Digital Ultrasonic Flaw Detector

CTS-9009PLUS





- Adjustable Square Wave Pulser
- High-resolution Display Screen
- VGA Video Output
- Portable & Reliable

SIUI

CTS-9009PLUS

Portable, Easy-to-Use, Reliable

—— New Generation General-Purpose Digital Flaw Detector



- Adjustable spike & square wave pulser up to 500V
- High-resolution display screen with 640×480 pixels
- VGA video output
- Adjustable damping
- Operation Frequency up to 20MHz
- High dustproof & waterproof: IP65 (IP67 as option)
- Optional functions: Network Projection/ DAC_JP function/ Auto Freeze/ Spectrum Display/ TCG

Superior Features

- Operating frequency range: 0.5~20MHz, highlighting advantages of high sensitivity and broadband.
- Adjustable pulse width square wave transmission is up to 500V.
- 80 ~ 2000Hz PRF with 10 steps adjustable: avoid reverberation signals during flaw detection.
- The convenient and useful probe spectrum analysis function enables the users to know the probe waveform, spectrum and center frequency, resulting in more precise flaw detection evaluation.
- Measure crack height by edge peak echo method.
- Max. sampling rate 240MHz; Measurement resolution 0.1mm.
- RF (Radio Frequency) echo display: good to thin-wall material measurement, academic research or qualitative analysis.
- The DAC curve works with echo compare function, making echo quantification of different distances and amplitudes more convenient.
- The AGC (auto gain control) function, together with peak echo and image freeze function, help quickly identify the flaw highest echo, enabling efficient flaw detection.
- Advanced thickness measurement function available.
- Featured with AWS D1.1/D1.5 and API 5UE evaluation standards.
- The gate magnifier function magnifies the echo area within the gate to the whole screen display.
- Up to 500 sets of curve and waveform can be saved for various workpieces and flaw detection standards.



VGA Video Output Function



VGA port for VGA monitor or projector connection

- VGA Video Output function makes it easier for you to have a presentation or a flaw detection demonstration.

*EN-12668-1 compliant

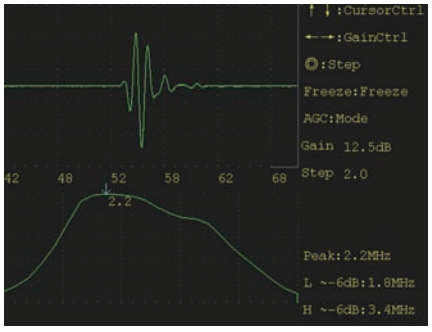
Superior Features

Detection on Large Forged Pieces



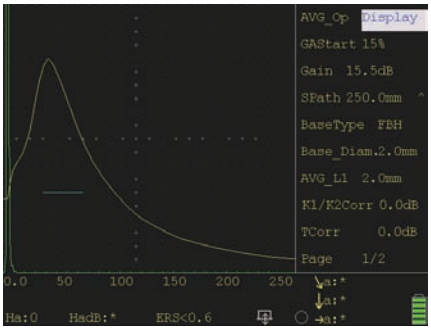
- Adjustable pulse width square wave transmission up to 500V.
- High penetration and large detection range to achieve detection on large forged pieces and coarse crystal material.
- This picture shows an echo from a 400mm 2 flat-bottom forged test block.

Probe Spectrum Analysis Function



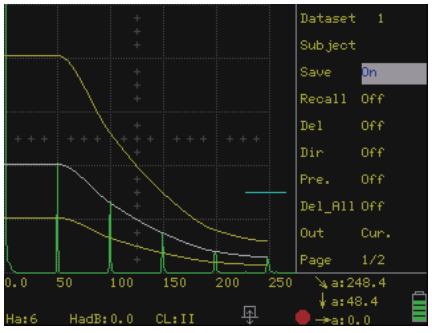
- The probe waveform, spectrum and center frequency of the probe can be measured precisely by capturing echoes.

