GEKKO

HIGH-RESOLUTION PA FLAW DETECTOR

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Phased-Array Ultrasound Techniques, TOFD and real-time Total Focusing Methods

M 2 M

PAUT MADE EASY

UNIQUE SET OF NDT TECHNIQUES

With a 64-channel parallel architecture, GEKKO is the only flaw detector offering conventional UT, standard PAUT, TOFD and real-time Total Focusing Method (TFM).

COMPLETE TOOLSET

All GEKKO techniques (UT, TOFD, PAUT, TFM) are available for conventional and phased-array probes as well as dual array probes (linear and matrix). Delay-laws and scan-plans are prepared onboard, avoiding the need to import files from a PC.

READY FOR FIELD INSPECTION

GEKKO meets or exceeds the minimum instrumentation and software requirements specified in ASME, AWS, API, ASTM, ISO-EN standards for code compliant inspections while providing unique means of default characterization. GEKKO is also certified by CSWIP and PCN approved.

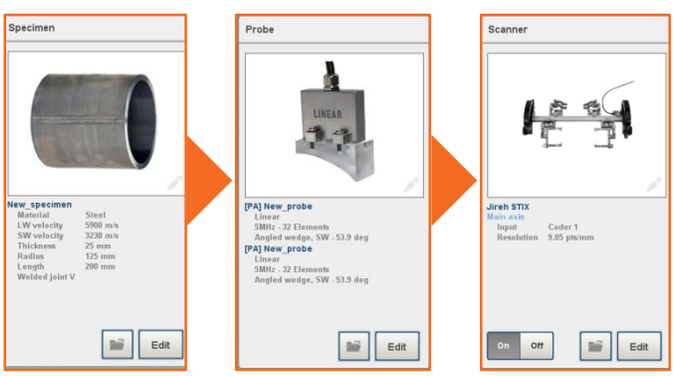
COMPATIBLE WITH ALL PROBES AND SCANNERS

GEKKO uses IPEX connectors for phased-array UT and LEMO connectors for conventional UT. With up to 3 encoders input, GEKKO offers compatibility with common and advanced scanning devices.

USER-FRIENDLY FLAW DETECTOR

EASY

GEKKO's user-interface is developed to ease the work of operators from level-1 to experts. Using simple yet powerful wizards, users can customize field-ready applications. Thanks to visual libraries and dedicated apps, the risk for errors is reduced while making the inspection easier and faster.

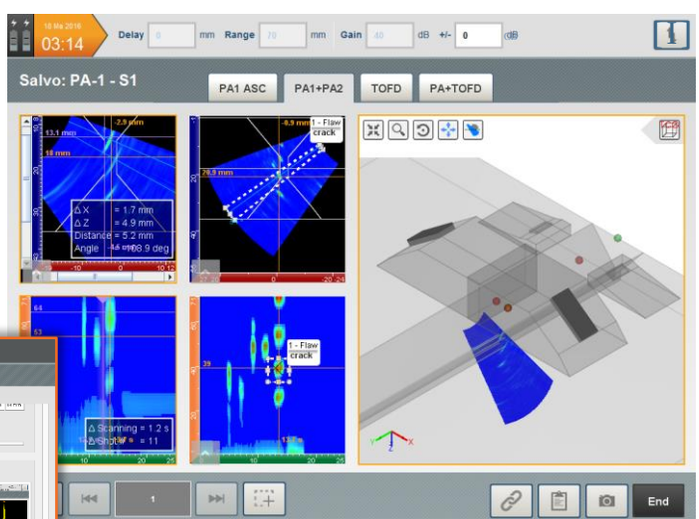


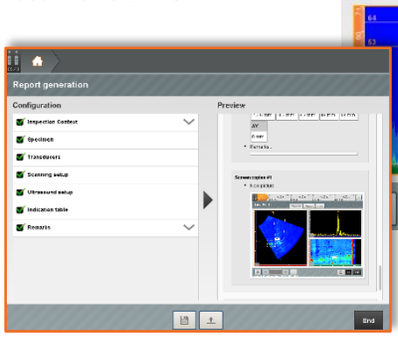
GUIDED

Step-by-step guidance is offered throughout the complete inspection process, including equipment definition, calibration and acquisition. GEKKO offers 3-click calibration tools for probe balancing, material calibration, wedge calibration, TCG and TOFD, for quicker and easier code-compliant inspections.

