METOS®
BY PESSL INSTRUMENTS

METOS TSM

Non-contact, high-resolution soil mapping for improved **turf management**

Technology

METOS TSM is a lightweight integrated sensor solution, especially designed for turf moisture mapping.

With is shallow depth of investigation and its high data acquisition rate, the sensor is perfectly suited to **map and monitor volumetric water in the root zone**.

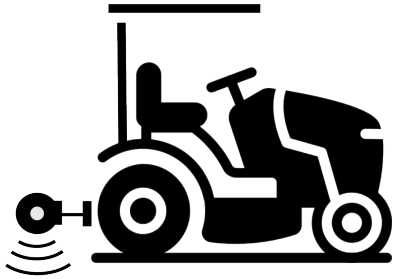
- non – contact mapping technology
- volumetric moisture content in the main root zone
- measuring on-the-go
- compact & lightweight
- easily mountable to mobile platforms like Fairway or Greens mowers

METOS TSM installation on a Fairway Mower

For autonomous operation, it can also be mounted on a robot.

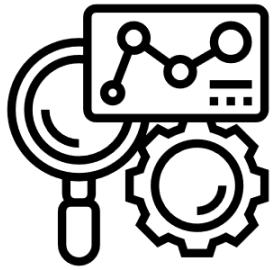
Our approach

We provide you a turn-key solution from data acquisition to soil moisture delivery.



