



GUIDED ULTRASONICS LTD.

Technology you can trust.



PRODUCTS & SERVICES

**Inspection & Monitoring
Guided Wave Technology**

“ I trust this catalogue illustrates how our products and services support you in making well-informed decisions for the safe and efficient management of your facilities.

GUL has an unrivalled depth of knowledge in the development and application of guided wave technology to real-world challenges. Whether you are new to the field or have years of experience, we are committed to helping you achieve the best results with our inspection and monitoring solutions.

If you have specific needs that go beyond what is presented here, please don't hesitate to get in touch. Many of our most valuable advances have grown from working closely with clients to adapt our standard offerings to meet new requirements. We enjoy tackling new opportunities.”


Dr Brian Pavlakovic
Managing Director



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Guided Ultrasonics Ltd. - **GUL** - has been shaping the future of **Guided Wave Testing (GWT)** since 1999. From the start, our focus has been clear: to develop technologies that give inspectors and asset owners the insight needed to safeguard critical infrastructure.

What sets us apart is not only our technology but our culture. We bring together **skilled engineers, designers, and support teams** who share a commitment to technical **excellence, collaboration, and openness**. This combination of expertise and values enables us to understand client challenges and deliver practical solutions that work in the field.

Our systems are **used worldwide** on pipelines serving oil and gas, refining, chemical processing, transport, and power generation industries. They provide **actionable information without interrupting operations**, helping users detect corrosion, monitor integrity, and extend the life of their assets. We do not provide inspection services; instead, we enable others through advanced equipment, monitoring solutions, consultancy, and training.

With headquarters in London and offices in Houston (Texas, USA) and Kuala Lumpur (Malaysia), we support a global community of partners and clients. Backed by a strong representative network and a consistent record of innovation, GUL continues to redefine how guided wave technology sets standards for pipeline inspection and monitoring while contributing to safer, more reliable, and more efficient industries.

SCREENING



The **Wavemaker® System** is the most advanced and reliable guided wave screening system available. From a single test location, it provides 100% volumetric coverage of the pipe wall over large distances, enabling efficient detection of corrosion, erosion, and other integrity threats without interrupting operations.

Screening is particularly effective for:

- **In-service inspections** where shutdown is not possible
- **Repeat inspections** for trending and monitoring change over time
- **Difficult-to-access areas**, such as buried sections, insulated or elevated piping, and wall penetrations
- **High-temperature lines** where conventional inspection is impractical

This **large-area coverage** supports asset integrity programmes by identifying locations that require further investigation with local inspection methods, maximising efficiency while reducing inspection costs.

Applications

Guided wave screening is widely used across industries to optimise resources and target areas of concern. Typical applications include:

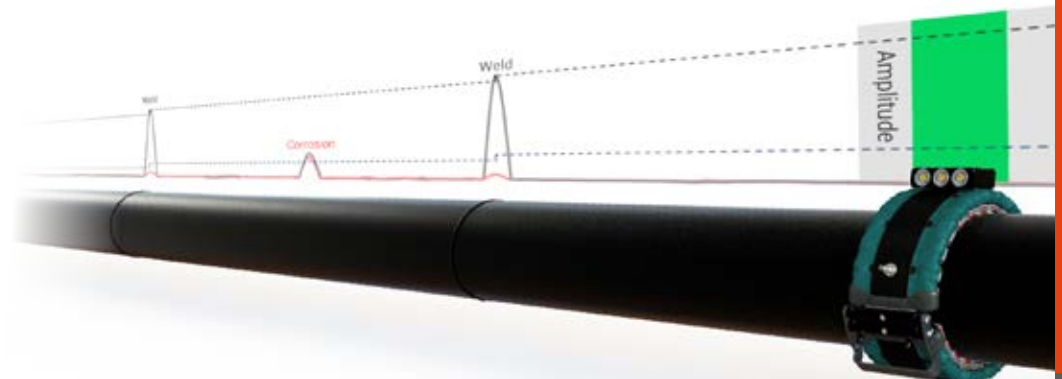
- Corrosion Under Insulation (CUI)
- Corrosion Under Pipe Supports (CUPS)
- Overhead piping
- Road crossings
- Wall penetrations
- Lines operating at up to 350°C
- Buried pipe
- Offshore risers
- Offshore caissons
- Subsea pipelines
- Repeat surveys
- Scheduled monitoring

Large-Area Coverage

A removable transducer ring is placed around the pipe at a convenient location. Transducers are spring or pressure loaded to achieve good shear contact without the need for couplant. Guided waves are excited in the pipe wall and travel many metres in both directions, reflecting from features such as welds, supports, or areas of corrosion. The returning signals are displayed as an A-Scan and an Unrolled Pipe view.

From a single location, this provides full volumetric coverage of the inspected length, showing the position, cross-sectional change, and circumferential extent of features or defects. These parameters determine the severity category of a defect.

By reaching distant regions from one test point, guided wave screening enables assessment of otherwise inaccessible or overlooked areas quickly and efficiently.



WAVEMAKER® G5

Wavemaker® G5 is our latest full-capability screening instrument, combining 32-channel performance, advanced processing tools, and robust field design in a portable unit. Its touchscreen interface, hot-swappable batteries, and connectivity options support uninterrupted field use and easy data transfer.

An on-board touchscreen computer runs the complete inspection process – setup, data collection, & analysis – without the need for a laptop, though remote PC operation remains available.

Its procedure-based interface and software-assisted feature recognition make it practical for both experienced inspectors and new users, ensuring consistent and reliable results.

Backward compatibility is built in: a new instrument to sensor cable supports existing rings, and enables the G5 to make full use of the of Compact® rings with TRIO modules.

While fully compatible with established systems, G5 is positioned as the platform for exciting new developments that will shape the future of guided wave screening.



Intuitive On-Board Control Interface



Touchscreen Control - 10.1" Ultra-Bright



Flexible Connectivity Options



Integrated GPS



Hot-Swappable Batteries



32 Data Channels



Extended Frequency Range



Remote Diagnostics



Quick On-Site Reporting



Operator ID - iButton Reader

Supplied with



WaveProV™ License



Accessories



Smart Battery (x2)



3m Sensor Cable



USB Laptop Cable



Mains Charger

Specifications

Number of Channels	32
Dimensions (W x H x D)	330 x 260 x 145 mm (8.5 x 12 x 5 inches)
Weight	4.4 kg (9.7 lbs)
Processing Options	Unrolled Pipe (EFC), Absolute Calibration, False Echo Simulation
PC Connectivity	USB, LAN, Wireless
Rings Compatibility	All GUL Screening Rings & non-ATEX Monitoring Sensors

COMPACT® RINGS

Compact® rings are designed for rapid deployment, with reduced weight, axial width, and radial clearance. Their lightweight build and easy-fit modules make them easier to transport, assemble, and use in the field.

When populated with TRIO modules, they provide both standard and high-frequency data without hardware changes, extending suitability to almost the full range of inspection conditions. With the Wavemaker® G5, this can be captured in a single pass, saving time and simplifying reporting.

For diameters above 24", two or more rings can be joined, with up to four supported when using the Wavemaker® G5. Alternatively, larger and non-standard sizes can be produced to special order.



Easy-Fit Modules



Pneumatic Loading



Smart Sensors



Ring Joining



Spring-Lock Latch



Ergonomic Design

Available Transducer Types



EC-TRIO

3-row transducer module with 42 mm & 21 mm spacing for an ultra-wide band frequency range without having to swap modules.



EC-LGN

3-row longitudinal mode transducer module for PHSMA compliant inspections.



EC-HD

2-row fixed space transducer module with four transducers per module to inspect at a high frequency range, which increases sensitivity.



