



OLYMPUS

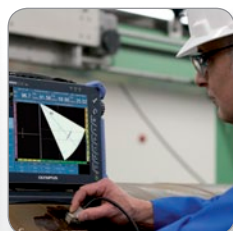
Your Vision, Our Future

PHASED ARRAY FLAW DETECTOR

OmniScan® MX2



The Standard in Phased Array, Redefined



- Bright, Large-Size Screen
- Fast, Intuitive Touch-Screen Interface
- Advanced Weld Overlay
- High-Capacity Data Storage
- Fast File Transfer
- **NEW** OmniPC Analysis Software

The Standard in Phased Array, Redefined

The result of over 10 years of proven leadership in modular NDT test platforms, the OmniScan MX has been the most successful portable and modular phased array test instrument produced by Olympus to date, with thousands of units in use throughout the world.

Building on a Solid Basis

This second generation OmniScan MX2 increases testing efficiencies, ensuring superior manual and advanced AUT application performance with faster setups, test cycles, and reporting, in addition to universal compatibility with all phased array and ultrasound modules: past, present and future. Designed for NDT leaders, this high-end, scalable platform delivers true next-generation NDT performance.

The OmniScan MX2 offers a high acquisition rate and new powerful software features for efficient manual and automated inspection performance—all in a portable, modular instrument.

Faster Is Better!

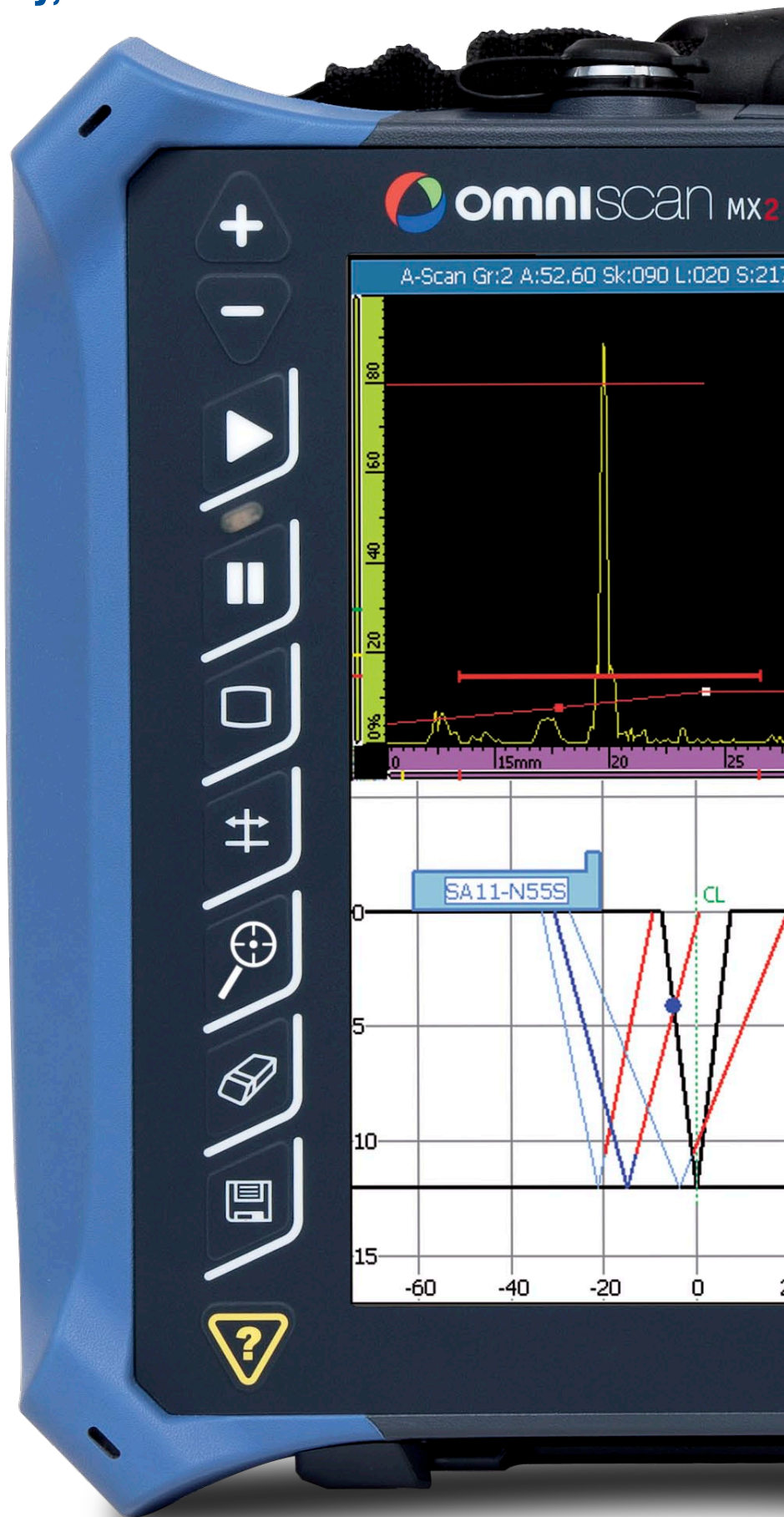
Powerstart your day the right way with the OmniScan MX2. The OmniScan MX2 simplifies and speeds up the setup process with its new Weld Overlay software feature, so you can start testing immediately. Featuring the industry-standard phased array user interface with faster-than-ever performance, a bigger and brighter 10.4 in. screen, new and unique intuitive touch-screen capabilities, and faster data transfer, enabling you to get to your next inspection quicker.

