GUIDELINEGEO | MALÅ

MALÅ Easy Locator Core

User Guide

Our Thanks...

Thank you for choosing Guideline Geo and MALÅ! The very core of our philosophy is to provide our users with excellent products, support, and services. Our team is committed to providing you with the most efficient and easy-to-use solutions to meet your efficiency and productivity needs.

Whether this is your first MALÅ product or an addition to the MALÅ collection, we believe that a small investment of your time to familiarize yourself with the product by reading this manual will be rewarded with a significant increase in productivity and satisfaction.

Please let us know about your use and experience of our products and the contents and usefulness of this manual. We are excited to be part of your journey!

MALÅ

Guideline Geo AB

www.guidelinegeo.com

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Preface

About this Manual

This manual is written for the end user, explaining how to set up and configure the product and providing detailed instructions on its use.

Additional Resources

Training:	www.guidelinegeo.com/training-gpr-resistivity-seismics-tem/
Downloads:	www.guidelinegeo.com/support-service-advice-training/resource-center/
Applications:	www.guidelinegeo.com/application-areas/

Feedback

Feedback regarding the contents of this manual or the product may be sent using any of the contact details found at www.guidelinegeo.com

Safety and Compliance User Notices

This GPR device is certified according to FCC, subpart 15, IC RSS-220 and ETSI EN 302 066-1&2.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: —Reorient or relocate the receiving antenna. —Increase the separation between the equipment and receiver. —Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. —Consult the dealer or an experienced radio/TV technician for help.

According to the regulations stated in ETSI EN 302 066-1 (European Telecommunication Standards Institute):

The control unit should not be left **ON** when leaving the system unattended. It should always be turned **OFF** when not in use.

The antennas should point towards the ground, walls etc. during measurement and not towards the air.

The antennas should be kept in close proximity to the media under investigation.

Canadian and US regulations state that whenever GPR antennas are in use the following notes apply:

This Ground Penetrating Radar device shall be operated only when in contact with or within 1m of the ground.

Only law enforcement agencies, scientific research institutes, commercial mining companies, construction companies and emergency rescue or firefighting organizations shall use this Ground Penetrating Radar Device.

This device complies with Industry Canada license-exempt RSS standards. Operation is subject to the following two conditions: (1) This device may not cause interference and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

French translations:

Cet instrument de Géoradar se devra d'être opéré seulement en contact à même le sol ou en deça d'un mètre du sol.

Cet instrument de Géoradar se devra d'être utilisé seulement par les agences chargées de l'application de la loi, les instituts de recherches scientifiques, les compagnies minières à buts lucratifs, les compagnies de construction et les organisations responsables pour le sauvetage et la lutte contre les incendies.

Cet instrument répond aux exigences de la licence avec Industrie Canada- exempt des standards RSS. L 'opération est sujette aux deux conditions suivantes: (1) Cet instrument ne peut pas causer une interférence et (2) cet instrument se doit d'accepter quelque interférence que ce soit, incluant une interférence qui pourrait causer une opération non-souhaitable de l'instrument.

Radiation Exposure Statement

To comply with ISED RF exposure compliance requirements, a separation distance of at least 20cm should be maintained between the EUT and all persons during normal operation.

Pour se conformer aux exigences de conformité d'exposition ISDE RF, une distance de séparation d'au moins 20 cm doit être maintenue entre l'EST et toutes les personnes pendant le fonctionnement normal.

About Easy Locator Core

MALÅ Easy Locator Core is a state-of-the-art Swedish quality product built on the latest research and innovation. It includes unique MALÅ features, such as MALÅ AI, Dynamic grid, Dynamic Menus, and direct access to MALÅ Vision, connecting all MALÅ products.

Together with the data acquisition software MALÅ Controller App and the data processing software MALÅ Vision, Easy Locator Core creates a streamlined chain from fieldwork to the office and delivery of results. Data collected with the Easy Locator Core can be instantly and securely uploaded and directly processed and interpreted at any office worldwide.

Unpack. Inspect. Register

Great care should be taken when unpacking the equipment. Be sure to verify the contents in the packing list and inspect the equipment and accessories for any loose parts or other damage.

