

AM200

Version 1.0

User Manual



Legal Notices

Use of the Manual

This Manual is intended to be used solely by authorized user of IDS GeoRadar Systems. It is specific for internal business purpose only. If you are not an authorized user, you are NOT allowed to read this Manual and you must return it to IDS GeoRadar as soon as possible. Access to and use of this Manual is also provided subject to the acceptance of the Disclaimer set out below.

Disclaimer

About the Manual

This Manual has been drafted by IDS GeoRadar with the due care in order to ensure the accuracy and completeness. However, please note that no warranty is provided about the fact that the Manual will be free from error or omission and about the accuracy and/or fitness to the purpose of any information contained herein.

Any representation and/or statement contained herein has been written in good faith and on the basis that, due to negligence, lack of care or otherwise, IDS GeoRadar is not liable for any loss, including direct, indirect or consequential losses, in contract or in tort for any misstatement or omission contained herein which has occurred or may occur with reference to any representation and/or statement contained in the Manual.

User shall also acknowledge that some information contained in the Manual may not be up to date. IDS GeoRadar may amend the information contained in the Manual from time to time and IDS GeoRadar shall not be deemed liable in the event that damages arise with reference to changed circumstances or other information which may affect the accuracy of any information contained in this version of the Manual.

About the Product

All products designed, produced and distributed by IDS GeoRadar, its Subsidiaries, Affiliated and authorized Distributors (Products) shall not be used, in the design, development, production or use of chemical, biological, nuclear ballistic weapons. Buyer/ User will defend, indemnify and hold IDS GeoRadar harmless against any liability (including attorney's fees) for non-compliance with the terms of this paragraph.

If IDS GeoRadar requires that Buyer/User shall carry out a training with reference to some Product categories, no operation or use of the Products shall be started before its designated Operator/s has got the User Certificate, as defined by IDS GeoRadar specific procedure which the Buyer confirms to know and accept.

For Products which include specific "Operational" software with automatic data processing and analysis "Tools", e.g. RockSpot, IBIS Products; Hydra Products, User shall be aware that the results provided by these "Tools" may be not error free. User that completely relies on the outcomes provided by these Tools only, does it at his own risk.

In no event IDS GeoRadar shall be liable for special, direct, indirect, incidental, exemplary, punitive or consequential damages including, but not limited to, loss of profits or revenue, caused by the missed or incomplete observance of the instructions and prescriptions for the use of the Products, either separately or in combination with other products.

This paragraph provides only a non-exhaustive summary of the full Product disclaimer. Please see the full Product disclaimer included into the relevant section of this Manual for detailed information.

Confidentiality

This Manual is strictly confidential and may be subject to legal and other privilege. IDS GeoRadar specifically reserves its rights in relation to this Manual.

None of these rights or any other rights subsisting in the Manual are waived if you have received this Manual in error or without permission.

No parts of this Manual may be copied, translated or reduced to any electronic medium, or machine-readable form, nor photographed or recorded in any way, without the prior written consent of IDS GeoRadar.

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1 INTRODUCTION

1.1 Purpose

This guide describes the procedures to assemble each part of the AM200 GPR unit. This is intended to be a quick assembly reference guide, that helps you during transfer from the office to the jobsite.

1.2 Intended readership

The intended reader of this manual should be the technician in charge of using the system that has undergone the IDS GeoRadar training for AM200.




2 HOW TO READ THE MANUAL

2.1 Manual Layout

This manual is meant to be a quick assembly reference guide, that helps you during transfer from the office to the jobsite, for the AM200 GPR unit.

2.2 SYMBOLS

Warning messages are an essential part of the Safety Concept of the instrument. They appear wherever hazards or hazardous situations can occur.

Type	Description
 WARNING	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 DANGER	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury.

Warning messages:

- make the user alert about direct and indirect hazards concerning the use of the product.
- contain general rules of behaviour.

For the user's safety, all safety instructions and safety messages shall be strictly observed and followed. Therefore, the manual must always be available to all persons performing any tasks described herein.

DANGER, WARNING, CAUTION and **NOTICE** are standardized signal words for identifying levels of hazards and risks related to personal injury and property damage.

