

M2M today



Overview

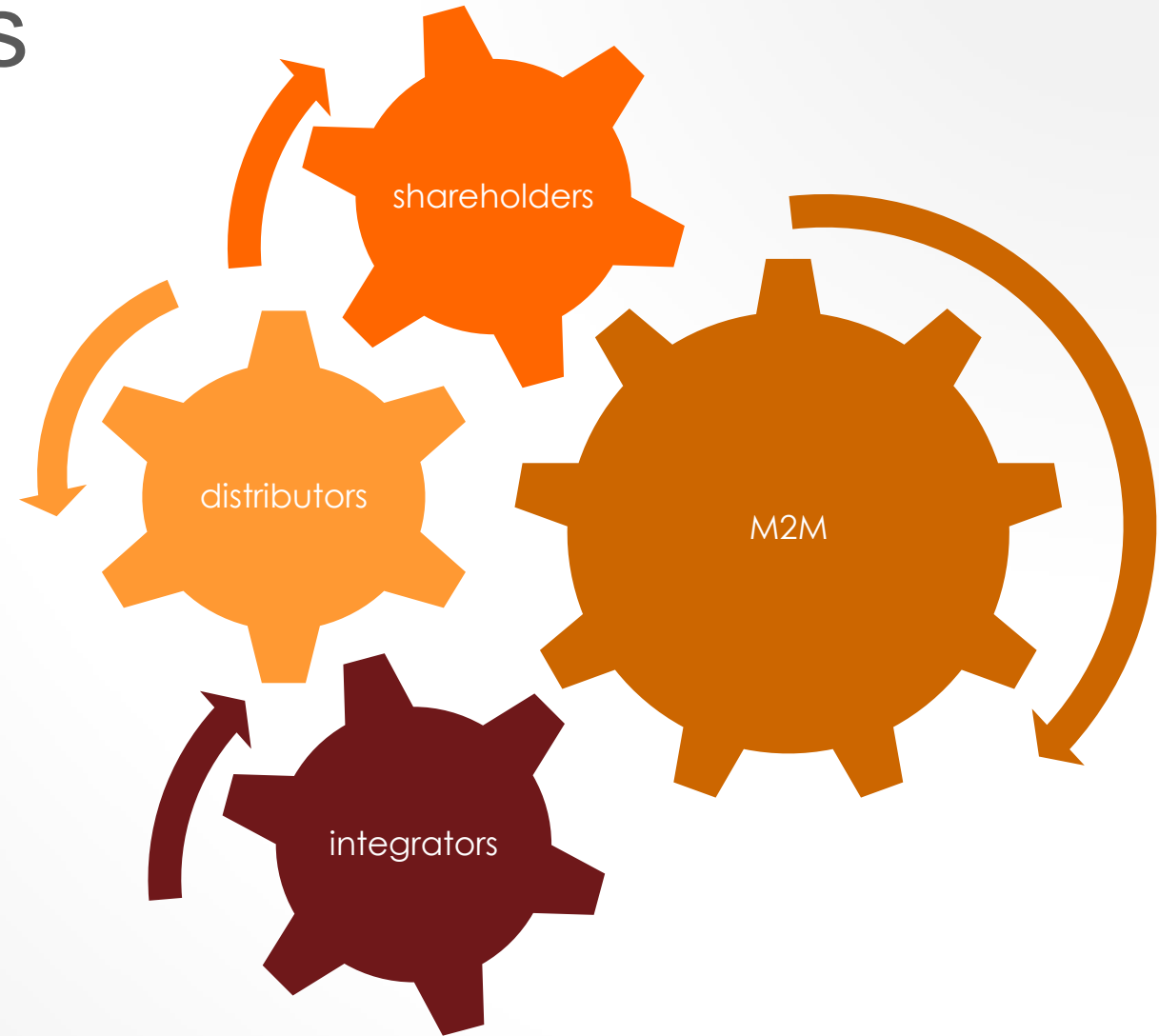
- M2M was created in November 2003 after a 3-year R&D program aiming for the development of an innovative ultrasonic phased array device
- M2M develops, produces and sells Ultrasonic systems for Non Destructive Testing
- All M2M products are benefiting from the latest advances in phased array technology

M2M team

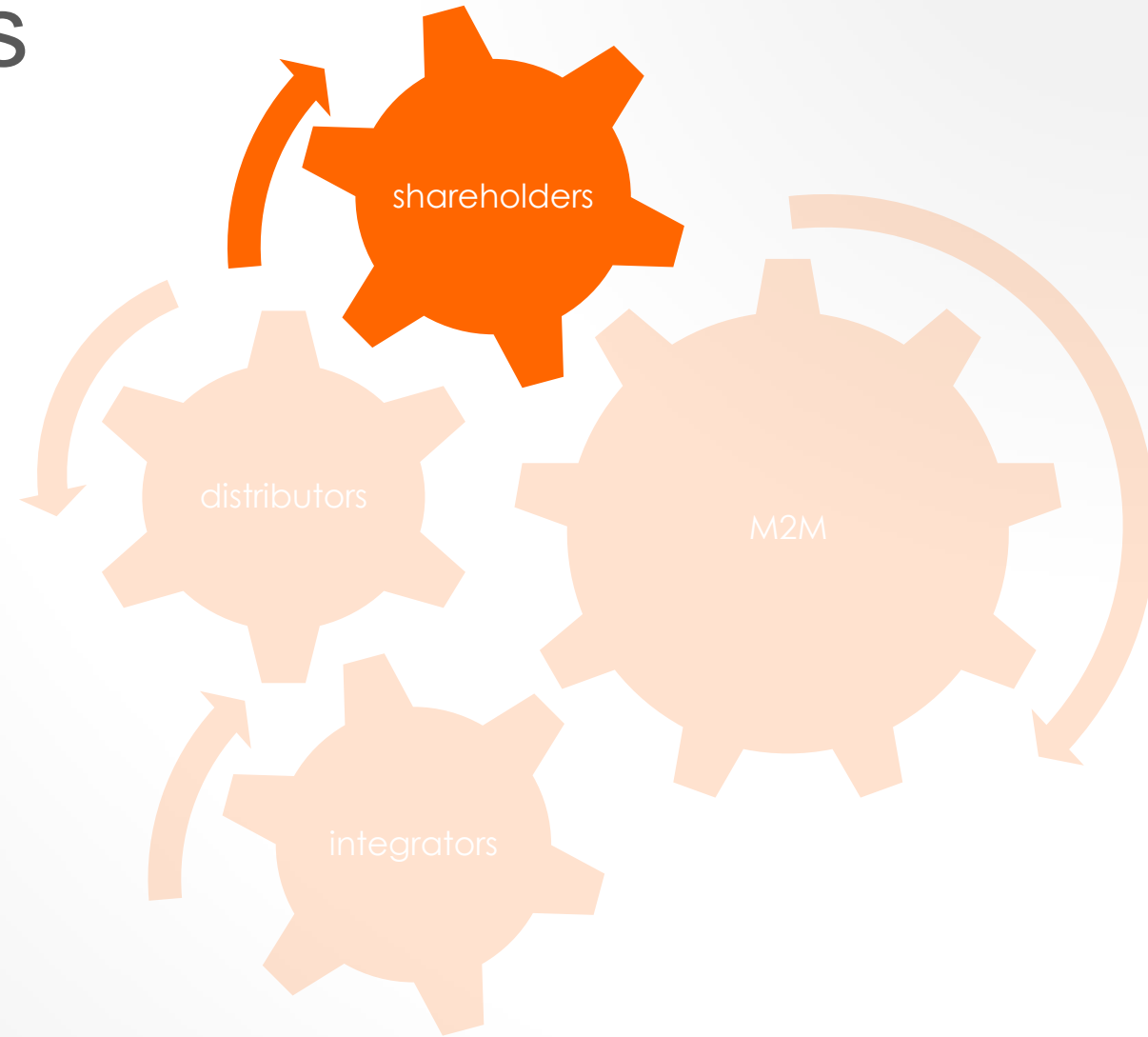
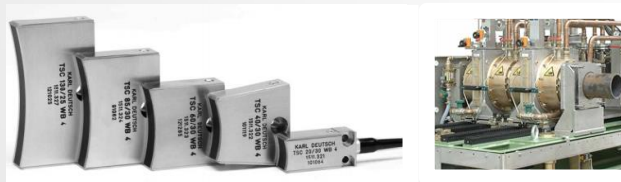
About 40 highly qualified and professional people



