

SAMRTECH LATAM

VIY5-37

Ground Penetrating Radar



User Manual
Part 1. Equipment

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All pictures in this User Manual are given for reference purpose only, and may differ from actual product appearance.

Product design and specification may be changed by manufacturer without notification.

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FCC Notice (for U.S. Customers):

FCC Notice (for U.S. Customers):

This device complies with part 15F of the FCC Rules:

Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

✓ **Warning:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Operation of this device is restricted to law enforcement, fire and rescue officials, scientific research institutes, commercial mining companies, construction companies and private parties operating on behalf of these groups. Operation by any other party is a violation of 47 U.S.C. § 301 and could subject the operator to serious legal penalties.

✓ **Warning:** UWB devices may not be employed for the operation of toys. Operation onboard an aircraft, a ship or a satellite is prohibited.

Coordination Requirements

(a) UWB imaging systems require coordination through the FCC before the equipment may be used. The operator shall comply with any constraints on equipment usage resulting from this coordination.

(b) The users of UWB imaging devices shall supply detailed operational areas to the FCC Office of Engineering and Technology who shall coordinate this information with the Federal Government through the National Telecommunications and Information Administration. The information provided by the UWB operator shall include the name, address and other pertinent contact information of the user, the desired geographical area of operation, and the FCC ID number and other nomenclature of the UWB device. This material shall be submitted to the following address:

Frequency Coordination Branch, OET
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554
ATTN: UWB Coordination

(d) Users of authorized, coordinated UWB systems may transfer them to other qualified users and to different locations upon coordination of change of ownership or location to the FCC and coordination with existing authorized operations.

(e) The NTIA/FCC coordination report shall include any needed constraints that apply to day-to-day operations. Such constraints could specify prohibited areas of operations or areas located near authorized radio stations for which additional coordination is required before operation of the UWB equipment. If additional local coordination is required, a local coordination contact will be provided.

✓ **Notice:** Use of this device as a wall imaging system is prohibited by FCC regulations.

For U.S. Customers**Ground Penetrating Radar Coordination Notice And Equipment Registration**

✓ Note: This form is only for Domestic United States users. The Federal Communications Commission (FCC) requires that all users of GPR who purchased antennas after July 15th, 2002 register their equipment and areas of operation. It is required that you fill out this form and fax or mail to the FCC.

Failure to do this is a violation of Federal law.

1. Date:**2. Company name:****3. Address:****4. Contact Information [contact name and phone number]:****5. Area Of Operation [state(s)]:****6. Equipment Identification:**

Brand Name: Transient Technologies LLC.

Antenna Model No. (center frequency): List all antennas being registered.

Model	Frequency	FCC ID

7. Receipt Date Of Equipment:

Fax this form to the FCC at: 202-418-1944

Or

Mail to:

Frequency Coordination Branch, OET
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554
ATTN: UWB Coordination

✓ Do not send this information to Transient Technologies

General information

General information

VIY5-37. New generation of Ground Penetrating Radars.

Ground Penetrating Radar (GPR) is designed for non-destructive scanning and inspecting of different structures and underground objects.

GPR can be applied by geophysicists, building companies, can be used in different ecological investigations, utilities condition assessment (including both metallic and non-metallic, plastic, concrete, asbestos pipes). Also the equipment can be used for searching and mapping of: underground water sources leaks, oil and other dangerous liquids underground pollutions; ground water level.

VIY5-37 Ground Penetrating Radar (GPR) has Dual Frequency antenna with central frequencies of 300 MHz and 700 MHz.

This GPR combines the best features from both antennas: big depth penetrating and high resolution.

VIY5-37 GPR allows user to reach depth of up to 8 meters in certain conditions.

Application of VIY5 series GPR

VIY5-37

- Utilities mapping and detection (pipes, cables);
- Civil engineering surveys (building basements, cellars etc.);
- Search for buried waste products, and graves;
- Mapping and location of near surface voids, karst and other cavities;
- Determination of boundaries of petroleum contamination zones etc.
- Archaeology
- Forensic and security investigations.

Package options

Order information



VIY5-37 GPR can be ordered with three different options sets:

VIY5-37t. Handcart version.

- 300 & 700 MHz antenna unit
- Cart-46 Foldable Handcart
- SH5-300 Replaceable bottom protector
- DC5-1 Cable (1.5m)
- Charger
- Backpack
- User manual

VIY5-37m. Manual version.

