narda
Safety Test Solutions
an L3 Communications Company
http://www.narda-sts.it

User's Manual

AMS-8061

AREA MONITOR SELECTIVE

SERIAL NUMBER OF THE INSTRUMENT
You can find the serial number on the upper cover of the receiver unit, on the side of the receiver unit baseplate and on the side of the Power Pack.
Serial number is in the form: 000XY00000.
The first three digits and the two letters are the Serial Number prefix, the last five digits are the Serial Number suffix. The prefix is the same for identical instruments, it changes only when a configuration change is made to the instrument.
The suffix is different for each instrument.

NOTE:

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

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

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

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

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

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

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

KEY TO THE ELECTRIC AND SAFETY SYMBOLS:

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

Warning, danger of electric shock

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

Earth Protection

Earth

Unit Earth Connection

Equipotential

KEY TO THE SYMBOLS USED IN THIS DOCUMENT:

DANGER — **The DANGER sign draws attention to a potential risk to a person's safety. All the precautions must be fully understood and applied before proceeding.**

WARNING — **The WARNING sign draws attention to a potential risk of damage to the apparatus or loss of data. All the precautions must be fully understood and applied before proceeding.**

CAUTION — **The CAUTION sign draws attention against unsafe practices for the apparatus functionality.**

NOTE: — **The NOTE draw attention to important information.**

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SAFETY RECOMMENDATIONS AND INSTRUCTIONS

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

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

EC Declaration of Conformity

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

The manufacturer,

NARDA Safety Test Solutions s.r.l. Socio Unico
via Benessea 29/B
17035 Cisano sul Neva (SV) – ITALY

based on the following harmonized European Standards, successfully applied:

Safety: EN 61010-1 (2010)
EMC: EN 61326-1 (2013)

declares, under its sole responsibility, that the product: **AMS-8061 Area Monitor Selective** conforms with the essential requirements of the Low Voltage Directive 2014/35/EU, of the EMC Directive 2014/30/EU, and of the RoHS directive 2011/65/EU.

Cisano sul Neva, 18/09/2015 *Egon Stocca*, General Manager

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X	**EC Conformity**

1 – General information

1.1 Documentation

This Users Manual contains the following annexes:

- A form to return to NARDA with the device when requesting service.
- A checklist of the parts included in the shipment.

This Users Manual also includes the description of the accessories of the system for distributed frequency selective monitoring of environmental electromagnetic fields.

1.2 Introduction

The AMS-8061 system is a revolutionary, accurate and reliable solution for remote and continuous monitoring of electromagnetic fields both in broadband and in frequency selective mode.
The AMS-8061 system includes an accurate and sensitive receiver which, being equipped with the proper filters and coupled to the specific broadband, omni-directional antennas, make it possible to measure the contribution to the total field of all the user definable frequency bands.
All commands are available to program any relevant parameter including automatic download of measurement results to the User's FTP server by means of GPRS remote communication.
In the event of any alarm, such as a threshold setting being exceeded, or any attempt to tamper with the remote unit, or a breakdown of the unit, it is possible to receive on any mobile phone an SMS informing the user of the event.

Fig. 1-1 AMS-8061 Field Monitoring System

AMS-8061 unit is equipped with solar panel (twin pair) and high capacity back-up batteries. An external power supply is provided for continuous, indoor operation.

1.3 Standard accessories

The monitoring station is composed by a main measuring/processing unit, GSM modem with GPS module and antenna system. An RF transparent radome protects the station from the weather. The measuring unit comes ready to be mounted on its pole and connected to the power pack.
The standard solar panel has to be mounted on the support base.

For remote communication it is essential to equip the unit with a SIM card that must be enabled for the selected data communication (GPRS/FTP, CSD or both).

Standard accessories included with the 8061 unit are:

- AC/DC power supply/battery charger
- USB cable
- Ethernet cable
- Ballast bags
- Tools kit
- Certificate of calibration
- CD-Rom with Software Installer and Manual
- Operating Manual
- Return for Repair form

1.4 Main Specifications Tables 1-1 – 1-2 list the specifications of AMS-8061.

TABLE 1-1 Technical Specifications of AMS-8061	
Frequency range	100 kHz – 6 GHz (in accordance with antenna specifications)
User-Programmable frequency bands	Up to 20, individual start-stop frequency settings
Sensor type	Triaxial, isotropic antenna system
Sensor dimensions (Ø)	120 mm
Sensor RF connection	50 Ohm, N-male
Sensor control	Multi-pin connector
Dynamic range	> 60 dB in all settings of the attenuator
Measurement range **Sensitivity** **Overload** **Resolution** **Linearity** **Frequency response (flatness)** **Overall anisotropy (EN50383)** **Unit**	Depending on the probe (please refer to the antenna specifications pag.1-5)
Out of band attenuation	>50 dB, depending on settings
Rejection	> 20 dB
Calibration	Performed in EA accredited laboratory: Accredia LAT nr.008
Calibration interval	2 years (recommended)
Reading rate	Down to 200 ms (depending on the band setting)
Measuring parameters	Settable bands and automatic configuration
EMF stored values	AVG or RMS, Max value
Average	Arithmetic (AVG) or RMS
Average time	1 – 15 minutes
Storing rate	1, 2, 6, 15 minutes
Max. logging before overwriting	30 days @ 6 minutes storing rate; circular memory
Alarms	SMS and/or data download for: field over limit, open case, temperature, humidity, low battery, sensor failure.

Communication	FTP and CSD protocols via internal GSM/GPRS modem, Ethernet, RS-232 and USB link.
Data download	FTP: automatic to server; CSD: automatic or manual to PC
SIM card type (not included)	Enabled for selected data transmission
SMS	SMS to 10 mobile phones (daily report of max. EMF value, battery voltage)
Battery history	Recording of battery voltage
Temperature and humidity sensors	Internal, logged in memory
GPS coordinates	Latitude, longitude
Clock	Internal real time clock
Firmware upgrade	Remotely upgradable (FTP, CSD, Ethernet, RS-232 and USB)
Interface	RS-232, Ethernet and USB
External memory	Micro SD card (not included)
Power supply	Solar panel 17.5 V, 2 x 40 W Backup sealed Pb rechargeable battery, 12 V External DC 12 V – 3 A AC power supply and battery charger 100…240 V, 50/60 Hz to 24 VDC, 1.25A
Autonomy with battery only	48 to 60 Hours, setting depending
Autonomy with Solar panel	24 Hours / 365 days for PSH ≥ 2
Operating temperature	-10 °C to 55 °C
Humidity	< 29 g/m^3 93%
Wind speed	Max. 150 km/h (unit must be installed according to instructions)
Protection grade	IP55
Overall dimensions (LxHxD)	1480x1100x715 mm
Radome dimension (Ø x H)	250 x 740 mm
Pole dimension (Ø x H)	60 x 760 mm
Base dimension (LxHxD)	660 x 95 x 600 mm
Solar panel dimension (LxHxD)	1100 x 610 x 35 mm
Weight: Approx.	Approx. 34 kg

1.5 Max acquisition time

The device can measure and save data for a long period of time. The total time depends on the storing rate, number of frequency bands.

The internal memory can be read at every new data transfer to the central unit, at set times or by remote control. Moreover, when the memory is full, the new data are overwritten on the oldest to ensure availability of the data for the most recent measurement period.

Settings can be made and the devices can be queried via SMS, serial connection, Ethernet, GSM or line modem, FTP communication through FTP server. The following table describes the different possibilities.

TABLE 1-2 Settings/Queries of the AMS-8061

Possible functions	SMS	8061 via Modem	8061 via RS-232
Settings	YES	YES	YES
Reading status and alarms	YES	YES	YES
Reading max value	YES	YES	YES
Reading average value	YES	YES	YES
Download data	NO	YES	YES
Reading of battery	YES	YES	YES
Reading of internal temperature	YES	YES	YES
Spontaneous call	NO	YES	NO
Reporting alarms	YES	YES	NO
Reporting via SMS of daily maximum	YES	NO	NO

TABLE 1-3 Antennas Specifications

Model	EHA-2B-01	HA-1B-01	EA-1B-01	EA-1B-02
Frequency range	100 kHz – 6 GHz	100 kHz – 110 MHz	110 MHz – 6 GHz	27 MHz – 3 GHz
Measurement range	0.01 – 160 V/m	100 µA/m ÷ 7 A/m	0.01 – 160 V/m	0.01 – 200 V/m
Sensitivity	0.01 V/m	100 µA/m	0.01 V/m	0.01 V/m
Overload	435 V/m	20 A/m	435 V/m	435 V/m
Resolution	0.01 V/m	100 µA/m	0.01 V/m	0.01 V/m
Linearity	≤ ± 2 dB	≤ ± 2 dB	≤ ± 2 dB	≤ ± 2 dB
Frequency response (flatness)	≤ ± 3 dB	≤ ± 3 dB	≤ ± 3 dB	≤ ± 3 dB
Overall anisotropy (EN50383)	<2.5 dB up to 3 GHz <3.5 dB up to 6 GHz	<2.0 dB	<2.5 dB up to 3 GHz <3.5 dB up to 6 GHz	<2.5 dB
Unit	V/m	A/m	V/m	V/m

The AMS-8061 system is equipped with mod. EHA-2B-01 antenna.

Fig. 1-2 EHA-2B-01 Antenna

NOTE

The EHA-2B-01 triaxial antenna includes a triaxial magnetic field sensor. Computation of electric field, expressed in V/m by the station, is done assuming the measurement is taken in far field condition where the known ratio between magnetic and electric field allows good correlation accuracy.
Operator should check distance from field sources to evaluate reliability.

Fig. 1-3 EA Antenna models

1.6 AMS-8061 receiver panel

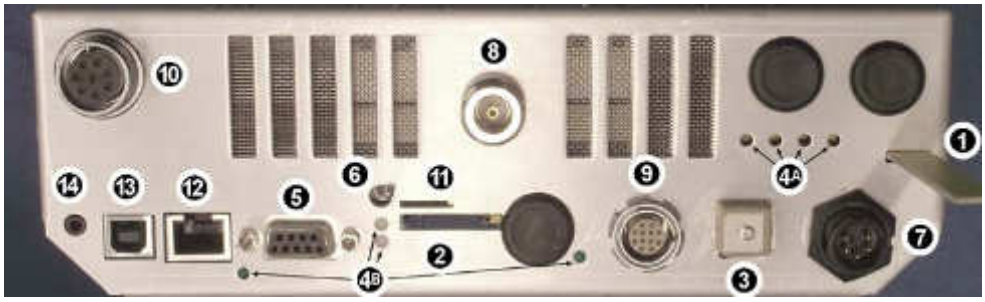
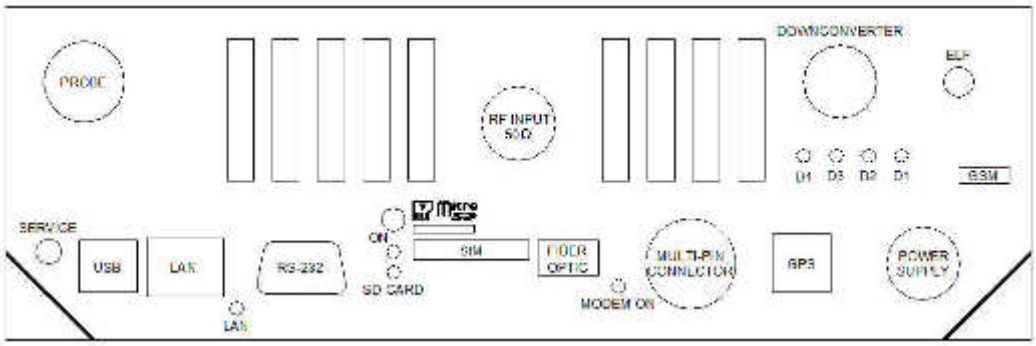


Fig. 1-4 AMS-8061 receiver unit panel



Legend:

1) GSM antenna

2) SIM card slot

3) GPS antenna

4A) Status LEDs

4B) Controller LEDs

5) RS232 serial interface connector

6) Power switch

7) Power supply connector

8) RF input N connector

9) Antenna data and power supply connector

10) Reserved

11) Micro-SD card slot

12) Ethernet RJ45 LAN connector

13) USB connector

14) Service 2.5mm-jack connector

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2 – Installation and use

2.1 Introduction

This section provides the information necessary to install and use the AMS-8061 Field Monitoring System.
It also includes information regarding initial inspection, power requirements, interconnections, working environment, assembly, cleaning, storage and shipment.

2.2 Initial inspection

Inspect the package for any possible damage.

WARNING

If the packaging or protective material are damaged, check that the content is complete and that the instrument has not been damaged in any of its electrical or mechanical parts. Check the accessories, referring to the checklist enclosed with the manual. Report any noticed damage to the forwarder and to NARDA.

2.3 Working environment

The working conditions for the instrument are as follows:

- Temperature From -10°C to +55°C
- Relative humidity <93% @ 30°C

The instrument should be stored in a clean, dry place free of acids, dust and moisture.
The storage environment must have the following specifications:

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

2.4 Return for repairs

Any part of the instrument, including the battery, can only be replaced by NARDA, therefore, in case of damage to parts and/or malfunctions, contact the NARDA service center.
When the instrument has to be returned to NARDA for repairs, please complete the form included in this Users Manual, filling in all the information necessary for the service requested.
To reduce the time necessary for the repair, be as specific as possible in describing the malfunction. If the problem only occurs under specific conditions, detail in the best possible way how to reproduce these conditions.
Whenever possible, it is preferable to use the original packing for return, making sure to wrap the device in heavy paper or plastic (see section 6 for detailed packaging instructions). In alternative, pack the equipment in a sturdy cardbox with plenty of impact absorbing material all around the equipment, to ensure a tight fit and prevent it from moving inside the box. Take special precautions to protect the solar cells and GSM modem antenna. Seal the package securely and write FRAGILE on the outside to encourage careful handling.

2.5 Cleaning

Use a clean, soft, dry cloth to clean the instrument and the solar cells.

WARNING

To clean the instrument do not use solvents, acids, cleaning fluid, turpentine, acetone or similar products which could damage it.

WARNING

It is suggested to replace air filter at least once a year or more frequently if needed.

2.6 Installation and use

The AMS-8061 Field Monitoring System consist of a vertical housing with circular shape made of material that is transparent to electromagnetic fields. Within this radome is housed the measuring device, as well as the measuring antenna and the remote communication device.
Batteries are located within the power pack on the support base.
The power supply system, using high capacity batteries, allows a good operating autonomy thanks to the power consumption that, relatively to the high performances, is kept low. In normal conditions, if continuous operation (24 hours/day selective measurement) is needed, the station should be powered by the mains or by external additional solar panels.

NOTE

AMS-8061 power system includes high quality lead batteries which provide very good performance even in the voltage, current and temperature most severe condition. Nevertheless, as happens in all lead accumulators, capacity is influenced by temperature. Best performance are achieved around 20°C.

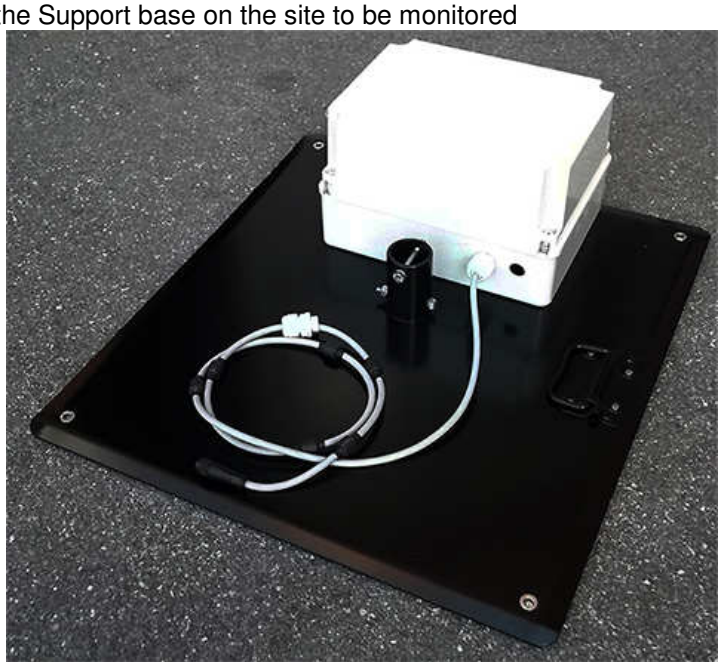
Fig. 2-1 AMS-8061 Field Monitoring System

2.6.1 Installation

The AMS-8061 Field Monitor is designed to operate outdoors, in the vicinity of the electromagnetic fields sources that shall be controlled, and under the most severe environmental conditions.

2.6.1.1 Support base, feet and pole

Install the Support base on the site to be monitored



WARNING

Before proceeding to permanent installation, make sure that the point at which the field monitor will be installed is adequately covered by the mobile phone service used for the GSM modem.
This can be done using any GSM mobile phone capable of indicating the intensity of the signal coming from the local base radio station of the company chosen for the SIM card.

WARNING

Correct readings may be conditioned by the nature of the places in which the AMS-8061 Field Monitoring System is installed.
The field measuring antenna is affected by huge metallic masses or other objects that may reflect the signal, if located in the vicinity of the unit.
Whenever possible, it is a good rule to install the unit at some distance from walls, high voltage pylons, buildings and other obstacles that could affect the signals reaching the sensor.

Screw the four adjustable feet under the support base.

Remove the bolt from the pole support, place the pole and fasten it to the base using the bolt with nut and washers.

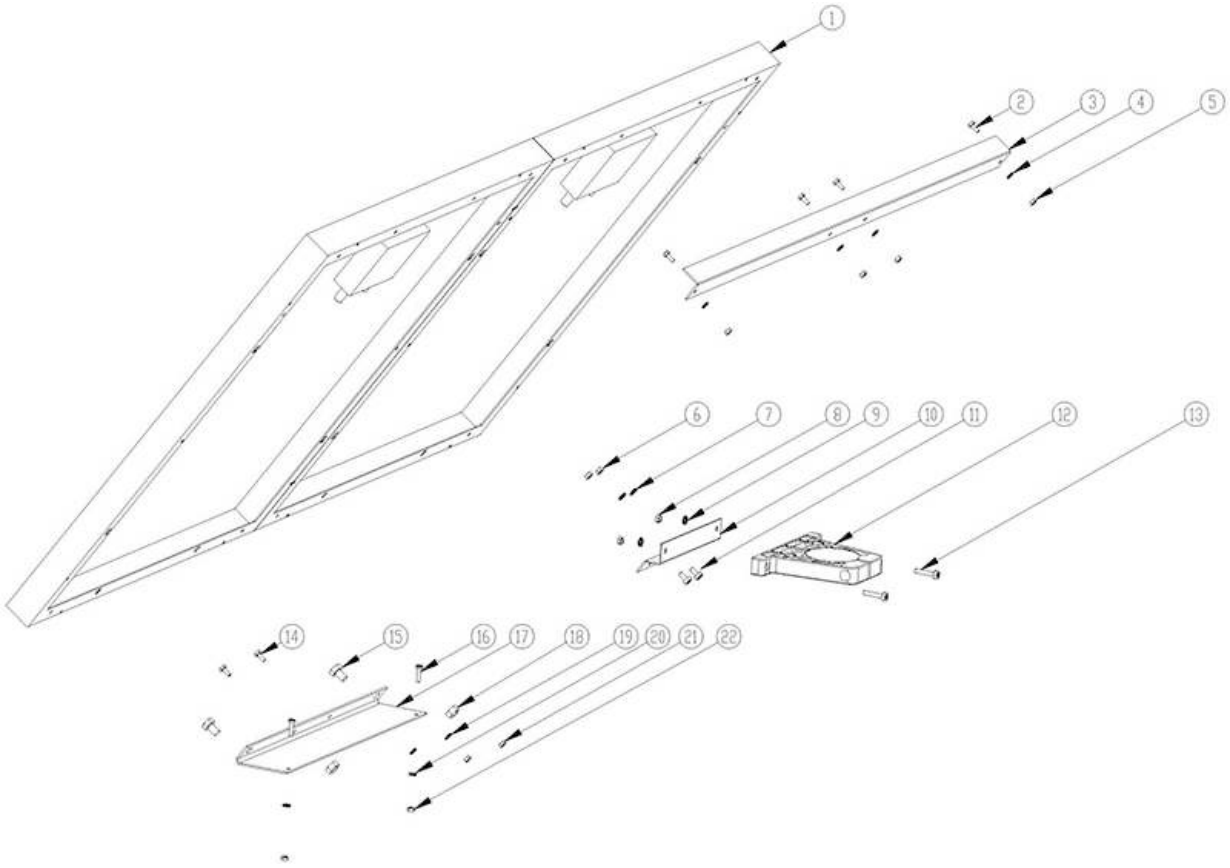
WARNING

Using the supplied pole, whose characteristics have been carefully assessed, is recommended to avoid any alteration of the field to be monitored.

2.6.1.2 Solar panel

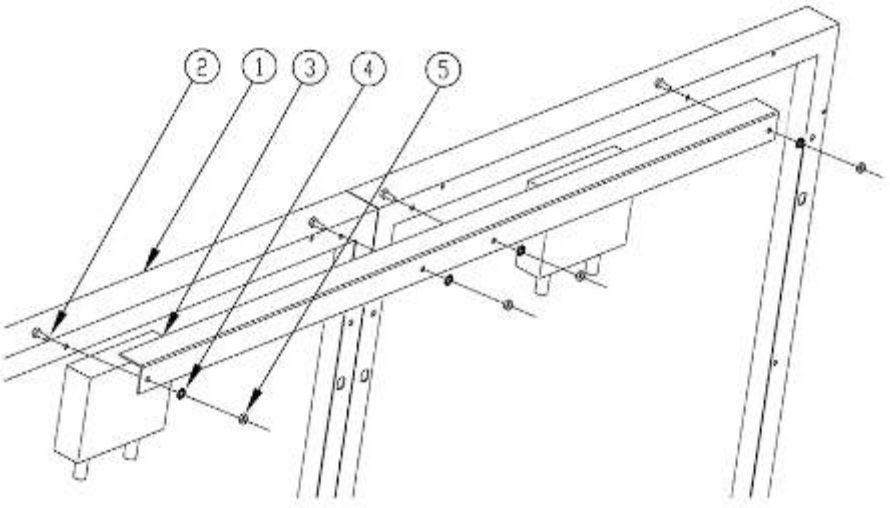
2.6.1.2.1 Solar panel mounting kit

The accessories included are:
1) 40W Solar panel (2 pcs);
2) Hexagon head bolt M4x10mm (4 pcs.);
3) **Upper L shaped bracket (1 pc.);**
4) Tooth washer Ø4mm (4 pcs.);
5) M4 nut (4 pcs.);
6) M5 nut (2 pcs.);
7) Tooth washer Ø5mm (2 pcs.);
8) M5 nut (2 pcs.);
9) Tooth washer Ø5mm (2 pcs.);
10) **S shaped bracket (1 pc.);**
11) Pan head machine screw X shaped M5x10mm (2 pcs.);
12) **PA6 black bracket (1 pc.);**
13) Pan head machine screw X shaped M5x25mm (2 pcs.);
14) Hexagon head bolt M4x10mm (2 pcs.);
15) Hexagon head bolt M8x12mm (2 pcs.);
16) Pan head machine screw X shaped M4x16mm (2 pcs.);
17) **55deg lower support (1 pc.);**
18) M8 nut (2 pcs.);
19) Tooth washer Ø4mm (2 pcs.);
20) Tooth washer Ø4mm (2 pcs.);
21) M4 nut (2 pcs.);
22) M4 nut (2 pcs.);
- 13mm combination wrench;
- 7mm combination wrench;
- Reversible screwdriver.

