

# NDT

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## MFD650C Portable Ultrasonic Flaw Detector



The MFD650C is an advanced digital ultrasonic flaw detector featuring a multi-color TFT LCD and a host of new features to meet challenging inspection requirements. It combines powerful flaw detection and measurement capabilities, extensive data storage, and the ability to transfer detailed inspection data to the PC via its high-speed USB port.

The instrument incorporates many advanced signal processing features including a 15MHz RF bandwidth to permit testing of thin materials, narrowband filters to improve signal to noise in high gain applications, a spike pulser for applications requiring higher frequencies, and a tunable square wave pulser to optimize penetration on thick or highly attenuating materials.

The instrument can be widely used in locating and sizing hidden cracks, voids, disbands, and similar discontinuities in welds, forgings, billets, axles, shafts, tanks and pressure vessels, turbines, and structural components.

### KEY FEATURES

The instrument extends the performance and range of applications that are capable of being satisfied by a portable instrument. The quality, portability, durability, and dependability that you need come from the popular Mitech MFD Series of instruments.

**Display**

Hi-resolution (640x480 pixels) multi-color TFT LCD with 4 user-selectable brightness control provides high contrast viewing of the waveform from bright, direct sunlight to complete darkness. The hi-resolution multi-color TFT LCD display with fast 60 Hz update gives an "analog look" to the waveform providing detailed information that is critical in many applications including nuclear power plant inspections.

**Range**

Up to 9999 mm in steel; selectable in fixed steps or continuously variable.

**Pulser**

Tunable square wave pulser

Pulse Energy selectable from 200V, 300V, 400V, 500V and 600V.

Pulse Width tunable from 0.1 $\mu$ s to 0.5  $\mu$ s to match the probes with different frequency.

Pulse Repetition Frequency adjustable from 10 Hz to 1 KHz in 1 Hz increments.

Test Modes include Pulse echo, dual and thru-transmission

Four selectable damping settings for optimum probe performance

**Receiver**

Sampling: 10-digit A/D Converter at the sampling speed of 160 MHz

Rectification: Positive Halfwave, Negative Halfwave, Fullwave and RF

Analog Bandwidth: 0.5MHz to 15MHz capability with selectable frequency ranges (automatically set by the instrument) to match probe for optimum performance.

Gain: 0 dB to 110 dB adjustable in selectable steps 0.1 dB, 1 dB, 2 dB, 6 dB and 0 dB.

Automatic Gain function will automatically set the basic gain

**Gates**

Two fully independent gates offer a range of measurement options for signal height or distance using peak triggering.

Echo-to-echo mode allows accurate gate positioning for signals which are extremely close together.

Gate Start: Variable over entire displayed range

Gate Width: Variable from Gate Start to end of displayed range

Gate Height: Variable from 0 to 99% Full Screen Height

Alarms: Threshold positive/negative

**Memory**

Memory of 100 channel files to store calibration set-ups

Memory of 1000 wave files to store A-Scan patterns and instrument settings

All the files can be stored, recalled and cleared.

**Video Recorder**

Screen scenes can be captured as movie files. More than 10 hours movie can be saved to the inside memory. They can be re-played using the instrument or the PC software delivered with the instrument. It is very convenient for those who want to analyze the probing activities later.

## **Functions**

- Automatic calibration of transducer zero offset and/or material velocity
- Live display Sound-path, Projection (surface distance), Depth, Amplitude
- Automatic flaw sizing using AVG/AVG or DAC
- Digital Readout and Trig. Function: Thickness/Depth can be displayed in digital readout when using a normal probe and Beam path, Surface Distance and Depth are directly displayed when angle probe is in use.
- Both the DAC and the AVG method of amplitude evaluation are available.
- TVG (Time Varied Gain).
- AWS D1.1.
- Curved Surface Correction feature
- Crack Height Measure function
- Weld figure feature
- Magnify gate: spreading of the gate range over the entire screen width
- Video Recording and play
- Auto-gain function
- Simultaneous display of live A-scan at 60 Hz update rate and envelope of A-scan display
- Peak Hold: Compare frozen peak waveforms to live A-Scans to easily interpret test results.
- A Scan Freeze Display freeze holds waveform and sound path data
- B Scan display feature

## **Real Time Clock**

The instrument clock keeps running tracking the time.

## **Knob**

Operating adjustments are easily and quickly made using the rotary knob.

## **Communication**

High speed USB 2.0 port. The DataPro software helps manage and format stored inspection data for high-speed transfer to the PC. Data can be printed or easily copied and pasted into word processing files and spread sheets for further reporting needs.

New features include live screen capture mode and database tracking.

## **Battery**

Internal rechargeable high capacity Li-ion battery pack rated 7.2V at 6600 mAh

10 hours nominal operating time depending on display brightness

8-10 hours typical recharge time

## Specifications

- Range: 0 to 9999 mm, at steel velocity
- Material Velocity: 1000 to 9999m/s
- Display Delay: -20 to 3400  $\mu$ s
- Probe Delay/Zero Offset : 0 to 99.99 $\mu$ s
- Sensitivity: 110 dB max in selectable resolution 0.1, 1.0, 2.0, 6.0 dB and locked.
- Test Modes: Pulse echo, dual element and thru-transmission
- Pulsar: Tunable Square Wave Pulsar
- Pulse Repetition Frequency ranges from 10 Hz to 1000 Hz
- Pulse Energy: Low, Medium and High
- Damping: 100, 200, 400 ohms
- Bandwidth (amplifier bandpass ): 0.5 to 15 MHz
- Gate Monitors: Two independent gates controllable over entire sweep range
- Rectification: Positive halfwave, negative halfwave, fullwave, RF
- System Linearity: Horizontal: +/-0.2% FSW, Vertical: 0.25% FSH, Amplifier Accuracy +/-1 dB.
- Reject (suppression): 0 to 80% full screen height
- Units: Inch or millimeter
- Transducer Connections: BNC or LEMO
- Power Requirements: AC Mains 100-240 VAC, 50-60 Hz
- Operating Temperature: -10 C to +50 C
- Storage Temperature: -30 C to +50 C

## MFD650C Standard Kit Configuration

No.	Item	Quantity
1	Main Body	1
2	Straight Beam Probe	1
3	Angle Probe	1
4	Machine-probe Cable (Q9-Q9)	1
5	Battery Module	1
6	Power Adapter (Charger)	1
7	Support Pillar	1
8	Manual	1
9	Instrument Case	1
10	DataPro Software	1
11	USB communication Cable	1

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