iMETOS®

Stations & Sensors

Pessl Instruments

iMETOS®

Pessl Instruments

www.metos.at

Gottfried J. Pessl

Founder and Chief Executive Officer

Why should you choose Metos®? What makes a Metos® from Pessl Instruments unique?

The Metos® brand offers the most complete range of wireless solar powered monitoring systems with web based software for informed decision making. This technology is used in various industries and applications for more than 30 years for all climate zones and in almost every corner of the world. Metos® is a global brand which offers most modern technologies for agriculture, research, hydrology, meteorology, flood warning and other industries with local support. The technology is durable, highly precise and supported by our trained global partners worldwide. The Metos® brand lasts longer, performs better, is easier to use and offers you the lowest total cost of ownership.

The Metos® brand by Pessl Instruments offers the best solution for your application.

AGRICULTURE:	Plant Protection Warning, Irrigation Management, Insect Warning, Frost and Heat Warning, Greenhouse and Irrigation Automation
RESEARCH:	Climate Studies, Global Warming, Application Studies, Soil Studies
METEOROLOGY:	Measurement of all related meteorological parameters for all climate zones.
HYDROLOGY:	Flood and Drought monitoring, Well and Water Level Monitoring
WIND AND SOLAR INDUSTRY:	Site Evaluation Studies, Permanent Monitoring
MOBILE MONITORING ON VEHICLES:	Spray Drift Information, Logistic Information
STORAGE MONITORING:	Permanent temperature and other related parameters in storage applications.

Look at this catalogue and find the best solution for your monitoring problem. We provide you with a turnkey solution for your complex problem together with highest quality, local support for pre-sale, installation and future expansion.

Pessl Instruments




Pessl Instruments with METOS® started an Industry!

1984 Metos® Electronic Disease Predictor for Apple Scab was made

1988 New electronics and new design Metos® Classic was born - with built in mini printer and PC Interface.

1990 Metos® DAT - DOS Software - Met8 and Met9 was made to have data on DOS PC's linked by cable.

1992 Metos® Compact with a PC interface and modem dial in for remote com munication was developed.

1994 Windows graphic software and new models for disease and irrigation management developed

1997 Wireless age started - data transfer via mobile networks using the GSM dial in launched.

2000 µMETOS® was developed. This small independent station had its own display and internal disease prediction models.

2004 MOST IMPORTANT STEP: METOS® goes online using the Internet only and creates www.fieldclimate.com
iMetos® was born and GPRS is used to transmit data to the platform automatically and continuously.

2006 New software and decision support system for irrigation management are launched. New soil moisture sensors are supported.

2009 Pessl Instruments celebrates 25 years and launches the T-monitor for Silo and Grain Storage monitoring.

2010 iMETOS® ica, an automatic irrigation controller was developed and irrigation system get automated intelligently via soil moisture readings.

2011 iMetos® ECO D2 is launched as low cost powerful logger for soil moisture, frost warning, meter reading and rain.

2012 iMetos® goes mobile – APPS for Android and Apple are launched.

2013 Pessl Instruments launches the wireless intelligent sensor mesh network - full wireless from the field to the palm in your smart phone. Total contro anywhere, anytime in near real time. Pessl launches the CDMA interface for the US market.

The Innovation continues ...

METOS™ Compact

µMETOS

iMETOS®

imeteo

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iMetos AG, SM

STATIONS & DATALOGGERS

IMT50..300

SMT50..300

iMetos AG is our internet based monitoring device for disease prediction and evapotranspiration monitoring. iMetos AG is available in various models. iMetos SM has the same purpose but comes with a soil temperature sensor and supports 6 Watermark sensors.

Sensors Layout	3 fixed analog inputs - wind speed, leaf wetness and rain gauge. 5 digital inputs - automatic sensor recognition (no sensor chain support). SMT model supports 6 additional watermark sensors via front panel.
Memory	128KB (approx. 3 days)
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA
Alarm	SMS, user configurable via website.
Dimensions without sensors	54 cm x 18 cm x 18 cm
Weight without sensors	1.3 kg
Measuring interval	5 minutes
Logging interval	User selectable
Internet contact interval	User selectable
6V, 4.5AH Battery	Operating range: -35°C to 80°C
Solar panel	Dimensions: 15 x 15 cm, 0.6 watt solar panel




iMetos PRO

TNS30

iMetos Pro is a very rugged data logger for all climatic conditions and is powered by rechargeable batteries and a solar panel. The data logger has a built-in GPRS modem for direct communication with Pessl Instruments world-renowned fieldclimate technology, and can handle up to 120 sensors, through the intelligent sensor bus system. The system is extremely reliable due to a non-volatile internal memory for more than 1 year of stored data.

Sensors Layout	3 fixed analog inputs - wind speed, leaf wetness and rain gauge. 5 digital inputs - automatic sensor recognition supporting sensor chains (max. 120 sensors).
Memory	4MB, (approx. 180 days)
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA
Alarm	SMS, user configurable via website
Dimensions without sensors	54 cm x 18 cm x 18 cm
Weight without sensors	1.1 kg
Measuring interval	5 minutes
Logging interval	User selectable
Internet contact interval	User selectable
6V, 4.5AH Battery	Operating range: -35°C to 80°C
Solar panel	Dimensions: 15 x 15 cm, 0.6 watt solar panel
Part.no. TNS30	iMetos II base unit (no sensors included) Internet based logger, battery 4.5A H, 0.6 watt solar panel, GPRS based, logger, mounting brackets

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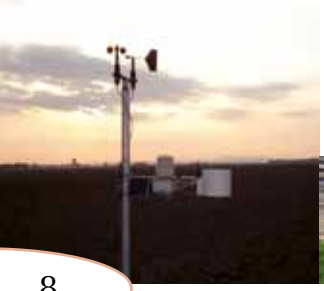
iMetos ECO D2

iDEC15

The wireless iMetos ECO D2 is solar and battery powered with rain, water level, temperature, soil moisture, salinity, etc. senors designed to work in extremely harsh applications and all climate zones. The system has a fully integrated GPRS/ EDGE modem for direct communication with Pessl Instruments world-renowned fieldclimate technology, and can handle up to 350 sensors through the intelligent sensor bus system.

Sensors Layout	1 rain gauge analog input 1 soil temperature or air temperature analog input 1 RS485 digital input - automatic sensor recognition supporting sensor chains 1 RS485 expansion input – supports 2 optional digital inputs
Memory	2MB flash memory
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA
Alarm	SMS, user configurable via website
Dimensions without sensors	21 cm L x 16 cm W x 19 cm H
Weight without sensors	2.6 kg
Measuring interval	5 minutes
Logging interval	User selectable
Internet contact interval	User selectable
6V, 4.5AH Battery	Operating range: -35° C to 80° C
Solar panel	Dimensions: 15 x 15 cm, 0.6 watt solar panel
Part.no. iDEC15	iMetos ECO „D2“ base unit (without sensors), solar charged, with mainboard




iMetos ICA

IMT
SMT
TNS30
iDEC15
ICA30/60
IM-TR
SMS30S

ICA30/60

iMetos® ica 30/60 is a web based controller that uses GSM/GPRS technology to operate remotely the irrigation or automation system of a farm or a residential area. The ICA 30/60 are self contained in an IP65 case, with a rechargeable battery and a solar panel, and can operate three (30) or six (60) DC solenoid valves.

Both systems have the Pessl Instruments chain interface on board, allowing the connection of all sensors supported by this technology (various soil moisture sensors, temperature, dendrometers, waterlevel sensors, water counter, pressure transducers, etc).

Sensors Layout	1 rain gauge analog input 1 RS485 digital input - automatic sensor recognition supporting sensor chains 1 pressure detector (ICA30) and 2 pressure detectors (ICA60)
Memory	2MB flash memory
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA
Alarm	SMS, user configurable via website
Dimensions without sensors	21 cm L x 16 cm W x 19 cm H
Weight without sensors	2.6kg
Measuring interval	5 minutes
Logging interval	User selectable
Internet contact interval	User selectable
6V, 4.5AH Battery	Operating range: -35° C to 80° C
Solar panel	Dimensions: 15 x 15 cm, 0.6 watt solar panel
Outputs	3 bi-directional Latch valves(DC) switches for 12 Volt solenoids with pulses of up to 2A on ICA30 6 bi-directional Latch valves (DC) switches for 12 Volt solenoids with pulses of up to 2A on ICA60
Part.no. ICA30	Internet Central Control for 3 DC valve with IP 65 box, 6 volt battery and solar panel
Part.no. ICA60	Internet Central Control for 6 DC valve with IP 65 box, 6 volt battery and solar panel

iTRAP

IM-TR

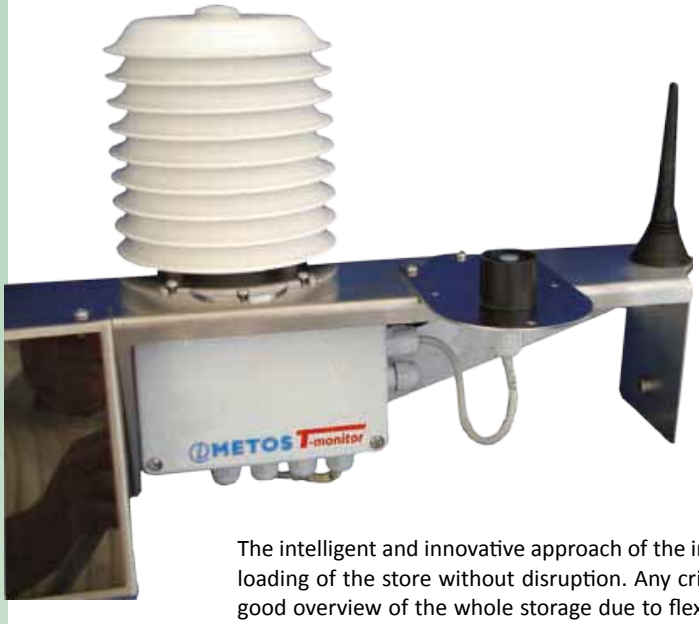
iTRAP and Trapview are a patented combination of hardware and software solutions for remote monitoring of different agricultural and industrial insects. The iTrap, with its integrated electronics and sticky plate, is light enough to be hung where needed. In the field, the device is self-sufficient, being powered by a solar panel and a battery. Multiple cameras take high-resolution pictures of the sticky plate within the iTRAP. Images are sent via GPRS to the Trapview web-platform. These pictures are analyzed with automatic detection of pest with the results visible on web or mobile devices. Control is real-time and data collected can be used for further analysis.