COMPLETE

With a fast SSD hard-drive, operators can store large inspection files (>10 Gb) and analyze them on the spot using the 10.4'' touchscreen. Incremented data saving and automatic reports can be customized and exported as PDF files. Data can also be exported for analysis on a PC using the free viewer provided with GEKKO.



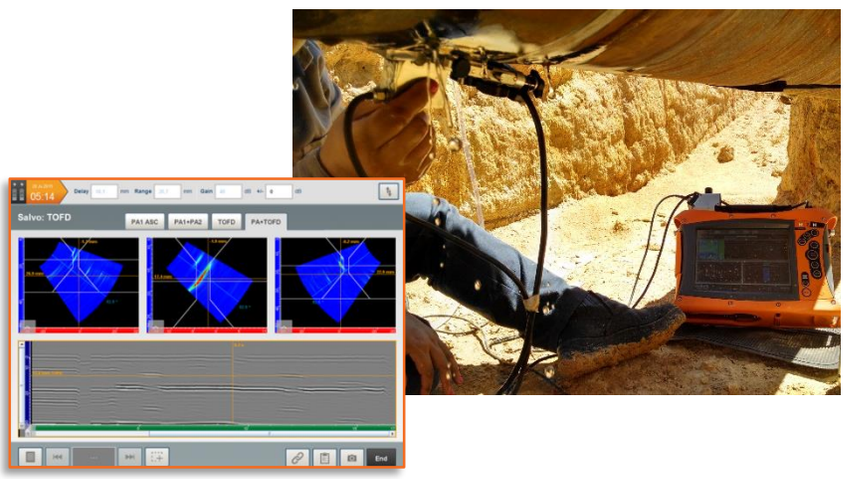


COMPLETE NDT TOOLSET

Some procedures require standard UT, others TOFD or PA. With GEKKO, all UT techniques are included to offer a versatile and field-ready equipment.

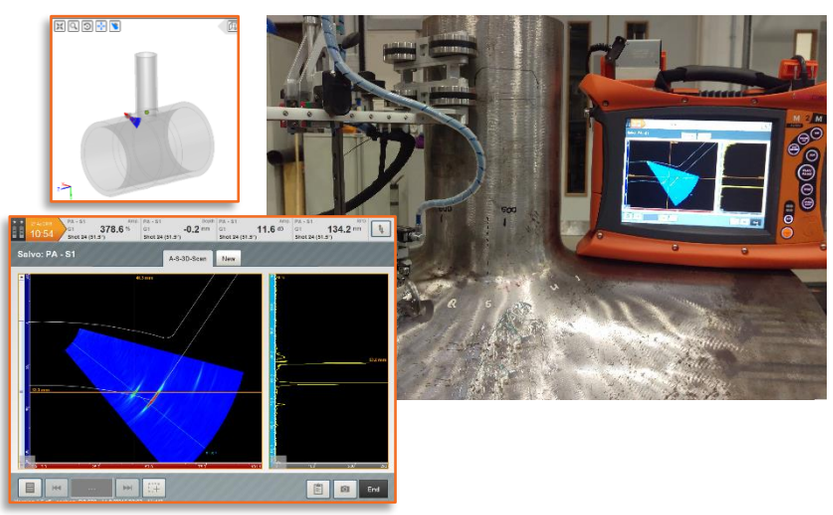
WELD INSPECTION

Features such as weld overlays, precise delay-laws, 800% dynamic range and 3D-corrected images ease the diagnostic to detect and size flaws. Combining various techniques and using up to 8 groups in a single pass substantially increases the productivity of inspections. GEKKO is compatible with scanners and accessories from market-leading vendors.



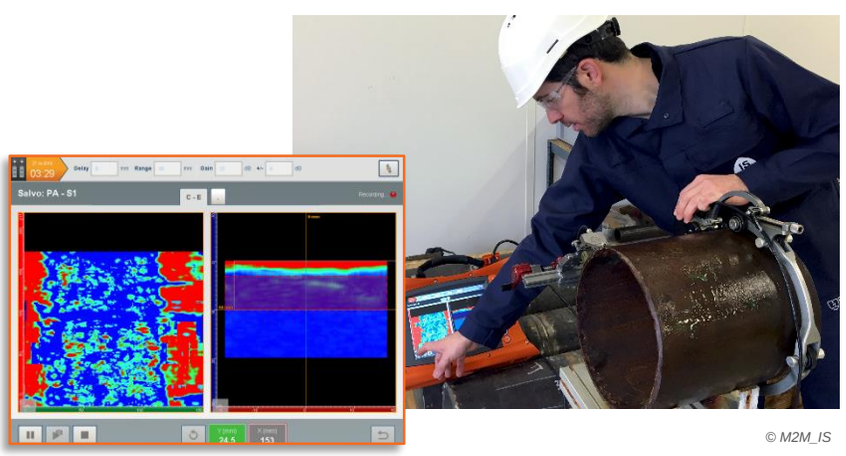
NOZZLE INSPECTION

With the possibility to define nozzle type geometries on-board, GEKKO can be used for 3-axis encoded nozzle inspections (scan, index and skew). A real-time cross-section overlay of the nozzle is superimposed on the S-Scan image as the operator scans the specimen.



