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User's Manual

PMM OR03

PROGRAMMABLE OPTICAL REPEATER

EQUIPMENT SERIAL NUMBER

You can find the Serial Number on the rear panel of the instrument.

Serial Number is in the form: 0000X00000.

The first four digits and the letter are the Serial Number prefix, the last five digits are the Serial Number suffix. The prefix is the same for identical instruments, it changes only when a configuration change is made to the instrument.

The suffix is different for each instrument.

NOTE:

® Names and Logo are registered trademarks of Narda Safety Test Solutions GmbH – Trade names are trademarks of the owners.



If the instrument is used in any other way than as described in this User's Manual, it may become unsafe.

Before using this product, the related documentation must be read with great care and fully understood to familiarize with all the safety prescriptions.

To ensure the correct use and the maximum safety level, the User shall know all the instructions and recommendations contained in this document.



This product is a **Safety Class III** instrument according to IEC classification and has been designed to meet the requirements of EN61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use).

In accordance with the IEC classification, the power supply of this product meets requirements **Safety Class II** and **Installation Category II** (having double insulation and able to carry out mono-phase power supply operations).

It complies with the requirements of **Pollution Class II** (usually only non-conductive pollution). However, occasionally it may become temporarily conductive due to condense on it.

The information contained in this document is subject to change without notice.

EXPLANATION OF ELECTRICAL AND SAFETY SYMBOLS :

 You now own a high-quality instrument that will give you many years of reliable service. Nevertheless, even this product will eventually become obsolete. When that time comes, please remember that electronic equipment must be disposed of in accordance with local regulations. This product conforms to the WEEE Directive of the European Union (2002/96/EC) and belongs to Category 9 (Monitoring and Control Instruments). You can return the instrument to us free of charge for proper environment friendly disposal. You can obtain further information from your local Narda Sales Partner or by visiting our website at www.narda-sts.it.



Warning, danger of electric shock



Read carefully the Operating Manual and its instructions, pay attention to the safety symbols.



Earth Protection



Earth



Unit Earth Connection



Equipotential

EXPLANATION OF SYMBOLS USED IN THIS DOCUMENT :



The DANGER sign draws attention to a serious risk to a person's safety, which, if not avoided, will result in death or serious injury. All the precautions must be fully understood and applied before proceeding.



The WARNING sign indicates a hazardous situation, which, if not avoided, could result in death or serious injury. All the precautions must be fully understood and applied before proceeding.



The CAUTION sign indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.



The NOTICE sign draws attention to a potential risk of damage to the apparatus or loss of data.



The NOTE sign draws attention to important information.

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⚠ WARNING

SAFETY RECOMMENDATIONS AND INSTRUCTIONS

This product has been designed, produced and tested in Italy, and it left the factory in conditions fully complying with the current safety standards. To maintain it in safe conditions and ensure correct use, these general instructions must be fully understood and applied before the product is used.

- When the device must be connected permanently, first provide effective grounding;
- If the device must be connected to other equipment or accessories, make sure they are all safely grounded;
- In case of devices permanently connected to the power supply, and lacking any fuses or other devices of mains protection, the power line must be equipped with adequate protection commensurate to the consumption of all the devices connected to it;
- In case of connection of the device to the power mains, make sure before connection that the voltage selected on the voltage switch and the fuses are adequate for the voltage of the actual mains;
- Devices in Safety Class I, equipped with connection to the power mains by means of cord and plug, can only be plugged into a socket equipped with a ground wire;
- Any interruption or loosening of the ground wire or of a connecting power cable, inside or outside the device, will cause a potential risk for the safety of the personnel;
- Ground connections must not be interrupted intentionally;
- To prevent the possible danger of electrocution, do not remove any covers, panels or guards installed on the device, and refer only to NARDA Service Centers if maintenance should be necessary;
- To maintain adequate protection from fire hazards, replace fuses only with others of the same type and rating;
- Follow the safety regulations and any additional instructions in this manual to prevent accidents and damages.

Dichiarazione di Conformità *EC Declaration of Conformity*



In accordo alla Decisione 768/2008/EC, conforme alle direttive EMC 2014/30/UE, Bassa Tensione 2014/35/UE e RoHS 2011/65/UE, ed anche alle norme ISO/IEC 17050-1 e 17050-2.

In accordance with the Decision 768/2008/EC, compliant to the Directives EMC 2014/30/UE, Low Voltage 2014/35/UE and RoHS 2011/65/EU, also compliant to the ISO/IEC standard 17050-1 and 17050-2

Il costruttore
The manufacturer

narda Safety Test Solutions S.r.l. Socio Unico

Indirizzo
Address

Via Benessea, 29 / B

I-17035 Cisano sul Neva (SV) - Italy

sulla base delle seguenti norme europee armonizzate, applicate con esito positivo:
based on the following harmonized European Standards, successfully applied:

EMC - Emissioni:
EMC - Emission:

IEC EN 61326-1 (2021)

EMC - Immunità:
EMC - Immunity:

IEC EN 61326-1 (2021)

Sicurezza:
Safety:

EN 61010-1 (2010)

dichiara, sotto la propria responsabilità, che il prodotto:
declares, under its sole responsibility, that the product:

Descrizione
Description

**RIPETITORE OTTICO PROGRAMMABILE
PROGRAMMABLE OPTICAL REPEATER**

Modello
Model

OR03

è conforme ai requisiti essenziali delle seguenti Direttive:
conforms with the essential requirements of the following Directives:

Bassa Tensione
Low Voltage

2014/35/EU

Compatibilità Elettromagnetica
EMC

2014/30/EU

RoHS
RoHS

2011/65/EU

Cisano sul Neva, 4 March 2024

**Egon Stocca
General Manager**

EC Conformity

VII

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1 – General information

1.1 Documentation

The following documents are included in this Manual:

- A questionnaire to be sent to NARDA together with the apparatus should service be required.
- A checklist of the Accessories included in the shipment.

1.2 OR-03 Introduction

OR-03 is a programmable optical repeater directly connected to a personal computer via optical fiber cable to USB adapter. With its internal battery and dedicated SW, it measures electric and magnetic fields through more than 18 different probes and immediately records and plots the results. The probes can be attached directly to the dedicated heavy-duty connector on the OR-03, which also features excellent shielding properties and can therefore be used at very high field strengths without interference. In addition to the standard WinOR03 software delivered with the Optical Repeater, the communication and control protocol is freely available so users can fully control the OR-03 with their usual test software. The OR-03 is an ideal solution for EMC applications, in chambers and TEM/GTEM cells, and in EMF applications.

1.3 Standard accessories

Standard accessories included with OR-03 are:

- USB-OC Optical converter
- Battery Charger + Power Cable
- FO-8053/10 Optical fiber
- FO-10USB Optical fiber
- Conical tripod support
- Software Media incl. user's manual
- Certificate of Compliance;

1.4 Optional accessories The following accessories may be ordered as options:

- EP-105 E-Field Sensor;
- EP-300 E-Field Sensor;
- EP-330 E-Field Sensor;
- EP-301 E-Field Sensor;
- EP-333 E-Field Sensor;
- EP-183 E-Field Sensor;
- EP-408 E-Field Sensor;
- EP-44M E-Field Sensor;
- EP-33M E-Field Sensor;
- EP-33A E-Field Sensor;
- EP-33B E-Field Sensor;
- EP-33C E-Field Sensor;
- EP-201 E-Field Sensor;
- EP-645 E-Field Sensor;
- EP-745 E-Field Sensor;
- HP-032 H-Field Sensor;
- HP-102 H-Field Sensor;
- HP-050 H-Field Sensor;
- HP-051 H-Field Sensor;
- USB-OC Optical converter;
- 8053-OC Optical converter;
- 8053-OC-PS Power Supply;
- FO-8053/10 Optical Fibre Cable (10m);
- FO-8053/20 Optical Fibre Cable (20m);
- FO-8053/40 Optical Fibre Cable (40m);
- FO-8053/80 Optical Fibre Cable (80m);
- FO-10USB Optical Fibre Cable (10m);
- TR-02A Tripod complete with joint;
- TT-01 Telescopic support;
- 8053-CC Rigid carrying case;
- 8053-CA Battery charger Car adapter;
- 8053-BC Battery charger,
- 8053-CAL Calibration Probe;
- SB-10 Switching Control Box;
- 8053-SW02 software for data import (requires SB-10).

1.5 Main specifications

The following conditions apply to all specifications:
Operating ambient temperature must be between -10°C and 40° C

Table 1-1 Technical specifications	
Output	HFBR-0500 standard fiber optic connector: Up to 10-meters link with USB-OC Up to 80-meters link with 8053-OC (optional)
Input	PMM Standard probe connector Battery charger connector
Internal battery	Rechargeable Ni-MH batteries (5 x 1,2 V)
Operating time	> 48 - 72 hours depending on chosen filter 10 Hz filter > 72 hours 20 Hz filter > 61 hours 40 Hz filter > 53 hours 80 Hz filter > 48 hours
Recharging time	< 4 hours
External power supply	DC, 10 ÷ 15 V, I = around 300 mA
Auto test	Internal diagnostic, probe connection and diodes
PC utility SW WinOR03	Displays field, battery, sampling, filters, averaging, frequency setting, manual data logging as text file.
Operating temperature	-10 °C ÷ +40 °C
Operating humidity	0 ÷ 98% RH (without condensation)
Storage temperature	-20 °C ÷ +70 °C
Tripod support	Threaded insert UNC 1/4"
Dimensions	Ø55 x 130 mm
Weight	270 g

1.6 OR03 panels



Fig. 1-1 Front panel

Legend:

1. PMM Standard Probe connector
2. Serial Number

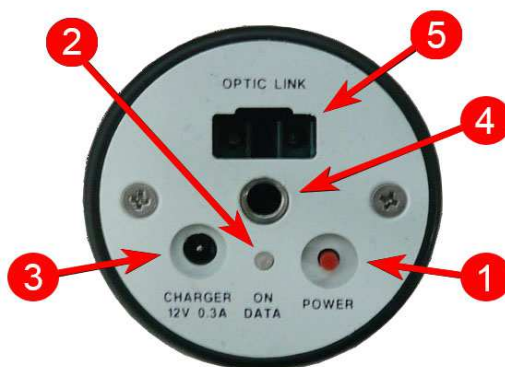


Fig. 1-2 Rear panel

Legend:

1. ON/OFF button
2. Led
3. Battery charger connector
4. Threaded insert UNC 1/4"
5. Fiber Optic connector

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2 - Installation and use

2.1 Introduction

This section provides the information required for installing and using the OR-03 Optical Programmable Repeater.

Information is included regarding initial inspection, power requirements, interconnections, work environment, assembly, cleaning, storage and shipment.

2.2 Preliminary inspection

Inspect the packaging for any damage.

NOTICE

If the packaging or anti-shock material have been damaged, check that the contents are complete and that the repeater has not suffered electric or mechanical damage.

Check that all the Accessories are there against the checklist found with the apparatus.

Inform the carrier and NARDA of any damage that has occurred.

2.3 Work environment

The work environment of the Accessories, must come within the following conditions:

- Temperature From -10° to +40° C
- Humidity < 90% relative

The repeater must be stored in a clean and dry environment, free from acid dusts and humidity.

The storage environment must come within the range of the following conditions:

- Temperature From -20° to + 70° C
- Humidity < 95% relative

2.4 Return for repairs

When the repeater needs to be returned to NARDA for repair, please complete the questionnaire appended to this User's Manual, filling in all the data that will be useful for the service you have requested.

For reducing the period of time required for the repairs, it is necessary to be as specific as possible in describing the problem. If the problem only occurs in certain circumstances, please describe in detail how it happens.

If possible it is better to reuse the original packaging; making sure that the apparatus is wrapped in thick paper or plastic.

Otherwise, use strong packaging by using a sufficient quantity of shock absorbent material around all sides of the repeater to ensure that it is compact and does not move around inside the package.

In particular, take every precaution to protect the front and rear panels.

Finish the package by sealing it up tightly.

Apply a FRAGILE label to the package to encourage greater care in its handling.

2.5 Instrument cleaning

Use a dry, clean and non-abrasive cloth for cleaning the meter.

NOTICE

Do not use solvents, acids, turpentine, acetone or other similar products for cleaning the meter in order to avoid damaging it.

2.6 Installation of the OR-03

Turn off the OR-03, connect the field probe to the probe connector on the front panel taking care that the two spigot (red dot) must be aligned. Then, connect the supplied fiber optic to the **OPTIC LINK** connector taking care that the spigot matches the housing. Connect the other end of the fiber optic to the provided USB-OC (taking care that the grip recess points towards the centre of the device) or **OPTIC LINK** connector of the optional 8053-OC. Connect the converter to a PC port.



Fig. 2-1 OR-03 link with USB-OC

The USB-OC standard accessory connected to the OR-03 allows a 10m maximum fiber length

Instead, if you connect the repeater to the RS232 port, you must use the optional accessories 8053-OC.



