

Roxar SandLog™



The Roxar SandLog effectively manages sand and erosion measurements in order to maintain the integrity of oil and gas assets, and to optimize production. Used as an on-line monitoring device for Emerson's Roxar sand and erosion sensors, the SandLog is used to control sand production in flowlines. Constructed for high durability in tough field conditions, the SandLog requires minimum maintenance, and its low power consumption makes it ideal for remote locations with limited access to equipment. Highly sensitive, yet unaffected by noise and vibration, the SandLog provides quick and reliable response to sand production.

SandLog features

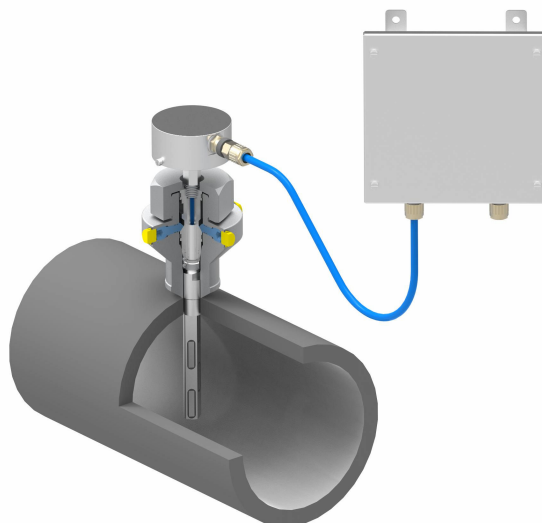
The Roxar SandLog sensors have the following features and benefits:

- High sand and erosion sensitivity due to a sensing element thickness resolution that goes down to 10 ppm
- A wide temperature operating range from -40 °F (-40 °C) to 140 °F (60 °C)
- A 24-bit instrument resolution (24-bit corresponds to 0.06 ppm of sensing element thickness)
- Flexible installation and maintenance options due to probe cable lengths up to 65.6 ft (20 m)
- Up to 1,500 measurements for off-line systems
- Intrinsically safe certification
- A robust design that uses:
 - Stainless steel housing
 - Electronics optimized for the tropics
 - Cable glands instead of instrument connectors
 - Efficient drains designed to keep internal humidity away from electronic components
- Low maintenance features:
 - Operational reliability and reduced maintenance requirements using online systems that operate without internal batteries (fieldbus and 4-20 mA versions)
 - Long term operation and low power consumption using common AAA alkaline batteries for off-line systems
- A flexible system configuration (online/offline) using a user-replaceable interface board
All raw data is available to the user for review and verification
- An integrated sand and corrosion monitoring system

Measurement principle

Using Electrical Resistance (ER) technology, the sand erosion probe measures the erosion effect of sand particles that come in contact with its sensing elements.

Figure 1: The Roxar SandLog system



Sand distribution in a pipe is difficult to control due to flow velocity dependencies and flow line design. In order to overcome these difficulties, use the following installation recommendations:

- Install the sand erosion probe in a vertical pipe, preferably 10 pipe diameters after a bend where the sand is likely to be uniformly distributed within the pipe. Other pipe positions, such as horizontal, are also acceptable depending on flow conditions.
- Install the sand erosion probe with the sensing elements facing the flow to maximize sensitivity and to minimize response time for sand erosion and performance.
- Install multiple elements (4 maximum) to increase sand distribution accuracy within the pipeline, and also provide probe measurement and performance redundancy.
- Combine intrusive sand erosion monitoring with acoustic, non-intrusive sand monitors for optimized sand and erosion monitoring in one integrated system. For more information, see the *Roxar Sand Acoustic Monitor - Product Data Sheet*.

The Roxar SandLog is also designed to read different options from the probe that combine sand erosion elements and corrosion elements in a single device.

Configuration options

Emerson highly recommends on-line monitoring of sand and erosion because it provides immediate warning of changes in sand production rates, and is a vital component of a total flow assurance solution. The Field Interface Unit (FIU) provides on-line monitoring, power, and communication to SandLog, which communicates with a PC equipped with Roxar software.

The Roxar SandLog is available with the following communication options for configuration:

- SandLog fieldbus (digital data through a Roxar fieldbus)
- SandLog terminal (continuous offline data logging, data retrieval is through the field terminal)
- SandLog 4-20 mA (analog)
- SandLog 4-20 terminal (combined)
- SandLog wireless is also available with WirelessHART® communication (see the *Roxar SandLog Wireless - Product Data Sheet*)

For all SandLog options, inline probes are connected to the SandLog through a probe cable with a maximum length of 65.6 ft (20 m). Connections for probe leads and probe cables are located within the housing.

SandLog fieldbus (online)

For online digital communications, the SandLog transmitter is powered and communicates through a cable via a Field Interface Unit (FIU). The FIU needs to be installed in a safe area. Each FIU can handle up to 8 SandLogs (2 cable loops with a maximum of 4 SandLogs per cable loop). CorrLogs™ and SandLogs can be combined in the same cable loops.

