

Operating Manual

Area Monitor System 2600

INSTRUMENT SERIES NUMBER

The serial number is placed on the rear cover of the instrument and is set out in the following way: 000XY00000.

The first four digits followed by the letter of the Series Number are the prefix, which remains the same for all identical instruments. This will change only if the configuration of the instrument has been altered.

The last five digits are the suffix which differs for each instrument.

ATTENTION: this instrument must be used according to the instructions contained in this Manual otherwise its safety will be compromised.

NOTE:

Before starting any application of this product, please read all the related documentation carefully, paying special attention to the safety instructions.

In order to ensure the correct use and the utmost safety, the user must be aware of all the information and prescriptions contained in this manual.



IP degrees of protection provided by enclosure according to EN 60529 standard: **IP54** (Total protection from dust and against water jet).

In accordance with the IEC classification, this product complies with **Safety Standard Class III** and **Installation Category III**.

This product has a tolerance **Pollution Level II** (normally non-conductive pollution only). Occasionally, however, temporary conductivity may occur due to condensation.

Before connecting this product to other equipment or accessories, and before applying power, ensure that there is a common earth connection between them.

All the information contained in this manual may be changed without prior notice.



EXPLANATION OF ELECTRICAL AND SAFETY SYMBOLS:



- 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 THE SYMBOLS USED IN THIS DOCUMENT:



- **DANGER:**

The DANGER sign indicates a potential risk to personal safety. All the instructions must be fully understood and adhered to before proceeding.



- **WARNING:**

The WARNING sign indicates a potential risk of damage to the equipment. All the instructions must be fully understood and applied before proceeding.



- **NOTE:**

The NOTE sign indicates important information.

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SAFETY INSTRUCTIONS AND CONSIDERATIONS

This product has been designed, manufactured and tested in Italy and has left the company in full working order and in compliance with safety standards; in order to ensure the safety and the correct use of this product, the following general instructions must be fully understood and adhered to before proceeding.

- When the unit needs to be connected permanently, and before any other connection is made, attach an earth wire protective conductor.
- If the unit needs to be connected to other equipment or accessories, ensure that there is a common earth wire connection between them.
- In the case of permanent connections of units to the mains without built-in fuses or other safety devices, ensure that the main power supply is provided with adequate protection matching that of the unit rates of consumption.
- If the unit needs to be connected to mains power supply, check that the voltage and fuses are the correct rating before applying power.
- All units complying with Safety Standard Class I, are provided with cable and plug for attachment to the mains, and must only be connected to power sockets provided with earth ground connection.
- Any interruption or loosening of the earth wire protective conductor, either inside or outside the unit, or mishandling of the connecting cable can cause a potential risk to personal safety.
- The earth wire protective conductor must not be interrupted intentionally.
- In order to avoid the danger of an electric shock do not remove covers or the unit protective panels, for maintenance and assistance refer only to a qualified service center.
- To avoid the risk of fire, replace the fuses only with those of the same type and rating.
- Always observe safety rules and regulations and any additional information contained in this manual in order to prevent and avoid damage and personal injury.



FIRST AID RULES in case of electric shock :

- 1) lay the injured person on his back;
- 2) remove any obstruction from his mouth and throat;
- 3) rotate his head, as shown in the picture, this will help breathing;
- 4) with your fingers, block his nostrils;
- 5) take a deep breath;
- 6) cover his mouth with yours and blow making sure his chest is rising;
- NOTE: blow forcefully into the mouth of adults, gently into children's;
- 7) move your face away to allow him to breath out, and make sure his chest is falling;
- 8) repeat this five or ten times at a rapid rate, then every three to five seconds;
- 9) keep his head tilted back as far as possible all the time;
- 10) **ask for help and have someone send for a Doctor;**
- 11) **Keep the patient warm and loosen his clothing.**

**DO NOT GIVE THE PATIENT ANYTHING TO DRINK
UNTIL HE HAS REGAINED CONSCIOUSNESS**

EC Declaration of Conformity

(in accordance with the directives: EMC 89/336/EEC and low voltage 73/23/EEC)

This is to certify that the product: 2600 REMOTELY OPERATED STATION FOR MONITORING ELECTROMAGNETIC FIELDS

Produced by: PMM S.r.l. Socio Unico
Via Benessea 29/B
17035 Cisano sul Neva (SV) - ITALY

conforms with the following European Standards:

Safety: CEI EN 61010-1 – 1994 & CEI EN 61010-1/A2 - 1996

Electromagnetic Compatibility: EN 61326-1 - EN 61326/A1

This product complies with EEC directives on low voltage requirements 73/23/EEC, amended 93/68/EEC, and with the EMC Directive 89/336/EEC amended by 92/31/EEC, 93/68/EEC, 93/97/EEC.

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1 – General information

1.1 Documentation

In this Manual you will find the following enclosures:

- A questionnaire to be returned completed, to Narda together with the unit, should servicing be required.
- A check-list of all the accessories enclosed with the shipment.

This manual includes the description of the accessories of the electromagnetic fields measuring system.

1.2 Instrument series number

The instrument series number is placed on the back cover of the unit.

The serial number is expressed in this format: 000XY0000.

The first four digits followed by the letter of the Series Number represent the prefix which remains the same for all identical instruments, this will only change in the event of a new configuration to the instruments. The last five digits is the suffix which differs for each instrument.

1.3 Narda 2600 System Introduction

The Narda 2600 system represents a “state of the art” solution for reliable and accurate continuous acquisition of electromagnetic fields in remote locations. The standard 2600 Field Monitoring Station is powered by two solar panels with internal batteries for back-up. Other configurations include four solar panels model 2600/15 and indoor configuration with external power source model 2600/30. Each station can be remotely configured or programmed via PC for downloading of stored data, modifying system configuration and activating measurements setups. Acquired data can be presented in various tabular and graphical formats.

A wide variety of alarm combinations are possible, including two threshold values and numerous station and system status parameters. Automatic alarm reporting can be transmitted to a PC or to a GSM PCS phone using SMS messages. Alarm identification and return to normal status are standard features.



**1.4 2600/01 Standard
Accessories**

The standard Area Monitor station is enclosed in an all-weather-proof case, which holds the meter, GSM modem, two solar panels, mounting hardware and rechargeable battery.

ATTENTION: it is mandatory to equip the station with at least one field sensor and with one SIM phone card.

The standard accessories are:

- Serial cable 1,5 m long
- Battery charger;
- Program diskette;
- Operating Manual,
- Calibration Certificate;
- Repair request form to be returned;
- Safety torx type screwdriver.
- Two brackets for the installation onto the supporting mast.

1.5 2600/15

This station is equipped with four solar panels for all applications where the sun light is limited during the year.

The station is enclosed in an all-weather-proof case, which holds the meter, GSM modem, four solar panels, mounting hardware and rechargeable battery.

The standard accessories are:

- Serial cable 1,5 m long
- Battery charger;
- Program diskette;
- Operating Manual,
- Calibration Certificate;
- Repair request form to be returned;
- Safety torx type screwdriver.
- Two brackets for the installation onto the supporting mast.

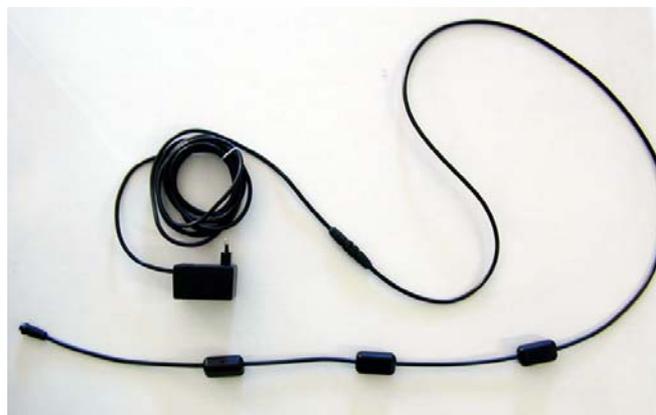


1.6 2600/30

This configuration offers the best solution for indoor applications where the sun light is not available and the station can be powered by mains power supply. The station does not have any solar panels.

The standard accessories are:

- Serial cable 1,5 m long
- Low noise linear RF filtered power supply/battery charger;
- Program diskette;
- Operating Manual,
- Calibration Certificate;
- Repair request form to be returned;
- Safety torx type screwdriver.
- Two brackets for the installation onto the supporting mast.



1.7 Optional Accessories :

- Type 300 High sensitivity Electric probe: 300 kHz – 3 GHz; 0.1 - 300 V/m
- Type 330 Electric field probe: 500 kHz – 3 GHz; 300 V/m; 0.3 – 300 V/m
- Type 344 Electric field probe for fields generated by SRB: 700 MHz – 3 GHz; 0.3 - 300 V/m
- Type 315 High sensitivity Electric field probe: 250 kHz – 1 GHz; 0.05 - 50 V/m
- Type 301 Electric field probe with high full scale: 300 kHz – 3 GHz; 1 - 1000 V/m
- Type 309 Electric field probe: 1 MHz - 18 GHz; 0.8 - 800 V/m
- Type 338 Electric field probe: 1 MHz – 40 GHz; 0.8 - 800 V/m
- Type 334 Electric field probe: 600 kHz – 800 MHz; 0.25 - 250 V/m
- Type 302 Magnetic field probe: 150 kHz – 30 MHz; 0.01 - 20 A/m
- Type 312 Magnetic field probe: 30 MHz – 1 GHz; 0.01 - 20 A/m
- Type 305 Magnetic field probe: 20 Hz – 3 kHz; 10nT - 40 μ T
- Type 306 Magnetic field probe: 20 Hz – 3 kHz; 50nT - 200 μ T
- Type 33DB Dual Electric probe: 300 kHz – 3 GHz/600 kHz – 800 MHz – 0.25 – 250V/m
- Type 33TB Triple Electric probe: 100 kHz –3 GHz/100 kHz-860 MHz/925 MHz-3 GHz – 0.5V/m
- Type 333A Electric field probe for EGSM band: 910 MHz – 970 MHz; 30 V/m
- Type 333B Electric field probe for EGSM band: 1770 MHz – 1900 MHz; 30 V/m
- Type 333C Electric field probe for EGSM band: 2085 MHz – 2195 MHz; 30 V/m
- Calibration probe
- 2600/91.01 Insulated mast, 2 m high, with base support
- 2600/01 PC Software
- 2600-SC2 top of area monitor with 2 solar panels
- 2600-SC4 top of area monitor with 4 solar panels.
- 2600-NSC top of area monitor without solar panels and new bottom panel with DC connector
- 2600-LPS linear power supply with special filter to connect 2600-IND to the mains
- 2600-WALL brackets to install 2600 to the wall
- Bracket topside
- Bracket bottomside



NOTE

The updated Narda 2600 firmware is available for downloading on the internet web site <http://www.narda-sts.com> or directly from the commercial offices of Narda.

1.8 Main specifications

The Tables 1-1 – 1-2 list the Narda 2600 and field sensors specifications.

TABLE 1-1 - Narda 2600 Technical specifications

Note: The technical specifications are subject to variations without prior notice.

Measurement range

Frequency range	5 Hz – 40 GHz
Dynamic range	depends on probe
Operating range	E: 0.03 V/m-100 kV/m H: 10 nT – 10 mT
Resolution	E: 0,01 – 100 V/m H: 0,1 nT – 0,1 mT
Sensitivity	depends on probe
Accuracy	depends on probe
Units (PC reading)	V/m, kV/m, μ W/cm ² , mW/cm ² , W/m ² , A/m, nT, μ T, mT. The units shown depend from the probe
Measured field	X, Y, Z and total; Max (Peak) and Average. X,Y and Z axis not available with Type 33DB and 33TP probes
Sampling rate	1 measurements/sec

Measuring/acquisition functions

Logging rate	5, 10, 15, 30 sec - 1, 2, 6 min
Averaging	Linear (Arithmetic) or RMS
Averaging period	5, 10, 15, 30 sec - 1, 2, 6 min
Memory	256 kByte (first in first out circular memory)
Max acquisition time	18 months with 1 sample every 6 min. (see table) before the memory is overwritten
Data downloading	Manual from PC Automatic at fixed time from the Area Monitor to the PC Automatic from PC Automatic generation of the equivalent TXT files during download
Functions	AVG, RMS, Max Peak; daily report by SMS sent to Cellular phone; Display and data marking when GSM is ON; Zoom and Marker
Daily Report	minimum battery and maximum field with time
Graph	Linear or Logarithm
Graph zooming	Vertical and horizontal
Zoom range	Full range, 2, 5, 10, 20, 50 up to x100 expansion
Alarms for E.M. fields	exceeding two programmable field thresholds
Clock	internal real time clock
SMS Messages	up to 10 different mobile phones (see table)
Probe	model and calibration date display
Battery management	remote solar panel and battery check with last 31 days display (battery voltagés and charging current are displayed) The model 2600/30 does not provide the solar panel

GSM Module	Dual Band
SIM Card	data communication type (to be provided by the user)
Probe input Interface	direct with standard Narda plug RS232 and modem
Protection	micro-switch for case opening
Software protection	dual level passwords
Alarms	case opening, high internal temperature, low battery, probe failure
Service I/O port	parallel port for servicing
Internal battery	lead battery; 6 V, 3,8 A/h
Power consumption	10 mA with GSM switched off; 30 mA with GSM in stand by 350 mA max with GSM active
External DC supply	DC, 10 – 15 V, 200 mA
Operating time	10 to 16 days in darkness with 10 min data transmission per day
Recharging time	< 24 hours with external battery charger
Self test	automatic during power on, every 7 days or remotely
Firmware update	remote via GSM or RS232
Software update	downloadable from Narda web site
Conformity	89/336, 73/23, CEI 211-6 CEI 211-7 Directives
Working temperature	-10 / +50°C
Size	(L x D x H) 200 x 200 x 710 mm
Weight	5 kg
Environmental protection	IP54

TABLE 1-2 - Narda 2600 max acquisition time

The Narda 2600 station can measure and store data over an extended period of time. The following table shows the internal memory capacity relative to the different acquisition times and type of data to be retained.

Resolut.	Total field value Average	Total field value Average and Peak	X,Y,Z+Total Average	X,Y,Z+Total Average and Peak
5 sec	>7 days	>3 days	>3 days	>45 hours
10 sec	>15 days	>7 days	>7 days	>90 hours
15 sec	>22 days	>11 days	>11 days	>5 days
30 sec	>45 days	>22 days	>22 days	>11 days
1 min	~3 months (91 d.)	>45 days	>45 days	>22 days
2 min	~6 months (182 d.)	>3 months (91 d.)	>3 months (91 d.)	>1 month (45 d.)
6 min	~18 months (546 d.)	>9 months (273 d.)	>9 months (273 d.)	>4 months (136 d.)

Stored data can be either downloaded at pre-programmed time or on remote command. In the event of memory being fully used, new data will replace the oldest ones, allowing for continuous capture of the latest available period.

TABLE 1-3 – Narda 2600 interrogate/program

You can interrogate or program every station either using a normal GSM phone or with a PC connected via modem to a phone line or a PC with Narda 2600/01 Software. The following table offers an overview of all possibilities:

Function	SMS	PC with GSM	PC with Modem	PC via RS232
Setting Area monitor set-up	YES	YES	YES	YES
Status and alarm reading	YES	YES	YES	YES
Reading of Max value	YES	YES	YES	YES
Reading of Average value	YES	YES	YES	YES
Downloading of stored field data	NO	YES	YES	YES
Battery reading	YES	YES	YES	YES
Downloading of battery status over the last 31 days	NO	YES	YES	YES
Reading of the battery value	YES	YES	YES	YES
Reading of the internal temperature	YES	NO	NO	NO
Spontaneous call	NO	YES	YES	NO
MARKERS sending	YES	YES	YES	YES
Alarm notification	YES	YES	YES	NO
Daily report	YES	NO	NO	NO

TABLE 1-4 - Narda 2600 field probes

The Narda 2600 system has a complete range of electric and magnetic field probes in the 5 Hz - 40 GHz range.

Field Probe	Frequency range	Meas. range
DUAL ELECTRIC PROBE Type 33DB	300 kHz – 3 GHz/600 kHz –800MHz	0,25 – 250 V/m
TRIPLE ELECTRIC PROBE Type 33TB	100 kHz - 3 GHz/100 kHz - 860 MHz/ 925 MHz – 3 GHz	0,5 – 300 V/m
HIGH SENSITIVITY ELECT. PROBE Type 300	300 kHz – 3 GHz	0,1 – 300 V/m
ELECTRIC FIELD PROBE Type 330	300 kHz - 3 GHz	0,3 - 300 V/m
ELECTRIC FIELD PROBE Type 344	700 MHz - 3 GHz	0,3 - 300 V/m
MAGNETIC FIELD PROBE Type 312	30 - 1000 MHz	0,01 - 20 A/m
ELECTRIC FIELD PROBE Type 315	250 kHz - 1000 MHz	0,05 - 50 V/m
MAGNETIC FIELD PROBE Type 302	150 kHz - 30 MHz	0,01 - 20 A/m
ELECTRIC FIELD PROBE Type 301	300 kHz - 3 GHz	1 - 1000 V/m
ELECTRIC FIELD PROBE Type 309	1 MHz - 18 GHz	0,8 - 800 V/m
ELECTRIC FIELD PROBE Type 338	1 MHz - 40 GHz	0,8 - 800 V/m
MAGNETIC FIELD PROBE Type 305	20 Hz – 3 kHz	10 nT - 40 μ T
MAGNETIC FIELD PROBE Type 306	20 Hz – 3 kHz	50 nT – 200 μ T
ELECTRIC FIELD PROBE Type 334	600 kHz - 800 MHz	0,25 - 250 V/m
ELECTRIC FIELD PROBE Type 333A	910 MHz - 970 MHz	0,03 - 30 V/m
ELECTRIC FIELD PROBE Type 333B	1770 MHz – 1900 MHz	0,03 - 30 V/m
ELECTRIC FIELD PROBE Type 333C	2085 MHz – 2195 MHz	0,03 - 30 V/m

TABLE 1-5

Field probes specifications

Note: The technical specifications are subject to variations without prior notice.

DUAL ELECTRIC FIELD PROBE Type 33DB

	<u>WIDE BAND</u>		<u>LOW BAND</u>
Frequency Range	300 kHz - 3 GHz		600 kHz - 800 MHz
Level Range	0.25 - 250 V/m		0.25 - 250 V/m
Overload	>500 V/m		>500 V/m
Dynamic Range	>60 dB		>60 dB
Resolution	0.01 V/m		0.01 V/m
Sensitivity	0.25 V/m		0.25 V/m
Absolute error	± 0.8 dB		± 0.8 dB
@ 50 MHz at 6 V/m			
Flatness			
10 – 300 MHz	± 0.5 dB	10 – 200 MHz	± 1.5 dB (typical +/- 0.8 dB)
3 MHz – 3 GHz	± 1.5 dB	200 – 800 MHz	± 2.0 dB (typical +/- 1.5 dB)
Isotropy	± 1 dB		± 1 dB
@ 50MHz 6 V/m			
Out band attenuation in reference at 50 MHz	Not Applicable	900 MHz – 3 GHz	> 12 dB (typical >15 dB)
H-field rejection	>20 dB		>20 dB
Temperature error	0.05 dB/°C		0.05 dB/°C
Calibration	internal E ² PROM		internal E ² PROM
Size:	352 mm, Ø 58mm		
Weight:	120 g		

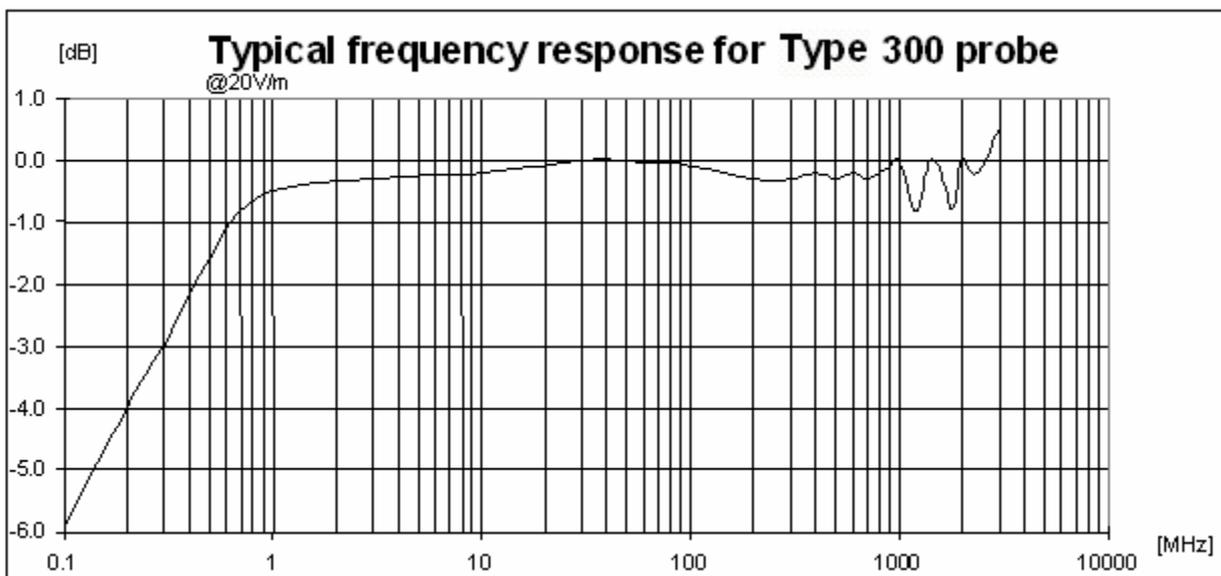


TRIPLE ELECTRIC FIELD PROBE Type 33TB

	WIDE BAND	HIGH BAND	LOW BAND
Frequency Range	100 kHz - 3 GHz	925 – 3000 MHz	100 kHz - 800 MHz
Level Range	0.5 - 300 V/m	0.5 – 300 V/m	0.5 - 300 V/m
Overload	>600 V/m	>600 V/m	>600 V/m
Dynamic Range	>55 dB	>55 dB	>55 dB
Resolution	0.01 V/m	0.01 V/m	0.01 V/m
Sensitivity	0.5 V/m	0.5 V/m	0.5 V/m
Absolute error	± 0.8 dB @ 50 MHz at 6 V/m	+/- 0.8 dB @ 1842.5 MHz at 6 V/m	± 0.8 dB @ 50 MHz at 6 V/m
Flatness	10 – 300 MHz 3 MHz – 3 GHz	10–300MHz ± 0.5dB 300MHz-3GHz +/- 1.5dB	925 – 1 GHz +1.5/- 3dB 1 – 3 GHz +/- 1.5 dB
Isotropy @ 50MHz 6 V/m	± 1 dB @ 50 MHz at 6 V/m	+/- 1 dB @ 1842.5 MHz at 6 V/m	30-300MHz ± 0.5 dB 300 – 835 MHz +/- 1.5dB 835 – 860 MHz +1.5/-3dB ± 1 dB @ 50 MHz at 6 V/m
Out band attenuation in reference at 50 MHz	Not Applicable	0.1- 600 MHz >20dB 600– 860MHz >10dB	925MHz-3GHz > 20 dB
H-field rejection	>20 dB		>20 dB
Temperature error	0.05 dB/°C		0.05 dB/°C
Calibration	internal E ² PROM		internal E ² PROM
Size:	343 mm, ∅ 133mm		
Weight:	300 g		

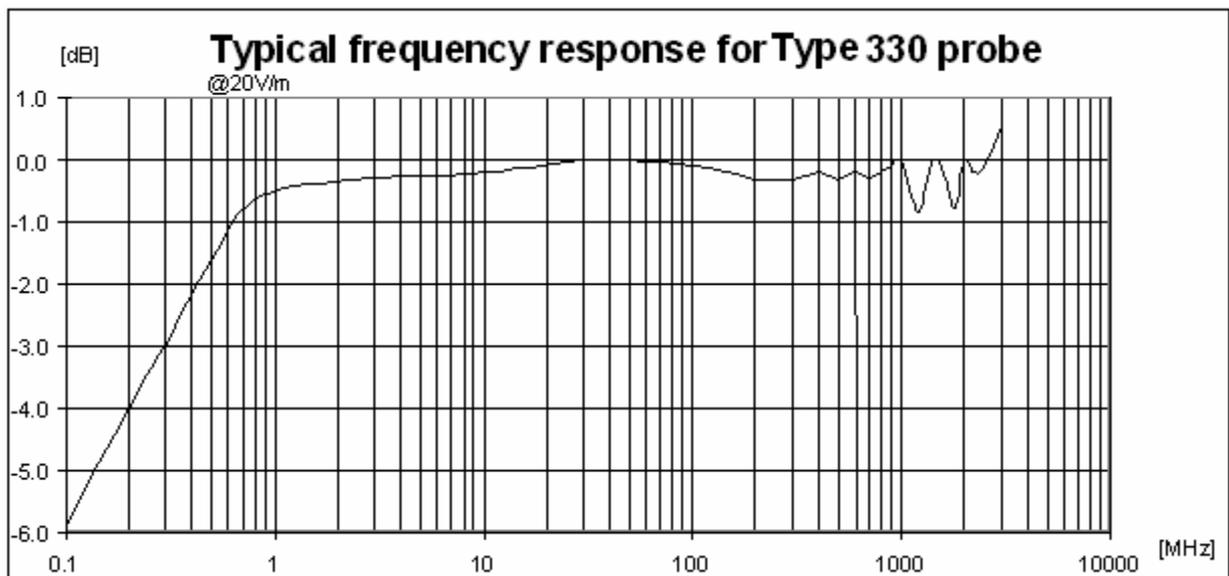
ELECTRIC FIELD PROBE Type 300

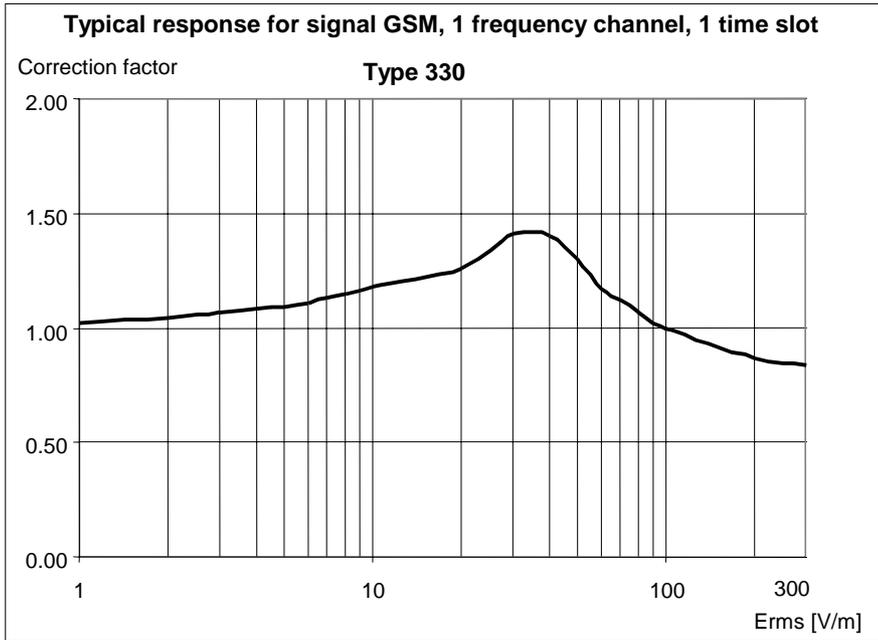
Frequency range	300 kHz - 3 GHz
Level range	0.1 - 300 V/m
Overload	> 600 V/m
Dynamic range	> 66 dB
Resolution	0.01 V/m
Sensitivity	0.15 V/m
Absolute error @ 50 MHz 20 V/m	± 0.8 dB
Flatness (10 - 300 MHz)	± 0.5 dB
Flatness (3 MHz - 3 GHz)	± 1.5 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 930 and 1800 MHz)
H-field rejection	> 20 dB
Temperature error	20°C ÷ 60°C = ±0.1 dB 0°C ÷ 20°C = -0.05 dB/°C -20°C ÷ 0°C = -0.15 dB/°C
Calibration	internal into E ² PROM
Size	317 mm length, 58 mm diameter
Weight	100 g



ELECTRIC FIELD PROBE Type 330

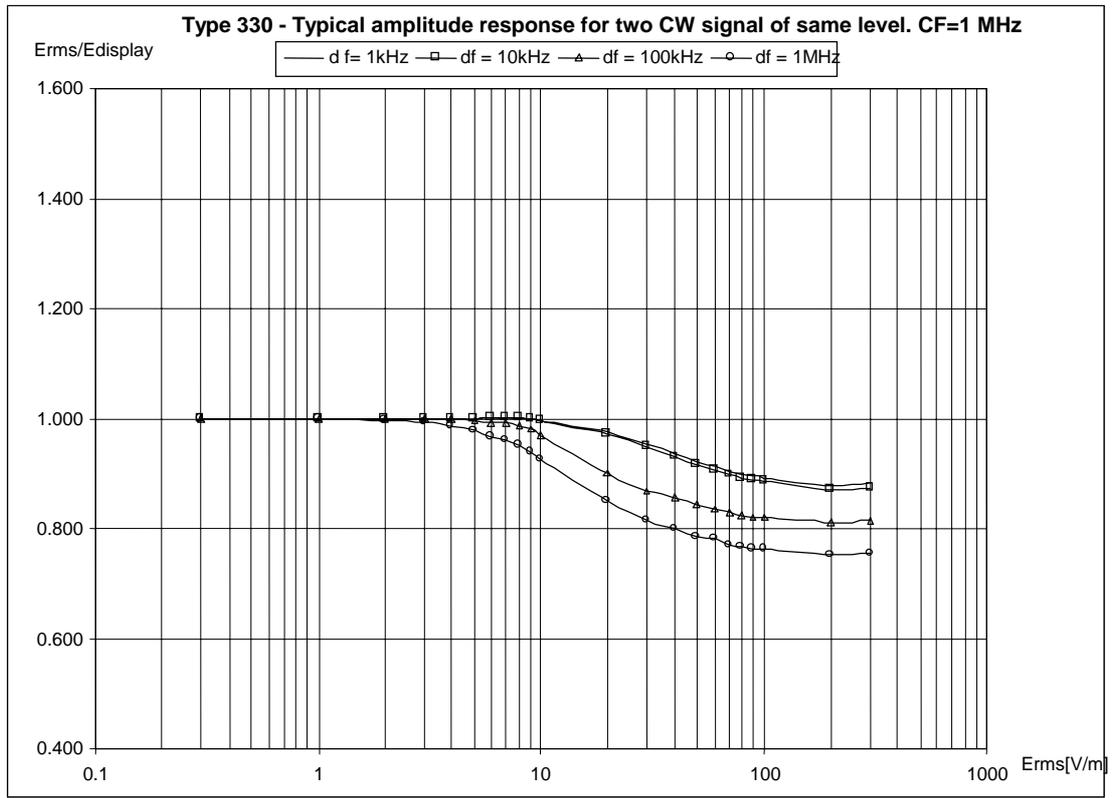
Frequency range	500 kHz - 3 GHz
Level range	0.3 - 300 V/m
Overload	> 600 V/m
Dynamic range	> 60 dB
Resolution	0.01 V/m
Sensitivity	0.3 V/m
Absolute error @ 50 MHz 20 V/m	± 0.8 dB
Flatness (10 - 300 MHz)	± 0.5 dB
Flatness (3 MHz - 3 GHz)	± 1.5 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 930 and 1800 MHz)
H-field rejection	> 20 dB
Temperature error	20°C÷60°C = ± 0.1 dB 0°C÷20°C = -0,05 dB/°C -20°C÷0°C = -0,15 dB/°C
Calibration	internal into E ² PROM
Size	317 mm length, 58 mm diameter
Weight	100 g