Turf mapping

integrated non-destructive & non-contact soil moisture scanner



Data engagement

Unlock the power of your data
Engage – Analyse - Succeed

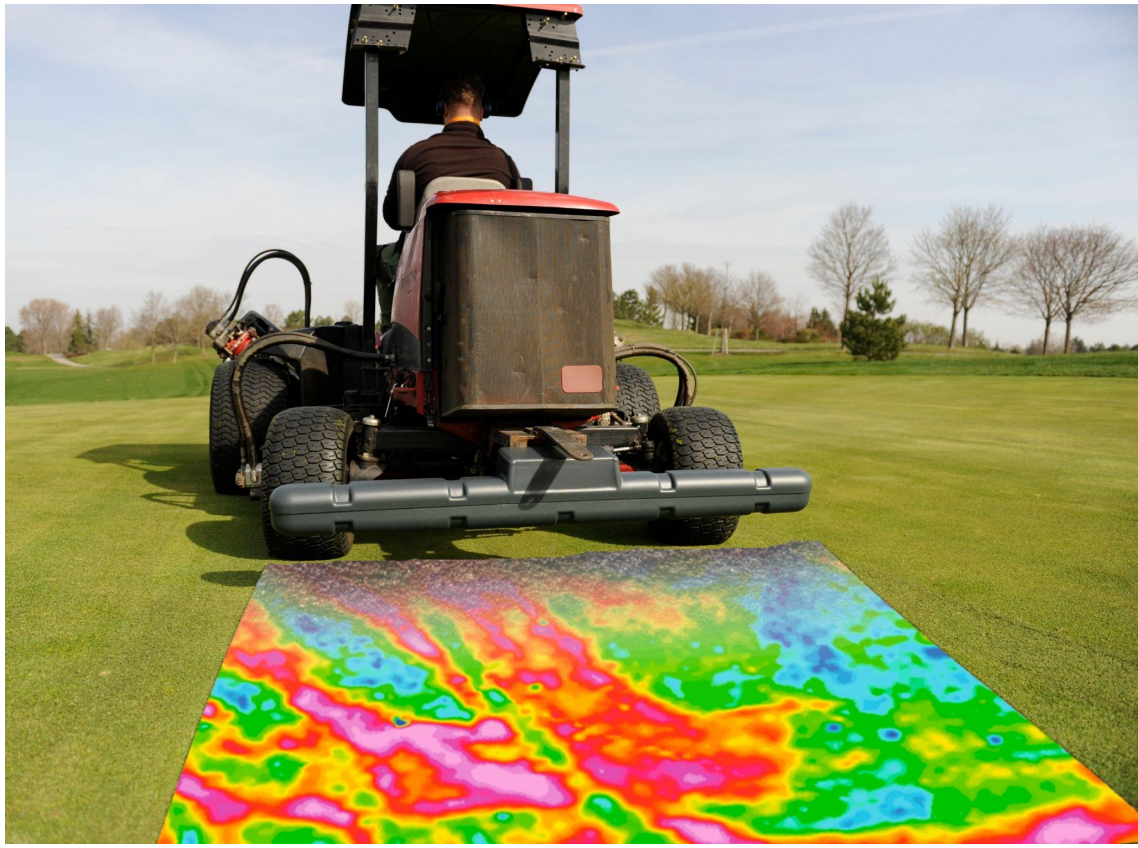
Persistent care

Continuing assistance and supervised data quality control

Benefits

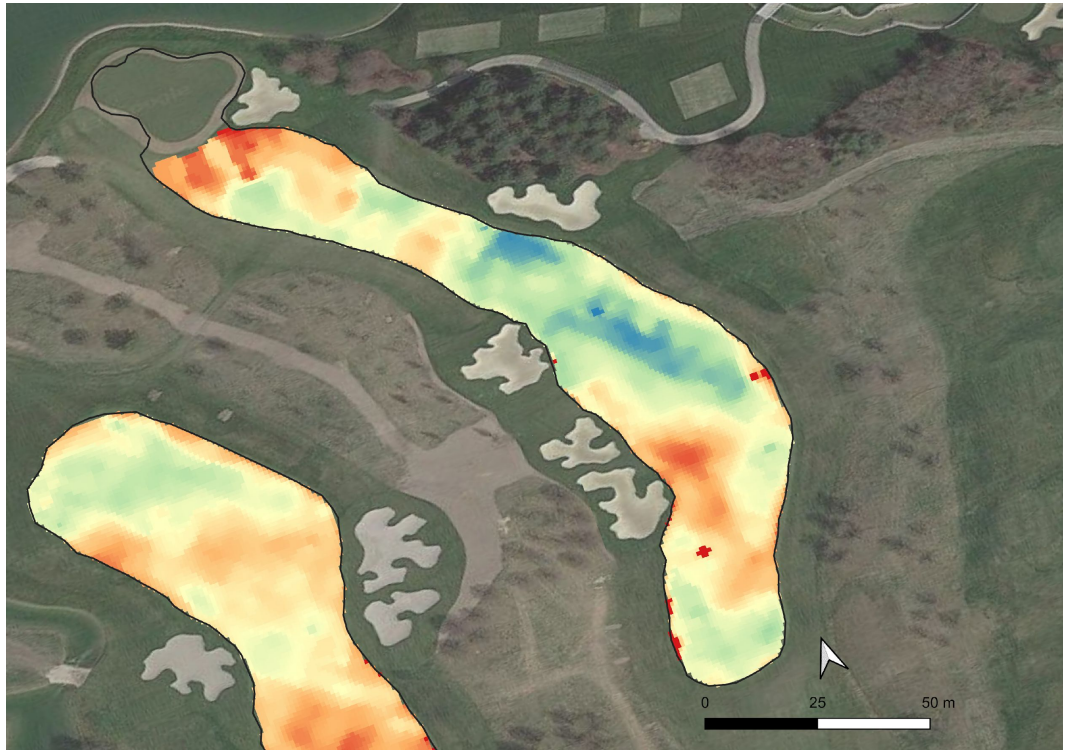
By using METOS TSM, you get:

- **moisture measurement** on-the-go
- non-contact **soil analysis**
- help with optimizing **irrigation management**
- **quantifying** physical **soil properties**
- creation of **soil zone maps**
- understanding **in-turf variabilities**
- **rapid** data collection
- **high** spatial resolution
- **sustainable** turfgrass management



