



# SUBMERSIBLE LVDT

## CANBus CiA 443

### Position Transmitters

#### MACRO SSB 937 | SSBR 937

#### Overview

The Macro Sensors SSB/SSBR series LVDTs are submersible position Transmitters with a CANopen interface compliant to CiA 443 for subsea instruments. The CiA 443 CANopen profile offers more interoperable and standardized communications to network devices among different manufacturers used on the ocean floor.

The Macro Sensors SSBR 937 Series Submersible LVDT Position Transmitters withstand deep sea environments with external pressures up to 7500 psi. These rugged, .94 inch [nom.] (24 mm) diameter sensors are available in standard ranges of 2.00 inches (50 mm), 3.00 inches (75 mm), 4.00 inches (100 mm), or 8.00 inches (200 mm) although other ranges are available at special request.

Reliability is of critical importance due to the cost of replacing subsea hardware. The sensors also offer extraordinary repeatability (error less than 0.01% of full range), regardless of offsets due to pressure.

Typical applications include elongation measurement as part of long-term finite element analysis of pipelines, derricks, moorings, choke valves and other critical high-stress members on offshore oil platforms that must be constantly monitored to ensure ongoing drilling platform stability. The submersible Position Sensors can measure the extension of structural members of oil platforms to a fraction of a microstrain. To ensure oil platforms don't shift, movement is measured to less than 2mm.

#### Performance @ 25°C (77°F)

<b>Linearity Error</b>	≤ ±0.10% of Full Range
<b>Repeatability Error</b>	≤ 0.01% of Full Range

#### Environmental Data

<b>Operating Pressure</b>	5000 PSIG*
<b>Proof Pressure</b>	7500 PSIG*
<b>Operating Temperature</b>	-30 to 80°C (-20 to 175°F)
<b>Temperature Sensitivity</b>	0.027%/°C (0.015%/°F) max.
<b>Vibration Tolerance</b>	20 g to 2 kHz
<b>Shock Survival</b>	100 g, 11 ms
<b>Ingress Protection</b>	IP68 Submersible*

\*with appropriate Seacon-Brantner mating connector

#### Benefits

- ◆ Long term reliability (20+ years)
- ◆ Inconel construction standard
- ◆ High pressure applications (to 5,000 psi)
- ◆ Firmware Upgradable via CANBus CiA 443 Portal
- ◆ Non-linearity of ±0.10% of FRO or better
- ◆ High pressure Seacon-Brantner subsea connector standard
- ◆ Available in either inline axial or radial connector configurations
- ◆ Welded connector also available

#### Applications

- ◆ Off-shore drilling platforms
- ◆ Pipeline monitoring
- ◆ Choke valves
- ◆ ROV and exploration
- ◆ Mooring cables
- ◆ Extensometers

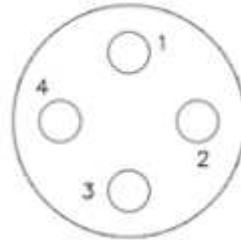
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SSB 937 | SSBR 937 Position Transmitters

### Electrical Data

<b>Protocol</b>	CANBus FT Interface with CANopen CiA 443 Protocol
<b>Output</b>	Direct Read in cm
<b>Input</b>	18-30 VDC
<b>Power Consumption</b>	350 mW typ.
<b>Supported Bitrates</b>	50 Kb/s, 125 Kb/s
<b>Max Number of Nodes</b>	127
<b>Bandwidth; Electrical:</b>	(-3dB): DC to 50 Hz

Pin 1	<b>CAN_V +</b>
Pin 2	<b>CAN_GND</b>
Pin 3	<b>CAN_H</b>
Pin 4	<b>CAN_L</b>



XSEE-4-BCR  
Connector

### Ordering Information

<b>SS</b>	<b>B</b>	<b>R</b>	<b>937</b>	<b>4000</b>	<b>006</b>
<b>Series</b>					
<b>Outputs</b> B = CANBus					
<b>Connector</b> R = Radial Leave Blank for Axial					
<b>0.937" (23.8 mm) Body Diameter</b>					
<b>Range (see table above)</b> 2000 = 2.00" (50.8 mm) 3000 = 3.00" (76.2 mm) 4000 = 4.00" (101.6 mm) 8000 = 8.00" (203.2 mm)					

