Roxar CorrLog
High Accuracy Corrosion Monitoring

Fast and reliable corrosion monitoring is a key for efficient corrosion management and control. In-line corrosion monitoring provides the highest available resolution and fastest response. Continuous monitoring adds value to the monitoring through faster response, better trending and correlation with process changes.

The CorrLog instrument offers a unique versatility and performance for in-line corrosion monitoring

Multipurpose instrument

- High accuracy Electrical Resistance (ER) probe measurements
- Linear Polarization Resistance (LPR) measurements
- Galvanic Probe Function
- Same probe cable and connections for all functions above

Configuration flexibility

CorrLog is available with a range of communication options;

- CorrLog Terminal (Continuous off-line data logging, data retrieval through field terminal)
- CorrLog Field Bus (Digital data through Roxar Field Bus)
- CorrLog 4-20 mA (analog)
- CorrLog 4-20 - Terminal (combined)
- CorrLog Wireless is also available with WirelessHART® communication (see separate data sheet)

Roxar CorrLog Features

- 24-bit instrument resolution (24 bit corresponds to 0,067 ppm of element thickness)
- Up to 20 meters probe adds flexibility to positioning of instrument for convenience and maintenance
- 1,500 measurement memory
- Power and communication via Field Interface Unit (FIU)
- "Open" philosophy, reads probes from most common suppliers.
- Intrinsically safe certification

Roxar Fieldwatch Software

Fieldwatch is Roxar's general data management and reporting software.

Roxar CorrLog is set up to be used with Roxar's Fieldwatch software[1].

- Set up and control of system
- Data management and reporting
- Data sharing between multiple locations
- Alarms and communication to main control systems via OPC or Modbus protocols

[1] Not 4 - 20 communication. Observer that MultiTrend software may be used for off-line applications
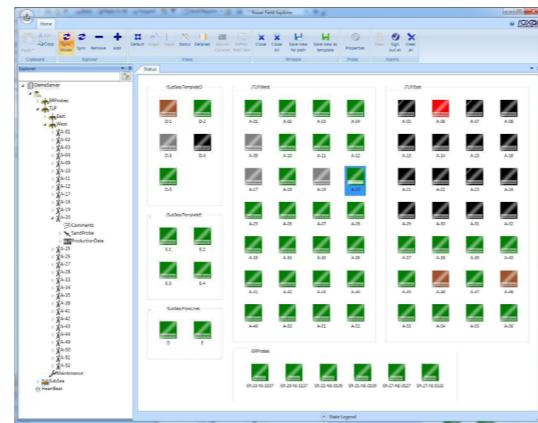
Fieldwatch view of ER probe data with tools for manual rate calculations

Measurement Principles

For all Roxar CorrLog options, in-line probes are connected to Roxar CorrLog through a probe cable (max length 20 m).

Roxar CorrLog features three different measurement principles in one instrument. This means that same instrument version can be used for different types of probes, and probe type can be changed without changing instrument or cables.

Roxar Retractable (left) and Retrievable (right) ER probes

Electrical Resistance (ER) Probe Measurements

ER probe measurements are based on measuring changes in resistance of the probe's measurement element and comparing this with the resistance of a reference element that is not exposed to the corrosion. Roxar CorrLog provides high accuracy measurements of resistance individually in each probe element, with a 24-digit resolution.

Raw data (resistance values) are transferred to the Fieldwatch sofware, where they are converted to metal loss[1]. Raw data access enables probe data for verifying condition of probe and to track temperature changes on the probe. Additional temperature compensation of the data can be done in Fieldwatch software should that be required.

Due to its open and flexible design, Roxar CorrLog can read

probes from most manufacturers, including probes in the marked named as "high accuracy probes".

[1] Not 4-20, see below:

*Roxar Retractable (left) and Retrievable (right) LPR probes*

Linear Polarization Probe Measurements

LPR (Linear Polarization Resistance) measurements are based on measuring the current response to a small polarization of the probe's working electrode in a 2- or 3- electrode configuration. The corrosion rate is proportional to the measured current response and utilizing theoretical/empiric factors, the corrosion rate can be determined directly from one measurement only.

LPR measurements require a conductive electrolyte (water) to perform, and is therefore normally used in water containing systems only.