- 300 & 700 MHz antenna unit
- Odometer VO-22
- SH5-300 Replaceable bottom protector
- Transportation pole
- DC5-2 Cable (2.5m)

- Charger
- Battery Box
- Backpack
- Laptop holder
- User manual

VIY5-37tm. Full version.

- 300 & 700 MHz antenna unit
- Cart-46 Foldable Handcart
- Odometer VO-22
- SH5-300 Replaceable bottom protector
- Transportation pole
- DC5-2 Cable (2.5m)
- DP5 Cable
- Battery Box
- Backpack
- Laptop holder
- User manual

✓ Laptop is not included in any GPR set and should be purchased separately

List of Equipment and Accessories

Item	View	Description
AB5-37		300&700 MHz dual frequency antenna unit with digital output, battery on board. Built-in inclinometers. Supports optional connection of GPS and measuring wheels.
Cart-46		GPR Handcart with bidirectional measuring wheel. Contains battery on board*. Designed to be used with VIY5-37, VIY5-300, VIY5-600 GPR *In case of Handcart version of VIY5-37, by default the battery is located inside Handcart's compartment.
Battery Box		Battery Box that contains a battery for supplying an antenna unit. Included in a manual version of GPR.
Laptop holder		Laptop holder, designed for fastening the laptop to the operator's backpack.
VO-22		VO-22 is a bidirectional odometer (measuring wheel) that measures traveled distance in both directions. Odometer can be mounted to an antenna unit and should be electrically connected to the antenna by special connector. Compatible with VIY5-125, VIY5-37, VIY5-300, VIY5-600 GPR
GPR Transportation pole		The pole for transportation of antenna forward and backward. Can be easily mounted to antenna. Designed to be used with VIY5-37, VIY5-300, VIY5-600 GPR

General information

SH5-300		Protective bottom cover SH5-300, compatible with AB5-37 antenna unit.
Backpack		The backpack for GPR antenna, accessories, laptop, and Battery Box.
DC5-1 Cable		Cable (1.5 m length) to connect DATA socket on the Handcart or Battery Box to a laptop.
DC5-2 Cable		Cable (2.5 m length) to connect DATA socket on the Handcart or Battery Box to a laptop.
DP5 Cable		Cable (2.5 m length) to transfer GPR data between Battery Box and AB5-37 antenna unit.
Charger		Charger for lead acid batteries. Included in all GPR sets.
Transportation Case		Transportation case for Cart-46 with AB5-37 or AB5-300 antenna units. Can be ordered optionally
GPS receiver		External GPS receiver. GPS kit includes: <ul style="list-style-type: none">GPS receiverGPR cableGPR adapter (10cm)
Synchro3 Planner		Software package for VIY5 GPR sounding process control, and also for processing and visualizing GPR data. Full software set can be downloaded for free here: http://viy.ua/download/install_VIY_SGPR.zip

Main components description

GPR consists of antenna unit connected via USB to a computer (laptop). Operator controls antenna unit through VIY5 software.

Optional user can use with GPR antenna:

- Cart-46 GPR Handcart with bidirectional odometer
- VO-22 bidirectional odometer
- GPS receiver

Handcart version

Picture below shows the general view of the version of VIY5-37 GPR with Cart-46 Handcart.

The antenna unit is suspended under the Handcart on ropes.

Laptop should be placed on Handcart laptop holder.

- ✓ We recommend to stick Velcro tape to the bottom of a laptop and a laptop holder to not let laptop drop.

The antenna should be connected to the Handcart via EXT Handcart cable (built on the Handcart).

Then DATA socket on the Handcart should be connected to USB port of operator's laptop via DC5-1 Cable.

Handcart odometer should be connected to Odometer socket on the antenna via Handcart Odometer cable (built on the Handcart).

Bidirectional odometer is built into the right rear wheel of the Handcart.

If GPS is present, it should be connected to GPS socket on the antenna.



Antenna unit with Cart-46 Handcart

Main components description

Manual version

Picture below shows general view of the manual version of VIY5-37 GPR with VO-22 odometer and a transportation pole.

In this case the battery is placed in the Battery Box to make the antenna unit lighter. The Battery Box can be carried inside the operator's backpack.

