# Makes precision irrigation possible

Grodan GroSens MultiSensor System








Grodan®

Part of the ROCKWOOL Group

# The Grodan GroSens MultiSensor System

The patented GroSens system is an ideal measurement tool for growers, making precision irrigation possible through accurate measurement and detailed display of the water content (WC), electrical conductivity (EC) and temperature levels in the stone wool substrate.

The GroSens system enables 24/7 real-time insight into the WC, EC and temperature of the stone wool substrate. The system can be connected to most climate-control computers, to provide an instant, continuous display of the data in graph form. Besides this, it also enables more detailed information to be displayed on any external computer connected to the grower's Internet / Ethernet. This provides valuable, timely information and guidance for optimising the irrigation strategy, allowing growers to improve the yield and quality of their crops. In combination with Grodan stone wool substrates and advice, the GroSens system makes it possible for the grower to optimise production and identify cost savings. In short, using the GroSens system enables Precision Growing. The GroSens system, in combination with Grodan stone wool substrate products and advice, is the best way of achieving optimum results.

## Precision Growing

With its focus on using the minimum input materials to generate the maximum output, Precision Growing is the most efficient and effective form of growing. It not only reduces growing costs but increases crop yield and quality. What's more, this form of growing actively contributes to sustainable horticulture.



GroSens MultiSensor



GroSens MultiSensor

Grodan® GroSens

# The Basic Set

## GroSens Sensor (wireless)

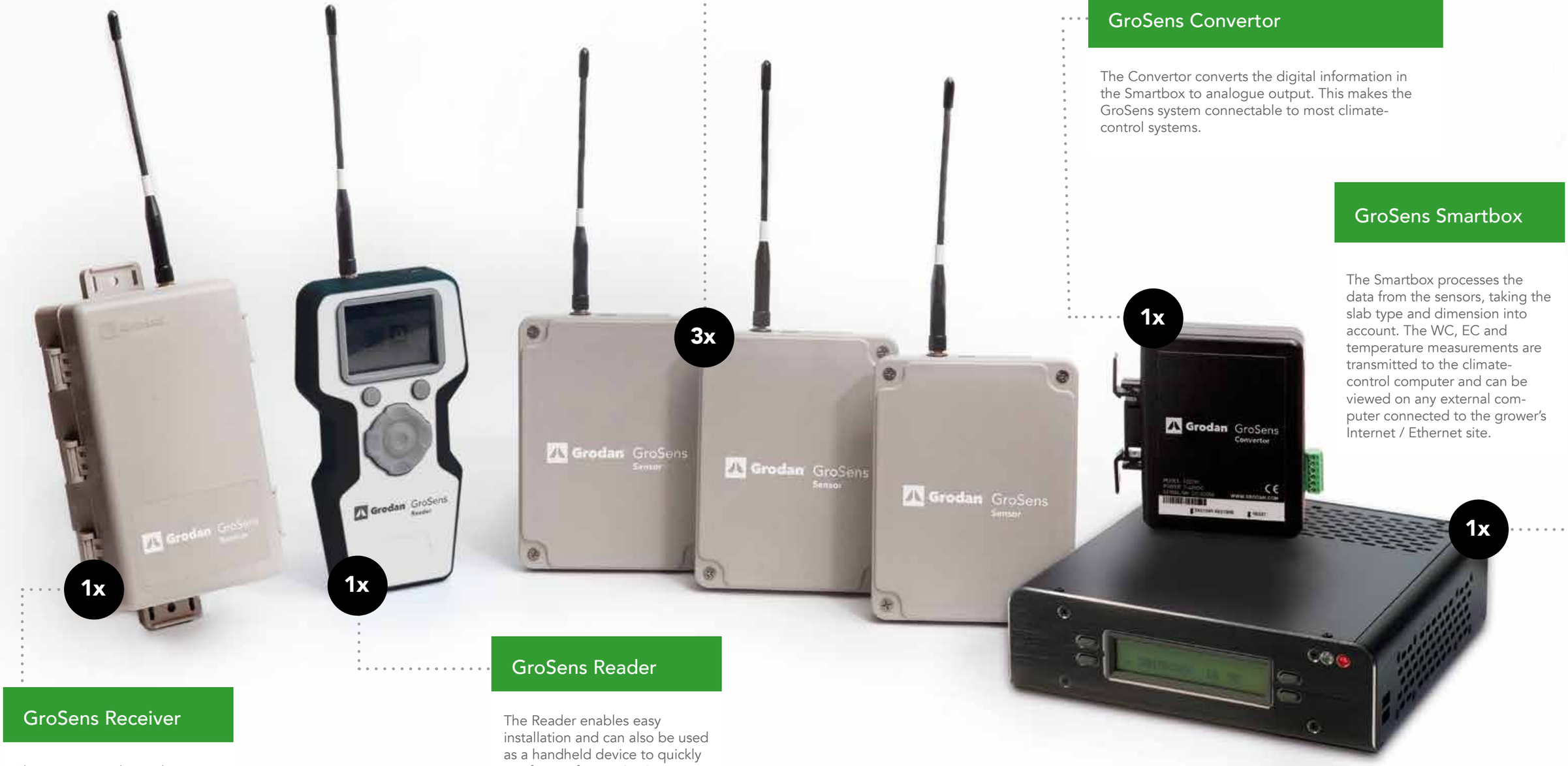
The Sensors give an extremely accurate measurement of WC, EC and temperature in the stone wool substrate.