Roxar Galvanic Probe Measurements

Galvanic Probe measurements are based on measuring the galvanic current between a brass and a carbon steel electrode, which are electrically connected through the Roxar CorrLog meter. The galvanic current is limited by the cathodic reaction at the brass electrode, which again is limited by the oxygen content. The galvanic probe is therefore an immediate response sensor for detecting oxygen where oxygen should not be present. Galvanic probes should not be attempted used for quantifying oxygen levels.
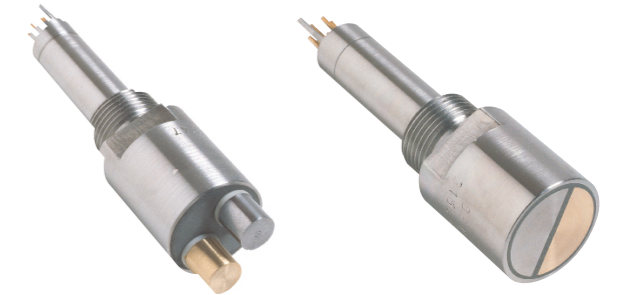
Roxar Galvanic probes
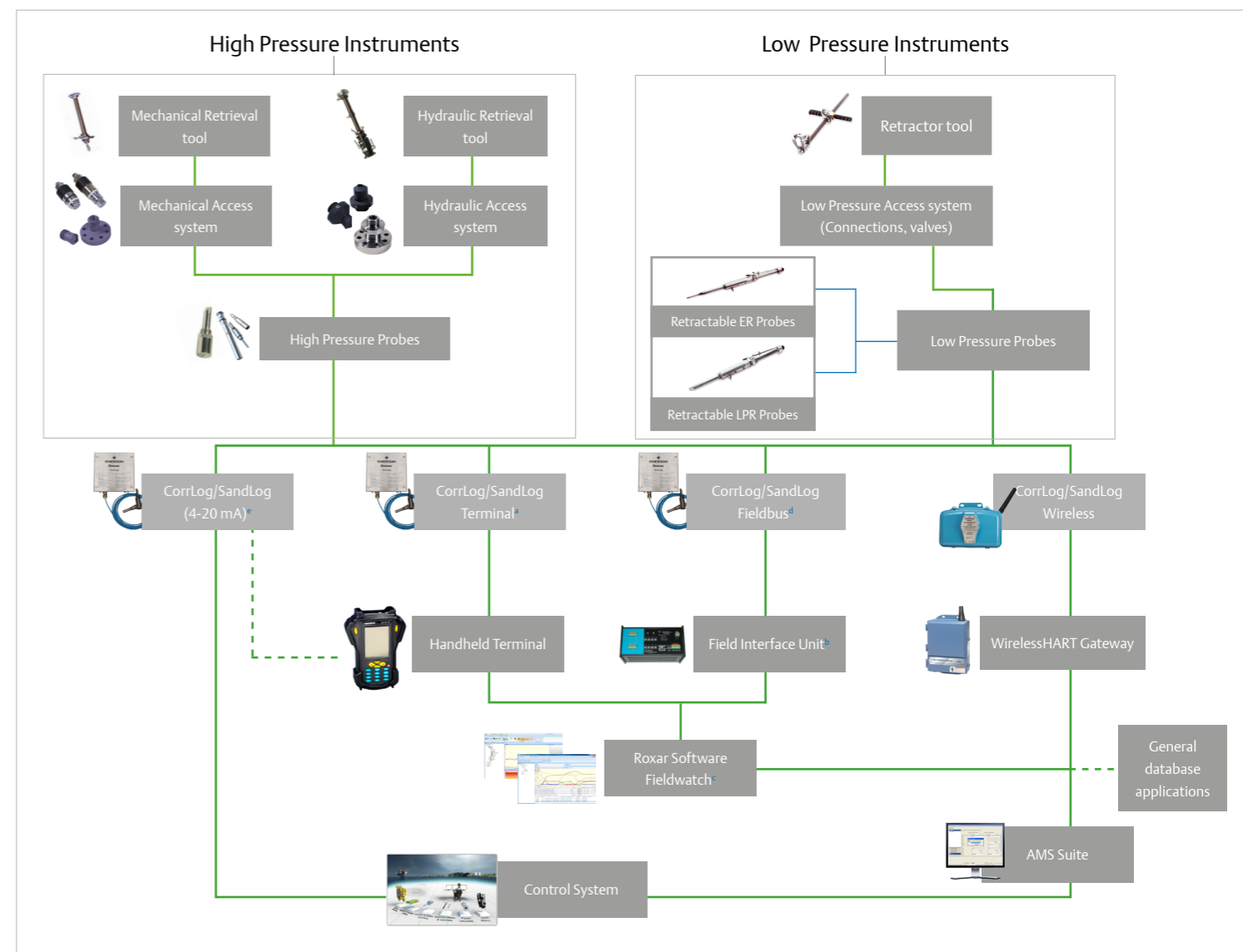
Overview over in-line corrosion and sand/erosion monitoring solutions, including high pressure and low pressure probes and Roxar CorrLog configurations.[1] Roxar CorrLog Wireless instrument is presented in separate data sheet.