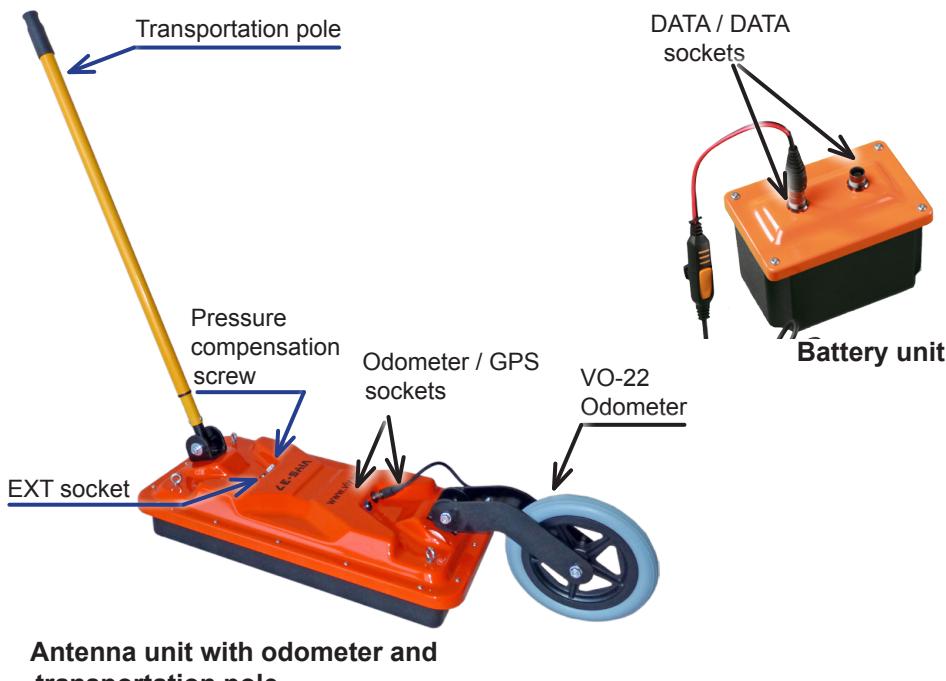
Laptop can be placed on the laptop shelf that should be fastened to operator's backpack.

The antenna should be connected to the Battery Box via DP5 Cable.

DC5-2 Cable should be connected to DATA socket on the Battery Box and to USB port of operator's laptop.

Odometer should be connected to Odometer socket on the antenna unit.

If GPS is present, it should be connected to GPS socket on the antenna unit.



Antenna unit with odometer and transportation pole

VO-22 Measuring wheel (odometer)

VO-22 is a bidirectional measuring wheel (odometer) that can be mounted on the antenna unit in manual version of this GPR. It can be mounted to the antenna unit without any extra tools.



Cart-46 Handcart

Cart-46 is GPR Handcart that is designed to carry either AB5-37, AB5-300 or AB5-600 antenna units. It can be folded and deployed easily and within very short time. The Handcart's parts and laptop holder can be fixed with a help of eccentric clamps.

The Handcart contains battery compartment, so user can use it to place GPR battery while carrying antenna on board.

Also the Handcart has its own cables to connect odometer to antenna and to connect EXT socket of antenna to the Handcart's EXT socket.

DC5-1 Cable should be directly connected to antenna's Data socket that is located on antenna's body.



Cart-46 Handcart deployed

Cart-46 folded

Transportation pole

The transportation pole is a special handle that should be mounted to the antenna unit to move antenna forward and backward during data acquisition process.



Main components description

Backpack for GPR accessories and laptop shelf

The backpack is included in each GPR set. The laptop shelf is an accessory that should be used as a support for user's laptop. The shelf can be fastened to the backpack.



Backpack with laptop



Laptop shelf

The backpack contains compartments for:

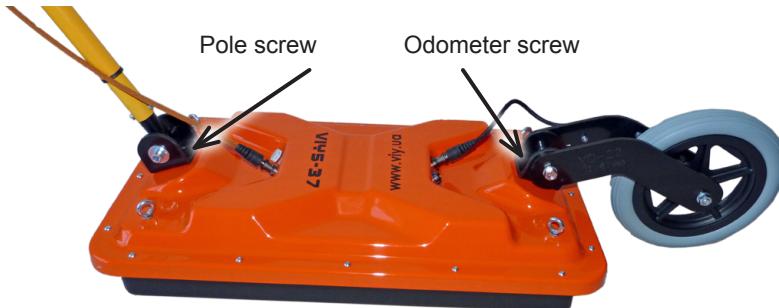
- GPR accessories (cables, charger, transport belt etc.)
- Odometer VO-22
- User's laptop
- Laptop shelf
- Battery Box

Getting Started

Manual version of VIY5-37 GPR

Mounting Transportation pole and Odometer to antenna unit.

