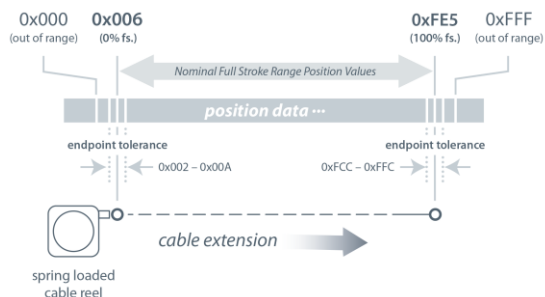


The SKJ is the perfect off-the-shelf linear position sensor for applications ranging from outrigger position on a mobile crane to tracking the height of a hydraulic lift table in a factory and anything else in between. Available in both 250 and 400-inch stroke ranges, this model offers the ultimate ease-of-use, compact design and user flexibility. Need to mount it upside down? Simply rotate its stainless mounting bracket to where you want it. Need the electrical connector to point in a different direction? Just rotate the rear cover to point the connector to the desired direction.

It's compact design, ease of use and the utmost in flexibility makes this model the perfect economically priced solution for both the single piece user to the higher volume OEM.

Output Signal



SKJ

Cable Actuated Sensor J1939 CANBus Output Signal

Linear Position to 400 inches (10 m)

Compact Design • Simple To Install

User Adjustable Measuring Cable Orientation

IN STOCK for Quick Delivery!