Memory	4 MB
Internet Connectivity	GSM - GPRS, EDGE, HDSPA
GPS receiver	Yes
Dimensions of electronics (without trap housing)	180 cm x 130 cm x 35 cm
Weight	0.93 kg
Internet contact interval	Up to four times per day (usually once a day)
Battery type	Lithium battery
Solar panel	Dimensions: 180x130cm, 7.2 Volt, 333 mA
Camera	4 x 2 megapixel cameras
Part.no. IM-TR	iTRAP- Internet based monitoring device, solar panel, rechargeable battery, GPRS Logger, Interface for 1 temp. input (no sensors incl.), 1 year webservice incl., GPS sensor




t-monitor® automatic real time monitoring, process control of storage rooms, silos etc.

IMT
SMT
TNS30
iDEC15
ICA30/60
SMS30S



SMS30S

The intelligent and innovative approach of the imetos t-monitor allows for installation any time after loading of the store without disruption. Any critical change of temperature or other factors gives a good overview of the whole storage due to flexible and representative mounting of the monitoring system in a cost effective way. Demands on the local infrastructure are minimal and the t-monitor can also work in areas without mains power as the system can function on battery and solar charge. The alarms can be sent to single or multiple store managers by SMS worldwide. This state of the art technical solution allows up to 140 temperature measuring points on different nodes and hubs on one system in combination with early warnings. Apart from the temperature many other parameters can be measured: Inside/Outside temperature and relative humidity, CO2, wind speed, rainfall, movement (theft protection) just to name a few.

Sensors Layout	3 fixed analog inputs - wind speed, leaf wetness and rain gauge. 5 digital inputs - automatic sensor recognition supporting sensor chains (max. 120 sensors).
Memory	4MB, (approx. 180 days)
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA
Alarm	SMS, user configurable via website
Dimensions without sensors	54 cm x 18 cm x 18 cm
Weight without sensors	1.1 kg
Measuring interval	5 minutes
Logging interval	User selectable
Internet contact interval	User selectable
6V, 4.5AH Battery	Operating range: -35°C to 80°C
Solar panel	Dimensions: 15 x 15 cm, 0.6 watt solar panel
Part.no. SMS30S	Silo Monitor “T-monitor” Solar

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Single Air Temperature

IM5021D

Precise measurement of Air Temperature in naturally ventilated radiation shield.

Sensor	SMT160-30
Supply voltage	4.57 - 7 V
Supply current	max. 200 µA
Short circuit protection	infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temp. range	-30°C to +99°C
Accuracy	min. 0.3°C (-30° C to +99°C)
Calibration error	max. 0.25°C (23°C)
Nonlinearity error	max. 0.2°C
Supply voltage sensitivity	max. 0.1°C/V
Repeatability	max. 0.2°C
Long term drift	max. 0.1°C
Output frequency	1 to 4 kHz
Duty cycle	0.320 (0°C), 0.00470°/C
Evaluation	Analog
Part.no. IM5021D	Single air temperature sensor with convection cap with 5 meter cable




Relative Humidity and Air Temperature

IM5021D
A660611
IM5042
IM505CD
IRTEMP

A660611

Relative humidity, temperature measurement and dew point calculation

- Outstanding accuracy and repeatability
- Integrated data acquisition and calibration history

Humidity sensor	ROTRONIC Hygromer® IN-1
Temperature sensor	Pt100 1/3 Class B
Accuracy with Standard adjustment profile	at 23°C and 10, 35, 80 %rh ± 0.8%rh / ± 0.1 K
Accuracy with High Precision adjustment profile	at 23 °C and 10, 20, 30, 40, 50, 60, 70, 80, 90 % rh ± 0.5%rh/ 0.1 K
Resolution, AirChip3000	Typically 0.02 %rh, 0.01 K
Long-term stability	< 1 %rh, 0.1°C / year
Humidity response time t 63	3...12 seconds (depending on probe type)
Measurement range	0...100 %rh, -100...200 °C (depending on probe type)
Electronics operating range	-50...100°C and 0...100 %rh
Analog output signals (standard, user scalable)	0...1 V = 0...100 %rh 0...1 V = -40...60°C
PC interface UART (standard)	with ROTRONIC interface cable HW4 compliant
Sensor	Yes (programmable, factory default = off)
Alarm function	Yes, analog & digital, programmable
Audit Trail & Electronic Records	FDA 21CFR Part 11 and GAMP compliant
Power supply & consumption	3.2...5 VDC ±0 % / typically 4 mA
Housing/probe material	Polycarbonate or stainless steel(depends on probe type)
Filter	Polyethylene insert, polycarbonate cage
Standards	CE-compliant 2007/108/EG
Part.no. A660611	RH & Temperature Hygroclip S3 with holder and convection cap
Part.no. A660610	RH & Temperature Hygroclip S3 without holder and convection cap
Part.no. A660915	RH & Temperature replacement sensor (sensor head only)
Part.no. A660920	Chain RH & Temperature Hygroclip S3 with holder and convection cap

Dual purpose soil and air temperature sensor

IM5042

The dual purpose soil temperature and air temperature sensor is designed to be used for measuring the soil temperature for seeding and later to be used for air temperature inside the convection cap. The sensor is designed to be inserted under all soil conditions and depth without breaking preventing a temperature bridge and offers multiple use as simple, economic and practical solution for arable farmers.

Sensor	SMT160-30
Supply voltage	4.57 - 7 V
Supply current	max. 200 µA
Short circuit protection	infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temp. range	-30 to +99 C
Accuracy	min. 0.5 C (-30 to +99 C)
Calibration error	max. 0.25 C (23 C)
Nonlinearity error	max. 0.2 C
Supply voltage sensitivity	max. 0.1 C/V
Repeatability	max. 0.2 C
Long term drift	max. 0.1 C
Output frequency	1 to 4 kHz
Duty cycle	0.320 (0 C), 0.00470/ C
Evaluation	ANALOGIC
Cable length	5 m
Part.no. IM5042	Soil and air temperature in carbon fiber tube with convection cap




Wet & Dry Bulb Temperature

IM5021D
A660611
IM5042
IM505CD
IRTEMP

IM505CD

The highly precise SMT 160-30 is built in a waterproof housing, covered by a cotton tissue and wetted by water. This is the most accurate way to directly determine the dew point.

Sensor	SMT160-30
Supply voltage	4.57 - 7 V
Supply current	max. 200 µA
Short circuit protection	infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temp. range	-30° C to +99° C
Accuracy	min. 0.3°C (-30° C to +99°C)
Calibration error	max. 0.25°C (23°C)
Nonlinearity error	max. 0.2°C
Supply voltage sensitivity	max. 0.1°C/V
Repeatability	max. 0.2°C
Long term drift	max. 0.1°C
Output frequency	1 to 4 kHz
Duty cycle	0.320 (0°C), 0.00470°/C
Evaluation	Analog
Cable length	5 m
Part.no. IM505CD	Single wet & dry bulb temperature
Part.no. IM504CD	Single wet bulb temperature

IR Temperature

IRTEMP

The infrared temperature sensor infers the temperature from a portion of the thermal radiation (blackbody radiation) emitted by the object being measured. It is a non-contact temperature measurement from a distance. By knowing the amount of infrared energy emitted by the object and its emissivity, the object's temperature can be determined.

Sensor	Melexis MLX90614-BCC
Resolution	0.1°C
Interface	RS 485 PI Sensor Bus
Size	20 mm (dia) x 24 mm
Sensor housing	Weather resistant PAS
Range	-40°C ... 85°C
Part.no. IRTEMP	Infrared Temperature

IM5021D

A660611

IM5042

IM505CD

IRTEMP




Rain Gauge

IM523

LMP02

IM523

Double spoon tipping bucket, 0.2mm resolution 200 cm² funnel, max 12 mm per minute. If the half spoon is filled by 4 ml of rain it tips over. A small magnet moves past a magnetic switch and opens the circuit.

Sensor Type	Double tipping bucket rain gauge
Output	Switch signal
Switch	Reed contact, magnetically operated
Sensitivity	1 tip per 0.2 mm
Collector Surface	200 q/cm
Dimensions	185 mm diameter x 250 mm H
Evaluation	Digital
Maximum Rain	12 mm/minute
Part.no. IM523	Rain gauge for iMetos 0.2 mm resolution
Part.no. IM523PRO	Rain gauge for iMetos pro with 5 meter cable and holder
Part.no. HRG01	Heating for rain gauge




Lambrecht

IM5021D

LMP02

LMP02

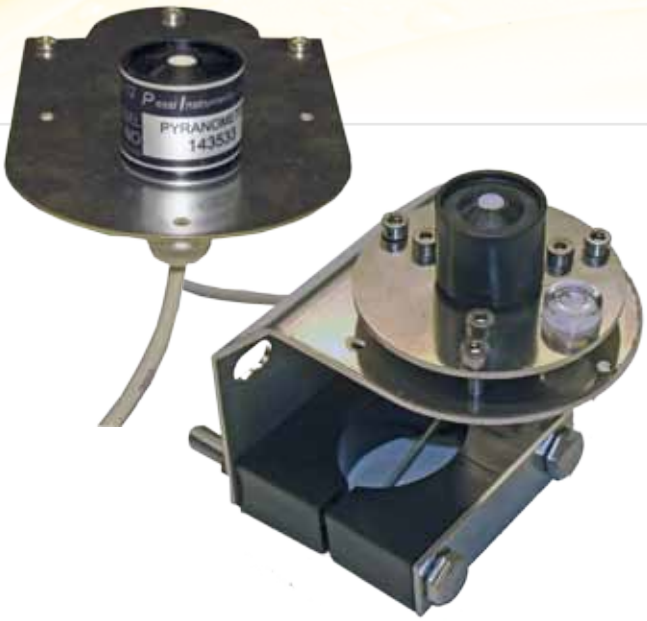
Precipitation sensor with Joss-Tognini type weighing tipping bucket.