Mount transportation pole and odometer to the antenna unit and screw them manually.



Connect the cable of odometer to antenna socket.

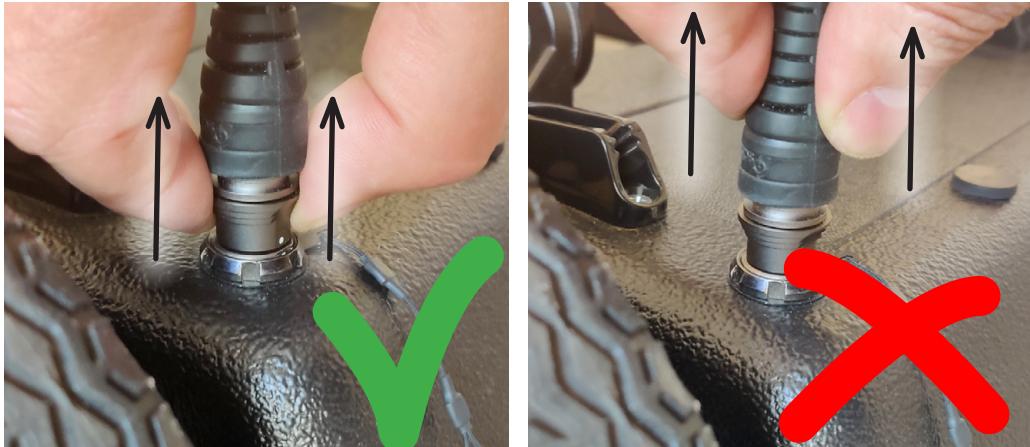
Push-pull connectors.

To connect push-pull connectors you should open cap then match together the white marks on a plug and a socket correspondingly and then insert the plug by holding its housing.



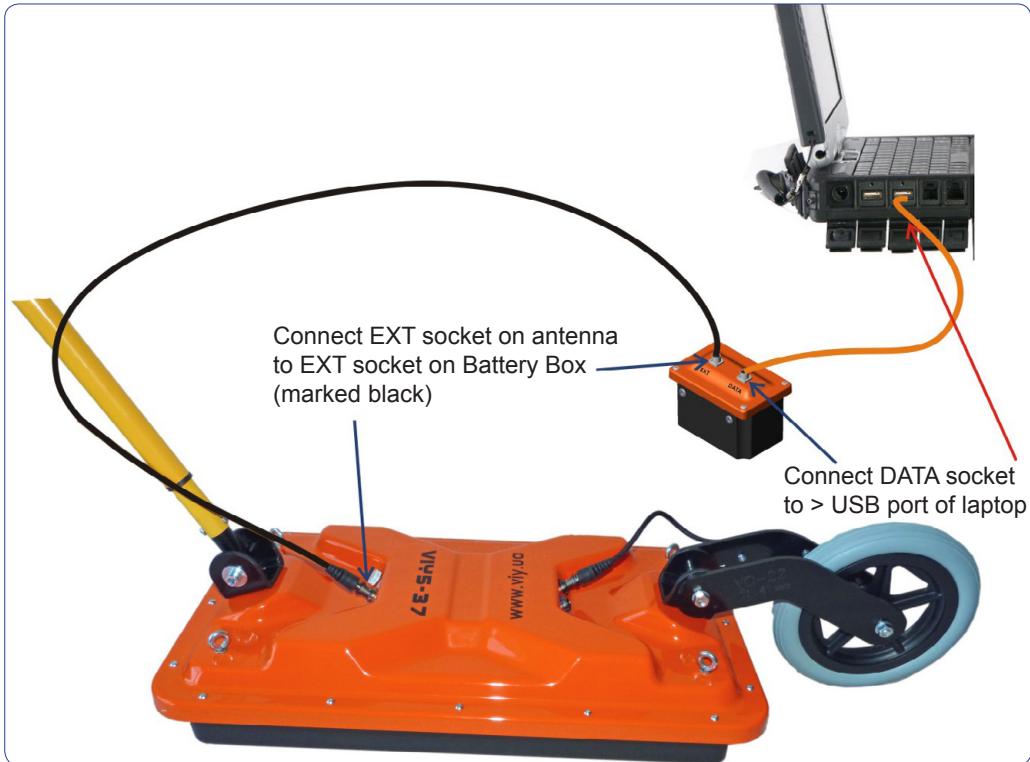
Getting Started

To disconnect - just pull the plug ring back and disconnect it.



