

# ELOTEST M2 V3

Ergonomic One-Hand Eddy Current Test Instrument

## Optimized for

- ▶ Dual-frequency inspections with mix
- ▶ Manual inspections of
  - ▶ Surfaces
  - ▶ Bore holes
  - ▶ Hidden structures
- ▶ **Measuring**
  - ▶ Conductivity
  - ▶ Layer thickness



## ELOTEST M2 V3 – Scope

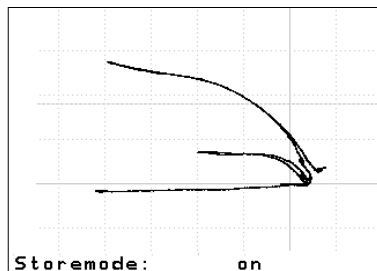


ELOTEST M2 V3 - designed as a “one-hand instrument” based on ergonomic industrial-medicine recommendations. The center of gravity rests in the palm to provide long fatigue-free work.

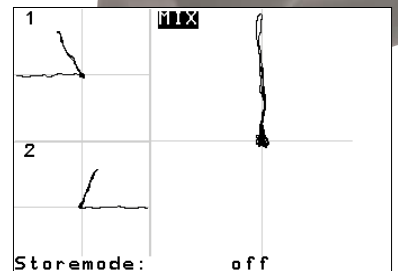
- ▶ The “one-hand” generation with full eddy current functionality.
- ▶ Dual frequency operation, independently adjustable.
- ▶ Full frequency range from 10 Hz to 12 MHz. All filter functions (LP, HP, BP) to optimize the signal for static and dynamic testing.
- ▶ High-definition LCD-display with LED-backlight. Full contrast in any kind of light.
- ▶ Integrated reference standards to promptly verify signals.
- ▶ Pictograph-guided unambiguous “one-hand operation” via 9 keys for all selected functions via the set-up menu.



Conductivity and layer thickness measurement with the ELOTEST M2 V3



**Standard Screen Mode**  
Display either as impedance plane or time-base; a task bar of pictographs is used to set the parameters.

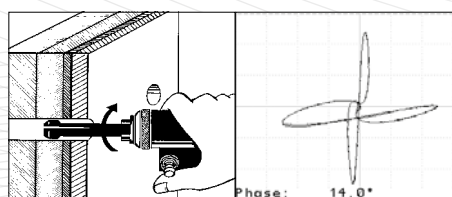


**Dual Frequency Mix Mode**  
Simultaneous display of both channels and the mix channel.

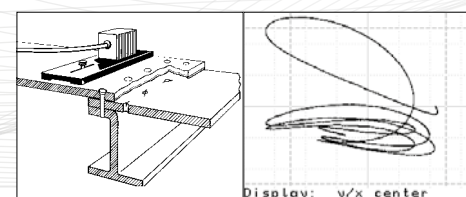
### Typical Applications



Manual inspection with differential and absolute probes



Multi-layer rotary inspection of bore holes



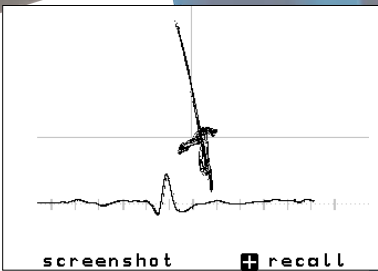
Testing for surface defects and hidden structural defects



The **ELOTEST M2 V3** allows all types of manual inspection beginning with the high-frequency crack detection of high-alloy components to medium-frequency crack and corrosion tests to low-frequency tests of multi-layer structures for stress cracks.

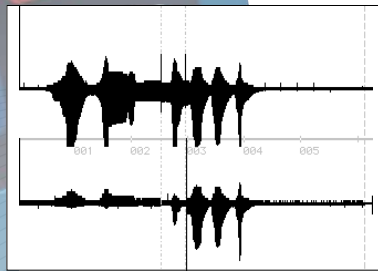


The docking station converts the one-hand instrument into a table-top instrument with a connector for PC or printer. By simply plugging it in, the intelligent charger electronics is activated and keeps the battery pack that is integrated in the instrument at its optimum load level.