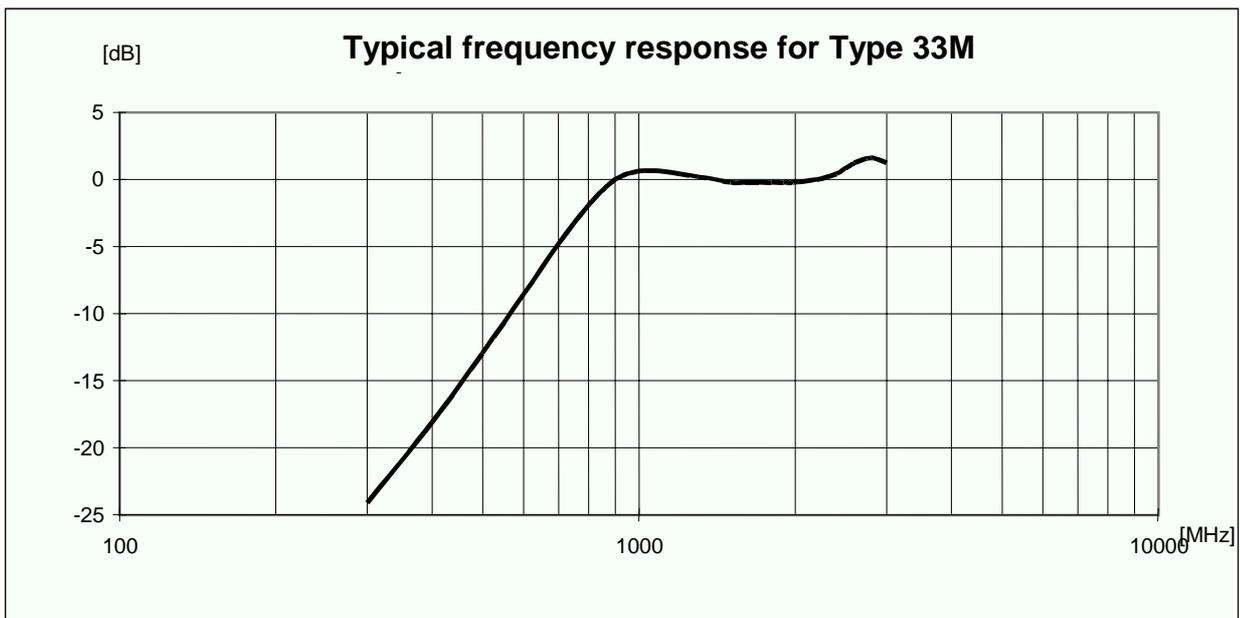
Erms [V/m]	Edisplay [V/m]	Correction factor
1	0.98	1.02
2	1.91	1.05
3	2.82	1.06
4	3.70	1.08
5	4.58	1.09
6	5.40	1.11
7	6.17	1.13
8	6.96	1.15
9	7.75	1.16
10	8.50	1.18
20	15.84	1.26
30	21.3	1.41
40	28.6	1.40
50	38.5	1.30
60	51.3	1.17
70	62.5	1.12
80	75.1	1.07
90	88.1	1.02
100	99	1.01
200	227	0.88
300	361	0.83

 ATTENTION	<p>This test is carried out with a signal currently used in laboratory for maximize the reading error to make a comparison of the performances of the probe with a common base.</p> <p>Actually the radio base station uses eight time slot of each channel so the effective error of the measurement is negligible.</p>
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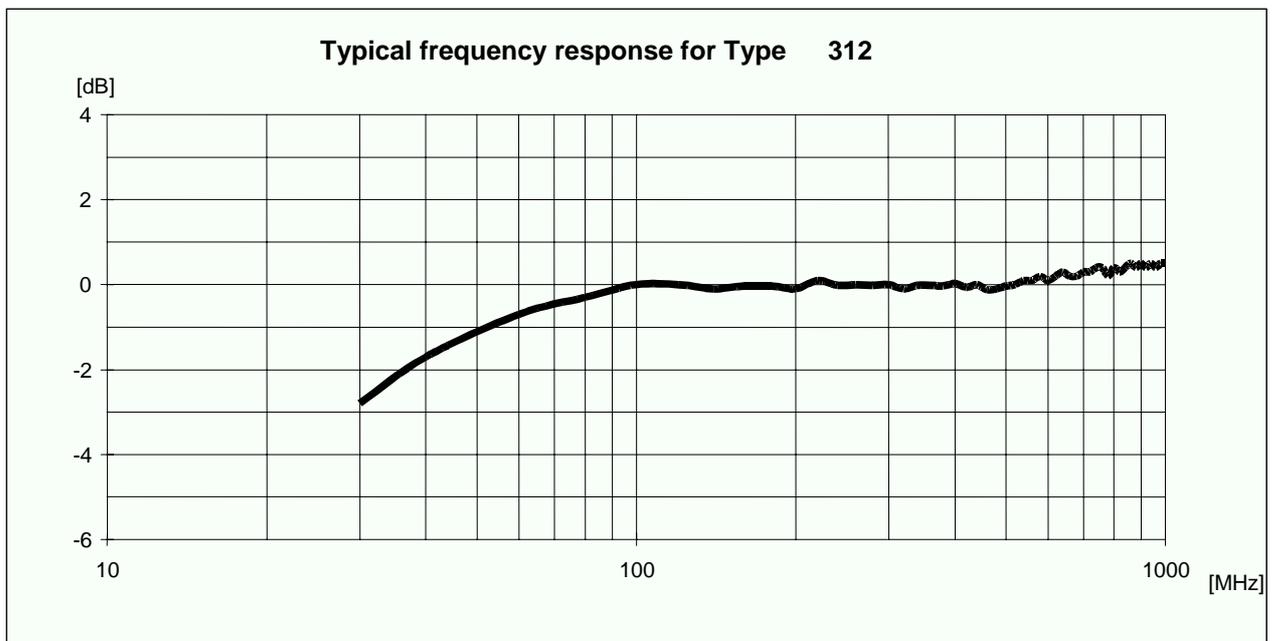
ELECTRIC FIELD PROBE Type 344

Frequency range	700 MHz - 3 GHz
Level range	0.3 - 300 V/m
Overload	> 600 V/m
Dynamic range	> 60 dB
Resolution	0.01 V/m
Sensitivity	0.3 V/m
Absolute error @ 930 MHz 20 V/m	± 1 dB
Flatness (900 MHz - 3 GHz)	± 1.5 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 930 and 1800 MHz)
H-field rejection	> 20 dB
Temperature error	0.05 dB/°C
Calibration	Internal into E ² PROM
Size	317 mm length, 58 mm diameter
Weight	100 g



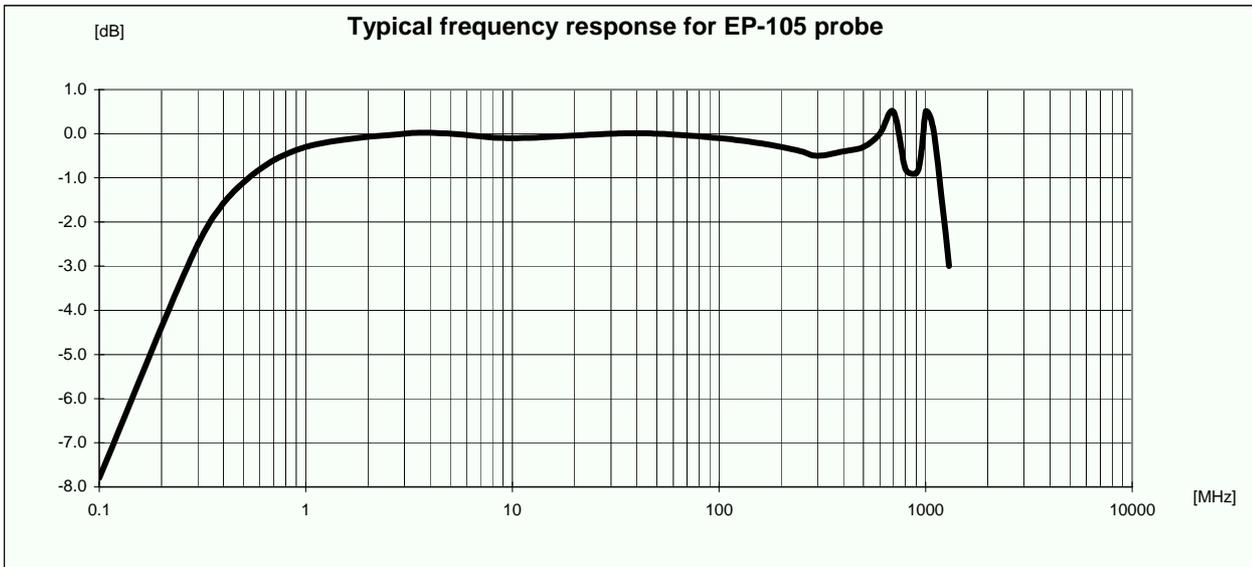
MAGNETIC FIELD PROBE Type 312

Frequency range	30 - 1000 MHz
Level range	0.01 - 20 A/m
Overload	> 40 A/m
Dynamic range	> 60 dB
Resolution	1 mA/m
Sensitivity	0.01 A/m
Absolute error @ 50 MHz 2 A/m	± 1 dB
Flatness (50 - 900 MHz)	± 1 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 930 MHz)
E-field rejection	> 20 dB
Temperature error	0.05 dB/°C
Calibration	Internal into E ² PROM
Size	317 mm length, 58 mm diameter
Weight	110 g



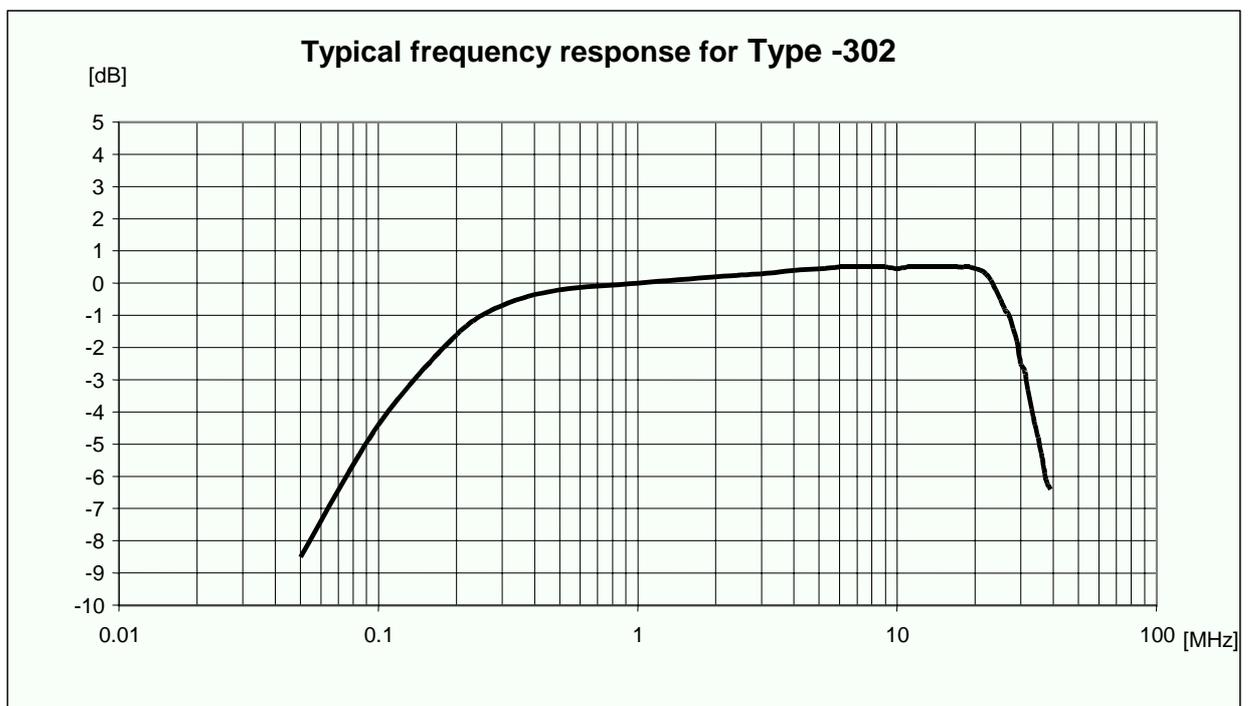
ELECTRIC FIELD PROBE Type 315

Frequency range	250 kHz - 1000 MHz
Level range	0.05 - 50 V/m
Overload	> 100 V/m
Dynamic range	> 60 dB
Resolution	0.01 V/m
Sensitivity	0.05 V/m
Absolute error @ 50 MHz 6 V/m	± 0.8 dB
Flatness (10 - 300 MHz)	± 0.5 dB
Flatness (300 kHz - 1 GHz)	± 1 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 930 MHz)
H-field rejection	> 20 dB
Temperature error	0.05 dB/°C
Calibration	Internal into E ² PROM
Size	350 mm length, 133 mm diameter
Weight	290 g



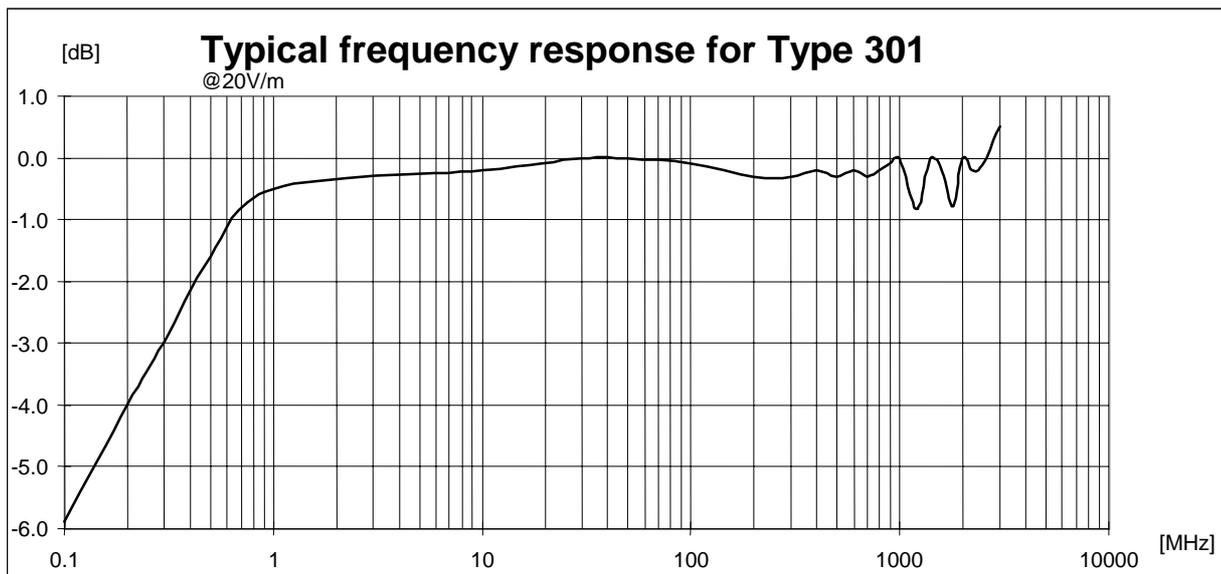
MAGNETIC FIELD PROBE Type 302

Frequency range	150 kHz - 30 MHz
Level range	0.01 - 20 A/m
Overload	> 40 A/m
Dynamic range	> 60 dB
Resolution	1 mA/m
Sensitivity	0.01 A/m
Absolute error @ 1 MHz 2 A/m	± 1 dB
Flatness (1 -25 MHz)	± 1 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 1 MHz)
E-field rejection	> 20 dB
Temperature error	0.05 dB/°C
Calibration	Internal into E ² PROM
Size	350 mm length, 133 mm diameter
Weight	400 g



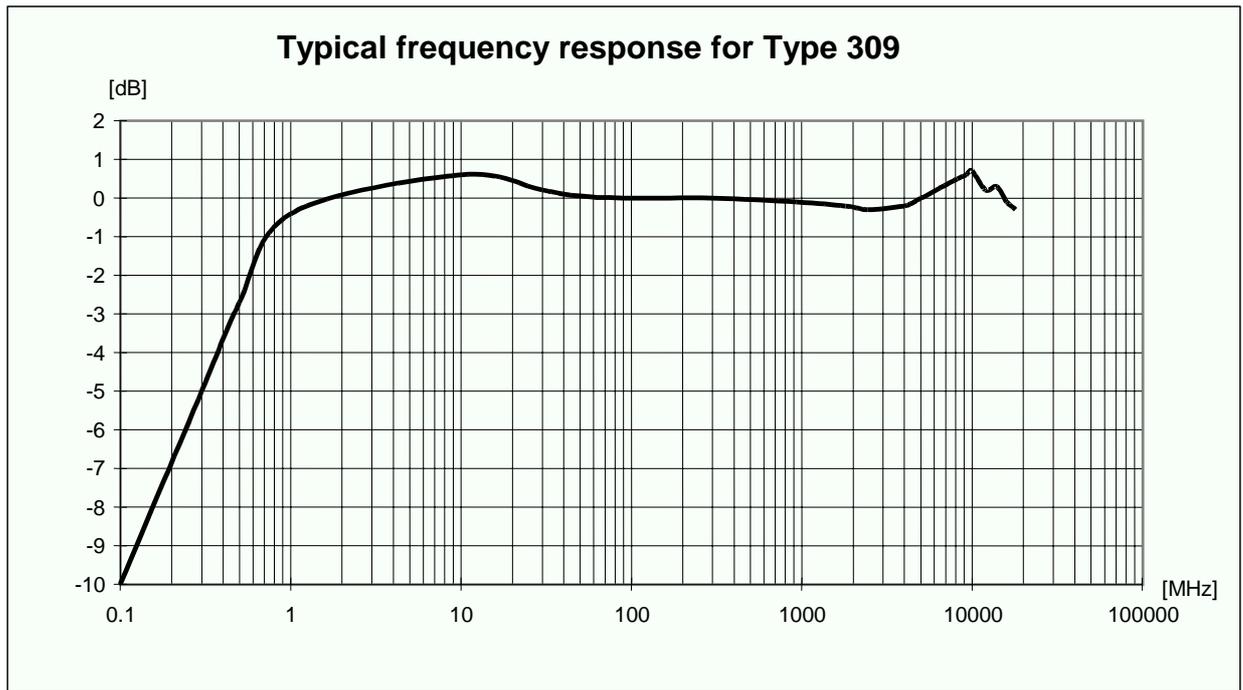
ELECTRIC FIELD PROBE Type 301

Frequency range	300 kHz - 3 GHz
Level range	1 - 1000 V/m
Overload	> 1200 V/m
Dynamic range	> 60 dB
Resolution	0.1 V/m
Sensitivity	1 V/m
Absolute error @ 50 MHz 20 V/m	± 0.8 dB
Flatness (10 - 300 MHz)	± 0.5 dB
Flatness (3 MHz - 1 GHz)	± 1.5 dB
Isotropy	± 0.8 dB (typical ± 0.5 dB @ 930 and 1800 MHz)
H-field rejection	> 20 dB
Temperature error	0.05 dB/°C
Calibration	Internal into E ² PROM
Size	317 mm length, 58 mm diameter
Weight	100 g



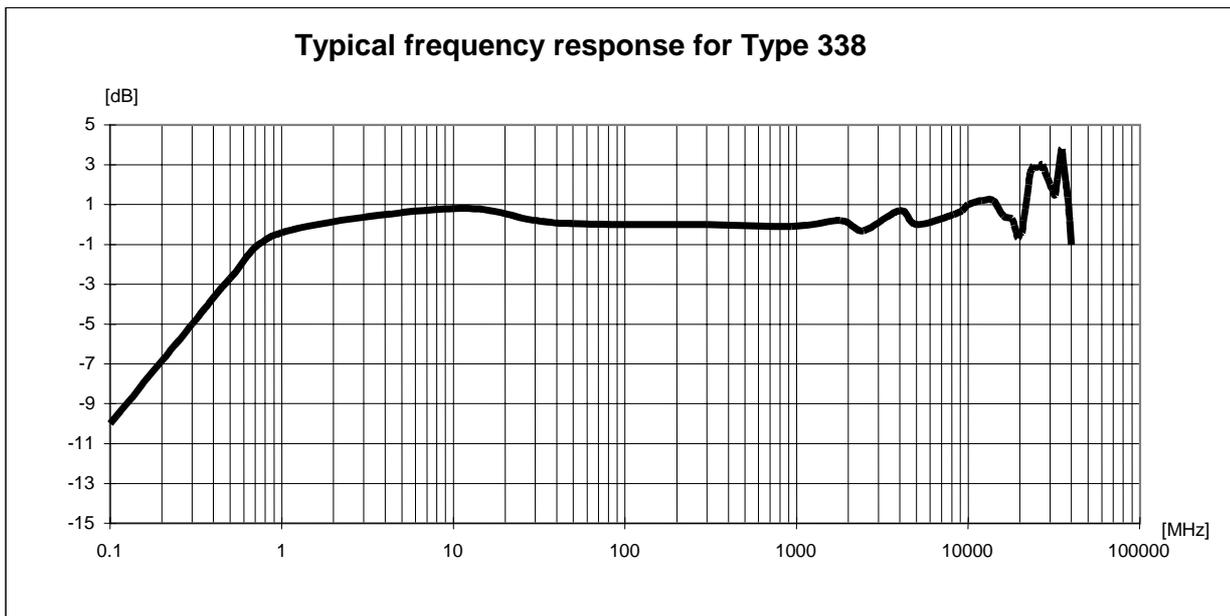
ELECTRIC FIELD PROBE Type 309

Frequency range	1 MHz - 18 GHz
Level range	0.8 - 800 V/m
Overload	> 1200 V/m
Dynamic range	> 60 dB
Resolution	0.01 V/m
Sensitivity	0.8 V/m
Absolute error @ 200 MHz 6 V/m	± 0.8 dB
Flatness (1 MHz - 1 GHz)	± 1.5 dB
Flatness (1 - 3 GHz)	± 2.0 dB
Flatness (3 - 18 GHz)	± 2.5 dB
Isotropy @ 200 MHz	± 0.8 dB (typical ± 0.5dB @ 930 and 1800 MHz)
H-field rejection	> 20 dB
Temperature error	0.02 dB/°C
Calibration	Internal into E ² PROM
Size	317 mm length, 50 mm diameter
Weight	90 g



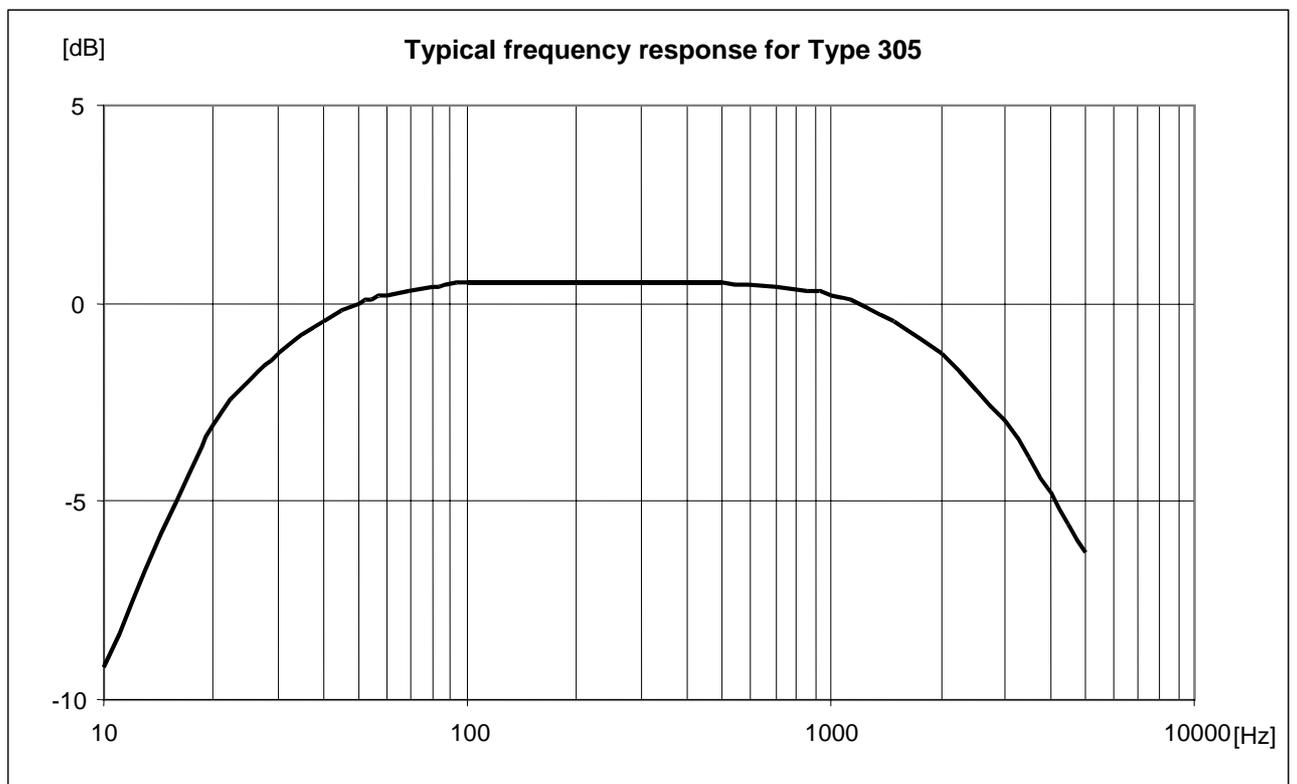
ELECTRIC FIELD PROBE Type 338

Frequency range	1 MHz - 40 GHz
Level range	0.8 - 800 V/m
Overload	> 1000 V/m
Dynamic range	> 60 dB
Resolution	0.01 V/m
Sensitivity	0.8 V/m
Absolute error @ 200 MHz 6 V/m	± 0.8 dB
Flatness (1 MHz - 1 GHz)	± 1.5 dB
Flatness (1 - 3 GHz)	± 2 dB
Flatness (3 - 18 GHz)	± 2.5 dB
Flatness (18 - 26.5 GHz)	± 3 dB
Flatness (26.5 - 40 GHz)	± 4 dB
Isotropy @ 200 MHz	± 0.8 dB (typical ± 0.5 dB @ 930 and 1800 MHz)
H-field rejection	> 20 dB
Temperature error	0.02 dB/°C
Calibration	internal into E ² PROM
Size	317 mm length, 52 mm diameter
Weight	90 g



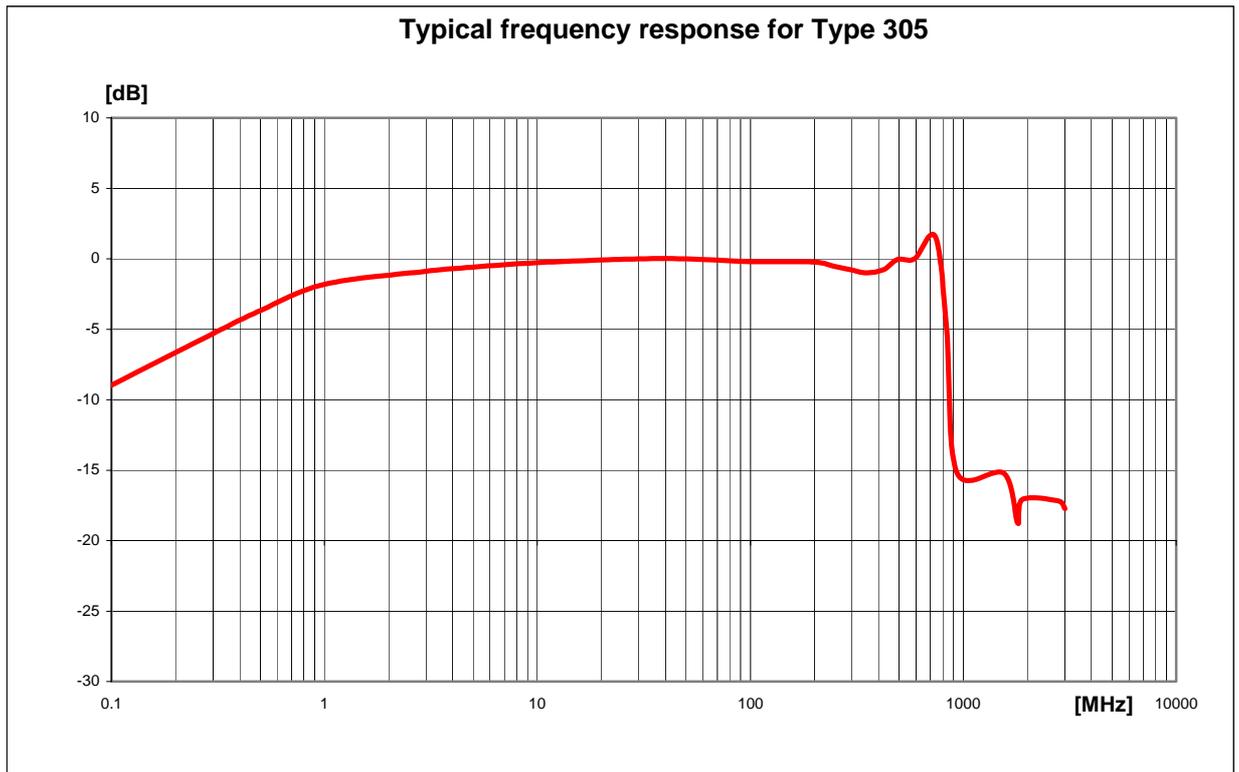
MAGNETIC FIELD PROBE Type 305

Frequency range	20 Hz – 3 kHz
Level range	10 nT – 40 μ T
Dynamic range	> 72 dB
Overload	> 400 μ T
Resolution	1 nT
Sensitivity	10 nT
Absolute error @ 50 Hz 200 nT 25 °C	\pm 0.4 dB
Flatness (40 Hz – 1kHz)	\pm 1 dB
Isotropy @ 50 Hz 200 nT	\pm 0.3 dB
E-field rejection	> 20 dB
Temperature error	0.015 dB/°C
Calibration	internal into E ² PROM
Size	350 mm length, 133 mm diameter
Weight	400 g