Synergies Partnerships



Synergies Partnerships



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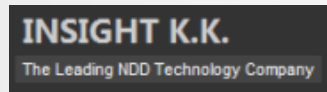
- M2M Subsidiaries (Brazil, China)



- Worldwide distributors



India



Japan



North America



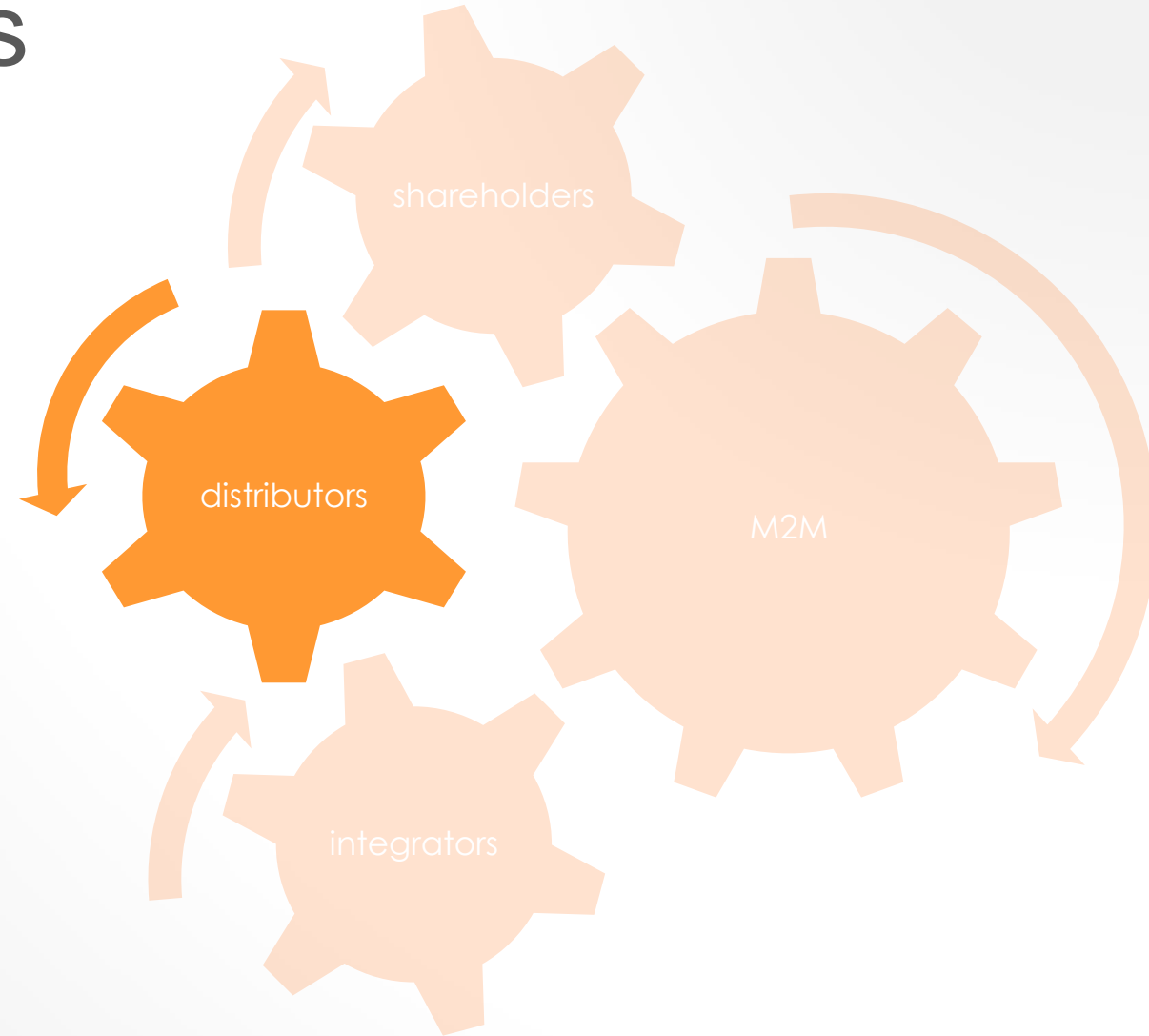
Russia



Saudi/ Bahrein/ Qatar



South Korea



Synergies Partnerships

ScanMaster
Ultrasonic Inspection Solutions

Mecnov

CLEMESSY

MARIETTA
NDT

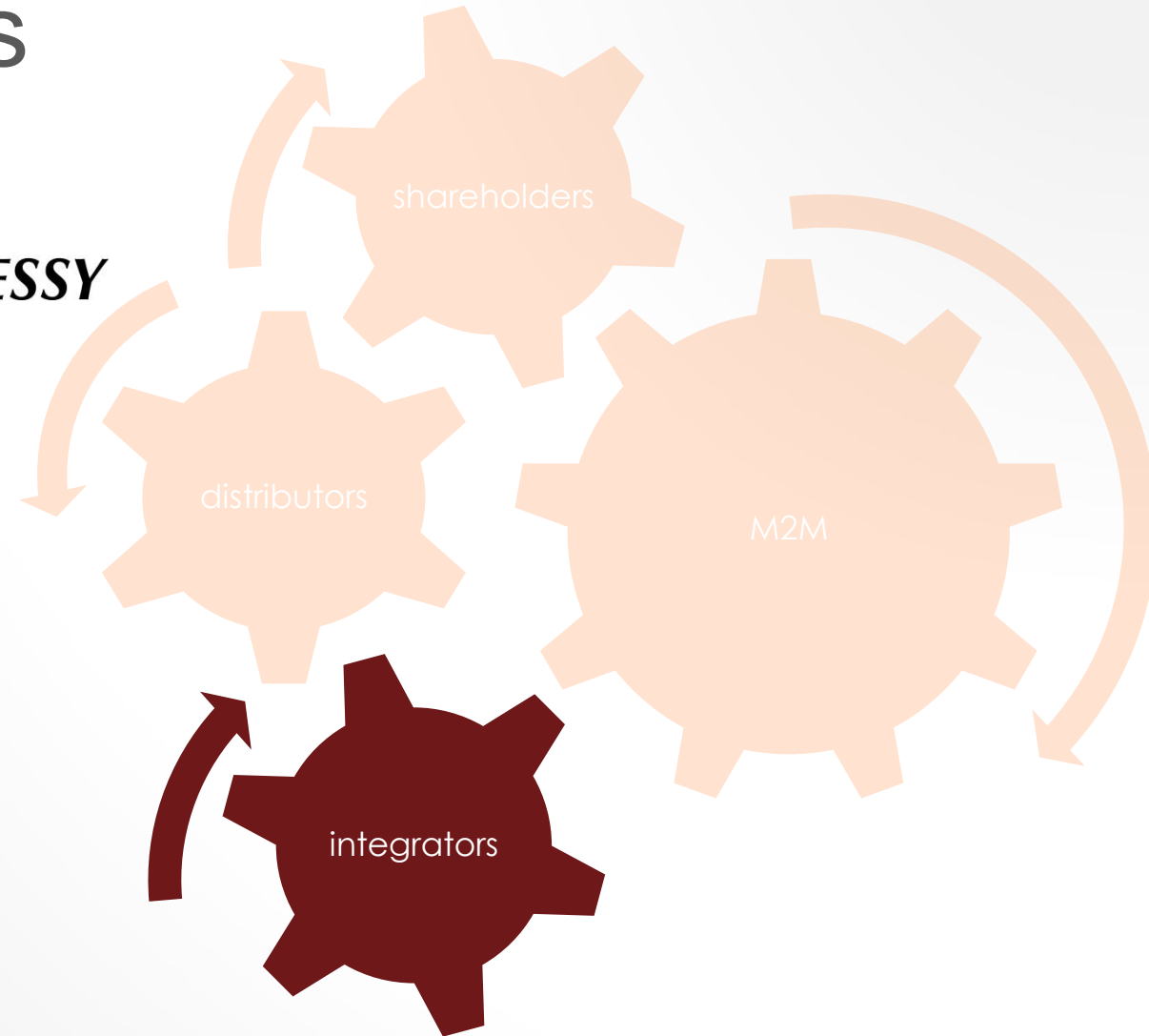
ULTRASONICS
VOGT

Matec
Instrument Companies

NDT
Automation

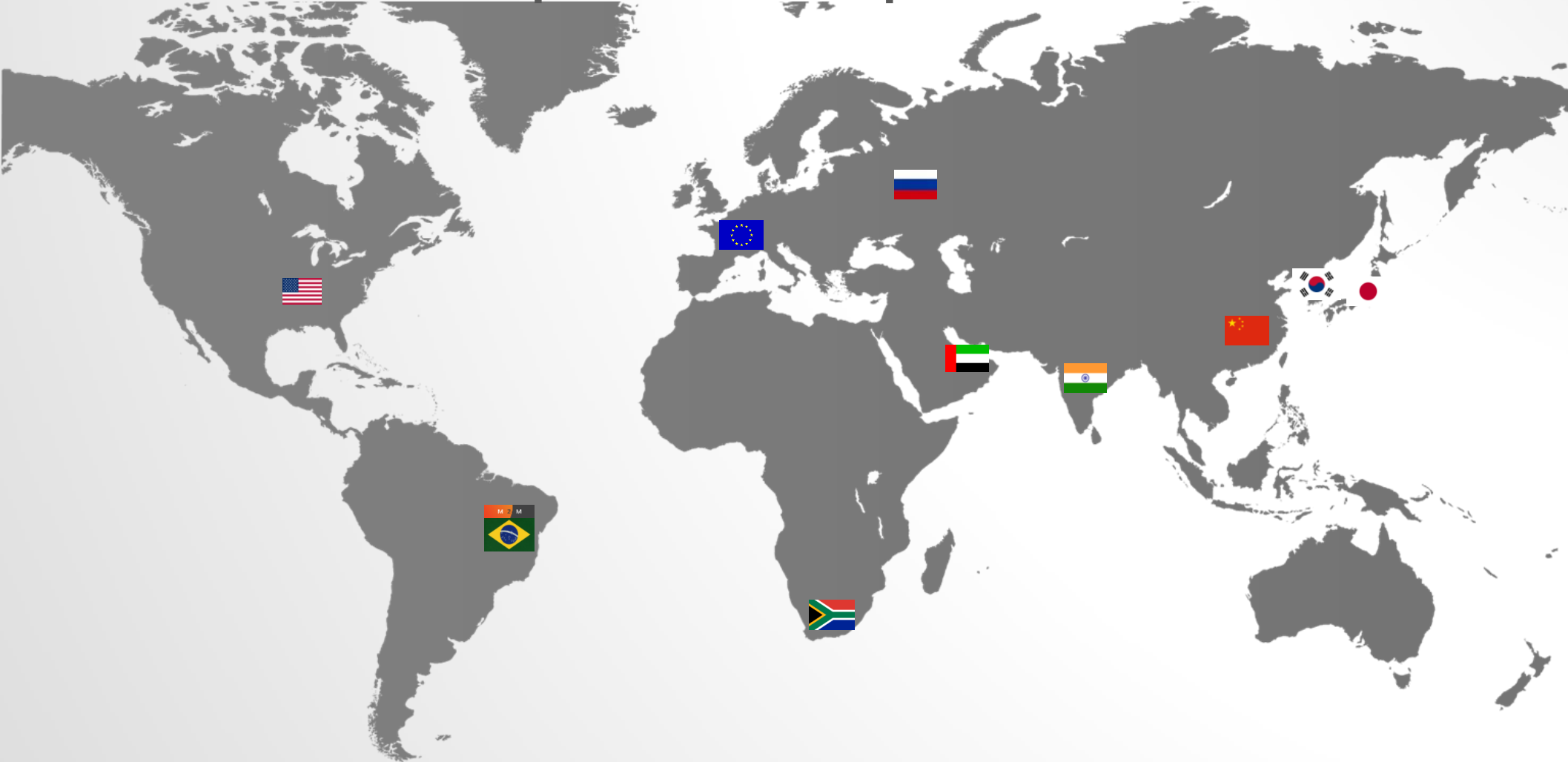
EADS

ISQ



International partnership

subsidiaries and distributors



Company

Industrial phased-array systems

- integrated systems — portable systems — table-top systems — OEM

Advanced phased-array techniques

- total focusing methods (TFM) — surface-adaptive ultrasound (SAUL)
- flexible arrays — pseudo-tandem inspection — full matrix capture (FMC) — 1D & 2D arrays

Integration support & services

- training — OEM support — inline integration support — remote control support

Procedure design & optimization

- probe design — probe optimization — custom phased-array techniques
- procedure evaluation — CIVA® subset inside M2M software — feasibility studies