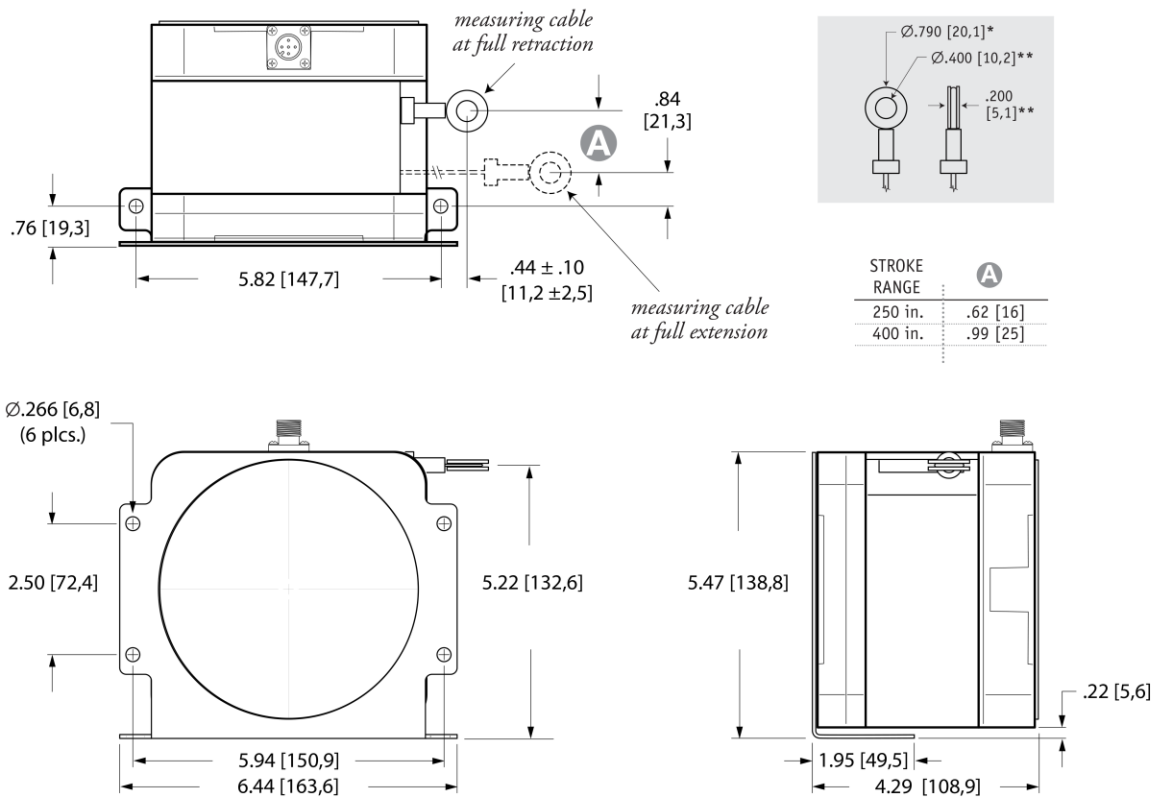
Specifications

Stroke Range Options	250 inches (6.4 m), 400 inches (10.2 m)
Accuracy	.35% FS.
Repeatability	.05% FS.
Resolution	12-bit
Input Voltage	10-36 VDC
Input Current	100 mA, max.
Measuring Cable	.031-inch dia. bare stainless steel
Maximum Cable Velocity	60 inches per second
Maximum Cable Acceleration	5 g
Measuring Cable Tension	23 oz. (6.4 N) \pm 40%
Sensor	plastic-hybrid precision potentiometer
Cycle Life	\geq 250,000
Electrical Connection	M12 connector, mating plug included
Enclosure	glass-filled polycarbonate
Environmental	IP67
Operating Temperature	-40° to 185° F (-40° to 85° C)

CANopen Specifications

Communication Profile	CANbus SAE J1939
Protocol	Proprietary B
Node ID	Adjustable via dipswitch (0-63), default set to 0
Baud Rate Options	125K (default), 250K, 500K
Data Rate	5ms (default), 20ms, 50ms, 100ms

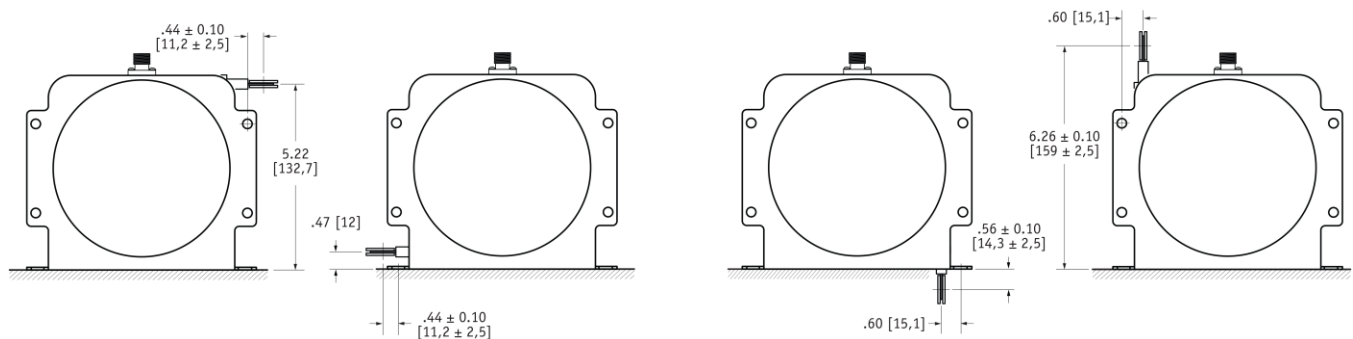
Outline Drawing



DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.04 IN. [1,0 MM] unless otherwise noted.

* tolerance = +.005 - .001 [+0,1 - 0,0]
** tolerance = +.005 - .005 [+0,1 - 0,1]

Mounting Options

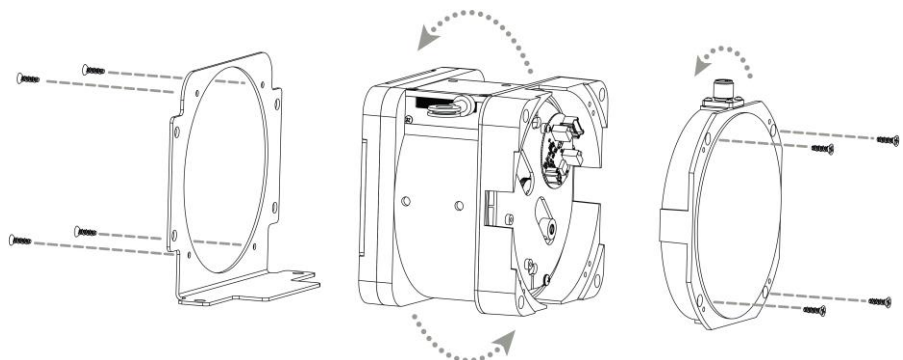


To change cable exit direction:

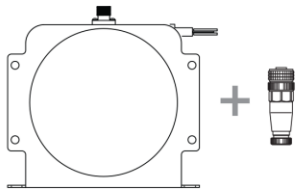
simply remove the 4 bracket mounting screws and rotate sensor body to desired direction.