AVG/DGS Curve



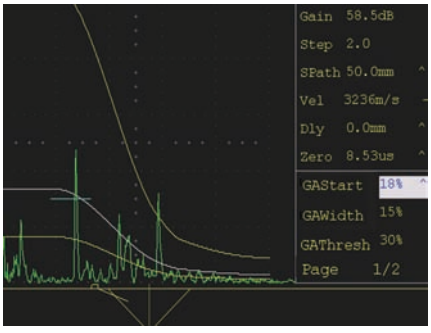
- AVG/DGS curve will be auto created by taking a known flat-bottom hole or large flat-bottom echo for reference.

DAC Curve



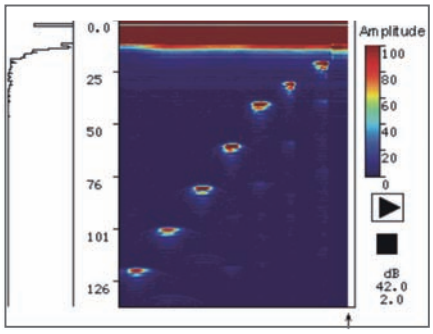
- The DAC curve function brings easier and more convenient flaw evaluation.

Weld groove profile function



- The weld groove profile function can directly point out the location of the defect.

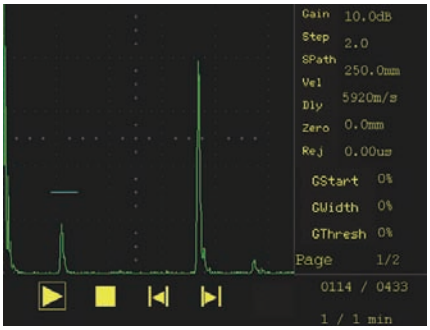
B-scan Function



- B scan images can be acquired by amplitude B scan.

Superior Features

Dynamic Cineloop



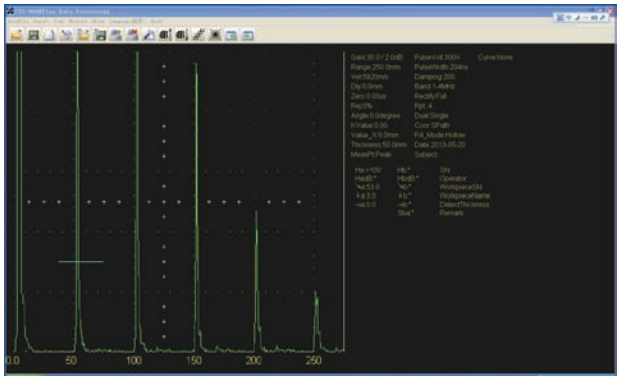
- Internal finite echo recording or external infinite USB dynamic recording function to achieve recording full scanning process.

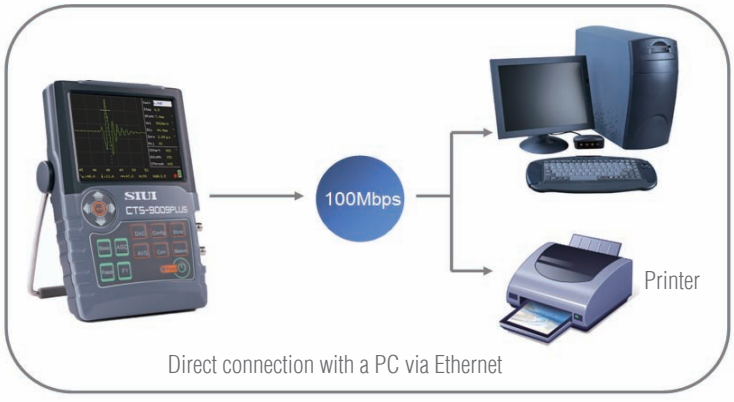
Echo-to-Echo Thickness Measurement



- With thickness measurement function module, CTS-9009PLUS can achieve a variety of thickness measurement modes.

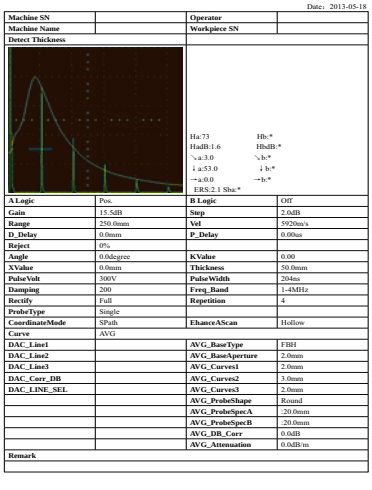
Ethernet Communication





- With network communication, the CTS-9009PLUS can be connected to a PC directly via 100Mbps Ethernet, so as to achieve real-time display and remote control.

