

Reliable Inspection Performance

Weld Inspection

for Tubes / Pipes



Mismatch



Undercut



Bead Height



Deflection



Freeze Line



Roll



Slope Angle



Bead Ratio

Description

The WI2000p post weld inspection system has been exclusively created for the tube and pipe industry to detect quality issues related to the welding process.

A high speed video camera combined with fast data capture and analysis rates provides detection of defects down to 0.015 mm in size on a typical tube or pipe mill. Defects inspected include weld undercut, sunken welds, bead height, deflection, freeze line and weld register (mismatch).

The process of welding tube and pipe requires several variables to be in check for efficient and stable production and to meet the quality demands of the industry. Mill dynamics, from setup to production, have an impact on the stability of these variables. Measuring and monitoring these variables is the first step in controlling them and improving weld quality.

Benefits Of Laser-Based Inspection Systems

- Simplify and reduce mill set up time
- Minimize down time
- Reduce operating costs
- Improve weld quality
- Decrease material scrap
- Measure shift efficiency, yield and raw material quality
- Lessen:
 - Customer Returns
 - Field Failures
 - Product Liability Claims

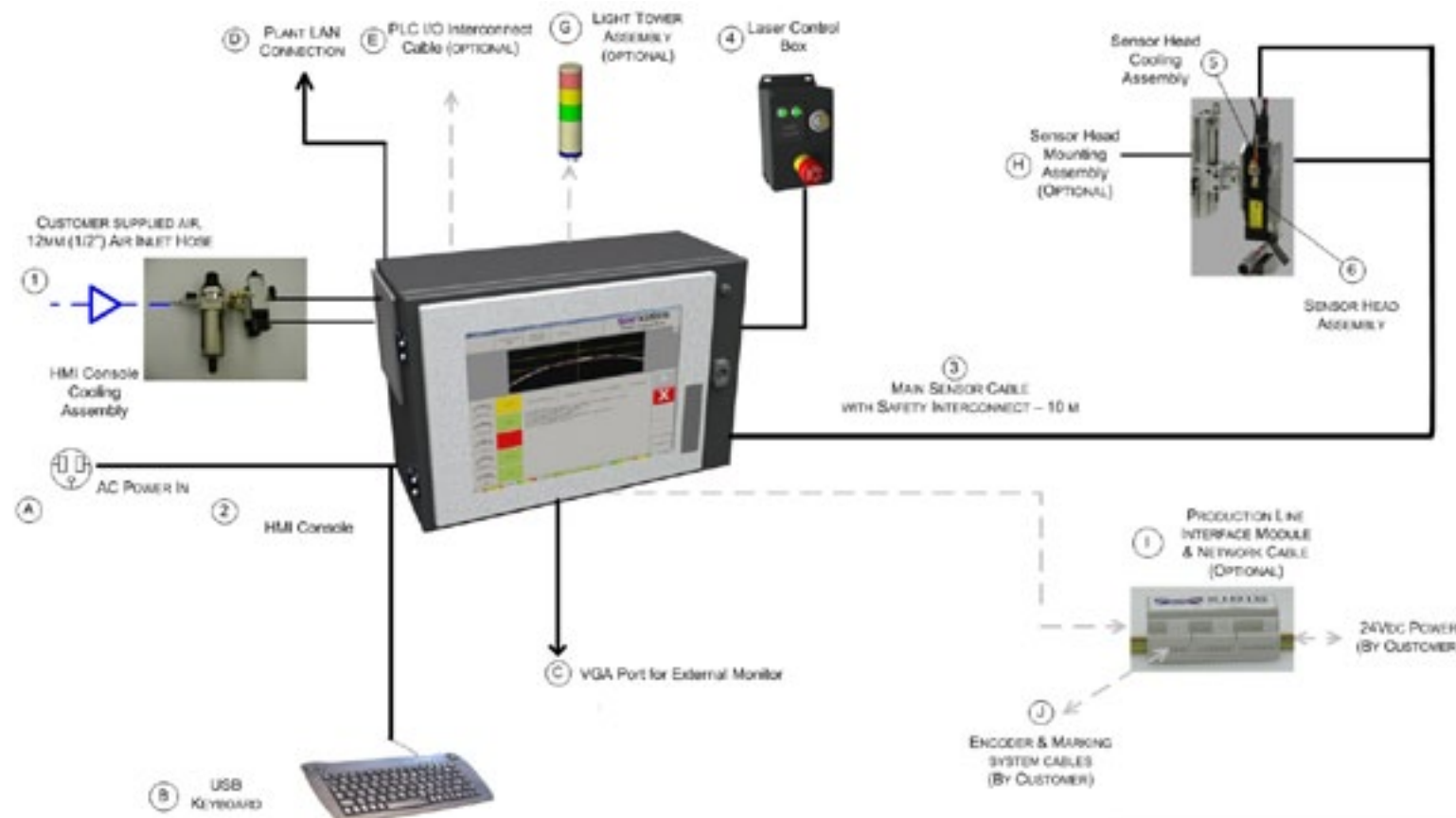
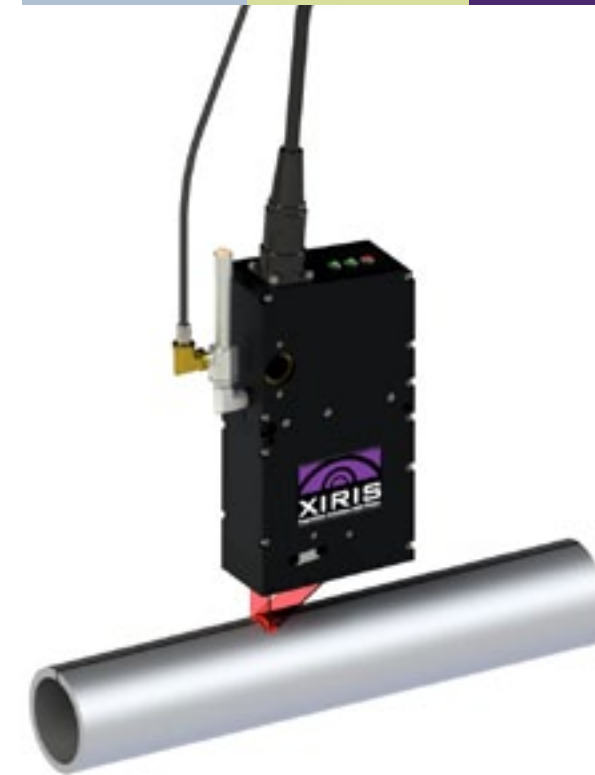
In the competitive tube market, quality, consistency and integrity need to be inherent in the product that is delivered to the client's door. Make sure your products meet their requirements with the WI2000p!



