GUIDELINEGEO | MALÅ

MALÅ GeoDrone 80
User Guide

Our Thanks…

Thank you for choosing Guideline Geo and MALÅ as your Ground Penetrating Radar solution provider. The very core of our corporate philosophy is to provide our users with the very best products, support and services. Our development team is committed to providing you with the most technologically advanced and easy-to-use GPR products with the capability to meet your needs for efficiency and productivity now, and into the future.

Whether this is your first MALÅ product, or addition to the MALÅ collection, we believe that 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.

At Guideline Geo, we welcome comments concerning the use and experience with our products, as well as the contents and usefulness of this manual.

Guideline Geo team

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Preface

About this Manual

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

Additional Resources

GPR Training   https://www.guidelinegeo.com/training-gpr-resistivity-seismics-tem/
GPR Method   https://www.guidelinegeo.com/ground-penetrating-radar-gpr/
GPR Applications   https://www.guidelinegeo.com/application-areas/
GPR Case Stories   https://www.guidelinegeo.com/solutions/case-stories/

Feedback

Feedback regarding the contents of this manual or the product may be sent by using any of the channels found on https://www.guidelinegeo.com/contact/

Safety and Compliance User Notices

The MALÅ GeoDrone equipment, developed and produced by Guideline Geo, has currently not yet been certified according to FCC, ETSI or other localized UWB regulations. In order to purchase and operate the MALÅ GeoDrone 80 users need to apply for an exemption from local regulation if such are in place.

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 1 m 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.

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

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.

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.

Unpack. Inspect. Register

Great care should be taken when unpacking the equipment. Be sure to verify the contents shown on 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 careful and any discrepancy should be reported to our sales department at www.guidelinegeo.com

> Note: All packing material should be kept in the event that any damage occurred during shipping.

File any claim for shipping damage with the carrier immediately after discovery of the damage and before the equipment is put into use. Any claims for missing equipment or parts should be filed with Guideline Geo within fourteen (14) business days from the receipt of the equipment.

Repacking and Shipping

The Guideline Geo packing kit is specially designed for shipping MALÅ GeoDrone 80. The packing kit should be used whenever shipping is necessary. If original packing materials are unavailable, pack the instrument in a box that is large enough to allow at least 80 mm of shock absorbing material to be placed all around the instrument. This includes 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/Support/Service-Repairs

Registering MALÅ GeoDrone 80

By registering your equipment, you ensure that you receive up-to-date documentation, software upgrades and product information, which all helps to optimize the utilization of the equipment and realize the maximum return on your investment.

To register your equipment, simply visit www.guidelinegeo.com/product-registration on our website and submit the registration form.

> Note: The serial numbers are found on the antenna and on the GX Controller (if this is a part of the system).

MALÅ GeoDrone 80

MALÅ GeoDrone 80 is a lightweight and unshielded antenna, specifically developed for airborne GPR measurements.
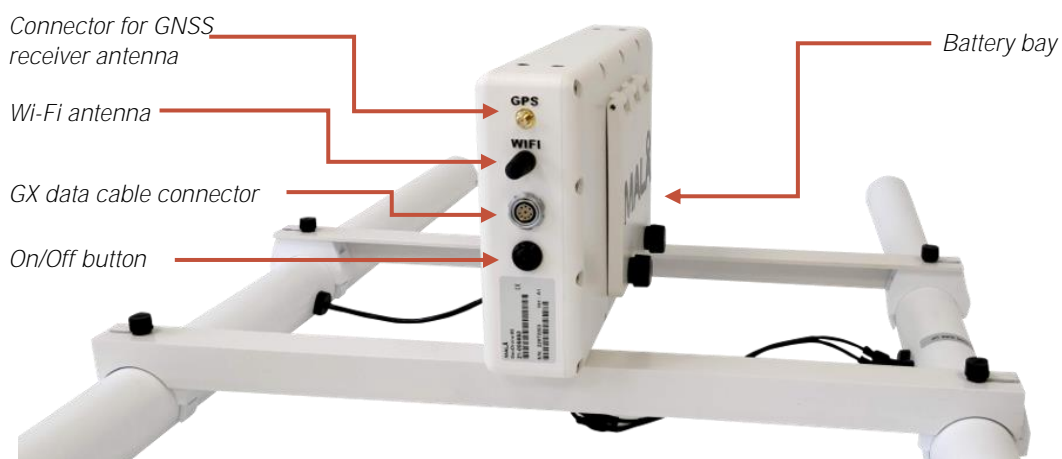
Antennas

The Transmitter (Tx) and Receiver (Rx) antennas are removable from the main unit for easier transportation. The Rx has two cable connectors to the control unit: N and P for Negative and Positive polarization. Depending on connection the polarization can thus be changed. The Rx antenna is marked with a label, for correct mounting. The Tx has one cable connector from the antenna to the main unit.

