OLYMPUS®

Your Vision, Our Future

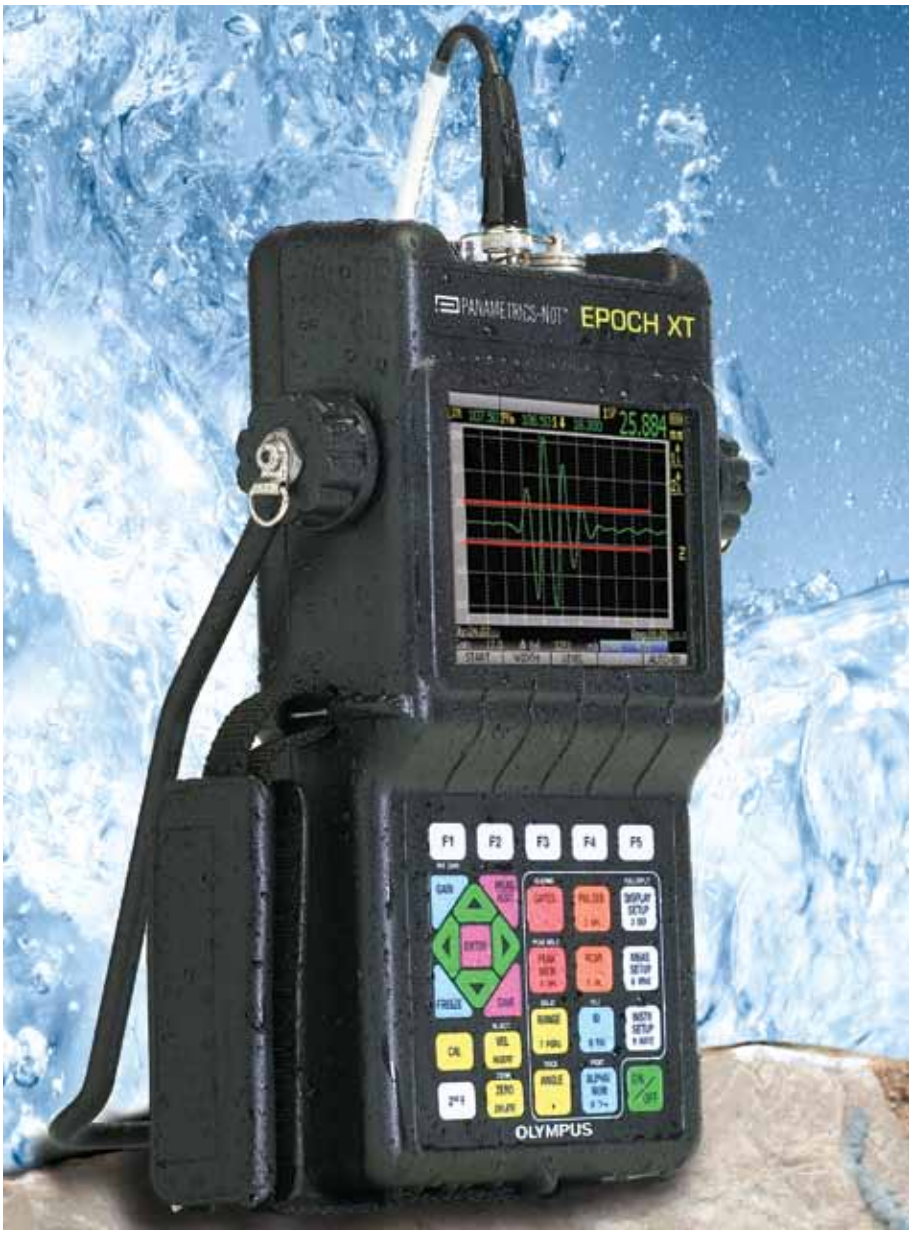
ULTRASONIC FLAW DETECTOR

EPOCH XT

- **Proven Ultrasonic Performance**
- **Broad Application Use**
- **Direct Access Interface**
- **EN12668-1 Compliant**

EPOCH XT

Advanced Ultrasonic Flaw Detector



The EPOCH XT Ultrasonic Flaw Detector is designed for great inspection flexibility and for use in extreme environments. It combines a multitude of enhanced flaw detection and measurement features, a bright multicolor LCD, versatile battery options, powerful data management, and numerous software features in a compact unit with a sealed case designed to meet IP67 requirements.

