USM Go+

Small but tall.
All you expect from
an ultrasonic flaw
detector, packed in
a handheld.

Introducing the new USM Go+ that takes field inspection NDT to the next level. Light, handy and controlled by an intuitive arrow-keypad, it has the latest industrial electronics under the hood and offers a host of Surface Resolution which allows for reliable detection of defects located just below the surface of the test piece.

USM Go+ When design and technology shake hands

Built for practice

The USM Go+ ultrasonic flaw detector offers you the best of both worlds: the performance and features of a tabletop ultrasound detector in a small, ultra-portable handheld instrument that is outstandingly equipped for ultrasound detection in the field. Its ergonomic design, useful features and big performance are the result of carefully listening to the experience of the people in the field who, through their everyday practice, know best what it takes to do a good job.

What a field NDT operator needs is:

→ An instrument you can use with one hand

The USM Go+ is the ideal device for ambulant ultrasonic testing. It is light (about 800 g) and so small it fits in your hand. It's the perfect tool for operation in confined spaces, areas with difficult access or other difficult environments.
Actually, you operate it with one hand, thanks to the arrow-keypad, which allows for intuitive navigation and fast and precise adjustments. That comes in handy, when you need your other hand to adjust the probe or just hold on to a ladder. Are you left -handed? No problem, use the 'flip' function to adapt the instrument to your hand.

→ A robust, heavy duty device

Its molded rubber casing makes the USM Go+ the sturdy instrument you need in the sometimes harsh conditions 'in the field'. It is dust- and waterproof to IP67 and has been tested according to the military standards.

→ The biggest and brightest screen in its class

The 108mm x 64,8 mm screen with an outstanding resolution of 800 x 480 pixels offers you best-in-class readability. Moreover, it is exceptionally bright so you can still discern the image even in full sunlight. On the other hand, when working in the dark, you can reduce the brightness in order not to get blinded. An integrated stand allows you to optimize the viewing angle, when the instrument is desk or bench mounted.

→ Outstanding UT performance

Equipped with state-of-the art technology, the USM Go+ takes UT performance in handheld instruments a step further. The high Near Surface Resolution enables you to detect flaws located just under the surface of the test piece, with a high degree of reliability. A wide Pulse Repetition Frequency range allows you to use the USM Go+ at low PRF to inspect forged parts without any "ghost" echoes and to inspect welds at high PRF when fast and regular scanning movement is required.

→ A tool that boosts your productivity

Ultra-portable, easy-to-handle, intuitive operation, high performance - the USM Go+ is your plug & play tool that will give your productivity a boost the moment you start using it.

Other key features & benefits

- Very long life battery (> 6 hours).

- A standard USB connection allows for data to be downloaded from the flaw detector for further analysis or storage.

- The instrument's 2 GB memory can be easily exchanged by SD cards up to 16 GB.

- Reports are produced in jpeg format so there is no need for special reading software.

- Backwall Echo Attenuator (BEA) helps to find very small defects, improving detectability.

- Automatic Gate Threshold for the 2 gates ensuring accurate measurements made under the same conditions.

- A-Scan video recording up to 8 minutes allows live reporting.

A wide range of applications

The USM Go+ has been designed to provide flaw detection capability in inspection situations throughout the industrial and process spectrum, from aerospace to power generation and from the automotive sector to the oil and gas industry.

Weld Inspection:
- Trigonometric projections
- AWS
- DAC
- DGS

Inspection of Forgings and Castings:
- Manual PRF adjustment
- Phantom echo indicator
- DGS
- Backwall Echo Attenuator (BEA)

Inspection of rails:
- High PRF (up to 2000 Hz)
- Lightweight: 850 g (1.87 lb.)
- Small size and ergonomics

Inspection of Composites:
- RF Display
- 2 gates with B-start triggered with echo in gate A
- TCG correction with high slope 120 dB/µs
- Reflector depth indicated in layer

For more demanding applications:
- Narrow band filters
- Low noise digital amplifier
- Square wave pulser

Technical Specifications of USM Go+

Display	5 inch, 800 x 400 pixels, 108 × 65 mm (W x H), >200 cd/m²
Size (W x H x D)	175 x 111 x 50 mm
Weight	850 g with battery
Protection class	IP 67
Operating temperature	0 – 55 °C
Battery	Li-Ion, rechargeable, 6 hours operation time
Power adapter / charger	100 – 240 V AC, 50/60 Hz
Probe connector	2 x Lemo-00 (T/R)
PC interface	Micro USB
Memory card	SD-Card 16 GB max
Reporting	Test report and A-Scan screen shot on SD-Card, Video recording of A-Scan
Pulser	120 – 300 V, 30 – 500 ns, flank < 10 ns, Spike, Square wave option
Puls Repetition Frequency	15 – 2000 Hz
Damping	50 and 1000 Ohm
Receiver	110 dB dynamic, 0,9 – 20 MHz analog bandwidth
Filter	BB 1 – 5 MHz, 2,25 MHz, 4 MHz, 5 MHz, 10 MHz, 13 MHz, 15 MHz
Gates	A and B independent, B triggered by A, C option
Units	mm, inch, µs
Options	AWS calibration tool (AWS D1.1), DAC 16 points according to EN 1712, EN 1713, EN 1714, ASTM E164, TCG 120dB dynamic, DGS cal. tool according to EN 1712, EN 1713, EN 1714, ASTM E164, Data Logger, 3rd gate C, Square Wave Pulser
Compliance	EN 55011,EN 61000-6-2: 2011, EN 12668, ASTM E 1324, E317, ANSI/NCSL Z 540-1-1994, MIL-STD 45662A, MIL-STD 2154

www.ge-mcs.com

Krautkramer USM 36: a proven reliable and robust ultrasonic flaw detector performer

The Krautkramer USM 36 is the latest development in GE's USM range of flaw detectors. It combines the 21st century operating platform with the reliable and robust hardware of GE's well-established Krautkramer portable flaw detection instruments. It incorporates a range of innovative features to ensure that this new instrument is adopted as the everyday workhorse of flaw detectors by NDT inspectors globally.

Largest Viewable A-Scan Display in its Class

1

- An important improvement in the Krautkramer USM 36 is its large 7 inch screen, with an 800x480 pixel resolution. The entire area is available to display crispy A-scans, making it the best in its class. Signals can be easily viewed and accurately interpreted, even in bright sunlight, with tired eyes at the end of a long working day.

2

Simple and Efficient Operation

- The Krautkramer USM 36 uses the familiar rotary knobs of previous models but the function keys have now been minimized into a simple, intuitive 6-key keyboard, allowing simple and efficient operation;
- Inspection set-up is also easy. Not only for technicians who have used USM Go or USM Go+ for previous inspections, as set-up data is transferable directly from these instruments, which share the same user interface. This commonality of interface also ensures a rapid learning curve for technicians familiar with the USM Go instruments.

3

Flexible Data Reporting and Storage

- As well as easy-to-interpret the crispy A-scans, data reporting on the Krautkramer USM 36 can also include screen shots and A-scan videos, where A-scans can be recorded for subsequent analysis or to provide proof of inspection. All data is stored on a removable SD-card and reports can be in jpeg or BMP format.
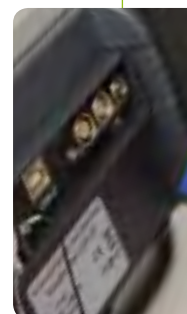
Available in Three Versions

- The versatile instrument is offered in three versions to meet the most standard inspection codes. The most advanced version can operate in DAC, AWS and DGS modes, features a powerful square wave pulser for excellent material penetration and can accommodate GE's patented *true*DGS probe technology, which offers unrivalled accuracy in sizing of flaws using the DGS method, as well the patented Phantom Echo Detection technology.

Can be Used in the Harshest of Environments

- The Krautkramer USM 36 is fully protected against dust and water ingress to IP66 and can be operated in ambient temperatures from -10°C to +55°C. It can be used in sandy deserts, frozen wastes and in the humid tropics.
- The new flaw detector weighs just 2.2 kg and is battery- or mains-operated. Its Li-ion battery has an operating life of more than 13 hours, with an integrated battery charger for those longer shifts.

Comprehensive Connectivity

- Connectivity is a major feature of the Krautkramer USM 36. Data can be stored on removable SD-card or USB memory stick, either for record purposes or to allow data sharing. A VGA connection allows the instrument's display to be shown on an external monitor or on a projector screen for training purposes.

Applications

The Krautkramer USM 36 has been developed for day-to-day use throughout the industrial spectrum, from weld inspection and corrosion measurement in the power generation and petrochemical industries, to castings and forgings inspection and thickness measurement in the automotive, metals and aerospace sectors to the inspection of special materials.

Weld Inspection in the Power Generation and Petrochemical Industries

Intuitive tools facilitate analysis and the use of color on the ultra-bright, 7 inch screen allows significant display benefits during weld inspection:
- Monitor gates and curves are displayed in various colors;
- Messages and alarms are displayed in red;
- A-scans can be displayed in different colors to assist comparison;
- Color display of all parameters involved in flaw location, including sound path, surface distance, depth position and leg number;
- GE's patented color coded display of legs for angle beam inspection.

