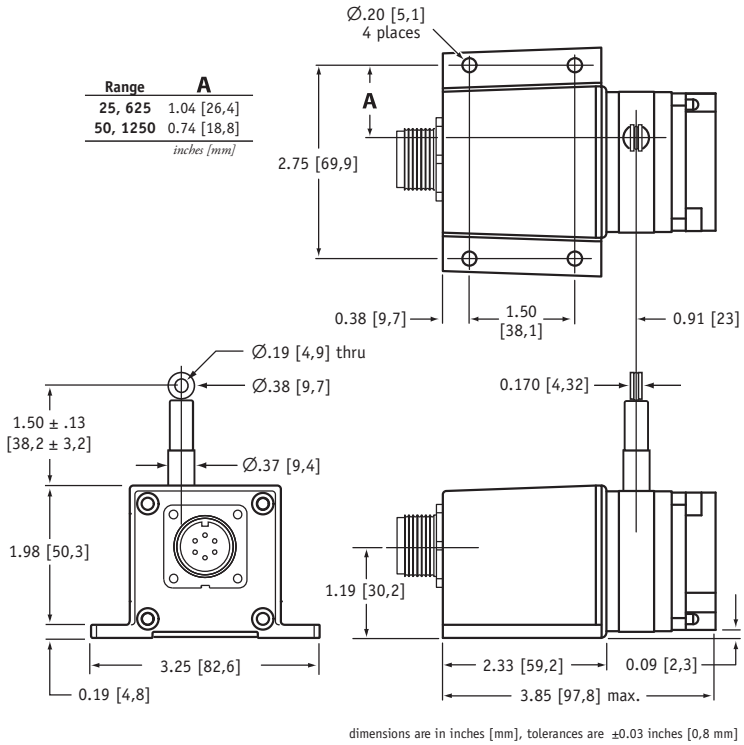
ENVIRONMENTAL

Enclosure ..... NEMA 4, IP 65
Operating Temperature ..... 0º to 160ºF (-17º to 71ºC)
Vibration ..... up to 10 G's to 2000 Hz maximum

The heart of the PT1E is an incremental optical encoder which delivers a quadrature formated digital pulse train. This compact transducer is available with several resolution options for a wide variety of applications from high accuracy position feedback to slow velocity feedback requirements.

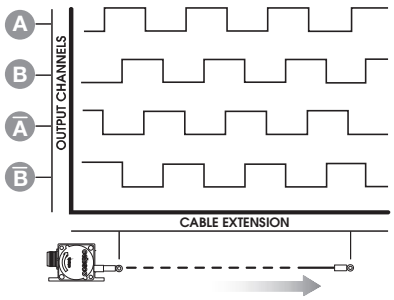
The PT1E has many options available including full stroke measurement ranges from 0-2 inches up to 0-50 inches, different output drivers and alternate measuring cable exits.

Outline Drawing



dimensions are in inches [mm], tolerances are ±0.03 inches [0,8 mm]

Output Signal



Ordering Information:

Model Number:

PT1E - ____ - ____ - ____ - ____ - ____ - ____ - ____

order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Sample Model Number:

PT1E - 25 - UP - 50 - AB-TTL - MC4 - SG

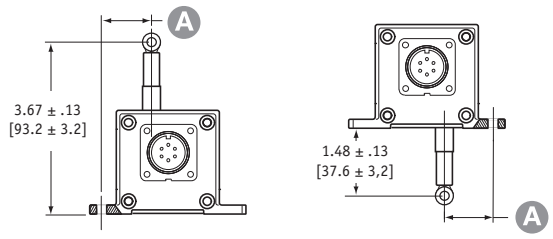
Ⓡ	range:	25 inches
Ⓐ	measuring cable exit:	up
Ⓑ	resolution:	50 pulses per inch
Ⓒ	electrical connection:	4-pin micro connector
Ⓓ	output signal:	TTL/CMOS driver, Channels A,B
Ⓔ	cable guide:	spring-loaded guide

Full Stroke Range:

Ⓡ order code:	25	50	625	1250
full stroke range, min:	25 in.	50 in.	625 mm	1250 mm
cable tension (±20%):	12 oz.	6 oz.	3,3 N	1,6 N
cable acceleration, max.:	11 G's	4 G's	11 G's	4 G's
resolution options:	50, 500, 1000, 1250 pulses per inch	25, 250, 500, 625 pulses per inch	2, 20, 40, 50 pulses per mm	1, 10, 20, 25 pulses per mm