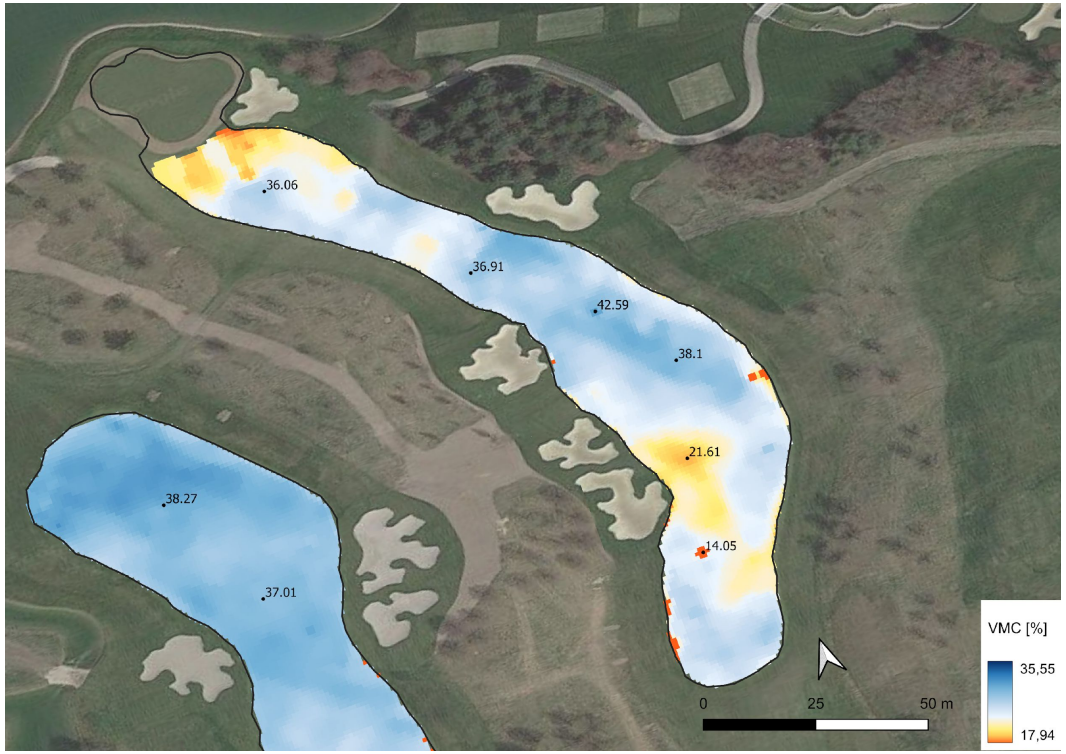
Glimpse on the data

raw sensor data



~ 25.000 data point / FWY
~ 5 pts / m²

spatial moisture distribution



0.1 % VMC resolution
moisture classes adjustable from 5 % - 60 %

Glimpse on the data

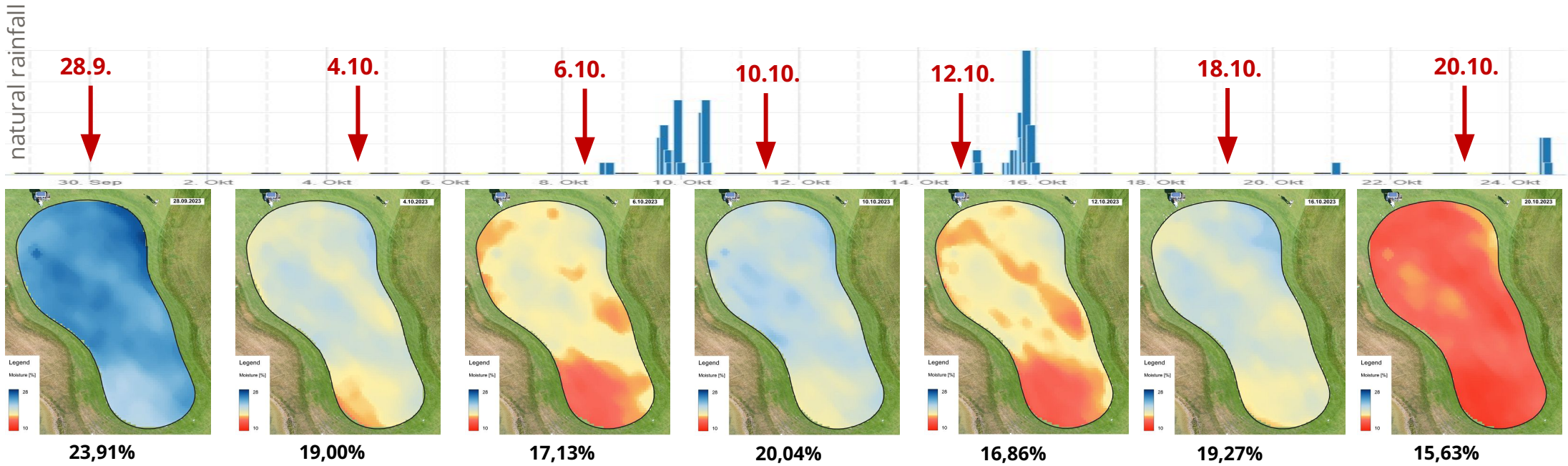
- classification make the identification of dry spots easy
- absolute moisture values keep data set comparable
- avoiding over and under irrigation
- enabling precision irrigation
- automatic data processing
- data access via TGM data portal
- moisture classification as *.pdf report immediately after terminating the survey
- OGC conform data formats
- API for 3rd party software integration

Sensor can be controlled manually via a mobile device and data can be accessed via an app

Time Series

MOISTURE MAPPING

Time series provide an up-to-date snapshot of the current moisture situation and a forecast of future irrigation requirements.