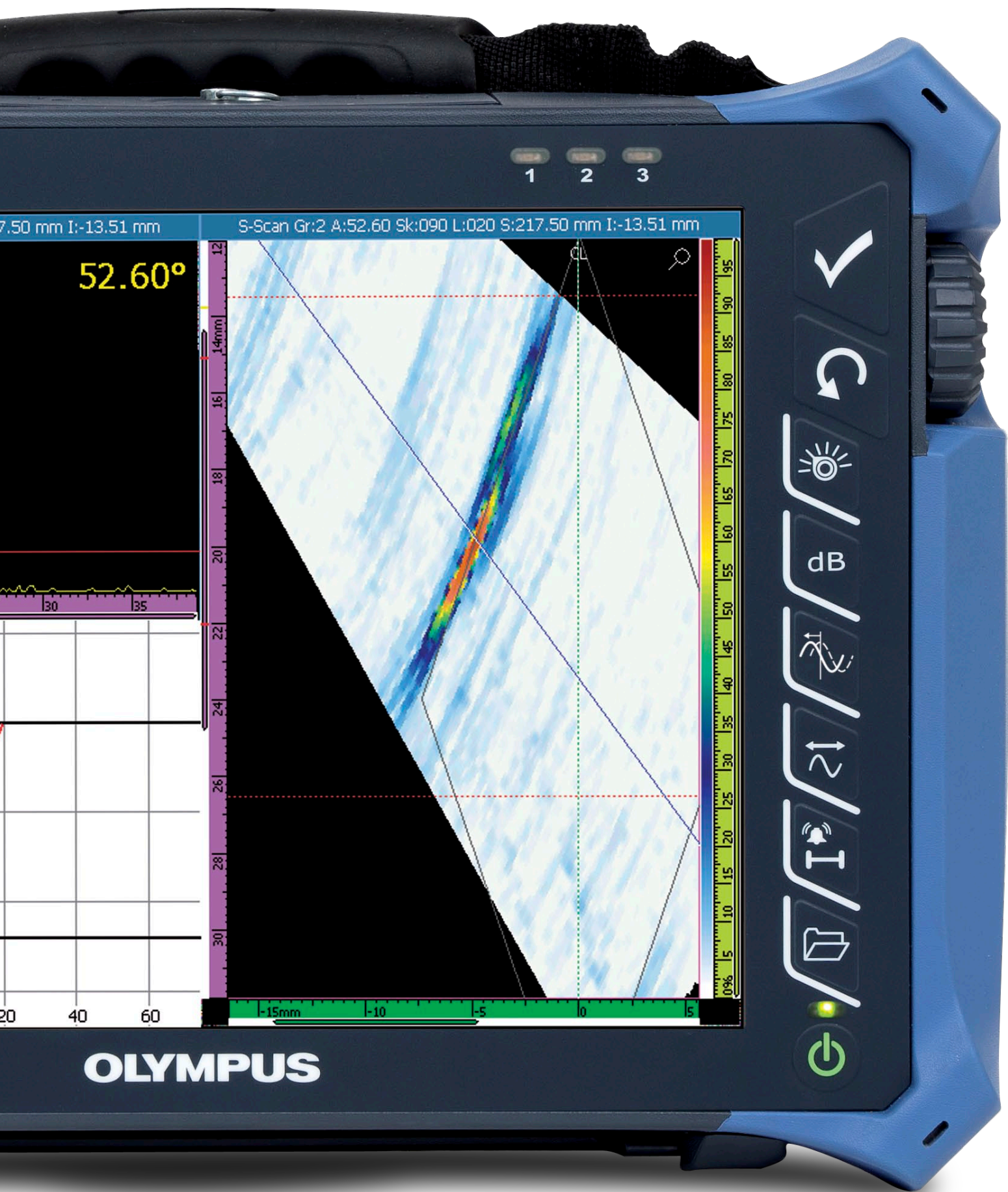
More Rugged than Ever

The OmniScan MX2 is now designed for IP66, and built to withstand the drops, spills, and abuse that typically occur in the most demanding inspection environments.

More than an Instrument —A Solution Provider

The OmniScan MX2 is an important part of your inspection solution, and can be combined with other critical components to form a complete inspection system. Olympus offers a complete product range that includes phased array probes, scanners, analysis software, and accessories, all of which are integrated and packaged into rapidly deployable, application-specific solutions for quick returns on your investment. In addition, Olympus offers a high-quality calibration and repair service worldwide, which is backed by a team of phased array application experts to ensure that you get the support you need.