The EPOCH XT allows the operator access to a wide variety of standard pulser and receiver features that make the unit flexible to a large number of flaw detector applications. With up to 475V pulse energy combined with Olympus NDT's PerfectSquare™ tunable square wave pulser, the EPOCH XT is capable of high penetration applications beyond the standard flaw detector. And with an arsenal of optional software features, the instrument can be enhanced to meet the needs of nearly any conventional ultrasonic inspector.

Key Features

- EN12668-1 compliant
- Tested for explosive atmosphere, vibration and shock
- Designed to meet IP67 requirements to withstand harsh environments
- Direct access hand-held design
- Split screen view of A-scan and parameters for fast calibration verification
- Dynamic DAC/TVG Standard
  – Dynamic DAC curves
  – Custom warning
  – Meets ASME requirements
  – TVG table allows fully customized TVG setups
- Onboard DGS/AVG feature
- Multiple battery options – can be used with lithium-ion, NiMH, or C-cells
- Host USB port for direct printing and storage to USB drives
- Client USB Port for PC communication
- Perfect Square™ Technology: Pulse is electronically controlled on both the leading and trailing edges to maximize transducer performance and near-surface resolution.
- Digital receiver filtering
  – 7 standard filters for excellent signal to noise ratio
  – 30 optional filters for expanded applications
- Wide pulse voltage range from 50V to 475V
- PRF adjustable from 10 Hz to 1 kHz in 10 Hz increments. All measurements are taken "single shot."
- Powerful alphanumeric data logger: Corrosion thickness gage file types can be set up onboard.
- Simple incremental and calibration files
- Multicolor LCD
- Lightweight – 2.1 kg (4.7 lb)

Loaded With Practical Measurement Features

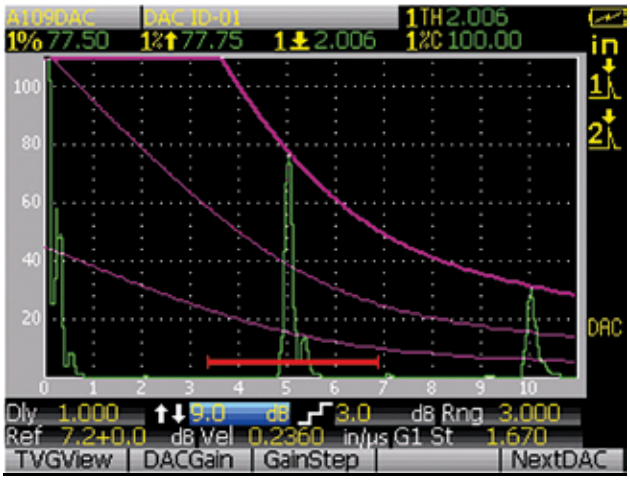
The EPOCH XT incorporates many standard measurement features including a tunable square wave pulser, selectable narrow-band and broadband digital filters, gain range from 0 dB to 110 dB, peak memory and peak hold, adjustable PRF, 0.01 mm (0.001 in.) measurement resolution, and two gates with programmable alarms. In addition, the unit offers many standard and optional application-specific software features: Dynamic DAC/TVG (Distance Amplitude Correction/ Time Varied Gain), On-board DGS/AVG, AWS D1.1 and D1.5, manual or encoded B-scan, Advanced Filter, and GageView Pro®.