ELECTRIC FIELD PROBE Type 334

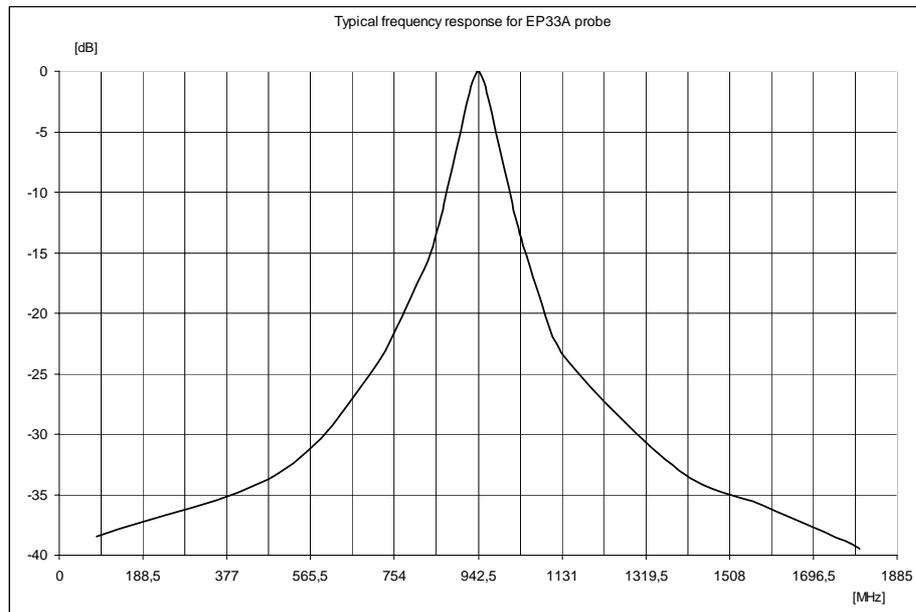
Frequency range	600 kHz - 800 MHz
Level range	0.25 - 250 V/m
Overload	> 500 V/m
Dynamic range	> 60 dB
Resolution	0.01 V/m
Sensitivity	0.25 V/m
Absolute error	
@ 50 MHz e 6 V/m	± 0.8 dB
Flatness	
(10 MHz - 200 MHz)	± 1.5 dB (typical ± 0,8 dB)
(200 MHz - 800 MHz)	± 2.0 dB (typical ± 1,5 dB)
Isotropy	± 0.8 dB (typical ± 0.5dB @ 740 MHz)
Out band attenuation respect to 50 MHz	
900 MHz – 3 GHz	> 12 dB (typical >15dB)
H-field rejection	> 20 dB
Temperature error	0.02 dB/°C
Calibration	Internal into E ² PROM
Size	317 mm length, 58 mm diameter
Weight	100 g

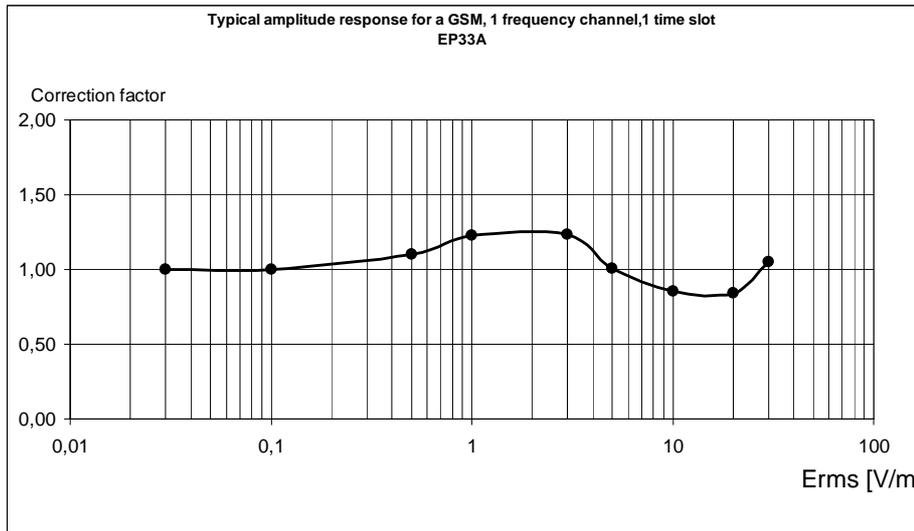
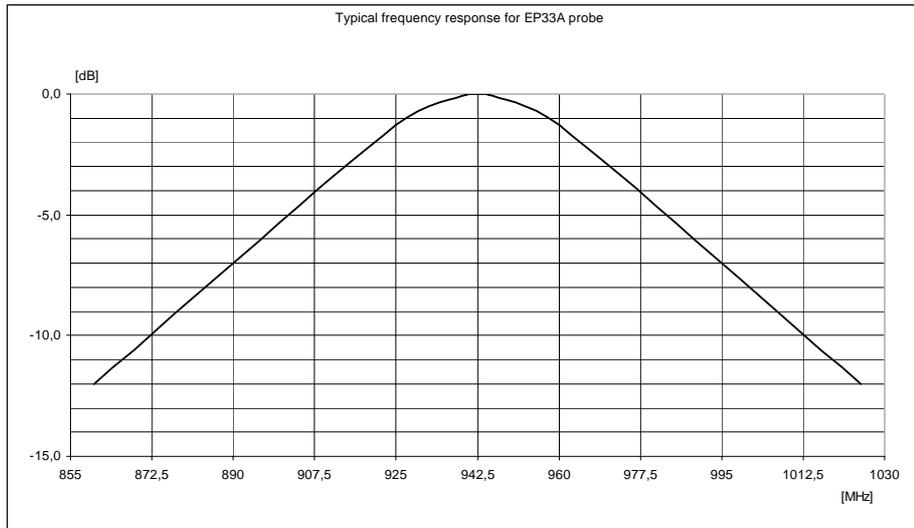




ELECTRIC FIELD PROBE Type 333A

Frequency range	910 MHz - 970 MHz
Level range	0,03 – 30 V/m
Overload	> 120 V/m
Dynamic range	> 60 dB
Resolution	0,001 V/m
Sensitivity	0,03 V/m
Absolute error @ 942.5 MHz e 20 V/m	± 1 dB
Flatness (925 - 960 MHz)	+ 0.2 dB / -1.8 dB
OFF Band attenuation respect to 924.5 MHz	
860 MHz	< -10 dB
1025 MHz	< -10 dB
Isotropicity	± 0.8 dB (Typical ± 0.5 dB)
Rejection to H field	> 20 dB
Temperature error	0°C ÷ 60°C = ± 0.2 dB -20°C ÷ 0°C = -0,1 dB/°C
Drift Frequency Vs Temperature	40°C ÷ 60°C = ± 100 kHz -20°C ÷ 40°C = -100 kHz/°C
Calibration	E ² PROM internal
Size	317 mm length, 58 mm diameter
Weight	100 g



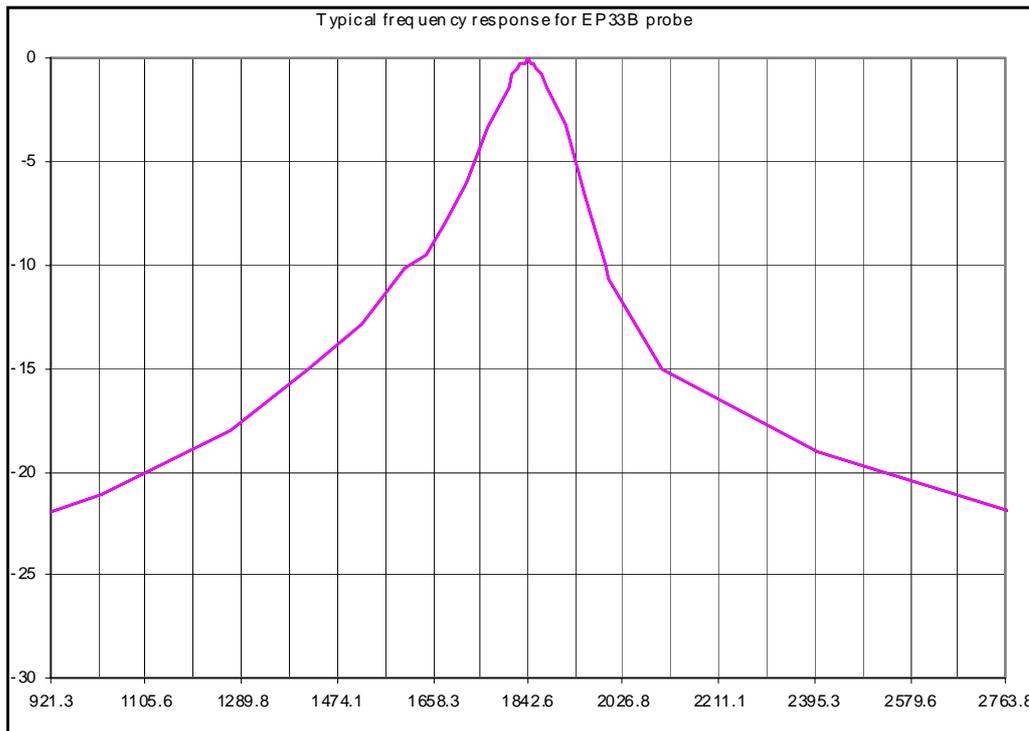


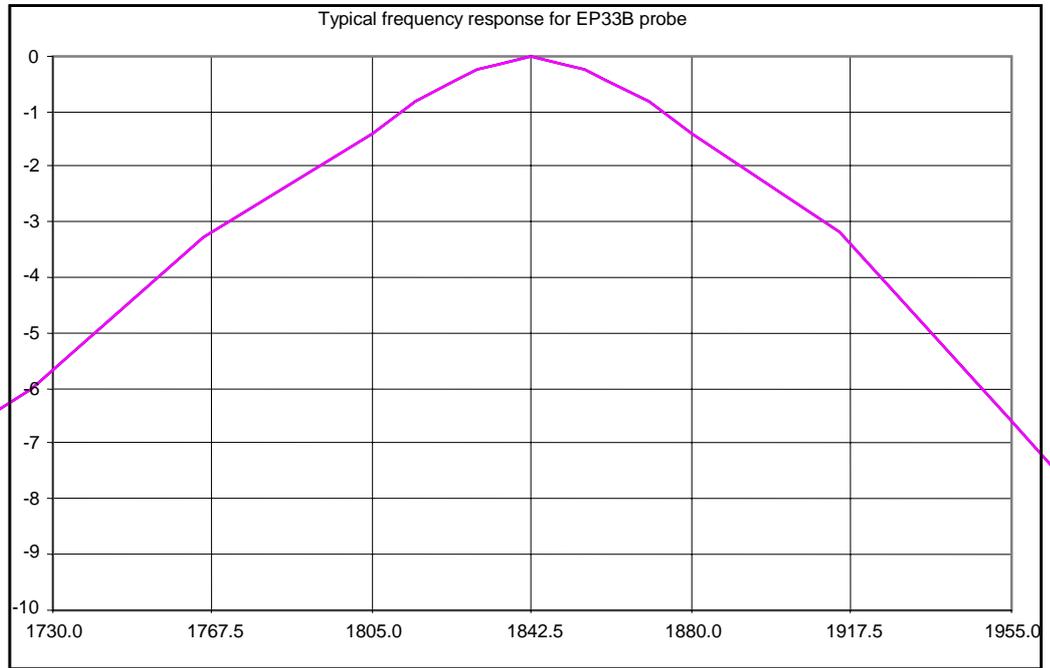
 <p>ATTENTION</p>	<p>This test is carried out with a signal currently used in laboratory for maximize the reading error to make a comparison of the performances of the probe with a common base.</p> <p>Actually the radio base station uses eight time slots of each channel so the effective error of the measurement is negligible.</p>
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ELECTRIC FIELD PROBE Type 333B

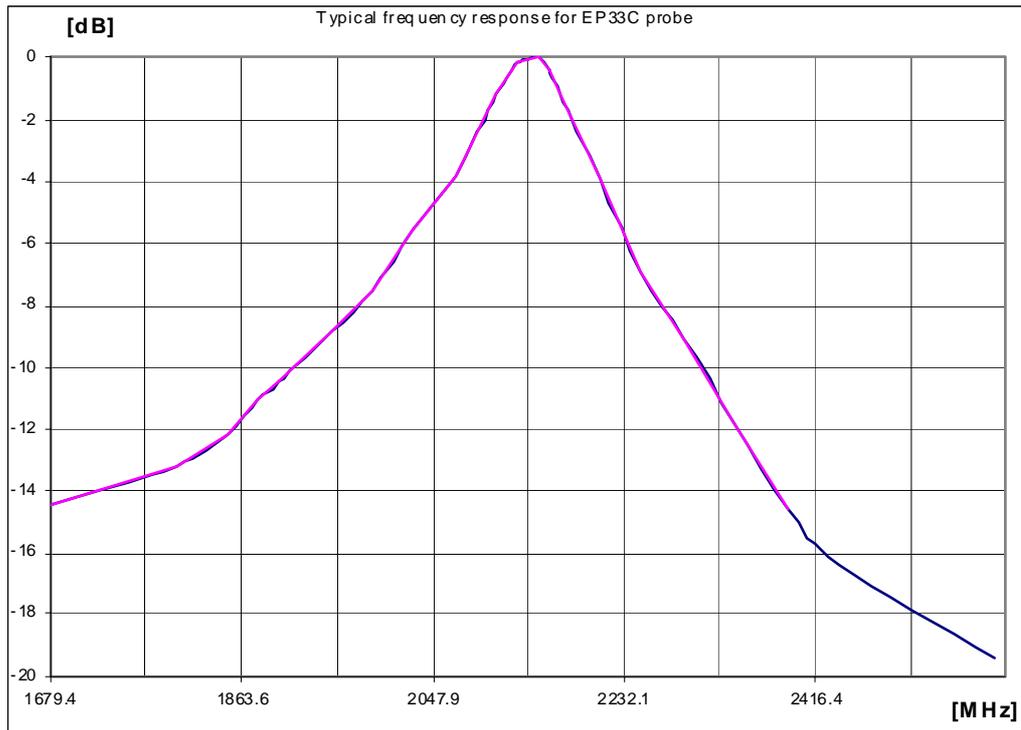
Frequency range	1770 MHz – 1900 MHz
Level range	0,03 – 30 V/m
Overload	> 120 V/m
Dynamic range	> 60 dB
Resolution	0,001 V/m
Sensitivity	0,03 V/m
Absolute error @ 942.5 MHz 2 V/m	± 1 dB
Flatness (1805 - 1880 MHz)	+ 0.2 dB / -1.8 dB
OFF Band attenuation respect to 1842.5 MHz	
1580 MHz	< -10 dB
2010 MHz	< -10 dB
Isotropicity	± 0.8 dB (Typical ± 0.5 dB)
Rejection to H field	> 20 dB
Temperature error	0°C ÷ 60°C = ± 0.2dB -20°C÷0°C = -0,1 dB/°C
Drift Frequency Vs Temperature	40°C ÷ 60°C = ± 100 kHz -20°C÷40°C = -100 kHz/°C
Calibration	E ² PROM internal
Size	317 mm length, 58 mm diameter
Weight	100 g

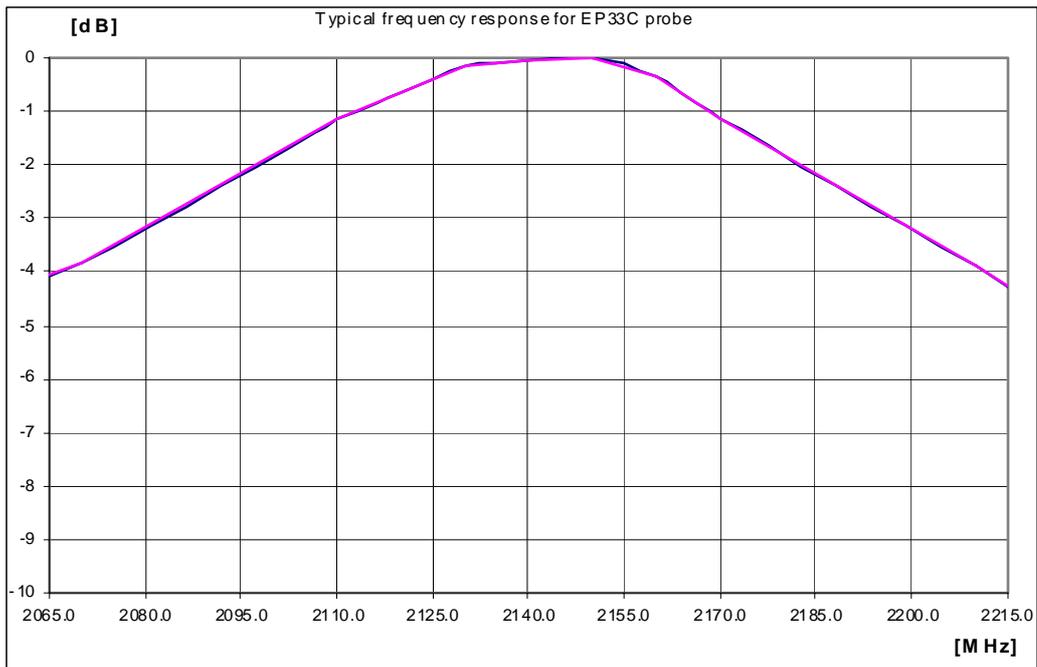




ELECTRIC FIELD PROBE Type 333C

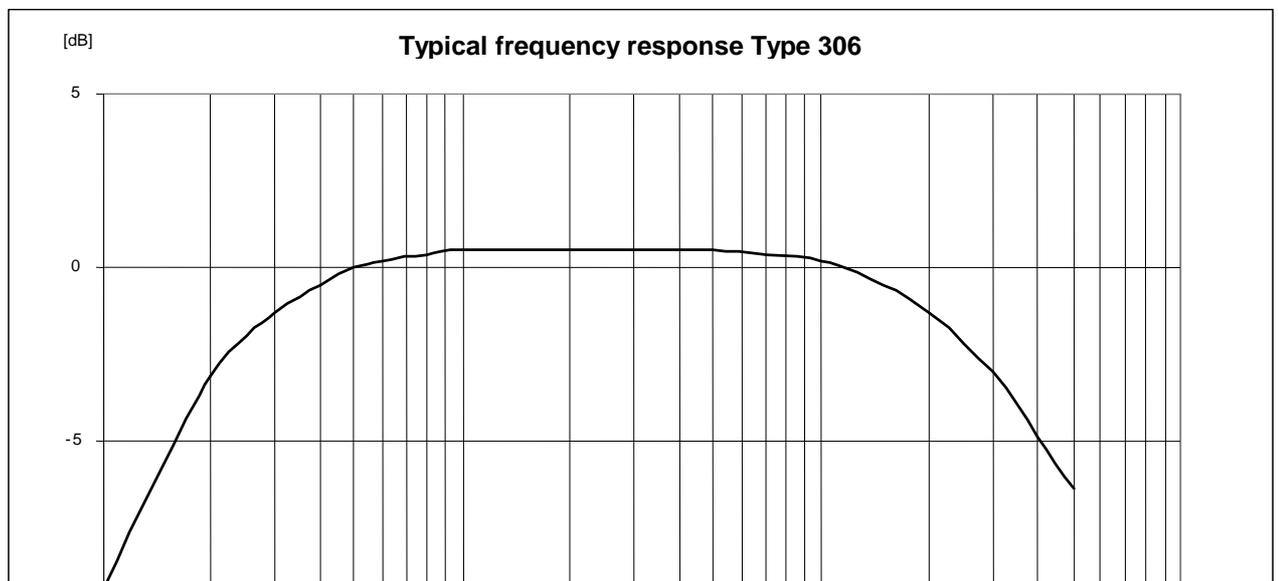
Frequency range	2085 MHz – 2195 MHz
Level range	0,03 – 30 V/m
Overload	> 120 V/m
Dynamic range	> 60 dB
Resolution	0,001 V/m
Sensitivity	0,03 V/m
Absolute error @ 2140 MHz 2 V/m	± 1 dB
Flatness (2110 - 2170 MHz)	+ 0.2 dB / -1.8 dB
OFF Band attenuation respect to 2140 MHz	
1880 MHz	< -10 dB
2320 MHz	< -10 dB
Isotropicity	± 0.8 dB (Typical ± 0.5dB)
Rejection to H field	> 20 dB
Temperature error	0°C ÷ 60°C = ± 0.2dB -20°C ÷ 0°C = -0,1 dB/°C
Drift Frequency Vs Temperature	40°C ÷ 60°C = ± 100 kHz -20°C ÷ 40°C = -100 kHz/°C
Calibration	E ² PROM internal
Size	317 mm length, 58 mm diameter
Weight	100 g



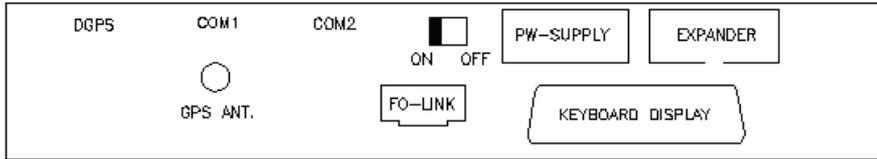


MAGNETIC FIELD PROBE Type 306

Frequency range	20 Hz – 3 KHz
Level range	50 nT – 200 μ T
Dynamic range	> 72 dB
Resolution	1 nT
Overload	> 400 μ T
Sensitivity	50 nT
Absolute error @ 50 Hz - 3 uT - 25°C	\pm 0.4 dB
Flatness @ 40 Hz - 1KHz	\pm 1 dB
Isotropy @ 50 Hz – 3 uT	\pm 0.3 dB
Electric field rejection	> 20 dB
Calibration	Internal into E ² PROM
Temperature error	0.015 dB/°C
Size	350 mm length, 133 mm diameter
Weight	400g



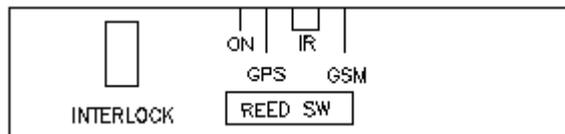
1.9 Narda 2600 internal front panel



Legend:

- DGPS:** Connection to an external Differential GPS
- GPS ANT:** Antenna connector for internal GPS
- COM1:** RS232 9 pin connection
- COM2:** RS232 plug
- ON-OFF:** power switch
- FO-LINK:** optic fiber link
- PW-SUPPLY:** power supply connector
- EXPANDER:** future use connector
- KEYBOARD DISPLAY:** service connector

1.10 Narda 2600 internal lateral panel



Legend:

- INTERLOCK:** case opening switch
- ON:** station on led indicator
- GPS:** Internal GPS led indicator (when available)
- IR:** infrared communication led
- GSM:** GSM modem in use led indicator
- REED SW:** (future use)

2 - Installation and use

2.1 Introduction

This section provides all the necessary information to install and use the Narda 2600S Remotely Operated Station Systems for Monitoring Electromagnetic Fields.

You will find information on the initial inspection, on power supply requirements, interconnection, working environment, assembly, cleaning, storage and shipment details.

2.2 Initial inspection



Inspect the packaging for any damage.

If the packaging and its shockproof material are damaged, check that the content is intact and that the instrument has not been mechanically or electrically damaged. Check the accessories against the check-list supplied with the Manual. The delivery company and the Narda office should be notified immediately of any damage.

2.3 Working environment

The working environment in which the instrument is to be placed must meet the following specifications:

- Temperature From -10° to +50° C
- Relative Humidity 80% (31°) – 50% (40°)

The instrument must be stored in a clean and dry place, free of dust, acids and humidity.

The storing area must meet the following parameters.

- Temperature From -20° to + 70° C
- Relative Humidity < 95%
- Altitude Max 4000 m (a.s.l.)

2.4 Return for repairs

Every part of the instrument, included the battery, can only be replaced by PMM/Narda, when the instrument needs repair or is malfunctioning, please contact the Narda Support center.

When the instrument needs to be sent to Narda for repairs please complete the questionnaire enclosed with this Operating Manual making sure you fill in all the details relative to the service requested.

In order to minimize repair time, please describe the nature of the failure. If the failure occurs only under certain conditions, please provide details on how we may recreate the same condition in order to identify the fault.

If possible, please reuse the original packaging, making sure the instrument is wrapped in heavy paper or plastic.

Alternatively, use a strong box filled with shockproof material, place enough material all around the equipment so that the unit is stable and firmly blocked inside the box.

Whilst packing, pay special care in protecting the unit's front panel.

Seal the box firmly before shipment.

Mark the box: FRAGILE HANDLE WITH CARE.

2.5 Instrument cleaning



To clean the equipment use only a dust free and dry non abrasive cloth.

To avoid damage never use any kind of solvent, acid, or similar to clean the instrument.

**2.6 Narda 2600
Installation and use**

A vertical insulated case holds the Narda 2600 Area Monitor. The case does not influence the electromagnetic fields. The top case holds the meter unit, the GSM modem, the probe and the solar panels.

Thanks to the low power consumption of the station, the solar panel power system allows a boundless operating time with normal sun exposure. The station can be powered also by the mains supply or external batteries.

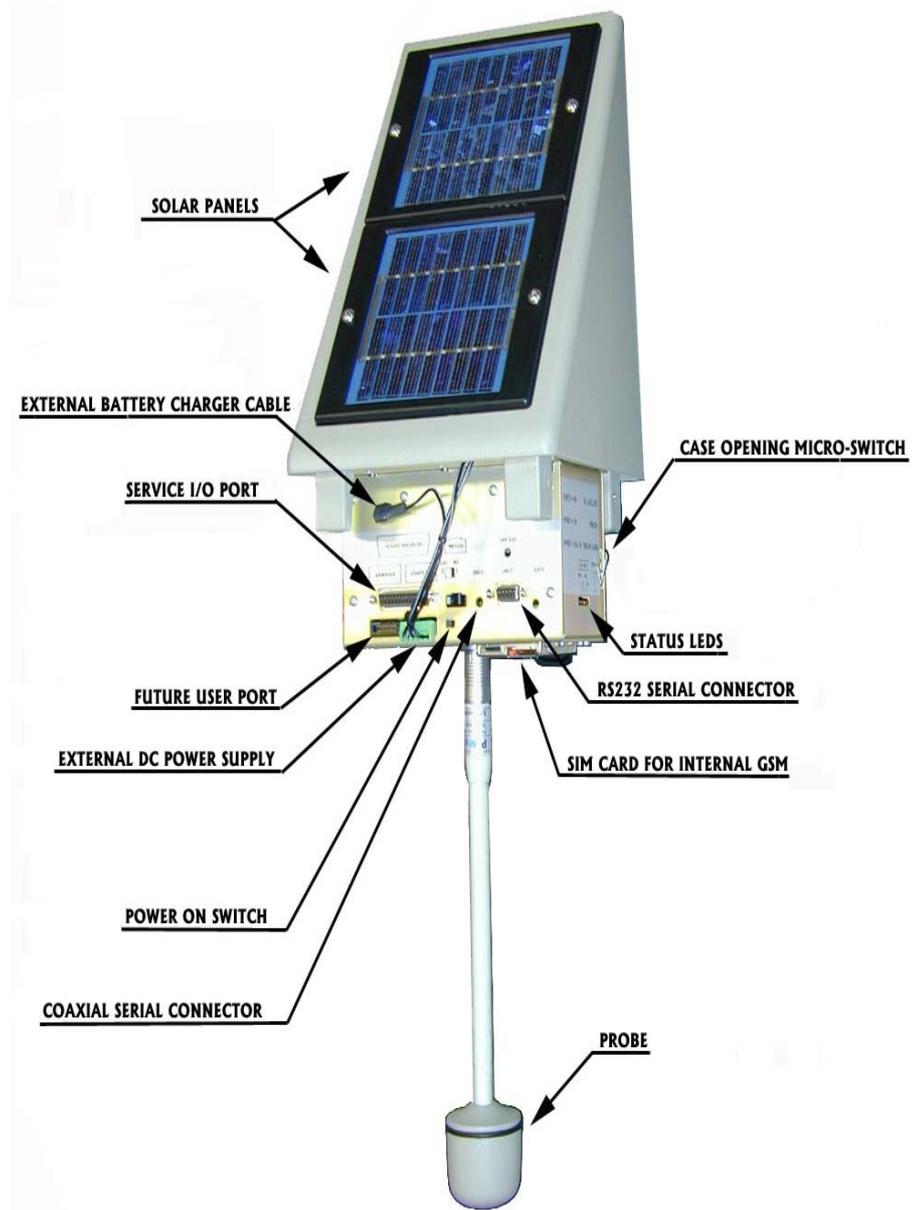


Fig. 2-1 Narda 2600 Internal connections and commands

2.6.1 Installation

The Narda 2600 station can operate in a heavy external environment, in proximity of the electromagnetic fields being controlled.

The Narda 2600 must be installed facing the solar panels to the south (for northern hemisphere), this allows the station to better utilize the solar radiation for continuous internal battery recharge.

The 35° inclination angle of the solar cells is optimized for the best solar radiation at the European latitudes, especially during winter periods when the solar radiation levels are lower than during summer.

The Narda 2600/15 offers a configuration with 4 solar panels for countries where the sun light is limited.

The Narda 2600/30 offers a configuration without solar panels for indoor applications.

2.6.2 Installation steps

Following list summarize main steps for final station installation:

1. Open the station unscrewing the four torx screws located on side panels of the case using provided screwdriver;
 2. Remove the PIN CODE of your SIM card
 3. Insert the SIM CARD in the GSM modem as listed early in this Chapter;
 4. Plug-in the probe in the probe connector located on the lower equipment side; usually the probe is already installed before shipping;
 5. Switch on the station by the main power switch;
 6. Verify the correct station initialization and power on, the power on led should be flashing and after a minute the GSM will turn on steady;
 7. Connect the battery charger for at least 24 hours in order to charge completely the internal batteries.
 8. Repeat step 1 closing the station;
- Hold the station case on the supporting mast turning it until the solar panel are facing the south;
 - Hook provided placeholders pushing them on the support.

On the remote control station run the Narda 2600/01 software and complete the station setting referring to the dedicated Chapter in this Manual.



NOTE

The same installation procedure should be applied to 2600/15 four solar panels station.

The 2600/30 does not mount any solar panels therefore the orientation is meaningful; also the electronic and the probe are mounted on the bottom case.



WARNING

For maximum battery recharge efficiency and then to match the given station autonomy, fix it in chosen position taking care no obstructing objects or buildings or walls can obscure the solar panels for the whole daylight period.



