METOS®
BY PESSL INSTRUMENTS



Product Portfolio

Technical Catalogue

FEBRUARY 2025 EDITION

www.metos.global



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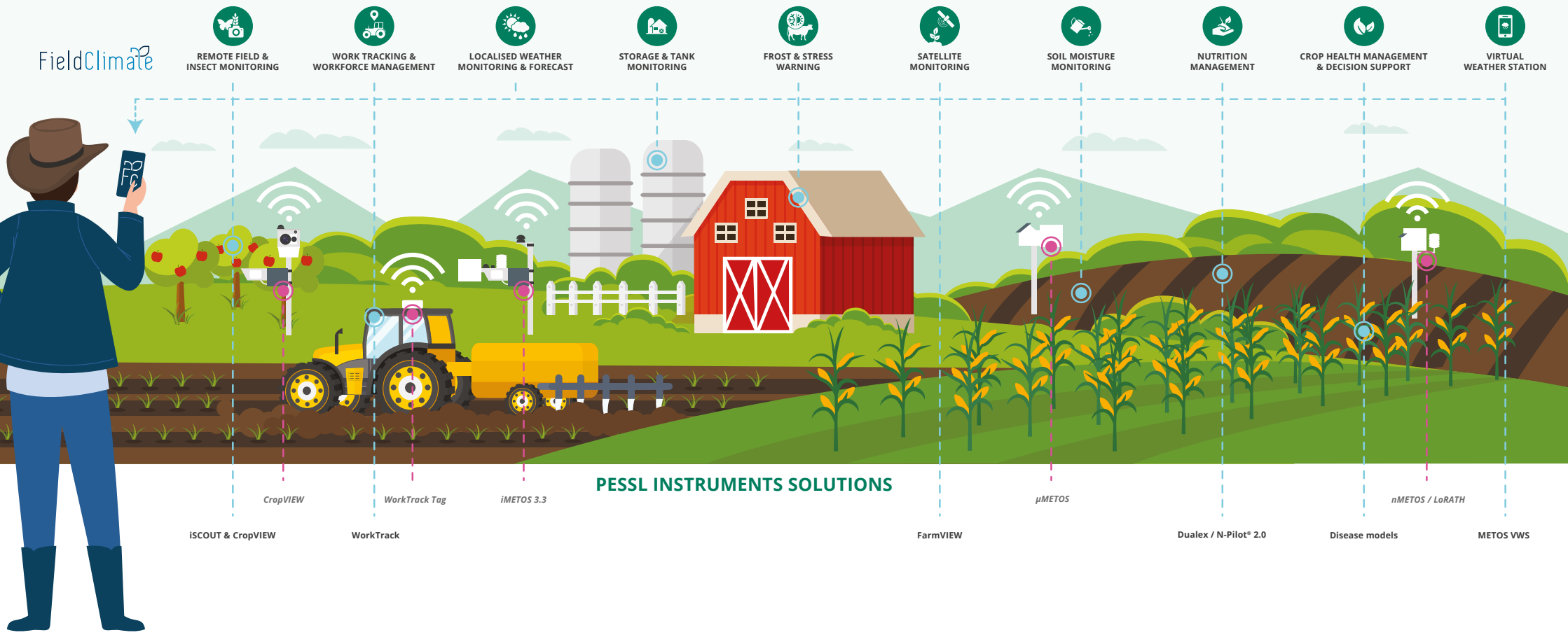
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Nested Approach to IoT Agriculture

Agriculture has changed dramatically in the last two decades and fast developing technologies will continue to have a tremendous influence on the farming practices in the years to come. IoT in agriculture is gaining importance since it helps monitor multiple on-farm assets all at once. But how does it work?

The Nested or Holistic approach means connecting many different devices/ solutions that are strategically placed in fields. Pessl Instruments connects all the dots, makes it easier to control your farm and fields, so you don't have to worry about important management decisions being overlooked. This way you avoid unnecessary trips to the field, know exactly what the conditions at any given time are, make timely decision about irrigation, fertilizing, pesticide application, harvesting, and more 24/7 all year round.

For the nested approach to work, you need multiple devices to monitor multiple issues in your field and around your farm; having just one weather station cannot provide enough data to respond to everything your farm needs.



INTRODUCTION

METOS by Pessl Instruments -

The Revolution of Decision Making for Your Farm

No matter which crop, soil, or part of the world is in question, digital IoT agriculture solutions will reduce guess work and enable data driven decisions for:

- **improved quality of your yield**
- **enhanced productivity of your team and**
- **increased profit of your farm.**

At the same time they will help:

- **optimize input use (water, energy, fertilizers, chemicals, and workforce),**
- **reduce the overall impact on the environment.**

Pessl Instruments has been serving growers, researchers and managers in 85 countries for more than 37 years. Customizable digital IoT agriculture hardware and software solutions cover all needs, pain points and challenges that boots on the ground face in their everyday work and we are proud to make the burden of decision making a bit lighter.

METOS IS APPLICABLE IN MULTIPLE SECTORS

AGRICULTURE · HYDROPONICS AND GREENHOUSES · LANDSCAPE (GOLF AND TURF) · CITY CLIMATE · ANIMAL WELFARE · RESEARCH · HYDROLOGY AND FLOOD WARNING · METEOROLOGY

PESSL INSTRUMENTS IN NUMBERS & FACTS

A global ecosystem with headquarters in Austria

OVER 120 EXPERTS
AI specialists, Satellite experts, Plant Pathologist, Entomologists, Modelers, Hardware and Software developers, Researchers

16 SUBSIDIARIES
Global brand with local support

In-house development and manufacturing

80.000+
Stations deployed worldwide

1 MIO +
Sensors connected

INTRODUCTION

GLOBAL INTERFACE PARTNERS

LINDSAY · JOHN DEERE · meteoblue · eesa · NEXT Farming · HORT@ · FIELDVIEW · LoRa · TALGIL · DKE DATA · planet. · xarvio Digital Farming Solutions · Cropwise · LAT Nitrogen · Microsoft Azure · aws

API PARTNERS

BEAMAD · SAP · SGS · aquagri · LACOS · 365FarmNet · HELENA · varda · WiseConn · Rivulis Irrigation · manna · Trimble · FASTERHOLT · IBF · BAUER · AgriMedic · CLIMATEMPO · a2a smart city · Crop Intelligence · AGRICOLUS · RWA · irriga · hispatec · DISAGRO · raindancer · AckerWetter.net · ZG Raiffeisen · RAIFFEISEN digIT-al GmbH · iXMAP · WINFIELD UNITED · MINFARMTECH · blugrape · DataFarm · PS Probe Schedule · AGRIVI · dropsight · Kwizda Agro · GLACIER farmmedia · JOANNEUM RESEARCH MATERIALS · AGROBIZNES · AGRODAT

TELECOMMUNICATION PARTNERS

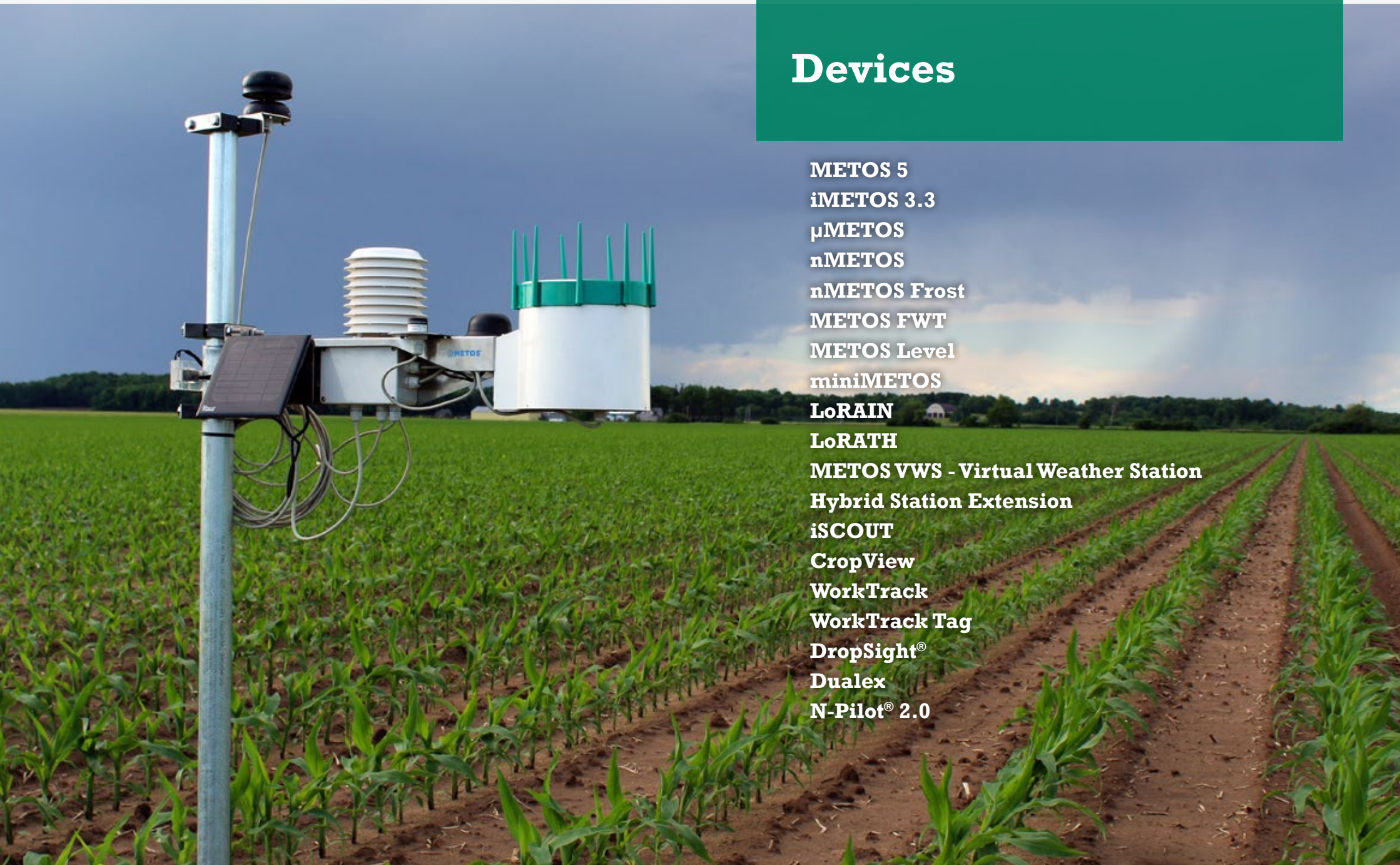
vodafone · HUAWEI · orange · IPKO · NOKIA · STARLINK · Telefónica

SENSOR PARTNERS

IRROMETER · Sentek · RIS · TOPCON · AquaCheck · spherag

INPUT INDUSTRY PARTNERS

YARA · syngenta · KWS · BASF We create chemistry · HZPC · ADAMA · Koppert · CORTEVA agriscience · Limagrain from earth to life · MAÏSADOUR · UPL OpenAg



Devices

METOS 5
iMETOS 3.3
µMETOS
nMETOS
nMETOS Frost
METOS FWT
METOS Level
miniMETOS
LoRAIN
LoRATH
METOS VWS - Virtual Weather Station
Hybrid Station Extension
iSCOUT
CropView
WorkTrack
WorkTrack Tag
DropSight®
Dualex
N-Pilot® 2.0

METOS 5

https://metos.global/metos5/



METOS 5 is a weather station that can utilize different connectivity options to deliver the measured sensor data to the FieldClimate Cloud. It is designed to support various different sensors for meteorological monitoring (rainfall, air temperature, relative humidity, ...), soil measurements (soil moisture, soil temperature, ...), irrigation systems monitoring (water pressure, water level, ...), etc. Thus, everything that the user needs, with the possibility for further expansion. Modularity provides its user the chance to get exactly what they need to get more yield from their fields.

By default, the sensor's data is consistently measured in 15-minute intervals and sent every 60 minutes to the FieldClimate Cloud, this can be changed to fit the specific monitoring needs.

To mitigate connectivity issues in remote areas, the station saves data from the last few months in its internal storage. Once the connectivity with the FieldClimate is restored, the stored measurements are automatically retransmitted. All data is synchronized and securely stored on the FieldClimate platform, where it is fully integrated with additional Pessl Instruments services and available for further integration via the API. Some communication modules also support an external antenna for enhanced connectivity and a built-in GPS sensor for precise location tracking.

TECHNICAL SPECIFICATIONS

Housing	ABS (Protection class IP67)
Connectivity	Various, depending on the communication board
Battery	6V 4.5A/20HR charging battery
Solar panel	Dimensions: 13.5 x 13.5 cm, 1,5 Watt solar panel
Dimensions (with rain gauge)	50.6 cm L x 38.9 cm W x 22.5 cm H
Weight (with rain gauge)	2.25 kg

Product Variations

	METOS 5 BASE	METOS 5 FROST	METOS 5 200	METOS 5 90-USW	METOS 5 250	METOS 5 280-MWS	METOS 5 300-MWS	METOS 5 280-USW	METOS 5 300-USW
Order number	*700283*	*700291*	*700284*	*700292*	*700289*	*700285*	*700287*	*700286*	*700288*
Precipitation	✗	✗	✓	✗	✓	✓	✓	✓	✓
Wet & Dry Bulb Temperature	✗	✓	✗	✗	✗	✗	✗	✗	✗
Air Temperature & Relative Humidity	✗	✗	✓	✓	✓	✓	✓	✓	✓
Leaf Wetness	✗	✗	✓	✗	✓	✗	✓	✗	✓
Global Radiation	✗	✗	✗	✗	✓	✓	✓	✓	✓
Wind Speed	✗	✗	✗	✓	✗	✓	✓	✓	✓
Wind Direction	✗	✗	✗	✓	✗	✗	✗	✓	✓
Dew Point	✗	✗	calc.	calc.	calc.	calc.	calc.	calc.	calc.
VPD	✗	✗	calc.	calc.	calc.	calc.	calc.	calc.	calc.
Delta T	✗	✗	calc.	calc.	calc.	calc.	calc.	calc.	calc.
ETo	✗	✗	✗	✗	✗	calc.	calc.	calc.	calc.

Connectivity Options

METOS 5 uses METOS 5 Communication boards for communication with the internet. There are several different communication options available and the client can select the one that fits his needs best.

	Communication board						
Order number	*600216*	*600224*	*600225*	*600223*	*600217*	*600227*	*600228*
2G/GSM	✓	✗	✓	✓	✗	✗	✗
3G/UMTS	✗	✗	✗	✗	✗	✗	✗
4G/LTE Cat 1	✗	✗	✗	✓	✗	✗	✗
LTE Cat M1	✓	✓	✓	✗	✗	✗	✓
LTE Cat NB1	✗	✓	✓	✗	✗	✗	✓
LTE Cat NB2	✗	✗	✗	✗	✗	✗	✓
LoRaWAN*	✗	✗	✗	✗	✓	✗	✗
WiFi*	✗	✗	✗	✗	✗	✓	✗
NTN*	✗	✗	✗	✗	✗	✗	✓

**Coming soon*

METOS 5

iMETOS 3.3

iMETOS 3.3 is a special weather station product that supports many (> 600) different sensors. It is a powerful, durable and flexible data logger for all climatic and meteorological conditions or any other type of application users can think of.

BEST USED FOR:

- specific research projects,
- having multiple different sensors on one location,
- common agricultural needs:
- Improving plant protection with disease models,
- Soil moisture monitoring and irrigation management,
- Frost monitoring, alarms etc.

SECTORS:

Agriculture, animal welfare, research, meteorology, hydrology, landscape (golf, turf, gardening), city climate



iMETOS 3.3

https://metos.global/imetos33/

A powerful, durable and flexible data logger for all climatic and meteorological conditions. They offer a complete solution for environmental monitoring, disease models, water management and more. Versatile, with the possibility to configure and connect many different sensors – over 600 sensors to choose from.



TECHNICAL SPECIFICATIONS

Sensors layout	1 wind speed, 1 leaf wetness, 1 rain gauge, 1 water-meter (reed), 2 hygroclips (air temperature and relative humidity)	
	5 digital inputs: automatic sensor recognition, supporting sensor chains (max. 600 sensors)	
Extension connector	Sentek Drill & Drop or ultrasonic wind sensor or two extra chain connectors – Pessl Instruments bus cable nodes	
GPS receiver	Yes	
Memory	8 MB flash memory	
Internet connectivity	2G, 3G, 4G (LTE class 1, LTE class M)	
Alert	SMS, user configurable via website	
Dimensions without sensors	41 cm L x 13 cm W x 7 cm H	
Weight without sensors	2.2 kg	
Battery	Rechargeable 6V, 4.5Ah, Operating range: -35°C to 80°C	
Solar panel	Dimensions: 13.5 x 13.5 cm, 2 Watt solar panel	
	DEFAULT	**FROST MODE**
Measuring interval	5 minutes	5 minutes
Logging interval	15 minutes	10 minutes
Transmission interval	60 minutes	10 minutes
	iMETOS 3.3 base unit (no sensors included), internet based logger, battery 4.5Ah, solar panel, UMTS based, logger, mounting brackets	

Turning Information Into Profits. www.metos.global 15

Product Variations

	iMETOS IMT BASE	iMETOS IMT200	iMETOS IMT280-MWS	iMETOS IMT280-USW	iMETOS IMT300-MWS	iMETOS IMT300-USW
Order number	*700120 (LTE RC7620)* *700121 (CA LTE HL7688)* *700122 (US LTE HL7618RD)*	*700135 (LTE RC7620)* *700136 (CA LTE HL7688)* *700137 (US LTE HL-7618RD)*	*700140 (LTE RC7620)* *700141 (CA LTE HL7688)* *700142 (US LTE HL-7618RD)*	*700145 (LTE RC7620)* *700146 (CA LTE HL7688)* *700147 (US LTE HL-7618RD)*	*700150 (LTE RC7620)* *700151 (CA LTE HL7688)* *700152 (US LTE HL-7618RD)*	*700155 (LTE RC7620)* *700156 (CA LTE HL7688)* *700157 (US LTE HL-7618RD)*
Precipitation	✗	✓	✓	✓	✓	✓
Air Temperature	✗	✓	✓	✓	✓	✓
Relative Humidity	✗	✓	✓	✓	✓	✓
Leaf Wetness	✗	✓	✗	✗	✓	✓
Global Radiation	✗	✗	✓	✓	✓	✓
Wind Speed	✗	✗	✓	✓	✓	✓
Wind Direction	✗	✗	✗	✓	✗	✓
Dew Point	✗	calculated	calculated	calculated	calculated	calculated
VPD	✗	calculated	calculated	calculated	calculated	calculated
Delta T	✗	calculated	calculated	calculated	calculated	calculated
ETo	✗	✗	calculated	calculated	calculated	calculated



iMETOS 3.3 in a vineyard

iMETOS IMT200



iMETOS IMT280-MWS



iMETOS IMT280-USW



iMETOS IMT300-USW



µMETOS

Monitor environmental parameters (rainfall, air temperature and humidity, frost, leaf wetness, solar radiation and wind speed), soil variables (soil moisture and soil temperature), as well as water level, water EC and pH.

