

# VeeScan-H Aircraft Wheel Half Inspection System.

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# Introduction

Why inspect wheel halves? – Wheels are subject to very high stresses and temperatures during landing and are vital in maintaining the safe operation of an aircraft

Why use Eddy Current? The wheels are coated to prevent corrosion and eddy current permits inspection without removing the coating.

Why automate this inspection? – Automation gives a faster and more consistent inspection resulting in a higher PoD.



#### Wheel Inspection Areas





## Requirements

- Reliability
- Easy to service/repair
- Suits difference setup scenarios e.g. free standing, in conveyors, height adjustable work station
- Safety
- Reliable calibration
- Easy setup



## Solutions

- Use standard and globally available components e.g. PC, Electromechanical control hardware
- Standard removable eddy current flaw detector
- Built in diagnostics and standard components
- Roller conveyor and height adjustable control panel
- No pinch points and no hardware above the work surface
- Dynamic setting standard which can be removed for verification
- Simple Graphical indication of machine setting and only three parameters be wheel half



#### **Complete Machine**





#### With Standard Flaw Detector



#### **Simple User Interface**





# **User Interface - Opening Screen**





# **User Interface - Settings**

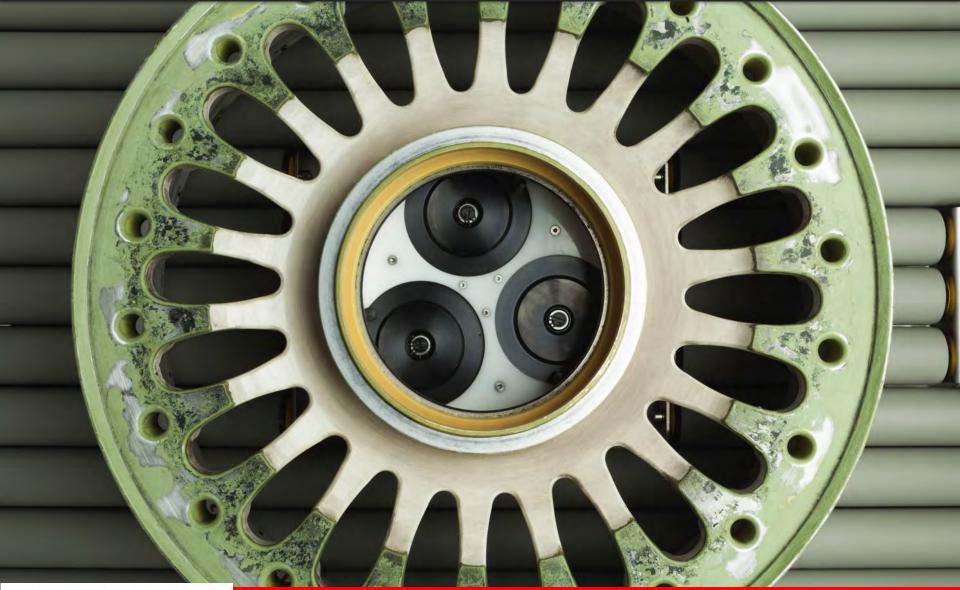
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#### VeeScan Automatic Wheel Inspection System

Home	Wheel Profile Setting	s Runnii	ng Inspection Report	Wheel Measure	Manual	Diagnostics	Errors
767			Wheel Specification				
Nosew	heel		Wheel Type				
I/B			Wheel Half				
148		8 7	Wheel Lift Height				
544		4	Wheel Diameter				
16		4	First Acquisition Start I	Height		Save Wheel	Profile
213		*	First Acquisition End H	eight	<u> </u>	Load Wheel	Profile
0		*	Second Acquisition Sta	rt Height	_		
0		*	Second Acquisition End	d Height	Loa	ad Original W	heel Profil
60		*	Wheel Speed		1	Start Inspe	ection
1.5		*	HelixRate			otore mope	
TW150	7		Serial Number				
TW150	7	1	PartNumber				
Test Engineer			Inspection Performed By				
ETher NDE			Customer				

