Greenhouse Management Guidelines

aranet

Setting the Greenhouse Environment Management Goals

Monitor environment and fine-tune growing operations to maximize yield. Aranet ecosystem allows you to communicate with your greenhouse to make the right decisions and avoid guessing.

Track ambient conditions

- Air temperature (T)
- Relative humidity (RH)
- CO_2 concentration
- Daily light integral
- Dew point
- Photosynthetically active radiation (PAR) light level

In greenhouse climate control, achieving the ideal conditions relies on proper ventilation and heating systems, CO_2 dosing, and lighting management using screens and artificial lights. **Track ambient conditions** to maintain **optimal temperature, relative humidity, CO_2 levels, and daylight exposure** throughout the greenhouse.

Precise conditions not only enhance growth and yield but also **prevent issues like condensation**, which can trigger disease outbreaks, and ensure uniform conditions across the greenhouse.

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Aranet T/RH sensor with Radiation Shield **(1)** provides essential, **accurate temperature and humidity measurements** in greenhouses exposed to direct sunlight by creating a passive ventilation flow that prevents sensor overheating. For precise monitoring of temperature distribution in the greenhouse, use a T/RH sensor **(2)**.

The Aranet PAR sensor **(3)** allows the **optimization of artificial lighting** strategies by adjusting the intensity based on the levels of natural light received. Different plants require varying CO_2 concentrations to maximize their growth rates – use the CO_2 sensor **(4)** to maintain these set values.

Track plant growth and root zone processes

While it is crucial to monitor the climate throughout the greenhouse, effective plant growth monitoring can be achieved by employing one or a few reference plants equipped with sensors. Reference plants provide valuable feedback on plant growth processes and root zone conditions, like irrigation, salinity, biomass gain, and other critical parameters, facilitating informed decision-making for all plants in the greenhouse.

Create reference plants

Plant growth processes

- Weight of the plants and fruits
- Plant leaf temperature
- Vapor pressure deficit (VPD)
- Micro-variations of stem diameter
- Sap flow in stem

Root zone conditions

- Volumetric water content (VWC)
- Salinity (EC) level
- Electrical conductivity in pores (ECp)
- Temperature
- Drainage water volume

Continuous weight measurement using the Aranet Weight sensor **(5, 6)** enables real-time monitoring of various factors including **biomass increase, plant weight, water addition, and drainage weight**. For more comprehensive insights, consider combining multiple weight sensors to detail processes within the greenhouse **(5)**.

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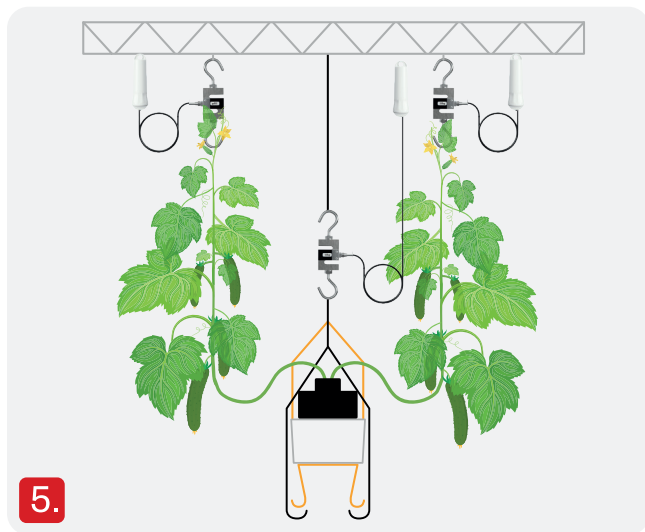
The Aranet IR Plant Temperature sensor **(7)** is specifically designed to measure plant leaf surface temperatures, making it invaluable for **calculating Vapour Pressure Deficit (VPD)** when used alongside T/RH measurements. Explore how irrigation rates and environmental factors impact water balance and plant growth by tracking micro-variations in Stem diameter and Sap flow **(8)**.

To ensure optimal irrigation, monitor **VWC, temperature, and Electrical Conductivity (EC)** – a strong indicator of nutrient status. Utilize the Soil sensor WET150 **(9)** for accurate monitoring in both **soil and soilless substrates**, applicable to **indoor and outdoor** greenhouse environments.

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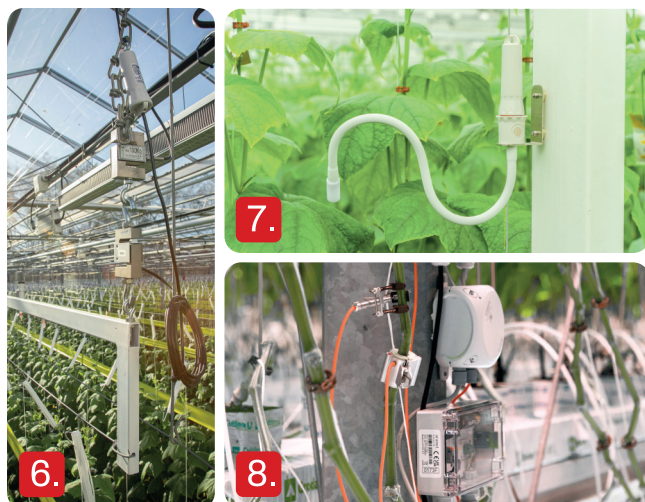
How Aranet PRO Ecosystem Works?

The Aranet solution utilizes **wireless sensors** that transmit data readings to the centrally located base station (gateway). This offers ultimate flexibility in moving the sensors around to find the most suitable placement, independently of any wiring. Select the measurement interval of each sensor from 1 to 10 minutes depending on the dynamics of the parameter and battery life preference. Most of the sensors operate on standard AA or AAA batteries, providing a lifespan of over 5 years.


If the base station is connected to **Aranet Cloud**, greenhouse **data is available from anywhere and anytime**! Manage data and Aranet devices from several greenhouses by using the Cloud platform. Cloud provides notifications when some parameters are out of specific range, data analysis, calculation options (virtual sensors), and other features. Share data with colleagues and agronomists for specific feedback.


Aranet ecosystem can be **integrated with 3rd party control systems** by using MQTT, Modbus TCP/IP, and BACnet IP protocols, as well as Cloud API can be integrated with any Web or cloud-based IT system or used as a data source for 3rd party applications.

Aranet is compatible with solutions from PRIVA, Argus Controls, Damatex, 30 MHz, Ledgnd, Source.ag, Grownetic, LetsGrow.com, Blockbax, Ageon, HortiAdvice, Trym, Hoogendoorn and others.
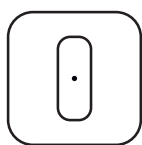
Sensors
Measure environment and conditions in the greenhouse
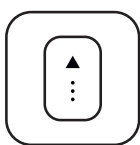
Base station
One or multiple base stations gather and store sensor data

Aranet cloud
Monitor and analyze processes from anywhere, anytime

Data-based decisions
Manage processes and adapt to plant needs

Scan the QR code to see
Full list of sensors for horticulture

Scan the QR code to see
Extended version of Greenhouse Management Guidelines