

## **Medical Device Developments / December Ad & Profile**

Materials Due Date: November 10<sup>th</sup>

### **Reliable Fluid Sensing & Control**

Non-invasive liquid monitoring is essential for the automation and proper functionality of Medical Devices involving fluid transfer or processing. Cosense Ultrasonic sensor technology offers robust, cost-effective solutions which meet specific device requirements.

### **Company profile**

Cosense, Inc. designs and manufactures Ultrasonic sensors for non-invasive detection of Air Bubbles, Air-in-Line, Flow, Foam and Particles passing through tubing. Continuous & Point Liquid Level detection for various chambers, reservoirs, & containers are available for safely monitoring fluids thus avoiding fluid contamination.

Cosense, now entering its 20<sup>th</sup> year, is dedicated to the success of our customers by being a world class supplier of innovative ultrasonic liquid sensing products to control and maintain the safe and reliable operation of fluid handling systems.

### **For further information:**

Website: [www.cosense.com](http://www.cosense.com)

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As designs of automated Medical Devices and Lab Instrumentation involving fluid transfer and control have become more complex from one generation of product to the next, so too have the requirements for more accurate, compact and reliable sensors to monitor the condition of these fluids in tubing, chambers, reservoirs, microplates, etc. Specialized or custom sensor designs and functional parameters for each individual OEM, more so than standard products, have increasingly become a necessity to meet performance requirements.

Mechanical sensor details such as form factor, type of material, mounting features, cabling and connectors are customized to meet specifications. Electrical functionality is adjusted to meet specifications through a combination of circuit board design and software when required. Input voltages, output logic, response times, self-test features, sensitivity to air bubbles and liquid level resolution can be engineered into these sensors at the design stage. Sensors being integrated into devices, whose system wide operation include conditions such as EMI, RFI or MRI are designed with features to allow for functional compatibility.

### **Benefits of Ultrasonic Fluid sensing**

Ultrasonic sensors provide highly reliable detection of fluid vs. air bubbles or foam flowing through tubing and for various liquid level measurement applications in industries including Medical, Biotech, Aerospace, Semiconductor and others involving fluid control. Non-invasive or non-contact sensor designs only need interface with the outer surface of tubing or a fluid vessel in order to monitor fluids thus preventing contamination of a system.

Ultrasonic sensing technology helps to provide optimum precision and repeatability without succumbing to localized effects that can cause other technologies such as capacitive or optical to fail. Conditions such as ambient light reflection, changes in dielectric constants of fluids, opaqueness, discoloration or masking the interior wall of tubing and liquid, which could cause alternate technologies to fail, will not affect the proper operation of an ultrasonic sensor.

## **Automated Fluid Detection**

Cosense's Sonic Eye™ Ultrasonic fluid detection technology allows for versatile design options for integrating sensors into OEM devices. AD-101 series Air Bubble / Air-in-Line detectors with integral circuitry are non-invasive and will alarm when unwanted air bubbles or foam traveling through blood, plasma, saline solution and other fluids becomes present at the sensor. AD-101 bubble detectors are designed for Medical applications including Apheresis, Dialysis, Infusion, Contrast Media and other fluidic based devices. The sensitivity to air bubbles can be based on the customer's specification. Features such as "continuous self-test" or "self-test on demand" are available. Point Air Detectors are similar to AD-101 sensors in that these are for detecting air bubbles. In some devices, fluid cassettes, as opposed to conventional tubing, channel fluids through different pathways, while allowing for limited sensor access to the area where air bubbles need to be detected. In this case a single crystal ultrasonic detector acts as both the signal transmit and receive with just a single point of contact on the cassette.

Ultrasonic liquid level sensing can be achieved non-invasively by either monitoring continuous level or by individual point level at critical positions. Sensors based on Cosense SL-730 series will allow for high resolution bottom-up continuous level sensing with data transferred through an RS-232 interface. For point liquid level, the SL-630 offers a compact design with integral circuitry, which adheres to or is held in place against the side of a reservoir. When a transition occurs from liquid or air to the alternate state, the sensor will send out an alarm signal in order to prevent a process from failing.

Cosense ML series Ultrasonic "through-air" transmitters offer a high accuracy, non-contact method of performing fill verification in various test tubes, vials, multi-well microplates. A narrow beam of ultrasonic energy is transmitted from a sensor to the well being measured and a reflected signal is returned to the sensor off the air / liquid interface. The round trip transit time of the energy is calculated. The ML circuitry performs the signal processing to establish the height of the liquid in the well and to alarm if the liquid is not in the acceptable range established by the customer. ML series transmitters and circuitry are available in single and multi-channel systems to meet all lab automation requirements.