For your safety it is important to read and fully understand the table below with the different signal words and their definitions. Supplementary safety information symbols may be placed within a warning message as well as supplementary text.



Note text/to keep in mind



Tip text

3 SAFETY DIRECTIONS

3.1 Description

The following directions enable the person responsible for the product, and the person who uses the equipment, to anticipate and avoid operational hazards.

The person responsible for the product must ensure that all users understand these directions and adhere to them.

3.2 Definition of Use

The intended use is geophysical surveying in the context of civil engineering applications.

3.3 Reasonably Foreseeable Misuse

- Use of the product without instruction.
- Use outside of the intended use and limits.
- Opening the product using tools, for example screwdriver, unless this is permitted for certain functions.
- Modification or conversion of the product.
- Use after misappropriation.
- Use of products with obvious damages or defects.
- Use with accessories from other manufacturers without the prior explicit approval of IDS GeoRadar s.r.l
- Inadequate safeguards at the working site.

3.4 Limits of Use

Environment: Suitable for use in an atmosphere appropriate for permanent human habitation. Not suitable for use in explosive environments.



DANGER: Local safety authorities and safety experts must be contacted before working in hazardous areas, or close to electrical installations or similar situations by the person in charge of the product.

3.5 Responsibilities

Manufacturer of the product - IDS GeoRadar s.r.l. is responsible for supplying the product, including the user manual and original accessories, in a safe condition.

Person responsible for the product - The person responsible for the product has the following duties:

- To understand the safety instructions on the product and the instructions in the user manual.
- To ensure that it is used in accordance with the instructions.
- To be familiar with local regulations relating to safety and accident prevention.
- To inform IDS GeoRadar s.r.l. immediately if the product and the application becomes unsafe.
- To ensure that the national laws, regulations and conditions for the operation of electromagnetics transmitters are respected.

3.6 Hazard of use

NOTICE: Watch out for erroneous measurement results if the product has been dropped or has been misused, modified, stored for long periods or transported.



Precautions:

Periodically carry out test measurements and perform the field adjustments indicated in the user manual, particularly after the product has been subjected to abnormal use and before and after of important measurements.

NOTICE: If the accessories used with the product are not properly secured and the product is subjected to mechanical shock, for example blows or falling, the product may be damaged.



Precautions:

When setting-up the product, make sure that the accessories are correctly adapted, fitted, secured, and locked in position. Avoid subjecting the product to mechanical stress.



DANGER: During surveys there is a danger of accidents occurring if the user does not pay attention to the environmental conditions around, for example obstacles, excavations or traffic.

Precautions:

During operations, the user of the product must be fully aware of the existing dangers.



DANGER: If the product is used with accessories, you may increase the risk of being struck by lightning.



Do not use the product in a thunderstorm.



DANGER: Because of the risk of electrocution, it is dangerous to use poles and extensions near electrical installations such as power cables or electrical railways.



Precautions:

Keep at a safe distance from electrical installations. If it is essential to work in this environment, first contact the safety authorities responsible for the electrical installations and follow their instructions.



DANGER: Inadequate securing of the working site can lead to dangerous situations, for example in traffic, on building sites, and at industrial installations.

Precautions:

Always ensure that the working site is adequately secured. Adhere to the regulations governing safety and accident prevention and road traffic.

NOTICE: If the product is improperly disposed of, the following can happen:

- If polymer parts are burnt, poisonous gases are produced which may impair health.
- If batteries are damaged or are heated strongly, they can explode and cause poisoning, burning, corrosion or environmental contamination.
- By disposing of the product irresponsibly you may enable unauthorized persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and rendering the environment liable to contamination.



RECYCLING



The crossed out wheeled bin symbol shown on the equipment indicates that the product must be recycled separately from other waste at the end of its useful life.

Separate waste disposal of this product at the end of its useful life will be organised and managed by IDS GeoRadar. When you decide to dispose of the equipment, contact IDS GeoRadar and follow the system that IDS GeoRadar has set up to permit the separate collection of the apparatus at its life end.

Adequate separate collection for its subsequent recycling, treatment and environmental friendly disposal contribute towards avoiding any unnecessary effects on the environment and to health and favour the reuse or recycling of the materials that make up the equipment. Unauthorised disposal of this product as unsorted waste by its possessor will lead to an administrative penalty foreseen by national regulations.