- Standard tunable square wave pulser with PerfectSquare™ Technology allows the operator to adjust pulse width to maximize transducer performance.
- Standard digital receiver filtering: broadband, several narrow-band settings, and a high-pass setting
- Five measurement displays that are fully customizable to meet inspection needs. Select any Gate 1 or Gate 2 measurement for each display box.
- Amplitude measurement resolution of 0.25% full-screen height
- Amplitude measurement from 0% to 110% full-screen height
- Gate measurement modes: Peak, Edge and First Peak Mode for thickness measurement applications
- Measurement rate adjustable from 10 Hz to 1 kHz in 10 Hz increments on live screen
- Peak Mem. and Peak Hold functions in all rectified modes. Peak Hold also functions in RF mode.
- Grid Display modes
  – Standard 1 to 10
  – Sound path
  – Leg mode for angle beam inspection
  – Selectable 100% or 110% vertical display
- Leg indicator and measurement mode indicator for each gate
- Alarm indicator for each gate

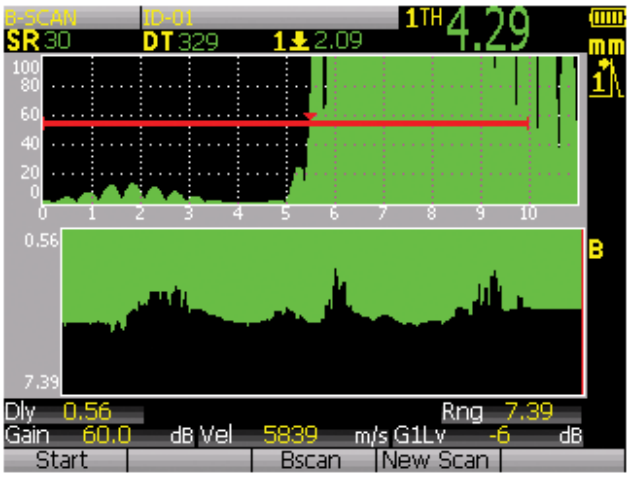
Direct-access Keypad

- Logical color-coded key organization
- Direct access to important instrument setup parameters
- Direct entry of alphanumeric characters
- Five customizable function keys allow the operator to quickly select preset values.
- Available in English, Japanese, or Chinese, or International symbols

Powerful Software Capabilities



EPOCH XT ASME III DAC



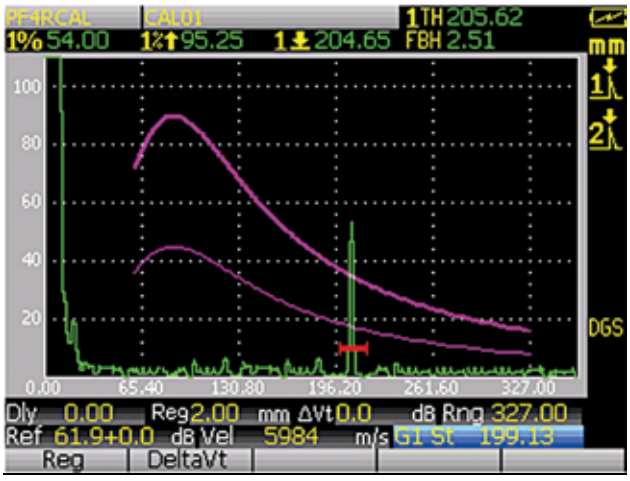
EPOCH XT B-scan and Floating Gate

Standard Software

Dynamic DAC/TVG
Calculates signal amplitude as a percentage or dB level compared to a DAC curve or a reference echo amplitude fixed with Time Varied Gain. DAC versions include ASME, ASME 3, JIS, and Custom. Contains several key features including: dynamically adjustable DAC curves, switchable DAC and TVG views, (20% to 80%) DAC/TVG, a flexible TVG table, and custom DAC warning curves.

CSC (Curved Surface Correction)
Corrects sound path information when using an angle beam transducer to circumferentially inspect a curved surface.

DGS/AVG
Flaw sizing technique that permits echo signals to be evaluated using a DGS/AVG diagram associated with a particular type of probe and material. The DGS/AVG diagram shows the relationship among echo height, flaw size, and distance from the transducer.