- ✓ GPR power supply is turning on when DATA socket is connected to the socket
- ✓ Do not pull the cable trying disconnect the plug. It may damage the connectors!

Connecting antenna unit to a laptop



Connect DP5 Cable (black cable) to EXT socket on antenna unit and to EXT socket on the Battery case.
Connect DC5-2 Cable (orange cable) to DATA socket on the Battery Box and to USB port of a laptop.

Handcart version of VIY5-37 GPR

In Handcart version the antenna unit is installed into the Cart-46 Handcart.



Cart-46 Handcart

Foldable Cart-46 Handcart was created to carry an antenna unit during survey. The Cart-46 can be used either with VIY5-37, VIY5-600, or VIY5-300 antenna units.

Before operating you should unfold Cart-46 to the working position.

Getting Started

Deploying Cart-46 Handcart

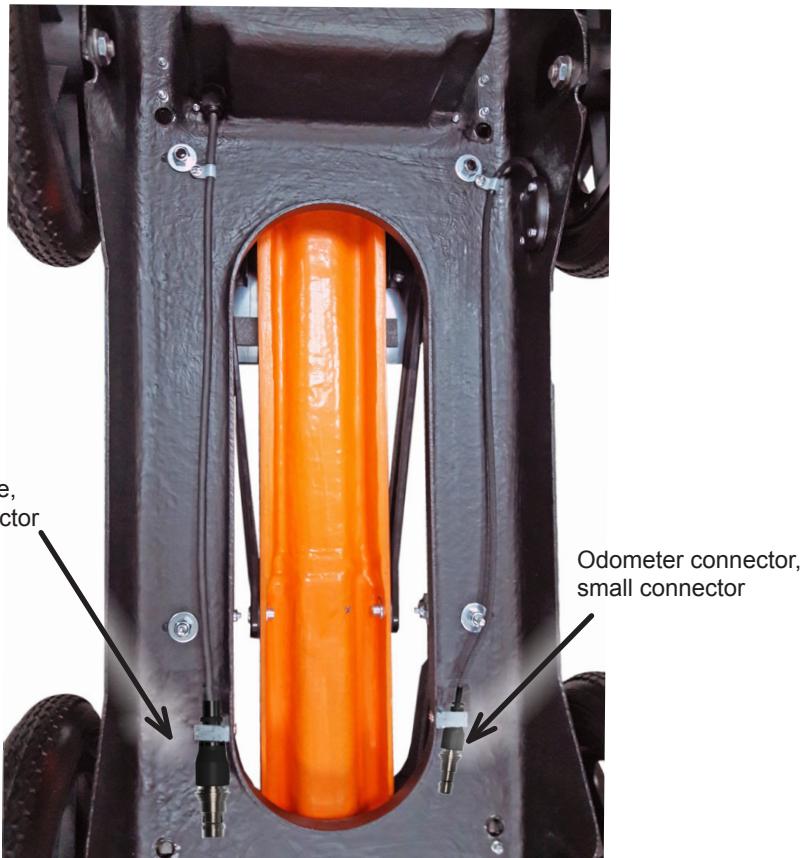
To unfold the Handcart you should loose an eccentric clamp and unfold the Handcart. Then fix the clamp back.



The same way you should loose the eccentric clamp of laptop holder and set it in the position that is the most convenient for work. Then fix the eccentric clamp back.

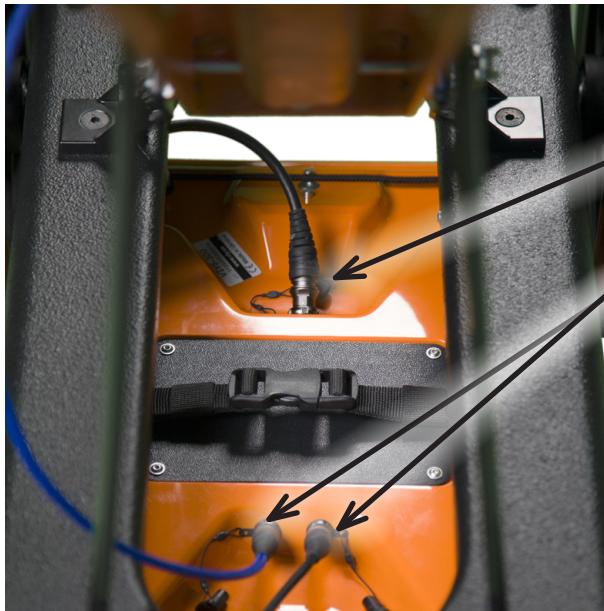
We recommend to use Velcro tape to fix a laptop to the laptop holder. You can stick some tape on the bottom of your laptop and another part of the tape - on the laptop holder.