BEST USED FOR:

- Soil moisture monitoring and irrigation management
- Improving plant protection with disease models
- Frost monitoring & alarms

SECTORS:

Agriculture, landscape (golf, turf, gardening), city climate

FAMILY MEMBERS: µMETOS variations



µMETOS

https://metos.global/micrometos-nbiot/



A mainstream weather station product fulfilling 99% of its users needs. It uses the LPWAN connectivity (NB-IoT NB1/Cat-M1/GPRS), enabling low power consumption and long-distance connectivity. It supports monitoring of all weather variables (rain, temperature, ...), soil measurements (soil moisture, soil temperature, ...), plants and irrigation systems conditions (water pressure, ...), etc. Data is consistently measured in 5-minute intervals and sent to the server every 60 minutes (this can be changed to fit the specific needs). For mitigating mobile network connectivity issues, the station stores data of the last few days internally and resends the measured values to the cloud when the mobile network is back online. All the data is synchronized and stored on FieldClimate platform, integrated with all additional services from Pessl Instruments and available for further integrations via API. It supports an external antenna option and has a built-in GPS sensor. For any other non-listed sensor support or special connectivity needs, check with your local sales contact.

TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP65)	
GPS receiver	Yes	
Dimensions	30 cm L x 16 cm W x 19 cm H	
Weight	1.6 kg	
Connectivity	NB-IoT NB1 / Cat-M1 / GPRS	
Battery	Rechargeable 6V, 4.5Ah, Operating range: -35°C to 80°C	
Solar panel	Dimensions: 13.5 x 13.5 cm, 2 Watt solar panel	
	DEFAULT	**FROST MODE**
Measuring interval	5 minutes	5 minutes
Logging interval	15 minutes	5 minutes
Communication interval	60 minutes	5 minutes

Product Variations

	µMETOS BASE	µMETOS FROST	µMETOS 90-USW	µMETOS 200	µMETOS 280-MWS	µMETOS 300-MWS	µMETOS 280-USW	µMETOS 300-USW
Order number	*700035*	*700036*	*700267*	*700037*	*700038*	*700040*	*700039*	*700041*
Precipitation	✗	✗	✗	✓	✓	✓	✓	✓
Wet & Dry Bulb Temperature	✗	✓	✗	✗	✗	✗	✗	✗
Air Temperature & Relative Humidity	✗	✗	✓	✓	✓	✓	✓	✓
Leaf Wetness	✗	✗	✗	✓	✗	✓	✗	✓
Global Radiation	✗	✗	✗	✗	✓	✓	✓	✓
Wind Speed	✗	✗	✓	✗	✓	✓	✓	✓
Wind Direction	✗	✗	✓	✗	✗	✗	✓	✓
Dew Point	✗	✗	calculated	calculated	calculated	calculated	calculated	calculated
VPD	✗	✗	calculated	calculated	calculated	calculated	calculated	calculated
Delta T	✗	✗	calculated	calculated	calculated	calculated	calculated	calculated
ETo	✗	✗	✗	✗	calculated	calculated	calculated	calculated

Optional: you can add soil temperature sensors (Aquacheck, Sentek, Watermark, PI54-D). Note that there are limitations how many sensors can be connected. For more details contact your local METOS branch or your dealer.

https://metos.global/nmetos/

nMETOS

Compact, cost effective, small, quick to install, and designed for large-scale deployment everywhere intelligent IoTs are needed.

BEST USED FOR:

- Field operations planning (workforce allocation, spray and irrigation planning)
- Improving plant protection with disease models
- Reducing the risk for animal health problems

SECTORS:

Agriculture, animal welfare, landscape (golf, turf, gardening), hydroponics and greenhouses, city climate, hydrology (county-wide rainfall networks)



nMETOS 100, 180, 180SM, 200

nMETOS is the latest generations of weather stations that operates on NB-IoT network and can be connected to any existing NB-IoT/CAT-M/GPRS network. nMETOS can measure rainfall, air and soil temperature, relative humidity, leaf wetness, and soil moisture. All the data is synchronized within FieldClimate.



TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP65)
Dimensions	22.5 cm L x 17 cm W x 18 cm H
Weight	1,10 kg
Connectivity	NB-IoT NB1 / Cat-M1
Power supply	3.6V high capacity primary battery* with supercap and solar panel
	DEFAULT
Measuring interval	5 minutes
Logging interval	15 minutes
Communication interval	60 minutes
SENSORS	
Rain Gauge	**Sensitivity:** 1 tip per 0.2 mm
Air Temperature	**Operating temperature range:** -40°C to +125°C **Thermometer error -10°C to +85°C:** +/- 0.3°C
Relative humidity	**Precision 0 - 80%:** +/- 2%; **Precision 80 - 100%:** +/- 3%

**Battery is not included and needs to be ordered separately.*

nMETOS 100, 180, 180SM, 200

nMETOS

nMETOS 100 **nMETOS 180** **nMETOS 180SM** **nMETOS 200**



	nMETOS 100	nMETOS 180	nMETOS 180SM	nMETOS 200
Order number	*700220 (HL7800)*	*700222 (HL7800)*	*700224 (HL7800)*	*700228 (HL7800)*
Precipitation	✓	✓	✓	✓
Wet & Dry Bulb Temperature	✗	✗	✗	✗
Air Temperature & Relative Humidity	✗	✓	✓	✓
Volumetric Water Content	✗	✗	✓	✗
Soil Temperature	✗	✗	✓	✗
Soil Water Tension	✗	✗	✓	✗
Leaf Wetness	✗	calculated	calculated	✓
Dew Point	✗	calculated	calculated	calculated
VPD	✗	calculated	calculated	calculated
Delta T	✗	calculated	calculated	calculated

By using proprietary intelligent sensor handling, nMETOS provides additional calculated sensor of:

- Leaf wetness for disease forecast,
- VPD and Delta T for defining crop health and best weather for spraying window,
- Dew point for frost prediction.
- "Frost mode" is enabled from the FieldClimate app.

nMETOS 80, 80SM

The nMETOS 80 and nMETOS 80SM product variants are designed for monitoring indoor conditions where the precipitation monitoring is not needed.



TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP65)
Dimensions	14.8 cm L x 11.8 cm W x 9.3 cm H
Weight	0.25 kg
Connectivity	NB-IoT NB1 / Cat-M1
Power supply	3.6V high capacity primary battery* with supercap and solar panel
Measuring interval	5 minutes
Logging interval	15 minutes
Communication interval	60 minutes
SENSORS	
Air Temperature	**Operating temperature range:** -40°C to +125°C **Thermometer error -10°C to +85°C:** +/- 0.3°C
Relative humidity	**Precision 0 - 80%:** +/- 2%; **Precision 80 - 100%:** +/- 3%

**Battery is not included and needs to be ordered separately.*

nMETOS 80, 80SM

nMETOS 80



nMETOS 80SM



	nMETOS 80	nMETOS 80SM
Order number	*700216 (HL7800)*	*700218 (HL7800)*
Precipitation	✗	✗
Air Temperature	✓	✓
Relative Humidity	✓	✓
Volumetric Water Content	✗	✓
Soil Temperature	✗	✓
Soil Water Tension	✗	✓
Dew Point	calculated	calculated
VPD	calculated	calculated
Delta T	calculated	calculated

nMETOS

By using proprietary intelligent sensor handling, nMETOS provides additional calculated sensors of:

- VPD and Delta T for defining crop health and best weather for spraying window,
- Dew point for frost prediction.



nMETOS

nMETOS Frost

https://metos.global/nmetos-frost/

Spring frost can be a devastating experience for any farmer – not only can it damage the plants and/or crops in the field, it can completely destroy them. This way, a great deal of hard work, time and effort the farmer puts into planting and nurturing the fields are lost; in the worst case scenarios, it can mean an extreme financial loss as well.



nMETOS FROST is a product that helps you fight against frost damage in your field. It is a simple product made for one specific use case: monitoring dry and wet bulb temperature and informing clients about the risks in real time based on the integrated logic inside the product. Simple to use, next to zero user settings required, easy battery exchange.

	nMETOS FROST
Order number	*700252 (HL7800)*
Precipitation	✗
Wet & Dry Bulb Temperature	✓
Air Temperature & Relative Humidity	✗
Volumetric Water Content	✗
Soil Temperature	✗
Soil Water Tension	✗
Leaf Wetness	✗
Dew Point	✗
VPD	✗
Delta T	✗

TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP65)				
Dimensions	30 x 26 x 8 cm				
Weight	0,6 kg				
Connectivity	NBIoT NB1 / Cat-M1				
Power supply	2x 3.6V high capacity primary battery*				
Work modes**					
Measuring interval	5 min	1 min	1 min	1 min	5 min
Logging interval	10 min	5 min	5 min	5 min	10 min
Communication interval	60 min	60 or 15 min when event*** (+/- 0.5°C)	60 or 5 min when event (+/- 0.5°C)	60 or 15 min when event (+/- 0.5°C)	60 min
Wet bulb temperature value	lower than -8° C	between -8°C and up to -6°C	between -6°C and up to 4°C	between 4°C and up to 8°C	8°C and higher

-8°C -6°C 4°C 8°C

SENSORS	
Wet bulb temperature, dry bulb temperature	**Temperature sensor:** DS18B20 **Operating temperature range: -**55°C to +125°C **Thermometer error:** -10°C to +85°C: ±0.3°C **Drift:** ±0.2°C

**Battery is not included and needs to be ordered separately.*

***Communication interval: every 60 minutes with on-demand event** driven additional communication. Measurement, logging and communication interval are fixed. They cannot be changed by the user from the FieldClimate Cloud platform.*

****Event: happens, when a wet bulb temperature sensor value changes for 0.5°C or more between two measurement intervals. Example: when it measures 3.2°C and it detects 0.5°C change at 12:03 pm measurement (compared to the previous logging interval at 12:00), data will be uploaded at 12:05 pm.*

Additional recommendation:

- We recommend using extra 3 month weather forecast subscription.

Level Monitoring

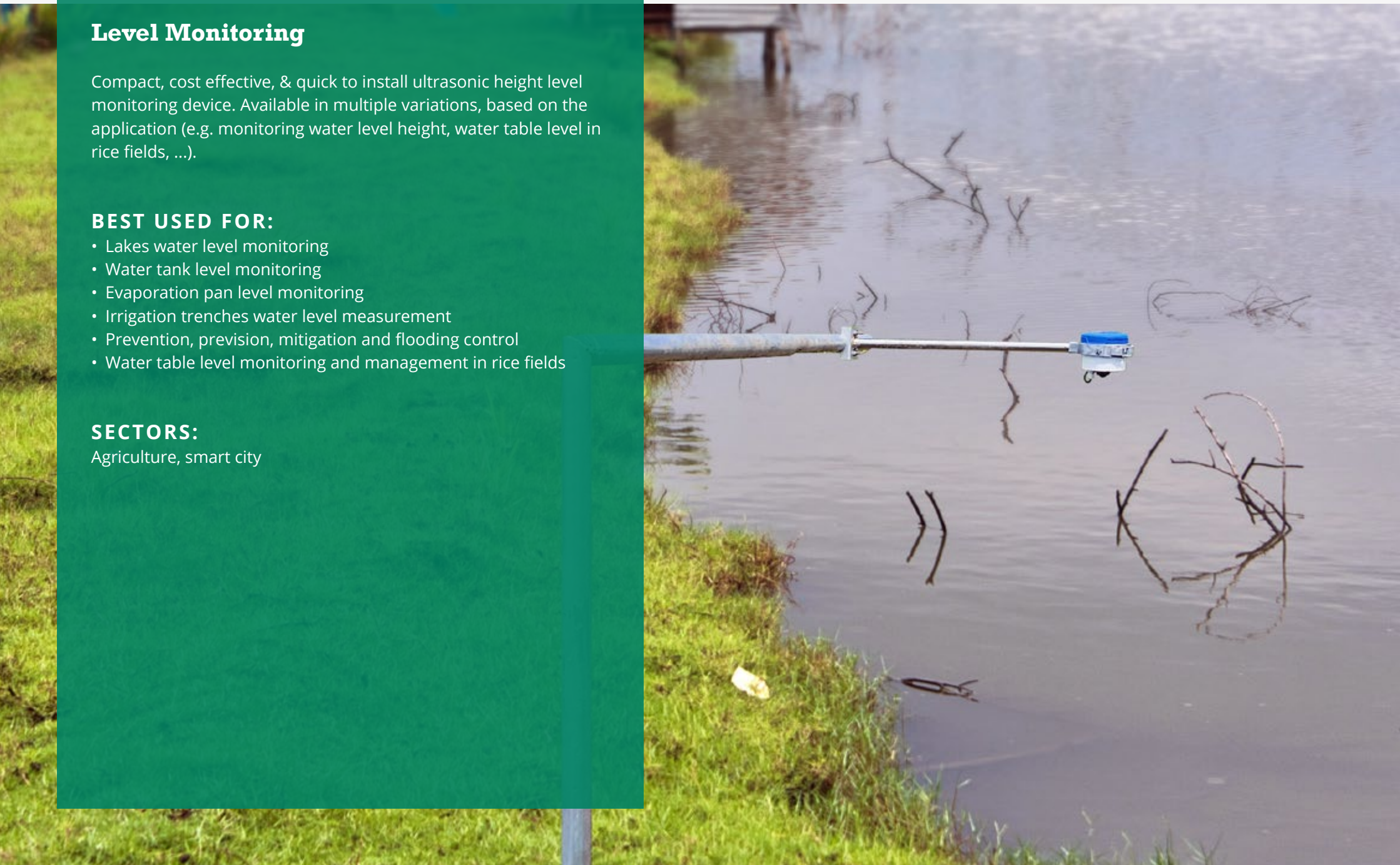
Compact, cost effective, & quick to install ultrasonic height level monitoring device. Available in multiple variations, based on the application (e.g. monitoring water level height, water table level in rice fields, ...).

BEST USED FOR:

- Lakes water level monitoring
- Water tank level monitoring
- Evaporation pan level monitoring
- Irrigation trenches water level measurement
- Prevention, prevision, mitigation and flooding control
- Water table level monitoring and management in rice fields

SECTORS:

Agriculture, smart city



METOS FWT

https://metos.global/metos-fwt/

Order number: 700248

METOS FWT is an IoT device designed to monitor the water level depth in flooded rice fields in real time.
The solution supports farmers in the adoption of the Alternate Wetting and Drying (AWD) methodology or similar water-saving techniques.
METOS FWT can be a very helpful tool supporting decisions to mitigate risks due to periods of water scarcity.
It is a ultrasonic height level monitoring device applicable in many different situations. The device comes with the top part and the tube needs to be sourced by the client or distributor locally to best fit the clients use case.



TECHNICAL SPECIFICATIONS

Dimensions	Cap diameter: 110 mm Box diameter: 98 mm Overall height: 110 mm
Weight	152 g (without batteries)
Connectivity	NBIoT and CatM1 (HL7800)
Power supply	2x 3.6V high capacity primary battery*
Measuring interval	every minute
Logging interval	every 15 minutes
Transmission interval	1x per hour
SENSORS	
Ultrasonic distance sensor - Resolution	1 mm
Ultrasonic distance sensor - Working temperature	-15°C to +60°C

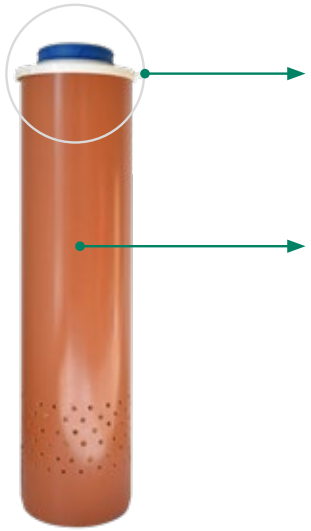
**Battery is not included and needs to be ordered separately.*

A COMPACT SOLUTION FOR YOUR RICE FIELD

Save time | **Reduce GHG emissions** | **Water savings (up to 20%)** | **Potential for higher yield** | **Plant health**

Alternate Wetting and Drying (AWD) is a water-saving technique for rice production. With the low-cost METOS FWT technology, the manual practice is digitalized and rice growers get real-time continuous monitoring that results in:

- Saved time and money,
- Precise water level monitoring applications,
- Decreased global warming potential thanks to the reduced GHG (methane) emission by healthier roots,
- Data that is automatically stored, sharable and accessible also for extension service field staff for better AWD knowledge transfer and management at the community level.



METOS FWT

Tube

- needs to be sourced locally and is not part of the delivered product,
- minimum 150 mm diameter,
- tube length: minimum 60 to maximum 80 cm,
- can be made from recycled materials, PLA, bamboo... (metal tubes are not recommended as they can influence the sensor readings).

METOS Level

https://metos.global/metos-level/

Order number: 700249

METOS Level is a device incorporating an ultrasonic level sensor to provide a cost-effective solution and an early warning system for remotely measuring water levels under extreme conditions. Monitoring and collecting data in sensitive areas can help to protect people and prevent big damages. The ultrasonic sensor provides non-contact measurements and is characterized by its high level of operating reliability, low energy consumption, fast installation, low maintenance cost and ease of use in the field.



