



## HandyScan RX - Multi-Function Ultrasonic Inspection Systems



### Features

- Highly Portable
- Sunlight Readable Screen
- Extensive Analysis Tools
- Powerful Reporting Functions
- Removeable Battery
- 2 Axis Encoder; Video tracking
- Import Setups from ESBeamTool®
- Up to x 8 Conventional Channels
- Up to 32/64 Phased Array
- Simultaneous PA, ToFD and/or PE data collection
- 128GB SSD Storage

### Applications

- Pressure Vessel Welds
- Pipeline Welds
- Corrosion Surveys
- Turbine Disks & Blades
- Complex Geometries
- Forgings & Castings
- Aircraft Components
- Hydrogen Damage Surveys



### Techniques

- Phased Array
- TOFD
- Pulse Echo
- Corrosion Mapping
- Weld Zone Discrimination

### Software

- Phased Array/Pulse Echo
- TOFD
- Strip-Scan (AUT)
- Long Range (Creep Wave & Corrosion Mapping)
- TD Super-View
- ESBeamTool®



## HandyScan RX - Technical Specification

### Hardware

#### System Options

|       |                                        |
|-------|----------------------------------------|
| 32/64 | 32 Active, 64 Elements, 8 Conventional |
| 16/64 | 16 Active, 64 Elements, 4 Conventional |

#### General

|                        |          |
|------------------------|----------|
| Number Of Focal Laws   | 1700 max |
| Dynamic Depth Focusing | Yes      |

#### Digitisation

|                                |                                                                              |
|--------------------------------|------------------------------------------------------------------------------|
| A/D Sampling Frequency         | Phased Array = 8Bit & 14Bit @ 100MHz<br>Conventional = 8Bit & 14Bit @ 100MHz |
| System Bandwidth(-3dB)         | Phased Array = 0.75MHz to 25MHz<br>Conventional = 0.75MHz to 25MHz           |
| Max Pulse Repetition Frequency | Variable up to 5KHz                                                          |

#### Pulser

|                          |                                                                              |
|--------------------------|------------------------------------------------------------------------------|
| Number of Pulsers        | 16/32/64                                                                     |
| Number of Active Pulsers | 1 to 32                                                                      |
| Pulser Delays            | 0µs to 20µs in 2.5ns steps                                                   |
| Output Impedance         | 6 Ohms                                                                       |
| HT Pulse Shape           | Square wave                                                                  |
| HT Pulse Voltage         | Phased Array = 5 to 190V in 1V Steps<br>Conventional = 5 to 190V in 1V steps |
| HT Pulse Width Range     | 20ns to 500ns in 2.5ns steps                                                 |
| Rise/fall time           | < 5ns                                                                        |

#### Receiver

|                            |                                                              |
|----------------------------|--------------------------------------------------------------|
| Number of Receivers        | 16/32/64                                                     |
| Number of Active Receivers | 1 to 32                                                      |
| Receiver Delays            | 0µs to 20µs in 1ns steps                                     |
| Gain Range                 | P/E=0 to 90dB in 0.1dB steps<br>P/A=0 to 72dB in 0.1dB steps |
| Input Noise Level          | 2.5nV/(Hz) 1/2 across full sytem bandwidth                   |
| Input Impedance            | 50 Ohms                                                      |

#### Dynamic Depth Focusing

|                    |                                            |
|--------------------|--------------------------------------------|
| Operation          | Dynamically optimises receive focus delays |
| Range Of Operation | User specified depth/range in mm or µs     |
| Performance        | 100MHz real-time                           |

#### Receiver DAC Curves

|                     |               |
|---------------------|---------------|
| Number of Curves    | 1 to 8        |
| Rate of Gain Change | Up to 40dB/µs |

#### A-Scan Digitising

|                             |                                           |
|-----------------------------|-------------------------------------------|
| A-Scan Points Per Channel   | 8000 samples per channel                  |
| Number Of Gates Per Channel | 3 overlapping hardware Gates              |
| Gate Start/Width            | User definable in 40ns steps              |
| Gate Reference Points       | Transmit Pulse or Material Interface Echo |
| Storage Modes Per Gate      | A-Scans, Peak Depth and Amplitude, Both   |