Meas. principle/ element	weighing tipping bucket system • precision stainless steel bucket acc. to Joss-Tognini
Meas. range/ Resolution	4 cm^3- (~4 g) volume of tipping bucket - 0.2 mm • 0...16 mm/min
Accuracy	± 2 % with intensity correction
Collecting funnel	200 cm^2/ WMO standard
Ranges of application	unheated varieties: 0…+70 °C metering (frost resistant down to -20 °C)
Pulse output	reed contact · polarity protected · bounce-free signal • supply voltage 4...30 VDC • current consumption max. 100 µA · typical 50 µA • load max. 30 VDC/ 0.5 A
Housing/ Funnel + ring	aluminium · anodized
Dimensions/ Weight	H 292 mm · Ø 190 mm · for mounting pipe Ø 60 mm · approx. 3 kg
Standards	WMO-No. 8 · VDI 3786 lf. 7 · EN 50081/82 · VDE 0100
Part.no. LMP02	Rain gauge Lambrecht - Resolution 0,2mm with 5 meter cable
Part.no. LMP02H	Rain gauge Lambrecht - Resolution 0,2mm with 5 meter cable with heating
Part.no. LMPS24	Power supply for Lambrecht rain gauge heating




Pyranometer Sensor

IM506D
IM507D
IM508D
CZ-LITE
CMP3
CMP6
CMA6
LP02



IM506D
IM5069D

The IM506D Pyranometer is designed for field measurement of global solar radiation in agricultural, meteorological, and solar energy studies. In clear, unobstructed daylight conditions, the Pessl Instruments pyranometer has favourable results compared to the first class thermopile-type pyranometers but is priced at a fraction of the cost.

Sensor	LI-200SZ
Calibration	Calibration against Kipp and Zone CMP3 under daylight. Absolute error max. 5%, typically 3%
Stability	2% drift on 2 years use
Time to measure	10µs
Temperature dependency	0.15% per Centigrade
Cosines correction	Sensor corrects up to 80° degrees
Direction error	1% through 360 degrees at 45°
Working temperature	-20°C to 65°C
Relative Humidity	0 to 100%
Sensor	Photodiode
Housing	Weatherproof PAS case with acrylic diffuser, stainless steel hardware
Size	12.68 cm length x 4.50 cm height
Weight	114g
Evaluation	Pulse Wide Modulation 0-80% = 0-2000 W/m^2
Spectral range:	300-1100 nm
Part.no. IM506D	Pyranometer (Solarimeter) „Economic“
Part.no. IM5061D	Pyranometer (Solarimeter) „Economic“ with 5 meter cable
Part.no. IM5069D	Pyranometer (Solarimeter) „HP“ with leveling plate, holder and 5 meter cable




PAR Quantum SENSOR

IM507D
IM5079D

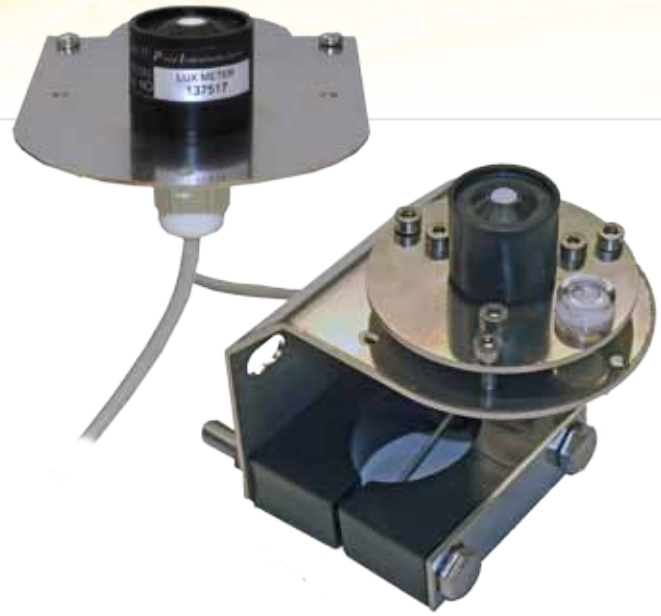
Photosynthetically Active Radiation (PAR), is typically measured as Photosynthetic Photon Flux Density (PPFD), which has units of quanta (photons) per unit time per unit surface area. The units most commonly used are micromoles of quanta per second per square meter (µmol s-1 m-2). Plant scientists, horticulturists, ecologists, and other environmental scientists use MD507D Quantum Sensors to accurately measure this variable.

Sensor	EG&G VACTEC VTB1012B
Calibration	Calibration against LI-190SZ under daylight Absolute difference max. 5%, typical 3%
Linearity	Maximum deviation of 1% up to 3000 W/m²
Stability	2% change over a 1 year period
Response Time	150 ms
Temperature dependency	0.15% per Centigrade
Cosine correction	Cosine corrected up to 80 degree of incidence
Azimuth	1% error over 360 degree at 45 degree elevation
Operating specs.	-20°C to 65°C, 0 -100 % rel H.
Housing	Weatherproof PAS case with acrylic diffuser, stainless steel hardware
Size and Weight	3.5 Dia.x 3.5 cm, 15g
Evaluation	PWM: 0 - 80% duty cycle. = 0 – 20 kJ/m²
Part.no. IM507D	PAR Quantum Sensor „Economic“
Part.no. IM5071D	PAR Quantum Sensor „Economic“ with 5 meter cable
Part.no. IM5079D	PAR Quantum Sensor with leveling plate, holder and 5 meter cable




Lux Meter Sensor

IM506D
IM507D
IM508D
CZ-LITE
CMP3
CMP6
CMA6
LP02



IM508D

IM5089D

Photometry or Luxmeter IM508D refers to the measurement of visible radiation (light) with a sensor having a spectral responsivity curve equal to the average human eye. The sensor is used to measure lighting conditions where the eye is the primary receiver, such as illumination of work areas, greenhouses, interior lighting etc.

Sensor	VTB 1012 HB
Calibration	Skye SKL 310
Stability	5% drift on 2 years use
Time to measure	250 ms
Temperature dependency	0.15% per Centigrade
Cosines correction	Sensor corrects up 80° degrees
Direction error	1% through 360 degrees at 45°
Working temperature	-20°C to 65°C
Relative Humidity	0 to 100%
Sensor	Photodiode
Housing	Weatherproof PAS case with acrylic diffuser, stainless steel hardware
Size	35 mm diameter, 45 mm height
Weight	114g
Evaluation	Pulse wide modulation Output 8.18% pulse wide at 0 Lux 91.82% pulse wide at 80 000 Lux
Spectral range:	330-730nm, Peak at 580 nm Par Quantum
Part.no. IM508D	LUX or Photopic Sensor „Economic“
Part.no. IM5081D	LUX or Photopic Sensor „Economic“ with 5 meter cable
Part.no. IM5089D	LUX or Photopic Sensor with leveling plate, holder and 5 meter cable

Kipp & Zonen SP Lite2 Pyranometer

CZ-LITE

SP Lite2 is designed for routine measurement of solar radiation. SP Lite2 can be used under all weather conditions. The sensor measures the solar energy received from the entire hemisphere. It is ideal for measuring available energy for use in solar energy applications, plant growth, thermal convection and evapotranspiration.

Response time (95 %)	< 500 ns
Non-stability (change/year)	< 2 %
Non-linearity (0 to 1000 W/m²)	< 1 %
Directional error (up to 80 ° with 1000 W/m² beam)	< 10 W/m²
Temperature dependence (-30°C to +70°C)	- 0.15 %/°C
Sensitivity	60 to 100 µV/W/m²
Impedance	50 Ω
Operating temperature	-30°C to +70°C
Spectral range	400 to 1100 nm
Typical signal output for atmospheric applications	0 to 100 mV
Maximum irradiance	2000 W/m²
Detector	Silicon photo-diode
Part.no. CZ-LITE	Kipp & Zonen Pyranometer „LITE“ with holder and 5 meter cable




Kipp & Zonen CMP3 Pyranometer

IM506D
IM507D
IM508D
CZ-LITE
CMP3
CMP6
CMA6
LP02

CMP3

The CMP 3 pyranometer is an instrument for measuring the solar irradiance. The thermopile sensor construction measures the solar energy that is received from the total solar spectrum and the whole hemisphere (180 degrees field of view). The output is expressed in W/m². The CMP 3 pyranometer is designed for continuous indoor and outdoor use.

ISO 9060:1990 CLASSIFICATION	Second Class
Response time (95 %)	< 18 s
Zero offsets *(a) thermal radiation (200 W/m²)* *(b) temperature change (5 K/hr)*	 < 15 W/m² < 5 W/m²
Non-stability (change/year)	< 1 %
Non-linearity (0 to 1000 W/m²)	< 1 %
Directional error (up to 80 ° with 1000 W/m² beam)	< 20 W/m²
Temperature dependence of sensitivity	< 5 % (-10 °C to +40 °C)
Tilt error (at 1000 W/m²)	< 1 %
Sensitivity	5 to 20 µV/W/m²
Impedance	20 to 200 Ω
Level accuracy	1°
Operating temperature	-40°C to +80°C
Spectral range (50 % points)	300 to 2800 nm
Typical signal output for atmospheric applications	0 to 20 mV
Maximum irradiance	2000 W/m²
Part.no. CMP3	Kipp & Zonen Pyranometer with holder and 5 m cable

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Kipp & Zonen CMP6 Pyranometer

CMP6

The CMP 6 pyranometer is intended for routine global solar radiation measurement research on a plane/level surface. Fully compliant with ISO 9060:1990 specification for a First Class pyranometer, the CMP 6 features a sixty-four thermocouple junction (series connected) sensing element. The sensing element is coated with a highly stable carbon based non organic coating, which delivers excellent spectral absorption and long term stability characteristics. Reliable all weather performance.

