

Digital UT Flaw Detector **ECHOGRAPH 1095**



Overview

- **Very large high-contrast 7" TFT color display (800 x 480 pixel)**
- **Rugged metal case with rubber frame (IP64, weight: 2 kg)**
- **Intuitive clear text user interface**
- **Wizards for adjustment and probe handling**
- **3 monitors to measure amplitude and time-of-flight with optical and acoustical alarm**
- **Separate adjustable gain within monitor 3**
- **Displays up to 6 measured values on the screen**
- **Adjustable square pulser**
- **6 assignable function keys**
- **Complies with EN12668-1**



Interfaces and Connectors

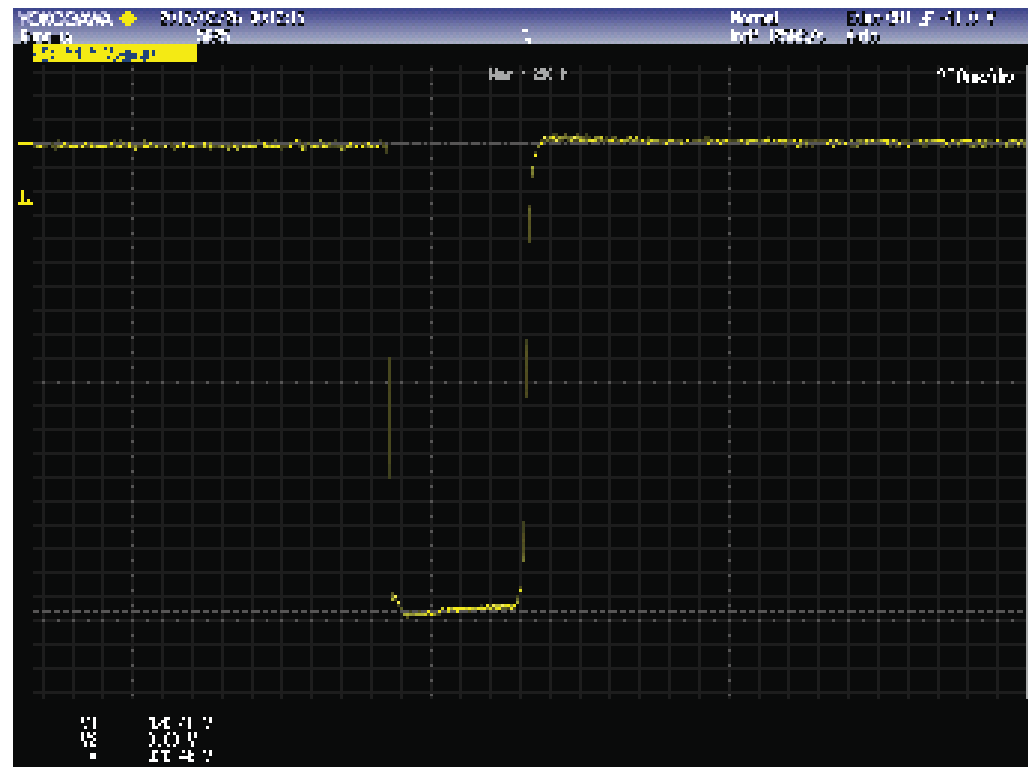
- **8 GB SD card (2 .. 32 GB)**
 - **Windows BMP files for A-Scans**
 - **Excel CVS files for measurement data**
- **Standard VGA connector**
- **USB interface (mass storage device, no driver needed)**

- **Power supply**
- **Optional analog output (via Interface box)**
- **3 monitors, synchronizing in and out (Level TTL 5V)**
- **2 x LEMO[®] 1 transducer connectors**



Transmitter/Receiver

- Adjustable square wave pulser
- Pulse width 30 .. 5000 ns (0.1 .. 17 MHz probes)
- Output Voltage 60 .. 320 V
- Pulse width is automatically set when loading probe configuration
- Automatic or Manual PRF of 10 .. 5000 Hz
- Range of Gain: 110 dB
- 7 digital Filters:
 - Low pass (0.2 .. 2 MHz),*
 - 2 MHz,*
 - 4 MHz,*
 - 5 MHz,*
 - Broadband (1.3 .. 14 MHz),*
 - 10 MHz,*
 - High pass (4.9 .. 22 MHz)*