XIRIS
Inspection Solutions with Vision

WI2000p System Performance Characteristics

Sensor Head Parameters	WI2000p SR5	WI2000p SR12	WI2000p SR26	WI2000p HR9	WI2000p HR12	WI2000p HR22	WI2000p HR5
Min. Tube/Pipe Size (OD)	6 mm (0.24")	11 mm (0.43")	21 mm (0.83")	5 mm (0.20")	7 mm (0.28")	13 mm (0.51")	2.5 mm (0.10")
Max. Weld Bead Width	3.2 mm (0.13")	8.2 mm (0.32")	16 mm (0.63")	7.4 mm (0.29")	9.9 mm (0.39")	17.3 mm (0.68")	1 mm (0.04")
Optics							
Horizontal field of view	4.7 mm (0.18")	12 mm (0.47")	25.5 mm (1.0")	8.7 mm (0.34")	12 mm (0.47")	21.5 mm (0.85")	4.7 mm (0.18")
Vertical field of view @ 200 pixels	1.6 mm (0.06")	4.0 mm (0.16")	8.7 mm (0.34")	1.8 mm (0.07")	2.3 mm (0.09")	4.5 mm (0.18")	1.6 mm (0.06")
Horizontal resolution	7 μ m (0.0003")	18 μ m (0.0007")	35 μ m (0.0014")	9 μ m (0.0004")	12 μ m (0.0005")	21 μ m (0.0008")	5 μ m (0.0002")
Vertical resolution	8 μ m (0.0003")	20 μ m (0.0008")	37 μ m (0.0015")	11 μ m (0.0004")	13 μ m (0.0005")	22 μ m (0.0009")	5 μ m (0.0002")
Standard Speed [profiles/sec]	250	250	250	120	120	120	120
Laser line Thickness	3-5 pixels	3-5 pixels	3-5 pixels	3-5 pixels	3-5 pixels	3-5 pixels	3-5 pixels
Measurement Accuracy / Resolution	$\pm 8 \mu$ m (± 0.0003 ")	$\pm 20 \mu$ m (± 0.001 ")	$\pm 37 \mu$ m (± 0.0015 ")	$\pm 11 \mu$ m (± 0.0004 ")	$\pm 13 \mu$ m (± 0.0005 ")	$\pm 22 \mu$ m (± 0.0009 ")	$\pm 5.5 \mu$ m (± 0.0002 ")
Measured Weld Parameters							
Mismatch	$> \pm 16 \mu$ m (0.0006")	$> \pm 40 \mu$ m (0.0016")	$> \pm 74 \mu$ m (0.0030")	$> \pm 22 \mu$ m (0.0009")	$> \pm 26 \mu$ m (0.0010")	$> \pm 44 \mu$ m (0.0017")	$> \pm 10 \mu$ m (0.0004")
Undercut, Bead Height & Deflection	$> 16 \mu$ m (0.0006")	$> 40 \mu$ m (0.0016")	$> 74 \mu$ m (0.0030")	$> 22 \mu$ m (0.0009")	$> 26 \mu$ m (0.0010")	$> 44 \mu$ m (0.0017")	$> 10 \mu$ m (0.0004")
Roll	$\pm \frac{1}{4}$ Bead Width	$\pm \frac{1}{4}$ Bead Width	$\pm \frac{1}{4}$ Bead Width	$\pm \frac{1}{4}$ Bead Width	$\pm \frac{1}{4}$ Bead Width	$\pm \frac{1}{4}$ Bead Width	$\pm \frac{1}{4}$ Bead Width



WI2000p Standard Configuration with Options

WI2000p System Overview

The WI2000p system is composed of an Image Acquisition assembly and an Image Processing/Display console.

The Image Acquisition assembly consists of a Sensor Head assembly (6), a Sensor Cooling assembly with Air Preparation/Control (5), and an optional Sensor Mount/Adjust assembly (H). The Air supply Hoses and Tubes for the Sensor Cooling assembly (1) must be provided by the customer, along with a post or gantry (not shown) for attaching the optional Sensor Mount/Adjust assembly.

The Image Processing/Display assembly consists of the Xiris Human Machine Interface (HMI) Console (2) including a touchscreen monitor for display of the Graphical User Interface (GUI), industrialized PC with Air Cooling assembly running WI2000p software in a MS Windows environment and external keyboard (B) with integrated touchpad. Enclosure is IP54/Nema 13 rated and has a standard VESA mounting on the back of the enclosure for easy mounting. Unit includes I/O interface module to communicate to customer line PLC.

Mill operators can interface their existing line Encoders and Defect Marking Systems via the optional Production Line Interface Kit that includes the Interface Module (I), Encoder Application software, and Interconnecting Cable. The Encoder Assembly, Defect Marking System, along with their related cables (J), must be provided by the customer.

