



# Odyssey<sup>®</sup> Xtream Multi-Profile Soil Moisture Logger and Sensor Datasheet

The Xtream multi-profile soil moisture logger system measures the moisture ( by capacitance ) and temperature of the soil at up to five depth levels. The logger itself also measures the ambient temperature. The readings are stored in the internal non-volatile memory along with the ambient temperature (measured inside the logger) and a timestamp. When in range, the logger wirelessly communicates to the Odyssey<sup>®</sup> Xtract software application ( download free from Play Store or App Store ) on your android phone or tablet and stores the readings on your device. When the Xtract application detects a network connection, it sends the data to the cloud database servers. Using any standard internet browser, connect to our Odyssey<sup>®</sup> Xpert Web portal to analyse your data.



## Features

- Soil Moisture Measurement at 5 depth levels
- Temperature Measurement at 5 depth levels
- Internal Ambient temperature reading.
- Calibrated temperature (traceable to NIST standards)
- Easily removed in the field for winter if necessary
- Wireless
- Variable logging Interval
- Continuous ring buffer storage

**Specification:** ( typical conditions, Battery Voltage 3V, Temperature 22°C )

Moisture Range	0.00 to 100.00% of Saturation or Volumetric.
Moisture Stability ( constant temperature )	±0.01%
Moisture Resolution	0.01%
Moisture Detection Radius	8.5cm
Soil salinity sensitivity	Less than 0.25% per 1000uS/cm.
Temperature Accuracy (factory calibrated)	±0.15°C (sensors in Probe), ±0.2°C ( in Logger)
Temperature Resolution	0.01°C
Calculated Battery Life – (Extended / Standard) – (Industrial)	2 Years. Based on 15min recording interval for 5 sensors 5+ Years ( Dependent on average temperature )
Memory Capacity	~17,800 For 5 level soil moisture sensor including temperature
Water Proof	IP67 ( 30 mins @ 1m)
Dimensions – Logger - Sensor / with access tube	46mm OD, 160mm Length 17.5mm OD, 1.25m long (max) / 21.5mm OD, 1.4m long (max)
Operating Temperature - (Standard) - (Extended / Industrial)	-20 to 55°C ( Standard battery with reduced life below 0°C ) -20 to 60°C / -30 to 85°C
Bluetooth LE	4.0
Supported Phone/Tablet	Android™ V6.0 or greater. Apple IOS® V9.3.6 or greater.
Battery ( 2 per logger ) (standard)	Alkaline AA 1.5V ( Energizer Max® E91 )
Approvals	FCC, RSS, MIC, CE, AS, NZ

## Installation



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Supplied separately by Odyssey®, drive a PVC access tube into the ground with the supplied impact plug. Be careful not to bend the access tube. The access tube is supplied with a black line on it which should be level with the soil surface. To reduce soil disturbance during installation, the access tube is only 21.5mm in diameter. For locations with firmer soils it may be possible to drill a hole to fit the access tube. If stones are located they may have to be dug out then the soil packed firmly around the access tube.

Slide the sensor probe into the access tube and hand tighten the large black nut to the access tube. Screw the logger onto the top of the sensor rod. Note for taller crops there is a sensor extension rod available from Odyssey®, which will elevate the logger by a further one meter. This has the added advantage of longer range wireless communications. For accurate ambient temperature readings keep the logger out of direct sunlight. Upon inserting the batteries into the logger, the loggers default settings are to start continuous logging.

## Calibration

The temperature sensors are factory calibrated and are traceable to NIST standards.

The soil moisture sensors are factory calibrated to our in house standard. Factory calibration removes most drift due to soil moisture temperature changes.

## Maintenance

The sensor probe and logger can be removed from the access tube for winter or at other times. Check the access tube does not have any moisture in it as this will affect the accuracy of your probe. A cap has been provided with the access tube to be placed over the top of the tube to prevent water ingress when the sensor probe is removed.

## Batteries

The battery life is dependent on a number of variables including sampling interval and operating temperature. The remaining battery life is indicated in the Xpert web portal. To replace the batteries, unscrew the cap and lift out the 2 batteries. Over time the cap can become very tight so we have available a special tool for opening the cap. As the batteries are non-hazardous, disposal is with your normal rubbish. We recommend with temperatures greater than 0°C that you use the Energizer Max E91 with PowerSeal Technology batteries as these have been tested in our Xtream products to give the best life and are least likely to leak. At 0°C the battery life has reduced to half of its calculated life and it further reduces to 1/8<sup>th</sup> of its life at -20°C.

For temperatures below 0°C (Extended temperature range) we recommend Energizer Lithium L91 batteries.

For temperatures above 55°C (Industrial temperature range) we recommend our 3.6V Lithium Batteries.

Replace the batteries in the logger in the indicated orientation in the battery holder. ( Note the unit will not be damaged if the batteries are inserted incorrectly ). Before replacing the cap check the O-Ring seal is present, clean and free from dirt. If required apply some silicon grease ( available from Odyssey® ). Replace the cap and tighten by hand. Do Not use any tools to tighten the cap. If you are not using the logger for more than a year, then remove the batteries to prevent any chance of leaking.

**Battery orientation is indicated inside the battery holder.**



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## Quick Start Guide

Once you purchase loggers you will be sent a username and password which will allow you to login to the Odyssey<sup>®</sup> Xpert web portal. You will also receive instructions on how to download and install the Xtract application to your data collection device. Check our Odyssey<sup>®</sup> website for a low cost tablet.

Browse to the Odyssey<sup>®</sup> Xpert web portal and enter the supplied username followed by your password. You will then be presented with a map showing your loggers with map pins. Zoom in on the map and select the logger you wish to configure. Once selected the logger details will appear on the right side of the map.

From the menu select Logger config. It is important to choose a unique name for your logger. It can include numbers, an asset code or anything you like to help you identify it, as the serial number of the logger is long. At this time you should also write the logger name on the logger label to help identify it. If you enable continuous logging, the logger will continuously log until its memory is full and then start overwriting the oldest readings first. If desired you can select a Start and End date/time. Select your time zone that the logger is installed at. Typically this will be your time zone. You can also add a site description and any deployment notes you may want. Once you press submit the settings will be stored in the database.

Start the Xtract application on your device (phone/tablet), select settings from the menu and enter the provided username and password. The Xtract application device will periodically check to see if any settings have been changed and download them into the device. Once the logger is turned on and in range, the Xtract application will automatically connect to the logger and update the logger settings. If there is any stored data on the logger it will also collect the data and automatically send it to the cloud database servers. You can view the progress of this by opening the Xtract Application. See the Odyssey<sup>®</sup> Xtract user manual for more features of this application. Un-calibrated raw data can be viewed on site by connecting to the logger in the View menu.

To view the recorded data in the Xpert Web portal select your logger from the map and choose chart from the menu. Select a date range, then press the Go button and your recorded data will be displayed in the graph below. Right mouse click on the chart to see a menu of the various export options. See the Odyssey<sup>®</sup> Xpert user manual for more features of this application.