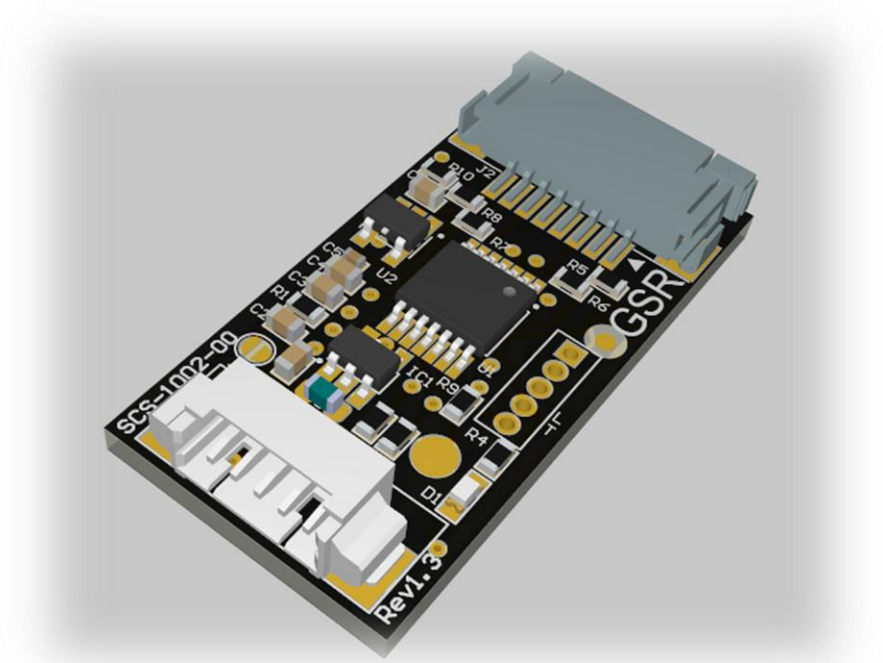
Data Sheet

Absolute Capacitive Level Sensor

SCS-1002-00



Version	1.0
Data	01/02/2025

Revision History

Revision	Data	Description
1.0	01/02/2025	First draft

GSR Technology Italy contacts

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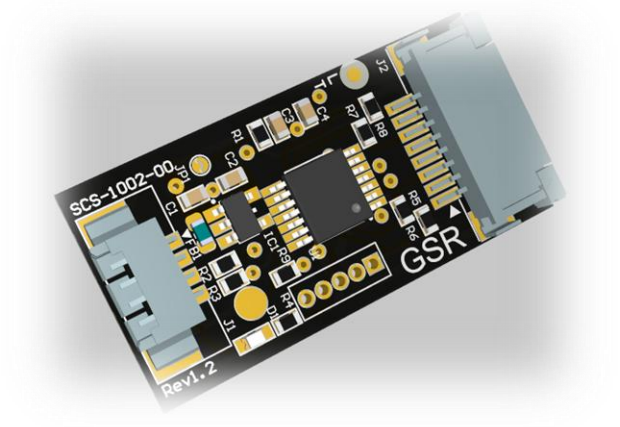
SCS-1002-00 – Absolute Capacitive Sensor

Plug-in, low cost, high sensitivity, superior noise immunity capacitive sensor for embedded applications.



The SCS-1002-00 sensor is designed to detect a level of a liquid, bulk-solid and powder materials enclosed in NOT conductive containers, silos, vessels, tanks, filling inlets, reservoirs, etc. The sensor does not require to be in direct contact with the media under measurement and typically can be mounted externally to the containers (NOT metallic neither conductive). Thanks to its smart and advanced technology based on the electric field analysis, the sensor has a superior sensitivity and very high noise immunity compared to classical solutions realized by capacitive sensing.

The active measuring pads are implemented using a common 8 pin FFC (having an arbitrary length) with pitch 1mm: for a comprehensive measurement, the FFC must be firmly attached (glued) to a wall parallel to the tank, minimizing the air gap as much as possible. The FFC can be installed on the sensor via ZIF connector or soldered to the PCB if needed.