Cable Exit:

Ⓐ order code:	UP	DN	FR	BK
direction:	up	down	front	back



measurement range —	25	50	625	1250
Ⓐ	1.04 in. 26,4 mm	0.74 in. 18,8 mm	1.04 in. 26,4 mm	0.74 in. 18,8 mm
Ⓑ	0.75 in. 19,1 mm	0.45 in. 11,4 mm	0.75 in. 19,1 mm	0.45 in. 11,4 mm
Ⓒ	1.43 in. 36,3 mm	1.73 in. 43,9 mm	1.43 in. 36,3 mm	1.73 in. 43,9 mm

Resolution:

Ⓑ order code:	50	500	1000	1250
25-inch full stroke range:	50 ±1 pulses per inch	500 ±10 pulses per inch	1000 ±20 pulses per inch	1250 ±24 pulses per inch

Ⓑ order code:	25	250	500	625
50-inch full stroke range:	25 ±0.5 pulses per inch	250 ±5 pulses per inch	500 ±10 pulses per inch	625 ±12 pulses per inch

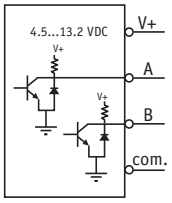
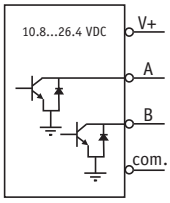
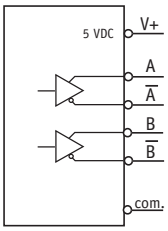
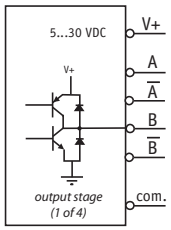
Ⓑ order code:	2	20	40	50
625 mm full stroke range:	2 ±0,04 pulses per mm	20 ±0,4 pulses per mm	40 ±0,8 pulses per mm	50 ±1 pulses per mm

Ⓑ order code:	1	10	20	25
1250 mm full stroke range:	1 ±0,02 pulses per mm	10 ±0,2 pulses per mm	20 ±0,4 pulses per mm	25 ±0,5 pulses per mm

Ordering Information (cont.)

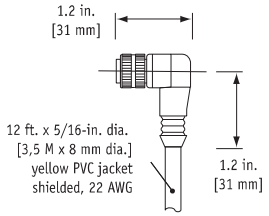
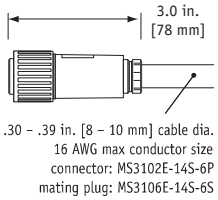
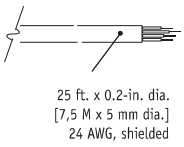
Output Signals:

Ⓒ order code:

	AB-TTL	AB-OC	ABC-LD	ABC-UD
output driver:	TTL - CMOS	Open Collector	5 V - Line Driver	Universal Line Driver
	Input voltage (V+): 4.5...13.2 Vdc Sink current: 20 mA max. Input current: 80 mA max.	Input voltage (V+): 10.8...26.4 Vdc Sink current: 20 mA max. Input current: 80 mA max.	Input voltage (V+): 5 Vdc Sink current: 20 mA max. Input current: 150 mA max.	Input voltage (V+): 5...30 VDC Source/Sink: 20 mA max. Input current: 100 mA max, no load
				

Electrical Connection:

Ⓓ order code:

MC4	M6	C25
4-pin micro-connector with 12 ft [3.5 M] cordset	6-pin plastic connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded
		

4-pin mating plug and cordset

contact view

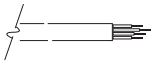
pin	color code	TTL/CMOS Open Collector
1	RED-BLK TR.	input voltage
2	RED-WHT TR.	channel A
3	RED	channel B
4	GREEN	common

6-pin mating plug

contact view

pin	TTL/CMOS Open Collector	5 V Line Driver Universal Line Driver
A	input voltage	input voltage
B	common	common
C	channel A	channel A
D	channel B	channel B
E	-	channel A'
F	-	channel B'