Reporting



Date：2013-05-18

Machine SN		**Operator**	
Machine Name		**Workpiece SN**	
Detect Thickness			
		Ha:73 Hb:* HadB:1.6 HbdB:* ↘a:3.0 ↘b:* ↓a:53.0 ↓b:* →a:0.0 →b:* ERS:2.1 Sba:*	
A Logic	Pos.	**B Logic**	Off
Gain	15.5dB	**Step**	2.0dB
Range	250.0mm	**Vel**	5920m/s
D_Delay	0.0mm	**P_Delay**	0.00us
Reject	0%		
Angle	0.0degree	**KValue**	0.00
XValue	0.0mm	**Thickness**	50.0mm
PulseVolt	300V	**PulseWidth**	204ns
Damping	200	**Freq_Band**	1-4MHz
Rectify	Full	**Repetition**	4
ProbeType	Single		
CoordinateMode	SPath	**EhanceAScan**	Hollow
Curve	AVG		
DAC_Line1		**AVG_BaseType**	FBH
DAC_Line2		**AVG_BaseAperture**	2.0mm
DAC_Line3		**AVG_Curves1**	2.0mm
DAC_Corr_DB		**AVG_Curves2**	3.0mm
DAC_LINE_SEL		**AVG_Curves3**	2.0mm
		AVG_ProbeShape	Round
		AVG_ProbeSpecA	20.0mm
		AVG_ProbeSpecB	20.0mm
		AVG_DB_Corr	0.0dB
		AVG_Attenuation	0.0dB/m
Remark			

Customized Report

Date:

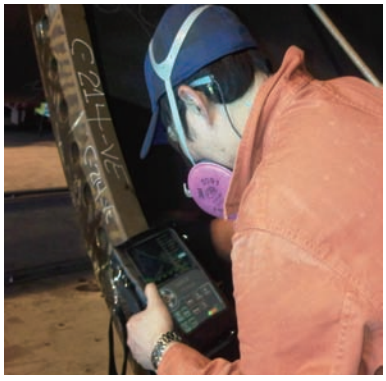
Machine SN		**Operator**	
Machine Name		**Workpiece SN**	
Detect Thickness			
A Logic		**B Logic**	
Gain		**Step**	
Range		**Vel**	
D_Delay		**P_Delay**	
Reject			
Angle		**KValue**	
XValue		**Thickness**	
PulseVolt		**PulseWidth**	
Damping		**Freq_Band**	
Rectify		**Repetition**	
ProbeType			
CoordinateMode		**EhanceAScan**	
Curve			
DAC_Line1		**AVG_BaseType**	
DAC_Line2		**AVG_BaseAperture**	
DAC_Line3		**AVG_Curves1**	
DAC_Corr_DB		**AVG_Curves2**	
DAC_LINE_SEL		**AVG_Curves3**	
		AVG_ProbeShape	
		AVG_ProbeSpecA	
		AVG_ProbeSpecB	
		AVG_DB_Corr	
		AVG_Attenuation	
Remark			
${REMARK}$			

Report Template

- Detection echoes, curves or parameters may be losslessly stored to a PC via 100Mbps Ethernet, facilitating report editing and data management.
- Screenshot and detailed info can be transferred into Microsoft Word for customized reporting.

Typical Applications





The CTS-9009PLUS is designed to increase productivity in various inspection situations. It is suitable for inspection flaw position and size, which can be widely used for various detection demands, such as pipes and tubes,welding seams, pressure vessels and airplane parts.