WARNING

The correct field measurement can be influenced by the local installation environment.

Metallic and reflecting objects close to the station can influence the field probe reading.

It is a good rule to install the station preferably as far as possible from walls, masts, metallic objects, buildings or other reflecting obstacles.

**WARNING**

Before final station installation verify the coverage of the local GSM net.

A GSM mobile phone can help showing the signal strength in the installation place.

**WARNING**

To assure the maximum efficiency for the internal battery charging and therefore the maximum expected autonomy of the station it is suggested to maintain the solar panels clean, checking them periodically.

Use a dust free and dry non-abrasive cloth with a normal glass cleaner product.

2.6.3 Station mounting

The station can be mounted on a 60 mm diameter pole by means of 2 insulated clamps that can be fixed on the rear of the station case.

A 2 meter high insulated mast, model 2600/91.01, is available as an option to install the station. The pole is completed with a metallic pedestal 60 x 60 cm with adjustable feet, holes for floor fixing and one handle for carrying it.

**WARNING**

It is suggested to install the station on the optional insulated pole to avoid influence on the measured field. The optional pole has been chosen and tested to have no influence on the measurements, offering on the other hand a stable support even in a heavy external environment.

In alternative to fix the station to a different pole or to a wall the insulated clamps or the fixing nuts can be used.

A care should be taken when the standard Narda mast is not used. The measured field levels can be strongly influenced by the distance from and the properties of the materials used as the support.

The station commands and connections are all inside the protection case, this to better protect them in the external environment conditions, where the station is typically used. Main station operation is available by remote via modem or GSM connection.

Anyway some commands, like the main power on switch, are located in the internal panel as listed in the following table.

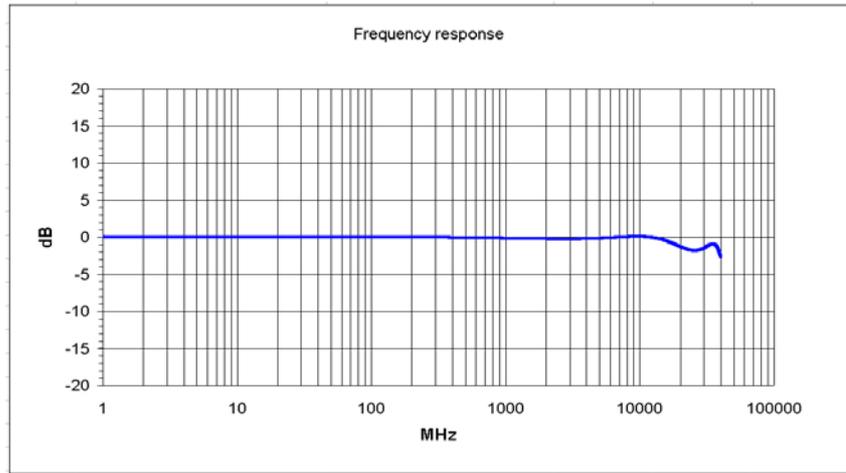
The internal panel is accessible removing the protection case by the provided torx screwdriver.



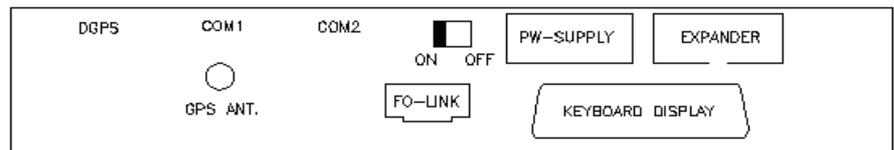
Figure 2-2
RF typical transparency
of the external case and
the mast.

Typical Frequency response for a Type 338 probe mounted into a 2600 station, completed of pole and sustaining clamps, normalised to the response of the probe itself.

The polarisation of the field was on a plane parallel to the axis of the mast.

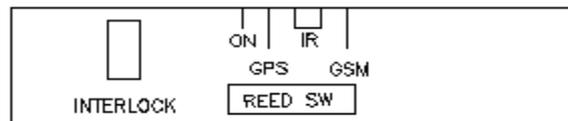


2.7 Internal panels



Front panel - Legend:

- DGPS:** optional differential GPS connection
- GPS ANT.:** optional Narda 8053-GPS antenna connection
- COM1:** RS232 9 pin connection
- COM2:** RS232 plug connection
- ON-OFF:** Power ON/OFF switch
- FO-LINK:** optic fiber link
- PW-SUPPLY:** power supply connector
- EXPANDER:** future expansion
- KEYBOARD DISPLAY:** service connector



Side panel - Legend:

- INTERLOCK:** case open microswitch
- ON:** station on Led
- GPS:** internal GPS on Led (if mounted)
- IR:** neighborhood station infrared link
- GSM:** GSM modem on Led
- RREED SW:** (future expansion)

On both station case sides there are two circular windows protected by a red Plexiglas that allow to check the Led status and to establish the infrared communication between neighborhood stations.

INTERLOCK

On the station internal side panel there is a micro switch to check when the protection case is being opened. It is possible to activate an alarm receivable via GSM informing the operator any station violation.

2.8 GSM Modem

The station has a cellular GSM modem built in that allows to communicate with the base for remote data collection and command control. The cellular GSM modem needs a user provided SIM CARD to work properly.

2.8.1 SIM CARD

The SIM CARD must be a data exchange type and the protection PIN CODE must be deactivated.

The user can select the proper SIM CARD upon the local mobile services, taking care of the radio coverage of the installation location of the station.

Figure 2-3 SIM Card



The modem is located on the lower part of the equipment, near the probe connector, the SIM CARD must be inserted in the slot like in the above figure, to extract it use the red push button.



WARNING

The station must be switched off before extract or insert the SIM CARD.



WARNING

If a rechargeable SIM CARD is being used check if it has enough communication time left. Before using a new SIM CARD the PIN code must be deactivated by any enabled mobile cellular phone.

Any time the station is switched on it is necessary to wait for about one minute for the end of the initialization process; the ON led will light for about one second after that it will flash, indicating the equipment has been powered on correctly.

After power on the leds on the side panel will light to indicate the working condition.

GSM led light = GSM modem powered on

ON led flashing = station correctly powered on and initialized

2.8.2 GSM modem power on modes

The GSM modem has three power on modes as listed below:

1. **Programmed** (the user decides when the station must switch on the GSM modem and for how long).
2. **Spontaneous** (the station automatically switch on the GSM modem when an alarm rise up)
3. **Automatic** (the station automatically switch on the GSM modem when some particular conditions rise up as explained below)

Programmed mode

In the programmed mode the user can set the switching on time, the repeat interval and the working period of the GSM modem.

The parameter Hour and Minute specifies the day time in which the GSM unit switch on in stand by state.



The parameter **Stand-By** specifies how long the GSM unit will stay in stand by state.

The parameter **Every** specifies the switching on repetition interval (in hours after last activation), to avoid hour change every day this parameter must be a sub multiple of 24, only 1,2,3,4,6,8,12,24 are valid input values.

Spontaneous mode

Every time an alarm exceeds or underpass the active threshold the GSM modem is switched on.

The GSM modem will initialize the remote communication and will call the phone number or will send the SMS message depending on the notification mode settled up.

After any operation the GSM modem enter the stand by mode for ½ hour.

Automatic mode

The following conditions turns on or off the GSM modem independently from the programmed mode:

1. GSM is turned off any time the station is switched on and the battery voltage is lower than 5.85 V. This allows the battery to be correctly recharged. This is shown by the flashing of the ON led while the GSM led is dark. In such a situation to achieve a quick charge of the battery connect the apposite AC/DC adapter described in chapter 6.7. In case the battery voltage is already higher than 5.85 V, or when the voltage overpasses the threshold, the modem is switched on for 24 hours.
2. When, during normal operation, the battery voltage exceeds **6.60 V**, the GSM switches to on until the battery voltage goes down this value, after that it will stay in stand by mode for one hour. If the GSM where already on, because of the programmed mode condition, the stand by mode will be the maximum between one hour and the residual programmed time. Therefore in summer time when the sun is particularly strong the GSM is tuned on for a period longer that the time programmed by the user.
3. If both Stand-By parameters ("Schedule for Modem" and "Schedule for SMS") are settled to zero the GSM will switch on in stand by mode at 11.00 AM every day and will stay on for 3 hours, otherwise it could not be called at all.

2.9 Field probes

The 2600 Area Monitor can monitor a wide range of electromagnetic field from 5 Hz to 40 GHz, using different field probes.

The field probes characteristics and frequency ranges are listed on Chapter 1 of this Manual.

The probe can be easily changed simply plugging it into the probe connector located on the lower equipment side to match needed operating frequency and full scale range.



WARNING

To connect or disconnect the probe, hold onto the connector. When inserting or removing the probe, holding on to the support or the head may cause damage to the probe.



WARNING

Note: The probe may be connected to the apparatus whether it is switched on or off. To avoid damage to the probe connector, the spigot, found in the external part of the probe connector, must be put facing the front part of the meter.

2.10 RF dangerous fields



WARNING

Note: The probe of Narda uses highly sensitive components. Do not insert the probe in an electric or magnetic field that is higher than the maximum permitted for the probe in use.

Whether 2600 is switched on or off or even if the probe is not connected to the meter, damage may be caused to the internal diodes when the probe is radiated by strong fields.

The integrated control system of the station recognizes the field probe automatically, when the probe is first plugged-in, there are no further settings required after probe change.

2.11 Internal battery check

The internal battery is automatically recharged by means of the solar panels. The remote control of the charging status is accomplished by the Narda 2600/01 software, where a dedicated window shows the actual battery voltage, an alarm reporting the battery malfunction can be also set. The value of the battery can be read by any cellular phone by sending the appropriate SMS message.



WARNING

According to the physics of the internal Lead batteries, the user should not allow to discharge them below 5.4 V.

Below such voltage an internal chemical process will start that could damage the batteries.

Therefore when 2600 is not used it is highly recommended to turn it off.

Also, for applications in dark environmental don't allow to take measurements longer that battery life. For these applications use the 2600/30 configuration.



WARNING

Every part of the instrument, included battery, can only be replaced by Narda, when the instrument needs repair or is malfunctioning, please contact the Narda Support center.

2.12 Suggestions and checking list to define Area monitor problems. The following are some recommended check points to be done to insure the proper usage of the Area Monitor:

1. Is the 2600 switched ON?
2. Are the battery and GSM Leds ON?
3. Is the battery charged correctly?
Note: GSM will be OFF if battery value is lower than 5.85V

Note-1: To charge battery correctly, the Area monitor has to connect the battery charger with the area monitor switched ON (Battery charging takes about 24 hours).

Note-2: To avoid any battery problem, you can connect the battery charger to the area monitor and call it via RS232 Cable. In this way the area monitor should always respond.

4. Is the GSM programmed to be ON during the period you want to call the Area monitor? If not, turn the Area monitor off and ON again.
5. Can you hear the typical noise coming out from the speaker of the modem connected to the PC during the calling process? If not, your modem is not working.
6. What kind of messages can the customer read in the bar-status of the SW02 during the calling process? Send this informations to PMM service center.
7. What kind of telephone line (dedicated or GSM) are you using to call station from its PC? Try to you the fax machine telephone line.
8. Are you sure that the modem and the telephone line are able to support data calls?
9. Is the modem or the RS232 Cable connected to the correct COM port of the PC?
10. Is the modem correctly installed on PC?

Note-3: Use diagnostic procedure to verify the correct installation and be sure the modem has all the protocols required for this kind of data communications – low cost modem for internet application only, may not support Area Monitor application.

11. Is the SIM Card in the Area Monitor available for Tx and Rx data communication? Has the PIN code been removed?

Note-4: If the communication with the area monitor is successful only by RS232 cable, the problem may also lay on the hardware of the GSM antenna. Please, verify also the jumper in the rear panel of the metallic box of the 2600, is correctly inserted (it is used to disconnect GSM modem from 2600 hardware during production procedure).

Note-5: to get a fast response form PMM support center, It is very important to provide always a picture reporting the system setup (storing settings, alarms status, start and stop of the download, etc..) and the files "BATTERY.DT5" and "LASTTIME.C55" to give a correct description of the conditions under which the area monitor was working during the faulty of the unit. Better if you can also provide the telephone number of the area monitor.

Remote diagnostic will offer a better understanding of all problems concerning the status of the Area monitor and to eliminate your local communication problems.

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3 –Narda 2600/01 Instructions for use

3.1 Introduction

This Chapter is a guide to install, update and use the Narda 2600/01 data acquisition and control Software.
Available functions and setting details are also included.

The procedure to follow for a proper use of 2600 system is:

- Install the software 2600/01 into the PC;
- Connect the external modem (for telephone line or GSM) if an internal modem is not available;
- Connect the telephone cable to the modem;
- Check that the 2600/01 software is driving the port where the modem is connected;
- Double click the icon 2600/01, to run Narda program;
- Insert the **first** protection PASSWORD to manage all the stations;
- Insert the **second** PASSWORD that allows to modify the station setting parameters. This operation can be done later on.
- Add your Station, into the station list, by inserting the name you wish to assign and the telephone number of the SIM installed on your station;
- Call the station with the command **CALL**;
- Modify the setting and acquisition parameters according to your application, inserting the second protection PASSWORD;
- Download the data to the PC according to your needs;
- Evaluate the acquired data.



NOTE

If the PC is connected via a GSM modem, it is necessary to remove the PIN code of the SIM card.

This powerful but flexible and easy to use Narda Software is the heart of this sophisticated data acquisition system. The Narda 2600/01 software provides for full configuration control for all remote stations and allows data to be downloaded and presented in graphical or text formats, with full save and print features.

The data download can be made either by phone modem or cellular GSM modem or RS232.

The central station is composed by a PC with Windows™ operating system, modem and 2600/01 software, allows to:

- Interrogate and monitor all installed stations;
- Program each station with different acquisition set-up;
- Interrogate the station at a specified time;
- Communicate via modem or GSM or RS232;
- Protect access using different level of password;
- Control and check the data reliability;
- Protect the acquired data;
- Acquire and show X, Y, Z and the average and peak values;
- Acquire data only between two markers;
- Save and manipulate all downloaded measurements
- Download data with an automatic TXT file generation
- Print graphs or tables

3.2 Hardware requirements

Suggested user PC hardware requirements for a complete software compatibility:

- Pentium processor;
- At least 16 Mb of RAM;
- At least 10 Mb of free hard disk space;
- Phone modem with proper protocol;
- Windows™ 95/98, NT, XP, ME or 2000 Operating System.

Either internal, external or GSM modems can be used.

NOTE

When a GSM or PCMCIA modem is used, the SIM CARD must allow to exchange data either with fix phone net and cell phones, verify with your local GSM telecommunications carrier for compatibility.

To install and use the modem please refer to the supplier instructions. Also, the modem must be connected to a direct telephone line.

NOTE

The updates for Narda 2600 software and firmware are available for download from the internet web site <http://www.narda-sts.com> or directly from the commercial offices of Narda.

3.3 Software installation

The software must be installed, on the central station PC, from the diskette provided, with the following procedure:

- Power on the PC with Windows™ operating system;
- Insert the Narda 2600/01 diskette into the diskette driver;
- call "Run" from main Menu ("Start");
- key in the command "A:SETUP" or "A:INSTALL" and push ("Enter").

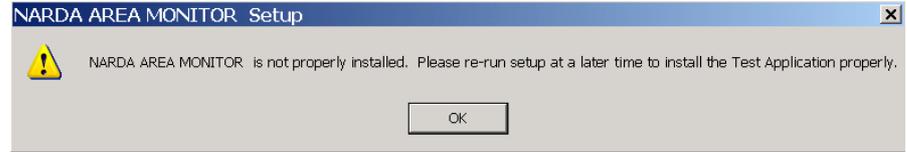
The program asks to confirm the installation directory.

Answer **OK** to accept the default **C:\2600W02**, or key in a new name.

A window similar to the following will be displayed:

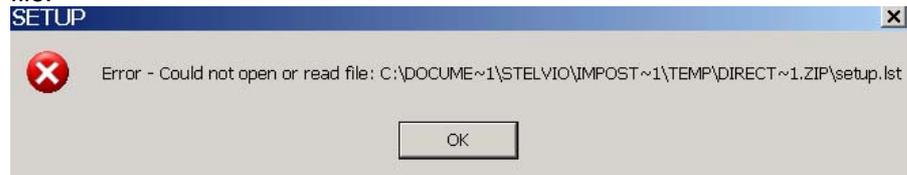


Select **Continue** to continue installation or press **Exit Set-up** to abort it. If Exit is selected the follow prompt will appear:



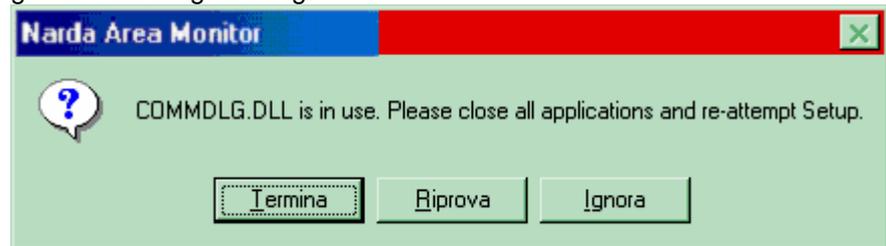
 **NOTE**

During installation, it could happen that a warning window appears on the PC informing that the software can not copy the file SETUP1 (**Could not copy SETUP1.exe** message will appear). To overcome this problem, with the Program manager go to Windows directory and cancel or rename this file.



Then start again with the installation.

The installation program try to install some system files needed to work correctly, if such files have been already installed in your system you may get the following warning:



If the case, select **Ignore** to go on with software installation, the files already installed in the system will be maintained.

At the end of the installation process the software will inform the user for completion with the following window:



Select **OK** to end installation.

The **2600/01 FOR WIN** icon will be created. For your convenience drag the icon to the desktop. If necessary with the Property function, you can change the name of it.

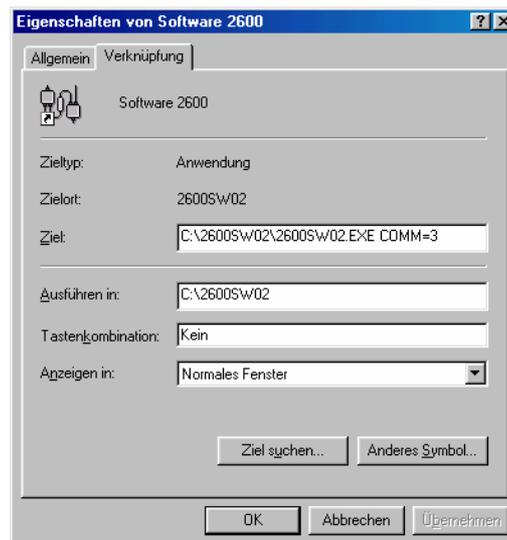
3.4 Running the program Double clicking the icon, the program is started and for a while, it shows the software revision and it will check for the modem.



3.4.1 Defining the serial port

After program launch it will look for the modem on the first free serial port, if the user wants to select a specific serial port the following procedure should be used:

- Select the **2600/01 FOR WIN** icon;
- Select **Property** with right mouse button;
- Key in the command: **C:\2600W02\2600W02.EXE COMM=N**
In the property field **Destination**. (ATTENTION the command must be **upper case**);
- Where **N** means the serial port number;
- Confirm clicking on "**Apply**"

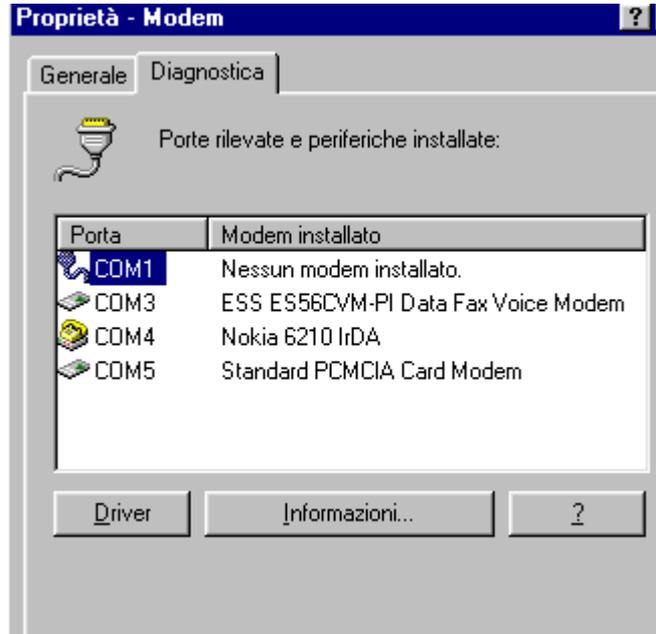


For example, if the internal modem is connected on port 3, you should type:
C:\2600W02\2600W02 COMM=3

3.4.2 Modem checking

If you have any doubt about modem (not working or not connected), some Windows command should be invoked. The procedure is:

- from the main icon **START**, select **Control panel**
- from Control panel, double click on **Modem** icon (an window will show the list of all modems installed)
- Click on **Diagnostic**; it will appear a similar window:



- With the mouse select the port where the modem is connected
- Push the button Information and read the window message to confirm that the modem is working properly

The selected port should be according with the value COMM=N previous selected with the command Property on 2600/01 icon.

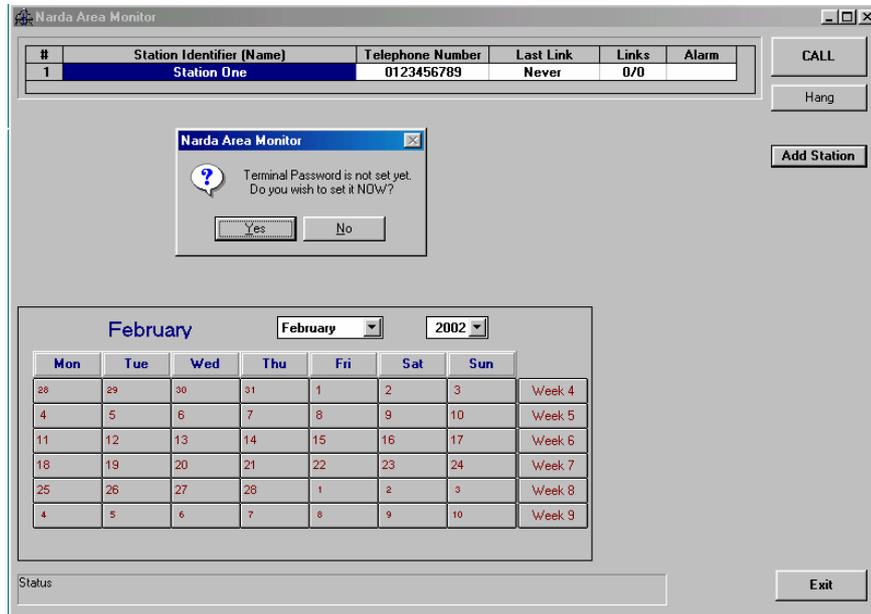
In the above example to select Nokia 6210 you should type COMM=4.

NOTE

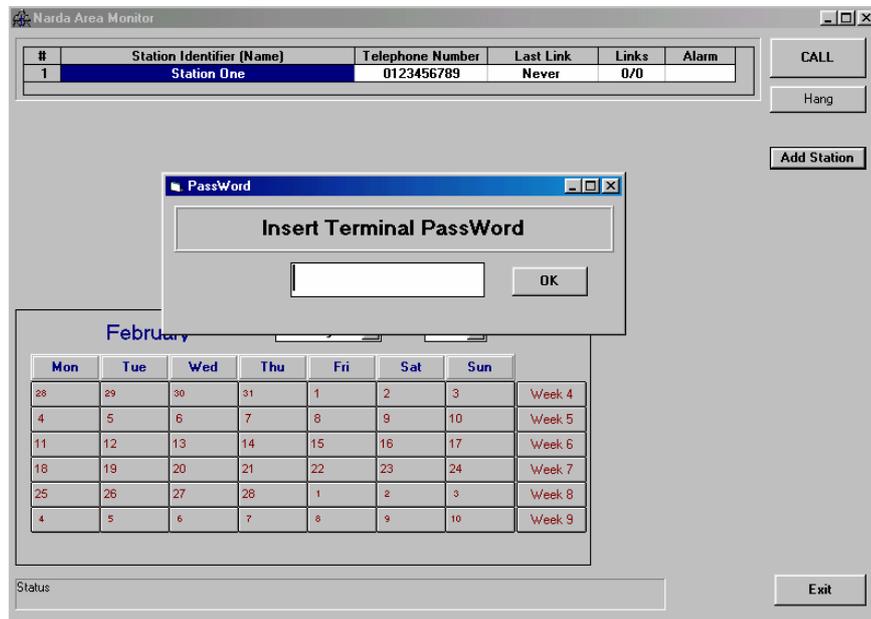
Preferably the modem should be connected to a direct telephone line (same type of connection used for the fax machine). Most of the time, if an automatic telephone switching board is used, you can get out (to call the Station 2600) but the station can not directly respond to your modem). Call your telephone operator to know how your system is working.

3.4.3 First PASSWORD

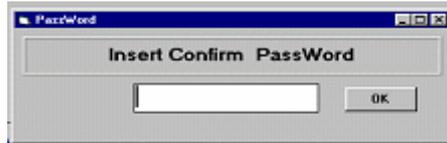
To prevent non authorized people to use your station, two levels of passwords are provided. Before to interrogate any station, the 2600 program will ask for the first **PASSWORD**. The window will be:



If you answer **YES**, a new window will be shown allowing to insert the first **PASSWORD**; if the answer in **NO**, the software allows to introduce it later.



Insert any sequence of alphanumeric characters and push **OK**. It is recommended to take a written note of it. Then the program will ask for the confirmation of your **PASSWORD**. The next window will be:



At this step you must digit the same Password. If you type a different Password the software will show:



Answering **Yes**, the software allows to insert again the right Password; if **NO** is selected, the program will start since the beginning.

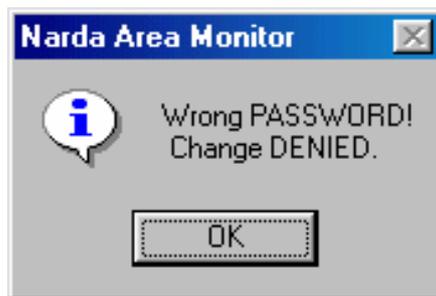
Changing a Password

If it is necessary to change the Password, activate the key **F10** of the PC. The display will be:



Answering **Yes** the software will ask for the original Password and then will let you to change to a new one. If you digit a wrong Password, the following window will appear:

 **NOTE**



Push **OK** and re-install the software.

- 3.4.4 Second Password** After inserting the first Password to manage the stations, the software will demand for the second Password to allow the modification of the set-up when a station is called.
The display will be:

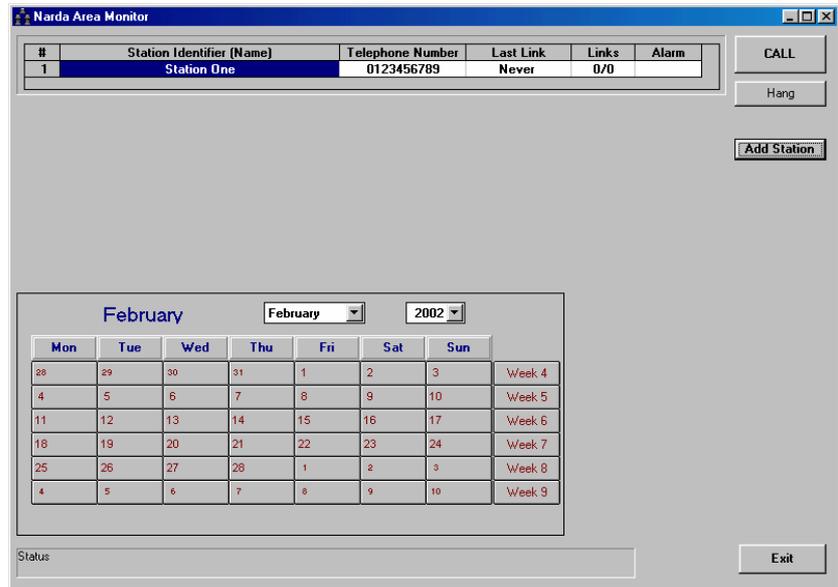


 **NOTE**

Answering **YES** it is possible to introduce the new Password (can be different from the first one) and confirm it when the new window will demand for it.
Answering **NO** this procedure could be done later.
Take a written note of it.

3.4.5 Main program window

After inserting the password, the main window will be displayed:



The upper window allows to choose in the list the station to be interrogated. The software 2600/01 will install two Narda stations, as an example, but they are not necessarily working or available to the user.

The following commands are also available:

- **CALL** to start the connection with the selected station;
- **Hang** to stop the current connection;
- **Add Station** to add a new station to the list;
- **Exit** to exit from the program

This is an example of the remote stations list:

#	Station Identifier (Name)	Telephone Number	Last Link	Links	Alarm
2	demo	123456789	09/02/04 17.21	0/4	UnLock
3	Areamon2	987654321	09/02/04 16.55	0/1	UnLock

- **Station Identifier (Name)**: station name;
- **Telephone Number**: station phone number;
- **Last Link**: the date of the last successful connection;
- **Links**: the number of total successful connections / the number of attempts;
- **Alarm**: alarm state of last connection;

3.4.5.1 Alarm column

umber	Last Link	Links	Alarm
76499	21/02/01 16.14	67/67	
26476	02/01/01 14.33	13/22	
456	18/06/03 18.36	0/0	• UnLock
56	/ /	0/1	
	/ /	0/1	
	UnLock, HangUp, No Call		• Several
79	15/04/04 16.36	1/8	• UnLock

The alarm column is normally empty if no alarm has been recorded, or a red dot followed by the alarm type.

When more than one alarm is present the word "**Several**" will be displayed.

The list of alarm recorded is displayed placing the mouse pointer on the corresponding Alarm cell.