Fig. 2-2 OR-03 link with 8053-OC

The 8053-OC optional accessory connected to the OR-03 allows a 80m maximum fiber length

With 8053-OC the program automatically establishes the connection on the first RS232 port that is not in use at that time, in the following order: COM1, COM2, COM3, etc.



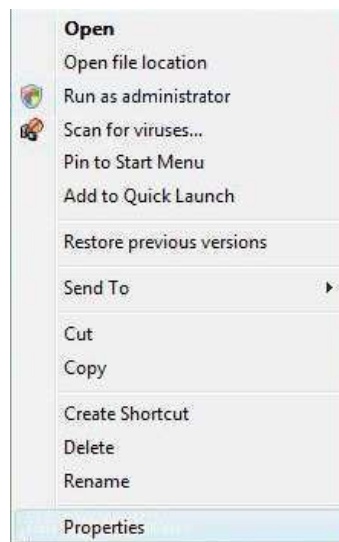
The energy available on the DB9 connector of some PC model could be not sufficient to guarantee a good link with 80 meter fiber.



The energy available on the DB9 connector of some PC model could be not sufficient to guarantee a link with 8053-OC. In this case, is necessary use 8053-OC-PS between the converter and PC (for more information see chapter 8 Accessories).

Whenever a port is tied up by a device which is not active or turned off at that time, the program recognises it as free and will therefore attempt to connect OR-03 to that port. In this case, it is necessary to “force” the next serial port by the following procedure:

- Right click on the program icon and select “properties”.



- Add the command COMM=N **preceded** by a **space** (in capital letters) at the end of the Destination field **where** N indicates the serial port to be used; for example, if the OR-03 is connected to port 2, add the command COMM=2.

The assigned COM port nr. must be between 1 and 9.



- In some operating system the Destination field is enclosed in double quotation marks (""); in this case, the command COMM=N, **preceded** by a **space** must be outside as in the example below;



- Then confirm by selecting Apply
- After switching the repeater ON, run the software.

2.7 OR-03 on and Led status



Turn on OR03 by pushing the red **POWER** button for one second; the LED will light up **red** for about 1/2 second and then turns fix green for about 20 seconds to perform a diagnostic test to check if everything is working properly. Afterwards the led will provide the following information.

TABLE 2-1 Led status		
LED flashing speed	LED colour	Explanations
Low speed	Green	Communication in progress and correct (with probe inserted)
Low speed	Red	Communication in progress and correct (with probe not inserted)
Medium speed	Green	OR03 disconnected or communication error (with probe inserted)
Medium speed	Red	OR03 disconnected or communication error (with probe not inserted)
Fast speed	Orange	Recharging battery
Fast speed	Green	Battery recharging completed
Fix	Green	Calibration repeater in progress and correct
Fix	Red	Calibration repeater non correct



Pressing the POWER down button for more than 4 seconds forces the hardware of the apparatus to shut down. Then, it is necessary to wait several seconds before switching it on again.



The OR03 automatically turns OFF when after 15 minutes the fiber optic has been disconnected or the communication with PC is not established.



The fiber optic of the OR-03 can be disconnected and reconnected while in use. In this case, communication will be restarted automatically.

2.8 Power supply and battery recharging

Bat.: 65 %

OR-03 has an internal rechargeable Ni-Mh battery that can be recharged with the battery charger supplied with it.

The AC/DC battery charger can be used with a power frequency at either 50 Hz or 60 Hz with a supply voltage between 100 and 240 AC Volt. International AC plug adapters are provided according to the various national standards and it can be easily removed from the battery charger to be replaced by a different one.

Ensure that the batteries are fully charged before using the repeater for longest battery operation time.

The battery status is reported by the WinOR03 software and displayed in 5% steps. It shows the residual autonomy during measurements and the achieved autonomy during charging

ALWAYS connect the battery charger to the power supply BEFORE connecting it to the OR-03.

The battery charger has an internal protective circuit that will limit the output of current if there is any load when connecting to the mains.

Battery charger:

output: DC, 10 - 15 V, ~ 500 mA



Connector:

In order to safeguard the features of the batteries, it is crucial to have a complete recharge before storing them for periods longer than 4 months. Therefore, it is warmly suggested recharging the batteries at least every 4 months even though the device has not been used.

The minimum voltage level for operation is about 5.4V. The batteries must be recharged for lower voltages. Below such voltage the analyzer will turn OFF automatically.

The time required for recharging the batteries is about 4 hours. When the recharge is complete, this is indicated by the Led of the OR-03, with a rapidly blinking Green light.

To take measurements **ALWAYS** remove the battery charger from OR-03.

2.9 Install and Run WinOR03 software

Install the WinOR03 software and the program automatically installs the driver for USB optical converter. For further information see chapter 3.

Run the WinOR03 software and the OR-03 led turns on low blinking **Green** (probe inserted) or **Red** (probe not inserted) light that means the correct communication with PC. For further information see chapter 4.

If the attempt to communicate is not successful or if the fiber optic is not connected to the PC, the OR-03 will automatically switch off after about 15 minutes to preserve the battery charge.

OR-03 must be ON before running WinOR03 control software. OR-03 may not be correctly recognized if switched ON when the control software is already running.

Pressing the POWER down button for more than 4 seconds forces the hardware of the apparatus to shut down. Then, it is necessary to wait several seconds before switching it on again.

2.10 OR-03 Applications

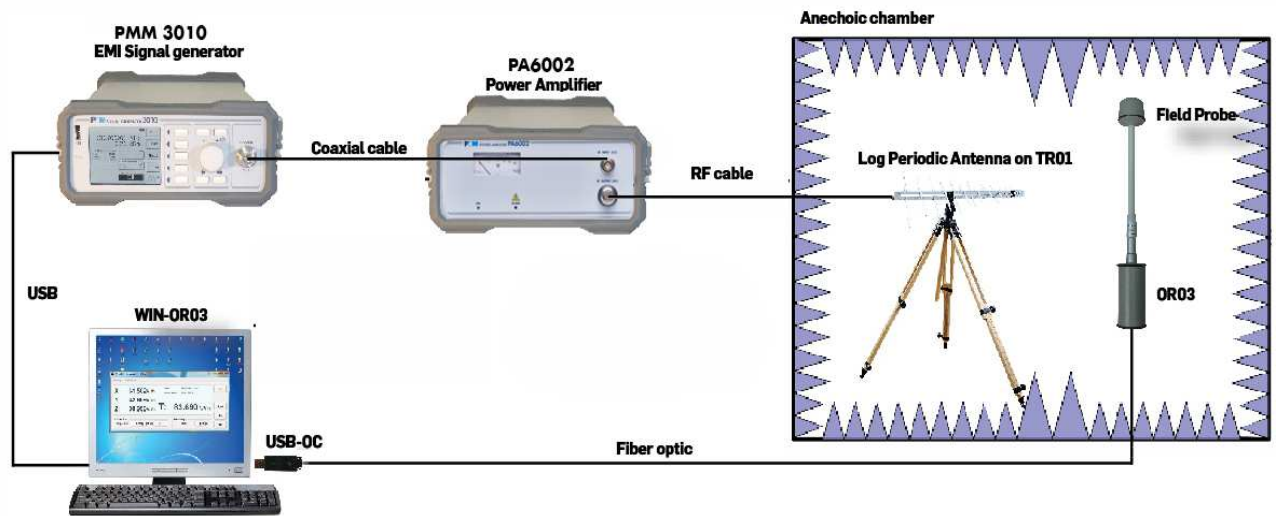


Fig. 2-3 Typical Immunity test irradiation configuration

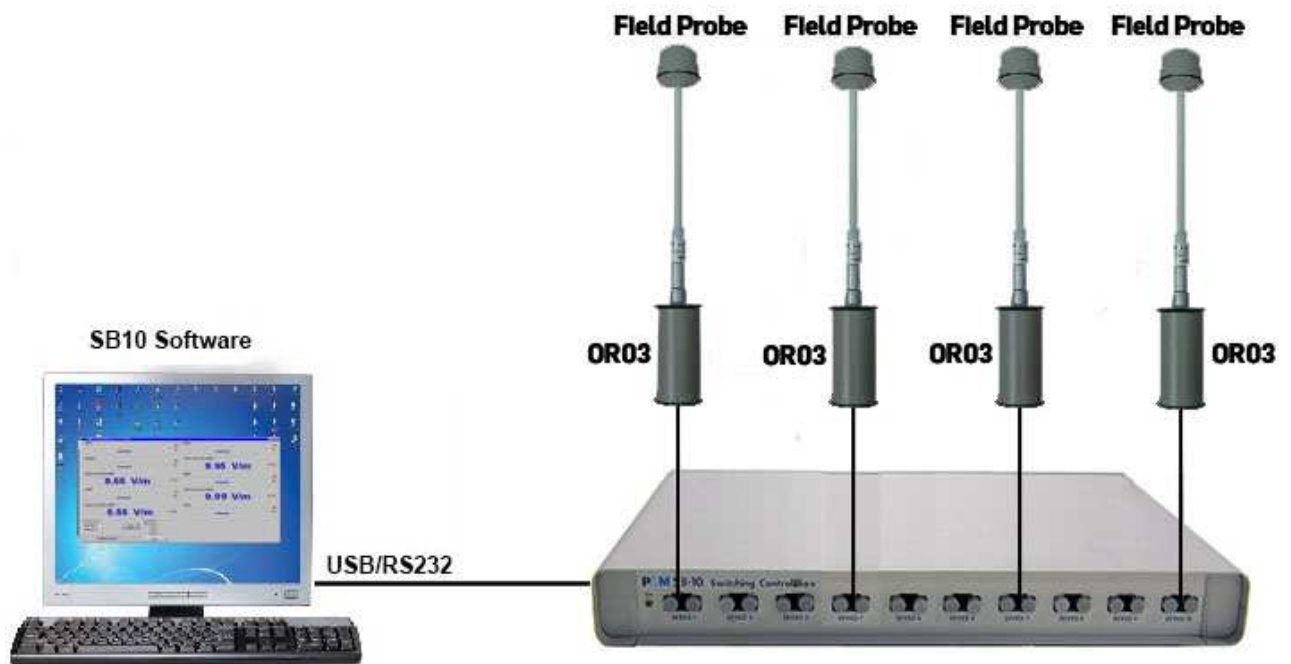


Fig. 2-4 OR3 with SB10 Switching Box



For further information about the use of OR3 repeater with the PMM SB10 refer to Switching Box manual.



Fig. 2-5 OR3 with PMM 8053B Portable Field Meter



For further information about the use of OR03 repeater with the PMM 8053B refer to portable field meter manual.



When measuring fields from transmitting aerials, it is important to place the probe with the supporting handle in line with the polarity of the aerial. This is to avoid any interference with the reading, especially when analysing signals of the megahertz range.

NOTICE

The probe used with the OR03 have highly sensitive components. Do not insert the probe in fields which exceed the maximum limit allowed.

The internal diodes may be damaged whether the OR03 is switched ON or OFF or regardless of whether the probe is connected to the instrument.

3 – WinOR03 Software installation

3.1 Introduction

This chapter is the installation and operation guide of the PC Software WinOR03 supplied with the OR03 Programmable Optical Repeater.

The WinOR03 is a software instrument that integrates the OR03 Programmable Optical Repeater and allows displaying the measured field probe level directly on a Personal Computer screen.

3.2 Hardware requirements

To ensure the proper operations of the WinOR03 software, the minimum hardware requirements of the Personal Computer are

- Processor Pentium
- 16 Mb RAM
- 10 Mb free space on hard disk;
- Windows Operating system™ XP/Vista/Win7/Win8/Win8.1/Win10



Software and Firmware updates can be downloaded from the web page <https://www.narda-sts.it/>.

3.3 Installation



To install the WinOR03 on PC from the supplied Software Media as follows:

Do not connect the OR03 to the PC until the installation is completed.

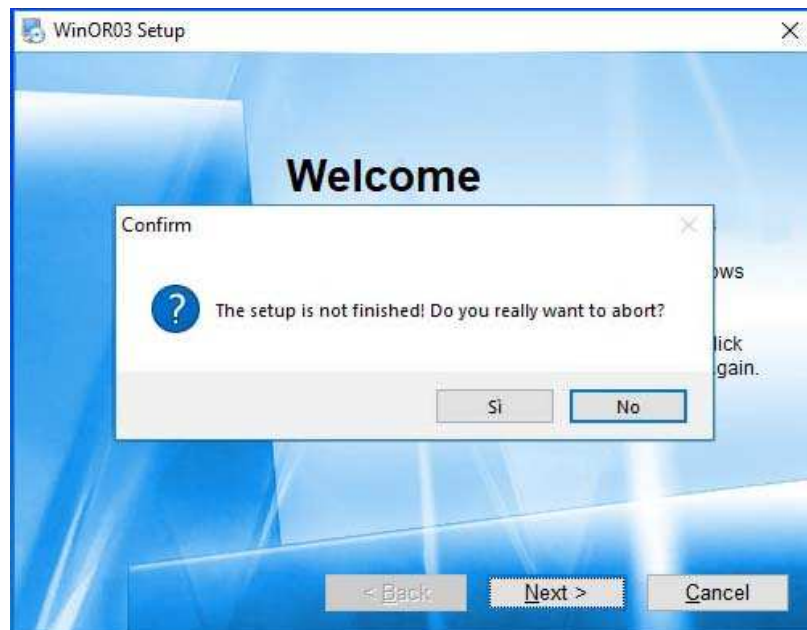


The User must have administrator privileges to install the WinOR03 software in Windows 7, 8 etc.; right click on the program .exe file and click on “Run as administrator” to temporarily run the program or application as an administrator until close it (Windows also allows to mark an application so that it always runs with administrator rights).

