

TD POCKET-SCAN

Multi-Function Portable Ultrasonic Inspection System



Techniques

TOFD
Pulse Echo

Applications

Conventional Welds
Electron/Friction Stir Welds
Pipeline Girth/Seam Welds
Corrosion Mapping
Pipeline Inspection
Tube Inspection
Pressure Vessels
Turbine Discs And Blades
Rotor Bore Examination
Complex Geometry Shapes

System Features

Exceptional Price/Performance
Very Portable, Yet Highly Capable
High Speed Realtime Data Collection
Fast Inspection Using All Techniques
Extensive Off-line Analysis Tools
Easy To Use Menus
Automated Reporting
Lid to 32 Pulse Echo Channels

Software Options

TOFD
Pulse Echo
Corrosion Mapping
Strip-Scan ("Pipeline Girth/Seam Welds")
Long Range("Thru-wall'/Longitudinal")
Pipe/Tube Inspection



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TD POCKET-SCAN : Technical Specification

HARDWARE - Specification

General

Number Of Probe Inputs 4 / 8
Number Of Software Channels 128 / 512

Digitisation

Main Sampling Frequency 8 / 14bits(option) @ 100MHz
System Bandwidth(-3dB) 0.25MHz to 30MHz
Pulse Repetition Frequency Up to 15KHz

Pulser

Number Of Pulsers 4 / 8 (expandable to 512 via external expansion port)
Single/Twin Crystals Yes
Output Impedance 6 Ohms
HT Pulse Shape Negative square wave
HT Pulse Voltage 0 - 200V user definable steps of 5V
HT Pulse Width Range 20ns to 500ns in 2ns steps with < 5ns rise/fall time

Receiver

Number Of Receivers 4 / 8 (expandable to 512 via external interface port)
Signal Bandwidth (-3dB) 0.25MHz - 30MHz
Gain Range 0dB to 100dB's in 0.1dB steps
Gain Linearity 0.25dB (typical)
Input Noise Level 1.4nV/(Hz)^{1/2} (typical) across full system bandwidth
Input Impedance 50R

DAC Curves

Number Of Curves 8
Gain Range 0 to 100dB in 0.1dB steps on each element
Rate Of Gain Change Up to 40dB/μs
DAC Time resolution Automatically controlled using gate Parameters
DAC Start reference Transmit Pulse or material i/f echo, user selectable

Analogue Signal Filtering

High Pass Filters (-3dB) 0.25, 0.5, 0.75, 1.0, 2.5, 5, 10, 15MHz
Low Pass Filters (-3dB) 1, 2.5, 5.0, 7.5, 10, 15, 20, 30MHz
Post Rect. Smoothing Filters (-3dB) No filter, 1, 2, 3, 4, 5, 6, 7MHz, all filters are user selectable
Filter Roll-Off Performance 60dB per decade
Filter Type 6dB Transitional, maintains signal shape with min. distortion

Rectification

Type Unrectified, Full Wave, +1/2 Wave, -1/2 Wave
Linearity Better than 1% full Scale

A-Scan Digitizing

A/D Converter 8 / 14 Bit (option), 100MHz single shot A/D converter
Number Of A-Scan Points/Channel 8192 / 32,768 (option) points per channel
Sampling delay 0 - 10ms, in 25ns steps @ 100MHz sampling rate
Number Of Gates Per Channel 3 hardware Gates
Gate Start/Width User definable in 25 ns steps
Gate Reference Points Transmit Pulse or Material Interface Echo
Storage Modes Per Gate A-Scans, Peak Depth and Amplitude, both
Data Storage Rates To Disk 10MByte/sec based on computer with Pentium 2.2GHz,

Signal Averaging

Number Of Channels All
Averaging Performance 100 million points per second
Averaging Rates Real-time averaging 1-256, user definable

