# Weldstar
## Hybrid AUT Girth Weld Inspection

Weldstar is the latest in pipeline girthweld inspection system from GE Inspection Technologies. It features a combination of conventional and Phased Array ultrasonics and thus offers an inspection solution not compromised by a single ultrasonic technique. Together with its unique modular design, this high-performance system is extremely versatile and reliable.

# Inspection integrity, unrivaled versatility.

The latest generation pipeline girth weld inspection system from GE Inspection Technologies is an automated ultrasonic testing solution that provides all functionality required for the job, from set-up to data archiving. Combining conventional and Phased Array ultrasonics, this advanced inspection tool provides the benefits of both techniques without compromise. Weldstar's unique modular design with the ultrasonic electronics located on the scanner head, and the simple umbilical that can be changed quickly, provides numerous benefits in applications versatility, performance and reliability.

## Inspection Integrity where Rapid Defect Detection is Critical

### Hybrid ultrasonic flexibility
Weldstar's remote scanner head contains all its ultrasonic hardware in four field-replaceable modules. The scanner head can be configured with four 8-channel conventional modules for a total of 32 conventional ultrasonic channels. Or, two of the modules can be exchanged for two 64-channel Phased Array modules providing a hybrid system containing 16 conventional and 128 Phased Array channels.

With its ability to fire 32 virtual elements from each 64-element Phased Array module and its unique connector design, Weldstar can fire a pair of 64-element Phased Array transducers or two pairs of 32-element Phased Array transducers. Weldstar's tremendous flexibility allows the operator to configure the optimum inspection solution for virtually any pipeline girth weld application.

### Highly versatile scanner design
The Weldstar scanner delivers the ultimate in versatility with the ability to adjust for pipe diameters as small as 200 mm (8 in) up to virtually flat surfaces. The Weldstar scanner is the only scanner adjustable to fit a variety of current pipe weld bands and can be configured to allow minimum coating cutback of less than 150 mm (6 in).

### Resistant to electromagnetic interference
Typical AUT systems are highly susceptible to electromagnetic interference preventing inspections from taking place while welding equipment is active. Great care is taken in the Weldstar's design to minimize the impact of this noise allowing greater inspection productivity and test integrity.

### Availability = reliability + serviceability
With a quick-change umbilical coupled to the scanner on a connector swivel, Weldstar minimizes costly downtime associated with umbilical failures. Modular electronics housed in the machined remote scanner head provide plug and play serviceability. To ensure robustness, the Weldstar design has been validated through severe shock, vibration, environmental and thermal loading. Weldstar has been tested to operate in ambient temperatures from -50C to +60C. Weldstar is supported by GE Inspection Technologies global service and training network.
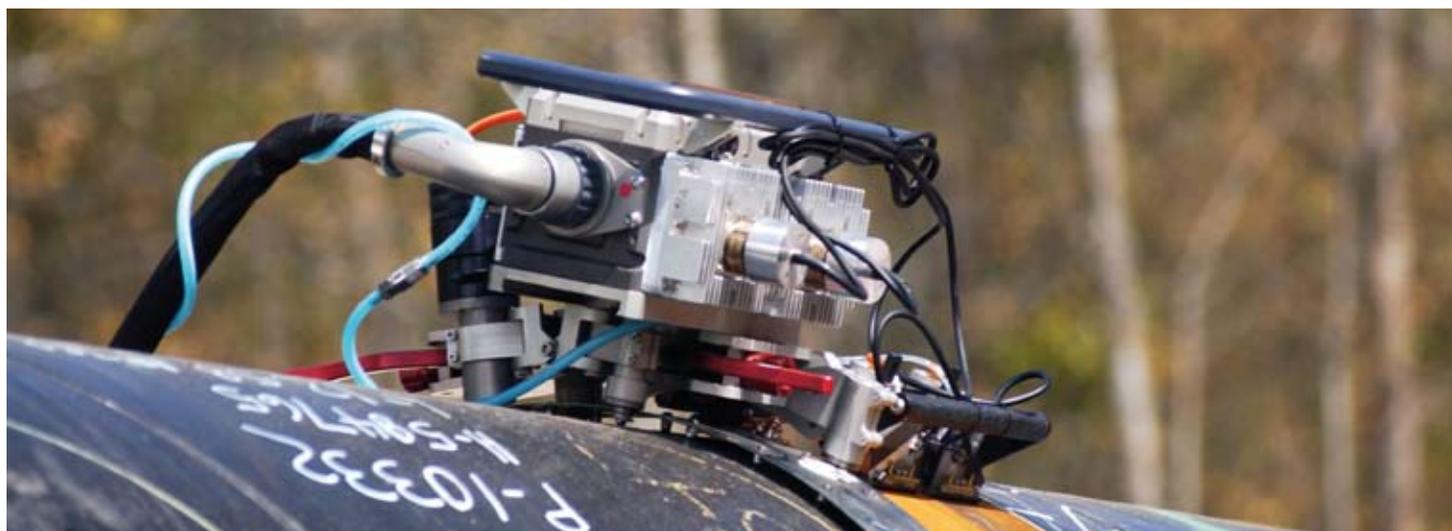
## Productivity Value through Smart Software