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Life-Size OmniScan MX2

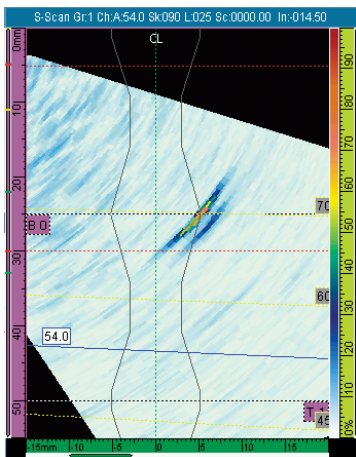
Touch-Screen Interface

The revolutionary touch-screen interface offers simple and quick navigation, enhanced text input functions, and easier, faster cursor control and gate setup.



Full-Screen Mode

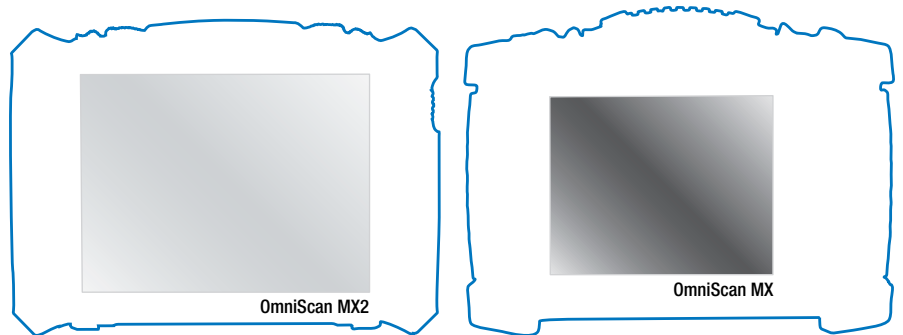
The unique full-screen mode offers operators increased viewing comfort, in addition to better readability at a distance. This feature can be used in both acquisition and analysis mode.







Weld Overlay Wizard

The Weld Overlay Wizard facilitates the creation of industry-standard weld overlays for analysis assistance and volumetric flaw placement.

Bright 10.4 in. Screen



OmniScan MX	
OmniScan MX2	
OmniScan MX	
OmniScan MX2	



Modular Instrument

Backward Compatible. Forward Compatible.
An Evolving Platform for your Growing Needs.

Designed to secure both your current and future phased array investments, the OmniScan MX2 can house any Olympus phased array module, including the reliable, field-proven models currently available, and the next-generation modules of the future. Its open architecture also supports future software updates and phased array module upgrades with configurations from 16:64M to 32:128 to ensure that your instrument evolves with your testing needs, and that you get the most from your investment.

Module Compatibility	OmniScan MX2	OmniScan MX
OMNI-M-PA1664M	✓	✓
OMNI-M-PA1664	✓	
OMNI-M-PA16128	✓	✓
OMNI-M-PA32128	✓	✓
OMNI-M-PA32128PR	✓	✓
OMNI-M-PA3232 (200 V)	✓	✓
OMNI-M-UT	✓	✓
OMNI-M-ECT/ECA		✓
Software Compatibility		
MXU-3.X ¹	✓	
MXU-2.X setup and data files	✓	✓
TomoView 2.9R12 (or higher) ¹	✓	✓
TomoView Remote Control	✓	✓

1. Data file compatibility



UT2
UT4
UT8

16:64 PA M

16:64 PA
16:128 PA

32:32 PA
32:128 PA

Setting Up for Success

Touch Screen

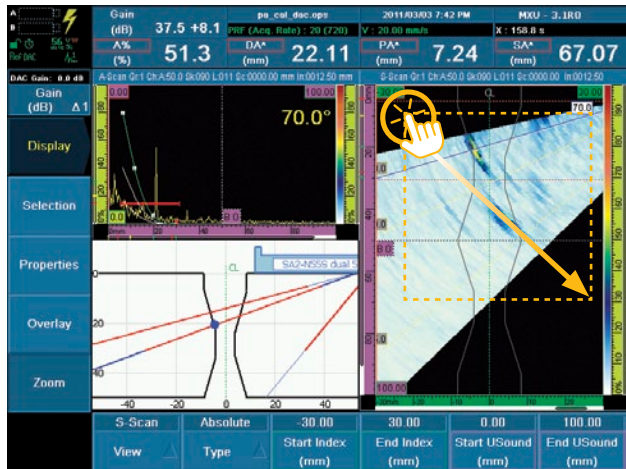
The bright 10.4 in. screen with its new, innovative, and revolutionary touch-screen interface improves browsing speed with its user-friendly gate, cursor, and display controls. In addition, the new on-screen text and value input makes devices like mice and keyboards unnecessary.

Menu Selection and Parameter Settings

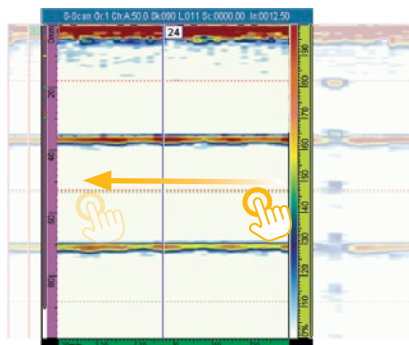


Tap once on the screen to quickly navigate through menus, submenus, and parameters.

