

# OmniScan MX ECA



## Eddy Current Array Inspection

### Eddy Current Array Technology

Eddy current array (ECA) technology allows to electronically drive and read several eddy current sensors positioned side-by-side in the same probe assembly. Data acquisition is made possible through the use of multiplexing, which avoids mutual inductance between the individual sensors.

The OmniScan™ ECA test configuration supports 32 sensor coils (up to 64 with an external multiplexer) working in bridge or transmit-receive mode. The operating frequency ranges from 20 Hz to 6 MHz with the option of using multiple frequencies in the same acquisition.

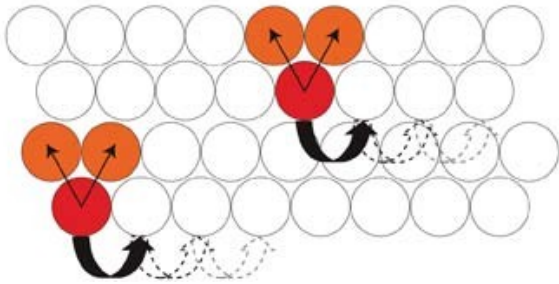
### Benefits of Eddy Current Arrays

Compared to single-channel eddy current technology, eddy current array technology provides the following benefits:

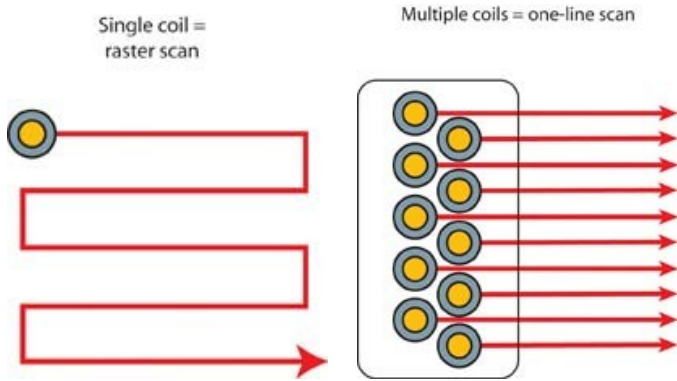
- Drastically reduces inspection time.
- Covers a large area in one single pass.
- Reduces the complexity of mechanical and robotic scanning systems.
- Provides real-time cartography of the inspected region, facilitating data interpretation.
- Is well suited for complex part geometries.
- Improves reliability and probability of detection (POD).

### Eddy Current Array Probes

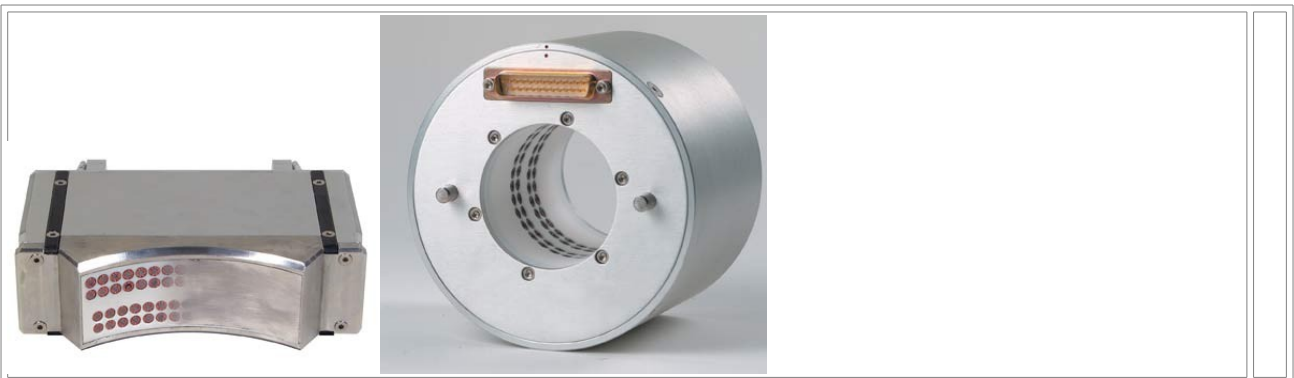
Olympus NDT manufactures R/D Tech ECA probes for a wide range of applications. Probes can be designed to detect a specific type of flaw or to follow the shape of the part to inspect. Standard designs are available to detect defects such as cracks and pitting, and subsurface defects like cracks in multilayer structures as well as corrosion.



Multiplexing principle between elements.



Eddy current array probes can replace one axis of a two-axis scan and offer greater flexibility in the eddy current setup.



Probes can be made in different shapes and sizes to better follow the contour of the part to inspect.



Transmit-receive probe for corrosion detection down to 6 mm (0.125 in.) in aluminum.



Transmit-receive probe for surface crack detection shown with optional encoder.



Absolute probe for surface crack detection.

## Eddy Current Modules Specifications\*

<b>Overall dimensions</b>	244 mm x 182 mm x 57 mm (9.6 in. x 7.1 in. x 2.1 in.)
<b>Weight</b>	1.2 kg (2.6 lb)
<b>Connectors</b>	1 OmniScan connector for eddy current array probes 1 19-pin Fischer® eddy current probe connector 1 BNC connector
Number of channels	32 channels with internal multiplexer 64 channels with external multiplexer
Probe recognition	Automatic probe recognition and setup
<b>Generator</b>	
Number of generators	1 (with internal electronic reference)
Maximum voltage	12 V p-p into 10 Ω
Operating frequency	20 Hz - 6 MHz
Bandwidth	8 Hz - 5 kHz (in single coil). Inversely proportional to the time slot duration and set by the instrument in multiplexed mode.
<b>Receiver</b>	
Number of receivers	1 to 4
Maximum input signal	1 V p-p
Gain	28-68 dB
<b>Internal multiplexer</b>	

Number of generators	32 (4 simultaneously on 8 time slots; up to 64 with external multiplexer)
Maximum voltage	12 V p-p into 50 $\Omega$
Number of receivers	4 differential receivers (8 time slots each)
Maximum input signal	1 V p-p

### **Data acquisition**

Digitizing frequency	40 MHz
Acquisition rate	1 Hz - 15 kHz (in single coil). The rate can be limited by the instrument's processing capabilities or by delays set by the multiplexed excitation mode.
A/D resolution	16 bits

### **Data processing**

Phase rotation	0° to 360° with increments of 0.1°
Filtering	FIR low-pass, FIR high-pass, FIR band-pass, FIR band-stop (adjustable cutoff frequency), median filter (variable from 2 to 200 points), mean filter (variable from 2 to 200 points)
Channel processing	Mixing Interpolation

### **Data storage**

Maximum file size	Limited by memory size
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### **Data synchronization**

On internal clock	1 Hz - 15 kHz (single coil)
External pace	Yes
On encoder	On 1 or 2 axes

### **Alarms**

Number of alarms	3
Alarm zone shape	Pie, inverted pie, box, inverted box, and ring

Output type Visual, audio, and TTL signals

Analog outputs 1 (X or Y)