



INSTALLATION GUIDE

Hydroponic System

Ikos Controller Cosmos · Substrate Crop Monitoring



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This manual outlines the comprehensive installation and commissioning process for the Ikos Controller Cosmos in hydroponic cultivation, along with the technical specifications for the equipment and its individual sensors. It is designed for installation technicians and serves as a reference document for the customer.

1 Equipment specification

An advanced measurement system for hydroponic crops, engineered to function wirelessly and autonomously, utilizing a rechargeable battery and solar panel.

It provides extensive crop monitoring via a network of high-precision sensors, perfect for enhancing plant performance and health.

The equipment not only enhances the regulation of crop conditions but also promotes greater efficiency in the management of water and energy resources, thereby contributing to more sustainable and profitable production.



System components

Ikos Controller • Data Logger and Transmission

Ikos Tensiometer • substrate tension

Ikos Multisensor • humidity, electrical conductivity, and temperature

Ikos DPV (H&T) • Temperature and Humidity

Ikos PAR Sensor • Radiation

Drainage meter • weight and reservoir

Volumetric meter • Irrigation capacity

Solenoid valve • line regulation

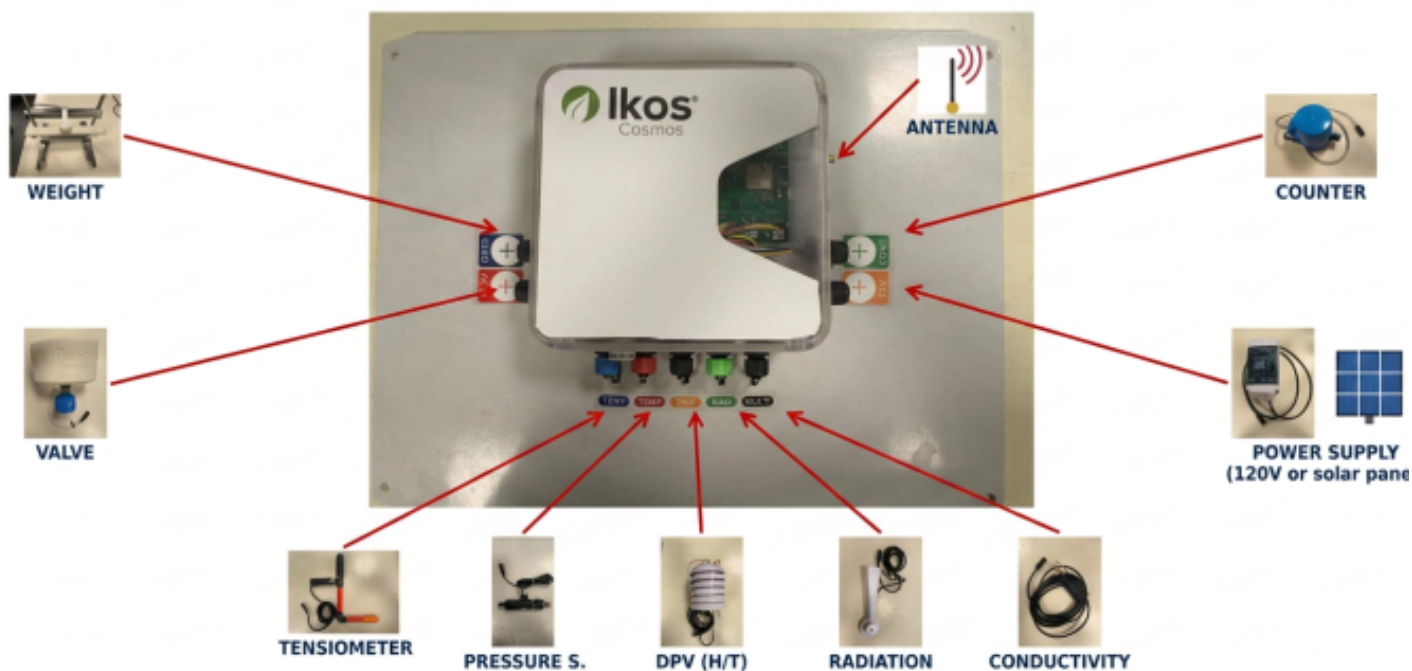
Key Features

- Multiple communications modules (UNB or GPRS) for enhanced connectivity.
- The capability to connect multiple sensors to each device facilitates comprehensive monitoring. It is
- powered by a rechargeable battery and solar panel, ensuring continuous and sustainable operation. Its
- easy-to-install and portable design makes it suitable for various types of crops and configurations.

2 Datalogger connectivity schematic

Before you commence, acquaint yourself with the connections on the box. Each sensor is designated a specific position on the datalogger, marked by its label: WEIGHT, VALVE, TEN-S, TEN-P, H&T, RAD, MULTI, CONT, and 12V. The antenna is connected to the upper side.