Zooming and Panning

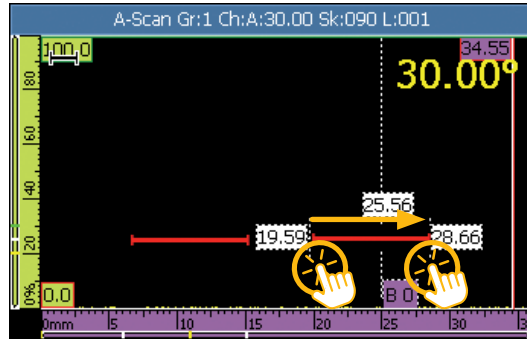


The touch screen's zooming functions can be used to zoom in on a specific area.



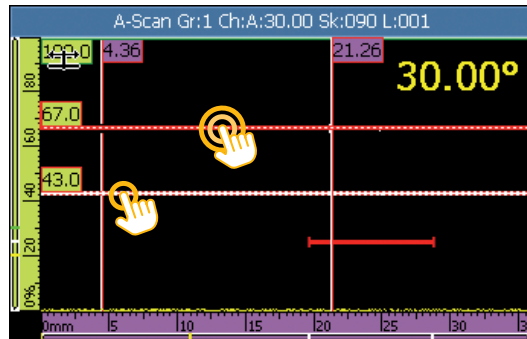
In Zoom mode, swipe to pan the window contents.

Gate Selection and Movement



In Gate mode, tap and hold a gate to move it to a new position.

Cursor Selection and Movement



In Cursor mode, tap once on a cursor to select it. Double-tap on a position to move the cursor to the desired location.

Text and Value Input

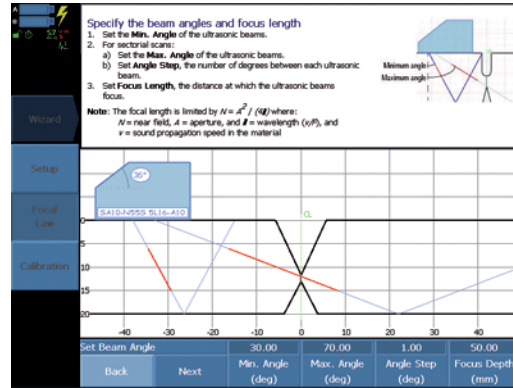


Double-tap on a parameter to bring up the keyboards or keypad on which values can be entered. Alphabetic and a numeric keyboards are available.

Setup

Group Wizard for All Essential Parameters

- Material selection, with a database for shear and longitudinal velocities, and configuration of components for flat or curved surfaces.
- A group copy option in the Wizard for fast creation of symmetrical two-probe inspections.
- Wedge selection from a database of Olympus wedges.
- Auto probe detection.
- Scanner configuration with offsets, skews, and probe positions.
- Wizard guidance for phased array, conventional UT, and TOFD channels.
- Detailed interactive and illustrated help menu for every step in the Wizard.
- Weld Overlay and RayTracing: step-by-step Wizard to configure the weld geometry.



Scan plan adjustment using the Focal Law Wizard.

Setup Speed

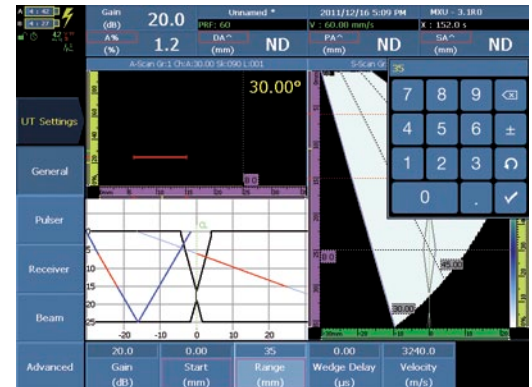
OmniScan MX

OmniScan MX2 **50% faster**

S-Scan and A-Scan Display Refresh Rate

OmniScan MX

OmniScan MX2 **300% better**



UT parameter adjustment using the touch-screen software keypad.

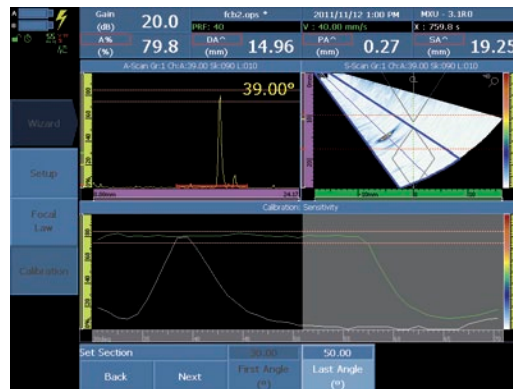
Calibration

Code-Compliant Calibration

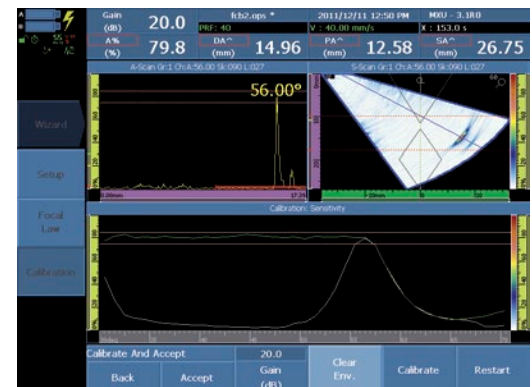
The Calibration Wizards ensure that every focal law in every group is the direct equivalent of a single-channel conventional flaw detector.