Precise Thickness Measurement in the Automobile Industry

The Krautkramer USM 36 provides precise thickness measurement, as the sound path differences are measured very accurately at the peaks of an echo sequence.

Corrosion Measurement in the Power Generation and Petrochemical Industries

Corrosion measurement can be carried out using dual element probes, where the screen displays both the thickness measurement and the A-scan, ensuring maximum reliability. A minimum capture mode provides the thinnest measured reading at the end of a continuous scan. An auto-freeze function, which minimizes the probe's surface contact time, is used for measuring structures and components with hot surfaces.

Inspection of Forgings

The instrument's Phantom Echo Detection technology is used in the inspection of fine grained and long work pieces to ensure accurate detection of flaws but not Ghost Echoes.

Inspection of Special Materials

The powerful square wave pulser which is an available option for the Krautkramer USM 36 provides excellent penetration of difficult materials, such as those sometimes used in the aerospace and automobile industries.

Technical Specifications of Krautkramer USM 36

Display screen

Size Diagonal	7"
Active range (W × H)	152.4 × 91.44 mm^2
Resolution (W × H)	800 × 480 pixels
Range	4 ... 14,108 mm (555") for longitudinal wave

Display

Display shift (delay)	−15 ... 3,500 µs
Probe delay	0 ... 1,000 µs
Velocity	250 ... 16,000 m/s
PRF	Automatically optimized 15 ... 2,000 Hz, 3 automatic setting modes: Auto Low, Auto Med, Auto High, Manual

Connectors

Probe connectors	2 × LEMO-1 or 2 × BNC
USB interface	USB type B connector
Service interface	LEMO-1B, 8 pin

Pulser

Pulser mode	Spike pulser, optionally: Square-wave pulser
Pulser voltage (SQ mode)	120 ... 300 V, in steps of 10 V with a tolerance of 10%
Pulser falling/rising time	max. 10 ns
Pulser width (SQ mode)	30 ... 500 ns, in steps of 10 ns
Pulser amplitude (Spike mode)	low: 120 V, high: 300 V
Pulser energy (Spike mode)	low: 30 nS, high: 100 nS
Damping	50 ohms, 1000 ohms

Receiver

Digital gain	Dynamic range 110 dB, adjustable in steps of 0.2 dB
Analog bandwidth	0.5 ... 20 MHz
Equivalent input noise	<80 nV/√Hz
Filters	Broadband: 1-5 MHz / 2, 2.25 MHz / 4, 5 MHz / 10 MHz / 13, 15 MHz
Rectification	Positive half-wave, negative half-wave, full wave, RF signal

Gates

Independent gates	Gates A and B (triggering by gate A), Gate C (option, triggering by gate A or B)
Measurement mode	Peak, Flank, J-FLANK, FIRST PEAK

Memory

Card slot	SD-card slot for all standard SD-cards
Capacity	8 GB, SD-card
Datasets	UGO data structure in ASCII
Reports	JPG or BMP format

General

Battery	Li-Ion, operating time: 13 hours with full charge Charging method (standard): internal with power adapter Charging method (optional): external charger Charge level: proportional charge level indicator
Power adapter	Universal power supply unit 100 ... 240 VAC, 50/60 Hz
Size (W × H × D)	255 × 177 × 100 mm (10" × 7.0" × 3.9")
Weight	2.2 kg incl. battery
Languages	Bulgarian, Chinese, Czech, Dutch, English, Finnish, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish
Damp heat and humidity (storage)	EN 60068 Part 2-30 6 cycles: 9 hrs at +25°C up in 3 hrs to +55°C, 9 hrs at +55°C then down to +25°C in 3 hrs, at 93% humidity
Vibration	EN 60068 Part 2-6 2g per axis, 5 ... 150 Hz, 1 oct/min, 25 cycles
Shocks	EN 60068 Part 2-27 1000 cycles per axis, 15 g, 11 ms, half-sine
Enclosure	IP66 according to IEC 60529
Operating temperature	−10 ... 55°C
Cold operation	−10°C for 16 hrs, 502.5 Procedure II
Heat operation	+55°C for 16 hrs, 501.5 Procedure II
Storage temperature	−20 ... +60°C, without battery
Cold storage	−20°C for 72 hrs, 502.5 Procedure I
Heat storage	+70°C for 48 hrs, 501.5 Procedure I

Options

AWS	AWS calibration tool, according to AWS D1.1 Structural Welding Code
DAC/JISDAC/CNDAC	DAC calibration tool, 16 points, according to EN 1712, EN 1713, EN 1714, ASTM E164, ASME, ASME III, JIS Z3060, GB11345 TCG: 120 dB dynamic, 110 dB/µs slope
DGS	DGS calibration tool, according to: EN 1712, EN 1713, EN 1714, ASTM E164
Data logger	Grid file creation
3G	Gate C
SWP	For pulser parameter optimization, voltage setting 120 ... 300 V in steps of 10 V, pulse width setting 30 ... 500 ns in steps of 10 ns
Phantom-PRF	Phantom-PRF for the identification of erroneous echoes caused by multiple reflections in low-attenuation materials
BEA	Blackwall Echo Attenuation

Specifications according to EN 12668

You will find the specifications according to EN 12668 for your instrument on the product CD included in the standard package.

www.ge-mcs.com

GEIT-20067EN (10/13)

Krautkramer USN 60/60L

Portable Ultrasonic Flaw Detectors

GE Inspection Technologies has optimized its USN 60 series for use in direct sunlight and operation at extreme temperatures. These new characteristics make the instruments ideally suited for outdoor use with its increased long battery operation time.

Depending on the applications challenges, you have the choice between the USN 60 and the USN 60L version.

GE imagination at work

The USN 60 series: outstanding ultrasonic performance

The combination of the rugged USN durability, 11 hours of battery operation, fast rotary knob operation, outstanding ultrasonic performance, and the "square wave pulser" form a powerful portable ultrasonic inspection tool.
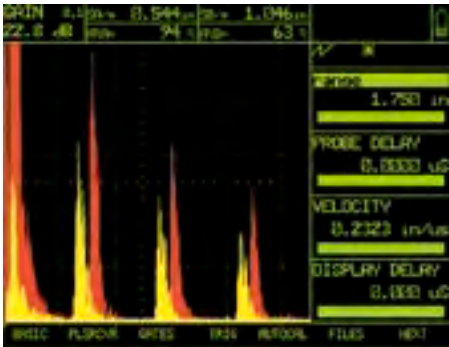
Optimized outdoor use design

The USN 60 / USN60L flaw detectors are especially designed to be used outdoors:
- Extreme temperature use (-20°C to +55°C /-4°F to 130°F)
- Easy to view in direct sunlight
- 11 hours battery operation

Vibrant colors

- Hi-resolution color LCD display produces "Analog Look and Performance" echo dynamics.
- 4 selectable vibrant display color schemes to match lighting conditions.
- Gates and gate functions are color coded for easy identification and fast adjustment.

User preferred features

- Simple operation with fast rotary knob adjustments; gain is always directly accessible with the left-hand rotary knob and lockable.
- Auto CAL makes calibration fast & easy.
- 15 Hz to 6 kHz (spike mode) PRF and 15 Hz to 2 kHz (square mode) PRF (pulse repetition frequency).
- 2 independent gates monitor amplitude and soundpath distance for both flaw detection and thickness measurement applications.
- 250 KHz to 25 MHz frequency range.
- RF display mode enhances signal evaluation and bond inspection of dissimilar materials.
- 4 selectable damping settings (50, 75, 150, 500 ohms) for optimum probe performance.
- 1 mm to 28 m (0.040" to 1100") range (in steel) covers thin to lengthy acoustically clean materials.

- dB REF key evaluates subsequent echoes gain value and amplitude against the highest echo in Gate A (reference echo) when activated.
- IF (Interface) Gate Option for automatic start of the display, Gate A, Gate B, and / or DAC / TCG for immersion testing applications.
- VGA Output Option provides an easy way to connect to a PC monitor or PC projector for viewing by large audiences or training purposes.
- RF Output Option outputs the raw RF waveform via a standard Lemo connector for further analysis.
- BEA (Backwall Echo Attenuator) Option allows independent gain control of the region under Gate B for backwall echo monitoring.
- 19" Rack Mount Model.

Wide range of applications

A 6 kHz pulse repetition frequency, real-time analog and TTL outputs makes the USN 60 flaw detectors series ideal for a wide range of automated systems testing applications. The exclusive SmartView feature displays even the shortest echoes for critical scanning and rotating part inspections.