Weldstar's advanced Setup Wizard steps the user through the complete job setup process. With features like built-in inspection protocol, an operator can create setups for a typical project in hours instead of days, including an automatically generated calibration block design and complete definition of inspection parameters. Once the Wizard is complete, the job setup is finished and the calibration block drawing and machining code can be e-mailed to the machine shop and used to fabricate the reference standard.

During an inspection, Weldstar automatically records full system parameters. Date, time and GPS coordinates are stamped onto each weld data set. A watchdog function alerts the operator when system checks are needed and built-in diagnostics monitor system parameters. Automated functions provide required verifications (such as amplifier linearity) to be performed and stored on demand.

PlusWeld software organizes and archives scan data seamlessly and automatically, allowing the operator to create weld quality tracking reports and trending information for immediate analysis by the welding department and quality management personnel. The integrated GPS tags all inspection data with geographic location providing valuable audit information for each and every weld inspected.

## Feature Summary

- Inspection to API 1104, DNV-OS-101 and other industry-specific specifications.
- Configurable with 32 conventional ultrasonic channels or 16 conventional plus 64:128 Phased Array channels.
- Simple, quick-change umbilical in lengths up to 91 m (300 ft).
- Excellent Electro Magnetic Interference (EMI) resistance.
- Versatile scanner design is easily adaptable to a variety of weld bands and pipe sizes from 200 mm (8 in) in diameter.
- Setup Wizard and PlusWeld database tool for full job management and reporting.
- On-board GPS provides the geographic position of each weld inspected.
- Rapid cycle times, typically 1 to 4 minutes per weld at up to 100 mm (4 in) per second scan speed.
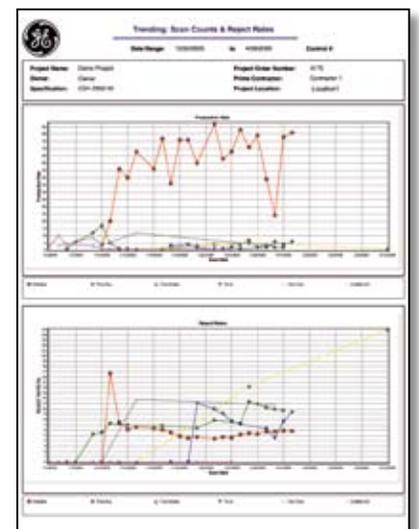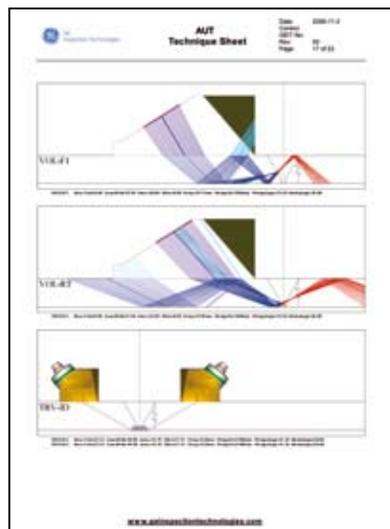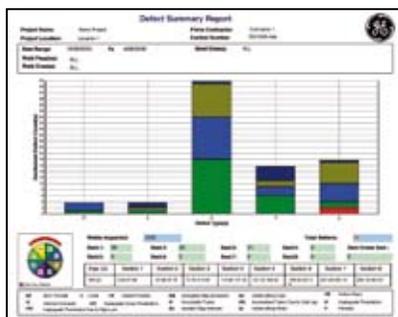
# Technical Specifications