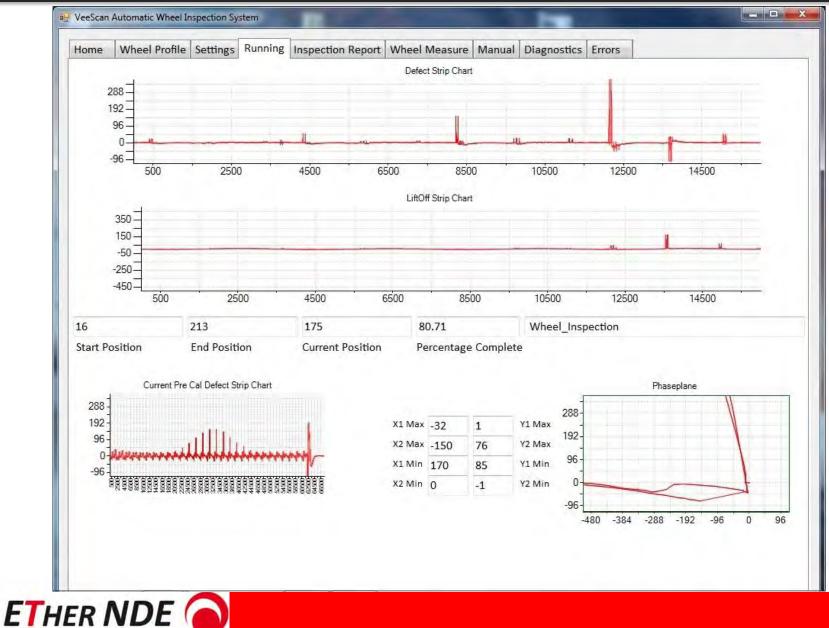


#### **Versatile Wheel Clamping System**



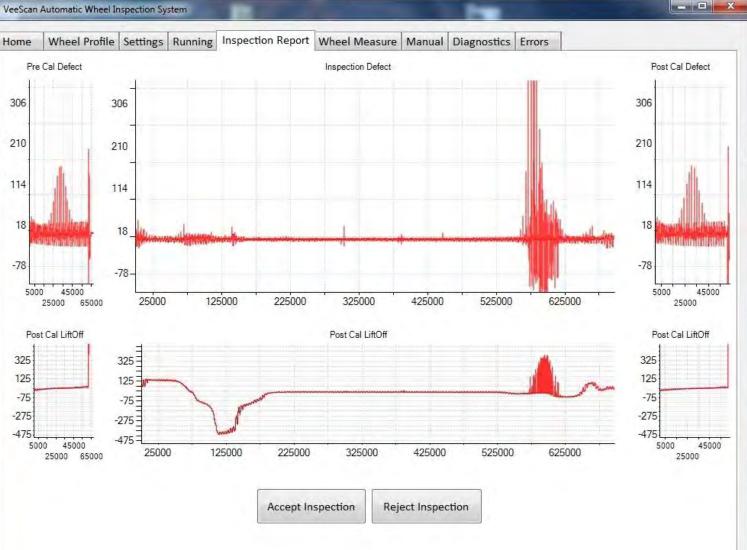


# **User Interface - Running**



# **User Interface - Reporting**

#### VeeScan Automatic Wheel Inspection System





# **User Interface – PDF Report**

## EESCAN



File Name -> C:\Users\VeeScanController\ETher NDE\VeeScan v3\20160920150247.pdf

Test Completion Date and Time -> 20/09/2016 15:02:47

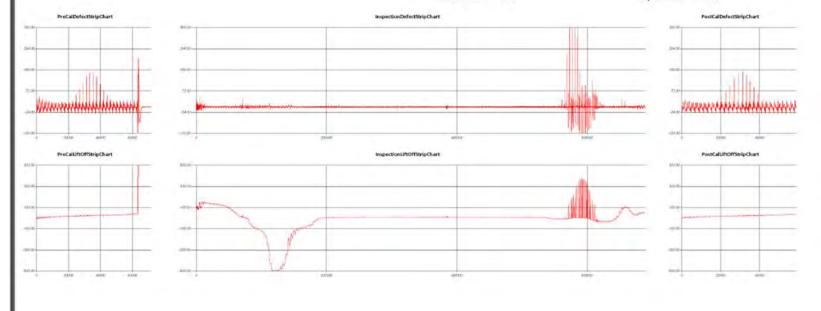
EC WHEEL INSPECTION SYSTEM

Test Result -> True

Inspection Performed By -> Test Engineer

Wheel Specification -> 767 Wheel Type -> Nosewheel Wheel Half -> I/B Serial Number -> TW1507 Part Number -> TW1507 Customer -> ETher NDE RPM -> 60 Helix Rate -> 1.5

Frequency -> 200 KHz Gain X -> 36dB Gain Y -> 52dB Phase -> 73degrees Filter LP -> 750Hz Filter HP -> 2Hz Drive Gain -> 12dB Input Gain -> 10dB