The quality, durability, dependability and ease of use that you have come to expect of Krautkramer's popular USN Series of instruments remains. From rugged field inspections to high resolution thin measurements, long acoustically clean materials, and immersion systems, the USN 60 flaw detector family extends the range of applications that a portable instrument can perform. Furthermore the selectable 450V Square Wave Pulser satisfies a wide range of tough-to-penetrate applications, such as difficult to penetrate metallic applications and especially non-metals inspection like composite materials.
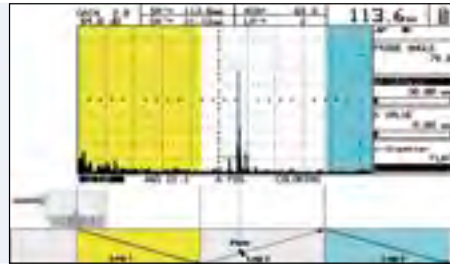
"Color Leg" indicator displays the legs of the angle beam inspection in different colors

Tools for easy weld inspection

- Color Leg allows easy identification of leg and skip distances for weld inspection.
  - GRID mode dynamically changes bands of display backgroundcolors for each leg.
  - A-SCAN mode dynamically changes the color for each leg of the "live" A-Scan
- Weld Rating Calculation simplifies the rating of weld indications according to AWS Specification D1.1. (Formula D = A – B – C).
- Trigonometric flaw location function with curvature correction automatically calculates depth, surface distance, and sound path to flaw along with the leg of the inspection when using angle beam probes. All TOF measurements can be displayed in mm, inches or µs.
- SmartView function along with variable persistence freeze modes displays the most important information (relevant shot) for a test.
- Real time (single shot) analog and TTL outputs handle a wide range of automated systems applications.
- Choose from Four Freeze Modes:
  ALL, Peak Std, Compare or Envelope for optimum waveform evaluation and comparison.
- Three Variable Persistence Modes are selectable in Freeze Envelope to visually assist flaw detection & evaluation for scanning and moving part inspections.
- Compare frozen reference wave-forms to live A-Scans in different colors to easily interpret test results.

Tools for easy defect sizing

- 40 dB dynamic DAC/TCG Option corrects for distance/ amplitude variations from material loss and beam spread with ability to edit or insert recorded echoes individually. Up to four DAC curves can be drawn on the screen at one time to show +/- dB curves in addition to the originally recorded DAC curve.
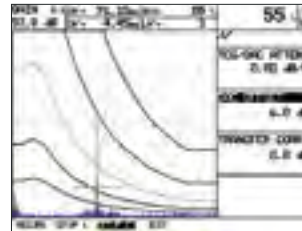
Tools for easy defect sizing Multiple curve DAC shows recorded DAC curve in magenta with 4 additional curves based upon dB Offset feature for added flaw sizing assistance. TCG Attenuation and Transfer Correction features make it very versatile for use on other materials and surface conditions.

- DGS (Distance Gain Size) Option displays a curve for a particular equivalent reflector size. The ERS (Equivalent reflector size) function automatically calculates the corresponding equivalent reflector diameter in mm or inches for any echo in the measurement gate.
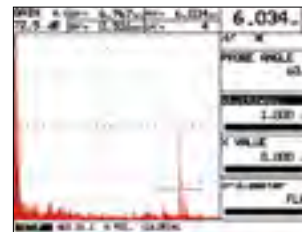
Four digital reading boxes at top display trigonometric calculations for weld inspection.
(SA soundpath to flaw in gate A, PA projection distance to flaw in gate A, DA depth to flaw in Gate A & LA leg of inspection that flaw occurs in gate A)

Square wave pulser with tunable pulse width solves composite testing applications.

Options

DAC / TCG Option
Multiple Curve DAC (Distance Amplitude Curve)/ TCG (Time Corrected Gain) for echo amplitude adjustment and evaluation, 40 dB dynamic range, 12 dB/µs slope, record up to 16 points, recorded points are individually editable, new points can be inserted. Display four additional curves based upon dB offset feature from originally recorded DAC curve. TCG attenuation and transfer correction features enable use on other materials and surface conditions.

IF (Interface) Gate Option
For automatic start of the display, Gate A, Gate B, and / or DAC / TCG for immersion testing applications.

DGS Option
Displays a curve for a particular equivalent reflector size as a function of the distance from the probe to the reflector for 25 narrowbanded probes. The ERS (Equivalent reflector size) function automatically calculates the corresponding equivalent reflector diameter in mm or inches for any echo in the measurement gate.

BEA Backwall Echo Attenuator Option
Allows independent gain control of the region under Gate B for backwall echo monitoring.

VGA Output Option*
Provides an easy way to connect to a PC monitor or PC projector for viewing by large audiences or training purposes.

RF Output Option*
Outputs the raw RF waveform via a standard Lemo #00 connector for further analysis.

HiSPD High Speed Digital Output Option
Outputs amplitude or thickness values 20 times faster than RS 232 port.

*Order with new instrument only. Later upgrade not possible.

Documentation and recording

- Store & preview a minimum of 200 user-named data sets with A-Scans for quick recall and instrument setup.
- UltraDOC 4 software program for bi-directional communication with a PC for easy storage of data sets with A-scan and documentation of test results.
- UltraMATE™ software program simplifies the transfer, storage, analysis, and documentation of thickness data.
- Reports with A-Scans are output directly to a variety of printers.
- Alphanumeric Thickness Datalogger for flexible, convenient storage of thickness readings in Linear, Grid, or Custom-Linear file structures with user-input filenames, location I.D.'s, notes, memo, & header fields.
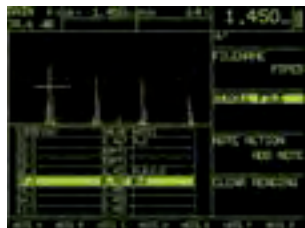
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Technical Specifications
USN 60 / USN 60L

Range USN 60	0.040" to 1100" (1 mm to 28 m) at steel velocity; range selectable in fixed steps or continuously variable
Range USN 60L	range is 0.040" to 480" (1 mm to 12 m)
Material Velocity	Continuously adjustable from 0.0098 to 0.6299 inches/µs (250 to 16,000 m/s); 65 selectable material velocities
Display Delay	-20 to 3498 µs in steel (dependent on range)
Probe Delay/ Zero Offset	0 to 999.9 µs
Damping	50, 75, 150, 500 ohms
Gain	0 to 110 dB adjustable in selectable steps 0.1, 0.5, 1.0, 2.0, 6.0, user definable, and locked
Test Modes	Pulse echo, dual, and thru-transmission
Pulser	Square wave excitation pulse
Pulse Voltage (Square wave pulser mode)	50 to 450 V scrollable in 10 V adjustments
Pulse Width (Square wave pulser mode)	Tunable from 50 to 1000 ns in 10 ns adjustments
Pulse Energy (Spike mode)	Low, High
Pulse Repetition Frequency USN 60	Autolow, autohigh, manually adjustable from 15 to 6000 Hz (spike mode) and 15 to 2000 Hz in square wave mode, in 5 Hz increments, external trigger (spike mode only)
Pulse Repetition Frequency USN 60L	Limited to 2000 Hz in both spike and square wave mode
Bandwidth (amplifier bandpass)	0.25 to 25 MHz with 10 selectable settings including broadband
Gate Monitors	Two independent flaw gates controllable over entire sweep range
Measurement Modes	Zero-to-first, multi-echo with selectable flank or peak detection
Rectification	Positive halfwave, negative halfwave, fullwave, RF
Reject (suppression)	0 to 80% linear
Units	Inch, millimeter, or microsecond selectable
Operating Temperature	-20° to 55°C (-4° to 130°F); -25° to 70°C (-13° to 158 ° F) storable
Languages	Selectable English, German, French, Spanish, Italian, Portuguese, Norwegian, Swedish, Finnish, Danish, Dutch, Russian, Czech, Romanian, Slovakian
Probe Connectors	BNC or Lemo selectable at order
Keypad	International symbols
Battery Power	Lithium Ion battery pack; NiMH, NiCad or alkaline cells substitutable
Battery Life	11 hours on Li-Ion battery pack
Size	11.1" W × 6.75" H × 6.25" D (282 × 171 × 159 mm)
Display	640 × 480 pixels Color LCD 132.48 × 99.36 mm
Weight	6.6 lbs. (3.0 kg) Li-Ion battery; 3.5 lbs.(1.6 kg) without battery
Color Leg	Easy identification of leg and skip distances for angle beam inspection in A-scan or grid background colors
Weld Rating Calculation	Simplifies the rating of weld indications according to AWS specification D1.1, (formula D=A-B-C)
Warranty	2 year conditional warranty on parts and labor; free 2nd year contingent upon return of unit within 13 months of purchase for recertification
Dust Proof/ DrippingWater Proof	As per IEC 529 specification for IP54 classification
Compliance	EMC/EMI: EN 55011:2007, EN 61000-6-2:2005 Ultrasound: EN 12668, ASTM E317

GEIT-20040EN (11/12)

Krautkramer USM 35X

Universal Ultrasonic Flaw Detector
with Bright Color Display and protected according to IP 66

A new design provides an improved environmental protection for everyday outdoor use.