## GroSens Convertor

The Convertor converts the digital information in the Smartbox to analogue output. This makes the GroSens system connectable to most climate-control systems.

## GroSens Smartbox

The Smartbox processes the data from the sensors, taking the slab type and dimension into account. The WC, EC and temperature measurements are transmitted to the climate-control computer and can be viewed on any external computer connected to the grower's Internet / Ethernet site.




## GroSens Receiver

The Receiver picks up the signals from the Sensors.

## GroSens Reader

The Reader enables easy installation and can also be used as a handheld device to quickly get figures from a GroSens sensor as you walk through the greenhouse.

The GroSens System, -Smartbox, -Sensor and Sensor design, are patented technologies.

# Benefits

**1** Highly accurate WC measurement

**2** Highly accurate EC measurement

**3** Highly representative WC and EC figures

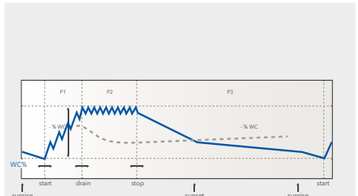
**4** Flexibility in measuring

**5** Custom made configurations possible

## 1 Highly accurate WC measurement

Highly accurate, 24/7 insights into the WC. Based on statistically reliable trials, the GroSens system measures the WC more accurate than existing water content meters (WCM).

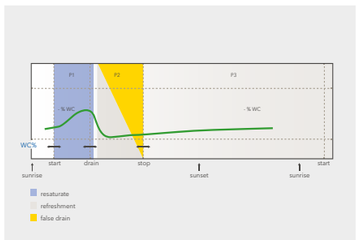
The GroSens system, with its highly improved WC measurement, is an indispensable instrument for growers who want to use professional precision irrigation to achieve optimal yield and quality. Accurate WC measurements in the stone wool substrate - supplied throughout the day and night - allow growers to exert great control over their crops. The measured values are immediately displayed as graphs on the climate-control computer and/or any external computer, providing the detailed, accurate information that enables precision irrigation. When connected to an external computer, connected to the grower's network, the GroSens system makes it possible to read the detailed values for each sensor.




## 2 Highly accurate EC measurement

Highly accurate, 24/7 insights into the EC. Based on statistically reliable trials, the GroSens system measures the EC more accurate than existing WCM's.

