

Real-time erosion and corrosion monitoring system



PipeMonit[®]

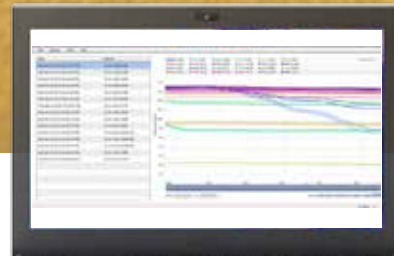
PipeMonit[®] is an ultrasonic erosion and corrosion monitoring tool which provides real-time and online wall thickness data for onshore and topside piping and pipelines. It is non-invasive and is installed and operated without interfering with production.

The PipeMonit[®] ability to provide fast and accurate erosion and corrosion rates makes it an effective tool for real-time feed back of corrosion inhibitor programs. The PipeMonit[®] system is ATEX rated for Zone 1.

The PipeMonit[®] sensor arrays are retrofittable and installed simply by strapping them on to the pipe. No gluing or welding required. Each sensor array has numerous ultrasound transducers providing reliable high precision ultrasonic wall thickness measurements at the selected locations. It is based on the well-established ultrasonic pulse-echo method. Being retrofittable, the sensor arrays can be removed or relocated.

Some key advantages are:

- Accurate erosion/corrosion estimates increase the service life of pipelines – improves OPEX
- Real-time feedback of the effectiveness of corrosion inhibitors
- Improved pipeline integrity management
- Accurate and direct sand erosion monitoring of pipes and bends
- Life extension and improved safety margins for late life pipelines
- Autonomous operations, no manual labour required during operation
- Dry coupling for quick and maintenance free installation



results, the PipeView® server application gives end users access to the data via a secure web interface. The PipeView® application offers full integration with the operators control system and includes export of data to Excel format.

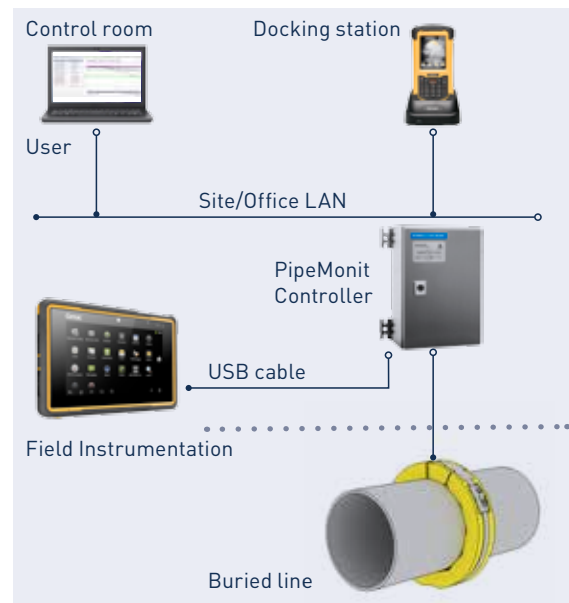
How does it work?

