

Acoustic Intensity Measurement System (AIMS)

AIMS is a precision scanning system mounted on a tank that allows measuring and mapping of acoustic fields in liquids. It is the heart of any ultrasound measurement system, suitable for medical imaging, pulsed and CW Doppler, therapeutic devices and industrial ultrasound between 0.25 and 60 MHz(*).

(* Note: System may be applicable for some measurements outside this range - consult Onda about your application.

Tank Sizes:

- ASTS01: Inside Dim: 0.73 m X 0.36 m X 0.44 m (29" x 14" x 17" tall)
- ASTS03: Inside Dim: 0.89 m X 0.51 m X 0.58 m (35" x 20" x 23" tall)

Applications

Engineering/Product Development: Evaluate prototype transducers and excitation systems from measurements such as:

- Beam Dimensions
- Focal Zone Location and Size
- Pulse Amplitude, Spectrum, Center Frequency and Bandwidth
- Pitch-Catch or Pulse Echo Measurement Modes

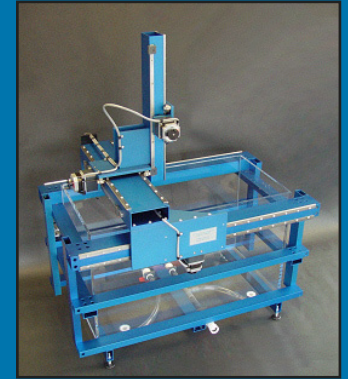
Government Compliance Testing: Gather all acoustic data needed for device compliance submittals. Measure, calculate and plot.

Diagnostic Devices:

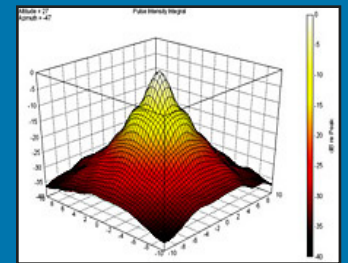
- Pulse waveform and pulse intensity integral plots
- Intensity: pulse average (Isppa), temporal peak (Isptp), temporal average (Ispta), pulse duration
- Mechanical Index
- In-water and derated intensity values
- Pressure: positive and negative peak values
- Acoustic power by planar integration
- Beam dimensions (1 and 2 dimensions)
- Center frequency and bandwidth

Therapeutic devices:

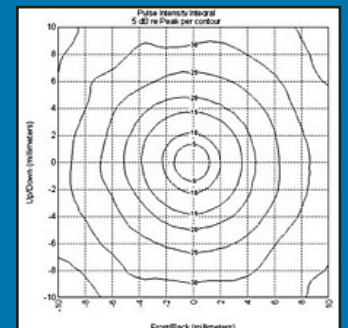
- Compute Effective Radiated Area (ERA)
- Compute Beam Non-Uniformity Ratio (BNR)



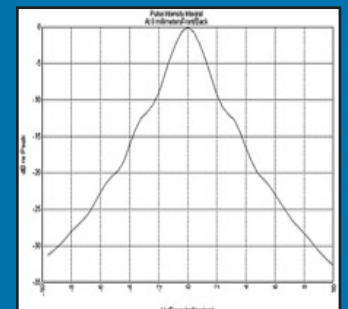
AIMS System



2D Intensity Plot



Contour Plot



1D Intensity Line Scan

Applications Continued

Production Testing

With data acquisition typically at 2 points per second, production line measurements are one common application for this system. Built-in scripting allows automation of repetitive measurement tasks, pass/fail checks, and message-based control of programs written by the user.

AIMS Capabilities

- Precise 3-axis scan, repeatable within 12 μ m and absolute accuracy of 25 μ m over 30 cm.
- Travel: 610mm x 360mm x 380mm vertical (AST01); 800mm x 510mm x 510mm vertical (AST03).
- Digitized and stored waveforms, 1- and 2-dimensional spatial scans. The software gathers, displays and stores the data.
- Automatic computation of most relevant acoustic parameters (see above).
- Computer-controlled adjustment of either the hydrophone or the transmitting transducer for beam alignment using the optional two axes Angular Positioner.
- Frequency scans, where the response is measured as a signal generator is stepped in frequency, is done with minimal additional hardware. This is valuable in transducer evaluation and hydrophone calibrations.

The AIMS basic package

- Acrylic tank with water circulation hookups
- Structural Frame with 3-axes positioner
- Hydrophone Holder Assembly Set
- Transducer Holder Assembly Set
- Stepper Drive Electronics for 3 axes (EMDS03)
- PC Motor Controller Card
- Stepper Drive Cables for 3 axes
- Spare parts, cables, toolkit
- AIMS Software Executable - featuring external control

Options

- Angular positioner (includes upgrade from 3 to 6-axes controller and cable)
- On-site installation and training (available in most worldwide locations)
- Water conditioning system for degassing, filtering and temperature control
- USB-to-GPIB adaptor with cable

Other required components

System Controller

- A PC compatible computer running Windows 2000 Pro or XP is needed, with one empty PCI slot.
- Onda offers a PC with all software and hardware installed.

Waveform Digitizer

- A digitizing oscilloscope is a necessary component. Many models are compatible with the AIMS software.
- Onda offers the Agilent DSO6012A Oscilloscope.

Hydrophone

- Onda offers a complete line of hydrophones for acoustic measurements.