CORROSION MAPPING

GEKKO can be used with chain-scanners for corrosion mapping. Real-time data is displayed allowing high-resolution corrosion detection. C-Scan amplitude and time of flight are available.

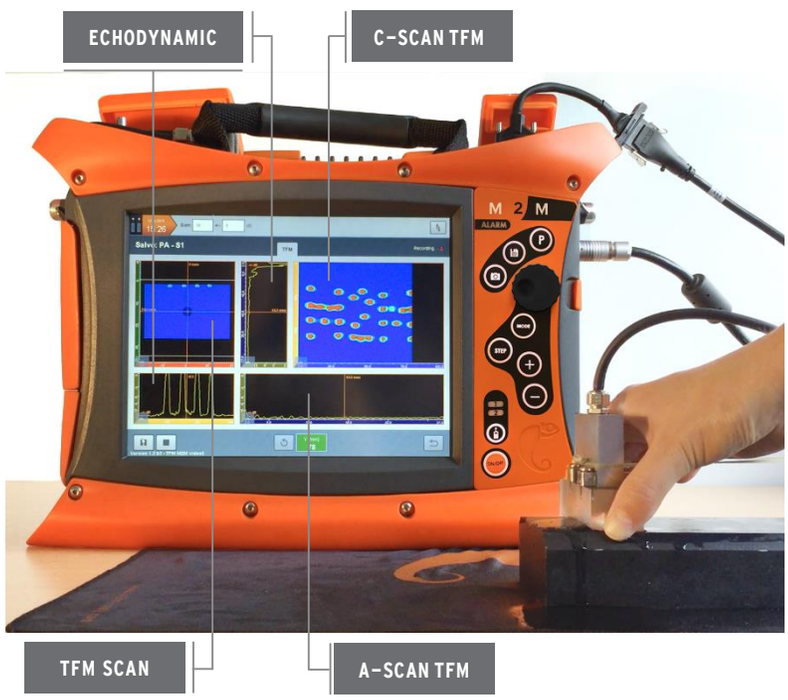


HIGH-RESOLUTION FLAW DETECTOR

For unparalleled resolution detection and characterization, GEKKO offers the real-time Total focusing Method (TFM) imaging.

REAL-TIME TFM

TFM focuses at each point of a user-specified zone for high-resolution imaging and accurate defect characterization. Real-time imaging with high scanning-speed can be achieved, for clear image and defect contouring. The TFM has a 256x256 pixels image resolution (65K points focusing).

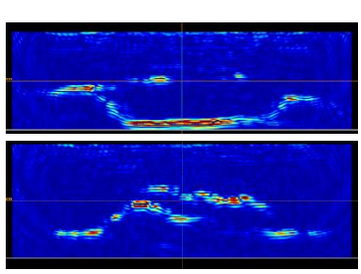


EXTENDED TFM IMAGES

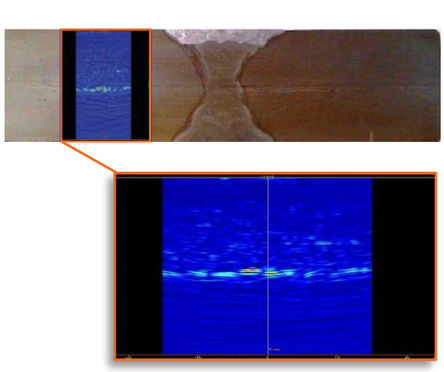
A-B-S-C Scan + 3D views are natively available for standard PA. GEKKO extends these standard NDT views to TFM allowing an operator to use advanced imaging in a familiar environment.