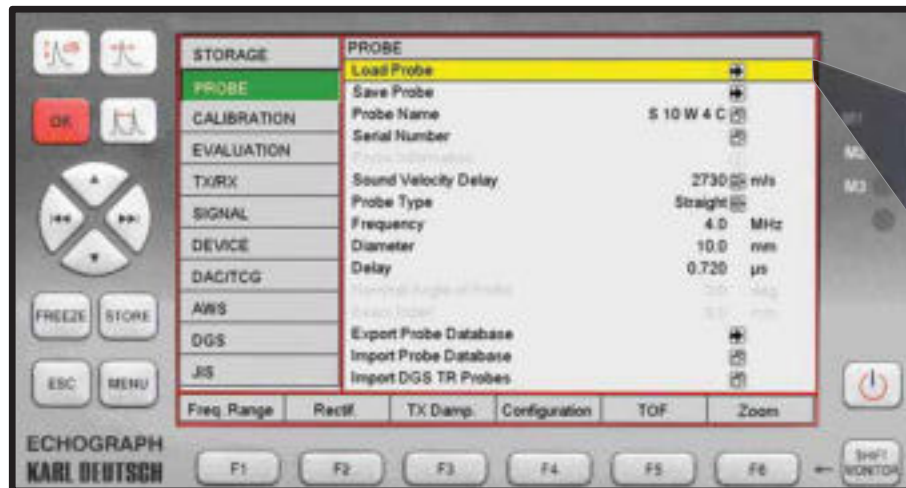
Monitors

- 3 independent monitors to measure amplitude and time-of-flight
- Precise wall thickness measurement with zero crossing gates
- Backwall echo attenuation within monitor 3
- Skip distance marker with monitor 1 and/or monitor 2
- Echo-to-echo measurement with monitor 2 fixed relative to monitor 1
- Visual and acoustical monitor alarms
- In freeze mode monitors can be modified
- 6 Function Keys, easily selecting gate functions



Probe Database

- Complete Data Set of all available KD standard transducers
- Easy adjustment of transducer data without using a PC
- Generating and handling of own transducer data sets

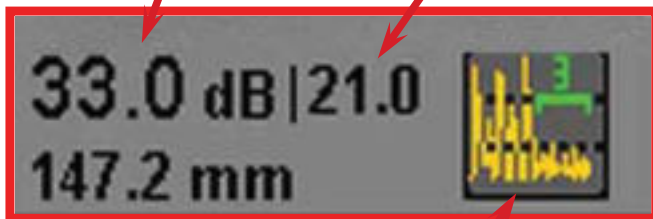


Backwall Echo Attenuation

- Backwall echo usually exceeds screen height, thus a drop is not observable

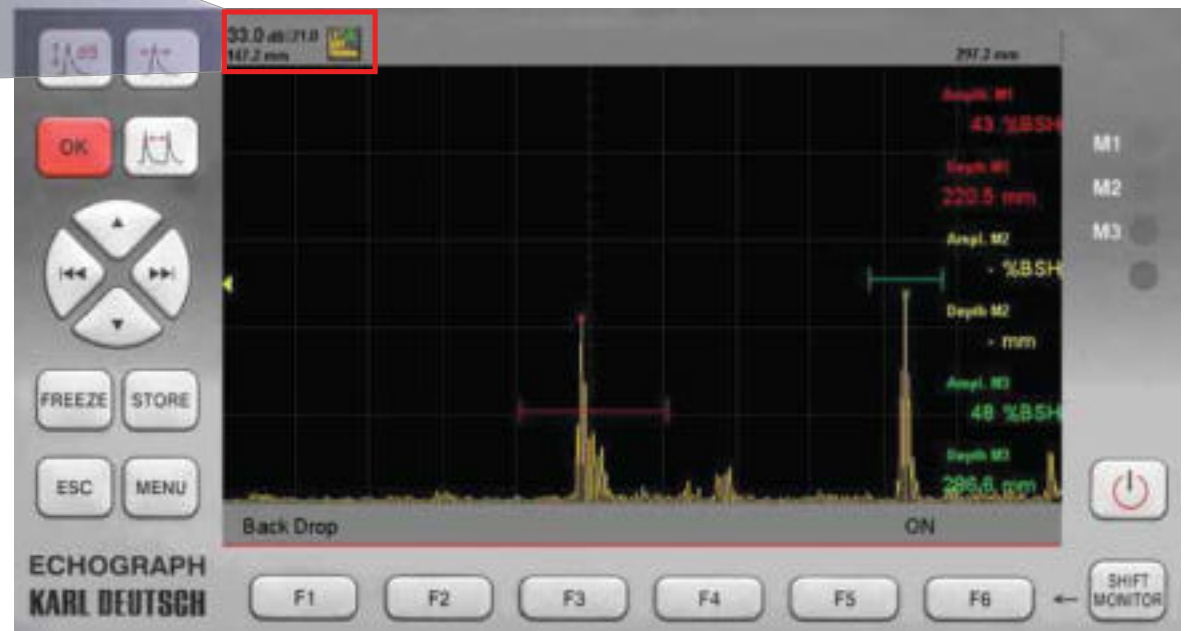
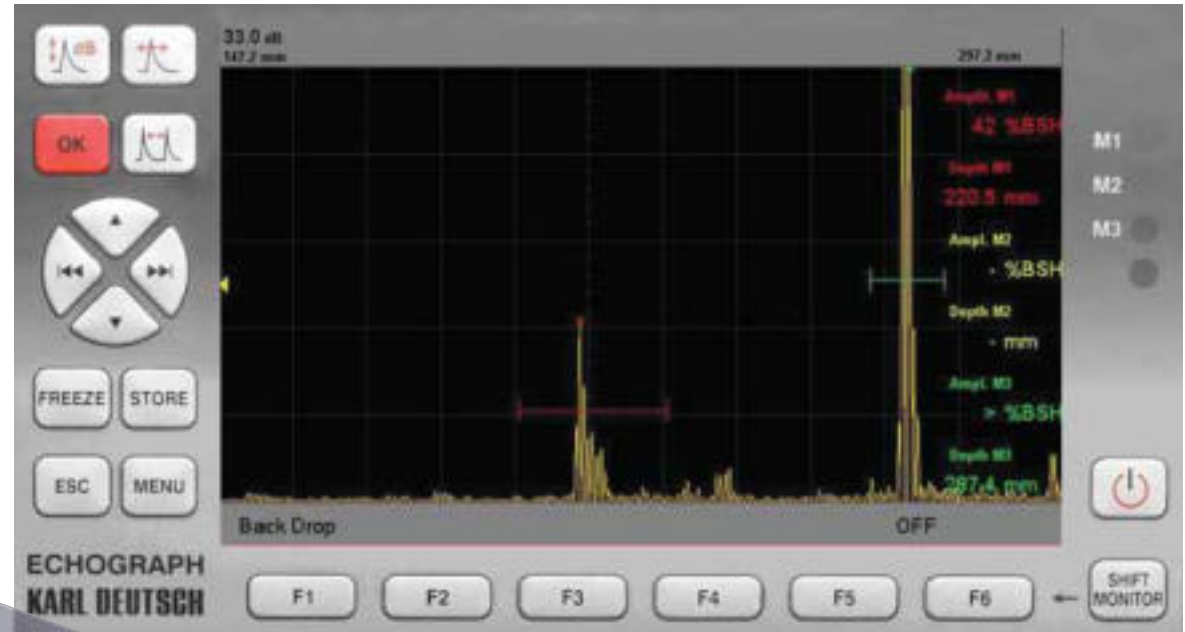
Standard Gain: 33.0 dB

