

Description

Advanced measurement system for hydroponic crops (substrate growing), designed to work wirelessly. It provides complete crop monitoring: substrate, climate, radiation, irrigation water and drainage water. It consists of: Ikos Cosmos datalogger, Ikos Tensiometer curvo, Ikos Multisensor, Ikos DPV externo, Ikos Sensor PAR, Ikos drainage meter, Ikos Sensor de Presión, solenoid valve and 12 V power box.

Features

- Multiple communications module (UNB or GPRS) for efficient connectivity.
- Measures irrigation pressure and drained water (by weight) to calculate drainage.
- Powered by the included 12 V power box (220 VAC mains or solar panel).
- Datalogger protected by a cover: every input labelled by sensor.

What the package includes

NO.	PART	QTY	MATERIAL
1	Ikos Cosmos datalogger	1	ABS box; electronic board; battery
2	Ikos Tensiometer curvo 15 cm	1	PVC body; transparent PVC tube; porous ceramic tip
3	Ikos Multisensor (conductivity)	1	ABS encapsulation, IP68; steel rods
4	Ikos DPV externo	1	Anti-radiation ABS probe BGT-BYX; painted metal bracket
5	Ikos Sensor PAR	1	Aluminium housing with Teflon ring
6	Drainage meter	1	Resin tank; metal frame
7	Ikos Sensor de Presión 6 bar	1	Aluminium 6061-T6 housing; FKM seal; silicone cable
8	Solenoid valve CWX-15	1	Bronze
9	12 V power box	1	Plastic
10	2.5 m extension cables	3	Cable with connectors
11	Installation kit · Bracket, antenna and cable ties	1	ABS bracket; nylon cable ties

Technical specifications



Ikos Cosmos datalogger

Power supply	12 V power box included (220 VAC or solar panel)
Microprocessor	ARM Cortex-M0+ 32 bit
Communications	Dual Ultra-Narrow Band (UNB) or GPRS
Output signal	3 analogue inputs, 1 RS485 input, 1 I2C
Number of sensor inputs	5
Connectors	4 × 4-pin M12
Dimensions	161 × 161 × 80 mm
Weight	600 g
Button	ON-OFF with LED switch
Accessory	Mounting anchor (bracket)
Cover	Lid without solar panel covering the device; one labelled input per sensor
Material	ABS box; electronic board; battery



Ikos Tensiometer curvo

Length	30 × 23 cm
Measurement	0 – 1000 mbar
Power supply	5 V
Accuracy	0.5 %
Overload pressure	150 % FS
Temperature compensation range	–10 ~ 70 °C
Operating temperature range	30 °C ~ +70 °C
Zero temperature coefficient	0.3 % FS/10 °C
Material	PVC body; transparent PVC tube; porous ceramic tip

The ceramic tip sits in the centre of the substrate bag.



Ikos Multisensor

Moisture range	0 – 100 %
Temperature range	–30 ~ +70 °C
Conductivity range	0 – 20 mS/cm
Output signal	RS485
Response time	< 1 s
Power supply	5 V
Effective measuring area	Ø 70 mm × 70 mm high
Operating temperature	–40 ~ +80 °C
Protection	IP68
Storage	10 – 60 °C · 20 – 90 % RH
Material	ABS encapsulation, IP68; steel rods

Buried horizontally inside the bag, under the dripper.



Ikos DPV externo

Voltage	5 V
Output signal	I2C
Working range	Temperature –40 ~ +85 °C · Humidity 0 – 100 % · Pressure 300 – 1100 hPa
Resolution	VPD 0 – 10 kPa · Temperature 0.01 °C · Humidity 0.008 %
Accuracy	Pressure 0.18 Pa · Temperature ±1 °C · Humidity ±3 %
Material	Anti-radiation ABS probe BGT-BYX; painted metal bracket

Fixed to the datalogger pole with its bracket, at plant height.



Ikos Sensor PAR

Spectral range	400 – 700 nm
Resolution	±5 %
Output signal	RS485
Measuring range	0 – 2500 µmol/m ² ·s · 0 – 2000 W/m ²
Working range	–40 ~ 80 °C · Humidity 0 – 100 %
Material	Aluminium housing with Teflon ring

At the top of the pole, above the plants and facing south.



Ikos drainage meter

Composition	Tray with its stand, load cell, drainage tank and 200 g calibration weight
Material	Resin tank; metal frame



Ikos Sensor de Presión 6 bar

Operating voltage	4.75 – 16 V DC
Working pressure	0 – 6 bar
Overload / burst	2 × FS / 5 × FS
Output voltage	0.5 – 4.5 V
Working temperature	Sensor –20 ~ +105 °C · cable –20 ~ +85 °C
Accuracy	±0.5 % FS between 10 and 40 °C
Response time	< 10 ms
Protection	IP6K8K
Process thread	G1/4
Weight	15 g
Material	Aluminium 6061-T6 housing; FKM seal; silicone cable

Screwed into the drip line pipe, as close as possible to the start of the line.



Solenoid valve

Model	CWX-15
Voltage	12 V
Working current	Max. 100 mA
Opening / closing	< 5 s
Control mode	Contact
Pressure	Max. 1.0 MPa
Power	< 3 W
Temperature range	0 – 100 °C
Valve size	DN20
Protection	IP65
Service life	100,000 operations
Material	Bronze

At the outlet of the drainage tank.