The connectors for the antennas are found underneath the GeoDrone 80 main unit. Use the black screws to securely attach the antennas to the main unit.

Note: Do not connect or disconnect the antennas while the GeoDrone main unit is powered ON.

Main Unit

Connector for GNSS receiver antenna

Wi-Fi antenna

GX data cable connector

On/Off button

Battery bay

Positioning

The GeoDrone 80 is provided with an external DGPS antenna to increase the reception from GNSS satellites. A DGPS receiver circuit board is located inside the control unit. The DGPS antenna is connected to the side of the control unit. The internal DGPS receiver will not work unless this external DGPS antenna is connected. The GeoDrone 80 only works with the provided positioning system.


Connection for external GPS is found on the side of the GeoDrone 80 main unit.

External DPGS provided with the MALÅ GeoDrone 80.

Power

The batteries for GeoDrone 80 are found under the hatch on the main unit. Two fully charged batteries give a measurement time of more than 3 hours (depending on settings). Use the supplied charger to charge the batteries. One battery at a time can be replaced while the unit is turned on.
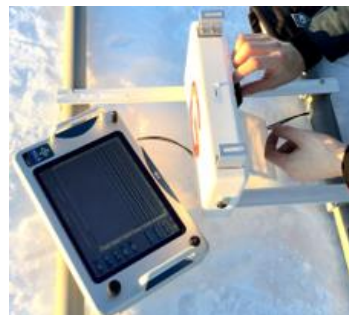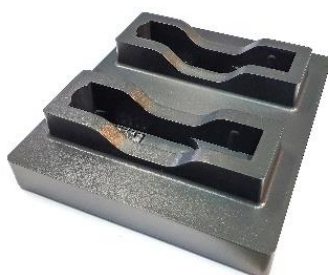
System set up

Make sure all batteries are charged. One battery at time can be changed in the GeoDrone 80 even if the unit is on.

Assemble the two antenna brackets, with two black screws for each bracket underneath the main unit.

Assemble the antennas to the brackets and connect the cables to the main unit.

Note: Tx has one connector and Rx two connectors. The Rx is marked with *This side up*.

Note: Do not connect or disconnect the antennas while the GeoDrone main unit is powered ON.
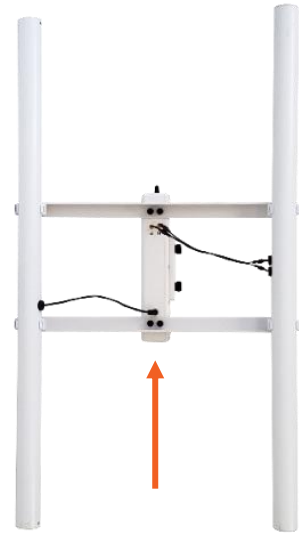
The two antennas assembled and connected to the main unit.

Connect the DGPS antenna. Attach the DGPS antenna on top of the drone for best reception.

Attach the MALÅ GeoDrone 80 to your drone. To prevent damage to the equipment, make sure the MALÅ GeoDrone 80 is securely attached prior to flight and do not use the GeoDrone 80 as landing gear.

Please contact Guideline Geo for help with constructing a secure attachment of the equipment, and information on Extended Warranty if needed.

Now you are ready to power up the MALÅ GeoDrone 80 and the data acquisition unit.

Note: The weight of the GPR system will affect the flight characteristics.

Note: Land the drone smooth and carefully to not harm the equipment.

Data acquisition

Data acquisition can be carried out with:

- MALÅ Controller App installed on a Samsung Galaxy Active Pro tablet. For more information regarding connection, settings, measurements, data recovery and data storage see *MALÅ Controller App Quick Guide* and *User Guide.*
- MALÅ GX Controller. For more information regarding connection, settings, measurements, data recovery and data storage see *MALÅ GX Controller User guide.*

Restoring missing traces

During remote operation (when the GeoDrone antenna is out of Wi-Fi reach of the tablet or GX Controller), or if the Wi-Fi is disrupted when working locally, the in-built memory card in the antenna will store the GPR data and thus enabling the measurement to continue. To stop the measurement, the GeoDrone antenna must come back into Wi-Fi range of the tablet or GX Controller.

Note: If the tablet, the GX Controller or the GeoDrone antenna loses power before measurements are properly stopped and data restored, data (up to 100 MB) can be recovered (primarily from the last measured profile) using the data recovery tool in MALÅ Controller App. For further instructions see *MALÅ Controller App User Guide.*

Note: If the Wi-Fi restore is interrupted when using the GX Controller, trace restoration by cable cannot be carried out. Use the data recovery tool in MALÅ Controller App instead. For further instructions see *MALÅ Controller App User Guide.*

For further information on data recovery with cable when using the GX controller, see *MALÅ GX Controller User guide.*