EPOCH XT DGS/AVG

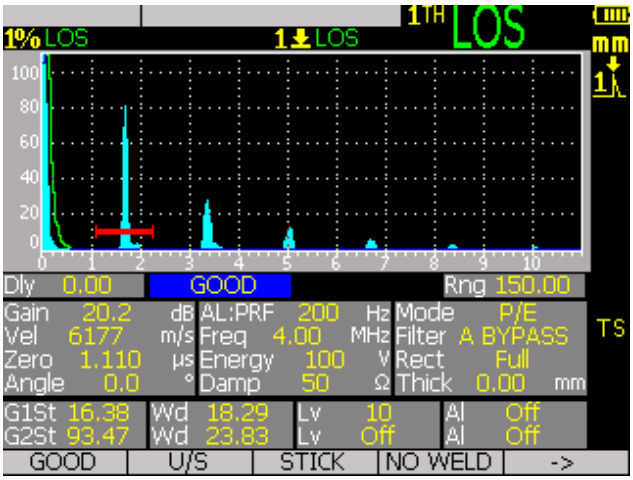
The **AVG/DGS Binder**, contains a DGS diagram and specification sheets for each angle beam, dual element, and protective face transducers from the Olympus NDT Atlas Transducers series. These diagrams are printed on splash and tear proof paper and housed in a six-ring binder.

Software Options

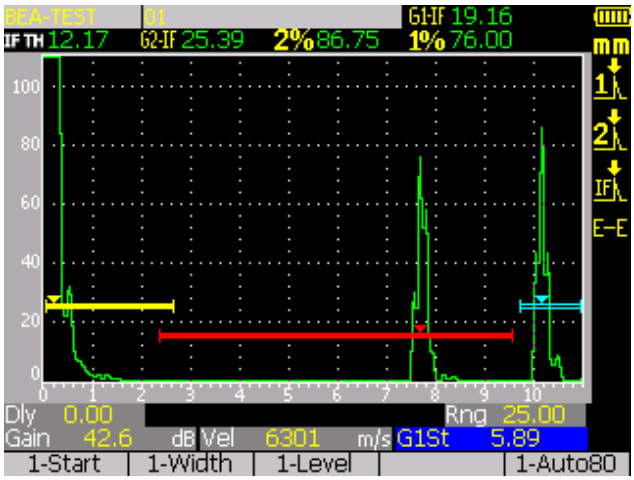
B-Scan
Single value (thickness) based B-scan that allows fully encoded or manual scans for corrosion monitoring. Simultaneous viewing of an A-scan and B-scan is available. Operates in all test modes including: TVG, Echo-to-Echo, and Floating Gate. Includes Floating Gate option.

Floating Gate
Gate option, which allows the operator to "float" Gate 1 and/or Gate 2 at a selected height compared to a gated echo (–1 dB to –14 dB). This feature is intended to allow more consistent, precise readings, especially in Edge Detection mode. This option is included in the B-scan option.

AWS D1.1 & D1.5
Provides a dynamic reflector "indication rating" for various AWS weld inspection applications. This allows for more efficient inspection by eliminating manual calculations.



Template Storage



Interface Gate

Template Storage
Allows on-screen comparison of a live waveform with a saved reference waveform. Saved templates can be dynamically toggled on and off with a single key press for fast waveform comparison. Gain adjustment feature allows each saved template a unique base gain for inspections requiring varying sensitivity levels. Excellent for spotweld analysis and other applications.

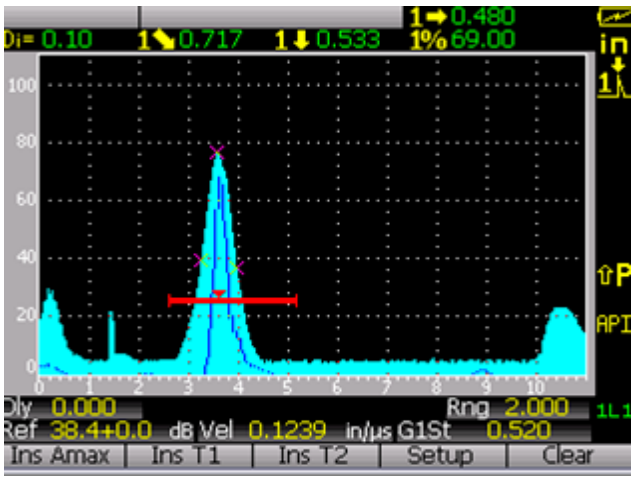
Advanced Filters
The Advanced Filters option takes advantage of the EPOCH XT's unique digital receiver design and allows unprecedented filtering flexibility. This option allows the EPOCH XT operator to choose from 37 different filter settings. Specific performance improvements from this option include:

- Performance improvement with low- frequency probes commonly used for inspection of composites and plastics.
- Improved initial pulse recovery with new DC coupled setups.
- Optimized broadband response from mid- to high-frequency transducers.
- Use of very low frequency transducers (50 kHz to 100 kHz range) for specialized applications.

