



EDDYSUN (XIAMEN) ELECTRONIC CO.,LTD.

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SMART-8003 ET/ACOUSTICS DETECTOR



SMART-8003 is an all-in-one detector including ECA, video inspection, satellite positioning, high sensitivity/broadband high-resolution UT, swept frequency, RF, MIA. It is designed for flaw inspection of metal material, and for sorting of alloy, heat treatment condition and thickness. The UT inspection, combined with strong emission high penetration and high sensitivity narrow band, is especially suitable for flaw detection of large heavy workpieces such as large forgings, castings and composites. The narrow pulse probe worked together with weak emission high resolution and broadband enables to find tiny flaws with very high sensitivity. Results from different inspection methods make engineers easy to analyze and easy to verify. This helps to obtain a more objective and true evaluation. The application fields including aviation, aerospace, electric power, nuclear industry, metallurgy, shipbuilding, petrochemical



industry, automobile and so on. It is especially suitable for flaw detection of composite material and adhesive structural parts.

01 EDDY CURRENT ARRAY

- 32-64 channels (optional) of eddy current array
- Welding inspection with no direction limit
- Compensation for lifting and shaking
- Distinct inspection for crack depth
- Special alarm mode of unequal amplitude and phase
- Various display modes: impedance display, time-base scanning display, time-base superposition display, ECA scanning (B/C) 2D/3D imaging display
- High definition and sensitivity
- Enable to preset special process parameters for further use
- Easy to operate, optional language of Chinese and English
- Data acquisition of C scanning
- Enable to test wall thickness reduction of tube, surface inspection, depth measurement, thickness measurement of coating and cladding on metal surface, sorting of metal material and hardness
- Designed with 8 mixing units to separate and suppress multiple interfering signals at the same time
- Various filter modes
- Various ways of storing data
- Provide the function of multi-frequency inspection configuration analysis
- Video inspection is available at the same time of eddy current testing.

02 UT, SWEEP FREQUENCY, RF, PULSE, MIA

- UT A scan: UT is widely used for internal flaw inspection of metal, nonmetal and composites. Ultrasonic pulse echo and pulse through methods are commonly used to detect poor bonding, debonding, holes and bonding quality for thick



composite materials such as multi-layer metal bonded composite plate.

- Swept frequency: the bonding quality is determined by amplitude change of return signals detected, processed and displayed by transmitting transducer, which is excited by electronic swept frequency (no couplant required, frequency range 20K~80KHz, can be extended to 5MHz).
- RF: debonding is determined by amplitude and phase change, which is measured by steady-state excitation from continuous wave (no couplant required).
- Pulse: the transmitting transducer is excited by short pulse, and the best frequency is selected to make the workpiece generate the biggest bending vibration. When the probe scans over the poor bonding area, the signal amplitude will be bigger than that on the good area (no couplant required).
- MIA: the transmitting transducer vibrates the work piece being tested. The mechanical impedance reflecting the work piece vibration performance reacts on the receiving chip to constitute the load of the transducer. When there's any defect or any bonding quality change, the vibration performance will change too. By measuring these changes, the discontinuity of the work piece under test can be found (no couplant required)

03 OTHER FEATURES

- Testing parameters and data can be saved, and reports can be exported in PDF\EXCEL\WORD format
- Designed with satellite positioning function
- The testing signal all through the inspection process can be saved and replayed
- Integrated with video inspection for visible surface defects
- To minimize personal error, SMART-8003 has functions of real-time menu prompt, man-machine interaction, touch screen operation, and keyboard/mouse operation
- Built-in lithium battery to operate more than 6 hours



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04 TECHNICAL SPECIFICATION

ITEM	SPECIFICATION
EDDY CURRENT ARRAY	
Number of frequency	4
Number of channel	32 / 64
Impedance display	8
Number of mixing unit	8
Frequency range	64Hz~5MHz
Gain	0~90dB, in 0.5 dB steps
High pass filter	0~500Hz
Low pass filter	10Hz~10KHz
Digital filter	1~100
Pregain	10~35dB
Drive	8 levels
AMP & PHA measure	Automatic/manual
Display mode on the same screen	Impedance, time-base scanning, B/C imaging, time-base superposition
Alarm type	Half AMP-PHA, AMP-PHA, Rectangle
Filter modes	High pass/low pass/digital filter
Balance mode	Digital electronic balance
Ultrasonic	
Frequency range	1~5, 0.5~15, 3~16MHz
Gain	0~110dB, in 0.5/1/2/6dB steps
Gain fine-tuning	-2~+2dB, in 0.1dB steps
Detection mode	Full wave, positive, negative and radio frequency (RF)
Detection range	Continuously tunable from 3~99990mm (longitudinal wave in steel), the minimum display range is 3mm
Pulse shift	-10.0~2000mm (longitudinal wave in steel)



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Probe delay	0~199.99us
Material velocity	1000~15000m/s
Damping	High/medium/low/narrow pulse
suppression	0~90%, linear suppression
Vertical linear error	≤ 3%
Sampling precision	10 bits AD
Sampling rate	800MHz
Inspection sensitivity margin	≥ 65dB
Remote field resolution	≥ 30dB
Horizontal linear error	≤ 0.5%
DAC curve	Record 10 echo reference points at most, distances of the three DAC lines are adjustable, echo reference points can be modified
Gate	a/b/c three independent alarm gates, gate a with function of tracking, gate b/c with function of echo expand
Measurement point selection	Select the front or the peak of the first echo in the gate
A echo frozen	Able to freeze A type inspection picture
Echo evaluation	Optional display of beam path, horizontal distance, vertical distance, echo amplitude, dB difference
Scan imaging	B scan/C scan
Swept frequency, pulse, RF, MIA	
Frequency range	Swept frequency 20k~80kHz MIA 2.5k~10kHz Conventional UT 0.5M~16MHz RF 20k~80kHz Pulse 20k~80kHz
Gain	UT: 0~110 dB in 0.5/1/2/6dB steps, acoustic inspection: 0~90 dB, in 0.5 dB steps
Microprocessor	32bit dual-core CPU based on A9
Storage	16G
Memory	1G
Interface	USB, network, HDMI, WIFI, mouse, shuttle knob operation



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Display screen	High brightness 6.5 in TFT color LCD touch screen with resolution 640*480
Operating temperature	-20°C ~ +55°C
Power requirements	DC 19V adapter, 14.8V 6.3AH rechargeable lithium battery