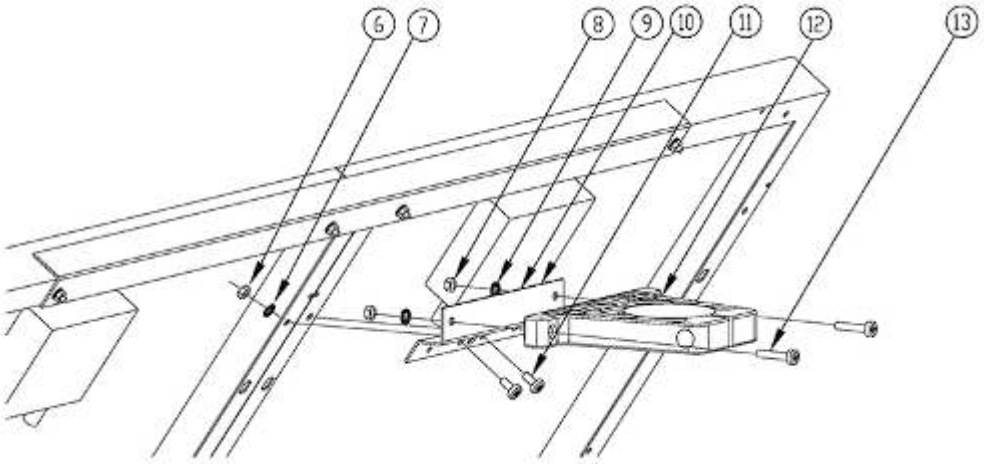


2.6.1.2.2 Installation Steps

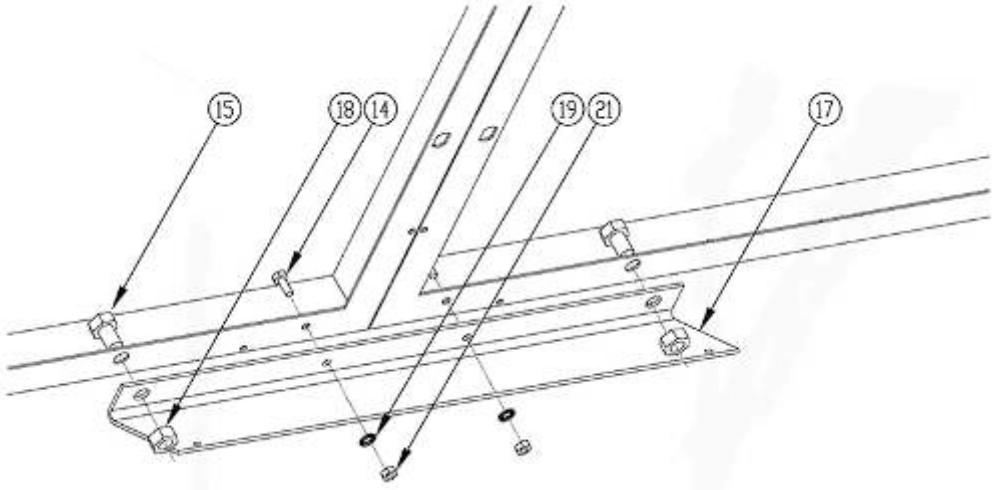
Upper L shaped bracket

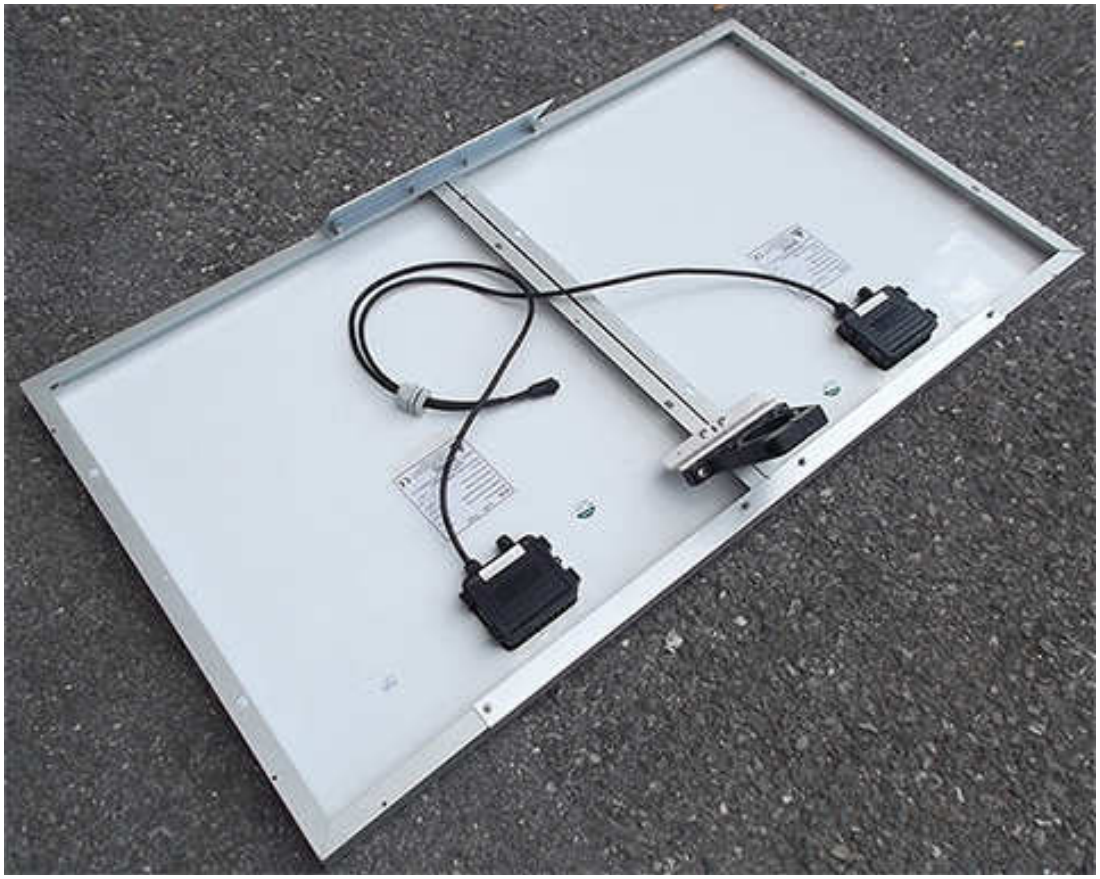


S shaped bracket and PA6 black bracket



55deg lower support





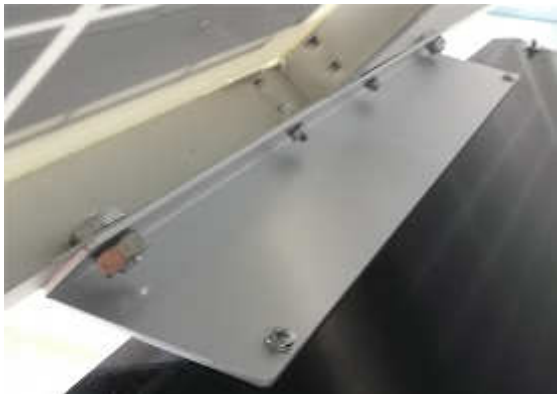
2.6.1.3 Install the Solar panel to the Support base

Unscrew the Pan head screw inside the PA6 black bracket without losing it completely.

Insert and slide the Solar panel into the fiberglass pole and position the 55deg lower support on the base

Position the Solar panel and the Support base on the ground as shown and install the 55deg lower support.

Install the 55deg lower support to the support base with the 2 pcs. Pan head machine screw X shaped M4x16mm (16), 2 pcs. Tooth washer Ø4mm (20) and 2 pcs M4 nut (22) remaining.



Position the Solar panel and the Support base on the ground as shown below.

WARNING

In the northern (boreal) hemisphere, the AMS-8061 should be installed with the solar cells facing south, in order to take the best advantage of the solar radiation for continuous recharging of the internal batteries. An angle of 35° with respect to vertical is the ideal position for the solar cells to optimize solar radiation in the European latitudes, specially in winter when the light levels are generally lower than in summer.

WARNING

To ensure maximum efficiency in recharging the battery and to take advantage of the maximum operating autonomy, make sure the position in which the unit is installed receives sunlight all the day long and is not shaded by buildings or other screening objects.

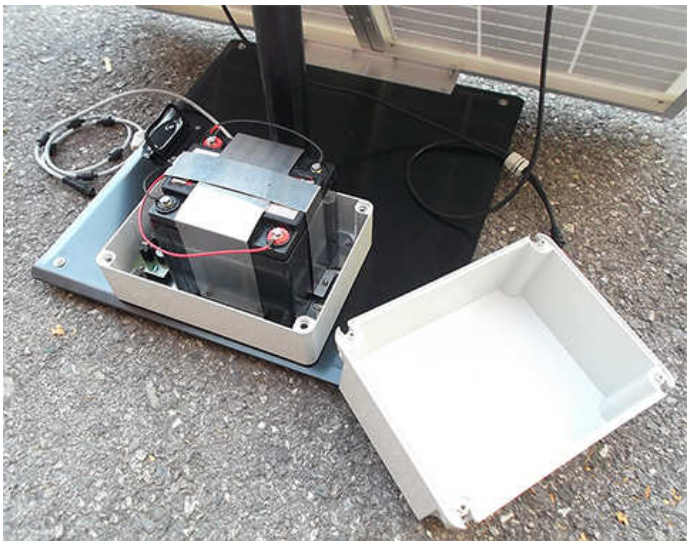
WARNING

To ensure maximum efficiency of recharging and optimum autonomy of the internal batteries, it is a good rule to keep the solar cells of the AMS-8061 clean, inspecting them periodically.
If necessary, clean them with a soft cloth and a normal glass cleanser.

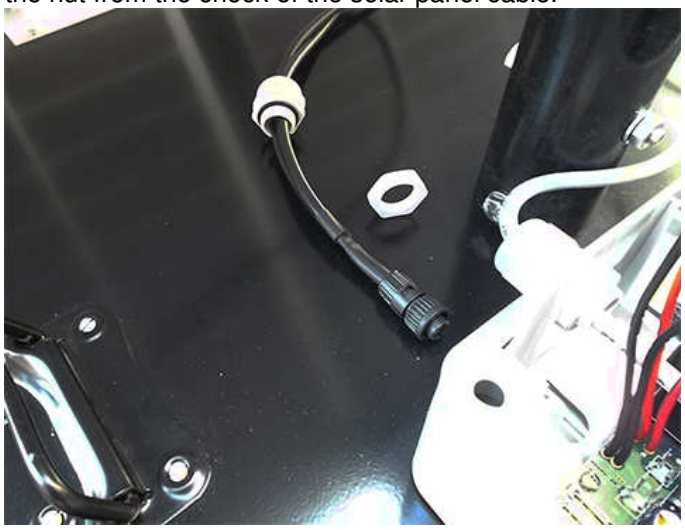
Fasten the Solar panel by tightening the bracket screws

2.6.1.4 Solar panel wiring and fuse

Remove the Power Pack cover

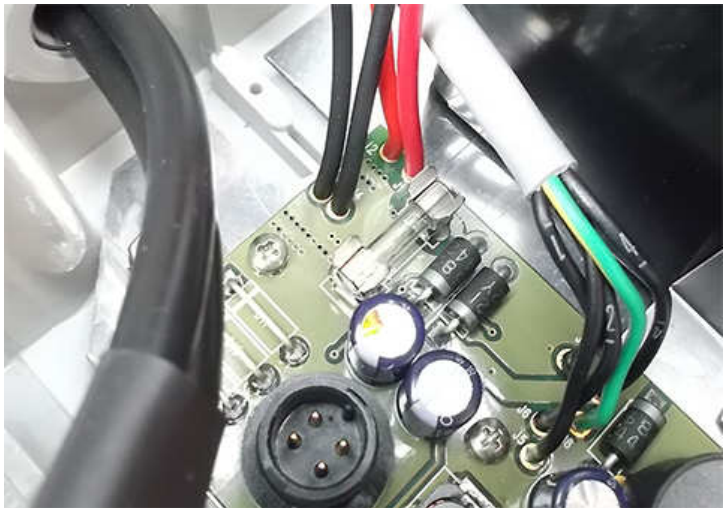


Remove the nut from the chock of the solar panel cable.

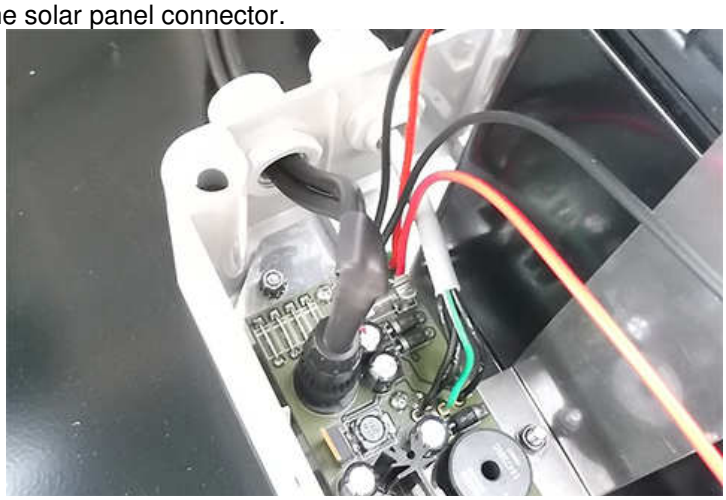


Thread the cable through the hole in the box and screw the nut to fasten the chock to the Power Pack.

Place the fuse.



Plug the solar panel connector.



Close the Power Pack box.

2.6.1.5 Receiver unit mounting

Before mounting the receiver unit on the pole, unscrew the Pan head screw inside the both PA6 black brackets without losing it completely.

Mount the receiver unit on the pole.

Fasten the unit by tightening the bracket screws

Remove the nut from the chock of the power cable.

Install the power cable by mounting the chock in the hole of the receiver baseplate; plug the power supply connector to the receiver unit holding by the plastic part.

2.6.1.6 Triaxial antenna

Carefully connect the antenna output to the receiver RF input and plug the antenna data connector looking at the alignment of the two red spot on the data connectors.

WARNING

To remove the antenna extract the multipolar connector first holding it by the metallic part, then turn the RF connector ring nut.
Do not insert or remove the antenna holding it by the head or by the data cable as serious damage may occur.

NOTE

The AMS-8061 station cannot operate without antenna even when downloading acquired field data.
In case the antenna is accidentally removed when station is ON a reset will be required: switch the station OFF, connect the triaxial antenna and switch ON again.

2.6.1.7 Connectors

The AMS-8061 has an USB, Ethernet and RS-232 port for direct connection to Personal Computer.

• **USB connector** for direct connection to Personal Computer.

• **Ethernet connector and its led** for direct connection to Personal Computer.

TABLE 2-1 Led Ethernet status	
LED	**Status Action**
Steady GREEN	Ethernet cable is connected

• **RS232 connector** for direct connection to Personal Computer.

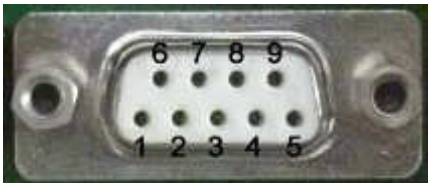


Fig. 2-2 DB9 Female front side view

DB9 Female Connector pin configuration:
Pin 2 RX [Received Data]
Pin 3 TX [Transmit Data]
Pin 5 GND [Signal Ground]
Pin 9 +3VD [Current limited]

NOTE

When the Ethernet cable is connected to the AMS module, and it is switched on, the RS232 port is not available.

NOTE

Every time the Ethernet cable is plugged into the AMS module, the connection will last 15 minutes regardless the scheduled time which continues to work in separate way.

2.6.1.8 SIM CARD and led modem status

The SIM Card to be used must permit the transmission and reception of data calls.
The user can choose the most suitable SIM Card to install, depending on the services and costs offered by the different mobile phone Service Providers; it should also be chosen so as to guarantee optimum coverage for the specific zone of installation of the field monitor.

Fig. 2-3 Slot for the SIM card

The modem for data transfer is housed inside the receiver module; the SIM Card has to be inserted in the slot shown in the figure (press the button to remove the SIM card).

WARNING

Before removing or inserting the SIM Card, switch off the AMS-8061.

WARNING

If you use a rechargeable SIM Card, make sure it is charged.
Before using the SIM Card with the AMS-8061, disable the PIN code using the proper function available on any mobile phone.

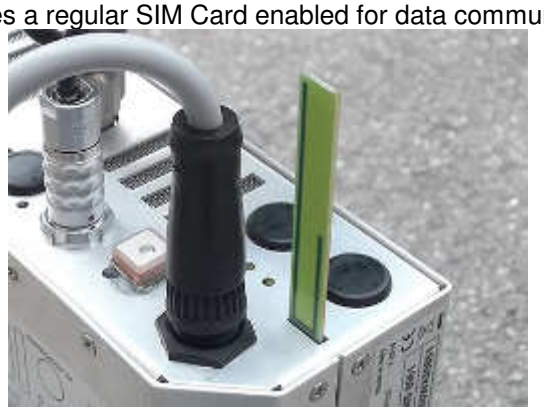
WARNING

The SIM card adopted shall be enabled to data transmission.
Dial up calls require that both the station SIM card as well as the PC modem one (if GSM) are enabled for CSD data communication.
GPRS/FTP communication mode require that the station SIM card is enabled for GPRS data communication allowing the station to access the user FTP server to download measurement results, automatically, according to the user setting. No modem but Internet access is required for the controller PC to access the user FTP server

TABLE 2-2 Led Modem status	
LEDs	**Status Action**
Steady GREEN	Modem ON

2.6.1.9 GSM Modem

The AMS-8061 station is supplied with a GSM modem and antenna which allows it to communicate with the controller PC for programming and for the remote collection of the data recorded. To function properly, the GSM modem requires a regular SIM Card enabled for data communication.



2.6.1.10 Micro SD card and led status

WARNING

The AMS-8061 is a self-contained instrument which does not require any external device such as mass-storage memory. Indeed, its built-in memory is large enough to store data for a year and a half or longer than three months with a rate of 1 minute.
However, the AMS-8061 supports Micro SD Cards. It is solely intended for backing up data when no other way is accessible among the many present (RS232, USB, FTP, Ethernet and MODEM-CSD).
Therefore, for no reason should an Micro SD Card be left in the slot permanently, or for a long time, as its power consumption would drastically reduce the autonomy with no advantage at all.
Moreover, GPS shares the same Micro SD Card port thus, when an Micro SD Card is present, the GPS is disabled.

Before removing or inserting the Micro SD card, switch off the AMS-8061.

To install the Micro SD Card:
- Slide the card into the slot
- Use your finger to gently push the card in until it stops and clicks into place.

Fig. 2-4 Slot for the Micro SD card

To remove the Micro SD Card:
- Use your finger to gently push the card in until it stops and clicks into place.
- Remove the card from the slot

In order to be used, an Micro SD Card should be first formatted, either FAT or FAT32, and then have a file named "SD8061.SD1"in the root .
The size of this file, "SD8061.SD1", determines the number of record will be backed-up on the Micro SD card.
According to the § 3.11 “D61 Structure, Download description”, each record takes 352 bytes. Thus to store N records the required size is 352 x N Bytes. For example, to back up 1000 records it is necessary to make the file "SDCOPY.SD9" whose size is 352000 bytes.
The AMS 8061, as soon as it detects the presence of an Micro SD Card, tries to open the file "SD8061.SD1" and, if successful, tries writing the last <size_of_file> divided by 352 records having thus the most recent ones. In the above example it would write the most recent 1000 records.
It is important to keep in mind that records will be aligned to last record-most recent record.

The Led let the user know about the state of process as shown in the following table.

TABLE 2-3 Led Micro SD card status		
LEDs	**Status**	**Action**
Blinking RED	DATA is being storing	*** **DO NOT REMOVE the SD Card** ***
Steady RED	SD Card ERROR	This can be caused by: • SD-card not formatted FAT or FAT32 • Damaged SD-Card
Steady ORANGE	SD Card ERROR	This can be caused by: • File "SD8061.SD1" not present. • Non-Writable SD-Card

Keep in mind that when storing all tasks are suspended thus it is better to limit the size to the minimum required to avoid missing data.
Once more, do not leave the SD-Card in the slot as it would not store anything more, as the storing process is triggered only by SD-Card insertion. Instead, it would stop GSP activity and draw energy reducing thus the autonomy.

2.6.1.11 Led ON in relation to the status of the monitoring station

When the monitoring station is switched on, the Led ON is first lit with a steady light for about 5 seconds, then starts to blink at the rate of one blink per second, indicating that the monitoring station is active in normal Stand-By conditions and **not** in the low consumption mode.

NOTE

The condition in which the LED blinks at a rate of one (brief) flash per second indicating that the monitoring station is in Stand-By mode and not in low consumption mode, are the following:

- All the time the Modem is on Stand-By
  Even if the user will disable most of the modem functions through the software, the minimum periods at which the internal modem would be ON (first hour after switch ON without Low Battery alarm and from 11:00 to 11:45 when the "Schedule for modem" and "Schedule for SMS" are set to zero) the LED will be blinking every second
- The time between acknowledgment of a command (via RS232, USB, Ethernet) to about 60 seconds from the last command received.
- All the time between the attempts by the monitoring station to establish a communication with the probe to about 60 seconds after correct acknowledgement of the connection.

After exiting this mode, the LED changes the manner of blinking to a (brief) flash every three seconds, thus indicating the low consumption status. The monitoring station remains in this status until an event rouses it and causes the return to Stand-by status again.
Possible events are:

- Modem switched on in Programmed or Spontaneous mode
- Sending of a programmed or spontaneous SMS
- Activity on the RS232, USB, Ethernet.

As indicated above, about 60 seconds after the termination of the event, the LED resumes blinking at the frequency of 0,3 Hz.

The LED also has five additional statuses:

- It blinks at a higher frequency than once per second during a communication (from the beginning to the end) to indicate the modem is in use.
- It remains on with fixed light during data downloads.
- It blinks red when the modem is on
- It blinks green when the modem is off
- It blinks orange when the Ethernet is connected

2.6.1.12 Radome

Remove the screws from the receiver baseplate to allow the Radome mounting.

NOTE

Considering that it has been designed for outdoor use and the main operations are generally performed remotely by means of an internal GSM modem, the AMS-8061 does not have any control or connection on the outside of the protective case.
Controls and connections are available inside the protective case as listed onward in this manual and can be reached by removing the station Radome or the power pack cover.

WARNING

The anti-tampering switch protrudes from the main unit.
Insert or remove along its axis the protective case; to avoid damage the interlock do not turn the radome of the monitoring station when closing or opening.

Place the Radome to align the hole near the inner label to the corresponding one in the receiver baseplate

Tighten the four screws to fix the Radome.

2.6.1.13 Interlock

A microswitch inside the unit is tripped when the Radome is removed. It is therefore possible to activate an alarm, to be sent to any mobile phone warning of any attempts to tamper with the device.

2.6.1.14 Bags

The AMS-8061 is usually installed outdoors where atmospheric agents, especially strong winds, can endanger its stability.
To ensure the necessary stability under the worst possible conditions, the unit is supplied with three ballast bags that can be filled with water or sand and fastened to the base of the mast.
Fasten the ballast bags to the mast using the plastic straps.

2.6.2 Battery charging

A complete battery charging should be completed (48 hours) before starting measurements.

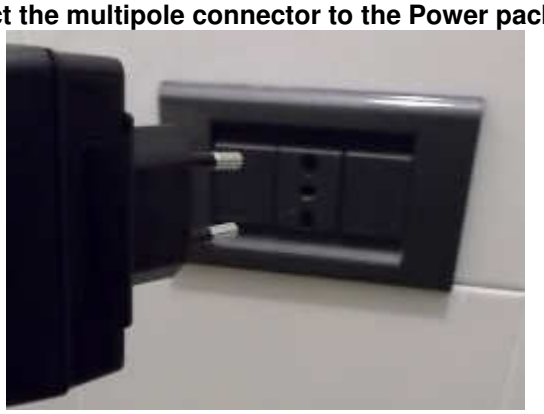
Remove the Power Pack cover.

Disconnect the solar panel from the Power Pack removing the chock.

Connect the provided power supply/battery charger for a complete charge.

WARNING

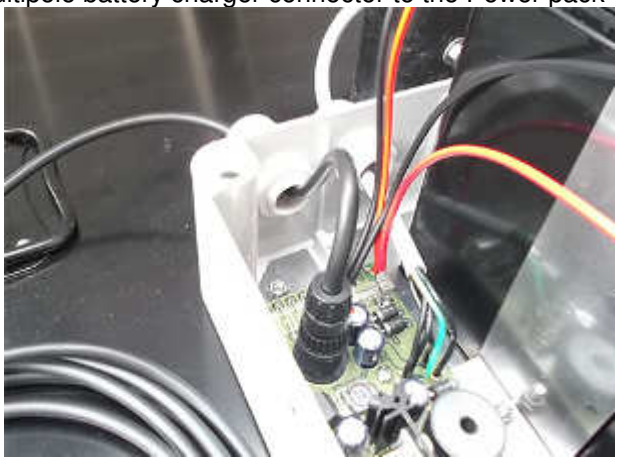
Plug the battery charger with the proper adapter to the mains outlet before connect the multipole connector to the Power pack.



Fasten the cable to the strain relief.

Thread the cable through the hole in the box and screw the nut to fasten the chock to the Power Pack.