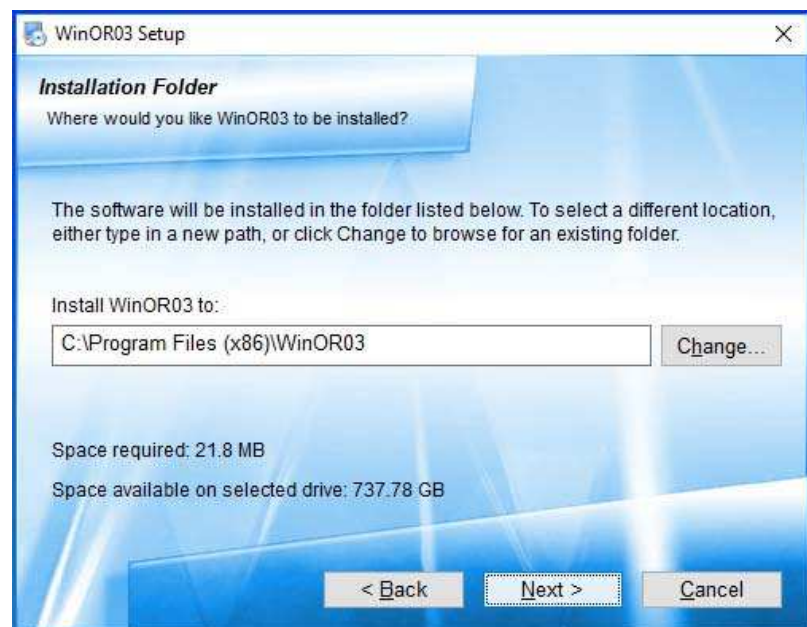
Browse the Software Media in Computer Resources and double click on the **WinOR03 Setup.exe** file to start the installation

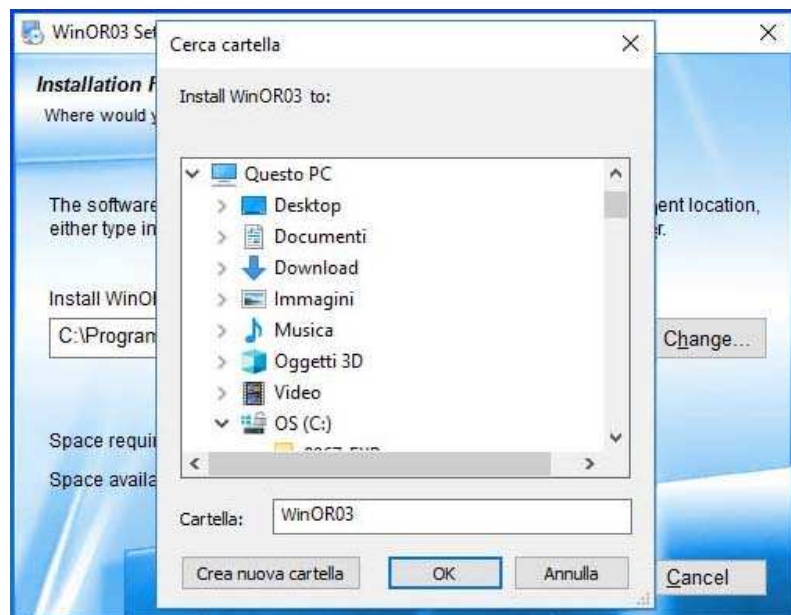


The installation can be aborted by clicking on **Cancel**:

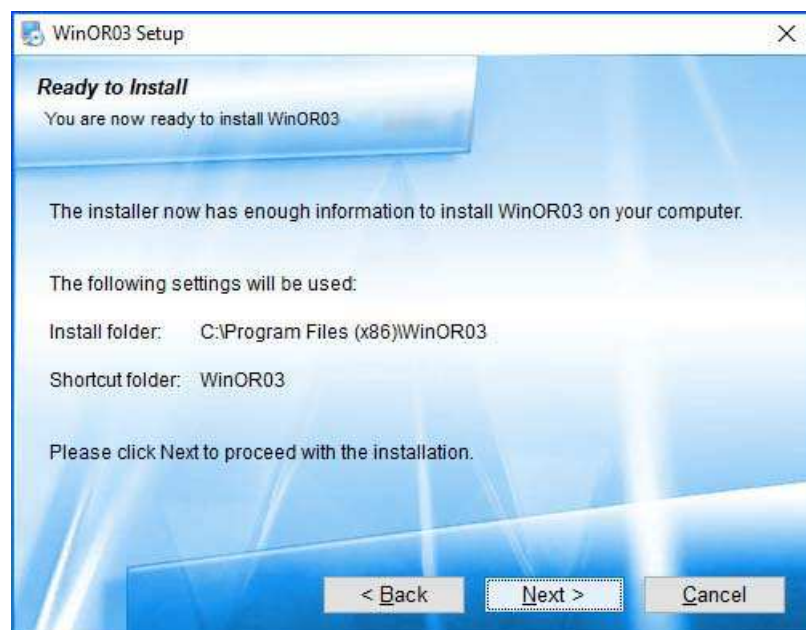


The installation folder must be specified. Click **Next** to confirm the default folder or **Change** to modify.

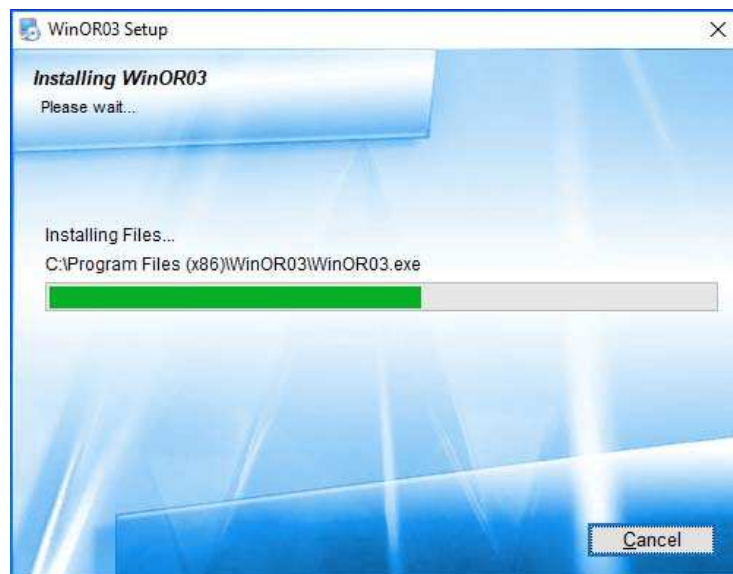




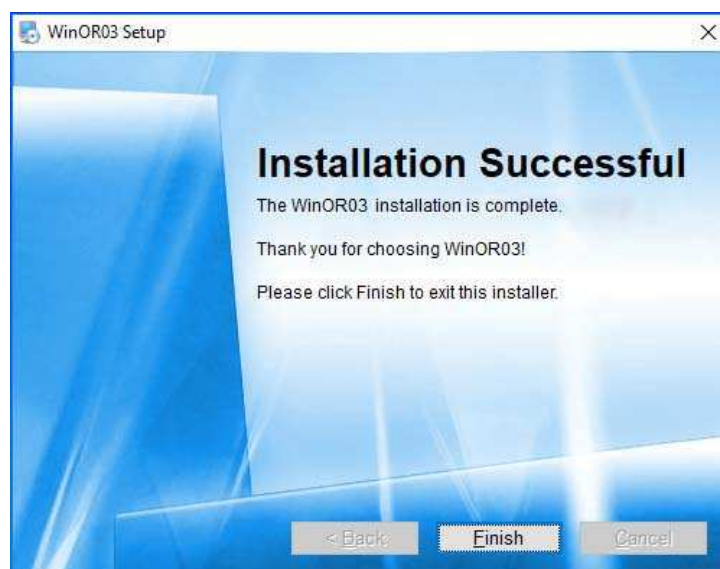
Click **Next** to proceed installing.



The installing status is displayed then:



Click **Finish** to complete and exit the installer.



The folder **WinOR03** is created under **Programs** with the icon **WinOR03** on desktop.



4 – WinOR03 Operating instructions

4.1 Introduction



This section provides the information necessary to use the WinOR03 software with the OR03 Programmable Optical Repeater.

Before starting WinOR03, it is recommended to limit the applications running on your computer.

Connect the OR03 to PC and click the icon on desktop.



Alternatively (Windows XP): **Start → All Programs → WinOR03 → WinOR03.**



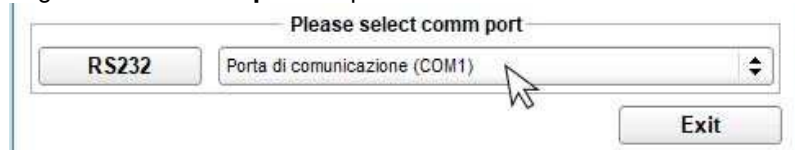
Windows Vista or 7: Click **Windows** () , **Programs**, **WinOR03**, **WinOR03**.

Windows 10: Click **Start** () , **WinOR03**, **WinOR03**

This window is displayed first.



The user can quickly change the desired communication channel by clicking onto the **Comm port** drop-down menu.

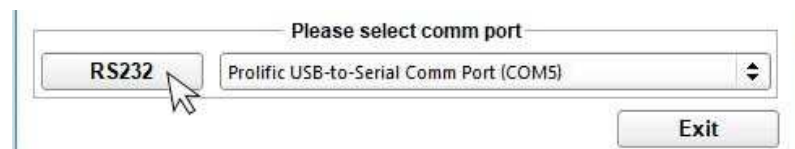


When the menu is selected, the communication port selector appears. It allows the user to choose between the RS232 port or USB-OC Converter that is needed if no RS232 port is available in the controller PC.

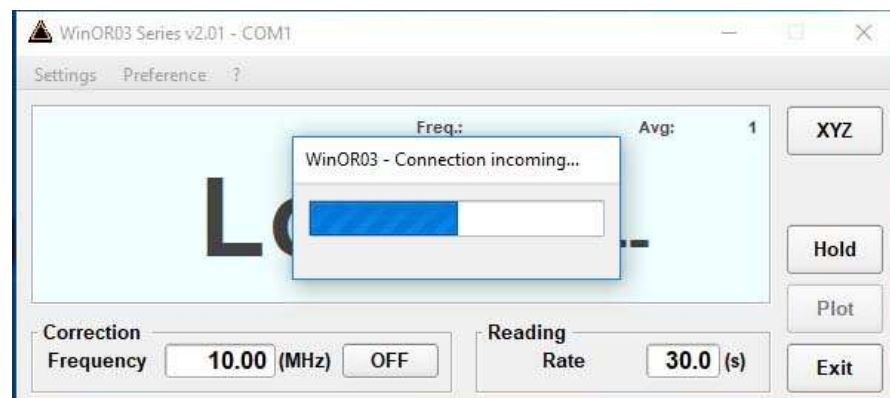


When the USB connection is used, the USB-OC converter appears among the devices as a “USB Serial Port (COMn)”.

Click on **RS232** to confirm.



Then, the main window is displayed together with the **WinOR03 - Connection Incoming** indication of the correct communication with the probe.



This message appears when OR03 is not connected or the communication is not established:

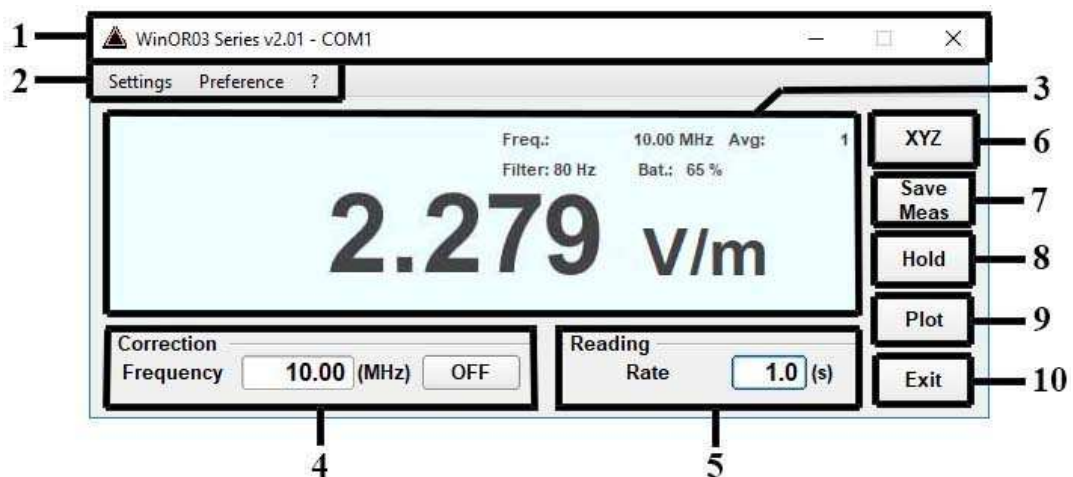


Select **NO** to quit the WinOR03.