Interface Gate
This optional third measurement gate enables real-time tracking of a variable interface echo in order to maintain consistent digital measurements.

Backwall Echo Attenuator (BEA)
Attenuates the backwall echo of an inspected part using the screen region defined by Gate 2. BEA is used to avoid screen saturation of the backwall echo to allow detailed flaw echo examination in the part region before the backwall while still monitoring the backwall echo for drop-out or signal reduction.

API 5UE
Allows defect sizing according to API Recommended Practice 5UE. Uses the Amplitude Distance Differential Technique (ADDT) to measure the size of potential defects during the proveup process of OCTG pipe. The measurement process is simple and repeatable since all ADDT variables are captured from a Peak Memory envelope.



API 5UE

Extensive Documentation and Data Management Capabilities

GageView Pro®

The optional GageView Pro interface program helps manage and format stored inspection data. Data can be printed or easily copied and pasted into word processing files and spreadsheets for further reporting needs. The GageView Pro interface program also allows the creation of a customized database of identifier (ID) strings that can be uploaded to the EPOCH XT. New features include remote display of live EPOCH XT screens on a PC, Live-Screen Capture mode, database backup/restore, and multi-view windows. The interface program is fully compatible with the EPOCH LT, XT, 600 and 1000 Series.

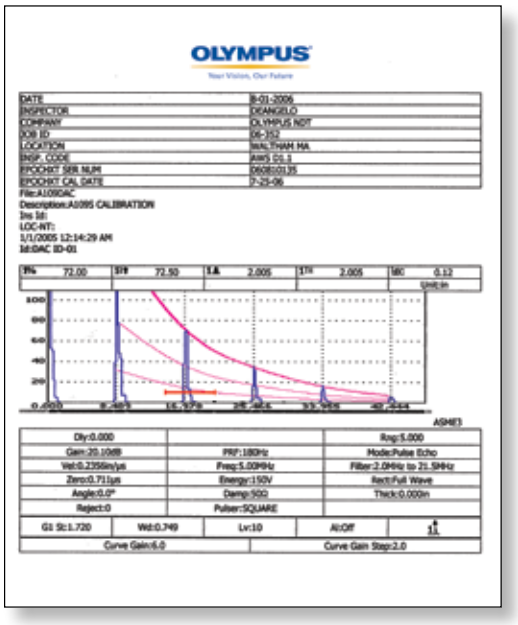
- Export thickness or amplitude data saved on the EPOCH to Excel, Word, or similar programs
- Create, format, and manage test databases
- View the live instrument display on a PC with Remote Display
- Import real-time screen snapshots
- Import and export setups between the EPOCH and a PC
- Create a custom DGS probe library

Data Logger and Documentation

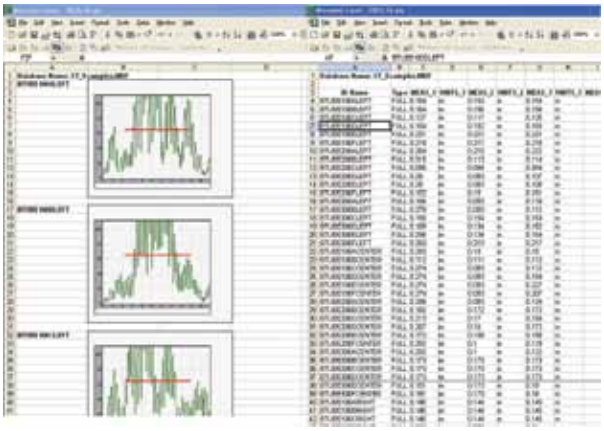
The EPOCH XT's sophisticated data logger is designed for ease of use while providing a wide range of features for many flaw detection and thickness gaging applications. Employing Panametrics™ corrosion thickness gage technologies, the EPOCH XT is ready to meet your inspection and thickness measurement survey requirements.

