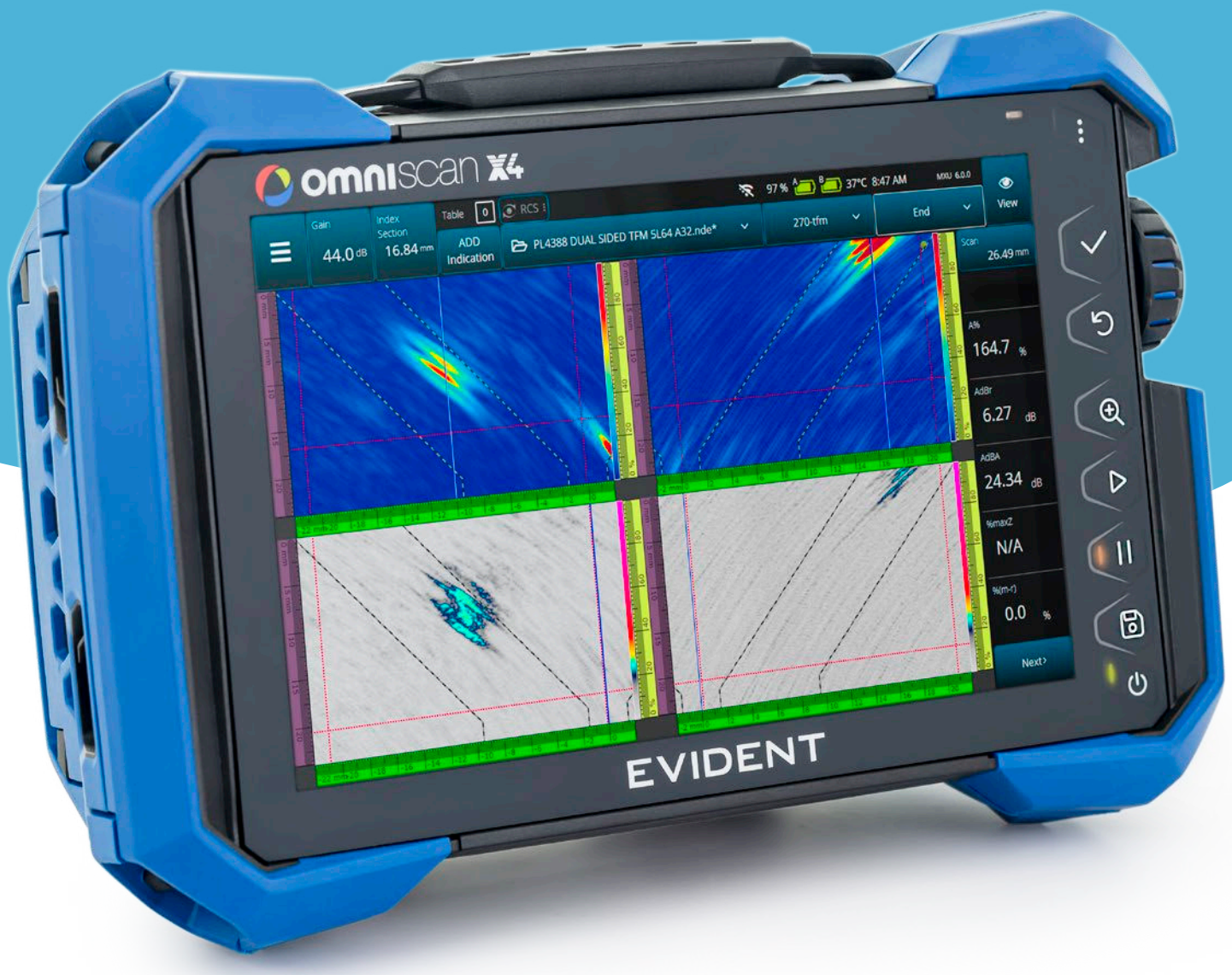
EVIDENT

OmniScan™ X4 Flaw Detector

Phased Array (PAUT), Total Focusing Method (TFM), and Phase Coherence Imaging (PCI) Technologies



Proven to Perform, Trusted to Deliver

Each OmniScan™ X4 unit is a comprehensive multitechnology inspection toolbox, enabling you to utilize multiple ultrasonic testing techniques to reliably detect and accurately assess flaws and corrosion. Leverage its advanced imaging and measurement capabilities to locate and evaluate the severity of damage before it becomes critical, protecting the integrity of assets and infrastructure.