Peak Processing

Peak Storage Modes All Peaks, First Peak, Largest Peak/s, Loss Of Signal
Thickness Measurement Modes Thinnest/Thickest/Between Peaks
Threshold Setup 5 to 100% in 1% steps per hardware Gate
Number Of Peaks Per Gate 64

Generic Scanner Interface Port

Input Type Encoder, Potentiometer or Video Camera
Number Of Axis Up to 3, TTL compatible
Number Of Limit Inputs 2, TTL compatible
Encoder Interface TTL compatible, 5V @ 250mA(max), 100KHz max.
Potentiometer Interface 0 to 2.5V, sampled at 100Hz
Video Camera Input 1Vpp Composite Video (PAL, RS-170)

Motor Drive (External)

External Servo Motor Control +/-2.5V Analogue Output
Interface To External Motor Unit +/-Via high speed serial interface or RS232
Data Rate Up to 10Mbits/s depending on cable length

External Pulser/Receiver Expansion Interface

Expansion Interface Via high speed digital / analogue interface
Number Of External Channels Up to 512 channels

Computer And Operating System Requirements

Computer Type Notebook or Desktop
Operating System Windows 95/98/ME/2000/XP
Processor Pentium 600 (min)
Memory 64MBytes (min), 512Mbytes recommended
Graphics Resolution 800 x 600 to 1680 x 1280
Hard Disk 5Gbyte (min)
Graphics Controllers All

Size, Weight And Environmental

Unit Dimensions 4 Channel - 81mm x 107mm x 32mm
8 Channel - 107mm x 107mm x 32mm
Weight 0.2Kg
Rating IP54, IP67(optional)
Temperature 0°C to 60°C operating, -25°C to 85°C storage
(for wider temperature range contact TD)

Power Requirement

DC Input 6V to 12.5V @ 5Watts (approx.)
AC Input 90 to 260VAC @ 40 to 60Hz

SOFTWARE - General Features

TOFD

Clear user friendly menu's simplify parameter entry
Very fast inspection rates up to 400mm/sec
Perform multi-channel TOFD and Pulse Echo inspections simultaneously
Full suite of image analysis tools for defect/crack sizing
Realtime multi-channel averaging significantly improves signal quality
Linearisation, Straightening, Synthetic-Aperture-Focusing-Technique(SAFT) as standard
Automatic report generation, user defined report fields
File utilities include file join, split, reverse, save partial etc..
Automatically create/export Bitmap images to any Windows application

Pulse Echo/Corrosion Mapping

Easy to use intuitive menu system
Realtime A,B,C and D-Scan images, with user defined display modes
Multiple peak data storage modes, including full/selective A-Scan storage
Trigger reference modes including Interface Echo or Tx Pulse
Multiple DAC curves via user defined gain/time points correct for material attenuation
Full suite of analysis, sizing, post processing utilities
Automated report generation including interactive Print-Preview
Displayed as conventional A, B, C, D-Scan Image showing depth and amplitude
User defined display option for each scan window
Full cursor analysis indicating peak depth, amplitude and x,y position
Supports single, dual x-y encoder/motor type scanner

Thru'-Wall/Longitudinal Pipe Examination

Two probe technique for 'thru' wall and longitudinal pipe examination
Monitors/displays signal amplitude/range attenuation
Simultaneous display of B-Scan, couplant checks and echo dynamic

Pipeline Inspection : Girth/Seam Welds

ASME compliant Girth/Seam weld examination software
Fast, accurate inspection at up to 200mm/sec
Combined TOFD, Pulse Echo, PE, Corrosion Mapping, couplant check, go-no-go in a single pass
Integrated TOFD analysis at the click of a button
Inspection displayed as strips indicating weld zones, C-Scan and TOFD images

Pipeline Inspection (Internal)

Supports internal fixed or rotating head scans using Phased Array or conventional probes
Display as conventional A, B, C, D-Scan's or rotational type scans
Perform inspections over km's of pipeline
Interfaces to external multi-channel Pulser/Receiver modules via high speed interface



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