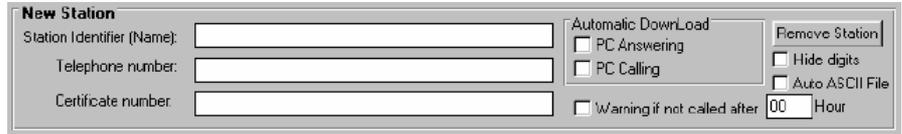
The possible alarms messages are:

- **UnLock**: the chassis of the area monitor is removed
- **OverHeat**: the temperature is higher than 80°C
- **Probe**: the probe is broken
- **Battery**: the battery is low
- **Warning**: the field level exceeds the warning threshold
- **Alarm**: the field level exceeds the Alarm threshold
- **No Call**: no communication happened before the time programmed by the user in the "Warning if not called after XX Hour" window
- **HangUp**: each time the communication is terminated by an interruption of the telephone (or mobile) line
- **Download failure**: every downloading started but not completed will result into an alarm
- **Several**: more than one alarm

3.4.6 Adding a new station



To call a station or to download data it is necessary with the **ADD Station** command to insert the station parameters to the existing list. The following window will open:



The procedure to follow is:

- Type the station name into **Station Identifier** field (any characters can be used) but only the first 8's are used. This name will be stored inside the station after the first time that the station is interrogated. This name will also appear on the display of the cellular phone when the station is interrogated by SMS messages or when the daily reports are automatically sent to the cellular phone.
- Type the **telephone number** of the SIM installed into the station (if the provider offers three numbers, like voice, fax and data, data number should be used).
- Type the protection code printed on the Certificate of Conformity into the Certificate number field.
- Select **Automatic Download** and or **Auto ASCII** file generation.
- Select **Warning if not called** mode of operation if necessary

 **NOTE**

For every operation the software requires the security terminal password.



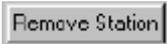
In case you enter a wrong name, the following message will appear.



 **NOTE**

The Certificate number is used to protect the station to be interrogated by whom, without authorization knows, for any reason the telephone number.

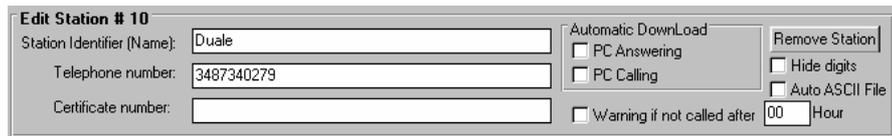
3.4.7 Removing a station To remove a station from the list, it is necessary to push the button **Remove Station**. The display will be:



NOTE

Answering **Yes**, the software will demand for the Password and the operation will be done; answering **NO** the software will ignore the command. If the deleted station will be added again, all the measurements files will be available to the user.

3.4.8 Modifying a station To modify the station identifier, the phone number or the downloading mode simply double click on the related field, the following window will open:



So you can edit the fields you need to change or activate/deactivate **Automatic Download** and **Hide digits**. For every operation the software requires the security terminal password.

3.4.9 Automatic data downloading

When a station is selected and the right button of the mouse is depressed, the window provides the **Automatic DownLoad** section, that allows for automatic data downloading and TXT table creation. Therefore some stations can be programmed for a manual downloading, other can download automatically the data when they are called and other can call the PC, at a programmed time, and transfer the data. In the last case the modem and PC must be on.

NOTE

If the field **Hide Digits** is crossed, all telephone numbers will be hidden to prevent unauthorized person to read the telephone numbers like in the following example.

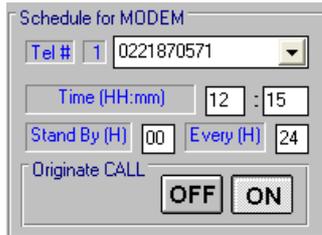
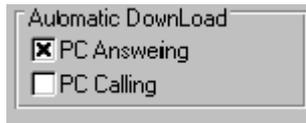
#	Station Identifier (Name)	Telephone Number	Last Link	Links	Alarm
1	P.zza G.Rossa 15 Ponte a Egola	3357201923	21/02/01 16.14	67/68	
2	dual probe	#####	03/01/03 10.32	10/30	
3	demo s/n 701	3487340494	23/11/02 10.02	6/7	
4	EP330 indoor demo	1022123456	29/12/02 10.38	0/0	UnLock



Also, the Status command will hide the telephone number during the dialing process.

It is possible to activate the auto download function either selecting **Answering** or **Calling** or both. If nothing is selected the measurements can be downloaded only manually.

3.4.10 Answering



Selecting **PC Answering**, the station will call the modem connected to the PC at the specific time programmed inside 2600 and will download the data. Of course the station must be programmed to perform such an operation. Therefore the first time the following procedure has to be performed:

- Call the station pushing **CALL** button
- Wait until the communication has been established
- When the software will show the station configuration, depress **Enable Setting** (type your second password too)
- Type the telephone number of the modem into the **Schedule for MODEM** window. Up to 10 telephone numbers can be written and will be called in sequence. Only the first one that provides a communication with the modem will download the data. Therefore the PC and modem have to be turned on.
- In the window **Time (HH:mm)** you should type the time when the automatic calling has to be done.
- In the **Stand By (H)** window type how many hours you want the GSM of the station should remain on. To save battery life you should use a short period of time. If you write 00, the station turns the GSM ON, send the data to the PC and then turns automatically OFF
- In the window **Every (H)** you should type a number sub multiple of 24 (usually we recommend 24 hours) to define when the next downloading should be repeated
- The function **Originate CALL** must be **ON** to enable this automatic function. If it is **OFF** nothing will happen.

When the software/PC receives a call from the station it checks the calling identifier and react with the following rules:

1. If the identifier (name given to the station) matches with the internal list, the software start to receive data into the corresponding folders;
2. If the identifier is not in the stations list, the software adds the new station to the list (with the phone number set to 00000000) and starts to receive data into the corresponding folders.
3. If the identifier is not received or is out of the required standard (ex. Voice phone call) the software enters the stand by state.

When the calling station matches correctly, either all its parameters are downloaded, as well all data related to last connection, this is for data continuity.

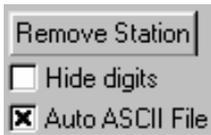
After the download finishes the software force the station to hang up minimizing the connection time and freeing the station for further calls.

3.4.11 Calling



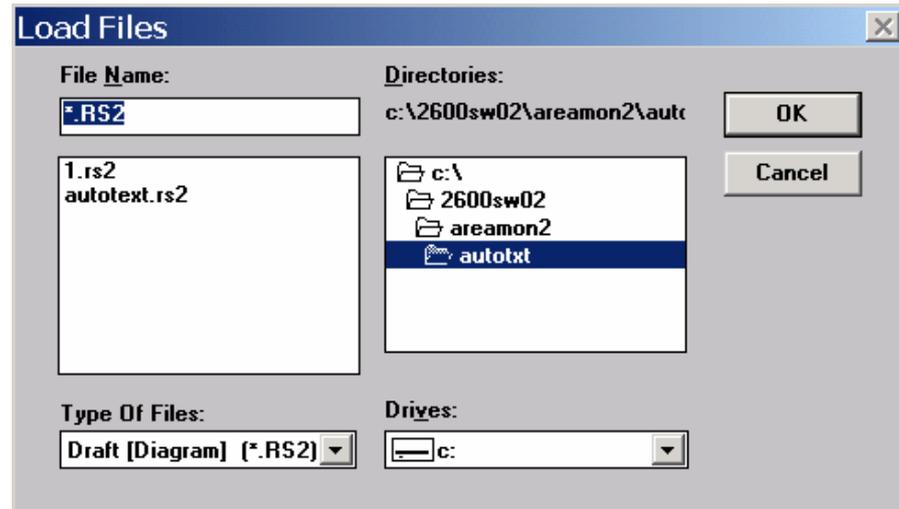
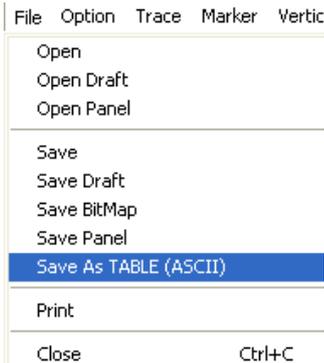
Selecting **PC Calling**, when pushing the button **CALL** (for manual operation), the data are automatically downloaded from the last time you did the downloading until the actual time. After that, the communication does not hang immediately but wait until manual user intervention by depressing any commands (or after two minutes since last operation). This mode of operation is very useful because the user has not to remember when the last downloading has been performed.

3.4.12 Auto ASCII File



By selecting **Auto ASCII File** function, it allows the user to automatically have a file ASCII, which contains all the information related to the downloaded data in the same format as it would be created with the "Save As TABLE" function from File Menu.

When a call, either outgoing or incoming, is notified by the remote station (I.E. giving its name) and data is retrieved, either manually or automatically, all the files that normally are put in the directory **Station Name\Year\Months\Day** are also copied in a special directory called **Station Name\Autotxt**.



After all data are downloaded the files are merged together in order to make just a whole file representing the data from and to an exact time. This is necessary because a download could start before midnight (as it usually happens) and therefore the files are split in different days. Then, the ASCII file is created and its name is **AUTOTEXT.TXT**.

NOTE

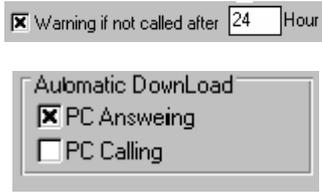
Every time a download is done, for that specific station, all previous data are overwritten (lost) by the newer ones.

Also, the file **autotext.txt** reflects the data which starts from **Date & time Start** and finishes at **Date & Time Stop** shown on the Download frame.

Therefore, it is possible to open autotext.txt file with any external applications (Word or Excel etc.) or to open directly with 2600/01 software. Then the file can be shown, zoomed or saved in a different directory.

3.4.13 Warning if not called after XX Hour

This function is used to inform the user putting the message “No Call” into the Alarm column in the following case:



Cortile Segrate S/N 10902	00393356042659	15/04/04 16.42	2/8	● Several
Demo Segrate S/N 21208	34873402	UnLock, No Call		● UnLock
Sonda Tripla	3483619150	24/06/04 13.46	1/1	● Several

- more than XX hours has been elapsed from the last manual or automatic call; the above example shows the alarm that happened after 24 hours.

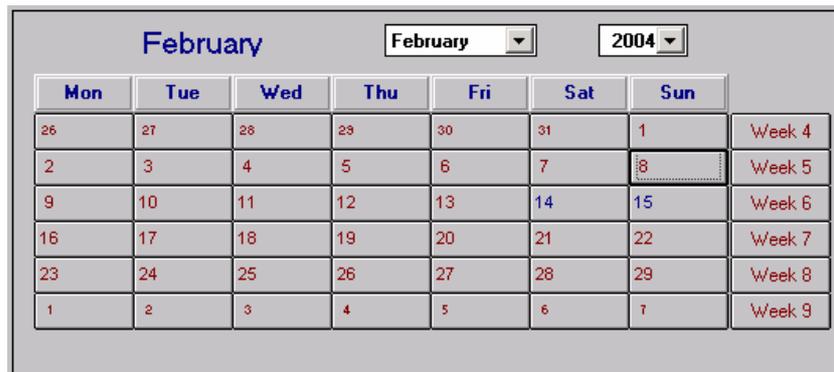
This message is useful to inform about the following possibilities:

- Area monitor did not wake up
- Area monitor software was not running
- The PC or user modem were OFF.
- GSM provider did not handle the communication

Please check the area monitor setup by performing a manual call.

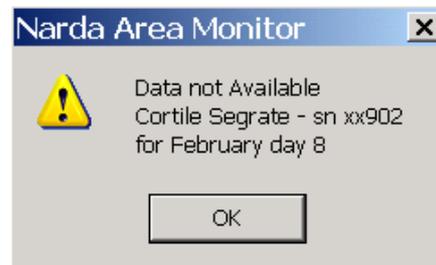
3.4.14 Measurement Calendar

The calendar is automatically created by Narda software and shows, by default, the current month and year; it allows to select and display downloaded data in a graphical format. It is as simple as select the wanted day or week by the corresponding button.

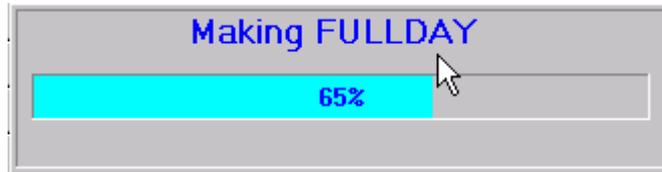


NOTE

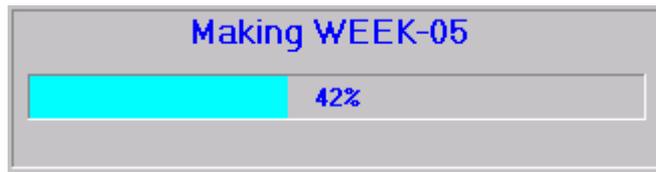
The blue color pushbuttons have already downloaded data. The red ones are empty. If you press a red day, the following message will appear:



The first time you select a day, the software will start the procedure to generate the graph to be shown later on.

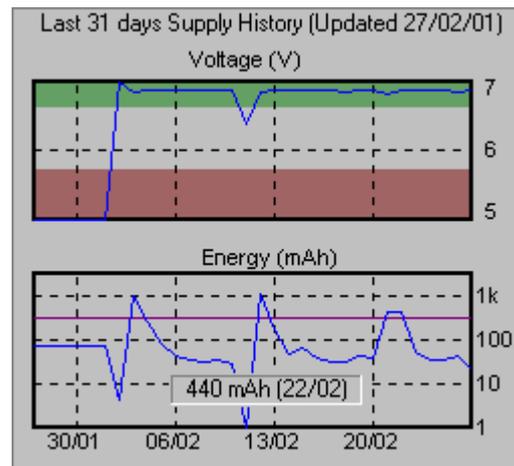


The first time you select a Week, the software will start the procedure to generate the graph to be shown later on.



NOTE

On the right side of the calendar there are graphical data of the maximum battery voltage and solar cells power balance for the last month. These graphs are extremely important and allows the user to program the maintenance of the station (battery failed or solar cells damaged by external agents).



NOTE

The full 31 days graph gives valid values only when your station has been used for at least one month. For example, if you are using a station since 10 days, only the previous 10 days give the exact values, the other 21 days give meaningful data.

It is also possible to visualize the exact value for a given time simply placing the mouse pointer along the curve (see example).

The bottom part of the main window shows the status window with additional program information and the exit button.



3.5 Station call



To call an Area monitor, you should:

- Assign a station name or use an existing one
- Assign a telephone number (if the area monitor is located outside your country, please add the prefix of the country called)
- The modem shall be correctly configured and switched on
- The right serial port where the modem is connected has to be selected. See Software installation chapter.
- Push CALL button

On the Status bar will appear in sequence all the operations performed by the software:

Checking MODEM

Modem testing

Dialing 33560442659

Dialing the Area Monitor

ATDT3356042659

Sending modem commands

Negotiating.....

Provider data exchange

31200 V42

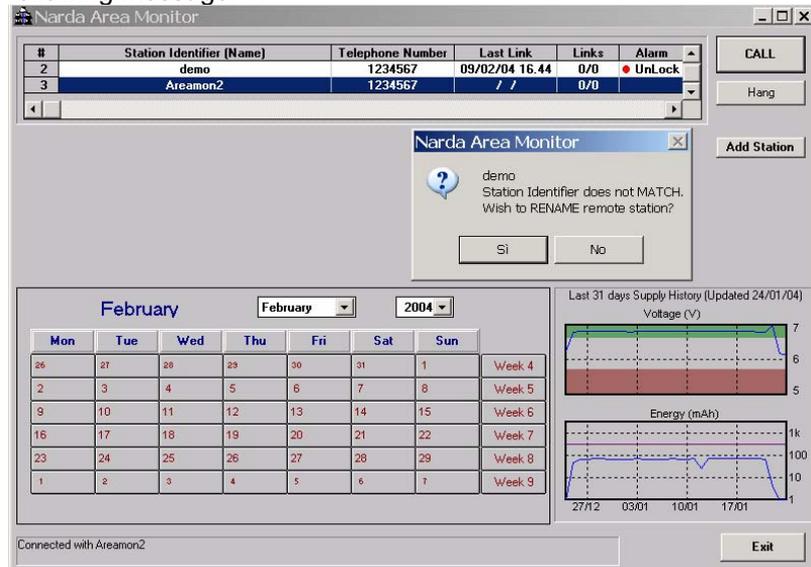
#00 IDN=Cortile Segrate - sn xx902;AMS 55; 1.20 01/04;*

Receiving notification from

the remote Area monitor

Sometimes it happens that a station is called with a name different from what is stored into the station itself.

Suppose that in your PC list you defined a station called **Areamon2** while the internal name of the station is **Demo**, the program notify it and offers the following message:



Answering **YES**, the software will rename the station with the new name **Areamon2** inside the station itself. That means that the PC has higher priority over the station. In this case all the downloaded data will be recorded under the directory Areamon2 and from now on the Area Monitor will be called **demo**.

Answering **No**, a new window will appear:



Answering **Yes**, the software allows to download the data and put the data under the directory Demo. The station name on the software is also updated.

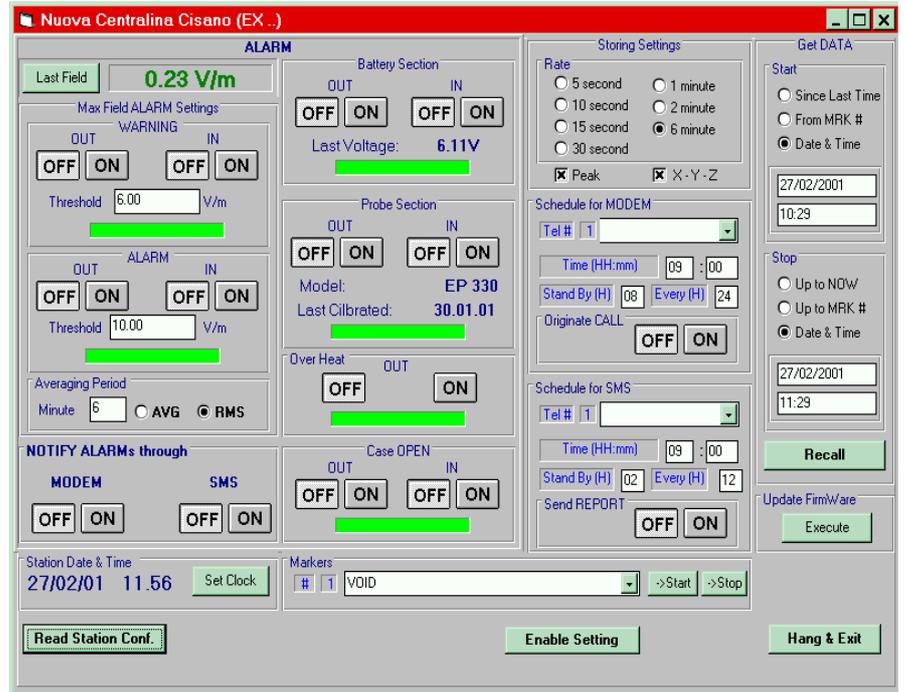
Answering **No**, the data will be downloaded into the directory **Areamon2** temporarily; answering **Cancel** no operation will be performed.

3.6 2600 Command window

After pushing the button **CALL**, the PC will send via the modem all the proper commands to communicate with the station GSM modem. When a good communication has been established, without errors, the command window will open, it allows to:

- Verify settings and parameters of the station;
- Modify settings entering the security "setting password";
- Download recorded data on the local PC.

The window will be similar to the following:



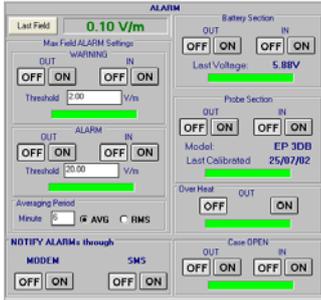
To close the communication push Hang & Exit. The following message will appear:



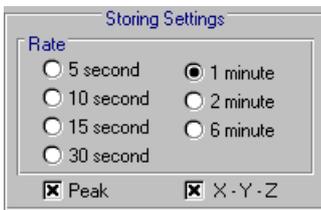
Answering **Yes** the communication will be terminated.

3.7 2600 Commands description

The command window is divided in several zones, each with different commands or functions; they are:

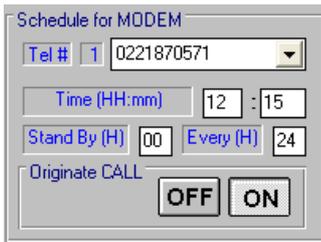


- **ALARM** with the subcommands:
- Last Field
- WARNING
- ALARM
- Averaging Period
- Battery Section
- Probe Section
- Over Heat
- Case OPEN
- NOTIFY ALARMS through



- **Storing Settings** with the subcommands:
- Rate
- Peak
- X-Y-Z (not available with Type 3DB and 3TB probes)

The **Rate** selected will impact the memory used



- **Schedule for MODEM** with subcommands:
- Telephone number
- Time
- Stand by (this value will impact the battery duration)
- Every
- Originate CALL

Up to 10 telephone numbers can be used



- **Schedule for SMS** with subcommands:
- Telephone number
- Time
- Stand by (this value will impact the battery duration)
- Every
- **Send REPORT**

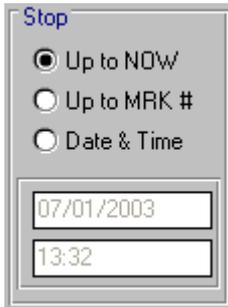
Up to 10 telephone numbers could be used



- **Get DATA** with the subcommands:
- **Start** and subcommands
 - Since Last Time
 - From MRK #
 - Date & Time

The starting date should be coherent with the Rate selected and not higher than the Stop date.

If you try to download data over a period of time longer than the memory used by the defined Rate you get an error message.



 **NOTE**

- **Stop** and subcommands
 - Up to NOW
 - Up to MRK #
 - Date & Time

Stop date should not be smaller then the starting date or higher then the actual date otherwise an error message will appear.

- **Update Firmware;**
- **Station Date & Time** with subcommand
 - Set Clock
- **Markers** with subcommands
 - Start
 - Stop

- **Read Station Configuration;**
- **Enable Setting;**
- **Hang & Exit.**

To change and store settings push the **Enable Setting** button.



Setting change requires the protection "Setting Password".

3.7.1 ALARM



Depending upon the local law, the installation ambient, the whether, the available sunlight or measurements duration, some alarms have to be activated to control the good operation of the area monitor 2600.

Also, if you install the station in a sensitive location where the electromagnetic field should not exceed a specific limit defined by local law, the Field Alarm should be activated to communicate in almost "real time" with a supervisor cellular phone.

All alarm settings have a double threshold, one for the event (**OUT**) and the other for returning to normal condition, event (**IN**).

Either only one or both thresholds can be activated by depressing **ON**.

OUT: activate the alarm for the following case:

1. When field level attention threshold exceed limit (Warning)
2. When field level alarm threshold exceed limit (Alarm);
3. When the battery level is low (< 5.7 V);
4. For one or more probe defective axis;
5. For excessive internal station temperature;
6. Opening the case.

NOTE

Any time an alarm happens the GSM modem is turned On for 30 minutes. It allows 2600 to send the proper SMS message and or to call the PC. Also, it allows to interrogate the station for getting other data or modify the setup of the station.



IN: activate the alarm by sending a SMS message to a cellular phone (or call the PC if it is on), when one of the above return in normal condition. To enable this function press **ON**.

NOTIFY ALARMS through

The alarm notification is sent by an SMS message or by modem call or both.

The alarm notification via SMS can be send up to 10 cellular phones.

The alarm notification via Modem will be sent to the first modem that permit the communication among 10 telephone numbers predefined.

To enable these function press ON.



For each alarm a bar indicates the actual alarm status, independently of alarm notification:

RED: active alarm;

GREEN: alarm not active.

Last Field

Last Field shows the average field of the last period settled in the **Averaging Period**.



Each time Last field is depressed you get on the display of the PC the averaged field value.

 **NOTE**

This value can be remotely interrogated by any cellular phone by sending the SMS message: **#00?LFA***

Averaging Period

Average time of **Last Field** value.

The mean can be arithmetical (**AVG**) or root-mean-square (**RMS**). The value ranges from 1 to 10 min.




Activating the function **Send REPORT ON**, all the cellular phones listed (max 10) will receive the daily Report with the worst Last Field averaged (higher value) and the time when this value happened.

Max Field ALARM Settings

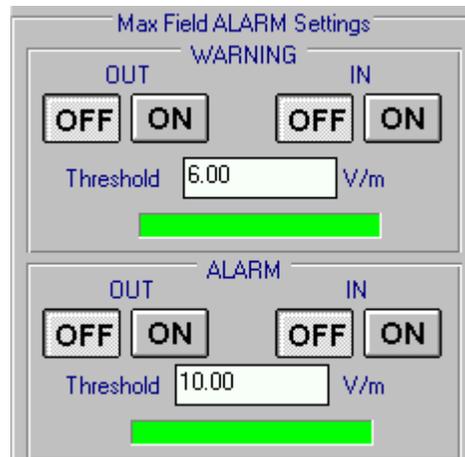
Field alarm.

The station is equipped with two field thresholds: **Warning** and **Alarm**

When a threshold is exceeded a message is sent to the modem or to the SMS cell phone depending on the **NOTIFY ALARMS through** setting.

Selecting the **ON** button the station monitors the threshold, selecting **OFF** no action is taken.

The **OUT** buttons verify the exceeding of the threshold, the **IN** buttons verify return to normal level under the threshold.



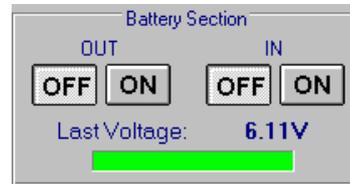
In this example, the Alarms will be activated when the Last Field acquired by 2600, according to its averaging period, exceed 6 or 10V/m.

Therefore if 1 minute is selected, the average value over 1 minute should exceed the threshold; for example if the field exceeds 6V/m for a short period of time it does not necessarily activate the alarm because the average value (Last Field) is below the threshold.

Battery Section

Battery alarm.

The internal control system have a voltmeter to monitor the battery voltage, this function continuously check the battery status. Setting is the same as in field alarm.



The green bar becomes red when the value is below 5.7 V and the alarm will be notified.

The current consumption of the station is about:

- 10 mA: GSM switched off;
- 30 mA: GSM in stand by status;
- 100 mA: GSM active.

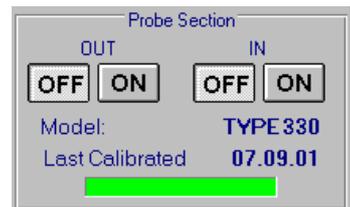
 **NOTE**

This value can be remotely interrogated whenever you want by sending the SMS command: **#00?BAT***

Probe Section

Probe alarm

The Probe Section shows the probe in use and its calibration date. An alarm can be activated to monitor probe axis malfunction.



The type of probe and its calibration data can be remotely interrogated by the SMS command: **#00?PRB***

Over Heat

Over Heat alarm

This section activates an alarm when the internal temperature is too high:

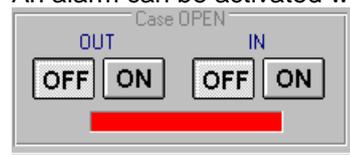


This value can be remotely interrogated by the SMS command: **#00?TMP***. This value is expressed in ° Fahrenheit.

Case OPEN

Case Open alarm

An alarm can be activated when the outer case is opened or removed



Inside 2600 it is installed a micro switch to detect the case opening.

3.7.2 Schedule for MODEM

Station setting for modem communication.

To interrogate the station or to download data via a central PC or by using a personal cell phone the internal GSM station modem must be active otherwise it is not possible to communicate with 2600.

NOTE

In case of any alarms, the station 2600 calls the PC (if this function is enabled) and send a SMS (if this function is enabled) alarm messages up to 10 cell phones. The internal GSM modem is always turned on for about 30 min.

The schedule for Modem section set the internal GSM modem power on time, the call repetition interval and the working period.

The parameter **Time (HH:mm)** is the time of the day the GSM will power on and stay in stand by status. The parameter **Stand BY (H)** set how long the GSM will stay on, and finally the parameter **Every (H)** set the GSM activation interval that is to say after how many hours last activation the GSM should power on again. This time must be a submultiple of 24 that means one of the following values: 1, 2, 3, 4, 6, 8, 12, 24.



Screenshot of the 'Schedule for MODEM' configuration window. The window contains the following fields and controls:

- Tel #**: A text input field containing '0123456789'.
- Time (HH:mm)**: A time selection field set to '09:00'.
- Stand By (H)**: A text input field set to '08'.
- Every (H)**: A text input field set to '24'.
- Originate CALL**: A section with two buttons, 'OFF' and 'ON'.

The minimum Stand By period is 0: in this way the 2600 calls the Modem, download the data and turn off again the GSM.

When the command **Originate CALL** is **ON**, at the programmed time or if an active alarm happens, the station will automatically call the remote central PC. If it is off or occupied the station will try to call the second phone number in the list and so on.

NOTE

Look at chapter number 2, paragraph 2.8.2, for the various modes of switching on of the modem.

3.7.3 Schedule for SMS

Station interrogation with SMS messages.

The station can be interrogated sending a SMS message from a GSM cell phone; the station can also send back alarm messages and daily reports to up to 10 different cell phones.

As for Schedule for Modem the **Schedule for SMS** section set the internal GSM modem power on time, the call repetition interval and the working period.

Screenshot of the 'Schedule for SMS' configuration window. The window contains the following fields and controls:

- Tel #**: A dropdown menu showing '1' and a text input field containing '03301234567'.
- Time (HH:mm)**: Two input fields, the first containing '14' and the second containing ':00'.
- Stand By (H)**: An input field containing '02'.
- Every (H)**: An input field containing '12'.
- Send REPORT**: A section with two buttons, 'OFF' and 'ON', where 'ON' is selected.

When the command **Send REPORT** is **ON**, the station automatically send the daily report to all cell phones in the list at the time settled in **Time (HH:mm)** window.

The minimum Stand By period is 0: in this way the 2600 sends the Report via SMS message, at the specified time, and turn off again

NOTE

The user can remotely ask for daily report by the SMS command: **#00?RPT*** (max field value, minimum battery value and station status, station phone number, hour and day).

The Report shown on the cell phone display reports the highest field value and the lowest battery value happened since last Report has been sent.

Therefore if a Report is sent at 14.00 (where the data are related to the last 12 hours as in this example) and at 18.00 another request comes to the station, the station will send the highest field value measured between 02.00 until 18.00.

To get the highest value between 14.00 till 18.00 you should send the message **#00?RPT0***.

The combination of both schedules will define the total time that the GSM modem will be On. If both are set at 0 the GSM will turn on for 3 hours at 11.00 a.m. of every day.

NOTE

A list of all available commands and SMS messages can be found on Chapter 5 of this Manual.

3.7.4 Storing Settings

Data recording settings

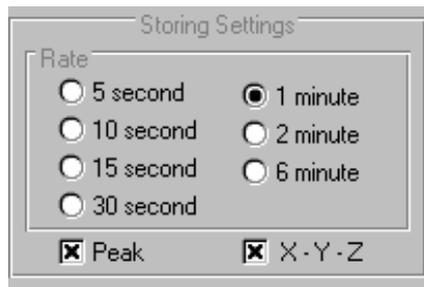
Data can be recorded into the station memory with a selectable rate between 5 sec to 6 minutes.