Images That Speak Volumes

Make Decisions Faster and More Decisively

In addition to phased array ultrasonic testing technology, all OmniScan X4 models come standard with phase coherence imaging (PCI), the total focusing method (TFM), and plane wave imaging (PWI), and their ease of use makes them more accessible for new users. Using multiple tools that provide more information about indications increases your confidence in your assessments.

See More Details with Phase Coherence Imaging

Identify and interpret challenging flaws such as hook cracks decisively and efficiently using PCI's capacity to clearly represent hard-to-detect defects. Make accurate assessments about fine flaws such as stress corrosion cracking (SCC) since phase-based PCI is far less susceptible to attenuation from adjacent flaws than amplitude-based techniques. Because tip diffractions of SCC are accentuated by the PCI, you can more easily characterize each crack's depth and exploit the software gates to quickly isolate the deepest flaws.

Up to 3x Faster TFM

Increase your productivity while exploiting the crisp definition and even focus provided by TFM. Depending on the configuration, the OmniScan X4 series' TFM is up to three times faster than its predecessor (the OmniScan X3 64 model) when using the sparse firing mode.

Dual-Sided Weld Inspection with Twin TFM and PCI

Give your weld prove up an efficiency boost using twin TFM and PCI. Leverage the individual attributes of PCI and TFM to thoroughly investigate the volume of welds from both sides simultaneously. Using two probes mounted on a scanner such as our AxSEAM™ long-seam scanner, you can produce crisp TFM and PCI results in one pass.

Intuitive Application Presets for Improved Efficiency and Consistency

Speed up your setup and improve the consistency of your results using the OmniScan X4 application presets. Choose from among our presets for common corrosion and flaw detection applications using our HydroFORM™, RollerFORM™, or FlexoFORM™ scanners. Each option provides preprogrammed parameters that you can edit as desired. Even new users can produce and reproduce optimal setups for PA and PCI inspections in minutes.

Accelerate B-Scan Screening Exponentially

Easily distinguish suspected flaws from geometry echoes using our unique merged B-scan. This data view combines all B-scans into one, increasing the efficiency of B-scan screening exponentially.

Optimized B-scan layouts, including the B-S-A single group and A-B-S multigroup, further improve your ability to clearly identify suspect indications.

Engineered for Speed and Simplicity

Streamline Inspection Workflows for Pipelines and Large Assets

The OmniScan X4 software's intuitive step-by-step scan plan and 3D graphics facilitate your setups, from the basic to the most complex. During inspection and analysis, real-world references, orientation correction, and a high data-volume capacity help save you time scanning, analyzing, and organizing the scan results for your report:

Setup

- Custom name the scan axes to help you manage the scanning data post-inspection.
- Define a reference point on the scan plan that is relative to the asset's datum to ease positioning the scanning results within the asset schema.

Inspection

- Inspect bigger parts for longer without having to pause mid-job to transfer data thanks to the 1 TB solid state drive (SDD).
- Equipped with a fast processor and expanded RAM, all OmniScan X4 models process data rapidly and the reactivity of the software for all common operations is nearly instantaneous.

Analysis

- True orientation correction of each raster scan pass constructs an image of the data that accurately depicts the inspected area so it's easy to comprehend.
- Wider pulse voltage range (5 Vpp–160 Vpp) eases identifying the true signal peak as low voltages prevent signal saturation and high voltages improve the signal-to-noise ratio (SNR) in attenuative materials, providing clean, high-quality images for better measurement reliability and consistency.

Designed to Evolve

Every time you update your OmniScan X4 onboard software (MXU 6), you gain new features and enhancements that expand your capabilities and facilitate your work, without having to reinvest.

Our free quarterly updates of MXU enable you to stay on the cusp of technique and technology developments in the rapidly evolving NDT sector.

Expand Your Capabilities with OmniScan X4 Solutions

Increase operational efficiency while reducing your equipment burden with versatile and portable OmniScan X4 inspection solutions, including our complete range of probes and scanners. Expand your capacity to perform a wider variety of applications with an easy-to-manage configuration.