Note: The packing list that is included with the shipment should be read carefully, and any discrepancy should be reported to our sales department at www.guidelinegeo.com

Note: All packing material should be kept if any damage occurs during shipping.

File any claim for shipping damage with the carrier immediately after discovering the damage and before the equipment is used. Any claims for missing equipment or parts should be filed with Guideline Geo within fourteen (14) business days from receiving the equipment.

Repacking and Shipping

The Guideline Geo packing kit is specially designed for shipping MALÅ Easy Locator Core. The packing kit should be used whenever shipping is necessary. If original packing materials are unavailable, pack the instrument in a large enough box to allow at least 80 mm of shock-absorbing material to be placed all around the instrument. This includes the top, bottom, and all sides.

Warning: Never use shredded fibres, paper or wood wool, as these materials tend to pack down and permit the instrument to move inside its packing box.

Please read our shipping instructions before returning instruments to Guideline Geo. These instructions can be found on our website at www.guidelinegeo.com.

Registering MALÅ Easy Locator Core

By registering your equipment, you ensure you will receive valuable information, such as manual updates, software upgrades and other product information, which helps optimize the equipment's utilisation and realize the maximum return on your investment.

To register your equipment, visit – www.guidelinegeo.com

Note: The serial number is found on the antenna.

Assembly and Start-up

Assembly

The Easy Locator Core is delivered assembled and folded. Release the locking strap holding the handle and antenna together. Unfold the handle until the hinge mechanism snaps in place.

Lift the rear handle piece in place and use the silver-coloured knob to attach the foldable handle to the rear handle piece.

Note: Please watch your fingers when unfolding the hinge mechanism.

Attach a tablet for data acquisition (and, if needed, an external GNSS device or a Total Station prism).

The rear left wheel has an internal encoder for data triggering and precise distance measurements.

The tablet is attached to the tablet holder on the top part of the handle. The GNSS device or Total Stations prims (on top of an extension pole) is attached to the GNSS bracket with a quick release mechanism.

Note: The EL Core is delivered with four axle sealing plugs. These should be saved and used when the EL Core is used without wheels, for instance, in an RTC Mini. See the RTC Mini and RTC Mini Quick Guide sections for further information.

Make sure the batteries are charged. See section *Power* below.

Open the battery compartment and insert the batteries.

Press the ON/OFF button to start the Easy Locator Core.

Note: Press and hold the ON/OFF button when powering OFF.

The batteries are found under the black lid. It is possible to hot-swap, one battery at a time, during measurements.

The ON/OFF button will blink to indicate start/boot. When the light turns steady, the Easy Locator Core is ready to be connected to the MALÅ Controller App.

Note: If the light is blinking very fast, this indicates a problem with the unit. Please get in touch with the Guideline Geo support team for further assistance.

Start measurements

Make sure the MALÅ Controller App is installed on your mobile device.

APP-ENABLED

MALÅ Controller App can be downloaded from https://www.guidelinegeo.com/product/mala-controller-app/ or by using the QR code.

Set up a mobile hotspot for communication between your mobile device and the Easy Locator Core. The Easy Locator Core serial number is found on the label on the back-right corner.

For the hotspot, change the network name (SSID) to MALAxxxxxxxx, where xxxxxxxx refers to the serial number and change the password for the mobile hotspot to mala0123

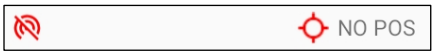
For further instructions, see the *MALÅ Controller App User Manual* or *MALÅ Controller App Quick Guide*.

Label with information on serial number and QR code.

Wireless connection

To communicate between the EL Core antenna and MALÅ Controller App, Wi-Fi (mobile hotspot) is used. When communication is working, the antenna model is displayed to the left in the status bar in the MALÅ Controller App, together with the battery and GPS status.

Successful connection



No connection

It is essential to have a stable Wi-Fi connection between the mobile device and the GPR antenna for effortless data collection. The MALÅ Controller App has advanced features to minimize the impact of difficult Wi-Fi conditions while you measure, such as automatic sync to recover data from interruptions.

Unstable Wi-Fi connections are typically caused by wireless interference. This can occur in or around apartment complexes or other dense areas where several Wi-Fi networks are active nearby.

If you have troubles with the wireless connection, see the Troubleshoot and Maintenance section.