Plug the multipole battery charger connector to the Power pack



2.6.3 External power supply

Execute the following wiring in the case an external power supply is requested during measurements.

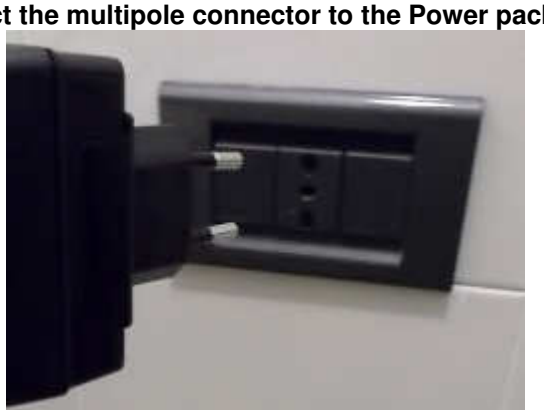
Remove the Power Pack cover.

Disconnect the solar panel from the Power Pack removing the chock.

Connect the provided power supply/battery charger.

WARNING

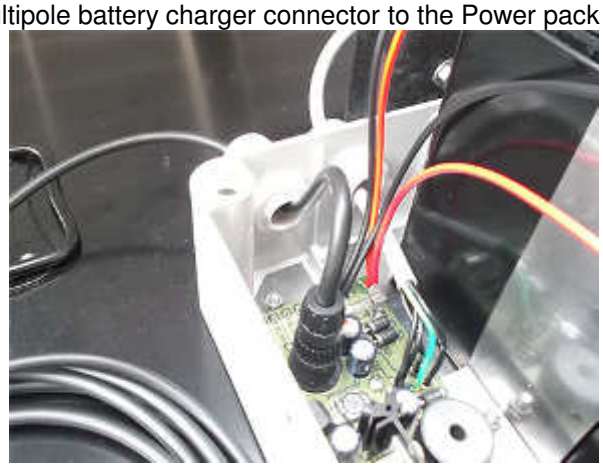
Plug the battery charger with the proper adapter to the mains outlet before connect the multipole connector to the Power pack.



Fasten the cable to the strain relief.

Thread the cable through the hole in the box and screw the nut to fasten the chock to the Power Pack.

Plug the multipole battery charger connector to the Power pack



2.7 How to switch the GSM modem on

On the AMS-8061 the GSM modem can be switched on in three different ways:

1. **Programmed** (the User decides when the modem has to be switched on and for how long).
2. **Spontaneous** (the AMS-8061 switches the GSM modem on whenever there is an alarm)
3. **Automatic** (the AMS-8061 switches the GSM modem on automatically when certain conditions arise)

2.8 Programmed Mode

The Programmed mode consists of setting a time for switching the modem on and off and the repetition interval.

The parameter “Hours and Minutes” specifies at what time of the day the GSM modem will be switched on and put in Stand-By mode.
The “Stand-By” parameter defines for how many hours the GSM modem remains on.
The parameter “Every” defines the repetition interval or after how many hours, from the last programmed activation, the GSM modem will switch on again.
The parameter “Every” must be a submultiple of 24 (1, 2, 3, 4, 6, 8, 12, 24) in order to have every day the same timing.

2.9 Spontaneous mode

In Spontaneous mode, whenever an alarm condition occurs or when the normal conditions are restored (e.g. exceeding the threshold value set for the field intensity or returning below the threshold) the GSM is switched on directly by the AMS-8061 either to make a call or to send an SMS (depending on the settings) to the modem number(s) memorized.
Afterwards, the GSM remains on stand-by for 15 minutes.

2.10 Automatic mode

The following condition turns the GSM modem on independently from the setting:

- 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.

2.11 Selective unit Switching ON/OFF

The selective unit is **OFF** every time the battery voltage is lower than **11 V**.

2.12 RF signals of dangerous intensity

The antenna used in the AMS-8061 and the receiver input stage contain highly sensitive elements.
Never place the unit in an electrical field higher than the maximum allowed level.
The type of the mounted antenna is automatically sensed.
No operation is required after the antenna installation or replacement.

2.13 Controlling the internal battery

The internal battery is automatically recharged by the solar panel (if connected) or by an external power source. The charge can be checked by remote using the proper command; a battery alarm can also be set, if necessary.

The lead batteries with a nominal voltage of 12V can be damaged if left for a long period with voltage below 11,58 V.
Below this value chemical processes, that could damage them, begin.
The AMS-8061 batteries apply a technology to reduce this phenomenon.
Furthermore the supply circuit disconnect the load (switching the unit off) when the battery voltage is low.
Anyway, if not used, the station should be switched off.
Battery should be recharged if the station has not to be used for a long period.

Any part of the instrument, including the battery, can only be replaced by NARDA, therefore in case of any damages to parts and/or malfunctions, please contact the NARDA Service Center.

2.14 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 8061 switched ON?
2. Is the GSM modem Led ON?
3. Is the battery charged correctly?

To charge the battery it is not necessary to switch the station on. Battery charging takes about 40 hours.

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

4. Is the GSM modem 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 probably off or the software is using a different COM port to which the modem is not connected.
6. What kind of telephone line (dedicated or GSM) are you using to call station from its PC? Try to use the fax machine telephone line.
7. Are you sure that the modem and the telephone line are able to support data calls?
8. Is the modem or the RS232 Cable connected to the correct COM port of the PC?
9. Is the modem correctly installed on PC (hardware and software)?

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.

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

If the communication with the area monitor is successful only by RS232 cable, the problem may lay on the modem or its antenna

If the modem of your PC is used as Windows "Fax Printer" peripheral it may be not available for the station. In this case, disabling the setting for the use of the modem in the "Fax Printer" will restore the normal operation.

To get a fast response from NARDA 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..) 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 (A SIM card allowed for international data calls should be available for remote diagnostic).
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 – GPRS and FTP

3.1 Introduction

As opposed to point-to-point Modem connection, which needs that both uploader and downloader are connected at the same time, GPRS via FTP mode works instead on a server way. Indeed, the monitoring station regularly stores all data on a server while a client application can retrieve them later on. This means there is no necessity to be on-line at the same time.
Moreover, more clients can share the same data as all data are stored in a server and stay there until they are deleted (by a client).
The method used is FTP.

Similarly to MODEM GSM schedule, which dials a remote Modem number stored in AMS-8061 telephone directory, GPRS establishes a connection using Provider Name, Username etc. stored in its memory.

Basically, at schedules, the AMS-8061 regularly establishes, via GPRS, a connection to the server and through FTP:

- First it loads, if any, all the (new) settings which have been written by the (client) application.
- Then it writes all data that have been requested by the application.
- Finally it erases all previous required settings in order to avoid reloading them at the next connection. Note that data related to field measurements are never deleted by the station.

After that the connection is terminated.

Although the AMS-8061 can operate in both modes, MODEM and GPRS, it cannot do it at the same time. This means that a setting command is used to configure the AMS-8061 to work either via MODEM way or via GPRS.

3.2 Structure

All data exchange is done on the directory named as the serial number of the monitoring station itself. That is in order to avoid having multiple stations that store on same directory and, at the same time, having a unique location. Here, an example of directory structure:

FTP_Root

- **000WE80201**
  - 8061.CFG
  - 8061.set
  - 8061FLD.TXT
  - 17_08_01_07_09_.D61
- **000WE80202**
  - 8061.CFG
  - 8061.set
  - 8061FLD.TXT
  - \ 20_00_01_07_09_.D61

The User must ensure that the directory is already present on the FTP root as the AMS-8061 will not create it.

3.3 Configuration (read)

Whenever the AMS-8061 connects to GPRS and accesses to FTP, it looks for a file named **8061.CFG** in its directory (its serial number). If the file is present, the AMS-8061 retrieves it and calculates the checksum in order to use it and thus get the new configuration. If the checksum is wrong, the file is discarded otherwise the new configuration is taken.
Is important to note that the new setting will not take effect immediately but only after the connection is closed.

All figures are Little Endian notation unless differently specified.

The structure of the configuration file is as follows.

Pos	Name	Size Byte	Type	Description
0	ChkSum	2	Unsigned int	Check sum (see the related paragraph)
2	idstation	34	Char	The name of Station. This is a null terminated string.
36	Mask alarm	2	Unsigned int Being Bits this is **BIG endian**	The mask of Alarm is a bit mask where '1' means Alarm Enabled while '0' is Alarm Disabled. Here is a list alarms. 0x0001-> MAX threshold Field OUT. 0x0002-> Warning threshold Field OUT. 0x0010-> LOCK OUT. 0x0080-> Low Battery Voltage OUT 0x0004-> Probe OUT 0x0020-> Temperature 0x0040-> Relative Humidity 0x0008-> MAX threshold Field IN. 0x0100-> Warning threshold Field IN. 0x0400-> LOCK IN. 0x0800-> Low Battery Voltage IN 0x0200-> Probe IN
38	Reserved	1	Unsigned char	None
39	AvgRms	1	Unsigned char	The way of averaging. If 'AvgRms' is 0 then is arithmetic average otherwise is Root Mean Square
40	MaxThr	4	Float	A little endian floating point figure that represents Max threshold used for Alarm.
44	WarnThr	4	Float	A little endian floating point figure that represents Warning threshold used for Alarm.
48	Logger	1	Unsigned char	This parameter sets the rate of the logger as follows "1" ->1 minute "2" ->2 minutes "3" ->6 minutes "4" ->15 minutes
49	reserved	1	Unsigned char	None
50	Naver	2	Unsigned int	This parameter represents the averaging time for Warning and Alarm threshold. It is expressed as 4 times the averaging time. For example a 6 min time is reported as 24
52	GPRS Appoint	2	Unsigned int	This parameter represents the scheduled time for connecting to GPRS of the day. It is expressed in minutes elapsed since midnight. For example the schedule 12:30 would be (12*60)+30 =750
54	GPRS Ton	1	Unsigned char	This parameter represents the time the GSM remains ON after a GPRS connections. It is expressed in quarter of hour.

55	GPRS Interval	1	Unsigned char	This parameter represents the interval between GPRS connections (starting from the first connection which is done at Appoint). It is expressed in hours.
56	Prxon	1	Unsigned char	This is the flag for connecting to GPRS upon alarms. If bit 0x01 is '1' and one or more unmasked alarm is set, a GPRS connection is done as it was for schedule. Note that bit 0x08, the GPRS Flag, must always be ON.
57	Reserved	1	Unsigned char	None
58	SMS Sched	2	Unsigned int	This parameter represents the scheduled time for SMS schedule of the day. It is expressed in minutes elapsed since midnight. For example the schedule 12:30 would be (12*60)+30 =750
60	SMS Ton	1	Unsigned char	This parameter represents how long the GSM remains in stand-by mode after a SMS connection. It is expressed in quarters of hour.
61	SMS Interval	1	Unsigned char	This parameter represents the interval between SMS connections (starting from the first connection which is done at Appoint). It is expressed in hours.
62	SMS Xon	1	Unsigned char	This is a double flag for sending a report and alarm on SMS. If bit 0x01 is '1' and one or more unmasked alarm is set, a "ALR" like SMS is sent to the number stored in the SMS telephone directory. If bit 0x02 is '1' a "RPT" like SMS is sent to the number stored in the SMS telephone directory.
63	Reserved	1	Unsigned char	Reserved
64	Reserved	2	Unsigned int	Reserved
66	Reserved	1	Unsigned char	Reserved
67	Reserved	1	Unsigned char	Reserved
68	Reserved	1	Unsigned char	Reserved
69	Reserved	1	Unsigned char	Reserved
70	Ethernet Sched	2	Unsigned int	This parameter represents the scheduled time for Ethernet schedule of the day. It is expressed in minutes elapsed since midnight. For example the schedule 11:08 would be (11*60)+8 =668
72	Reserved	1	Unsigned char	Reserved
73	Ethernet Interval	1	Unsigned char	This parameter represents the interval between Ethernet connections (starting from the first connection which is done at Ethernet Sched). It is expressed in hours and it can be either 12 or 24.
74	Ethernet Schedule Active	1	Unsigned char	This parameter enables/disables Ethernet Scheduling When "Ethernet Schedule Active" = 0x02 the Ethernet activity is regulated by "Ethernet Sched". Instead, when "Ethernet Schedule Active" is 0 the Ethernet is OFF
75	Reserved	3	Unsigned char	Reserved
78	StartFreq	4	float	Little Endian 32bit IEEE floating point number representing the start frequency of the first band and it is expressed in Hz.
82	StopFreq	4	float	Little Endian 32bit IEEE floating point number representing the Stop frequency of the first band and it is expressed in Hz.
86	Reserved	1	Unsigned char	Reserved, it must be 0
87	Reserved	1	Unsigned char	

19 bands follow here exactly as the above described band 1.					
n= 1 to 19					
	n*10+78	StartFreq	4	float	Little Endian 32bit IEEE floating point number representing the start frequency of the n band and it is expressed in Hz.
	n*10+82	StopFreq	4	float	Little Endian 32bit IEEE floating point number representing the Stop frequency of the n band and it is expressed in Hz.
	n*10+86	Reserved	1	Unsigned char	Reserved, it must be 0
	n*10+87	Reserved	1	Unsigned char	Reserved
278	Reserved	8	Unsigned char	Reserved	

The checksum must be calculated starting from **idStation** (position 2) up to (included) position 285 for a total of 284 bytes.

3.4 FLD File (Read)

After having dealt with the configuration file **8061.CFG**, the AMS-8061 check for the presence of a file named 8061FLD.TXT.
This is an ASCII file which contains the date of the first requested record and the number of them.
The syntax is: **FLD HH:mm;GG/MM/YY;n** where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year
- n is the number of records required (if n="---" then all records starting from the date/hour up the last recorded record will be uploaded).

For example the string FLD **18:13;23/04/14;100**
Asks for 100 records from the 23th of April 2014 at 18:13.

If, instead, the string would have been FLD **18:13;23/04/14;---**
It would ask for all records from the 23th of April 2014 at 18:13 up to now.

in case of "---" (up to now option), in order to avoid huge files and long transfer time, the number of records will be limited to 5000.

Once the AMS-8061 has read the file 8061FLD.TXT, it deletes it. It will be replaced later with the newer self created 8061FLD.TXT which reflects the last record.
This solves the continuity of records even without any external intervention. Indeed, for every connection the AMS-8061 uploads the records and writes a new FLD file which reports the date/hour of last record so that next connection will continue from this having thus an uninterrupted series of records.

3.5 Record File (Write)

After having read the FLD file, which informs the AMS-8061 about which records have to be uploaded, it writes a file named **HH_mm_GG_MM_YY.D61** where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year

The content of this file is binary and reflects what is described, according to the setting, in the specific paragraph:

- D61 Structure

Please refer to it for the correct interpretation of data.

3.6 FLD File (Write)

After having written the record file **HH_mm_GG_MM_YY.D61**, the AMS-8061 writes the file named 8061FLD.TXT which replaces the old one.
This is an ASCII file which contains the date of the last uploaded record and terminates with the string "---".
The content will be therefore: **FLD HH:mm;GG/MM/YY;---** where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year

For example the string FLD **20:30;23/04/14;---**
Says that the last updated record is related to the date of 23th of April 2014 at 20:30.

If a client does not necessitate a specific period, and needs a simple continuous data logger, there is no need to write any FLD File as the system is self-sufficient.

3.7 Event File (Write)

After having written the FLD file, the AMS-8061 writes a file named **HH_mm_GG_MM_YY.TXT** where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year

Which represents the events file.
This is an ASCII file which contains all the new events since last connection.
Alternatively, soliciting a connection, by the SMS command, different event history can be retrieved as follows:

- **SCGNA** : all the stored events are written in EVENT.TXT file
- **SCGNL** : The last 20 events are written in EVENT.TXT file

The content of EVENT file is the chronological history of all events up to the time of connection (RTC setting assumed to be correct).

3.8 Setting Status. (Write) After having written the EVENT.TXT file, the AMS-8061 writes a file named **8061.set** which reflects the configuration of the monitoring station.
Similarly to the Configuration **8061.CFG** the file is binary.
This file is solely intended for reading as it is ignored by AMS8061 and therefore any change of it will be discarded. Use 8061.CGF if you want to change any setting.

All figures are in Little Endian notation.

The structure of the configuration file is as follows.

Pos	Name	Size Byte	Type	Description
0	ChkSum	2	Unsigned int	Check sum (see the related paragraph)
2	idstation	34	Char	The name of Station. This is a null terminated string.
36	Mask alarm	2	Unsigned int Being Bits this is **BIG endian**	The mask of Alarm is a bit mask where '1' means Alarm Enabled while '0' is Alarm Disabled. Here is a list alarms. 0x0001-> MAX threshold Field OUT. 0x0002-> Warning threshold Field OUT. 0x0010-> LOCK OUT. 0x0080-> Low Battery Voltage OUT 0x0004-> Probe OUT 0x0020-> Temperature 0x0040-> Relative Humidity 0x0008-> MAX threshold Field IN. 0x0100-> Warning threshold Field IN. 0x0400-> LOCK IN. 0x0800-> Low Battery Voltage IN 0x0200-> Probe IN
38	Reserved	1	Unsigned char	None
39	AvgRms	1	Unsigned char	The way of averaging. If 'AvgRms' is 0 then is arithmetic average otherwise is Root Mean Square
40	MaxThr	4	Float	A little endian floating point figure that represents Max threshold used for Alarm.
44	WarnThr	4	Float	A little endian floating point figure that represents Warning threshold used for Alarm.
48	Logger	1	Unsigned char	This parameter sets the rate of the logger as follows "1" ->1 minute "2" ->2 minutes "3" ->6 minutes "4" ->15 minutes
49	reserved	1	Unsigned char	None
50	Naver	2	Unsigned int	This parameter represents the averaging time for Warning and Alarm threshold. It is expressed as 4 times the averaging time. For example a 6 min time is reported as 24
52	GPRS Appoint	2	Unsigned int	This parameter represents the scheduled time for connecting to GPRS of the day. It is expressed in minutes elapsed since midnight. For example the schedule 12:30 would be (12*60)+30 =750

54	GPRS Ton	1	Unsigned char	This parameter represents the time the GSM remains ON after a GPRS connections. It is expressed in quarter of hour.
55	GPRS Interval	1	Unsigned char	This parameter represents the interval between GPRS connections (starting from the first connection which is done at Appoint). It is expressed in hours.
56	Prxon	1	Unsigned char	This is the flag for connecting to GPRS upon alarms. If bit 0x01 is '1' and one or more unmasked alarm is set, a GPRS connection is done as it was for schedule. Note that bit 0x08, the GPRS Flag, must always be ON.
57	Reserved	1	Unsigned char	None
58	SMS Sched	2	Unsigned int	This parameter represents the scheduled time for SMS schedule of the day. It is expressed in minutes elapsed since midnight. For example the schedule 12:30 would be (12*60)+30 =750
60	SMS Ton	1	Unsigned char	This parameter represents the time the GSM remains ON after a SMS connections. It is expressed in quarters of hour.
61	SMS Interval	1	Unsigned char	This parameter represents the interval between SMS connections (starting from the first connection which is done at Appoint). It is expressed in hours.
62	SMS Xon	1	Unsigned char	This is a double flag for sending a report and alarm on SMS. If bit 0x01 is '1' and one or more unmasked alarm is set, a "ALR" like SMS is sent to the number stored in the SMS telephone directory. If bit 0x02 is '1' a "RPT" like SMS is sent to the number stored in the SMS telephone directory.
63	Reserved	1	Unsigned char	Reserved
64	Reserved	2	Unsigned int	Reserved
66	Reserved	1	Unsigned char	Reserved
67	Reserved	1	Unsigned char	Reserved
68	Reserved	1	Unsigned char	Reserved
69	Reserved	1	Unsigned char	Reserved
70	Ethernet Sched	2	Unsigned int	This parameter represents the scheduled time for Ethernet schedule of the day. It is expressed in minutes elapsed since midnight. For example the schedule 11:08 would be (11*60)+8 =668
72	Reserved	1	Unsigned char	Reserved
73	Ethernet Interval	1	Unsigned char	This parameter represents the interval between Ethernet connections (starting from the first connection which is done at Ethernet Sched). It is expressed in hours and it can be either 12 or 24.
74	Ethernet Schedule Active	1	Unsigned char	This parameter enables/disables Ethernet Scheduling When "Ethernet Schedule Active" = 0x02 the Ethernet activity is regulated by "Ethernet Sched". Instead, when "Ethernet Schedule Active" is 0 the Ethernet is OFF
75	Reserved	3	Unsigned char	Reserved
78	StartFreq	4	float	Little Endian 32bit IEEE floating point number representing the start frequency of the first band and it is expressed in Hz.

82	StopFreq	4	float	Little Endian 32bit IEEE floating point number representing the Stop frequency of the first band and it is expressed in Hz.
86	Reserved	1	Unsigned char	Reserved, it must be 0
87	Reserved	1	Unsigned char	Reserved
19 bands follow here exactly as the above described band 1.				
n= 1 to 19				
n*10+78	StartFreq	4	float	Little Endian 32bit IEEE floating point number representing the start frequency of the n band and it is expressed in Hz.
n*10+82	StopFreq	4	float	Little Endian 32bit IEEE floating point number representing the Stop frequency of the n band and it is expressed in Hz.
n*10+86	Reserved	1	Unsigned char	Reserved, it must be 0
n*10+87	Reserved	1	Unsigned char	Reserved

278	Reserved	8	Unsigned char	Reserved
286	Status alarm	2	Unsigned int Being Bits this is **BIG endian**	The status of Alarm contains the alarm bit by bit where '1' means Alarm ON while '0' is Alarm OFF. Here is a list alarms. 0x0001-> MAX threshold Field OUT. 0x0002-> Warning threshold Field OUT. 0x0010-> LOCK OUT. 0x0080-> Low Battery Voltage OUT 0x0004-> Probe OUT 0x0020-> Temperature 0x0040-> RH 0x0008-> MAX threshold Field IN. 0x0100-> Warning threshold Field IN. 0x0400-> LOCK IN. 0x0800-> Low Battery Voltage IN 0x0200-> Probe IN
288	Temp	2	int	This parameter shows the AMS-8061 Temperature. It is ten times the last measured temperature. Thus, in order to get actual temperature Temp should be divided by 10
290	RH	2	Int	This parameter shows the AMS-8061 Relative Humidity. It is ten times the last measured Relative Humidity. Thus, in order to get actual Relative Humidity, RH should be divided by 10
292	Battery	2	Int	This parameter shows the AMS-8061 current voltage. It is hundred times the last measured Battery Voltage. Thus, in order to get actual Battery Voltage, Battery should be divided by 100
294	Reserved	186		None
480	Firmware	32	Char	The Fw name and version. This is a null terminated string

3.9 GPRS – FTP Settings

In order to establish a GPRS connection and a FTP transfer, a number of data are required which are divided into 2 main fields as follows. Each fields cannot be more than 31 characters.
These commands cannot be executed via FTP/GPRS (because they would need to be already correctly set).

