In-situ tooling, fixtures and integrated UT solutions for composite materials, rotating equipment, heat exchangers, pressure vessels and piping welds.

Sensor Networks offers transducer solutions in a variety of styles, compatible with any major manufacturer’s conventional or phased-array instruments.

- **In-situ:** self-aligning wand transducers for hard-to-access rotating equipment
- **Phased-array:** linear & matrix • annular, daisy & circular • contact & immersion • single & dual • flat & curved
- **O.D. Transducers:** for tubing weld or braze joints
- **ASME Section XI:** compound-radius wedges • refracted longitudinal • phased-array duals • contact or immersion • TOFD • complex wedges & delays
- **Small-diameter (< 0.25"/6 mm) ID Bore Probes:** shear-wave, L-wave, duals and tandem types
- **7 MHz Ultra-high-temp Delay-line:** transducer and mounting clamp for continuous 500°C (932°F)
- **SensorScan™ QS:** conventional transducers for quick swapping onto delay lines or wedges
- **2 MHz PAUT Dual:** with 2×16 elements per probe and detachable wedge
- **711x846 SensorScan™ and Low-Noise Blue™ are trademarks of Sensor Networks, Inc. ©2017. All rights reserved.**

Optimized Solutions for Cost-effective Productivity

176-500 Technology Dr. • Boalsburg, PA, 16827
(814) 466-7207 • offices in Houston, Hong Kong, Beijing

www.sensornetworksinc.com

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Sensor Networks is a Pennsylvania-based technology company specializing in the design and fabrication of industrial ultrasonic transducers and tooling for demanding in-situ test and inspection applications. Engineered for precision, ease-of-use and maximum durability, our offering includes ultrasonic transducers, fixtures, couplant-delivery systems, qualification/calibration standards, procedure development, personnel training and instrumentation.

Who We Are:

Sensor Networks uses industry-preferred design and simulation tools to create an optimized mechanical, electrical and ultrasonic model of the inspection task, including its scan plan.

**SolidWorks:** Parametric 3D CAD and Mechanical Properties Modeling  
**AutoCad:** 2D CAD and Ray-Tracing  
**CIVA:** Acoustic Beam Modeling and Delay Law Calculation for Conventional and Phased Arrays  
**PiezoCad:** Transducer Construction & Performance Modeling  
**Field II:** Transducer Construction & Performance Modeling  
**UltraVision 3D:** NDT Data Imaging and Analysis Software for Conventional and Phased Arrays  
**ES Beam Tool:** Ultrasonic Inspection Plan Design and Validation Software.

Successful Ultrasonic Applications Engineering

is the result of 3 major elements:

- Experience
- Capabilities
- Process

Our experienced team of engineers, technicians, assemblers and general management has an extremely deep level of knowledge and background in solving unusual, demanding and complicated NDT projects with an average and aggregate of 20 and 250 years, respectively, of experience. Industries served over this time include aerospace engines and airframes, nuclear vessels and heat exchangers, large gas turbines and others.

SWI’s deep domain expertise enhances NDT solutions through the selection, design and optimization of the ultrasonic technique. The transducer’s efficiency is paramount for converting electrical energy into sound, then coupling and directing that acoustic energy into the test piece to maximize its signal-to-noise ratio.

In-house CAD/CAM capabilities, including our 5-axis CNC Mill, allows for rapid prototyping of complex shapes in most engineering materials.

Our Process:

- customer issue  
- application request  
- concept development  
- import or model test subject geometry  
- design prototype  
- test prototype  
- build prototype  
- modify prototype  
- document solution mechanical/electrical/ acoustic  
- produce solution  
- finalize design  
- extensive consultation  
- special probe request
Quick-swap Angle-beam Transducers
Conventional transducers for quick-swapping onto delay lines or wedges

- Features quick-swap screw-in attachment.
- Features state-of-the-art piezo-composite elements.
- Offered with quick-swap wedges for shear-wave weld inspection.
- Available with new MCX-style low-profile swivel connectors.
- Available in a wide variety of sizes and frequencies.
- Ships with certification documents. (RF waveform, frequency spectrum, average center-frequency calculations.)