Protection according to IP 66

A very sturdy housing has been designed for the USM 35X. We achieve a higher environmental protection and have improved the durability of this flaw detector for harsh use. The IP level corresponds to the degree of protection provided by the housing according to the IEC 529:1989.

IP 66 means that the instrument is totally protected, i.e. dust and water cannot penetrate into the instrument, even with heavy rain, sea spray and powerful jets of water coming from any direction.

Harsh field and industrial environments

- Extended temperature range from 0° C/32° F to 60° C/140° F
  (-10° C/14° F to 60° C/140° F after individual climatic testing)
- Weighs only 2.2 kg
- Extended battery life to 14 hours under real test conditions

Intuitive tools to help analysis

- The Color-Leg function displays coded information on the leg in color about angle beam inspection.
- 2 new carats (colorized triangles pointing at the echo for each gate).
- One carat ∇ pointing to the gate bar indicates the sound path measurement point at the echo
- The other carat ∆ pointing up indicates the amplitude measurement point at the echo in the gate.

Fast and bright color screen

Color brings you many additional benefits in your daily inspection job:

- Color display of monitor gates and curves (DAC, TCG, DGS) for direct recognition
- Messages and alarms in red characters for increased attention
- Use of color to display references (A-scan) to make comparisions easy

A-scan comparision

- Patented color coded display of legs for angle beam inspection of welds
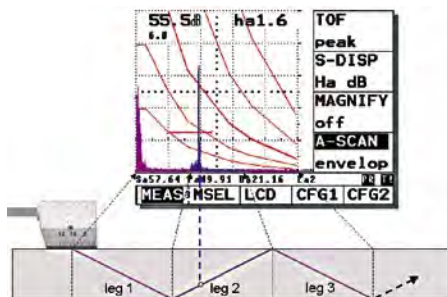
Color-coded display of legs in tests using angle-beam probes

- Colorized envelope curve display for echo dynamic analysis
- Multicolor screen combinations for operator preferences and to select best suitable color scheme according to the working environment.
- VGA output to connect the instrument to an external monitor or video projector
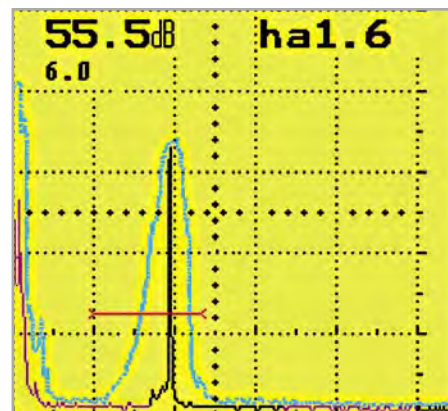
Envelope curve

New readings

Three new additional readings can be displayed for measurements taken with gates:

- dB-difference to reference gain with DAC / TCG
  (in the USM 35X DAC and USM 35X S)
- DGS reference gain
  (in the USM 35X S)
- Flaw classification according to JIS Z3060
  (in the USM 35X DAC and USM 35X S)

Other benefits

We have also implemented innovations from the computer industry in the battery concept to make your daily work easier: the rechargeable lithium-ion battery pack enables you to carry out your inspections for at least 14 hours. Charging is easily carried out internally within the instrument over night just by connecting the power pack/battery charger to the USM 35X. You can also insert 6 normal C-cells should the battery pack be drained and if no A/C power connection is available.

The optimum combination of innovation and proven performance

It's a tradition

Every worthwhile feature that has been of advantage to industry has been kept. For example the popular intuitive spin'n'set operating concept working on the basis of the two rotary knobs that give an „analog feeling". The instrument gain and the required functions are always directly accessible. A lot of attention was paid to clarity when arranging functions and menues:

- Simple to use, quick to operate, from basic to challenging inspection requirements.
- From high frequency inspections for thin materials up to low frequency for attenuative materials
- From automotive, power generation, oil and gas to aerospace applications

Additional DAC functions

Recording reference echoes in DAC mode will be simplified by automatic gain adjustment. The echo to be recorded will be set automatically at 80 % and stored The dB-difference to the first reference echo can be displayed, if needed. The new JIS-DAC meets the latest JIS Z3060-2002 specifications.

Data reporting

800 datasets enable a great number of calibration settings and test results to be stored. Each report can be documented with a memo field containing 6 dedicated areas with up the 24 characters and 3 numerical fields (flaw coordinates) for inspection reports and settings. The report or setting can be printed directly via a RS-232 or up/downloaded to a computer using an RS-232 or USB (with USB-RS accessory).

All three versions may be additionally extended by the Data Logger option: this enables you to use the USM 35X for recording and documentation of 5,000 readings (sound path, amplitude, etc.) and 500 A-scans at the same time. Moreover, you have a third gate, a tolerance monitor and a minimum reading capture at your disposal.

## Three different time of flight measurements

Depending an the time of flight mode selected, the distances (measurement carat ∇ red triangle) and amplitudes (carat ∆) will be measured and displayed for the echo in each gate. The measurement points are indicated by the color coded carats for each gate.
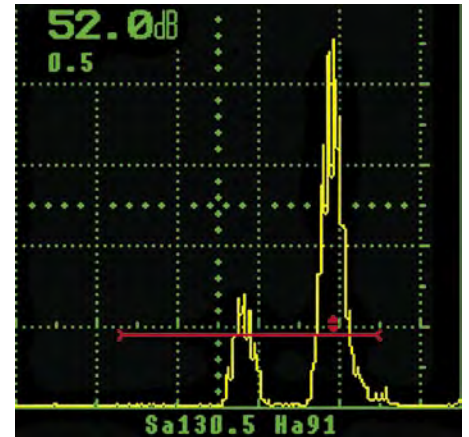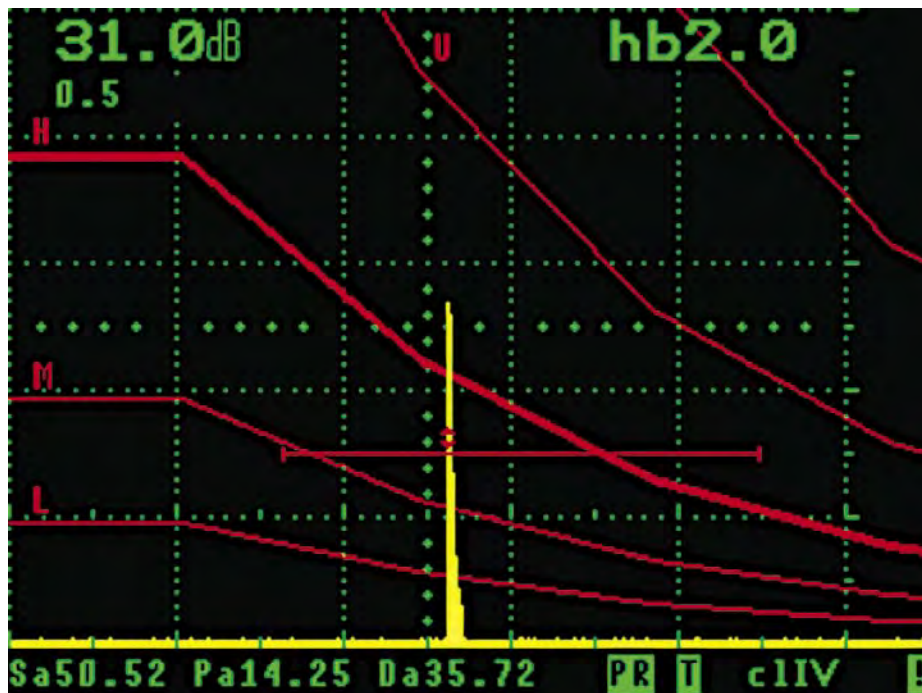

Peak: sound path and amplitude at the highest echo in the gate
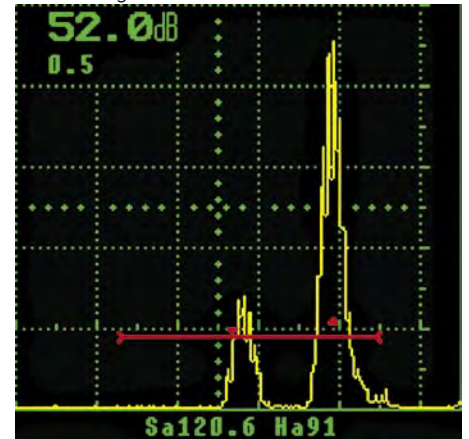
Flank: sound path at the intersection of the first echo with the gate threshold; amplitude at the highest echo in the gate
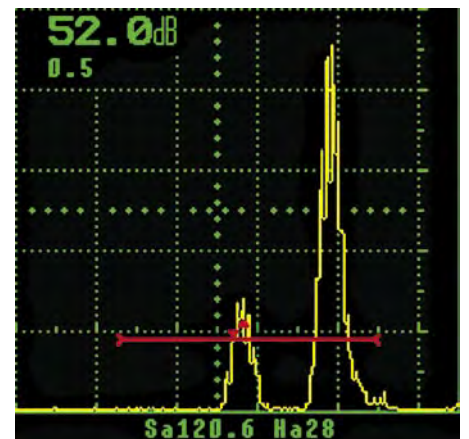
JFlank: sound path at the intersection of the first echo with the gate threshold;amplitude at the first echo in the gate

*New DAC function according to the latest JIS Z3060-2002 specifications*

Examples for the various applications
of the high performance and light Krautkramer USM 35X.