#### Signal Averaging

|                    |                                             |
|--------------------|---------------------------------------------|
| Number Of Channels | All (128 software channels)                 |
| Averaging Rates    | Real-time averaging 2 - 256, user definable |

#### Peak Processing

|                          |                                                                         |
|--------------------------|-------------------------------------------------------------------------|
| Peak Storage Modes       | All Peaks, First Peak, Largest Peak/s,<br>Loss of Signal, Between peaks |
| Threshold Setup          | 5 to 100% in 1% steps per hardware Gate                                 |
| Number Of Peaks Per Gate | 16 max                                                                  |

#### Scanner Interface Ports

|                         |                                      |
|-------------------------|--------------------------------------|
| Input Type              | Encoder, Potentiometer, Video Camera |
| Number of Axis          | 2 Axis, TTL compatible               |
| Encoder Interface       | TTL compatible, 5V @ 1A, 12V @ 0.4A  |
| Potentiometer Interface | 0 to 2.5V, sampled at 100Hz          |
| Video Input             | 1Vpp Composite                       |

#### PC (Internal)

|                        |                                         |
|------------------------|-----------------------------------------|
| Operating System       | Windows®                                |
| 3rd Party Software     | ESBeamTool® (Eclipse Scientific)        |
| Processor              | Intel®                                  |
| Memory                 | 2GB                                     |
| Display                | Colour TFT (industrial type) 8.4"       |
| TFT Display Resolution | 800 x 600 - Sunlight Readable Screen    |
| Storage                | 128GB SSD                               |
| Ports                  | 2 x USB, 1 x 10/100 Ethernet, 1 x Video |

#### Size, Weight and Environmental

|                         |                                   |
|-------------------------|-----------------------------------|
| Unit Dimensions         | 270 x 300 x 110 (WxHxD)           |
| Weight                  | 5kg                               |
| Temperature - Operating | -10°C to 40°C                     |
| - Storage               | -25°C to 85°C (without batteries) |

#### Power Requirements

|                        |                             |
|------------------------|-----------------------------|
| Battery Operating Time | 4 Hours (approx)            |
| DC Input               | 19V                         |
| AC Input               | 90 to 260VAC @ 40Hz to 60Hz |

### Software

#### General Features

- Simultaneous Phased Array, TOFD, Pulse Echo data collection
- Operator definable weld geometry overlays
- Real-time A, B, C and D-Scan images, with user defined display modes
- Internal report generation including interactive print-preview and user-definable report fields
- Full cursor analysis indicating peak depth, amplitude and x,y position
- Export Bitmap images to any Windows® application
- 8 or 14 bit Data acquisition for Phased array, TOFD and Pulse Echo
- Import ESBeamTool® setups

#### Phased Array

- User configurable control of beam angle, focal distance and spot size
- Fixed-angle electronic or sectorial scans
- Dynamic Depth Focusing (DDF) provides a user-definable focal range
- 2000 Focal Laws
- Supports Linear probe/wedge geometry
- Normalisation of amplitude across sectorial scan angles or fixed angle focal laws
- Beam Apodisation
- Skip Correction provides correct depth/range relationship for multiple legs

#### ToFD

- Perform multi-channel TOFD and Pulse Echo inspections simultaneously
- Full suite of image analysis tools for defect/crack sizing
- Real-time multi-channel averaging significantly improves signal quality
- Linearisation, Straightening, Synthetic-Aperture-Focusing-Technique (SAFT)
- File utilities include file join/split, reverse, save partial, output data to text file

#### Pulse Echo

- Independent control of transmit and receive parameters
- C-scan with end views for corrosion mapping
- Trigger reference modes including Interface Echo or Tx Pulse
- Multiple peak data storage modes, including full/selective A-Scan storage

#### Weld Zone Discrimination

- Combined TOFD, Time/Amplitude view, Map View, Couplant Check & Go/No-Go and in a single pass
- Inspection data displayed as strip-charts indicating weld zones
- Integrated TOFD analysis
- Automated report generator