

MALÅ

MALÅ RoadCart

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



Under the copyright laws, this manual may not be copied, in whole or in part, without the written consent of Guideline Geo. Your rights to the software are governed by the accompanying software license agreement. The MALÅ logo is a trademark of Guideline Geo registered in Sweden and other countries.

The product described in this document is subject to continuous developments and improvements. All particulars of the product and its use contained in this document are given by Guideline Geo in good faith. However, all warranties implied or expressed, including but not limited to implied warranties of merchantability, or fitness for purpose, are excluded. This document is intended only to assist the reader in the use of the product and every effort has been made to ensure that the information in this manual is accurate. Guideline Geo shall not be liable for any loss or damage arising from the use of any information in this document, or any error or omission in such information, or any incorrect use of the product.

Guideline Geo, the MALÅ logo, are trademarks of Guideline Geo, registered in Sweden and other countries. Other company and product names mentioned herein are trademarks of their respective companies. Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. Guideline Geo assumes no responsibility with regard to the performance or use of these products.

Guideline Geo AB

<http://www.guidelinegeo.com>

Table of Contents

Preface	5
Unpack. Inspect. Register	6
Repacking and Shipping	6
Registering MALÅ RoadCart	6
Assembly and Use	7
Assembly	7
Mounting ProEx antennas	8
Mounting of GX antennas	9
Attachment to car	10
Additional features	11

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/>



Unpack. Inspect. Register

Great care should be taken when unpacking the equipment. Be sure to verify the contents shown 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 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 occurs 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.

Rewrap and Shipping

The Guideline Geo packing kit is specially designed for shipping MALÅ RoadCart. The packing kit should be used whenever shipping is necessary. If original packing materials are unavailable, pack the equipment 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 <https://www.guidelinegeo.com/service-and-repairs/>

Registering MALÅ RoadCart

By registering your equipment, you ensure that you will receive important information, such as manual updates, software upgrades and other 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

Assembly and Use

MALÅ RoadCart should always be used in accordance with any relevant local, national, or regional legislation or guidelines. Guideline Geo cannot be held responsible for any improper or illegal use of the product.

Note: The MALÅ RoadCart is constructed for a maximum speed of 30 km/h (18.6 mph).

Assembly

The MALÅ RoadCart is delivered in one piece, ready to use.



The MALÅ RoadCart system includes:

For MALÅ ProEx GPR systems (21-002590):

- The MALÅ RoadCart with wheels and antenna carrier for MALÅ ProEx shielded antennas (250, 500 or 800 MHz) and for the 1.2 GHz HF antenna (found between the wheels) and a towbar coupling.
- Black plastic holder for 1.6 and 2.3 GHz HF antennas.
- HF encoder adapter cable.
- Extra trailer coupling (if the height of the MALÅ RoadCart does not fit the car used).
- Extra encoder wheel O-rings.
- Hex key kit and screws.

Note: Power cable to the shielded antenna electronics and an extension HF antenna cable is also needed.

For MALÅ GX GPR systems (21-005090):

- The MALÅ RoadCart with wheels and antenna carrier for MALÅ GX antennas (160, 450 or 750 MHz) and a towbar coupling.
- Extra trailer coupling (if the height of the MALÅ RoadCart does not fit the car used).
- Extra encoder wheel O-rings.
- Hex key kit and screws.

Note: Extra-long GX Communication cable is also needed if data collection is made with a GX Controller.



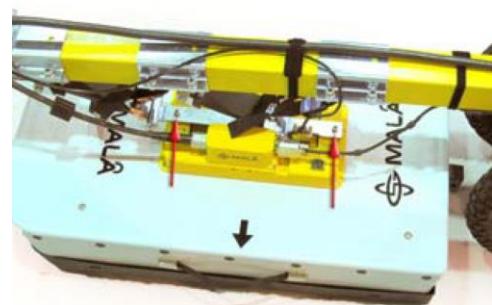
Note: Unfold the yellow beam and fasten it with four screws before you mount the antennas.



Mounting ProEx antennas

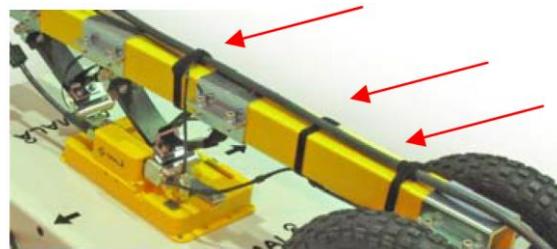
The MALÅ ProEx antennas (250, 500 or 800 MHz) are secured with screws (M6x55 Hex Screws) on the front and back side of the antenna electronics.

The screws go through both the metallic antenna holder and the antenna electronics into the antenna box.



The height of the antenna is adjusted with the two black straps.

Connect the encoder cable from the RoadCart wheel and the power cable (from the power supply stored in the car) to the antenna electronics, and the fibre optics from the antenna electronics to the control unit used.



The MALÅ HF antennas (1.2, 1.6 and 2.3 GHz) are mounted on the black plastic HF holder which again is attached in-between the wheels of the MALÅ RoadCart.

To mount the HF antenna the back metallic holder must be removed first. The height of the lower HF holder part is adjustable.



Connect the HF encoder adapter cable between the encoder wheel cable and the HF antenna and connect the HF antenna cable to the control unit used (use extension HF cable if needed).



Note: Make sure that all cables are tightly attached to the MALÅ RoadCart prior measurements. Use the hook and loop cable ties.

Mounting of GX antennas

All GX antennas are mounted in front of the wheels. You can fit a 160, 450 or 750 MHz GX antenna on the RoadCart.



The MALÅ RoadCart is equipped with two different types of holders. The longer type is used for the 450 and 750 MHz antennas and the shorter type for the 160 MHz antenna.



Both holders are attached to the antenna with 4 screws.



160 MHz GX antenna mounted on the RoadCart.

Note: Make sure that all cables are tightly attached to the MALÅ RoadCart prior measurements.
Use the hook and loop cable ties.

Attachment to car

The RoadCart is attached to a car with the towbar coupling (which is factory mounted on the cart). If the height needs to be adjusted, an extra trailer coupling is provided.



Additional features

If only one HF antenna is to be used, then the MALÅ RoadCart can be divided, and the back part (with the wheels) can be directly attached to the car with the extra trailer coupling.



If a GNSS antenna is used, this can most often be equipped with a magnetic holder which can be attached directly on the metallic parts of the RoadCart.



Note: The measurement point of the antennas is in the middle of the antenna box, marked with arrows. If two GPR antennas are used simultaneously, it can be best to place the GNSS antenna in-between these two GPR antennas for best positioning of both.

The MALÅ RoadCart can be equipped with three different ProEx antennas if needed. One extra antenna holder for a shielded antenna is then needed and an extension unit to the MALÅ ProEx control unit. In the picture, a combination of 800 MHz, 250 MHz and an HF antenna is mounted.



Note: The control unit (if using a ProEx) and power supply are placed in the back of the car, and the data acquisition unit (XV Monitor or laptop for ProEx and tablet or GX Controller for GX) in the front seat.

Note: The ProEx antennas are powered externally (connected with power cable to a power source in the back of the car) while GX antennas can be powered internally.

When measuring with two ProEx antennas, the antennas can be left mounted on the MALÅ RoadCart during transportation, just fold the beam of the cart together.