ISO 9060:1990 CLASSIFICATION	Second Class
Response time (95 %)	< 18 s
Zero offsets *(a) thermal radiation (200 W/m²)* *(b) temperature change (5 K/hr)*	 < 15 W/m² < 5 W/m²
Non-stability (change/year)	< 1 %
Non-linearity (0 to 1000 W/m²)	< 1 %
Directional error (up to 80° with 1000 W/m² beam)	< 20 W/m²
Temperature dependence of sensitivity	< 5 % (-10°C to +40°C)
Tilt error (at 1000 W/m²)	< 1 %
Sensitivity	5 to 20 µV/W/m²
Impedance	20 to 200 Ω
Level accuracy	1°
Operating temperature	-40°C to +80°C
Spectral range (50 % points)	300 to 2800 nm
Typical signal output for atmospheric applications	0 to 20 mV
Maximum irradiance	2000 W/m²
Part.no. CMP6	Kipp & Zonen Pyranometer with holder and 5 m cable




Kipp & Zonen CMA6 Albedometer

IM506D
IM507D
IM508D
CZ-LITE
CMP3
CMP6
CMA6
LP02

CMA6

The CMA albedometers are double pyranometers that measure both global and reflected solar irradiance in one instruments. CMA albedometers are suitable for measuring global radiation and/or albedo over many differing types of surface. The upper pyranometer measure incoming global solar radiation and the lower sensor measures solar radiation reflected from the surface below. CMA 6 is constructed around two CMP 6 pyranometer sensors.

ISO 9060:1990 CLASSIFICATION	First Class
Response time (95 %)	< 18 s
Zero offsets **(***a) thermal radiation (200 W/m²)* *(b) temperature change (5 K/hr)*	 < 12 W/m² < 4 W/m²
Non-stability (change/year)	< 1 %
Non-linearity (0 to 1000 W/m²)	< 1 %
Directional error (up to 80 ° with 1000 W/m² beam)	< 20 W/m²
Temperature dependence of sensitivity	< 4 % (-10°C to +40°C)
Tilt error (at 1000 W/m²)	< 1 %
Sensitivity	5 to 20 µV/W/m²
Impedance	20 to 200 Ω
Level accuracy	0.1°
Operating temperature	-40°C to +80°C
Spectral range (50 % points)	285 to 2800 nm
Typical signal output for atmospheric applications	0 to 20 mV
Maximum irradiance	2000 W/m²
Part.no. CMA6	Kipp & Zonen CMA6 Albedometer with holder and 5 m cable

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Hukseflux LP02
Heat Flux Plate/Heat Flux Sensor

LP02

LP02 serves to measure the heat that flows through the object on which it is incorporated or in which it is mounted. The actual sensor in HFP01 is a thermopile. This thermopile measures the differential temperature across the ceramics-plastic composite body of LP02. Working completely passively, LP02 generates a small output voltage proportional to the local heat flux.

Sensitivity (nominal):	50 µV/ Wm^2
Temperature range:	-30°C to +70°C
Sensor thermal resistance:	< 6.25 10 -3 Km^2/W
Range :	+2000 to -2000 Wm^2
Calibration traceability:	NPL, ISO 8302 / ASTM C177
Expected typical accuracy: (12hr totals)	within +5/- 15% in most common soils, within +5/ -5% on walls
Part.no. LP02	Hukseflux soil heat flux sensor with holder




Wind Direction

IM511CD
IM512CD
05103L
85106

IM511CD

Vane type wind direction sensor for accurate direction measurement in all weather conditions.

IM511CD Wind Sentry Vane (Wind Direction - Azimuth)	
Range	360° mechanical, 352° electrical (8° open)
Sensor	Balanced vane, 16cm turning radius.
Damping Ratio	0.2
Delay Distance	0.5m (1.6ft)
Threshold	1.3m/s (2.9mph) at 10° displacement 1.9m/s (4.2mph) at 5° displacement
Transducer	Precision conductive plastic potentiometer, 10kOhm ±20% resistance 1.0% linearity, life expectancy 50 million revolutions Rated 1 watt at 40°C, 0 watt at 125°C
Transducer Excitation Requirement	Regulated DC Voltage, 15 VDC max
Output	RS 485
Part.no. IM511CD	Digital wind direction sensor
Part.no. IM513CD	Crossarm for wind speed and wind direction sensor

Wind Speed

IM512CD

Cup type anemometer for low cost and long lasting accurate wind measurements for all types of application.

IM512CD Wind Sentry Anemometer (Wind Speed)	
Range	0 to 50m/s (112mph), gust survival 60m/s (134mph)
Sensor	12cm diameter cup wheel assembly, 40mm diameter hemispherical cups
Turning Factor	75cm (2.46ft)
Distance Constant (63% recovery)	2.3m (7.5ft)
Threshold	1.1m/s (2.5mph)
Transducer	Stationary Coil, 1300 Ω nominal resistance
Transducer Output	AC sine wave signal induced by rotating magnet on cup wheel shaft. 100mV p-p at 60rpm. 6V p-p at 3600rpm.
Output Frequency	1 cycle per cup wheel revolution. 0.75m/s per Hz.
Part.no. IM512CD	Wind speed sensor




Wind Monitor

IM511CD
IM512CD
05103L
85106

05103L

The Wind Monitor combines wind speed and wind direction. It is constructed of a four blade helicoid propeller for highly accurate wind speed measurement with integrated wind direction sensor.

Range	
Wind speed	0-100 m/s (224 mph)
Azimuth	360° mechanical, 355° electrical (5° open)
Accuracy	
Wind speed	±0.3 m/s (0.6 mph) or 1% of reading
Wind direction	±3 degrees
Threshold	
Propeller	1.0 m/s (2.2 mph)
Vane	1.1 m/s (2.4 mph)
Dynamic Response	
Propeller distance constant (63% recovery)	2.7 m (8.9 ft)
Vane delay distance (50% recovery)	1.3 m (4.3 ft)
Damping ratio	0.3
Damped natural wavelength	7.4 m (24.3 ft)
Undamped natural wavelength	7.2 m (23.6 ft)
Output	RS 485
Power Requirement	
Potentiometer excitation	15 VDC maximum
Dimensions	
Overall height	37 cm (14.6 in)
Overall length	55 cm (21.7 in)
Propeller	18 cm (7 in) diameter
Mounting	34 mm (1.34 in) diameter (standard 1 inch pipe)
Weight	
Sensor weight	1.0 kg (2.2 lbs)
Part.no. 05103L	RM Young wind monitor (speed/direction) with gust system and LI battery
Part.no. 05103-45	RM Young wind monitor (speed/direction) with gust system and LI battery (alpine version)




RM Young - Ultrasonic Anemometer

85106

Extremely precise and maintenance-free measurement of wind velocity and wind direction. In contrast to traditonal „cups and vanes“ the ultrasonic wind sensor is designed without mechanical parts.

Sensor	RM Young 85106 Ultrasonic Anemometer
WInd speed	
Range:	0-70 m/s (156 mph)
Resolution:	0.1 m/s
Accuracy:	
0 to 30 m/s	±2% or 0.1m/s
30 to 70 m/s	±3%
Wind Direction	
Azimuth Range:	0-360°
Resolution:	1°
Accuracy:	± 2°
Serial output	
Type	RS-232, RS-485, SDI-12
Formats	ASCII Text (polled and continuous), RMYT (Wind Tracker), NMEA, SDI-12 (v1.3)
Baud Rates	1200, 4800, 9600, and 38400 baud
General	
Output rate:	1 Hz typical (selectable)
Power Supply:	9 to 16 VDC, 150 mA max
Dimensions:	34 cm high x 17 cm wide
Weight:	0.7 kg (1.5 lb)
Part.no. 85106	RM Young Ultrasonic Anemometer




Large Diameter Dendrometer DD-L

DN501

DN501

Dendrometers are sensors for continuous measurement of plant growth (changes of the plant diameter).

The dendrometer allows us to record the plant parameters using the same time interval, as environmental parameters. The data, therefore, allows the direct assignment of plant responses and stress to environmental influences. Dendrometers are a cost-effective and useful tool for ecophysiological studies.

Ecomatik Diameter Dendrometer large (DD-L)	
Suitable for plant size	Diameter 3-30 cm
Range of the sensor	11 mm
Accuracy	±2 µm ± 0.12%
Resolution	Infinite
Linearity	1%
Thermal expansion coefficient of the sensor	<0,1 µm/K
Operating conditions	Air temperature: -30 to +40°C, air humidity: 0-100%
Part.no. DN501	Dendromter Interfacebox with IP65 box (in addition you have to order the sensor, there are several types – please ask)

Leaf Temperature

IM522CD

IM521CD

LWN530

IM522CD

IM522CD is a highly accurate temperature sensor. It measures the radiated temperature around the surface of a leaf or a canopy.

Sensor	SMT160-30
Supply voltage	4.57 - 7 V
Supply current	max. 200 µA
Short circuit protection	infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temp. range	-30°C to +99°C
Accuracy	min. 0.3°C (-30° C to +99°C)
Calibration error	max. 0.25°C (23°C)
Nonlinearity error	max. 0.2°C
Supply voltage sensitivity	max. 0.1°C/V
Repeatability	max. 0.2°C
Long term drift	max. 0.1°C
Output frequency	1 to 4 kHz
Duty cycle	0.320 (0° C), 0.00470°/ C
Evaluation	Analog
Cable length	5 m
Part.no. IM522CD	Single leaf temperature sensor




Leaf Wetness Sensor

IM522CD

IM521CD

LWN530

IM521CD

Leaf Wetness works by measuring the conductivity in a filter paper. The filter paper is held between two stainless steel electrodes in a transparent holder. The use of transparent Lucite plastic as a holder reduces warming of the sensor when it is exposed to direct sunlight.