Calibration Wizards

- Guide the user step-by-step through Velocity, Wedge Delay, Sensitivity, TCG, DAC, AWS, and DGS calibrations.
- Enable experimental or theoretical sensitivity, and TCG curves based on two, three, or all beams for a real or interpolated calibration.
- Offer a simple, easy-to-use interface that enables all focal laws to be visualized simultaneously for a particular calibration task.
- Features an interactive help menu with detailed graphics and definitions, which is available in each step of each Wizard.



Sensitivity calibration for a defined section in a sectorial scan.



Sensitivity calibration for all beams in a sectorial scan.

Acquisition

- A scan menu for quick and easy configuration of inspection parameters for manual, one-line, raster, and helicoidal scans.
- Multiple encoder modes, including Clock, Quadrature, and Clicker.
- C-scan configuration for amplitude and position C-scans, and display setup.
- Data storage options for full A-scans, S-scans, and/or C-scans.
- Preconfigured display layouts for easy inspection preparation.
- PRF auto adjustments for optimized, maximum speed, or manually-controlled settings.
- Data storage options for flash card or USB media devices.
- Real-time data acquisition displays, with the ability to rewrite data in both scan directions when using an encoder.
- Easy to interface with encoded scanners.
- Different gate-synchronization capabilities.

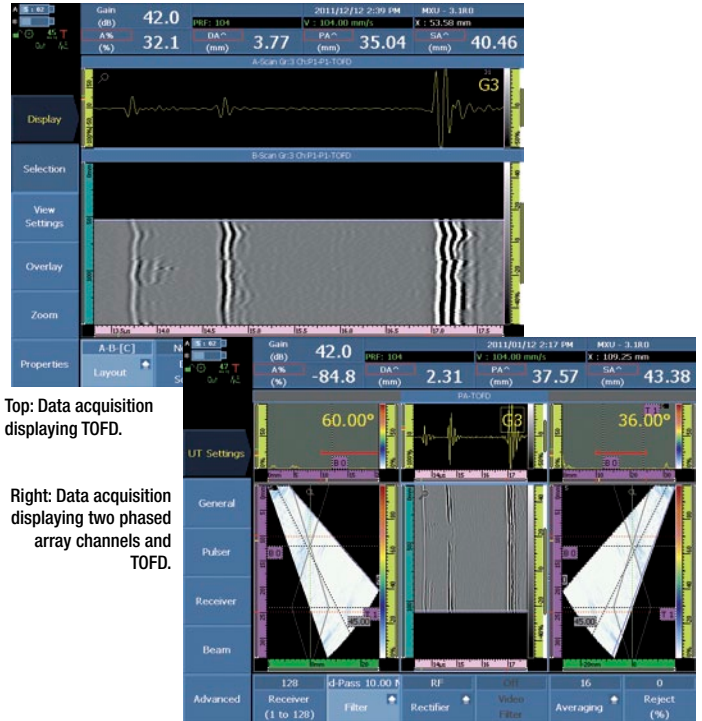
Pulse Repetition Frequency (PRF)



Saving Inspection Data File to USB (speed)



Maximum File Size (Mb)



Flawless Data Management

An SD Card is used to store data for easy transfer to a computer. The SD card can also be inserted and removed without having to reboot the unit. In addition, data can be transferred to external media using the USB 2.0 port. The OmniScan MX2 provides data transfer speeds up to 400% faster than the OmniScan MX (depending on the device used).

Analysis

- An extensive display menu for preconfigured multigroup and multiprobe inspection layouts.
- Data, reference, and measurement cursors for defect sizing and reporting.
- Extensive Readings database for trigonometry, flaw statistics on axes, volumetric position information, code-based acceptance criteria, corrosion mapping statistics, etc.
- All Readings are available online, and are also available off-line when full A-scans are saved in data files.
- Linked displays for interactive analysis of A-scans, B-scans, S-scans, and C-scans for multigroup and multiprobe inspections.
- Optimized preconfigured layouts for quick and simple length, depth, and height sizing of flaws for code-based or non-code-based inspections.
- Interactive off-line gate repositioning.