Datalogger connectivity schematic



3 Before You Begin • Essential Recommendations

- Tray location: avoid installation beneath a water channel and select the most representative bags of the line.
- No leaks: the drip line must be free of any leaks, both in the pipe and in the drippers, as this would impact the drainage assessment.
- Level tank: the tank must be drained of as much water as possible; it should be completely empty. contact with the tank or the load cell.
- Registration and calibration: weight calibration is consistently conducted by an Ikos technician, who transmits the codes calibration (200g reference weight provided).
- Extension cables: volumetric counter → 25 m; radiation sensor, weight, and valve → 2.5 m each.

4 Installation procedure

1 Selection of the installation location

Choose the most appropriate installation location. Avoid placing the tray beneath a water channel and select the most representative bags. Identify the midpoint of the line, position the tray adjacent to the brackets, and secure them with screws.



Tray and legs displayed in their designated position.



Tray affixed to the supports with screws.

2 Tray positioning

Remove the two bags of plants that you will replace with the tray and position it in that location, ensuring the water outlet faces down the slope of the property to facilitate drainage. Position the growing bar in the center.



Tray positioned in lieu of the removed sacks

3 Leveling the tray.

Utilizing the screws that secure the tray to the legs, adjust the tilt using a level. First, level it across the width, followed by leveling it along the length, ensuring it slopes toward the water outlet connection.



Leveling the width of the tray



Assessing the variation in elevation along

4 Installation of the bags along with their drippers

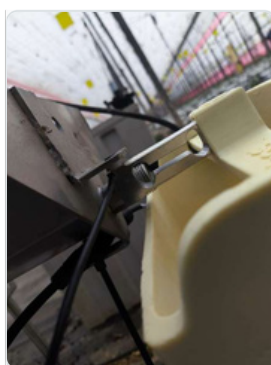
Position the plant bags with their drippers on the tray that has been previously installed and leveled.



Sacks containing plants with drippers affixed to the tray

5 Installation of weight support and reservoir

Install the weight bracket using the two screws and spacers in the specified position, and then attach the tank. Both the weight and the tank are equipped with connectors that must be linked to a 2.5 m extension cable, which in turn connects to the appropriate connector on the box.



Weight cell and storage unit



Detail of the weight support along with its spacers

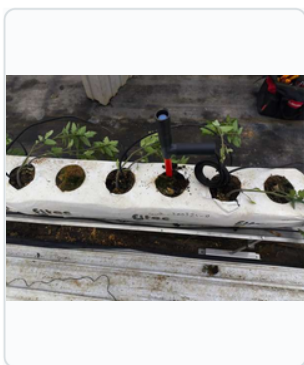
6 Installation of the sensors.

Tensiometer: Position it at the center of the plant, ensuring the ceramic component faces the plant. For larger or more mature specimens, install it from the side. In both scenarios, the ceramic part should be centered within the bag and at mid-height.

EC sensor: Place it similarly, ensuring that the dripper descends vertically onto the sensor's prongs.

Radiation sensor: It is positioned facing south, elevated above the plants, ensuring that they do not obscure it throughout their growth cycle.

Temperature and humidity sensor (DPV): Install at the height of the plant canopy. Connect each sensor to its designated position on the datalogger.



Pressure monitor has been installed on the central floor.



EC sensor with its spikes enclosed in the bag



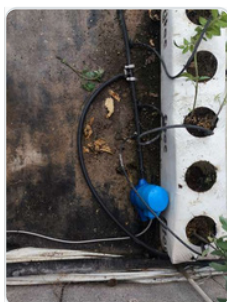
Radiation sensor positioned at an elevated location



Temperature and humidity sensor positioned at the height of the cup.

7 Meter installation

Install the meter at the start of the drip line. Note its position: the arrow signifies the direction of water flow. If the number of drippers it supplies is fewer than 40, connect an additional pipe after the meter. It is crucial that drip lines terminate with a cap and are not linked to another secondary pipe.



Water meter featuring an arrow that indicates the direction of water flow.



Branch to an adjacent pipe (< 40 drippers)



Auxiliary rubber connection elbow

8 Installation of the power supply box

Install the 12V power supply unit adjacent to the datalogger, connect it to a 220VAC source, and link it to the datalogger.



12V power supply unit installed adjacent to the datalogger.

9 Datalogger installation and initiation

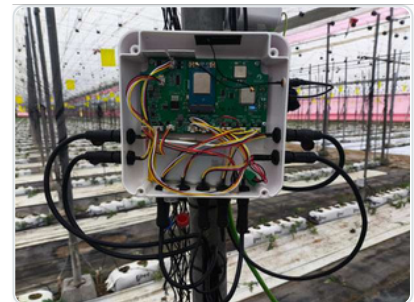
Install the data logger box bracket onto the pole utilizing a metal clamp or plastic cable ties, and secure the box in proximity to the other sensors. Connect the antenna and battery to the electronic board. After installing the sensors, calibrate the weight and register the device. Finally, close the box.