Standard Operating Conditions

	Min	Typ	Max	Unit
Supply Voltage	3.7	5	5.5 (1)	V
Supply Current	-	3.5	4	mA
Temp. Range	0		85	°C Internally compensated
Output Signal	-	Analog 0-3.3V	-	V
Sensor Size	-	15 x 30 x 3.6 (2)	-	mm
Type of connector	Molex PicoBlade 53261-0471 (3)			
Fixing and installation	Mechanical tracks, Dual Side Tape, Silicone or Epoxy resin			

(1) A version compatible with input voltages up to 30V is available upon request
(2) 1.6mmis the PCB thickness, 3.6 mm is the thickness considering components connector excluded
The length does not include the FFC used as active measurement pad
(3) Match with Molex PicoBlade 51021-0400

Typical application

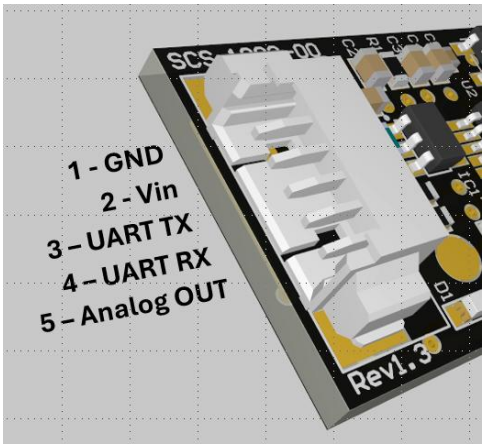
The sensor is suitable for Home Appliance, Home Automation and Industrial application.

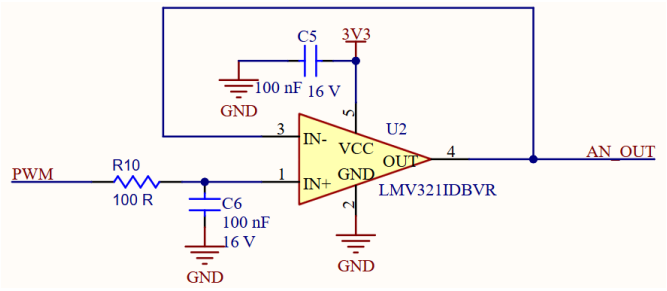
Main features	Typical applications
➢ High reliability ➢ Very high sensitivity ➢ Superior immunity to electrical noise ➢ Temperature stability due to internal compensation ➢ One shot calibration (minimum and maximum readable value) ➢ No need of direct contact between the sensor and the media	➢ Home appliances • Water level sensor for coffee machines • Coffee Grain presence • Water level sensor for dryer • Water level sensor for steam oven • Liquid inside tanks in general ➢ Home automation • Rain sensor • Closure switch • Spas, bathtubs ➢ Industrial • Floor cleaning machines water level sensor • Material detection in silos • Grain detection

Pin Out Connections

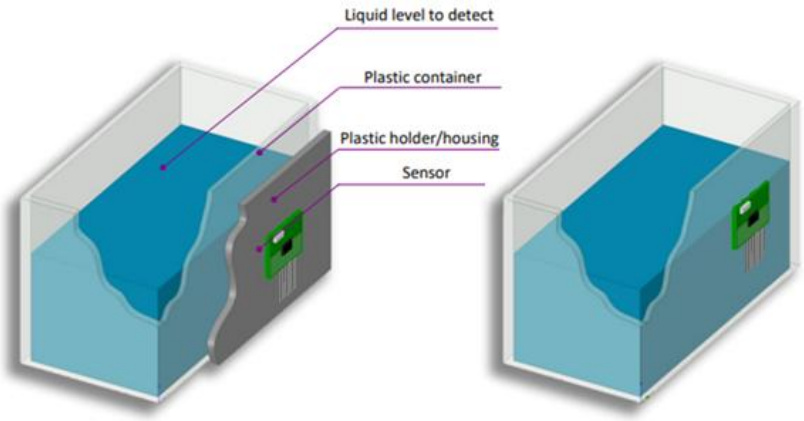
The UART RX/TX pins are always active and are responsible for receiving/transmitting commands/data from/to the host: commands are necessary to change the configuration parameters, data are useful to monitor the interaction between sensor and environment. The UART operates at 115200, 8n1.

By its nature, the sensor output must be a continuous analog quantity: the SCS1002-00 is equipped with a digital-to-analog converter that provides a voltage output (in low impedance in the range 0-3.3V) proportional to the value read.