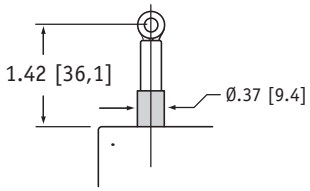
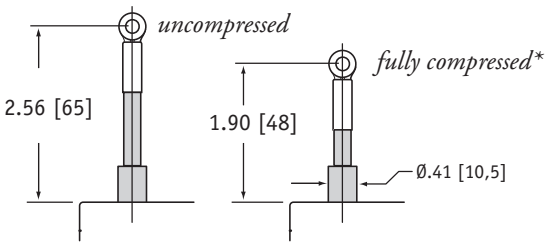
25-ft. cable



color	TTL/CMOS Open Collector	5 V Line Driver Universal Line Driver
red	input voltage	input voltage
black	common	common
green	channel A	channel A
white	channel B	channel B
blue	-	channel A'
brown	-	channel B'

Cable Guide:

Ⓔ order code:

blank	SG
standard cable guide	spring-loaded guide
	cushions impact from accidental free release
	

note: start of full stroke range begins at **full compression point*

version: **4.0** last updated: **April 28, 2010**

DeviceNET®
Ranges: 0-2 to 0-50 inches
Compact Size • OEM Applications

PT1DN

Specification Summary:

GENERAL

Full Stroke Ranges ..... 0-2 to 0-50 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 ..... .019-in. dia. nylon-coated stainless steel
Enclosure Material ..... glass-filled polycarbonate and black anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 1 lb. 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 4, IP 67
Operating Temperature ..... 0º to 185ºF (-17º to 85ºC)
Vibration ..... up to 10 G's to 2000 Hz maximum

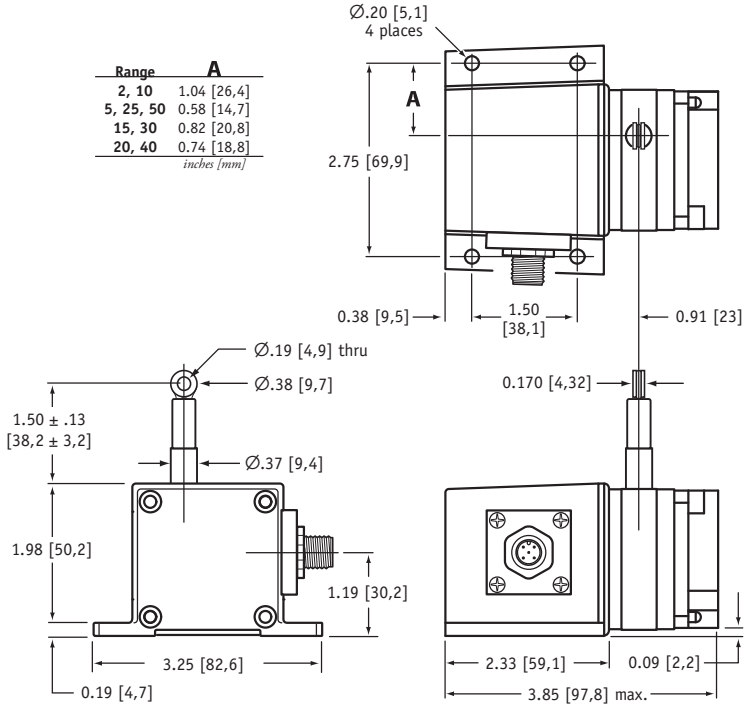
The PT1DN communicates to your PLC over DeviceNET® and provides a precision position feedback signal for full-scale measurement ranges from 2 to 50 inches. Because the PT1DN uses a potentiometer as it's sensing element, the position signal is "absolute" and does not have to be reset to a "home" position upon startup.

The PT1DN is part of Celesco's compact line of cable-extension transducers and is perfect where space is limited.

Outline Drawing

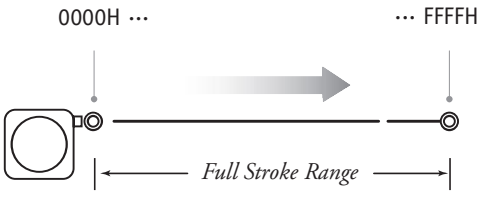
Range	A
2, 10	1.04 [26,4]
5, 25, 50	0.58 [14,7]
15, 30	0.82 [20,8]
20, 40	0.74 [18,8]

inches [mm]