Box support affixed to the post using cable ties.



Datalogger enclosure positioned on the stand.



Within the enclosure containing interconnected sensors and an operational board

5 Significant observations

- **Weight calibration:** This process is consistently conducted by an Ikos technician, who transmits the calibration codes; the customer aids by positioning the weight as directed by the technician. The provided weight is a 200-gram unit.
- **Drainage calculation:** Upon completion of the installation, input the quantity of drippers in the tray and the number of drippers supplied by the line meter. The system will subsequently compute the drainage for each irrigation cycle based on this information.
- **Leveling the tank:** After positioning, introduce a small quantity of water to confirm it is level and does not collect water along the sides. No objects should be in contact with the tank or the load cell, as any extra weight would mimic the presence of water.
- **Leaks:** the drip line must be free of any leaks, whether in the pipe or the drippers, as this would impact the drainage calculation.
- **Extension cables:** The volumetric counter is equipped with a 25-meter extension cable. Additionally, the radiation sensor, the scale, and the valve each come with a supplementary 2.5-meter extension cable for connection to the data logger.

6 Technical specifications

Ikos Regulator



Power Supply Solar Panel	Li-Po, 3.7 V, 4400 mAh
Microprocessor Communication	3.6 W · 6.6 V ARM Cortex-M0+ 32-bit DUAL:
Output Signal Number of Sensor	Ultra Narrow Band (UNB) or GPRS
Inputs Connectors Dimensions	3 analog inputs · 1 RS485 input · 1 I2C 5
Weight Color Additional Button	4 × M12 4 pins
Protection Type Accessory	161 × 161 × 80 mm
	600 g Grey ON-OFF · LED push button switch IP
	65 Mounting anchor

Ikos Tensiometer



Measurement Power Supply Length per	0 – 1000 mbar
Tensiometer Accuracy Overload Pressure	5 V
Temperature Compensation Range	30 cm
Operating Temperature Range Zero	0.5 %
Temperature Coefficient	150 % FS
	-10 °C ~ 70 °C
	30 °C ~ +70 °C
	0.3 % FS / 10 °C

Ikos Multisensor



Humidity range	0 – 100 %
Temperature range	-30 °C ~ +70 °C
Conductivity range	0 – 20 mS/cm RS485 < 1 s
Output signal	5 V Ø 70 mm · height 70 mm
Response time	ABS
Power supply	-40 °C to +80 °C, IP68
Effective measurement area	10 – 60 °C @ 20 % ~ 90 % RH
Encapsulation	
Operating temperature range	
Protection	
Storage	

Ikos DPV Pendant (H&T)

Voltage Output	5 V I2C Temperature: -40 °C to +85 °C · Humidity: 0% to 100% ·
Signal Operating	Pressure: 300 hPa to 1100 hPa DPV: 0 kPa to 10 kPa · Temperature: 0.01
Range	°C · Humidity: 0.008% · Pressure: 0.18 Pa · Temperature: ±1 °C · Humidity: ±3% · Pressure: ±1 Pa
Resolution	— data to be verified at the source —
Precision	
Safeguardi	

ng

Ikos PAR Radiation Sensor



Spectral range	400 – 700 nm
Resolution	± 5 %
Output signal	RS485
Measurement range	0 – 2500 µmol/m ² ·s · 0 – 2000 W/m ²
Operational range	Temperature: -40 °C to 80 °C · Humidity: 0 – 100 %

Ikos Volumetric Flow Meter



Power Supply	5 V RS485
Output Signal	1000 m IP68 Cold water: 0.1 °C to 30 °C · Hot water:
Maximum Distance	0.1 °C to 90 °C
Protection	
Operating Range	

Ikos Drainage Gauge



Water tank	Fiber, metallic
design	green hue

Ikos Solenoid Valve



Model	CWX-15
Voltage	12 V
Operating Current	Max. 100 mA
Opening/Closing Time	< 5 s
Control Modes Pressure	Contact
Power	Max. 1.0 MPa
Temperature	< 3 W
Range	0 – 100 °C
Valve Size	DN20
Protection	IP65
Product Lifespan	100,000 times

DO YOU REQUIRE ASSISTANCE?

Ikos Technical Support

For inquiries related to installation, weight calibration, or equipment registration, our support team is available to assist you.

Please have the team number, property, and sector prepared.



TELEPHONE AND WHATSAPP

+34 950 50 51 50 Monday through Friday, 8:00 AM to 4:00 PM



SUPPORT EMAIL

support@ikosadvanced.com



HELP DESK

help.ikosadvanced.com

- manuals, information sheets, and diagnostic assistance



TICKET WITHIN THE APPLICATION

More » Preferences » Assistance

- Include photographs, screenshots, and date/time



From data to decision-making.

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