ETHER NDE

PHASECHECK & AMCHECK

ADVANCED HIGH PERFORMANCE DUAL PROBE/DUAL FREQUENCY EDDY CURRENT FLAW DETECTORS WITH C-SCAN CAPABILITY.

- Based on the well respected AeroCheck+ and sharing the same look and feel user interface, means that users will more quickly be able to become familiar with operation.
- Flexible Dual Bridge and Reflection probe inspection.
- Connection of two encoders for XY scanning.
- Automatic Control and C-Scan Data Acquisition using a 2 axis stepper motor scanner.
- Ability to post analyse data for peer review and audit purposes.
- Readily incorporate C-Scan inspection results in a report.

PHASECHECK

Eddy Current is no longer held to the conventional conductive metal's applications. As the industry is tasked with making lighter, cheaper parts and structures while still maintaining strength and integrity, Eddy Current methods are being re-visited to see how they can be applied to meet the detection criteria and demands of the OEM and vendors.

They say "A picture is worth a 1000 words", to date "pictures" (C-Scans) in eddy current have been limited to expensive large laboratory instruments. Now for the first time C-Scan data is available in a hand-held eddy current flaw detector package, the PhaseCheck.

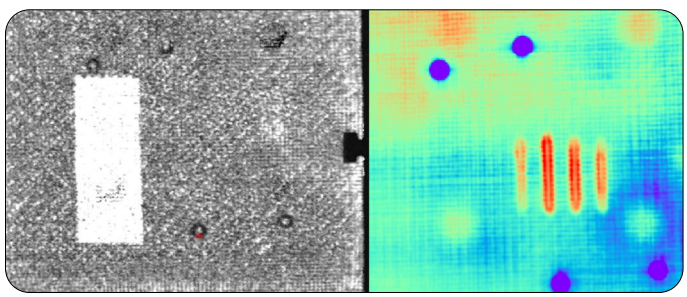
The PhaseCheck carries all the features and performance of the AeroCheck+ Eddy Current Flaw Detector combined with the ability to scan areas and document inspection results using a C-Scan display and X/Y and R/Theta manual scanners with an easy scan calibration. Flexible encoder configuration will allow various scanner mechanisms to be interfaced. C-Scans can be exported as a Bitmap, Excel spreadsheet or raw data file for subsequent analysis.

Features

- **C-Scan:** typically is 120mm x 100mm at 0.1mm resolution. Maximum resolution size is 1 million data points.
- **Data Logging:** Real time recording or signal data and "replay" on instruments & desktop PC, up to 164 seconds.
- **Innovative "Loop" Feature:** "Loop" is a convenient way of capturing a live repetitive signal and then adjusting the instrument settings especially Phase, Gain and Filters in order to simplify the task of optimising the parameters.
- **Trace:** The trace function allows a reference waveform to be stored on the screen and appears along with the graticule behind the live spot. This allows the operator to readily compare the live data with the reference calibration.
- **Operator defined "soft keys"**

Advantages

- Dual probe or dual frequency capability.
- Allows up to 2 encoders to be connected, flexibility that will permit many scanner mechanisms to be interfaced.
- Flexible Dual Bridge and Reflection probe inspection.
- Ability to post analyse data for peer review and audit purposes.
- Readily incorporate C-Scan inspection results in a report.
- User friendly interface, single level menu system, "quick function" sidebar.
- Large daylight readable display 145mm (5.7").
- Rugged lightweight housing 1.2kg (2.6lbs).
- 2 year standard warranty.
- Optional ETherCover warranty to 5 years.



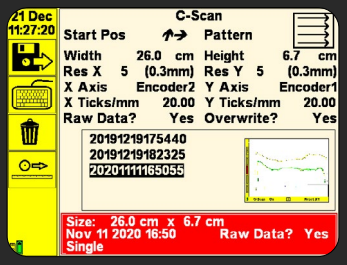
Comparison: UT Scan on left and EC Scan on right.

On Board Eddy Current (EC) Modes

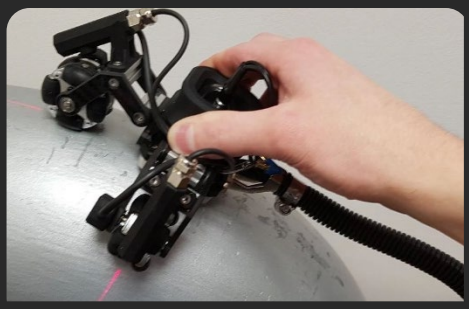
C-Scan, EC single probe frequency,
EC dual probe frequency, EC dual probe dual channel, Rotating Drive,
Conductivity with thickness.