File types to meet your needs:

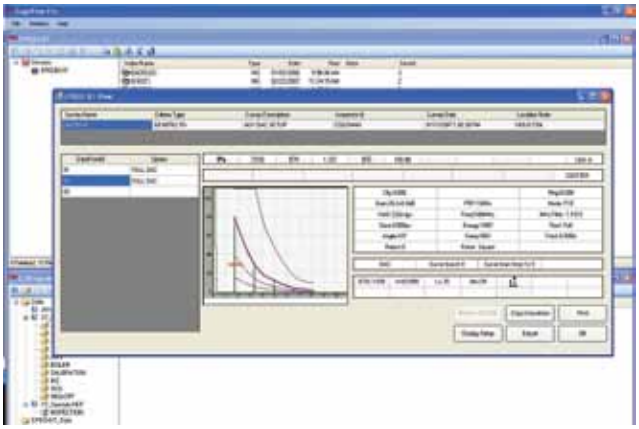
- Incremental
- Sequential
- 2-D, 2-D EPRI
- 2-D custom point
- 3-D
- Boiler
- CAL



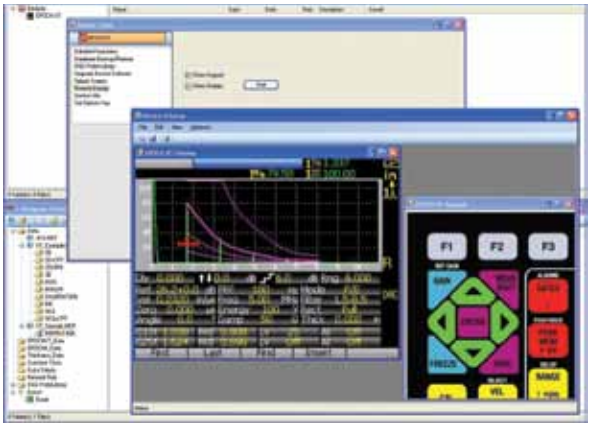
The EPOCH XT offers onboard report generation. Operators can set up custom report headers and print directly from the instrument using the USB host port.



Export inspection data to MS Excel spreadsheet. Data is organized into worksheets for waveforms, measurement data and instrument data.



GageView Pro Main File View



Remote display allows the operator to view the live EPOCH XT display on a PC. Operator can also control all instrument functions with the on-screen keypad or the PC keyboard.

DGS Probe Library Management Screen

Built For Tough Environments

Physical Features

- Hand strap can be mounted for left or right-hand operation
- Easy-to-use rubberized Pipe Stand that can be folded in or removed
- Durable instrument-mounted D-rings for chest harness use
- Sealed battery compartment—no tools required for battery replacement
- Sealed I/O door for AC adaptor and USB connections

Multiple Battery Options

The EPOCH XT offers three battery options that provide long-lasting battery operating time.

- Internal, rechargeable: NiMH, lithium-ion, or alkaline C-cells
- Optional external smart battery charger

Environmental Ratings	
IP rating	Designed to meet IP67 environmental seal requirements. The product design was confirmed to meet the IP rating by means of Olympus NDT's internal design verification test process.
Explosive atmosphere	Approved for Explosive Atmosphere per MIL-STD-810F, Procedure 1, NFPA 70E, Section 500, Class 1, Div. 2, Group D
Shock tested	EC 60068-2-27, 60 g, 6 µs H.S., 3 axes, 18 total
Vibration tested	Sine Vibration per IEC 60068-2-6, 50 Hz to 150 Hz at 0.03 in. DA or 2 *g*, 20 sweep cycles
Operating temperature	Lithium-ion: –20 °C to 50 °C (–4 °F to 122 °F) Nickel Metal Hydride: 0 °C to 50 °C (32 °F to 122 °F) Alkaline: –10 °C to 50 °C (14 °F to 122 °F) Recharge temperature: 0 °C to 40 °C (32 °F to 122 °F)
Battery storage temperature	–10 °C to 60 °C (–14 °F to 140 °F)

Optional Protective Case

The EPOCH XT is available with an optional rubber protective case that is intended to protect the unit in harsh environments. Operators have the choice of selecting the rubber protective case in black or white rubber. The white rubber case, along with the optional white background keypad (shown left) are designed to minimize heat absorption in very hot climates with intense sunlight.