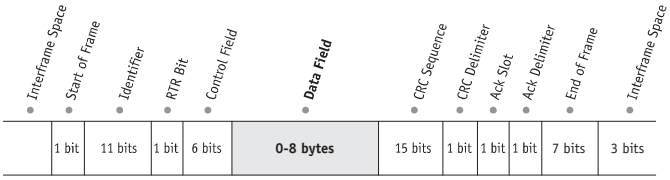
dimensions are in inches [mm], tolerances are 0.03 inches [0,8 mm]

Output Signal

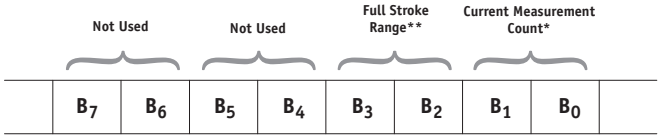


I/O Format

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:

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

Example:

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

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

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.

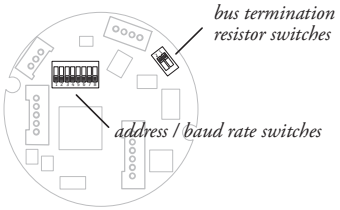
DIP-7	**DIP-8**	**baud rate**
0	0	125k
1	0	250k
0	1	500k
1	1	125k

Bus Termination

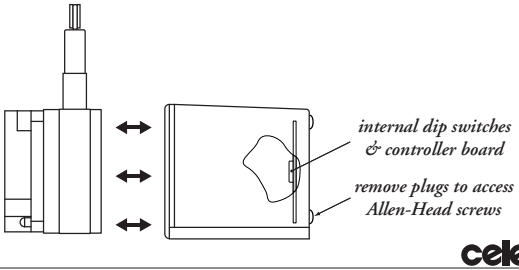
The setting of the internal bus termination resistor may be specified upon order or manually changed by the end user at the time of installation.

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



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



Ordering Information:

Model Number:

PT1DN - ____ - ____ - ____ - ____ - ____ - ____ - ____
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Sample Model Number:

PT1DN - 30 - UP - SG - 500 - TR - SC5

Ⓡ	range:	30 inches
Ⓐ	measuring cable exit:	up
Ⓑ	cable guide:	spring-loaded guide
Ⓒ	baud rate:	500 k bits/sec.
Ⓓ	terminating resistor:	yes
Ⓔ	electrical connection:	5 meter cordset with straight plug

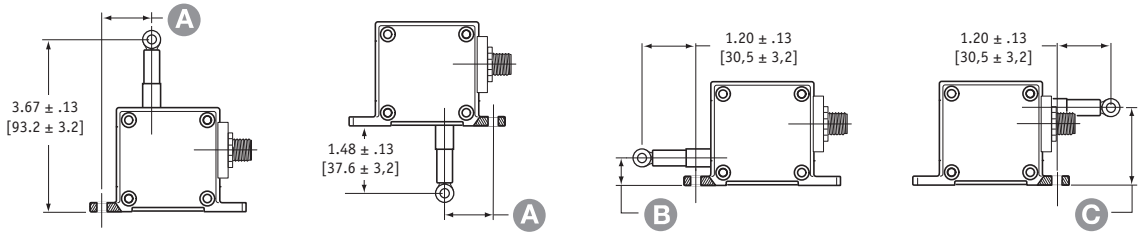
Full Stroke Range:

Ⓡ order code:	2	5	10	15	20	25	30	40	50
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.
accuracy (% of f.s.):	0.25%		0.15%				0.10%		
potentiometer cycle life:	2,500,000 cycles		500,000 cycles				250,000 cycles		
cable tension (20%):	12 oz.	5 oz.	12 oz.	9 oz.	6 oz.	5 oz.	9 oz.	6 oz.	5 oz.
maximum cable acceleration:	11 G's	3 G's	11 G's	5 G's	4 G's	3 G's	5 G's	4 G's	3 G's

Cable Exit:

Ⓐ order code: **UP** | **DN** | **FR** | **BK**

direction: up | down | front | back

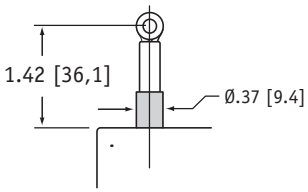


measurement range —	2	5	10	15	20	25	30	40	50
A	1.04 in. 26,4 mm	0.58 in. 14,7 mm	1.04 in. 26,4 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm
B	0.75 in. 19,1 mm	0.29 in. 6,1 mm	0.75 in. 19,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm
C	1.43 in. 36,3 mm	1.89 in. 48,0 mm	1.43 in. 36,3 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm

Cable Guide:

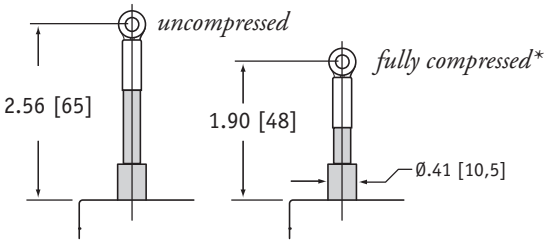
Ⓑ order code: **blank** | **SG**

blank — standard cable guide



SG — spring-loaded guide

cushions impact from accidental free release



**note: start of full stroke range begins at full compression point (except 2-inch and 5-inch ranges).*

Ordering Information (cont.)

Baud Rate:

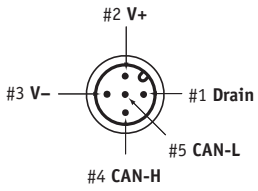
order code:	125	250	500
	125 kbaud	250 kbaud	500 kbaud

Terminating Resistor:

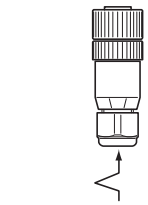
order code:	TR	NR
	terminating resistor	no terminating resistor

Electrical Connection:

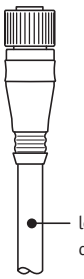
order code:	blank	MC5	SC5	NC5
	5-pin micro-connector *(no mating plug supplied)*	5-pin micro-connector w/ mating plug	5-pin micro-connector and 5 meter length cordset w/straight mating plug	5-pin micro-connector and 5 meter length cordset w/90° mating plug



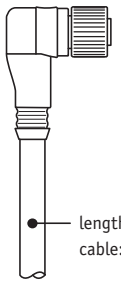
connector
(contact view)



0.16" - 0.32" OD Cable (THIN)

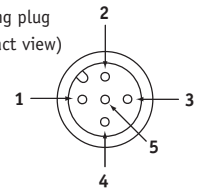


length: 16ft [5M]
cable: Thin



length: 16ft [5M]
cable: Thin

mating plug
(contact view)



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

RS232 Data Communication
Ranges: 0-2 to 0-50 inches
Compact Size • OEM Applications

PT1232

Specification Summary:

GENERAL

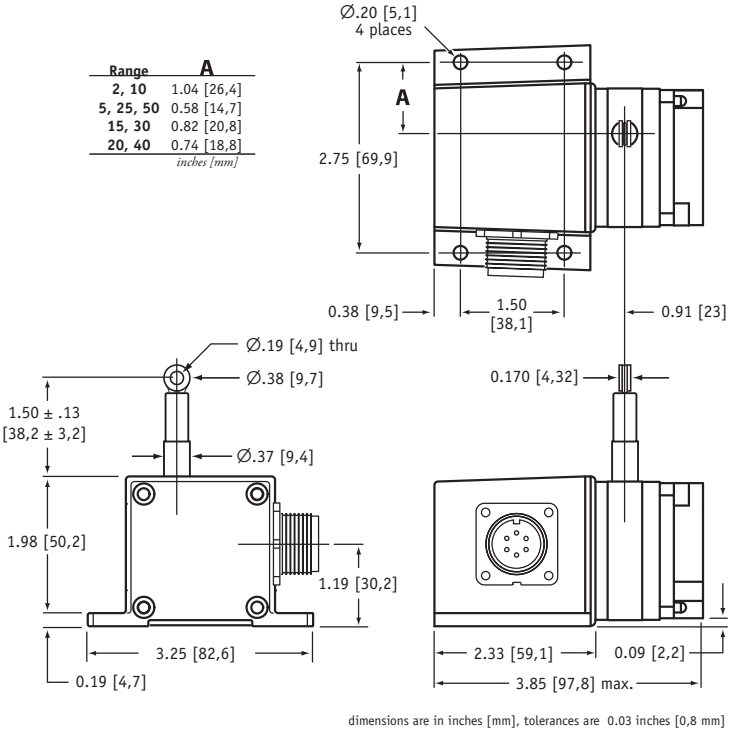
Full Stroke Ranges ..... 0-2 to 0-50 inches
Electrical Interface RS232
Format ..... Hex
Accuracy ..... ± 0.25 to 0.10% full stroke
Repeatability ..... ± 0.02% full stroke
Resolution ..... ± 0.003% full stroke
Measuring Cable ..... 0.019-in. dia. nylon-coated stainless steel
Enclosure Material ..... glass-filled polycarbonate and anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 1 lb., max.

