

SGJ

SAE J1939 CANBus Output Signal

Compact Mid-Range String Pot • Absolute Position

80, 120-inch Stroke Range Options

Polycarbonate Enclosure • IP67

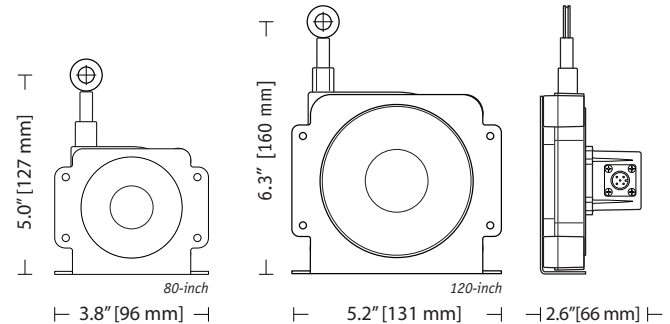
In Stock for Quick Delivery

GENERAL

Stroke Range Options	80 inches (2032 mm), 120 inches (3048 mm)
Accuracy	.5% FS.
Repeatability	.05% FS.
Resolution	12-bit
Input Voltage	10-36 VDC
Input Current	100 mA, max.
Measuring Cable	.019-inch dia. nylon-coated stainless steel
Measuring Cable Tension, 80-inch	14 oz. (3.9 N) ±30%
Measuring Cable Tension, 120-inch	9 oz. (2.5 N) ±30%
Maximum Acceleration	10 g
Sensor	plastic-hybrid precision potentiometer
Cycle Life	≥ 250,000
Electrical Connection	M12 connector (mating plug included)
Enclosure	glass-filled polycarbonate
Environmental	IP 67
Operating Temperature	-40° to 185° F (-40° to 85° C)
Weight, 80-inch (not including bracket)	.6 lbs (272 g)
Weight, 120-inch (not including bracket)	1 lb. (454 g)

CANbus SPECIFICATIONS

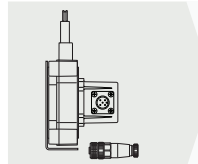
Communication Profile	CANbus SAE J1939
Protocol	Proprietary B
Node ID	Adjustable via dipswitch (0-63), default set to 0
Baud Rate Options	125K (default), 250K, 500K, 1M
Data Rate Options	5ms (default), 20ms, 50ms, 100ms
Termination Resistor	See Ordering Information



The economically priced SGJ provides linear position sensing over J1939 CANbus for OEM, mobile equipment and factory automation applications. Designed to withstand IP67 environments, the SGJ is constructed with a rugged polycarbonate body, an extremely durable spring-loaded stainless steel measuring cable and a stainless steel mounting bracket. For the OEM, customized options are available.

ORDERING INFORMATION

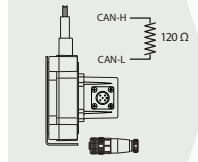
w/o terminating resistor



Part No.
SGJ-80-4
80-inch stroke range,
no terminating resistor,
5-pin M12 mating plug,
mounting bracket included

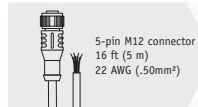
Part No.
SGJ-120-4
120-inch stroke range,
no terminating resistor,
5-pin M12 mating plug,
mounting bracket included

w/ terminating resistor

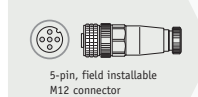


Part No.
SGJ-80-4-TR
80-inch stroke range,
with terminating resistor,
5-pin M12 mating plug,
mounting bracket.

Part No.
SGJ-120-4-TR
80-inch stroke range,
with terminating resistor,
5-pin M12 mating plug,
mounting bracket.



Optional
Cordset
Part No.
9036810-0030
for short-run connections, a convenient optional 16-ft. cordset with a 5-pin M12 connector.



Field Installable Connector
Part No.
9036810-0032
While every SGJ ships with a field installable 5-pin M12 mating plug, additional connectors are available.