TECHNICAL SPECIFICATIONS

Dimensions	Cap diameter: 110 mm Box diameter: 98 mm Overall height: 110 mm
Weight	152 g (without batteries)
Connectivity	NBIoT and CatM1 (HL7800)
Power supply	2x 3.6V high capacity primary battery*
Measuring interval	every minute
Logging interval	every 15 minutes
Transmission interval	1x per hour
SENSORS	
Measurement distance	up to 3 meters**
Measurement resolution	1 mm
Operating temperature range	-15°C to +60°C

**Battery is not included and needs to be ordered separately.*

***Beam angle is 3° therefore we suggest providing at least 50 cm diameter of flat surface directly underneath when the product is installed at the maximum height of 3 meters.*

Note: METOS Level needs to be installed parallel to the flat measured surface.

DIFFERENT APPLICATIONS

Lakes water level



Water tank level



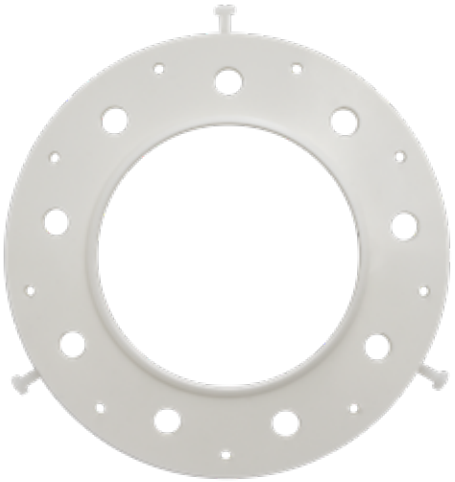
Water irrigation trenches



METOS LEVEL

OPTIONAL MOUNTING KITS

Optimised ring for tubes:
Order number: 600198 / 900262



Optimised ring for water tanks:
Order number: 100228



Outer diameter	172 mm
Hole diameter	100 mm
Total height	23 mm

For irrigation trenches, lakes, irrigation pools:
Order number: 600199 / 900263



Pole length: 534 mm



LEVEL MONITORING

miniMETOS

Compact, cost effective, small, quick to install, and designed for deployment where hardware needs to be hidden for aesthetic or operational reasons.

BEST USED FOR:

- Irrigation management
- Turf health monitoring

SECTORS:

Landscape (golf, turf, gardening), hydroponics and greenhouses, agriculture, city climate



miniMETOS

https://metos.global/minimetos/

Order number: 7000047 (HL7800)



miniMETOS is a combination of most essential sensors for irrigation and stress management. It permanently measures soil temperature & volumetric water content (VWC) with Pessl Instruments Soil Moisture Sensor PI54-D and Watermark (soil moisture tension) in near real-time wherever you want. The installation of a logger can be completely underground (invisible); therefore, it is a perfect installation for golf courses, parks, home & garden, as well as in agriculture where vandalism and theft could be a problem.
The device is battery powered with a lifespan between 6 to 12 months, and provides actionable data, such as the exact amount of soil moisture and the soil temperature in each inch/cm of the measurement area, to help you plan the irrigation event and to warn you about possible stress points in a timely fashion.

TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP67)
Dimensions	14.8 cm L x 11.8 cm W x 9.3 cm H
Weight	0.25 kg
Connectivity	NB-IoT NB1 / Cat-M1
Power supply	3.6V high capacity primary battery*
Measuring interval	15 minutes
Logging interval	15 minutes
Communication interval	60 minutes
SENSORS	
PI54-D	see page 118
Watermark	see page 124

**Battery is not included and needs to be ordered separately.*

With miniMETOS all the potential issues and stress events can be identified before they occur or become visible.

KEY FEATURES:

- Permanent measurement of the soil moisture and soil temperature at any of your locations
- Invisible, so it doesn't affect the workers and the aesthetic of location (golf course, park etc.)
- No solar panel needed as long life battery powered based on the latest power harvesting technology
- 6 to 12 months of battery life and quick installation
- Cost-effective and durable
- Prevents possible vandalism



INSTALLATION ON GOLF COURSE

Laying the cable - inserting the sensors in the main turf root zone.



Preparation of the irrigation box for the data logger.



Re-installing the lawn tiles to cover the sensors. 14 days later - "invisible".

LoRAIN, LoRATH

Compact, cost effective, small, quick to install, and designed for large-scale deployment everywhere intelligent IoTs are needed.

BEST USED FOR:

- Field operations planning (workforce allocation, spray and irrigation planning)
- Improving plant protection with disease models
- Reducing the risk for animal health problems

SECTORS:

Agriculture, animal welfare, landscape (golf, turf, gardening), hydroponics and greenhouses, city climate, hydrology (county-wide rainfall networks)



LoRAIN

https://metos.global/lorain/

LoRAIN is a new generations of weather stations that operate on LoRaWAN® network. LoRAIN devices measures rainfall, air and soil temperature, relative humidity, leaf wetness, and soil moisture. All the data is synchronized within FieldClimate.



TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP65)
Dimensions	22.5 cm L x 17 cm W x 18 cm H
Weight	1,10 kg
Connectivity	LoRaWAN® Frequency plans: EU863-870, RU864-870, US902-928, AU915-928 and AS920-925
Power supply	Supercapacitor and solar panel
Measuring interval	5 minutes
Logging interval	15 minutes
Communication interval	15 minutes
SENSORS	
Rain Gauge	**Sensitivity:** 1 tip per 0.2 mm

SPECIAL ORDERS ONLY

This product is available on special demand only. Contact your local METOS distributor or contact orders@metos.at for more information.

LoRAIN Rain only



	LoRAIN Rain only
Order number	*700000 (EU 863-870)* *700001 (US 902-928)* *700002 (AU 915-928)* *700003 (RU 864-870)* *700004 (AS 920-925)*
Precipitation	✓

LoRAIN product uses LoRaWAN® communictation technology and is by default using the TTN LoRaWAN® network. For any specific LoRaWAN network (other than TTN) the client needs to fill out the order document available at https://metos.global/wp-content/uploads/2022/07/LPWAN-LoRaWAN-order-details-V1.4.pdf

LoRAIN

LoRATH

https://metos.global/lorath/

LoRATH is a new generation of a battery powered IoT data logger that operates on LoRAWAN network. It can be connected to any existing LoRaWAN® network. LoRATH measures air temperature, relative humidity, leaf wetness and soil moisture. All the data is synchronized within FieldClimate. The unit is prepared to be mounted mainly inside (tunnels, greenhouses, indoor applications).



TECHNICAL SPECIFICATIONS

Housing	UV resistant polycarbonate plastic (Protection class IP65)
Dimensions	14.8 cm L x 11.8 cm W x 9.3 cm H
Weight	0.25 kg
Connectivity	LoRaWAN® Frequency plans: EU863-870, RU864-870, US902-928, AU915-928 and AS920-925
Power supply	Supercapacitor and solar panel
Measuring interval	5 minutes
Logging interval	15 minutes
Communication interval	15 minutes
SENSORS	
Air Temperature	**Operating temperature range:** -40°C to +125°C **Thermometer error -10°C to +85°C:** +/- 0.3°C
Relative humidity	**Precision 0 - 80%:** +/- 2%; **Precision 80 - 100%:** +/- 3%

SPECIAL ORDERS ONLY

This product is available on special demand only. Contact your local METOS distributor or contact orders@metos.at for more information.

LoRATH 80



	LoRATH 80
Order number	*700021 (EU 863-870)* *700022 (US 902-928)* *700023 (AU 915-928)* *700024 (RU 864-870)* *700025 (AS 920-925))*
Air Temperature	✓
Relative Humidity	✓
Dew Point	calculated
VPD	calculated
Delta T	calculated

LoRATH product uses LoRaWAN® communictation technology and is by default using the TTN LoRaWAN® network. For any specific LoRaWAN network (other than TTN) the client needs to fill out the order document available at https://metos.global/wp-content/uploads/2022/07/LPWAN-LoRaWAN-order-details-V1.4.pdf

Weather Station Use

THIS IS WHAT YOU CAN DO:

- Plan the work week based on a localized weather forecast for your operations
- Plan your work day based on the actual rain, temperature data and the daily weather forecast for your field
- Plan your spray program based on disease models and check the quality of spray work online
- Plan your irrigation based on ET-crop and predicted plant water use
- Pass data directly into your management software and and operations center via API



Precipitation shown in FieldClimate



24-hour rain map



7-day rain map



METOS VWS

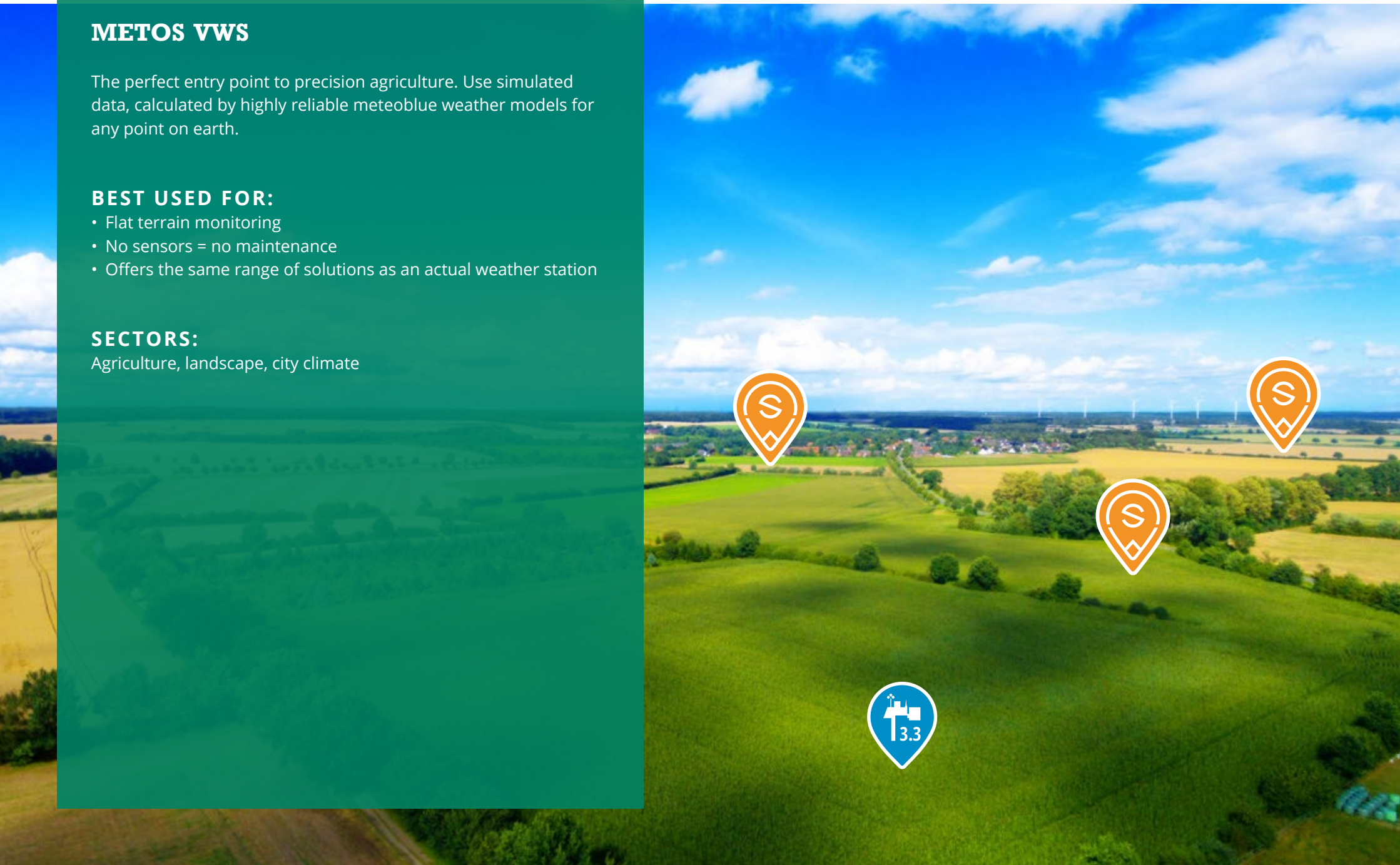
The perfect entry point to precision agriculture. Use simulated data, calculated by highly reliable meteoblue weather models for any point on earth.

BEST USED FOR:

- Flat terrain monitoring
- No sensors = no maintenance
- Offers the same range of solutions as an actual weather station

SECTORS:

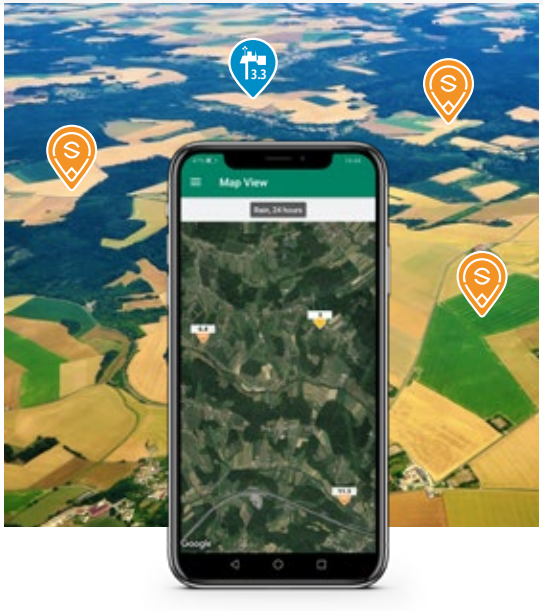
Agriculture, landscape, city climate



METOS VWS - Virtual Weather Station

https://metos.global/imetos-vws/

Order number: 800005



Virtual Stations exist for any point on the earth, for which meteoblue can derive weather data. The data is not the result from an actual METOS station measurement, but consists of simulated data, calculated by highly reliable meteoblue weather models.

In some terrains, such as flatlands, the calculated data is highly accurate with minimal discrepancies to actual values, such as temperature or precipitation. These are the regions where virtual stations prove to be a great asset.

In cases where terrain is more complex or discrepancies from the actual values, we recommend installing a METOS station.

METOS VWS vs METOS IoT STATION

	Virtual station	METOS IoT Stations
Variables	Same parameters as iMETOS IMT300 + soil temperature	Based on sensor set
Precision	Limited	High
Availability	Anywhere in the world	Only where the station is installed
Terrain	Not complex terrain	Any terrain
Maintenance	No maintenance	Regular hardware maintenance necessary
Suitability for high value decisions (frost, water management etc.)	Limited	High

DATA QUALITY

Air temperature	👍
Relative humidity	👍
Solar radiation	👍
Wind speed	👍
Precipitation	👎
Leaf wetness	👎
Soil temperature	👎

With actual case studies, METOS VWS is under continuous improvements.

VIEW RESULTS ON OUR WEBSITE:

MAIN FEATURES

Calculated sensor variables equal to iMETOS IMT300 sensor set: wind speed, solar radiation, soil temperature, air temperature, precipitation, relative humidity and leaf wetness, along with calculated values of ETo, vapor-pressure deficit (VPD) and Delta T. All data and decision support services are accessible online through FieldClimate platform.

THE ADVANTAGES

A perfect entry into precision agriculture with no maintenance cost

Offers the same range of solutions as an actual weather station

Very cost effective, simple to use and activated with just a few clicks on the computer or phone

Works as a complete decision support service - provides weather forecast, offers disease models and helps with work planning

Hybrid Station Extension

https://metos.global/hybrid-station/

Order number: 800065

You can make your physical METOS station a “Hybrid” by extending it with virtual sensors (METOS VWS full set available). The service is available via yearly subscription. The virtual sensors will be added to the chart and table, together with the physical sensors, but properly differentiated. The possible sensors to be added are:

- Air temperature (virtual)
- Relative humidity (virtual)
- Leaf wetness (virtual)
- Precipitation (virtual)
- Wind speed avg (virtual)
- Wind speed gust (virtual)
- Wind direction (virtual)
- Global solar radiation (virtual)
- Soil temperature (virtual)



WHERE VIRTUAL DATA COMES FROM?

- Virtual sensor data quality is the same as our other product METOS VWS (Virtual Weather Station) and comes from the best available weather simulation for the specific location.
- Various weather models are incorporated, which in turn are calculated from data measured by weather stations, observation data from satellites, and a number of other data sources.
- For locations with a nearby weather station, the station’s data are automatically used to further improve the quality.
- The precipitation virtual data is updated using radar data (if available) and satellite data is used to update the data for cloud cover and global solar radiation.

KEY FEATURES

- Hybrid station is the perfect solution to expand any physical METOS station at low price.
- Get access to advanced tools like Disease models, ETo.
- Virtual sensors are shown together with the physical sensors, but differentiated.



HYBRID STATION

Camera Products

A remote monitoring system that provides time-lapse images that monitors insect pressure (iSCOUT) and growth of your crops for stage of development, germination, disease issues and size of fruit (CropVIEW).