12 V

12 V power box

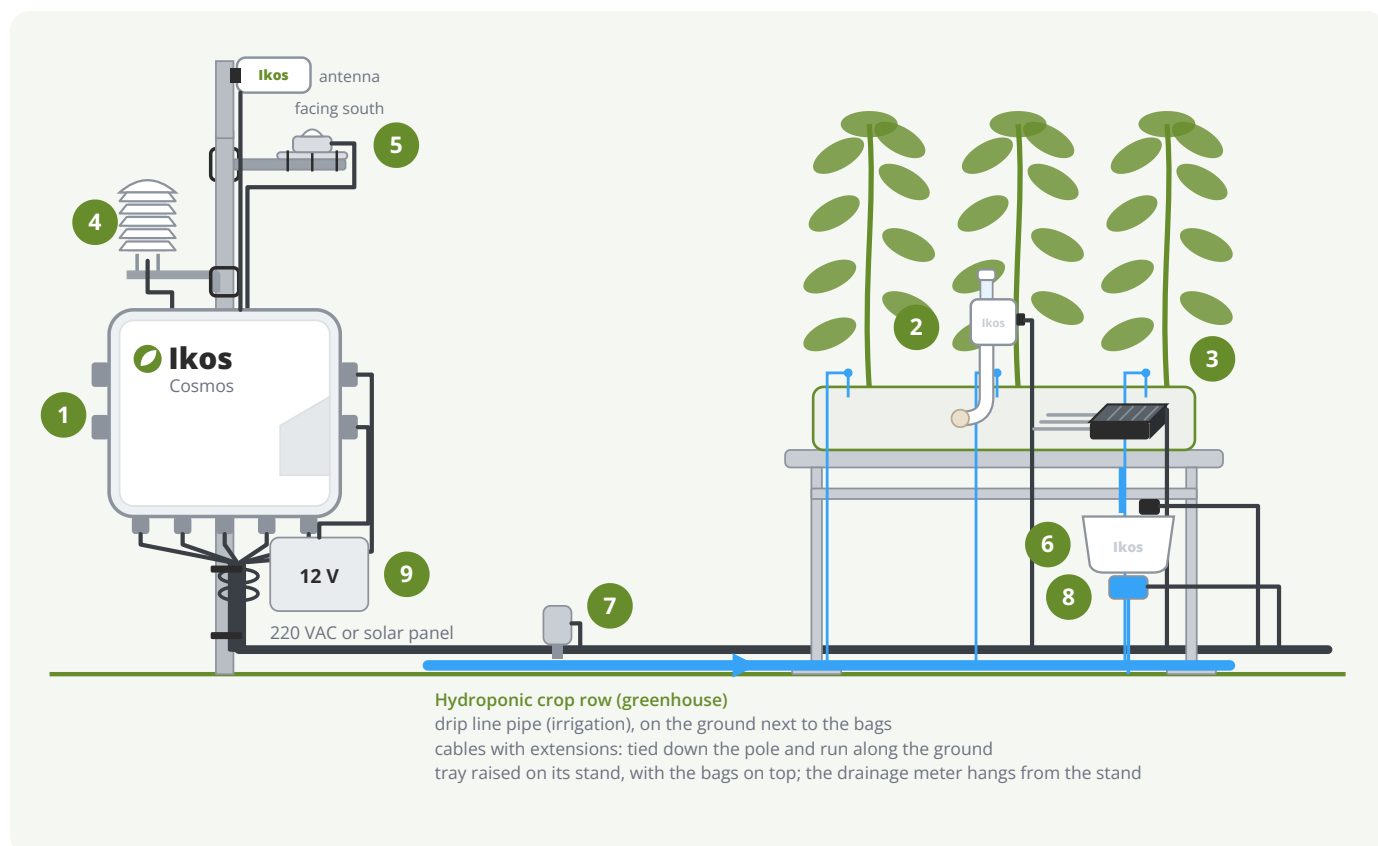
Input	220 VAC (or solar panel)
Output	12 V
Material	Plastic



Extension cables and installation kit

2.5 m extension cables	3 pcs · radiation sensor, weight and valve
Kit	Bracket, antenna and cable ties (no stakes)
Material	Extension cables: cable with connectors; ABS bracket; nylon cable ties

Installation



Each sensor connects to its labelled datalogger input, using extension cables. The cables are tied down the pole and run along the ground.

Assembly steps

1. Assemble the stand and place the tray (6) on top, in the middle of the row instead of 2 bags, level across its width and sloping towards the water outlet. Put the bags with their drippers on top.
2. Hang the load cell with the drainage tank (6) and the solenoid valve (8) from the stand, under the tray outlet. No hole in the ground is needed.
3. Screw the pressure sensor (7) into the drip line pipe (G1/4), as close as possible to the start of the line, so that the water for the largest number of drippers passes that point.
4. Tensiometer (2) at the central plant with the ceramic tip in the centre of the bag; Multisensor (3) buried horizontally inside the bag, parallel to the ground and under the dripper; DPV externo (4) fixed to the pole with its bracket, at plant height; PAR sensor (5) at the top of the same pole, above the plants and facing south.
5. Fix the datalogger (1) to the pole with a clamp or cable ties, connect each sensor to its label (with extension cables) and the 12 V box (9). Calibrate the weight with an Ikos technician.