EC-30

2-row transducer module with fixed spacing of 30 mm, for medium frequency inspection.

Specifications

Module Type	EC-LGN	EC-TRIO	EC-HD	EC-30
Number of Channels	24			16
Nominal Pipe Size (NPS)	6" to 40" (DN 150 to 1000)			
Operating Temperature	-40°C to 150°C (-40°F to 302°F)			
Radial Clearance	38 mm (1.5")			
Instrument Compatibility	Wavemaker® G5		Wavemaker® G5 or G4 ^{MINI}	

WavePro™ is a dedicated software for guided wave data acquisition, processing, and interpretation. It manages the complete inspection workflow: test setup, collection, validation, signal processing, feature recognition, analysis, and reporting.

Its advanced tools – Enhanced Focusing Capability (EFC), Absolute Calibration (AbsCal), and dynamic frequency controls – support accurate interpretation and characterisation of findings, ensuring consistent results across different inspectors and field conditions.

WavePro™ operates in two environments to suit different workflows: WaveProX™ on the Wavemaker® G5, or WaveProV™ on a connected Windows® OS computer.

- Seamless Frequency Sweeping
- Enhanced Focusing Capability (EFC)
- Absolute Calibration
- Rapid Data Processing
- Advanced Data Quality Checks
- Quick Schematic
- User Friendly
- Report Generator
- Routine Software Updates

WAVEPROX™



WaveProX™ is embedded in the Wavemaker® G5, enabling the entire inspection process to be performed directly on the instrument.

- **PC-free operation** simplifies logistics and setup.
- **Procedure-based workflow** & feature recognition tools support consistent data collection.
- Immediate **on-site results** allow rapid validation and reporting before leaving the location.
- Works fully offline, with **export via USB, LAN, or Wi-Fi** when required.

- Procedure-Based Operation
- Software-Assisted Feature Recognition
- Streamlined Data-to-Report Workflow

WAVEPROV™

WaveProV™ runs on a Windows® PC for operating the G5 remotely or for advanced analysis and reporting.

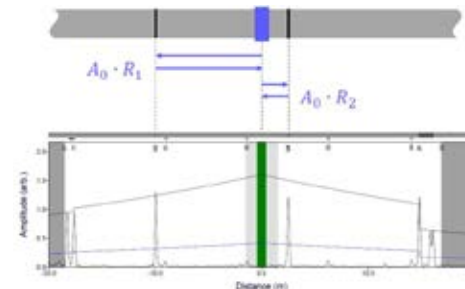
- Full control from a laptop replicates the traditional **workstation workflow**.
- Extended workspace for **detailed review and editing**.
- Supports large datasets, file management, & reporting.
- Ideal for **office-based validation, quality review**, and client deliverables.



- Multiple Connection Interface Options
- Windows® 7 to 11
- Extended Reporting Capabilities

A perpetual licence for use of the software is included with the Wavemaker®.

Absolute Calibration

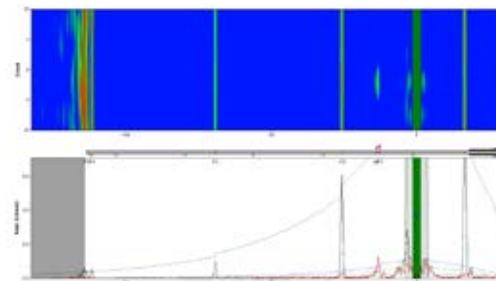


A-Scan with Absolute Calibration & Simulated Reverberation

Absolute Calibration (AbsCal) is our patented routine for automatic amplitude calibration and reverberation simulation. It calculates the Distance-Amplitude Correction (DAC) levels to ensure accurate assessment of indications, while simulated reverberation assists inspectors in identifying false echoes. WavePro evaluates whether the guided wave result under analysis is suitable for AbsCal.

- Amplitude Calibration
- Simulation of Reverberation Echoes

Enhanced Focusing Capability (EFC)



Unrolled Pipe Display (C-Scan)

EFC is the advanced post-processing method that uses Full Matrix Capture (FMC) data to focus guided wave signals, sharpening reflections from features and defects, improving data clarity.

It helps distinguish genuine indications from spurious responses, enhancing characterisation through better sizing, more precise circumferential orientation, and more precise circumferential extent.

The results are shown in the Unrolled Pipe view – a C-Scan type display of the reflections mapped on an unrolled image of the pipe – enabling inspectors to identify indications with greater confidence and accuracy.

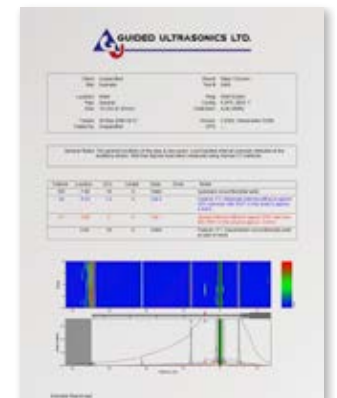
- Synthetic Focusing
- Orientation of Features

Report Generator

Built-in tools compile analysed data into clear, professional reports. A-Scan, Unrolled Pipe view, pipe schematic, notes, and photos are automatically combined into a concise document listing findings, with their positions and related annotations, and defects highlighted according to their assigned severity. This streamlines reporting, reduces workload, and ensures timely communication of results.

Reports can be exported in PDF, Word (RTF), or Excel format, giving users flexibility to adapt the content in their preferred editing software.

- Excel
- Word
- PDF





- Lightweight
- Built-In GPS
- On-Board Diagnostics
- Rechargeable Removable Battery
- 16 Data Channels
- High Speed Data Acquisition
- External PC Controlled
- Operator Identification

The Wavemaker® G4^{MINI} is our compact guided wave screening instrument, trusted since 2014 for its reliability and performance. Its lightweight design and powerful data acquisition make it practical for pipe screening in a wide range of environments.

The full capabilities of the G4^{MINI} are accessed through the WavePro4™ software, running on a connected computer. This delivers the traditional Wavemaker® features that allow inspectors to configure tests quickly, ensure data quality, interpret results with ease, and generate detailed reports.

WAVEPRO4™

Mains Charger

WavePro4™ software is used to operate the G4^{MINI}, running on a Windows® computer connected via USB or Ethernet cable. WavePro4™ continues to be supported, with its established functions kept up to date for data collection, analysis, and reporting.

- Seamless Frequency Sweeping
- Quick Schematic
- Report Generator

A perpetual licence for use of the software is included with the Wavemaker®.

Supplied with

- WavePro4™ License
- USB Cable
- 2 x 2.5m LEMO® Cables
- Ethernet Cable
- Soft Carry Bag

Specifications

Model	G4 ^{MINI} (Full)
Number of Channels	16
Dimensions (W x H x D)	300 x 220 x 130 mm (8.5 x 12 x 5 inches)
Weight	4.4 kg (9.7 lbs)
Processing Options	Unrolled Pipe (EFC), Absolute Calibration
PC Connectivity	USB, LAN
Rings Compatibility	GUL Screening Rings & non-ATEX Monitoring Sensors

Solid transducer rings are used for screening pipes with nominal sizes between 2" and 8". The ring is clamped to the pipe by tightening two ergonomic handles, firmly pressing the transducers onto the surface.

Standard configurations operate with torsional guided waves, requiring just two rows of transducers. Special versions can be manufactured in non-standard sizes, or with four rows of transducers to enable inspection using both torsional and longitudinal modes.

Precision Milled Body

Spring Loaded Transducers

Ergonomic Fastening Handles

Available Models



LITE

Key application areas include:

- Bare / Painted Pipes
- Sleeved / Unsleeved Road Crossing Pipes
- Buried Pipes



HT

Designed to inspect pipes operating at temperatures up to 350°C, in addition to the applications listed for LITE rings.