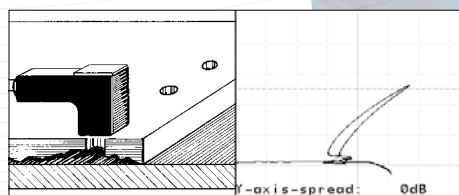
**Dual Screen Rotor Mode**

Impedance display with circumferential presentation.

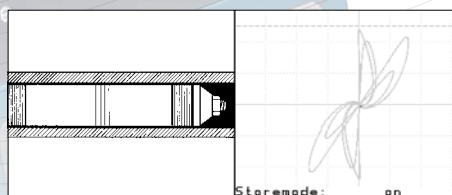


**Strip Chart Mode**

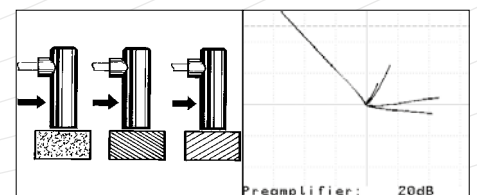
Long-term recording of the X- and Y-signal components with a reconstruction feature for the impedance display.



Measuring corrosion and conductivity



Defect analysis of built-in tubes with co-axial and rotating internal tubes probes



Material properties / hardness sorting

## Technical Data

### User-Interface ELOTEST M2 V3

- ▶ Pictograph-based, one-hand operation via key pad with key-click
- ▶ 6 languages: English, German, French, Italian, Swedish and Spanish
- ▶ Direct-function keys for offset- and liftoff-compensation
- ▶ Programmable function key
- ▶ Intuitive operation using only one submenu-level

### Probe Connection

- ▶ 11-pin Fischer socket, compatible with the 8-pin Rohmann connector
- ▶ BNC connector for parametric probes (resonant probes)
- ▶ OEM probes to be connected via an adapter or directly to the BNC connector
- ▶ Speed control for rotor (torque compensated) in 10 steps (corresponds to approx. 900 rpm to 2700 rpm using Rohmann standard rotors)

### Active Probe Compensation

- ▶ Compensation of the probe response signal for optimum signal dynamics
- ▶ Automatic test frequency selection using the probe characteristics
- ▶ Automatic balancing of single-coil probes using finely graduated, internal compensating loads (no external elements required)

### Frequency Range

- ▶ 10 Hz to 12 MHz, continuously adjustable, display in Hz, kHz, MHz
- ▶ Adjustable driver current, from 0 % to 100 % in 2 % steps
- ▶ Frequency variation from nominal less than 1 %; frequency stability 50 ppm
- ▶ Dual-frequency operation in multiplex-mode

### Gain

- ▶ Preamplification 0 to 60 dB in 0.5 dB steps (0 to 40 dB in 100 kHz range)
- ▶ Gain 0 to 60 dB in 0.5 dB steps
- ▶ Axis spread 0 to 20 dB in 1 dB steps
- ▶ Automatic selection of preamplification and gain

### Phase

- ▶ 0-359.5 in 0.5 steps; step size adjustable

### Filter

- ▶ Low-pass filter 1.3 Hz to 10 kHz in 40 steps
- ▶ High-pass filter 0 Hz to 10 kHz in 40 steps
- ▶ Band-pass filter 0 Hz to 10 kHz; combination of HP and LP
- ▶ Selectable automatic filter for rotor operation

### LCD-Display

- ▶ LCD featuring long-life LED backlight, 80 x 60 mm (3.15" x 2.36")
- ▶ Temperature-compensated contrast setting
- ▶ Resolution 320 x 240 Pixel; refresh rate 75 Hz,
- ▶ 220,000 data samples/second, no signal delay
- ▶ Signal display covering 100 % of the screen; over 89 % with menu displayed
- ▶ 80 viewing angle

### Display Modes

- ▶ Impedance plane / spot display (X/Y), available for all probes
- ▶ Time-base/sweep display (Y/t), 5 ms to 60 s in 17 steps; synchronized
- ▶ Simultaneous X/Y- and Y/t-display (dual-screen mode)
- ▶ Reference signal may be displayed in the background
- ▶ 2 screen grid sizes with adjustable intensity
- ▶ Selectable display range:  
X/Y center – X/Y center bottom – X/Y bottom right
- ▶ Freely positionable zero/null point
- ▶ Automatic trigger during rotor operation
- ▶ Simultaneous multi-signal display during multi-frequency operation
- ▶ Persistence: 0.1 s to 70 s adjustable in 12 steps
- ▶ On-screen signal storage; cleared manually or via auto-erase (2 - 80 s)