The PhaseCheck C-Scan menu allows easy, flexible encoder setup and scan parameter setting and can be used with a single axis encoder to produce a C-Scan.

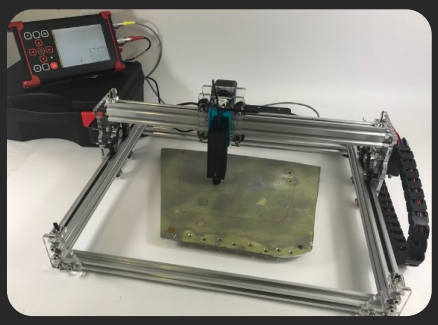
Scanner Control Menu facilitates rapid setup of an automated scan.



Portable Manual X/Y & R/Theta Scanner



2D Encoder



X/Y Automated Scanner

Incremental Miniature
Encoder with Spring Lever and Measuring Wheel

Applications

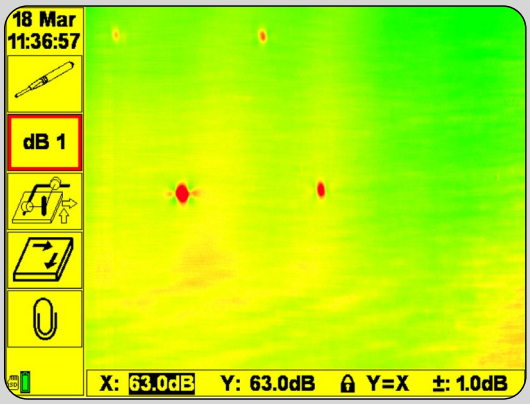
• Recording of the results of an inspection on a large area at a 1mm by 1mm resolution can be as large as an area up to 1m by 1m in one data file, with dual channel data.

• Providing pictorial representation of inspection results.

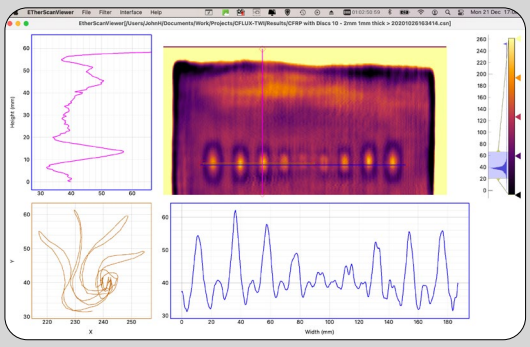
• Enables peer review of data collected (both on instrument or on a desktop computer). As the underlying data is recorded the data may be manipulated to further enhance the data. Data files can also be analysed remotely.

ETherScan Viewer
Post Test Analysis Software

The data recorded in the C-Scan can be further analysed on-board the instrument by changing the channel views, the phase and gain, or exported for further analysis using the post analysis PC Application ETherScan Viewer.



On Instrument Display Screen.
Gain and Phase may be adjusted.



ETherScan Viewer PC Application.

AMCHECK

Developed with the Additive Manufacturing industry in mind the AmCheck can be conveniently panel mounted for inspection of Additive Manufactured (AM) parts during inspection.