High Temperature Operation



HD

Designed to utilise a higher frequency regime for applications where increased sensitivity and resolution are required:

- Localised Pitting
- Concrete Anchor Supports
- Many welded supports

High Frequency Operation Capable

Specifications

Model	LITE	HT	HD
Number of Channels	16 ⁽¹⁾		16
Nominal Pipe Size (NPS)	2" to 6" (DN 50 to 150)	2" to 8" (DN 50 to 200)	3", 4", 6" (DN 80, 100, 150) ⁽²⁾
Operating Temperature	-40°C to 150°C (-40°F to 302°F)	-40°C to 350°C (-40°F to 662°F)	-40°C to 250°C (-40°F to 482°F)
Radial Clearance	76 mm (3")		51 mm (2")
Instrument Compatibility	Wavemaker® G5 & G4 ^{MINI}		

⁽¹⁾ 12 channels for 2"

⁽²⁾ For 2" & under check Claw Transducers

INFLATABLE RINGS

Inflatable transducer rings are available for screening pipes with nominal sizes from 6" upwards, using pneumatic pressure to hold the transducers evenly against the pipe surface.

Interchangeable transducer modules are used to populate the rings, so one set can be applied across different sizes. Different module types are available to suit a wide range of applications.

For diameters above 36", two smaller rings can be joined. Alternatively, non-standard and larger sizes up to 60" can be produced to special order.



Pneumatic Loading



Ratchet Latch



Ring Joining

Available Models



Standard EFC

Key application areas include:

- Bare / Painted Pipes
- Unsleeved Road Crossing
- Localised Pitting
- Buried Pipes
- Sleeved Road Crossing
- Many welded supports



HT

Designed to inspect pipes at up to 300°C, when used with HT modules, in addition to standard applications.



High Temperature Operation



Smart Sensors



HD

Designed for applications where higher sensitivity and resolution are required when used with HD modules.



High Frequency Operation Capable



Smart Sensors

Specifications

Model	EFC	HT	HD
Number of Channels	16 ⁽¹⁾		
Nominal Pipe Size (NPS)	6" to 36" (DN 150 to 900)		
Operating Temperature	-40°C to 150°C (-40°F to 302°F)	-40°C to 300°C ⁽²⁾ (-40°F to 572°F)	-40°C to 150°C (-40°F to 302°F)
Radial Clearance	63 mm (2.5")		
Instrument Compatibility	Wavemaker® G5 & G4 ^{MINI}		

⁽¹⁾ 12 channels for 6"

⁽²⁾ HT modules required for temperatures > 150°C

TRANSDUCER MODULES

Modules for inflatable rings have two rows of transducers. Transducer spacing and configuration define the frequency regimes each module can cover. Together with its temperature rating, this determines suitability for different applications.

The ring-module combination must be carefully chosen to match the requirements of the application. All module types can be installed in any inflatable ring, though not every combination is suitable for all conditions.



Interchangeable



Spring Lock Easy Install

Available Module Types



Standard

Fixed-spacing module for medium frequency regime inspection. Application areas include:

- Bare / Painted Pipes
- Sleeved / Unsleeved Road Crossing



Adjustable

Module with four possible transducer spacings to cover a wider frequency range. Can be used on HT rings when full temperature range is not required, and on HD rings when maximum resolution is not needed.

In addition to those for Standard modules, application areas include:

- Buried Pipes
- Pipes with General Corrosion
- Inspections for Localised Pitting
- Pipes with many Welded Supports



HT

Adjustable module with four transducer spacings designed for use on pipes operating at temperatures up to 300°C when installed on HT rings, in addition to the applications listed for Standard and Adjustable modules.



HD

Fixed-spacing module with four transducers (two per row), operating at a higher frequency regime for increased sensitivity and resolution when installed in HD rings. It extends the applications of Standard and Adjustable modules to cases where higher resolution becomes critical.

Application Suitability





Ring Model	Standard EFC		HT		HD	
Module Type	STD	ADJ	HT	ADJ	HD	ADJ
Generic Pipe	●	●	●	●	●	●
General Corrosion	●	●	●	●	●	●
Supports	●	●	●	●	●	●
High Temp (>150°C)	●	●	●	●	●	●
Concrete Interface	●	●	●	●	●	●
Buried Pipe	●	●	●	●	●	●

● RECOMMENDED

● SUITABLE

● NOT SUITABLE



-  Tube Applications
-  High Frequency Operation Capable
-  Spring Loaded Transducers
-  Precision Milled Body
-  Ergonomic Fastening Handles

Claw is designed for efficient screening of boiler tubes and other small-diameter pipes, particularly in restricted access areas. Its compact shape and spring-loaded grip allow fast attachment without additional tooling.

Two-row and four-row models are available to suit different inspection requirements. Claw is suitable for guided wave inspection of:

- Boiler Tubes
- Heater Tubes
- Furnace Tubes
- Anchor Rods

Available Models

Model		Minimum OD	Maximum OD	Suitable for	
2-Row	4-Row			Tube size	or Pipe size
R2G19	R4G19	17 mm	22 mm	0.75"	-
R2G25	R4G25	23 mm	28 mm	1"	0.75"
R2G31	R4G31	30 mm	35 mm	1.25"	1"
R2G38	R4G38	38 mm	43.2 mm	1.5"	1.25"
R2G44	R4G44	43.5 mm	48.5 mm	1.75"	1.5"
R2G50	R4G50	47.5 mm	52.5 mm	2"	1.5"
R2G57	-	55.5 mm	60.5 mm	2.25"	-
R2G63	-	59.5 mm	64.5 mm	2.5"	2"

Specifications

Model	2-Row	4-Row
Number of Channels	8	16
Nominal Pipe Size (NPS)	¾" to 2.5" (DN 20 to 65)	¾" to 1.5" (DN 20 to 40)
Operating Temperature	-40°C to 250°C (-40°F to 482°F)	
Radial Clearance	38 mm (1.5")	38 mm (1.5")
Axial Clearance	7.5 mm (3")	15 mm (6")
Instrument Compatibility	Wavemaker® G5 & G4 ^{MINI}	



-  Low Profile
-  Precision Cast Body
-  Ergonomic Handles

Slinky is an ultra-low profile ring designed to fit around pipes with very limited radial clearance, such as those found in culverts or pipe racks. With less than 25 mm of clearance needed, they can be mounted in spaces where other rings cannot fit.

By design, Slinky rings cover a narrower pipe size range than traditional solid rings. Standard configurations cover API nominal pipe sizes within API 5L tolerance.

They are suitable for inspection of low-clearance:

- Bare / Painted Pipes
- Sleeved Pipes
- Insulated Pipes

Available Transducer Types

Slinky rings use three distinct models of 2-row transducer modules. Each model has a fixed transducer spacing which determines the frequency regime of the inspection.