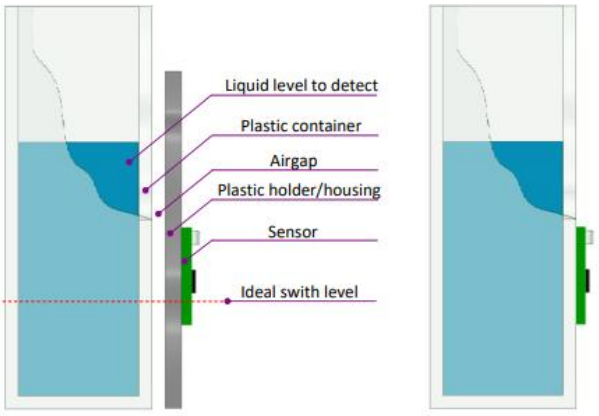


Typical Use case: Water Level Sensor



Implementation for removable container case

Direct application on container wall

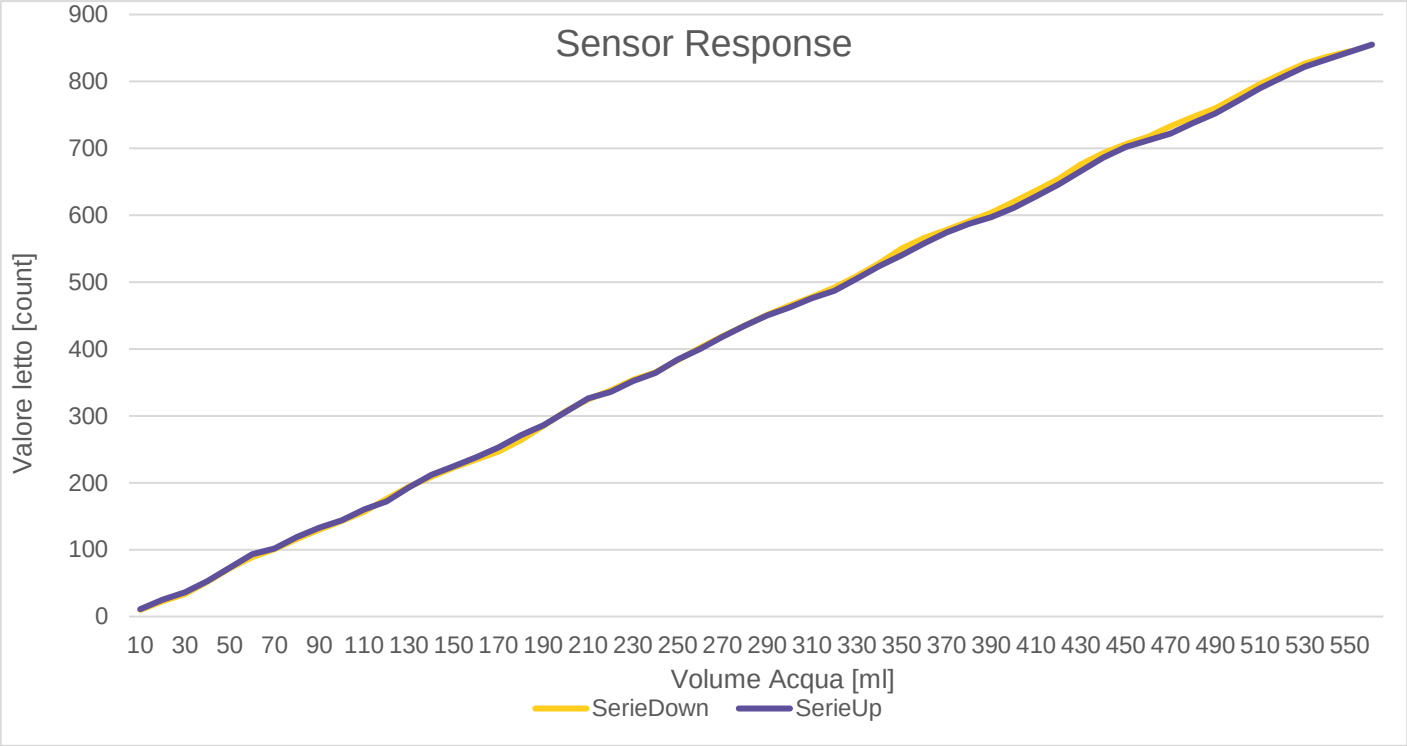


Implementation for removable container case Stack-up view

Direct application on container wall Stack-up view

Performances

In the follow, a sensor response is shown considering the injection (SerieUp) and subsequent extraction (SerieDown) of liquid into a PETG tank (95 x 95 x 70 mm) with steps of 10ml of water each.



The characterization has been conducted at a temperature of 20°C; however, the sensor is equipped with a temperature meter that allows to compensate the performances in the range 0-85°C.

your embedded partner

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