M2M phased array products

Parallel architecture

MultiX

16 to 128 channels

MultiX-LF Low frequency

16 to 64 channels

MultiX-WM Wavemaster

16 to 64 channels

MultiX++

32 to 256 channels

Multiplexed Architecture

Multi2000

16x64, 32x128, 64x256 or 128x512

Portable System

Pocket parallel

32 or 64 parallel channels

Pocket Multiplexed

8x32 or 16x64

Exist in OEM version



M2M phased array products



Technology

Cutting-edge functionalities

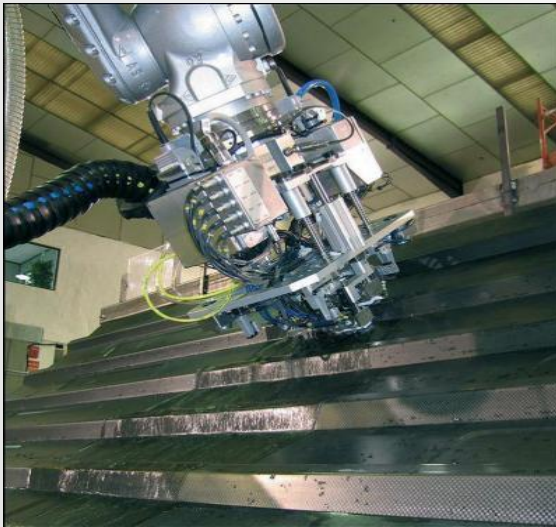
- Advanced ultrasound imaging
- Integrated CIVA simulation
- Surface Adapting Ultrasound (SAUL)
- Total Focusing Methods (TFM)
- Smart Flexible Arrays
- Ultra-fast parallel inspections

Innovation

Strong R&D through

- in-house R&D projects
- contractual and continuous R&D with CEA
- close cooperation with industrial research groups (EADS, Dassault, Vallourec, ...)
- collaboration to international R&D programs

Achievements



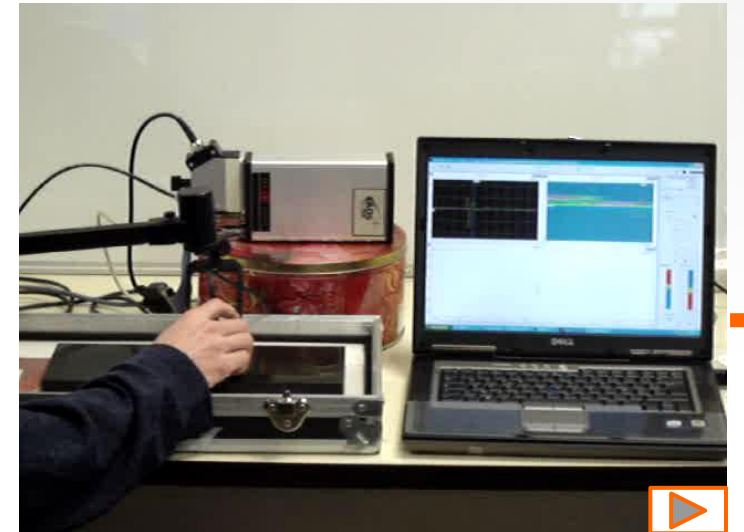
Vought, USA

Robotic Inspection of Boeing composite sections (with Tecnatom)



Aubert&Duval, France

In line bar testing



aerospace

Achievements



EADS Composites Aquitaine, France

First Industrial system (SAUL)



Airbus, France

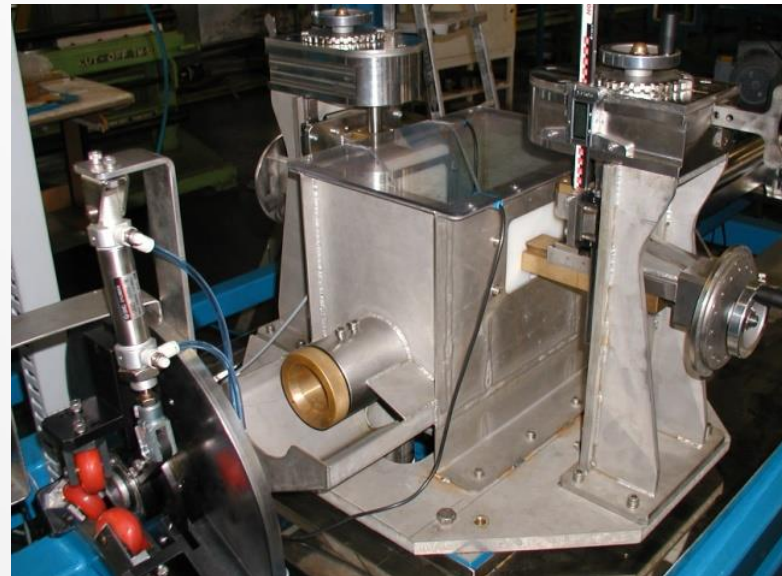
Immersion High speed inspection of 3D composite structure

Achievements



Vallourec, France

Thick pipes High speed inspection



CST Valinox India, Valinox Great Wall China, Valinox Nuclear France

On line inspection of heat exchanger tubes



Vision of the future

Breakthrough products for NDT

Strategic axes

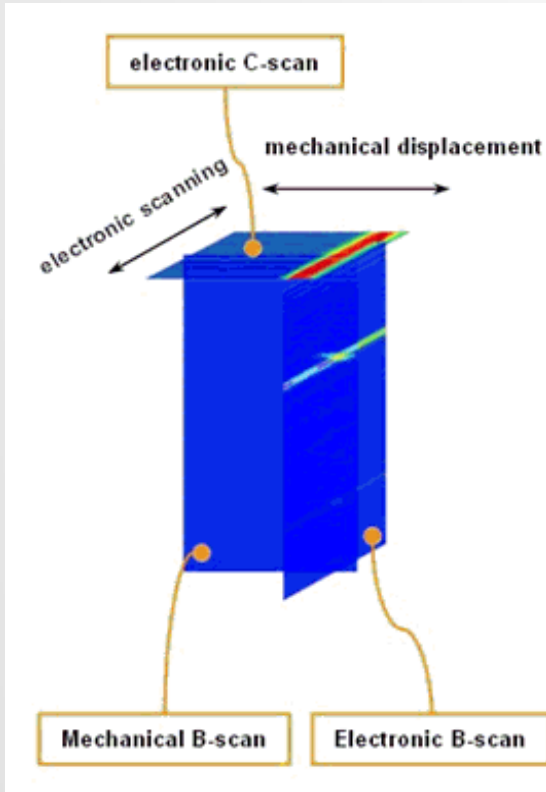
- Innovation for systems and solutions
- Diversification of markets
- New products

Keep on improving m2m products and customers support

Thank you

technology

Imaging vocabulary



A-Scan: sum of elementary signals corresponding to one sequence at a given position of the probe

electronic **B-Scan:** representation of all the sequences at a given position of the probe as a function of time