20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

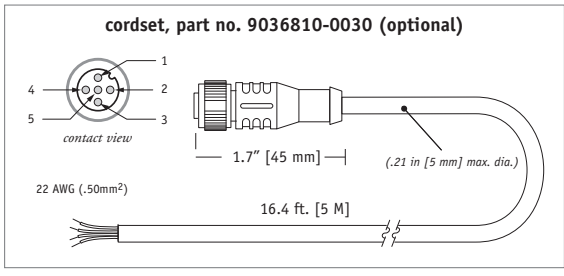
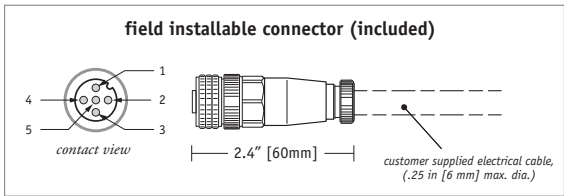


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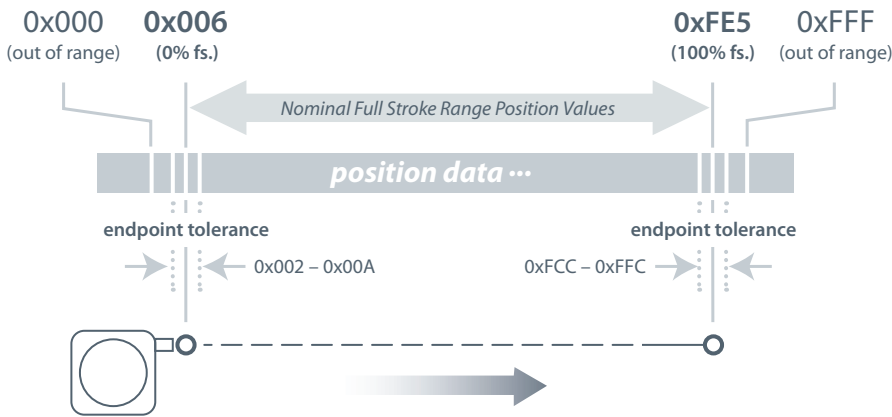
Electrical Connection:



signal	pin	pin-colorcode
drain	1	1 - brown
10...36 Vdc	2	2 - white
common	3	3 - blue
CAN high	4	4 - black
CAN low	5	5 - green/yellow



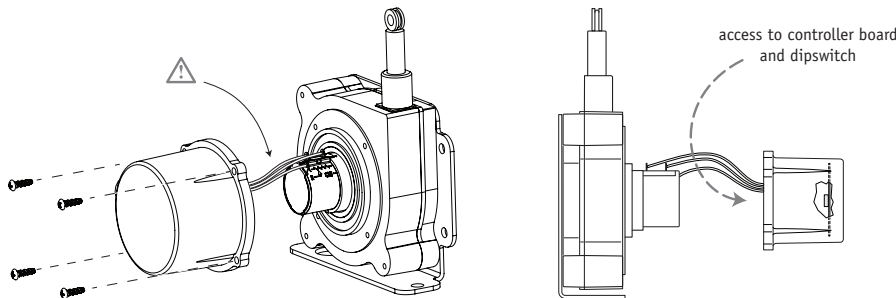
Position Data Overview:



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 potentiometer to the controller board mounted directly to the rear cover.

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



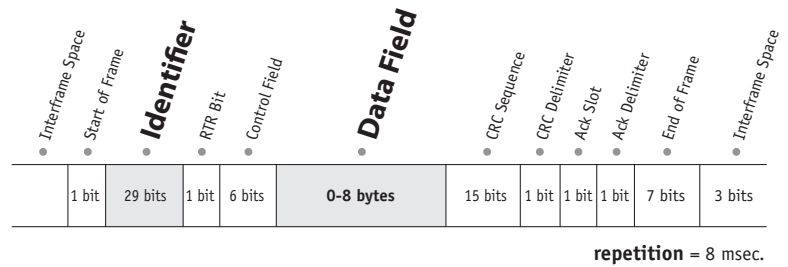
BAUD rate options	baud rate	SW2		SW3	
		on	off	on	off
}	125 kbps	off	off	off	off
	250 kbps	on	off	off	off
	500 kbps	off	on	on	on

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

node ID options 0-63 (0x00-0x3F)

node ID	Dec. Hex	SW1	SW2	SW3	SW4	SW5	SW6
		(2 ⁰)	(2 ¹)	(2 ²)	(2 ³)	(2 ⁴)	(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

I/O Format:



Identifier:

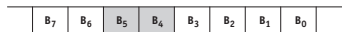
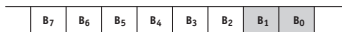
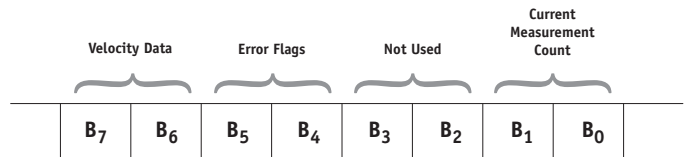
	Message Priority				Future Use		J1939 Reference Proprietary B								Data Field Type*								Not Used		Node ID**						
Example –	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1	1	1
Identifier Bit No. –	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
Hex Value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