Weld inspection in the power generation and petrochemical industries
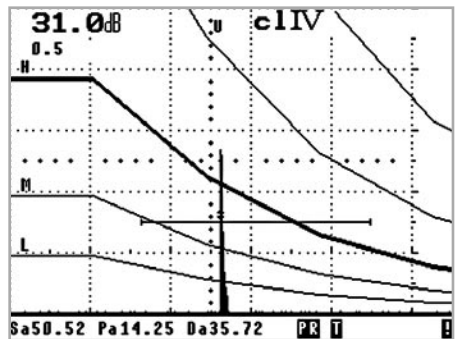
- Flaw location with display of **all coordinates**, sound path, (reduced) surface distance, depth position and leg number
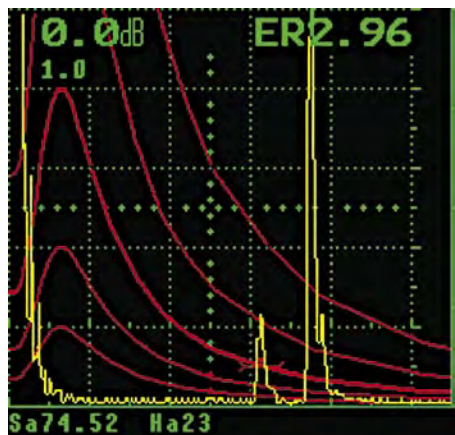
`Sa57.64 Pa49.91 Da21.16   La2`

- Display of every sound beam reflection (number of half skip distances or legs) and identification of **leg color** on the "live" A-scan
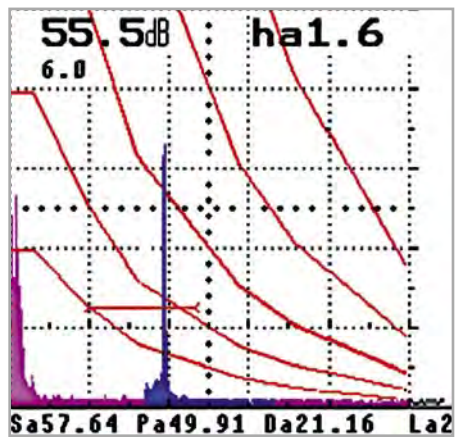
- New powerful DAC/TCG with JIS DAC module according to JIS Z 3060-2002

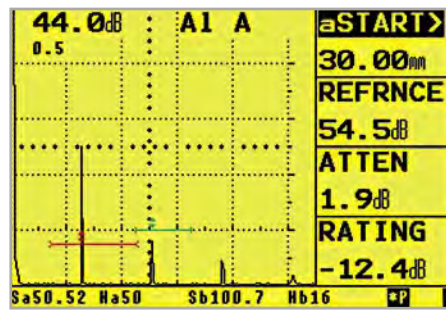- DGS evaluation with direct digital ERS readout (USM 35X)

Inspection of a weld

- Amplitude evaluation in dB refering to a previously recorded reference echo or according to **AWS D1.1**

Precise thickness measurement for the automobile industry

You can measure the sound path difference precisely at the peaks of an echo sequence with a resolution of 0.01 mm / 0.001 inch. In doing this, trigger the gates at the 1st backwall echo: this automatically positions gates correctly for the measurement.

Corrosion wall thickness in the power generation and petrochemical sectors

During wall thickness measurement on corroded parts using dual element probes, you simultaneously check the reading together with the A-scan, thus receiving the maximum reliability for the measurement. On hot surfaces you use the auto-freeze function, minimizing the probe's contact time. The minimum capture mode gives you the thinnest measured reading at the end of a continuous scan.

Inspection of forgings in the power generation and aerospace sectors

The manual setting of the pulse repetition frequency down to 4 Hz eliminates phantom echoes while inspecting fine grain and large work pieces. Defects from an equivalent reflector size 0.3 mm onwards will be detected.

Inspection of special materials in the aerospace and automobile industry

Use probes down to 250 kHz in order to penetrate highly attenuative or composite materials. Our composite probes on the USM 35X will drastically improve the signal-to-noise ratio on sound scattering materials (glass or carbon reinforced plastics, composites or alloys).

Krautkramer USM 35X

Universal Ultrasonic Flaw Detector
with Bright Color Display and protected according to IP 66

Specifications:

Calibration ranges

Min.:   0 to 0.5 mm +10 % (steel),
         0 to 0.02" +10 % (steel)
Max.:   0 to 9,999 mm +10 % (steel),
         0 to 390" +10 % (steel) within
         the frequency range from 0.2
         to 1 MHz / 0.5 to 4 MHz
         0 to 1,420 mm +10% (steel),
         0 to 56" +10 % (steel) within
         the frequency range from 0.8
         to 8 MHz / 2 to 20 MHz

Sound velocity

1,000 to 15,000 m/s, 40 to 600 inch/ms variable
in steps of 1 m/s, 0.1 inch/ms
and fixed programmed values

Display delay

From -10 to 1,000 mm, -0.3 to 40" (340 μs)

Probe delay

0 to 200 μs

Auto calibration

Measurement and setting of sound velocity and
probe delay using two known calibration echoes
(2-point calibration)

Pulse intensity

220 pF, 1 nF

Damping

50 ohms, 500 ohms (1,000 ohms in TR mode)

Pulse repetition frequency

4 to 1,000 Hz, variable in 10 steps

Frequency ranges (-3 dB)

0.2 to 1 MHz / 0.5 to 4 MHz / 0.8 to 8 MHz /
2 to 20 MHz

Gain

0 to 110 dB, variable in steps

Gain steps

0.5 / 1 / 2 / 6 / 12 dB (or user-adjustable),
step 0 is locked

Fine gain

4 dB, continuously variable in 40 steps

Rectification

Full-wave, negative and positive half-wave,
RF mode

Reject

Linear, 0 to 80 % screen height
Variable in steps of 1 %

Monitor gates

2 independent gates in color bar mode, start and
width variable over the entire calibration range,
response threshold of 10 to 90 % screen height
variable in steps of 1 % (coincidence and anti-co-
incidence), alarm signal via LED and connectable
internal horn, Gate A switchable as interface gate
for Gate B, gate magnifier (zooming of gate range
over the entire display range)

Sound path measurement

Digital display of sound path (projection distance,
depth) between initial pulse and the first echo in
the gate, or between the echoes in the two gates,
measurement always at the intersection point
with the echo flank or echo peak

Measurement resolution

0.01 mm within a range up to 99.99 mm/
0.1 mm within a range from 100 to 999.9 mm/
1 mm above 1,000 mm,
0.001" within a range up to 9.999"/
0.01" above 10"
With evaluation in the frozen A-scan: 0.5 % of the
calibration range setting

Amplitude display

In % screen height
USM 35X DAC: additionally in dB above DAC or TCG
USM 35X S: additionally in dB above DGS curve
or ERS

Displayed reading

Sound path, (reduced) projection distance, depth,
amplitude for every gate, user-
configurable at four positions of measurement
line and of the zoomed display in the A-scan

A-scan functions

Manual or automatic A-scan freeze,
A-scan comparison, echo dynamics
(envelope), peak echo storage

Color functions

Patented color-coded display of legs in angle
testing, adaptation of background color to the
light conditions of test environment, color display
of monitor gates and of registration curves (DAC,
TCG, DGS) for direct recognition, messages and
alarms in red characters

DAC / TCG (Option)

Only USM 35X DAC and USM 35X S: Distance-Amplitude Curves (DAC) or TCG line (TCG) with a maximum of 10 reference echoes,
4 other curves or lines can be displayed with variable dB intervals. JIS DAC can be selected in order to allow inspection acording to JIS Z3060-2002 (Japanese Inspection Standard). Automatic gain control during DAC recording.

DGS (Option)

Only USM 35X S: DGS curves for single-element and dual-element probes (B1S, B2S, B4S, MB2S, MB4S, MB5S, WB...-1, WB...-2, SWB...-2, SWB...-5, MWB...-2, MWB...-4, SEB and MSEB) and for all materials, sound attenuation and transfer loss correction, 4 other curves can be displayed with variable dB intervals

Display size / resolution

116 mm x 87 mm, 4.6" x 3.4" (W x H)
320 x 240 pixels

A-scan size / resolution

116 mm x 80 mm, 4.6" x 3.2"
320 x 220 pixels (zoom)

Units of measurement

mm, inch

Data memory

800 instrument setups or reports, including A-Scans can be stored, recalled, printed or exported to a computer.