Select **YES** to retry establishing the communication (check the OR03 correct installation before).

4.2 Main window contents

Once connected the main window is displayed:



Commands description:

1. Title bar
2. Measurements and settings
3. Settings selection (main window)
4. Correction frequency setting in MHz
5. Reading rate in seconds (s)
6. Toggle between total field value or contemporary x - y - z axis readings
7. Button to store the field value (every time the software starts the button is disabled).
8. Hold/run readings
9. Plot (graph view)
10. Exit and quit the program

4.2.1 Title bar

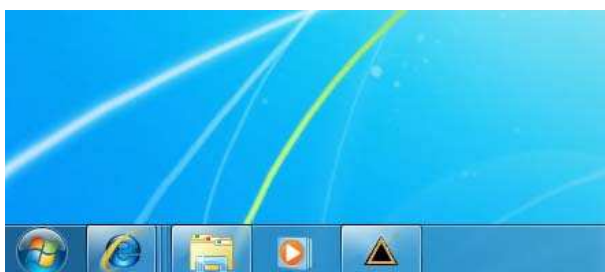
The software release shown here, together with the serial port in use to connect the OR03.



The control buttons allow to minimize to icon, enlarge/restore the main window and exit the program:



When minimizing the main window the information is displayed in the Windows application bar at the bottom of screen.



The total field measurement remains displayed on desktop meanwhile (for more information see par. "Setting/Preference/Minimized UI").



4.2.2 Main window displayed measurements

The measurements displayed in the main window are:

- **field values** as x - y - z or total (see par. "XYZ / TOT").

Mode x - y - z



Mode Total (TOT)



- **Measuring unit** the electric or magnetic field measuring unit depend on the probe model connected; the value is displayed with three decimals. Min. value displayed: 0.010 V/m or A/m

- **Correction frequency** see par. "Frequency setting"
Default: *Freq: 10.00 MHz*

- **Average and Filter** see par. "Settings"
Default: *Avg: 1 Filter: 10Hz*

- **Battery status** displayed in 5% steps. It shows the residual autonomy during measurements and the achieved autonomy during charging.



Battery voltages below 5.1V (5% of charge) are displayed red.

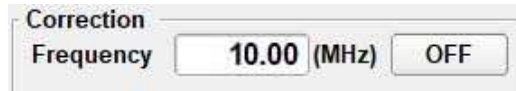
4.2.3 Frequency correction setting

This setting in MHz recalls the corresponding frequency correction factor stored in the OR03 memory. It allows an extremely precise measurement of the field level at the selected frequency.



The setting displayed at the first run is the default; the last setting will be displayed then.

The frequency is displayed with two decimals, max. resolution of 0.01 MHz. Press the enter key to enter the set frequency value.



To disable the frequency correction, click OFF; the button toggles to ON for enabling the function when required.



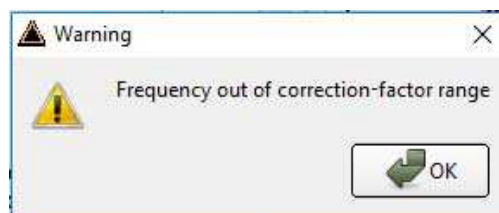

When entering the frequency correction value or enabling the function, the "Frequency value" will be updated according to the Reading Time setting.



When entering the frequency correction value while in HOLD mode, the new value will be not displayed until the HOLD is released.



The following message will appear when entering frequencies out of the probe frequency range:



4.2.4 Reading Rate setting

It shows the time interval (in seconds) between subsequent readings.
Setting resolution of 0.1 s.
Press the enter key to enter the set frequency value.




The setting displayed at the first run is the default; the last setting will be displayed then.



The minimum time interval between readings is in function of the filter setting. The table Filter (Settings/Filter) show the minimum reading rate allowed.



The max. time interval between readings is of 30 s regardless of the filter setting.



Entering a reading rate not allowed will cause a warning message to appear:



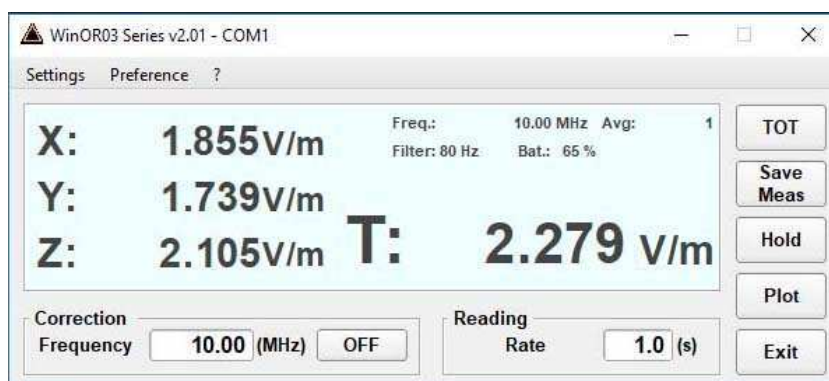
4.2.5 XYZ / TOT



Button for selecting the x - y - z (**XYZ**) or Total mode (**TOT**).
Max. display resolution: 0.001 V/m or A/m; the unit depends on the probe model.



Click on the XYZ button to toggle to Total mode.



If the field value of the probe is outside the nominal level range, the following messages are displayed:

Ovr : the field level is higher than 110% of the probe nominal maximum level (for example, 880 V/m for EP-183).

! : the field level is between 100% and 110% of the probe nominal maximum level (for example, from 800 to 880 V/m for EP-183). The symbol is close to the value.

***** : the field level is lower than probe nominal minimum level. The symbol is close to the value.

- For example, 0.8 V/m per EP-183 on the total;
- For example, 0.8 / $\sqrt{3}$ per EP-183 on the single axis.

Low : the field level is lower than 1/15 of the probe nominal minimum level.

- For example, 0.8 / 15 per EP-183 on the total;
- For example, 0.8 / (15 x $\sqrt{3}$) per EP-183 on the single axis.

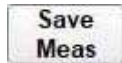


The chapter 1 of the 8053B manual includes the list of the field probes available and their technical specification

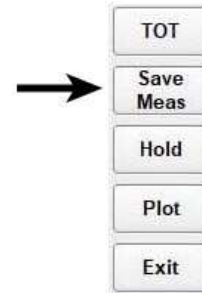
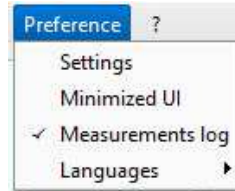


The field value outside the nominal level range could be unreliable.

4.2.6 Save Meas

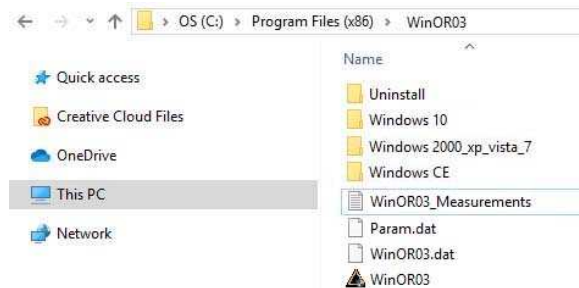


Active **Measurements Log** (✓) to display the **Save Meas** button in the main window.



When the software starts, the function **Measurements Log** is disabled

Every time the button **Save Meas** is selected, the field value is stored in the file *WinOR03_Measurements.txt* file located on the installation folder; at the first selection the file is created automatically (**the software must be run as Administrator**).



When the file is saved in TXT format and the table is opened, a huge amount of data are available

Measurements log - Thursday 23 July 2020 - 10:21:13 (EP 183)					
Time	X(V/m)		Y(V/m)	Z(V/m)	T(V/m)
10:21:13.072	7.477		6.273	1.779	9.920
10:22:56.867	LOW	*	2.167	1.892	2.870
10:23:07.947	1.154		LOW	1.046	2.020
10:23:10.154	2.995		0.402	2.980	3.170
10:23:11.355	3.999		2.178	3.024	5.440
Measurements log - Thursday 23 July 2020 - 10:23:46 (EP 183)					
Time	X(V/m)		Y(V/m)	Z(V/m)	T(V/m)
10:23:55.345	1.024		0.652	0.963	3.380
10:23:57.985	1.188		LOW	1.406	1.780
10:24:11.443	4.681		5.645	LOW	8.150
10:24:15.105	1.851		1.469	1.695	2.900
10:24:17.407	LOW	*	LOW	1.123	1.120
Measurements log - Thursday 23 July 2020 - 10:27:59 (EP 183)					
Time	X(V/m)		Y(V/m)	Z(V/m)	T(V/m)
10:28:02.725	6.375		4.330	9.478	12.210
10:28:16.004	3.474		LOW	3.514	4.940
10:28:19.146	LOW	*	LOW	1.104	1.100
10:28:21.021	2.103		LOW	2.959	2.120
10:28:28.774	LOW	*	0.305	1.018	1.630
Measurements log - Thursday 23 July 2020 - 10:53:14 (EP 183)					
Time	X(V/m)		Y(V/m)	Z(V/m)	T(V/m)
10:53:14.255	-		-	-	8.820
10:53:14.896	-		-	-	8.820

If the field value measured is outside the nominal level range, the following messages are displayed with **Ovr**, or **!** or ***** or **Low**. See the previous paragraph for further information.

For every working session (from starting to closing the software) the following headline will be created in the txt file:

```
Measurements log - Monday 20 July 2020 - 16:32:05 (EP 183)
Time      X(V/m)      Y(V/m)      Z(V/m)      T(V/m)
```

dd/mm/yyyy: working session date.

(Probe model): between brackets is reported the probe connected to the OR03

Time: hour, minute, second of the start of the working session.

Time: hour, minute, second, thousandths of a second of the measurement acquisition

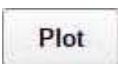
X(unit) Y(unit) Z(unit): field value on x, y and z axis. If the **XYZ** mode is not enable, each axis will be marked with a minus sign "-". Between brackets is reported the unit

T (unit). Total field value; between brackets is reported the unit.

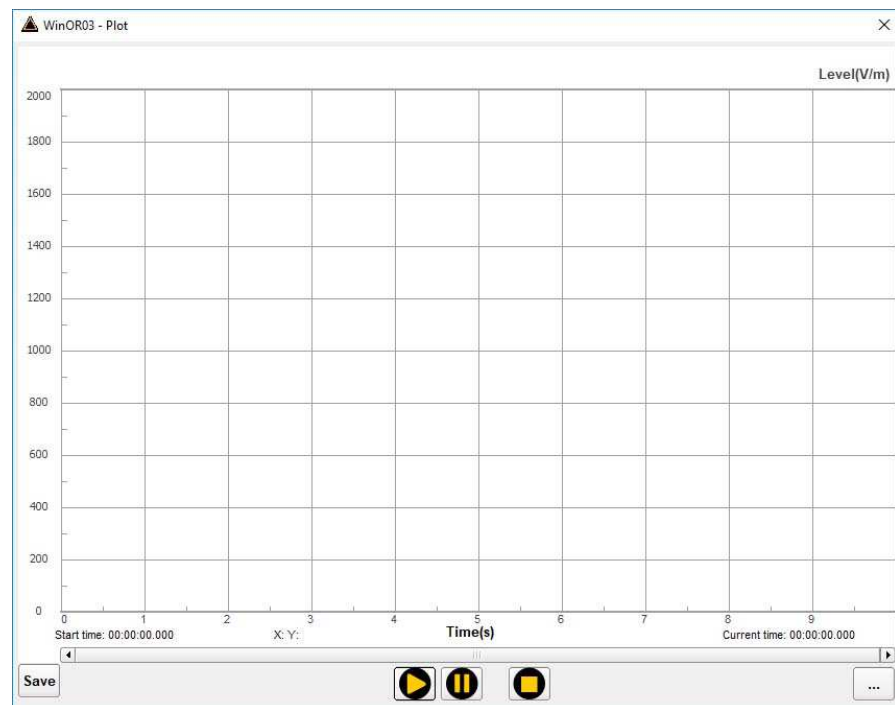


The recorded data can be viewed either as a graph or as a table. By using Word or Excel application, click the Open file command and select "Type of file": "all files"; then find the file to open starting from the directory and follow the necessary path until the file is found.

