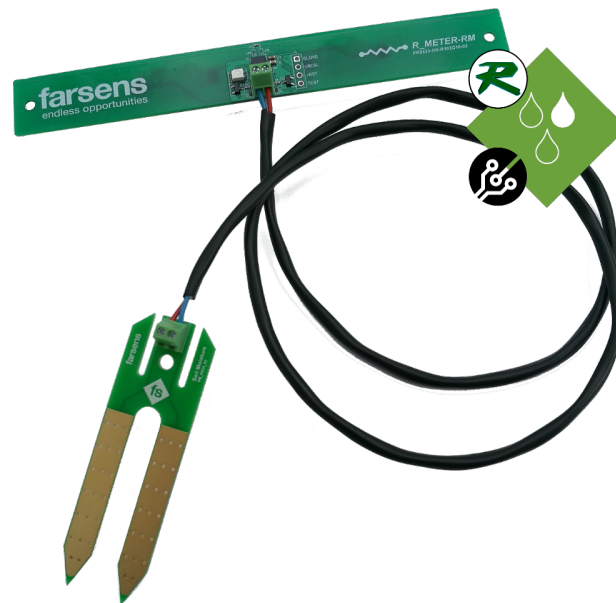


## EPC C1G2 BATTERYLESS SOIL MOISTURE SENSOR

Check for samples: [EVAL01-HYDRO-RM-H402](#)



### FEATURES

- EPC C1G2 compliant
- ISO 18000-6 Type C compliant
- 160-bit EPC Bank: Up to 128-bit EPC
- 96-bit TID Bank: Up to 48-bit Serial Number
- Available User Memory: Up to 1008-bit Non Volatile User Data
- Long range in passive mode: 5m
- Extended range in battery assisted passive mode: 20m
- Resistive soil moisture sensor
- Pick to light indicator for visual identification

### DESCRIPTION

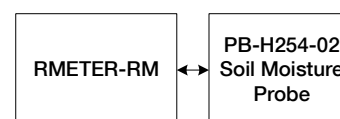
HYDRO-RM-H402 is an EPC Class-1 Generation-2 (C1G2) RFID tag based on Farsens' batteryless sensor technology. Built in a compact PCB format, the tag includes soil moisture sensor.

These RFID sensor tags are compatible with commercial UHF RFID readers (EPC C1G2). With a 2W ERP setup the battery-less resistance meter can communicate to over 5 meters - 16 feet.

The HYDRO-RM-H402 can be customized with different antenna design and sizes, depending on the specific application. It can be encapsulated in an IP67 or IP68 casing for usage in harsh environments. It may also be possible to customize the specifications of the sensor upon request.

### BLOCK DIAGRAM

The HYDRO-RM-H402 tag consists of an RMETER-RM batteryless resistance metering device and a PB-H254 resistive soil moisture probe.



## CHARACTERISTICS

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
<b>RFID</b>					
$r_{operation}$	Operation range full passive		5		m
	Operation range BAP		15		m
	Operation range EBAP		20		m
<b>OPERATING CONDITIONS</b>					
$T_{OP\_TOP}$	Operating temperature range	-40		85	°C
<b>MOISTURE PROBE</b>					
$R_{wet}$	Resistance wet		100		$\Omega$
$R_{dry}$	Resistance dry		10M		$\Omega$

## MOISTURE CONVERSION

The resistance of the device connected to HYDRO-RM-H402 can be read using standard EPC read commands. Refer to the documentation of RMETER-RM for detailed instructions.

Once the resistance value of the probe has been read, the value has to be converted to the equivalent moisture level. Given that the resistivity of the soil depends on its specific characteristics the conversion may need some customization or calibration. As an example, the following equation can be used to convert the resistance value into a qualitative soil moisture percentage level in a generic way:

$$soil\ moisture\ [\%] = \frac{8 - \log(resistance)}{6} \times 100 \quad (1)$$

## DEMO SOFTWARE

Demonstration software to read and control the HYDRO-RM-H402 is available in the web. Download the latest software and user guide at: <http://www.farsens.com/software.php>. Check the website for updated reader compatibility list. Up to the date of writing this document, this is the status of the compatibility list:

Fixed readers			
Manufacturer	Model	Tested HW rev.	Tested FW rev.
Impinj	R420	HLA: 1.00   PCBA: 4.00	5.12.1
Impinj	R220	-	-
Impinj	R120	-	-
Nordic ID	Sampo	PWM00282	5.4 A
Nordic ID	Stix	PWM00226	5.10 A

## REFERENCES

The next table shows the available references of the HYDRO-RM-H402.

Ref.	Name	Description
40902	EVAL01-HYDRO-RM-H402-DKWB	HYDRO-RM-H402, dipole wideband antenna, PCB format

For custom references with other antennas and housings, please contact us at [sales@farsens.com](mailto:sales@farsens.com).