TEHNICAL SPECIFICATION

The equipment offered must meet the minimum technical specifications or better.

LOT 1: Weather station

- Ultrasonic anemometer for performing 2-dimensional wind measurements:
  - wind direction accuracy < 3° RMSE at > 1.0 m/s,
  - wind speed measuring range: 0 to 75 m/s
- Temperature sensor:
  - measuring range (-50 to +60 °C), accuracy ±0.2 °C (-20 to 50 °C), and
  - relative humidity 0–100%, accuracy ±2% RH, and
  - air pressure 300 to 1200 hPa, accuracy ±0.5 hPa (0 to 40 °C)
- Precipitation gauge with anti-icing system (single tipping bucket), collector area at least 200 cm²
- Direct solar radiation sensor
- Net radiation sensor
- Soil moisture sensor – fork-type
- Module for data acquisition, storage, and transmission, including appropriate mounting hardware
- Gateway for data transmission
- Access to a web platform for data storage and visualization
- Solar panels and battery system for powering the measurement system
- Mounting structure system for sensor installation, including ground screw
- Installation and transport

LOT 2: Soil moisture measuring devices

Data logger, **(4 pieces):**

- Programming: None (plug-and-play)
- Communications: Cellular /Wi-Fi / Bluetooth
- Power: AA batteries + solar
- Data storage (at least): 80k records
- Integrated sensors: GPS + barometric pressure

Soil moisture sensor, **(2 pieces):**

- Measurement Specifications
  - DielectricMeasurement Frequency: 70MHz
  - Measurement Volume: 351 cm³ per segment
  - Temperature Range: –20 to +60 °C
  - Temperature Resolution: 0.03 °C
  - Temperature Accuracy: ±0.5 °C from –20 °C to 0 °C; ±0.25 °C from 0 °C to 60 °C
  - Measurement Depths: 15, 30, 45, and 60 cm
- Communication Specifications
  - Output: DDI Serial and SDI-12 communications protocol (3-wire cable version)
  - Output: RS-485Modbus RTU and tensioLINK serial communications protocol (4-wire version)
  - Data Logger Compatibility:METER ZL6 and EM60 data loggers or any data acquisition system capable of 4.0- to 24.0-VDC power and serial interface with SDI-12 and/or RS-485 interface,Modbus RTU, or tensioLINK communication

- Physical Specifications
  - Diameter (Shaft): 6.0 cm (2.36 in)
  - Length: 75.0 cm (29.53 in)
  - Width (Head): 11.0 cm (4.33 in)
  - Operating Temperature Range: Minimum –20 °C, Maximum +60 °C
  - Cable Length (Standard): 5.0 m (stereo plug and stripped and tinned wires)
  - Cable Length (M12): 5.0 m and 10 m
  - Maximum Custom Cable Length: at least 75.0 m
  - Cable Diameter (Stereo Plug): 4.2 ±0.2 mm (0.16 ±0.01 in) with minimum jacket of 0.8 mm (0.031 in)
  - Cable Diameter (M12 Plug): 5.5 ±0.2 mm (0.22 ±0.01 in) with minimum jacket of 1.0 mm (0.039 in)
  - Connector Size (Stereo): 3.50 mm diameter
  - Connector Size (M12): 14.4 mm diameter
  - Connector Types: Stereo plug connector, 4-pin M12 connector, or stripped and tinned wires
  - Conductor Gauge (Stereo Plug): 22-AWG / 24-AWG ground wire
  - Conductor Gauge (M12 Plug): 22-AWG
- Electrical and Timing Characteristics
  - Supply Voltage Power to Ground: Minimum 4.0 VDC, Maximum 24.0 VDC
  - Digital Input Voltage (Logic High): Minimum 2.8 V, Typical 3.6 V, Maximum 5.0 V
  - Digital Input Voltage (Logic Low): Minimum –0.3 V, Typical 0.0 V, Maximum 0.8 V
  - Digital Output Voltage (Logic High): Typical 3.6 V
  - Power Line Slew Rate: Minimum 1.0 V/ms
  - Current Drain (During Measurement): Minimum 3 mA, Typical 35 mA, Maximum 50 mA (during 500-ms measurement)
  - Current Drain (While Asleep): Minimum 0.03 mA, Typical 0.1 mA
  - Power Up Time (DDI Serial): Minimum 500 ms, Maximum 800 ms
  - Power Up Time (SDI-12): Typical 1,000 ms
  - Power Up Time (SDI-12, DDI Serial Disabled): Minimum 500 ms, Typical 600 ms, Maximum 800 ms
  - Measurement Duration: Minimum 500 ms, Maximum 800 ms

Cloud platform for storage **(6 pieces):**

- Storage, visualization, and management of environmental monitoring data
- Data transmission: Automatic upload from field data logger via cellular or Wi-Fi
- Data access: Web-based interface accessible from desktop and mobile devices
- Visualization: Real-time graphs, maps, and time-series data display
- API: REST API for automated data access and integration with external systems
- Threshold alerts: Ability to define threshold values and trigger notifications
- Soil parameters: Input of soil parameters such as field capacity and permanent wilting point
- Environmental models: Built-in options including including Growing Degree Days (GDD), Plant Available Water (PAW), ET_o, ETr, ...
- Data export: Download of datasets in standard formats (e.g., CSV)
- User management: Multi-user access and data sharing
- Security: Encrypted data transmission and secure cloud storage
- Subscription: Annual cloud service subscription for platform access and data hosting