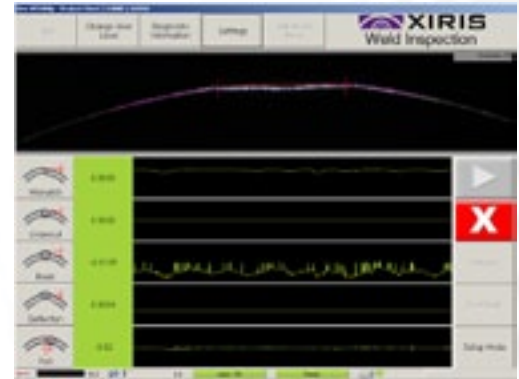
WI2000p System Installation

The Sensor Head is equipped with secondary protective windows, and is cooled by air via the Air Cooling assembly. Mounting and adjustment on the mill is done via an (optional) Sensor Mount/Adjust assembly (H) that allows for precise vertical and horizontal alignment of the Head to ensure optimal inspection. The System is interconnected via a set of Cables: one Main Sensor Head Cable (3), one Computer Power Cable, and one (optional) PLC I/O Cable (E). The system uses I/O signals (per optional digital I/O kit) to communicate to the plant PLC, has an Ethernet connection for optional LAN connection (D) and an optional Light Tower with buzzer assembly (G) that informs the operator on the system's status. A Laser Control Box (4), including Laser Master Control key switch, Laser Power Status LEDs, E-Stop button, external interlock port and cable to HMI controller is also included with the system.

Reliable Inspection Performance

Features:

- Easy to tune settings as configuration is done on the fly for continuous production.
- Unlimited number of (data) presets can be saved for later recall - reduces mill set-up time and increases overall production volume.
- Process monitoring through real-time trend reporting - simplifies mill set-up, minimizing down time and material scrap.
- Powerful software suite: proprietary 3D triangulation algorithm allows for high speed processing with closely spaced data intervals.
- Real-time trend reporting and alarm notification of process variables notifies the operator immediately of impending tolerance breaches and/or weld faults, allowing for easy reporting and diagnostics.
- Data logging for process playback gives the ability to evaluate shift efficiency, yield, and raw material quality.
- Direct integration with tube mill's marking system allows for weld defects to be marked instantaneously without halting the mill.
- Laser Safety interlocks – four levels of interlocks allow for safe operation of the Sensor Head and quick automatic stopping of the system in case of emergency.



Specifications:

Camera and Resolution	Single Chip Monochrome CCD with GigE interface 656 x 492 pixels grey level (SR) or 1024 x 776 pixels grey level (HR)
Frame Rate	120 to 400 frames /sec with 656 x 100 window pixels; Images are acquired in a free running mode
Sensor Head	128 mm (5.0") (W) X 59 mm (3.1") (D) x 244 mm (9.6") (H); 4.0 Kg (9lb)
Sensor Head + Optional Mount Bracket - Size	128 mm (5.0") (W) X 222 mm (8.7") (D) x 346 mm (13.6") (H); 7.0 Kg (15lb) Universal Mount / Adjust system for easy Vertical & Horizontal set-up
HMI Enclosure	Industrial enclosure with 15" Touch Screen LCD, Wall-Mount standard 500 mm (19.6") (W) X 230 mm (9.1") (D) x 340 mm (13.4") (H); 16 Kg (35lb)
GUI Languages Supported	English, German, Spanish, Japanese, Chinese. Others on request.
Cooling Assembly	Adjustable Air pressure for coolant inlet: Sensor Head: 55 L/min @ 6 bar (2 cfm @ 90 psi) PC Console: 425 L/min @ 6 bar (15 cfm @ 90 psi)
Machine Interface	16 digital inputs (5-48 VDC, opto-isolated, NPN) 16 digital outputs (5-48 VDC, opto-isolated open collector)
Cable	10m (32.8') standard Fully compliant to IEC6100-4-2 Level 4, IEC6100-4-4 Level 4 Electrical Immunity
Operating Conditions	Power: 100 -240 VAC, 500 watts, 50-60 Hz. Ambient Temperature: 10-50 °C (50-122 °F) Sensor Operating Temperature (internal with air coolant): 12-30 °C (59-86 °F)

Xiris is a registered trademark of Xiris Automation Inc. in Canada and other countries.



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Specifications are subject to change without notice. Please check our website for most recent details. May 2014.