Green

High frequency



Blue

Medium frequency

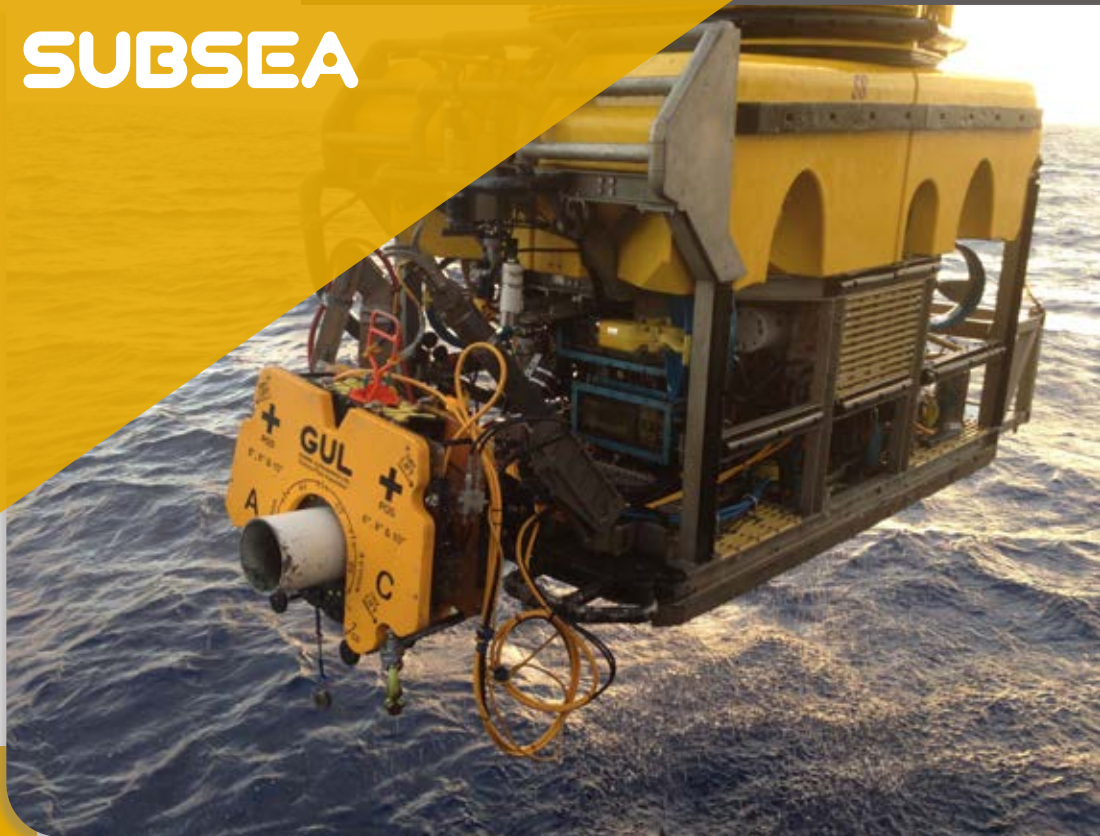


Red

Low frequency

Specifications

Number of Channels	8 to 16
Nominal Pipe Size (NPS)	2" to 8" (DN 50 to 200)
Operating Temperature	-40°C to 120°C (-40°F to 248°F)
Radial Clearance	25 mm (1")
Instrument Compatibility	Wavemaker® G5 & G4 ^{MINI}



Through extensive offshore experience in the North Sea, Mediterranean, Gulf of Mexico, and Caribbean, **GUL Subsea** systems have developed into a dependable modular solution for underwater guided wave inspection.

Designed to adjust easily to different pipe sizes, our subsea rings can be deployed by remotely operated vehicles (ROVs) or divers. From a single position, they deliver large-area coverage, providing detailed insight into asset condition without the need for intrusive methods.

Typical applications include risers, caissons, flowlines, tie-ins, and splash-zone sections. Subsea rings make it possible to:

- **Screen unpiggable pipelines** for internal or external corrosion and erosion
- **Inspect beneath weight coatings and insulation** with minimal cleaning or excavation
- **Provide immediate on-site results**, enabling ROVs or divers to follow up indications directly

SUBSEA INSPECTION



ROV Deployed

A Subsea G4^{MINI} is mounted on the ROV. A hydraulic connection is used for opening and closing the ring. The test is carried out from the ROV control room.



Diver Deployed

The test is controlled via an umbilical from a topside interface box to the Wavemaker instrument. The rings are installed on a clean section of pipe by 1 or 2 divers using a mechanical clamping mechanism.

Specifications

Deployment Type	ROV	Diver
Number of Channels	12	12
Nominal Pipe Size (NPS)	6" to 10" (DN 150 to 250)	4" to 26" (DN 100 to 650)
Operating Depth	Down to 3,000 msw	Any diver depth
Instrument Compatibility	Wavemaker® Subsea G4 ^{MINI} only	Wavemaker® G5 or G4 ^{MINI} (< 50m depth) Subsea G4 ^{MINI} (> 50m depth)



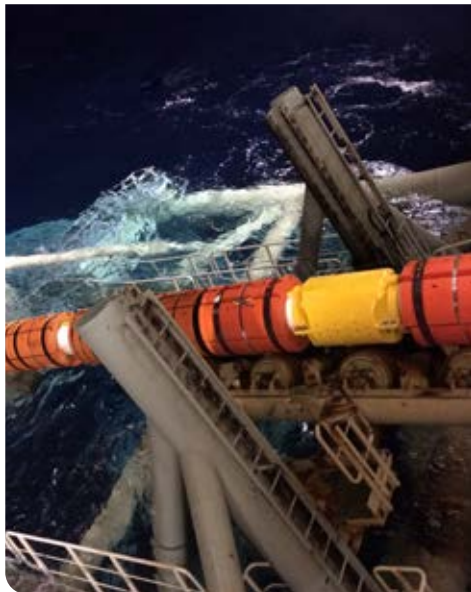
gMAT

A magnetic, flexible and lightweight transducer ring for diver installation, designed for easy transport and rapid deployment offshore. Approved for airfreight on commercial flights, it is highly portable and provides an effective solution for subsea screening and monitoring across a wide range of pipe sizes.

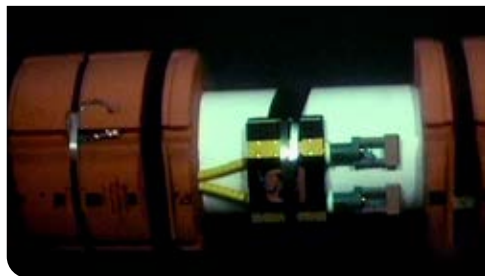
Specifications

Deployment Type	Diver
Number of Channels	Variable
Nominal Pipe Size (NPS)	8" (DN 200) and above
Operating Depth	Any diver depth
Instrument Compatibility	Wavemaker® G5 or G4 ^{MINI} (< 50m depth)

SUBSEA MONITORING



gPIMS® Subsea sensor during pipeline installation

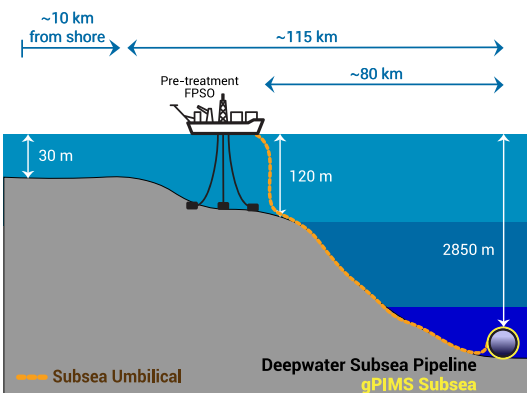


gPIMS® Subsea sensor having reached a depth of 873 m

GUL Subsea solutions extend guided wave monitoring to deepwater environments, providing the same combination of precise wall thickness measurement and large-area coverage, while reducing offshore inspection costs and risks.

gPIMS® Subsea sensors can be installed on new pipelines before lay, with a design life exceeding 20 years, or retrofitted at critical tie-ins and transition points. Field deployments have proven reliable at depths of up to 3,000 m, with sufficient sensitivity to detect small cross-sectional changes over extended ranges.

When coupled with a **Subsea FCU** (Field Control Unit) connected to a subsea umbilical, operators obtain real-time information from the most inaccessible pipelines.



Real-time monitoring data from deepwater pipelines

In shallower waters, magnetically attached sensors can be retrofitted by divers. Solutions can be tailor made to suit a large number of cases, including configuration for ROV or diver data retrieval.