Direct documentation

Display screen contents, report including A-scan, reading, function list (parameter dump)

Printer driver

HP DeskJet, HP LaserJet, HP DJ 1200 (DeskJet)
HP LJ 1012 (LaserJet), EPSON FX/LX, SEIKO DPU

RS 232 interface

9-pin DSUB, bi-directional, 300 - 57,600 baud
An USB adapator cable can be provided to connect the USM 35X to a computer that does not have RS 232 port

Input/Output

8-way Lemo-1 socket (trigger output, gate alarm, test data release)
Additional analog output for amplitude or sound path in selected gate

VGA output

10-way Lemo-1 socket for the connection of an external display screen or beamer

Probe connections

2 x Lemo 1 or BNC

Dialog languages

German, English, French, Italian, Portuguese, Spanish, Danish, Swedish, Norwegian, Finnish, Czech, Slovenian, Romanian, Dutch, Croatian, Hungarian, Russian, Polish, Slovakian, Japanese

Battery operation

Li-ion battery or 6 C-cells (NiCad, NiMH or AlMn), operating time: 14 hours with Li-ion battery (6.6 Ah), approx. 3 hours with NiMH cells (3 Ah), battery charge check by an icon in the measurement line

Power pack/ battery charger operation

Via an external power supply (85 to 265 VAC);
Operating voltage: 6 to 12 VDC
Current consumption: max. 9 W, depending on the setting

Weight

2.2 kg, 4.9 lbs., including batteries

Size

177 mm x 255 mm x 100 mm,
7.0" x 10" x 3.9" (H x W x D)

Environmental

Protection class: IP 66
Shock proof acc. to DIN IEC 68: 6 ms, 60 g,
3 shocks per orientation
Vibration proof acc. to DIN IEC 68: 0 - 150 Hz, 2 g,
20 cycles per orientation
Operating temperature: 0° to 60°C; 32° to 140°F
(-10°C; 14°F on special request)
Storage temperature: -20° to 60°C; 4° to 140°F

Data Logger Option

Memory capacity

5,000 readings, 500 A-scans for the readings, 100 jobs, 10 comment texts per job

Storable readings

Sound paths and sound path differences of all gates, amplitudes (% SH, dB-to-threshold, dB-to-curve, %-to-curve, ERS), alarms of all gates or tolerance monitor

Lines / columns

Number of lines: maximum 5,000 (Linear file with one column), numerical indexing
Number of columns: maximum 26,
indexing: A, ..., Z

Tolerance monitor

Lower and upper acceptance level with monitor function
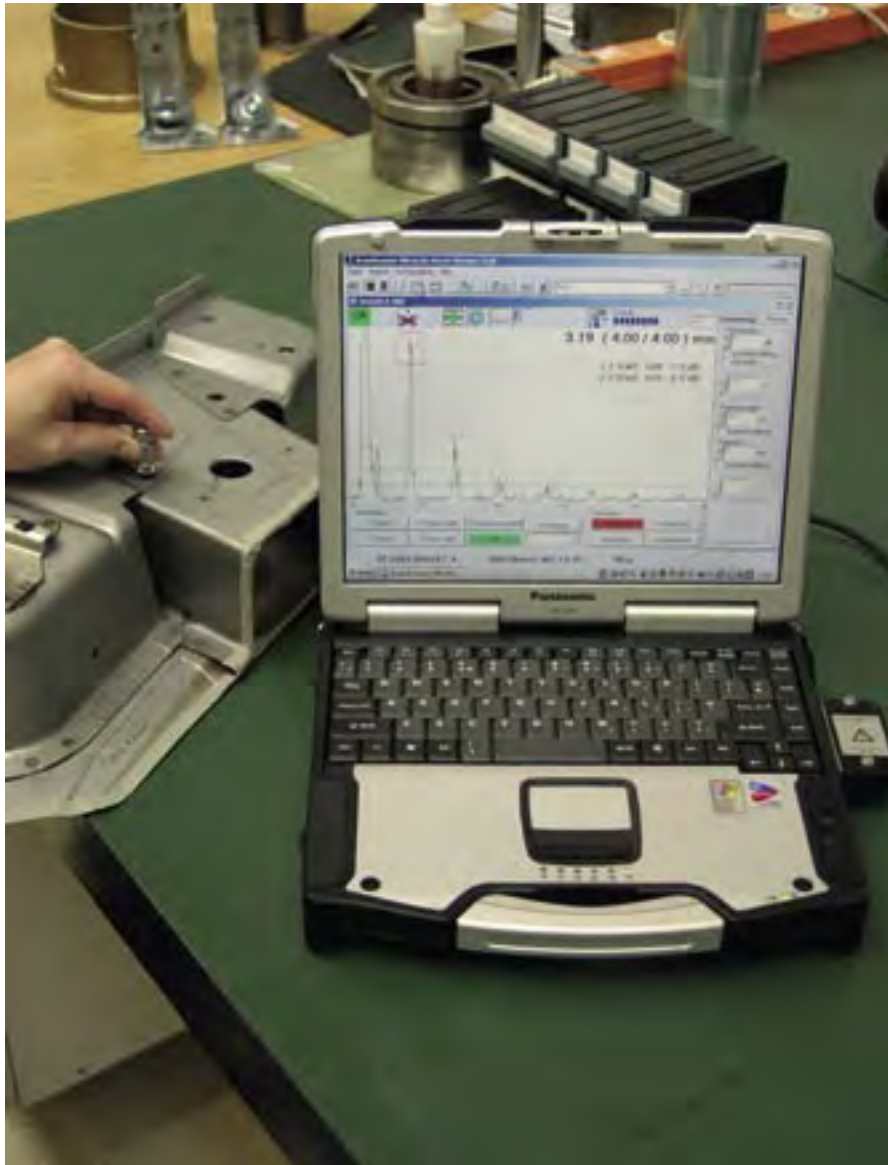
Minimum reading capture

Storage of the minimum value measured in continuous scanning, display of the value 3 seconds after uncoupling the probe

Monitor gate

1 additional independent gate in color bar mode

Krautkramer USLT 2000

The Ultrasonic Test System
in a Notebook for Today and Tomorrow

GE imagination at work

For mobile test use,
first-rate documented ultrasonic performance

The demands on ultrasonic tests are changing - and with them also the technical prerequisites for fulfilling new needs and requirements. We keep pace with the development: our USLT 2000 provides you with state-of-the-art technology that multiplies the application possibilities in everyday testing - and maintains a perfect ease of use. The advantages for the Quality Management are also obvious: the USLT 2000 solves all your problems with the management, evaluation and exchange of test-relevant data.

For everyday testing ...

Ultrasonic testing with a notebook means: high-tech ultrasonics *plus* modern data management *plus* mobility.

The USLT 2000 stands for excellent ultrasonic performance to accomplish even the most demanding test tasks. It stands for the openness toward the EDP world because the complete Windows functionality is utilized. In the end, the USLT 2000 stands for a truly mobile use: a PC weighing just about 3 kg (6.6 lbs.) becomes a universal ultrasonic instrument able to withstand - as an industrial-type notebook - even adverse ambient conditions.

For the Quality Management ...

Ultrasonic testing using a mobile notebook also means: undreamt-of possibilities for data processing.

Documentation of ultrasonic tests and test results, Export to Microsoft Excel, forwarding of data to company databases and networking of test systems - the USLT 2000 paves the way in today's and tomorrow's world of data.

... Krautkramer technology

This advancement was made possible by the cheque card-sized PCMCIA card especially developed by Krautkramer and taking care of the complete digitization of the test system.

Test technology for special demands

The pick of ultrasonics

Extreme miniaturization of the electronics and maximization of performance - that's USLT 2000.

The system is not only characterized by a high measuring accuracy and a large frequency range but also by extensive matching features enabling you to tailor the USLT 2000 to your individual application needs.

This includes for example the choice of the echo display mode that helps you with the evaluation: you can superimpose a stored display of test findings on the currently active A-scan in order to compare the test results. You can alternatively record the echo dynamics and simultaneously display the real-time signals. Even the possibility of an adjustable signal averaging is available to you in this connection.

The USLT 2000 offers universal evaluation options for detected indications to meet both national and international test specifications: DGS curves, user-friendly recording of a DAC and TCG for both methods.

A highlight: the A-scan

With the USLT 2000, the days when you missed the analog screens of the usual test instruments in some test jobs are gone because the SVGA screen achieves a maximum A-scan resolution of 635 x 400 pixels thus enabling an almost analog display. Added to this are the large color display and the fast echo display.