ELECTRICAL

Input Voltage ..... 9...22 VDC
Input Current ..... 40 mA
Baud Rate ..... 9600 (selectable to 38.4K)
Update Rate ..... 32 msec

ENVIRONMENTAL

Environmental Suitability ..... NEMA 4, IP 65
Operating Temperature ..... 0º to 185ºF (-17º to 85ºC)
Vibration ..... up to 10 G's to 2000 Hz maximum

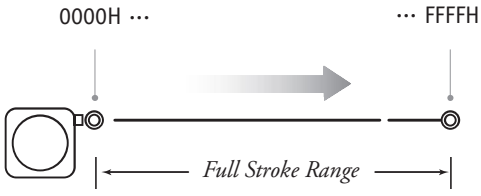


dimensions are in inches [mm], tolerances are 0.03 inches [0,8 mm]

The PT1232, part of our compact line of cable extension transducers, delivers position feedback via RS232 serial communication to your data acquisition or controller system. The PT1232 sends a raw 16-bit position count from 0000 to FFFF (hex). Additionally this device can be set to continuously send data or send data only when polled.

As the internal position sensing element is a precision potentiometer, this transducer maintains current accurate position even during power loss and does not need to be reset to a "home" position.

Output Signal



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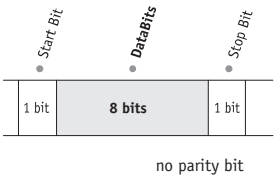
Celesco Transducer Products, Inc.
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

I/O Format:

Data Format



Data Frame

6 byte Hex string:

STX	CMD	B_0	B_1	B_2	ETX

STX = 0x02 **CMD** = Command Code* B_0 - B_2 = Data Field* **ETX** = 0x03

** –see below*

Important! All communications to/from the transducer are in **HEX**!

User Commands:

	User Command				Sensor Response			
Description	**<CMD>**	**<B_0>**	**<B_1>**	**<B_2>**	**<CMD>**	**<B_0>**	**<B_1>**	**<B_2>**
Get Sensor Info	0x05	0x00	0x00	0x00	0x05	version(4)	date(5)	date(5)
Get Serial Number	0x15	0x00	0x00	0x00	0x15	serial number(3)		
Start Continuous Data	0x25	0x00	0x00	0x00	0x25	0x00	0x00	0x00
Stop Continuous Data	0x35	0x00	0x00	0x00	0x35	0x00	0x00	0x00
Get Position Data	0x45	0x00	0x00	0x00	0x45	CMC(1)	CMC(1)	status(2)

(1)CMC - Current Measurement Count (Position)

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.

(2)Status

The status byte is used as a flag to indicate the validity of the position signal that the internal electronics receives from the potentiometer.

Flags are as follows:
0x00 = GREEN, 0x55 = YELLOW, 0xAA = RED

A "green" flag shows everything OK. A "yellow" or "red" flag indicates that the sensor has either been extended beyond its range or that there is a problem with the potentiometer.

(3)Serial Number

Each sensor has it's own unique serial number. This information can be retrieved by sending the sensor the "Get Serial Number" command.

The serial number is a 3 byte value from which ranges from 0 to 9999999 (decimal).

(4)Version

This is a single byte value (0-255 decimal) which indicates the currently installed firmware version of the sensor.

(5)Date

This is a 2 byte value showing the date of currently installed firmware. This value ranges from 01011 - 12319 (decimal). Format is MMDDY. While the month and day are expressed as two digit numbers the year is expressed in a single digit only.

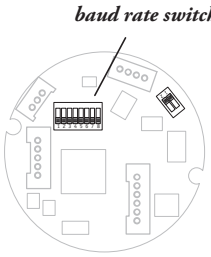
Example: 08054 = August 5, 2004

Baud Rate

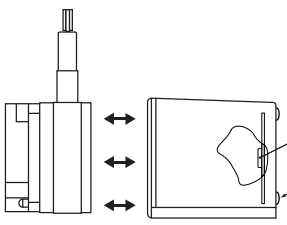
The baud rate can be set using switches **7** & **8** on the 8-pole DIP switch found on the rs232 controller board located inside the transducer.

