GEMIT®

GEMIT® Echo Server
Network based industrial
Ultrasonic Tester

System Overview

June 2008

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Echo Server is a network based multi channel industrial ultrasonic instrument for inspection and monitoring in a harsh industry environment. It is available with software for different ultrasonic applications.

Echo Server provides up to 8 ultrasonic channels with outstanding performance, all in a convenient waterproof die cast aluminium case. The unit is suitable for inspecting tube, bar, or plate material and can be configured for flaw detection, thickness gauging and velocity measurement individually for each channel. It features four independent flaw / thickness gates in each channel. The flexible robust I/O interface with 16 inputs and 6 outputs directly connects to standard PLC´s or controllers. It allows direct connection to encoders for acquiring and recording of scanner data. The high speed ethernet network based data communication guarantees an easy to use plug and play interface to standard PC systems.

The unit can be installed very close to the ultrasonic transducers. It is not necessary to mount any additional hardware like pre-amplifiers to the measuring application. Complete signal processing is performed inside the **Echo Server** unit. The instrument will be parameterized from an external PC system. All data communication is carried out by a network connection over a high speed ethernet cable. The distance between the units can be up to 100 meters. The PC acts as the user interface for data storage and visualization.

Wall Thickness and concentricity measuring

GEMIT® Echo Server unit in combination with PC based software TCM is suitable for measuring wall thickness and concentricity. Tubes with a wall thickness from 0.005 mm to 40 mm can be monitored during or after production. By utilization of the TCM software it is possible to measure the wall thickness and graphically display and compare it to the tolerance specification. Real-time color graphic displays, shows control charts, histograms, SPC information for thickness and concentricity. The closed loop facility automatically feeds back the actual information to regulate the extrusion or monitor the press process and maintain more consistent product size. This reduces scrap and improves product quality. A detailed statistical report of measured product dimensions can be displayed and logged for every tube.

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Figure 1 shows a typical system structure for wall thickness gauging of tubes. For wall thickness measurement one probe is required. In case of concentricity acquisition 3 or 4 probes are required.

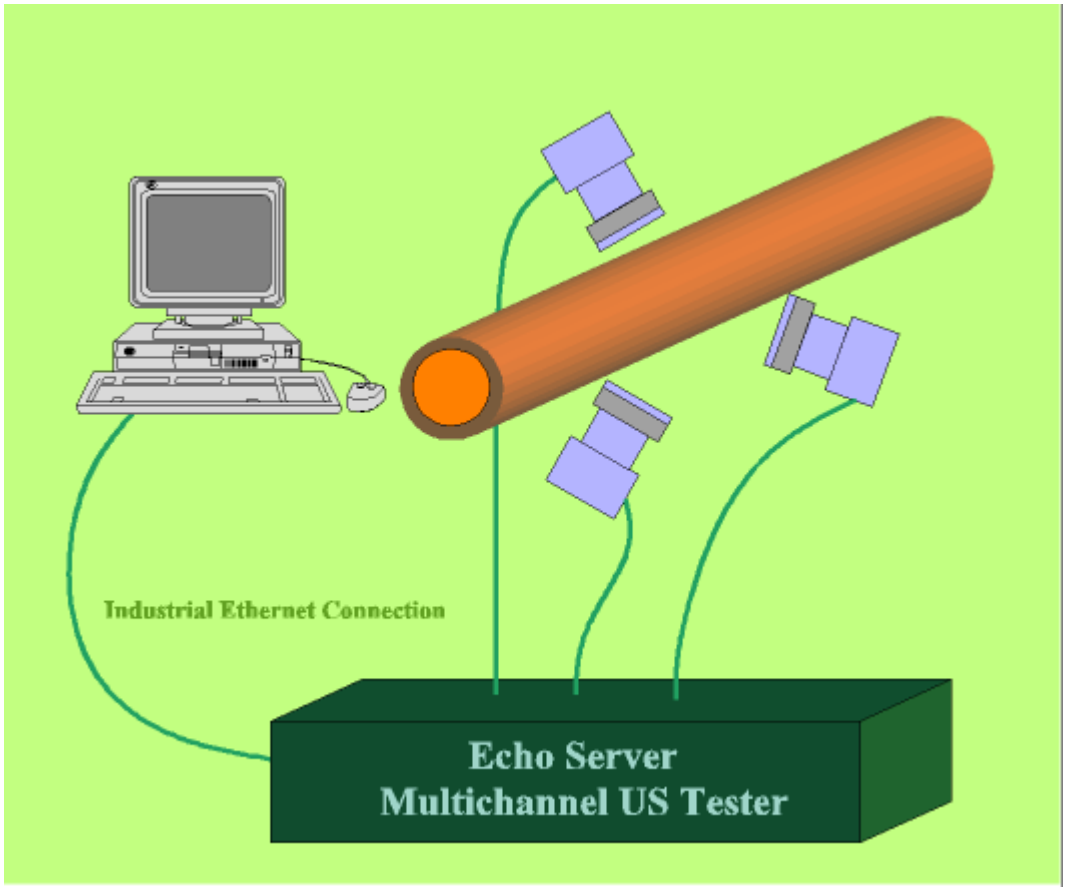

Figure 1 Echo Server - Wall thickness and eccentricity measurement system

Defect detection and evaluation

The GEMIT® Echo Server instrument in combination with PC based software FMS is intended for flaw and defect inspection in finished or semi-finished products. Detectable are discontinuities and irregularities. Up to 8 channels can be processed in real time with a repetition rate of up to 20.000 / second. This allows online monitoring and fault detection even at highest line speeds. The powerful signal processing guarantees highest resolution and defect detection. The total range for defect detection in depth is between 0 and 160 µs (0 - 800 mm in steel). With the build in I/O interface the unit can process incremental encoders. In this way it is possible to directly connect scanners. FMS software will graphically display and A- B- and C-scans. Up to 4 gates

with a resolution of 5 ns can be set and processed in real time by the software. With build in time gain control (TGC) it is possible compensate signal attenuation in the test material. TGC can be edited graphically and will be stored in the Echo Server unit. The real-time color graphic displays, shows control charts, parameters and scans. The software is capable to generate detailed statistical information and report generation for every part or for a complete production batch.

FEATURES / BENEFITS

- **Integrated System** monitors, controls and documents product quality.
- **Easy to Operate:** Create and store unlimited recipes using standard PC technology. The system can be used by operators with minimum training.
- **Turn-Key Solution:** Including ultrasonic sensors / assembly / pumps, PC, touch screen monitor, alarms, feedback control, and documentation
- **Zero Defect Production:** 100 % inspection means quicker set up times, reduced scrap and improved quality.
- **Reduce material costs:** Closed loop control allows much tighter control of process and reduction in material usage.
- **Flexibility:** Interfaces to standard PLC´s or controllers·
- **Easy set up:** By storing and recalling parameter setups in a PC system.
- **Adaptable:** From 1 – 8 ultrasonic channels for defect and wall thickness measuring with walls from 0.025 to 20mm, mm. Single, double or triple wall tubes can all be measured with one system.
- **System Hardware**: Completely contained in a sealed die cast aluminium case. Communication to PC over a high speed industrial ethernet network cable. PC with WindowsNT operating system provides security, networking, unlimited data storage and easy upgrades.
- **Quality Certification:** Real-time color graphic displays, showing control charts, histograms, SPC information for thickness and concentricity on wall, OD and ID dimensions