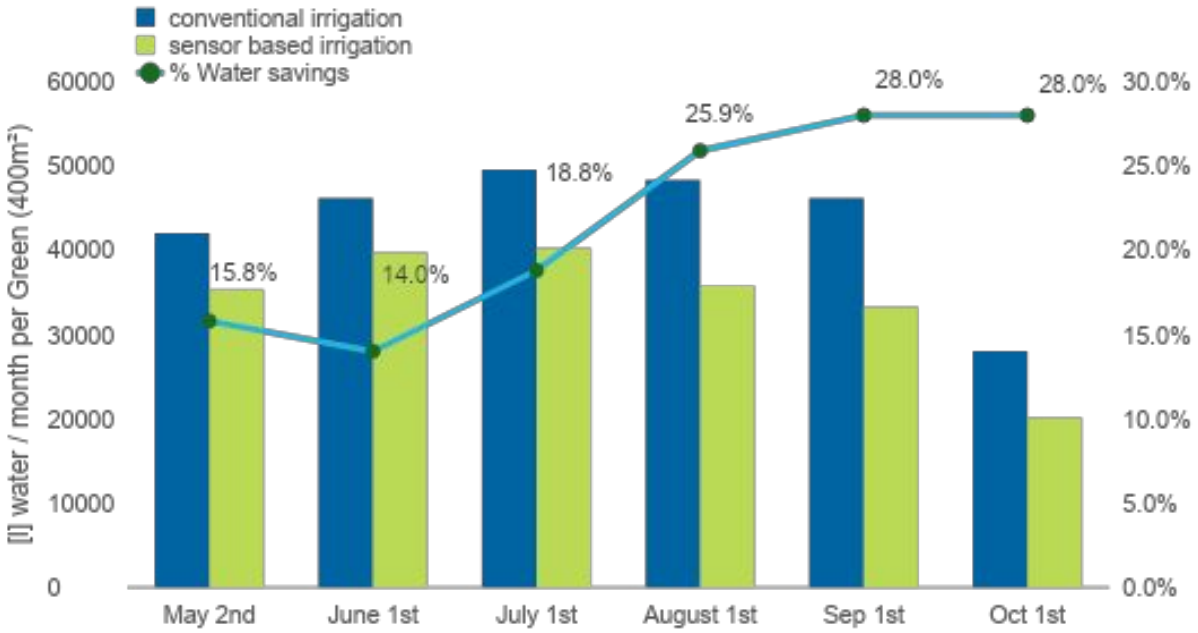
average moisture

Voice of Customers

Canada / Austria

BARRY B. BRITTON
TURF AND AGRONOMY CONSULTING

Golf Course agronomist and maintenance consultant for existing golf courses throughout Europe; including construction, renovation and modernization of existing facilities. Focusing in agronomical and maintenance practices and advancement.



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PROs:

- Cutting-edge technology for calibrating **irrigation management** based on **actual soil moisture** and **plant available water**.
- In times of scarce water resources a must have for responsible Golf Course and Sport field operators

CONs:

- Integration of in-site soil sensors for cross-correlation with other sources

Voice of Customers

AG and Turf product HW Sensors utilize same technical components which fit one electronic design to two applications. Multiple Software services through API´s and cloud services for each sensor are available.