The Windows operator interface with A-scan and setup menu. Dialog language and units can be easily changed.
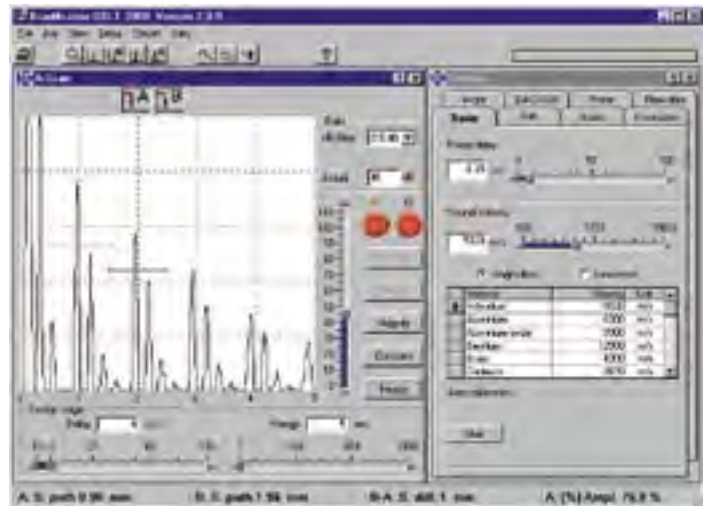
The operator interface with A-scan in zoom mode, echo comparison, multiple DAC and display evaluation
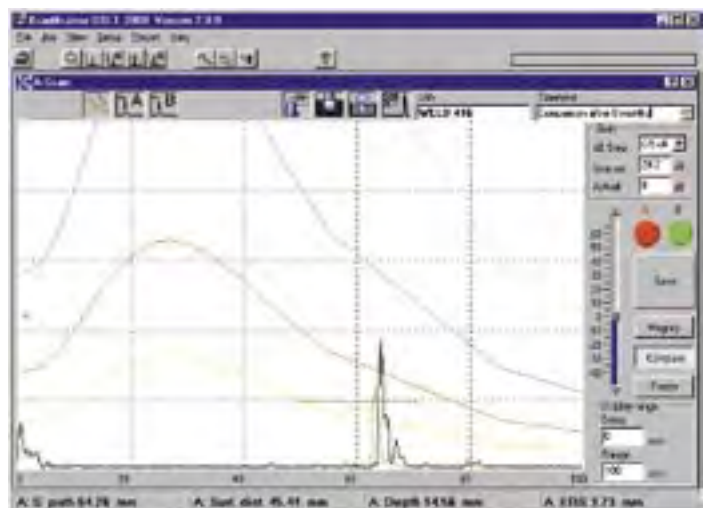
This makes the USLT 2000 even suitable for applications in which an excellent resolution is important: for example, bonding tests and flaw detection on thin work-pieces, or in particular the inspection of spot-welded joints, for instance within the automotive industry.

An operator-interface, especially tailored to this application, automatically carries out spot weld evaluation and stores all the results in the database.

The probe solution

The pulser and receiver electronics is accommodated in a small aluminium box. Just select the probe required for your test task and connect it.

The intelligent Krautkramer dialog probes provide a special ease of use because they are automatically recognized by the system. All important probe data are automatically transferred to the USLT 2000.

EDP technology
to make life easy for you

The Windows interface

With the clear and well-arranged graphical Windows interface, in four languages, you will have no problem with the system handling. The system is operated via keyboard, an integrated touchpad, an optionally connected mouse or via a remote control having eight assignable instrument functions.

The Windows world

As the USLT 2000 is a standard PC, you can of course also install other Windows applications and use them for your individual applications parallel to the ultrasonic functionality. This means that if you're not using the USLT 2000 as an ultrasonic instrument, you can, for example, also work with word processing and spreadsheet programs.

You will learn to appreciate the advantages made available by the Windows world with its entire functionality even more. The so-called "multitasking" - that means simultaneous application of several programs and exchange of all sorts of data - offers great ease of use in this regard. In view of working with the USLT 2000, this means: you generate your test report forms in MS Excel. After this, you determine the fields into which the parameters and readings from the test results of the USLT 2000 are to be transferred. All you then have to do is select the test jobs and results which you wish to file and the forms are automatically filled out and ready to be printed.

Database

The storage of test data is indispensable not only for repetitive in-service tests. The importance of documentation also ranks enormously high today.

Instrument settings for different applications as well as countless test results, including the A-scans, must be permanently filed or statistically evaluated in many ultrasonic tests for reasons of product liability.

The method best suited to accomplish this task is a well-structured database: in the USLT 2000, all settings and findings are stored and managed in a MS ACCESS database.

Application software

The openness of the Microsoft concept offers all the possibilities of an individual postprocessing of data here as well because the most different programs have access to the filed data: analyzing programs, programs for test job management, and not forgetting - the tailored Krautkramer application software.

All USLT 2000 utilities (functions, function values and readings) are freely available to the user and can be applied for development of own test and control programs, together with the UltraWorks program.

Excel export of inspection results

We reserve the right to technical modifications without prior notice.

Krautkramer USLT 2000

The Ultrasonic Test System
in a Notebook for Today and Tomorrow

Specifications

Calibration ranges

min.: 0 - 2.5 mm; 0 - 0.1" (steel)
max.: 0 - 9700 mm; 0 - 381" (steel)

Sound velocity range

500 - 15000 m/s; 0.02 - 0.59 "/ms
integrated, editable material table

Pulse shift

-10 - 1500 mm; -0.39 - 50" (steel)

Probe delay

0 - 100 µs

Damping

50 ohms / 500 ohms; 1000 ohms with Dual or
Through-Transmission modes

Intensity

220 pF / 1 nF

Frequency range

0.5 - 20 MHz (-3 dB); 4 filter ranges

Pulse repetition frequency

1-1000 Hz, automatically or manually adjustable

Gain

110 dB, adjustable in steps of 0.5 / 1 / 2 / 6 dB

Operating modes

Pulse-Echo, Dual, Through-Transmission

Rectification

full-wave, positive half-wave, negative half-wave, RF
display (up to 150 mm/5.9" steel)

Suppression

0 - 90 % linear

DAC/TCG

DAC with up to 16 curve points (reference reflectors),
dynamic range 37 dB, maximum slope 6 dB/ms;
3 additional curves at adjustable dB distances, can
be changed to TCG (Time-Corrected Gain) mode
(horizontal recording threshold); meets national and
international test specifications

DGS

recording curves for all valid equivalent reflector sizes
and probes with DGS capability; setting as DAC or TCG;
evaluation in dB related to curve, ERS or class (JIS);
sound attenuation and transfer correction; reference
reflectors used: backwall, circular disk reflector and
side-drilled hole

Monitor gates

2 independent monitor gates, adjustable over the entire
maximum calibration range; evaluation on the basis of
A-scan at display refresh rate; gate alarm: off, coinci-
dence, anticoincidence; visual and/or acoustic alarm

Distance measurement

individually selectable for each gate at the echo flank
or peak, in the RF mode addition-ally at the zero
transition of the increasing or decreasing echo flank
- initial pulse and measurement point in
  gate A or B
- measuring points: gate B - gate A
  (differential measurement)

Measurement resolution

sound path/time of flight: up to 12.6 mm: 0.01 mm;
otherwise 0.2 % of display width

Amplitude

0.5 % screen height or 0.2 dB

A-scan digitization

1024 x 1024 pixels

Display freeze

static A-scan freeze, dynamic A-scan freeze (peak
value, echo dynamics + real-time signal), average
freeze via 2 to 32 ultrasonic pulse cycles

Echo comparison

simultaneous display of the currently active signal and
a stored A-scan

Outputs

documentation via standard interfaces of the notebook

Inputs

2 analog inputs, e.g. for probe coordinates,
digitization with 10 bits each

Dialog languages

German, English, French, Spanish and Italian

Units

mm, inch, µs

Probes

standard and dialog probes (automatic recognition)
can be connected

Data storage

database for storing and managing instrument
settings, test jobs and test results, including A-scan,
DAC and alphanumeric comments, Export to
Microsoft Excel; limited only by the hard disk size

Software

operating system: Windows2000/XP; Client-Server
interface OLE 2.0; options: UltraWORKS (design tool),
FFT (Frequency analyses)
EHT (hardening depth), RTM (resonance thickness
measurement with 1 µs resolution), UltraLOG
(evaluation program for spot weld testing)

Notebook versions (trademarked units)

standard or industrial version (IP 52)

Mains and battery operation

approx. 5 h, depending on the processor workload

Operating temperature

5 °C - 45 °C; 41 °F - 113 °F (standard)
0 °C - 50 °C; 32 °F - 122 °F (industrial)

Dimensions (H x W x D)

63 mm x 300 mm x 230 mm;
2.5" x 12" x 9" (standard)
64 mm x 302 mm x 273 mm;
2.5" x 11.9" x 10.7" (industrial)

GE imagination at work

KRAUTKRAMER USLT 2000B

The proven and tested ultrasonic notebook as a PC-based instrument

USLT 2000B ultrasonic instrument

GE Inspection Technologies is constantly advancing its products and testing solutions, and has developed the new USLT 2000B portable ultrasonic instrument for testing welding spots with ultrasound, in particular for meeting the requirements of the automotive industry. The key features comprise:

Mobile use:
This light, battery-driven ultrasonic test system is recommended for local application, e.g. in production plants. The large TFT screen allows test data to be read easily from significant distances.

