

SOIL SCOUT

ECHO Repeater - Quick Installation Guide

The ECHO Repeater receives data wirelessly from the underground Scouts, via a Receiving Antenna, and seamlessly forwards it to a Base Station (via other ECHO's if necessary). The ECHO is used to extend the range between Scouts and the Base Station and provide a link path around possible obstacles.

Power / Orientation / Mounting

The ECHO Repeater is normally powered by a solar panel and an internal rechargeable battery, and for auxiliary use in dim conditions, it has a DC supply socket of the same kind as in the Base Station. The ECHO is mounted with the supplied metal strap to a 50mm/2" round vertical mast (not included), with the power switch and type label facing down. For optimal solar energy harvesting, the panel on the front should face the sun most of the day – in the northern hemisphere the panel should face directly south and in the southern hemisphere directly north. In the tropics the orientation is not critical. If the unit is partially shaded during the day, the best way to overcome this is to raise the unit higher as this will increase the radio range as well. Another option is to move the mounting mast to a less shaded area.

Reception and Transmission

The reception characteristics of the ECHO are exactly the same as those of the Base Station, including the suggested antennae and their mounting and expected ranges between Scout units and the receiving antenna. The stub antenna supplied with the unit allows for reception from close by, and increased range can be obtained with the use of a larger antenna. Refer to the Range Estimation Table for expected distances.

For transmitting, the ECHO has an internal antenna, and the line-of-sight range between ECHO and another receiving unit, whether Base Station or another ECHO, is multiple kilometres. Having obstacles such as a tree line or a building between the two units will decrease range significantly – having both antennae as high as possible mitigates this risk. Multiple ECHO Repeaters can be used in a daisy-chain setup if required.

Usage

To install, simply mount the unit and switch it on. No additional configuring or setting up is required: all packets received are automatically forwarded onwards. In addition, any duplicate packets caused by a Base Station picking up a Scout packet both directly and through an ECHO are automatically discarded. Adding the unit to the Soil Scout Cloud is recommended to allow monitoring of the device health, as well as battery and solar voltages.

When the device is switched off, the solar panel will not charge the internal battery.

Battery Operation

If the unit is placed in such a place that it cannot harvest the required power from the sun, a DC supply can be connected to the connector on the bottom of the unit. The unit will then charge the internal battery regardless of the power switch state.

The internal battery is a 18650-sized 3,7V Li-Ion battery with a long life span. If for some reason you suspect a failed battery, please consult your local distributor. There are no user serviceable parts inside the unit, and opening the enclosure may void your warranty.

**CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
USED BATTERIES MUST BE DISPOSED OF ACCORDING TO LOCAL LAWS AND REGULATIONS.**

For additional information, please visit: www.soilscout.com