B₀ = LSB current measurement count byte
B₁ = MSB current measurement count byte
B₂ = not used
B₃ = not used

B₄ = error flag
B₅ = error flag
B₆ = LSB velocity data byte
B₇ = MSB velocity data byte



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 **0x008** 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:

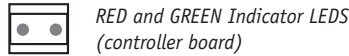
$$\left(\frac{\text{current measurement count}}{4061} \right) \times \text{full stroke range}$$

Sample Conversion:

If the full stroke range is **80 inches** and the current position is **0x4FF** (1279 Decimal) then,

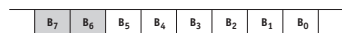
$$\left(\frac{1279}{4061} \right) \times 80.00 \text{ inches} = 25.2 \text{ inches}$$

Error Flags



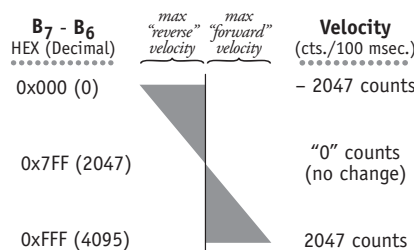
0x00 (GREEN - ON, RED - OFF) indicates the sensor is operating within normal calibrated limits.

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.



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.



Velocity Calculation

$$\left(\frac{\text{count change} - 2047}{.1 \text{ sec. time period}} \right) \times \left(\frac{\text{full stroke range}}{4061} \right)$$

Sample Calculations

Cable Extension (positive direction):

B₇.B₆ = 0x8D3 (2259Dec), **full stroke = 80 in.**

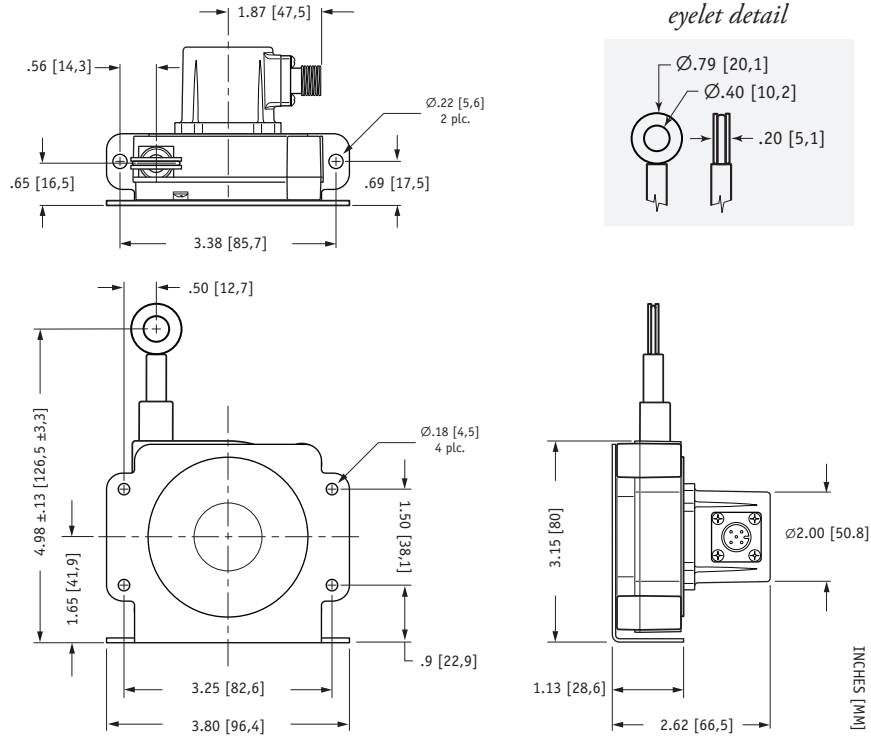
$$\left(\frac{2259 - 2047}{.1 \text{ sec}} \right) \times \left(\frac{80 \text{ in.}}{4061} \right) = 41.76 \text{ in. / sec.}$$

Cable Retraction (negative direction):