System parts

Antenna box and wheels

The antenna box contains two antenna elements: a transmitter (Tx) and a receiver (Rx). The location of the measurement point is defined as the point between these two antenna elements. This is marked on the antenna itself (on three sides of the antenna box).

For easy lifting, larger handles (countersinks) are on all sides of the antenna box.

The wheels are made of solid, durable rubber and are easily detachable by pressing and holding the quick-release button on the wheel hub and then pulling the wheel and axle out.

The left-hand side rear wheel is equipped with an internal pulse encoder for precise distance measurements during a survey. When this wheel is re-attached, ensure the axle is firmly attached and secured. Dirt can prevent proper locking of the wheel.

The encoder wheel is factory-calibrated. Make sure to choose the correct wheel type in the MALÅ Controller App settings before starting a measurement. It is also possible to re-calibrate the wheel using the MALÅ Controller App.

Power

Two 10.8V 6.9Ah Li-Ion batteries power the Easy Locator Core. The batteries are in the battery compartment behind the black lid. Ensure the lid is securely closed to prevent water and dust from entering.

A hot swap of one battery at a time is possible. The Easy Locator Core can also run on one battery if needed.

The batteries are charged in an external RRC charger, where both batteries can be charged at the same time.

External dual battery charger

Powering the charger

1. Connect the cable from the mains adapter to the battery charger.
2. Connect the power cable to the mains adapter and plug it into the mains socket.
3. The LED will turn off after the self-test of the battery charger. The battery charger is then ready for use.
4. If the red control lamp remains on and no battery is in the charger, the battery charger is defective.

Charging batteries

1. Connect the battery charger as described above.
2. Place a discharged Smart Battery into the battery charger.
3. The battery charger makes battery recognition and initialisation.
4. The battery will be charged; leave the battery until the green LED lights.
5. Remove the battery for use.

The LED light on the external charger indicates the following cycles.

One time Red/Orange/Green	Self-test: Charger is ready for use
Red/Green blinking	The battery is not recognised as a Smart Battery. Either a conventional battery is inserted or an excessively discharged Smart Battery. If it is a Smart Battery, it will be reactivated within 15 minutes and recharged. If this is not the case, the LED will light red – see below.
Orange blinking	The battery is currently being calibrated.
Orange light	The inserted battery is the correct type and is currently being charged.
Green light	The battery is charged and can be removed for use.
Red blinking	The battery is too hot or too cold to be charged without damage. If the battery is too cold, it will be charged as soon as it has warmed up sufficiently. If the battery is too hot, it should be removed to cool down.
Red light	Either the battery is damaged and must be replaced, or it is a conventional battery that cannot be recharged.

An additional 12 Volt option is available for the RRC charger to charge the batteries from a 12V outlet if needed.

The 12V DC connector on the Easy Locator Core can power the Easy Locator Core from the optional MALÅ battery bag and batteries.

Power connector for an external power source.

Handle

The handle can be folded for transportation and completely detached from the Easy Locator Core antenna. The handle is attached with four quick-release bolts. Release these, and the handle can be removed.

Release the four bolts by pulling and rotating a quarter turn.

The soft part of the handle is interchangeable with any ordinary bike handle and can be purchased as spare parts.

External encoder wheel

The Easy Locator Core can be used with the RTC Mini for rough terrain use or an external encoder wheel. The RTC Mini or external encoder is connected to the rear connector panel of the Easy Locator Core. The EL Core GPR system will automatically detect this if the RTC Mini or an external wheel is connected.

The connector for the external encoder is found to the left.

RTC Mini

The RTC Mini is an off-road rough terrain cart that enables the use of the Easy Locator Core in areas of uneven terrain.

RTC Mini with optional GPS/Prism attachment

To insert the Easy Locator Core into the RTC Mini, remove the wheels and handle assembly and insert the four axle sealing plugs into the axle recess.

Press the quick-release pin and pull the wheel to remove it.

The sealing plug.

The sealing plug inserted in the axle recess.

Insert the antenna into the RTC Mini and connect the encoder wheel from the RTC Mini to the external wheel port on the rear of the antenna. Next, place the tablet into the tablet holder.

See the *RTC Mini Quick guide* for more information.