Supply voltage	4.75 - 5.25 V
Supply current	max. 1500 µA
Short circuit protection	infinite (within supply voltage range)
Dry / Wet threshold	220 - 390 kohm
Output	dry: max. 0.4 VDC wet: min. VCC-0.4VDC
Dimensions	127 mm x 254 mm x 508 mm
Electronic	Totally plastic encapsulated - SMD
Evaluation	Digital - Filter paper
Cable length	5 m
Part.no. IM521CD	Leaf wetness sensor with 5 m cable

Decagon LWS Leaf Wetness Sensor

IM522CD

IM521CD

LWN530

LWN530

Decagon LWS is designed to detect wetness (presence and duration) and ice formation.

Measurement Time	10 ms (milliseconds)
Sensor Type	Frequency domain
Output	320 - 1000 mV @ 3 V excitation
Operating Environment	-40°C to 50°C
Power	2.5 VDC @ 2 mA, to 5 VDC @ 7 mA
Cable Length	5 m standard; custom cable lengths available
Sensor Dimensions:	11.2 cm x 5.8 cm x .075 cm
EXPECTED LIFETIME:	2 + years of continuous use
Part.no. LWN530	Decagon leaf wetness sensor
Interface	Necessary Interface to connect this sensor with iMetos ECH870EXT / ECH871EXT




Soil Temperature

IM5041D

The Soil Temperature Sensor is a SMT 160-30 in a waterproof stainless steel housing. The sensor output is a duty-cycle signal.

Sensor	SMT160-30
Supply voltage	4.57 - 7 V
Supply current	max. 200 µA
Short circuit protection	infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temp. range	-30° C to +99°C
Accuracy	min. 0.3°C (-30° C to +99°C)
Calibration error	max. 0.25°C (23°C)
Nonlinearity error	max. 0.2°C
Supply voltage sensitivity	max. 0.1°C/V
Repeatability	max. 0.2°C
Long term drift	max. 0.1°C
Output frequency	1 to 4 kHz
Duty cycle	0.320 (0°C), 0.00470°/C
Evaluation	Analog
Cable length	5 m
Part.no. IM5041D	Single soil & water temperature with 5 m cable

Multiple Soil Temperature

SAR19

SAR19M

SAR19/SAR19M provide soil temperature measurement from several centimeters to 15 meter depth by using the Pessl Instruments sensor BUS. The distance between the sensors can be chosen according the application. Up to 10 sensors can be attached on one sensor chain.

Temperature Sensor	DS18B20
Operating Temperature Range	-55°C to +125°C
Supply DC Voltage (range)	3 - 5.5 V
Thermometer Error -10°C to +85°C	±0.3°C
Drift	±0.2°C
Data transmission	Rs 485 Digital signal (temperature data sent on demand of iMetos main board) iMetos checks all sensors every 5 minutes
Part.no. SAR19	Single chain soil temperature (1 soil temperature + interface)
Part.no. SAR19M	Additional soil temperature to connect on SAR19 (max. 10 sensors, min. distance in between)




Decagon EC-5 Soil Moisture Sensor

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

ECH500

The EC-5 is a basic, reliable and low cost Soil Moisture Sensor. The EC-5 determines volumetric water content (VWC) by measuring the dielectric constant of the media using capacitance/frequency domain technology. Its 70 MHz frequency minimizes salinity and textural effects, making this sensor accurate in almost any soil or soilless media. It is just 5 cm long, and has a 0.3 L measurement volume.

Accuracy *Mineral Soil* *Rockwool* *Potting Soil*	 ±3% VWC, most mineral soils, up to 8 dS/m ±1-2% VWC with soil specific calibration ±3% VWC, 0.5 to 8 dS/m ±3% VWC, 3 to 14 dS/m
Resolution	0.1% VWC (mineral soil) 0.25% VWC (rockwool)
Range	calibration dependant; up to 0-100% VWC with polynomial equation
Dimensions	8.9 x 1.8 x 0.7 cm
Cable Length	5 m, custom cable lengths available upon request
Measurement Time	10 ms
Power	2.5 - 3.6 V DC @ 10 mA. Output proportional to input voltage. 2.5 V and 3 V excitations supported with calibration equations
Output	Voltage, correlated linearly (soil) or polynomially (growing media) with VWC
Temperature	-40°C to +50°C
Part.no. ECH500	Decagon Echo5 probe sensor
Interface	Necessary Interface to connect this sensor with iMetos ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT

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Decagon 10HS Soil Moisture Sensor

ECH510

The 10HS soil moisture sensor has a larger volume of influence. Being 10 cm long, the 10HS measures 1 liter area of soil. The 10HS determines volumetric water content (VWC) by measuring the dielectric constant of the soil using capacitance/frequency domain technology. Using a 70 MHz frequency minimizes salinity and textural effects, making the 10HS accurate in most soils. Factory calibrations can be used in most typical soils with a saturation extract EC of 10 dS/m.

Accuracy *Apparent Dielectric Permittivity (ε_a)* *Soil Volumetric Water Content (VWC)*	± 0.5 from ε_a of 2 to 10, ± 2.5 from ε_a of 10 to 50 Using standard calibration equation: ± 0.03 m^3/m^3 (± 3% VWC) typical in mineral soils that have solution electrical conductivity < 10 dS/m Using soil specific calibration, ± 0.02 m^3/m^3 (± 2% VWC) in any soil
Resolution ε_a *VWC*	1.1 from ε_a of 1 to 30, 0.2 from ε_a of 30 to 50 1.2 0.0008 m^3/m^3 (0.08% VWC) in mineral soils from 0 to 0.50 m^3/m^3 (0-50% VWC)
Range ε_a *VWC*	1 (air) to 50 Calibration dependant; up to 0 - 57% VWC with polynomial equation
Measurement Time	10 ms (milliseconds)
Sensor Type	Capacitance (frequency domain)
Output	300 - 1250 mV, independent of excitation voltage
Operating Environment *Survival Temperature* *Operating Temperature*	 -40 - 50°C 0 - 50°C
Power requirements	3 VDC @ 12 mA to 15 VDC @ 15 mA
Cable Length	5 m standard; custom cable lengths available
Part.no. ECH510	Decagon 10HS Echo probe sensor
Interface	Necessary Interface to connect this sensor with iMetos ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

Decagon 5TM Soil Moisture Sensor

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

ECH5TM

Temperature integrated with soil moisture: The 5TM delivers temperature, measured by an onboard thermistor, along with accurate volumetric water content. The 5TM's small size makes it easy to install. Perfect for in field installations.

Accuracy *Apparent Dielectric Permitivity (ε_a):* *Soil Volumetric Water Content (VWC):* *Temperature:*	 ± 1 ε_a from 1 - 40 (soil range); ± 15% from 40 – 80 Using Topp equation: ± 0.03 m^3/m^3 (± 3% VWC) typical in mineral soils that have solution electrical conductivity < 10 dS/m Using medium specific calibration: ± 0.02 m^3/m^3 (± 2% VWC) in any porous medium ± 1°C
Resolution ε_a: *VWC:* *Temperature*	 0.1 ε_a from 1-20, < 0.75 ε_a from 20-80 0.0008 m^3/m^3 (0.08% VWC) from 0 to 50% VWC 0.1°C
Range ε_a: *Temperature*	 1 (air) to 80 (water) -40 - 50°C
Dimensions	10 cm x 3.2 cm x 0.7cm
Cable Length	5 m standard, custom cable lengths available upon request
Measurement Time	150 ms (milliseconds)
Power	3.6 - 15 VDC, 0.3 mA quiescent, 10 mA during 150 ms measurement
Output	RS232 or SDI-12
Part.no. ECH5TM	Decagon 5TM sensor
Interface	Necessary Interface to connect this sensor with iMetos ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT

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Decagon 5TE Soil Moisture Sensor

ECH5TE

Soil moisture, temperature, and electrical conductivity: The 5TE lets you monitor bulk electrical conductivity (EC), in addition to volumetric water content (VWC) and soil temperature. Monitoring salt levels can be as important as monitoring soil moisture in water-limited areas. The 5TE allows you to measure salt levels through bulk electrical conductivity.

Accuracy *Apparent Dielectric Permittivity (ε_a):* *Soil Volumetric Water Content (VWC):* *Electrical Conductivity (EC):* *Temperature:*	 ± 1 ε_a (unitless) from 1 - 40 (soil range), ± 15% from 40 – 80 Using Topp equation: ± 0.03 m^3/m^3 (± 3% VWC) typical in mineral soils that have solution electrical conductivity < 10 dS/m Using medium specific calibration, ± 0.01 - 0.02 m^3/m^3 (± 1 - 2% VWC) in any porous medium ± 10% from 0 to 7 dS/m, user calibration required above 7 dS/m ± 1°C
Resolution ε_a: *VWC:* *EC:* *Temperature*	 0.1 ε_a (unitless) from 1 - 20, < 0.75 ε_a (unitless) from 20 - 80 0.0008 m^3/m^3 (0.08% VWC) from 0 to 50% VWC 0.01 dS/m from 0 to 7 dS/m, 0.05 dS/m from 7 to 23.1 dS/m 0.1 °C
Range ε_a: *EC:* *Temperature:*	 1 (air) to 80 (water) 0 - 23 dS/m (bulk) -40 - 50°C Calibration dependant; up to 0 - 57% VWC with polynomial equation
Measurement Time	150 ms (milliseconds)
Sensor Type *VWC:* *EC:* *Temperature:*	 Frequency domain Two probe design Thermistor
Output	RS232 (TTL), or SDI-12
Operating Environment	-40 - 50°C
Power	3.6 - 15 VDC, 0.3 mA quiescent, 10 mA during 150 ms measurement
Cable Length	5 m standard, custom cable lengths available upon request
Sensor Dimensions	10 cm x 3.2 cm x 0.7 cm
Part.no. ECH5TE	Decagon Combi-Echo 5TE
Interface	Necessary Interface to connect this sensor with iMetos ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100




Decagon MPS-2 Dielectric Water Potential

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

ECH511

The MPS-2 is a maintenance-free water potential and temperature sensor. The MPS-2 measures a wide range of soil water potentials (-10 to -500 kPa (pF 1.71 to pF 3.71)) without user maintenance.