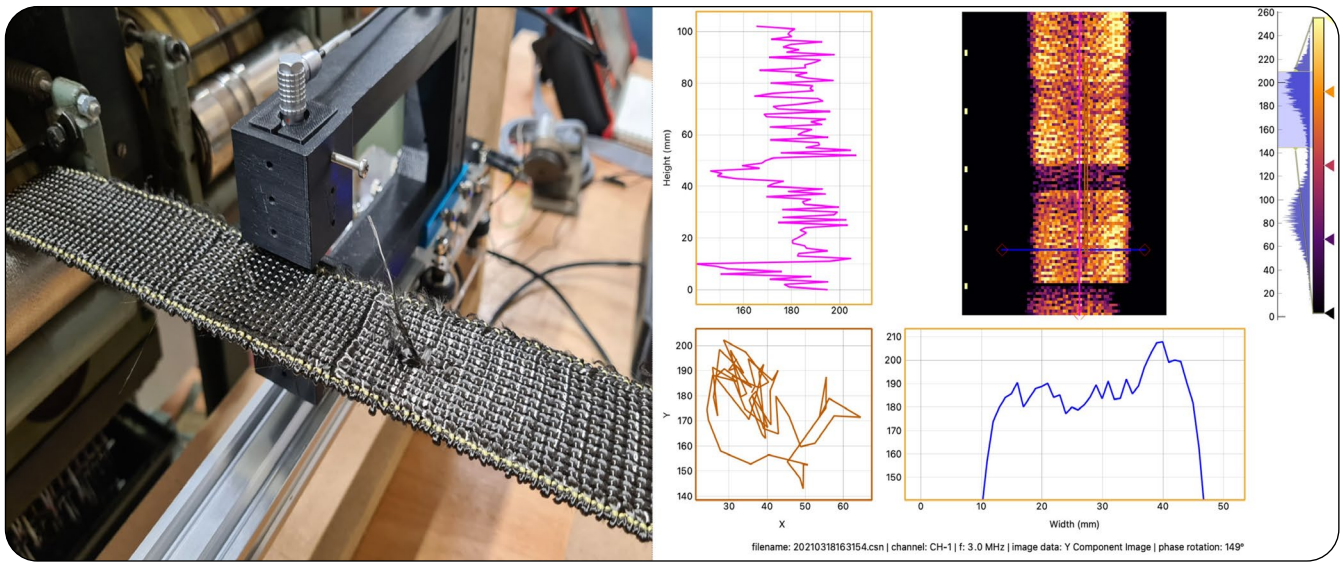
A high performance eddy current flaw detector which can deliver C-Scan data storage and has Dual probe or dual frequency capabilities. Using the AmCheck eddy current flaw detector, DLL data may be streamed over USB to the AM host computer for display, analysis and reporting.

Applications

• Designed as a Turnkey solution for AM manufacturers needing to add or retro-fit Eddy Current inspection to an Additive Manufacturing CNC or Robotic System.

• Eddy Current's unique non-contact and intrinsically hassle free attributes (no couplant, no effluent and no radiation) means it is the best solution for in- process NDT. Allowing the part to be inspected during manufacture, one or more layers at a time.

Image courtesy of Hybrid Manufacturing Technologies



Eddy Current On Loom, scanning of 3D Woven Carbon Fibre.
CFlux Project: Innovate UK

SPECIFICATION

Operating Modes	Eddy Current Modes	C-Scan
		Eddy Current Single Probe Frequency
		Eddy Current Dual Probe Frequency
		Eddy Current 2 Probe, 2 Channel
		Rotating Drive
		Conductivity with thickness
Probe	Connectors	Simultaneous probe operation possible using LEMO 12 way and LEMO 4 way
		12-Way LEMO 2B (Absolute, Bridge, Reflection, Rotary, Conductivity)
		4-Way LEMO 0B (Bridge, Reflection)
	Rotary	600-3000 rpm. EThер Mercury Drive (ADR002) and Saturn (ARD001), Hocking 33A100, Rohmann MR3, SR1 and SR2 Drive (special adapter needed)
	Conductivity	Option becomes active with use of AMCheck conductivity probe and cable.
Frequency	Dual Frequency	10Hz - 12.8MHz & Mix -18 to +18dB on output
Gain	Overall	-18 to + 104dB, 0.1, 1 and 6dB steps (104dB maximum)
	Input	0dB or 12dB
	Drive	0dB, 6dB and 10dB (0dB reference 1mW into 50 ohm).
	Max X/Y Ratio	+/-100.0 dB
Phase	Range	0.0-359.9°, 0.1° steps
Filters	High Pass	DC to 2kHz or Low Pass Filter, which ever is lower in 1Hz steps. Plus variable adaptive balance drift compensation 0.01 - 0.5 Hz (6 steps).
	Low Pass	1Hz to 2kHz or a quarter of the lowest test frequency, which ever is lower in 1 Hz steps.
Balance Load	Manual	14 internal balance loads; 2.2µH, 5.0µH, 6.0µH, 6.5µH, 7.0µH, 7.5µH, 8.2µH, 12µH, 15µH, 18µH, 22µH, 30µH, 47µH, 82µH
	Automatic	Optimised balance load selection.
Mix Channel	Frequency	Full frequency range available on both channels
	Probe Mode	Simultaneous reflection / bridge and absolute including simultaneous two probe Differential and Absolute
	Mix Gain	X/Y -18 to +18dB
	Mix Phase	0.0-359.9°, 0.1° steps
Alarm Gates	Box	Fully configurable, Freeze, Tone or Visual.
	Sector	Fully configurable, Freeze, Tone or Visual.
Display	Type	5.7” (145mm), 18 bit Colour, daylight readable.
	Viewable Area	115.2mm (Horizontal) x 86.4mm (Vertical)
	Resolution	640 x 480 pixels
	Flip	Manual or automatic screen orientation change to enable left or right handed use.
	Configurable Screen	Full Screen, Single, Dual Spot or Dual Pane with variable size and location and function e.g. XY, Timebase, Waterfall and Meter.
	Colour Schemes	User configurable Dark, Bright and Black & White
	Display Modes	Spot, Time base (0.1-20 seconds x 1-200 sweeps, up to 55 seconds), Waterfall, Meter with peak hold and % readout, Distance (single axis, changes with direction), Strip Chart (single axis, unidirectional) and C-Scan.
	Graticules	None, Grid (4 sizes 5, 10, 15 and 20% FSH), Polar (4 sizes 5, 10, 15 and 20% FSH)
	Offset	Spot Position: Y =-50 to +50, X =-65 to +65%
	Digital Spot Position Readout	Display in X,Y or R,θ
	Summary	Display of all settings in Legacy Format
Removable Data Storage	Media	Micro SD HC Card 32GB
	Setup Storage	Over 10,000 settings
	Stored Screen Shots	micro SD up to 32GB, holding over 10,000 screen shots
	Recorded Data	Over 500 2.5 minute long data recordings.
	Guides	10,000 Slides plus
	C-Scan	Max no of C-Scan Data Files 1,000

