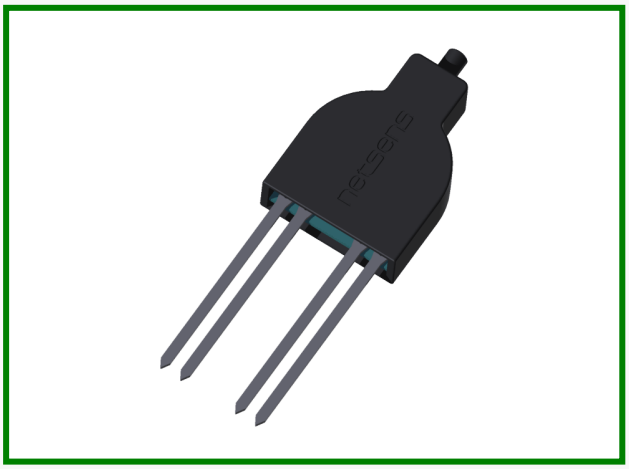
Sensing the Environment

EC Sense – Soil conductivity sensor
PS-0084-CF

EC Sense

Main features:
- Measure of electric conductivity in water or soil
- Four electrodes operating principle
- Stainless steel and epoxy for full water immersion
- RS485 serial output (on request: MODBUS RTU)
- Internal temperature compensation
- Internal digital measuring circuit

Applications:
- Fertilizer dosage
- precision agriculture



Description

EC Sense measures electric conductivity in a liquid solution. It can be used for measuring conductivity in a soil sample, for evaluating ions concentration.

This application is useful for assessing the amount of fertilizers in the soil, and when applicable, for regulating fertilizers dissolved in irrigation water.

The sensor operates on a four electrodes principle: this solution provides relevant benefits with respect to standard two-electrodes sensors; it allows to make the measurement independent of the type of electrodes and by their condition, ensuring accurate and stable measurements over time.

Internal microcontroller acquires measured data and automatically compensates for temperature.
EC Sense features RS485 serial output, for data retrieving and parameters set-up. The sensor can be connected with Netsens MeteoSense stations and7or AgriSense/VineSense wireless acquisition units.
On request, it can be configured with MODBUS RTU RS485 protocol.
Power supply must be in the 3.3 – 5.0 VDC range.

Dimension:

180x56x19 mm

Electrical specification:

Power supply: 3.3 – 5.0 VDC
Current consumption: < 50 mA
Output interface:
- WSCOMM Serial: RS485, 115200 bps
- MODBUS RTU: RS485, 19200 bps

Wiring diagram:

Signal	Color
Vcc	Brown
Ground	White
RS485 A	Yellow
RS485 B	Green

Technical specification:

Conductivity:
operating temperature: -20 +50 °C
Output: 0 – 15 dS/m (0 – 15 mS/cm)

Soil temperature:
Accuracy: 1 %
Resolution: 1 ° C
Output: - 20 + 50 ° C

Environmental protection: IP67
Standard cable: 300 cm

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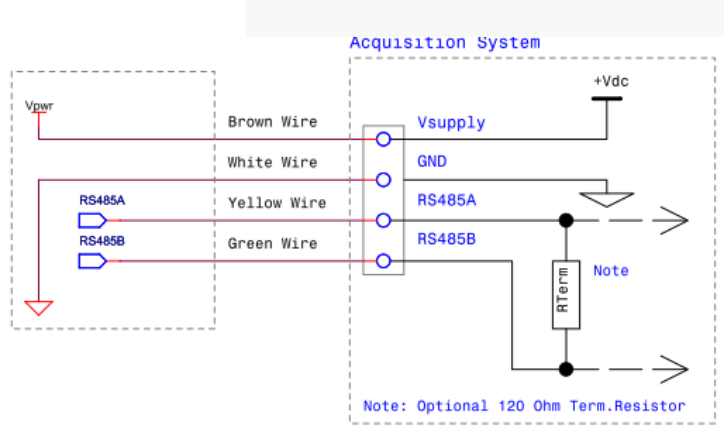
Electrical wiring:



RTU Modbus configuration (to be requested at order time):

The EC Sense can be requested to operate in MODBUS RTU RS485 mode. Configuration parameters are in the following:

- Serial configuration: 19200,n,8,1
- Device ID: 58
- Register address from 1 to 2, UINT16 (0x0000 > 0xFFFF)
- Output data:
  Register 1: Temperature x 10
  Register 2: EC x 100

Example:
Register 1, value 201 > T=20.1°C
Register 2, value 317 > EC=3.17 dS/m

Installation:

The soil conductivity sensor can be installed in the soil at different depths to measure the soil conductivity around the root system of plants.
Thanks to the plastic housing that covers the electronics and special insulating paint coating, the sensor is completely sealed and immune to attacks and dissolved salts in the soil.
For proper operation, during installation you must take care to meet the following requirements:
- Drill a hole in the soil depth to be achieved and a diameter of 10 cm.
- Grasp the sensor from the plastic (cable side) and insert the sensor into the hole, making it fully penetrate into the ground.
- Take care that the earth adheres to the sensor, to ensure uniformity of measurement.
- Only in the case of ground very dry, moisten with water.
- Cover the sensor with the ground up to fill the hole.

WARNING:
Pay attention in correctly connecting the power cables, reverse polarity could affect the integrity of the sensor and cause irreversible damage.
In case of mechanized operations, please signal the sensor position in order to allow operators to avoid damaging the sensor.
Do not use solvents for cleaning. Do not pull the sensor using the cable, always hold for the plastic sensor body. Do not contaminate the electrodes with chemical or corrosive substances.

Traceability, packaging and shipping:

Each sensor PS-0084-CF is individually tested and a unique serial number identification is assigned, which allows tracking over time; this code can be printed on the shipping carton, on the sensor itself or alternatively on the appropriate section of the user manual. Please keep this code carefully, to be communicated to the technician in case of failure or replacement.

Sensing the Environment

EC Sense – Soil conductivity sensor PS-0084-CF

The sensors are sold individually equipped with its own package, which will protect the sensor during transport.
If the box is open or visibly damaged, don't accept delivery by courier. Do not open the box with knives, cutter blades, which could damage the sensor or its cable.

Ordering codes:

CODE	DESCRIPTION
PS-0084-CF	Conductivity sensor, serial WSCOMM output with 3 m cable
PS-0084-CF-M	Conductivity sensor, serial MODBUS RTU RS485 output with 3 m cable

Warranty:

Netsens s.r.l. warrants that the above described components will be free from defects in material and workmanship for the following time period from the purchasing:

- Two years for items purchased by final users for non professional use;
- One year for items purchased by companies and organizations for professional use.

This warranty is valid only if all the components are used accordingly to the Manufacturer's indication and to the recommendations included in this User Manual.
This warranty does not cover: batteries, fuses, lights and any other consumable equipment. Also this warranty does not apply for damages due to neglect, misuse, contamination, alteration, accident or abnormal conditions of operation or handling, including failures caused by use outside Manufacturer specifications.
This warranty covers the original purchaser and it is not transferable.
If one or more components are supposed to be defective, contact Netsens s.r.l. or your local reseller in order to obtain a valid return authorization.
Netsens s.r.l. shall not be liable for any special, indirect, incidental or consequential damages or losses, arising from any cause.
Please contact Netsens s.r.l. for any additional information concerning warranty.

Disposal of Waste Electrical & Electronic Equipment:

The symbol (crossed out wheeled-bin) on your product indicates that the product shall not be mixed or disposed with your household waste at their end of use.
The product shall be handed over to your local community waste collection point for recycling of the product.
For more information, please contact your Government Waste Disposal department in your country.
Inappropriate waste handling could possibly have a negative effect on the environment and human health due to potential hazardous substances.
With your cooperation in the correct disposal of this product, you contribute to reuse, recycle and recover the product and our environment will be protected.

Revisions:

Date	Version	Page(s)	Notes
21/06/2013	1.0	1-3	First release
29/03/2017	1.1	1-3	Update with MODBUS version

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