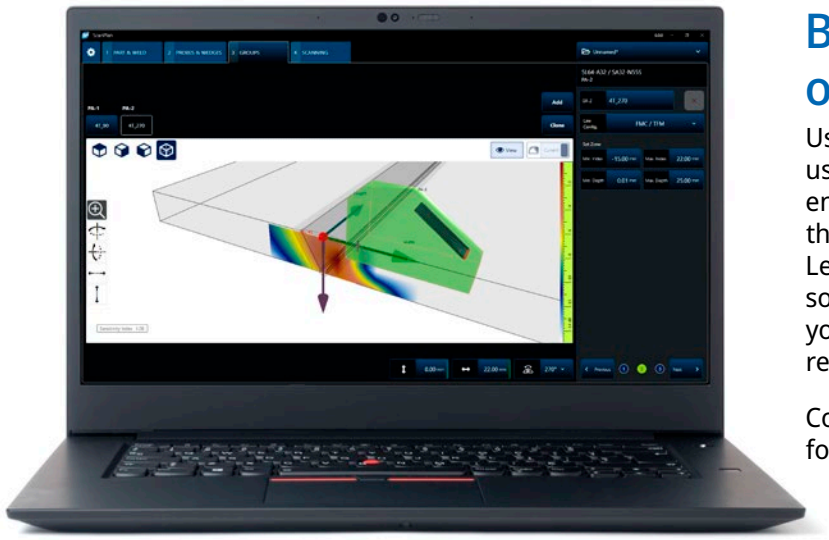
Integration Ready, Future Ready

Enable communication between an OmniScan X4 unit and external software using the free OmniScan Black Box app and NDT Device API (application programming interface), an open code protocol developed by Evident. Integrating an OmniScan X4 unit into your inspection ecosystem unleashes your potential to advance, diversify, and reach peak productivity.

- Maximize your beamforming capacity and your potential to solve challenging applications using large-element array probes and fully exploiting the 64:128PR or 128:128PR* model's 128-element PA and TFM capabilities.
- Access the raw FMC data acquired with the 64:128PR or 128:128PR model and use it to experiment and develop advanced and novel applications and continually expand your capabilities.**
- Control the OmniScan X4 unit remotely using data acquisition software including our WeldSight™ Inspection software or AeroView™ Inspection software, acquiring data directly on your PC or laptop (using a 16:128PR, 32:128PR, 64:128PR, or 128:128PR model).

For details about using the Black Box app and NDT Device API, contact Evident or your local Evident representative.

*Patent pending



Build Your Scan Plan on Your PC

Using the familiar OmniScan X4 scan plan user interface and tools, ScanPlan software enables you to create basic setups that can then be imported into the flaw detector. Leverage the larger screen and ScanPlan software's 2D and 3D views to easily prepare your inspection and take screenshots for reporting purposes.

Contact Evident or your local representative for license enquiries.

**Reading the raw FMC data requires software programming using the NDT Device API. Contact Evident or your local representative for more information.

Specifications

General and Enclosure	
Size	335 mm × 221 mm × 151 mm (13.2 in. × 8.7 in. × 5.9 in.)
Weight	5.7 kg (with 1 battery) for model 16:64PR 5.9 kg (with 1 battery) for models 16:128PR, 32:128PR, 64:128PR, and 128:128PR*
Onboard Storage	1 TB internal SSD storage. Maximum 25 GB individual file size. Storage extensible using external USB drive
Storage Devices	SDHC and SDXC cards, or most standard USB storage devices
Wireless	Wi-Fi® 6E and Bluetooth® 5.3 onboard
PAUT Connectors	1 PA connector, 2x UT channels (2 P/R connectors each)
Available Configurations and Groups	OmniScan X4A – 128:128PR: 8 groups OmniScan X4A – 64:128PR: 8 groups OmniScan X4A – 32:128PR: 8 groups OmniScan X4A – 16:128PR: 8 groups OmniScan X4B – 16:648PR (PA, UT, or TFM) or a specific configuration of 2 PA groups + 1 TOFD
Drop Testing	Drop-tested according to MIL-STD-810G
Ingress Protection Rating	IP65 Certified (completely protected against dust and water jets from all directions (6.3mm nozzle))
Display	269 mm (10.6 in.) TFT LCD with resistive touch screen, 1280 × 768 pixels
Battery	2 hot-swappable Lithium-ion batteries included, 87 Wh each
Battery Life	Minimum of 5 hours (using ISO18563 standard setup parameters)
Operating Temperature	-10 to 45 °C (14 °F to 113 °F)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F) (with battery inside) -20 °C to 70 °C (-4 °F to 158 °F) (with no battery inside)

