Last Updated: February 19th, 2021

METER Group
SOLUS Troubleshooting Guide for Resellers

INTRODUCTION

This troubleshooting guide is meant to be used by resellers of the SOLUS, offered by METER Group. All support of the SOLUS should be handled directly by the reseller. METER Group will support the reseller in turn if the reseller deems this necessary. Potential RMAs will be handled according to the written agreement signed between METER Group and the reseller.

TROUBLESHOOTING

Table 1. Common issues with the SOLUS and their Potential Solutions.

Problem	Possible Solutions
ZSC cannot connect to Android over Bluetooth	Ensure location services are enabled on the Android device. Ensure Bluetooth is enabled on the device. Ensure that the device supports using Bluetooth Low Energy (BLE). Check the Android OS and confirm that it is v4.3 or higher. Upgrade the OS if necessary. Confirm the LED on the ZSC turns on after the button is pressed. If the light does not come on, replace the batteries in the ZSC.
ZSC cannot connect to iPhone over Bluetooth	Ensure Bluetooth is enabled on the device. Ensure that the device supports using Bluetooth Low Energy (BLE). Check the iPhone OS and confirm that it is v10 or higher. Upgrade the OS if necessary. Confirm the LED on the ZSC turns on when after the button is pressed. If the light does not come on, replace the batteries in the ZSC.
LED on ZSC will not turn on	Change the batteries in the ZSC
TEROS 12 sensor measurements will not show up on app	Ensure the TEROS 12 sensor connector is fully inserted in the ZSC using the provided adapter cable.

METER Group
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Table 2. Common issues with the SOLUS and their Potential Solutions (continued).

Problem	Possible Solutions
TEROS 12 sensor measurements looks wrong	Ensure the TEROS 12 sensor connector is fully inserted in the ZSC. Ensure the TEROS 12 sensor is properly inserted in the substrate. Choose the TEROS 12 sensor placement in the substrate carefully as the TEROS 12 sensor measures only where placed. Please use the AROYA Alignment Tool as a guide when installing the TEROS 12 sensor.
EC measurement looks wrong	The TEROS 12 sensor will provide less reliable EC values as the water content drops below a certain percentage. Please see Appendix A below for more information.
I can't connect multiple ZSC at once	That's correct. The SOLUS app does not allow multiple ZSC to be connected at once. However, one has the freedom to connect and disconnect to any ZSC within range as they will all show up in the list.
How do I locate which ZSC is which in the list of units within range on the SOLUS app	The ZSC does not have the serial number printed on them. When one connects to a ZSC the blinking blue light will turn solid. If multiple ZSC will continually be within range it is recommended that one mark each ZSC with the serial number once identified after having connected and disconnected to them one by one. Note: A connected ZSC will have a solid blue light.
My ZSC won't stay connected to my smartphone for an extended period of time	That's correct. The SOLUS is a spot-measurement device and will shut off and disconnect after some time to preserve battery life. For continued monitoring, please visit aroya.io to learn more about the AROYA offering.

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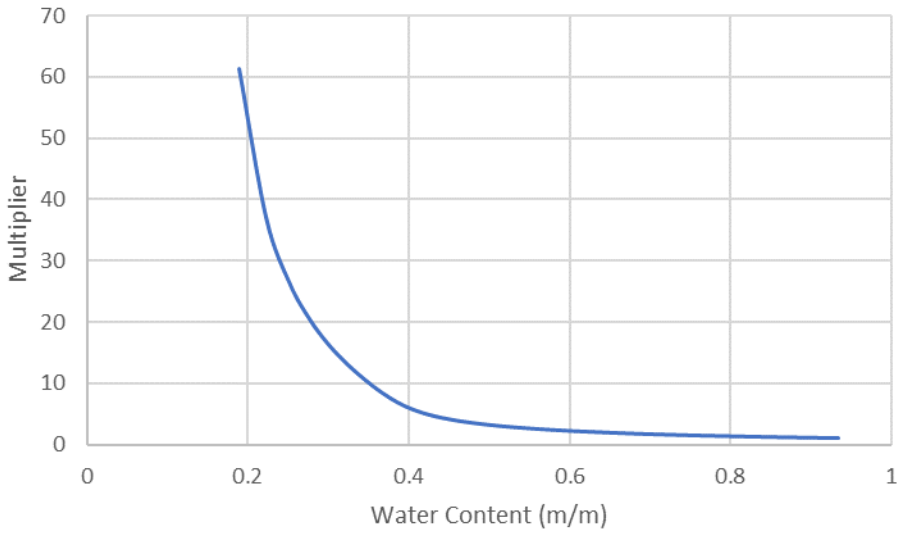
APPENDIX A

Measuring Electrical Conductivity of Porous Materials at Low Water Content

Electrical conductivity (EC) is often used to determine the concentration of nutrient solution in soils and soilless media, such as rock wool. The concentration of interest is that of the water in the soil pores (called pore water EC, or EC_w), but this can only be directly measured by squeezing some of the water out of the medium and measuring the EC of that water. We can, however, directly measure the electrical conductivity of the bulk medium (called bulk EC, or EC_b) with *in situ* sensors. Bulk EC will always be less than pore water EC, because the porous medium and any air spaces in it will interfere with its ability to conduct electricity. Bulk EC will therefore depend on pore water EC, but its value will also depend on the solids and air in the medium.

Pore water EC is calculated as the product of bulk EC and some multiplier that depends on the solids and air content of the medium. Empirical relationships have been obtained for that multiplier. The one used in Aroya is shown in the following graph.



You can see that at high water content the multiplier is close to 1, but as water content decreases it rapidly increases. At water contents above 0.4 t the multiplier is 5 or less, and estimates of pore water EC are quite reliable, but as water content decreases below those values the multiplier becomes much larger and the estimates are much less reliable. At high water content the multiplier is reliable, and less dependent on the properties of the medium. At low water content the multiplier becomes much larger, less reliable, and more dependent on the properties of the medium. At a water content below about 0.12 the multiplier becomes negative, which is clearly non-physical, but even well above that value the EC values it predicts should be treated as uncertain.