HYDROGEN BLISTERING CHARACTERIZATION

- HTHA High Temperature Hydrogen Attack



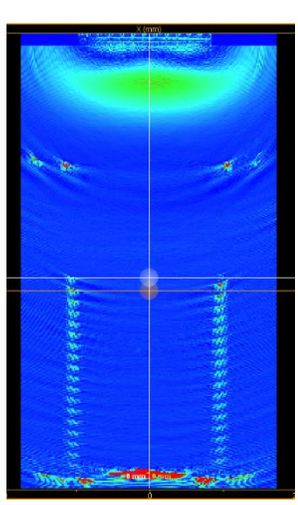
- HIC Small defect detection for carbon steel specimen inspection.



Courtesy of Comex

SCREW THREAD INSPECTION

Optimal resolution is obtained along the thread.

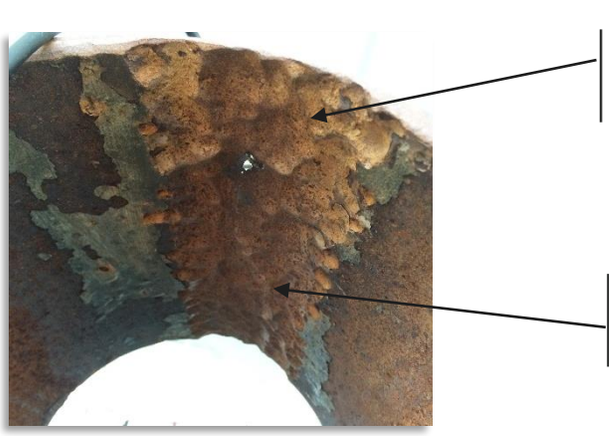


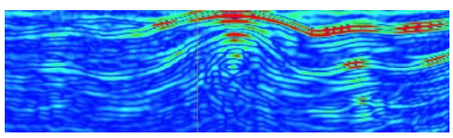
Courtesy of Karl Deutsch

HIGH-RESOLUTION FLAW DETECTOR

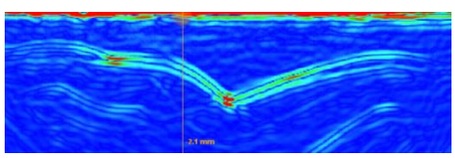
REAL-TIME TFM

- Reduced dead zone: detection of corrosion less than 1mm from the front surface.
- Pitting detection smaller than 1 mm



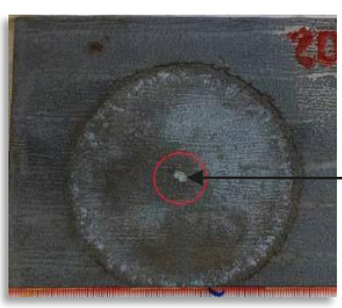


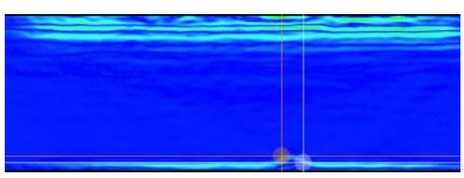
Corrosion till 1 mm under the surface



Detection of inclined area

Courtesy of Insitut de Soudure

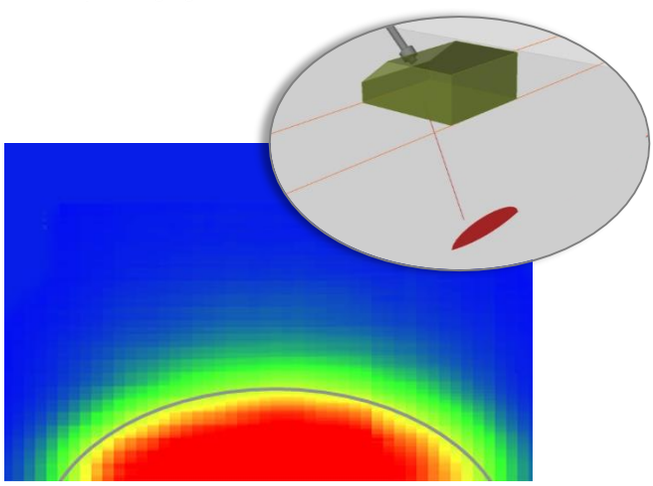




0.5 mm pitting detection

TRUE IMAGING OF 2-MM ELLIPTICAL FATIGUE CRACK

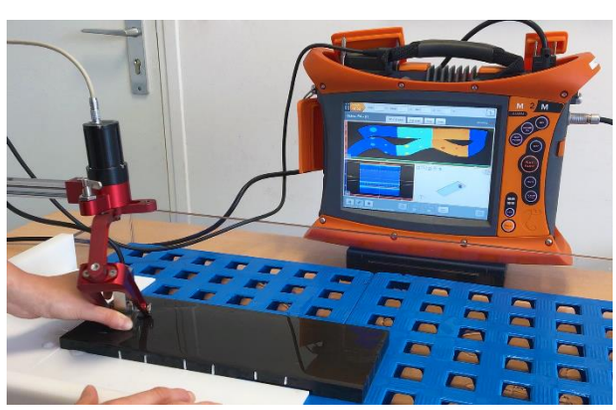
- Sizing of defects possible even without a diffraction signal
- True-shape imaging of defects