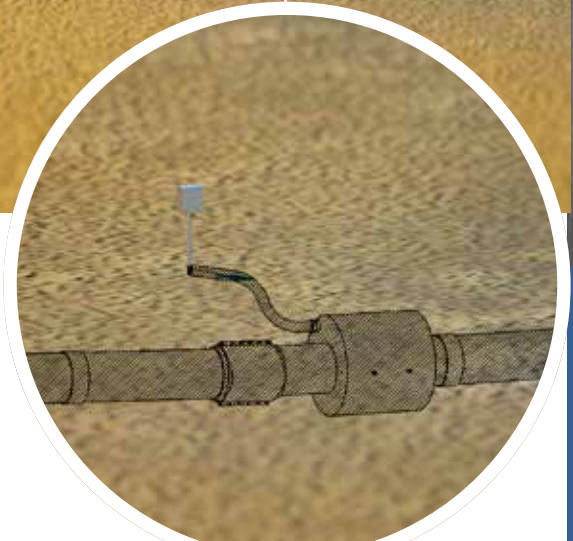
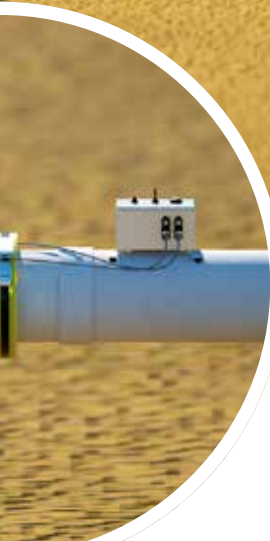
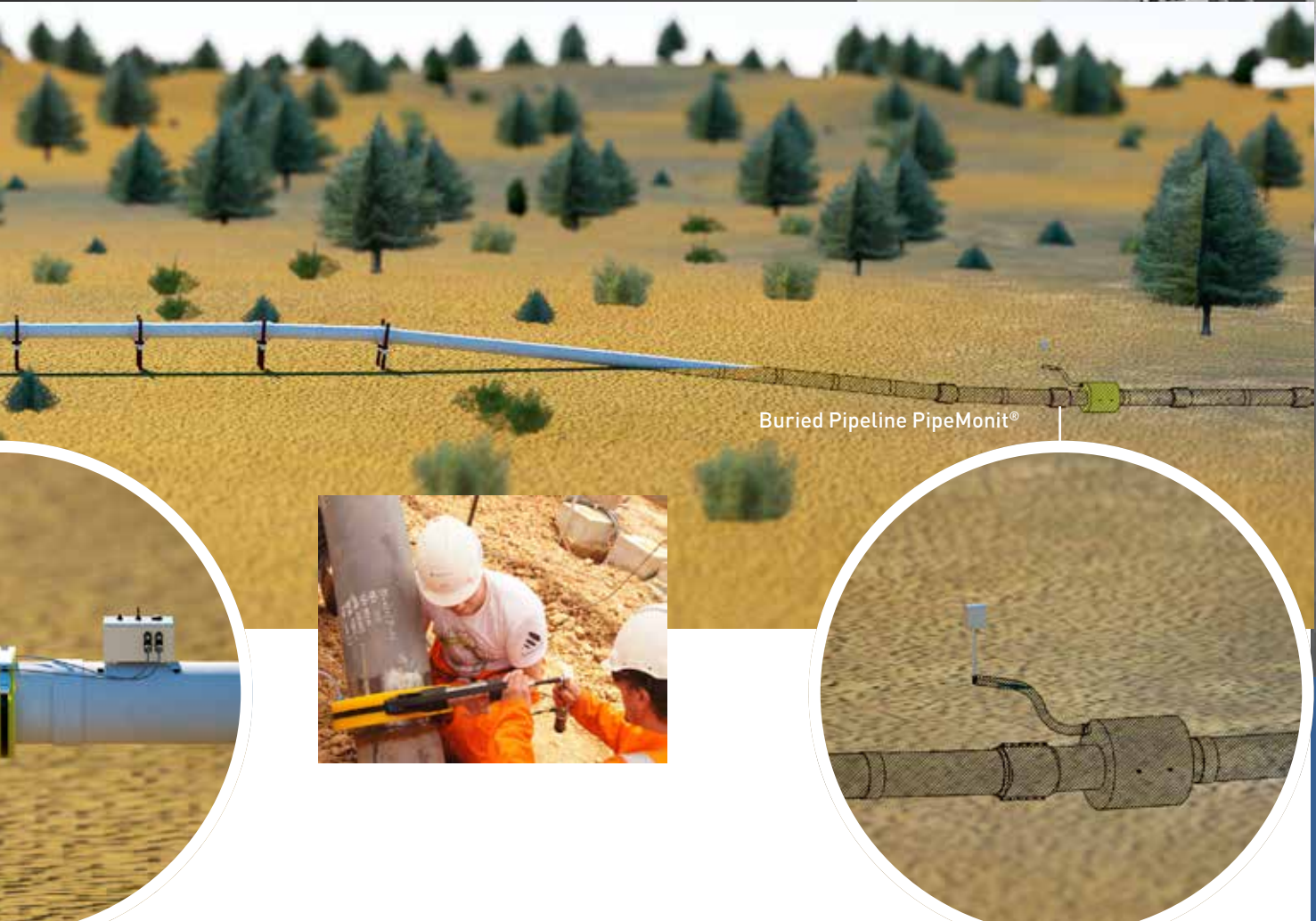
The ultrasound transducers measure wall thickness as a function of time and provide high resolution data on pipe wall loss. The sensor array can be clamped directly to a pipeline, a bend, on top of a weld seam or to a vessel or tank.

The Field Data Logger – FDL – operates the sensor array and communicates via USB, Bluetooth, Ethernet, RS485, OPC, Modbus protocols or GSM (cell phone network). If online communication is not available the data is stored locally and can be downloaded to a PDA using the PipeView® app. The FDL can be fitted with a long-life battery or hooked up to an external power supply.

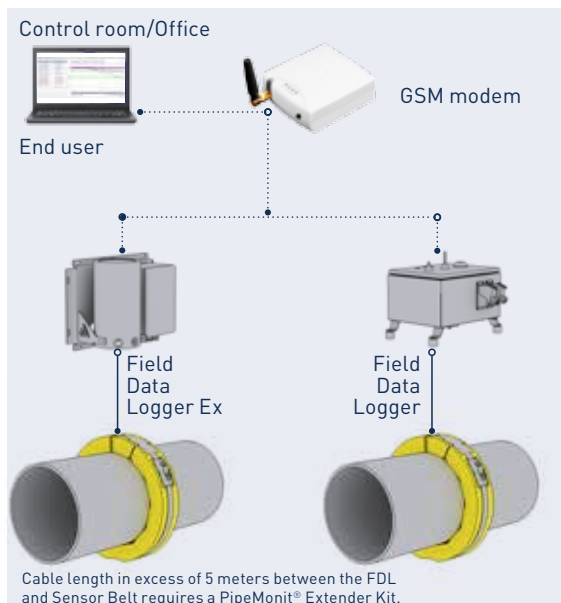
Corrosion data can be uploaded and viewed on any Windows based PC using the PipeView® app. As an alternative for wider distribution of monitoring

