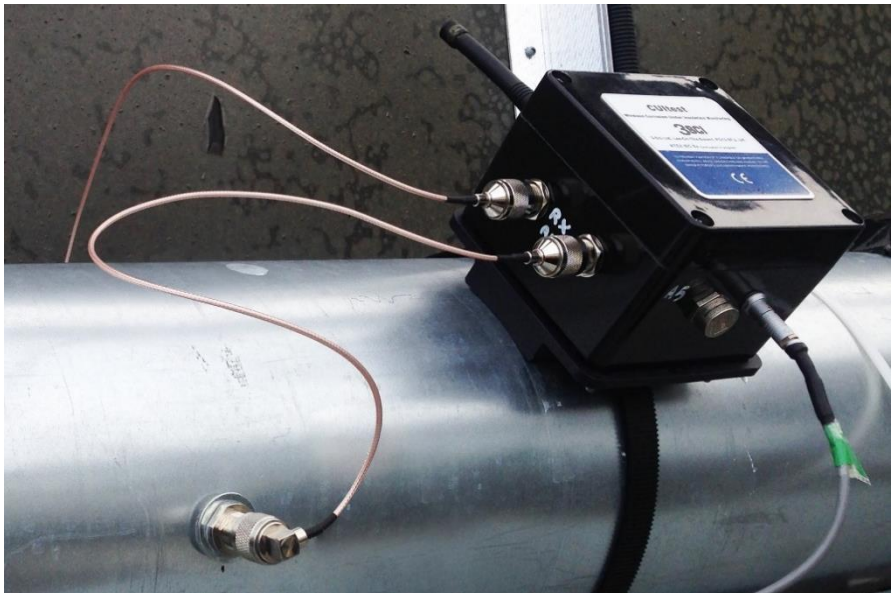
Wi-Corr® CUI

Easy-fit mitigation of Corrosion Under Insulation

Monitoring asset integrity and lowering operational risk



Wi-Corr® CUI is a revolutionary new monitoring system. Through a self-organising network of permanently installed, wireless enabled sensors, accurate measurements of moisture content of the thermal insulation over small or large distances can be obtained cost-effectively, so that the conditions that cause Corrosion Under Insulation (CUI) can be precisely monitored. This information allows concentrations and movements of moisture in insulation to be tracked over great distances, enabling a proactive approach in planning of turnarounds and timely preventative

CUI-related failures in process facilities and equipment are a major source of risk to upstream and downstream assets. Inspection of pipes by manual methods, or through deployment of imaging techniques involving Eddy Currents, X-rays, Neutron Back scatter, Thermography or Sacrificial Wires all have drawbacks due to invasiveness, costs and limited measurement range.

Escalating costs are incurred by deploying inspection teams to facilities, obtaining work permits, preparing scaffolding, or in abseiling to access difficult locations.

Unexpected CUI can be influenced by the presence and variations of liquid content in thermal insulation, caused by internal and external leaks. The severity of CUI varies with influences such as temperature, material types and structural geometries, making the optimised recurrence of manual inspections difficult to plan.

In response to these challenges, Wi-Corr® CUI has been developed to revolutionise the way CUI is assessed.

- Reduces operational risk with dispersed sensors
- Easy, quick, permanent or temporary installation on live plant.
- Low profile, wireless sensors, can be installed under insulation.
- Large or small sensor number deployments
- +5 year battery life, live plant replacement
- Automatic reporting and historical trending with easy-to-use software
- Measurements on demand 24/7
- Earliest possible detection of potential CUI problems
- 10 ppm moisture resolution over 30 metre pipe lengths
- 1m to 30 m range – straight pipes and bends
- Temperatures to 200°C (full coverage of CUI threat temperatures)

How does Wi-Corr® CUI work?

Wi-Corr® CUI uses small sensors inserted directly into thermal insulation. These sensors send and receive electromagnetic waves over tens of metres through the insulation, detecting the presence and quantity of liquids through variations observed in the transmitted signals. Data can then be transmitted wirelessly, back to the user automatically at pre-selected intervals, or by user command.

Measurements of the liquid content in insulation between sensors are sent back to a central controller over the air-borne Radio Frequency (RF) mesh network. Via the Wi-Corr software user interface, automatically-processed data revealing moisture content can be viewed and short and long-term trends examined of liquid content. The likelihood of CUI can then be deduced. Alarms can be set to warn the user of excessive liquid content. All this capability allows better process control and proactive planning of maintenance by the asset manager.

Increased safety

Installing a Wi-Corr® CUI system will reduce the need to repeatedly work at height to erect scaffolding, remove insulation and gain work permits in hazardous areas.