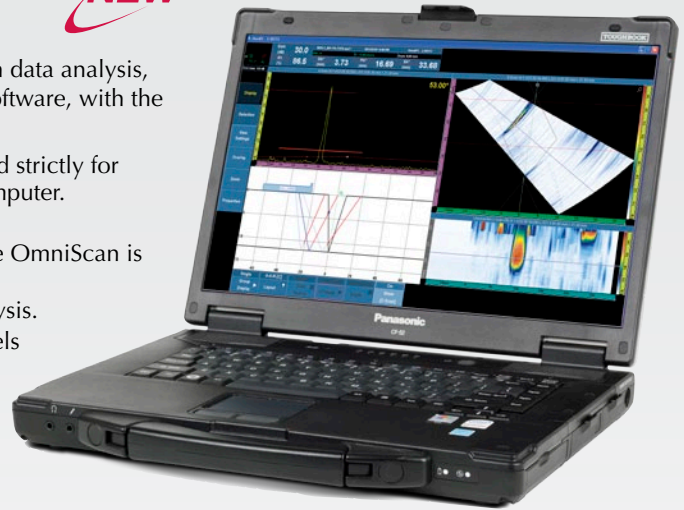
Data Analysis with OmniPC



This new software is the most efficient and affordable option for OmniScan data analysis, and features the same analysis tools provided in the OmniScan onboard software, with the added flexibility of running on a personal computer.

- Optimized use of your OmniScan: The OmniScan unit can now be used strictly for scanning while analysis is performed simultaneously on a personal computer.
- Affordable software.
- Same user interface as the OmniScan. An inspector with training on the OmniScan is automatically qualified to use the OmniPC.
- Compatible with extra large screens for increased visibility during analysis.
- Intuitive keyboard shortcuts have been added to boost productivity levels during file analysis.
- The inspector can validate the parameters used for inspection.

OmniPC is the perfect choice for performing analysis with most applications, including composite, corrosion, and weld inspection with up to three groups.



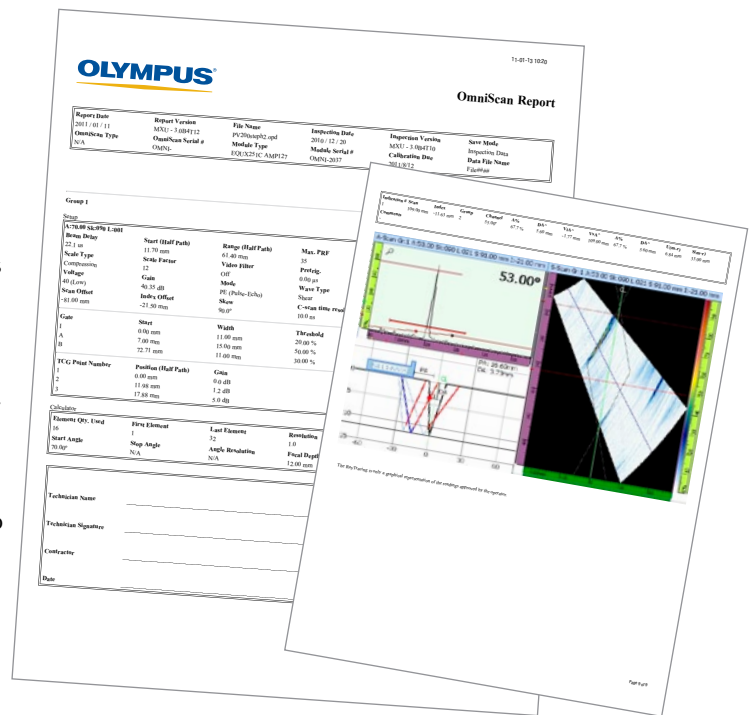
OmniPC and TomoView Feature Comparison

		OmniPC 3.1	TomoView Analysis
Standard Analysis	Ray tracing	✓	
	Offline peak selection in gates	✓	
	Metric and imperial units	✓	✓
	Multigroup combined display (PA, UT, and TOFD)	✓	✓
	Ability to zoom in and out of the display	✓	✓
	Predefined weld overlay display	✓	✓
	Selectable information groups (readings)	✓	✓
	Off-line data management and processing	✓	✓
	Indication-table tools	✓	✓
	Built-in report generator (customizable)	✓	✓
	Ability to modify/create color palettes	✓	✓
Advanced Analysis	Volumetric merge tool (automatic or manual)		✓
	Software gain adjustment		✓
	Advanced layout tools		✓
	Zone tool for statistical measurements		✓
	3-D cursor		✓
	Ability to open multiple files simultaneously		✓
	Merge tool (data files and C-scans)		✓
	Advanced off-line data management and processing		✓
	Signal-to-noise ratio (SNR) analysis tool		✓
	Hysteresis correction		✓
	Ability to export data groups to .txt files		✓
	FFT calculation		✓
	Microsoft Excel Exchange		✓
Acoustic field simulation (AFISIMO)		✓	

Reporting

The OmniScan MX2 is designed to inspect, analyze, and generate reports directly on the instrument, or off-line on a computer.

- The reports created on the OmniScan include an indication table that can be customized with additional readings and comments specific to each indication.
- RayTracing tools are included to represent indication positions on the weld profile.
- Option to include a high-resolution image of the current display in the report.
- The autogenerated report contains relevant parameters for the instrument, software, calibration, UT parameters, phased array parameters, scanner setup, and flaw reporting.
- Up to eight readings from the original setup can be displayed using the touch screen's simple toggle operations.
- Reports are stored and viewed on the instrument, and can also be saved as HTML documents for use on a computer.
- Reports are fully customizable and come with several preconfigured templates.