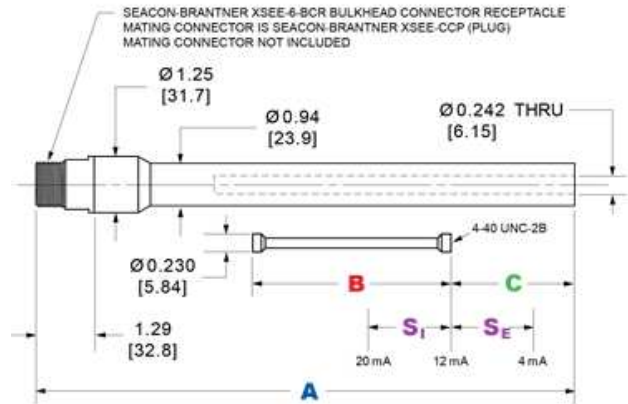
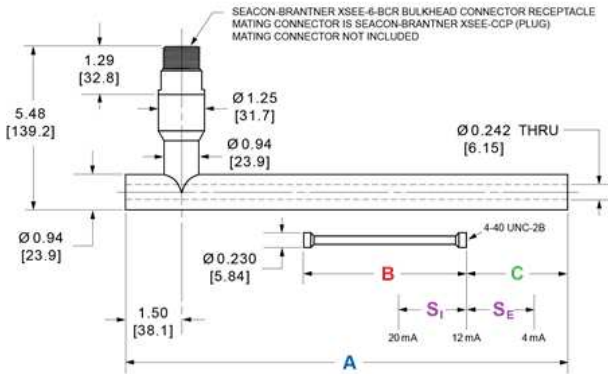
#### Metric Threaded Core Option

006 = M3 x 0.5, 6H Metric Thread  
No suffix required for standard #4-40 UNC-2B Thread

**Dimensions**

SSBR 937 Parameter	Range Code	2000	3000	4000	8000
Range	Inches	2.00	3.00	4.00	8.00
	mm	50.8	76.2	101.6	203.2
Body Length "A"	Inches	8.80	11.95	11.95	17.00
	mm	223.5	303.5	303.5	431.8
Core Length "B"	Inches	4.36	6.33	6.33	7.15
	mm	111.0	161.0	161.0	181.0
Core Position "C" (at 12 mA)	Inches	1.70	2.70	2.70	4.66
	mm	43.2	68.6	68.6	118.4
Stroke "S" (S <sub>I</sub> = Insert Stroke) (S <sub>E</sub> = Extend Stroke)	Inches	1.00	1.50	2.00	4.00
	mm	25.4	38.1	50.8	101.6
Weight - Body	ounces	30	40	40	46
	g	850	1130	1130	1297
Weight - Core	ounces	0.50	0.65	0.65	0.74
	g	14	18	18	21

SSB 937 Parameter	Range Code	2000	3000	4000	8000
Range	Inches	2.00	3.00	4.00	8.00
	mm	50.8	76.2	101.6	203.2
Body Length "A"	Inches	12.85	16.25	16.25	22.00
	mm	326.4	412.8	412.8	558.8
Core Length "B"	Inches	4.36	6.22	6.22	7.15
	mm	111.0	158.0	158.0	181.6
Core Position "C" (at 12 mA)	Inches	1.70	2.42	2.42	4.66
	mm	43.2	61.5	61.5	118.4
Stroke "S" (S <sub>I</sub> = Insert Stroke) (S <sub>E</sub> = Extend Stroke)	Inches	1.00	1.50	2.00	4.00
	mm	25.4	38.1	50.8	101.6
Weight - Body	ounces	30	40	40	46
	g	850	1130	1130	1297
Weight - Core	ounces	0.50	0.65	0.65	0.74
	g	14	18	18	21



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