### **Standard Globally Available Control System**



# **User Interface - Diagnostics**

#### P- VeeScan Automatic Wheel Inspection System

ETHER NDE

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lome	Wheel Profile	Settings	Running	Inspection Report	t Wheel Measure	Manual Diagnostics Error	5	
	are Status			el Rotation Status	Motor Z Status	Motor Y Status	X: 73 0	
Emergency Stop				I Rotation Communications	Probe Vertical Motor Communication	Probe Horizontal ns Motor Communications	Y: -18 0	
Good			Good	4	Good	Good		
Probe Obstruction Good			Whee	Rotation Motor	Motor Z State	Motor Y State	Disconnect	
Lift Motor Positional State			Good			Good	EC Comms	
Good			Runn	ng Order Received		ed Running Order Received	Waiting	
Probe Holder Detached			Off			Off	PLC Comms	
Good			Moto	Zeroed	Motor Zeroed	Motor Zeroed		
Inspection Status			Off		On	On	S/W Comms Test	
Manual Mode (Wheel Lift At Inspection Height)			Switch -	Limit Switch -	Limit Switch -	DLL - Version + 1.0.1		
			Conta		Non Contact	Non Contact	DEC-VEISION 1.0.1	
Startup Sequence				Switch +	Limit Switch +	Limit Switch +	Send Orders	
Good	First Init	ialisation	Conta		Non Contact	Non Contact	Bit 0 Abort	
Good	Reset In	dicators	Good	wer Limit Switch			Bit 1 Continue After Balance Bit 2 Continue Block Reference	
Good Initialise Graphs			oper Limit Switch	<ul> <li>Bit 3 Go Manual Position</li> <li>Bit 4 Erase Fault Memory</li> <li>Bit 5 Lift-Off</li> </ul>				
		Good	per clinic switch					
Good	Load Set	ttings		otor Timeout			Bit 6 Beep Bit 7 Wheel Lift	
Good	Initialise	PLC Comms	Good				<ul> <li>Bit 8 Initialising</li> </ul>	
Good	Initialisa	ation		1000		01100000000000101		
Good	Coofigur	ation	Axi	s Y Vertical Status				
Axis Z Horizontal Status 00		000000000000000000000000000000000000000	0110000000000101					
Good	Initialise Language Axis W Roti		W Rotation Status	000000000000000000000000000000000000000				
Check System Status					Get Error :	sk.		
Reinitialise Hardware			Clear	Hardware Faults	Reset USB	-		
Se	elect File ToLog	То		100.0004				
		4.1			Sweep Tir			
						• 0.2		
			USB	Tx: OUSB R	\$232			
ALARN	1! ALARM!							

## Specification

•Instrument AeroCheck+

•**Probe** Differentially connected absolute (integral balance load) with circular head. Recommended Frequency 200kHz, option 100kHz, 500kHz and 1.5 MHz. Recommended diameter 6mm (mm also available and narrow shaft for large wheels)

•Wheel Diameter 0-900mm 0-35"

•Max Wheel Height 400mm 16"

•Max Load 150Kg / 330 lbs

•Typical Inspection Helix 1.5mm 0.06"

•Rotation Speed 15-120 rpm

• Probe Position Adaptive contour following using dual axis pressure sensors with fully bi-directional control

•Alarms Acoustic and visual

•Frame Extruded Aluminium

•Wheel Position The wheel is lifted clear of the roller tray using a 250mm 10" stroke electric actuator and then held under its own weight by an adaptive automatic grip mechanism

•Data Recording & Storage Yes with pdf reports.

•Automatic Calibration Yes, by means of dynamic standard option

•Automatic Stop on Defect Yes

•Turntable Roller Tray Rubber coated steel rolls

•Control Station External free standing. Height adjustable with machine and eddy current control. 7" screen. Use of keyboard and tracker ball

•Machine Weight 275kg / 600lbs

•Dimensions (w\*d\*h) 850mm x 1120mm x 904-975 (typical 945mm) mm 33.5" x 44" \* 36-38"

•Power Supply 110-240v ac 50/60Hz



## VeeScan





VeeScan Pivot Arm Option.

## VeeScan

Avia Services / Air Atlanta	MRO/Airline	ик
Abu Dhabi Aviation	MRO	UAE
Aerolineas Argentinas	Airline	Argentina
Airbus Defence	Military	Spain
Australian Forces-2 Units*	Military	Australia
Emirates – 2 units*	Airline	UAE
Fly Dubai	Airline	UAE
Israeli Airforce*	Military	Israel
Kuwait Airforce	Military	Kuwait
NAVAIR (6 Units)*	Military	USA
Oman Air Force/via BAE*	Military	Oman
Rotable Repairs- 2 units*	Airline	UK
Sabena Technik*	MRO	Belgium
Singapore Airlines	Airline	Singapore
SkyWheels-2 units	MRO	ик



## VeeScan

When 7 out of your first 15 Customers are all placing repeat orders within 2 years that is the best endorsement of all.



### **Advantages over Competition**

- Footprint of VeeScan much smaller.
- Height adjustable to fit in line with a production line.
- Cost of probe (competitor over \$3,000).
- Large competitor unit will not test wheels less than 250mm/10" minimum diameter
- Easy data interpretation
- Overhead cone is a safety risk
- Overall cost of system.
- Flexibility & ease of set up.