Applications include monitoring Corrosion-Resistant Alloy (CRA) to carbon steel transition points, giving confidence that corrosion rates remain within tolerance in the carbon steel.

G-SCAN RAIL TRACK SCREENING



G-Scan is a **rapid rail inspection system** that can be deployed on tracks during normal operation. It screens the entire rail cross-section in a single test by using several guided wave modes simultaneously. As each mode carries energy in different parts of the rail, reflections reveal location of defects such as corrosion in any section, including the foot.

The G-Scan is suitable for screening:

- General rail
- Rail welds of all kinds
- Level crossings
- Tunnels

Specifications

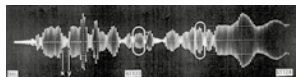
Number of Channels	26
Rails Sizes	CEN60, CEN56, CEN54, CEN50
Operating Temperature	-40°C to 120°C (-40°F to 248°F)
Instrument Compatibility	Wavemaker® G4

GUIDED ULTRASONICS LTD.

Global Leader in Guided Wave Technology

Result of first attempt without a full understanding of guided waves.

Source: Bartle, P. M. (1987). "Acoustic pulsing monitoring: principles operational requirements and potential," The Welding Institute, Abington, Cambridge

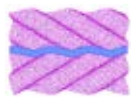


Transducer ring, early site test (circa 1994)

Dolphin Lab System developed.



Method and Transduction patented by Imperial College (Alleyne & Cawley).



Disperse software released (Lowe & Pavlakovic).



WavePro™ software developed based on site experience and customer feedback.

Guided Ultrasonics Ltd. is formed in 1999. Malcolm Russell is elected first chairman.



SE16 System launched.

Rail inspection development started.



1986

1992

1994

1996

1998

1999

2000

Wavemaker® G4 launched. Introduces new advances in Guided Wave Testing.



Modular range of Subsea rings first used.



High Temperature rings released. Can be used on pipes at 350°C.



gPIMS® Corrosion Monitoring sensors. Starts the revolution.



First PIMS installed.

First subsea inspection.



2004

2012

High Definition rings released. Improved performance for small defects.



Patented Absolute Calibration routine introduced (GUL).



Patented Quantitative Short Range (QSR) device.



Claw transducer for boiler tube inspection released.

Unrolled Pipe Display and focusing released in WavePro™.



Wavemaker® G3 launched. Set the standard for Guided Wave Testing for almost a decade.

Tube inspection tool developed and released.



2014

2016

2018

2019

2022

2024

2025

Wavemaker® G4mini launched. Lightweight and powerful.



Compact® rings launched. Lightweight, fast, efficient, and reliable.



QSR1® launched. Ground-breaking technology.



gPIMS® FCU launched. Autonomous Monitoring.



Studio Suite™ launched. From Sensor to Desktop.



QSR® Axial Scanner is launched. Opening more possibilities.



gPIMS® HT sensors are released. Monitoring on pipes at 200°C.



Wavemaker® G5 Next Generation Guided Wave Technology

SCANNING



The **QSR® System** is the first quantitative guided wave system, developed to measure remaining wall thickness in areas not easily accessible or hidden from direct inspection.

This patented **Quantitative Short Range** technology employs EMAT transducers, which make it relatively **tolerant of surface roughness**, and uses advanced frequency-based signal processing to deliver accurate **corrosion sizing**. The results provide detailed **wall thickness profiles** that illustrate the extent of any wall loss, offering inspectors the information necessary to determine the next course of action.

QSR® allows inspectors to:

- Quantify **Corrosion Under Pipe Supports (CUPS)** without lifting
- Measure wall thickness beneath external **scabs** without disturbance
- Assess **penetrations** where conventional inspection is not practical

Among its wider applications, **Scanning** can also be used to verify the severity of inaccessible indications identified through **Screening**, making the two methods **complementary** within asset integrity programmes.

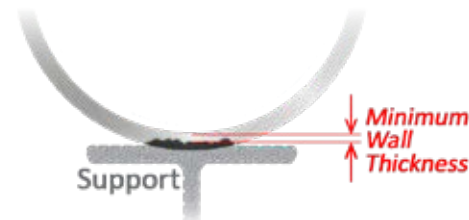
Applications

Guided wave scanning is used where corrosion must be quantified rather than just detected. Typical applications include:

- Simple supports
- Clamped supports
- Wall penetrations
- Sleeved penetrations
- Insulated penetrations
- External corrosion scabs



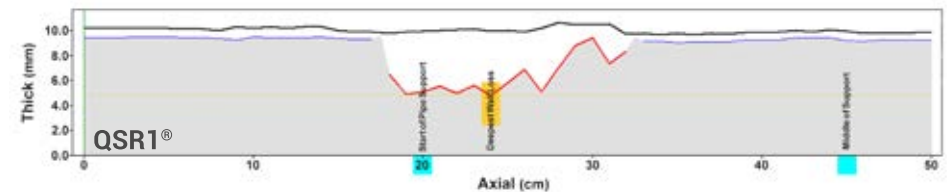
Thickness Profile



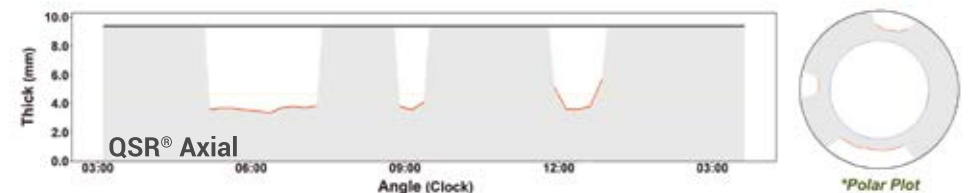
The QSR® system automatically measures:

- Average Wall Thickness
- Minimum Remaining Wall Thickness

When using the QSR1® circumferential scanner, the wall thickness profile is plotted against axial distance along the pipe.



When using the QSR® Axial scanner, the profile is plotted against circumferential position (angle) or distance around the pipe, accompanied by a polar view of the findings.



QSR1® - CIRCUMFERENTIAL

The QSR1® moves axially along the top of the pipe, sending guided waves around its circumference to generate a thickness profile of the area of interest. The system provides a quantitative measure of the average wall, as well as the remaining pipe wall thickness.



-  Lightweight - 12 kg / 26.5 lbs
-  Robust Design
-  Semi-Automated Scanning
-  Built-In GPS
-  Operator Identification



Supplied with

-  WaveProQSR™ License
-  USB Cable
-  Transport Case
-  Ethernet Cable




Specifications

Nominal Pipe Size (NPS)	6" to 24" (DN 150 to 600)
Pipe Thickness	6 mm to 13 mm (0.236" to 0.512")
Operating Temperature	-20°C to 70°C (-4°F to 160°F)
Communications	USB, LAN
Clearance	Varies according to diameter. Special frames available for limited clearance.

QSR® - AXIAL

The QSR® Axial combines with the QSR1® electronics pod to send guided waves axially along a pipe. This orientation allows even further applications for the QSR® System, like clamped supports, wall penetrations, and air-ground interfaces. The Traction Unit allows for Motorized Scanning of pipes between 6" and 16" (DN 150 to 400) in diameter.