BEST USED FOR:

- Preventing damage on crops and fields
- Reducing the use of pesticides or insecticides
- Early detection of diseases & insect pressure
- Yield forecast of fruit crops through AI on following crop growth

SECTORS:

Agriculture, animal welfare, research, landscape (golf, turf, gardening)

FAMILY MEMBERS: iSCOUT variations & CropVIEW variations

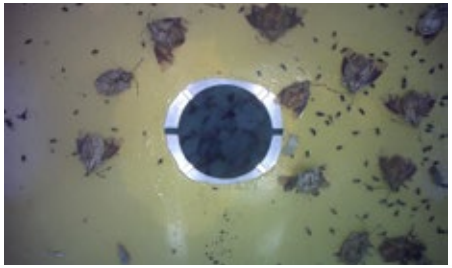


iSCOUT - AI-Based Insect Scouting

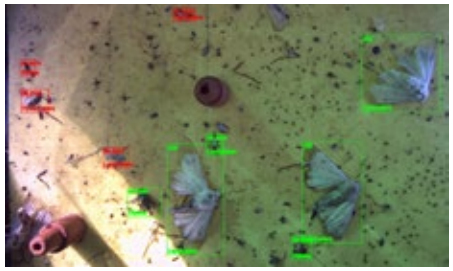
https://metos.global/iscout/



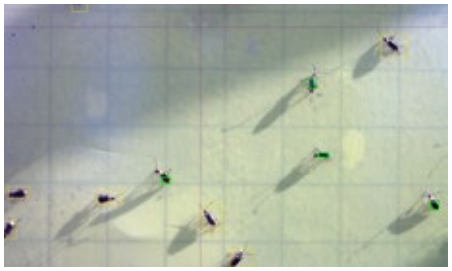
iSCOUT is a combination of hardware and software solutions for remote monitoring of different pest insects. It is an insect trap with integrated electronics and a sticky plate. Due to its low weight, it can be hung anyhwere in the field. The device is self-sufficient, as it is powered by a solar panel and a battery. 10 MP camera takes high-resolution pictures of the sticky plate within the iSCOUT trap. Images are sent via LTE communications to an online platform where they are analyzed and counted by automatic pest detection framework, using AI and self-learning algorithms. All data from camera system and AI software is displayed online, within the FieldClimate. Camera devices (iSCOUT or CropVIEW) can be connected to control unit. Every power unit can also connect the following environmental sensors: rain, temperature and relative humidity (Hygroclip) and leaf wetness.



iSCOUT Bug



iSCOUT uses automatic recognition algorithm for recognizing pests.



iSCOUT Color Trap

TECHNICAL SPECIFICATIONS

Memory	32 MB + 8 GB (for photos)	
Internet connectivity	LTE class 1	
GPS receiver	Yes	
Dimensions of trap housing without control unit	20 cm L x 15.5 cm W x 17 cm H	
Weight without control unit	0.93 kg	
Battery	Rechargeable 6V, 12Ah, Operating range: -35°C to 80°C	
Solar panel dimensions	17.5 x 17.5 cm, 7.2 Volt, 333 mA	
Camera	10 megapixel camera	
	CONTROL UNIT - SENSORS	**CAMERA - PHOTOS**
Measuring interval	15 min	taking photos: selected by the user (1 to max 3 times per day*)
Logging interval	30 min	
Transmission interval	60 min	after photo is taken
	Internet based monitoring device, solar panel, rechargeable battery, GPRS Logger, GPS sensor	

***Photo taking and transmission:** depending on mobile network type: max 1 photo per day when using the GPRS connectivity and max 3 photos per day when using LTE connectivity. On closed traps it should be set at night (between 23:00 - 3:00).

Camera Control unit base with interface to camera devices and opportunity to connect environmental sensors (not included). Following sensors can be connected: Rain gauge, temperature, relative humidity and leaf wetness.



Control Unit Board



iSCOUT

iSCOUT Variations

iSCOUT PHEROMONE



Designed to catch insects with insect-specific pheromone lures. Target species include **codling moth, European grape berry moth, tomato leafminer, and many others**. The iSCOUT Pheromone includes a metal plate for attaching sticky paper and a pheromone lure.

Order numbers: 700160 (LTE RC7620) / 700161 (CA LTE HL7688) / 700162 (US LTE HL7618RD)

iSCOUT POPILLIA ADD-ON



Developed for monitoring the invasive **Japanese Beetle**, *Popillia japonica*. This is a modification of the iSCOUT Pheromone, adding a pheromone holder and a slide mechanism that prevents beetles from escaping once caught. Requires the purchase of an iSCOUT Pheromone.

Order numbers: 600231 / 900272

iSCOUT FRUIT FLY



Suitable for trapping fruit flies, including **spotted wing drosophila, Mediterranean fruit fly, and many other species**. It features 3 mm netting over the entries to exclude larger flies (e.g., house flies). Includes a tank system for the lure and a metal plate for attaching sticky paper. The netting can be removed to catch and monitor larger flies.

Order numbers: 700172 (LTE RC7620) / 700173 (CA LTE HL7688) / 700174 (US LTE HL7618RD)

iSCOUT BUG



Built to catch **marmorated stink bugs and other bugs**. It includes a metal bottom plate with black pyramid wings and closed side entries. Bugs enter the trap from the bottom and are trapped on the plate.

Order numbers:
700164 (LTE RC7620)
700165 (CA LTE HL7688)
700166 (US LTE HL7618RD)

iSCOUT COLOR TRAP



Intended for monitoring sticky traps of different colors. The device includes a high-resolution camera and a holder for a sticky plate.

The types of insects caught depend on the color of the plate used:

- Blue: **Flies, leafminers, and others**
- Yellow: **Leafminers, olive fruit fly, western corn rootworm, common pollen beetle, and others**
- White: **Apple sawfly, plum sawfly, plum fruit sawfly, raspberry beetle, and others**

Order numbers:
700168 (LTE RC7620)
700169 (CA LTE HL7688)
700170 (US LTE HL7618RD)

CropVIEW - AI-Based Crop & Growth Monitoring Solution

https://metos.global/cropview/



CropVIEW is an advanced agricultural information system designed to provide real-time insights into your crops and their growth. This innovative solution **captures high-resolution images of farmland, research plots, crop canopies, orchards, and more at regular intervals**. These images are automatically uploaded to FieldClimate, enabling continuous monitoring of crop quality and yield.

The high-resolution photos serve multiple purposes, such as assessing seed germination, tracking the impact of fertilizers and pesticides on crop development, and helping make informed decisions about the presence of diseases or pests that could affect profitability. What sets CropVIEW apart is its seamless and effortless operation. You can view and analyze these images daily over time with no additional effort on your part.

Operating year-round in most climatic zones, CropVIEW is powered by a rechargeable battery and a solar panel, ensuring uninterrupted service. Each power unit also supports a range of environmental sensors, including rain, temperature, relative humidity (Hygroclip), and leaf wetness.

With CropVIEW, you gain a powerful tool that not only simplifies crop monitoring but also enhances your ability to make data-driven decisions for better crop management.



Images, taken by CropVIEW.

TECHNICAL SPECIFICATIONS

Housing	Power supply and sensor support box: 41 cm L x 13 cm W x 7 cm H	
GPS receiver	Yes	
Weight without sensors	2.2 kg	
Camera module	Stainless steel base with IP65 box 27 cm L x 17 cm W x 9 cm H, weight: 1.5 kg	
Battery	Rechargeable 6V, 12Ah, Operating range: -35°C to 80°C	
Solar panel dimensions	17.5 x 17.5 cm, 7.2 Volt, 333 mA	
Model/Type	Cortex M4 processor module with integrated Communication model for UMTS/LTE operation	
Camera and optics	MT9J003 10 Mega Pixel 2/3“ CMOS sensors - Optics DSL377A-650-F2.8 2/3“ Lens with 2.5 mm Focal length and DSL901J-650-F3.0 2/3“ Lens with12 mm Focal Length	
Control Unit	Camera Control unit base with interface to camera devices and opportunity to connect environmental sensors (not included). Following sensors can be connected: Rain gauge, temperature, relative humidity and leaf wetness.	
	CONTROL UNIT - SENSORS	**CAMERA - PHOTOS**
Measuring interval	15 min	taking photos: selected by the user (1 to max 3 times per day*)
Logging interval	30 min	
Transmission interval	60 min	after photo is taken

CropVIEW VARIATIONS:

CropVIEW Panorama
1x 10 MP wide angle lens
Order number:
700176 (LTE RC7620)
700177 (CA LTE HL7688)
700178 (US LTE HL7618RD)

CropVIEW Tele
One 10 MP tele lens
Order number:
700180 (LTE RC7620)
700181 (CA LTE HL7688)
700182 (US LTE HL7618RD)

CropVIEW Dual
2x 10 MP lens - wide angle + tele
Order number:
700184 (LTE RC7620)
700185 (CA LTE HL7688)
700186 (US LTE HL7618RD)

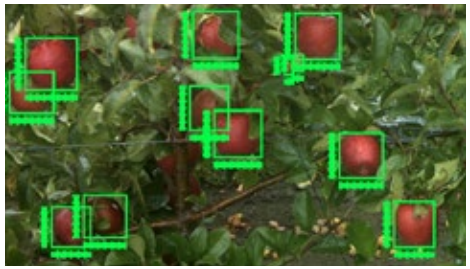
A tool in FieldClimate enables you to select specific fruits on pictures taken in your orchard or field by a zoom lense in CropVIEW. If you know the precise distance between the camera and crop, you will get a reliable measurement of fruit diameter in mm.



APPLE ORCHARD USE CASE



Tele lens focusing on a tree and detecting the apples automatically (CropVIEW automatic detection).



Marking auto-detected apples manually and following their growth during the season.



The minimum, maximum and average diameter (in mm) of all selected fruits is shown on a graph, and the exact values in a table.

VITICULTURE USE CASE



Following the growth of shoots and developing leaves.



Inflorescence of grapes is clearly seen on the photos.

SERIES OF PICTURES IN MAIZE/WHEAT USE CASE



Germination and emergence of wheat.



Different BBCH stages of wheat, for example tillering stages.









Following the uniform emergence and growth of maize daily.

With CropVIEW you receive a time lapse of your crop growth. Check the time lapse of maize growth here:

https://youtu.be/V_ZXBSD_7XQ

WorkTrack

A battery-powered versatile tracking device that is easily mounted on any asset (sprayer, mower, utility vehicles, tractors, carts, ...).

BEST USED FOR:

- Detailed activity report about where, when, and how much an asset has been operational
- Optimisation and enhancement of work and workforce planning
- Knowing current position of all active machines

SECTORS:

Agriculture, landscape (golf courses, parks), city climate

FAMILY MEMBERS: WorkTrack, WorkTrack Tag



WorkTrack

https://metos.global/imetos-trackers/

Order number: 700212

With WorkTrack you have your fleet always under full control - you know exactly when your drivers are coming and going.



The WorkTrack agriculture GPS tracking unit combined with the WorkTrack Tags feature allows you the capability of both fleet tracking and asset tracking, to manage your entire farm from equipment to employees.

On our FieldClimate platform, you see your vehicles and implements and have all data stored about where and which operations you have running. Together with your connected METOS weather station, you can see the application of wet or dry fertilizer or chemical as well as any farm delivery, grain transport, over-the-road trucking, seed delivery, and equipment rental on the mobile phone/iPad or desktop. WorkTrack connects all farming equipment automatically and swiftly. Companies that have implemented the WorkTrack have improved their efficiency by 25-30% while decreasing fuel consumption by 15%. Most companies have seen these benefits within their first 30 days of activation.

TECHNICAL SPECIFICATIONS

Connectivity	LTE CAT M1/NB-IoT/GSM (FMM230) or 4G LTE Cat 1, GSM (FMC230) or GSM, Quad-band 2G network (FMB230)
GNSS	GPS, GLONASS, GALILEO, BEIDOU, accuracy < 3m, internal high gain GNSS antenna
Housing	UV resistant polycarbonate plastic (Protection class IP67)
Power	(+6...+30) V DC via car power plug
Communication	It uses UDP protocol for data delivery to FieldClimate platform
Dimensions	72,5 x 73 x 27 mm

WorkTrack:

- Records a GPS position and speed every 5 seconds and transfers the data every 30 seconds to FieldClimate.
- It is activated with vibration and movement and records the first position when the super capacitor is sufficiently charged.
- The super capacitor can hold charge when connected to a permanent power source (tractor battery).
- In sleep mode the current uptake is below 100µAmp. It can empty a fully charged 75Ah battery within 750 000 hours. When it is connected to a switched-on power source the super capacitor will discharge within 24 hours after being disconnected from power.

This is what you get with WorkTrack:

- A detailed activity report about where, when, and how much the machine has been running
- Current positions of all active machines





WorkTrack used on a golf cart.

WorkTrack Tag

Order number: 100423

The new WorkTrack Tag is a low-cost yet fast and easy to use device that connects your machines - to save time, resources, improve productivity and profitability. With WorkTrack Tag together with WorkTrack all your machines will be connected to the FieldClimate. You can track all your tractors, support vehicles and machines all in one place.



WorkTrack Tag comes with real-time views that include:

- GPS Location
- Hours & Mileage
- Location History
- Heading, Speed and more

Together with FieldClimate, we made it easy to monitor all your machines (tractors, support vehicles, fuel trucks, sprayers, and others). By attaching an WorkTrack Tag to whichever machine you like you'll be able to track:

- Maintenance of the device
- Work scheduling
- Fuel Logs and Automated Reporting
- Dispatching
- Movement and prevent theft

HOW DO WORKTRACK AND WORKTRACK TAG WORK TOGETHER?

The connection between the two is fast and they work together

- to maximise the efficiency of the workforce
- completely transparent fleet tracking

WorkTrack tags are automatically recognised by WorkTrack tracker and are transmitted to the FieldClimate.

You mount the WorkTrack on your tractor and each WorkTrack Tag to the device, vehicle or any other machine you want tracking.

1 WorkTrack = up to 20 WorkTrack Tags



WorkTrack Tag

Analysers

Analysers are a group of various devices that are used to determine the current state of plant's development, to determine what the plant needs and to help with spraying application management.

BEST USED FOR:

- measuring spray deposition efficiency
- determinating nitrogen status of plants
- determinating fertilization needs
- plant spraying and protection management

SECTORS:

Agriculture, research



DropSight® - Sprayer Calibration and Deposition Management

https://metos.global/dropsight/

Order number: 700255



DropSight® is an easy-to-use, scientifically developed tool for measuring spray deposition efficiency of the formulation on natural plant surfaces. Through the specially designed photographic laboratory (LeafLab), UV fluid (UView) and the DropSight® app for a smartphone, one can stop guessing and make informed decisions based on quantitative measurements of spray deposition.

The DropSight® app, combined with LeafLab and UVIEW, offer the complete solution to a quantitative analyses of UV tracer deposition levels on leaf surfaces.

LeafLab is a portable, on-site laboratory, purposely developed for plant leaf UV photography with DropSight® to quantify the deposition efficiency onto a crop within minutes of application. UV led lightning with wavelength, intensity and uniformity to optimise fluorescence for smartphone photography when using UView tracer, completes the technical specification. The UView fluorescent fluid is recognised by DropSight® software and the deposition efficiency is measured and calculated.

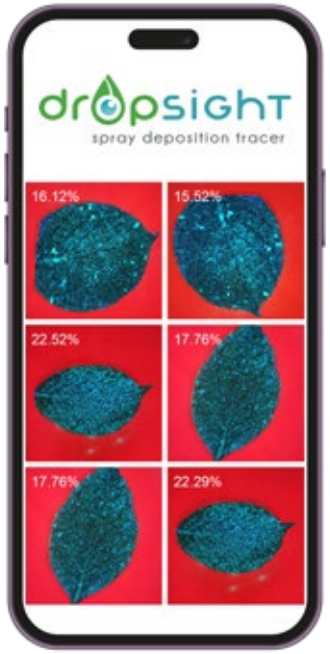


Typical DropSight® results

VALUE PROPOSITION

- Reduce the risk of poor biological control outcomes due to poor sprayer set up and spray deposition.
- Reduce the risk of unacceptable residue levels due to accumulation and run off resulting from too high volume and/or too large droplet spectrum used.
- Reduce the chemical losses due to run off resulting from excessive spray volumes.
- Reduce the risk of soil and ground water contamination due to excessive spray volumes.
- Evaluate and quantify the risk of drift on neighbouring crops.
- Optimize the use of chemical formulations preventing over- and under application, minimizing crop loss and potential resistance development.
- Optimize the selection and use of adjuvants and additives to improve deposition efficiency.
- Optimize the design of sprayer performance.





DROPSIGHT®

Dualex - Instant, Non-Destructive Nitrogen and Chlorophyll Measurement

https://metos.global/dualex/

Order number: 700256

Dualex is a leaf-clip sensor designed to measure chlorophyll and polyphenols in plant leaves. Using patented optical technology, Dualex allows for simple, rapid, and non-destructive measurements of **chlorophyll**, **flavonols**, and **anthocyanins**.



ACCURATE MEASUREMENT OF CHLOROPHYLL

Chlorophyll plays a vital role in photosynthesis and overall plant development. Dualex quantifies chlorophyll by analyzing light transmitted through the leaf, delivering a measurement range of **0-150 µg/cm²**.

UNIQUE LEAF-CLIP SENSOR FOR MEASURING FLAVONOLS AND ANTHOCYANINS

Flavonols are synthesized primarily in response to light exposure, making them an indicator of a plant's light interaction history. Dualex measures both flavonols and anthocyanins by analyzing their screening effect on chlorophyll fluorescence. Flavonols and anthocyanins are provided as relative indices (in the range of 0 to 2.5).

NBI®: NITROGEN BALANCE INDEX

Chlorophyll content alone is commonly used as an **indicator of plant nitrogen status**. However, research shows that polyphenols - specifically flavonols - are also reliable indicators of nitrogen allocation within leaves. The Nitrogen Balance Index (NBI®) combines chlorophyll and flavonol measurements to provide a robust, single-value indicator of nitrogen status, which correlates closely with leaf nitrogen content. Unlike chlorophyll alone, NBI® is less affected by environmental factors such as leaf age or thickness, making it a more stable and accurate metric for nitrogen management.

TECHNICAL SPECIFICATIONS

Measured material	Plant leaves
Measuring system	Transmittance and screening effect on chlorophyll fluorescence
Measured parameters	**Chl: Chlorophyll content** (µg/cm²)
	Flav: Flavonols (index)
	Anth: Anthocyanins (index)
	NBI: Nitrogen Balance Index, calculated from chlorophyll and flavonols
Accuracy (NRMSE)	Chl: 2.0%; Flav: 4.1%; Anth: 4.5%
Repeatability (sd)	Chl: 0.37; Flav: 0.005; Anth: 0.009
Reproducibility (sd of repeated means)	Chl: 0.45; Flav: 0.013; Anth: 0.039
Measurement process	Automatic or manual
Measurement area	5 mm in diameter (19.6 mm²)
Sample thickness (leaf)	1 mm maximum
Measurement area access	8.5 cm maximum
Acquisition time	< 1 s
Storage capacity	10,000 multiparametric measurements
Data classification	3 levels (file, group, measurement numbers)
Light sources	5 LEDs: 1 UV-A, 1 green, 1 red, and 2 NIR (near-infrared)
User interface	LCD, sound warning
Data downloading	USB connection for data transfer
Battery	Li-ion rechargeable
Data output	.csv file
Total weight	226 g (with battery)
Size	207 x 66 x 54 mm
Positioning	Internal GPS
Languages	English, French, Spanish, German
Safety	Ring for leash
Updating	USB connection for manual firmware update
Operating temperature	5 to 45°C

DUALEX

N-Pilot® 2.0

https://metos.global/n-pilot/

Order number: 500171

N-Pilot® 2.0 by Pessl Instruments helps farmers optimize fertilizer use in cereals and rapeseed, enabling smarter decisions for higher yields with lower input costs. This handheld, portable reflectometer measures specific wavelengths of light in the visible and near-infrared spectrum, calculating the scientifically validated indices NDVI and GNDVI to estimate chlorophyll content and biomass.