 **NOTE**

The station always acquires data every second storing the average value (arithmetic or quadratic according to the Averaging Period selection) for the selected period. These data are not available to the user.

The suggested Rate for most of the applications is 1 minute.

Example: if 1 minute is selected the station acquires 60 measures and stores the mean value.



Together with the total value, it is possible to acquire the peak (highest total field) and the individual field of each probe axis. The Peak is the highest value measured among the rate selected.

Each axis value is the average value calculated over the Rate selected.

X - Y - Z is not suitable for Type 33DB and 33TB probes.

 **WARNING**

The acquisition method chosen is very important to select the appropriate data downloading interval, to avoid overwriting of useful data in memory.

When any of these settings are modified all the data already stored are lost. A specific message warns when this occurs.

The following table shows the memory capacity related to data acquisition time interval:

Resolution	Total field value Average	Total field value Average and Peak	Field value X,Y,Z+Total Average	Field value X,Y,Z+Total Average and Peak
5 sec	>7 days	>3 days	>3 days	>45 hours
10 sec	>15 days	>7 days	>7 days	>90 hours
15 sec	>22 days	>11 days	>11 days	>5 days
30 sec	>45 days	>22 days	>22 days	>11 days
1 min	~3 months (91 d)	>45 days	>45 days	>22 days
2 min	~6 months (182 d)	>3 months (91 d)	>3 months (91 d)	1 month (45 d)
6 min	~18 months (546 d)	>9 months (273 d)	>9 months (273 d)	>4 months (136 d)

 **NOTE**

When memory reaches the maximum capacity new data overwrite old ones, last period data are then always available. Attention has to be used when Storing Setting is changed because with the new Storing Rate the old stored data are not valid anymore. The message will be:



Answering **Yes**, the software will show a second message to prevent a wrong selection.



If the choice is **Yes**, you change the Storing Rate but all the previous data are invalidated and all your old graphs will be unusable even if such data can be downloaded.

 **WARNING**

If a new probe replace an existing one, all data previously collected with the old probe will be no valid even if they downloadable. Therefore take a written note of the date and time when a new probe has been replaced or use the Marker function. The correct data are available from this time on.

3.7.5 Get DATA

Station data downloading to central PC.

The user can manually download data from the internal station memory to the central PC with one of following methods, choosing a Start and Stop event:

The (Start) and the (Stop) of data downloading is among the following commands in any combination:

- **Since Last Time:** since last download time and day;
- **From MRK #:** depending on marker settings;
- **Date & Time:** from user defined date and time;
- **Up to NOW:** (local station date and time) ;

the button “Recall” starts the data download.

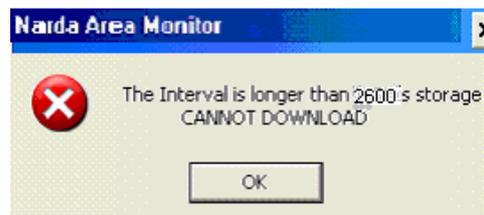
The calendar on the main window will be automatically filled with new valid data and the corresponding days will change their color from red to blue.

NOTE

Note 1: the start time must precede the stop otherwise an error will rise up. The error message will be:



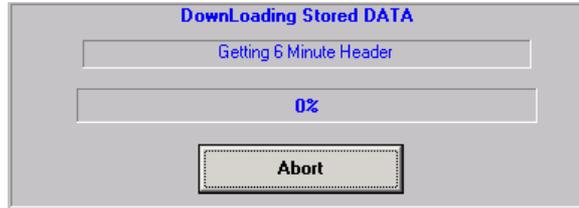
Note 2: if the downloading interval (start to stop date) is longer then the memory available for the defined Rate and Peak and X-Y-Z selection, the station refuses to operate. The following message will appear.



Push **OK** and select new parameters.

Note 3: the user must click on Hang & Exit to be able to analyze downloaded data.

During the downloading process two progress bars will indicate the status of the downloading.



 **NOTE**



The horizontal slide bar will show each two hours downloading. In case of transmission error or difficulty to communicate with the station try again by depressing Recall push button.

3.7.6 Errors Messages

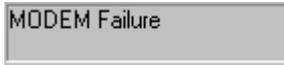
Several things could affect a good communication with the station or the modem usage.

If the station has a poor or disturbed GSM signal, we can get several kind of error messages.

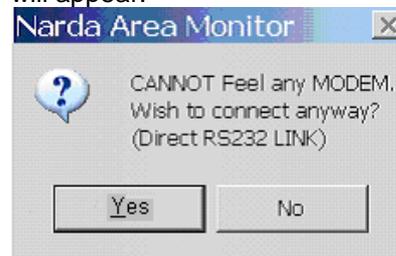
Possible problems from an Area monitor systems could come from:

- Area monitor itself (electronic or battery)
- Internal GSM modem of the area monitor with its SIM card
- GSM provider
- Telephone line
- Modem connected to the PC
- PC itself

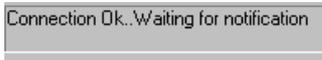
The message in the Status window will be:



If the modem is OFF or if the software is driving a different serial port from the one where the modem is connected to the PC or it is not appropriate to transfer and receive data from or to a mobile phone the following message will appear:



The software assumes that 2600 is connected via an RS232 communication port.



If you answer **YES**, the message will be:



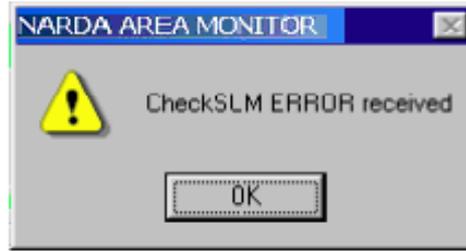
Answering **YES** the software will try to communicate with the station.



The station does not answer. 2600 could be OFF or the internal GSM is OFF or the battery is below the minimum value.

In case of an RS232 connection this message appears when the cable is not connected between 2600 and PC.

Sometimes happens that the data transferred by the Area Monitor and received by modem have some errors. Thanks to the checking algorithm used by 2600/01 software the corrupted data are identified.



Typical corrupted data message.

The Check Sum warrants the quality of data received. Most of the time the Windows operating system goes out of 2600 application.

Double click the 2600 icon and start again.

Sometimes would be useful to delete the complete data file created into your Area monitor directory and recall aging the station.

 **NOTE**



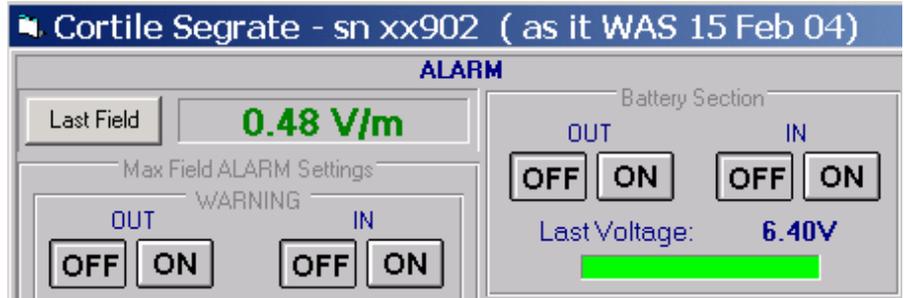
No answer from station message. Try again with Recall command.



Data cannot be downloaded.

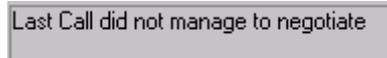


Selecting Read Station Conf. when station doesn't respond last successful connection will be displayed.



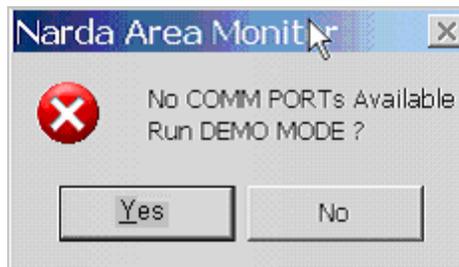
GSM Communication error. Maybe there is too much traffic on the base station that is communicating with 2600 or the SIM card is not enable for data exchange.

Press OK. The Status bar will show:



When the station is off or the telephone line signal is unavailable we get the message **NO CARRIER** on the **Status** window.

If 2600 software does not see any port, the following message will appear.



See paragraph 3.4.2 selecting the right port and start again to run 2600/01 software otherwise pushing **Yes** you enter in a Demo mode.

3.7.7 Firmware Update

Station Internal Firmware update

To update firmware simply click **Execute** button.

The station will store in a temporary memory the old firmware and try to load the new one. If any CRC error occurs or the phone link is poor the station stores again the old firmware back in place to avoid any malfunction or blocking.

It is possible to update firmware connecting the PC to the station serial port.

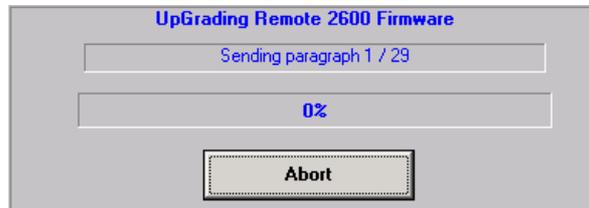
A progress bar indicates the firmware upload status.



1. Upload confirmation request;



2. Uploading with progress status bar.



3. Back writing (internal FW copy);
4. Reset and station activation with new firmware version.



 **NOTE**

The updates for Narda 2600 firmware are available for download from the internet web site <http://www.narda-sts.com> or directly from the commercial offices of Narda.

3.7.8 Station Date & Time The station clock is updated with the local PC clock.



NOTE

The internal clock of the station is very accurate, much more than your PC but it does not change automatically during the European legal time period. Also, whenever the clock is changed the measurements stored could be not contiguous any more. Some period of time could be shown without any data.

3.7.9 Markers

Markers creation and use.

The typical station usage is to leave it always on acquiring data, when a specific range of time has to be put in evidence, as direct intervention or station moving, a Marker start and stop can be set for.

Data between two markers can be downloaded and displayed.

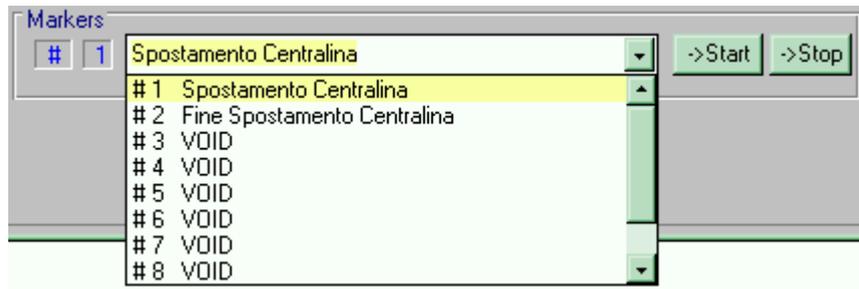
This feature is useful when the station is moved from one location to another, the acquired data in this period is not meaningful and the user can clearly identify them with markers.



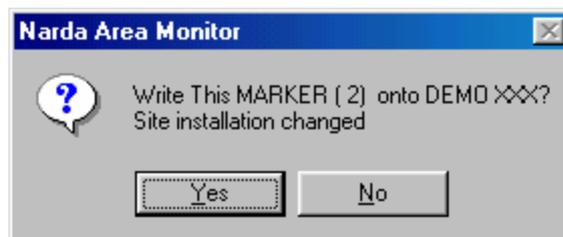
Marker setting

Up to 10 markers can be set.
Empty markers show "VOID"

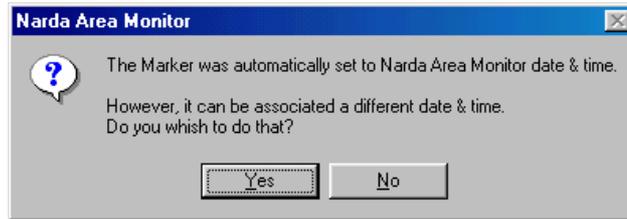
- Select marker to set in the pull down window;



- Write down the marker description then key **Enter** a confirm window like the following will pop up;



- The marker will get the current station time for default, however It is possible to set a different time and date:



- The following window will pop up when date has to be changed:



- Repeat above steps to set the stop;

Deleting a Marker

To cancel a Marker, select the Marker you wish to cancel and press Cancel button and confirm.



NOTE

Start and **Stop** buttons allow to send selected markers to **Get DATA** window:



The marker Stop event time must be subsequent to the start one, otherwise a error indication will pop up.

3.8 General commands

On the bottom of the main window there are 3 general commands:
Read Station Conf
Enable Setting
Hang & Exit

Read Station Conf.

Read Station Conf button allows to start a new station interrogation and to download the actual station configuration.



 **NOTE**

This command is similar to RECALL but it does not download any data.

Enable Setting

With **Enable Setting** button the user is allowed to send any new setting to the station.



The setting change requires a protection password:



Hang & Exit

Hang & Exit button end the connection with the station, hang the phone line and return to the main software window.



3.9 RS232 data downloading

In some applications, for example where there is no GSM coverage, it is possible to place the station and start data acquisition without downloading the data day by day via the internal GSM modem. After the period of the acquisition, the station can be connected to any PC via the serial port and download all the data.

The procedure to follow is:

- Open the station by removing the 4 screws
- Connect the provided serial cable from the serial port of the PC to the RS232 connector of 2600
- Change the property of 2600/01 icon by typing the command `COMM=N`; where N is the number of the COM port where the RS232 cable is connected
- Run the 2600 software
- Call the connected station by pushing CALL button

Of course, since RS232 is used, the software will not feel any modem and the following message will appear



Selecting **YES**, you will enter the main menu of the station and then you can modify the setup or download any desired data.

Possible error messages If the station is OFF or the serial communication does not work, the following message is displayed.



Answer **NO** and try to fix the problem by checking the serial cable or if it is connected to the right port.

Answering **YES**, you can not download any new data but you can see how it was programmed last time that you communicate with it.



3.10 Software update

To update the software you can download the newest release from Narda website: www.narda-sts.com.

After you have saved it into the PC, you must unzip it to get the complete list of files to be installed. You can save them into a floppy disk or save into PC hard disk.

Start the installation calling "Run" from the Windows main menu by using "Start" command. Type the command "A:SETUP" if you are installing 2600/01 software from floppy or type "C:\2600/01" if you are using the hard disk. If you have some problems during installation, try to use the file INSTALL instead of SETUP.

After few seconds the software will ask where you wish to place the area monitor software. The default directory is 2600W02.



If you want to avoid the software installation select **Exit Setup** otherwise press **Continue** pushbutton.



During the installation process, the software will ask if you want to delete all the PassWords already registered.

If you answer **YES**, all the Stations and measurements already registered will be hided and to recover them you must manually add all stations by remembering the exact names (including capital letters and spaces) and the telephone numbers of each stations previously installed.

With this procedure you will recover all 2600 stations and all measurements will be available to the user.

If you answer **NO**, all stations, telephone numbers and measurements will immediately available to the user.



Just after the PassWords selection, the software will create the 2600 icon showing the last message as below.

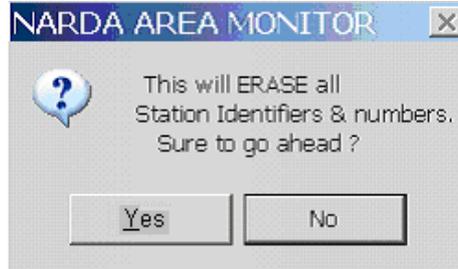




AREA MONITOR 2600
Collegamento
1 KB

When the Icon is available, it would suggest to move it to the Desktop by dragging the icon with the mouse.

In the case you wish to cancel all stations previously registered, a new prompt will be shown to make sure of your decision.



If the answer is **NO**, the software will be installed keeping all station names and telephone numbers.

If the answer is **YES**, the software will continue the installation process until it is completed.



4 – Data presentation

4.1 Introduction

This Chapter is a guide to display, to interpret or manipulate the data downloaded from the Narda 2600 Area Monitor by the 2600/01 data acquisition and control Software.

Any time a new station is being added to the list, a new directory is automatically created under the root 2600SW02 program directory, all data downloaded from the new station will be written into that directory.

The name assigned to the new directory is in the following form: first 8 characters of the station name (without spaces and special characters)

Example: for a station called NUOVA CENTRALINA CISANO the directory name will be NUOVACEN.

4.2 The Calendar

Every time the station is interrogated the downloaded data are stored in the directory assigned to that station, divided by year, month and day.

On the main program window there is a **Calendar** window where user can select data to display by day or week.

February							February	2003
Mon	Tue	Wed	Thu	Fri	Sat	Sun		
27	28	29	30	31	1	2		Week 4
3	4	5	6	7	8	9		Week 5
10	11	12	13	14	15	16		Week 6
17	18	19	20	21	22	23		Week 7
24	25	26	27	28	1	2		Week 8
3	4	5	6	7	8	9		Week 9

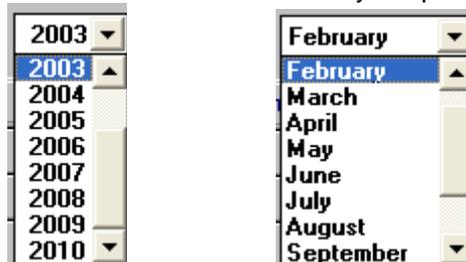


WARNING

To avoid program malfunction it is important to **NOT** move data directory or files from assigned program .

By selecting the corresponding day or week on the Calendar windows it is possible to recall the corresponding data and display them in a graphical format.

Year and month is selected by the pull down menus.



NOTE

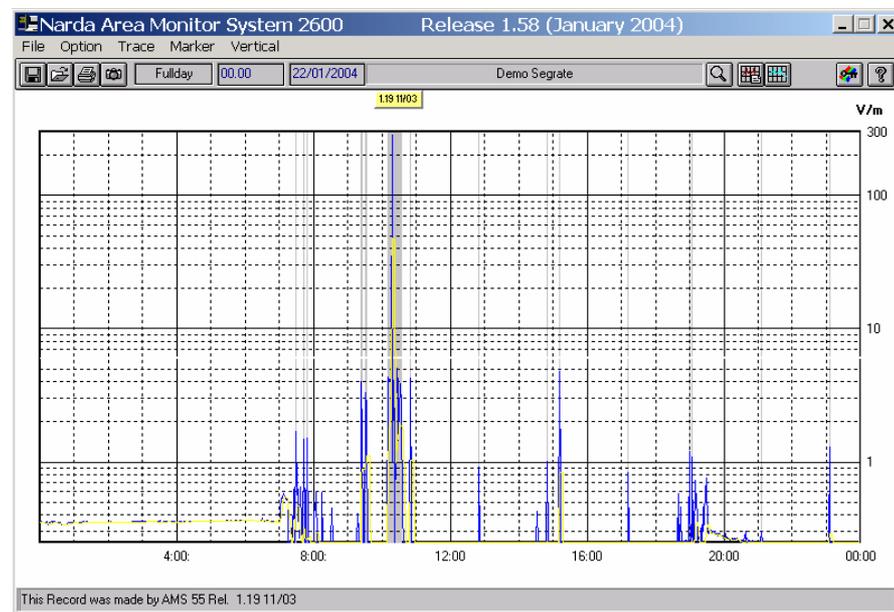
The blue color pushbuttons have already downloaded data.

The red ones are empty. It is possible to open the week if at least one blue day is available.

4.3 Data window

Selecting a day or a week of blue color it is possible to enter the graphic menu. In this window it is possible:

- To show any graph of any station (**Open Files** function)
- To select the averaging time (**Option**)
- To save the graphs into a file (**Save Files** function)
- To print any graph (**Print** function)
- To add or to modify a comment (**Comment** function)
- To select the Limit and the color of set-up (**Setup** function)
- To highlight or to hide when the GSM was ON; to show all axis, the Peak value and the average value (**Trace** function)
- To position the Marker over a specific trace (**Marker** function)
- To expand horizontally the graphs (**ZOOM** function)
- To expand vertically the graphs (**Vertical** function)
- To show the software release (? icon)



The graphical data window displays acquired data by day or week, in the above example you can note several vertical bands, they represent the internal GSM modem activation.

The 2600 internal modem can be activated by the user to interrogate the station, but also from the mobile provider to periodically check the communication.

That indication allows the user to discriminate field generated by modem from those in the installation environment.

The data window is divided in 3 sections:

- The main command bar on the top followed by a secondary commands one;
- The graphical window for data presentation in the middle;
- The status bar on the bottom.

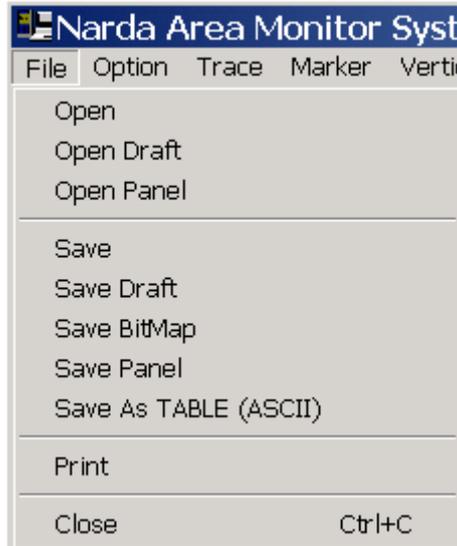
4.4 Main Commands

The main commands are:



4.4.1 File

This command is used to open any files of any station or to save the downloaded data.

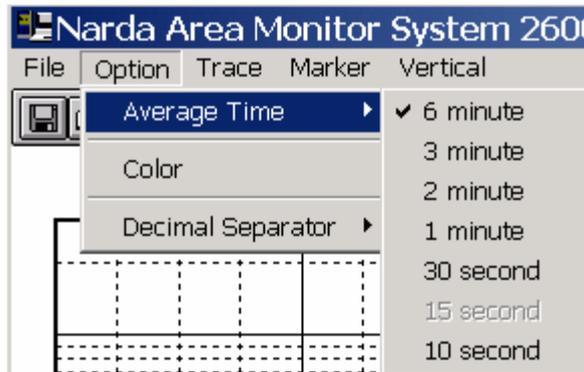


For the proper use see the Open files and Save files commands described later on.

4.4.2 Option

This command is used to select the time for averaging (**Average Time**), the colors (**Color**); see the Setup icon described later on; the decimal separator (**Decimal Separator**).

The window will be:



The possible Averaging Time choices will be according to Storing setting selected into the station. The minimum available Average Time will be the Rate defined in the area monitor.

4.4.3 Trace



The Trace command allows to select which trace have to be displayed. The possible choices are:

- **AVG 6 min (or RMS 6 min):** 6 minutes averaging; default function
- **X Axis:** X axis; if it has been activated into the station
- **Y Axis:** Y axis; if it has been activated into the station
- **Z Axis:** Z axis; if it has been activated into the station
- **Peak:** Peak value; if it has been activated into the station
- The average value performed with the storing rate selected into the station; in this example is 1 minute (**AVG 60 s**)
- **GSM Band:** to show or to hide the GSM activity
- **X-Y-Z ON:** to show all axis
- **X-Y-Z OFF:** to hide all axis
- **All Trace ON:** to show all traces
- **All Trace OFF:** to hide all traces

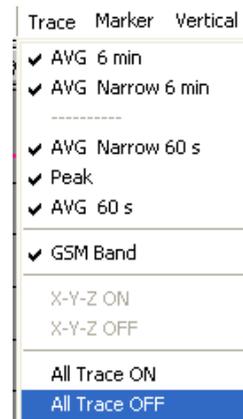


 **NOTE**

Only the enabled traces will be used to create the equivalent TXT file during Save file process.

4.4.3.1 Trace with Type 33DB probe

In case of usage of the dual probe model Type 33DB, the Trace display will be:



Since Type 33DB does not provide X, Y and Z axis, this function is disabled.

4.4.3.2 Trace with Type 33TB probe

In case of usage of the triple probe Type 33TB, the Trace display will be:



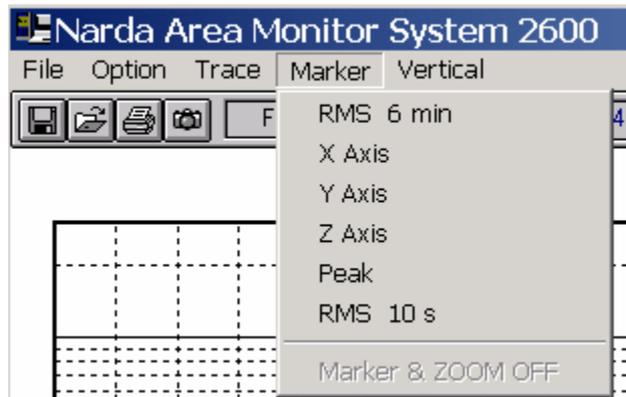
Since EP-3TB does not provide X, Y and Z axis, this function is disabled.

4.4.4 Marker



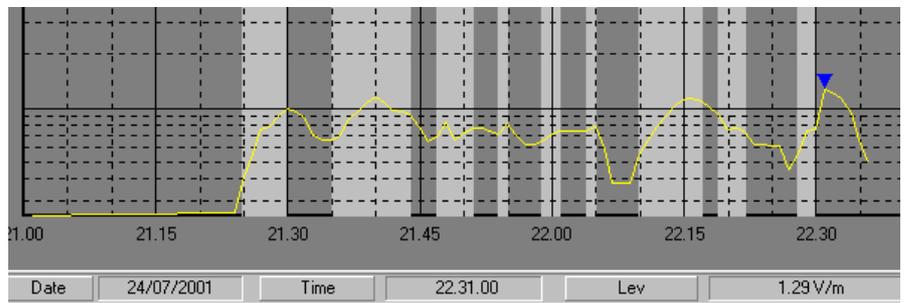
When the station is programmed to capture all possible data, the graphical display is crowded with many traces. The function Marker allows to position a small triangle over the desired trace and to display the value of the field and the related time.

The window will be:



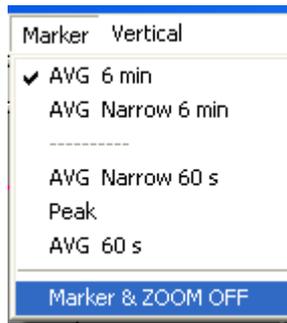
 **NOTE**

The Marker is only visible activating the function ZOOM.



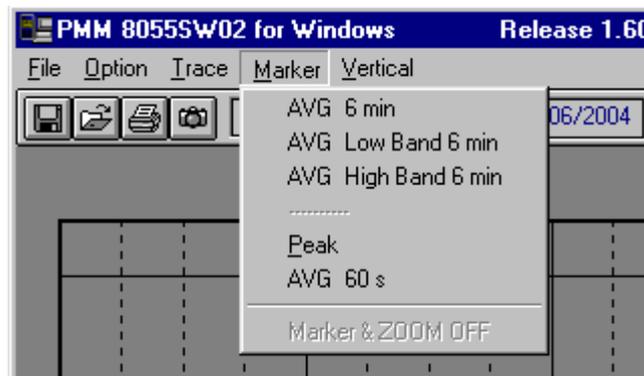
4.4.4.1 Marker for Type 33DB probe

If Type 33DB probe is used, the Marker display will be:



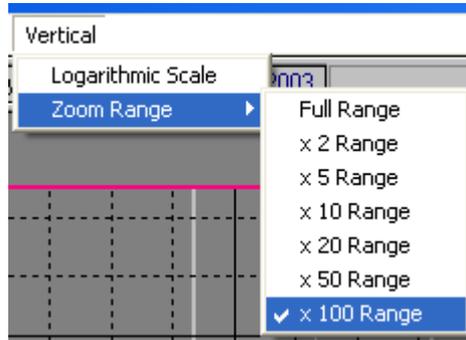
4.4.4.2 Marker for Type 33TB probe

If Type 33TB probe is used, the Marker display will be:



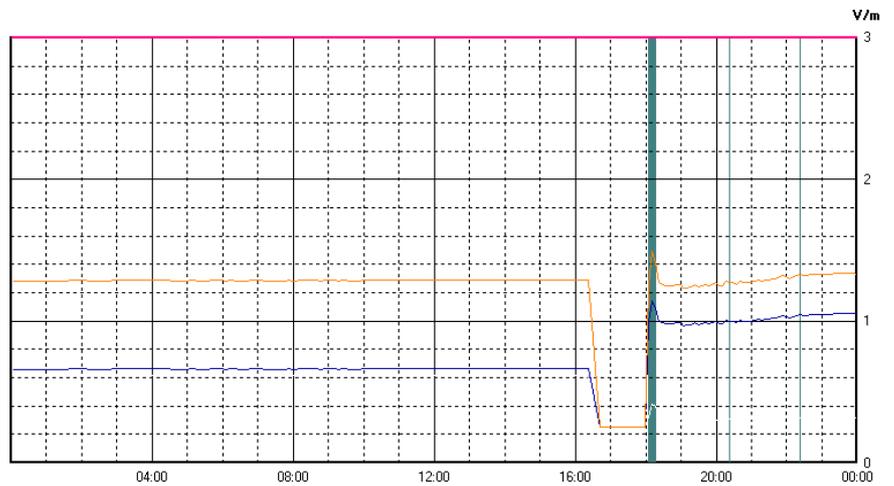
4.4.5 Vertical

This function is used to display the graph in linear or logarithmic scale and allow to select the full scale value.
The display will be:

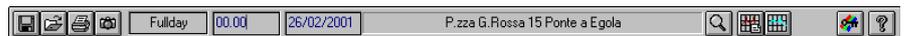


By selecting **x 100 Range** user get the highest sensitivity.

 **NOTE**



4.5 Secondary Commands



The secondary Commands are:

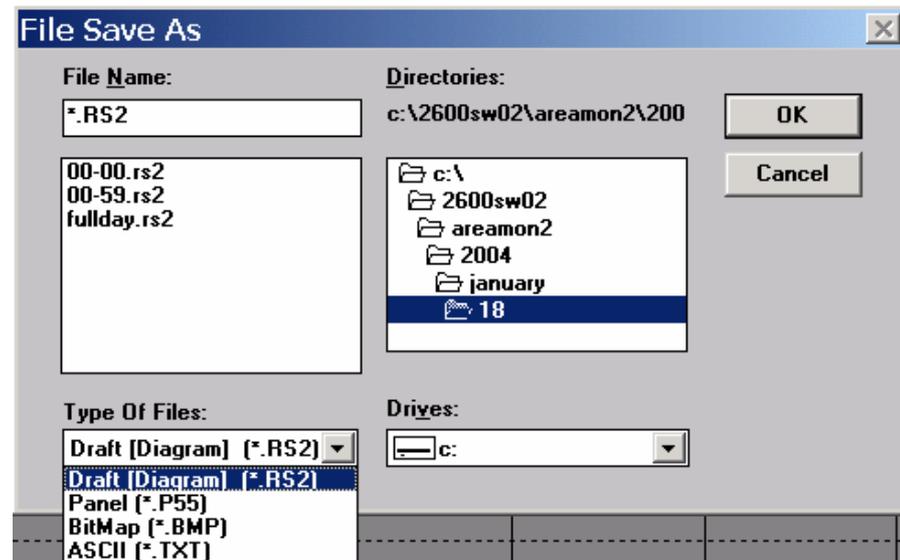
4.5.1 Save Files



It is possible to save the menu setup and all measurement in different formats.