Accuracy *Soil Water Potential* *Soil Temperature*	 ± 25% of reading from -10 kPa to -100 kPa ± 1°C
Resolution *Soil Water Potential* *Soil Temperature*	 0.1 kPa 0.1°C
Range *Soil Water Potential* *Soil Temperature*	 -10 to -500 kPa (pF 1.71 to pF 3.71) -40°C to 50°C
Measurement Speed	150 ms (milliseconds)
Equilibration time	10 min to 1 hr depending on soil water potential
Sensor Type	Frequency domain with calibrated ceramic discs, thermistor
Output	RS232 (TTL) with 3.6 volt levels or SDI-12 communication protocol
Operating Environment	-40°C to 50°C
Power	3.6 - 15 VDC, 0.03 mA quiescent, 10 mA max during 150 ms measurement
Cable Length	5 m, custom cable lengths available
Sensor Dimensions	9.6 cm (l) x 3.5 cm (w) x 1.5 cm (d)
Part.no. ECH511	Decagon MPS2 water tension probe
Interface	Necessary Interface to connect this sensor with iMetos ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT

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Soil Moisture Sensor - Watermark

MD510SM

The Watermark Sensor consists of two concentric electrodes buried in a special reference matrix material that is held in place by a synthetic membrane. The matrix material has been selected to reflect the maximum change of electrical resistance over the growth range of production crops as well as to neutralize the effect of soil salinity. In operation, soil moisture is constantly being absorbed or released and the electrical resistance between the electrodes changes. This resistance is read by the weather station. The sensor is manufactured from non-corrosive parts and lasts up to three years.

Size	2.2 cm diameter x 5 cm length
Measuring Principle	Resistance with Gypsum Block (Tensiometer Type)
Working Range	10 to 200 kPa
Precision	5%
Evaluation	Analog
Cable	5 meters
Part.no. MD510SM	Soil moisture sensor type Watermark with 5 meter cable
Interface	Necessary Interface to connect this sensor with iMetos:WM-BUS or WM-BUSINT




SOIL MOISTURE SENSOR

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

GS3

The Decagon GS3 sensor measure soil moisture, soil temperature and EC. The sensor has been optimized for use in soilless substrates, giving it a wider range of EC measurement and an increased temperature range. The steel needles not only slice through the substrates for perfect contact, but they also improve the sensor's ability to measure EC in porous substrates such as peat or perlite. The sensor also works well in mineral soils. The GS3 measures water content, temperature, and EC independently. Its 70 MHz frequency minimizes salinity and textural effects, making it accurate in most soil or soilless media. Stainless steel needles have an extended surface area to optimize EC measurements, while minimizing substrate disturbance during insertion.

ACCURACY	
Apparent Dielectric Permittivity (εa):	± 1 εa (unitless) from 1 - 40 (soil range), ± 15% from 40 - 80
Soil Volumetric Water Content (VWC):	Using a generic calibration: ± 0.03 m3/m3 (± 3% VWC) typical in mineral soils that have solution electrical conductivity < 10 dS/m Using medium specific calibration, ± 0.01 - 0.02 m3/m3 (± 1 - 2% VWC) in any porous medium
Electrical Conductivity (EC):	± 10% from 0 to 10 dS/m, user calibration required above 10 dS/m
Temperature:	± 1°C
RESOLUTION	
εa:	0.1 εa (unitless) from 1 - 20, < 0.75 εa (unitless) from 20 - 80
VWC:	0.002 m3/m3 (0.2% VWC) from 0 to 40% VWC, 0.001 m3/m3 (0.1% VWC) > 40% VWC
EC:	0.001 dS/m from 0 to 23 dS/m
Temperature:	0.1°C
RANGE	
εa:	1 (air) to 80 (water)
EC:	0 - 23 dS/m (bulk)
Temperature:	-40 to 80°C
MEASUREMENT SPEED	150 ms (milliseconds)
SENSOR TYPE	
VWC:	Frequency domain
EC:	Two probe design
Temperature:	Thermistor
OUTPUT	Serial TTL, 3.6 Volt Levels or SDI-12
OPERATING ENVIRONMENT	-40°C to 80°C
POWER	3.6 - 15 VDC, 0.3 mA quiescent, 25 mA during 150 ms measurement
CABLE LENGTH	5 m standard, custom cable lengths available upon request
SENSOR DIMENSIONS	9.3 cm x 2.4 cm x 6.5 cm
Part.no. ECH-GS3	Decagon GS3 – Volumetric Soil Moisture, Electrical Conductivity and Soil Temperature
Interface	Necessary Interface to connect this sensor with iMetos: ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT




Tensiometer

TNS103..7

The instrument measures soil water tension, in centibars (cb) or kilopascals (kPa). This value represents the energy a plant's root system uses to draw water from the soil. Understanding soil moisture activity helps the user make informed irrigation scheduling decisions resulting in improved yield and quality while reducing water, fertilizer, labor and energy costs.

INSTRUMENT BODY MATERIALS	Butyrate body, ceramic tip, neoprene stopper
RESERVOIR SECTION DIMENSIONS *HEIGHT* *DIAMETER*	 120 mm – 130 mm including cap 51 mm – 55 mm including cap
BODY TUBE SECTION DIMENSIONS *LENGTH* *DIAMETER*	 Ranges from 15 cm to 150 cm 22 mm
INSTRUMENT WEIGHT	30 cm is 0.439 kg with increases of 0.114 kg per 30 cm
CERAMIC TIP	White tip – used for most soil types
Operating Suction	0-100 cb (kPa)
Operating Temperature	0°C to 50°C
Part.no. TNS103	Irrometer Tensiometer 15 cm without Manometer
Part.no. TNS104	Irrometer Tensiometer 30 cm without Manometer
Part.no. TNS105	Irrometer Tensiometer 45 cm without Manometer
Part.no. TNS106	Irrometer Tensiometer 60 cm without Manometer
Part.no. TNS107	Irrometer Tensiometer 90 cm without Manometer
Interface	Necessary Interface to connect this sensor with iMetos: TNS100

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100




AquaCheck Sub-Surface Probe

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

AQ600

The AquaCheck sub-surface soil moisture probe offers capacitance based soil moisture measurement offering up to six depths or sensors per probe.

Sensor Type	Profile type integrated sensor without access tube
Probe lengths	from 400 mm to 1200 mm
Number of sensors	Up to 6 soil moisture and 6 soil temperature sensors depending on the probe length. (Up to 6 sensors or depths per probe.)
Shaft diameter	32mm.
Use	Can be used for pastures, arable crops, viticulture or other sub-surface measurement applications
Communication Interface options:	SDI-12 (serial data interface, 1200bd) / MODBUS, 2400bd
Compliancy	CE certified
Cable length	Supplied with a 5m 3-core cable
Voltage input	4-12V for standard models; 9-16V option available on BASIC II (on request)
Power Requirement	10uA (0.01mA) during idle; 20mA for 2 seconds during measurement
Sensor Spacing	10cm or 20cm (fixed)
Sensor Reading Count	approximately 32000 for air and 1000 in water
Sensor Resolution	Approximately 13 bits
Temperature Sensor	0-51°C, steps of 0.2°C
Part.no. AQ600	AquaCheck sub-surface MOD (600 mm) 6 soil moisture and temperature sensors
	This sensor works only with ECO D2.




Soil Moisture

100SMT

The 100SMT is an accurate soil moisture probe for monitoring water content and soil temperature. The oscillation frequency is related to the dielectric permittivity of the surrounding medium. The relation between the permittivity and the soil moisture depends on the soil type and the soil temperature. Therefore all dielectric measurement techniques require a material and temperature dependent calibration for highest precision.

Multilayer printed circuit board	Butyrate body, ceramic tip, neoprene stopper
Overall dimensions	220 x 32 x 10 mm
Connector cable length	1-10 m
Volumetric water content accuracy	~ 1.5 % (depending on soil specific calibration)
Volumetric water content resolution	~ 0.5 %
Temperature range for temperature	-55°C to 125°C
Temperature range for permittivity	-10°C to 70°C
Temperature accuracy	± 0.5°C
Weight	approx. 250 g
Power consumption	65 mA for less that 1s during measurement
Voltage supply	4-12 VDC, up to 28V on request Reverse polarity protection and overvoltage protection
Digital interface	RS485
Other interfaces	SDI-12, USB, analog on request
Identification	unique 24bit identifier for each sensor (digital readout)




Sentek EasyAG Soil Moisture

SEN12512
SEN13512

SEN12512	
Measuring range	0-100% Vol
Method	HF Capacitance
Accuracy	+/- 0,06% Vol
Installation method	PVC access tube
Power supply	7 to 12 Volts
Interface	SDI-12
Lengths	50cm
Number of Sensors	5

Sentek sensors utilize capacitance-based technology to provide near continuous measurements within the soil profile. By creating a high frequency electrical field around the sensor, extending through the access tube into the surrounding soil, the sensor detects the changes in dielectric constant, or permittivity, of the soil over time. At high frequency the measurement is affected predominantly by water molecules. The greater is the amount of water, the smaller is the frequency measured between the two brass rings of the sensor.

SEN13512	
Measuring Range	0 - 100% Vol
Method	HF Capacitance
Salinity	0-17 dS/m (Bulk EC)
Accuracy	+/- 5% (Salinity)
Installation method	PVC access tube
Power supply	7 to 12 Volts
Lengths	50cm
Interface	SDI-12
Number of Sensors	5
Sensor Depths in cm	10/20/30/40/50
Operating Temperature	-20°C - +75°C

The TriSCAN sensor provides measurements of both soil water and salinity. By employing a patented measurement technique the TriSCAN sensor is able to distinguish between soil water content and salt content. This information is then processed using a Sentek derived model to calculate soil volumetric ion content (VIC) separately from the Volumetric Water Content. The TriSCAN sensor is designed for fertilizer and salinity management in research, agriculture and environmental applications.