CAUTION: High mechanical stress, high ambient temperatures or immersion into fluids can cause leakage, fire or explosions of the batteries.

Precautions:

Protect the batteries from mechanical influences and high ambient temperatures.



Do not drop or immerse batteries into fluids.

DANGER: During the transport, shipping or disposal of batteries it is possible for inappropriate mechanical influences to constitute a fire hazard.



Precautions:

Before shipping the product or disposing of it, discharge the batteries by running the product until they are flat.

When transporting or shipping batteries, the person in charge of the product must ensure that the applicable national and international rules and regulations are observed. Before transportation or shipping contact your local passenger or freight transport company.



NOTICE: Only IDS GeoRadar authorized technical service are entitled to repair this product.

4 HOW TO ASSEMBLE AM200

AM200 GPR unit doesn't need any set-up or assembly. It appears as shown in Fig. 1, Fig. 2 and Fig. 3.



Fig. 1 – AM200 GPR unit

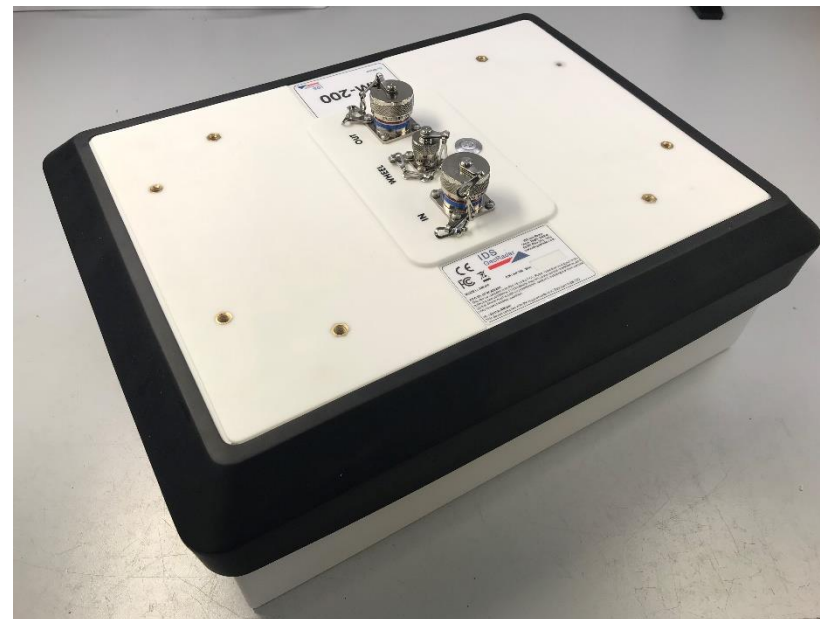


Fig. 2 – AM200 GPR unit



Fig. 3 - AM200 GPR unit

5 HOW TO OPERATE AM200 GPR unit

On top of the cover of the AM200 GPR antenna unit there are 3 external connectors and 1 button (Fig. 4):

- IN: 19 pin multipolar connector, providing power supply and Ethernet connectivity.
- OUT: 19 pin multipolar connector, providing power supply and Ethernet connectivity towards other AM200 modules.
- WHEEL: 4 pin connector, compatible with IDS Georadar's survey kit.
- BUTTON: power button



Fig. 4 – AM-200 connections

To correctly operate the AM200 antenna, the user must apply the following steps:

1. Connect on end of the multipolar cable provided with the unit to IN port (Fig. 5).

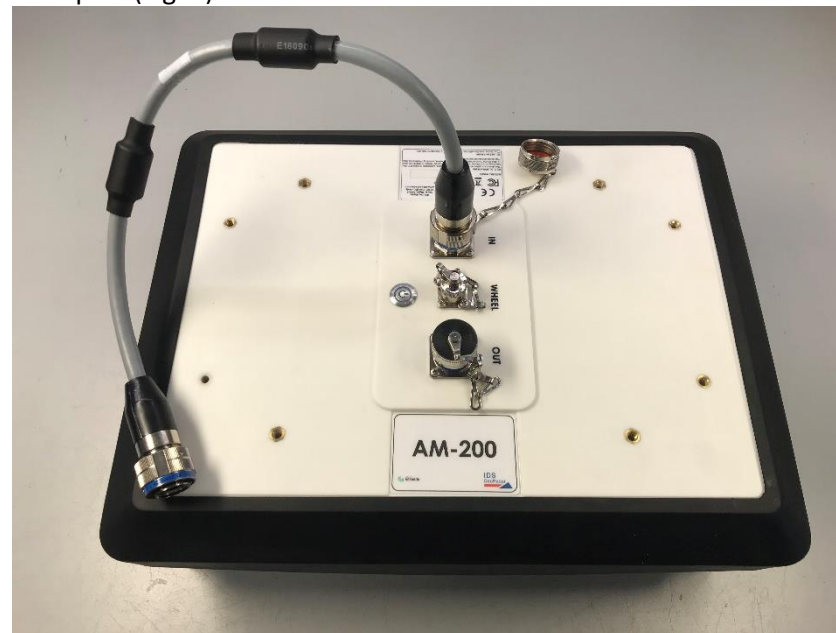


Fig. 5 – Connection of multipolar cable

2. Connect the other end of the multipolar cable to the junction box (provided with AM200 unit) (Fig. 6).
3. Connect the junction box to a laptop via standard Ethernet cable (having RJ 45 connectors) and battery cable (provided with AM200 unit) (Fig. 6).
4. Connect the battery cable to a 12V-12Ah sealed lead battery (Fig. 6).

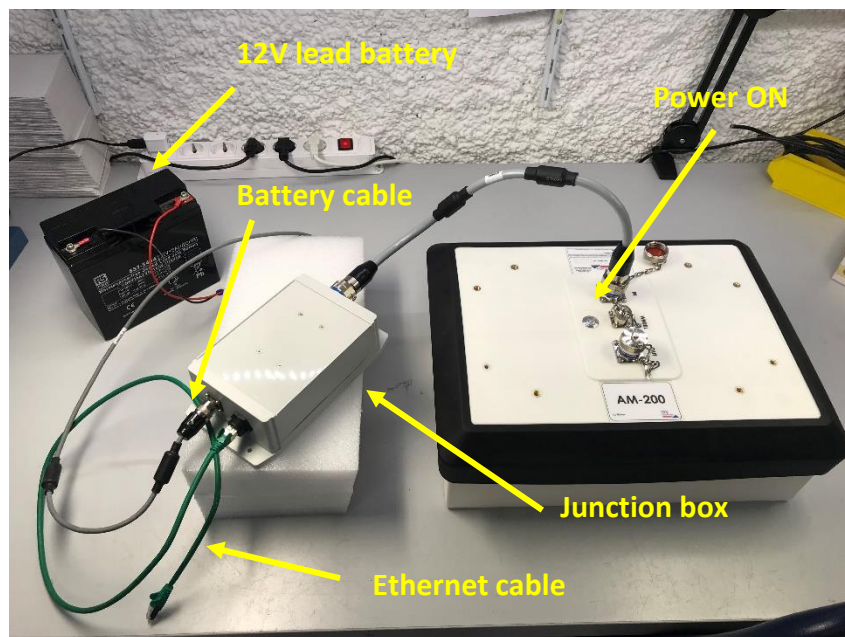


Fig. 6 - Connection of AM200 GPR unit

5. Press the power on button.
6. Operate the GPR unit, with the use of provided IDS Georadar's software, according the survey the user intends to perform (please, refer to specific software product User Manual).

6 TECHNICAL SPECIFICATIONS

Data	Measure
Size	333 mm x 433 mm x 142 mm (h)
Weight	3.35 kg
Power supply	12V DC
Power consumption	5.5 W
Input ports	19 pin connector + 4 pin connector
Output ports	19 pin connector
Communication ports	Ethernet 100 baseT
Transmitting elements	2
Receiving elements	2
Environmental	IP65
Operational temperature range	-20 - +40 °C

7 CARE AND TRANSPORT

7.1 Cleaning Information



CAUTION

CLEANING INFORMATION

Before cleaning any external parts of the apparatus, make sure that all cables have been disconnected, including the power supply cable. If a damp cloth is used, make sure it is not too wet, to avoid any damage to the electrical components of the equipment. Wait until the equipment is totally dry before reconnecting the cables.