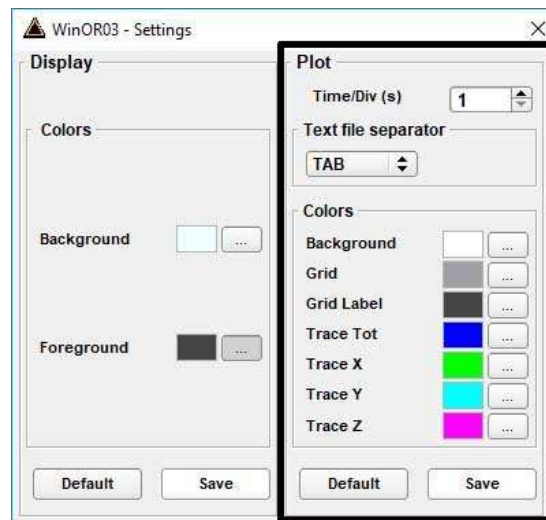
4.2.7 Plot



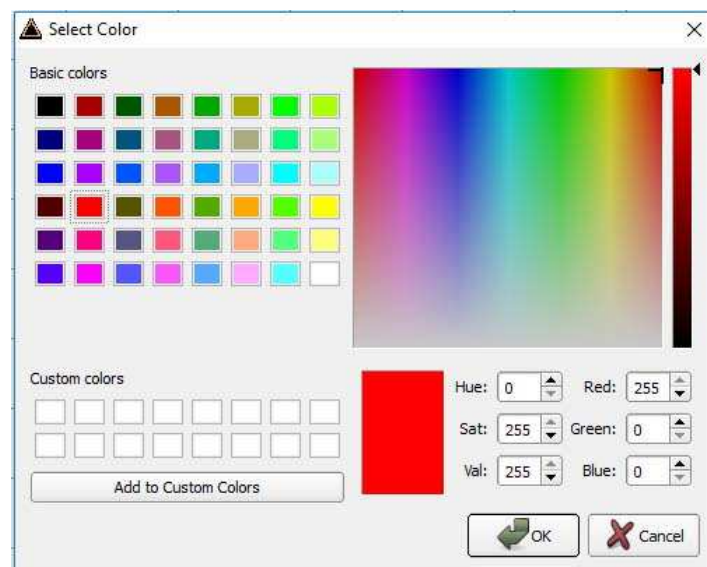
The **PLOT** function allows to show the field measured during the test in an intuitive graphical way; the plot represents the level versus time in seconds. Once selected the button **PLOT**, the graph will appear:



Use the button **Settings**  at the bottom of the screen to customize the plot appearance:



- The resolution time (**Time/Div (s)**);
- The character used as data separator when required by the table form (**Text file separator**);
- Different color combinations of the background, grid, labels and traces are listed under **Colors**. The choice is made by selecting the corresponding  to be changed and then using the Color Palette window.

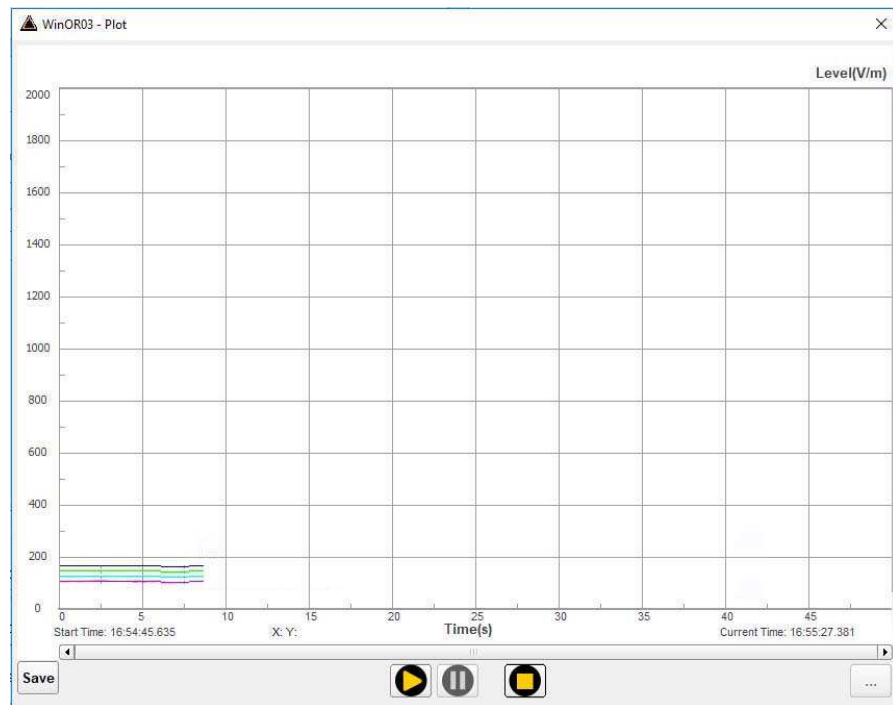


The new settings can be saved with **Save**. Otherwise, press **Default** button to completely restore the initial aspect.



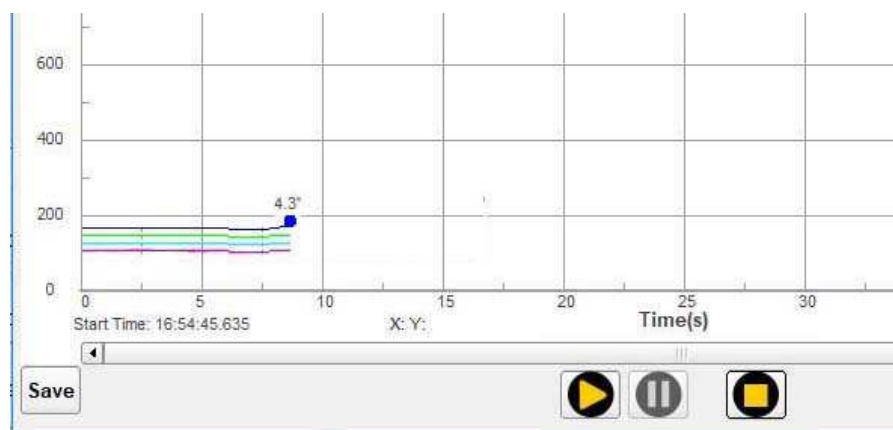
The **Display** section allows to set the desired color of the main window; see §6.2.10.2 “Preference” for further information.

Once modified the appearance of the graph, press Play  to start the analysis. In this case, the analysis is done with Time/Div set to 5s .



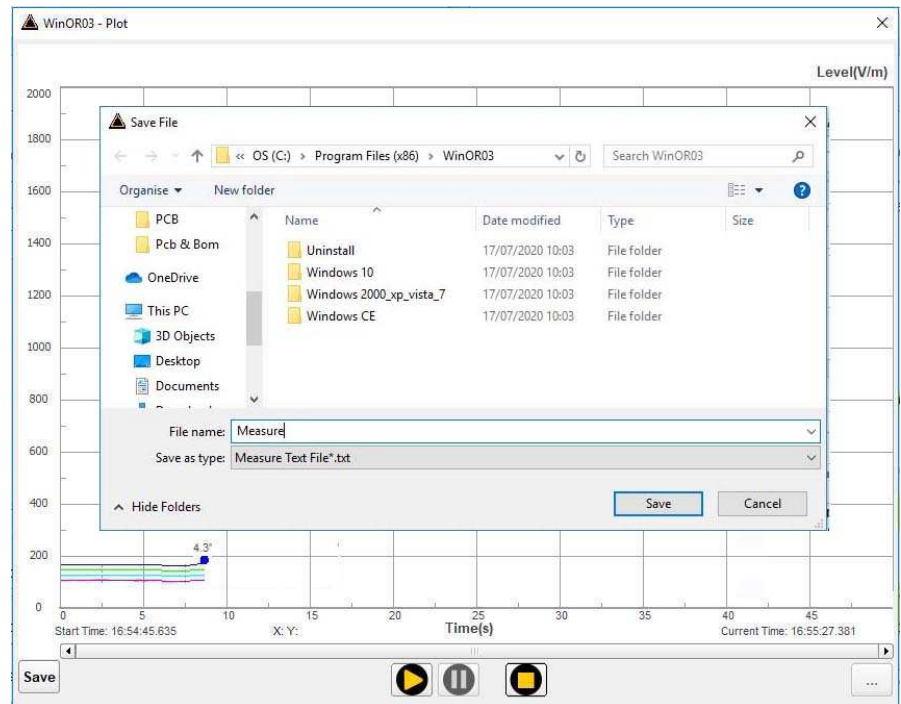
At any time, the graph can be paused  or terminated by clicking the **STOP** button .

Once pressed Pause  button, it will be shown a round marker with a "pausing" time count close to it.



In pause mode, the field produced in that interval can be saved in table form pressing **Save** button .

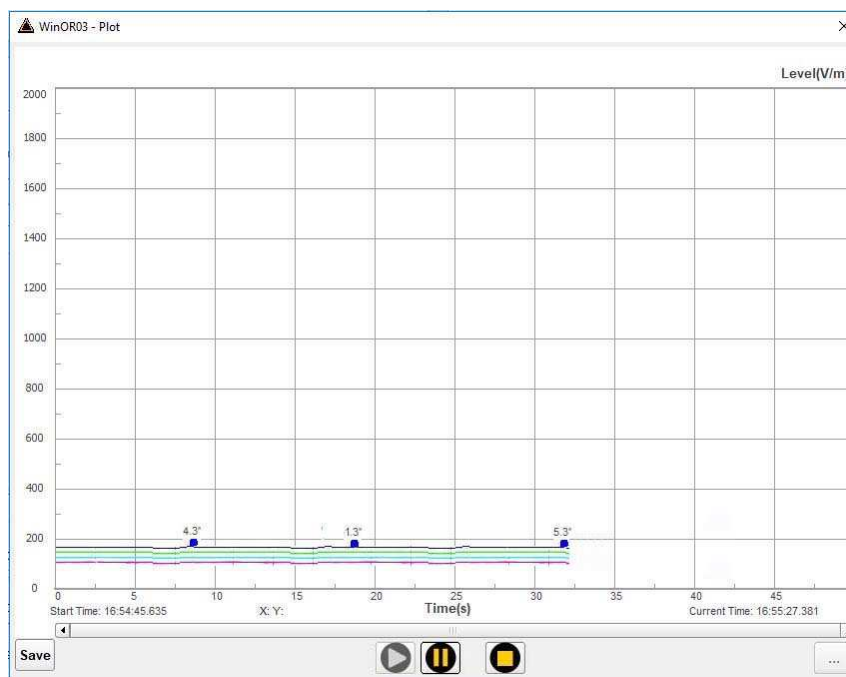
The folder must be specified, enter the file name assigned to the work session and press **Save**



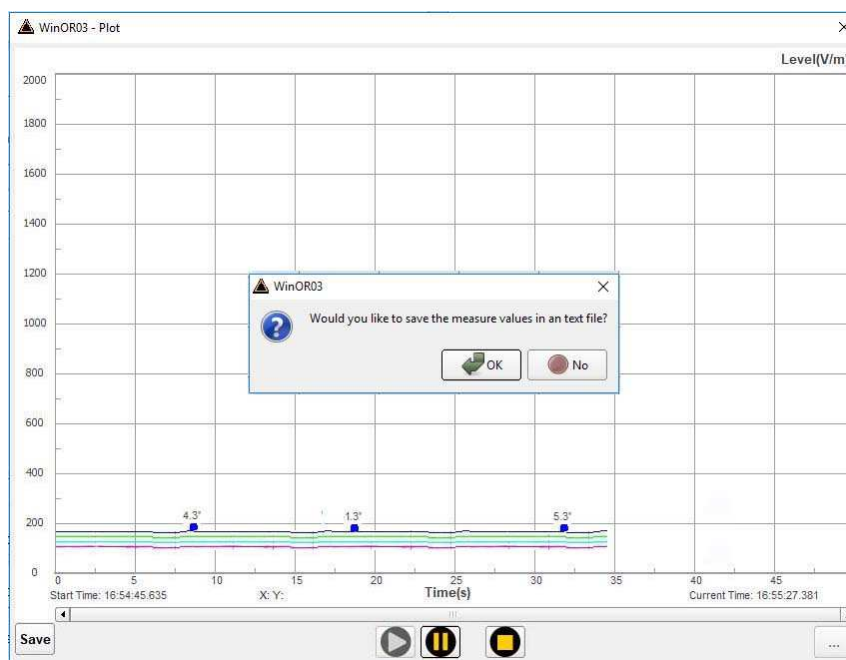
The file is saved in TXT format and once the table is opened, a huge amount of data are available

Measure - Notepad				
File Edit Format View Help				
Thursday 23 July 2020 - 12:49:09 (EP 183)				
Time	X(V/m)	Y(V/m)	Z(V/m)	T(V/m)
16:54:45.545	161.130	150.630	140.231	175.390
16:54:45.737	161.129	150.663	140.125	175.420
16:54:45.944	161.148	150.684	140.333	175.480
16:54:46.155	161.212	150.729	140.023	175.430
16:54:46.346	161.096	150.669	140.111	175.430
16:54:46.553	161.215	150.672	140.777	175.480
16:54:46.760	161.099	150.733	140.691	175.440
16:54:46.971	161.119	150.759	140.321	175.500
16:54:47.174	161.159	150.648	140.646	175.400
16:54:47.385	161.130	150.704	140.498	175.420
16:54:47.624	161.165	150.589	140.861	175.380
16:54:47.815	161.161	150.715	140.123	175.470
16:54:48.042	161.220	150.552	140.417	175.380
16:54:48.249	161.200	150.629	140.369	175.350
16:54:48.440	161.005	150.733	140.888	175.470
16:54:48.647	161.119	150.686	140.159	175.420
16:54:48.905	161.154	150.613	140.357	175.390
16:54:49.127	161.170	150.718	140.258	175.370
16:54:49.323	161.077	150.691	140.791	175.400
16:54:49.514	161.088	150.643	140.333	175.470
16:54:49.702	161.228	150.674	140.151	175.430
16:54:49.877	161.148	150.666	140.154	175.460
16:54:50.088	161.194	150.609	140.789	175.410
16:54:51.295	161.184	150.598	140.877	175.390
16:54:51.502	161.168	150.663	140.159	175.440
16:54:51.709	161.217	150.743	140.789	175.530
16:54:51.920	161.094	150.815	140.321	175.510
16:54:52.127	161.122	150.782	140.123	175.500
16:54:52.334	161.139	150.624	140.147	175.360
16:54:52.561	161.098	150.683	140.369	175.410
16:54:52.768	161.210	150.615	140.789	175.430
16:54:52.959	161.199	150.648	140.358	175.450
16:54:53.182	161.202	150.622	140.987	175.380
16:54:53.389	161.135	150.617	140.357	175.400
16:54:53.581	161.158	150.682	140.951	175.410

During the session work, the graph can be resumed with  button, paused  and saved  at any time (the existing TXT file can be overwritten or a new one can be saved with a different file name).