Gate 3 Gain: 21.0 dB



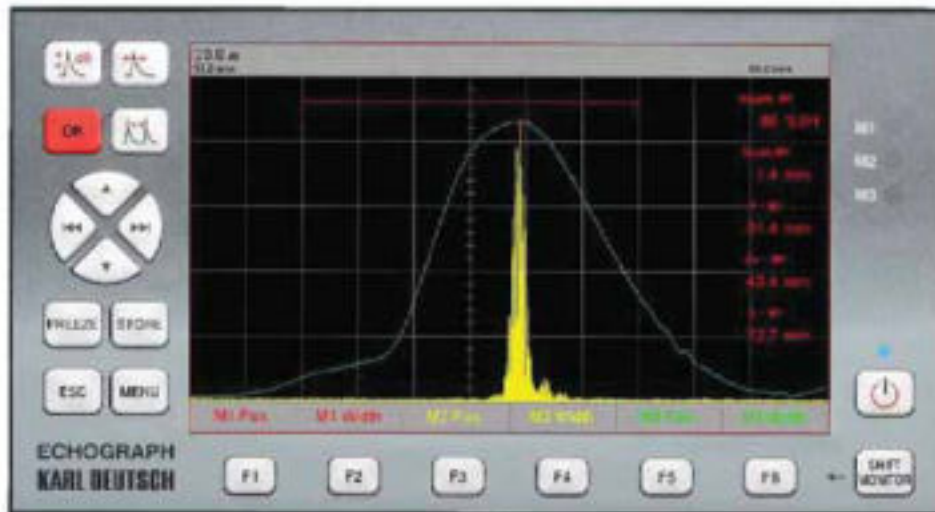
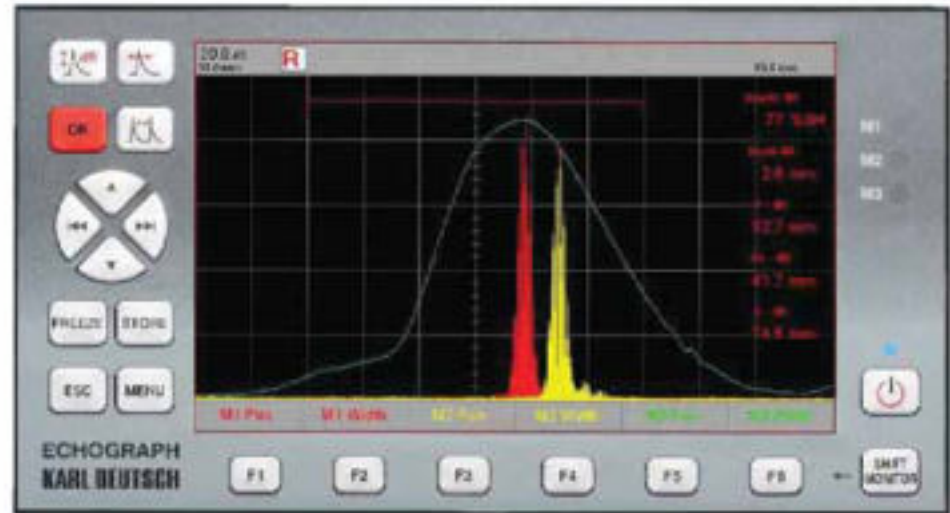
Symbol for monitor attenuation

- Separate gain within monitor 3 (green)
- Observable backwall echo



Envelope Function

- Record Envelope to specify echo dynamics
- Envelope can be stored with configuration
- Envelope will be recovered when loading configuration and can be edited or used as reference as well



The image shows a menu screen on the ultrasound device. The 'STORAGE' menu is highlighted in green. The menu items are listed in a table format.