Advanced Data Acquisition and Analysis with TomoView

TomoView™ is the perfect PC-based complement to the OmniScan® family of instruments, and seamlessly imports OmniScan files for advanced processing and analysis in TomoView.

- **Displays volume-corrected views** that are fully customizable and come with several preconfigured templates.
- **Imports and merges several** data files. For simplified interpretation, several groups are merged into one.
- **Corrects potential operator errors** in acquisition parameters (incorrect skews, index offsets, etc.) by reading back raw acquisition data without altering original data.

Advanced Inspection Tools

TomoView offers advanced inspection tools to simulate, test, and prepare setups for the OmniScan.

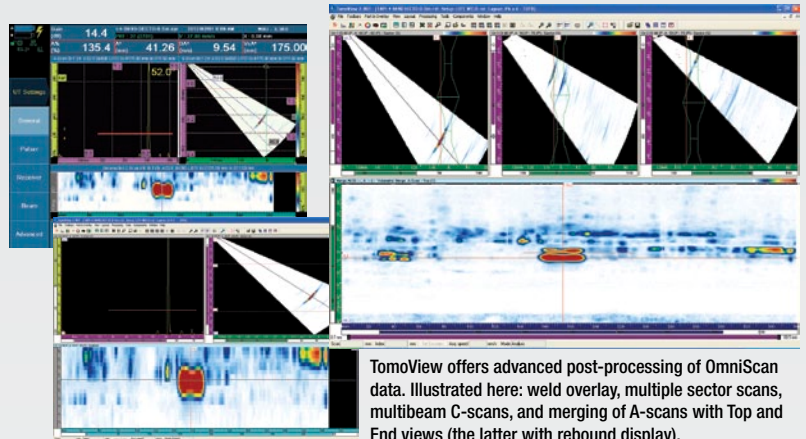
- 2-D matrix
- Pitch-and-catch, tandem
- Advanced focusing

Advanced Analysis Tools

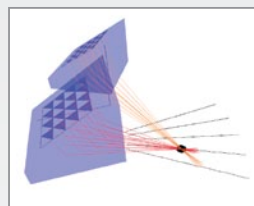
- The TOFD Manager performs TOFD calibration, lateral wave straightening, lateral wave removal, and the synthetic aperture focusing technique (SAFT).
- C-Scan Merge: Merges C-scans based on minimum or maximum amplitude, or time-of-flight (TOF).
- Signal-to-noise ratio (SNR): On a C-scan, this tool calculates and displays areas in which SNR is above and/or below a certain threshold.

Reporting

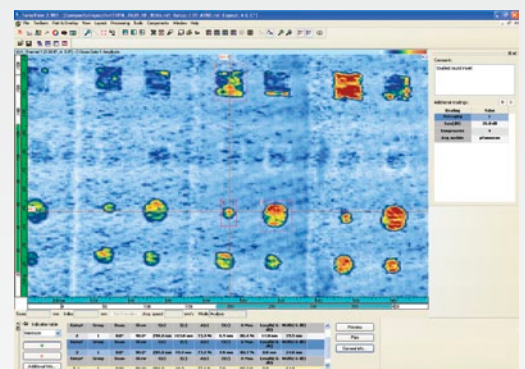
Creating a report in TomoView takes just a few clicks. Defects can be added into the indication-table database, the indication table can be customized with additional readings, and you can add comments specific to each indication.



TomoView offers advanced post-processing of OmniScan data. Illustrated here: weld overlay, multiple sector scans, multibeam C-scans, and merging of A-scans with Top and End views (the latter with rebound display).



Dual matrix PA probe (TRL).



Indication table built from composite inspection data.

Typical Applications

Girth Weld Inspection

The OmniScan PA is at the heart of the Olympus manual and semiautomated circumferential weld-inspection solutions developed for the oil and gas industry. These phased array systems, which are certified for tube inspection in compliance with ASME, API, and other code criteria, offer superior inspection speed and detection, and facilitate interpretation of indications.



Pressure Vessel Weld Inspection

A complete inspection of pressure vessel welds can be performed in a single scan using an OmniScan PA and a motorized scanner such as the WeldROVER. By combining TOFD and PA in a single inspection pass, a significant reduction in inspection time can be achieved as compared with conventional raster scanning or radiography. Furthermore, inspection results are available immediately, enabling you to detect problems with welding equipment and fix them right away.



Weld Inspection of Small-Diameter Pipes

When coupled with the COBRA manual scanner, the OmniScan flaw detector is capable of inspecting pipes ranging from 0.84 in. OD to 4.5 in. OD. With its very slim design, this manual scanner is able to inspect pipes in areas with limited access. Adjacent obstructions such as piping, supports, and structures can be as close as 12 mm (0.5 in.).