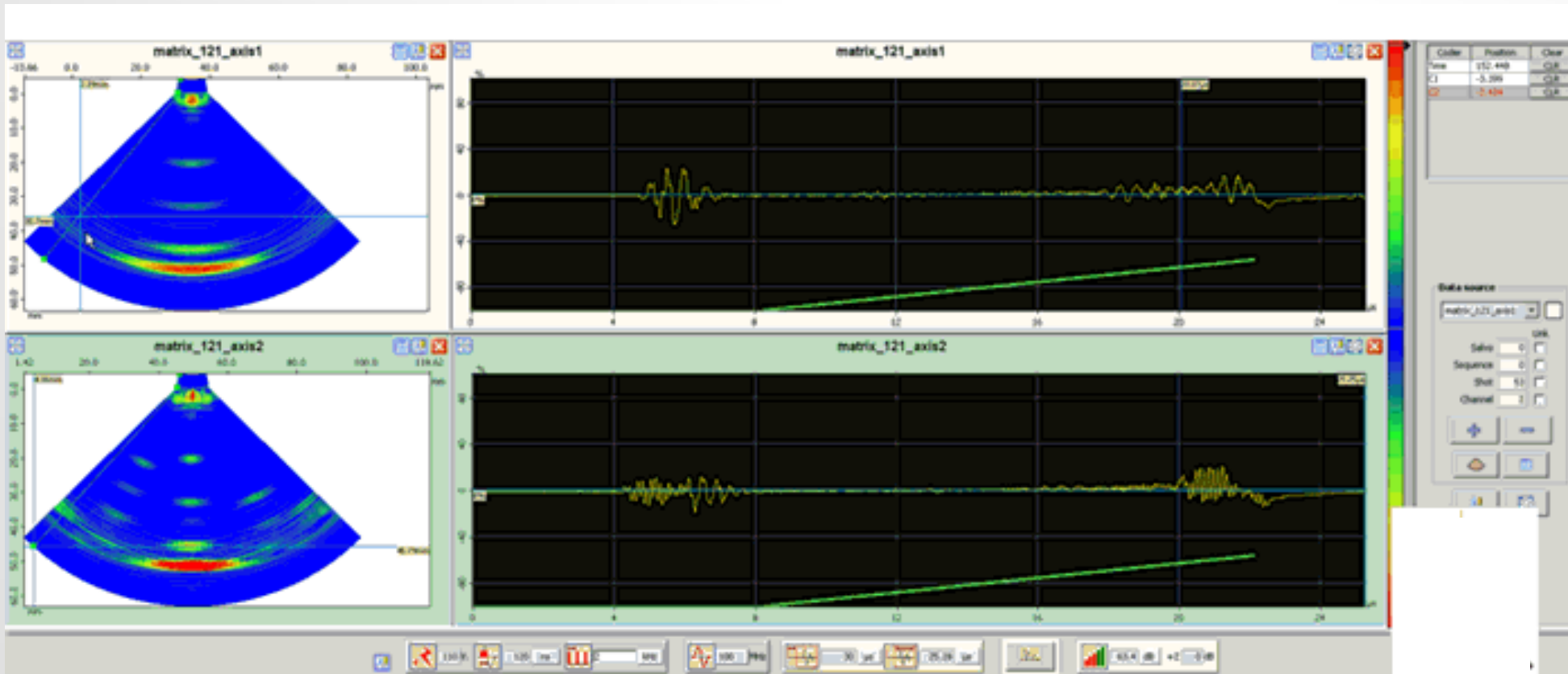
electronic **C-Scan:** representation of the sequences along the scanning axis