Menu Item	Sub-Item	Value
STORAGE	Device Configuration	2
PROBE	Reference Mode	0
CALIBRATION	DATA RECORD	
EVALUATION	Create Record	0
	Open Record	0
TRFX		
SIGNAL	Save A-Scan	0
DEVICE	MATH-RECORDER	
	Create Matrix	0
	Open Matrix	0
DAD/CG	Evaluate Matrix	0
AWS		
DGS		
AS	Store A-Scan Direction	0

The display includes a control panel with buttons for 'OK', 'MENU', 'ESC', 'FREEZE', 'STORE', and 'SHIFT MONITOR'. The text 'ECHOGRAPH KARL DEUTSCH' is visible at the bottom left.

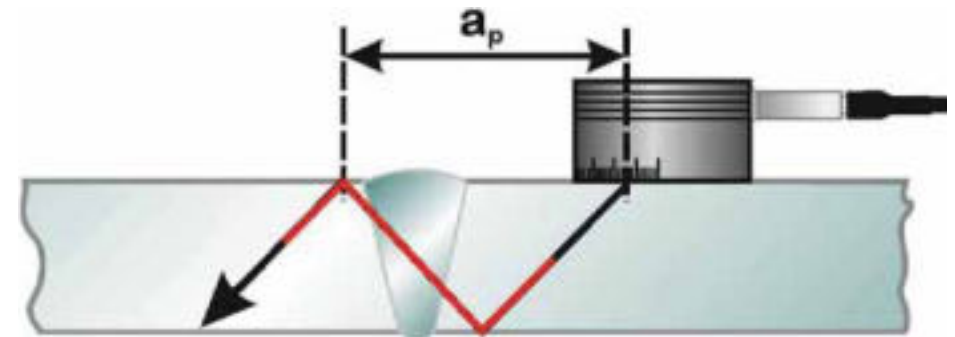
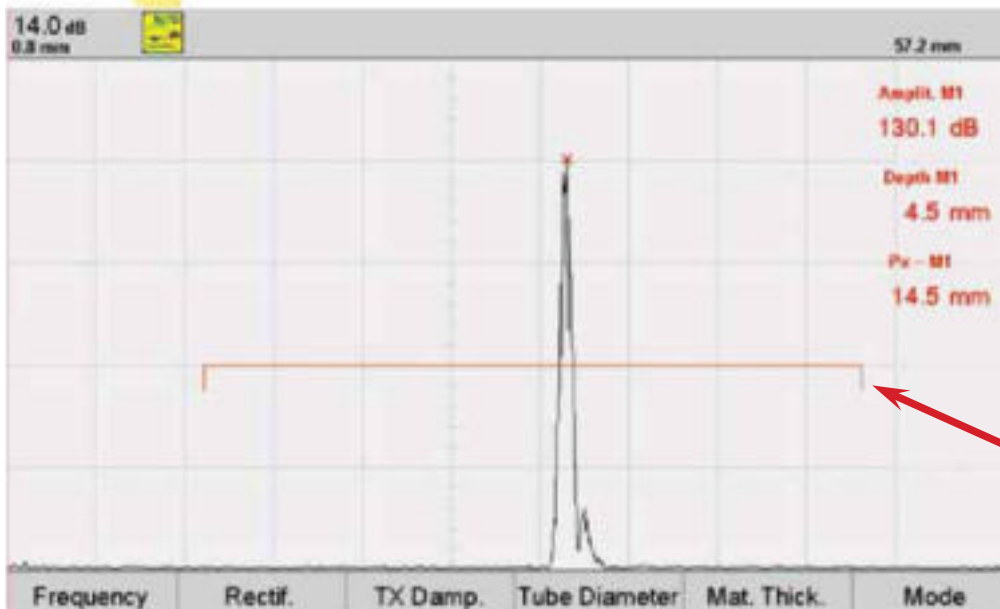
Automatic Monitor Settings for Angled Probes

Symbol to indicate mode



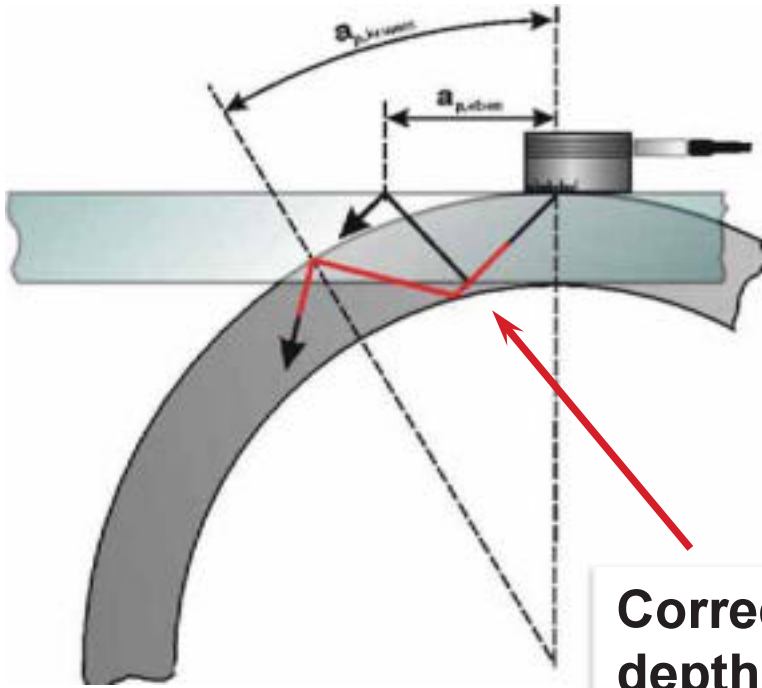
EVALUATION PARAMETERS					
STORAGE	Monitor 1 <input checked="" type="checkbox"/>				
PROBE	Monitor 2 <input type="checkbox"/>				
Monitor 1					
CALIBRATION	Evaluation Mode M1 dBabs				
	M1 Statistical Clearing 0				
EVALUATION	M1 Sound Off				
	M1 Signal Mode Normal				
TX/RX	Skip Marking M1 <input checked="" type="checkbox"/>				
M2 follows M1					
Skip Marking M1					
DEVICE	Start M1 0.3 S (p)				
	Stop M1 1.3 S (p)				
DAC/TCG					
DGS					
Frequency	Rectif.	TX Damp.	Tube Diameter	Mat. Thick.	Mode

