

Optimized Solutions for Cost-effective Productivity

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



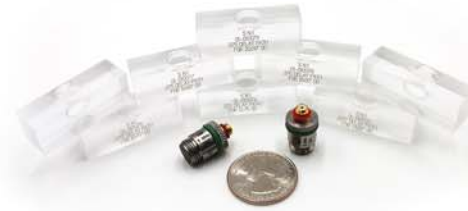
In-situ: self-aligning wand transducers for hard-to-access rotating equipment



7 MHz Ultra-high-temp Delay-line: transducer and mounting clamp for continuous 500°C (932°F)



O.D. Transducers: for tubing weld or braze joints



SensorScan™ QS: conventional transducers for quick swapping onto delay lines or wedges



ASME Section XI: compound-radius wedges • refracted longitudinal • phased-array duals • contact or immersion • TOFD • complex wedges & delays



2 MHz PAUT Dual: with 2x16 elements per probe and detachable wedge

Phased-array: linear & matrix • annular, daisy & circular • contact & immersion • single & dual • flat & curved



Small-diameter (< 0.25"/6 mm) ID Bore Probes: shear-wave, L-wave, duals and tandem types



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Ultrasonic Applications Engineering, Custom & Standard Transducers including Phased Array

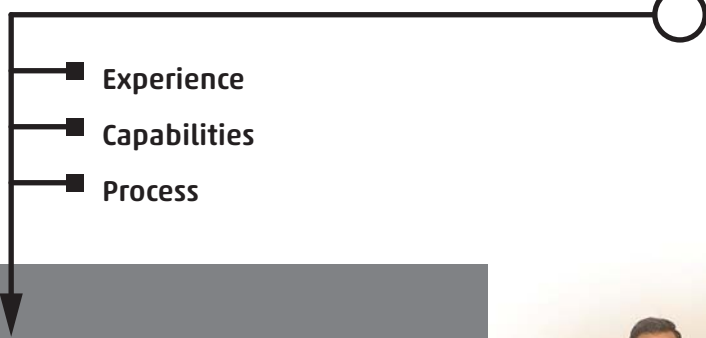
In-situ tooling, fixtures and integrated UT solutions for composite materials, rotating equipment, heat exchangers, pressure vessels and piping welds.



Who We Are: 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.

Successful Ultrasonic Applications Engineering

is the result of 3 major elements:

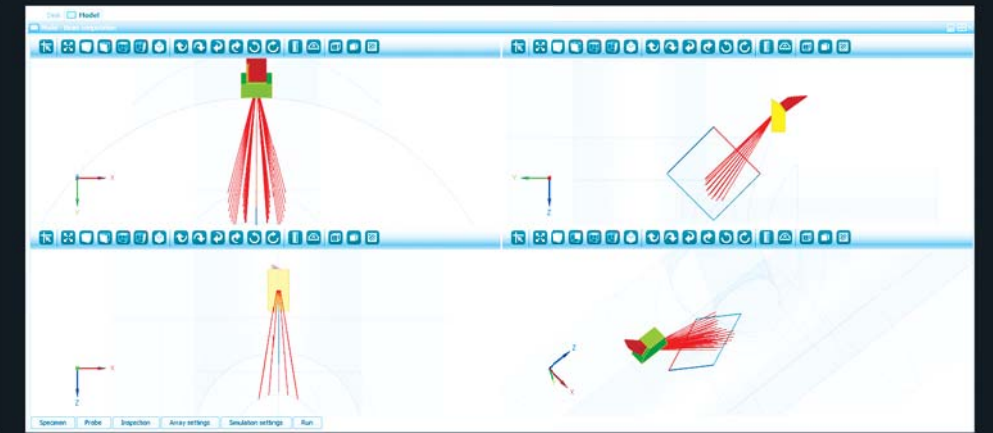
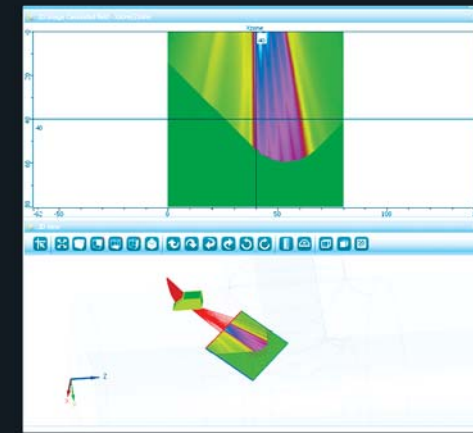


SNI's deep domain expertise enhances NDT solutions through the selection, design and optimization of the ultrasonic technique. The transducer's efficiency is paramount for converting electrical energy into sound, then coupling and directing that acoustic energy into the test piece to maximize its signal-to-noise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



SNI's customers have direct access to our highly-experienced team of NDT professionals.