When the test is over, the graph can be terminate with  and the following message will appear:



Press **OK** to save. Select **NO** to exit without saving and start a new session work.

4.2.8 HOLD / RUN



Press **HOLD** to freeze the readings.
Click on the button to toggle from **HOLD** to **RUN**
The button XYZ/TOT is active even when in **HOLD**.



If the program is exit when in **HOLD** mode, it will restart in **RUN** mode.

4.2.9 EXIT



Press **EXIT** to end the program. The current settings are saved and will be recalled at the next start.

Message:

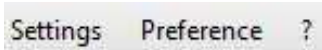


Press **YES** to close the software (the OR03 will remain on).

Press **NO** to continue using the software

4.2.10 Settings menu

Commands:



- **Settings:** set Average and Filter

- **Preference:** select program skin and enable the function **Minimized UI**

- **? (Info):** software and product information

4.2.10.1 Settings



Settings options:

- **Filter:** the OR03 internal A/D converter feature digital filters to improve resolution and sensitivity, as well to reducing interferences. The filters can be selected according to the application requirements: from the faster (F1) to the slower (F4).

To set the required filter click on the corresponding line, which turns blue. The selected filter will be displayed in the main window.



When selecting a new filter while in HOLD mode, the filter setting indication in the main window will be updated only after toggling to RUN mode.

Filter		
	Filter(Hz)	Settling time(ms)
F1	80	150
F2	40	250
F3	20	450
F4	10	900

Close

Filter(Hz): indication of the filter characteristics

- 80 Hz filter
- 40 Hz filter
- 20 Hz filter
- 10 Hz filter

Settling time (ms): time required for getting a complete reading:

- 150 ms with 80 Hz filter
- 250 ms with 40 Hz filter
- 450 ms with 20 Hz filter
- 900 ms with 10 Hz filter

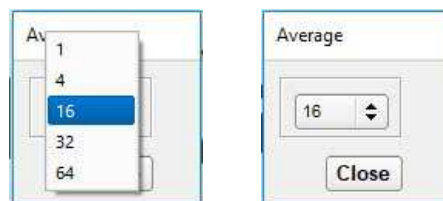
Normally a fast field measurement is required for faster response and better stability when the field probe controls as feedback for a preset field value the radiated power of a system composed by antenna and RF generator.

However, as faster the measurements as higher the noise is, with consequent reduction of sensitivity.

Slower measurements increase sensitivity but increase the response time and the power consumption.



- **Average:** setting of the number (1, 4, 16, 32 or 64) of readings to calculate the arithmetic average (AVG).



When setting **Average = 1**, the readings are not averaged and the current measurements are displayed.

In the example, the average value of the last 16 field readings will be displayed. The “**Avg**” counter shows the progressing of the average calculation, updating according to the “Reading rate” time interval setting.



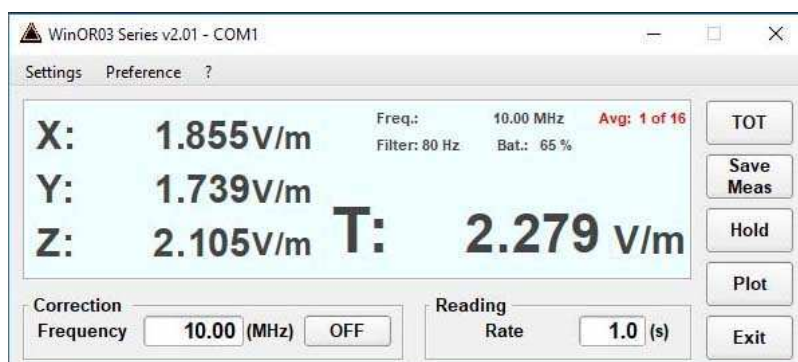
The message **AVG: OK** will be displayed shortly after completion of the averaging process, then followed by the indication of the preset averaging **Avg: 16**.

Then the process continues in moving Average mode: of the 16 readings block, the older is discarded and the latest is added at the speed of the Reading rate setting.

The process is restarted from the beginning when setting a different Average value.



When toggling from TOT to XYZ mode the Average is reset to recalculate the field values for each single axis.

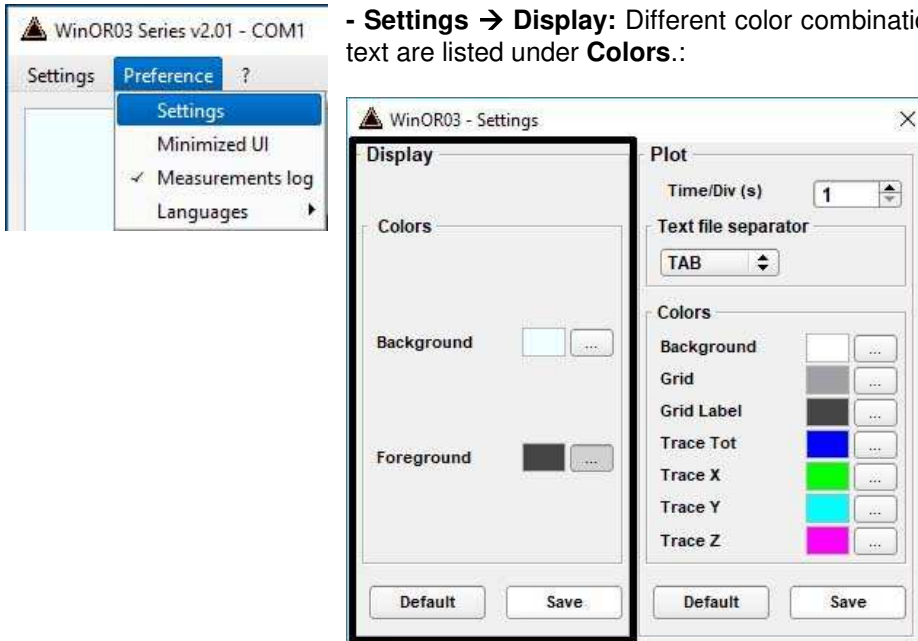


When in **HOLD** mode, the new Average value is displayed in the main window and is updated only when the **HOLD** is released.

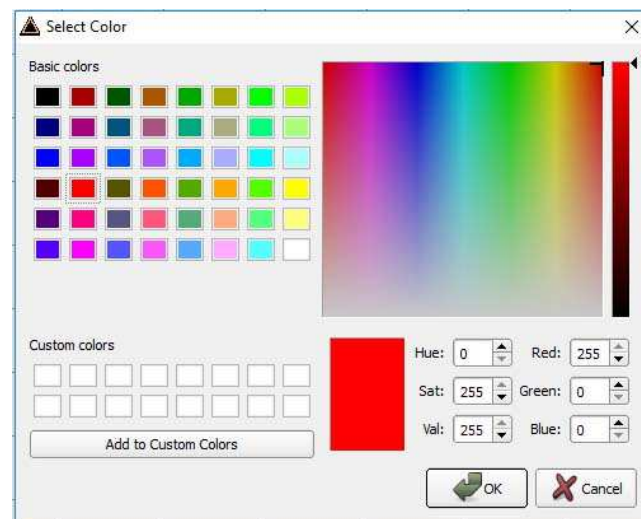
4.2.10.2 Preference

Functions of the **Settings** menu:

- **Settings** → **Display**: Different color combinations of the background and text are listed under **Colors**.

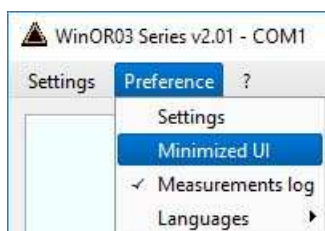


The choice is made by selecting the corresponding  to be changed and then using the Color Palette window.



The new settings can be saved with **Save**. Otherwise, press **Default** button to completely restore the initial aspect.

The **Plot** section allows to set the desired color of the plot; see §5.2.7 “Plot” for further information.



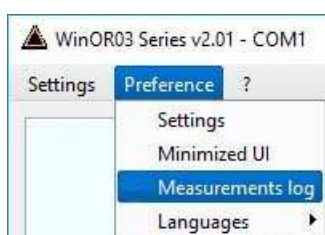
- **Minimized**: enable the function **Minimized UI (Unit Interface)** to keep the field readings displayed on desktop when minimizing the main window on the tray.



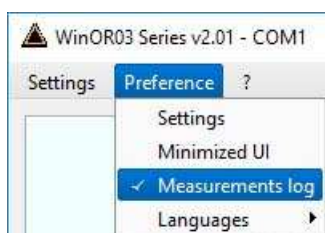
This window can be moved anywhere on the desktop, keeping its final position even at the next minimizing of the main window.



To close this window, restore the main window from the tray and deselect the “Minimized UI” function.



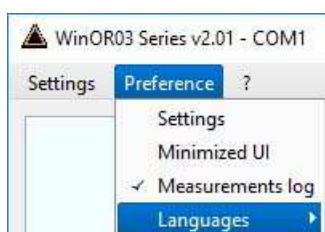
- **Measurements Log**: click on it to enable the function **Measurements Log** to display the **Save Meas** button in the main window. The symbol ✓ means that the function is activated.



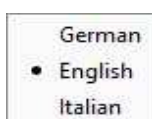
See **Save Meas** button for further information.



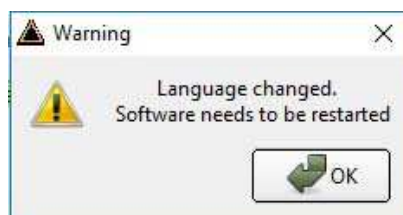
Every time the software starts, the function **Measurements Log** is disabled.



- **Languages**: selection of different language of the main window among:



Once selected the new language, a message will appear:

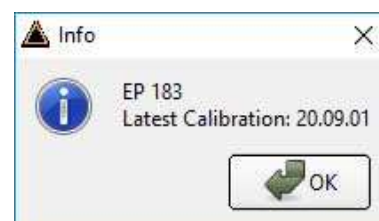
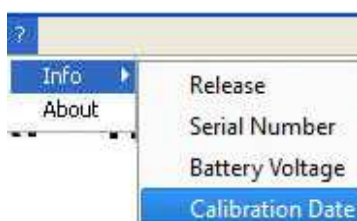
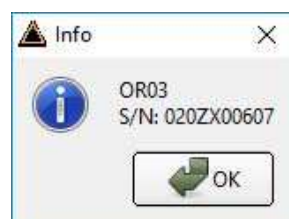
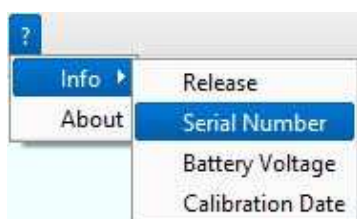
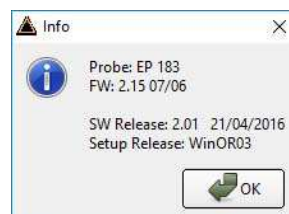


Confirm with **OK** to restart the software with the new language.

4.2.10.3 Info button

Contents:

- **Info:** Probe model, current OR03 firmware and date, current WinOR03 release and date, serial number, battery voltage and latest probe calibration.



- **About:** Manufacturer information.



4.3

Uninstalling WinOR03

Press **EXIT** to quit WinOR03, disconnect the OR03 from the PC and uninstall the software.

