

ECHO SOLUTION PARTNER



Echo solution for smart farm

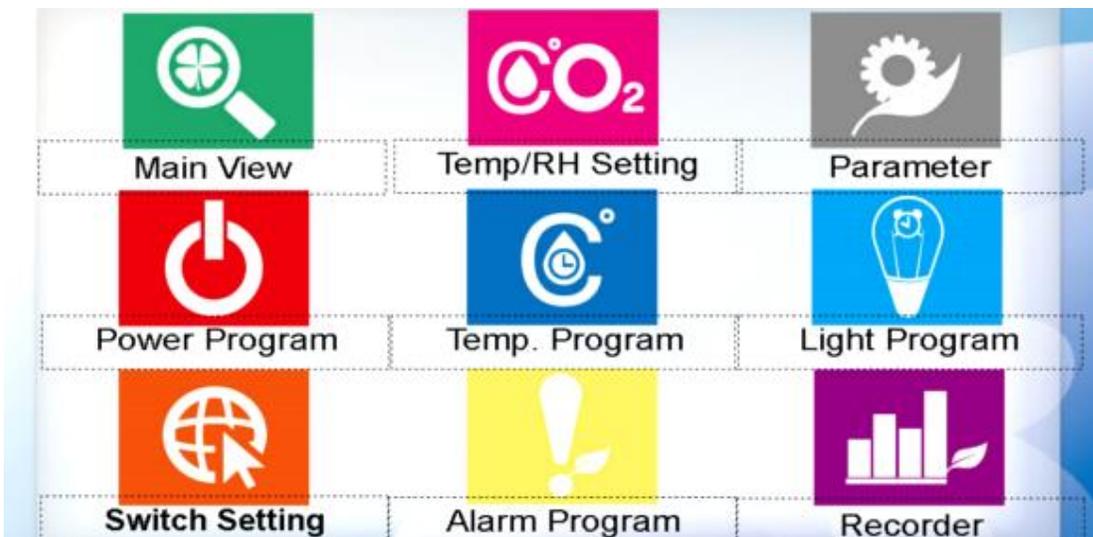


GREENHOUSE ATMOSPHERE CONTROL

One Central network
Wide range of control
modules Minimal cabling

Our Control System connects and controls all processes in your controlled field and enables you to optimize them even further. It helps the user to create the most optimal growing conditions for your experiment or crop, enabling you to take control of your energy facility, including your boilers, heat-power installations, heat pumps, and CO₂. Climate controls are supplied as standard with a large number of optimized options including air handling, ventilation, heating, CO₂ quantity management, screens, lighting and irrigation. We manages the development of its system from the conception to the delivery and formation. We have developed and we control each characteristic of our system which allow us to modify customize or integrate new settings if necessary.