[1] Portable terminal as displayed will be replaced by portable tablet, please contact supplier for more details.

Roxar CorrLog Configuration Options

For all Roxar CorrLog options, in-line probes are connected to the Roxar CorrLog instrument via a probe cable (maximum length 20 meter). A probe connection housing is used for connecting probe leads to the probe cable.

Roxar CorrLog Terminal[a] (Off-line).

In this version, a battery powered Roxar CorrLog instrument is set up to monitor the probe continuously (measurement intervals from every 2 minutes to every 24 hours). Data is stored in Roxar CorrLog, and retrieved by the use of a portable tablet.

Roxar CorrLog Terminal is powered with AAA lithium batteries. Due to the energy efficient operation of Roxar CorrLog, long battery life is still provided (more than 1 year at 1 measurement per hour for ER probes).

Roxar CorrLog Terminal can be upgraded to Roxar CorrLog Field Bus by changing the instrument's interface card.

Roxar CorrLog Field Bus[d] (On-line).

For on-line, digital communication, Roxar CorrLog instruments are powered and communicate through cable via a Field Interface Unit (FIU)[b]. The FIU needs to be installed in safe area (could be an explosion proof enclosure). Each FIU can handle up to 8 Roxar CorrLog instruments (2 cable loops, maximum 4 Roxar CorrLog instruments per cable loop). Observe that Roxar CorrLog and SandLog instruments can be combined in the same cable loops.

The FIU communicates with PC/Fieldwatch[c] software through a variety of options (RS 232, RS 485, LAN, telephone modems, etc).

In this version, Roxar CorrLog instrument does not contain batteries, and the instrument can be considered maintenance -free.

Roxar CorrLog Field Bus requires Fieldwatch software for operation and data management.

Roxar CorrLog 4-20 mA[e].

Roxar CorrLog is also available with communication over an analog 4 - 20 mA cable loop. From the measurements, metal loss (ER probes) and corrosion rates (LPR probes) are calculated in the instrument, and converted to a signal between 4 - 20 mA. The signal is converted back to metal loss or corrosion rates at the receiving end.

Roxar CorrLog 4 -2 0 mA provides data directly to receiver without the use of Fieldwatch instrument. The Roxar CorrLog 4 - 20 mA is powered via the 4 - 20 mA cable loop. Observe that a barrier is required on the 4 - 20 mA cable loop to maintain intrinsically safe certification.

Fieldwatch software is not applicable for this option.

Roxar CorrLog 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.

In this case, CorrLog is powered via AAA Lithium batteries.

Integrated Flow Assurance Monitoring System

Roxar CorrLog forms a part of an integrated flow assurance monitoring offering from Roxar, that also includes:
- Intrusive Sand/Erosion Monitoring (Roxar SandLog)
- Non-intrusive corrosion monitoring (Roxar FSM)
- Non-intrusive, acoustic sand monitoring (SAM)
- Non-intrusive, acoustic pig detectors
- All integrated in one cabinet, and controlled by Roxar Fieldwatch Sofware

Integration of functions above provide commercial and technical advantages in the project, installation, training and after sales support phase - in addition to reduced hardware requirements since same cabinet, cabling, server can be used for multiple functions.

