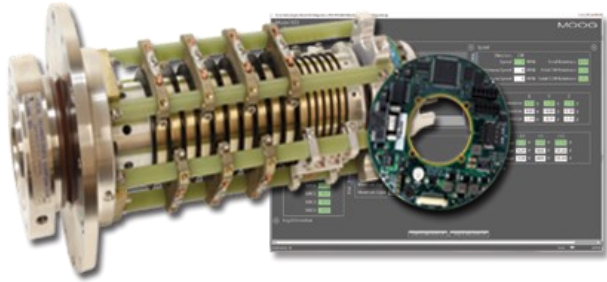# Slip Ring Sensor
Model 923-SRS

Focal Technologies Corporation, a Moog Inc. company, has over 30 years of expertise in supplying standard and custom marine products for harsh environment applications and is a leading manufacturer of high performance and high quality slip rings. Contact Focal for any assistance in selecting the best solution for your requirements.

The Model 923 Slip Ring Sensor is a miniature, ruggedized, health monitoring and data logging system for Focal rotary products.

When installed as an option in Focal's slip rings, such as the Model 176 or larger units, the Model 923 Slip Ring Sensor provides real-time access to diagnostic information as well as data storage for offloading at a later time. The diagnostic information obtained can be used to determine the overall health of the slip ring. Typically mounted inside the slip ring, the Model 923 Slip Ring Sensor logs measurements from a number of on-board sensors for parameters such as: temperature, slip ring rotations, speed, relative humidity, acceleration (3-axis), and ambient light. Additional sensors can be added through expansion interfaces available on the cards.

Diagnostic readings may be accessed via an RS485 serial link in real time by using Focal™ Graphical User Interface (GUI) software, based on the Microsoft®.NET Framework, or by using a customer's own software configured to read Modbus RTU format.

Features

- Real-time ESR health monitoring of temperature, relative humidity, shock, rotation and other parameters
- Programmable data logging intervals
- Hierarchical data logging with statistical summaries to optimize use of on-board memory
- Turns counting for monitoring slip ring rotations and life
- Small size and ruggedized electronics to mount inside an ESR
- Diagnostic GUI software available for Windows-based PC
- Open diagnostic protocol for customer development
- On-board real-time clock (RTC) with battery backup
- Sensor bus port for future expansion
- Used with high voltage units up to 7.2KV
- Pressure tolerant up to 6000psi

Benefits

- Tracks ESR health for better planning of maintenance intervals
- Allows early identification of potential problems in a rotary joint, e.g. increasing temperature
- Provides remote access to diagnostics for technical support
- Establishes baseline and historical data for ESR monitoring
- Provides a "black box" record of events leading up to a fault condition

Applications

- Real-time ESR health monitoring
- Maintenance planning for ESRs
- Black box storage for fault analysis
- Shock monitoring
- Data collection for: ESR/EOSR Units, Hydraulic Utility Swivels, Electrical Swivels and FPSOs
- Marine applications: surface (dry) and pressure tolerant (wet) slip rings, hazardous and non-hazardous areas

FOCAL™

Specifications

Sensors

Temperature	Onboard -20 to +70 °C
Relative Humidity*	5 to 95% RH
Accelerometer (3-Axis)	± 200 g per axis with shock event detection
Ambient Light*	300 to 1000 nm
Turns Counter	Direction, speed, total turns (10 degree resolution typical)

* Relative humidity and ambient light not intended for use in oil filled slip ring

Data Logger

Non-volatile Memory	64 MB Flash RAM
Logging Interval	1 - 120 minutes, time stamp
Data Retention	20 years (+40 °C)
RTC Battery Capacity	MS Li-ion, 3.0 mAh nominal

Electrical

Voltage	9 - 28 VDC
Current	25 mA @ 24 VDC
Power Dissipation	1 W max. (Normal Mode)
Overvoltage	30 VDC max.
Reverse Polarity	30 VDC max.

Diagnostic Serial Link

Signal Type	RS485
Speed	115.2 kbps
Protocol	Modbus RTU

Connectors

Power/Data	9-pin Micro D
Expansion Bus	Micro USB, Type B, RS485,2X Analog Input

Environmental

Temperature	-20 °C to +70 °C (operational) -20 °C to +70 °C (storage)
Humidity	95% RH, non-condensing
Shock	MIL-STD-810G 40 g, 11 msec, 3 axis
Vibration	MIL-STD-167-1A 4 to 33 Hz, 3 axis
ESD	±15 kV air/HBM, ±8 kV contact
ESR Voltage	7.2 kV AC max.
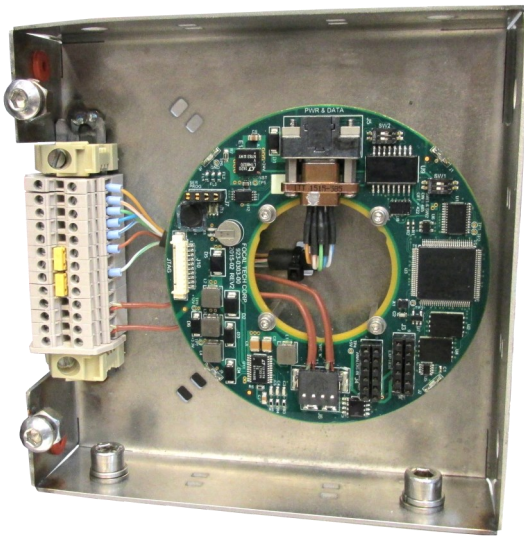
Installed in FPSO Junction Box

Slip Ring Sensor Software

www.moog.com/marine

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