Smart Water Ions Sensor Guide
Development website
Search

Initial page
General
New version: Smart Water Ions v3.0
Waspmote Plug & Sense!
Ions measurement
Ion Selective Electrode (ISE) sensors frequent questions and answers
Before calibrating sensors
Hardware
Sensors
Calibration process
Board configuration and programming
Consumption
Safety Guides
Documentation changelog
Maintenance
Disposal and recycling

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Waspmote Plug & Sense!

Smart Water Ions

The Smart Water Ions model specializes in the measurement of ions concentration for drinking water quality control, agriculture water monitoring, swimming pools or waste water treatment. The PRO sensors have higher performance than the former Single and Double sensors.

The Smart Water line is complementary for these kinds of projects, enabling the control of parameters like turbidity, conductivity, oxidation-reduction potential and dissolved oxygen.

Figure: Smart Water Ions Waspmote Plug & Sense! model

PRO

This special variant integrates extreme quality sensors, with better performance than the former Single or Double lines. In this case, there is only one type of reference probe and up to 16 different ion parameters can be analyzed in 4 sockets.

Sensor sockets are configured as shown in the table below.

Sensor Socket	Sensor probes allowed for each sensor socket (Parameter)	Sensor pr each sens (Referenc
A, B, C or D	Ammonium Ion (NH4 +) [PRO]	9412
A, B, C or D	Bromide Ion (Br-) [PRO]	9413
A, B, C or D	Calcium Ion (Ca2+) [PRO]	9414
A, B, C or D	Chloride Ion (Cl-) [PRO]	9415
A, B, C or D	Cupric Ion (Cu2+) [PRO]	9416
A, B, C or D	Fluoride Ion (F-) [PRO]	9417
A, B, C or D	Iodide Ion (I-) [PRO]	9418
A, B, C or D	Lithium Ion (Li+) [PRO]	9419
A, B, C or D	Magnesium Ion (Mg2+) [PRO]	9420
A, B, C or D	Nitrate Ion (NO3 -) [PRO]	9421
A, B, C or D	Nitrite Ion (NO2 -) [PRO]	9422
A, B, C or D	Perchlorate Ion (ClO4 -) [PRO]	9423
A, B, C or D	Potassium Ion (K+) [PRO]	9424
A, B, C or D	Silver Ion (Ag+) [PRO]	9425
A, B, C or D	Sodium Ion (Na+) [PRO]	9426
A, B, C or D	pH [PRO]	9411
E	Reference Sensor Probe [PRO]	9410 (incl
F	Soil/Water Temperature	9255-P (in

Figure: Sensor sockets configuration for Smart Water Ions model, PRO variant

> ⓘ For more technical information about each sensor probe, go to the Sensors section on this guide:

Sensors

Differences between Ion Sensors and Ion Sensors PRO

> ⓘ Libelium discontinued the Single and Double variants. The Smart Water Ions PRO variant continues with no change.

Ions sensors are divided into two different groups: the normal ion sensor line and the PRO ion sensor line. The normal sensors are divided into Single and Double. It is important to know that it is not possible to combine the different groups of sensors (Single, Double and PRO). Each group has its own reference probe, and the reference probe can only be used with the corresponding sensors of that group:

- Normal Ion Sensors (discontinued):
  - Single Junction Reference Probe
  - Double Junction Reference Probe
- PRO Ion Sensors
  - Smart Water Ions Reference Sensor Probe [PRO]

The main differences between the normal sensors and the PRO sensors are:

- Increased stability on time: PRO sensors are more stable and require less calibration and maintenance.
- Versatility: PRO sensors can be combined freely because all of them use the same reference probe.
- Modularity: The sensors of the PRO line are interchangeable, so you can measure different ion parameters just changing the header.
- Construction: PRO sensors are based on the technology of solid state carbon nanotubes.
- More parameters: The PRO line allows to measure parameters like Magnesium and Sodium; these ions are very important for hydroponics applications.

> ⓘ The calibration and maintenance processes depend on the external conditions and the final usage of the sensor.

Smart Water

The Smart Water model has been conceived to facilitate the remote monitoring of the most relevant parameters related to water quality. With this platform you can measure more than 6 parameters, including the most relevant for water control such as dissolved oxygen, oxidation-reduction potential, pH, conductivity and temperature. An extremely accurate turbidity sensor has been integrated as well.

The Smart Water Ions line is complementary for these kinds of projects, enabling the control of concentration of ions like Ammonium (NH4+), Bromide (Br-), Calcium (Ca2+), Chloride (Cl-), Cupric (Cu2+), Fluoride (F-), Iodide (I-), Lithium (Li+), Magnesium (Mg2+), Nitrate (NO3-), Nitrite (NO2 -), Perchlorate (ClO4-), Potassium (K+), Silver (Ag+), Sodium (Na+) and pH. Take a look to the Smart Water Ions line in the previous section.