Hardware Input/Output Port Option

- Optional 16 Pin HW I/O port
  - Alarm outputs
  - Trigger input/output
  - Encoder interface
- 16 Pin I/O cable available

VGA Output

The EPOCH XT comes standard with a VGA output port which allows the display to be viewed on most external monitors, projectors and other display devices. The instrument connects to VGA-compatible devices with the EPOCH XT VGA cable.

Analog Output Option

The EPOCH XT features an optional hardware port for analog output. This option provides continuous output of depth or amplitude information to an external device, such as a strip chart recorder or a PC outfitted with an Analog/Digital converter card. The information is output as a voltage, either on a 0 V to 1 V or 0 V to 10 V scale.

Dual USB Ports

- USB client port for high-speed data transfer to computer
- USB host port to interface directly to printers with USB ports and back up critical inspection data to USB drives

USB connections and AC input adaptors are sealed behind a thumb-screw accessible door.

EPOCH XT Specifications*

General	
Overall dimensions (W x H x D)	277 mm x 150 mm x 51 mm (at hand), 71 mm (at display); 10.9 in. x 5.9 in. x 2 in. (at hand), 2.8 in. (at display)
Weight	2.1 kg (4.7 lb) with lithium-ion battery
Keypad	English, International, Japanese, Chinese
Languages	English, Spanish, French, German, Italian, Japanese, Chinese, Russian, Korean, Norwegian, Swedish
Transducer connections	BNC or Number 1 LEMO
Data storage	10,000 IDs onboard
Battery type	Choice of lithium-ion, nickel metal hydride, and alkaline C-cells
Battery life	Lithium-ion: 9 h to 10 h; NiMH: 5 h; C-cells: 1 h to 2 h
Power requirements	AC Mains: 100 VAC to 120 VAC, 200 VAC to 240 VAC, 50 Hz to 60 Hz
Display type	Color Liquid Crystal Display: With 60 Hz update, user-selectable color schemes and brightness, and split-screen and full-screen modes.
Display dimensions (W x H, Diag.)	320 pixels x 240 pixels color 101 mm (4 in.) x 75 mm (3 in.), 125 mm (5 in.)
Pulser	
Pulser	Tunable Square Wave
PRF	User selectable or auto from 10 Hz to 1 kHz
Energy settings	50 V to 475 V in 25 V increments
Pulse width	Adjustable from 40 ns to 5,000 ns (0.1 MHz) with PerfectSquare™ Technology
Damping	50 Ω, 63 Ω, 150 Ω, 400 Ω
Receiver	
Gain	0 to 110 dB
Maximum input signal	20 V p-p
Receiver input impedance	400 Ω ± 5%
Receiver bandwidth	0.2 MHz to 26.5 MHz at –3 dB
Digital filter settings	Seven digital filter sets standard (0.2-10 MHz, 2.0-21.5 MHz, 8.0-26.5 MHz, 0.5-4 MHz, 0.2-1.2 MHz, 1.5-8.5 MHz, 5-15 MHz), additional filters optional
Rectification	Full-wave, Positive Half-wave, Negative Half-wave, RF
System linearity	Horizontal: ± 0.2% FSW Vertical: 0.25% FSH, amplifier accuracy ± 1dB
Reject	0 to 80% FSH with Visual Warning
Amplitude measurement	0 to 110% full screen height with 0.25% resolution
Measurement rate	Equivalent to PRF in all modes
Calibration	
Automated calibration	Velocity, Zero Offset Straight Beam (First Backwall or Echo-to-Echo) Angle Beam (Soundpath or Depth)
Test modes	Pulse Echo, Dual, or Through Transmission
Units	Millimeters, inches, or microseconds
Range	1.86 mm to 13,409 mm (0.073 in. to 527 in.) @ longitudinal velocity in steel
Velocity	635 m/s to 15240 m/s (0.0250 in./µs to 0.6000 in./µs)
Zero offset	0 µs to 4950 µs
Display delay	–59 mm to 12700 mm (–2.323 in. to 500 in.)
Refracted angle	0.1° to 85° in 0.1° increments
Measurements	
Measurement gates	2 fully independent gates for amplitude and TOF measurements
Gates (1, 2)	Thickness, Soundpath, Projection, Depth, Amplitude, Time-Of-Flight, Min./Max. Depth, Min./Max. Amplitude
Gate start	Variable over entire displayed range
Gate width	Variable from Gate Start to end of displayed range
Gate height	Variable from 2 to 95% full screen height
Alarms	Positive and Negative Threshold, Minimum Depth (Gate 1 and Gate 2)
Measurement display locations	5 locations available (manual or auto selection)
Echo-to-Echo	Standard Gate 2-Gate 1
Other measurements	Overshoot (dB) value for DGS/AVG, ERS (equivalent reflector size) for DGS/AVG, AWS D1.1/D1.5 rating (D), Reject Value
DAC/TVG	Standard
DAC points	Up to 50 points, 110 dB dynamic range
Special DAC modes	20-80% DAC, Custom DAC (up to 6 curves)
Curved surface correction	Standard OD or Bar correction for Angle Beam measurements