Specifications - Roxar CorrLog

General:	For connection of one ER, LPR or galvanic probe
Logging and Storage:	Measuring interval from 2 minutes to 24 hours 1500 readings, each including measurement results, probe #, hour, day, month and year
Communication:	Roxar fieldbus, digital terminal, analog 4 - 20 mA
Instrument Resolution:	24-bit (0,06 ppm of probe element thickness)
ER probe - actual sensitivity:	10-100 ppm of probe element thickness, depending on probe type, measurement frequency, and environmental conditions. (Sensitivity 250 ppm for 4 - 20 mA communication)
LPR probe - actual accuracy:	1% of measured current and voltage
Current resolution galvanic probes:	$0.01\mu a$
Power requirements:	Online: via fieldbus cable from FIU Terminal and 4-20 – Terminal (Combined): 3x Lithium AAA batteries 4 - 20mA loop for 4-20 mA versions
Cable length:	**Field Bus communication:** Max cable length between instrument (junction box) and FIU is 350 meters (1150 feet) when connecting 4 CorrLog/SandLog instruments per loop. Longer cables can be used if number of CorrLog/SandLog per loop is reduced – ask vendor for advice. **4 -20 mA communication:** 650 meters (2133 feet) max cable from instrument, assuming 1 pair 0,75 mm^2 cable and safety barrier included in the loop.
Operating temperature:	CorrLog FB and CorrLog 4-20: -40ºC to + 70 ºC/-40F to + 158F CorrLog Terminal and CorrLog 4-20/Term: -40 ºC to +60 ºC/- 40F - +140 F
Housing:	AISI 316L construction, IP66 / NEMA type 4x SS, deluge proof. Dimensions 270mm x 260mm x 77mm, weight 3.5kg / 10.63" x 10.24" x 3.03", 7.7 lbs
Mounting:	4 x M10 / 4 x 3/8-UNC bolts
Cable connector:	Cable gland M20, connector
EX classification:	⟨Ex⟩ II 1 G Ex ia IIC T4 Ga IECEx Ex ia IIC T4 Ga 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 Selector - CorrLog

Model	Product Description		
CORRLOGI	Corrosion Monitor and Logger, IS		
Code	**Communication Protocol**		
10	Wired Roxar Fieldbus		
20	Wired 4-20mA		
30	Wired Terminal		
40	Wired 4-20mA-Terminal		
Code	**Enclosure Material**		
A	Stainless Steel		
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
X9[6]	Other gland		
Code	**Probe Cable Size Range**		
0[1]	Not Applicable		
1[2]	5,5-12mm OD / 3,5-8,1 ID	(Selection for Roxar Standard SM Probe Cable)	
2[2]	9,5-16mm OD / 6,5-11,4mm ID		
3[2]	12,5-20,5mm OD / 8,4-14,3mm ID	(Selection for Roxar Heavy Duty BFOU SM Probe Cable)	
4[2]	16,9-26mm OD / 11,1-19,7mm ID		
Code	**Field Cable Gland**		
G0	No Gland (Client provided or not applicable)		
M2[3]	Metric	Brass	Hawke 501/453/Universal Ex de
M3[3]	Metric	Nickel plated brass	Hawke 501/453/Universal Ex de
M4[3]	Metric	Stainless steel	Hawke 501/453/Universal Ex de
N2[3]	NPT	Brass	Hawke 501/453/Universal Ex de
N3[3]	NPT	Nickel plated brass	Hawke 501/453/Universal Ex de
N4[3]	NPT	Stainless steel	Hawke 501/453/Universal Ex de
X9[6]	Other gland		

Code	Field Cable Size Range	
0[4]	Retractable System Packing Box (incl. Safety wire and bleed valve)	
2[3,5]	9,5-16mm OD / 6,5-11,4mm ID	(Selection for Roxar Standard Field Cable)
3[3,5]	12,5-20,5mm OD / 8,4-14,3mm ID	(Selection for Roxar Heavy Duty BFOU Field Cable)
4[3,5]	16,9-26mm OD / 11,1-19,7mm ID	
Code	**Blind and Drain Plug Material**	
P	Nylon (TBV)	
B	Brass	
N	Nickel-plated Brass	
S	Stainless Steel	
Code	**Approvals**	
A1	ATEX/ IECEx/ CSA/ INMETRO/ EAC	Intrinsically Safe
Code	**Tag Plates**	
ZZ	No tag plates	
TG	Standard tag plates	
XX[6]	Project Specific Tag Plates	
Code	**Factory Options**	
Z	Standard product	
X	ETO product	

[1] Available only with Probe Cable Gland option G0, No Gland
[2] Not available with Probe Cable Gland option G0, No Gland
[3] Not available with Communication Protocol option 30, Wired Terminal
[4] Available only with Field Cable Gland option G0, No Gland
[5] Not available with Field Cable Gland option G0, No Gland
[6] Not Available with factory Option Z

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