Figure: Smart Water Plug&Sense! model

Sensor sockets are configured as shown in the table below:

Sensor Socket	Parameter	Reference
A	pH	9328
B	Dissolved Oxygen (DO)	9327
C	Conductivity	9326
E	Oxidation-Reduction Potential (ORP)	9329
F	Soil/Water Temperature	9255-P (in
F	Turbidity	9353-P

Table: Sensor sockets configuration for Smart Water model

> ⓘ For more technical information about each sensor probe, go to the Smart Water Sensor Guide.

Smart Water Xtreme

Smart Water Xtreme was created as an evolution of Smart Water. This model integrates high-end sensors, calibrated in factory, with enhanced accuracy and performance. Their reduced recalibration requirements and robust design enlarge maintenance periods, making it more affordable to deploy remote Smart Water applications. This line includes a great combination of the most significant water parameters like dissolved oxygen, pH, oxidation-reduction potential, conductivity, salinity, turbidity, suspended solids, sludge blanket and temperature.

Figure: Smart Water Xtreme Waspmote Plug & Sense! model

Sensor sockets are configured as shown in the table below:

Sensor	Sensor probes allowed for each sensor socket **(Parameter)**	Sensor pr each sens **(Referenc**
A, B, C, D and E	Optical dissolved oxygen and temperature OPTOD	9488-P
A, B, C, D and E	Titanium optical dissolved oxygen and temperature OPTOD	9489-P
A, B, C, D and E	pH, ORP and temperature PHEHT	9485-P
A, B, C, D and E	Conductivity, salinity and temperature C4E	9486-P
A, B, C, D and E	Inductive conductivity, salinity and temperature CTZN	9487-P
A, B, C, D and E	Turbidity and temperature NTU	9353-P
A, B, C, D and E	Suspended solids, turbidity, sludge blanket and temperature MES5	9490-P
A, B, C, D and E	COD, BOD, TOC, SAC254 and temp StacSense, 2 mm path	9500-P
A, B, C, D and E	2COD, BOD, TOC, SAC254 and temp StacSense, 50 mm path	9501-P
A, B, C and D	Radar level VEGAPULS C21	9514-P
A and D	Temperature, air humidity and pressure	9370-P
A and D	Luxes	9325-P
A and D	Ultrasound	9246-P
F	Total coliform bacteria, TLF, turbidity and temperature Proteus	9513-P
F	Manta+ 35A sensor probe	9502-P
F	Manta+ 35B sensor probe	9503-P
F	Chlorophyll sensor for Manta probe	72470
F	BGA sensor for Manta probe	72471
F	Organic matter CDOM/FDOM sensor for Manta probe	72472
F	Ammonium sensor for Manta probe	72473
F	Nitrate sensor for Manta probe	72474
F	Chloride sensor for Manta probe	72475
F	Sodium sensor for Manta probe	72476
F	Calcium sensor for Manta probe	72477
F	Bromide sensor for Manta probe	9504-P
F	Total Dissolved Gas TDG sensor for Manta probe	9505-P
F	Rhodamine sensor for Manta probe	9506-P
F	Crude oil sensor for Manta probe	9507-P
F	Refined oil sensor for Manta probe	9508-P
F	Flourescein sensor for Manta probe	9509-P
F	Optical brighteners sensor for Manta probe	9510-P
F	Tryptophan sensor for Manta probe	9511-P

Table: Sensor sockets configuration for Smart Water Xtreme model

> ⓘ For more technical information about each sensor probe, go to the Smart Water Xtreme Sensor Guide.

Smart Security

The main applications for this Waspmote Plug & Sense! configuration are perimeter access control, liquid presence detection and doors and windows openings. Besides, a relay system allows this model to interact with external electrical machines.

Figure: Smart Security Waspmote Plug & Sense! model

> ⓘ The probes attached in this photo could not match the final location. See next table for the correct configuration.

Sensor socket	Parameter	Reference
A, C, D or E	Temperature + Humidity + Pressure	9370-P
A, C, D or E	Luminosity (Luxes accuracy)	9325-P
A, C, D or E	Ultrasound (distance measurement)	9246-P
A, C, D or E	Presence - PIR	9212-P
A, C, D or E	Liquid Level (combustible, water)	9239-P, 92
A, C, D or E	Liquid Presence (Point, Line)	9243-P, 92
A, C, D or E	Hall Effect	9207-P
B	Liquid Flow (small, medium, large)	9296-P, 92
F	Relay Input-Output	9270-P

Table: Sensor sockets configuration for Smart Security model

As we see in the figure below, thanks to the directional probe, the presence sensor probe (PIR) may be placed in different positions. The sensor can be focused directly to the point we want.

Figure: Configurations of the Presence sensor probe (PIR)

> ⓘ For more technical information about each sensor probe, go to the Events Sensor Guide.

Previous
New version: Smart Water Io...
Next
Ions measurement

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