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.



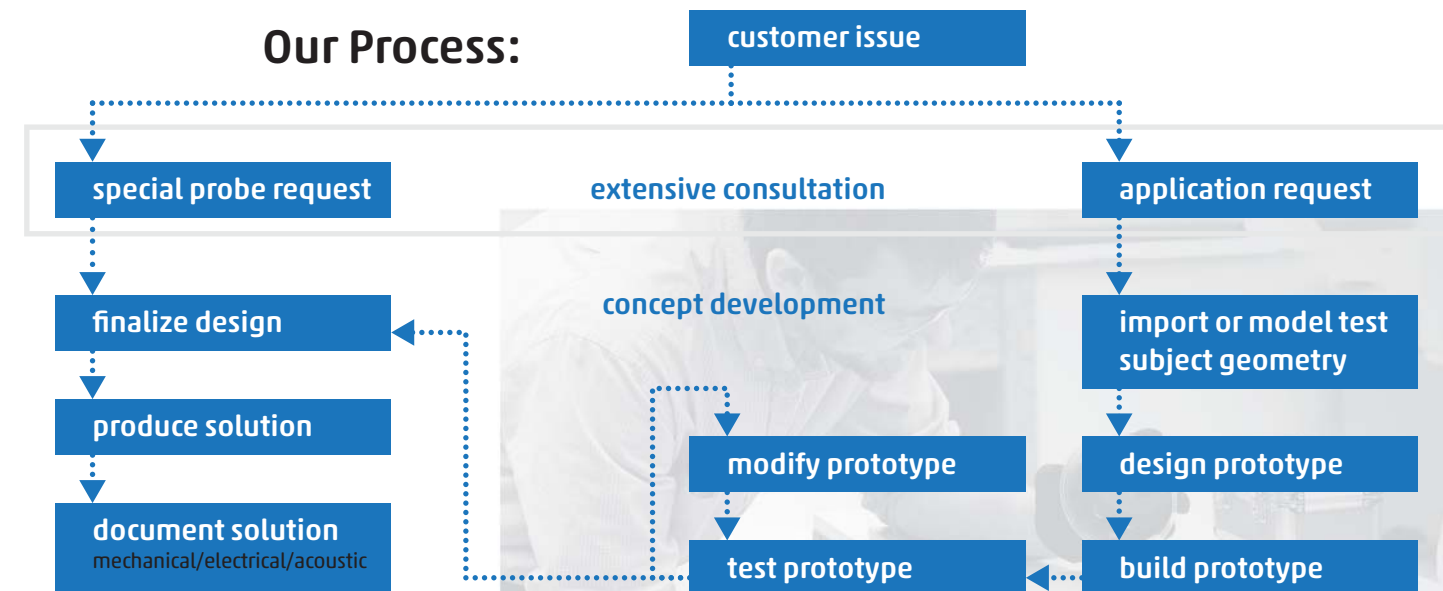
Sensor Networks uses industry-preferred design and simulation tools to create an optimized mechanical, electrical and ultrasonic model of the inspection task, including its scan plan.

- **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.



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

Our Process:



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.)

Microdot transducers

	0.250"	0.375"	0.500"	0.750"
frequency 1		00-010137MD	00-010138MD	00-010211MD
1.5	00-010216MD	00-010217MD	00-010218MD	00-010212MD
2.25	00-010122MD	00-010123MD	00-010124MD	00-010213MD
3.5	00-010125MD	00-010126MD	00-010127MD	00-010214MD
5	00-010128MD	00-010129MD	00-010130MD	00-010215MD
7.5	00-010131MD	00-010132MD	00-010133MD	
10	00-010134MD	00-010135MD	00-010136MD	

6' microdot-to-BNC (RG174) cables: 07-010012 (1-3 days delivery)

MCX transducers

	0.250"	0.375"	0.500"	0.750"
frequency 1		00-010137MCX	00-010138MCX	00-010211MCX
1.5	00-010216MCX	00-010217MCX	00-010218MCX	00-010212MCX
2.25	00-010122MCX	00-010123MCX	00-010124MCX	00-010213MCX
3.5	00-010125MCX	00-010126MCX	00-010127MCX	00-010214MCX
5	00-010128MCX	00-010129MCX	00-010130MCX	00-010215MCX
7.5	00-010131MCX	00-010132MCX	00-010133MCX	
10	00-010134MCX	00-010135MCX	00-010136MCX	