<table>
<thead>
<tr>
<th>Angle</th>
<th>Microdot</th>
<th>M CX</th>
<th>Wedges</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.250”</td>
<td>00-010137MD 00-010138MD 00-010139MD</td>
<td>00-010211MD 00-010212MD 00-010213MD</td>
<td>00-010189 00-010193 00-010197 00-010201</td>
</tr>
<tr>
<td>0.375”</td>
<td>00-010121MD 00-010122MD 00-010123MD</td>
<td>00-010217MD 00-010218MD 00-010219MD</td>
<td>00-010190 00-010194 00-010198 00-010202</td>
</tr>
<tr>
<td>0.500”</td>
<td>00-010115MD 00-010116MD 00-010117MD</td>
<td>00-010215MD 00-010216MD 00-010217MD</td>
<td>01-010268 01-010269 01-010270</td>
</tr>
<tr>
<td>0.750”</td>
<td>00-010130MD 00-010131MD 00-010132MD</td>
<td>00-010219MD 00-010220MD 00-010221MD</td>
<td>01-010192 01-010196 01-010200</td>
</tr>
</tbody>
</table>

AWS Angle-beam Transducers

- Complies with American Welding Society D1.1 and D1.5
- Square elements available.
- Available with state-of-the-art piezo-composite elements or traditional monolithic elements.
- Available with AWS wedges for shear-wave weld inspection.
- Ships with certification documents. (RF waveform, frequency spectrum, average center-frequency calculations.)

<table>
<thead>
<tr>
<th>Angle</th>
<th>Frequency</th>
<th>Composite</th>
<th>Carbon Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25”</td>
<td>0.625” × 0.625”</td>
<td>00-010239 00-010240 00-010241</td>
<td>01-010268 01-010269 01-010270</td>
</tr>
<tr>
<td>0.25”</td>
<td>0.625” × 0.75”</td>
<td>00-010239 00-010240 00-010241</td>
<td>01-010268 01-010269 01-010270</td>
</tr>
<tr>
<td>0.25”</td>
<td>0.75” × 0.75”</td>
<td>00-010239 00-010240 00-010241</td>
<td>01-010268 01-010269 01-010270</td>
</tr>
</tbody>
</table>

Delay-line Transducers

- Highly damped signal and removable delay line provides better near-surface resolution than contact transducers.
- Enables measurement of very thin parts and finding small near-surface flaws using direct contact pulse-echo technique.
- Contoured delays available to improve coupling to curved parts.
- Ships with certification documents. (RF waveform, frequency spectrum, average center-frequency calculations.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.125”</td>
<td>00-010246</td>
</tr>
<tr>
<td>0.25”</td>
<td>00-010247</td>
</tr>
</tbody>
</table>

SensorScan™ Transducers

SN’s proprietary Low-Noise Blue™ damping material significantly improves signal-to-noise ratio. Standard and custom wedges are available radiused for OD or ID exams, with self-aligning gimbles and couplant-feed nozzles for any SN transducer.

Standard or custom delay-lines can be designed for thickness measurements, ring-groove or spot-weld inspection.
SensorScan™ Transducers (cont'd)

**Phased-array Transducers**

- Linear arrays, matrix arrays, dual matrix arrays, curved arrays, annular arrays, annular sectorial.
- Available with multiple connector options.
- Ships with certification documents. (RF waveform, frequency spectrum, average center-frequency calculations.)
- Available with standard 2.5m cable, other lengths and connectors available on request.

**TOFD Transducers**

- Highly damped longitudinal wave transducers.
- Features quick-swap screw-in attachment.
- State-of-the-art piezo-composite elements.
- Time-of-flight diffraction (TOFD) uses refracted longitudinal waves to size cracks in steel welds.
- Ships with certification documents. (RF waveform, frequency spectrum, average center-frequency calculations.)

**Duals**

<table>
<thead>
<tr>
<th>part no.</th>
<th>freq.</th>
<th>desc.</th>
<th>connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>00-010240</td>
<td>7.5</td>
<td>FN24+, range: 0.25&quot; to 3.0&quot;</td>
<td>00 Lemo</td>
</tr>
<tr>
<td>00-010332</td>
<td>7.5</td>
<td>FN24+ Flaw, FN24+</td>
<td>BNC</td>
</tr>
<tr>
<td>00-010655</td>
<td>7.5</td>
<td>FN24+ NR, wear-resistant model</td>
<td>00 Lemo</td>
</tr>
<tr>
<td>00-010675</td>
<td>7.5</td>
<td>FN24+ M, reduced-contact face, 0.280&quot;</td>
<td>00 Lemo</td>
</tr>
<tr>
<td>00-010676</td>
<td>5</td>
<td>64 elements</td>
<td>00 Lemo</td>
</tr>
<tr>
<td>00-010200</td>
<td></td>
<td>64 elements</td>
<td>ZPAC or IPEX</td>
</tr>
</tbody>
</table>

**TOFD Transducers**

- Highly damped longitudinal wave transducers.
- Features quick-swap screw-in attachment.
- State-of-the-art piezo-composite elements.
- Time-of-flight diffraction (TOFD) uses refracted longitudinal waves to size cracks in steel welds.
- Ships with certification documents. (RF waveform, frequency spectrum, average center-frequency calculations.)