SPECIFICATION (cont)

Advanced Features	Data Logging	Real-time recording of signal data and Replay on instruments and desktop PC up to 164 seconds
	Guides	Create and display a slide show containing instructions, tutorials and procedures using Microsoft PowerPoint.
	Attachments	Screenshots and Data Recordings are saved in a folder with the name of the Settings.
	Loop	Capture a live repetitive signal and then optimise the instrument settings (Phase, Gain, Filters) to simplify optimising the parameters
	Trace	Allows a calibration reference signal to be stored on the screen and then compared with the live signal
	Auto Phase	Allows phase angle to be automatically set to a pre-set angle
Scanning	Connector	8 way LEMO 1b for encoder and scanner control
	Encoder	2 phase 2 axis; =X/Y or R-Theta
	Automatic	Controls and acquires data from a Stepper Motor Driven XY Scanner
	Count Rate Max	100kHz
C-Scan	Resolution	Max size 1 million data points
	Scaling	0.1-999.9 pixels/mm.
	Typical Scan	120 by 100 mm at 0.1mm resolution.
	Data Saved	Data stored as XY Pairs for 2 Channels. Data presentation X, Y, R or theta on CH1, Ch2 or Mix.
Outputs	PC Connectivity	Open collector transistor (32v dc at 10mA max) available on 12 way LEMO.
	Digital Volt Free Alarm	On Lemo 12 way Open collector transistor (36v dc at 10mA max).
	VGA	Full 15 way VGA output (EC screens only)
Languages		Selectable from English, French, Spanish, Italian, Portuguese, Russian, Japanese, Chinese, Turkish, Czech, and Norwegian.
Verification Levels		The system includes on delivery a 2 year validity Verification Level 2 detailed functional check and calibration as per ISO 15548-1:2013
Power-on self test		The system performs a self test on start up of external ram, sd ram, accelerometer, Micro SD card, LCD screen buffer.
Power	External	100-240 v 50-60Hz 30 Watts
	Battery	Internal 7.2V nominal @ 3100mAh = 22.32 watt.hr
	Running Time	Up to 8 hours with a 2MHz Pencil Probe 30% Back Light and up to 6 hours with a Rotary Drive 50% duty cycle.
	Charging Time	2.5 hrs. charge time, Simultaneous charge and operation
	Weight Including Internal Battery	1.3 kg, 2.9 lbs.
Physical	Size (w x h x d)	237 x 146 x 53 mm / 9.3 x 5.7 x 2.1 inches
	Material	Aluminium alloy Mg Si 0.5 powder-coated epoxy
	Operating Temperature	-20 to +60 °C
	Storage Temp	Storage for up to 12 months -20 to +35 °C Nominal +20 °C
	IP Rating	IP54

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