The TriSCAN sensor is optimized for one of agriculture's most common soil textures of sands and sandy loams, and is currently not suitable for clays.

Echo Chain Interface
for 3 Decagon Sensors

ECH870EXT
ECH870INT

Connection Possibilities	3 pc. of following Decagon Sensors: EC-5 Soil Moisture Sensor (ECH500) 10HS Soil Moisture Sensor (ECH510) 5TM Soil Moisture Sensor (ECH-5TM) 5TE Soil Moisture Sensor (ECH-5TE) MPS-2 Dielectric Water Potential (ECH511) Decagon Leaf Wetness Sensor (LWN530)
Dimension	80 x 55 mm
General Information	Part.no. ECH870EXT Echo Chain Interface with Box Part.no. ECH870INT Echo Chain Interface internal mounted, only for ECO D2 (only one pc. possible per station)
Cable length (Part.no. ECH870EXT)	5 m standard, custom cable lengths available upon request




Echo Chain Interface
for 2 Decagon Sensors & 2 Watermark Sensors & 1 Soil Temperature Sensor

IM5041D
SAR19
ECH500
ECH510
ECH5TM
ECH5TE
ECH511
MD510SM
GS3
TNS103..7
AQ600
100SMT
SEN12512
SEN13512
ECH870EXT
ECH871EXT
ECH874EXT
WM-BUS
TNS100

ECH871EXT
ECH871INT

Connection Possibilities	2 pc. of following Decagon Sensors: EC-5 Soil Moisture Sensor (ECH500) 10HS Soil Moisture Sensor (ECH510) 5TM Soil Moisture Sensor (ECH-5TM) 5TE Soil Moisture Sensor (ECH-5TE) MPS-2 Dielectric Water Potential (ECH511) Decagon Leaf Wetness Sensor (LWN530) 2 pc. of following Sensor: Soil Moisture Sensor Type Watermark (MD510SM) 1 pc. of following Sensor: Soil Temperature for WM-BUS (WMTEMP)
Dimension	80 x 55 mm
General Information	Part.no. ECH871EXT Echo Chain Interface with Box Part.no. ECH871INT Echo Chain Interface internal mounted, only for ECO D2 (only one pc. possible per station)
Cable length (Part.no. ECH871EXT)	5 m standard, custom cable lengths available upon request

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Echo Chain Interface
for 1 Decagon Sensor & 4 Watermark Sensors & 1 Soil Temperature Sensor

ECH874EXT
ECH874INT

Connection Possibilities	1 pc. of following Decagon Sensors: EC-5 Soil Moisture Sensor (ECH500) 10HS Soil Moisture Sensor (ECH510) 5TM Soil Moisture Sensor (ECH-5TM) 5TE Soil Moisture Sensor (ECH-5TE) MPS-2 Dielectric Water Potential (ECH511) Decagon Leaf Wetness Sensor (LWN530) 4 pc. of following Sensor: Soil Moisture Sensor Type Watermark (MD510SM) 1 pc. of following Sensor: Soil Temperature for WM-BUS (WMTEMP)
Dimension	80 x 55 mm
General Information	Part.no. ECH874EXT Echo Chain Interface with Box Part.no. ECH874INT Echo Chain Interface internal mounted, only for ECO D2 (only one pc. possible per station)
Cable length (Part.no. ECH874EXT)	5 m standard, custom cable lengths available upon request




Watermark BUS
for 3 Watermark Sensors and 1 Soil Temperature Sensor

WM-BUS
WM-BUSINT

Connection Possibilities	3 pc. of following Sensor: Soil Moisture Sensor Type Watermark (MD510SM) 1 pc. of following Sensor: Soil Temperature for WM-BUS (WMTEMP)
Dimension	80 x 55 mm
General Information	Part.no. WM-BUS Watermark BUS with Box Part.no. WM-BUSINT Watermark internal mounted, only for ECO D2 (only one pc. possible per station)
Cable length (Part.no. WM-BUS)	5 m standard, custom cable lengths available upon request

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Tensiometer Interface
with 4 tensiometer connectors

TNS100

Connection Possibilities	4 pc. of following Sensor: Tensiometer sensor head with pressure transducer with 5 m cable and 3/8 inch male screw (TNS101)
Dimension	80 x 55 mm
General Information	For each Tensiometer you can choose following: Irrometer Tensiometer 15 cm without Manometer (TNS103) Irrometer Tensiometer 30 cm without Manometer (TNS104) Irrometer Tensiometer 45 cm without Manometer (TNS105) Irrometer Tensiometer 60 cm without Manometer (TNS106) Irrometer Tensiometer 90 cm without Manometer (TNS107)
Cable length (Part.no. TNS100)	5 m standard, custom cable lengths available upon request




Ultrasonic snow depth sensor

USH8

SHM30

USH8

Non-contact measurement of snow-depth in extreme conditions by ultrasonic sensors. The sensor is characterized by its high level of operating reliability, low energy consumption and ease of use in the field.

Measurement range – Snow depth	Measurement range: 0 to 8 m; resolution: 1 mm; accuracy: 0.1 % (FS) Measurement principle / sensor: ultrasonic (frequency 50 kHz; beamwidth 12°)
Measurement range – Temperature	Measurement range: -35 °C to +60 °C; resolution: 0.1 °C; non-linearity: ≤0.15 % Measurement principle / sensor: semiconductor (external sensor in air-cooled radiation shield)
Interface – Analog	Distance / snow level Signal: 0/4 to 20 mA (configurable); resolution: 12 bit; max. load 100 Ω
Interface – Digital	Distance / snow level and air temperature Interface: RS 232; data transmission rate: 1.2 to 19.2 kBd Protocol: various ASCII protocols
Power supply	Supply voltage: 10.5 ... 15 VDC Current consumption: max. 200 mA (Measuring phase about 3 sec); <1 mA (Standby) Power consumption: 0.5 Ah / day (with measuring interval of 1min)
Range of application	Operating temperature: -35°C to +60°C
Protection rating	IP66
Installation	Mast-mounting device for 61 mm (2 “) pipe
Part.no. USH8	Ultrasonic snow depth sensor

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Jenoptik snow Depth Sensor

SHM30

Optoelectronic laser sensor for determining snow depths from very small to high levels of snow.

Range for snow depth	0.1 m ... 10 m
Measuring accuracy	5 mm (snow) 1 mm (natural surfaces)
Time to measure	< 10 s
Measuring interval	1 s ... 600 s (programmable)
Interfaces	RS 485
Power consumption *without heating* *with heating*	 0.5 W (avg.) / 1W (max) 12 W (avg.) / 24W (max)
Power supply *without heating* *with heating*	 10 ... 30 VDC 15 ... 24 VDC
Part.no. SHM30	Jenoptic snow depth sensor




Noise Sensor

NS100

The Pessl Instruments sound level noise sentry is a high-performance sound level meter integrated in the iMetos data logger. It includes a precision MEMS microphone, and accurately records date/time of sound levels. Its very small size allows it to be mounted wherever needed or embedded within monitored equipment. It is used in the building industry and in animal behavior monitoring.

Bandwidth	20Hz to 20 kHz
Dimensions	80 x 80 x 55 mm
Weight	250 g
Measurements	Max Acoustic Level (linear-Pa or dB-SPL) / Min Acoustic Level (linear-Pa or dB-SPL) / Average Acoustic Level (LEQ) (linear-Pa or dB-SPL)
Weighting Functions	A / C
Alarms	Max Instantaneous Level / Max Integrated Level (Dose)
Battery type	CR2032 lithium battery
Operating temperature range	-20°C to 70°C
Storage temperature range	-30°C to 80°C
Noise Floor	39 dB (typical)
Saturation Level	110 dB (typical)
Resolution	0.1dB
Recorded Resolution	1 dB
Precision	+-2 dB (50 Hz – 8 kHz) (typical) / +-5 dB (20 Hz – 20 kHz) (typical)
Sensor Type	MEMS Microphone
Recording interval	Adjustable 1s to 12H, with 10 minutes resolution
Logging interval	User Selectable
Internet contact interval	User selectable
Sensitivity	Adjustable
Part.no. NS100	Noise Sensor




Barometer

MD514D

The Pessl Instruments barometric sensor measures the “absolute air pressure” of the atmosphere at the site. It is designed for application in the field of environmental protection, where high accuracy, quick responding behaviour, long term stability and reliability are required. The instrument is suited for indoor and field application.

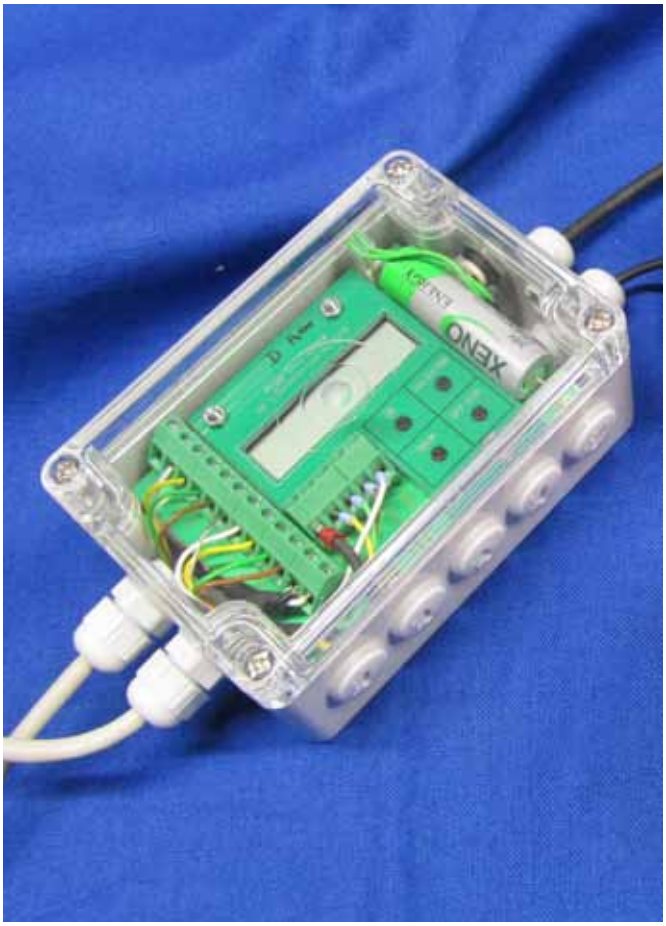
A tempered piezoceramic sensor for absolute pressure is used, characterized by its thermal and mechanical stability.