MEASUREMENT PRINCIPLE:

N-Pilot® 2.0 measures reflectance from the crop canopy using red, green, and near-infrared wavelengths to calculate NDVI and GNDVI, providing insights into the nitrogen nutritional status of crops.

DEVICE ACTIVATION AND DATA TRANSFER:

The N-Pilot® 2.0 is activated via a simple tap of the mobile phone's NFC chip, while Bluetooth (BLE) ensures smooth and uninterrupted data transfer.

MOBILE APP: EASY MEASUREMENTS FOR IMMEDIATE RESULTS

N-Pilot® 2.0 will work with a paid mobile app, to enable quick and easy assessments of nitrogen demand across the field. Each measurement will be completed in just a few seconds while moving through the field. The app is planned to offer nitrogen fertilization recommendations for various crops.

The app will be available in a limited number of countries (subject to change): Austria, Germany, France, Hungary, Bulgaria, Romania, UK, Czech Republic, and Slovakia.



KEY FACTS:

- Fast, reliable, and cost-effective nitrogen diagnosis.
- Planned app features will provide advice on nitrogen fertilization in the field.
- It helps optimize both yield and protein content.
- Fee-based service (mobile app).
- Robust and autonomous device.



Sensors

- Precipitation
- Temperature
- Leaf
- Light
- Wind
- Barometer
- Soil Moisture
- Soil Temperature
- Water
- Snow
- Plant
- Interfaces

Pessl Instruments Rain Gauge

Order number: 600169 / 900208

The mechanic consists of a magnet, which moves past a reed switch and opens or closes the circuit. The double spoon tips left or right and does not lose any water due to a very fast switching mechanics. The resolution with a surface of 200 cm^2 is 0.2 mm, while the resolution with the 80 cm^2 is 0.5 mm. Heating for rain gauge can also be included.



TECHNICAL SPECIFICATIONS

Sensor type	Double tipping bucket rain gauge
Output	Switch signal
Switch	Reed contact, solid state
Sensitivity	1 tip per 0.2 mm or 1 tip per 0.5 mm
Collector surface	200 cm^2
Evaluation	Digital
Maximum rain	12 mm/minute
Dimensions	159.6 mm (6.28”) diameter x 160 cm (6.3”) H
Catch surface size	200 cm2 (31 square inch)
Cable length	60 cm (23.62”)
Accuracy	±5%

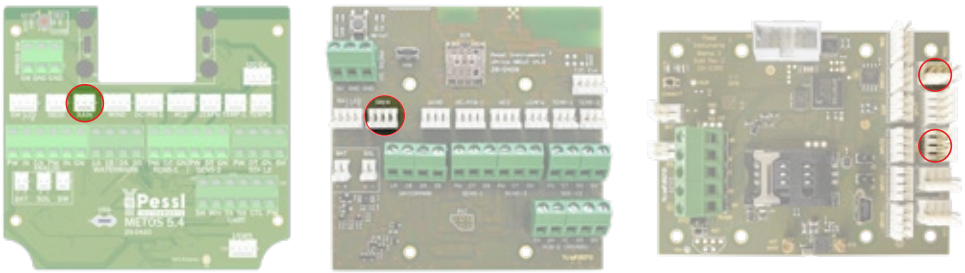
Protect your rain gauge from birds - add bird protection crown. Very easy to install and dismantle.

Order number: 900191



CONNECTION TO MOTHERBOARDS

METOS 5 μMETOS iMETOS 3.3



Note: The sensor can be connected to the REED input with an approprate input reconfiguration.

PRECIPITATION

Hygroclip (Air temperature & Relative Humidity)

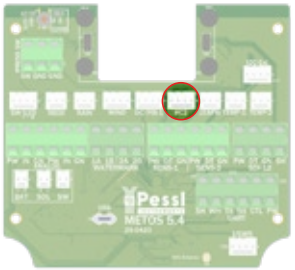
Order number: 600149 / 900074 (IMT), 600148 / 900073 (µMetos; EcoD3)

Measures relative humidity and temperature with outstanding accuracy and repeatability. It has an integrated data acquisition and calibration history. Dew point , VPD and delta T calculations available.

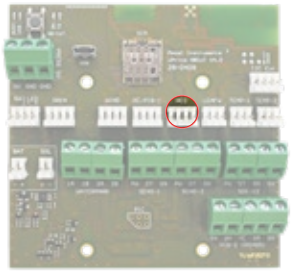


CONNECTION TO MOTHERBOARDS

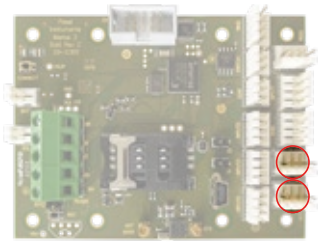
METOS 5



µMETOS



iMETOS 3.3



TECHNICAL SPECIFICATIONS

Temperature sensor	PT1000 1/3 Class B
Humidity sensor	ROTRONIC Hygromer® IN-1
Accuracy with standard adjustment profile	at 23°C and 10, 35, 80% rh ±0.8% rh / ±0.1°C
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°C
Resolution, AirChip3000	Typically 0.02% rh, 0.01°C
Long-term stability	< 1% rh, 0.1°C / year
Humidity response time t 63	3 seconds
Measurement range	0...100% rh, -100...200°C
Electronics operating range	-50-100°C and 0-100% rh
Output signals	Serial port UART
Audit trail & electronic records	FDA 21CFR Part 11 and GAMP compliant
Power supply & consumption	3.2 V / 4 mA
Housing/probe material	Polycarbonate
Filter	Polyethylene insert, polycarbonate cage
Standards	CE-compliant 2007/108/EG

Pessl Instrument Air Temperature & Relative Humidity Sensor

Order number: 600019 / 900026 (µMetos), 600009 / 900021 (LoRain)

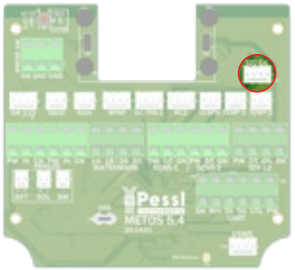
Measures air temperature and relative humidity and is used for low power consuming applications on µMETOS.

I2C Bus Considerations: I2C Bus is sensitive to the electromagnetic waves and can be distorted under certain conditions. On the contrary, Hygroclip is less sensitive. Recommended cable length: no longer than 1 m.

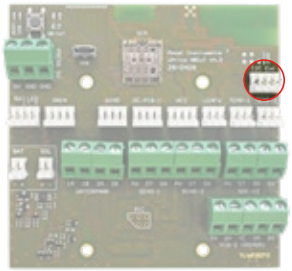


CONNECTION TO MOTHERBOARDS

METOS 5



µMETOS



nMETOS/LoRAIN



TECHNICAL SPECIFICATIONS

Sensor	HYT221
Operating temperature range	-40°C to +125°C
Humidity range	0% to 100% RH
Accuracy	±0.2°C (0°C to +60°C) ±2% RH at +23°C (0% to 90% RH)
Operating voltage	2.7V to 5.5V
Digital interface	I²C, address 0x28 or alternative address
Operating voltage (limit data)	0.3 V to +6 V
Storage conditions	-20°C to +50°C

TEMPERATURE

Pessl Instrument Air Temperature & Relative Humidity Sensor with a longer (5 m) cable

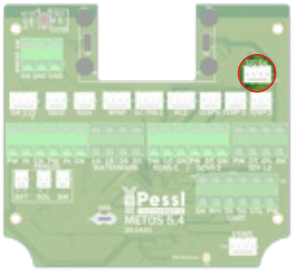
Order number: 600019 / 900026 (µMetos), 600009 / 900021 (LoRAIN)

Measures air temperature and relative humidity with additional calculation of virtual sensors like dew point, VPD and delta T. The sensor is used for low power consuming applications on µMETOS.
Application: when long distances up to 15 m from the main station are required i.e. in greenhouses in/out, when two or more sensors are needed.

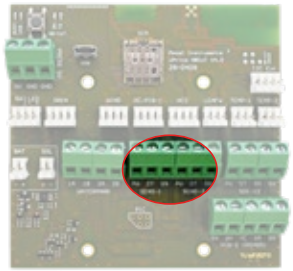


CONNECTION TO MOTHERBOARDS

METOS 5



µMETOS



TECHNICAL SPECIFICATIONS

Sensor	HYT221
Cable lenght	5 m
Operating temperature range	-40°C to +60°C
Humidity range	0% to 100% RH
Accuracy	±0.2°C (0°C to +60°C) ±2% RH at +23°C (0% to 90% RH)
Operating voltage	2.7V to 5.5V
Digital interface	RS485 with PI-Bus, insertable in a chain
Operating voltage (limit data)	0.3 V to +6 V
Storage conditions	-20°C to +50°C

TEMPERATURE

Pessl Instruments Wet and Dry Bulb Temperature

Order number: 600165 / 900134 (iMETOS 3.3), 600071 / 900014 (µMETOS)

Two highly reliable and tested PT1000 are built in a waterproof housing. One of them is covered with cotton tissue and wetted with water.



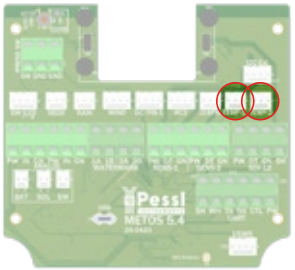
TECHNICAL SPECIFICATIONS

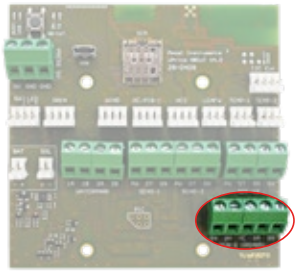
Sensor	PT1000
Supply voltage	4.57-7 V for chain version
Supply current	max. 200 µA
Short circuit protection	Infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temperature range	-30°C to +60°C
Accuracy	0.1°C
Cable length	5 m

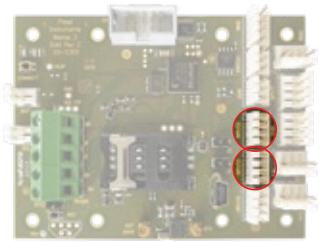
CONNECTION TO MOTHERBOARDS

Order number: 600165 / 900134 *Order number: 600164 / 900132*

METOS 5 µMETOS iMETOS 3.3







Note: The Wet and Dry Bulb temperature sensors can be connected to the TEMP-1 and TEMP-2 inputs without the need for a middle interface board. Appropriate configuration of the inputs is made via a terminal menu.

Pessl Instruments
Leaf Temperature

Order number: 600127 / 900169 (IMT), 600126 / 900171 (µMetos)

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



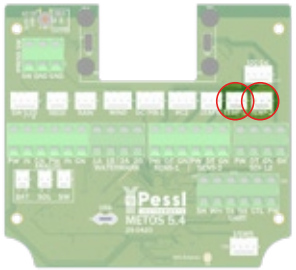
TECHNICAL SPECIFICATIONS

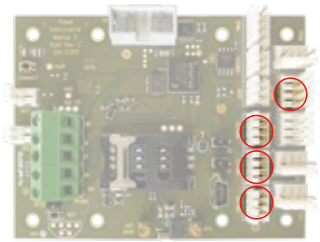
Sensor	PT1000
Accuracy	min. 0.1°C (-30°C to +99°C)
Supply current	max. 200 µA
Short circuit protection	Infinite (within supply voltage range)
Short circuit supply current	max. 40 mA
Operating temperature range	-30°C to +99°C
Nonlinearity error	max. 0.2°C
Supply voltage sensitivity	max. 0.1°C/V
Repeatability	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

CONNECTION TO MOTHERBOARDS

METOS 5

iMETOS 3.3





Note: The sensor can be connected to TEMP-1 or TEMP-2 input with an appropriate input reconfiguration.

Pessl Instruments
IR Temperature

Order number: 600131 / 900066

The infrared temperature sensor infers the temperature from a portion of thermal radiation (blackbody radiation) emitted by the object being measured. It is a non-contact temperature sensor. By measuring the amount of infrared energy emitted by the object and its emissivity, the object 's temperature can be determined. Main use: canopy or leaf temperature measurements.

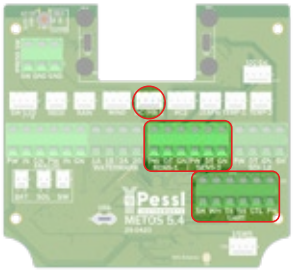


TECHNICAL SPECIFICATIONS

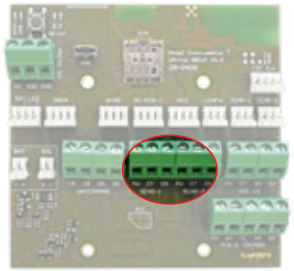
Sensor	Melexis MLX90614-BCC
Resolution	0.1°C
Interface	RS 485 PI Sensor Bus
Size	20 mm (dia) x 24 mm
Sensor housing	Weather resistant PAS
Range	-40°C to +85°C

CONNECTION TO MOTHERBOARDS

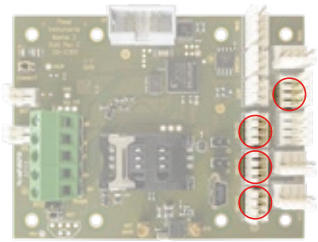
METOS 5



µMETOS



iMETOS 3.3



LEAF

Pessl Instruments
Leaf Wetness

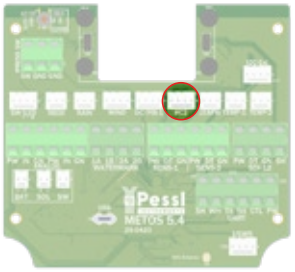
Order number: 600015 / 900025 (µMETOS / IMT); 600188/900245 (nMETOS - LoRAIN)

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

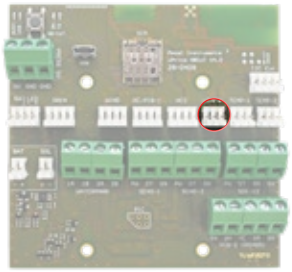


CONNECTION TO MOTHERBOARDS

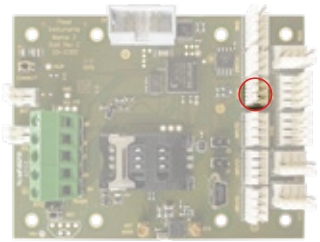
METOS 5



µMETOS



iMETOS 3.3



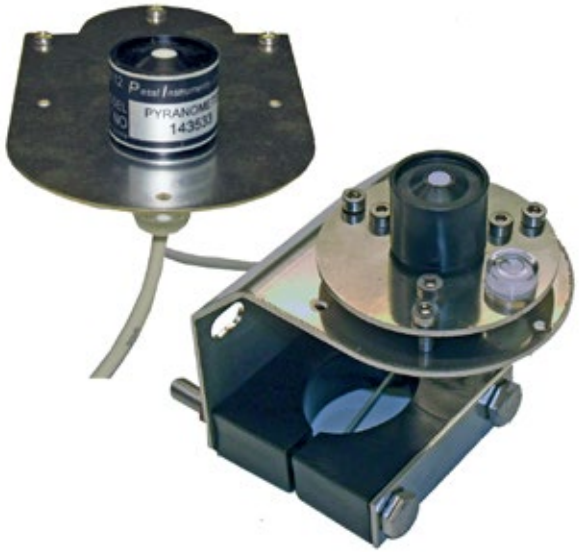
TECHNICAL SPECIFICATIONS

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-0.4 VDC
Electronic	Totally plastic encapsulated – SMD
Dimensions	42 mm x 78 mm x 15 mm
Cable length	5 m

Pessl Instruments Pyranometer

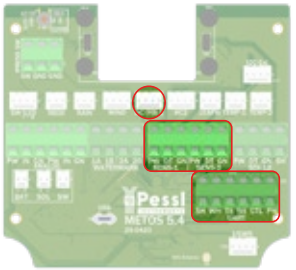
Order number: 600021 / 900002 (µMetos), 600035 / 900000 (IMT)

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

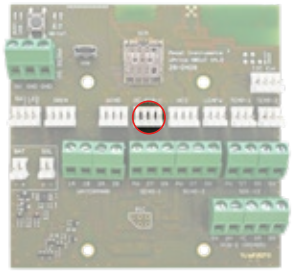


CONNECTION TO MOTHERBOARDS

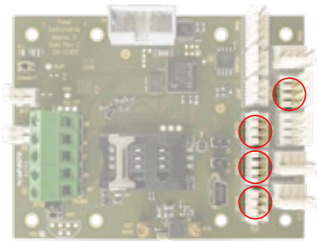
METOS 5



µMETOS



iMETOS 3.3



TECHNICAL SPECIFICATIONS

Sensor	VTB1112H
Calibration	Calibration against Kipp & Zonen CMP3 under daylight. Absolute error max. 5%, typically 3%
Stability	2% drift on 2-year use
Time to measure	10 µs
Temperature dependency	0.15% per°C
Cosines correction	Sensor corrects up to 80° degrees
Azimuth	1% error over 360 degree at 45 degree elevation
Operating temperature range	-20°C to 65°C
Operating relative humidity range	0 to 100%
Sensor	Photodiode
Housing	Weatherproof PAS case with acrylic diffuser, stainless steel hardware
Size	35 mm diameter, 45 mm height
Weight	114 g
Evaluation	Pulse Wide Modulation 0-80% = 0-2000 W/m^2
Spectral range	320-1100 nm

Pessl Instruments PAR Quantum

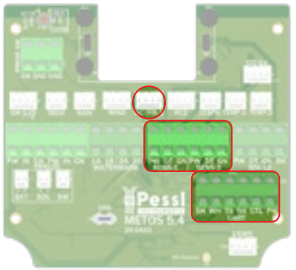
Order number: 600078 / 900005

Photosynthetically Active Radiation (PAR) is typically measured as Photosynthetic Photon Flux Density (PPFD), which has units of quanta (photons) per unit of time per unit of surface. The units most often 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.