Measurement Unit acquires soil physical parameter and pre-process data, RT intelligence provides soil properties in real time for implement control

Operator Interface enables in field human machine communication and data visualization

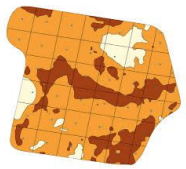
On premises services provide to backend infrastructure to transform field data into valuable soil information

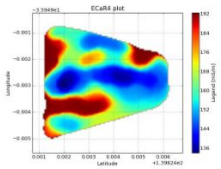
Cloud Services provide access to server hosted data and enables a direct access for 3rd party applications and connected services

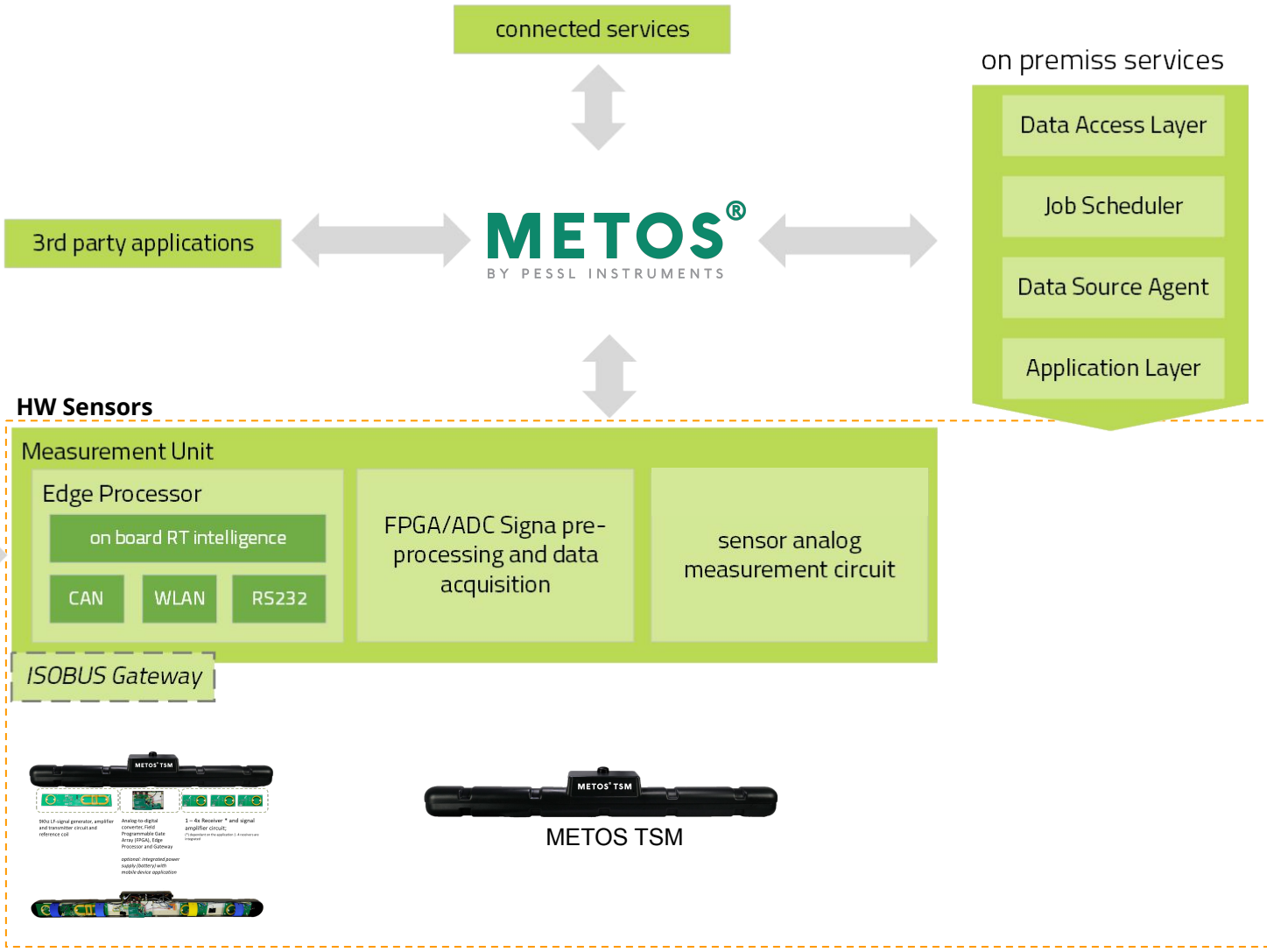
The **ISOBUS Gateway** connects the sensor to the machine communication infrastructure enable direct machine control

Operator Interface
- Mobile Device
- ruggedized Terminal

Together with the sensor a bundle of tools are provided to offer the user a maximum on flexibility



