

Sector: Laboratory Automation**Sub-sector:** Liquid Handling Systems

Proportional Microvolume Capacitive Liquid Level Sensor Array

Information Summary

Reference Code:	ROI 05077
Technology overview:	Capacitance-based micro-volume liquid-level sensor array for non-contact sensing of liquid volumes in 96-well microplate geometry.
Application:	Modular device in HTS laboratory automation arrangements
Validation:	A 3×3 prototype liquid level sensor was designed and implemented as a proof of concept
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Technology Description

Present day systems biology and drug discovery research requires high-throughput laboratory automation. Researchers at McGill have developed a capacitance-based micro-volume liquid-level sensor array for non-contact sensing of liquid volumes in the standard 96-well microplate geometry. Operationally-independent, calibrated sensors transduce liquid-volumes (over an extremely wide range of liquid permittivity and conductivity) in the microliter range by measuring

the effective capacitance of a sensor while surrounding electrodes provide inter-sensor shielding.

Advantages

Automated laboratory systems for large-scale research in systems biology and drug discovery employ probe-based sensors that contact the liquid and have important shortcomings: potential for the cross-contamination of samples, inter-probe interference and limited accuracy. The new sensor array overcomes limitations inherent in probe-based sensors allowing liquid-volumes to be measured under non-contact conditions. The concept can therefore enhance the functionality of multi-well microplates on laboratory systems by offering a high level of automated control for a reliable execution of sophisticated protocols.

Market Opportunity

The sensor represents an elegant solution to an unfilled need in liquid-handling systems for quantitative, parallel, on-line sample monitoring and will be an essential component of next-generation closed-loop automated platforms employing the microplate format.

Additional Reference Material:

Seliskar DP, Waterbury RG, and Kearney RE. Proportional Microvolume Capacitive Liquid Level Sensor Array. Conf Proc IEEE Eng Med Biol Soc., 2005, 7(1): 7258-7261.