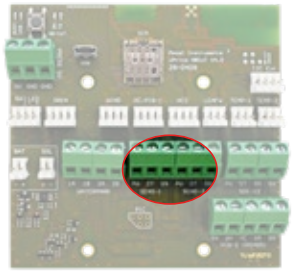


CONNECTION TO MOTHERBOARDS

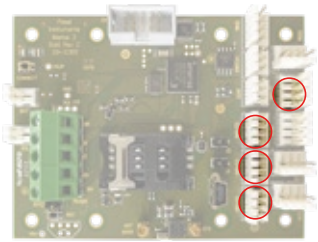
METOS 5



µMETOS



iMETOS 3.3



TECHNICAL SPECIFICATIONS

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°C
Cosines correction	Sensor corrects up to 80° degrees
Azimuth	1% error over 360 degrees at 45 degree elevation
Operating temperature range	-20°C to 65°C
Operating relative humidity range	0 to 100%
Sensor	Photodiode
Housing	Weatherproof PAS case with acrylic diffuser, stainless steel hardware
Size	35 mm diameter, 45 mm height
Weight	114 g
Evaluation	PWM: 0-80% duty cycle = 0-20 kJ/m²

Pessl Instruments Ultrasonic Wind Sensor

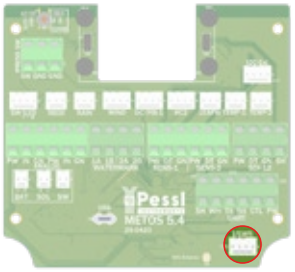
Order number: "600023 / 900028 (µMetos), 600064 / 900047 (IMT)"

Pessl Instruments ultrasonic wind speed sensor is a two-dimensional sonic wind sensor, built specifically for agricultural, forestry, and environmental research applications. It calculates average and maximum (gust) wind speed and direction over 5 minutes interval.

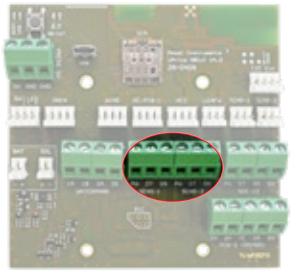


CONNECTION TO MOTHERBOARDS

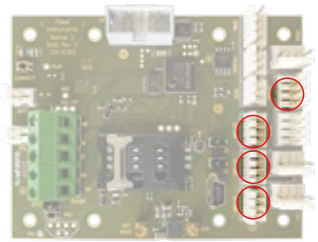
METOS 5



µMETOS



iMETOS 3.3



TECHNICAL SPECIFICATIONS

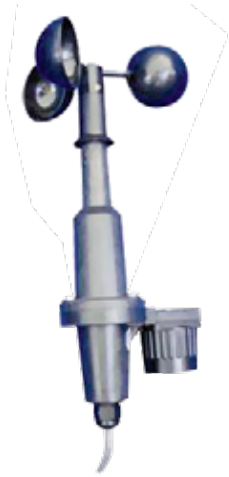
Output data format	PI-bus
Information transmitted	Vectorial average wind direction, wind run speed and gust
Output rate	1-10 min
Wind module sensitivity	0.15 m/s
Wind module resolution	0.1 m/s
Wind module dynamic	0.5 to 40 m/s
Direction sensitivity	+/-1.5°
Direction resolution	1°
Power supply	3.7V to 6V with supercap
Electrical consumption	0.5 mA Avg
Operating temperature without icing	-20°C to +55°C
Cable	2.5 m / LIYCY
Connection	4 wires for iMETOS 3.3 and reprogramming, 3 wires for µMETOS
Weight of the head	N/A
Weight of unit assembly	200 g with mounting part
Mounting	Pessl Instruments clamp

*weather station measurement interval needs to be set to 5 minute value

Pessl Instruments
Wind Speed

Order number: 600034 / 900040

IM512CD is a cup type anemometer for low cost and long term, accurate wind measurements for all kinds of use. It calculates average wind speed in the specific time period.

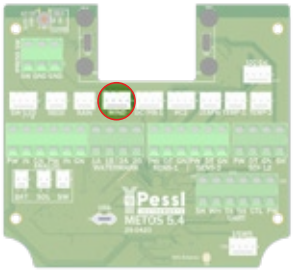


TECHNICAL SPECIFICATIONS

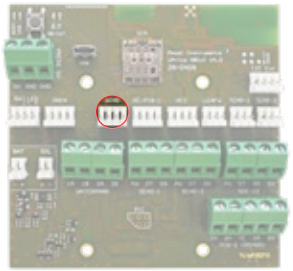
Range	0 to 50 m/s, gust survival 60 m/s
Sensor	12 cm diameter cup wheel assembly, 40 mm diameter hemispherical cups
Turning factor	75 cm
Distance constant (63% recovery)	2.3 m
Threshold	1.1 m/s
Transducer	Stationary Coil
Transducer output	AC sine wave signal induced by rotating magnet on cup wheel shaft. 100 mVpp at 60 rpm. 6 Vpp at 3600 rpm
Output frequency	1 cycle per cup wheel revolution. 0.75 m/s per Hz

CONNECTION TO MOTHERBOARDS

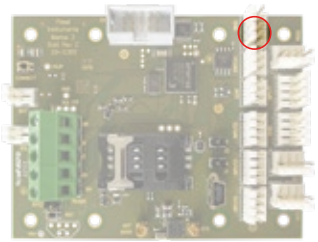
METOS 5



µMETOS



iMETOS 3.3



Turning Information Into Profits. www.metos.global

RM Young Wind Monitor

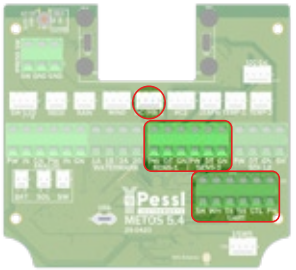
Order number: 600129 / 900064

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. It measures peak values.

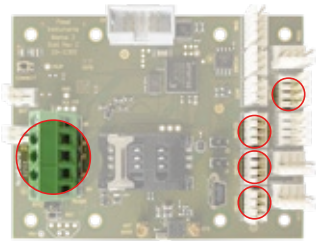


CONNECTION TO MOTHERBOARDS

METOS 5



iMETOS 3.3



TECHNICAL SPECIFICATIONS

Range	0-100 m/s (224 mph), 0- 360°
Accuracy	**Wind Speed:** ±0.3 m/s (0.6 mph) or 1% of reading
	Wind Direction: ±3 °
Operating temperature range	-50 to 50°C
Threshold	**Propeller:** 1.0 m/s (2.2 mph)
	Vane: 1.1 m/s (2.4 mph)
Signal output	**Wind speed:** magnetically induced AC voltage, 3 pulses per revolution. 1800 rpm (90 Hz) = 8.8 m/s (19.7 mph)
	Wind direction: DC voltage from conductive plastic potentiometer − resistance 10K Ω, linearity 0.25%, life expectancy − 50 million revolutions
Power Requirement	Potentiometer excitation: 15 VDC maximum
Dimensions	37 cm (14.6 in) H x 55 cm (21.7 in) L, Propeller: 18 cm (7 in) dia. Mounting: 34 mm (1.34 in) dia. (standard 1 inch pipe)
Weight	1.0 kg

Pessl Instruments Barometer

Order number: 600157 / 900163

The Pessl Instruments barometric sensor measures the “absolute air pressure” of the atmosphere on site. It is designed for application of environmental protection, where high accuracy, quick response, long term stability and reliability are required. The instrument is suitable for indoor and outdoor use. A tempered piezoceramic sensor for absolute pressure is used, characterized by its thermal and mechanical stability.

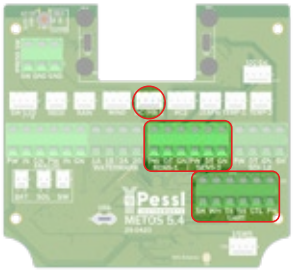


TECHNICAL SPECIFICATIONS

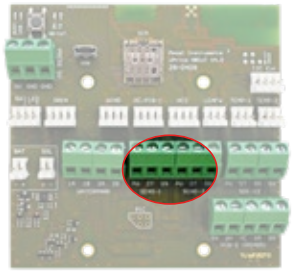
Working range	0-1150 mbar
Weight	ca. 50 g
Power supply	5.0 VDC (6 VDC maximum)
Zero offset	0.50 ±0.09 VDC
Power uptake	max. 20 mA
Precision	0.1% max. Thrift
Temperature range	-40°C to 125°C
Measuring type	Serial (RS 485)

CONNECTION TO MOTHERBOARDS

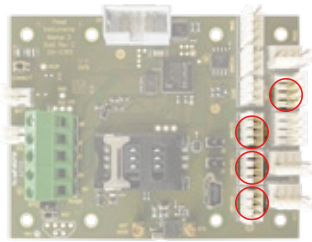
METOS 5



µMETOS



iMETOS 3.3



Pessl Instruments Soil Moisture & Soil Temperature Sensor PI54-D

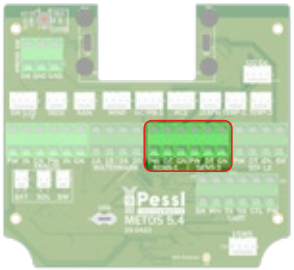
Order number: 600118 / 900012

The PI54-D soil moisture and soil temperature sensor has a larger volume of influence. It determines volumetric water content (VWC) by measuring the dielectric constant of the soil using capacitance technology and soil temperature. It is 10 cm long and thus measures 1 Liter of soil, while high frequency minimizes salinity and textural effects which makes PI54-D accurate in most soils.

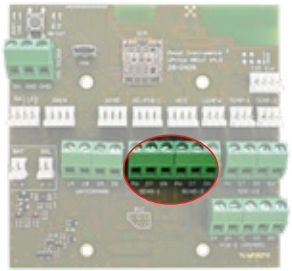


CONNECTION TO MOTHERBOARDS

METOS 5



µMETOS



nMETOS



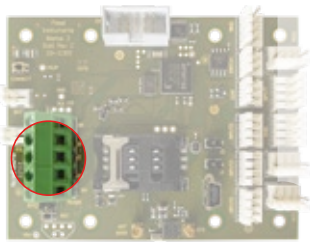
TECHNICAL SPECIFICATIONS

Volumetric water content (VWC)	**Range:** 0–0.57 m³/m³ (0%–57% VWC) **Resolution:** 0.0008 m³/m³ (0.08% VWC) in mineral soils from 0–0.50 m³/m³ (0%–50% VWC) **Accuracy:** With standard calibration equation, 0.03 m³/m³ (3% VWC) typical in mineral soils that have solution electrical conductivity <10 dS/m NOTE: With soil-specific calibration, ±0.02 m³/m³ (±2% VWC) is typical in any soil.
Dimensions	16.0 cm (6.3 in) length; 3.3 cm (1.3 in) width; 0.8 cm (0.3 in) height
Prong length	10 cm (3.94 in)
Cable length	5/10 m
Supply voltage (VIN to GND)	Minimum: 3.6 VDC at 12 mA Maximum: 15 VDC at 20 mA
Measurement duration	Maximum 10 ms
Temperature accuracy	±0.3°C in the soil temperature (range -5°C to +25°C approx.)
Output	Digital

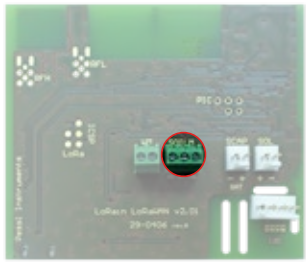
INTERFACE

Necessary Interface to connect this sensor with METOS:
600069 / 900052, 600068 / 900051, 600167 / 900057 or 900173, 900174, 900175

iMETOS 3.3



miniMETOS, LoRATH soil, LoRAIN soil

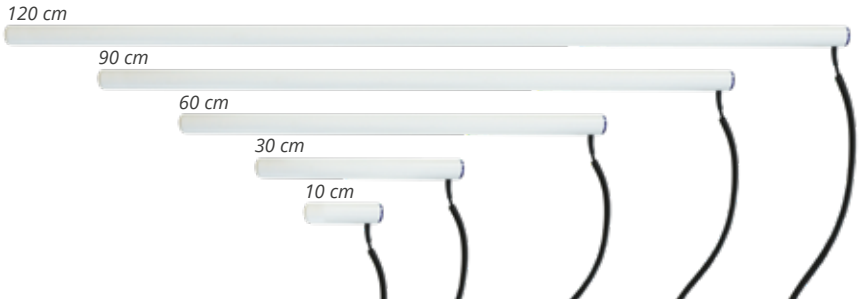


SOIL MOISTURE

Sentek Drill & Drop and TriSCAN Probe

Order number: 600098 / 900104, 600099 / 900106, 600100 / 900107, 600101 / 900108, 600102 / 900109, 600103 / 900110, 600104 / 900111, 600105 / 900112, 600106 / 900113, 600107 / 900114

Sentek Drill & Drop probe provides the user with great flexibility for precision monitoring of temperature, water, and salinity (Triscan) at multiple depths in a soil profile. Available in five lengths: 10 cm, 30 cm, 60 cm, 90 cm and 120 cm with sensors fixed at every 10 cm increment.

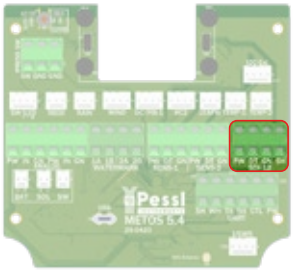


TECHNICAL SPECIFICATIONS

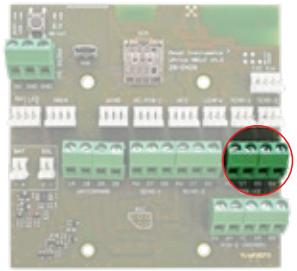
Probe lengths	10 cm (4") / 30 cm (12") / 60 cm (24") / 90 cm (36") / 120 cm (48")
Number of sensors	1 / 3 / 6 / 9 / 12
Outer probe diameter (top-bottom)	24-24.5 mm / 28-29.5 mm / 27-29.5 mm / 26-30 mm / 24.5-29.5 mm
Moisture (VWC) range	Oven dry to saturation
Method	Capacitance based technology
Resolution	**Moisture (VWC):** 1:10000 **Salinity (Triscan) (VIC, Volumetric Ion Content):** 1:6000 **Temperature:** 0.3°C
Moisture precision	±0.03% vol.
Temperature accuracy	±2°C at 25°C
Operating temperature range	-20°C to 60°C

CONNECTION TO MOTHERBOARDS

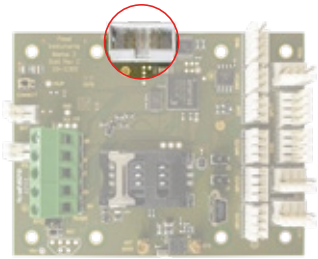
METOS 5



µMETOS



iMETOS 3.3



INTERFACE

Necessary Interface to connect this sensor with METOS:
600150/900105

SOIL MOISTURE

PI-Profile Probe

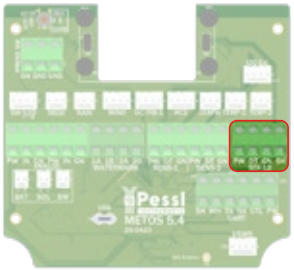
Order number - 60 cm: 600196 / 900260
Order number - 90 cm: 600197 / 900261

The PI-Profile Probe system is ideal for broad-acre row crops like corn, cotton, alfalfa and soybeans as well as all permanent crops. Due to its special design where the sensor and the cable are trenched below the surface there is no need for annual installation and removal of soil sensors from the field. The sensor comes with a 5-meter cable and watertight rapid connector so the In-field telemetry can be removed only during tillage, seeding or harvest and moved back in after that. Highly scalable with a low total cost of ownership; no annual installation and removal! The PI-Profile Probe is available with 60 cm and 6 sensors (every 10 cm) and with 90 cm and 6 sensors (every 15 cm) which measures soil moisture and soil temperature in the vertical profile.

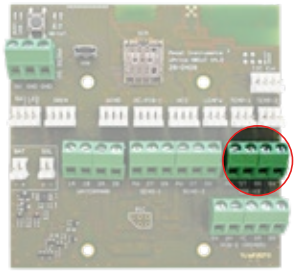


CONNECTION TO MOTHERBOARDS

METOS 5

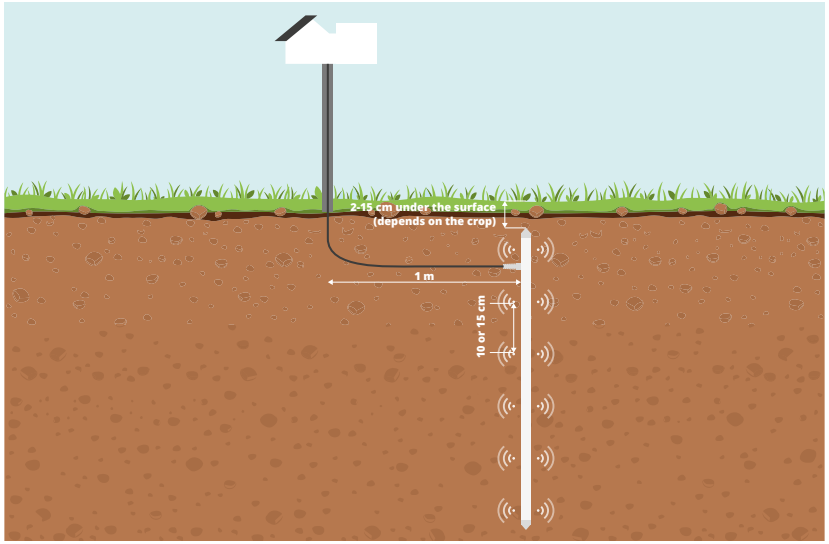


µMETOS



TECHNICAL SPECIFICATIONS

Probe lengths	60 or 90 cm
Probe diameter	25 mm
Number of sensors	6
Separation of sensors	60 cm probe: one sensor every 10 cm 90 cm probe: one sensor every 15 cm
Soil moisture range & accuracy	0-100% (mm). Accurate to within 1% V/V.
Soil temperature range & accuracy	**Soil temperature probe reading resolution:** 0.0625°C **Soil temperature probe reading accuracy:** within 1°C in range 0°C to +64°C **General temperature range** that can be used: 0°C to 64°C
Method	FDR
Influence of salinity	Less than 1% over standard operating range
Environment	-15°C to 60°C air temperature; 0 to 90% relative air humidity
Storage	0°C to 65°C air temperature; 0 to 90% relative air humidity *Do not store in direct sunlight. Do not exposed to strong radiometric radiation (i.e. cell phone signal).*
Cable length	5 m



SOIL MOISTURE

Irrometer Watermark Soil Moisture Sensor

Order number: 600120 / 900010

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 crop production, 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 electrode's changes. This resistance is read and logged by the weather station.