Sensor	XT0-15PSIA
Working range	0 - 1150 mbar
Weight	ca. 50g
Power Supply	5.0 VDC (6VDC maximum)
Zerro Offset	0.50+-0.09 VDC
Power uptake	max. 20mA
Precision	0.1% max. Thrift
Temperature range	-40°C to 125°C
Measuring type	Serial (RS 485)
Part.no. MD514D	Barometric Pressure




EC500PH EC & PH Interfacebox
with display in IP65 box

EC500PH



The EC500PH EC & PH Interfacebox is a measuring device with Display in IP65 Box to be integrated into any iMetos sensor chain interface for continuous EC & PH measurement in water. The outstanding design allows the use of most industry standard EC & PH sensors available in the world market. On the display the actual reading can seen. With the built in calibration mode all sensors readings can be calibrated and checked from time to time.

Connection Possibilities	1 pc. EC Sensor (Part.no. EC501) 1 pc. PH Sensor (Part.no. PH501)
General Information	Display shows actual data by pressing the button Works with iMetos II and ECO D2
Cable length	5 m standard, custom cable lengths available upon request
Part.no. EC500PH	EC&PH Interfacebox with display in IP65 box

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EC SENSOR
PH SENSOR

EC501
PH501

PH: The pH sensor is a reliable and cost-effective sensor for measuring the pH value of various aqueous solutions. The pH scale covers values between 0 and 14. Acids have pH values towards 0; caustic solutions have pH values towards 14.
EC: The Conductivity Sensor provides a complete self-contained measurement. The sensor utilizes a reliable and robust sensor for conductivity measurement and a thermistor for temperature measurement. The sensor is ideal for use in hydrographical and environmental water monitoring in agriculture and industrial applications. The durable design ensures suitability for the harshest environment applications.

EC Sensor	
Range	0.001-100 mS
Resolution	0.01 mS/cm
Accuracy	±0.01pH
Temperature compensation	Automatic
Probe Material	PP
Probe Diameter	12mm
Min. Immersion	40mm
Part.no. EC501	EC Sensor
Interface	Necessary Interface to connect this sensor with iMetos: EC500PH Interface box with Display

PH Sensor	
Range	pH 0.00 to 14.00
Resolution	0.01 pH
Accuracy	±2% F.S.
Temperature compensation	Automatic
pH probe	Up to 7 bar, 3 m cable, 2-ring-flow-through
pH-calibration	2-point with automatic buffer (recognition pH 4.0 and pH 7.0)
Probe Material	Glass
Probe Diameter	12 mm
Min. Immersion	35 mm
Temp. Operating Range	15°C - 60°C
Response time	<= 90s
Part.no. PH501	PH Sensor
Interface	Necessary Interface to connect this sensor with iMetos: EC500PH Interface box with Display




Pressure Switch

EC500PH
EC501
PH501
PS010
LMP305
LMP306
ET-250

PS010

Simple and robust construction
Adjustable switching point through headless screw
Suitable for compressed air, hydraulic oil, oil emulsions, water. The main purpose of this sensor is to control/check the correct performance of the irrigation system.

Material:	brass (G1/8 „) or zinc-plated steel (G1/4 „)
Switching function:	Open contact, closed contact, changeover
Media:	Compressed air, hydraulic oil, oil emulsion, water
Max. Medium temp.:	+85°C
Adjustment ranges:	1 to 10 bar (14,5-145 psi)
Switching frequency:	max. 200 / min
Switching pressure difference:	10 to 15 %
Mech. service life: **switching voltage**	106 Open contact/closed contact 42 V max. 2 A Changeover 250 V max. 2 A
Part.no. PS010	Pressure Switch adjustable form 1-10 BAR
Interface	Necessary Interface to connect this sensor with iMetos: PS100 Pressure Switch electronic with 5 m cable, box and stainless steel holder




Water Level Sensor

LMP305

The LMP305 is an accurate but cost effective stainless steel submersible water level sensor that can be connected to iMetos stations with the precision of +/-3 % within the measurement ranges. Sensor has an integrated Barometric sensor module to increase the precision. Pressure (Measuring) ranges: 0 mWC up to 5 mWC (other distances on request – please define at order).

Applications: Depth or level measurement in wells and open waters (Rivers and Lakes) and ground water level measurement.

Accuracy according to IEC 60770	Limit Point Adjustment (Nonlinearity, Hysteresis and Repeatability) within +/-3 % within the measurement ranges
Response time	~ 5 ms
Range	0 to 5 m water gauge
Resolution	1cm
Accuracy	3 cm of water depth
Operating temperature range	0 to 50°C
Storage temperature range:	-20 to 80°C
Dimensions Gauge shaft	90 x 20 mm (height x diameter)
Weight	1.1 kg (including cable)
Housing	Stainless steel 1.4571
Diaphragm	Stainless steel 1.4404
Seals	FKM
Cable Sheath	Shielded PVC
Measuring ranges	0 mWC up to 5 mWC (more on request)
Output signal	0 – 5 Volts
Support	Pessl Instruments BUS only at the end of the chain
Part.no. LMP305	Water level sensor (+/- 3% accuracy) please let us know measuring depth and necessary cable lengths (no sensor cable is included please add requested length on CAB11)
Part.no. CAB11	Water level special cable – Li2YCYv black cable (price per meter)




Water Level Sensor

EC500PH
EC501
PH501
PS010
LMP305
LMP306
ET-250

LMP306

The LMP306 is a highly accurate stainless steel submersible water level sensor that can be connected to iMetos stations with the precision of +/-0,5% within the measurement ranges. The sensor has an integrated barometric sensor module to increase the precision. Pressure (Measuring) ranges: 0 mWC up to 5 mWC (other distances are awailabe on request – please, define in the order).

Applications: Depth or level measurement in wells and open waters (rivers and lakes) and ground water level measurement.

Accuracy according to IEC 60770	Limit Point Adjustment (Nonlinearity, Hysteresis, Repeatability) within +/-0,5% within the measurement ranges
Response time:	~ 5 ms
Range:	0.1 to 5 m water gauge
Resolution	1 mm
Accuracy	3 mm of water depth
Operating temperature range	0 to 50°C
Storage temperature range:	-20 to 80°C
Dimensions Gauge shaft	90 x 20 mm (height x diameter)
Weight	1.1 kg (including cable)
Housing	Stainless steel 1.4571
Diaphragm	Stainless steel 1.4404
Seals	FKM
Cable Sheath	Shielded PVC
Measuring ranges	0 mWC up to 50 mWC (more on request)
Output signal	0 – 5 Volts
Support:	Pessl Instruments BUS
Part.no. LMP306	Water level sensor (+/- 0.5% accuracy) please let us know measuring depth and necessary cable lengths (no sensor cable is included please add requested length on CAB11)
Part.no. CAB11	Water level special cable – Li2YCYv black cable (price per meter)

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Water level Keller sensor
submersible pressure transducer
Evaporation Gauge

ET-250

ET-250 is an highly accurate stainless steel submersible water level sensor used for Class A Evaporation pans to be connected to iMetos stations. Highest precision is reached with Keller sensor technology, water temperature compensation and integrated barometric sensor module. Due to its innovative design, most mechanical Class A pans can be retrofitted with automatic ET measurements.

Accuracy according to EC 60770	Limit Point Adjustment (Nonlinearity, Hysteresis and Repeatability) within +/-0.3mm within the measurement range of 0 to 350 mm
Response time	~ 5 ms
Range	5 to 350 mm water gauge
Resolution	0.1 mm
Accuracy	0.3 mm of water depth
Operating temperature range	0 to 50°C
Storage temperature range	-20 to 80°C
Dimensions Gauge body	60 mm (diameter) stainless steel
Gauge shaft	90 x 20 mm (height x diameter)
Weight:	1.1 kg (including cable)
Housing:	Stainless steel 1.4571 with holder in water
Diaphragm	Stainless steel 1.4404
Seals	FKM
Cable Sheath	Shielded PVC 5 meter
Measuring ranges	0 mmWC up to 350 mmWC
Output signal	0 – 5 Volts
Support	Pessl Instruments BUS only at the end of the chain
Part.no. ET-250	Keller – submersible pressure transducer evaporation gauge (0.2% accuracy) with 5 m cable




CO_2 SENSOR

CO2

CO2 sensors, with patented auto-calibration for climate technology and building management are based on a 2-source, 2-beam process. This technology offers long-term stability ensured by the tested and trusted NDIR CO2 measurement cell. The miniature design of CO2 sensor is ideally suited for applications in the environmental fields indoors as well as outdoors.

Measuring principle	non-dispersive infrared technology (NDIR)
Measurement range	0...2000 / 5000 / 10000ppm
Accuracy at 25°C and 1013mbar	0...2000ppm: < ± (50ppm +2% from the measured value)
0...5000ppm:	< ± (50ppm +3% from the measured value)
0...10000ppm	< ± (100ppm +5% from the measured value)
Response time t90	< 195s
Temperature dependency	type 2ppm CO2/°C (0...50°C)
Long-term stability	type 20ppm / a
Housing / Protection class	Plastic PC / Housing IP65 4.75 - 7.5V DC
Operating temperature and conditions	-40...60°C 0...100% rF (non-condensing) 85...110kPa
Storage temperature and condition	-40...75°C 0...100% rF (non-condensing) 70...110kPa
Dimensions	96 x Ø18.5mm
Part.no. CO2	CO2 Sensor

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