technology

Advantages

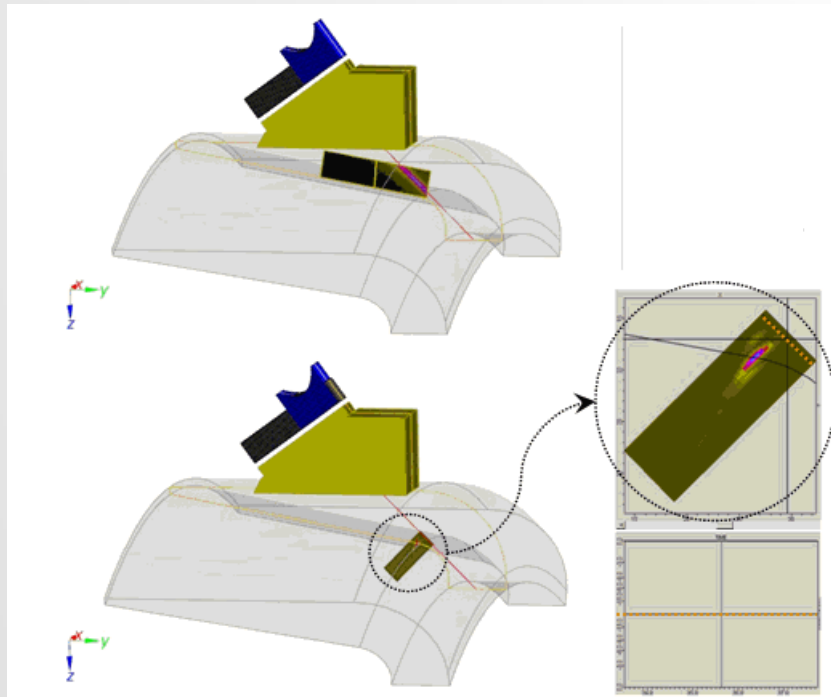
Real-time data visualization

3D focusing – data superposition

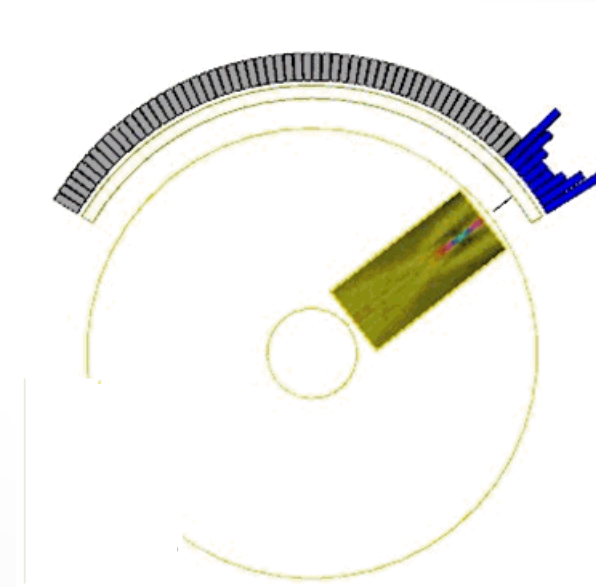


Advantages

Electronic scanning



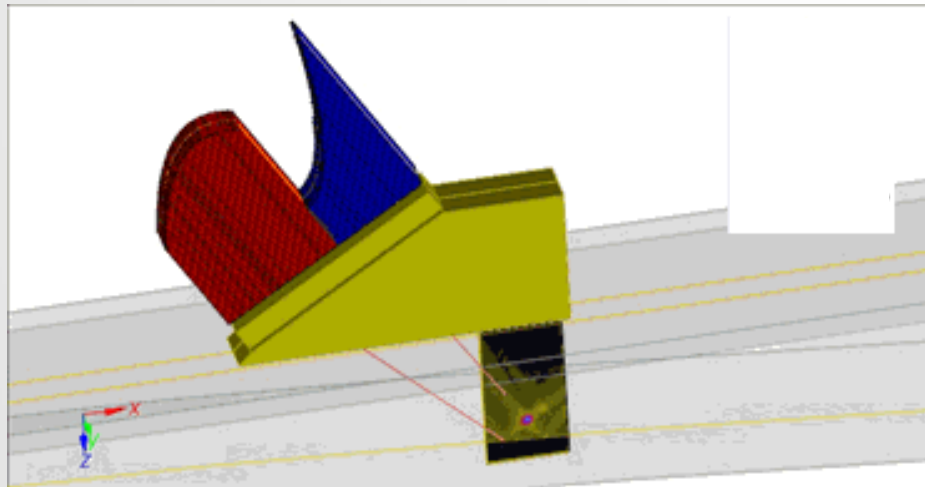
Dynamic depth focusing



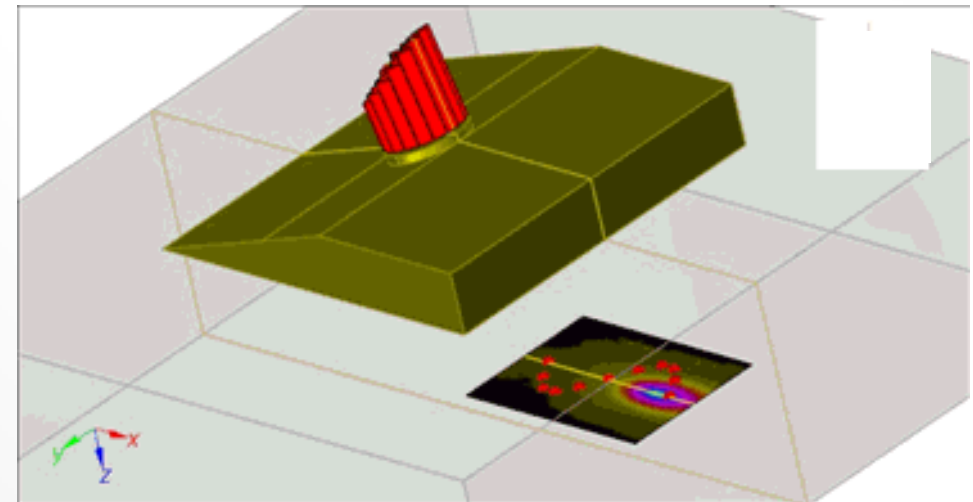
technology

Advantages

Virtual tandem probe

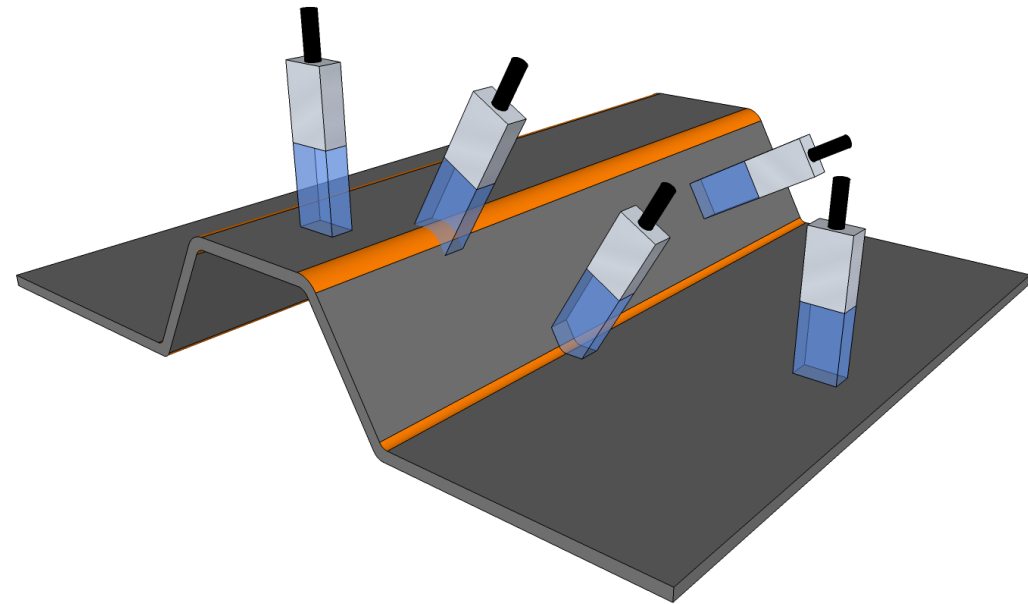


3D focusing



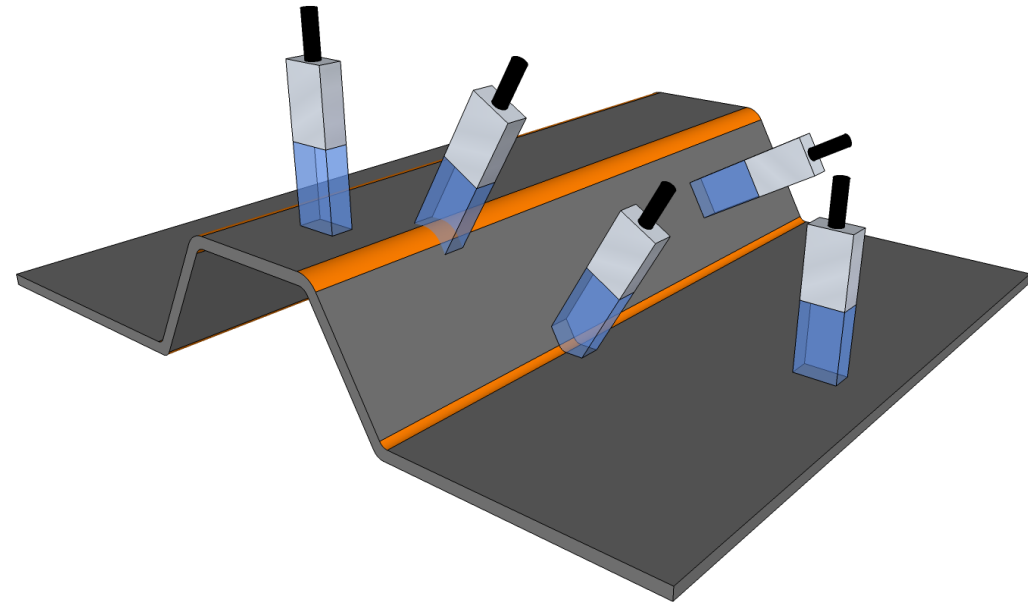
Aero-SAUL

- 1 probe does it all
- self-adapting to geometry
- ID & OD radius + flats
- ideal for composite stringers and stiffeners