The sensor is manufactured from non-corrosive materials and lasts up to three years.



TECHNICAL SPECIFICATIONS

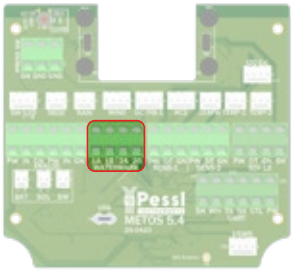
Size	2.2 cm diameter x 5 cm length
Measuring principle	Soil water tension correlated with electrical resistance in granular matrix
Working range	0 to 200 kPa
Precision	5%
Evaluation	Analog
Cable length	3.5 m / 10 m

INTERFACE

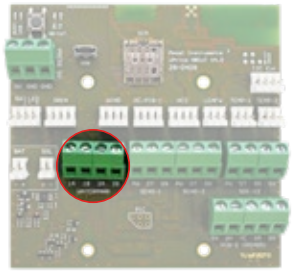
Necessary Interface to connect this sensor with METOS:
600068 / 900051, 600167 / 900057, 900174, 900175

CONNECTION TO MOTHERBOARDS

METOS 5



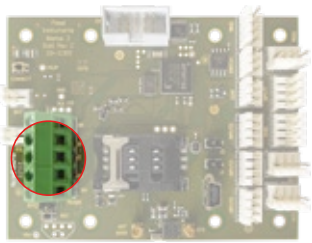
µMETOS



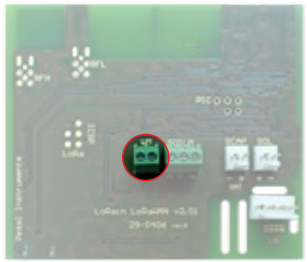
nMETOS



iMETOS 3.3



miniMETOS, LoRATH soil, LoRAIN soil



Irrometer Tensiometer

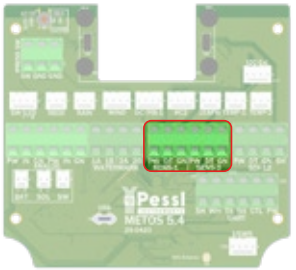
Order number: TNS101

The instrument measures soil water tension (or suction). This value represents the energy a plant's root system uses to draw water from the soil. Understanding soil moisture dynamics helps the user make informed irrigation scheduling decisions, resulting in improved yield quantity and quality while reducing water, fertilizer, labor, and energy costs. Available in different lengths: 15 cm, 30 cm, 45 cm, 60 cm and 90 cm.

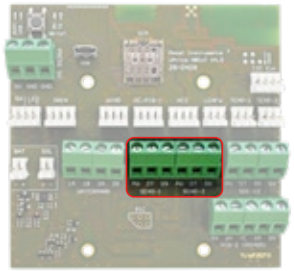


CONNECTION TO MOTHERBOARDS

METOS 5



µMETOS



TECHNICAL SPECIFICATIONS

Instrument body materials	Butyrate body, ceramic tip, neoprene stopper
Weight	30 cm weights 0.439 kg. It increases 0.114 kg per 30 cm
Ceramic tip	White tip – used for most soil types
Operating suction	0-90 kPa
Operating temperature range	0°C to 50°C
Reservoir dimensions	Height: 120-130 mm including cap; Diameter: 51-55 mm including cap
Body tube dimensions	Length: ranges from 15 to 90 cm; Diameter: 22 mm

INTERFACE

Necessary Interface to connect this sensor with METOS:
600069 / 900052, 600068 / 900051, 600167 / 900057 or 900173, 900174, 900175

Pessl Instruments
Soil Temperature

Order number: 600159 / 900124 (iMETOS 3.3), 600020 / 900027 (µMETOS, ECHO)

The Soil Temperature Sensor is a PT1000 in a waterproof stainless-steel housing. The sensor output is a duty-cycle signal.

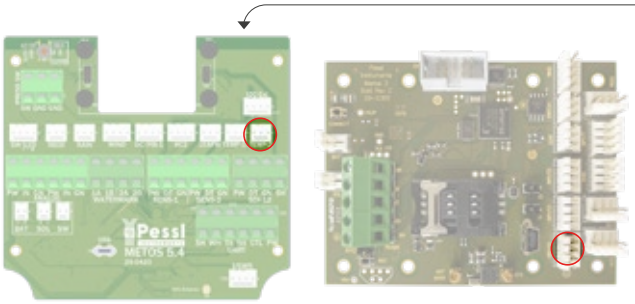


TECHNICAL SPECIFICATIONS

Sensor SMT172	**Operating temperature range:** -30°C to +75°C
	Accuracy: ±0.5°C (-30°C to +75°C)
Sensor PT1000	**Operating temperature range:** -30°C to +75°C
	Accuracy: ±0.1°C (-30°C to +75°C)
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
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
Evaluation	Duty cycle
Cable length	5 m

CONNECTION TO MOTHERBOARDS

METOS 5 iMETOS 3.3



Note: The sensor can be connected also to the TEMP-1 input with an appropriate input reconfiguration.

SOIL TEMPERATURE

Pessl Instruments
Multiple Soil Temperature

Order number: 60079/900058 (Sensor chain with box, holder and 3 sensors) / 900227 (Sensor chain with box, holder and 1 sensor) / 900226 (Additional sensor)

SAR19/SAR19M provides soil temperature measurement from several centimeters to 15-meter deep by using the Pessl Instruments sensor BUS. The distance between the sensors can be chosen according to the application, but only up to 10 sensors can be attached to one sensor chain.

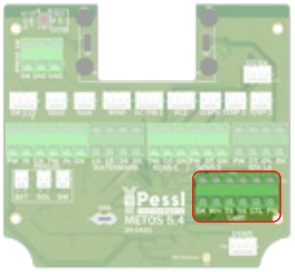


TECHNICAL SPECIFICATIONS

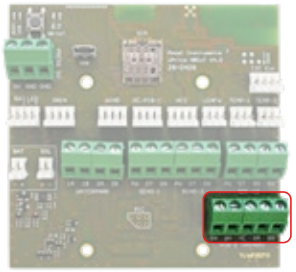
Temperature sensor	DS18B20
Operating temperature range	-55°C to +125°C
Supply DC voltage (range)	3-5.5 V
Thermometer error -10°C to +85°C	±0.3°C
Drift	±0.2°C
Data transmission	Rs 485 Digital signal (temperature data sent on demand of METOS main board)

CONNECTION TO MOTHERBOARDS

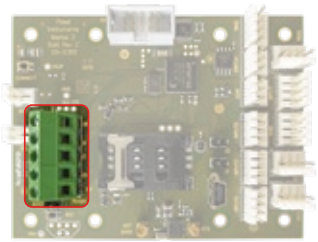
METOS 5



µMETOS



iMETOS 3.3



Turning Information Into Profits. www.metos.global

SOIL TEMPERATURE

Pessl Instruments
Single Soil Temperature

Order number: 600020 / 900027

WMTEMP is a soil temperature sensor.

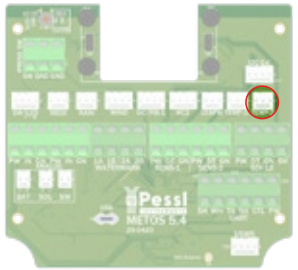


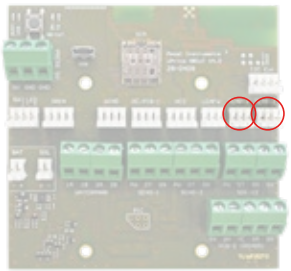
TECHNICAL SPECIFICATIONS

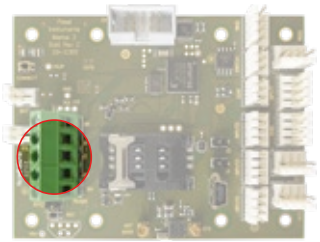
Temperature sensor	DS18B20
Operating temperature range	-55°C to +125°C
Supply DC voltage (range)	3-5.5 V
Thermometer error -10°C to +85°C	±0.3°C
Drift	±0.2°C
Data transmission	Rs 485 Digital signal (temperature data sent on demand of METOS main board)

CONNECTION TO MOTHERBOARDS

METOS 5 μMETOS iMETOS 3.3







Note: The sensor can be connected also to the TEMP-1 input with an appropriate input reconfiguration.

INTERFACE

Necessary Interface to connect this sensor with METOS:
ECH871EXT, ECH874EXT or ECH871INT, ECH874INT or RFRN09, RFRN12 or WM-BUS

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SOIL TEMPERATURE

Pessl Instruments Heavy Duty Multiple-temperature Probe

Multiple-temperature probe is a thermometer, designed to make measurements in extremely harsh conditions like temperature of waste on disposal sites, and chipped wood in storage rooms.

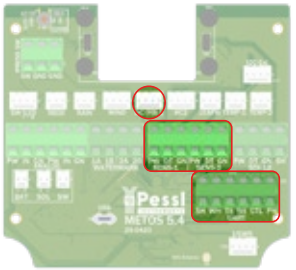


TECHNICAL SPECIFICATIONS

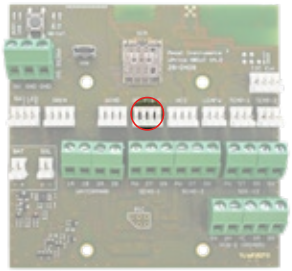
Operating temperature range	-55°C to +125°C
Supply DC Voltage (range)	3-5.5 V
Thermometer error -10°C to +85°C	±0.3°C
Drift	±0.2°C
Data transmission	Rs 485 Digital signal (temperature data sent on demand of METOS main board) METOS checks all sensors every 5 minutes

CONNECTION TO MOTHERBOARDS

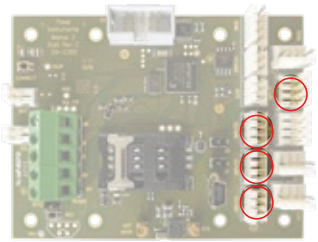
METOS 5



µMETOS



iMETOS 3.3

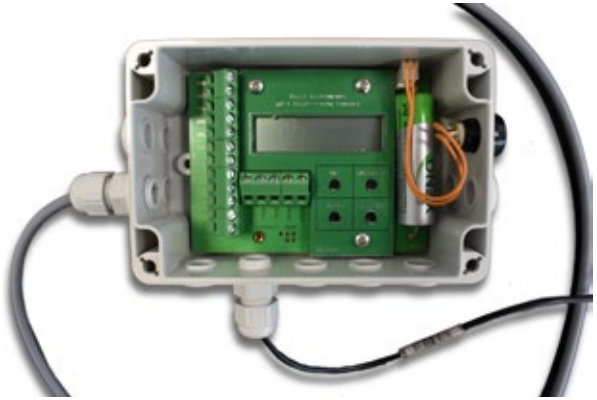


SOIL TEMPERATURE

EC & pH Interface Box with Display in IP65 Box

Order number: 600025 / 900029

The EC500PH EC & pH Interface box is a measuring device with display in IP65 Box to be integrated into any METOS sensor chain interface for continuous EC & pH measurements in water. It is compatible with most industry standard EC & pH sensors. The actual reading can be seen on the display. With the built-in calibration mode, all sensor readings can be calibrated and checked from time to time.

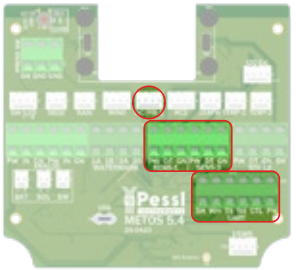


Connection Possibilities

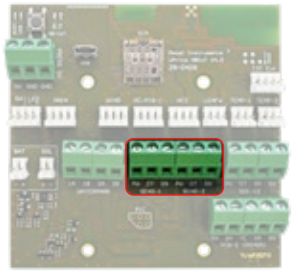
- 1 EC Sensor (Part.no. EC501)
- 1 pH Sensor (Part.no. PH501)

CONNECTION TO MOTHERBOARDS

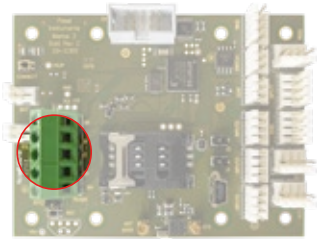
METOS 5



µMETOS

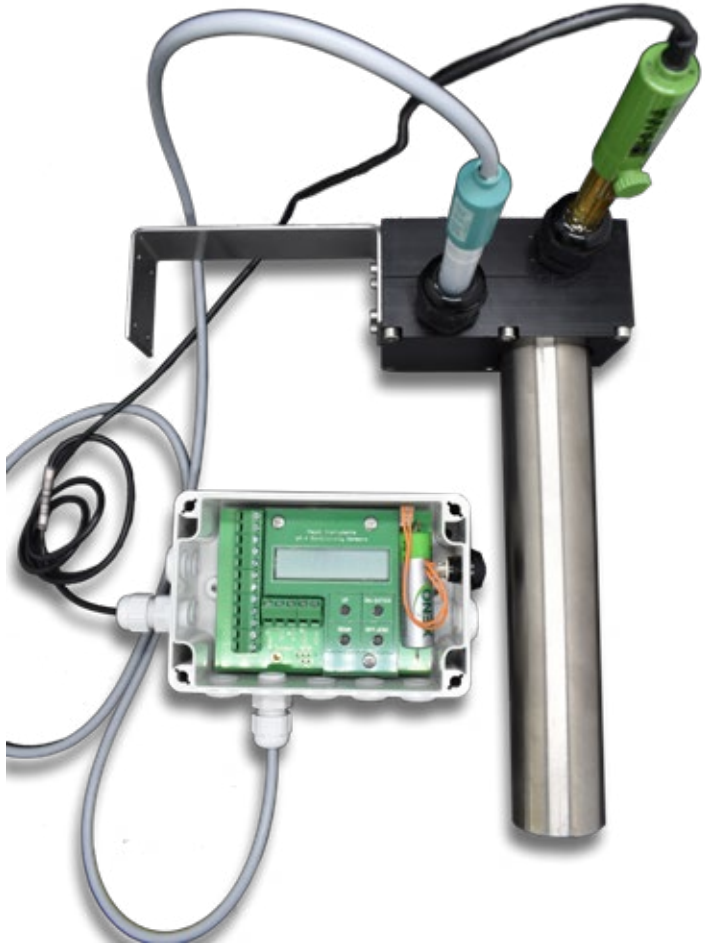


iMETOS 3.3



TECHNICAL SPECIFICATIONS

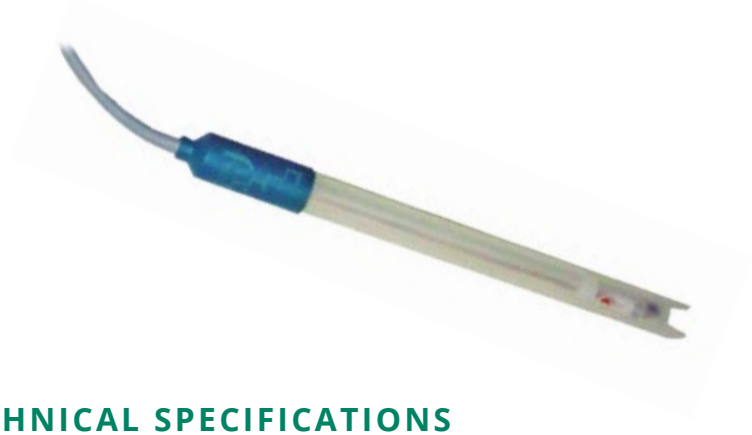
General information	Display shows actual data by pressing the button. It works with iMETOS 3.3 and µMETOS.
Cable length	5 m standard, custom cable lengths available upon request



Pessl Instruments Electrical Conductivity

Order number: 600145 / 900032

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 hydrographical and environmental water monitoring, in agriculture and industrial applications. The durable design ensures suitability for the harshest environment applications.



TECHNICAL SPECIFICATIONS

Range	0.1 µS/m - 1000 mS/cm
Resolution	0.1 µS/cm
Temperature compensation	Automatic
Probe material	PP
Probe diameter	12 mm
Min. immersion	40 mm

INTERFACE

Necessary Interface to connect this sensor with METOS:
600025 / 900029 Interface box with display

Pessl Instruments pH Sensor

Order number: 600144 / 900030

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 between 0 and 6; caustic solutions have pH values between 8 and 14. Value 7 is neutral.



TECHNICAL SPECIFICATIONS

Range	pH 0.00 to 14.00
Resolution	0.001 pH
Accuracy	±2% F.S.
Temperature deviation	3% (range 5°C to 30°C)
pH probe	Standard up to 0.1 bar (other types on request), 3 m cable, 2-ring-flow-through (please specify type of application)
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
Operating temperature range	15°C to 60°C
Response time	≤ 90 s

INTERFACE

Necessary Interface to connect this sensor with METOS:
600025 / 900029 Interface box with display

Pessl Instruments Pressure Switch

Order number: 600168 / 900198

Simple and robust design makes pressure switch suitable for use with compressed air, hydraulic oil, oil emulsions and water. Detection threshold is 0.5 bar (7.25 psi) and switch off is at 0.25 bar (3.62 psi) (other values on demand). The main purpose of this sensor is to control/check the performance of the irrigation system in different types of applications (resistance to high pressure makes it usable also for frost protection system).