GPRS Connection Data		
Field	**Description**	**Setting command** Command to be issued by either SMS or RS232
GPR**0** **APN** Access Point Name	The provider name of the GPRS bearer.	#SMSGPR**0** <apn>* where <apn> is Access Point Name Example: #SMSGPR**0** web.omnitel.it*
GPR**1** **GUN** User Name for Gprs access	The User Name required for logging-in. Sometimes this field might not be required and thus can be left empty.	#SMSGPR**1** <gun>* where <gun> is the User Name of GPRS access. Example: #SMSGPR**1** MyGPRS*
GPR**2** **GPSW** Password for Gprs access	The Password required for logging-in. Sometimes this field might not be required and thus can be left empty.	#SMSGPR**2** <gpsw>* where <gpsw> is the Password of GPRS access. Example: #SMSGPR**2** 1234*

FTP Connection Data		
Field	**Description**	**Setting command** Command to be issued by either SMS or RS232
GPR**3** **FUN** User Name for FTP access	The User Name required for accessing to the FTP server. This word is usually issued from the FTP administrator and is nothing to do with the bearer.	#SMSGPR**3** <fun>* where <fun> is the User Name for FTP. Example: #SMSGPR**3** MyFTP*
GPR**4** **FPSW** Password for FTP access	The Password required for accessing to the FTP server. This word is usually issued from the FTP administrator and is nothing to do with the bearer.	#SMSGPR**4** <fpsw>* where < fpsw > is the Password for FTP. Example: #SMSGPR**4** abcd*
GPR**5** **FIP** FTP IP Address	This parameter is the server address for FTP (IP Address of FTP). Normally this is the static IP Address that routes the file transferring process to the wanted server	#SMSGPR**5** <fip>* where < fip > is the IP Address for FTP. Example: #SMSGPR**5** 194.183.2.17*

MISC		
Field	**Description**	**Setting command** Command to be issued by either SMS or RS232
CGN Connect GPRS Now	This command starts a GPRS connection immediately. All the procedures are then the same as it would for a scheduled connection.	#SMSCGN*
CGNL Connect GPRS Now (Last Events)	This command starts a GPRS connection immediately as for CGN but it forces to have a EVENT.TXT file containing the last 20 events instead of the most recent, and not yet loaded, ones.	#SMSCGNL*
CGNA Connect GPRS Now (All Events)	This command starts a GPRS connection immediately as for CGN but it forces to have a EVENT.TXT file containing all the events available instead of the most, and not yet loaded, ones.	#SMSCGNA*
CGNFW Connect GPRS Now and update Firmware	This command starts a GPRS connection immediately as for CGN. Additionally, if the 2 firmware files are found, it updates the firmware and reboots.	#SMSCGNFW*
CGNFWI Connect GPRS Now and Immediately update Firmware	This command starts a GPRS connection immediately as for CGN. Additionally, if the 2 firmware files are found, it updates the firmware and reboots without uploading any records. The difference from CGNFW is that it does not upload the data before updating the FW thus all unloaded records are lost.	#SMSCGNFWI*
NETE Enable GPRS protocol	This command enables the AMS-8061 to connect via GPRS instead of point-to-point GSM-MODEM connection. The reply is the same as for command ?TSM	#SMSNETE*
NETD Disable GPRS protocol	This command disables the AMS-8061 GPRS and enables point-to-point GSM-MODEM connection. The reply is the same as for command ?TSM	#SMSNETD*
STS id Set Timedate SMS	This command sets the internal real clock time by using the SMS provider's information. To use it **id** (the AMS-8061 telephone number) must be sent. This command works assumes that the SMS provider gives the correct Clock/Date and its feedback is within 30 seconds. The reply is sent only if the real time clock has been updated and is the same as for the command "?CLK"	#SMSSTS nnnnnnnn* where nnnnnnnn is the telephone number of AMS-8061

3.10 Checksum algorithm

As previously mentioned, there is a little endian 16 bit unsigned int which is called checksum. The checksum is intended for verifying the reliability of the array read mainly from the AMS-8061's side as a corrupt configuration could potentially make the AMS-8061 ineffectual.
Therefore the application must ensure that the checksum in the 8061.CFG file reflects the actual state of the configuration setting. Otherwise, if the checksum does not match the exact value, the new configuration will be ignored.

The Checksum is calculated as the sum of all the bytes involved starting from a seed of 0xAAAA.
Then, from the result the modulo 0x10000 is taken (which also means truncating the result to 4 bytes).

3.11 D61 Structure, Download description

This paragraph describes the structure of a multiband record.
These records are created by either GPRS/ftp enabled (files D61) or "?FLS" command.

3.11.1 Command Mode

Sintax	Description
?FLS HH:mm,dd/MM;n	Request for **n** samples starting from Hour **HH** and minute **mm** of the day **dd** of the month **MM** of the current year. In case MM is higher than current month, the referred year is the past one. For example, the command **#SM ?FLS 13:00,01/08;60*** asks for 60 measures starting from 13:00 of the 1st of August This answer is a block of binary data

The block of bytes in replying to #SM **?FLS HH:mm,GG/MM;n** command is as follows:

A Header: made of #SM **FLS=***<CR><LF> (11 bytes)
A series of (**32** bytes + 16* Number of Bands) per sample as shown in the following table.
A final Checksum as described at the end of this document.

3.11.2 GPRS/FTP Mode

At GPRS schedule a file named HH_mm_dd_MM_yy_.D61 is created (see the proper paragraph in this chapter).
This file contains (**32** + 16* Number of Bands) * **n** bytes (where n is the number of requested records).

All figures in this document are LITTLE ENDIAN

3.11.3 Selective Multiband Structure description

Header

Reserved		Reserved		Reserved		Charge	RH
Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8

Battery	Temperature	Alarm	PERTS	PROC	Month	DateTime	
Byte 9	Byte 10	Byte 11	Byte 12	Byte 13	Byte 14	Byte 15	Byte 16

Latitude int		Latitude Fract		Longitude int		Longitude Fract	
degree Byte 17	minute Byte 18	Byte 19	Byte 20	degree Byte 21	minute Byte 22	Byte 23	Byte 24

NOB	Reserved						
Byte 25	Byte 26 SelRate	Byte 27 LstBnd	Byte 28	Byte 29	Byte 30	Byte 31	Byte 32

Sub-Band(s) 1- NOB

Freq_Start				Freq_Stop				RBW	Res	Peak		Avg		Reserved	
+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F

The figure named **Charge** is shown as follows:

Charge	D07	D06	D05	D04	D03	D02	D01	D00
Byte 7	8 bit unsigned integer							

This value represents the charging current of the AMS-8061 battery. The number should be considered as an unsigned 8 bit integer.
To get the value in CH_Units the following formula should be used:
CH_Units)= **Charge** * 0.78

If, for example, the 8 bit figure named **Charge** is 0x57 (decimal 87) then the CH_Units would be ~68

The figure named **RH** is shown as follows:

	D07	D06	D05	D04	D03	D02	D01	D00
RH Byte 8	8 bit unsigned integer (**RH**)							

This value is the relative Humidity and is expressed in percent . The number should be considered as an unsigned 8 bit integer.

If, for example, 8 bit figure named **RH** is 0x32 (decimal 50) then the value of RH would be 50%

The figure named **Battery** is shown as follows:

	D07	D06	D05	D04	D03	D02	D01	D00
Battery Byte 9	8 bit unsigned integer (**Voltage**)							

It is the voltage of the AMS-8061 battery. The number should be considered as an unsigned 8 bit integer. To get the correct value of the battery voltage the following formula is used: Volt = **Voltage * 0.133**

If, for example, 8 bit figure named **Battery** is 0x5D (decimal 93) then the battery voltage will be ~12.37 V

The figure named **Temperature** is shown as follows:

	D07	D06	D05	D04	D03	D02	D01	D00
Temperature Byte 10	SPR FLAG	7 bit unsigned integer (**Temperature**)						

It is the Temperature recorded in the interval. The number should be considered as an unsigned 7 bit integer. In order to avoid negative figure an offset of 40 degrees centigrade is added thus, to get the correct value of the temperature, the following formula is used: T Centigrade = **Temp - 40.**
SPR Flag is a reserved one and should be masked (for example **Temp & 0x7F**).
If, for example, 8 bit figure named **Temp** is 0x3f (decimal 63) then the temperature will be 23°C

The figure named **ALARM** is shown as follows:

	D07	D06	D05	D04	D03	D02	D01	D00
ALARM Byte 11	ABAT	ARH	ATMP	ALCK	**Reserved**	ASENS	AWRN	AALR

It is the block of alarms recorded in the interval. Each bit should be considered individually as follows:

- ABAT When High it flags that the battery voltage was out of the safe limits.
- ARH When High it flags that the relative humidity is out of working range.
- ATMP When High it flags that the temperature was out of working range.
- ALCK When High it flags that the case was unlock.
- ASENS When High it flags that a Sensor failure was detected.
- AWRN When High it flags that the RMS field value overcame Warning threshold.
- AALR When High it flags that the RMS field value overcame Alarm threshold.

The figure named **PERTs** is shown as follows:

	D07	D06	D05	D04	D03	D02	D01	D00
PERTs Byte 12	Reserved	Reserved	Reserved	TXON	**Reserved**	USB	CHG	ETH

It is the block of every single perturbing occurrence recorded in the interval. Each bit should be considered individually as follows:

- TXON When High it flags that RF Modem was ON during sampling.
- USB When High it flags that the USB connection was ON during sampling.
- CHG When High it flags that the external Charger was connected by cable during sampling.
- ETH When High it flags that the Ethernet connection was ON during sampling.

The presence of one of the above flags indicates that the record has been perturbed by external influence and the result, in the best case, could be unreliable.

The figure named **PROC** is shown as follows:

	Reserved			Reserved	AVGP			
	D07	D06	D05	D04	D03	D02	D01	D00
MISC Byte 13			RMS		**AVGPeriod** 4 bit unsigned integer			

This figure (**PROC)** reports how the process took place in the period.

- RMS (D05) flags whether the averaging has been made linear mean (AVG) or Root Mean Square(RMS). If the Flag is 1 then the RMS was taken otherwise was AVG.
- **AVGPeriod** is a 4 bit unsigned integer which shows the interval (expressed in minute) related to the time span used to get the average (RMS or AVG).

The figure named **MONTHS** is shown as follows:

	Reserved	**MONTHS**						
	D07	D06	D05	D04	D03	D02	D01	D00
MONTHS Byte 14		7 bit unsigned integer						

MONTHS is a 7 bit unsigned integer which indicates how many months have been elapsed since 1st January 2014. Being the range limited to 127 the overlapping period is more than 10 years.
D07 is reserved and should be masked.
If, for example, **MONTHS** is **0x10** then the meaning will be:

- MONTHS =16 (May 2015). Indeed **0x10 = 16 =12 + 4**

The figure named **DateTime** is shown as follows:

	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
DateTime Byte 15/16	**DateTime**															

DateTime should be considered as a **little**-endian unsigned 16 bit integer and indicates how many minutes have been elapsed since the beginning of the current month (previous MONTHS data).
If, for example, **DateTime** is 0x95AE (decimal 38318) then the record will be related to the 27th of the month at 14:38.
Indeed :

Day = 1 +Int(**DateTime** / 1440) = 1 +Int (38318 / 1440) = 27
Hour = Int((**DateTime** Mod (1440)) / 60) = Int ((38318 Mod (1440)) / 60) = 14
Minute = (**DateTime** Mod (1440)) Mod 60)= (38318 Mod (1440)) Mod 60) = 38

Merging the data with MONTHS we can get the full date of acquisition which is 14:38 27/05/2015

3.11.4 GPS Information

The 16 bit figure named **Latitude int** is shown as follows:

	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 17/18	Degree								**N/S**	**V**	Minute					

The figure named **Latitude int** is made of 4 fields and represents the integer part of the GPS Latitude.

- **Degree** is a 8 bit unsigned integer which indicates the degree of latitude.
- **N/S** (D7) is a flag which indicates whether the latitude is North or South. When referred to North N/S=0 while if N/S=1 the latitude is South.
- **V** (D6) is a flag which indicates whether data is valid or not. When coordinates are valid V=0. When V=1 the GPS was not able to correctly get the position.
- **Minute** is a **6 bit** unsigned integer which indicates the minute integer part of latitude.

The 16 bit figure named **Latitude int** is shown as follows:

	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 19/20	**Ten thousandths of a minute**															

The figure named **Latitude Fract** is a **little**-endian unsigned 16 bit integer and indicates the fractionary part of the GPS Latitude and it is expressed in Ten-thousandths of a minute.
Merging the previous data **Latitude int** and this figure the full latitude can be obtained.
If, for example, **Latitude int=0x2c04** and **Latitude Fract=0x12a9** then the GPS latitude would be:
44 degree, 04.4777 minute North.
Indeed, 0x2c=44, 0x04=04 and 0x12a9=4777. N/S is 0 then the latitude is North.

The 16 bit figure named **Longitude int** is shown as follows:

	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 21/22	Degree								**E/W**	**res**	Minute					

The figure named **Longitude int** is made of 4 fields and represents the integer part of the GPS Longitude.

- **Degree** is a 8 bit unsigned integer which indicates the degree of latitude.
- **E/W** (D7) is a flag which indicates whether the Longitude is East or West. When referred to East E/W=0 while if E/W=1 the Longitude is West.
- **D6** is reserved and have to be masked out.
- **Minute** is a **6 bit** unsigned integer which indicates the minute integer part of Longitude.

The 16 bit figure named Longitude **Fract** is shown as follows:

	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 23/24	**Ten thousandths of a minute**															

The figure named **Longitude Fract** is a **little**-endian unsigned 16 bit integer and indicates the fractionary part of the GPS Longitude and it is expressed in Ten-thousandths of a minute.
Merging the previous data **Longitude int** and this figure the full Longitude can be obtained.
If, for example, **Longitude int=0x0809** and **Longitude Fract=0x16b3** then the GPS Longitude would be: 8 degree, 09.4777 minute East.
Note that position is valid only when **Flag V** of **Latitude int** is zero.

The figure named **NOB** is shown as follows:

	OldData	Reserved		**NOB**				
	D07	D06	D05	D04	D03	D02	D01	D00
Byte 25	Flag			5bit unsigned integer				

NOB is a 5 bit unsigned integer which indicates how many bands have been measured and present in the current period. Based on this figure, starting from the 33rd byte, then 16 bytes for each band will follow.
If **NOB** is out of the allowed range (1-20), such in case of an empty record, **NOB** should be considered to be 0 (no bands recorded) and thus the 33rd byte is in fact the 1st byte of the next record.
OldData is a bit which flags whether the following data are still the same or are fresh ones.
When **OldData** is 0 then data have been updated since the previous record otherwise, **OldData** is '1', data have not completely updated yet. The latter is the case when the energy is low and the measuring process is reduced in rate to save power.

	Reserved							
	D07	D06	D05	D04	D03	D02	D01	D00
Byte 26								

	Reserved															
	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 27/28																

	Reserved															
	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 29/30																

	Reserved															
	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte 31/32																

Then 16 bytes follow and contain all data related to the first band

Freq_Start				**Freq_Stop**				**RBW**	**Res**	**Peak**		**Avg**		**Reserved**	
+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F

The, additional packets of 16 bytes follows according to[**NOB**]

3.11.5 Band Packet description

The figure named **Freq_Start** is shown as follows:

	Freq_Start
Byte +0 - +3	32 bit Float

Freq_Start is a Little Endian 32bit IEEE floating point number representing the start frequency of the band and it is expressed in Hz
If **Freq_Start=0xffffffff** or **Freq_Start=0x00000000** then the band is empty and should be ignored.

The figure named **Freq_Stop** is shown as follows:

	Freq_Stop
Byte +4 - +7	32 bit Float

Freq_Stop is a Little Endian 32bit IEEE floating point number representing the start frequency of the band and it is expressed in Hz.

The figure named **RBW** is shown as follows:

	D07	D06	D05	D04	D03	D02	D01	D00
Byte +8	**DivExp**				**Index**			

This figure (**RBW)** gives two figures:

- the **Index** of RBW used. **Index** is a 4 bit unsigned integer.
- **DivExp** is a 4 bit unsigned integer and express the exponent of the **Scaler. Scaler=**10^(DivExp-2).

For example, if RBW=0x31 then **Index**=1 and **DivExp**=3. Therefore, **Scaler=**10^(3-2) = 10.

	Reserved							
	D07	D06	D05	D04	D03	D02	D01	D00
Byte +9								

The 16 bit figure named **Peak** is shown as follows:

	D15	D14	D13	D12	D11	D10	D09	D08	D07	D06	D05	D04	D03	D02	D01	D00
Peak Byte +10/+11	16 bit unsigned integer															

It is the **Peak** value detected in the stored interval, of field strength measured in the band. The number should be considered as a Little-endian unsigned 16 bit integer multiplied by the **Scaler** above calculated. In the particular case in which the figure **Peak** is equal to **0xFFFF** then **Peak** value must be considered invalid (AMS-8061 was not able to get a measurement) and the data are meaningless.
If, for example, 16 bit figure named **Peak** is 325 and the **Scaler** 0.01 then the **PEAK** field strength value related to the band will be 3.25.

The 16 bit figure named **Avg** is shown as follows:

	D15	D14	D13	D12	D11	D10	D09	D08	D07	D06	D05	D04	D03	D02	D01	D00
Avg Byte +12/+13	16 bit unsigned integer															

It is the averaged value, either RMS or AVG, detected in the stored interval, of field strength measured in the band. The number should be considered as a Little-endian unsigned 16 bit integer multiplied by the **Scaler** above calculated. In the particular case in which the figure **Avg** is equal to **0xFFFF** then **Avg** value must be considered invalid (AMS-8061 was not able to get a measurement) and the data are meaningless.
If, for example, 16 bit figure named **Avg** is 2153 and the **Scaler** 0.001 then the **Avg** field strength value related to the band will be 2.153.

	Reserved															
	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Byte +14/+15																

These (32 + 16 * NOB) bytes above described constitute the block containing all record data related to the interval. Therefore, the number of blocks sent are as many as the required sample (asked by **n** parameter) by the command:**?FLS HH:mm,dd/MM;n** or, when GPRS/ftp enabled, through the file 8061FLD.TXT (see the proper paragraph in this chapter).

Then, according to the mode used, either command or ftp, the behavior is as follows:

Command query (**?FLS HH:mm,dd/MM;n**).

As soon as all records have been sent an additional byte (8 bit) is appended. This additional character represents the checksum of the just sent packet. This checksum is calculated summing up all received bytes and making then modulo 256. This can be helpful for checking the transmission correctness.
The reply starts with the header ("#SM FLS=*\r\n"), and it is followed by the above mentioned packets of (32 + 16 * NOB) per each sample plus 1 byte of checksum.

As the monitor station, when sending data, suspends all other tasks (sending data gets highest priority) storing included, it is preferable asking not many data at once so that the AMS-8061 is not engaged, for say, for more than 10 seconds. Therefore, when having a lot of data to retrieve, it is better to split up into consecutive smaller requests instead of asking the whole block so that the AMS-8061 can service its own tasks in between them. On the other hand, the overall transmission time will not be significantly influenced as few millisecond are needed for sending a new command.

GPRS/ftp mode (8061FLD.TXT file).

At GPRS schedule a file named HH_mm_dd_MM_yy_.D61 is created (see the proper paragraph in this chapter).
This file contains n*(32 + 16 * NOB) bytes (where n is the parameter present in the file content (FLD HH:mm;dd/MM/yy;**n**)

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4 - SMS Messages and Commands

4.1 Introduction

This Chapter includes a list of commands which can be sent to the AMS-8061 in the form of SMS, by means of a mobile phone, or directly by serial connection (RS-232 cable or modem), USB and Ethernet.

Because of their text length, some commands cannot be used via SMS, such as: ?EVN, ?EVNL, ?EVNR, ?BNDALL.

When any password is set in the Station, it is necessary to add the ?IDN (or ?IDNF) command before of any other one to be sent.

Username and Password must only contain alphanumeric characters; any special characters are not allowed.

As for example, to ask for the last field measurement, the query SMS would be: #SM?IDN password* #SM?LFA*

Commands allow the user to set several parameters and ask for data or information about the station status.

Commands have the following syntax:

#SMQCommand(parameters)* where:

# = command string start character;
SM = SM always present to distinguish the model;
Q = **?** for query commands;
S for setting commands;
Command = command string;
(parameters) = setting parameter (where needed);
***** = command string end character.

Commands are divided in two main categories:

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

4.2 Command list

Query COMMANDs

Syntax	Function
#SM?ALR*	Field Alarm threshold query command.
#SM?AQ_*	Current Acquisition mode query command (Alias ?AQP)
#SM?AQP*	Alias of ?AQ_ command
#SM?BAT*	Battery voltage query command.
#SM?BNDn*	Specified Band data query command.
#SM?BNDALL*	All Bands data query command
#SM?CLK*	Station internal clock query command.
#SM?EVN	Events query command
#SM?EVNL	Last 20 Events query command
#SM?EVNR	Not yet read Events query command
#SM?GPS x*	GPS position data query command.
#SM?IDN*	Identifier query command.
#SM?IDNF*	Full Identifier query command.
#SM?LFA*	Last mean value query command.
#SM?MSK*	Alarm Mask query command.
#SM?PRB*	Antenna data query command.
#SM?RPT*	Report query command.
#SM?RPT0*	Report with reset query command.
#SM?STA*	Alarms status query command.
#SM?TDM*	Modem phone directory list query command.
#SM?TDMn*	Modem single phone number query command.
#SM?TDS*	SMS phone directory list query command.
#SM?TDSn*	SMS single phone number query command.
#SM?TMP*	Temperature query command.
#SM?TSE*	Ethernet scheduling query command
#SM?TSM*	Modem scheduling query command.
#SM?TSS*	SMS scheduling query command.
#SM?WRN*	Field Warning threshold query command.

?AQ_ and ?AQP are equivalent (the same for the corresponding setting command). The AQP has been introduced for compatibility with some SMS network which reject the "_" character. So, in case of problems, please try the alias command.

Setting COMMANDs

Syntax	Function
#SMSALR(parameters)*	Alarm threshold setting.
#SMSAQ_(parameters)*	Acquisition mode setting (alias #SMSAQP)
#SMSAQP(parameters)*	Alias for SAQ_ command
#SMSATH*	Hang off current call.
#SMSATH0*	Hang off current call and switches the Modem off.
#SMSAVGx*	Average Time for Alarm and Warning
#SMSBND(parameters)*	Bands Frequency setting
#SMSCLD(parameters)*	Clock date setting.
#SMSCLT(parameters)*	Clock time setting.
#SMSCNL(parameters)*	Deferred call enabling.
#SMSDIC*	Disable Call.
#SMSDIE*	Disable Ethernet.
#SMSDIG*	Disable GPS
#SMSDIR*	Disable Report.
#SMSDMO*	Disable Modem
#SMSENC*	Outgoing call enabling.
#SMSENE*	Enable Ethernet.
#SMSENR*	Report send enabling.
#SMSETH*	Ethernet hang up
#SMSGOI*	GPS On Immediately
#SMSGOIF*	GPS ON Immediately with Feedback
#SMSIDN(parameters)*	Station identifier setting.
#SMSMSK(parameters)*	Alarm mask setting.
#SMSPSW*	New Password setting
#SMSRST*	Reset to default configuration
#SMSRSTR*	Reset to default configuration and rate
#SMSTDM(parameters)*	Modem phone number setting.
#SMSTDS(parameters)*	SMS phone number setting.
#SMSTSE(parameters)*	Time Schedule Ethernet setting.
#SMSTSM(parameters)*	Time Schedule Modem setting.
#SMSTSS(parameters)*	Time Schedule SMS setting.
#SMSWRN(parameters)*	Warning threshold setting.

GPRS Connection Data

Syntax	Function
#SMSGPR0<apn>*	Access Point Name setting.
#SMSGPR1<gun>*	User Name setting
#SMSGPR2<gpsw>*	Password setting

Username and Password must only contain alphanumeric characters; any special characters are not allowed.

FTP Connection Data

Syntax	Function
#SMSGPR3<fun>*	User Name setting.
#SMSGPR4<fpsw>*	Password setting
#SMSGPR5<fip>*	IP Address setting
#SMSCGN*	GPRS Connect now
#SMSCGNL*	GPRS Connect now + 20 Events file
#SMSCGNA*	GPRS Connect now + All the Events file
#SMSNETE*	Enable GPRS Protocol
#SMSNETD*	Disable GPRS Protocol

Username and Password must only contain alphanumeric characters; any special characters are not allowed.

4.3 Query COMMANDs Query commands interrogate the station for data; it responds back with a message containing the requested information.
Query commands contain a **?** character in the command string.