Instrument Inputs/Outputs

USB Client Port: For communication with GageView Pro

USB Host Port: Allows direct printing to any PCL5 compatible laser or inkjet printer as well as data storage on USB drives

LEMO® Hardware I/O (optional): Alarm outputs, trigger in/out, encoder interface

VGA Output Port: Connects to standard VGA monitor or projector

Analog Output Port (optional): Selectable voltage output of depth or amplitude data

Data Storage

Up to 10,000 IDs with waveforms, measurements, and setup parameters

Standard Package

EPOCH XT: Digital ultrasonic flaw detector

EP-MCA: AC adaptor

CASE-10009 (U8764102): Transport case

910-264: Operating manual

EPXT-BAT-L (U8760021): Lithium-ion or **EPXT-BAT-N (U8760038):** Nickel metal hydride battery

Optional Accessories

EPXT-EC (U8767043): External smart battery charger

EP4/CH (U8140055): Chest harness

EPXT-RPC (U8764043): Rubber protective case (black)

EPXT-RPC-W (U8764044): Rubber protective case (white)

EPXT-DP (U8780047): Clear display protectors (10)

EPXT-C-16HW-6 (U8840086): 16-pin hardware I/O cable with diagram

EPXT-C-VGA-6 (U8779019): VGA Cable

Software Options

EPXT-AWS (U8140068): AWS D1.1/D1.5

EPXT-BSCAN (U8140025): B-scan software

EPXT-BSCAN-KIT-XX: B-scan kit including software, encoder, and encoder cable

EPXT-FG (U8140073): Floating Gate

EPXT-FILTERS (U8140099): Advanced Filters

EPXT-BEA (U8140142): Backwall Echo Attenuation software

EPXT-TEMPLATE (U8140143): Template Storage software

EPXT-API5UE (U8140144): API RP-5UE software

EPXT-IG (U8140145): Interface Gate software

GAGEVIEWPRO-KIT-USB (U8140078): GageView Pro

OLYMPUS NDT INC. is ISO 9001 and 14001 certified.

OLYMPUS®

www.olympus-ims.com

info@olympusNDT.com

OLYMPUS NDT INC.
48 Woerd Avenue, Waltham, MA 02453, USA, Tel.: (1) 781-419-3900
12569 Gulf Freeway, Houston, TX 77034, USA, Tel.: (1) 281-922-9300

OLYMPUS NDT CANADA INC.
505, boul. du Parc-Technologique, Québec (Québec) G1P 4S9, Tel.: (1) 418-872-1155
1109 78 Ave, Edmonton (Alberta) T6P 1L8

Epoch_XT_EN_8p_201202 • Printed in the USA •