Skip distance factors for the selected monitor



Automatic monitor positioning according to the selected skip distances

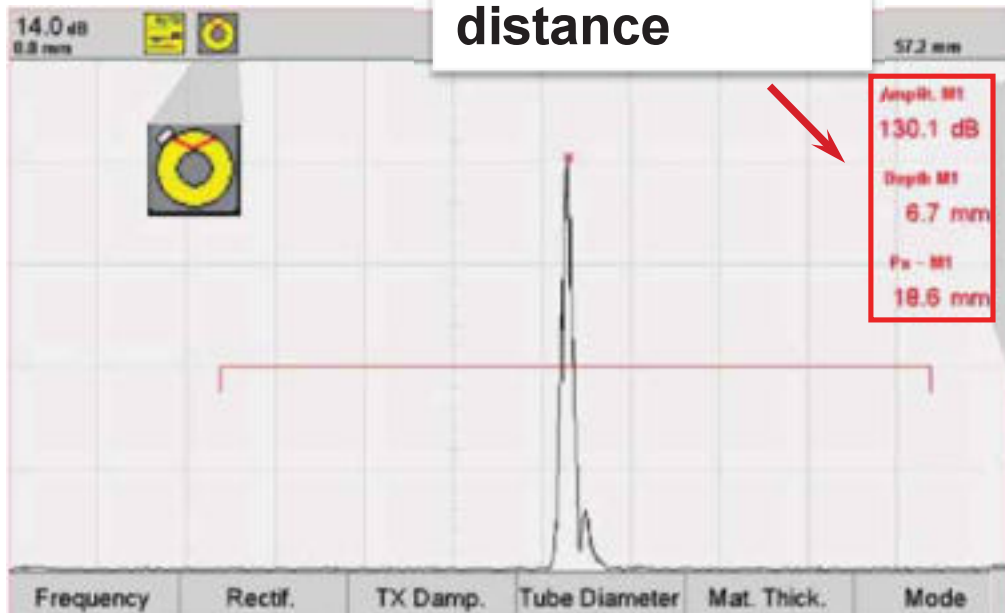
Curved Surfaces



Corrected
depth and skip
distance

STORAGE	CALIBRATION CALIBRATION	
	2 Point Adjustment	<input checked="" type="checkbox"/>
PROBE	Auto Adjustment	<input checked="" type="checkbox"/>
	Delay Path Measurement	<input checked="" type="checkbox"/>
CALIBRATION	Auto Adjustment	
EVALUATION	Probe Name	WK 45 PB 4 I <input type="text"/>
	Load Probe	<input type="text"/>
TX/RX	Measurement Selection	On <input checked="" type="checkbox"/>
SIGNAL	Sound Velocity	3255 <input type="text"/> m/s
	Mode	Tube
DEVICE	Material Thickness	15.0 <input type="text"/> mm
	Tube Diameter	250.0 <input type="text"/> mm
DAC/TCG	Next	<input type="button" value="➔"/>
DGS		

In tube mode:
Input of tube
diameter and
material
thickness



Amplit. M1
130.1 dB
Depth M1
6.7 mm
Px - M1
18.6 mm

Wall Thickness Measurement

STORAGE	EVALUATION PARAMETERS	
PROBE	Monitor 1	On <input type="checkbox"/>
	Monitor 2	On <input type="checkbox"/>
	Monitor 3	Off <input type="checkbox"/>
CALIBRATION	Measurement Selection	On <input type="checkbox"/>
	Time of Flight	Zero-crossin <input type="checkbox"/>
EVALUATION	Modification	None [M] <input type="checkbox"/>
TX/RX	Transmission Mode	Off <input type="checkbox"/>
	Zoom	Off <input type="checkbox"/>
SIGNAL	WALL THICKNESS	
	Averaging [M1-M2]	Zero-crossin 16
DEVICE		
DAC/TCG		
DGS		
Fill Echoes	Rectif.	Zoom
	Meas. Select.	Mat. Thick.
		TOF