-  Lightweight - 9 kg / 20 lbs
-  Low Profile
-  Semi-Automated Scanning



Traction Unit for Motorized Scanning

Supplied with

-  QSR® ePOD Adapter Cable
-  Transport Case






Specifications

Nominal Pipe Size (NPS)	Manual Scan:	4" to 48" (DN 100, DN 450 to 1200)
	Motorized Scan:	6" to 16" (DN 150 to 400)
Pipe Thickness		6 mm to 15 mm (0.236" to 0.590")
Operating Temperature		-20°C to 70°C (-4°F to 160°F)
Clearance	Sensor:	Less than 28 mm (1.1")
	Traction Unit:	Less than 85 mm (3.4")

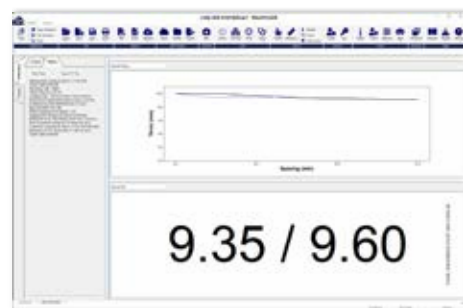
WaveProQSR™ controls the configuration and collection of QSR® data in real time. After collection, it conducts automated quality checks and supplies powerful tools for analysis and reporting.

The software runs on Windows®, connecting to the QSR® ePOD via USB or Ethernet. It also interfaces with the Scanning Studio platform for further automation of validation and reporting, improving consistency and shortening inspector training time.



-  Automated Configuration
-  Advanced Data Quality Checks
-  Rapid Data Processing
-  Reporting & Exporting Functions
-  Routine Software Updates
-  Windows® 7 to 11

Automated Configuration



Automated Configuration Result

WaveProQSR™ automatically optimises configuration parameters based on the detected pipe diameter, wall thickness, and coating. These routines reduce setup time and minimise likelihood of settings errors.

Throughout the scan, the software adapts continuously to **ensure the optimum data set is acquired at each location** along the scanned pipe section.

Reporting & Exporting

The system records both the average and minimum remaining wall thickness for each scanned location. The resulting thickness profile forms the basis of the report and can be **exported to a spreadsheet for FFS calculations** or saved directly as a PDF.

Analysed data can also be uploaded to Scanning Studio for assistance with validation and reporting.



Excel



PDF



Scanning Studio is a web-based post-processing platform for QSR® data. It **streamlines the analysis, validation, and reporting** of scans collected with WaveProQSR™, ensuring efficient workflow management.



Uploaded data is securely stored for centralised access, file organisation, & traceable record keeping. **Built-in AI and Machine Learning** algorithms, trained on millions of data points, can assist inspectors with automated analysis of QSR1® files to support accurate and repeatable results.

By providing **consistent data interpretation and reducing variability** linked to differences in experience or levels of fatigue, this platform enables inspectors to focus on critical areas and make better use of available resources, an essential aspect of advanced NDT work.

Reports are fully **customisable** and can include graphs and photographs. They can be exported as PDFs or spreadsheets for integration into client documentation or asset management systems.



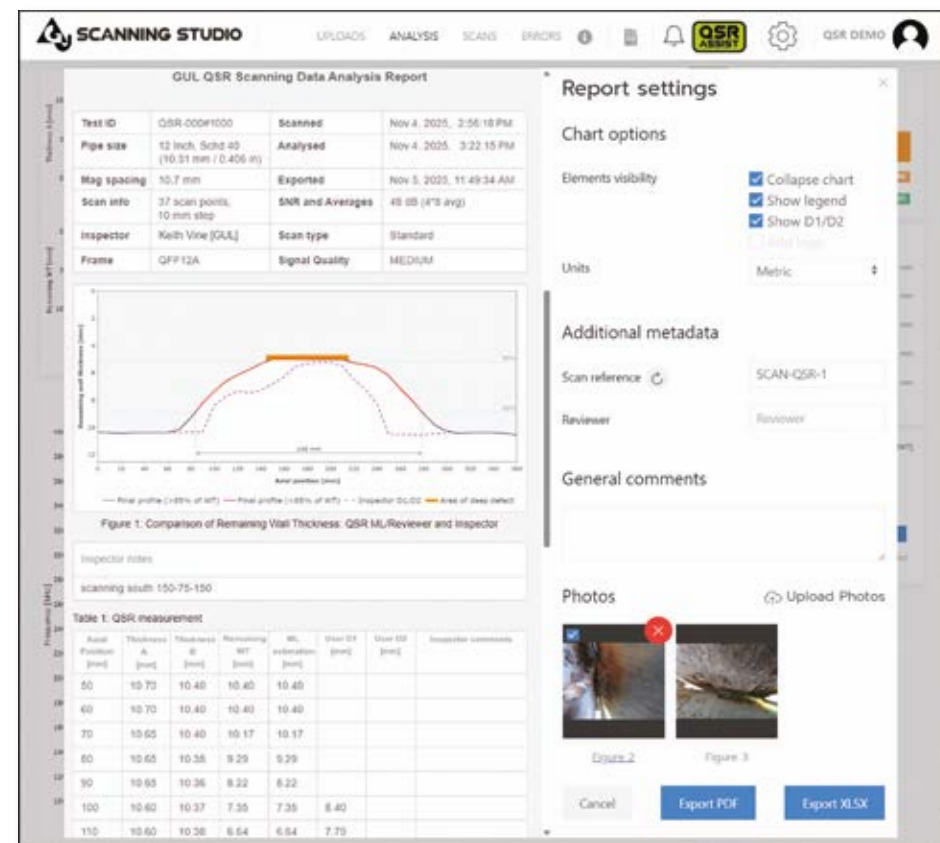
Upload & Analyse



File Manager



Report Generator



Scanning Studio - Generate Report

MONITORING



gPIMS® (Guided Wave Permanently Installed Monitoring System) continuously monitors pipework for corrosion and erosion, providing insight into the impact of operating decisions on integrity. This enables better-informed choices that enhance regulatory compliance, safety, and profitability.

The system **tracks wall thickness** at the sensor location and provides **large-area coverage** along the pipe to discover randomly occurring defects away from the sensor. Frequent collection intervals further improve sensitivity and reliability.

Monitoring systems deliver this through:

- Permanently installed **robust sensors** on the pipe
- Data collection via **temporary or permanent electronics**
- Signal processing with software built on **decades of expertise**
- Results presented in **Monitoring Studio**, showing how features evolve
- **Export** to historians for correlation with operational conditions

Applications

Guided wave monitoring supplies continuous data to support maintenance, operations, and compliance.

- **Midstream** – risk mitigation in variable flow and pressure
- **Refineries** – corrosion trend tracking for process optimisation
- **Offshore & Subsea** – integrity monitoring in restricted access areas
- **Power & Nuclear** – corrosion management at high temp & radiation
- **Geothermal & Renewables** – high-corrosion, high-temperature loops
- **Mining** – erosion and slurry wear tracking in harsh environments

Dual Capability

Small Area Thickness Monitoring

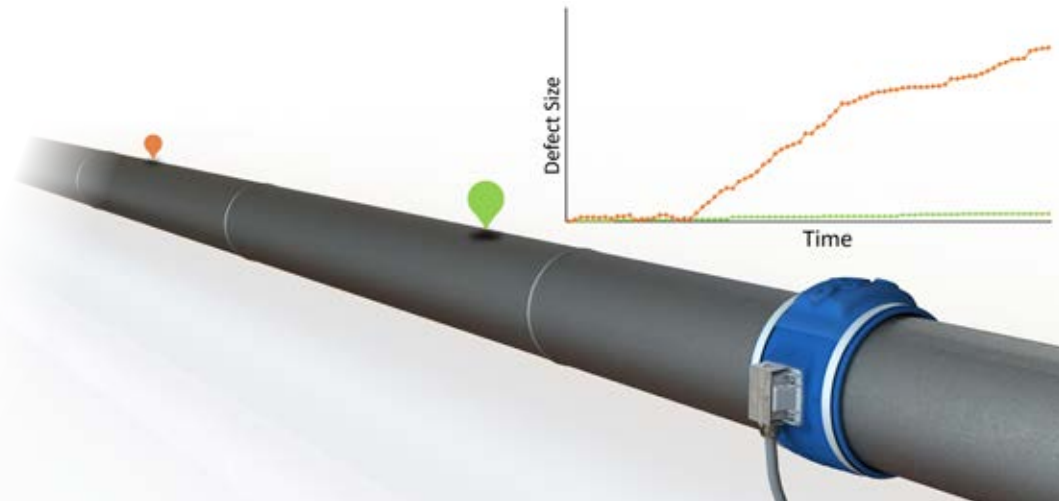
The wall thickness underneath the sensor can be tracked in eight segments around the pipe circumference.