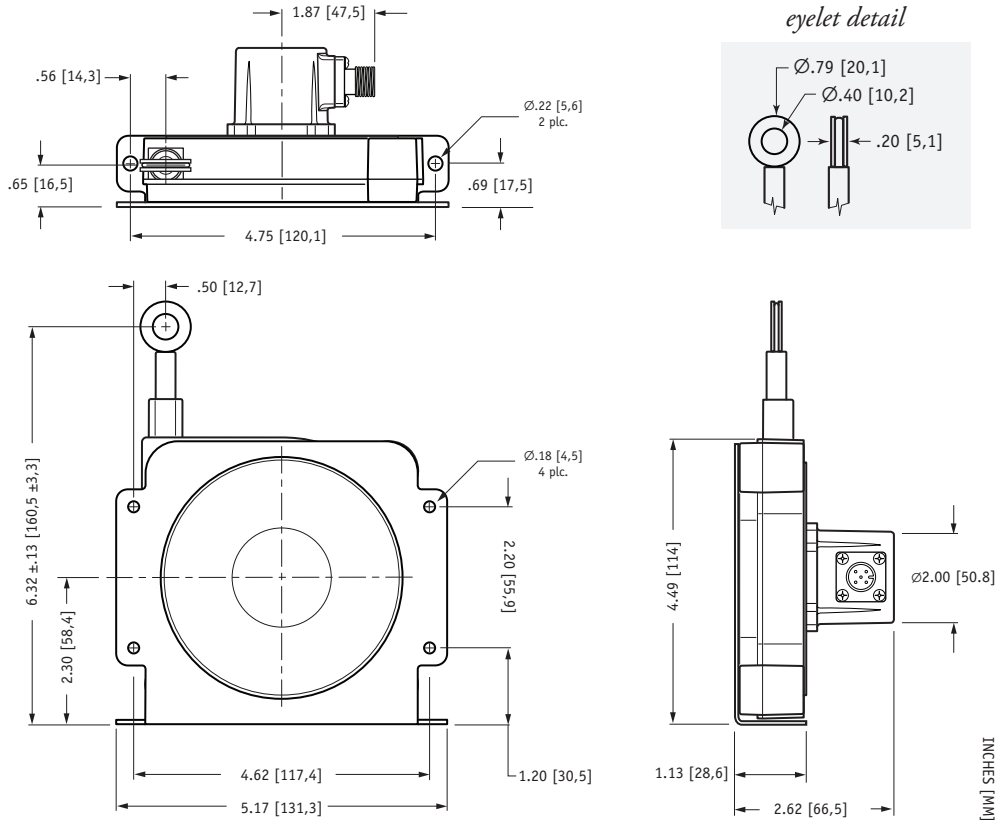
B₇.B₆ = 0x7D0 (2000Dec), **full stroke = 80 in.**

$$\left(\frac{2000 - 2047}{.1 \text{ sec}} \right) \times \left(\frac{80 \text{ in.}}{4061} \right) = -9.26 \text{ in. / sec.}$$

80-inch SGJ-80-4 w/ Mounting Bracket:



120-inch SGJ-120-4 w/ Mounting Bracket:



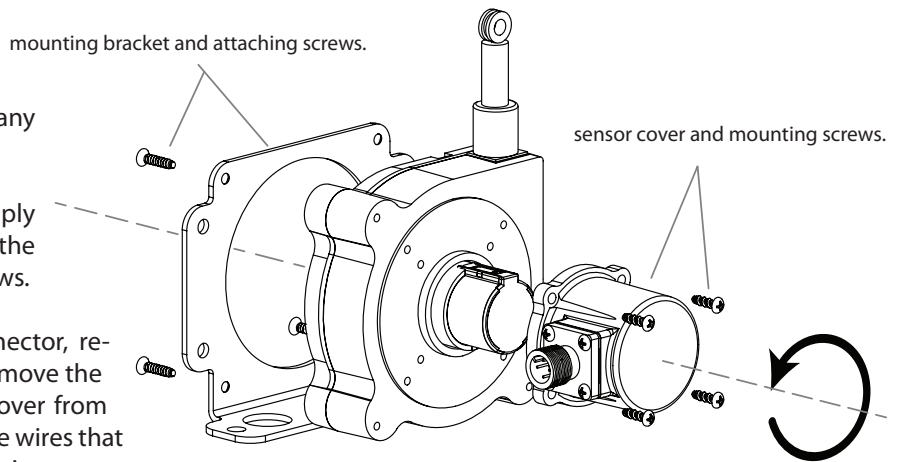
Mounting Options:

Changing Measuring Cable Exit and Electrical Connector Direction:

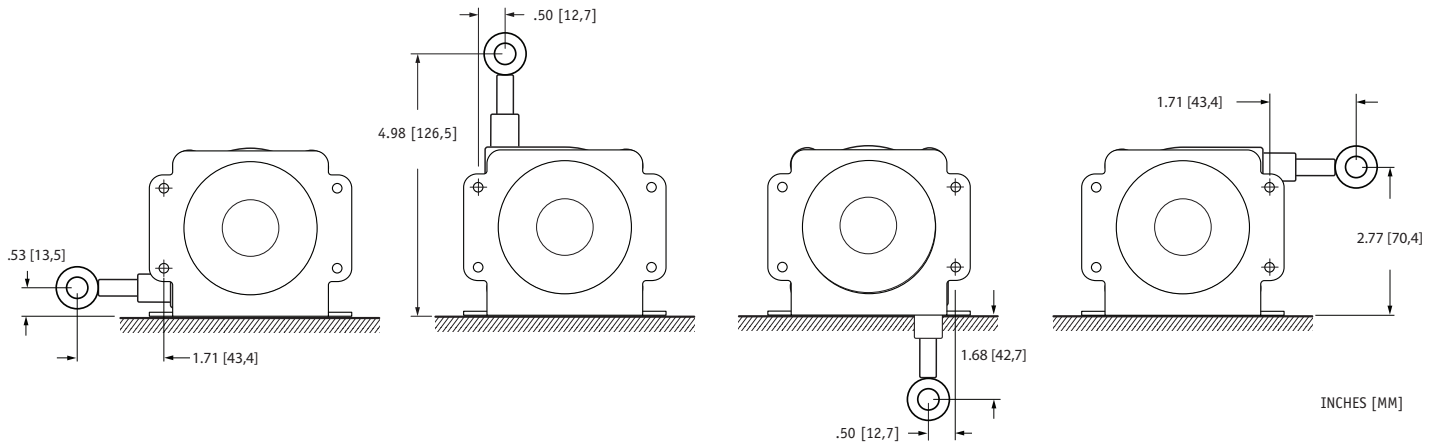
For the ultimate in flexibility, the measuring cable exit direction and the direction of the electrical connector can be rotated around in 90° increments to accommodate just about any installation requirement.

To change measuring cable exit direction, simply remove the 4 mounting bracket screws, rotate the bracket to desired position and replace the screws.

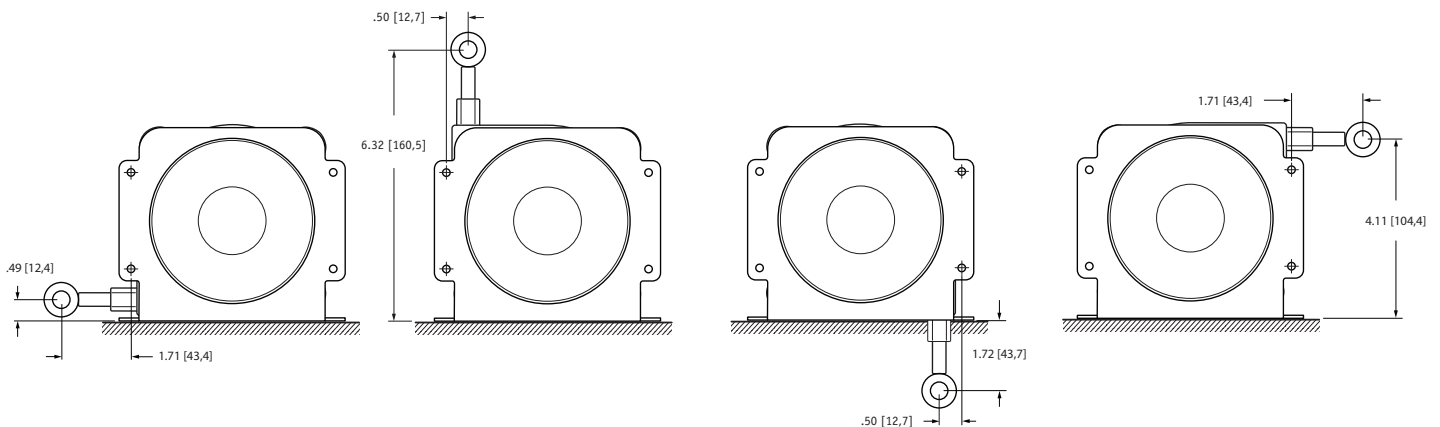
To change the direction of the electrical connector, remove the 4 sensor cover screws and carefully remove the sensor cover just far enough to separate the cover from the main body. Be careful of the three small gage wires that attach the internal controller board to the potentiometer.



Mounting Option Mounting Dimensions (SGJ-80-4):



Mounting Option Mounting Option Dimensions (SGJ-120-4):



version: 2.0 last updated: January 21, 2015