

S2G2 WS
series

**The Most
Powerful ECA
Instrument
on the Market**



**Through innovation,
we surpass standard expectations**





Harnessing Power and Affordability for Exceptional Electromagnetic Tube & Surface Eddy Current Array Inspection.



Building on the technical success of the S2G2-800, SG NDT have introduced several key improvements to create the S2G2-WS. While maintaining the same industry leading signal-to-noise, the S2G2-WS includes battery operability for full operational autonomy, the S2G2 also employs industry standard probe connections for common tube inspection applications, meaning that existing fleets of tube inspection probes can be used with the S2G2-WS.

Key Advantages

Several advantages can be found in this new SG NDT creation. It's new functionalities improve performances, in a freshly designed enclosure.

- Battery operated (10 hours typical worktime)
- Easy-to-use, hot-swappable batteries



- Industry standard connectors for tube inspection
- RJ-45 Ethernet connection or WI-FI protocol to PC or Tablet
- Light-weight and compact 4.75kg (10.5lbs)

S2G2-WS
series

A RFT/NFT/MFL Probe Connector

- 19-pin industry-standard Amphenol connector
- Used for conventional methods only, not array



B Extended ECT Probe Connector:

- 41-pin industry-standard Amphenol connector
- Used for conventional methods (Via adaptor) and tube inspection array methods (ECA, RFA, NFA, MFLA)
- Used for Eddy Current Array surface inspection probes
- May be used for various bespoke probes or probes with additional capability requirements

C Eddy Current Probe Connector

- 4-pin industry-standard Amphenol connector
- Used for conventional ECT methods only, not array

D Power On/Off

- Illuminated push button

E I/O Connector

- 18-pin Amphenol connector
- Several I/O configurations to drive automatic sequencing

F Ethernet Connector

- RJ-45 industry-standard connector
- Used for connecting instrument to PC
- Instrument can also be connected wirelessly using the Wi-Fi protocol

G External Power Connector

- 12VDC-2-pin Amphenol Power Input



Compatible Probes and Accessories

Eddy Current Test (ECT)

These probes are commonly used for inspecting non-ferrous heat exchanger tubes made of materials such as austenitic stainless steel, brass, Inconel™, titanium, and copper. These probes are particularly effective in detecting and analysing defects such as erosion, baffle cuts, pitting, and cracking. Additionally, they are sensitive to defects that may be present under support plates in shell-and-tube heat exchangers.



Eddy Current Array (ECA)

These probes are an efficient tool for inspecting tubes and gathering a large amount of data for defect analysis. ECA probes can generate data from their circumferential bobbin coils, displayed in a strip chart presentation, they can also produce a high-quality c-scan of the tube in a single scan by using an array of small bobbin coils, making data analysis simple and accurate. ECA probes are sensitive to defects in any orientation, which is a common feature of other array technologies.



Remote Field Testing (RFT)

These probes are commonly used to inspect ferrous heat exchanger tubes made of materials such as carbon steel. They are especially effective in detecting common defects such as corrosion, erosion, wear, and pitting.



Remote Field Array (RFA)

These probes are utilized to inspect heat exchanger tubes made of ferrous metals. These probes offer superior resolution and measurement capabilities compared to traditional RFT probes. RFA probes are highly sensitive to defects near external features such as tube support plates and tube sheets. Similar to other array technologies, RFA probes can detect defects in any orientation.



Near Field Testing (NFT)

NFT probes are commonly utilized to inspect ferrous heat exchangers that have external cooling fins. The Near Field is limited to the thickness of the tube wall, making them perfect for identifying defects in the inner diameter as they eliminate interference from the fins.



Near Field Array (NFA)

Inspecting aluminium-finned carbon steel tubes can be challenging because the external fins can affect the signals from the probe. However, Near Field Array (NFA) probes can help overcome this problem by generating high-resolution c-scans of the tube inner diameter (ID). These probes can easily detect common defects found in fin-fan air cooler tubes such as internal cracking at the tube sheets, ID pitting, internal erosion, and wall loss. Furthermore, NFA probes are highly sensitive to defects in any orientation, making them a reliable option for inspecting aluminium-finned carbon steel tubes.