The guided wave method used by gPIMS® is tolerant of rough corrosion surfaces and is accurate to within tens of microns.



Large Area Corrosion Monitoring

Corrosion can be detected and tracked anywhere within the diagnostic length along the pipe. Frequent data collection and advanced signal processing - via Monitoring Studio - achieves sensitivities better than 1% cross-section change.





Monitoring Studio is a user-friendly platform for viewing data generated by our monitoring systems, analysing it for information such as corrosion rates, and generating reports.

It is a secure portal that provides engineers with easy access to current and historical data from their desktop or mobile devices, supporting quick, informed decision-making.

- Data Management
- Data Audit & Review
- Secure Data Storage
- Data Interpretation
- Powerful Analytics
- Secure Data Export

Wall Thickness & Corrosion Rate

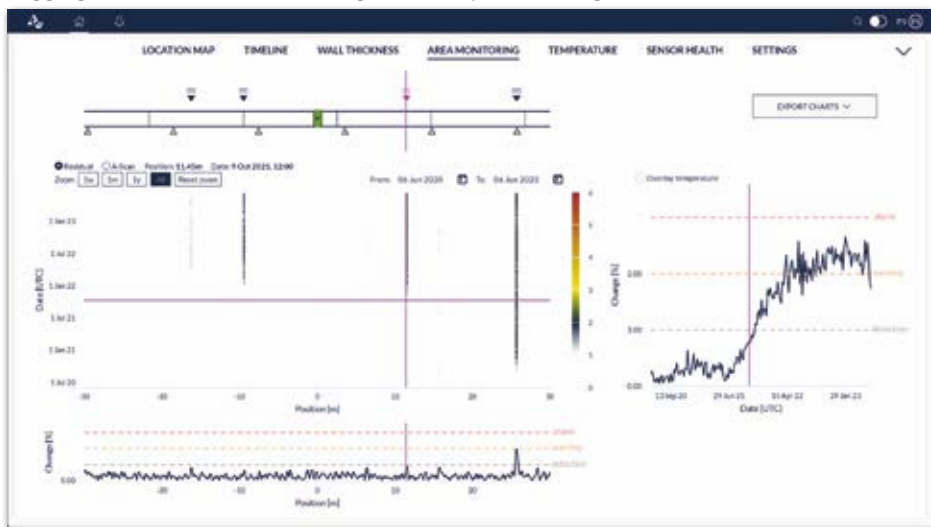


Wall thickness data, after applying temperature compensation, is displayed as trend plots for each of the eight segments covering the full pipe circumference at the sensor location.

Corrosion rates can be calculated automatically when automated systems are in use, or evaluated manually in all cases.

Area Monitoring

Available for automated systems, this mode features a trend map for easy identification, logging, and visualisation of changes that require tracking over time.



The Field Control Unit (FCU) samples data from gPIMS® Sensors which provide both thickness and large area monitoring data.

The gPIMS® FCU collects data automatically without the need for a Wavemaker® instrument nor a standard orange connection box. This unit can be retrofitted to most existing models of gPIMS® Sensors.

- Dual Capability
Thickness Monitoring
- Automatic Collection
- GUL
Monitoring Studio
- ATEX / IECEx
version available
- Rechargeable Battery
(for non-EX)
- Solar Recharge Option
(for non-EX)

Available Configurations

USB

A unit designed for periodic manual data retrieval. The unit stores a copy of the collected data in an easy-to-access USB Key.

4G

Designed for autonomous data upload, this unit is supplied with an active 4G SIM Card that works in most countries.

EX

An ATEX/IECEx certified unit for use in hazardous atmosphere restricted areas, designed for autonomous data upload via Wi-Fi network.

Specifications










Configurations	USB	4G	EX
Number of Channels	16		
Sensor Compatibility	gPIMS® Sensors		gPIMS® EX Sensors
Typical Battery Life	500 Collections	250 Collections	500 Collections
Solar Panel Charging	Compatible with GUL Supplied Panel		Not Available
Cellular Modem (LTE/UMTS/GSM)	--	Quectec EG21-G	--
Internal Data Storage	Minimum 8GB (Archives last 2000 Collections)		
Removable Data Storage	USB Key		--
Configuration Interface	Wi-Fi		

gPIMS® SENSOR RINGS

gPIMS® sensor rings are an environmentally robust range of sensors developed to be easily bonded onto pipes. Once installed and sealed, they remain in place to provide both small area (thickness beneath the sensor) and large area monitoring data.

Each sensor connects by cable to either an automated Field Control Unit (FCU) or an easy-to-access connection box.

When linked to a connection box, a licensed Wavemaker® configured for repeat testing is required to obtain data. The instrument detects the collection settings, allowing use by operators with minimal training.

-  Low Profile
-  Smart Sensors
-  Dual Capability
Thickness Monitoring
-  ATEX / IECEx
version available
-  Advanced Materials
-  Efficient Installation
-  GUL
Monitoring Studio
-  Environmentally
Protected
-  Save Costs

Available Models



EFC

A 16-channel gPIMS® ring kit for applications in higher consequence areas that do not require hazardous area certification.

EX

An ATEX/IECEx certified 16-channel gPIMS® ring kit for use in restricted areas where hazardous atmospheres may be present.












gPIMS® HT SENSOR RINGS

gPIMS® HT sensor rings are purpose-built for high-temperature service and designed for long-term use once sealed onto the pipe. This variant is suited to applications such as process piping, can be installed under insulation, and is available in an intrinsically safe version for use in hazardous areas.

These sensors connect via cable to a gPIMS® Wi-Fi Field Control Unit (FCU) for automated data collection.

In non-hazardous locations, they may also be connected to a licensed Wavemaker® through a connection box to perform repeat manual testing.

-  High Temperature
Operation
-  Smart Sensors
-  Dual Capability
Thickness Monitoring
-  ATEX / IECEx
version available
-  Advanced Materials
-  Efficient Installation
-  GUL
Monitoring Studio
-  Environmentally
Protected
-  Save Costs

Available Models



HT

A 16-channel gPIMS® ring kit for applications in higher consequence areas that do not require hazardous area certification.

EX-HT

An ATEX/IECEx certified 16-channel gPIMS® ring kit for use in restricted areas where hazardous atmospheres may be present.

Specifications

Model	EFC	EX
Nominal Pipe Size (NPS)	3" to 72" (DN 80 to 1800)	6" to 48" (DN 150 to 1200)
Pipe Thickness	3 mm to 50 mm (0.12" to 2")	
Operating Temperature	-40°C to 90°C (-40°F to 194°F) / 130°C (266°F) with special order	
Radial Clearance	25 mm (1")	
Sensor Axial Length	200 mm (8")	

Specifications

Model	HT	EX-HT
Nominal Pipe Size (NPS)	2" to 48" (DN 50 to 1200)	
Pipe Thickness	3 mm to 50 mm (0.12" to 2")	
Operating Temperature	-40°C to 200°C (-40°F to 392°F)	
Radial Clearance	40 mm (1.6")	
Sensor Axial Length	220 mm (8.7")	

TRAINING



As with all inspection methods, proper training of guided wave inspectors is a critical component in developing the technology. **Skilled inspectors** make a real difference to the usefulness of results for asset owners, which is why GUL has always placed strong emphasis on training.