To change electrical connector orientation:

remove the 4 rear screws and carefully remove the rear cover and rotate cover.



Ordering Information



Part Number	full stroke range	accuracy	max. acceleration	measuring cable tension (± 40%)
SKJ-250-4	250 in (6.4 m)	.35%	5 g	23 oz. (6,4 N)
SKJ-400-4	400 in (10.2 m)	.35%	5 g	23 oz. (6,4 N)

includes mounting bracket & mating connector.

Optional Cordsets



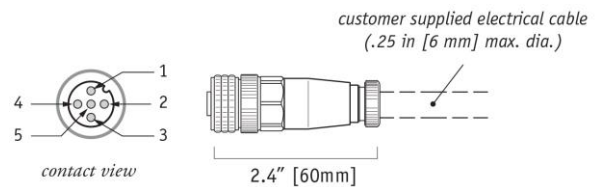
Part Number	length	wire size	connector
9036810-0030	13 ft (4 m)	22 AWG (.34mm ²)	straight 5-pin M12
9036810-0031	13 ft (4 m)	22 AWG (.34mm ²)	90° 5-pin M12



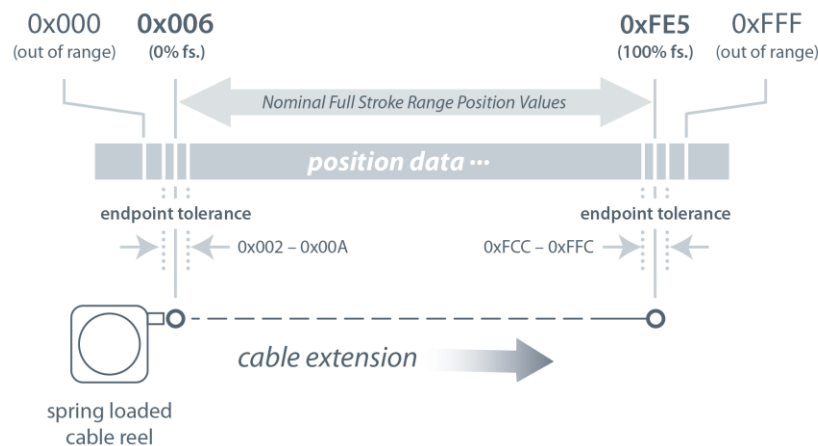
Electrical Connection

Output Signal	field installable connector	optional cordset
n/c	pin 1	pin 1 - brown
10..36 Vdc	pin 2	pin 2 - white
common	pin 3	pin 3 - blue
CAN - High	pin 4	pin 4 - black
CAN - Low	pin 5	pin 5 - green/yellow

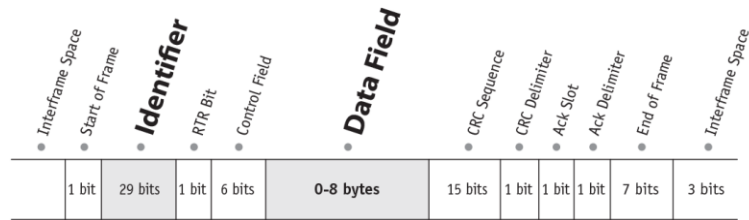
Field Installable Connector



Position Data Overview



I/O Format



Identifier

	Message Priority					Future Use		J1939 Reference Proprietary B								Data Field Type*								Not Used		Node ID**							
Example –	1	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1	1	1	1			
Identifier Bit No. –	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0				
Hex Value –	0					F				F				5				3				3				F							

*Sensor field data can be factory set to customer specific value. **Customer defined, set via Dips 1-6. Bit values shown for example only, see **Address Setting** below.