The RIS MF Hi MOD should be cleaned periodically using a damp cloth.

Do not use solvents or abrasive detergents.

Do not apply liquid directly to the electrical contacts of the various connectors. If a specific spray is used to clean the PC TFT monitor, make sure it is not flammable; in any case, do not spray it directly on the screen, instead, spray it onto the cleaning cloth.

7.2 Battery Removal Information



CAUTION

BATTERIES REMOVAL INFORMATION



Laptop Batteries:

Type: Li-ion Ni

Characteristics: 10.65V 5.7Ah

Removal instructions:

1. turn off the laptop;
2. open the drawer with the symbol of the batteries;
3. extract the battery pack pulling the tab.

Radar batteries:

Manufacturer: FIAMM FG21202 / SAFT MP176065

Type: rechargeable lead acid / rechargeable lithium-ion

Characteristics: 12V & 12Ah / 15V & 6.8Ah

Removal instructions:

1. disconnect the battery from the instrument:
 - a. pull the connector wings;
 - b. separate the connectors;
2. remove the battery from the cover (optional) opening the strap.

APPENDIX A DISCLAIMER

1. Generals.

- i. The present Disclaimer applies to all products designed, produced and distributed by IDS GeoRadar s.r.l., its Subsidiaries, Affiliated and authorized Distributors (the “Products”). IDS GeoRadar s.r.l. reserves full ownership and intellectual property rights of any “Information” contained in this Disclaimer including Trade Marks and Graphics. No part of this Disclaimer may be used or reproduced in any forms without the prior written agreement of IDS GeoRadar s.r.l.
- ii. In the event that any provision of this Disclaimer may be invalid, unlawful or incapable of being enforced by a rule of law, all other provisions shall, nonetheless, remain in full force and effect. Failure to either enforce or exercise any right, privilege, or legal remedy at any time, any provision contained in this Disclaimer, shall not be deemed a waiver of such provisions or right, remedy, or privilege.
- iii. This Disclaimer shall be interpreted, governed, construed and enforced in accordance with the laws of Italy. User/Buyer hereby consents to the exclusive jurisdiction of Pisa.

2. Initial Precautions for Setting-up and Use of the Products.

- i. The User/Buyer, for setting-up and using the Products, shall consult the official documentation provided by IDS GeoRadar s.r.l. for the Products (“Reference Documentation”) and carefully ascertain the compliance with national laws and requirements, which may limit or even forbid their use.
- ii. For Products which shall operate by circulation in Public Areas/Roads, with or without moving traffic, Buyer/User shall verify the approval of local authority and/or site’s owner according to their specific procedures. IDS GeoRadar s.r.l. shall not be liable for any direct, indirect, special, incidental or consequential damages or injuries, including without limitation, lost revenues or lost profits, resulting by un-authorized use of the Products in Public Areas/Roads.
- iii. Buyer/User further warrants:
 - that these Products are not being used, in the design, development, production or use of chemical, biological, nuclear ballistic weapons. Buyer/User will defend, indemnify and hold IDS GeoRadar s.r.l. harmless against any liability (including attorney’s fees) for non-compliance with the terms of this article.

- That, if IDS GeoRadar s.r.l. requires that Buyer/User shall carry out a training with reference to some Product categories, no operation or use of the Products shall be started before its designated Operator/s has got the User Certificate, as defined by IDS GeoRadar s.r.l. specific procedure which the Buyer confirms to know and accept.
- iv. For Products which include specific “Operational” software with automatic data processing and analysis “Tools”, e.g. the IBIS Products and Hydra Products, User shall be aware that the results provided by these “Tools” may be not error free. User that completely relies on the outcomes provided by these Tools only, does it at his own risk.
- v. In no event IDS GeoRadar s.r.l. shall be liable for special, direct, indirect, incidental, exemplary, punitive or consequential damages including, but not limited to, loss of profits or revenue, caused by the use of the Products, either separately or in combination with other products or relied upon the results provided by the above “Tools”.