Command	Description	Example
?ALR	Field **Alarm threshold** query command. The answer displays the threshold value in the current unit followed by the averaging time (minutes).	Example: **#SM?ALR*** Response: **ALR=20 V/m; 1**
?AQ_ alias command: **?AQP**	Acquisition mode query command. The reply is in the format: **AQ_LTR** where: **L** is an index to indicate the storing rate 1 for 1 min 2 for 2 min 3 for 6 min 4 for 15 min **T** is a factory parameter which can be ignored **R** indicates the averaging mode which can be A for AVG and R for RMS.	Example: **#SM?AQ_*** Response: **AQ_=40A** It means that the Stations is storing a measurement every 15 minutes and the mean calculation is Average. The alias command can be used in the same way. Example: **#SM?AQP*** Response: **AQ_=10R**
?BAT	**Battery** voltage query command. The answer displays the battery values VOLT and centimes of VOLT in the format: **BAT=VV.vv***	Example: **#SM?BAT*** Response: **BAT=13.38**
?BNDn	Asks for data related to the specified frequency band, where n = band number. The reply is the Start and Stop frequencies in MHz.	Example: **#SM?BND1*** for band number 1. Response:**BND 1=0.100,1.000**
?BNDALL	Asks for data related to all of the frequency bands. The reply is the list of the bands, as for the ?BNDn command (This command cannot be used via SMS)	Example: **#SM?BNDALL*** Response:**BND 1=0.100,1.000** **BND 2=1.000,20.00**
?CLK	Station internal **clock** query command. The answer displays the time and date in the format: **CLK=HH.mm.ss;GG.MM.YY*** **H** ---> hours **m** ---> minutes **s** ---> seconds **G** ---> day **M** ---> month **Y** ---> year	Example: **#SM?CLK*** Response: **CLK=13.32.57;23.11.07**

Command	Description	Example
?EVN	All Events list request. The reply shows the complete list of all the available events, stored by the Station. This command is not available via SMS.	Example: **#SM?EVN***
?EVNL	Last 20 Events list request. The reply shows the list of latest 20 available events, stored by the Station. This command is not available via SMS.	Example: **#SM?EVNL***
?EVNR	Not yet read Events list request. The reply shows the complete list of all the available events, that are not yet been read before, stored by the Station. This command is not available via SMS.	Example: **#SM?EVNR***
?GPS	Asks for GPS position data. Response format: **GPS=NMEA standard protocol string.**	Example: **#SM?GPS*** Response: **GPS=$GPRMC,053740.000,A,2503.6319,N,12136.0099,E,2.69,79.65,100106,,,A*53***
?IDN	**Identifier** request with password authentication. The answer displays the Station identifier (that can be set by the SIDN command) followed by the serial number (factory preset). It is always necessary to send this command, before any other one, when a password is set in the remote Station and any wireless connection is used. Via SMS, it is advisable to send this message, instead of ?IDNF, to make the password authentication. Please look at the SPSW command to find information about how to save the password in the Station.	Example: **#SM?IDN*** Response: **IDN=democisano;000WX50802;** Another Example: **#SM?IDN PASSWORD* #SM?BAT*** Response: **IDN=democisano;000WX50802; BAT=13.07** The reply to an incorrect password is: **DENIED**

Command	Description	Example
?IDNF	**Full Identifier** request with password authentication. The reply displays the brand (Nsts), Station model and firmware release, serial number, last calibration date, originate call (ON, OFF or NET if set to GPRS/FTP), time and switch on interval Modem 1, SMS Report (ON or OFF), time and interval Modem 2, Alarm mask. Format: **IDN=identifier;Nsts,AMS-8061;R.rr MM/YY;** **Serial Number; Date of calibration;** **ON|OFF|NET HH:mm (Xq) each Yh;ON|OFF** **HH:mm (Zq) each Wh;ALARM;** Where: **identifier** is the name of the Station, stored by SIDN command. **R.rr** is the release and MM/YY the date of the internal firmware. **Serial Number** is written in factory. **Date of calibration** is the last calibration date, as dd.MM.YY. **Originate Call** can be ON, OFF or NET to indicate the Station call mode. **HH:mm (Xq) each Yh** shows the Modem status for first interval, same as ?TSM command. **Send Report** can be ON or OFF to indicate if the SMS report sending is active or not. **HH:mm (Zq) each Wh** shows the Modem status for second interval, same as ?TSS command. ALARM is a symbolic string to show the alarms states, as for ?ALR command . The argument PASSWORD is always necessary, as a security authentication, when a password is set in the remote Station and any wireless connection is used. Via SMS, it is advisable to send the ?IDN command, instead, to make the password authentication. Please look at the SPSW command to find information about how to save the password in the Station.	Example: **#SM?IDNF*** Response: **IDN=democisano;Nsts,AMS-8061;B.10 09/15;000WX50802;13.08.15;NET 12:15 (4q) each 01h;ON 17:10 (1q) each 24h;----------;** Another Example: **#SM?IDNF PASSWORD* #SM?BAT*** Response: **IDN=democisano;Nsts,AMS-8061;A.46 08/15;000WX50802;21.07.15;NET 12:15 (4q) each 01h;ON 17:10 (1q) each 24h;----------;BAT=13.07** Where: **democisano** is the Station identifier **Nsts** is the narda brand **AMS-8061** is the model **A.46** is the fw release and **08/15** means August 2015 **000WX50802** is the Station's S/N **21.07.15** means July 21th 2015 and is the latest calibration date **NET 12:15 (4q) each 01h** means that the Station is set to call via GPRS/FTP, at 12:15, remaining on for 4/4 of hour each hour (that is to say, permanently on) **ON 17:10 (1q) each 24h** means that the SMS Report is sent at 17:10 and the Station Modem remains on for ¼ of hour each 24 hours (1 day) **----------** means no Alarm is active **BAT=13.07** is the reply to the second command and means the internal battery voltage is 13.07 V The reply to an incorrect password is: **DENIED**
?LFA	Last mean value query command. The answer displays the mean value in the current unit, calculated along the set averaging time (set by the SAVG command)	Example: **#SM?LFA*** Response: **LFA=0.46** It means 0,46 V/m is the mean value for last rate interval.

Command	Description	Example
?MSK	**Alarm mask** query command. The answer displays a string containing the alarm setting mask and selected method of notification in the following format: **MSK=AWLVPTCawlvp MODEM SMS** Each character represent an enabled alarm. Type of alarm as described below in the **?STA** command explanation. The character "**-** " shows an alarm **not** enabled. When MODEM is displayed, any alarm is notified by a call to the controller PC. When SMS is displayed, any alarm is notified by SMS to mobile phone.	Example1: **#SM?MSK*** Response: **MSK=A-L---------** Description: alarms enabled are: (field) Alarm OUT, Case Open OUT. Even if activated, alarms will not be notified. Example2: **#SM?MSK*** Response: **MSK=AW-----aw--- MODEM** Description: alarms enabled are: (field) Alarm OUT, (field) Warning OUT, (field) Alarm IN, (field) Warning IN. Activation of any of the above alarms will be notified by modem (automatic call to the controller PC). Example3: **#SM?MSK*** Response: **MSK=---V-T----v- SMS** Description: alarms enabled are: Battery Voltage OUT, Over Heat, Battery Voltage IN. Activation of any of the above alarms will be notified by SMS (message to the mobile phone numbers specified by the command STDS). Example4: **#SM?MSK*** Response: **MSK=AWLVPTCawlvp MODEM SMS** Description: all alarms are enabled. Activation of any of the above alarms will be notified by both SMS and modem.
?PRB	Antenna information query command. The answer displays the antenna model, last calibration date, unit, divisor, level range and frequency range.	Example: **#SM?PRB*** Response: **PRB=EHA_2B_01:21.07.15; : 100: 650: 0.01:**

Command	Description	Example
?RPT	It asks for max recorded field, with date and time stamp since last automatic Report was sent, and current battery voltage. (the "Send Report" function should be enabled sending the "**SENR**" message). Showed field value is related to the **Total** band.	Example: **#SM?RPT*** Response: **RPT=** **MAX:2.14V/m** **10:57 19/10/07** **Battery=11.62V**
?RPT0	Same as above but with reset function to start a new observation period.	Example: **#SM?RPT0*** Response: **RPT=** **MAX:2.14V/m** **10:57 19/10/07** **Battery=11.62V/m** Example of next SMS: **#SM?RPT*** Response: **RPT=** **MAX:0.38V/m** **10:19 08/11/07** **Battery=12.70V**
?STA	Alarm status request. Information about any active alarm is returned in the following format: **STA=WwAaPpVvLITC** Every letter identify an active alarm as follows: **W**= (field) Warning OUT **w**= (field) Warning IN (back in normal condition after Alarm OUT) **A** = (field) Alarm OUT **a**= (field) Alarm IN **P**= Device Section OUT **p**= Device Section IN **V**= Battery Section OUT (alarm threshold) **v**= Battery Section IN (alarm threshold) **L**= Case Open OUT **l**= Case Open IN **T**= Over Heat **C**= Relative Humidity Character "**-**" means the specific alarm is not active.	Example: **#SM?STA*** Response: **STA=--------L---** Description: Case Open alarm is active. Example: **#SM?STA*** Response: **STA=------V-----** Description: Battery Section alarm is active due to the low battery voltage. Example: **#SMSTA*** Response: **STA=------V----C** Description: Battery Section alarm is active due to the low battery voltage, and also the Relative Humidity alarm is active due to high humidity inside the Station.

Command	Description	Example
?TDM	**Modem** phone directory list query command. The answer displays the phone numbers stored in the modem phone directory or VOID if empty in the format: (a <LF> Line Feed after each number): **TDM=** **xxxxxxxxxx** **xxxxxxxxxx** **void** *	Example: **#SM?TDM*** Response: **TDM=** **0123456789** **void** **void** **void** **void** **void** **void** **void** **void** **void**
?TDMn	Same as above but selecting a specific position in the directory list (**n** variable between 0 and 9). The answer displays the requested phone number or VOID in the format: **TDMn=xxxxxxxxxx***	Example: **#SM?TDM1*** Response: **TDM1=VOID**
?TDS	**SMS** phone directory list query command. The answer displays the phone numbers stored in the SMS phone directory or VOID if empty in the format: (a <LF> Line Feed after each number): **TDS=** **xxxxxxxxxx** **xxxxxxxxxx** **void** *	Example: **#SM?TDS*** Response:**TDS=** **1234568565** **void** **void** **void** **void** **void** **void** **void** **void** **void***
?TDSn	Same as above but selecting a specific position in the directory list (n variable between 0 and 9). The answer displays the requested phone number or VOID in the format: **TDSn=xxxxxxxxxx***	Example: **#SM?TDS1*** Response:**TDS1=1234568565**

Command	Description	Example
?TMP	Internal temperature and Relative Humidity query command. It returns the internal temperature in °C and the RH % in the format: TMP=TT,RH.	Example: **#SM?TMP*** Response: **TMP=39.08,30.4** Which means that the internal Temperature is 39.08°C and the RH is 30.4%
?TSE	**Ethernet** programming time setting query command. Answer returns information (as set by the STSE command) with the following format: **TSE=ON|OFF HH:mm each XXh** HH:mm is the time when the LAN port switches on XXh is the repetition interval in hours	Example: **#SM?TSE*** Response: **TSE=OFF 00:00 each 00h** It means that the LAN port is set to be always OFF.
?TSM	**Modem** programming time setting query command. Answer returns information (as set by the STSM command) with the following format: **TSM=ON|OFF|NET HH:mm (Xq) each YYh (DIS)** Where: **HH:mm** is the time when the Modem switches on **(Xq)** is the stand-by time, in quarters of hour (maximum 24, that is to say 6 hours) **YYh** is the repetition interval in hours **(DIS)** string informs that the disable command is active (please look at SDMO setting command). When the string is not shown, the modem schedule works as expected.	Example: **#SM?TSM*** Response: **TSM=NET 12:15 (4q) each 01h** It means that the modem is scheduled to be switched on at 12:15 and remain on for 4/4 of hour, every hour (that is to say to be permanently on).

Command	Description	Example
?TSS	**SMS** programming time setting query command. Answer returns information (as set by the STSS command) with the following format: **TSS=ON|OFF HH:mm (Xq) each YYh (DIS)** **HH:mm** is the time when the Modem switches on **(Xq)** is the stand-by time, in quarters of hour (maximum 24, that is to say 6 hours) **YYh** is the repetition interval in hours **(DIS)** string informs that the disable command is active (please look at SDMO setting command). When the string is not shown, the modem schedule works as expected.	Example: **#SM?TSS*** Response: **TSS=ON 17:26 (1q) each 24h** It means that the modem is scheduled to be switched on at 17:26 and remain on for 1/4 of hour, and it happens every day.
?WRN	Field Warning threshold query command. The answer displays the threshold in the current unit followed by the time (minutes) of the calculated mean.	Example: **#SM?WRN*** Response: **WRN=4.00 V/m;6**

4.4 Setting COMMANDs Setting commands send setting data to the system, the station can answer back with a message with requested information or a setting confirmation. Setting commands contain a "**S**" character at the beginning of the string.

Command	Description	Example
SALRx.x	Alarm threshold setting. The parameter xx.x is the threshold value in the format: **#SMSALR xx.x*** (same response as **?ALR** command)	Example: **#SMSALR6.0*** Response: **ALR= 6.00 V/m; 6**
SAQ_ Alias command: **SAQP**	Acquisition mode setting command. The syntax is: **#SMSAQ_LTR*** where: **L** is an index to indicate the storing rate 1 for 1 min 2 for 2 min 3 for 6 min 4 for 15 min **T** must be "0" (reserved) **R** indicates the averaging mode which can be A for AVG and R for RMS. The reply is the same to ?AQ_ command.	Example: **#SMSAQ_10R*** Response: **AQ_=10R** It means that the Stations is storing a measurement every 1 minute, and the mean calculation is RMS. The alias command can be used in the same way. Example: **#SMSAQP40A*** Response: **AQ_=40A**
SATH	This command hang up the current communication and the line. It should be always used to end any remote operation (by modem) to confirm the end of data exchange.	Example: **#SMSATH*** Response is always: **ATH=OK**
SATH0	This command is very similar to SATH. In addition it switches the Modem OFF after having completed all current operations; this takes from one to two minutes.	Example: **#SMSATH0*** Response is always: **ATH=OK**
SAVGx	Mean Time for Alarm and Warning threshold setting. The parameter **x** is in minutes. (same response as **?ALR** command)	Example: **#SMSAVG6*** Response: **ALR= 6.0; 6**

Command	Description	Example
SBND n, start,stop	Specified band frequency setting Format: SBND n,start,stop Where: n is the band index, between 1 and 20 Start and Stop are the corresponding frequencies, expressed in MHz. It is mandatory that Start is lower than Stop. It is not recommended to set a Start frequency lower than another one before, in order not to waste time. Set Start = 0 to cancel a band The reply is: BND=OK if command granted BND=ERR when there are errors and the command is rejected BND=VOID when the band has been deleted.	Example: **#SMSBND 1,21,80*** Response: **BND=OK** The first band (#1) is set starting at 21 MHz and ending at 80 MHz
SCLD	Clock date setting. Format: **SCLD DD.MM.YY** The response is the same as in the ?CLK command.	Example: **#SMSCLD 12.08.15*** Response:**CLK=11.55.57;12.08.15**
SCLT	Clock time setting. Format: **SCLT HH.MM.SS** The response is the same as in the ?CLK command. NOTE The SCLT command should not be sent by SMS as, being the message delivery time not known, the station clock would not be set as expected. See the SSTS command for clock setting by SMS."	Example: **#SMSCLT 12.13.40*** Response:**CLK=12.13.40;12.08.15**
SCNL	This command enable a deferred call to the number **nnnnnnnn** The call is initiated **d** minutes later. The format is: **#SMSCNL d nnnnnnnn *** where **d** is in minutes between 1 and 9 and **nnnnnnnn** is the remote phone number to be called.	Example: **#SMSCNL 5 5550101*** Response: **CNL=5550101** The station will call that phone number after 5 minutes.
SDIC	This command disables the station's outgoing calls. When disabled the MODEM will power on at time set with the STMS and enters a stand by state, ready for incoming calls or SMS messages. (same response as **?TSM** command).	Example: **#SMSDIC*** Response: **TSM=OFF 14:53 (1q) each 24h** Confirm the station is disabled to call. The modem scheduling is showed too.

Command	Description	Example
SDIE	This command disables the Ethernet port planned activity. If disabled, the LAN port stays permanently off independently from the time schedule set via the STSE command. (same response as **?TSE** command).	Example: **#SMSDIE*** Response: **TSE=OFF 12:00 each 24h** confirming the LAN port is disabled (**OFF**).
SDIG	This command disables the GPS module. If disabled, the GPS stays permanently off to save energy. (same response as **?TSG** command).	Example: **#SMSDIG*** Response: **TSG=OFF 12:00 each 24h** confirming the GPS is disabled (**OFF**).
SDIR	SMS Report send disabling. When disabled the GSM modem will power on at time set with the STMS command and enter a stand by state, ready for incoming call or SMS messages. (same response as **?TSS** command).	Example: **#SMSDIR*** Response: **TSS=OFF 16:15 (2q) each 24h** Confirm the station is disabled to send SMS report. The “schedule for SMS” is showed too.
SDMO	Modem disabling command. This is accepted only in case of Battery Alarm (low voltage). When disabled the GSM modem will power off, until the battery alarm ends. (same response as ?TSM command).	Example: **#SMSDMO*** Response: **TSM=16:15 (1q) each 24h** The **(DIS)** string is not shown at the end of the reply, it means the disabling command has been ignored.
SENC	This command enables the station to call. The time of call shall be set with STSM 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: **#SMSENC*** Response: **TSM=ON 14:53 (1q) each 24h** Confirm the station is enabled (**ON**) to call. The “schedule for modem” is showed too.
SENE	This command enables the Ethernet port to switch on at the planned time. The time of call shall be set with STSE command. The station power on the LAN port and it remains on for 10 minutes. (same response as **?TSE** command).	Example: **#SMSENE*** Response: **TSE=ON 12:00 each 24h** Confirm the LAN port is enabled (**ON**) to be ready at the programmed time.

Command	Description	Example
SENR	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: **#SMSENR*** Response: **TSS=ON 12:00 (2q) each 24h** Confirm the station is enabled to send SMS report. The “schedule for SMS” is showed too.
SETH	This command hangs up the Ethernet communication and switches the LAN port OFF. It is recommended to switch the Ethernet port OFF as soon as it becomes no more necessary. The reply is **ETH=OK**	Example: **#SMSETH*** Response: **ETH=OK** confirming the command has been granted.
SGOI	This command enables immediately the GPS module. It remains on until the first FIX or the timeout (4 minutes). The reply is **GOI=OK**.	Example: **#SMSGOI*** Response: **GOI=OK** confirming the command has been granted.
SGOIF	This command enables immediately the GPS module. It remains on until the firs FIX or the timeout (4 minutes), then it will send a feedback SMS to all the saved phone numbers (SMS list) in NMEA RMC format (NMEA 0183 ver 3.01). The reply is **GOI Feedback=OK**.	Example: **#SMSGOIF*** Response: **GOI Feedback=OK** confirming the command has been granted.
SIDN	Station identifier setting. Max 20 characters. The response is the same as for the ?IDN command. The command format is: **#SMSIDN Station Name*** NOTE The use of this command via SMS, while properly setting the new identifier, could not get an answer. This happens if the length of the response message, including the response to the command recognition password, exceeds the maximum number of characters allowed for SMS.	Example: **#SM SIDN Marconi Inst. 23*** Response: **IDN=Marconi Inst. 23;Nsts,AMS-8061; A.43 08/15;000WX50803; 13/08/2015;OFF 12:05 (4q) each 01h;OFF 16:00 (2q) each 24h;--L-------;**

Command	Description	Example
SMSK	Alarm mask setting. The mask contains mnemonic symbols representing each alarm as in the following table. Symbols can be in each order. **W**= (field)Warning threshold exceeded **A**= (field)Alarm threshold exceeded **w**= (field)Warning threshold re-entered **a**= (field)Alarm threshold re-entered **P**= Device section alarm **p**= Device section alarm re-entered **V**= Low battery alarm **v**= Low battery alarm re-entered **L**= Case open alarm **l**= Case open alarm re-entered **T**= Overtemperature alarm **C**= Relative Humidity alarm **S=** notify alarm through **SMS,** enable **M=** notify alarm through **MODEM,** enable (same response as ?MSK command)	Example: **#SMSMSK AL S*** enables field and case open alarms to be notified by SMS. Response: **MSK= A-L--------- SMS** NOTE **To get a notification of the alarm, also Modem or SMS should be enabled.**
SPSW	New Password setting. Format: **SPSW password** Where password is the alphanumeric string that will be stored and used as password by the Station. At least one blank space is required between the command and the password. If another password was already set in the Station, it is necessary to send the command ?IDN oldpassword before of the SPSW newpassword statement.	Example: **#SMSPSW PASSPMM*** Response: **PSW0=PASSPMM**
SRST	Reset to default configuration. The command restores the main parameters as following: - Alarms are all masked - Scheduled Modem calls disabled - Scheduled SMS sending disabled - Averaging period = 6 minutes - Running average zeroed - Averaging method = RMS - Interval 1: Modem ON at 12:05 for 1 hour every 24 hours - Interval 2: Modem ON at 16:00 for ½ hour every 24 hours The reply is **RST=OK**	Example: **#SMSRST*** Response: **RST=OK** confirming the command has been granted.

Command	Description	Example
SRSTR	Reset to both default configuration and storing rate. Similar to SRST command, in addition to its default settings, resets also the storing rate to 6 minutes.  Pay attention this command invalidates any data already stored in the Station. The reply is **RST RATE=OK**	Example: **#SMSRSTR*** Response: **RST RATE=OK** confirming the command has been granted.
STDM	**Modem** phone number setting. In the following format: **#SMSTDMn 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: **#SMSTDM2 987654321*** Response: **TDM2=987654321**
STDS	**SMS** phone number setting. In the following format: **#SMSTDSn 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: **#SMSTDS2 0000000*** Response:**TDS2=VOID***
STSE	**Ethernet** programmed time setting. In the following format: **#SMSTSE HH.mm.xx.ee*** where: **HH.mm** is the Ethernet port power on time. **xx** on time period (must be 01 fixed, which means 10 minutes). To save energy it is recommended to switch the LAN port off as soon as it is not needed anymore, via the SETH command. **ee** repetition interval in hours (the value can be 12 or 24).	Example: **#SMSTSE 12.10.01.24*** Response: **TSE=ON 12:10 each 24h** the Ethernet port will power everyday on at 12:10, and will stay ready for 10 minutes.

Command	Description	Example
STSM	**Modem** programmed time setting. In the following format: **#SMSTSM HH.mm.xx.ee*** where: **HH.mm** is the MODEM power on time (switched on and in Stand-By). **xx** on time period in quarters of hour (max 24). **ee** repetition interval in hours. xx and ee must always be 2 numerals without spaces, and submultiples of 24. (same response as **?TSM** command).	Example: **#SMSTSM 14.53.01.24*** Response: **TSM=OFF 14:53 (1q) each 24h** the modem will power on at 14:53, will stay on for ¼ of hour and the power on operation will be repeated every day.
STSS	**SMS** programmed time setting. In the following format: **#SM 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. xx and ee must always be 2 numerals without spaces, and submultiples of 24. (same response as **?TSS** command).	Example: **#SMSTSS 12.00.02.24*** Response: **TSS=OFF 12:00 (4q) each 24h*** the modem will power on at 12:00, will stay on for 1 hour and the power on operation will be repeated every day.
SWRNx.x	Warning threshold setting. The parameter xx.x is the threshold value in the format: **#SMSWRN 4.0*** (same response as **?WRN** command)	Example: **#SMSWRN4.0*** Response: **WRN= 4.0 V/m; 6**

4.5 GPRS Connection Data

The following commands and information are related to the adoption of the GPRS and FTP protocol communication.
In the proper chapter of this manual, it is specifically described the syntax, format and protocol for data and settings files.

GPRS Connection Data		
Field	**Description**	**Setting command** Command to be issued by either SMS or RS232
APN Access Point Name	The provider name of the GPRS bearer.	#SMSGPR**0** <apn>* where <apn> is Access Point Name Example: #SMSGPR**0** web.omnitel.it*
GUN User Name for Gprs access	The User Name required for logging-in. Sometimes this field might not be required and thus can be left empty.	#SMSGPR**1** <gun>* where <gun> is the User Name of GPRS access. Example: #SMSGPR**1** MyGPRS*
GPSW Password for Gprs access	The Password required for logging-in. Sometimes this field might not be required and thus can be left empty.	#SMSGPR**2** <gpsw>* where <gpsw> is the Password of GPRS access. Example: #SMSGPR**2** 1234*

4.6 FTP Connection Data The following commands are specific for FTP protocol communication.

FTP Connection Data		
Field	**Description**	**Setting command** Command to be issued by either SMS or RS232
FUN User Name for FTP access	The User Name required for accessing to the FTP server. This word is usually issued from the FTP administrator and is nothing to do with the bearer.	#SMSGPR**3** <fun>* where <fun> is the User Name for FTP. Example: #SMSGPR**3** MyFTP*
FPSW Password for FTP access	The Password required for accessing to the FTP server. This word is usually issued from the FTP administrator and is nothing to do with the bearer.	#SMSGPR**4** <fpsw>* where < fpsw > is the Password for FTP. Example: #SMSGPR**4** abcd*
FIP FTP IP Address	This parameter is the server address for FTP (IP Address of FTP). Normally this is the static IP Address that routes the file transferring process to the wanted server	#SMSGPR**5** <fip>* where < fip > is the IP Address for FTP. Example: #SMSGPR**5** 194.183.2.17*
CGN Connect GPRS Now	This command starts a GPRS connection immediately. All the procedures are then the same as it would for a scheduled connection. a	#SMSCGN*
CGNL Connect GPRS Now (Last Events)	This command starts a GPRS connection immediately as for CGN but it forces to have a EVENT.TXT file containing the last 20 events instead of the most recent and unloaded ones .	#SMSCGNL*
CGNA Connect GPRS Now (All Events)	This command starts a GPRS connection immediately as for CGN but it forces to have a EVENT.TXT file containing all the events available instead of the most recent and unloaded ones .	#SMSCGNA*
NETE Enable GPRS protocol	This command enables the AMB8061 to connect via GPRS instead of point-to-point GSM-MODEM connection. The reply is the same as for command ?TSM	#SMSNETE*
NETD Disable GPRS protocol	This command disables the AMB8061 GPRS and enables point-to-point GSM-MODEM connection. The reply is the same as for command ?TSM	#SMSNETD*

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5 – Packaging Instructions

5.1 Introduction

This section provides the information useful for a correct packaging in case the unit has to be returned for service to the factory or whenever you need to prepare the AMS-8061 unit for shipment.