Plugging connectors



- Odometer connector and DATA connectors are clamped to the bottom of Cart-46.
- You should take them out from their holders.
- Connect big connector forward socket on antenna unit.

Getting Started

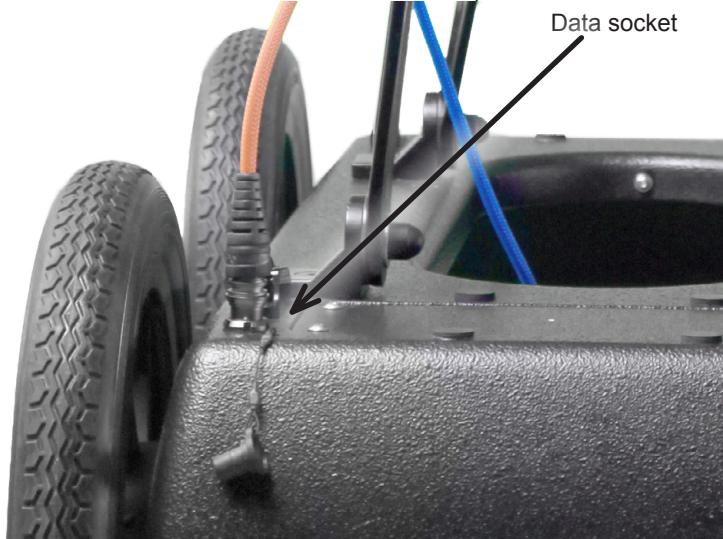


Data cable,
big connector on the cart

Odometer cable,
small connector on the cart
GPS cable
Sockets are interchangeable

- ✓ Connect small connector to odometer socket on antenna unit.
- ✓ There are two identical small sockets for GPS and odometer. You can connect either GPS or odometer to any of these sockets.
- ✓ Color of Handcart's cables may differ from the ones on the pictures

- Connect DC5-1 Cable to Data socket on the body of Handcart



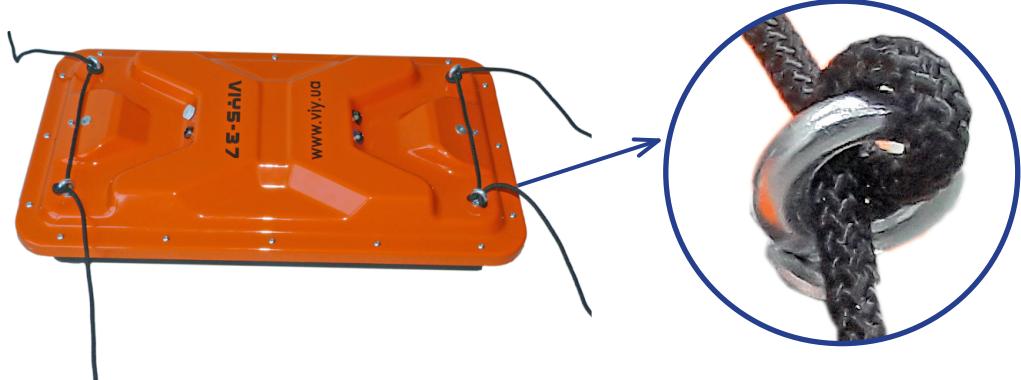
- Connect another end of the DC5-1 Cable to USB port of your laptop.

Folding Cart-46 back to transport position

To fold the Cart-46 back to transport position you should perform all described above in a reverse way. You can either take an antenna out of the Handcart, or fold the Handcart together with the antenna.

Mounting the antenna unit on the Cart-46 Handcart

- Place the antenna unit on a ground and insert mounting ropes into antenna's mounting rings:



✓ We recommend to make a loop on the rope around the ring to secure it there.

Place antenna under the Handcart.

From the bottom of the Handcart insert 4 ends of the rope into fastening slots on the Handcart:



Adjust ropes the way that the bottom of the antenna almost touches the ground:



You need just tighten the rope into the slots. It will be fixed that way.
The bottom of the antenna should be parallel to ground.