Magnetic Flux Leakage (MFL)

Probes utilize a permanent magnet to magnetize the tube wall, which enables magnetic sensors to detect the leakage field. These probes are specifically designed for inspecting the aluminium-finned carbon steel tubes on fin-fan coolers. They can accurately and reliably detect internal and external defects, such as corrosion, erosion, pitting, and circumferential cracking.



SPEN Weld Inspection

These probes employ a tangential coil arrangement enabling dynamic lift-off technology. These probes are ideal for inspections where access is limited, or where arrays are not suitable.



WAVE Probe 180

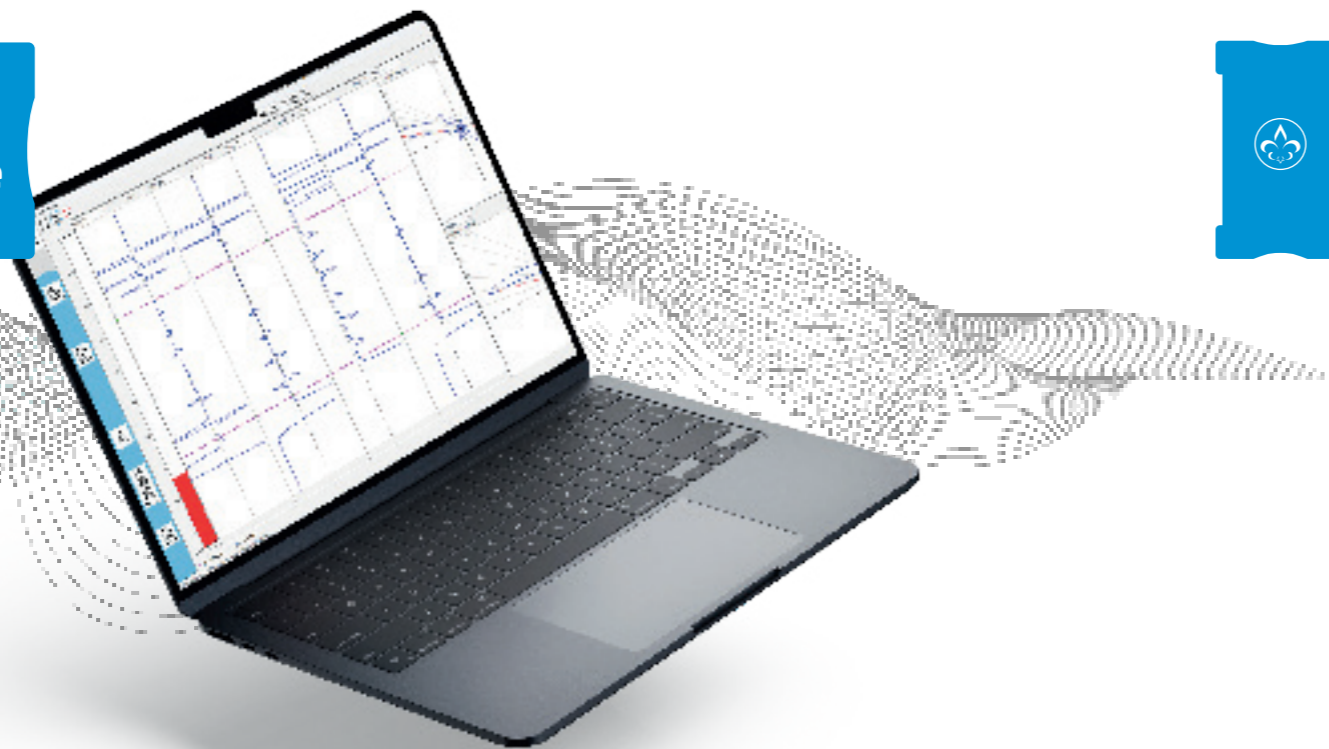
This probe is specially designed to perform manual, encoded inspections of carbon steel and stainless-steel butt welds that have a rough surface finish. The probe is equipped with dynamic lift-off technology, which makes it ideal for inspecting painted welds without having to remove the paint.



WAVE Probe 090

This probe is specially designed to perform manual, encoded inspections of carbon steel and stainless-steel butt and fillet welds that have a rough surface finish. The probe is equipped with dynamic lift-off technology, which makes it ideal for inspecting painted welds without having to remove the paint.