Network and interfaces





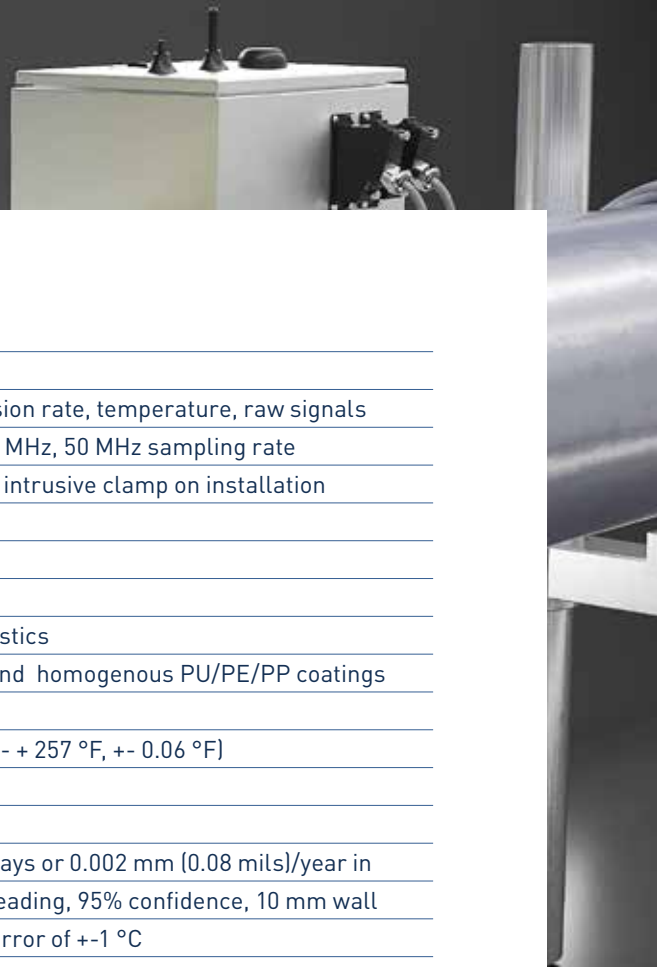
Network and interfaces



How do you install it?

- Remove dirt from pipe, and lubricate
- Clamp on the sensor array, and install the Data Logger or Controller
- Verify good ultrasound signals
- Done

Due to this very simple installation procedure, the PipeMonit® can be installed or moved at any time.



PRODUCT SPECIFICATIONS

TECHNICAL DATA

Output data:	Wall thickness, corrosion/erosion rate, temperature, raw signals
Transducers:	Pulse/echo 10 mm diameter, 5 MHz, 50 MHz sampling rate
Transducer quantity and matrix:	Flexible and configurable, non intrusive clamp on installation
Temperature range:	-40 to +90 °C [-40 to 194 °F]
Pipe size:	>= 2 inch OD (50 mm)
Wall thickness:	>3 mm (0.12 inches)
Wall material:	Steel or solid homogenous plastics
Coating materials:	Works through external FBE and homogenous PU/PE/PP coatings
Inclinometer:	± 2° (angular)
Temperature sensor:	-40 °C – + 125 °C, ± 0.1°C [-40 - + 257 °F, +- 0.06 °F]
Repeatability:	2.5 µm (0.1 mils)
Absolute wall thickness accuracy:	0.1 mm (4 mils)
Corrosion Rate Resolution:	0.04 mm (1.7 mils)/year in 30 days or 0.002 mm (0.08 mils)/year in 365 days assuming one daily reading, 95% confidence, 10 mm wall thickness and a temperature error of +-1 °C
ATEX certified:	Yes
PipeView® Software:	Runs on Windows operated PDAs and Computers. Used for commissioning and operation of PipeMonit® stations. Provides the end user with corrosion and erosion data, trends, wall thickness, temperature and raw signals
PipeView® Server:	Runs on Microsoft operated servers Communicates with PipeMonit® stations over internet, Ethernet or GSM. Provides secure Web access for end users/operators
Portable Data Collector:	ATEX portable tablet with PipeView® for collection of data via Bluetooth from installed Field Data Logger Ex
Portable Data Logger:	Rugged Windows based PDA with full PipeView® software. Powers and operates PipeMonit® stations over USB or communicates with Field Data Loggers over Bluetooth
Field Data Logger:	Autonomous operation of PipeMonit® stations. Powered by battery, 9-36 VDC or 110-240 VAC. Communicates over Ethernet (via hard cable) or wireless, Modbus TCP/IP, OPC, RS485, GSM, Bluetooth, USB
PipeMonit® Extender Kit:	Allows up to 1000 meter cable length between Field - or Portable Data Logger and local PipeMonit® Sensor matrix
PipeMonit® Controller:	Installed in lieu of a FDL enabling the station to be powered and operated by connecting a Portable Data Logger to the USB port

ELECTRICAL DATA

Power supply:	9-36 VDC – battery solution possible
Typical power consumption:	<6 W
Communication options:	Ethernet (via hard cable) or wireless, Modbus TCP/IP, OPC, RS485