3. Disclaimer for the “Use” of the Products.

- i. The User shall follow the instructions provided by IDS GeoRadar s.r.l. in its official “Reference Documentation” for the Product, in particular the User’s Technical Manual which contains all the specific steps and recommendations for a correct setting-up and use of the Product.
- ii. In no event IDS GeoRadar s.r.l. shall be liable for special, direct, indirect, incidental, exemplary, punitive or consequential damages including, but not limited to, loss of profits or revenue, caused by the missed or incomplete observance of the instructions and prescriptions for the use of the Products, either separately or in combination with other products, including but not limited to the following main aspects:
 - a. Use of IDS GeoRadar s.r.l. Products outside its limitation of use, without proper and adequate scientific/technical knowledge or without specific training.
 - b. Use of results/outcomes of the measurements performed by the Product aimed to safety aspects without using adequate control procedures and assessment by skilled personnel.
 - c. Opening of the Equipment (for HW Products) without express written authorization of IDS GeoRadar s.r.l.;

- d. Unauthorized changes and additions to the Products.
- e. Use of the Products connected to suspected non-working equipment or with equipment (mainly PC) having characteristics not in compliance with the required specifications of IDS GeoRadar s.r.l. not expressly authorized by IDS GeoRadar s.r.l.;
- f. Poor or faulty operation of the electrical and telecommunication networks not directly managed by IDS GeoRadar s.r.l. or its delegates.
- g. Poor or faulty operation Software/Hardware of the third parties connected with IDS GeoRadar s.r.l. Equipment.
- h. Poor or faulty operation of the Products due to Software Virus which infected the Products after their delivery.
- i. Use of the Products which have encountered suspected manumissions, accidents, electrostatic shocks, flashes, fire, earthquake, flooding or other natural disasters or unexpected events.
- j. Use or storage of the Products outside the limits of the “Operational Temperature Range” specified by IDS GeoRadar S.r.l.

APPENDIX B IMPORTANT NOTICE FOR THE US CUSTOMER

FCC ID: UFW-AM200

This device complies with part 15 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, and construction companies. Operation by any other party is a violation of 47 U.S.C. § 301 and could subject the operator to serious legal penalties.

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

(c) The manufacturers, or their authorized sales agents, must inform purchasers and users of their systems of the requirement to undertake detailed coordination of operational areas with the FCC prior to the equipment being operated.

(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.

(f) The coordination of routine UWB operations shall not take longer than 15 business days from the receipt of the coordination request by NTIA. Special temporary operations may be handled with an expedited turn-around time when circumstances warrant. The operation of UWB systems in emergency situations involving the safety of life or property may occur without coordination provided a notification procedure, similar to that contained in CFR47 Section 2.405(a)-(e), is followed by the UWB equipment user.

APPENDIX C – IMPORTANT NOTICE FOR CANADIAN CUSTOMER

Canadian Requirements of RSS-220 for Ground Antennas

IMPORTANT NOTE FOR THE CANADIAN CUSTOMERS

IC Certification Number: **8991A-AM200**

This device complies with the requirements of IC Standard RSS-220

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

This Ground Penetrating Radar Device shall be operated only by law enforcement agencies, scientific research institutes, commercial mining companies, construction companies, and emergency rescue or firefighting organizations.

NOTE IMPORTANTE POUR LES UTILISATEURS CANADIENS

Numéro de certification : **8991A-AM200**

Cet appareil est conforme aux exigences de la norme RSS IC-220

Cet équipement géoradar doit être utilisé que lorsqu'il est en contact ou à moins de 1 mètre du sol.

Cet équipement géoradar doit être utilisé que par des organismes d'application de la loi, des instituts de recherche scientifique, des sociétés minières commerciales, des entreprises de construction et de secours d'urgence ou les organisations de lutte contre les incendies.

APPENDIX D CUSTOMER SUPPORT

The IDS GeoRadar Technical Support team is available to answer any question about:

- general enquiries
- request of advertising material
- technical issues
- any other business
- As well as listening to your suggestions too.

Please, feel free to contact us sending an e-mail to:
support.geo@idsgeoradar.com

Or call the Number:

+39 050 8934 200

Customer Care Office

Address:

IDS GeoRadar srl

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