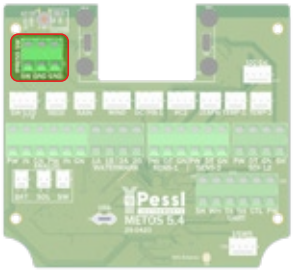


TECHNICAL SPECIFICATIONS

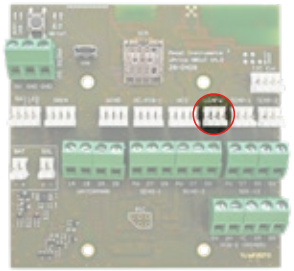
Material	Zinc-plated steel (G 1/4")
Switching function	Open contact, closed contact, changeover
Media	Water, compressed air, hydraulic oil, oil emulsion
Maximum medium temperature	+85°C
Adjustment ranges	1 to 10 bar (1.4-14 psi), 0-1 bar
Switching frequency	max. 200 /min
Switching pressure difference	10 to 15%
Switching voltage	Open contact/closed contact 42V max. 2A; Changeover 250 V max. 2A

CONNECTION TO MOTHERBOARDS

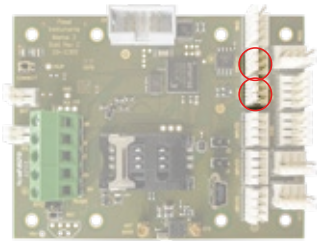
METOS 5



µMETOS



iMETOS 3.3



WATER

Pessl Instruments
Water Counter Interfaces

Order number: 600155

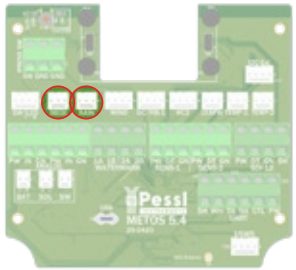
These interfaces support most of the water meters used in irrigation with a pulse output.

SECTORS: Irrigation management, irrigation consulting, smart irrigation, irrigation tractability and bookkeeping, alarms, and supervision. Used widely in open field crops, hydroponics, and green house.

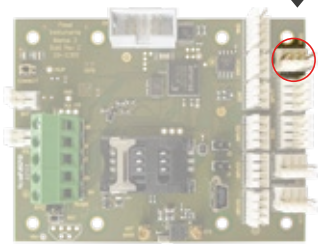
SW1000 pulse counter (Reed/Rain input)



METOS 5



iMETOS 3.3



Note: The sensor can be connected to REED and RAIN input with an appropriate input reconfiguration.



WATER

Pessl Instruments
Pipe Pressure (WPS)

Order number: 600154 / 900204

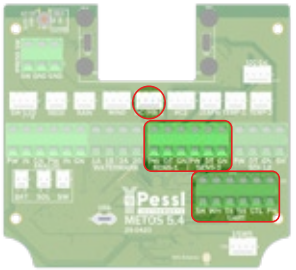
This sensor enables continuous monitoring of the pressure in irrigation pipes (main pipe or sector pipes) and it measures up to 50 bar, so it can be used in all types of irrigation systems (drip irrigation, sprinkler, hydroponics ...).
Technical specification of the full scale and resolution can be changed in the benefit of the user.

SECTORS: Irrigation monitoring and supervision, identification of pressure loss in the installation.

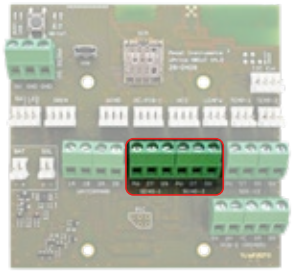


CONNECTION TO MOTHERBOARDS

METOS 5



µMETOS



TECHNICAL SPECIFICATIONS

Range	0 to 500 m of water column
Resolution	10 mbar
Accuracy	0.3%
Operating temperature range	0°C to 50°C
Storage temperature range	-20°C to 80°C
Weight	300 g (including cable)
Housing	POM
Diaphragm	Ceramic
Cable sheath	Shielded PVC
Output signal	Voltage
Support	µMETOS Sens 1 and Sens 2
Dimensions gauge shaft	90 x 20 mm (height x diameter)

Pessl Instruments
Water Level Sensor

Order number: 600026 / 900201, 600153

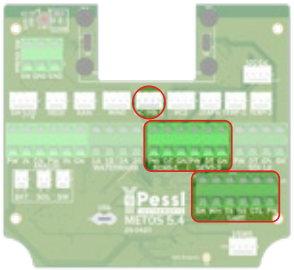
The Water level sensor is an accurate and cost effective submersible water level sensor that can be connected to METOS stations with the precision of 3 mm within the measurement ranges. Sensor has an integrated barometric sensor module to increase precision. Pressure (Measuring) ranges: 0 mWC up to 5 mWC (other distances on request). Special cable is also available.

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

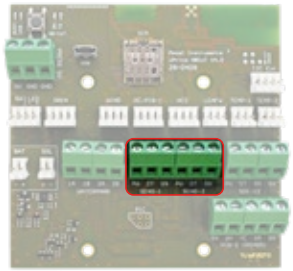


CONNECTION TO MOTHERBOARDS

METOS 5



µMETOS



TECHNICAL SPECIFICATIONS

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 10 m of water column (other on request)
Resolution	1 mm
Accuracy	0.5% of maximum water level
Operating temperature range	0°C to 50°C
Storage temperature range	-20°C to 80°C
Weight	300 g (cable not included)
Housing	Stainless steel 1.4301
Diaphragm	Ceramic
Seals	FKM
Cable sheath	Shielded PVC
Output signal	Analog voltage
Support	PI-bus only at the end of the chain
Dimensions gauge shaft	90 x 38 mm (height x diameter)



WATER

Pessl Instruments Ultrasonic Snow Height or Water Depth Sensor

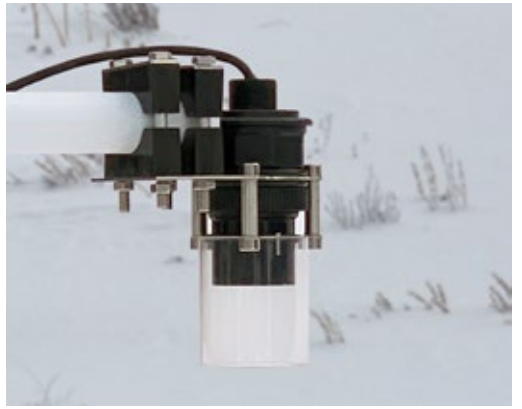
Order number: 600173 / 900209

Ultrasonic snow depth sensor is used for non-contact measurements of snow depth and river levels in extreme weather conditions. The sensor is characterized by its high level of operating reliability, low energy consumption, fast installation and ease of use in the field.



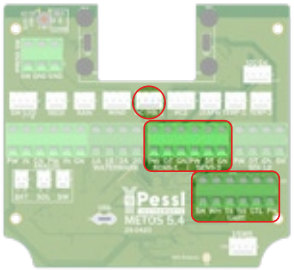
TECHNICAL SPECIFICATIONS

Range	0 to 10 m
Resolution	10 mm
Accuracy	0.5% (FS)
Measurement principle	Ultrasonic
Temperature measurement range	-40°C to +60°C
Digital RS-232 interface	Serial port protocol, distance or snow depth
Power supply	From the input of the METOS, in areas with limited sun extended battery is needed (ord. no. USH8-BATT-EXT).
Ingress protection	IP 66

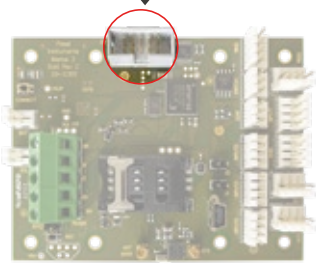


CONNECTION TO MOTHERBOARDS

METOS 5



iMETOS 3.3





To connect Snow Depth Sensor to the motherboard, you will need **MOD BUS** interface.

Pessl Instruments Dendrometer

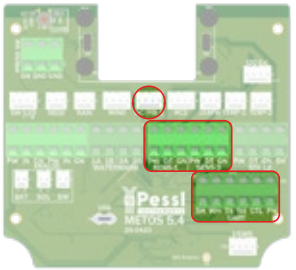
Order number: 100358, 100359, 100361, 100360

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 allows the direct assignment of plant responses and stress to environmental influences. Dendrometers are a cost-effective and useful tool for Eco physiological studies.

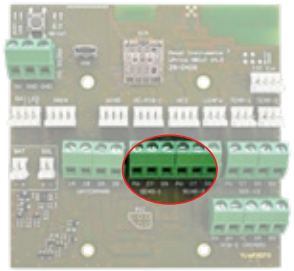


CONNECTION TO MOTHERBOARDS

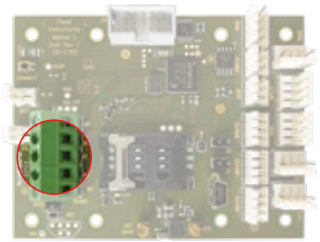
METOS 5



µMETOS



iMETOS 3.3



TECHNICAL SPECIFICATIONS

To specify plant size range	Diameter 3-30 cm
Range of the sensor	11 mm
Accuracy	±1.5 µm ±0.12% (CR1000 Logger)
Resolution	0.2-2.6 µm (dependent on used data logger)
Linearity	1%
Thermal expansion coefficient of the sensor	<0.1 µm/K
Operating temperature range	-25 to 70°C
Operating relative humidity range	0 to 100%

INTERFACE

Necessary Interface to connect this sensor with METOS:
600170 / 900205

PLANT

Chain Node Interface for 3 Pessl Instruments Sensors

Order number: 600069 / 900052 / 900173

This Interface enables the connection of up to 3 PI54-D sensors to a METOS weather station.
The Interface can be an External box for iMETOS 3.3 (ECH870EXT).



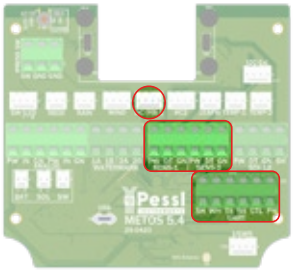
YOU CAN CONNECT:

The following Pessl Instruments sensors:

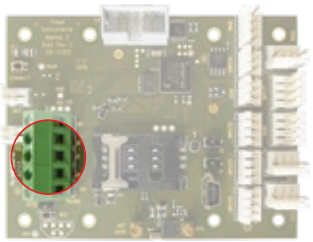
- Vacuum Tensiometer
- Water Level Sensor
- PI54-D

CONNECTION TO MOTHERBOARDS

METOS 5



iMETOS 3.3



Chain Node Interface for 2 Pessl Instruments Sensors & 2 Watermark Sensors & 1 Soil Temperature Sensor

Order number: 600068 / 900051 / 900174

This Interface enables the connection of up to 5 soil sensors to a METOS weather station.
It is possible to connect 2 PI54-D sensors, 2 Watermark sensors and 1 soil temperature sensor.
The Interface can be an External box for iMETOS 3.3 (ECH871EXT).



YOU CAN CONNECT:

Two pieces of the following sensor:

- Watermark sensor

One piece of the following sensor:

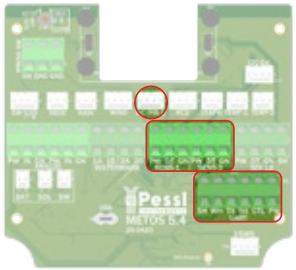
- Soil Temperature (WMTEMP)

Two pieces of the following Pessl Instruments sensors:

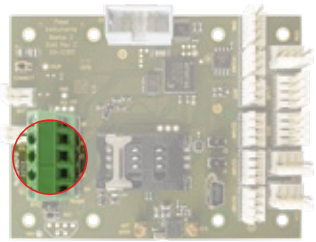
- Vacuum Tensiometer
- Water Level Sensor
- PI54-D

CONNECTION TO MOTHERBOARDS

METOS 5



iMETOS 3.3



Chain Node Interface for 1 Pessl Instruments Sensor & 4 Watermark Sensors & 1 Soil Temperature Sensor

Order number: 600167 / 900057 / 900175

This Interface enables the connection of up to 6 soil sensors to a METOS weather station. It is possible to connect 1 PI54-D sensor, 4 Watermark sensors and 1 soil temperature sensor.
The Interface can be an External box for iMETOS 3.3 (ECH874EXT).



YOU CAN CONNECT:

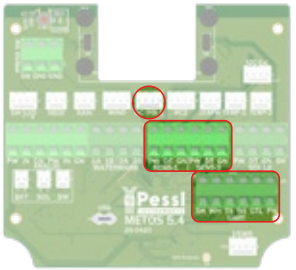
Four pieces of the following sensor:
- Watermark sensor

One piece of the following sensor:
- Single Soil Temperature

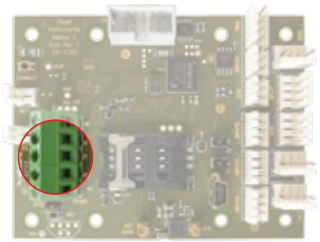
One piece of the following Pessl Instruments sensors:
- Vacuum Tensiometer
- Water Level Sensor
- PI54-D

CONNECTION TO MOTHERBOARDS

METOS 5



iMETOS 3.3



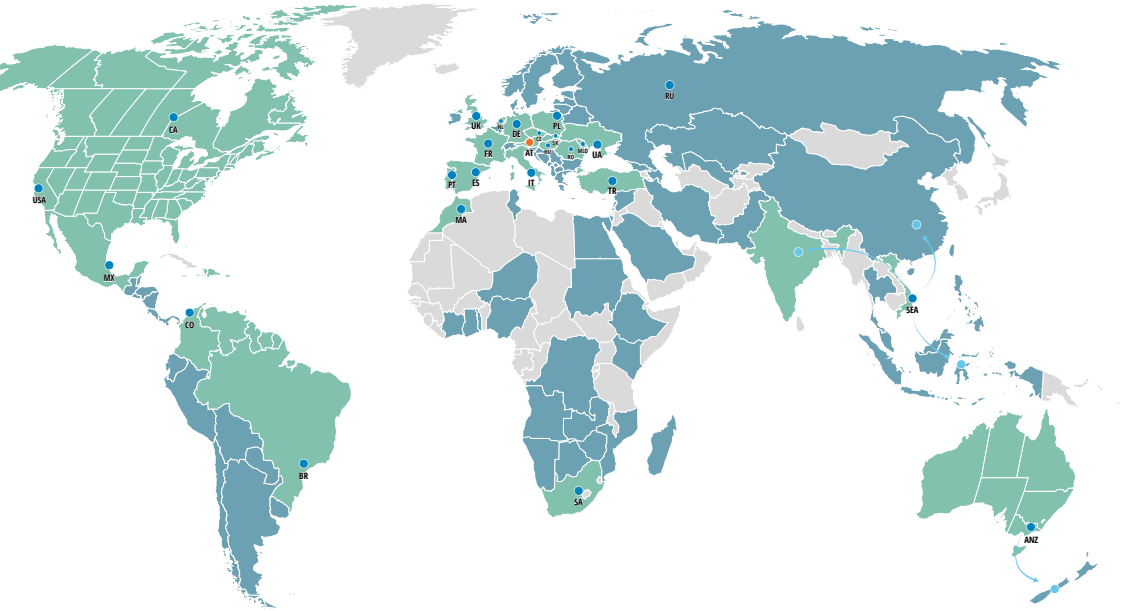


Where Can You Find Us?

HEADQUARTERS

AUSTRIA
Pessl Instruments GmbH
Werksweg 107
8160 Weiz

Tel.: +43 (0) 3172 5521
Fax: +43 (0) 3172 5521 23
email: office@metos.at



- Headquarters
- Branch offices
- METOS subsidiaries, affiliates & distributors
- Distributors

AUSTRALIA & NEW ZEALAND
Sam Eyres
METOS - Australia & NZ
+61 0407 534 559
sam.eyres@metos.com.au

BRASIL
Luciano Loman
METOS Brasil Importação e Exportação Ltda.
+55 (11) 3380-1022 / +55 (11) 98350-0003
brasil@metos.at

CANADA
Guy Ash
METOS Canada Inc.
+1 204 229 6139
guy.ash@metos.at

COLOMBIA & LATAM
Yonathan Rivas
METOS Colombia S.A.S.
+55 11 97592 9386
yonathan.rivas@metos.at

FRANCE & BELGIUM
Erik Bijwaard
METOS France SAS
+33 6 61 30 04 54
erik.bijwaard@metosfrance.fr

HUNGARY
Annabella Hajós
METOS Magyarország Kft.
+ 36 30 236 5278
annabella.hajos@metos.at

ITALY
Federico Fantin
Metos Italia Srl
+39 327 6738804
federico.fantin@metos.at

MEXICO
Enrique Audiffred
Metos Mexico
+52 452 149 2300 / +52 452 121 6161
enriqueav@agrotamerica.com /
contacto@metos.mx

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MOLDOVA
Sergiu Smocinschi
iMETOS SRL
+37 368 151 515
sergiu.smocinschi@metos.at

AGRI PRECISION
MOROCCO
Lahsen Ait El Moueddane
Agri Precision
+212 522 254 900
agriprecision@gmail.com

NETHERLANDS
Benedikt Pircher
0620374668
benedikt.pircher@metos.at

POLAND
Marek Wilanowski
Metos Polska Sp. z o.o.
+48 733 601 304
marek.wilanowski@metos.at

aquagri
PORTUGAL
Onno Schaap
Aquagri IIM
+351 21 466 0773
agriprecision@aquagri.com

RUSSIA
Dmitry Nikiforov
+7 903 141 20 36
dmitry.nikiforov@metos.at

SOUTH AFRICA
Gabrielle Redelinghuys
METOS SA (Winfield United)
+27 79 117 7593
gredelinghuys@winfieldunited.co.za

SOUTH ASIA
Puneet Singh
METOS South Asia
+9198 6665 8383
puneet@metos.asia

SALES OFFICES

SPAIN
Juan Jose Loperfido
METOS Iberia SA
+34 954 547 222
juanjose.loperfido@metos.at

SOUTH-EAST ASIA
Sherwin Lee
METOS Asia
+6016 909 7283
sherwin@metos.asia

TURKEY
Fikriye Berk
METOS TR
+90 324 221 96 74
info@metos.com.tr

UKRAINE
Sergey Kovalenko
METOS Ukraine, LLC
+38 050 494 3422
sergey.kovalenko@metos.at

UNITED KINGDOM
David Whattoff
METOS UK LTD
07752 426006
david.whattoff@metos.at

USA
Marty Cook
Metos USA
431-877-7799
marty.cook@metos.ca

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Pessl Instruments GmbH, Werksweg 107, 8160 Weiz

Tel: +43 (0) 3172 5521 • Fax: +43 (0) 3172 5521 23 • Email: office@metos.at