Application examples are as follows:

Weld Inspection

Weld groove profile function
Peak memory function
AVG/DGS curve
Advanced DAC curve
AWS



Forgings and Casting Inspection

Adjustable square wave pulser: Up to 500V pulse voltage
Manual PRF adjustable: 80~2000Hz with 10 steps adjustable
Peak memory function
AVG/DGS curve

Thin Plates Inspection

High operating frequency: 0.5~20MHz
Manual PRF adjustable: 80~2000Hz with 10 steps adjustable
Good near-field resolution
Peak memory function
AVG/DGS curve



Rail Inspection

High PRF: Up to 2000Hz
Lightweight: The whole unit weight (battery included) is approx. 1.25 kg.
Peak memory function
Advanced DAC curve
AVG/DGS curve

Function	Unit	Specifications
Testing Index		
Attenuator Error	dB	Every 12dB ±1dB
Vertical Linearity Error	%	≤3
Dynamic Range	dB	≥30
Horizontal Linearity Error	%	≤0.5
Pulser		
Transmission		Negative spike or negative square, with adjustable voltage Pulse voltage range: 50V ~ 500V: Square pulse width range: 51~850ns
PRF	Hz	10 steps (80~2000Hz adjustable, but subject to detection range, material velocity, pulse shift, probe zero, transmit parameters, etc.)
Damping	Ω	25 / 75 / 200 / 1000
Receiver		
Operating Frequency Range	MHz	0.5 ~ 20: multiple wide/narrow frequency steps for selection Including: 1~4/ 0.5~10 / 2~20/ 1/ 2.5/ 4/ 5/ 10/ 13/ 15/ 20
Reject	%	0 ~ 80
Gain Adjustment	dB	Range: 0 ~ 110; Adjustable Steps: 0.5 / 2 / 6 / 12
Measurement		
Detection Range	mm	0 ~ 13000 (Longitudinal wave in steel)
Thin Plate Resolution	mm	≤3 (with a C5-10L probe)
Pulse Shift Range	mm	-10 ~ 1000 (Longitudinal wave in steel)
Rectify		Positive/ Negative/ Full/ RF/ Filter
AWS D1.1/ D1.5		Welding level is calculated as per AWS (American Welding Society) steel structural welding code (D1.1) and bridge welding code (D1.5)
API 5UE		A quantitative method for defect depth according to API (American Petroleum Institute).
Curved Surface Correction		For depth and horizontal distance correction when testing circumference with an angle probe.
Crack Height Measure		Crack height calculated with endpoint reflected wave method when using an angle probe.
Thickness Measure		Simple thickness measurement when using a narrow-pulse normal probe.
Auto Gain		Enabling the echo amplitude within the gate auto adjusted to a designated amplitude Amplitude setup: 40% / 50% / 60% / 70% / 80% / 90% / 100%
Angle Measurement		Measure probe angle
Gate		
Gate		There are two measure alarm gates available. Gate mode: off / positive / negative / measurement Gate Start: 0~109% Gate Width: 1~109% Gate Thresh: 10~90%
Optional Software		
Network Projection		Display on the PC software the same image as on the system through network
DAC_JP		DAC curve for Japanese standard
Auto Freeze		Auto freeze signals within gate A/B exceeding gate thresh
Spectrum Display		Display signal spectrum within 50mm from gate A initial position.
TCG		Converted from DAC curve, echo amplitude compensated according to DAC curve, which enables artificial reflectors with different sound path but the same size have the same echo amplitude.
General Technical Specification		
Display Screen		5.7" high brightness TFT LCD, 640×480 pixels
Measure Unit		Inch / mm
Peripheral port		USB, Ethernet and VGA ports
Storage		500 data sets, including system setup, detection state, echo figures, etc.
Language		Up to nine kinds of language for selection, including Chinese, English, Japanese, French, Spanish, Russian, German, Portuguese, Polish
Power Supply		Adapter (CD-92A) or Li-ion battery (DC-92);Adapter: AC in 100V~240V; DC out: DC9V~12V Battery: 6.4V ~ 8.4V
Battery Operating Time	h	≥7 (in factory default mode)
Operating Temperature	℃	-10 ~ +40
IP Code		IP65
Weight	kg	Approx. 1.25 (including battery)
Dimension	mm	152 × 240 × 52 (W×H×L)

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CE

Specifications and appearance are subject to change without prior notice.
DCY2.781.EN.CTS-9009PLUS. CY/6A01