For **over 25 years**, GUL Training (GULT) has delivered an **industry-leading programme** that combines unique expertise in guided waves with a focus on equipping trainees with the knowledge and mindset needed for success. More than 3,000 inspectors have been trained worldwide, with over 50 courses delivered each year.

All training follows the **Guided Ultrasonics Limited Training (GULT) Qualification and Certification Scheme**, the only approved route for operating GUL equipment. Aligned with international standards, the scheme provides a pathway from introductory to advanced levels across GUL Screening, Scanning, & Monitoring.

GULT **qualification courses** are available as **company-dedicated** sessions at client premises or as **open courses** held at GUL offices. GULT also offers **appreciation courses** tailored to meet specific client requirements.

Qualification and Certification Scheme

GULT runs the Qualification and Certification Scheme for guided wave testing. Aligned with **ISO 17024 for personnel certification** and consistent with the principles of **ISO 9712 for NDT inspectors**, it is overseen by an independent, industry-led Advisory Committee and sets the requirements for inspectors operating GUL equipment.

Courses are tailored to the method sectors of GUL equipment and apply across a wide range of products, such as pipes, rails and plates.

Certification is awarded following successful training, examination and validation. Recognition is provided through a **Certificate of Competence** and an **Inspector iButton**, which identifies the inspector to the software and operates as a software licence.

Auditing Services

GUL provides a data audit service to help **ensure inspection results meet the highest standards**. Data is checked against procedures and analysed consistently, reinforcing the lessons from training and giving confidence that results are reliable regardless of inspector.

The service supports both inspection companies and asset owners. It can provide feedback to inspectors who are new to the technology or assure clients that reports they receive are accurate and consistent. Data review is available for **individual files or as annual packages**, covering Wavemaker® and QSR® data.

Appreciation Course



One-day introductory level course which aims to provide an introduction to the guided wave testing (GWT) method and to the screening of pipes using the GUL Wavemaker® system.

Course Content

- Introduction to Guided Ultrasonics Ltd.
- Guided Wave Testing Basics
- Guided Wave Monitoring
- Guided Wave Inspection Savings
- GUL Training and Support
- Guided Wave Testing Case Studies

Level 1 P

Suitable for NDT inspectors new to the field of **Guided Wave Testing (GWT)** (40 hours).

Course Content

- Level 1 guided wave theory
- Introduction to Wavemaker® system
- Introduction to WavePro™ Software
- Selection of test parameters
- Basic data interpretation
- Basic reporting

Recommended Qualifications

- Experienced Level 2 UT technician, or
- Degree or HNC in a technical subject



Level 2 SP

Advanced application specific training course for the **Inspection of Supports and Process Pipework** (40 hours).

Course Content

- Advanced equipment configuration
- Advanced data collection
- Advanced calibration
- Inspection of supports
- Inspection of welds & pipe fittings
- Detailed review of Level 1 work

Requirements

- Level 1 Pipe qualification
- 6 months of on-site experience



Level 2 XB

Advanced application specific course for the **Inspection of Road Crossings and Buried Pipes** (40 hours).

Course Content

- Advanced data interpretation
- Advanced data collection protocols
- GWT of buried pipes
- GWT of pipes under road crossings
- Pitch & catch configuration
- Combining transducer rings

Requirements

- Level 1 Pipe qualification, and
- 6 months of on-site experience



Level 1 Q

Suitable for NDT inspectors new to the field of **Guided Wave Scanning** using the **QSR®** (16 hours).

Course Content

- Guided wave theory
- Introduction to QSR® Scanning System
- Introduction to WaveProQSR™ Software
- Data Collection Procedures with QSR1® & Axial
- Basic data analysis
- Basic reporting

Recommended Qualifications

- Experienced NDT technician (1 year), or
- Experienced Level 2 NDT technician, or
- Degree or HNC in a technical subject



Level 2 QT

Advanced application specific training course for the **Inspection of Touchpoint Supports** (16 hours).

Course Content

- Advanced equipment configuration
- Advanced data collection with QSR1® & Axial
- Advanced data analysis
- Reporting

Requirements

- Level 1:Q qualification, and
- Degree or HNC in a technical subject, or
- Valid Level 2 or 3 UT qualification



Level 2 PM

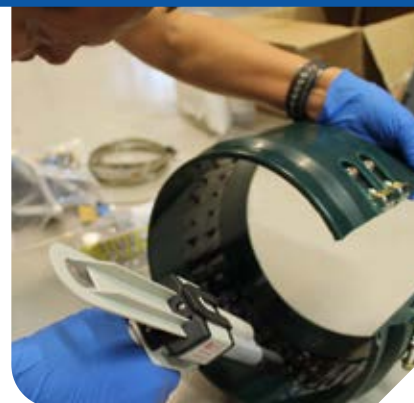
Advanced application specific training course for the **Installation of the gPIMS® Corrosion Monitoring System** (32 hours).

Course Content

- Introduction to gPIMS®
- Guided wave monitoring
- Installation of gPIMS®
- Practical session

Requirements

- Level 1 Pipe qualification
- 6 months of on-site experience





Consultancy & Support

Decades of research and field experience form the basis of the support and consultancy available to our clients. The knowledge that shaped guided wave technology is applied to help inspection teams refine their methods, assess data, and resolve application challenges.

We assist with tasks requiring our guided wave expertise, such as procedure development or configuration optimisation. The aim is to ensure users achieve the best performance from their equipment.

Our engineers are available to support projects worldwide, providing instruction and practical guidance remotely or on site, enabling inspection teams to deliver accurate and dependable results.



Data Audit & Review



Procedure Development



On-site and Off-site Support



Bespoke Solutions

Equipment Service & Calibration

We offer comprehensive calibration and maintenance services for QSR® and Wavemaker® systems that go well beyond a basic recalibration.

Each service includes a full hardware inspection, together with firmware and software updates. Minor repairs are included; major repairs require owner approval. An updated Calibration Certificate is issued at the end of the process,

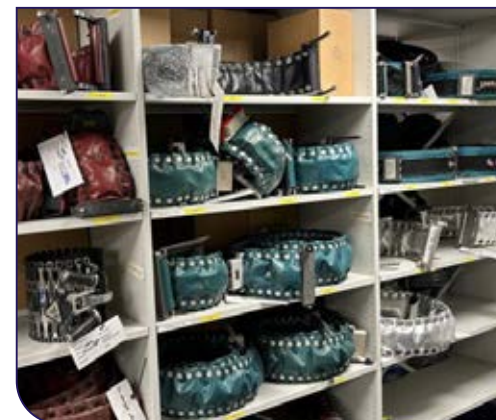
Recommended calibration and servicing intervals are 12 months for QSR® units and 36 months for Wavemaker® instruments.

Rental Equipment

We provide a range of rental equipment exclusively for existing customers who already operate a Wavemaker® or QSR® system and have a qualified inspector available.

This service offers access to additional instruments, ring sizes, or sensor types that may only be required occasionally, helping companies manage costs and maintain flexibility during busy periods.

Our rental inventory is limited; when the required equipment is available, it is typically dispatched within one working day of receiving a purchase order.



Spares & Accessories



A full range of spare parts and accessories is available to support the continued use and maintenance of all Wavemaker® and QSR® systems components.

These include cables, batteries & chargers, spare kits for modules and rings, carry bags, and ring-joining converter boxes.

All items are manufactured or approved by GUL to guarantee compatibility and reliable performance.



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