Manual and Semiautomated Corrosion Mapping

The OmniScan PA system with the HydroFORM scanner is designed to offer the best inspection solution for detecting wall-thickness reductions resulting from corrosion, abrasion, and erosion. In addition, it detects mid-wall damage such as hydrogen-induced blistering and manufacturing-induced laminations, and easily differentiates these anomalies from loss of wall thickness.

For this application, phased array ultrasound technology offers superior inspection speed, data point density, and detection.



Composite Inspection

Parts made of laminate composite materials pose an inspection challenge due to their various shapes and thicknesses.

Olympus offers complete solutions for the inspection of carbon-fiber-reinforced polymer structures. These solutions are based on the OmniScan flaw detector, the GLIDER™ scanner, and dedicated probes and wedges designed for CFRP flat panel and radius inspection.



OmniScan MX2 Specifications

OmniScan MX2 Mainframe Specifications

Overall dimensions (W x H x D)	325 mm x 235 mm x 130 mm (12.8 in. x 9.3 in. x 5.1 in.)
Weight	5 kg (11 lb), including module and one battery
Data Storage	
Storage devices	SDHC card, most standard USB storage devices, or fast Ethernet
Data file size	300 MB
I/O Ports	
USB ports	3
Speaker out	Yes
Video output	Video out (SVGA)
Ethernet	10/100 Mbps
I/O Lines	
Encoder	2-axis encoder line (quadrature, up, down, or clock/direction)
Digital input	4 digital TTL inputs, 5 V
Digital output	4 digital TTL outputs, 5 V, 15 mA
Acquisition on/off switch	Remote acquisition enabled TTL, 5 V
Power output line	5 V, 500 mA power output line (short-circuit protected)
Alarms	3 TTL, 5 V, 15 mA
Analog output	2 analog outputs (12 bits) ± 5 V in 10 k Ω
Pace input	5 V TTL pace input
Display	
Display size	26.4 cm (10.4 in.) (diagonal)
Resolution	800 pixels x 600 pixels
Brightness	700 cd/m ²
Number of colors	16 million
Type	TFT LCD
Power Supply	
Battery type	Smart Li-ion battery
Number of batteries	1 or 2 (battery chamber accommodates two hot-swappable batteries)
Battery life	Minimum 6 hours with two batteries
Environmental Specifications	
Operating temperature range	0 °C to 45 °C; 0 °C to 35 °C with 32:128 PA (32 °F to 113 °F; 32 °F to 95 °F with 32:128 PA)
Storage temperature range	-20 °C to 60 °C (-4 °F to 140 °F) with batteries -20 °C to 70 °C (-4 °F to 158 °F) without batteries
Relative humidity	0% to 85% noncondensing No air intake; designed for IP66
Shockproof rating	Drop-tested according to MIL-STD-810G 516.6

Phased Array Module Specifications (Applies to OMNI-M-PA32128)

Overall dimensions (W x H x D)	244 mm x 182 mm x 57 mm (9.6 in. x 7.1 in. x 2.1 in.)
Weight	1.2 kg (2.6 lb)
Connectors	1 OmniScan connector for phased array probes
Number of focal laws	256
Probe recognition	Automatic probe recognition
Pulser/Receiver	
Aperture	32 elements
Number of elements	128 elements
Pulser	
Voltage	45 V or 90 V per element
Pulse width	Adjustable from 30 ns to 500 ns, resolution of 2.5 ns
Pulse shape	Negative square wave
Output impedance	Less than 30 Ω
Receiver	
Gain	0 dB to 74 dB, maximum input signal 1.25 Vp-p
Input impedance	50 Ω
System bandwidth	0.53 MHz to 21 MHz (-3 dB)
Beamforming	
Scan type	Sectorial and linear
Group quantity	Up to 8
Active elements	32
Elements	128
Data Acquisition	
Digitizing frequency	100 MHz (10 bits)
Maximum pulsing rate	Up to 10 kHz (C-scan)
Data Processing	
Number of data points	Up to 8,000
Real-time averaging	2, 4, 8, 16
Rectifier	RF, full wave, halfwave +, halfwave -
Filtering	Low-pass (adjusted to probe frequency), digital filtering (bandwidth, frequency range)
Video filtering	Smoothing (adjusted to probe frequency range)
Data Visualization	
A-scan refresh rate	Real time: 60 Hz
Data Synchronization	
On internal clock	1 Hz to 10 kHz
On encoder	On 1 or 2 axes
Programmable Time-Corrected Gain (TCG)	
Number of points	16 (1 TCG curve per channel for focal laws)
Alarms	
Number of alarms	3
Conditions	Any logical combination of gates
Analog outputs	2

Compatible with the Following Inspection Codes:

The OmniScan MX2 is compatible with standard industry inspection codes, including, but not limited to:

ASME Section V, Article 4
All ASME phased array code cases
ASTM E2700-09
ASTM E2491-06

AWS
API 1104 and API RP2X
CEN EN 583-6
BSI BS7706
... and more

OLYMPUS NDT INC. is ISO 9001 and 14001 certified.

OLYMPUS

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Mixed Sources
 Product group from well-managed
 forests, controlled sources and
 recycled wood or fiber

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