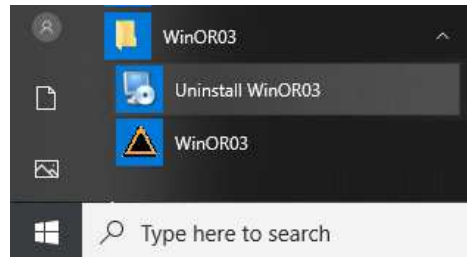
In Windows XP: click **Start, All Programs, WinOR03, Uninstall WinOR03**.



In Windows Vista or 7 click **Windows**  and in Windows 10: click **Start**



. Then **WinOR03, Uninstall WinOR03**.

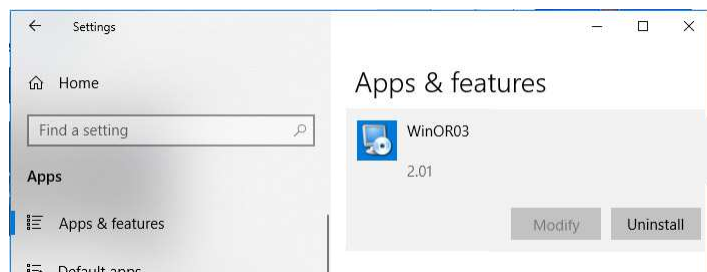


If the Uninstaller is not available:

Click **Start, Settings, Control Panel** and **Add or Remove Programs** (**Programs and functions** for Windows Vista or 7). Find **WinOR03** then click **Remove** and follow the instructions.



Click **Start, Settings, App&Features**. Find **WinOR03** then click **Uninstall** and follow the instructions.



When asked if removing the shared files, answer NO to prevent other programs not to run correctly.

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5 – Uninstalling USB-OC

5.1 Uninstalling driver for USB-OC

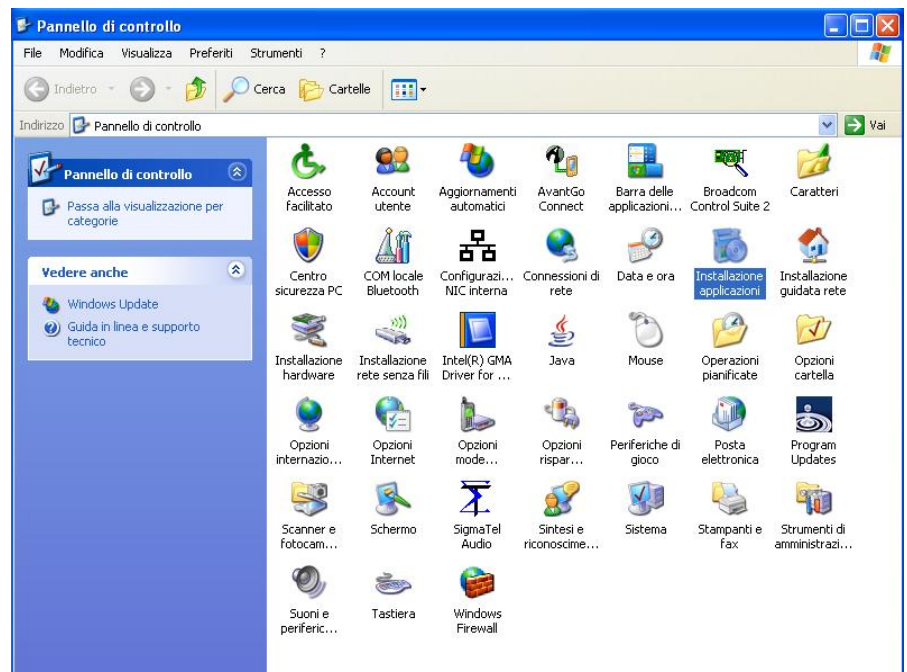
It is possible to remove the USB-OC driver from the PC according to the following procedure:

Open the Windows Control Panel.

The following procedure shows how to remove the driver in Windows XP environment. It may be different depending on the operating system in use.



Double click "Application Installation".



From the application list select “FTDI FTD2XX USB Drivers” and click “Change/Remove”.

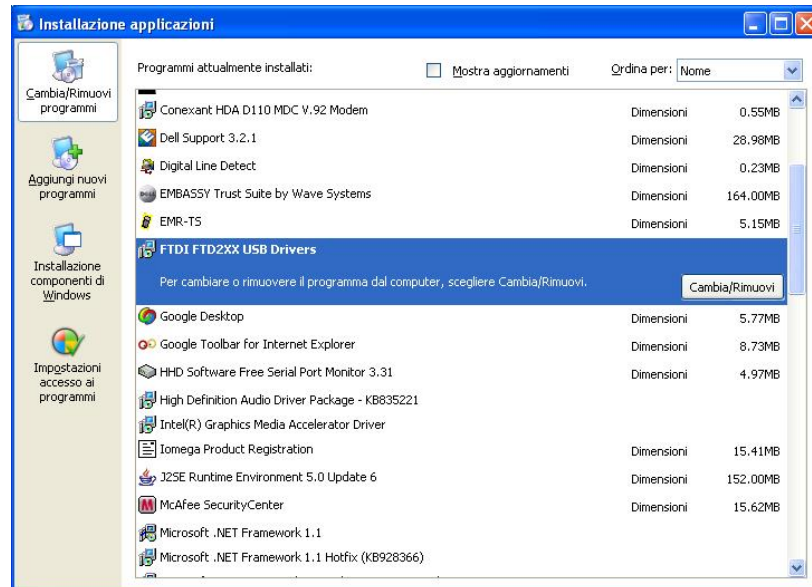
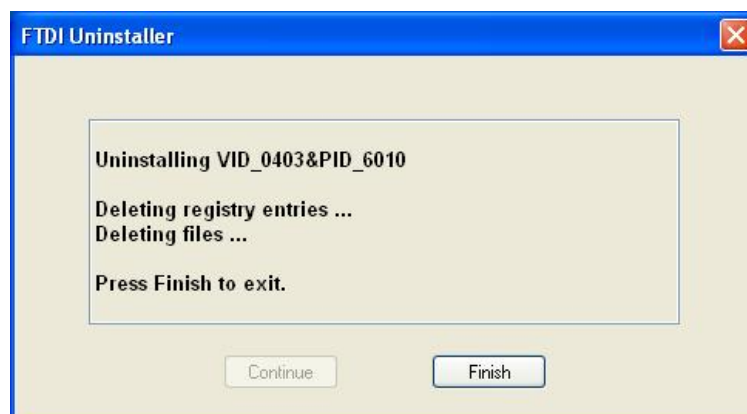


Fig. 5-1 Uninstalling USB-OC

Unplug the USB-OC converter, if connected, and click “Continue”.



Click “finish” to exit the uninstaller, USB driver is now removed from your system.

6 - Command protocol

6.1 Introduction

This chapter provides the information required to control the OR03 Programmable Optical Repeater via the fiber optic connected to a PC and by means of user's own PC software applications.

The serial transmission between the host and the OR03 is in USB (USB-OC) or RS232 (8053-OC) standard.

Communication protocol is the following:

- Baud: 9600 or 38400 (automatic selection)
- Parity: NONE
- Length: 8 bit
- Bit Stop: 1

The commands have the following general format:

#00command* where:

= opens the command string;

00 = string always included;

? = for query commands only;

Command = command string;

***** = closes the command string.

The commands available are divided into two main categories:

- **Query COMMANDs;**
- **Setting COMMANDs.**

The reply is enclosed between the **#** and the ***** character.

Example: to request the probe's name is as follows **#00?N***

The answer is **#EP330 ***

The Baud Rate is set at 9600 baud as default.

To switch to 38400 baud, simply send a command at 38400 and the OR03 will automatically switch to the current rate.

It is possible to return to a 9600 baud by following the same procedure. Obviously, in such a case, the previous command is lost.

To allow operation with 8053B accessory, OR03 is automatically set in "Master" mode at power ON.

Measurement data are continuously sent over the communication port regardless of received commands.

Since this operating mode might be not useful when interfacing to other software, any command can be sent to the analyzer to turn it in "Slave" mode; while operating in Slave mode, OR03 send answers to the received commands according to the communication protocol described below.

To turn the OR03 in "Master mode", switch the probe off and then on again; it will be automatically set in Master mode at power ON.

The OR03 automatically turns off 15 minutes after receiving a command to save battery.

6.2 List of commands

Query COMMANDs

Syntax	Function
#00?V*	Requests Firmware version.
#00?N*	Requests Probe name.
#00?R*	Requests Probe calibration date.
#00?U*	Requests Probe unit
#00?K*	Requests Frequency correction value.
#00?T*	Requests Total field.
#00?E*	Requests Batteries status.
#00?X*	Requests X component of the field.
#00?Y*	Requests Y component of the field
#00?Z*	Requests Z component of the field

Setting COMMANDs

Syntax	Function
#00k n*	Sets the frequency correction value and makes it active.
#00K n*	Sets the frequency correction value, makes it active and returns the string
#00w8*	Sets the post-filter on 80Hz.
#00w4*	Sets the post-filter on 40Hz.
#00w2*	Sets the post-filter on 20Hz.
#00w1*	Sets the post-filter on 10Hz.
#00W8*	Sets the post-filter on 80Hz and reply with the following string # Bw:80.0 Hz*
#00W4*	Sets the post-filter on 40Hz and reply with the following string # Bw:40.0 Hz*
#00W2*	Sets the post-filter on 20Hz and reply with the following string # Bw:20.0 Hz*
#00W1*	Sets the post-filter on 10Hz and reply with the following string # Bw:10.0 Hz*

6.3 Query commands

Using these commands the OR03 can be queried with a series of requests to which the repeater will respond.

Query commands are characterized by the character ? in the string.

TABLE 6-1 Query commands

#00?V*	Requests Firmware version. Example #OR03 1.00 09/00*
#00?N*	Requests Probe name. Example #EP330*
#00?R*	Requests the Probe calibration date. Example #19.07.99*
#00?U*	Requests Probe unit Example # V/m*
#00?K*	Requests Frequency correction setting. Example # FREQ 50.5 * In case it is disabled the answer will be # FREQ OFF *
#00?T*	Requests Total field. The answer is as follows: # nnnn* where nnnn is the field value without unit of measure. The unit of measure is implicit and is always that of the probe. Example # 5.235 *
#00?E*	Requests Batteries status. Example #BAT=6.48V* Example #BAT=Charging*
#00?X*	Requests the X component of the field with frequency correction if activated. The answer is in the format: # nnnn* where nnnn is the field value without measuring unit. The unit of measure is implicit and is always that of the probe. Example # 1.25 *
#00?Y*	Requests the Y component of the field with frequency correction if activated. The answer is in the format: # nnnn* where nnnn is the field value without measuring unit. The unit of measure is implicit and is always that of the probe. Example # 1.25 e-2*
#00?Z*	Requests the Z component of the field with frequency correction if activated. The answer is in the format: # nnnn* where nnnn is the field value without measuring unit. The unit of measure is implicit and is always that of the probe. Example # 20.023*

6.4 Settings commands

These commands are used to make settings on the OR03.

TABLE 6-2 Setting commands

#00k n*	Sets the frequency correction value and makes it active. The <n> item represents the frequency in MHz. When <n> is out of the probe frequency range, the correction is disabled. Example #00k 503.8*. You must leave a space between the character k and <n>. To disable the correction, set <n> out of the frequency range of the probe. Example #00K 0*
#00K n*	Sets the frequency correction value, makes it active and responds returning the string with the value set. Example #00K 251.5* returns #FREQ 251.5* Example #00K 0* returns #FREQ OFF *
#00w8*	Sets the post-filter on 80Hz.
#00w4*	Sets the post-filter on 40Hz.
#00w2*	Sets the post-filter on 20Hz.
#00w1*	Sets the post-filter on 10Hz.
#00W8*	Sets the post-filter on 80Hz and responds with the following string #Bw:80.0 Hz*
#00W4*	Sets the post-filter on 40Hz and responds with the following string #Bw:40.0 Hz*
#00W2*	Sets the post-filter on 20Hz and responds with the following string #Bw:20.0 Hz*
#00W1*	Sets the post-filter on 10Hz and responds the following string #Bw:10.0 Hz*

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7 - Accessories

7.1 Introduction

This section provides information required for installing and using accessories of the OR03 Programmable Optical Repeater. Information is included regarding initial inspection, power requirements, interconnections, work environment, assembly, cleaning, storage and shipment.

The following general information is applicable to all accessories.

7.2 Preliminary inspection

Inspect the packaging for any damage.

NOTICE

If the packaging or anti-shock material have been damaged, check that the contents are complete and that the product has not suffered electric or mechanical damage.

Check that all the Accessories are there against the checklist found with the apparatus.

Inform the carrier and NARDA of any damage that has occurred.

7.3 Work environment

Unless otherwise specified, the work environment of the Accessories, must come within the following conditions:

- Temperature From -10°C to +50° C (0°C to 40°C for Battery Charger)
- Humidity < 90% relative

The Accessories must be stored in a clean and dry environment, free from dust, acids and humidity.