Aero-SAUL

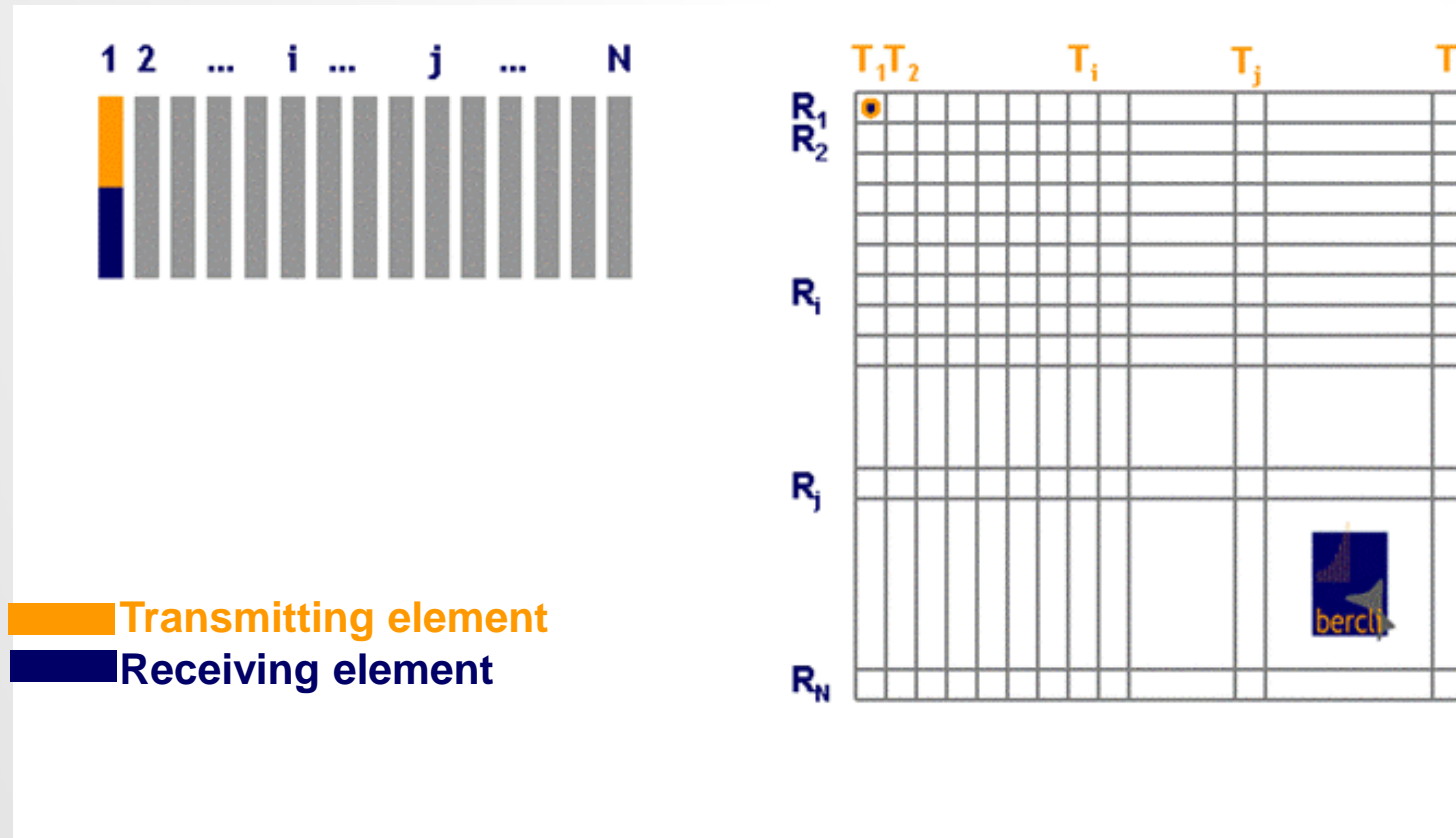
- M2M MULTIX
- Matrix probe
- Motion control
- M2M software + SAUL plugin



MultiX

technology

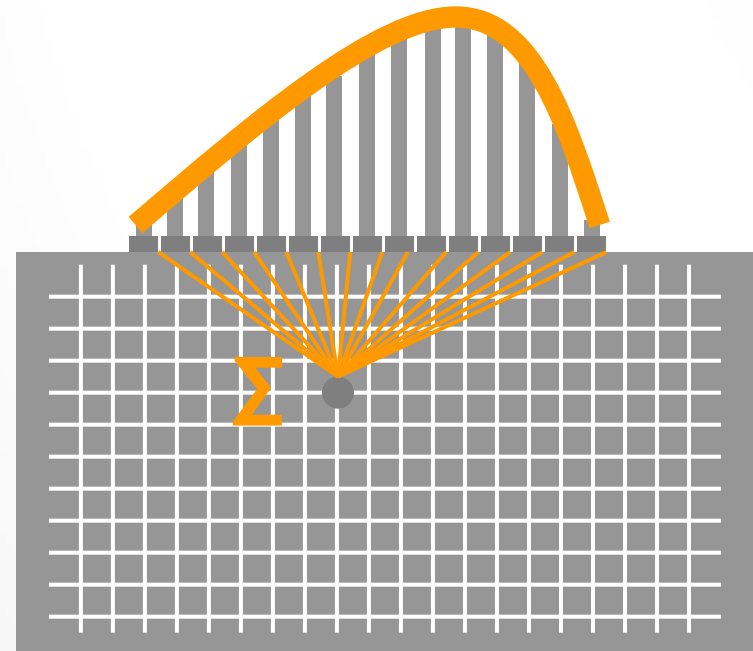
Total focusing methods: data acquisition (FMC)