1. **Draft (Diagram) (*.RS2)** (Default Narda format) Archive for future data processing.
2. **Panel (*.P55)** A file with extension *.P55 is saved. It contains the setting chosen by the Setup function. The user can easily recall the file with preferred settings. (the program start by default with setting in the file **default.P55**)
3. **BitMap (*.BMP)** a graphic file in bitmap format is saved, it is the actual diagram displayed on the graphical window.
4. **ASCII (*.TXT)** A text file with all measurement data is saved.

The window will be:



The measurement data could be saved in any directory. During this procedure the software will show all files already saved.

4.5.1.1 Save File in ASCII format



NOTE

The **TXT** files in ASCII format display an * (asterisk) on lines corresponding to when the internal modem of the station is interrogated by the GSM provider or by the user during data downloading.

Such data are represented on the graphic display with vertical bands on light color (the colour can be selected by the user).

On the following example you can note 3 lines with an asterisk following the **Time** column. Of course the Peak column has the highest value.

Narda Area Monitor System 2600

Station: Demo 902

Name: Fullday Date: 13/01/2003 Time: 00.00

Probe Type 330

Limit = 6,0 V/m

AVG

Date	Time	6 min	60 s	Peak	X	Y	Z
13/01/2003	9:21	1.41	1.40	1.41	1.02	0.57	0.77
	9:22	1.41	1.40	1.42	1.02	0.57	0.77
	9:23	1.41	1.41	1.42	1.03	0.57	0.78
	9:24	1.40	1.41	1.42	1.03	0.57	0.78
	9:25	* 1.40	1.41	1.42	1.03	0.57	0.78
	9:26	1.41	1.41	1.42	1.03	0.57	0.78
	9:27	1.41	1.40	1.41	1.02	0.57	0.77
	9:28	1.40	1.39	1.40	1.01	0.56	0.77
	9:29	1.40	1.39	1.39	1.01	0.56	0.77
	9:30	* 1.40	1.39	1.39	1.01	0.56	0.77
	9:31	* 1.41	1.46	2.24	1.05	0.60	0.82
	9:32	1.40	1.39	1.40	1.01	0.56	0.77
	9:33	1.40	1.39	1.39	1.01	0.56	0.77
	9:34	1.40	1.39	1.39	1.01	0.56	0.77
	9:35	1.40	1.39	1.40	1.01	0.56	0.77
	9:36	1.40	1.39	1.39	1.01	0.56	0.77

In this example, at 9.25 the station has been interrogated by the provider for a short period of time. There is no field increase detected.

From 9.30 to 9.31 the station has been called by the PC for a data downloading. On the **Peak** column it is possible to see a very significant field increase (2.24 V/m).



NOTE

If in Trace Menu the **GSM Band** was not enabled the asterisks (*) do not appear in the table.

Only the traces enabled in Trace menu will be used to create the TXT file.

4.5.1.2 Data interpretation

When a file is saved in TXT format and the table is opened, an huge amount of data are available. Peak, X, Y and Z are available only if the 2600 has been programmed to collect such data and the Trace menu have enabled them.

The file contains:

station name, file name, date and time, Probe used, the limit (if defined in the Setup menu) and the type of averaging. After such information, the table will provide all requested data enabled by the Trace menu.

Narda Area Monitor System 2600

Station: DEMO S/N 907

Name: Fullday Date: 18/11/2002 Time: 00.00

Probe Type 330

Limit = 6,0 V/m RMS

Date	Time	6 min	60 s	Peak	X	Y	Z
18/11/2002	9:04	0.66	0.64	0.84	0.21	0.58	0.18
	9:05	0.73	0.86	0.98	0.40	0.64	0.41
	9:06	0.67	0.84	0.96	0.38	0.64	0.39
	9:07	0.73	0.70	0.74	0.25	0.59	0.27
	9:08	0.76	0.88	1.06	0.41	0.64	0.44
	9:09	0.81	0.88	0.99	0.39	0.65	0.44
	9:10	0.84	0.87	0.99	0.38	0.65	0.44
	9:11	0.87	1.03	1.26	0.51	0.70	0.55
	9:12	0.95	1.24	1.29	0.65	0.77	0.72
	9:13	0.99	1.01	1.28	0.50	0.69	0.55
	9:14	1.02	1.04	1.18	0.51	0.70	0.57
	9:15	1.04	1.00	1.08	0.50	0.69	0.53
	9:16	1.03	0.85	0.99	0.41	0.63	0.39
	9:17	1.00	0.83	0.96	0.40	0.62	0.37
9:18	0.92	0.78	0.91	0.35	0.61	0.34	
9:19	0.93	1.05	1.10	0.55	0.70	0.56	
9:20	0.94	1.11	1.20	0.59	0.72	0.61	
9:21	0.93	0.89	1.02	0.46	0.62	0.44	

In the above example, **60sec Sample rate** was used. According to area Monitor internal operating mode, the 2600 acquires one measurement every second of X, Y and Z axis. After one minute (60 samples) it calculates the averaging value of those 60 samples and put the result into the 2600 internal memory; the process is done for **X, Y and Z**.

Therefore X, Y and Z values, reported on the table, represent the result of 1 minute averaging (Linear or RMS according to 2600 setup).

Also, every one second 2600 calculates the total value (Square root of the sum of square value of each axis). The highest value of these 60 calculations will represent the **Peak value** and also it will be stored inside 2600 memory.

The 60s column offers the **total values** obtained from the Square root of the sum of square values of X, Y and Z reported in each individual row of the table.

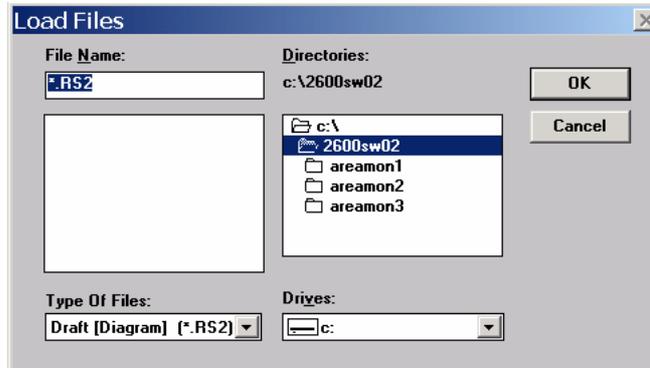
The last column shows the averaging value over 6 minutes if it was enabled in the Trace Menu. Other averaging time could be selected according to the **Option** menu choices.

4.5.2 Open Files

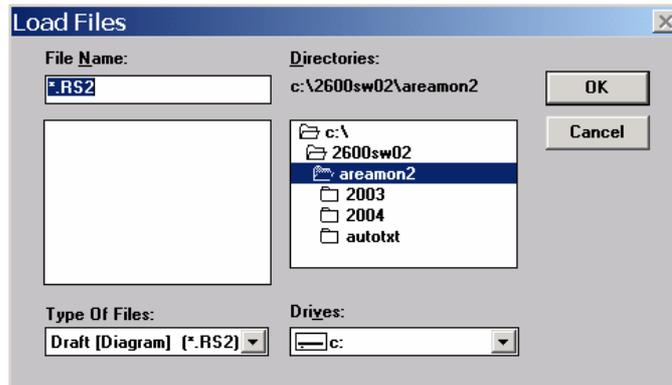


Saved measurement (*.RS2) or setting (*.P55) files can be opened (loaded into 2600 software) with **Open Files** button.

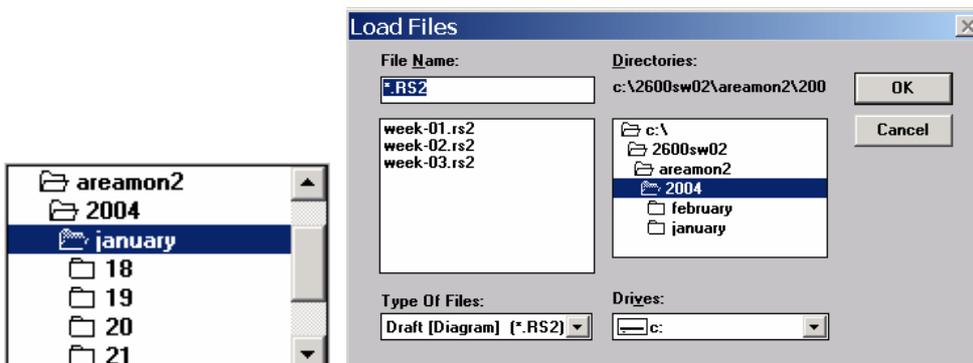
If the software is already in the Graphic mode, select File and then Open; the software will show all available stations.



By selecting a station (in this example **demosn90**), the following window will show the Years and “**autotxt**” directory:

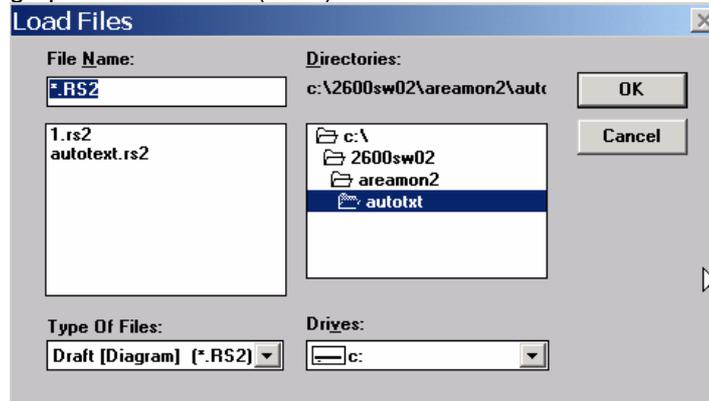


Associate with each station name, the software creates the directory of the year (2002 and 2003 in this example) and the directory “**autotxt**” that contains all data saved automatically if the function **Auto ASCII File** was enabled. By selecting the desired year, the menu will show all Months and Weeks available:

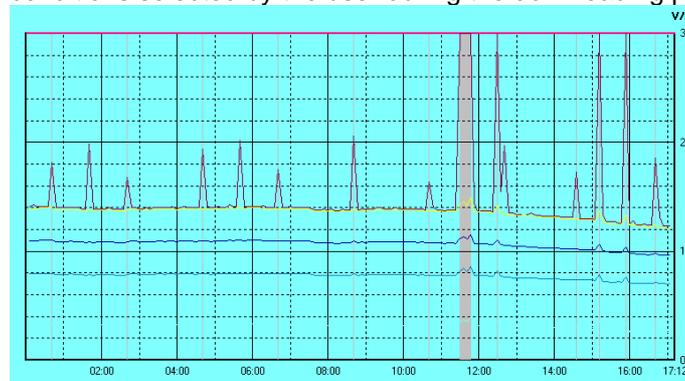


By selecting the Month, the software will list all available days that have data in it. Select the day of the month required and Click **OK** to open data, **Cancel** to abort.

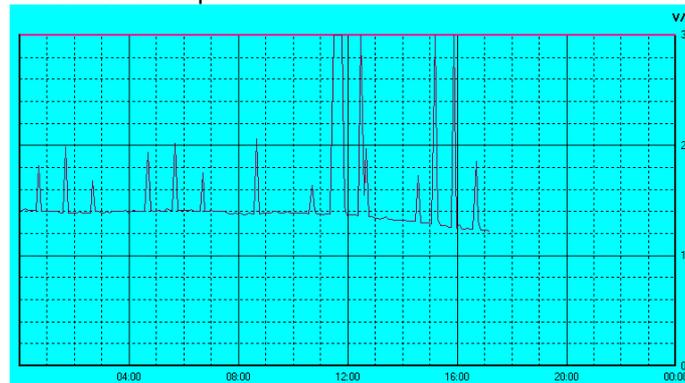
4.5.2.1 Open Autotext file The file inside **Autotxt** directory is saved in TXT format to be easily exported to any data base applications, but also they can be shown in graphic 2600 format (.RS2).



The Start and Stop time frame of the graph is defined by the download conditions selected by the user during the downloading process.



The above example shows the Autotext.RS2 file from 00.00 to 17.12. Instead, opening the Fullday.RS2 equivalent file, automatically created inside the Month/Day directory, in Narda format, the graph will always show the complete day from 0.00 to 24.00 instead to stop at 17.32 as for the below example.

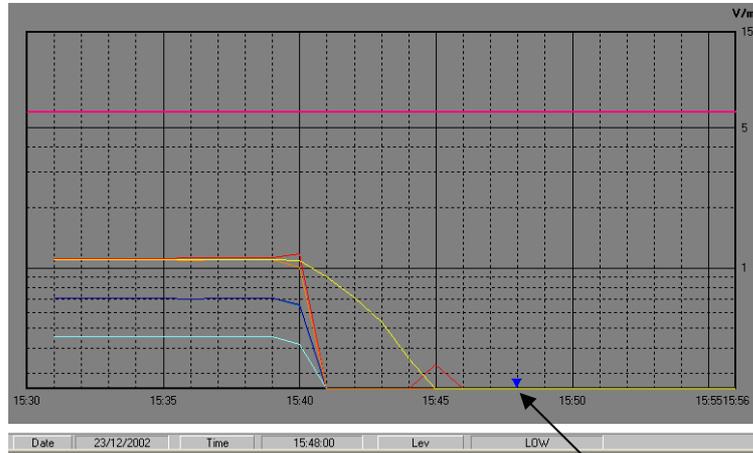


NOTE

Therefore with the function **Auto ASCII File** is possible to create any graph with user definable start and stop day and time. For example, from Friday to Monday or from a time frame that includes two months. Of course, the time frame has to be selected during download procedure.

4.5.2.2 Data evaluation

Sometimes the measured field is quite low and below the minimum sensitivity of the probe. In this case the software assigns the string LOW. The following example offers a partial graph of a full day acquisition. It shows the X,Y,Z fields, the total, the peak and the 6 min average starting from 15:30.



The marker is positioned at 15:40 and show **LOW** as a field value. The string LOW appears anytime the measured value is below of the specific sensitivity of the probe. If the above file is saved as a TXT file and later recovered with WORD or EXCEL application, the result will be:

```
Area Monitor System 2600
Station: Areamonitor2 s/n 907
Name: Fullday      Date: 23/12/2002 Time: 00.00
Probe Type 330
Limit = 6.0 V/m      AVG
Date      Time      6 min      60 s      Peak      X      Y      Z
23/12/2002 15:30      1.10      1.10      1.11      0.46      0.71      0.71
15:31      1.10      1.10      1.11      0.46      0.71      0.71
15:32      1.10      1.10      1.11      0.46      0.71      0.71
15:33      1.10      1.10      1.11      0.46      0.71      0.71
15:34      1.10      1.10      1.11      0.46      0.71      0.71
15:35      1.10      1.10      1.11      0.46      0.71      0.71
15:36      1.10      1.09      1.12      0.45      0.70      0.70
15:37      1.10      1.10      1.13      0.46      0.71      0.71
15:38      1.10      1.10      1.13      0.46      0.71      0.71
15:39      1.10      1.10      1.13      0.46      0.71      0.71
15:40      1.08      1.01      1.18      0.41      0.65      0.66
15:41      0.90      LOW      LOW      LOW      LOW      LOW
15:42      0.72      LOW      LOW      LOW      LOW      LOW
15:43      0.54      LOW      LOW      LOW      LOW      LOW
15:44      0.35      LOW      LOW      LOW      LOW      LOW
15:45      0.17      LOW      LOW      0.33      LOW      LOW      LOW
15:46      LOW      LOW      LOW      LOW      LOW      LOW
15:47      LOW      LOW      LOW      LOW      LOW      LOW
15:48      LOW      LOW      LOW      LOW      LOW      LOW
```

Usually if X, Y and Z are LOW the Average (60s) is LOW too; that is not true for the Peak. In this example, at 15:45 we have the Peak value of 0.33 V/m while X, Y and Z are LOW. That means that among the 60 samples at least one total field values was higher then the probe sensitivity.

Low fields measurements

In the following example the Area Monitor is storing a very low field using a sample rate of 10 sec.

If the field is smaller than the probe sensitivity the Area Monitor writes LOW in the memory. The column of 10sec represents the average value of the 10 measurements inside 10 sec interval. All these data come from a mathematical calculation by reducing the sensitivity of square root of 3.

Time	6 min	10 s	Peak	X	Y	Z
9:32:50	0.25	0.17	LOW	LOW	LOW	LOW
9:33:00	0.18	0.17	LOW	LOW	LOW	LOW
9:33:10	0.18	0.17	LOW	LOW	LOW	LOW
9:33:20	0.18	0.18	LOW	LOW	LOW	LOW
9:33:30	* 0.59	3.35	6.10	1.81	2.38	1.51
9:33:40	* 0.73	2.61	4.16	1.19	1.94	1.27
9:33:50	* 0.84	2.53	3.01	0.73	2.25	0.89
9:34:00	* 0.87	1.42	2.01	0.35	1.33	0.36
9:34:10	* 0.93	1.92	2.50	0.53	1.75	0.60
9:34:20	* 1.01	2.43	3.04	0.68	2.17	0.84
9:34:30	* 1.05	1.72	2.11	0.46	1.57	0.52
9:34:40	* 1.07	1.06	1.07	0.25	1.03	LOW
9:34:50	* 1.09	1.25	1.64	0.29	1.20	0.20
9:35:00	* 1.12	1.61	1.66	0.38	1.49	0.48
9:35:10	1.12	0.16	LOW	LOW	LOW	LOW
9:35:20	1.12	0.16	LOW	LOW	LOW	LOW
9:35:30	1.12	0.16	LOW	LOW	LOW	LOW
9:35:40	1.12	0.16	LOW	LOW	LOW	LOW
9:35:50	1.12	0.16	LOW	LOW	LOW	LOW
9:36:00	1.12	0.16	LOW	LOW	LOW	LOW

 **NOTE**

That is the reason why we have some numbers in the 10s column, and always **LOW** on Peak and X,Y and Z axis.

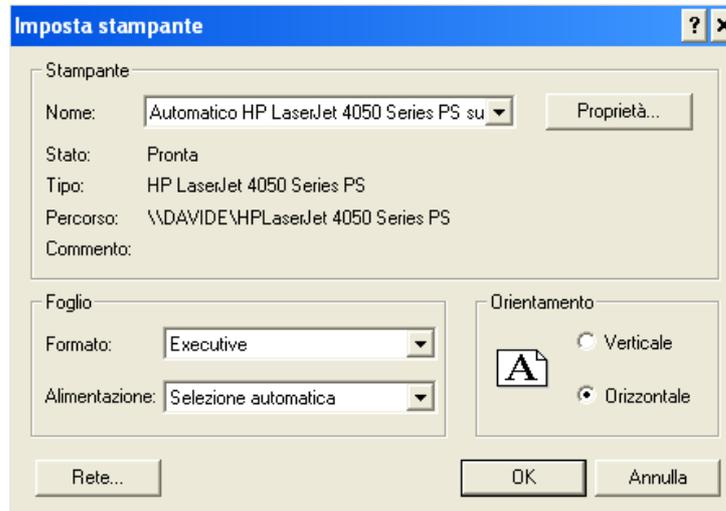
As an overall rule, all data below the individual probe sensitivity are meaningful and should not to be taken into consideration.

4.5.3 Print



Print command prints the current display on the selectable printer. Palette colors settled by **Setup** function are used on the output print.

Selecting the **Print** button the following window will open:

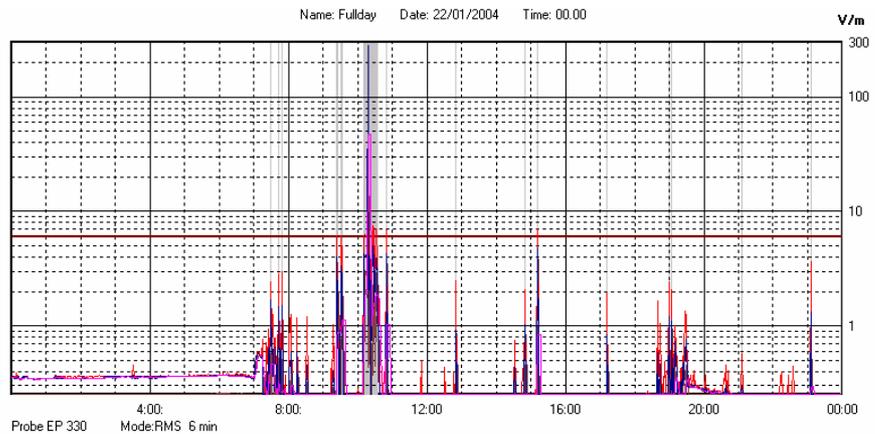


4.5.4 Clip Board



The current bitmap of the displayed window is copied into the Windows Clipboard. The user can paste the image on other active software, without create exchange files. This command is useful when a Word Processor, like Word for Windows™, is used to generate reports for the measurement taken.

Palette colors settled by **Setup** function are used on the output. The following is an example what is shown on an Word file by using Clip Board function after a graph is pasted on it.



Fullday

The **File Name** sub window displays the current file name. It is normally refreshed after every **LOAD** command.

00.00 | 26/02/2001

The **Status 1** e **Status 2** sub windows show the initial time of the displayed data.

Next sub window displays the station name.

Nuova Centralina Cisano (EX ..)

4.5.5 Zoom Mode



In **Zoom Mode** the user can zoom on any part of the data line. The **Marker** function is also activated.

To activate the Zoom do the following:

- Select Zoom Mode;
- Place the Marker arrow by mouse on the desired zoom start point;
- Holding the left mouse button down, move the Marker to the desired zoom end point;
- Release the mouse button to expand the display between the selected zoom points.

To help user to select the wanted zoom two vertical lines will be displayed during this procedure

To return to normal display select again the button **Zoom Mode**.

Attention: the minimum zoom span is 120 seconds (2 minutes). If a shorter time is selected an error message will pop up.

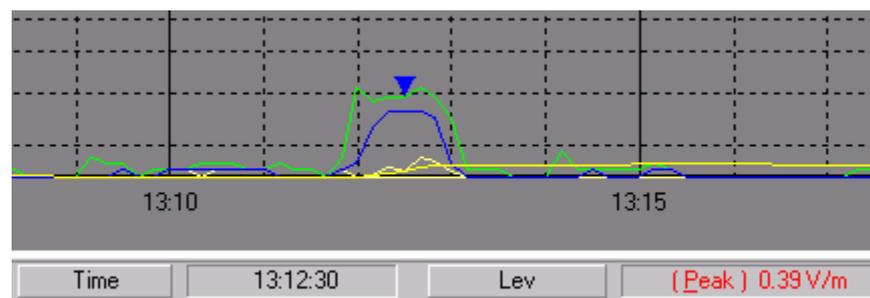
NOTE



Selecting the **Zoom Mode** also the **Marker** is activated.

The Marker is represented by a colored arrow, the user can move along the graphical line by mouse.

The time elapsed since the measure start and the field level corresponding to the current Marker position will be displayed on the status bar. This function helps when a detailed analysis of data values is required.



NOTE

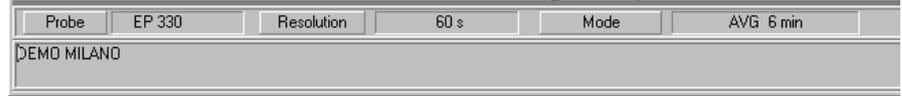
Anytime the **Zoom Mode** button is active Open files and Option commands are inactive.

4.5.6 Comment



This command displays the Comment field, the user can write or modify a comment with **maximum 1024 characters**.

The window field will be similar to the following example:



NOTE



The comment will be printed or saved only if this command is active.

4.5.7 Redraw



The Redraw command refreshes the display.

This operation is required when the PC does not have enough memory and several applications are running simultaneously.

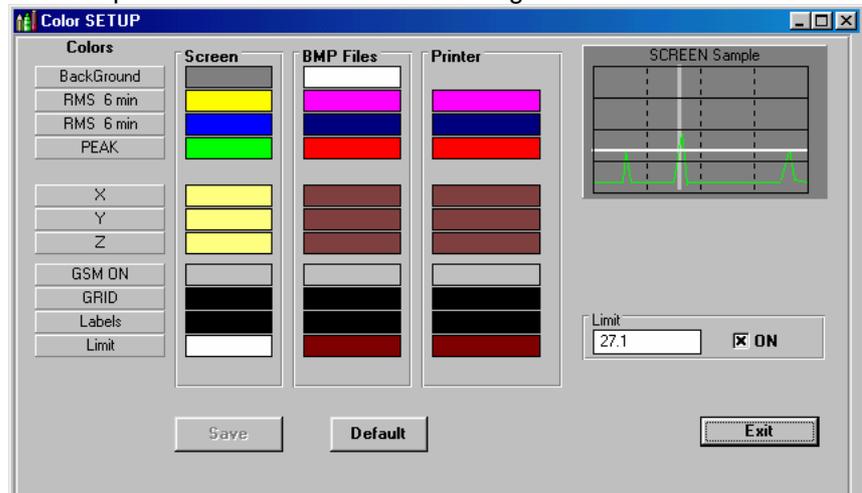
4.5.8 Setup



The **Setup** command opens the setup window.

The setup can be changed at any time, new setup can be saved on file and recalled later.

The setup window is similar to the following:



Every line of the graph, listed under the column **Colors**, can be changed, the user can select different colors for the display (**Screen**), the BMP file (**BMP Files**) or for the printer(**Printer**).

Color Palette

The Color Palette windows help the user to select the wanted colors.



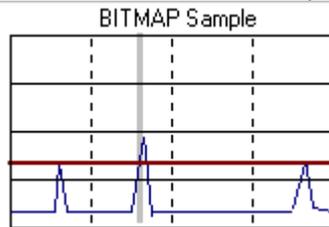
4.5.9 Limit

The **Limit** setting displays a reference line on the graph and also it is reported on the TXT file. The limit can be activated or deactivated selecting the corresponding **ON** selection.



SCREEN Sample

The small sub window on the upper right corner shows an example of the settled colors either for display, save or print.

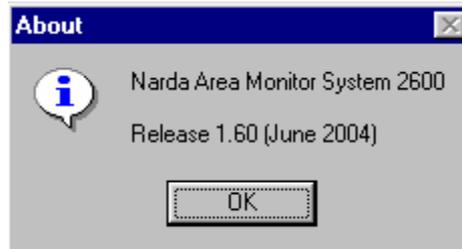


NOTE

With **Exit** button the **Setup** window will be closed maintaining settings for the current graph display, to recall later the same configuration the current settings must be saved selecting **Save Files** function.

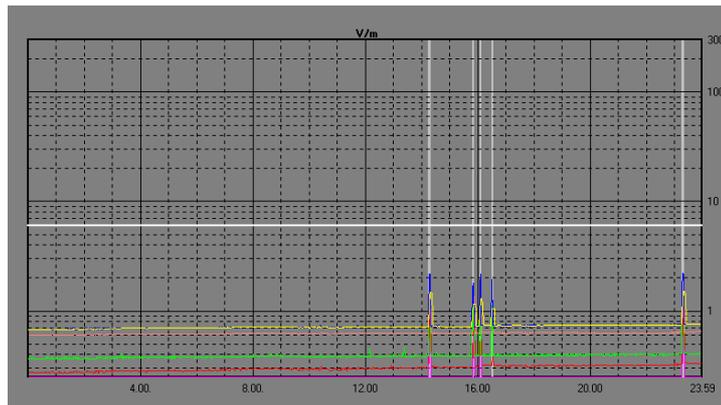
4.5.10 Software release

Click the icon to shown the software release installed.



4.6 Graphical window

The sub window in the middle of the main window displays data graph:



In the graphical window are displayed lines of data acquired as settled on the **Storing Settings** section.

When **Zoom Mode** is active a small triangle with apex down put in evidence the actual **Marker** position.

The limit settled in the **Setup** window, helps in comparing graph levels.

4.7 Status window

The lower part of the main window displays the status sub window.

The Status window tell the user about various program status condition, it also displays a brief explanation of window command and options when mouse is placed over each of them.

Following are some examples:

Probe	EP 330	Resolution	60 s	Mode	RMS 6 min
-------	--------	------------	------	------	-----------

Current mode of operation.

Date	26/02/2001	Time	14.22.00	Lev	1.47 V/m
------	------------	------	----------	-----	----------

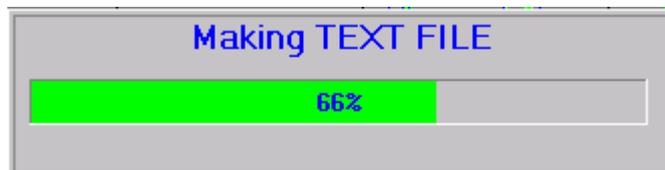
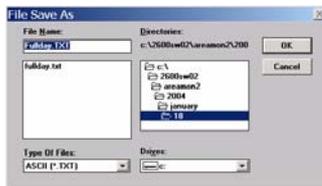
Values of the **Marker** position.

Makes a BITMAP and put it in the clipboard so that it can be pasted to other applications such as word processor and image editors

Description of **Clip Board** button.

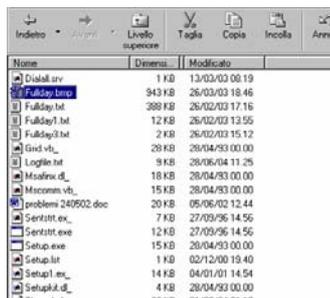
4.8 Data Import from Word or Excel

All graphs can be saved into TXT format and retrieved later on. During the process of converting and saving the graphic into a TXT file, the following window will appear:



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 2600SW02 and follow the necessary path (Station name, year, month and day) until the file is found.

4.9 Log File



All activities requested by manual interventions from the user or done automatically by the area monitor are registered into a file called "Logfile.txt".

The file is created and continuously updated in the directory where the software has been installed.