The FIU communicates with a PC or with the Fieldwatch™ software through a variety of options (RS-232, RS-485, LAN, telephone modems, etc).

The SandLog does not contain batteries for a terminal set up, and is therefore considered maintenance free. SandLog fieldbus requires Fieldwatch software for operation and data management.

SandLog terminals (offline)

The battery-powered SandLog is designed to monitor the probe continuously with measurement intervals from every 2 minutes to every 24 hours. Data is stored in the SandLog and retrieved by a portable terminal (Mesa 2). The SandLog terminal is powered by 3 x AAA batteries. The SandLog terminal can be upgraded to SandLog fieldbus by changing the SandLog's interface card.

SandLog 4-20 mA

The SandLog transmitter is also available with communication that occurs over an analog 4-20 mA communication loop. The metal loss is calculated in SandLog and converted to a signal between 4-20 mA. For multiple element probes, the average metal loss for all elements is transmitted.

SandLog 4-20 mA provides data directly to the receiver without the use of Fieldwatch.

The SandLog 4-20 mA is powered via the 4-20 mA cable loop. A barrier is required on the 4-20 mA cable loop to maintain intrinsically safe certification.

SandLog 4-20 mA/terminal

This version combines the 4-20 mA communication with the option of downloading digital data to a terminal for data analysis and reporting. For this setup, the SandLog is powered using AAA batteries.

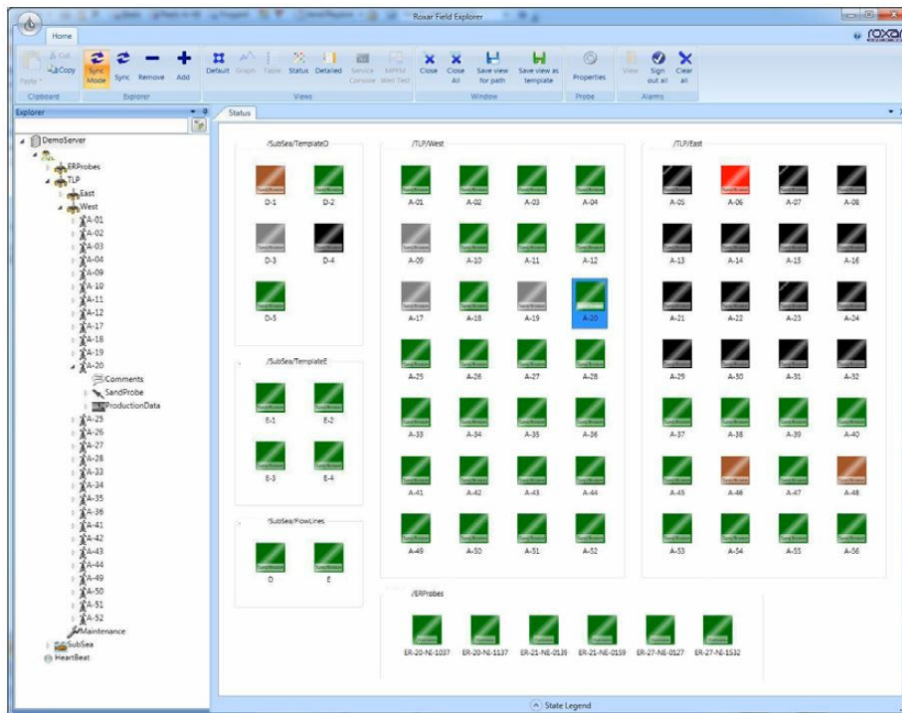
Note

Sand production and erosion rates can change rapidly. Therefore, Emerson recommends digital online configuration for permanent sand erosion monitoring.

Fieldwatch software

The Roxar Fieldwatch software handles data collection, analysis, reporting, and alarms — as well as provides an interface with the control systems. For testing purposes and temporary installations, SandLog can also be used to log data in standalone mode, powered by long-life batteries.

Figure 2: Example of Fieldwatch software



Specifications

General	For connection to the multiple element sand erosion probe, or combined sand, erosion, corrosion probe, through probe cable and probe connection housing
Logging and storage	Measuring interval from 2 minutes to 24 hours Up to 1500 measurements, each measurement includes measurement results, probe number, hour, day, month, and year
Communication	Roxar fieldbus, digital terminal, analog 4-20 mA
Sensitivity	10-100 ppm of element thickness (~250 ppm for 4-20 mA communication)
Power requirements	Online: via fieldbus cable from FIU Terminal: 3 x AAA batteries
Cable length	Maximum cable length: 985 ft (300 m) from SandLog to FIU Maximum probe cable length: 65.6 ft (20 m)
Operating temperature	Standard -40 °F (-40 °C) to 158 °F (70 °C)
Housing	AISI 316L construction, IP66, NEMA type 4x SS, deluge proof Dimensions: 10.63 in (270 mm) x 10.24 in (260 mm) x 3.03 in (77 mm) Weight: 7.7 lb (3.5 kg)
Mounting	4 x M10 UNC bolts
Cable connector	Cable gland M20, connector
EX classification	Ex 1 G EEx ia IIC T4 IECEEx Ex ia IIC T4 CSA C/US Class 1, Div. 1, groups A, B, C, D, T4
Approval	CE according to EMC 89/336/EEC and 92/31/EEC