TOUCHSCREEN PANEL

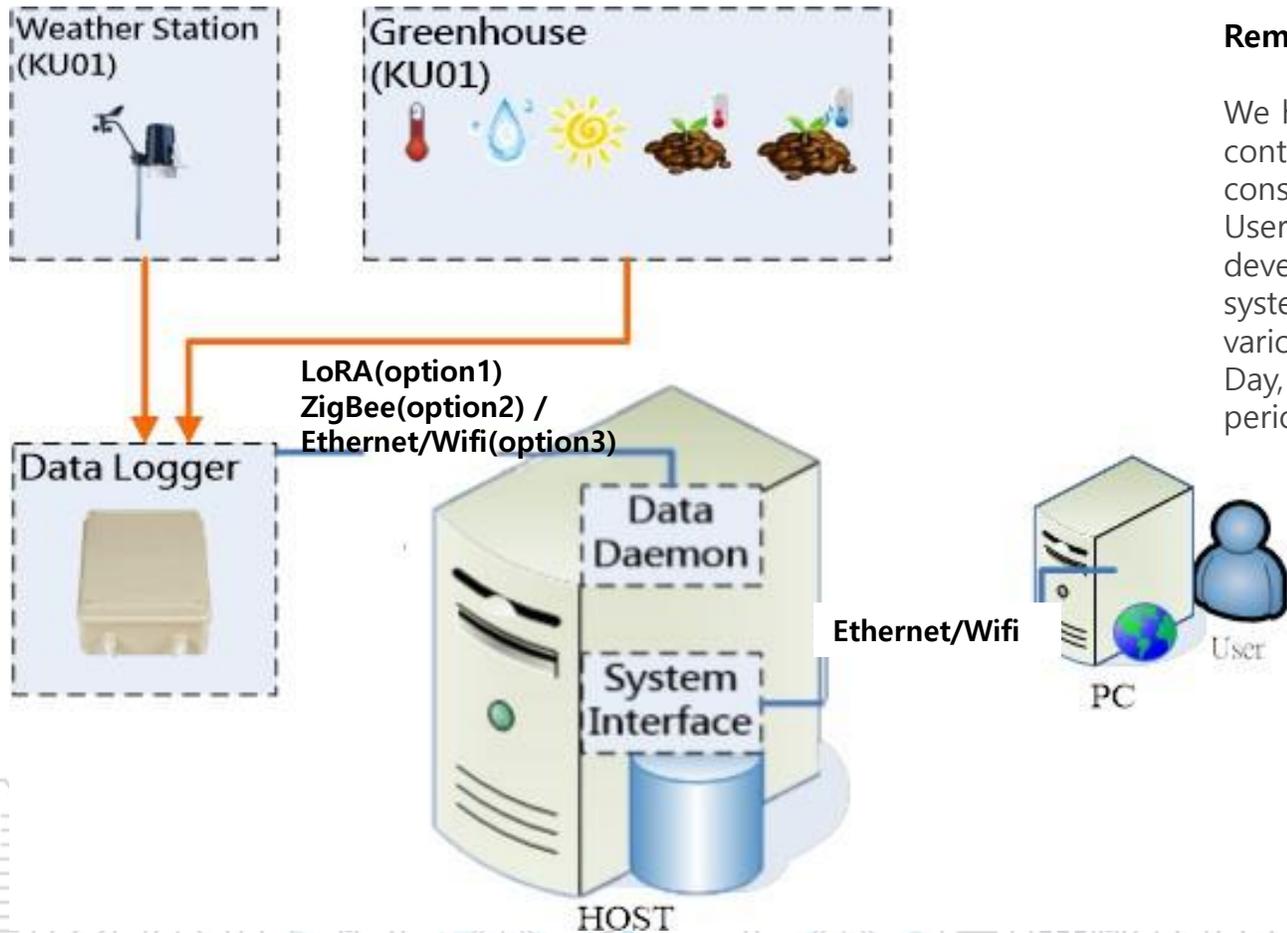


Simple operation
Flexible and expandable
Easy to install and use

It is a cost-effective, easy-to-use control system developed specially for greenhouse environments.

It is designed to provide accurate environment control for optimizing plant experiment or increasing production, while saving energy, water and fertilizer. The range of module available gives the opportunity to create optimal growing conditions for your plants. We provides an extensive and advanced range of control modules in the greenhouse sector. We always help our customer to increase the number of possible control systems in order to control in the best way the environment for each experiment.





Remote control display

We have put the accent on the layout to allow an excellent visual control of the operating system and the different elements which constitute the Environment control.

User friendly, the central computer operating system has been developed to offer comfortable visual control screens that make the system easy to use. The user can store the programmed parameters for various climatic conditions so that they can be reused at a later date. Day, weeks, seasonal program that are typically used during a growth period can be reapplied later.

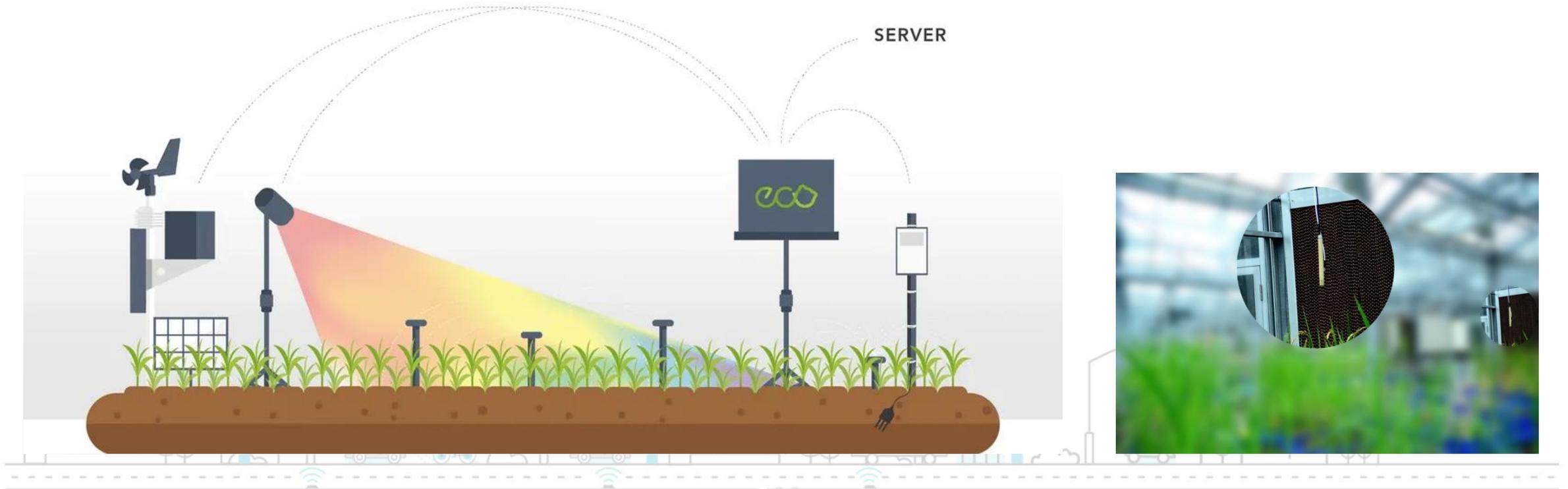
Automatic access to your local weather forecast