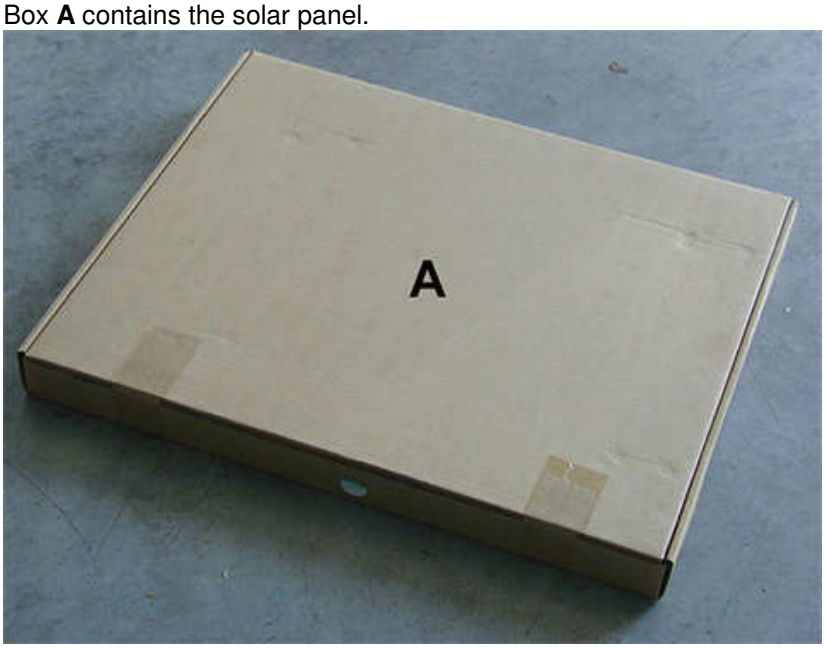
The station should be disassembled stepping back the installation procedure included in section 2.

The unit includes parts that are sensitive to mechanical shocks as well as heavy ones like the power pack. It is therefore suggested to follow carefully the packing instructions to avoid damages due to the shipment.

The following instruction provide several picture useful to identify the various boxes of the original packaging and their use.

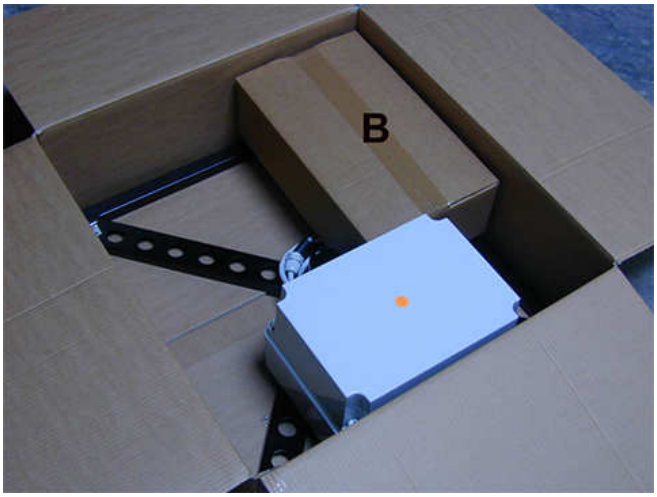
5.2 Packaging instructions

Box **A** contains the solar panel.



Box **B** contains accessories

Box **C** inside view

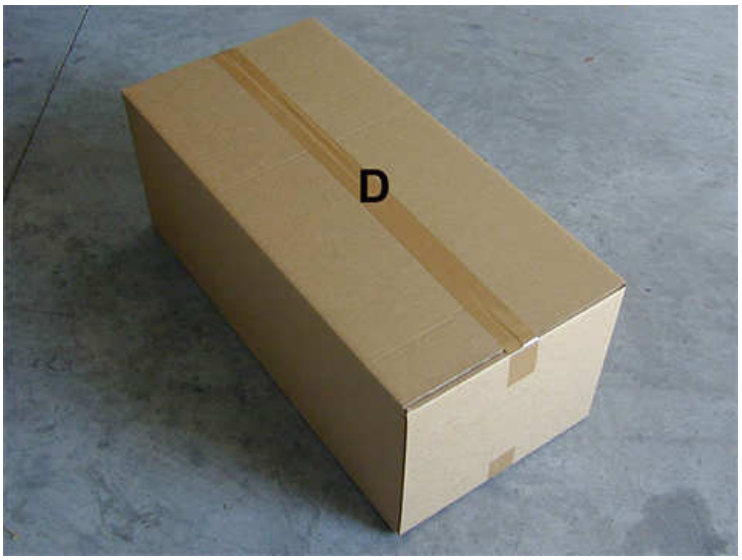


Box **C** contains power pack and **box B**

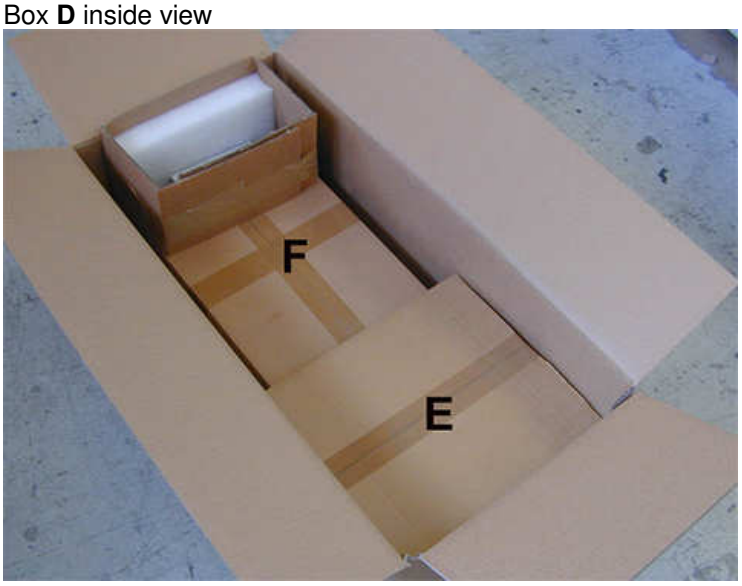
Box **F** contains the receiver unit

Box **E** contains antenna

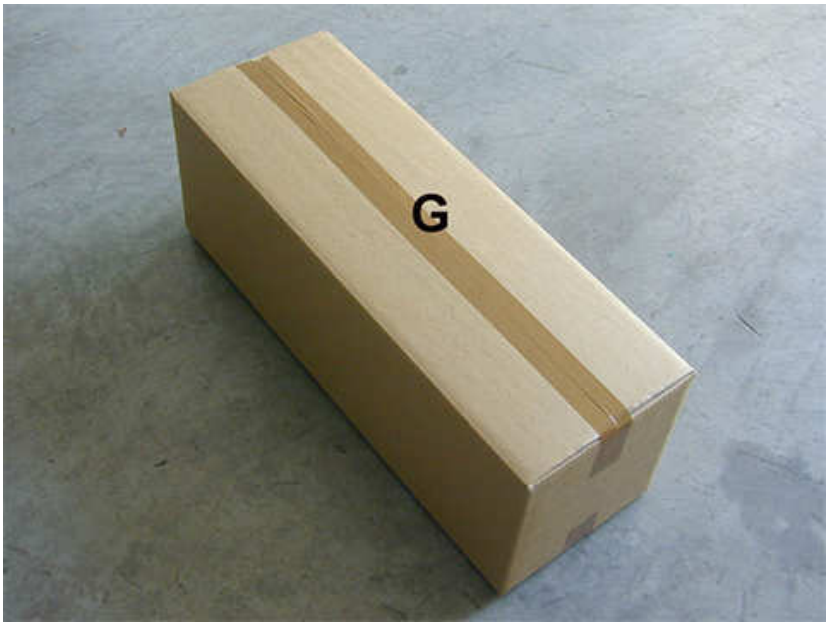
Box **D** contains box **F** and box **E**



Box **D** inside view



Box **G** contains radome



Box **H (main box)**

Insert **Box C** in the **Box H**

Insert **Box D** in the **Box H.**

Insert **Box G** in the **Box H.**

Insert **Box A** in the **Box H**

Box H (Main)

Use pallet and straps for the final packing.

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6 – Action of the wind on the AMS-8061

6.1 Introduction

This section provides the information necessary to install and use the Area Monitor Selective AMS-8061 in the presence of wind.

The Field Monitor is usually installed outdoors where the strong winds can endanger its stability that depends on the weight and eventual ballast bags or nylon wind strays.

WARNING

It is necessary to add the ballast bags with their full weight, and fasten nylon wind strays in case of installation in windy places.

Fig. 6-1 AMS-8061 Field Monitoring System

6.2 AMS-8061

Table 6-1 Wind resistance of the AMS-8061

Wind speed [km/h]	Wind speed [m/s]	Aerodynamic form	Air density [N/mc]	Wind pressure [N/m^2]	Overturning moment [Nm]	Stabilizing moment [Nm]	Weight ballast [N]	NOTE
3,60	1,00	1,20	1,25	0,75	0,32	0,49	-610,62	Ballast bags not necessary
7,20	2,00	1,20	1,25	3,00	1,30	1,95	-603,32	
10,80	3,00	1,20	1,25	6,75	2,92	4,38	-591,16	
14,40	4,00	1,20	1,25	12,00	5,19	7,78	-574,13	
18,00	5,00	1,20	1,25	18,75	8,11	12,16	-552,23	
21,60	6,00	1,20	1,25	27,00	11,68	17,51	-525,48	
25,20	7,00	1,20	1,25	36,75	15,89	23,84	-493,85	
28,80	8,00	1,20	1,25	48,00	20,76	31,14	-457,36	
32,40	9,00	1,20	1,25	60,75	26,27	39,41	-416,01	
36,00	10,00	1,20	1,25	75,00	32,44	48,65	-369,79	
39,60	11,00	1,20	1,25	90,75	39,25	58,87	-318,70	
43,20	12,00	1,20	1,25	108,00	46,71	70,06	-262,75	
46,80	13,00	1,20	1,25	126,75	54,82	82,22	-201,94	
50,40	14,00	1,20	1,25	147,00	63,57	95,36	-136,25	
54,00	15,00	1,20	1,25	168,75	72,98	109,47	-65,71	
57,60	16,00	1,20	1,25	192,00	83,03	124,55	9,70	Ballast bags filled with water
61,20	17,00	1,20	1,25	216,75	93,74	140,61	89,98	
64,80	18,00	1,20	1,25	243,00	105,09	157,63	175,12	
68,40	19,00	1,20	1,25	270,75	117,09	175,64	265,13	
72,00	20,00	1,20	1,25	300,00	129,74	194,61	360,00	
75,60	21,00	1,20	1,25	330,75	143,04	214,56	459,74	Ballast bags filled with sand
79,20	22,00	1,20	1,25	363,00	156,99	235,48	564,34	
82,80	23,00	1,20	1,25	396,75	171,58	257,37	673,81	
86,40	24,00	1,20	1,25	432,00	186,83	280,24	788,14	Fastening the nylon wind strays
90,00	25,00	1,20	1,25	468,75	202,72	304,08	907,34	
93,60	26,00	1,20	1,25	507,00	219,26	328,89	1031,41	
97,20	27,00	1,20	1,25	546,75	236,45	354,68	1160,34	
100,80	28,00	1,20	1,25	588,00	254,29	381,44	1294,13	
104,40	29,00	1,20	1,25	630,75	272,78	409,17	1432,79	
108,00	30,00	1,20	1,25	675,00	291,92	437,87	1576,32	
111,60	31,00	1,20	1,25	720,75	311,70	467,55	1724,71	
115,20	32,00	1,20	1,25	768,00	332,14	498,20	1877,96	
118,80	33,00	1,20	1,25	816,75	353,22	529,83	2036,08	
122,40	34,00	1,20	1,25	867,00	374,95	562,42	2199,07	
126,00	35,00	1,20	1,25	918,75	397,33	595,99	2366,92	
129,60	36,00	1,20	1,25	972,00	420,36	630,54	2539,64	
133,20	37,00	1,20	1,25	1026,75	444,04	666,05	2717,22	
136,80	38,00	1,20	1,25	1083,00	468,36	702,54	2899,67	
140,40	39,00	1,20	1,25	1140,75	493,34	740,01	3086,98	
144,00	40,00	1,20	1,25	1200,00	518,96	778,44	3279,16	
147,60	41,00	1,20	1,25	1260,75	545,23	817,85	3476,20	
151,20	42,00	1,20	1,25	1323,00	572,15	858,23	3678,11	

WEIGHT BALLAST VARIATION IN COMPARISON TO THE WIND SPEED

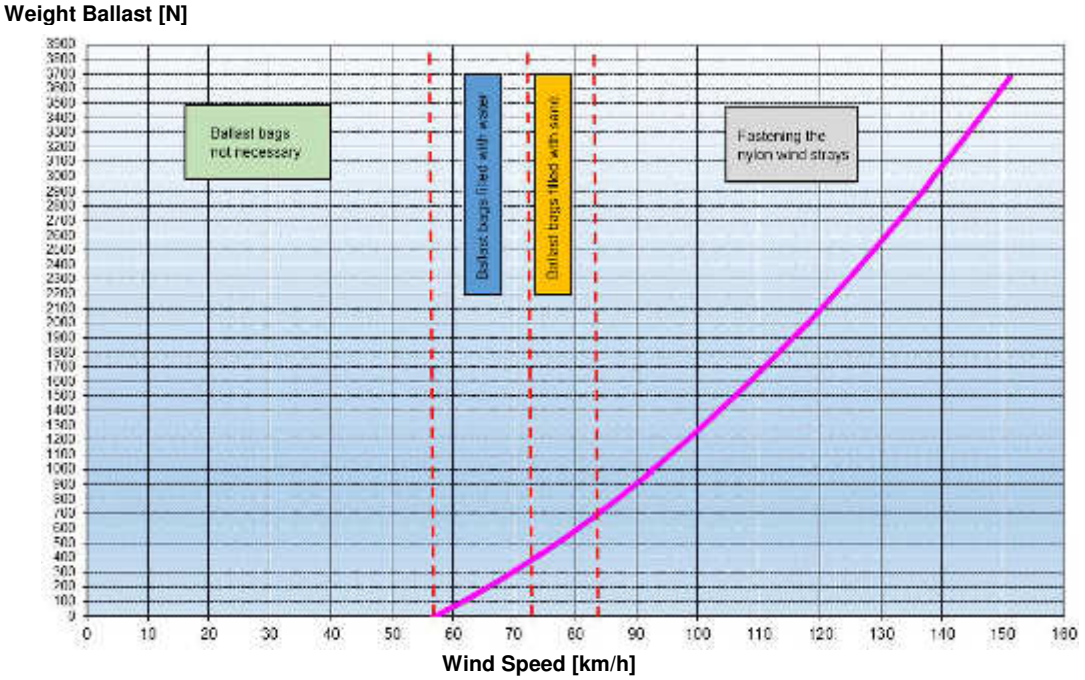

Fig. 6-2 Weight Ballast variation in comparison to the wind speed for AMS-8061

For wind speed below 15 m/s (corresponding to about 54 km/h) the stability is ensured by the weight of the apparatus self and therefore it is not required ballast bags.

The weight of ballast bags filled with water can be maximum 390 N; the maximum wind speed that does not cause the overturning of the AMS-8061 is 20 m/s (corresponding to about 72 km/h).

The weight of ballast bags filled with sand can be maximum 720 N; the maximum wind speed that does not cause the overturning of the AMS-8061 is 23 m/s (corresponding to about 83 km/h).

The AMS-8061 must be firmly fasten by nylon wind strays for wind speed above 23 m/s.

WIND SPEED [km/h]	WIND SPEED [m/s]	TYPE OF BALLAST
<54 km/h	<15 m/s	Ballast bags not necessary
54-72 km/h	15-20 m/s	Ballast bags filled with water
72-83 km/h	20-23 m/s	Ballast bags filled with sand
>83 km/h	>23 m/s	Fastening the nylon wind strays

WARNING

It is necessary to calculate the speed and pressure of the wind in the place of installation; through the table 6-1 it is possible to determine if it is necessary to use the ballast bags with their full weight or to fasten the nylon wind strays.

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7 – Instructions for use of the 8061SW-02 control software

7.1 Introduction

This Chapter provides a guide for the installation and use of the data acquisition and control software 8061-SW02.
It also explains the functions available and the configuration details.

AMS-8061 can be connected to the PC via USB, RS232 and Ethernet ports.

AMS-8061, that is equipped with a GSM/GPRS modem, provide additional remote communication modes like SMS (see chapter 4), GPRS/FTP (see chapter 3) and CSD.

CSD is a dial-up, point to point, remote data communication and require that the SIM card installed in the area monitor modem, as well as the one installed in the PC modem (if GSM), are specifically enabled for CSD communication mode.
8061SW-02 shows two main sections: CSD and FTP.
The CSD section provides functionalities for the local RS232, USB and Ethernet communication too.

The procedure for the correct use of the AMS-8061 system is the following:

- Install the software on the PC that will be used to control the AMS-8061 system;
- Check the internet line or, if the CSD communication mode is desired, connect an external line or GSM modem if the PC internal one will not be used and make sure the software drives the proper serial port to which the modem is connected;
- Click twice on the 8061-SW02 icon to run the software;
- Enter the **Terminal** PASSWORD for management of Field Monitor;
- Enter the **Setting** PASSWORD that is needed to edit the acquisition parameters of the Field Monitor. This operation can also be done later;
- Add the ID's of unit (**name** of the unit **and phone number** of the SIM card installed into the unit) in the list of Field Monitoring Stations which will be managed by the PC;
- Make the first connection via CSD communication mode(remote via modem or local through RS232 or USB cable), Call the desired station by pressing **CALL;**
- Set the correct Date and Time;
- If the GPRS communication is to be used, set the proper parameters;
- Change the monitoring parameters, if required, after typing the SETTING PASSWORD;
- Press **Hang&Exit** to end the connection;

Using a GSM Modem make sure the PIN code of the SIM card in use has been removed.

The 8061-SW02 software is a control program fully integrated into the System for Distributed Frequency Selective Monitoring of Electromagnetic Field AMS-8061.
It allows accessing all the remote Field Monitor stations for the remote setting and downloading of acquired data that are then shown in graph or table form. 8061-SW02 can be used for saving and printing measured field data and Field Monitor station configuration parameters. Data transfer can be controlled by the Internet (FTP protocol), line or GSM modem, Serial or Ethernet or USB port of the controller PC.
The software is based on the Windows™ operating system.
The software features the following basic functions:

- Querying and monitoring all the Field Monitors installed;
- Programming different AMS-8061 Field Monitors individually with different acquisition modes;
- Querying the Field Monitors at given times;
- Communicating via Internet (FTP), line/GSM modem, RS232, Ethernet or USB;
- Protecting accesses with different keys at different querying levels;
- Controlling and verifying the reliability of the data recorded;
- Protecting the data recorded;
- Acquisition and display of fields detected, the average and peak values;
- Saving and manipulating all the downloaded readings;
- Saving graphs and tables representing all the measured data;
- Downloading data with automatic generation of a text file .TXT to be used for easy data exchange with any “Office” applications;

7.2 Hardware requirements

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

- Processor: Pentium or equivalent;
- 256 MB RAM;
- At least 100 MB of free space on hard disk;
- Minimum display resolution 1024x768 (the Windows™ default screen appearance setting is recommended. Depending on the operating system in use, some customized screen appearance could cause abnormal displaying of the control software);
- 1 free USB or RS232 or Ethernet port;
- GSM or line modem (for CSD data communication);
- Full internet access allowed for FTP (for GPRS communication);
- Windows Operating system™ XP/Vista/Win7/Win8

The modem, if used, can be either internal or external or GSM. It must support the data transmission protocol.

If a GSM modem with SIM Card is used, it must allow to receive and transmit data, not only on fixed phone numbers but also to and from cellular phones. GSM 9600b/s C.S.D. data communication mode is required, check with the Telephone Service Provider to make sure this additional service is available.

For proper installation of the modem refer to the instructions of modem manufacturer.

The updated AMS-8061 firmware and software is available for downloading on the internet web site www.narda-sts.it or directly from the commercial offices of NARDA.

The User should have administrator privileges to install and run the software in environments such as Windows Vista, 7, 8.

When choosing the GPRS communication, an Internet FTP Server must also be available.

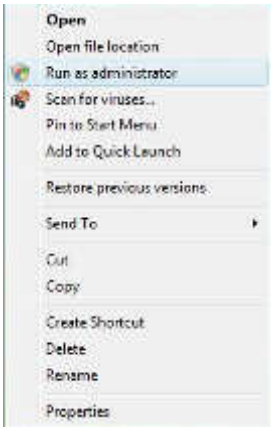
7.3 Installation of the software

8061-SW02 control software shall be installed on the PC using the installation disk supplied with the 8061 System.
The installation procedure is as follows:

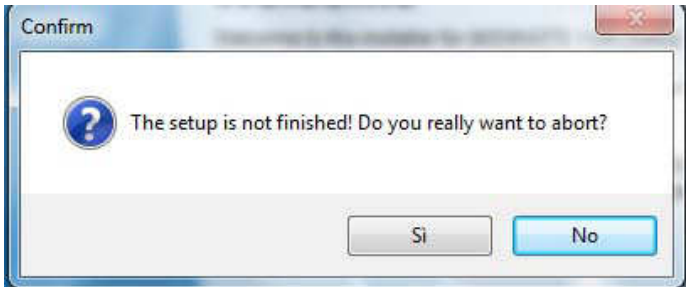
- start the PC with the Windows™ operating system;
- insert the 8061-SW02 disk in the disk drive;
- Run the application “Setup8061SW02.exe”.

NOTE

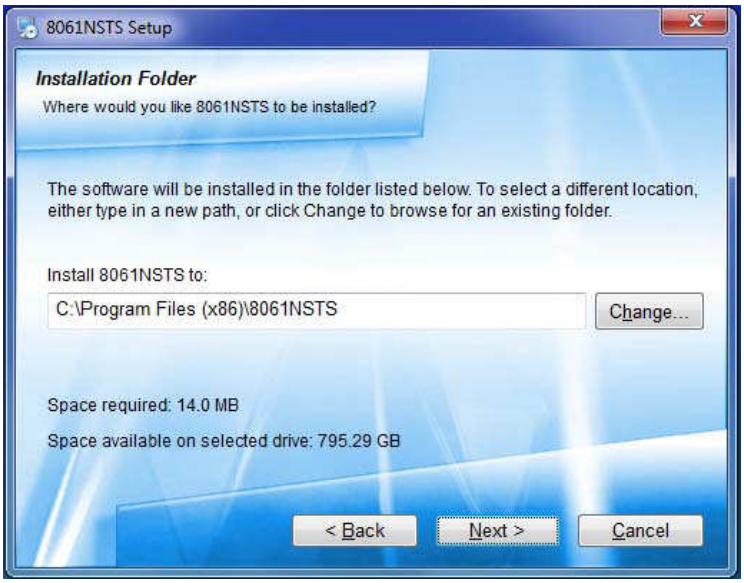
The User must have administrator privileges to install the 8061SW-02 software in Windows 7; right click on the program .exe file and click on “Run as administrator” to temporarily run the program or application as an administrator until close it (Windows 7 also allows to mark an application so that it always runs with administrator rights).