DIP-7	DIP-8	baud rate
0	0	9600
1	0	19200
0	1	38400
1	1	9600

RS232 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:

PT1232 - ____ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ

Sample Model Number:

PT1232 - 50 - UP - M6 - SG

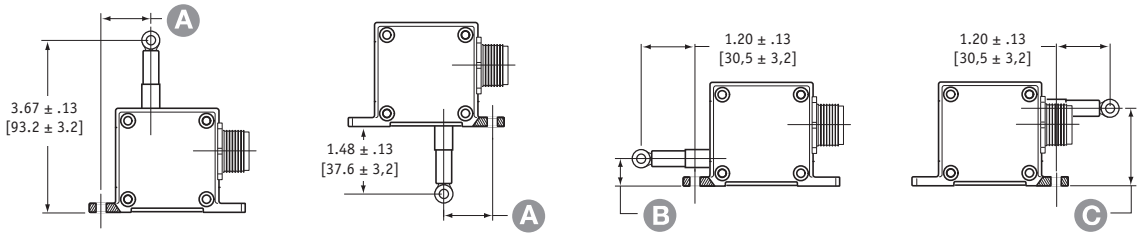
Ⓡ	range:	50 inches
Ⓐ	measuring cable exit:	up (top exit)
Ⓑ	electrical connection:	6-pin plastic connector
Ⓒ	cable guide	spring loaded

Full Stroke Range:

Ⓡ order code:	2	5	10	15	20	25	30	40	50
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.
accuracy (% of f.s.):	0.25%		0.15%				0.10%		
potentiometer cycle life:	2,500,000 cycles		500,000 cycles				250,000 cycles		
cable tension (20%):	12 oz.	5 oz.	12 oz.	9 oz.	6 oz.	5 oz.	9 oz.	6 oz.	5 oz.
maximum cable acceleration:	11 G's	3 G's	11 G's	5 G's	4 G's	3 G's	5 G's	4 G's	3 G's

Cable Exit:

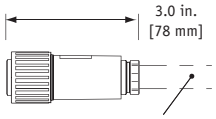
Ⓐ order code:	UP	DN	FR	BK
direction:	up	down	front	back



measurement range	2	5	10	15	20	25	30	40	50
Ⓐ	1.04 in. 26,4 mm	0.58 in. 14,7 mm	1.04 in. 26,4 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm	0.82 in. 20,8 mm	0.74 in. 18,8 mm	0.58 in. 14,7 mm
Ⓑ	0.75 in. 19,1 mm	0.29 in. 6,1 mm	0.75 in. 19,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm	0.53 in. 13,5 mm	0.45 in. 11,5 mm	0.29 in. 6,1 mm
Ⓒ	1.43 in. 36,3 mm	1.89 in. 48,0 mm	1.43 in. 36,3 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm	1.65 in. 41,9 mm	1.73 in. 43,9 mm	1.89 in. 48,0 mm

Electrical Connection:

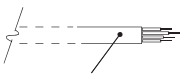
Ⓑ order code:	M6	C25
	6-pin plastic connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded



.30 – .39 in. [8 – 10 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

contact view

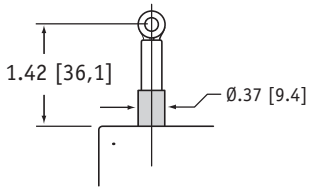
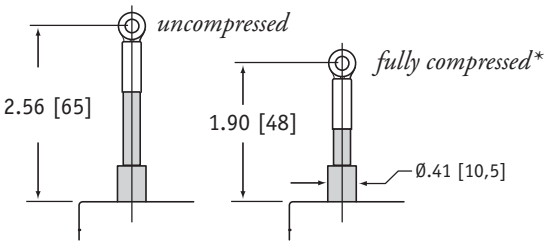
pin	signal
A	9...22 VDC
B	common
C	–
D	Transmitted Data
E	Received Data
F	common



25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

color code	signal
Red	9...22 VDC
Black	common
White	–
Green	Transmitted Data
Blue	Received Data
Brown	common

Cable Guide:

order code:	**blank**	**SG**
	standard cable guide	spring-loaded guide
		cushions impact from accidental free release
		

**note: start of full stroke range begins at full compression point (except 2-inch and 5-inch ranges).*