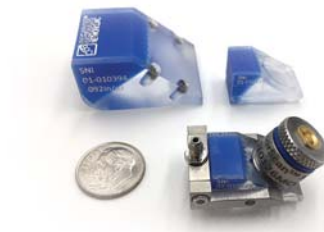
6' straight MCX-to-BNC (RG174) cables: 07-010007 (1-3 days delivery)

6' right-angle MCX-to-BNC (RG174) cables: 07-010008 (1-3 days delivery)

wedges

angle	0.250"	0.375"	0.500"	0.750"
30	01-010189	01-010193	01-010197	01-010201
45	01-010190	01-010194	01-010198	01-010202
60	01-010191	01-010195	01-010199	01-010203
70	01-010192	01-010196	01-010200	01-010204

special angles, curves, skews and combinations available on request



SNI'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 SNI transducer.



Micro-miniature angle-beam models available on custom request.

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.)



Standard or custom delay-lines can be designed for thickness measurements, ring-groove or spot-weld inspection.

transducers

	0.125"	0.25"
frequency 5		00-010246
10		00-010247
15	00-010417*	

*ALPHA2 DFR Plus thickness-gaging probe

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.)



transducers

		0.625" x 0.625"	0.625" x 0.75"	0.75" x 0.75"
frequency 2.25	general purpose	00-010393	00-010395	00-010397
2.25	composite	00-010242	00-010394	00-010396
2.25	phased array	00-010477ZPAC/IPEX 16 element: 1 mm, 16 mm		

wedges

angle		
45	carbon steel	01-010268
60	carbon steel	01-010269
70	carbon steel	01-010270

Duals

part no.	freq.	desc.	connector
00-010424	7.5	FH2E+, range: 0.03" to 3.0"	00 Lemo
00-010532	7.5	FH2E+ Flaw, FH2E+	BNC
00-010565	7.5	FH2E+ WR, wear-resistant model	00 Lemo
00-010675	7.5	FH2E+ M, reduced-contact face, 0.280"	00 Lemo
00-010676	7.5	FH2E+ BT, extended body length	00 Lemo
00-010220	5	64 elements (32 pitch + 32 catch) / 1.5mm P	ZPAC or IPEX

duals



Top left: Special-purpose duals also possible with any simple or complex, OD or ID radiuses.

Lower left: Dual linear corrosion array.

Right: FH2E-Plus dual-element 'thickness gaging' transducers, optimized for rough surface and pitted pipes, are available with BNC or mini-LEMO gage connectors as shown.



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.)

transducers

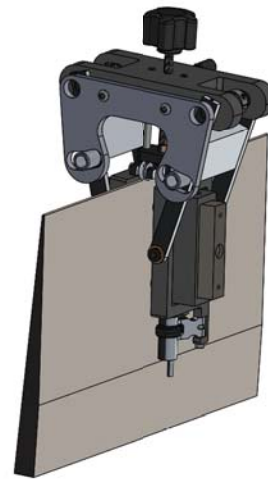
	0.125" Microdot	0.25" Microdot	0.125" LEMO	0.25" LEMO
5	00-010168	00-010398	00-010299	00-010300
10	00-010166	00-010387	00-010298	00-010386
	housed in 3/8-32 case / 10-32 Microdot		housed in M12 case / 00 LEMO	
wedges	01-010475	wedge, TOFD, 45L, 3/8-32 thread		
	01-010476	wedge, TOFD, 60L, 3/8-32 thread		
	01-010477	wedge, TOFD, 70L, 3/8-32 thread		

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.

Right: Custom through-transmission phased-array tool head for scanning composite aerospace materials with complex geometries.