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



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



NOTE

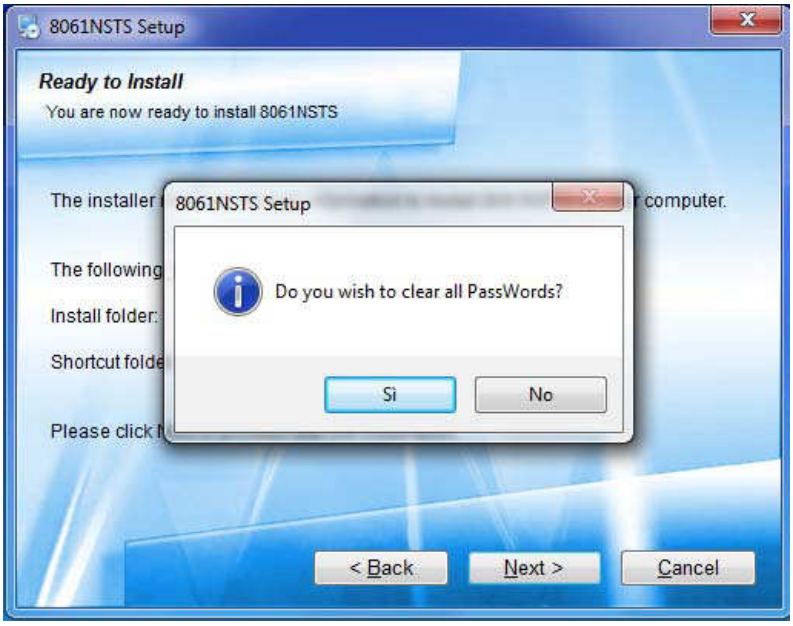
Click **OK** to confirm the directory**.** You can also type a different name**; in Windows 7 the maximum number of characters for the name is 24** (**including spaces**)**; a message will appear in case of error.**

NOTE

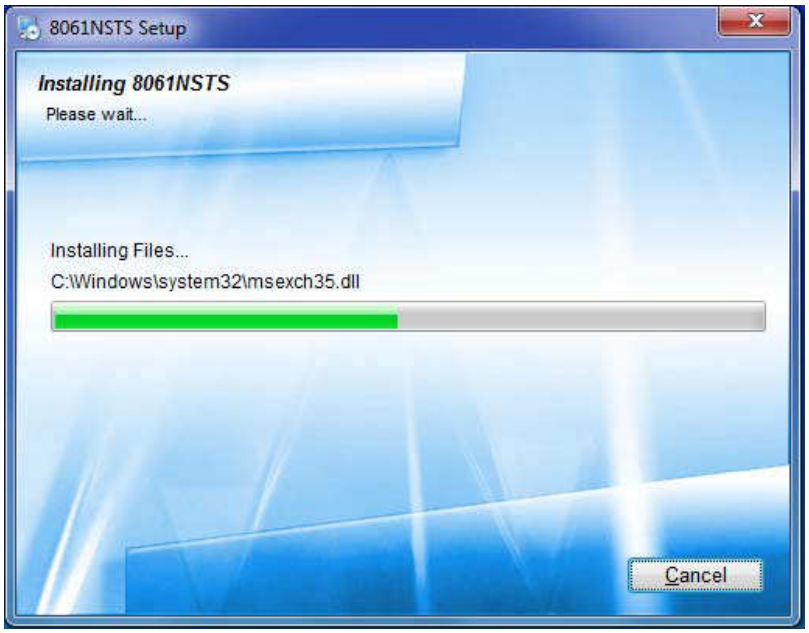
The same procedure will be followed for any future software upgrade. If you select a different folder, be sure to select the same one when installing future upgrades.

Click **Next** to proceed installing.

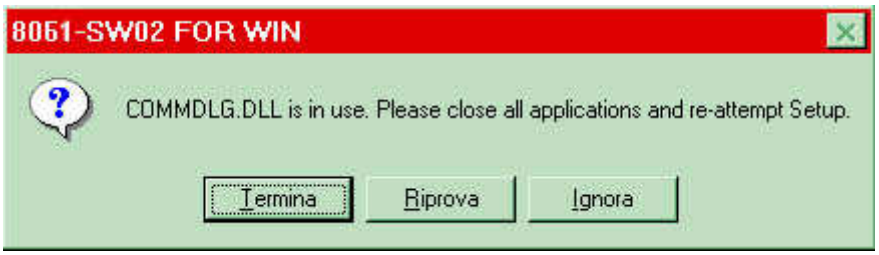
During the installation process the software will ask the User if he wants to cancel all the existing Passwords.
If the answer is **YES,** all the stations and measurements already saved will be hidden, but still accessible by adding all the stations used and maintaining the original name (respecting upper and lower case letters) and phone number.
With this procedure, all hidden stations are made accessible to the User.
Answering **NO**, all the stations, telephone numbers and the respective Device Passwords will be immediately visible to the User.



The installing status is displayed then:



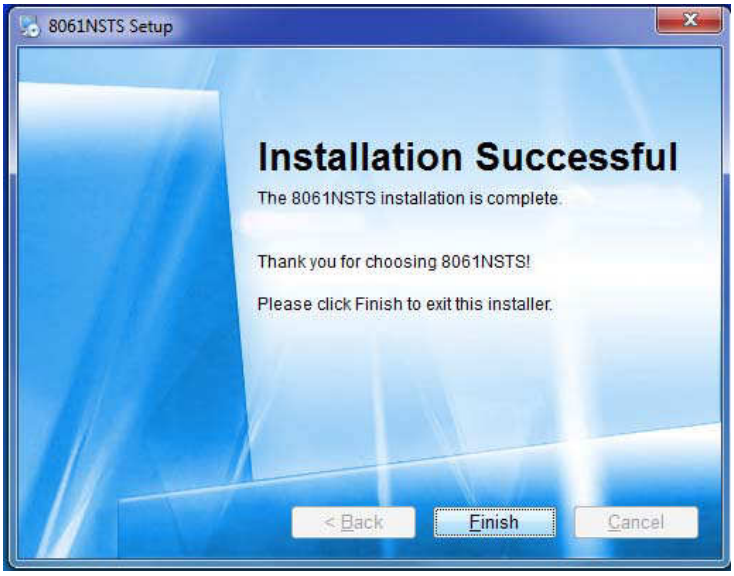
The installation program needs certain system files to function properly. If these files already exist or are used by the system, it may happen the following message appears:



In this case select **Ignore** and proceed with the installation in order to keep the files existing in the system.

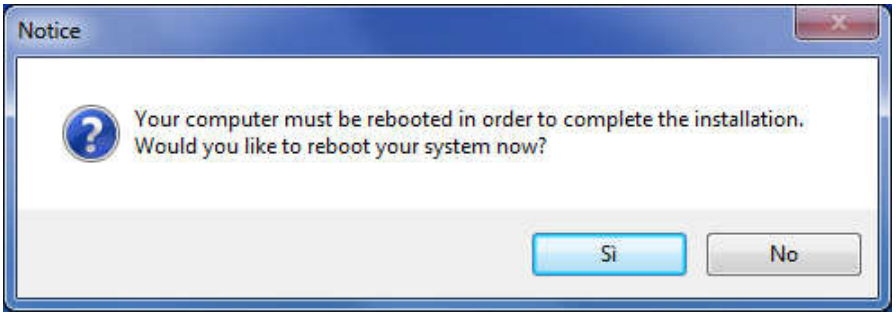
Click **Finish** to complete and exit the installer.

The folder **8061NSTS** is created under **Programs** with the icon **8061SW-02** on desktop.




8061SW02

When asked for, reboot your system to complete installation



8061SW-02 software is now installed in your PC, you can remove it, if needed, simply running the **Uninstall 8061NSTS** application (see §3.22).

7.4 Starting the program

Click twice on the 8061-SW02 icon to start the software. First, a window appears displaying the software release, the presence and the status of the modem, the selected COM port.

NOTE

The first connection may take place either via GSM modem (if available, depending on station model) or via direct RS232 or USB connection. The direct connection is much faster; therefore, it is advisable to make the first connection in this way even if the subsequent operations will be done via GSM modem. For more details, see chapter 2.

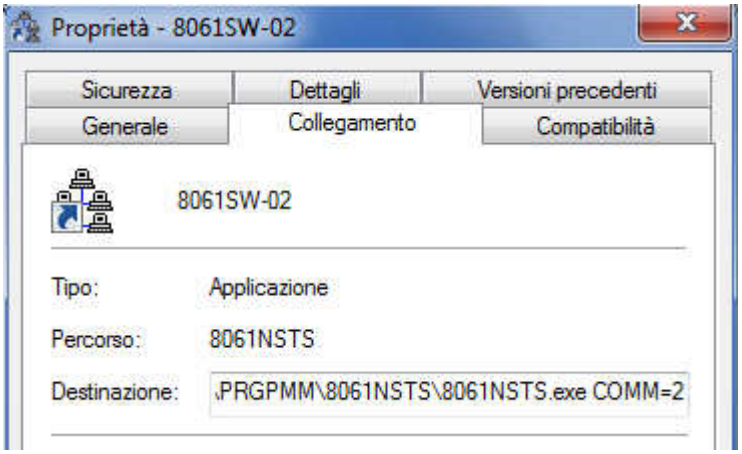
7.4.1 Assigning the serial port

After startup, the program normally searches the modem to be used to communicate with the Field Monitor on the first available COM port.
If your modem (or serial cable in case of local connection) is connected to a different one, the COM port number must be assigned using the following procedure:

- Select the icon **8061-SW02** with the right mouse button;
- Select **Properties**;
- Add the command **COMM=N** preceded by a space (in capital letters) at the end of the Destination field where N indicates the serial port to be used; for example, if the 8061 or Modem is connected to port 2, add the command COMM=2.

NOTE

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



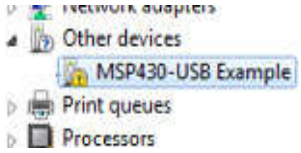
NOTE

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

- Then confirm by selecting **Apply**

7.4.1.1 Virtual COM port installation

All AMS-8061 models can be connect to the PC via USB.
When connecting the AMS-8061 to the PC USB port for the first time, a message informing that new hardware has been found will be shown.
Enter in **Peripheral management** (**Start** > **Control Panel** > **Device Manager).** In **Other Devices** will be shown the device **MSP430 – USB Example** with a yellow exclamation point next to it.

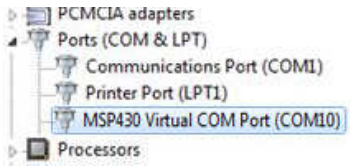


MSP430 Virtual COM Port requires a driver program to be installed in the system. The 8061SW-02 installation folder includes the file requested for the driver installation.

To install the MSP430 Virtual COM Port select the device **MSP430 – USB Example** with the right mouse button, click **Upgrade driver software** and **Browse my computer for driver software**.
Select **Browse,** locate the folder where is stored the file **MSP430_CDC.inf**, select **Next** and allow Windows to install the driver program.

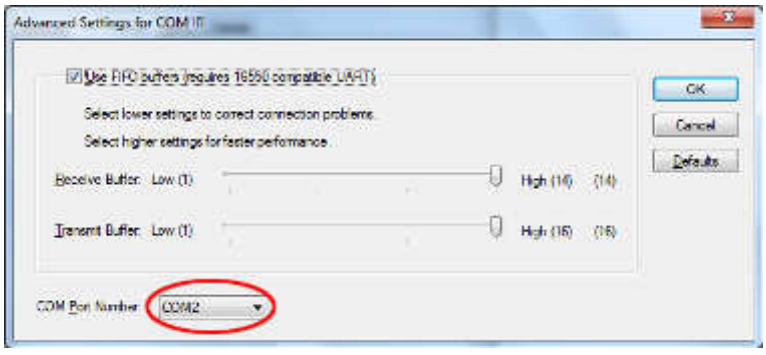
NOTE

After having installed the MSP430 Virtual COM Port successfully, make sure the assigned COM port nr. is comprised between 1 and 9.
In **Peripheral management,** the assigned COM can be found in **Ports (COM & LPT) – MSP430 Virtual COM Port (COMx)**.
COMx shows the COM port assigned to the device.



NOTE

If the device is set for a COM port nr. Not comprised between 1 and 9, double click the line **MSP430 Virtual COM Port (COMx),** enter in **Port settings** and **Advanced.**
In **Advanced Settings** select the COM port and click **OK** to confirm.



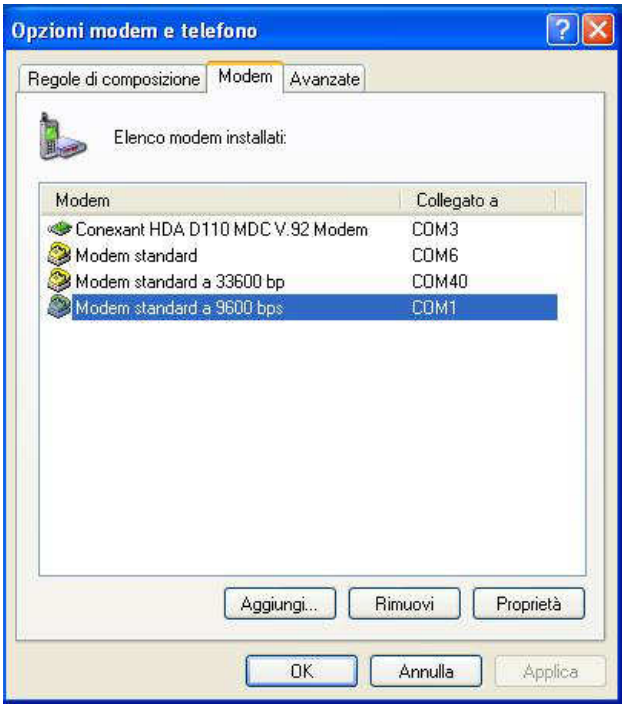
NOTE

The serial port selected must correspond to the value of COMM=N on the Destination line of the icon properties of the software 8061SW-02.
In the example shown above, for the MSP430 Virtual COM Port write COMM=2 (in capital letters).

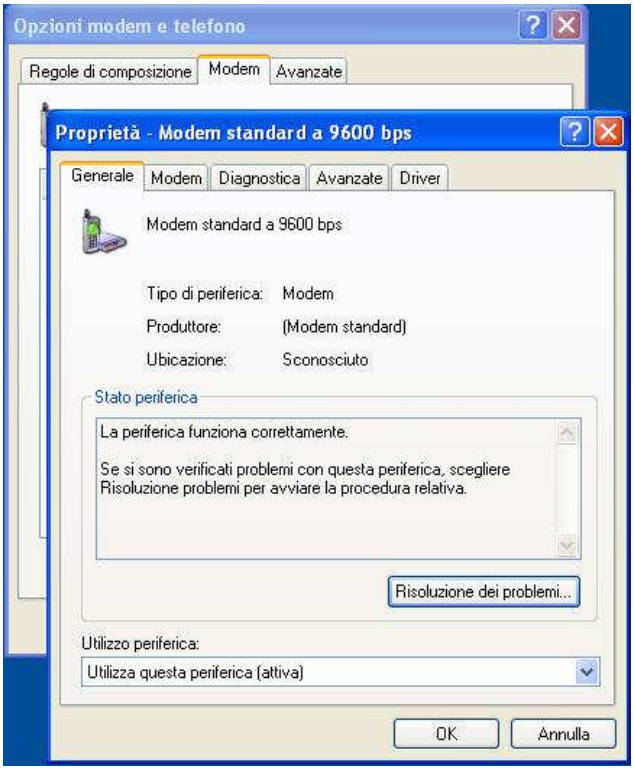
7.4.2 Checking for the modem

If there is any doubt about the presence of the modem or its working conditions, proceed as follows using the Windows commands (the procedure may differ slightly depending on the operating system used):

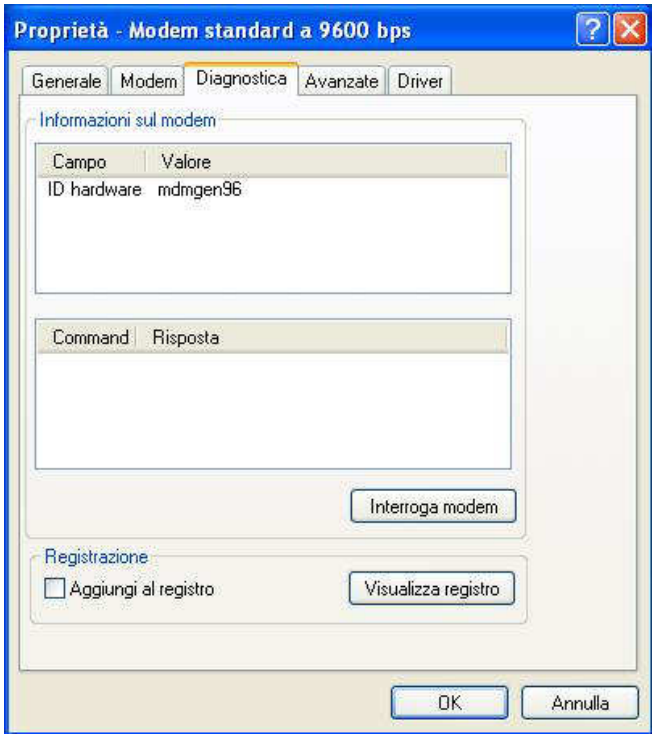
- on the **Start** icon, access the system settings and select **Control Panel**;
- on **Control Panel**, click twice on the icon relative to the **MODEM** options. That will open a window with the list of the modems installed;

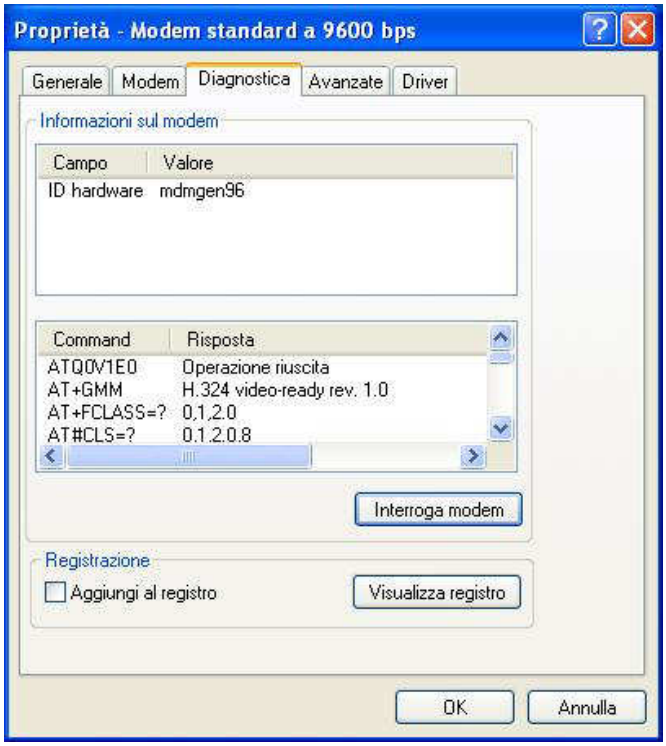


- Select the modem you are going to use and click “properties” to display details;



- The diagnostic section allows to test the modem:





NOTE

The serial port selected must correspond to the value of COMM=N on the Destination line of the icon properties of the software.
In the example shown above, for the modem "Standard a 9600 bps" write COMM=2 (in capital letters).

Preferably, the modem should be connected to a direct phone line (the same connection used for a fax machine). Sometimes, if there is a switchboard system, it may only be possible to place outgoing calls but not to receive incoming calls (where an extension may be needed, etc.). Contact your switchboard operator for guidance.
It is possible to connect a GSM modem. Check which port has been assigned to the modem in the control panel.
Type this number **N** in the command string **COMM=N**

If the internal modem/fax - specially in case of Notebook PC – is set as printer "Fax" allowing to send and receive fax directly from Windows applications, it may happens that the serial port on which the modem is installed appears busy and so not available for the program.

In such case from the control panel select the folder related to the printers and fax and, right clicking the printer "Fax", select "Properties". Open the folder "Peripherals" and, choosing "Properties", disable the internal modem for fax transmitting and receiving.
Remember to re-enable the modified settings in the case the internal modem should be used to receive and send fax.

- To use the CSD remote communication, the baud rate of the Modem must be set to 115200.

- Remove the PIN CODE on the SIM card and be sure that on the monitoring site the signal of the selected GSM provider is strong enough to allow operations.

- Be sure that the tray for the SIM card is locked inside its slot

- Make sure all cables are well connected to the Modem.

- Make sure the serial port corresponds to the value of COMM=N on the Destination line of the icon properties of the software 8061SW-02.

- Send some command by means of any Terminal program or similar applications to make sure the modem is working properly.

NOTE

The User must have administrator privileges to run the 8061SW-02 software in Windows 7; right click on the program .exe file and click on "Run as administrator" to temporarily run the program or application as an administrator until close it (Windows 7 also allows to mark an application so that it always runs with administrator rights).

Click twice on the 8061SW-02 icon to start the software. First a window appears displaying the software release, the port COM assigned and, if the previous time 8061SW-02 was closed from the CSD section, the presence and the status of the modem will be checked .

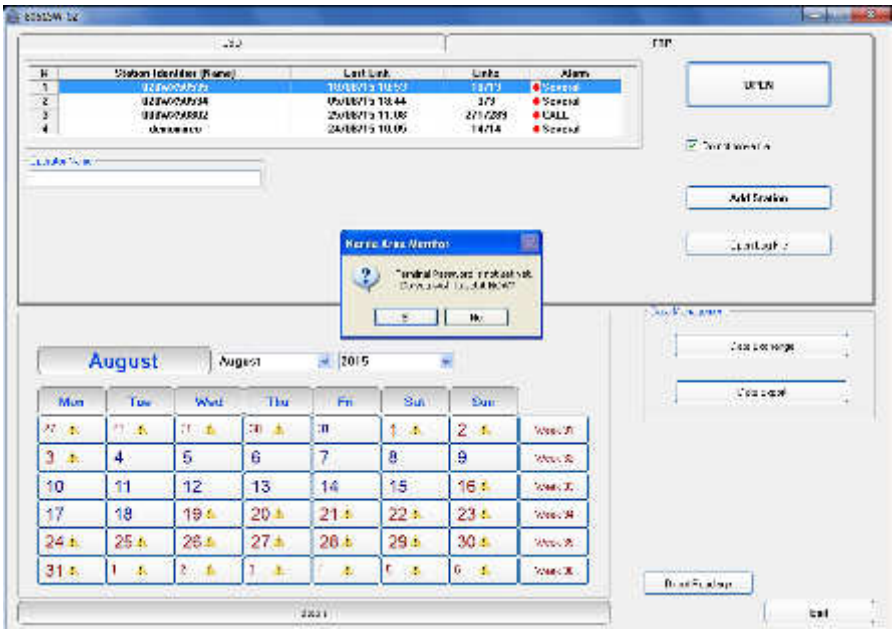
NOTE

In case the software does not detect any modem, the message MODEM NOT FELT will be displayed at the startup.

In case a modem is detected, the message **MODEM OK** will appear.