The following is an example:

```

24/06/04 13.47.17      Calling Sonda Tripla 3483619150
24/06/04 13.47.43      Connected
24/06/04 13.47.43      Connected Sonda Tripla
24/06/04 13.48.34      Storing rate changed to 1 minute
24/06/04 13.48.42      Scheduled Modem Call at 07:15 every 01 for 00 H
24/06/04 13.48.48      Scheduled Modem Call at 07:15 every 01 for 12 H
24/06/04 13.49.30      Downloading from 24/06/2004 12:47 to 24/06/2004 13:47
24/06/04 13.49.41      Closing communication
24/06/04 13.49.41      NO Carrier:
24/06/04 13.52.26      Program finished

25/06/04 10.45.18      Calling Demo104 348123456
25/06/04 10.45.53      NO Carrier:
25/06/04 11.08.33      Program finished

28/06/04 09.35.38      Calling Dual probe

28/06/04 09.36.06      Launched PMM 8055SW02 for Windows Release 1.60
(June 2004) (COMM 1 Ready) MODEM OK
28/06/04 09.36.07      P.zza G.Rossa 15 Ponte a Egola Auto ASCII File ON
28/06/04 09.36.09      Demo104 Auto ASCII File OFF
28/06/04 09.36.13      Cortile Segrate S/N 10902 Auto ASCII File ON

28/06/04 09.36.16      Calling Cortile Segrate S/N 10902 00393356042659
28/06/04 09.36.21      NO Carrier:

28/06/04 09.36.41      Calling Cortile Segrate S/N 10902 00393356042659
28/06/04 09.36.43      Modem Failure
28/06/04 09.36.45      Direct Connection
28/06/04 09.36.49      Cortile Segrate S/N 10902 NOT notified
28/06/04 09.37.10      Closing communication
28/06/04 09.37.31      Sonda Tripla Auto ASCII File OFF

28/06/04 09.37.33      Calling Sonda Tripla 3483619150
28/06/04 09.37.59      Connected
28/06/04 09.37.59      Connected Sonda Tripla
28/06/04 09.38.23      Downloading from 25/06/2004 08:50 to 28/06/2004 09:37
28/06/04 09.41.26      NO Carrier:
28/06/04 09.41.55      Closing communication
28/06/04 10.25.26      Dual probe removed from the list
28/06/04 11.06.20      Demo Segrate S/N 21208 Auto ASCII File ON
28/06/04 11.06.28      Sonda Tripla Auto ASCII File OFF

```

This file is never cancelled. It can be deleted by the user,

5 - SMS Messages and Commands

5.1 Introduction

This Chapter is a guide to the Short Messages System communication, commands and protocol for the Narda 2600 Area Monitor for Monitoring Electromagnetic Fields.

Any station can be called or interrogate by a GSM cell phone; several SMS commands allows the user to query for data and to send commands to it.

Also these commands could be sent via a PC connected to a telephone modem running the Terminal software or your own application.

The commands have the following syntax:

#00QCommand(parameters)* where:

= command string start character;

00 = zero zero (**00**) always present;

Q = ? for query commands;

S for setting commands;

Command = command string;

(parameters) = setting parameter (where needed);

***** = command string end character.

The SMS commands are divided in two main categories:

- **Query COMMANDS;**
- **Setting COMMANDS.**

5.2 Command list

Query COMMANDS

Syntax	Function
#00?IDN*	Identifier query command.
#00?CLK*	Station internal clock query command.
#00?STA*	Alarms status query command.
#00?MSK*	Alarm mask query command.
#00?BAT*	Battery voltage query command.
#00?RPT*	Report query command.
#00?RPT0*	Report with reset query command.
#00?PRB*	Field probe data query command.
#00?TDM*	Modem phone directory list query command.
#00?TDMn*	Modem single phone number query command.
#00?TDS*	SMS phone directory list query command.
#00?TDSn*	SMS single phone number query command.
#00?ALR*	Field Alarm threshold query command.
#00?WRN*	Field Warning threshold query command.
#00?TSM*	Modem programming time setting query command.
#00?TSS*	SMS programming time setting query command.
#00?MRK*	All markers data query command.
#00?MRKn*	Single marker data query command.
#00?MRD*	All markers date and time query command.
#00?MRDn*	Single marker date and time query command.
#00?AQ_*	Current acquisition mode query command.
#00?LFA*	Last mean value query command.
#00?TMP*	Temperature request

Setting COMMANDS

Syntax	Function
#00SACL*	Autocalibration and probe integrity check.
#00SCLT(parameters)*	Clock hours setting.
#00SCLD(parameters)*	Clock date setting.
#00SIDN(parameters)*	Station identifier setting.
#00SMSK(parameters)*	Alarm mask setting.
#00SALR(parameters)*	Alarm threshold setting.
#00SWRN(parameters)*	Warning threshold setting.
#00SAVG(parameters)*	Warning and Alarm thresholds mean time.
#00STDM(parameters)*	Modem phone number setting.
#00STDS(parameters)*	SMS phone number setting.
#00STSM(parameters)*	Modem programmed time setting.
#00STSS(parameters)*	SMS programmed time setting.
#00SENC*	Outgoing call enabling.
#00SDIC*	Outgoing call disabling.
#00SENR*	Report send enabling.
#00SDIR*	Report send disabling.
#00SATH*	Hang of current call.
#00SCNL(parameters)*	Deferred call enabling.
#00SAQ_(parameters)*	Acquisition mode setting.
#00SMRKn(parameters)*	Marker setting.
#00SMRDn(parameters)*	Marker date and time setting.

5.3 Query COMMANDS

Query commands interrogate the station for data, it respond back with a SMS message containing requested information.

Query commands contain a ? character in the command string.

Command	Meaning	Example
?IDN (IDENTITY)	Identifier request. The answer displays the identifier followed by the station model and firmware release in the format: #00 IDN=NAME;NARDA 2600; R.rr MM/YY*	Example: #00?IDN* Response: #00 IDN=Istituto Marconi;NARDA 2600; A.00 10/00;*
?CLK (CLOCK)	Station internal clock query command. The answer displays the time and date in the format: #00 CLK:HH.mm.ss;GG.MM.YY* H ---> hours m ---> minutes s ---> seconds G ---> day M ---> month Y ---> year	Example: #00?CLK* Response: #00 CLK:20.02.09;19.10.00*
?STA (STATUS)	Alarms status query command. The answer displays a string with related alarms in the format: #00 STA=WwAaPpVvLIT* W = Warning threshold exceeded A = Alarm threshold exceeded w = Warning threshold re-entered a = Alarm threshold re-entered P = Probe malfunction alarm p = Probe malfunction alarm re-entered V = Low battery alarm v = Low battery alarm re-entered L = Case open alarm l = Case open alarm re-entered T = Over temp alarm A dash (-) means not active	Example: #00?STA* Response: #00 STA=-----V-L
?MSK (MASK)	Alarm mask query command. The answer displays a string containing related alarms in the format: #00 MSK=WwAaPpVvLIT MODEM SMS* description is the same as ?STA When MODEM is displayed the alarm is active on modem. When SMS is displayed the alarm is active on SMS.	#00?MSK* Response: #00 MSK=---A-----L--* #00?MSK* Response: #00 MSK=---A-----L-- MODEM* #00?MSK* Response: #00 MSK=---A-----L-- SMS* #00?MSK* Response: #00 MSK=---A-----L-- MODEM SMS*
?BAT (BATTERY)	Battery voltage query command. The answer displays the battery values VOLT and centimes of VOLT in the format: #00 BAT=V.vv*	Example: #00?BAT* Response: #00 BAT=6.14*

Command	Meaning	Example
?RPT (REPORT)	Report query command. Data request of max field and min battery voltage recorded since last reading. Each data also reports the time of the event.	Command example: #00?RPT* Response: #00 REPORT=MAX:0.70 V/m 18:08 28/10/00 Min Battery=6.14V 18:05 28/10/00*
?RPT0 (REPORT & reset)	Report with reset query command. Data request of max field and min battery voltage recorded since last reading. Each data also reports the time of the event. Besides a data reset is performed, it is then possible to start a new acquisition period.	Command example: #00?RPT0* Response: #00 REPORT=MAX:0.70 V/m 18:08 28/10/00 Min Battery=6.14V 18:05 28/10/00*
?PRB (PROBE)	Field probe data query command. The answer displays the probe model, last calibration date, the unit of measure and the division rate in the format: #00 PRB=NAME:gg.MM.YY; unit: division:range:minlevel*	Example: #00?PRB* Response: #00 PRB=EP 330:13.09.00; V/m: 100.:300.:.3.*
?TDM (Telephone Directory Modem)	Modem phone directory list query command. The answer displays the phone numbers or VOID if empty in the format: (a <LF> Line Feed after each number): #00 TDM= xxxxxxxxxxxx xxxxxxxxxxxx void *	Example: #00?TDM* Response: #00 TDM= 0123456789 void void void void void void void void void*
?TDMn (Telephone Directory Modem n)	MODEM n single phone number query command. (n variable between 0 and 9). The answer displays the requested phone number or VOID in the format: #00 TDMn=xxxxxxxxxxxx*	Example: #00?TDM1* Response: #00 TDM1=VOID*
?TDS (Telephone Directory SMS)	SMS phone directory list query command. The answer displays the phone numbers or VOID if empty in the format: (a <LF> Line Feed after each number): #00 TDS= xxxxxxxxxxxx xxxxxxxxxxxx void *	Example: #00?TDS* Response: #00 TDS= 1234568565 void void void void void void void void void*

Command	Meaning	Example
?TDSn (Telephone Directory SMS n)	SMSn single phone number query command. (n variable between 0 and 9). The answer displays the requested phone number or VOID in the format: #00 TDSn=xxxxxxxxxxx*	Example: #00?TDS1* Response: #00 TDS1=1234568565*
?ALR (ALARM)	Field Alarm threshold query command. The answer displays the threshold in the current unit of measure followed by the time (minutes) of the calculated mean.	Example: #00?ALR* Response: #00 ALR= 6.0; 6*
?WRN (WARNING)	Field Warning threshold query command. The answer displays the threshold in the current unit of measure followed by the time (minutes) of the calculated mean.	Example: #00?WRN* Response: #00 WRN= 4.0; 6*
?TSM (Time Schedule Modem)	Modem programming time setting query command. The answer has the following format: #00 TSM=ON HH:mm (Xh) each Yh* or: #00 TSM= HH:mm (Xh) each Yh* depending on auto call setting of the modem. (Xh) is the stand-by time	Example: #00?TSM* Response: #00 TSM=ON 17:26 (1h) each 24h*
?TSS (Time Schedule SMS)	SMS programming time setting query command. The answer has the following format: #00 TSS=ON HH:mm (Xh) each Yh* or: #00 TSS= HH:mm (Xh) each Yh* depending on report setting. (Xh) is the stand-by time	Example: #00?TSS* Response: #00 TSS=ON 17:26 (1h) each 24h*
?MRK (MARKER)	All markers data query command. The answer displays the Markers content or VOID if empty. (a <LF> Line Feed after each number)	Example: #00 ?MRK* Response: #00MRK= This is the first marker.. This is second... void void void void void void void void *
?MRKn (MARKER n)	Single marker data query command. (n variable between 0 and 9). The answer displays marker text or VOID.	Example: #00 ?MRK0* Response: #00 MRK0= This is the first marker*

Command	Meaning	Example
?MRD (MARKER Date)	All markers date and time query command. The answer displays the date and time for all markers or VOID. (a <LF> Line Feed after each number)	Example: #00 ?MRD* Response: #00MRD= 18:10 18/12/00 08:00 01/02/01 18:13 01/02/01 void void void void void void void *
?MRDn (MARKER Date n)	Single marker date and time query command. (n variable between 0 and 9). The answer displays the date and time for all markers or VOID.	Example: #00 ?MRD2* Response: #00 MRD2=18:13 01/02/01*
?AQ_	Current acquisition mode query command. The answer has the following format: #AQ_LTR* where: L is the recording interval between 0 (5 seconds) and 6 (6 minutes). T is bit by bit which data (beyond the mean) are recorded. bit 1 = Peak, bit 2 = XYZ axis R is the mean type: A= AVG; R=RMS	Example: #00 ?AQ_* Response: #00 AQ_=43A* Means the station is recording data every minute, Peak, XYZ axis and media are also recorded, the mean is of Average type.
?LFA	Last mean value query command. The answer displays the mean value with current unit of measure, the time (minutes) of the calculated mean. (same as ALR command)	Example: #00 ?LFA* Response: #00 LFA=1.23 V/m;06* Means 1,23 V/m is the mean value for last 6 minutes

5.4 Setting COMMANDS Setting commands send setting data to the system, the station can answer back with a SMS message with requested information or a setting confirmation.

Query commands contain a **S** character at the beginning of command.

Command	Meaning	Example
SACL	Autocalibration and probe integrity check. The station performs automatically an autocalibration every 7 days at 23:00. With this command the user can force the autocalibration.	Example: #00SACL* Response: #00 ACL=OK*
SCLT	Clock hours setting. The response is the same as in the ?CLK command. The response format is: #00SCLT HH.mm.ss * where: H ---> hours m ---> minutes s ---> seconds	Example: #00SCLT* Response: #00 CLK:20.02.09;19.10.00*
SCLD	Clock date setting. The response is the same as in the ?CLK command. The response format is: #00SCLD MM.GG.YY * G ---> day M ---> month Y ---> year	Example: #00SCLD* Response: #00 CLK:20.02.09;19.10.00*
SIDN	Station identifier setting. Max 20 characters. The response is the same as in the ?IDN command. The response format is: #00SIDN Istituto Marconi, 23*	Example: #00SIDN* Response: #00 IDN=Istituto Marconi 23;NARDA 2600; A.00 10/00;*
SMSK	Alarm mask setting. The mask contains mnemonic symbols representing each alarm as in the following table. Symbols can be in each order. W = Warning threshold exceeded A = Alarm threshold exceeded w = Warning threshold re-entered a = Alarm threshold re-entered P = Probe malfunction alarm p = Probe malfunction alarm re-entered V = Low battery alarm v = Low battery alarm re-entered L = Case open alarm I = Case open alarm re-entered S = SMS enable M = MODEM enable (same response as ?MSK command)	Example: #00SMSK AL* enables field and case open alarms. Response: #00 MSK=--A----L-- MODEM SMS*  NOTE To get a notification of the alarm, also modem or SMS should be enabled.

Command	Meaning	Example
SALRx.x	Alarm threshold setting. The parameter xx.x is the threshold value in the format: #00SALR 6.0* (same response as ?ALR command)	Example: #00SALR6.0* Response: #00 ALR= 6.0; 6*
SWRNx.x	Warning threshold setting. The parameter xx.x is the threshold value in the format: #00SWRN 4.0* (same response as ?WRN command)	Example: #00SWRN4.0* Response: #00 WRN= 4.0; 6*
SAVGx	Warning and Alarm thresholds mean time. The parameter x is in minutes: #00SAVG 4.0* (same response as ?ALR command).	Example: #00SAVG4.0* Response: #00 ALR= 4.0; 6*
STDM (Telephone Directory Modem)	Modem phone number setting. In the following format: #00 STDMn xxxxxxxxxx* where: n is the list # between 0 and 9, xxxxxxxxxx is the phone #. To replace simply rewrite the number, to cancel write down 00000 . (same response as ?TDMn command).	Example: #00 STDM2 987654321* Response: #00 TDM2=987654321*
STDS (Telephone Directory SMS)	SMS phone number setting. In the following format: #00 STDSn xxxxxxxxxx* where: n is the list # between 0 and 9, xxxxxxxxxx is the phone #. To replace simply rewrite the number, to cancel write down 00000 . (same response as ?TDSn command).	Example: #00 STDS2 0000000* Response: #00 TDS2=VOID*

Command	Meaning	Example
STSM (Time Schedule Modem)	<p>Modem programmed time setting. In the following format: #00 STSM HH.mm.xx.ee* where: HH.mm is the MODEM power on time (switched on and in Stand-By). xx on time period in hours. ee repetition time in hours.</p> <p> NOTE</p> <p>xx and ee must always be 2 numerals without spaces, and submultiples of 24. (same response as ?TSM command).</p>	<p>Example: #00 STSM 14.53.01.24* Response: #00 TSM=14:53 (1h) each 24h* the modem will power on at 14:53, will stay on for 1 hour and the power on operation will be repeated every day.</p>
STSS (Time Schedule SMS)	<p>SMS programmed time setting. In the following format: #00 STSS HH.mm.xx.ee* where: HH.mm is the MODEM power on time (switched on and in Stand-By). xx on time period in hours. ee repetition time in hours.</p> <p> NOTE</p> <p>xx and ee must always be 2 numerals without spaces, and submultiples of 24. (same response as ?TSS command).</p>	<p>Example: #00 STSM 12.00.02.24* Response: #00 TSS=12:00 (2h) each 24h* the modem will power on at 12:00, will stay on for 2 hour and the power on operation will be repeated every day.</p>

Command	Meaning	Example
SENC (Enable Call)	This command enables the station to call. The time of call shall be set with STMS command. The station power on the MODEM, initiate the communication link and call the first number in the MODEM phone number list, at the end of call the modem enter a stand by state for the time remaining. Note that only call is enabled and not also the modem power on. (same response as ?TSM command).	Example: #00 SENC* Response: #00 TSM=ON 14:53 (1h) each 24h* Confirm the station is enabled (ON) to call indicating also the time and mode settings.
SDIC (Disable Call)	This command disables the station to call. When disabled the MODEM will power on at time set with the STMS and enter a stand by state ready for outgoing call or SMS messages. (same response as ?TSM command).	Example: #00 SDIC* Response: #00 TSM= 14:53 (1h) each 24h* Confirm the station is disabled to call indicating also the time and mode settings.
SENR (Enable Report)	SMS Report send enabling. When enabled the station power on the GSM, at the time set with the STSS command, initializes communication and send the report with a SMS message to all phones in the SMS numbers list, at the end it enter the stand by state for the time remaining. Note that only message sending is enabled and not also the GSM power on. (same response as ?TSS command).	Example: #00 SENR* Response: #00 TSS=ON 12:00 (2h) each 24h* Confirm the station is enabled to call and send SMS (ON) messages indicating also the time and mode settings.
SDIR (Disable Report)	SMS Report send disabling. When disabled the GSM will power on at time set with the STMS and enter a stand by state, ready for out coming call or SMS messages. (same response as ?TSM command).	Example: #00 SDIR* Response: #00 TSS= 12:00 (2h) each 24h* Confirm the station is disabled to call indicating also the time and mode settings.

Command	Meaning	Example
SATH (HANG)	This command hang up the current communication and the line. It should be always used to end any remote operation to confirm the end of data exchange.	Example: #00 SATH* Response is always: #00 ATH=OK*
SCNL (Call Number Later)	This command enable a deferred call at the number nnnnnnnn The call is initiated d minutes later. The format is: #00 SCNL d nnnnnnnn * where d is in minutes between 1 and 9 and nnnnnnnn is the remote phone number.	Example: #00 SCNL 5 018220346* Response: #00 SCNL=018220346* The station will recall that phone number after 5 minutes.
SAQ_	Acquisition mode setting. (same response as ?AQ_ command). The format is: #SAQ_LTR* where: L is the recording interval between 0 (5 seconds) and 6 (6 minutes). T is bit by bit which data (beyond the mean) are recorded. bit 1 = Peak, bit 2 = XYZ axis R is the mean type: A= AVG; R=RMS	Example: #00 SAQ_43A* Response: #00 AQ_=43A* The station settings are: record data every minute, Peak, XYZ axis and AVG mean recording.
SMRKn (MARKERn)	Marker n setting where n is between 0 and 9. The string can be max 32 characters long. When setting is successful the answer is the text in storage, otherwise an error will came up. To cancel marker data write down 00000 .	Example: #00 MRK1 10:25,29/10 RECORD Iniziato nella scuola* Response: #00 MRK1=10:25,29/10 RECORD Iniziato nella scuola*
SMRDn (MARKERn Date)	Marker n date and time setting where n is between 0 and 9. The format is: HH:mm MM.GG.YY.  NOTE This command is not used to set the marker date and time, in fact it is automatically created when marker is written, but is useful to change it later. The answer is the inputted date and time if no errors.	Example: #00SMRD2 12:30 12/23/2000* Response: #00 MRD2=12:30 12/23/2000*

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6 - Accessories

6.1 Introduction

This section provides the information required for installing and using the Accessories of the Narda 2600 Remotely Operated Station for Monitoring Electromagnetic Fields.

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:

6.2 Preliminary inspection

Inspect the packaging for any damage.

If the packaging or anti-shock material have been damaged, check that the contents are complete and that the meter 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.

6.3 Work environment

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

- Temperature From -10° to +40° C
- 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 -20° to + 70° C
- Humidity < 95% relative

6.4 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 meter 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.

6.5 Cleaning

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



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

6.6

Calibration Probe

Introduction

Narda Calibrator is a useful accessory for checking that the Narda 2600 is working properly

It checks the absolute reading, the efficiency of the connection, the recognition system of the probe and the internal system for calculating the total field values.

Narda Calibrator is supplied with a Certificate of Calibration.

Installation

Insert Narda Calibrator in the connector of the probe paying attention to the position of the locating key.

Functioning

Narda Calibrator simulates that there is a probe linked to Narda 2600 generating three voltage reference values equivalent to 57.7 V/m on each axis.

The total field value read by Narda 2600, if it is functioning properly, should be:

$$100 \text{ V/m} \pm 2 \% (98 - 102 \text{ V/m})$$

This derives from: $\text{V/m}_{\text{total}} = \sqrt{x^2 + y^2 + z^2}$

To verify station remotely connect it, as described in this Manual, and check for the correct field value reading.

The 3 fields can be read by calling the 2600 area monitor from the PC (either via modem or via RS232 if the unit is closed to the personal) or sending an SMS message (#00?LFA*) to get the total value.

Power supply

Narda Calibrator is directly powered from Narda 2600.

General feature

Size (WxD)	60x18mm
Weight	54g
Power supply	5V (from Narda 2600)
2600 Connector	Fisher 12 poles connector Probe type



6.7

AC/DC Battery Charger

Power supply and battery recharging of the Narda 2600

Even if the Narda 2600 has a power system, which is autonomous from the mains and is supplied by both internal rechargeable battery and directly from the solar panels, the station can also be connected to an additional AC/DC battery charger.

If for example the station has been used indoors for a long time, without the possibility of a direct sun exposure, the internal battery could become deeply discharged. In such a circumstance it is convenient to quickly recharge the battery by connecting the external provided AC/DC battery charger before reinstalling the station.

NOTE

Depending on dominant frequency present at the installation location, and how is the charger cable path from mains to the 2600, some field measurement increase could happen (typically less than 1 V/m or even more with the dual probe EP-3DB or triple probe EP-3TB).

For a good indoor application always use the **2600/30** area monitor or modify your standard 2600 with a special low noise linear power supply with RF filters model Narda **2600-LPS**.

The battery charger coaxial jack must be connected to the adequate connector placed at the end of the free wire, which comes from the PW-Supply connector located on the 2600 internal box. For further details look at figure 2-1.

Before connecting the charger the 2600 case must be opened unscrewing the four Torx screws located on side panels of the unit using the provided screwdriver.

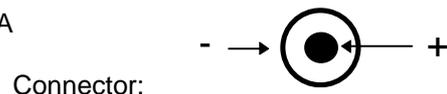
The battery charger can be used with a power frequency at either 50 Hz or 60 Hz with a supply voltage between 100 and 240 AC Volt. It can be supplied with different connectors to the supply mains in accordance with the various national standards. The connector to the mains supply is fitted to the battery charger, to substitute it just disconnect it and fit the new connector.

NOTE

ALWAYS connect the battery charger to the power supply BEFORE connecting to the Charge input of the 2600.

The battery charger has an internal protective circuit that will break the output of current if there is a charge in output when connecting to the mains.

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



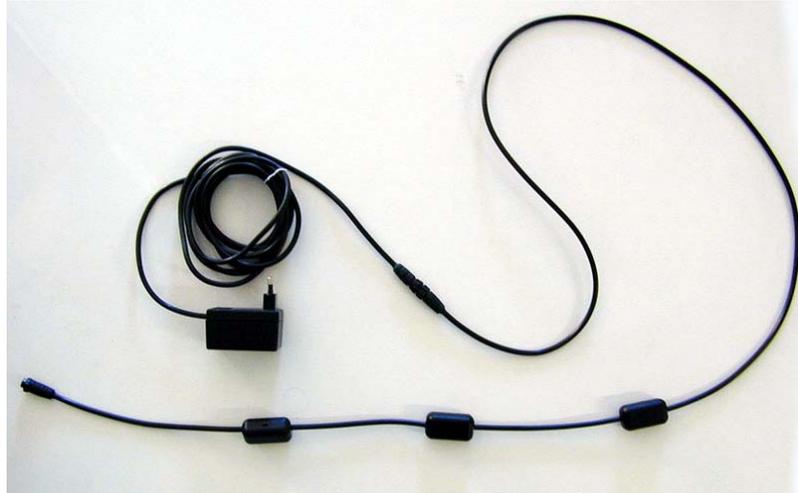
NOTE

The charge condition of the battery can be checked at any time in the way described on chapter 3 of this manual. The internal circuitry guarantees a protection to avoid over-charging.

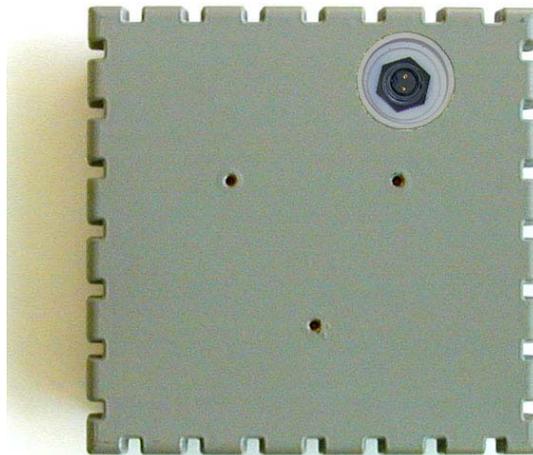
6.8

2600-LPS Linear RF filtered power supply

For indoor application you can power on the station with the standard battery charger taking in account that the measurement could be affected by the field captured by the cable of the battery charger. To avoid this kind of measurement error a low noise linear power supply with special RF filter should be used: Narda **2600-LPS**.



To connect the linear power supply, the area monitor should be provided with a special bottom cover (included standard with 2600-IND) like in the figure below:



Of course, to operate properly the internal electronic and the probe should be mounted in opposite side (the electronic should be screwed on bottom cover).

6-9 Wall installation

Also, to connect the area monitor to the wall you should use the following clamps model **2600-WALL**:



6.10

2600/91.01 Station support

Installing the station with the optional support

The Narda 2600 can be installed onto the especially designed pole that is fixed on an adequate basement with handles.



TABLE 6-1 - Narda 2600/91.01 Technical specifications

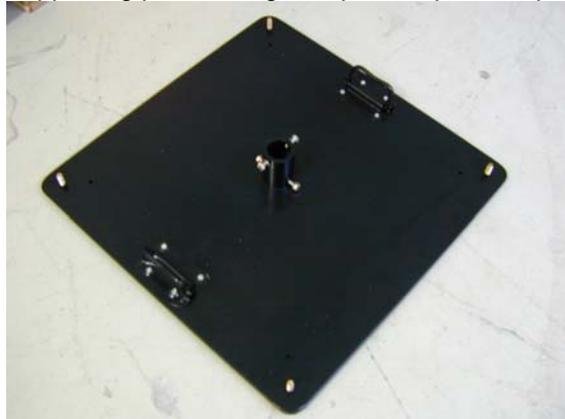
Note: The technical specifications are subject to variations without prior notice.

General specifications

Basement material	Black painted iron
Pole material	Fiberglass
Working temperature	-20 / +50°C
Size	(LxDxH) 600 x 600 x 2000 mm
Pole external diameter	60mm
Total weight	27 kg

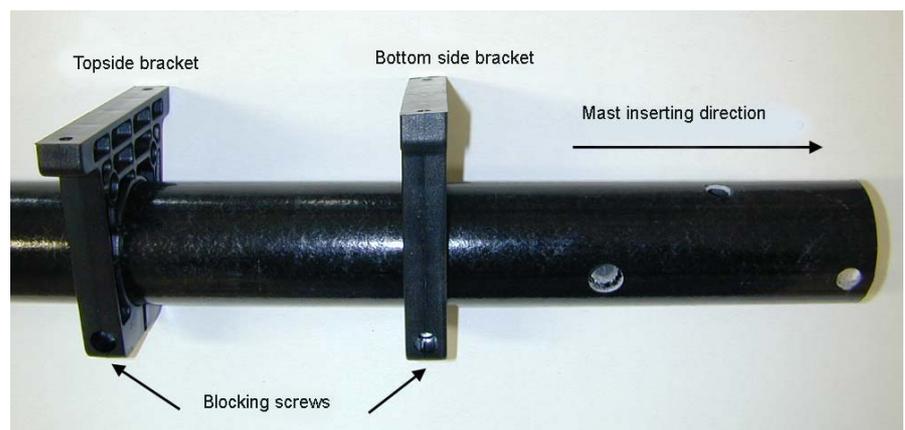
The metal basement

First of all, using the provided handles, the metal base must be placed in the right position and the four adjustable gum feet can be regulated to obtain a good stability. Else the foreseen holes on the basement can locate screws for a fixed locking to the supporting plane using adequate expansion plugs.



CLAMPS (Brackets)

The two distinct brackets provided with the kit must be fixed to the 2600 case on its back cover. The thicker one, with a not-planar base, must be the inferior while the thinner one must be placed on the topside. The inferior clamp must be positioned with the thicker face turned to the ground. The two couples of different special Torx screws must be used to fix these brackets.



Introduce now the drilled side of the pole into the top bracket at first, and then slip it into the inferior one. Look at the pictures for any further information. After that fix the two brackets by tightening the blocking screws at the desired height.

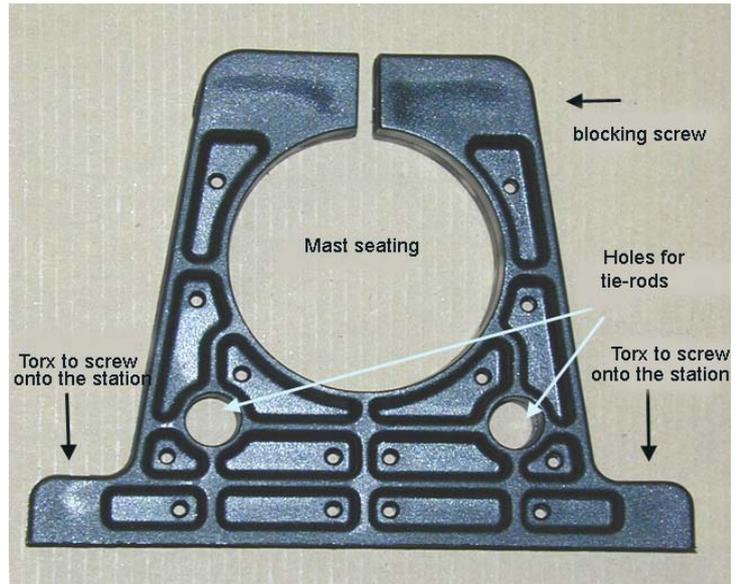
Brackets for 2.5 inch tube are available on demand.

The pole

Then the pole must be inserted into the clutch located in the centre of the basement. So it can be locked to the base using the two bolts 8MAx20mm with relative washers and nuts. See the picture below for further details.



Indications for the supporting brackets
(picture of the top side clamp)



The 2600/91.01-Mast kit provides also the tools that the installation needs.

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