Precision wall thickness measurement with zero crossing gate

|M1-M2|
2.00 mm

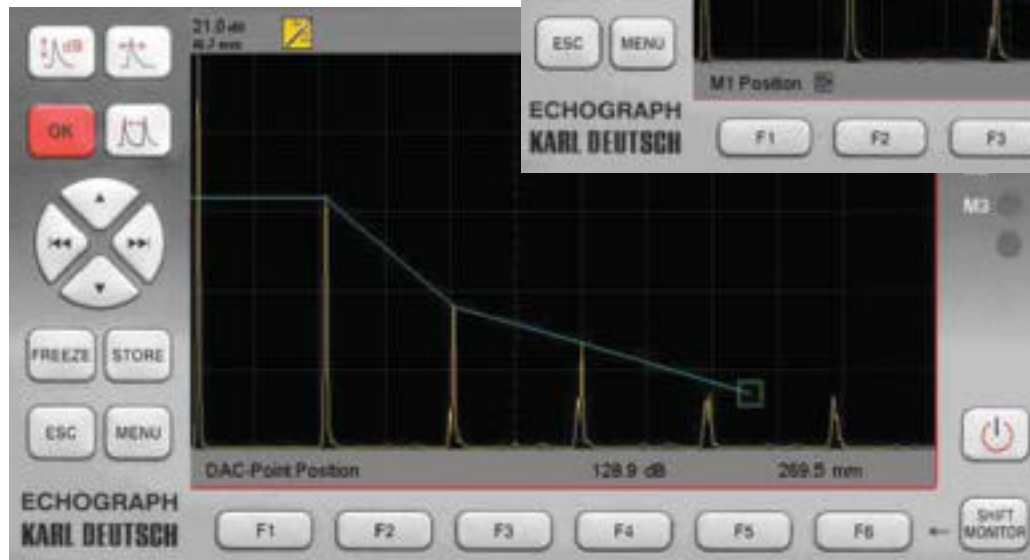
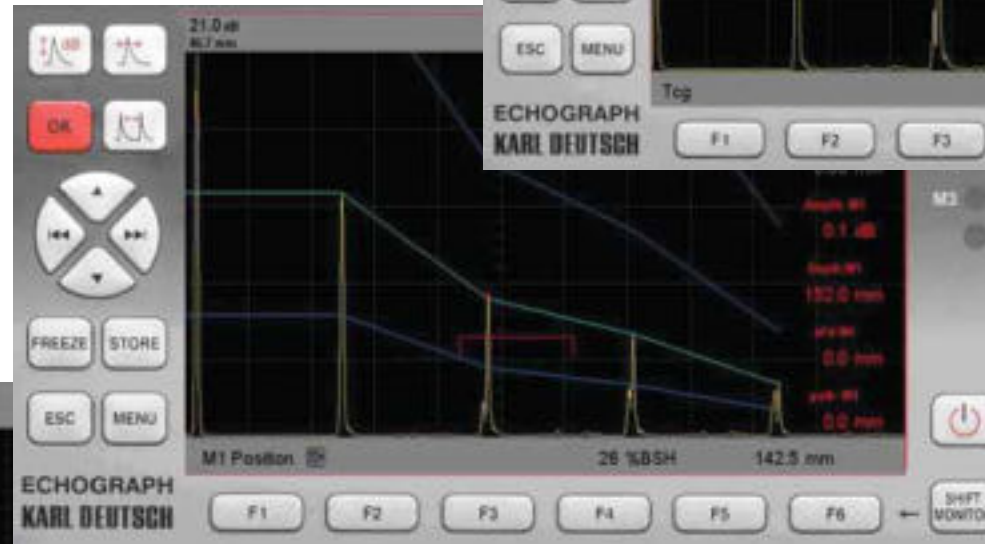
Higher resolution by averaging



Min / Max – storage of wall thickness data

DAC and TCG (Optional)

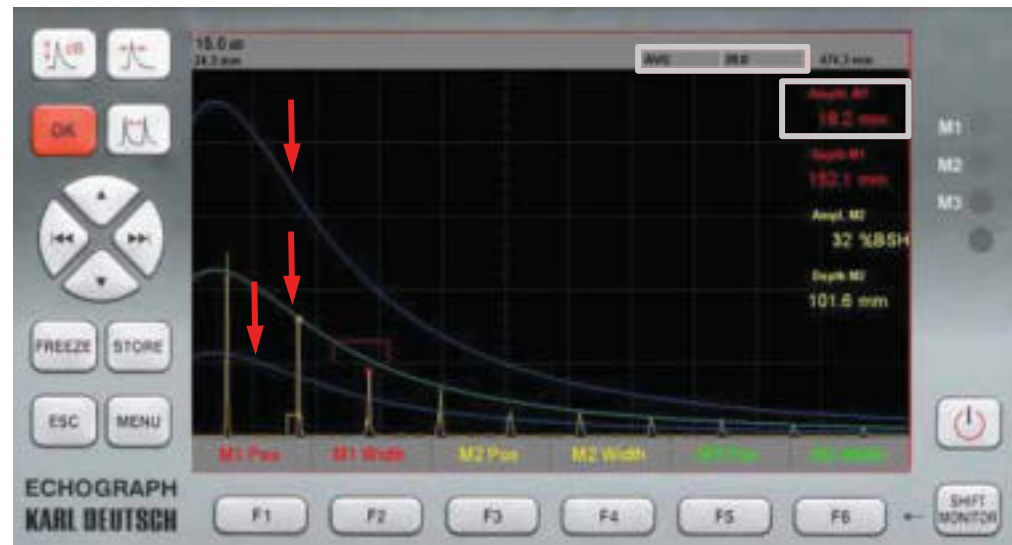
- Up to 16 DAC points
- Points can be added, shifted or deleted
- Displays up to 6 additional thresholds
- Optical or acoustical alarm on exceeding the main threshold
- TCG