## General

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|---|---|
| **Joint Type** | Circumferential Girth Welds |
| **Pipeline Diameter** | 200 mm (8 in) to Virtually Flat |
| **Wall Thickness** | 6 mm to 35 mm (1/4 in to 1-1/2 in) |
| **Weld Bevel** | CRC-Evans®, J, V, Double V, X and Others |
| **Inspection Codes** | API 1104, DNV2000-OS-F101, CSA Z-662, etc. |
| **Band Compatibility** | CRC-Evans®, Vermaat®, Others (Adjustable) |
| **Umbilical Lengths** | 23 m (75 ft),  45 m (150 ft), 91 m (300 in) |
| **Power Requirements** | 120 V to 240 VAC, 50/60 Hz |
| **Operating Temperature** | -50° C to 60° C (-58° F to 140° F) (Remote Scanner Head) |
| **Environmental Rating** | IP65 Waterproof (Remote Scanner Head) |
| **Shipping Weights** | UTM Box -          635 mm x 635 mm x 584 mm (25 in x 25 in x 23 in) – 66 kg (145 lbs) |
| | UTR Box -          635 mm x 635 mm x 356 mm (25 in x 25 in x 14 in) – 32 kg (87 lbs) |
| | Scanner Box -     635 mm x 457 mm x 483 mm (25 in x 18 in x 19 in) – 39 kg (105 lbs) |
| | Spare Parts Box - 559 mm x 533 mm x 432 mm (22 in x 21 in x 17 in) – 36 kg (97 lbs) |
| | Umbilical Box -   635 mm x 635 mm x 254 mm (25 in x 25 in x 10 in) – 30 kg (81 lbs) |
| **Training and Certification** | Operator Training |
| | AUT Training/Weldstar Certification |

## Instrumentation

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|---|---|---|
| **Number of Channels** | 64:128 Phased Array, and 16 Conventional UT or 32 Conventional UT | |
| **Inspection Modes** | Pulse Echo, Through Transmission (TOFD, Transverse Defect) | |
| **Display Modes** | Twin Gate Strip Chart<br>B-Scan (Color or Gray Scale)<br>TOFD | |
| **Data Storage** | Redundant on Two Removable Drives | |
| **Gates** | 2 per Channel to max 50 mm Wide, All Data Recorded | |
| **Amplitude Resolution** | 1% from 1 to 500% FSH | |
| **Conventional UT** | Acquisition Rate | 1 Sequence Set per Unit of Encoded Resolution Selected at up to 100 mm/sec (4"/sec) |
| | Pulser | 80 – 250 V |
| | Filters | Software Selectable |
| | Gain | 80 dB |
| | Bandwidth | 1 - 15 MHz |
| | TOFD Resolution | 0.1 mm (0,004 in) minimum |
| **Phased Array UT** | Acquisition Rate | 1 Sequence Set per Unit of Encoded Resolution Selected at up to 100 mm/sec (4"/sec) |
| | Pulser | 50 - 120 V Bi Polar Square Wave 500 ns max Pulse Width |
| | Bandwidth | 3 to 11 MHz |
| | Focal Laws | 4095 |
| | Transducers | 2 x 64 Element Linear<br>4 x 32 Element Linear |

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