EMMA Software Interface

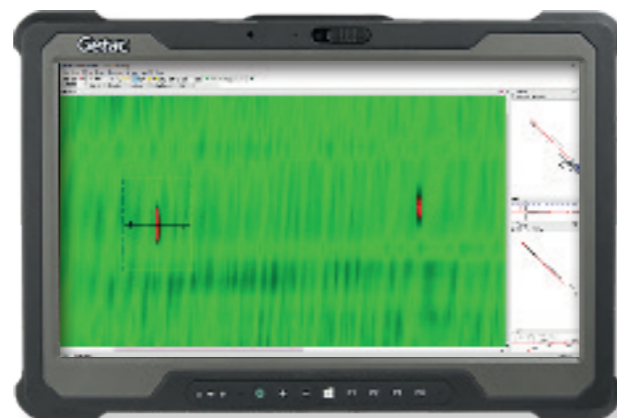
The heart of all SG NDT inspection instruments is our own EMMA software, having been developed through many years of continuous research and development to support the most demanding of electromagnetic inspection applications.

EMMA is a powerful and intuitive software designed for use across the entire range of SG NDT electronics and supporting several electromagnetic methods, including:

- Eddy Current / Eddy Current Array
- RFT / RFT Array
- NFT / NFT Array
- MFL / MFL Array
- EMMA is your new inspection partner for Eddy Current and Eddy Current Array non-destructive inspections.

LabVIEW Software Development Kit:

The LabVIEW SDK enables users to quickly and easily interface with any S2G2 device.



API Documentation:

SG NDT can provide all necessary information required to interface with the device, to program the device and acquire signals through a TCP/IP link.



S2G2 series - WS Specifications

General Specifications

Power Requirements	110V-220VAC, 50-60Hz (Auto voltage sensing) OR Lithium-Ion Battery DoT compliant (RRC2054-2) - 10Hrs typical run time
Operating Voltage	12 VDC Power
Environmental	Sealed enclosure, designed for IP55
Size (external dimensions)	33cm x 26cm x 14cm (13" x 10.2" x 5.5")
Weight (excl.batteries)	4.75 Kg (10.5lb)
Weight (incl.batteries)	5.75Kg (12.7lb)
Computer Interface	Gigabit Ethernet-1000 BASE-T OR Wi-Fi protocol
Compliance Standards	CE, RoHS
Operating Temperature	0°C to 50°C (32°F to 122°F)
Inputs/Outputs	<ul style="list-style-type: none"> • RJ45 Ethernet • 18-pin I/O Connector • 41-pin Amphenol - Extended ECT Connector • 19-pin Amphenol Connector (RFT/NFT/MFL) • 4-pin Amphenol Connector (ECT) • 12VDC-2-pin Amphenol Power Input
Encoders	2 quadrature encoder inputs
Remote Controls	<ul style="list-style-type: none"> • Start/Stop • Balance • Status
Alarms	2 independent real-time alarms

Eddy Current / Array (ECA)

Frequency Range	20Hz to 2MHz
Generators / Probe Drivers	2 fully independent
Drive Voltage	0-20 Vpp (single driver)
Output Current	1 A max
Reference Generators	2 generators for Electronic balancing
Probe Inputs	8
Number of EC channels	<ul style="list-style-type: none"> • 128 ECA channels • 256 ECA channels (upgradeable) • 512 ECA channels (upgradeable)
Number of frequencies	Up to 5 simultaneous
Data Resolution	32 bits
Data rate	100,000 data points/s/ input
Connector	41-Pin Amphenol Connector OR 4-pin Amphenol connector

Additional Inspection Methods

Remote Field (RFT) and Near Field (NFT)	Via 19-pin connector
Magnetic Flux Leakage (MFL)	Via 19-pin connector (may require an adaptor) Probe types: <ul style="list-style-type: none"> • Inductive • Hall effect • Giant Magnetic Restrictive (GMR)
RFT Array(RFA) and NFT Array(NFA)	Via 41-pin connector
MFL Array	Via 41-pin connector

Are you interested in S2G2-WS?

Our team are ready
to answer your
questions.

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**Through innovation,
we surpass standard expectations**