DGS (Optional)

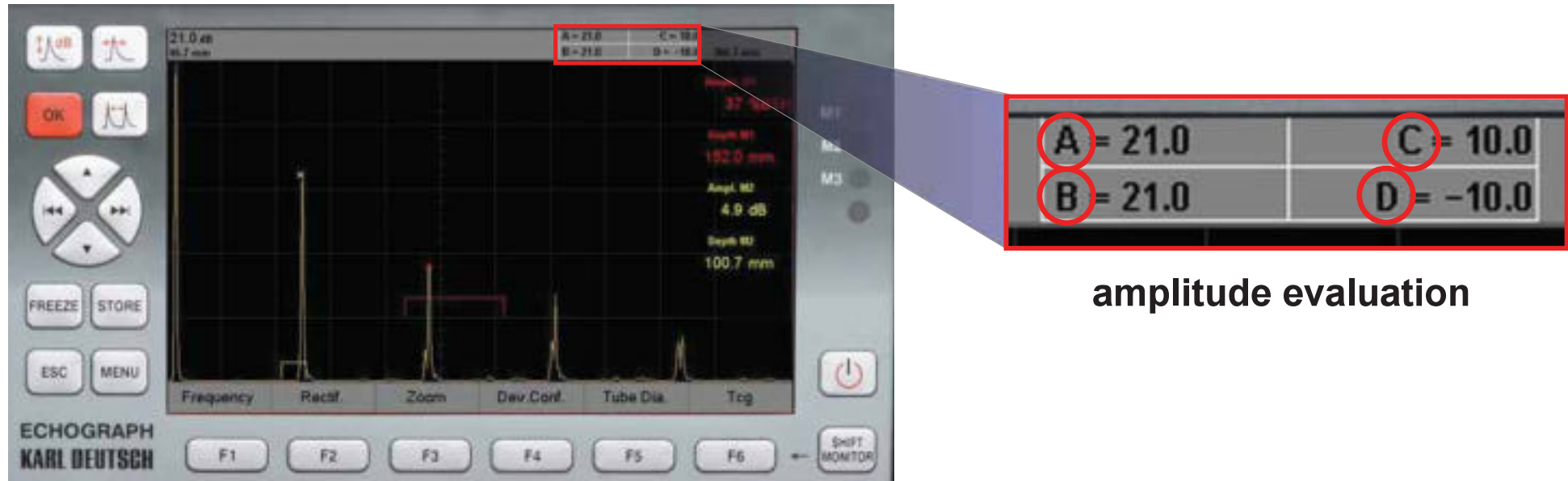
Evaluates the reflected echo in DGS Mode (Distance Gain Size), and calculates the *Equivalent Reflector Size* acc. to EN 1330-4.

- DGS curve is calculated and displayed within the instrument
- Not restricted to special probes
- Equivalent reflector size (FBH = flat bottom hole) is directly calculated
- Up to 6 additional curves
- TR probes



AWS (Optional)

AWS D1.1 (American Welding Society) Weld Rating Software



A = Discontinuity indication level (dB)

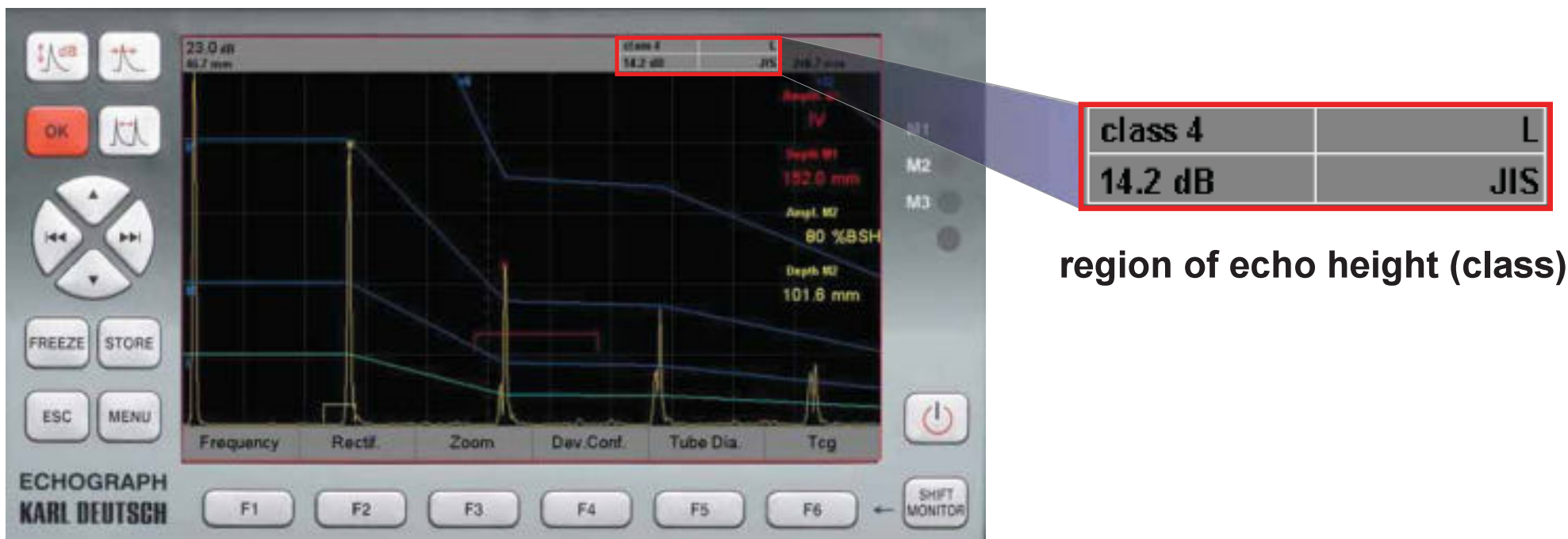
B = Reference indication level (dB)