Below: SNI's proprietary Low-Noise Blue™ damping material significantly improves signal-to-noise ratio.



transducers

part no.	freq.	description	connector	application & use description
00-010328ZPAC[IPEX]	1.5	16EL, 1mm, 12mm	ZPAC/IPEX	low frequency linear (coarse grain materials)
00-010340ZPAC[IPEX]	2	32EL, .4mm, 12.7mm	ZPAC/IPEX	miniature angle beam PA (fits conventional wedges)
00-010335ZPAC[IPEX]	2	8EL, 1mm, 9mm	ZPAC/IPEX	low frequency linear (coarse grain materials)
00-010477ZPAC[IPEX]	2.25	16EL, 1 mm, 16 mm	ZPAC/IPEX	AWS linear
00-010265ZPAC[IPEX]	2.25	16EL, .75mm, 12mm	ZPAC/IPEX	general purpose linear array
00-010330ZPAC[IPEX]	2.25	16EL, 1.5mm, 19mm	ZPAC/IPEX	general purpose linear array
00-010267ZPAC[IPEX]	2.25	64EL, .6mm, 10mm	ZPAC/IPEX	general purpose linear array
00-010336ZPAC[IPEX]	4	16EL, .5mm, 9mm	ZPAC/IPEX	general purpose linear array
00-010266ZPAC[IPEX]	5	16EL, .6mm, 10mm	ZPAC/IPEX	general purpose linear array
00-010329ZPAC[IPEX]	5	32EL, .6mm, 10mm	ZPAC/IPEX	general purpose linear array
00-010339ZPAC[IPEX]	5	32EL, .4mm, 12.7mm	ZPAC/IPEX	miniature angle beam PA (fits conventional wedges)
00-010268ZPAC[IPEX]	5	64EL, .6mm, 10mm	ZPAC/IPEX	general purpose linear array
00-010341ZPAC[IPEX]	10	16EL, .31mm, 5mm	ZPAC/IPEX	small footprint high frequency
00-010338ZPAC[IPEX]	10	32EL, .4mm, 12.7mm	ZPAC/IPEX	miniature angle beam PA (fits conventional wedges)
00-010269ZPAC[IPEX]	10	64EL, .6mm, 10mm	ZPAC/IPEX	general purpose linear array
00-010331ZPAC[IPEX]	3.5	64EL, 1mm, 7mm	ZPAC/IPEX	near wall linear immersion (elements close end)
00-010332ZPAC[IPEX]	5	64EL, 1mm, 7mm	ZPAC/IPEX	near wall linear immersion (elements close end)
00-010333ZPAC[IPEX]	5	128EL, .75mm, 10mm	ZPAC/IPEX	linear immersion
00-010334ZPAC[IPEX]	5	32EL, 1.32mm, 6mm	ZPAC/IPEX	curved array for composite radius inspection
00-010327ZPAC[IPEX]	5	64EL, 1.27mm, 8mm	ZPAC/IPEX	hardwater linear array (minimizes water gap needed)
00-010220ZPAC[IPEX]	5	2x32EL, 1.5mm, 5mm	ZPAC/IPEX	dual linear array for corrosion inspection
00-010337ZPAC[IPEX]	1.5	2x15(5x3)EL, 3.8mm, 4mm	ZPAC/IPEX	dual matrix (t/r) array - coarse grain material
00-010342ZPAC[IPEX]	2	2x32(16x2)EL, 1.75mm, 4mm	ZPAC/IPEX	dual matrix (t/r) array - coarse grain material

phased-array wedges

part no.	desc.	type
01-010293	REX, 38.0 DEG INC, FLAT, A, 00-010274/5 COMPATIBLE	E1
01-010294	REX, 38.0 DEG INC, FLAT, B, 00-010274/5 COMPATIBLE2	E1
01-010295	REX, 38.0 DEG INC, FLAT, A, 00-010276 COMPATIBLE	E2
01-010296	REX, 38.0 DEG INC, FLAT, B, 00-010276 COMPATIBLE	E2
01-010297	REX, 38.0 DEG INC, FLAT, 00-010277 COMPATIBLE	E3
01-010298	DUAL, REX, 18.0 DEG INC, FLAT, 00-010278 COMPATIBLE	E4
01-010035	DUAL18INC 2.3RF, REX, FLAT	E5
01-010535	0.5", 45S, Plex	MSWS
01-010536	0.5", 60S, Plex	MSWS
01-010537	0.5", 70S, Plex	MSWS
01-010705	REX, 38.0 DEG INC, FLAT	MSWS
01-010531	40-70L CASE	AM
01-010703	40-70S CASE	AM
01-010706	ODG CASE	LM
01-010707	40-70S CASE	LM
01-010708	40-70L CASE	LM
01-010709	30-70S CASE	A11
01-010710	30-60S CASE	A00
01-010711	45-70S CASE	A00



Above, 48-element (6 x 8) matrix array transducer in an integral-wedge design with proprietary Low-Noise Blue™ damping material.



Above, left to right: Hypertronics (Zetec Dyna-ray and Amdata), ZPAC (Zetec™), IPEX (Omniscan™). Other connectors available.