Inputs and Outputs	
Ports	2x USB 3.1, 1x video out (HDMI), 1x SDHC memory card slot, 1x communication (Ethernet)
Encoders	2-axis encoder line (quadrature or clock/direction)
Digital Inputs and Outputs	4 digital inputs (TTL), 4 digital outputs (TTL) including one reserved for acquisition on/off
External DC Supply	18 VDC, circular 2.5 mm diameter connector, center-positive

General Ultrasonic Specifications	
Effective Digitizing Frequency	Up to 100 MHz; User-adjustable compression factor
Maximum Pulse Repetition Rate (PRF)	Up to 20 kHz; Actual maximum PRF is often limited by physics (the time of flight required to obtain the ultrasonic signals)
Maximum Number of A-Scan Data Points	Up to 16,384
A-Scan Bit Depth	16 bits
Rectification	RF, full wave, half wave+, half wave-
Video Filtering	Smoothing (adjusted to the probe frequency range)
Filtering	PA channel: selection of band-pass filters, high-pass filters, and averaging UT channel: selection of low-pass filters, band-pass filters, high-pass filters, and averaging
Time-Corrected Gain (TCG)	PA: 40 dB per step of min. 0.1 dB UT: 100 dB per step of min. 0.1 dB Maximum slope of 40 dB/10 ns
Supported Beam Types (Groups)	Selection of phased array ultrasonics (PAUT) beam types (linear, sectorial, and compound), single ultrasonic beam (UT), time-of-flight-diffraction ultrasonics (TOFD), total focusing method (TFM), phase coherence imaging (PCI), full matrix capture (FMC), and plane wave imaging (PWI)
Raw Full Matrix Capture (FMC) Data Collection	Available only with models 64:128PR and 128:128PR when using the NDT Device API or the OmniScan Black Box onboard application used with external acquisition software

*Patent pending

Acoustic Specifications

		PA Channel	UT Channels
Certification	Calibration Certification	ISO 18563-1:2022	EN22232:2020
Pulser	Voltage	5 Vpp, 10 Vpp, 20 Vpp, 40 Vpp, 80 Vpp, 120 Vpp and 160 Vpp	85 V, 155 V, and 295 V
	Pulse Width	Adjustable from 30 ns to 1000 ns; resolution of 5 ns (half period of bipolar pulse or duration of negative pulse)	Adjustable from 30 ns to 1,000 ns; resolution of 2.5 ns
	Pulse Shape	Bipolar negative-positive square pulse	Negative square pulse
Receiver	Gain Range	0 dB to 80 dB; maximum input signal 900 mVp-p (full-screen height).	0 dB to 120 dB; maximum input signal 30 Vp-p (full-screen height)
	System Bandwidth	0.2 MHz to 26.5 MHz	0.25 MHz to 28.5 MHz

PAUT Specifications

OmniScan X4 Variant	128:128PR	64:128PR	32:128PR	16:128PR	16:64PR
Maximum Pulsing Aperture	128	64	32	16	16
Maximum Number of Receiving Channels	128	128	128	128	64
Number of Focal Laws	1024 maximum total (512 maximum per group)				

FMC / TFM / PCI / PWI Specifications

OmniScan X4 Variant	128:128PR	64:128PR	32:128PR	16:128PR	16:64PR
Maximum Extended Aperture (FMC)	128	128	64	32	32
Maximum Aperture (PWI)	128	64	32	16	16
Maximum TFM or PCI Groups	4	4	4	4	2
Live TFM Envelope	Yes – Actual Hilbert Transform				
Image Resolution	Up to 1024 × 1024 (1M points) for each TFM or PCI wave set				
FMC Supported Wave Sets (TFM or PCI Modes)	Pulse-Echo: L-L, T-T, and TT-TT Self-Tandem: TT-T, TT-TTT, LL-L, LT-T, TL-T, TT-L, and TL-L				
PWI Supported Wave Sets (TFM or PCI Modes)	Pulse-Echo: L-L and T-T				

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Certified to ISO 9001, ISO 14001, and OHSAS 18001.
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