C = Attenuation factor (dB) $[0.079 \text{ dB/mm} \cdot (s - 25.4 \text{ mm})]$

D = Indication rating (dB) $[A-B-C]$

JIS (Optional)

JIS (Japanese Industrial Standard) Z3060



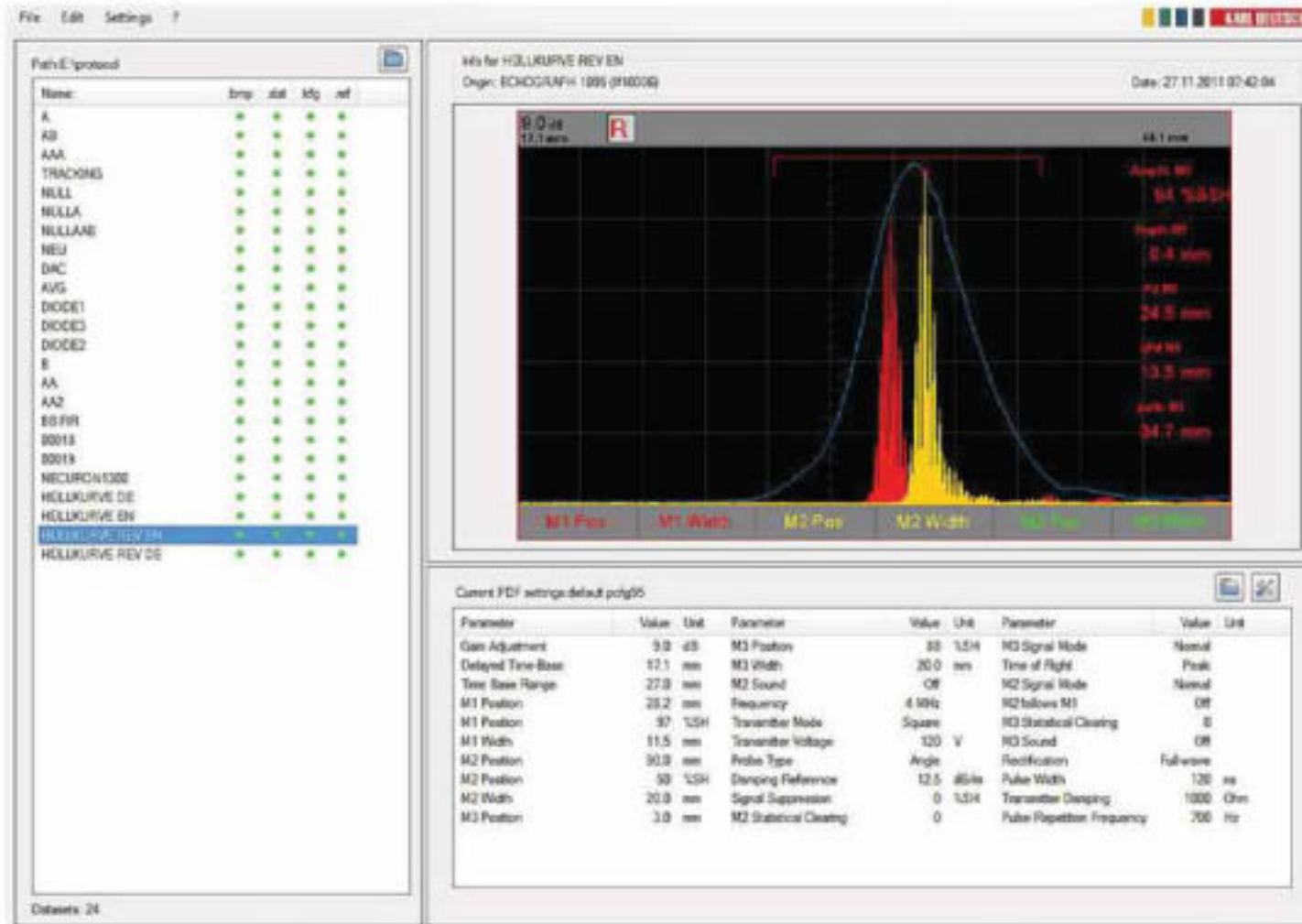
H Line – reference curve

M Line – 6 dB below the H line

L Line – 12 dB below the H Line

Any of these three lines can be used as reference (the baseline for further measurements). The remaining three offset lines are drawn at 6, 12, and 18 dB above the H line.

Software eCom 95



- Easy test report creation
- Im- / Export and manage device configurations
- Export A scan screenshots