Self-organising network

Wi-Corr® CUI uses a 2.4GHz self-organising mesh network enabling coexistence with IEC 62591 (WirelessHART) which has been proven in cluttered environments. Data from 1000s of sensors are sent back to a central control hub for user viewing and advanced control. No lengthy cabling is required.

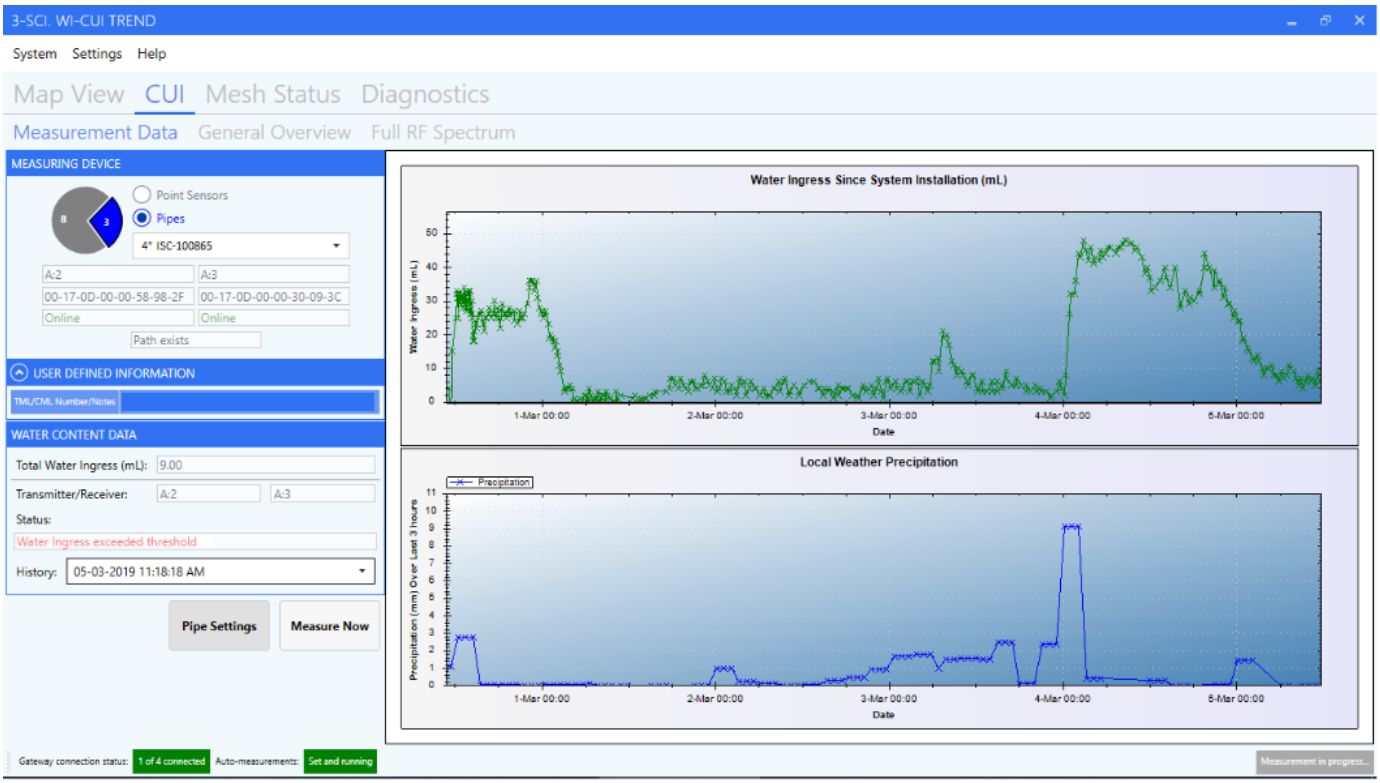
Measurement resolution

Wi-Corr® CUI sensors are state-of-the-art devices, demonstrating moisture content resolution of better than 10 ppm by volume in a typical 30 metre length of insulated pipe.

Wi-Corr® CUI is applied easily to straight or curved metal surfaces. Signals are transmitted over a wide range of pipe diameters travelling around 45° and 90° bends. Thermal insulation temperatures and humidity levels to resolutions of +/- 0.05°C and 1% relative humidity respectively are reported.

Ease of installation

The Wi-Corr® CUI sensors and network can be installed during normal plant operation, so no shutdown is required. Hand-held thermal-insulation insertion techniques mean that sensors can be installed in just a few minutes, without needing special work permits.



Wi-Corr user interface demonstrating a correlation between detected water ingress inside the cladding and local rainfall