technology

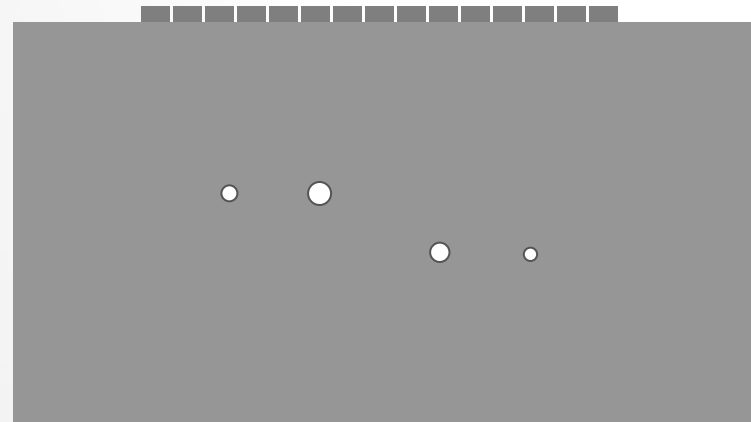
Total focusing methods

- Delay computation
- Time shifting
- Summation
- Iteration

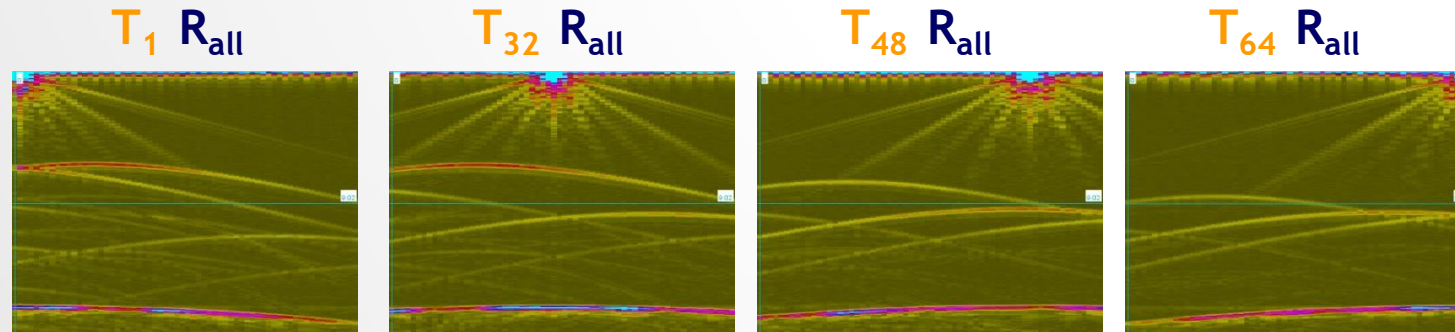


TFM example

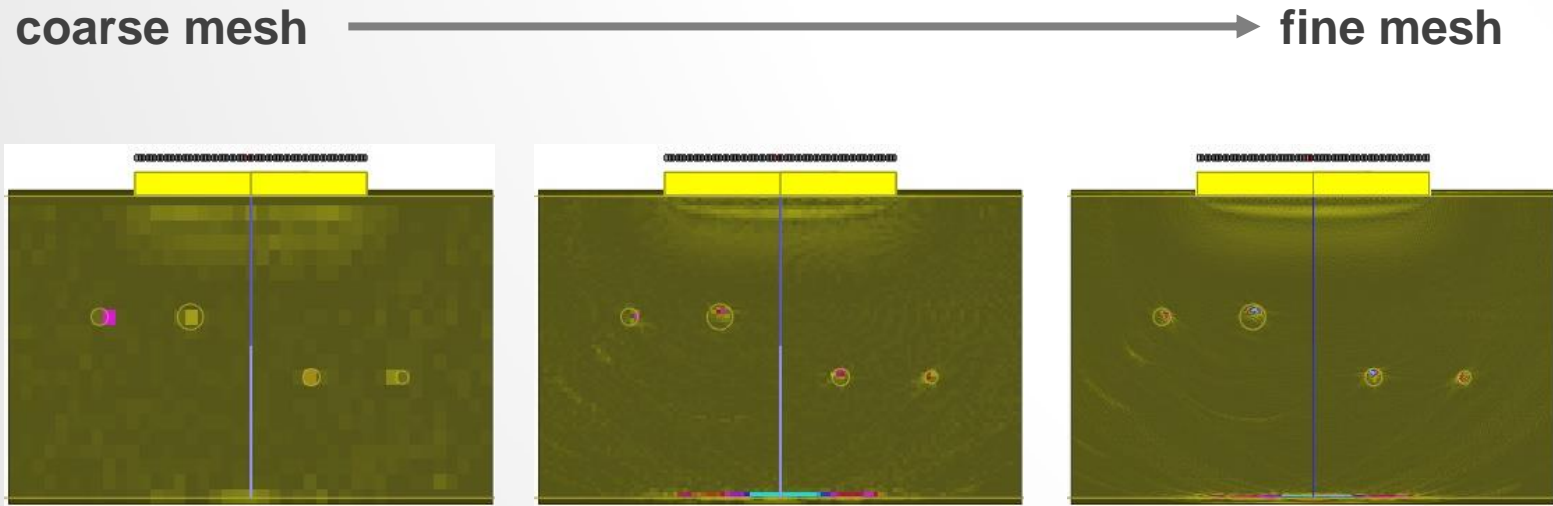
Aluminum block
with 4
Side-drilled holes



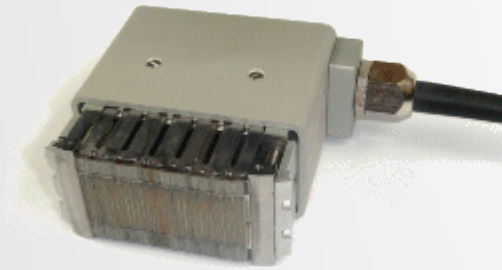
5MHz IMASONIC probe
64-element linear array
+
MULTIX64 M2M System



TFM example

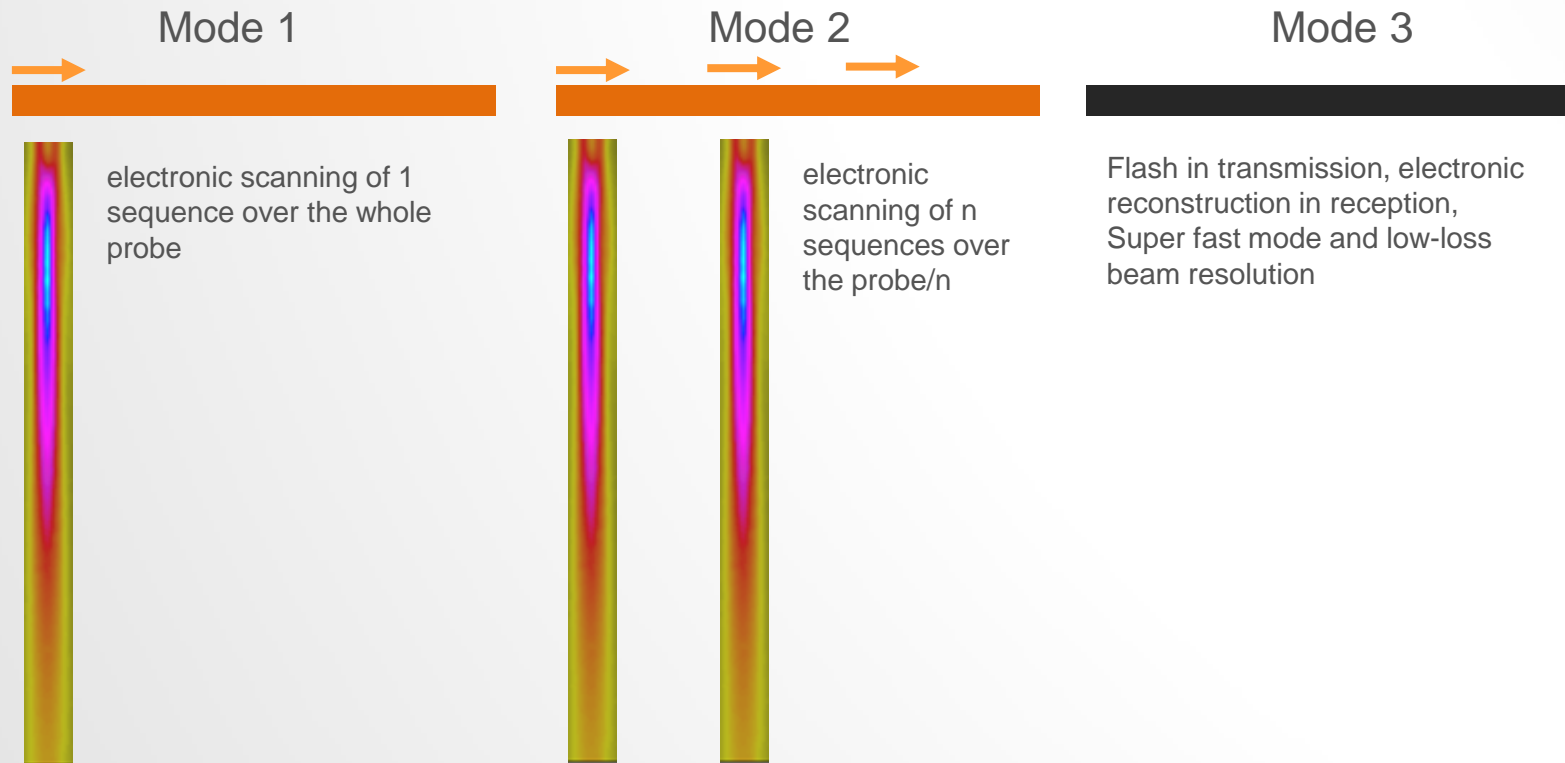


smart flexible arrays (IMASONIC/CEA)



technology

ULTRA-FAST parallel inspections



technology