Easy handling:
The USLT 2000B distinguishes itself by an ergonomic user interface. The built-in touch screen and the 14 programmable function keys considerably simplify the operation.

A variety of outputs:
The standard interfaces, such as LAN, USB and VGA, allow the instrument to be connected with all known tools from the office world.

From one source you will receive software packages for ultrasonic testing instruments for easy monitoring of joins.

Test your joins non-destructively with ultrasound!

The variety of jointing methods used in automotive welding and assembly lines has significantly increased in the last few years. While a few years ago resistance-welding and MIG/MAG welds were the favoured joining methods, nowadays laser welding/soldering, bonding, etc, are preferred.

Since all of these procedures are more and more used complementarily (best fit), a lot of great demands have been made on the test engineering.

Instead of destructive testing of welding spots, for instance with a hammer and chisel, in recent years non-destructive testing with ultrasound has become more and more prominent. The continually increased acceptance of this procedure is last but not least due to the fact that GE Inspection Technologies, co-operating with industry, has made substantial contributions to the technical progress.

All well-known car manufacturers already work successfully with these innovative systems.

Constant readiness for the future by virtue of productivity, quality and security is and remains a special characteristic of our technology for testing solutions.

Creation of inspection plans with the Database Manager

The Database Manager contains an entire database system for the creation and administration of the testing records. You can plan, control and document your testing, for instance by distributing world-wide via E-mail testing records tuned to the structure of your manufacturing process.

Test with the UltraLOG program

With our application software the evaluation of the welding spots is automated to a large extent. During the testing, which follows an individual test plan, the program delivers a proposal for evaluation.

UltraLOG carries on with testing when the operator has accepted the result. The results are automatically documented, too.

Technical data

Adjustment ranges

min.:   0 - 2.5 mm (steel)
max.:   0 – 9,700 mm (steel)

Range of sound velocity

500 – 15,000 m/s
integrated editable table of materials

Pulse shifting

-10 mm - 1500 mm (steel)

Probe delay

0 - 100 ms

Damping attenuation

50 Ohms / 500 Ohms; 1000 Ohms when used as double transducer probe or in transmission

Pulse strength

220 pF / 1 nF

Frequency range

0.5 - 20 MHz (-3 dB); 4 filter ranges

Pulse repetition frequency

1-1000 Hz, adjustable automatically or manually

Amplification range

110 dB, adjustable in steps of 0.5 / 1 / 2 / 6 dB

Modes of operation

Pulse Echo, as double transducer probe, transmission alignment, one way positive, one way negative, R.F. representation (up to 150 mm steel)

Suppression

0 - 90 % linear

Depth compensation

DAC with up to 16 reference reflectors, dynamic range of 37 dB, maximum slope of 6 dB/ms; Three additional curves with adjustable dB-intervals, convertible as depth compensation (horizontal recording level); satisfies national and international testing regulations

DGS

Recording curves for all valid replacement reflector sizes and probes suitable for DGS; adjustment to DAC or depth compensation; evaluation in dB to the curve, ERG or class (JIS); sound attenuation and transfer correction; applicable reference reflectors: back wall, disc-shaped reflectors and cross holes

Monitor gates

Two independent gates, adjustable across the whole adjustment range; evaluation from the A-scan with frame repetition rate; gate alarm: off, coincidence, anticoincidence; – optic and/or acoustic alarm

Range finding

Individually selectable for each gate at the echo edge or peak in R.F. presentation, and additionally at the zero crossing of the leading and trailing edges of an echo
- Original pulse indication and check point in gate A or B
- Check points: gate B – gate A (differential measurement)

Measurement resolution

Sound path / delay up to 12.6 mm: 0.01 mm; or 0.2 % of the screen width

Amplitude display

0.5 % of screen height or 0.2 dB

A-scan digitising

1024 x 1024 pixels

Image storage

A-scan freeze static, A-scan freeze dynamic (peak value, echo dynamics and real-time signal), average from 2 to 32 ultrasonic shots

Echo comparison

Simultaneous display of the current signal with a saved A-scan

Outputs

Documentation on the existing standard interfaces of the ultrasonic instrument

Conventional languages

German, English, French, Spanish and Italian

Measurement units

mm, inches, µs

Probes

Connection of standard and dialogue probes (automatic recognition)

Interfaces with PC

4 x USB 1.1
Ethernet TCP/IP 10 MBd
Monitor SUB-D 15 pol.

Data storage

Database for the storage and administration of instrument settings, test jobs and test results with A-scan, DAC and alphanumeric commentary, export to Microsoft Excel; limited only by size of hard drive

Software

Operating system: client-server interface OLE 2.0; optional: UltraWORKS (development tool), FFT (Fast Fourier Transformation), EHT (Effective Hardening Testing), RTM (Resonance Thickness Measurement 1 µs resolution), UltraLOG (evaluation program for welding spot testing), UDB Manager (creation of inspection and test schedules) 12,1", TFT, SVGA touch-screen

Display

12.1" TFT, SVAG touchscreen

Battery operation

Approx. 4 h, depending on load on the processor

Operating temperature

0 °C to 40 °C

Dimensions (H x W x T)
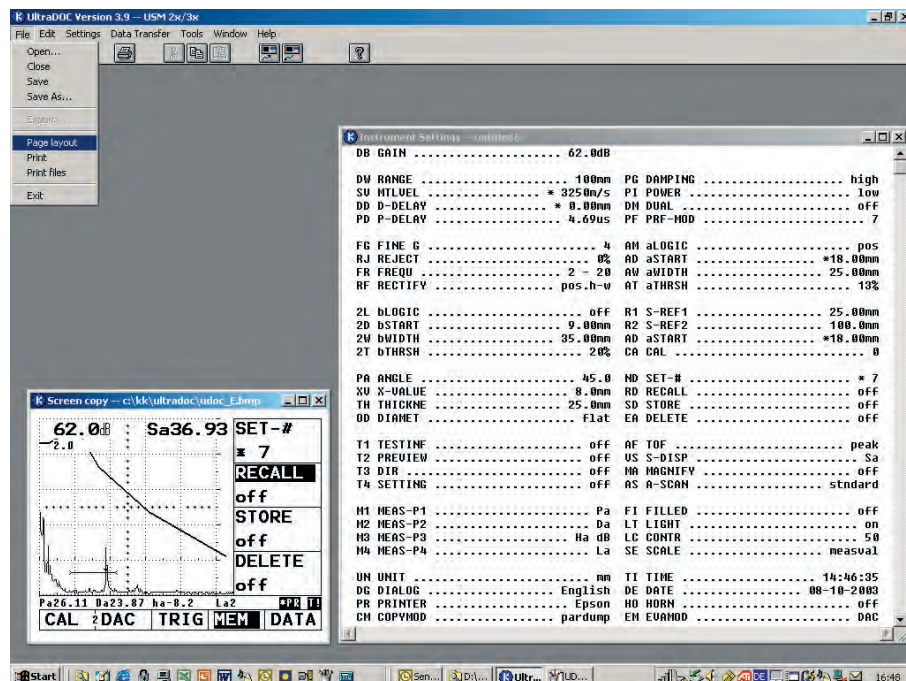
390 mm x 374 mm x 155 mm

Weight (incl. 1 battery)

6.7 kg

Options

USLT 2000B	USLT software
USLT 2000BP3	USLT software + UltraLOG
USLT 2000BA3	USLT software + UDB-Manager + UltraLOG

GEInspectionTechnologies.com

Krautkramer UltraDOC

On the safe side
with your documentation

Other documents, such as training documentation or re-search reports, can also be presented in a professional way using UltraDOC. But UltraDOC has a lot more to offer: from the transfer of stored instrument calibrations back to the test instrument, through quick viewing of stored test data on the PC display, up to the remote control of the test instrument.

By using UltraDOC you can:

- transfer instrument settings from the test instrument to a PC, store them as ASCII text and further process them

- transfer any display contents of your choice, store them in IMG, BMP or PCX format and further process them

- store complete instrument settings and calibration tables and transfer them back to the testinstrument

- gain a quick overview of stored test data

- remote control your test instrument.

UltraDOC was developed for a great number of our flaw detectors and other test instruments having an RS232 inter-face. It is available as Windows version, it only requires standard computer systems, it is easy to install - and even easier to use.

The value of today's quality assurance tests depends on the quality of the corresponding documentation. You know the statutory provisions: in the case of damage, an objective proof of all measures that had been taken for the quality assurance of a product must be furnished.

Test instruments in combination with the UltraDOC software provide you with the required safety because UltraDOC makes the documentation process considerably easier.

UltraDOC allows you to transfer test data from the test instrument to the PC (for example parameter dumps, A-scans, menus) and to store them in usual data formats so that you will be able to further process them as you like. Word process-ing, DTP or spreadsheet programs - the whole world of EDP is at your feet.

You will have no trouble in creating your test reports and in carrying out the docu-mentation of your test results quickly, reliably and conveniently.

GE imagination at work

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