Our system calculates the requirements for the following 24-hour period based on the settings and the next 24h forecast weather forecasts of your locality. These forecasts are aligned to your needs to meet criteria such as available capacity and energy supply contracts.

Sensors

- **Accurate, robust and reliable**
- **Low maintenance**
- **Minimal calibration**

We provides the best sensors to monitor and control the Environment. With a high degree of functionality they are fully integrated with the Environment computer control. Data is recorded and stocked in high capacity data storage.



Ceiling Vent Position Sensor

The Vent position sensor, which measures the opening of windows, is connected to the process computer allowing accurate ventilation strategies to be implemented and alerts issued if abnormal ventilation positions arise.

ECO Fan

The ECO Fans exchange air volume vary from 2000 m³/hour to 8000 m³/hour. The housing is ideally suited to humid greenhouse conditions. Air recirculation ensures more uniform growth, due to better temperature and moisture uniformity. The ECO Fan can be deployed at the top or bottom of the greenhouse.



SENSORS

Weather Station

Weather Station in connection with the process computer provide all information about wind speed, wind direction, precipitation and temperature sensors. The Weather Station is customizable adding sensors including various types of lights and gas sensors. A RH sensor measures the relative air humidity outside the greenhouse, which can differ considerably from internal levels. The greenhouse climate can be optimally adjusted according to both inside and outside measurements.

Measuring Box Data log (T + RH + CO₂)

The measuring box reads temperature, relative air humidity, CO₂ values and record it for each greenhouse unit. The Data can be directly transferred and stocked in the general server as back up. The CO₂ sensors read, and monitor carbon dioxide concentrations. The value is directly sent to the Control panel where it is displayed in Real Time on the 4.3" color touchscreen. The sensor allows also to control the level of CO₂ if needed (CO₂ control option).

Infrared Plant Temperature Sensor

Based on plant temperature and ambient temperature, the infrared plant temperature sensor can control cooling, ventilation, screens, overhead irrigation, misting and CO₂ dosage more effectively.



Irradiation Sensor

It measures heat radiation losses from greenhouse to the ambient air. In clear weather, irradiation is higher than when cloudy. To combat heat loss from the greenhouse, screens can be quickly closed in clear weather by using this sensor. It saves energy because heating is not required to raise the greenhouse temperature.

PAR Sensor

PAR Sensor measures that part of the light spectrum that stimulates photosynthesis. This sensor is designed to provide a highly accurate indication of PAR illumination. Since we have developed our LED SUN LIGHT with adjustable wavelengths intensity, it possible thanks to it and the shades screens to adjust the lighting by simply entering the required PAR value.