### Gates/Alarm

- ▶ Alarm: optical and acoustic
- ▶ Active in all display modes; may be inverted
- ▶ Adjustable gates: +Y-gate, Box-gate, Circle-gate with adjustable flat in the Y-direction

### Parameter Settings/Image Memory

- ▶ 99 user settings may be programmed, stored and recalled

- ▶ 50 application-related factory default settings (cannot be overwritten)
- ▶ 32 signal memories incl. parameter settings for documentation
- ▶ Parameter setups and images may be named using alphanumeric characters
- ▶ Image and parameter data may be printed and transmitted to personal computer
- ▶ Long-term recording (strip chart) of X- and Y-signals, from 20 s to 24 hours; 90,000 min/max-values (envelope, without data-loss)
- ▶ Data storage maintained (backup-battery)

### Conductivity Measurement

- ▶ Measurement in % IACS or MS/m from 1 % IACS to 110 % IACS.
- ▶ Measuring frequency: 60 kHz
- ▶ Calibration using 2 individually adjustable calibration points

### Coating Thickness Measurement

- ▶ Measurement of non-conductive layers on conductive non-ferromagnetic materials
- ▶ Measurement range up to 1000 μm or 40 mils

### Multi-Frequency Operation

- ▶ 2-frequency multiplex
- ▶ Multiplex rate up to 1 kHz
- ▶ Both frequencies fully adjustable, independent of each other
- ▶ Signal mix-function to suppress unwanted effects

### Interfaces

- ▶ RS232-interface for PC or printer (printer-types on request)

### Operation with Lithium-Ion Batteries

- ▶ Without background light and rotor: approx. 8 hours
- ▶ With light and rotor: approx. 6 hours
- ▶ Indication of remaining charge capacity
- ▶ Acoustic and optical alarm for low battery
- ▶ Charge time Li-Ion battery from 0 % to 70 % - approx. 1 hour
- ▶ Charge time Li-Ion battery from 0 % to 100 % - approx. 6 hours
- ▶ Battery may be replaced in less than 10 seconds

### Ambient Conditions

- ▶ Operation between -20 C (-4 F) and 50 C (122 F) at max. 85 % rel. humidity (non-condensating)
- ▶ Storage between -30 C (-22 F) and 80 C (176 F) at max. 85 % rel. humidity (non-condensating)
- ▶ Battery charge between 0 C (32 F) and 40 C (104 F) at max. 85 % rel. humidity (non-condensating)

### Dimensions

- ▶ Ergonomic design
- ▶ Max. dimensions:  
320 mm (12.6") / 125 mm (4.92") / 73 mm (2.87") (length/width/depth)
- ▶ At display:  
120 mm (4.72") / 107 mm (4.21") / 53 mm (2.08") (length/width/depth)
- ▶ At handle:  
185 mm (7.2") / 63 mm (2.48") / 44 mm (1.73") (length/width/depth)

### Weight

- ▶ Ergonomically optimized center of gravity (inside the operator's hand)
- ▶ Instrument without battery approx. 530 g (1.1 lbs)
- ▶ Lithium-ion battery approx. 390 g (0.85 lbs)
- ▶ Wide-range charger approx. 560 g (1.23 lbs)
- ▶ Table-top charger (docking station) approx. 1,070 g (2.35 lbs)

### Power Supply (Options)

- ▶ Li-ion battery (14.8 V/2300 mAh)
- ▶ Mains operation with desk-top docking station (88 – 265 VAC/47 – 440 Hz) featuring intelligent battery management separately for instrument and second battery pack

### Calibration Standards (optional)

- ▶ Calibration standards: titanium, aluminum, stainless and ferromagnetic
- ▶ steel with reference notches: 0.2/0.5/1.0 mm (0.039/0.02/0.008 inch) deep; may be inserted into the instrument handle

### Setting Manager

- ▶ PC-software to archive settings, generate test reports and screen shots