Model code numbering system

Product description

Code	Product description
SANDLOGI	Sand/erosion monitor and logger, IS

Communication protocol

Code	Communication protocol
10	Wired Roxar fieldbus
20	Wired 4-20 mA
30	Wired terminal
40	Wired 4-20 mA terminal

Enclosure material

Code	Enclosure material
A	Stainless steel

Probe cable gland

Code	Probe cable gland
G0	No gland
M2	Metric; brass; Hawke 501/453/Universal Ex de
M3	Metric; nickel-plated brass; Hawke 501/453/Universal Ex de
M4	Metric; stainless steel; Hawke 501/453/Universal Ex de
N2	NPT; brass; Hawke 501/453/Universal Ex de
N3	NPT; nickel-plated brass; Hawke 501/453/Universal Ex de
N4	NPT; stainless steel; Hawke 501/453/Universal Ex de

Probe cable size range

Code	Probe cable size range
0 ⁽¹⁾	Not applicable
1 ⁽²⁾	5.5 mm to 12 mm OD / 3.5 mm to 8.1 mm ID
2 ⁽²⁾	9.5 mm to 16 mm OD / 6.5 mm to 11.4 mm ID
3 ⁽²⁾	12.5 mm to 20.5 mm OD / 8.4 to 14.3 mm ID
4 ⁽²⁾	16.9 mm to 26 mm OD / 11.1 mm to 19.7 mm ID

(1) Available only with probe cable gland option G0, no gland.

(2) Not available with probe cable gland option G0, no gland.

Field cable gland

Code	Field cable gland
G0	No gland (client provided or not applicable)
M2 ⁽¹⁾	Metric; brass; Hawke 501/453/Universal Ex de
M3 ⁽¹⁾	Metric; nickel-plated brass; Hawke 501/453/Universal Ex de
M4 ⁽¹⁾	Metric; stainless steel; Hawke 501/453/Universal Ex de
N2 ⁽¹⁾	NPT; brass; Hawke 501/453/Universal Ex de
N3 ⁽¹⁾	NPT; nickel-plated brass; Hawke 501/453/Universal Ex de
N4 ⁽¹⁾	NPT; stainless steel; Hawke 501/453/Universal Ex de

(1) Not available with communication protocol option 30, wired terminal.

Field cable size range

Code	Field cable size range
0 ⁽¹⁾	Not applicable
1 ⁽²⁾⁽³⁾	5.5 mm to 12 mm OD / 3.5 mm to 8.1 mm ID
2 ⁽²⁾⁽³⁾	9.5 mm to 16 mm OD / 6.5 mm to 11.4 mm ID
3 ⁽²⁾⁽³⁾	12.5 mm to 20.5 mm OD / 8.4 to 14.3 mm ID
4 ⁽²⁾⁽³⁾	16.9 mm to 26 mm OD / 11.1 mm to 19.7 mm ID

(1) Available only with field cable gland option G0, no gland.

(2) Not available with communication protocol option 30, wired terminal.

(3) Not available with field cable gland option G0, no gland.

Blind and drain plug material

Code	Description
P	Nylon (TBV)
B	Brass
N	Nickel-plated brass
S	Stainless steel

Approvals

Code	Approvals
A2	ATEX; intrinsically safe
A3	IECEX; intrinsically safe
A4	CSA; intrinsically safe
A5	INMETRO; intrinsically safe
A6	EAC; intrinsically safe

Tag plates

Code	Tag plates
ZZ	No tag plates
TG	Standard tag plates for cables

Factory option

Code	Factory Options
Z	Standard product

Emerson Automation Solutions

Roxar Norway:
Gamle Forusveien 17
4031 Stavanger
Europe: + 47 51 81 8800
Russian/CIS: + 7 495 504 3405

www.Emerson.com/Roxar
info.roxar@emerson.com

Emerson Automation Solutions

North America: + 1 281 879 2300
Latin America:
Mexico: + 52 55 5809 5300
Argentina: + 54 11 4809 2700
Brazil: + 55 15 3413 8000
Chile: + 56 2 2928 4800
Peru: + 51 15190130

Emerson Automation Solutions

Asia Pacific: + 60 3 5624 2888
Australia: + 1 300 55 3051
Middle East: + 971 4811 8100

©2020 Roxar AS. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Roxar is a trademark of Roxar ASA. All other marks are property of their respective owners.

Roxar supplies this publication for informational purposes only. While every effort has been made to ensure accuracy, this publication is not intended to make performance claims or process recommendations. Roxar does not warrant, guarantee, or assume any legal liability for the accuracy, completeness, timeliness, reliability, or usefulness of any information, product, or process described herein. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice. For actual product information and recommendations, please contact your local Roxar representative.

Roxar products are protected by patents. See <http://www.emerson.com/en-us/automation/brands/roxar-home/roxar-patents> for details.