Soil Temperature Sensor

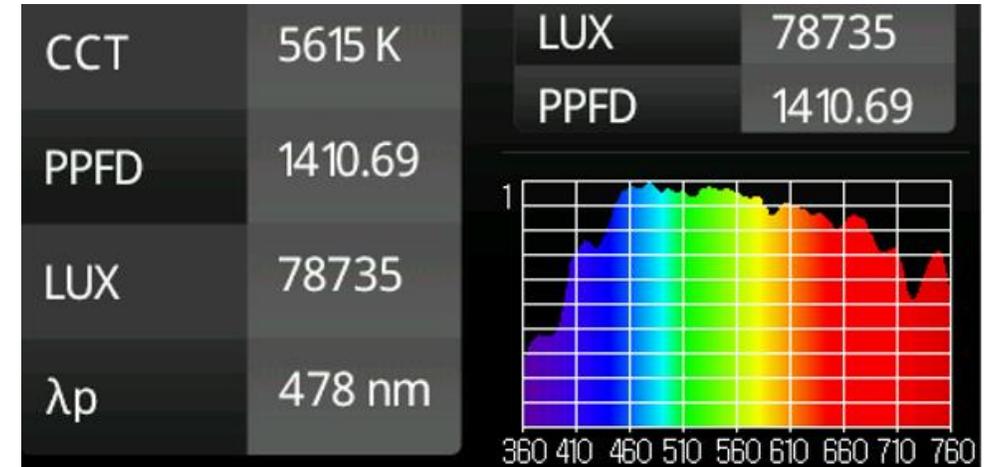
The sensor measures the temperature in the ground, and is connected to the process computer allowing heating control based on pot temperature.

Water Temperature Sensor

This water sensor measures the temperature of water in boilers (for cold countries) and coolers (for hot countries), pipes and boiler tanks.

Cooling System Temperature Sensor

This water sensor measures the temperature of the cooling system. More Sensors can be provided if requested to monitor all the elements of the Greenhouse.



GREENHOUSE WATER CONTROL

Fully computer controlled, irrigation water control has been developed and tested in many places, as Korea, for quantity of projects. Energy and cost saving, all the parameters as quantity of water, fertilizers are precisely managed by outstanding sensors to develop the best growth.

Water Disinfection

The applied principle is suitable for disinfecting either small or large volumes of water. The water disinfection system saves on water and expense of fertilisers. Disinfecting the water helps to re-use it and solve virus, moulds, bacteria and eelworms problems. The system is energy efficiency in term of investment and running costs. Connected to the computer the system signal when UV lamps need to be replaced and the system automatically cleans the lamps to guarantee an optimum disinfection.

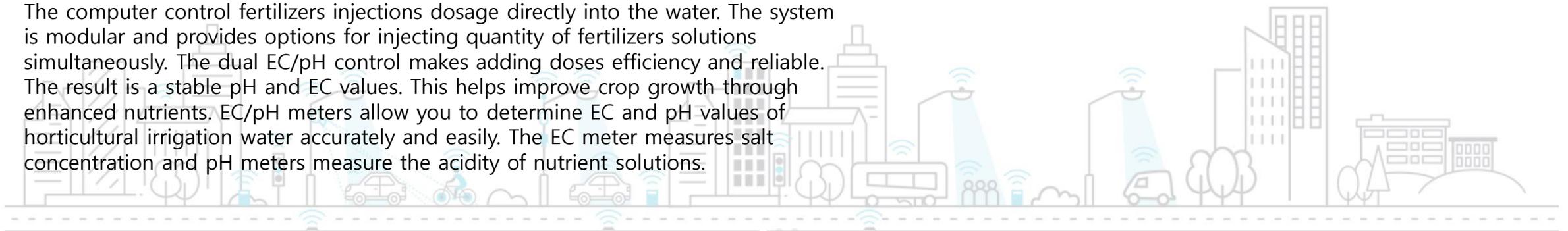


Water Management

includes controls for pre-treatment of supply water, dosing of nutrients as well as disinfecting of drain water and the preparation for re-use. All processes are fully controlled by the computer system. The water can be used for an hydroponic system or soil irrigation. The computer system manages irrigation cycle based on the quantity of water absorbed and the water in the soil. All is optimized according to conditions, the state of the crop and the type of substrate.

Fertilizer's Control

The computer control fertilizers injections dosage directly into the water. The system is modular and provides options for injecting quantity of fertilizers solutions simultaneously. The dual EC/pH control makes adding doses efficiency and reliable. The result is a stable pH and EC values. This helps improve crop growth through enhanced nutrients. EC/pH meters allow you to determine EC and pH values of horticultural irrigation water accurately and easily. The EC meter measures salt concentration and pH meters measure the acidity of nutrient solutions.



Water Sensors

EC Sensors / pH sensor

EC and pH sensors check EC and pH values of water and forward readings to the process computer.

Drain Sensor System

The Drain Sensor System measures the drainage volume and the drainage water EC value discharged from the substrate.

Moisture sensor

It allows to check the moisture content in soil/substrate, record it and manage the irrigation program.

Micro pump Sensors

measure water and fertilizers doses.

Miscellaneous Pressure Sensors

Water and air pressure sensors for water silos, tanks and fertilizers storage tanks.