The storage environment must come within the range of the following conditions:

- Temperature From -30°C to + 70°C (-20°C to 60°C for Battery Charger)
- Humidity < 95% relative

7.4 Return for repair

When the Accessories need to be returned to NARDA for repair, please complete the questionnaire appended to this User's Manual, filling in all the data that will be useful for the service you have requested.

For reducing the period of time required for the repairs, it is necessary to be as specific as possible in describing the problem. If the problem only occurs in certain circumstances, please describe in detail how it happens.

If possible it is better to reuse the original packaging; making sure that the apparatus is wrapped in thick paper or plastic.

Otherwise, use strong packaging by using a sufficient quantity of shock absorbent material around all sides of the product to ensure that it is compact and does not move around inside the package.

In particular, take every precaution to protect the front panels.

Finish the package by sealing it up tightly.

Apply a FRAGILE label to the package to encourage greater care in its handling.

7.5 Cleaning

Use a dry, clean and non-abrasive cloth for cleaning the instruments.

NOTICE

Do not use solvents, acids, turpentine, acetone or other similar products for cleaning the devices in order to avoid damaging them.

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7.6

USB-OC Optical USB Converter

7.6.1 Introduction



USB-OC is an standard accessory of the OR03 Programmable Optical Repeater.

It converts the signals of some of the system's accessories, which are only connected via fiber optic, into USB-compatible signals. It, therefore, makes it possible to link the following items up to the USB port of any Personal Computer to operate them in conjunction with specific application software and for firmware updating.

- EHP-50F Electric and Magnetic Field Analyzers, 1 Hz – 400 kHz
- EHP-200A Electric and Magnetic Field Analyzers, 9 kHz – 30 MHz
- EHP-200AC Electric and Magnetic Field Analyzers, 3 kHz – 30 MHz

Either USB-OC or 8053-OC is indispensable for updating the internal firmware via a Personal Computer and update software is available free-of-charge on NARDA's Web site at: <http://www.narda-sts.it>

7.6.2 Installation

Insert USB-OC in the connector of a free USB port of the PC, connect the fiber optic coming from the repeater or other Accessories treating the locating key with care.

Considering the very low consumption of the device, the power required by USB-OC is taken directly from the USB port of the PC. This means no maintenance is needed.

Table 7-1 Technical specifications of the USB-OC Optical USB Converter

Max. length of the fiber optic	40 m (10m with 8053B, OR03 and EHP200A/AC)
USB Connector	Type A Male



NOTE

The link between USB-OC and a HUB USB device or USB cable extension could not work properly. Connect the USB-OC to the PC directly.

Front view



Key:

Fiber optic connector

Rear view



Key:

USB Type A Male

Fig. 7-1 USB-OC adapters

Power supply

USB-OC is powered directly from the USB port of the PC.

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7.7

8053-OC Optical RS232 Converter

7.7.1 Introduction



8053-OC is an optional accessory of the OR03 Programmable Optical Repeater.

It converts the signals of some of the system's accessories, which are only connected via fiber optic, into RS-232-compatible signals. It, therefore, makes it possible to link the following items up to the serial port of any Personal Computer to operate them in conjunction with specific application software and for firmware updating.

Either 8053-OC or USB-OC is indispensable for updating the internal firmware via a Personal Computer and the update software is available free-of-charge on NARDA's Web site at: <http://narda-sts.it>

7.7.2 Installation

Insert 8053-OC in the connector of a free serial port of the PC, connect the fiber optic coming from the repeater or other Accessories treating the locating key with care.

Considering the very low consumption of the device, the power required by 8053-OC is taken directly from the serial port of the PC. This means no maintenance is needed.

Table 7-2 Technical specifications of the 8053-OC Serial Optical Converter

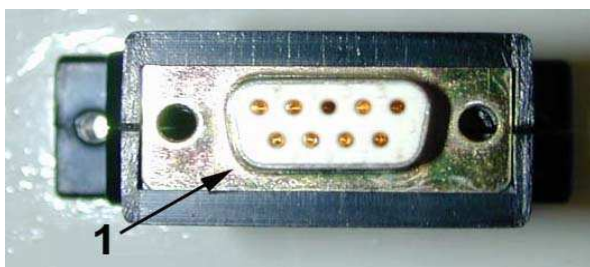
Max. length of the fiber optic	80 m
RS 232 Connector	9 pin DB9

Front panel



Key:

1 – Fiber optic connector



Rear panel

Key:

1 - RS232 female DB9 connector

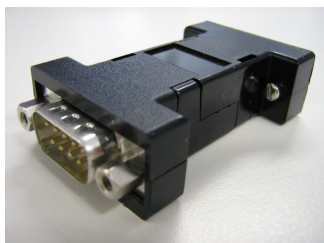
Fig. 7-2 8053-OC Panels

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7.8

8053-OC-PS Power Supply

7.8.1 Introduction



8053-OC-PS is an optional accessory of the OR03 Optical Programmable Repeater.

8053-OC-PS is indispensable for some PC model do not have sufficient energy on the Serial Port to guarantee a link with 8053-OC.

7.8.2 Installation

Insert 8053-OC-PS in the connector of a free serial port of the PC or serial cable and connect the 8053-OC to 8053-OC-PS. To supply the 8053-OC-PS with 230Vac - 9Vdc Wall Adapter. Connect the fiber optic coming from the probe or other Accessories to 8053-OC.

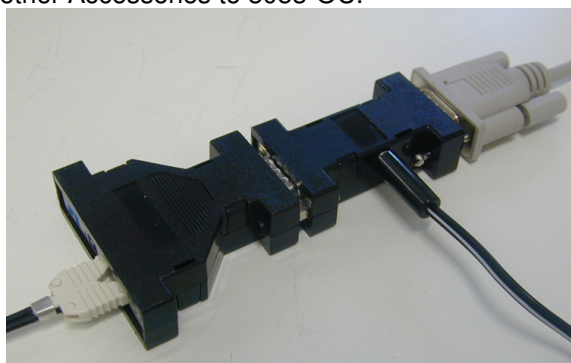


Table 7-3 Technical specifications of the 8053-OC-PS Power Supply

RS 232 Connectors

9 pin DB9



Front panel

RS232 male DB9 connector



Rear panel

RS232 female DB9 connector



Side panel

Supply male connector

Fig. 7-3 8053-OC-PS Connectors

Power supply

8053-OC-PS is powered through 230Vac - 9Vdc Wall Adapter.

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7.9

TR-02A Tripod

7.9.1 Introduction



TR02A is an Optional Accessory of the OR03 Programmable Optical Repeater. It allows OR03 to be easily supported during field measurements.

Each of these instruments has a securing screw, usually placed on the bottom part of its container, that enables it to be easily and quickly put into place through the 8053-SN swivel supplied with the tripod.

The design and materials of the TR-02A tripod have been specially selected to prevent it from disturbing the sensors and, therefore, the measurements taken.

The height of the tripod can be adjusted by means of its extendable legs and it is furnished with special feet that are able to adapt to all surfaces thereby improving stability. The height of its central support can also be adjusted.

It is supplied with a small protective carrybag to make it easy to carry.

Table 7-4 Technical specifications of the TR-02A Tripod

• Legs	3 legs x 3 extendable sections
• Transport size:	76 x 12 x 12 cm
• Minimum height:	60 cm
• Maximum height:	180 cm
• Weight	2.8 kg
• Load capacity:	10 kg
• Tripod support	Threaded insert 1/4 "

Details of the mounting head of the central column of the support and its adjustments:

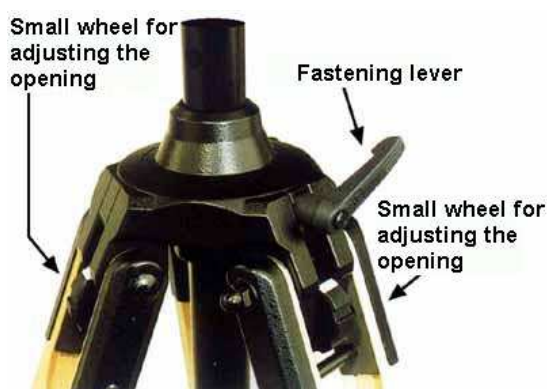


Fig. 7-4 TR-02A Tripod

The angle for opening each leg into three different positions can be adjusted by using special small adjustable wheels:

- fixed opening of 20°: White adjustment indicator is visible (as in the Figure);
- fixed opening of 45°: Red adjustment indicator is visible;
- variable opening: no indicator is visible.

The central support can be adjusted and blocked by means of a special fastening lever.

Details of the swivel for fastening to the **8053-SN**:

- full height: 8 cm
- weight: 160 g
- load capacity: 10 kg
- Threaded insert 1/4 "

The adjustable swivel makes mounting and fastening the instrument easy as well as changing the angle in any directions via the locking knob.



7.10

TT-01 Fiber Glass Telescopic Support

7.10.1 Introduction

TT-01 is an Optional Accessory of the OR03 Programmable Optical Repeater. It allows OR03 Repeater to be easily supported during field measurements.

This device, on the top part of its container, has a screw to fix the relative apparatus.

The design and materials of the TT-01 have been specially selected to prevent it from disturbing the sensors and, therefore, the measurements taken.

Table 7-5 Technical specifications of the TT-01 Fiber Glass Telescopic Support

• Diameter	32 mm
• Minimum height:	120 cm
• Maximum height:	420 cm
• Weight	500 g

TT-01 Fiber Glass Telescopic Support with soft carrying case



The height of the TT-01 can be adjusted.

Fig. 7-5 TT-01 Fiber Glass Telescopic Support

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7.11

PMM SB-10 Switching Control Box



Please refer to SB-10 User's manual



Fig. 7-6 SB-10 front view



Fig. 7-7 SB-10 rear view

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Caro cliente

grazie per aver acquistato un prodotto NARDA! Sei in possesso di uno strumento che per molti anni ti garantirà un'alta qualità di servizio. NARDA riconosce l'importanza del Cliente come ragione di esistenza; ciascun commento e suggerimento, sottoposto all'attenzione della nostra organizzazione, è tenuto in grande considerazione. La nostra qualità è alla ricerca del miglioramento continuo. Se uno dei Suoi strumenti NARDA necessita di riparazione o calibrazione, può aiutarci a servirla più efficacemente compilando questa scheda e accludendola all'apparecchio.

Tuttavia, anche questo prodotto diventerà obsoleto. In questo caso, ti ricordiamo che lo smaltimento dell'apparecchiatura deve essere fatto in conformità con i regolamenti locali. Questo prodotto è conforme alle direttive WEEE dell'Unione Europea (2002/96/EC) ed appartiene alla categoria 9 (strumenti di controllo). Lo smaltimento, in un ambiente adeguato, può avvenire anche attraverso la restituzione del prodotto alla NARDA senza sostenere alcuna spesa. Può ottenere ulteriori informazioni contattando i venditori NARDA o visitando il nostro sito Web www.narda-sts.it.

Dear Customer

thank you for purchasing a NARDA product! You now own a high-quality instrument that will give you many years of reliable service. NARDA recognizes the importance of the Customer as reason of existence; in this view, any comment and suggestion you would like to submit to the attention of our service organization is kept in great consideration. Moreover, we are continuously improving our quality, but we know this is a never ending process. We would be glad if our present efforts are pleasing you. Should one of your pieces of NARDA equipment need servicing you can help us serve you more effectively filling out this card and enclosing it with the product.

Nevertheless, even this product will become obsolete. When that time comes, please remember that electronic equipment must be disposed of in accordance with local regulations. This product conforms to the WEEE Directive of the European Union (2002/96/EC) and belongs to Category 9 (Monitoring and Control Instruments). You can return the instrument to us free of charge for proper environment friendly disposal. You can obtain further information from your local NARDA Sales Partner or by visiting our website at www.narda-sts.it.

☒ **Servizio richiesto:** ☒ *Service needed:*

☐ Solo taratura ☐ Riparazione ☐ Riparazione & Taratura ☐ Taratura SIT ☐ Altro:
☐ Calibration only ☐ Repair ☐ Repair & Calibration ☐ Certified Calibration ☐ Other:

Ditta:

Company:

Indirizzo:

Address:

Persona da contattare:

Technical contact person:

Telefono:

Phone n.

Modello:

Equipment model:

Numero di serie:

Serial n.

☒ **Accessori ritornati con l'apparecchiatura:** ☐ Nessuno ☐ Cavo(i) ☐ Cavo di alimentazione ☐ Altro:
☒ Accessories returned with unit: ☐ None ☐ Cable(s) ☐ Power cable ☐ Other:

☒ **Sintomi o problemi osservati:** ☒ *Observed symptoms / problems:*

☒ **Guasto:** ☐ Fisso ☐ Intermittente **Sensibile a :** ☐ Freddo ☐ Caldo ☐ Vibrazioni ☐ Altro
☒ Failure: ☐ Continuous ☐ Intermittent Sensitive to: ☐ Cold ☐ Heat ☐ Vibration ☐ Other

Descrizione del guasto/condizioni di funzionamento:

Failure symptoms/special control settings description:

Se l'unità è parte di un sistema descriverne la configurazione:

If unit is part of system please list other interconnected equipment and system set up:

[illegible]