Data Field

B ₇	B ₆	B ₅	B ₄	B ₃	B ₂	B ₁	B 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 12-bit value that occupies 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 **0x006** with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at **0xFE5**. This holds true for all ranges.

Converting CMC to Linear Measurement

To convert the current measurement count to inches or millimeters, simply divide the count by 4061 (total counts over the range) and then multiply that value by the full stroke range:

$$\left(\frac{\text{CMC} - 6}{4063} \right) \times \text{full stroke range}$$

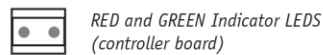
Sample Conversion:

If the full stroke range is **250 inches** and the current position is **0x4FF** (1279 Decimal) then,

$$\left(\frac{1279 - 6}{4061} \right) \times 250 = 78.8 \text{ inches}$$

B ₇	B ₆	B ₅	B ₄	B ₃	B ₂	B ₁	B ₀
----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------

Error Flags



0x00 (GREEN - ON, RED - OFF) indicates the sensor is operating within normal calibrated limits.

0x33, 0x55, 0xAA, 0xCC (RED or GREEN - FLASHING) indicates sensor is at or beyond its calibrated measurement range. Should any of these conditions occur within calibrated range, return unit to factory for evaluation or service.

B ₇	B ₆	B ₅	B ₄	B ₃	B ₂	B ₁	B ₀
----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------

Velocity

Data in bytes **B₇** - **B₆** is the change in the CMC (current measurement count) over a 100 msec time period. This data can then be used to calculate velocity in a post processing operation.

B ₇ - B ₆ HEX (Decimal)	max "reverse" velocity	max "forward" velocity	Velocity (cts./100 msec.)
0x000 (0)			- 2047 counts
0x7FF (2047)			"0" counts (no change)
0xFFF (4095)			2047 counts

Velocity Calculation

$$\left(\frac{\text{count change} - 2047}{.1 \text{ sec. time period}} \right) \times \left(\frac{\text{full stroke range}}{4063} \right)$$

Sample Calculations

Cable Extension (positive direction):

B₇..B₆ = 0x8D3 (2259Dec), full stroke = 250 in.

$$\left(\frac{2259 - 2047}{.1 \text{ sec}} \right) \times \left(\frac{250 \text{ in.}}{4063} \right) = 130.45 \text{ in. / sec.}$$

Cable Retraction (negative direction):

B₇..B₆ = 0x7D0 (2000Dec), full stroke = 250 in.

$$\left(\frac{2000 - 2047}{.1 \text{ sec}} \right) \times \left(\frac{250 \text{ in.}}{4063} \right) = - 28.92 \text{ in. / sec.}$$

Baud, Node ID and Data Rate

Baud Rate, Node ID and Data Rate settings are set via dip switch found on the internal controller board. To gain access to the controller board, remove the 4 cover attaching screws and carefully separate the sensor cover from the main body. Be careful not to damage the small gage wires that connect the controller board to the connector mounted directly to the rear cover.

Follow the instructions below for desired settings and reinstall sensor cover.

node ID options 0–63 (0x00–0x3F)

node ID Dec. Hex	SW1 (2 ⁰)	SW2 (2 ¹)	SW3 (2 ²)	SW4 (2 ³)	SW5 (2 ⁴)	SW6 (2 ⁵)
0 0x00	off	off	off	off	off	off
1 0x01	on	off	off	off	off	off
2 0x02	off	on	off	off	off	off
3 0x03	on	on	off	off	off	off
...
62 0x3E	off	on	on	on	on	on
63 0x3F	on	on	on	on	on	on

BAUD rate options

baud rate	SW7	SW8
125 kbps	off	off
250 kbps	on	off
500 kbps	off	on

access to controller board and dipswitch

Data Rate options

Data Rate	SW9	SW10
5 ms	off	off
20 ms	on	off
50 ms	off	on
100 ms	on	on

NORTH AMERICA

Measurement Specialties, Inc.,
a TE Connectivity company
20630 Plummer Street
Chatsworth, CA 91311
Tel +1 800 423 5483
Tel +1 818 701 2750
Fax +1 818 701 2799
Customercare.chtw@te.com

TE.com/sensorsolutions

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