Highly improved EC measurement takes accurate control of EC levels to the next level. For growers who want precision EC management, the GroSens system will enable this, opening the way for further yield optimisation and improved quality. Accurate EC measurements in the stone wool substrate - supplied throughout the day and night - enable growers to exert greater control over their crops.








## 3 Highly representative WC and EC figures

More measurement points lead to more representative WC and EC figures in the irrigation section.

The GroSens system starts with 3 sensors. However, the more sensors you install, the more accurate your insight into the WC and EC situation in the greenhouse will be. Additionally, the GroSens measures with double the amount of measuring points, providing more reliable data. This combination leads to much more representative WC and EC figures on the irrigation section that the crop is steered on. Accurate figures are crucial for determining the right precision irrigation strategy. The optimum irrigation strategies for each irrigation section lead to optimum results.



## 4 Flexibility in measuring

The wireless sensors allow tremendous flexibility in where you can measure in the greenhouse. They are easy to install and easy to replace.

With the GroSens system, it's extremely easy to position the wireless sensors in any pre-defined irrigation section in the greenhouse whenever needed. Changing the position of the sensors during the growing season can be done in a few seconds. This makes it possible to read WC and EC data from any predetermined location in the greenhouse at any time. Measuring representative slabs leads to better WC and EC management. Moreover, this flexibility in positioning the sensor will not lead to additional installation costs. The wireless systems also eliminate the risk of accidentally cutting electricity cables during the growing season.



## 5 Custom made configurations possible

Because the GroSens system is modular, it can be scaled to multiple configurations.

The GroSens Basic Set has been designed to guarantee reliable, representative WC and EC figures for one watering section. Depending on the size of the greenhouse, and if the grower wants to take the next step in precision irrigation, all of the components in the GroSens Basic Set are available separately. This makes it possible to configure the GroSens system perfectly for each grower, individually.



# GroSens System

## Legenda

- wireless
- CAT5, CAT6, UTP or Ethernet cable

Greenhouse ← → Grower's office

## GroSens Receiver



Centrally positioned in the greenhouse

## GroSens Smartbox




Close to the climate computer

## GroSens Convertor



In between Smartbox and climate computer

## GroSens Sensors



In the stone wool slab

## GroSens Reader



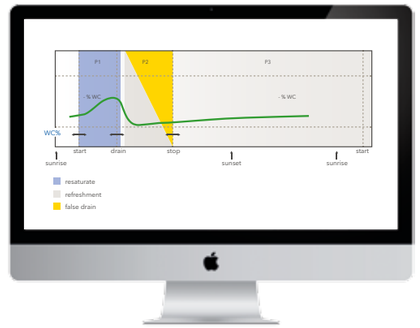
Handheld device

## Computer



Connected to grower's Internet / Ethernet

## Climate computer



GroSens MultiSensor




# Product specifications

- The most reliable, representative WC and EC measurements (WCM) available 24/7
- WC measurements in the range between 0-100%
- EC measurements in the range between 0-10 mS/cm
- Temperature measurements in the range between 0 and 50 degrees Celsius
- Connectable to most climate-control computers
- Detailed information on WC and EC data can be obtained via any computer connected to the grower's Internet / Ethernet

# System requirements / technical attention points

- Availability of Internet / Ethernet in the grower's office
- Sensors need to be placed within a 50-metre radius of the receiver
- A CAT5 or CAT6 UTP cable for connecting the Receiver to the Smartbox (in the grower's office)
- Each 100 meter CAT5 or CAT6 UTP cable requires an additional Extender
- Connecting to the climate-control computer requires 3 available COM ports

The Grodan Group supplies innovative, sustainable stone wool substrate solutions for the professional horticultural sector. Based on Precision Growing principles, these solutions are particularly applied to the cultivation of vegetables and flowers. In addition to its stone wool substrates, the Grodan Group also provides tailor-made advice and tools to support Precision Growing and thus facilitate the sustainable production of healthy, safe and tasty fresh produce for consumers.

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