D-Scan and TFM reconstruction

3-AXIS POLAR SCANNER FOR COMPOSITE INSPECTION

- 3-axis polar scanner motion can be read by GEKKO and transformed into a X, Y Cscan for composite inspection.



SPECIFICATIONS

general

L x W x H: 410mm x 284mm x 126mm	10.4'' high contrast resistive screen - resolution 1024x768 px
Operating temperature range: from -10°C to 45°C | 14°F to 113°F	Weight: 6kg (without battery) ; 0,480g /battery
Storage temperature range: -10°C to 60°C | 14°F to 140°F with battery	IP66
Operating time: 4h (hot swappable battery)	Shock resistance according to MIL-STD-810G

standard phased-array

Linear scanning, sectorial scanning, compound scanning	Linear, matrix, DLA and DMA probes
Maximum active aperture: 64 channels	Up to 6 probes | Up to 8 groups | Up to 2,048 delay-laws
Phased array computation delay laws on plate, cylinder, T & Y, nozzle	CIVA fueled phased-array calculator
Focusing mode: true depth, sound path, projection	

real-time TFM

Reconstruction channels: up to 64	Max number of points of reconstructed image: up to 65k
Max refresh rate: up to 80fps	Sound paths: direct (L or S), indirect and converted modes

pulsers

64 phased-array channels*:	**4 UT-TOFD channels**:**
Negative square pulse, width: 35ns to 1250ns	Negative square pulse, width: 30ns to 1250ns
Voltage: 12V – 100V with 1V step	Voltage: 12V to 200V with 1V step
Max. PRF: up to 20kHz	Max. PRF: up to 20kHz

receivers

64 phased-array channels*:	**4 UT-TOFD channels**:**
Input impedance: 50 Ω	Input impedance: 50 Ω
Frequency range: 0.4 to 20MHz	Frequency range: 0.6 to 25MHz
Max. input signal: 2Vpp | TCG – ACG – DGS calibration wizard | DGS	Max. input signal: 2Vpp
Gain: up to 120dB (0.1dB step)	TCG – DAC calibration wizard
Cross-talk between two channels < 50 dB	Gain: up to 120dB (0.1dB step)

digitizer

Digitizing and real-time summation on 64 channels	Resolution: 16bits
FIR filters	Max. sampling frequency: 100 MHz
Real-time averaging up to x32	Digitizing depth up to 16k points
Rectified, RF, envelope	A-scan range or delay max 65k points

acquisition

Hardware acquisition gates	Max. data flow 150 MB/s on a 128Gb SSD (extensible up to 1 To)
A-Scan/Peak data recording	Inspection data file size: up to 10Gb
FMC recording	Data transfer through Ethernet
Acquisition trigger on time, event, encoder	800% amplitude range

wizards

CAD overlay and 3D view	Scanner calibration
Real-time phased array calculator	Amplitude calibration (TCG, DAC, DGS)
Base-time calibration for conventional UT	Probe design | Weld geometry design
Wedge calibration (angle, height, velocity)	Amplitude balancing
Specimen velocity calibration	Part geometry with parametric shapes: plate, cylinder, T & Y, nozzle

analysis

Capture © software with analysis and reporting tools – Free viewer	Amplitude range: up to 800%
A-Scan, B-Scan, C-Scan, D-Scan, Echodynamic, Top view, Side view, 3D view	Overlay part geometry: plate, cylinder, T or Y section, nozzle
Analysis gates	Overlay weld geometry
Compatibility with CIVA analysis and ENLIGHT	Customizable inspection report

I-O

1 IPEX connector for phased-array (can be upgraded to 2 with splitter)	4 LEMO 00 connectors for conventional UT
3 encoder inputs	1 external trigger
3 USB 2.0	Acquisition file transfer through Ethernet
	16 analog inputs

Indicated values may change without notice. *Standard: EN ISO 18563-1 for phased array channels
**Standard: EN ISO 12668-1 for conventional channels

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