Note: Select the correct wheel option in the Controller App settings. See *MALÅ Controller App Quick Guide* or *User Manual* for more information.

Positioning

The Easy Locator Core has an internal DGPS inside the antenna box.

The Easy Locator Core also works with an external GNSS device like an RTK-GPS. The external GNSS needs to be able to communicate an NMEA0183 string via Bluetooth.

The Easy Locator can utilize coordinates from a Total Station, communicating a pseudo-GGA string via Bluetooth.

Attaching the external GNSS or Total Station prism using the GNSS holder on the handle is recommended. The external GNSS antenna position or Total Station prism is preset in the MALÅ Controller App to enable the correct position for each trace.

Read more in the *MALÅ Controller App User Manual*.

The GNSS device or a Total Station prism is attached to the GNSS holder on the Easy Locator Core handle. This gives a location at the measurement point of the GPR antenna. The extension pole is attached using the quick-release mechanism.

Data acquisition software

Data visualisation and collection from the Easy Locator Core system is made using the MALÅ Controller App. This simple and straightforward application is designed to collect, view, and save Easy Locator Core data on a mobile device. For more information, see the *MALÅ Controller App User Manual*.

Troubleshoot and Maintenance

As with all electronic equipment, handling the Easy Locator Core with excellent care is essential, as well as avoiding harsh handling and bumps against the antenna box or the tablet. During the transport of the equipment, the Easy Locator Core should be adequately packed and firmly in a transport box. When finishing a survey, the equipment should be checked and loaded correctly before transport.

Below, troubleshooting for connectivity issues and some good maintenance procedures are given to make your Easy Locator Core last.

Always check our website, www.guidelinegeo.com, for the latest news and updates, and if needed, please get in touch with Guideline Geo support (support@guidelinegeo.com) or your closest Guideline Geo sales representative.

Troubleshoot connectivity issues

If you cannot connect to the antenna, follow the workflow described in the Start Measurement section or the *MALÅ Controller App Quick Guide* or *MALÅ Controller App User Manual*. **Make sure everything is configured exactly as described**.

1. Ideally, you should set up your system in an area with minimal Wi-Fi interference to reduce potential problems.
2. Make sure that no other hotspot with the same network name (SSID) is running on another mobile device. Do this by turning off the hotspot and searching for Wi-Fi networks. Make sure there is no other Wi-Fi network with the same SSID as you have set up.
3. Disable Wi-Fi on your mobile device and then turn off and turn on the hotspot.
4. Make sure you are using the correct SSID for the hotspot (MALAxxxxxxxx). The xxxxxxxx indicates the serial number of your GPR antenna. Also, check the password, which should be mala0123.
5. Make sure that the antenna batteries are charged. The battery indicator should have at least two bars for Easy Locator Core. The LED may be on even though there is not enough battery power to initiate a connection to the MALÅ Controller App.
6. If that does not work, restart the MALÅ Controller App on your mobile device and wait for at least 30 seconds. This is done by "Close all" or swipe off the app in the Recent view (button with three lines or a square).
7. Restart the tablet and open the MALÅ Controller App again.
8. If you still cannot get a connection, or if you, for some reason, lose connection to the antenna, press the ON/OFF button on the antenna 5 times within 5 seconds. This will reinitialize the antenna and reset the connection. Please note that this may take up to 2 minutes.
9. If that does not work, press and hold the ON/OFF button to turn the antenna off completely, then power it on again.

Maintenance

The following actions are advisable to carry out before measurements:

Make sure that the batteries are charged.

Make sure that the battery compartment is firmly closed.

Ensure that the connector lids for the external wheel and power ports are firmly fitted if not in use.

The following actions are advisable after measurements:

Check the O-rings around the battery compartments. These should be changed if broken.

Also, check the GNSS-pole quick lock for dirt ingress.

Batteries should be charged (40-60%), and when stored away for extended periods, they should be charged occasionally. It is not recommended to leave the batteries uncharged for longer than 1 month and not store batteries without charging them for more than a year.

Every 6 months, spray the axle and bushing with WD40 and wipe with a clean cloth to remove any dirt or moisture. Then apply silicon-based oil to the axle and bushing and replace the axle.

Note: Use the axle sealing caps (provided at delivery) when wheels are removed to prevent ingress of dirt.