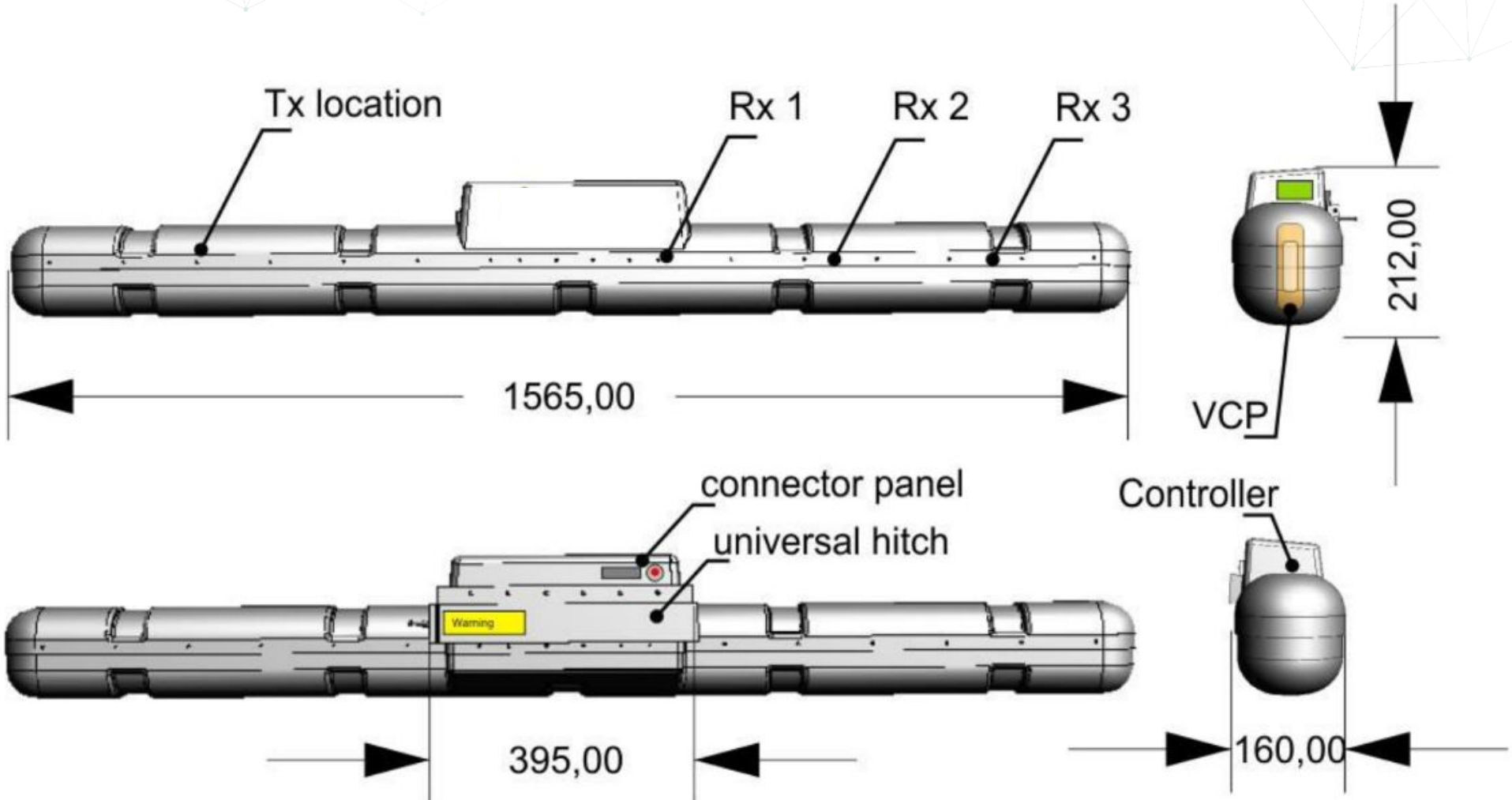




Technical details

Technology	Frequency Domain Electromagnetics
Frequency	6-12 KHz
Sampling Rate	5 – 20 Hz
Vertical sampling	2 – 4 dedicated depth
Max DOE*	75 cm
Width	156 cm = 61.41“
Weight	15 kg
Material/colour	ASA/ABS, RAL 7016
Interfaces	RS232, WLAN, CAN
Positioning	GPS (internal/external) TTL input, 1pps trigger

Technical details



More Information needed?

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https://metos.global/en/metos-tsm/

Thank you

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