



1 *UltraSoundSystem (USS) connected to a Notebook.*

2 *Multi-Titer-Plate (MTP) Level Metering System.*

ULTRASOUND SYSTEM (USS I)

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System Description

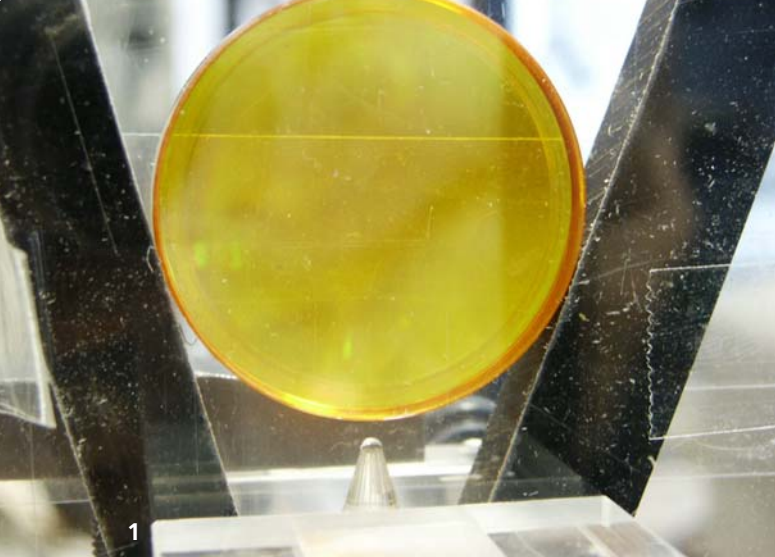
Fast data acquisition and logging are necessary in applications like ultrasound based quality control, monitoring or sonar mapping. In such applications the ultrasonic high-frequency-data have to be transferred to a PC for an analysis that requires no real-time-processing (off line or quasi off line). The most important requirement is the high speed transfer.

USS is a micro-controller (μC) based system that fulfills this requirement. The system is working in pulse echo mode. It can be multiplexed to a maximum of 8 channels so that several measurement paths can be served. The data transfer to the computer is done in USB 2.0 high speed mode.

Application

Ultrasound based flow and level metering as well as quantitative turbidity detection are flexible and reliable methods for process control in small and big facilities like hydroelectric power plants, sewage plants or production lines. Ultrasound is used for water and gas metering in homes as well as for level metering in tanks or vessels (MTP, figure 2).

The detection of flaws or the measurement of the thickness of liners are typical tasks in the quality control of sewer or fresh water pipes. Beyond the long term inspection of working facilities the technology is used for the final acceptance of new or reconstructed systems.



Further Applications

The 100%-control of manufacturing tolerances of parts or the quality control of laser lenses under operation conditions can be done by the use of appropriate sensors in combination with a fast and powerful hardware like the single channel system USS I. An integration of the system in existing quality management systems is possible.

Further applications for ultrasonic based quality control are material characterizations, the measurement of temperatures, the detection of concentrations, bubble detection, the measurement of the thickness of layers or films, viscosity control or containments in liquids, e.g. in milk, yogurt or liquid chocolate.

Specifications

Transmitter

Frequency	0 – 20 MHz
Output Voltage	max 90 Vpp (50 Ω)
Waveform	bidirectional
Waveshape	Burst, 1 – 256 Period

Receiver

Input Impedance	configurable
min. Input Voltage	20 μVpp
Amplifier	max 92 dB
Bandwidth	configurable
Standard Filter	configurable

Conversion

ADC	14 bit 60 MSPs
Memory	1 k– 256 k x 18 bit

Power Consumption

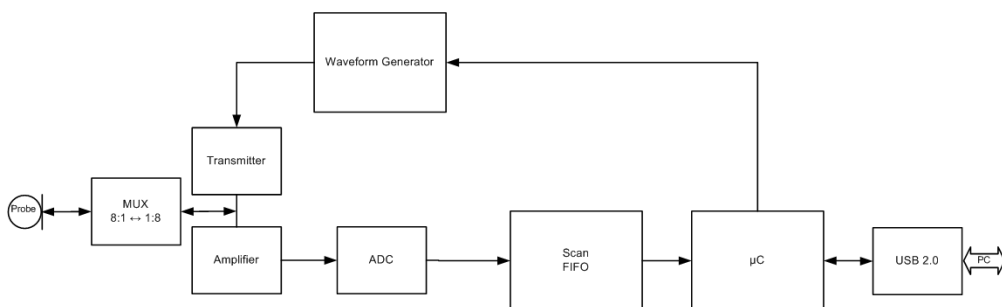
12 V, 500 mA

Multiplexer

Configurable up to 8 channels

Interfaces

USB 2.0 (high speed)
RS232
Stand Alone with external Power



1 Temperature-Measurement in a Glass-Lens.

2 Liner Thickness Measurement with USS.