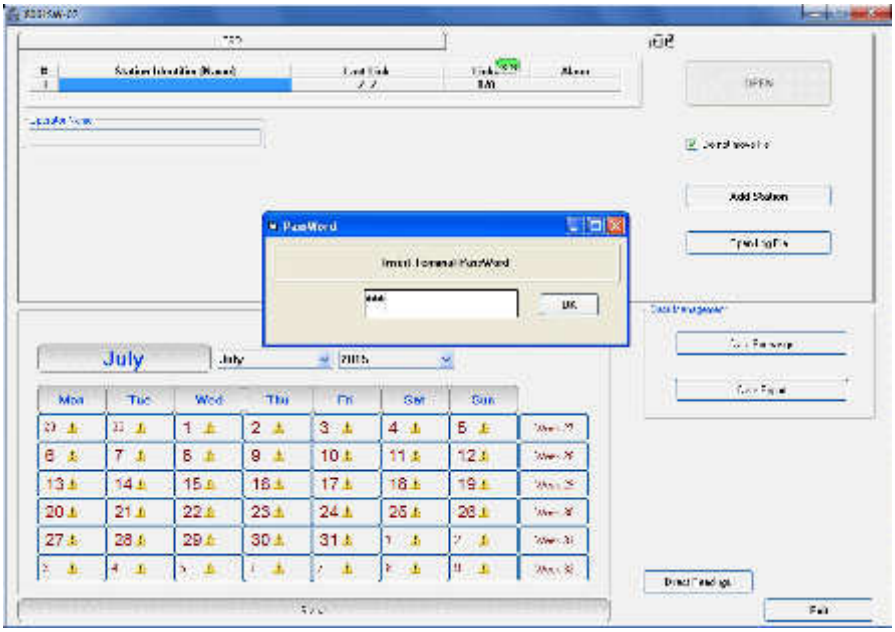
7.4.3 Entering the Terminal PASSWORD

Before to access any software functions, the User is requested to enter a **Terminal PASSWORD** to prevent the improper use of the software by non admitted personnel. The screen looks like this:



NOTE

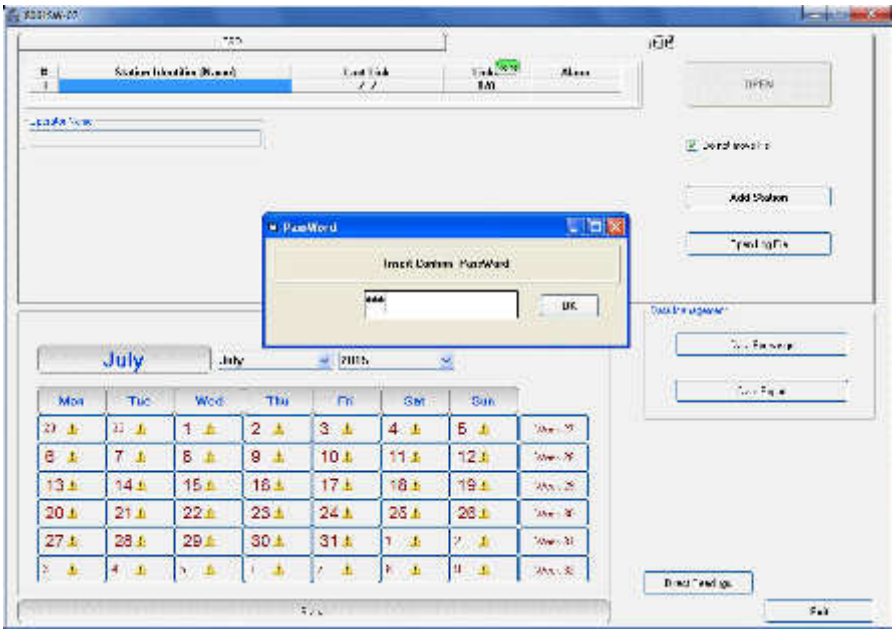
If the answer is YES, a window will be opened where it is possible to enter the Terminal PASSWORD for the management of the Field Monitors. If the answer is NO, the program will allow to enter the password later. If the answer is YES, the screen looks like this:



NOTE

The User can enter any sequence of alphanumerical characters.
We recommend to take a note of the Terminal PASSWORD entered.
It will be necessary to install the control software again in the case the password is missing.

After entering the **Password** with **OK**, the software will request confirmation of the password before registering it into the system.
The next screen will therefore look like this:



At this point, type the same **Password** again. In case of any mistake, the software will display the following message:

After the answer **YES** it is possible to re-enter the correct password; answering **NO** the procedure for the assignment of a new password starts over again.

7.4.4 Changing a Password

If it is necessary to change the Terminal Password, just press function key F10. The software displays the message:

If the answer is **YES**, first enter the old **Terminal Password,** then enter the new one. If a wrong old **Terminal Password** is entered, the following message pops up:

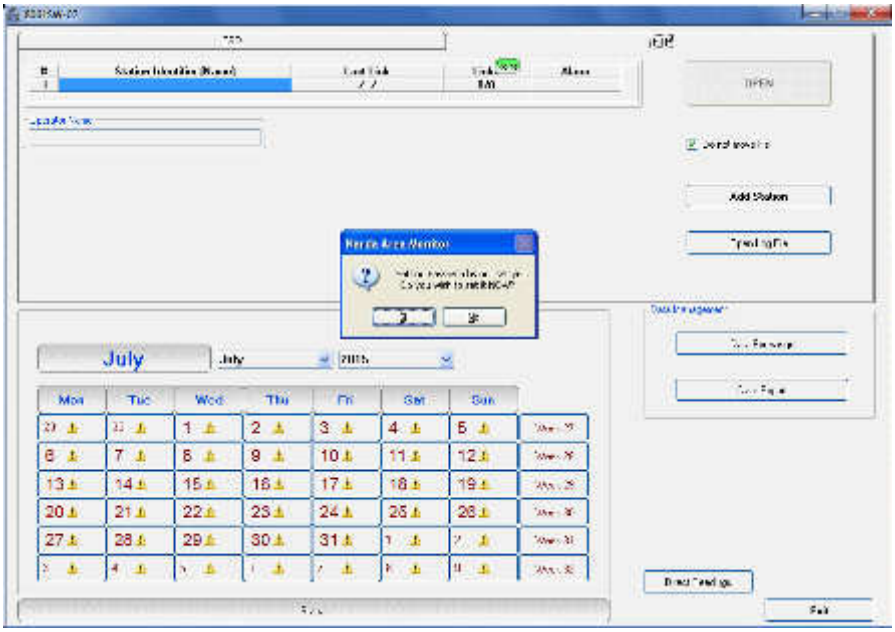
Press OK and try again.

NOTE

Remember that it will be necessary to reinstall the software in case the password is missing.

7.4.5 Entering the Setting PASSWORD

After entering the **Terminal Password** needed to ensure the secure management of the Field Monitors (Station identifier, telephone number, automatic downloads, automatic text file creation…), the software asks to enter a **Setting PASSWORD** which is needed to edit the parameter settings on the Field Monitors to be queried (alarm settings, storing rate, frequency bands, firmware upgrading…). The **Setting Password** screen looks like this:



If the answer is **YES**, the User will be asked to enter and confirm a new **Password** (which may be different from the Terminal Password).
If the answer is **NO,** it is also possible to enter this Setting Password later on, at the time of the first call to the Field Monitor.

NOTE

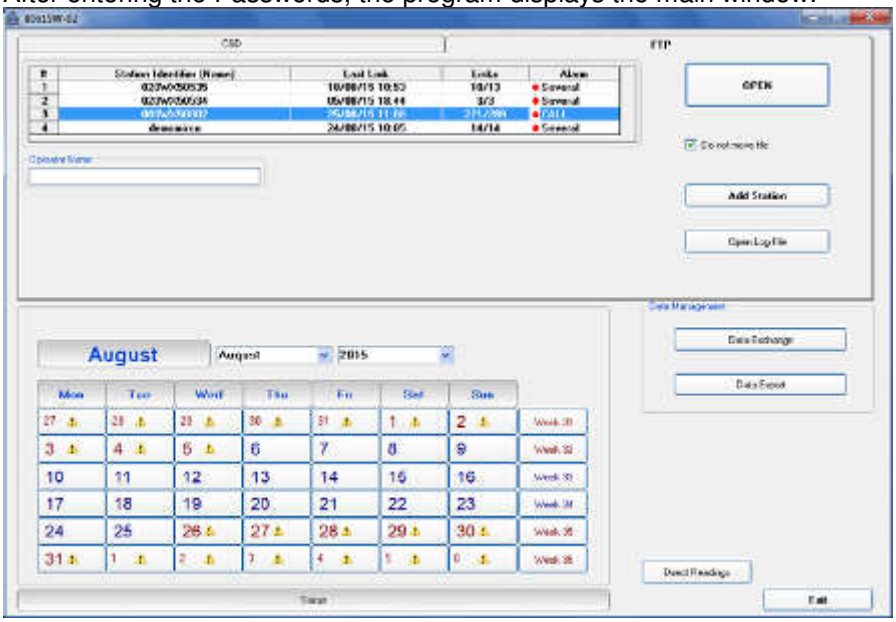
Always take a note of the Setting Password entered.

NOTE

The User can enter any sequence of alphanumerical characters; any special characters are not allowed.
Avoid using null passwords: “”

7.4.6 Main window

After entering the Passwords, the program displays the main window:



The communication between the remote station and the PC can be carried out in CSD and in FTP modes.

7.5 CSD mode

CSD is a dial-up, point to point, remote data communication and require that the SIM card installed in the area monitor modem, as well as the one installed in the PC modem (if GSM), are specifically enabled for CSD communication mode.

The CSD connection is available via Modem (wireless), and (wired) RS232, USB and Ethernet ports.

The first connection may take place either via GSM modem or via direct RS232, Ethernet or USB connection. The direct connection is much faster; therefore, it is advisable to make the first connection in this way even if the subsequent operations will be done via GSM modem. For more details, see chapter 2.

Remote communication in CSD mode is protected by a "Device Password" that is stored in every AMS-8061 Area Monitor.
The same password must be set, by the user, in the CSD station list provided by the control software.
Remote communication in CSD mode is not allowed in case the two passwords do not match.
Device passwords are not checked during local RS232 or USB or Ethernet communication.
All the monitoring stations are initialized in the factory with the password "PASSPMM" that is advisable to replace during the first connection.

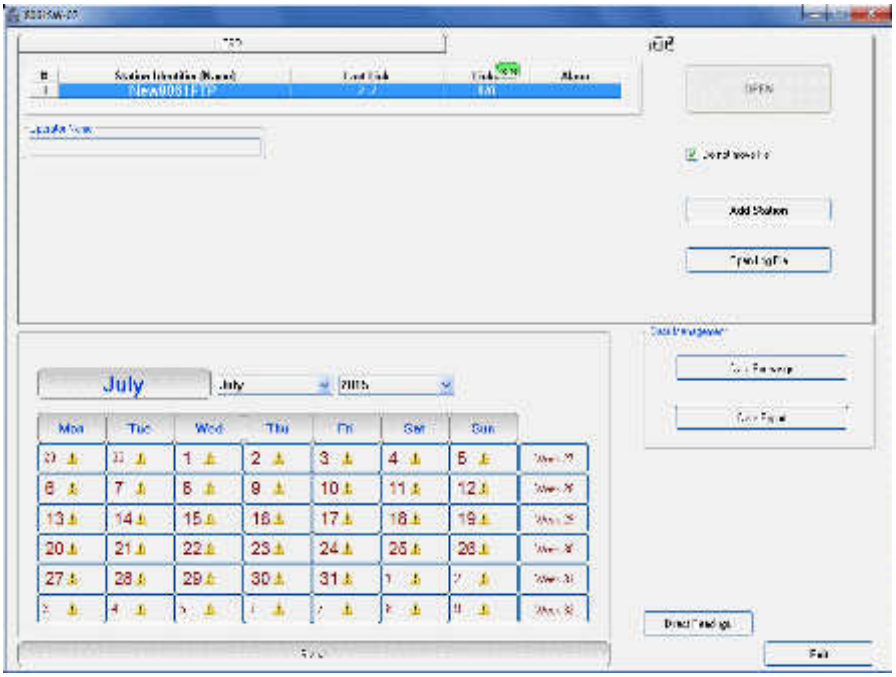
Using a GSM Modem make sure the PIN code of the SIM card in use has been removed.

For GPRS communication mode, first connection must be done via RS232 or USB cable to allow proper setting of GPRS parameters.

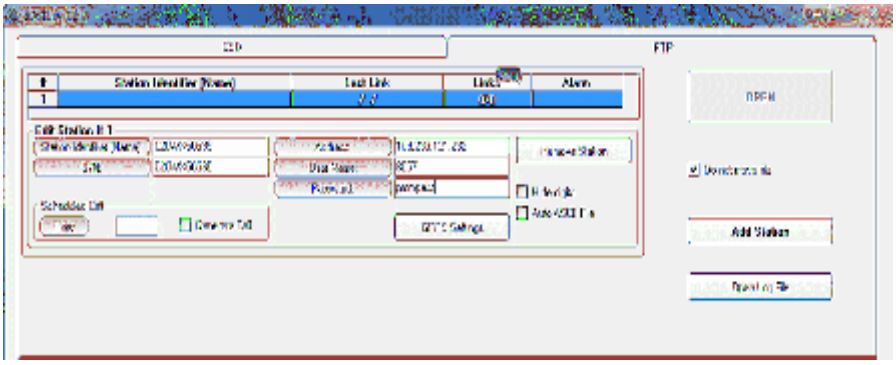
Some commands, specially related to the modem activity, are not enabled for the real time setting that can be done in RS232/USB and CSD if the station is set for FTP communication.

The stations intended to be normally accessed for programming and data downloading in CSD or RS232/Ethernet/USB communication mode, must be set accordingly the following steps:

- connect the station to the controller PC by means of the cable for RS232/Ethernet/USB communication and assign the correct COM port.
- run 8061SW-02 and, if not already active, select the FTP section by clicking the FTP area on the right, upper side of the main window.
- the main window appears as follows:

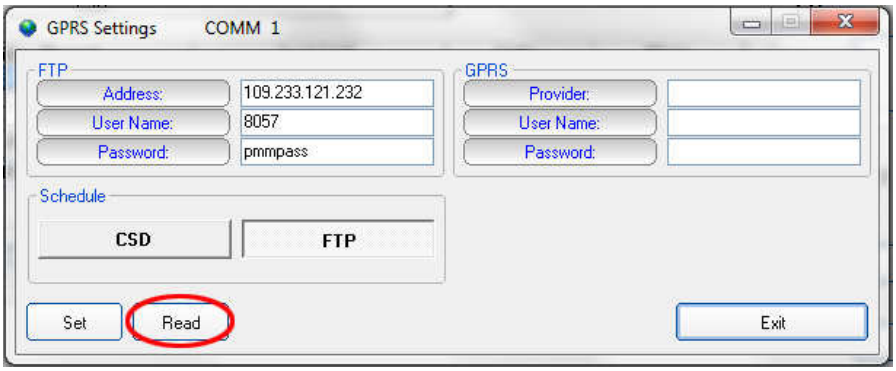


- double click the first station listed in the FTP station list (new software installations show the “New8061FTP” station, on the list, as an example).
- The “Edit station” frame appears:

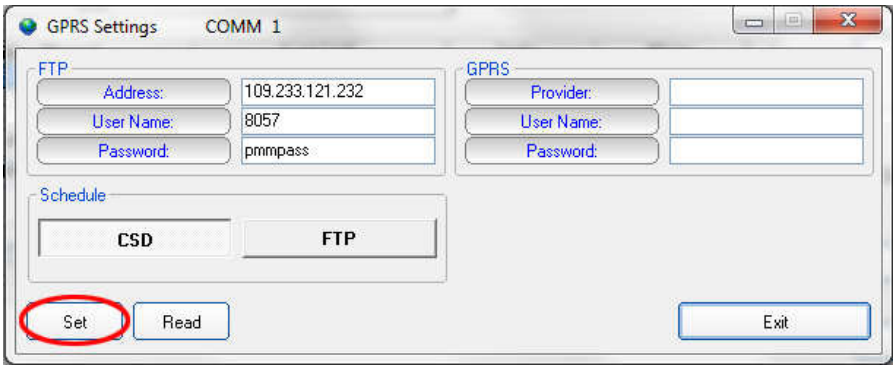


click the button “GPRS Settings”

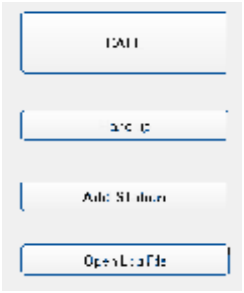
- The GPRS Setting window allows to set stations for FTP or CSD



- click the “Read” button and type the Terminal password when requested.
  The “Read” buttons queries the station connected by RS232 or USB and displays, in the “Schedule” frame, which communication mode is enabled.
  The above picture shows a station set for FTP communication mode.
- To set the station to the CSD mode select “CSD” in the “Schedule” frame, click the “Set” button and type the Terminal password when requested.



- the “Read” button can be used to check that the CSD mode has been correctly enabled in the station connected to the controller PC.
- Click the “Exit” button to go back to the main window and select the CSD section.



After entering the Passwords, the program displays the main window.
The first part of the main window is used to select from the list the Field Monitor to be queried. The software automatically installs, as an example, a dormant station.

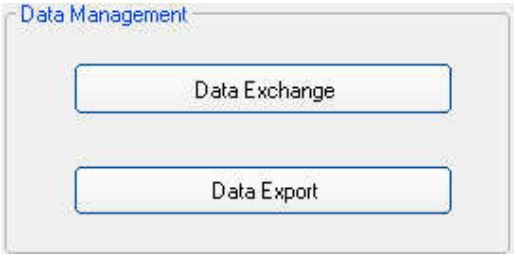
The following commands are also available:

- **CALL** to make a call to the station selected;
- **Hang up** to end the call in progress;
- **Add Station** to add a new AMS-8061 Field Monitoring station to the list;
- **Open Log File** to show the Log of all the station activities

- **Direct Readings**
- **Post Setting**
- **Exit** to exit the program**.**

A “Data Management” window contains the following commands:

- **Data Exchange** to exchange data with other control centers (i.e. other PC’s);
- **Data Export** to generate .txt and .bmp files of measurement results related to user selectable time periods.



Selecting two or more stations will cause the following error message:

NOTE

The list of remote stations contains the following information:

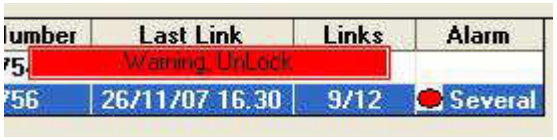
#	Station Identifier (Name)	Telephone Number	Last Link	Links	Alarm
1	P.zza G.Rossa 15 Ponte a Egola	102203388476499	16/03/01 16.18	67/66	Several
2	Milano Negroli	102203356026476	16/03/01 16.09	13/22	Several

- **Station Identifier (Name):** the station name
- **Telephone Number**: the telephone number of the station SIM card
- **Last Link**: date and time of the latest connection made;
- **Links**: number of completed connections/number of trials;
- **Alarm**: alarm status relative to latest link;

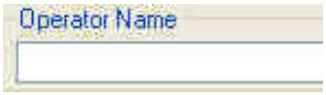
Clicking the line of the selected station will open a window displaying more information.

7.5.1 Alarm column

The status of alarms relative to latest link, in the last column, is normally empty if there were no alarms. A red dot is displayed, followed by a description of the type of event causing the alarm in case of just one alarm.



In case of no alarm, a green box with the word “None” will appear when the mouse cursor is positioned over the alarm cell.
If more alarms occurred, to avoid overcrowding the column the word "**Several**" is displayed: position the mouse pointer on the Alarm field to display the list of all the alarms.



The name of the operator can be entered in the “Operator Name” field, so as to maintain a log of the operations performed and who requested them.

Possible messages:

- **UnLock:** case open
- **Over Heat:** temperature higher than 60°C
- **Probe:** receiver, antenna or probe error
- **Battery:** low battery
- **Warning:** E.M. field beyond the Warning threshold
- **Alarm:** E.M. field beyond the Alarm threshold
- **No Call:** no communication from a time longer than the value set in: “Warning if not called after XX hours”
- **HangUp:** the fixed or mobile telephone line hung up
- **Download failure:** the download has not been completed
- **Several:** informs that more than one alarm occurred.

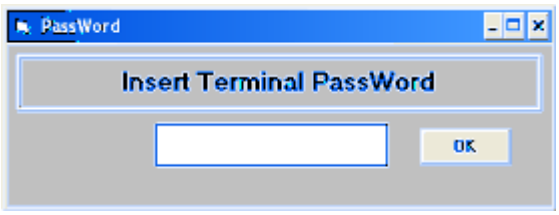
7.5.2 Entering a new station

Before making calls or downloading data from an existing Field Monitor, click the **Add Station** button to add the station to the list. The screen looks like this:

The procedure to add a station is as follows:

- Enter the station name (alphanumeric ASCII characters only) on the **Station Identifier (Name)** line. This name will be recorded in the station memory the first time it is queried. It will also appear on the display of your mobile phone every time the station is queried via SMS or when that station sends its daily Reports;
- Enter the phone number of the SIM card installed in the station. (SIM cards allowed for CSD data communication are generally provided with three different numbers: Voice call, Fax, Data. Be sure to type the number assigned for CSD data communication); **the field Telephone Number must be filled even if the CSD communication mode is not desired or provided. Type a number string like "0123456789" to add the new station to the station list.**
- Optionally, you can enter the number of the Certificate of Conformity provided with the station;
- Enter the **Device Password** identifying the station to allow CSD remote communication;
- If necessary, select one of the **Automatic Download** functions to start downloading data automatically every time a remote station calls the controller PC (**PC answering**) and /or every time the controller PC calls a remote station **(PC calling**).
- Select **Auto ASCII File** function if you want a data txt file to be automatically generated after any data download has been completed;
- In the **Scheduled Call** field, enter a **Time** when the PC, if enabled with the **Generate Call** function, automatically calls the station in CSD mode

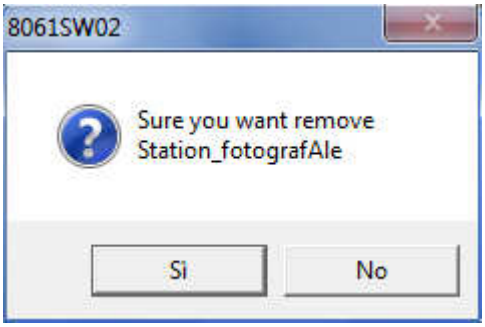
The security Terminal password will be requested for every operation.



If a wrong password is entered, the following message appears:

7.5.3 Removing a station

To remove a station from the list, click **Remove Station**. The message is:



If the answer is **YES**, the software will ask for the Terminal Password and the station will be deleted; if the answer is **NO**, the operation will be aborted.

NOTE

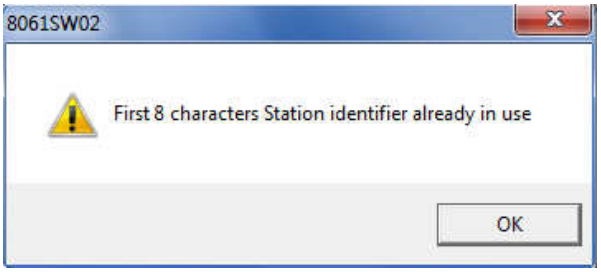
Entering the Device Password prevents the station from being queried by any unauthorized person who might in some way to know its telephone number.
This Device Password is unnecessary only when connection is make via cable (RS232 or USB).

NOTE

If a station that had been removed is added again with the same name (as well as a station is renamed using a name that has been yet used before) all the data related to the previously performed measurements will be automatically restored in the PC memory unless the folders containing these specific data has been erased.

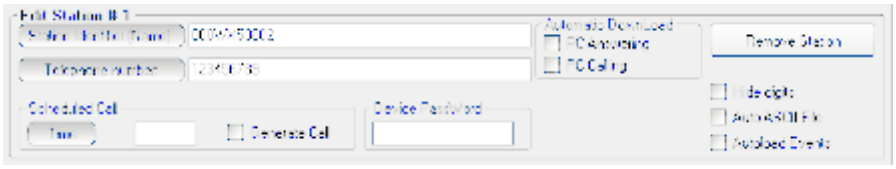
WARNING

The first 8 characters of the Station Identifier (Name) must differ from those of any other stations already entered. If they do not, the following error message will be displayed:



7.5.4 Editing a station

To change the name or telephone number of a station, click on that station line to open the following window:



It is now possible to edit the station data, enable or disable automatic download functions or automatic creation of .TXT files, or set the telephone number digits to “Hide” condition. For each of the above operations the program will require to enter the security *Terminal Password*.

7.5.5 Automatic data downloads

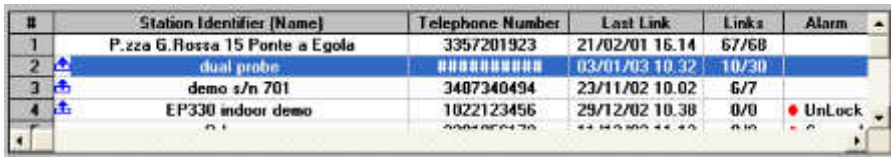
The window for editing or adding the stations also provides an **Automatic Download** function which makes monitoring fully automatic, with transfer of the data from the station, generation of the .TXT file, etc..
Therefore some stations can be programmed for manual connection, other units, after being called, will automatically transfer the data, while others again will automatically call the control PC at a preset time and download their data by themselves.

It is possible to enable the station for automatic download by selecting the flag **PC Answering** or **PC Calling** or both.
In this case a symbol appear at the left of the station name:

Arrow up = PC Answering
Arrow down = PC Calling
Both = both flags selected

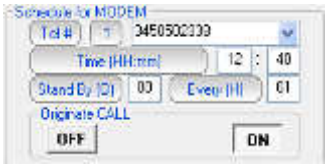
If no command is enabled, data can only be downloaded manually.

If the function Hide Digits is selected, the telephone numbers of the stations to call, edit or add will be encrypted and no longer displayed on the window screen.



The telephone number will be masked even in the status window.

7.5.6 Answering



By enabling the command PC Answering, every time the controller PC answers to an automatic call coming from the station, measured field data are downloaded automatically. The downloaded period starts from the first data after last download.

To program the station for automatic calls, proceed as follows:

- access the station by pressing Call;
- wait for the connection to be established;
- when the software displays the configuration of the station, use the command Enable Setting and enter the Setting Password
- In the window Schedule for MODEM write the telephone number of the controller PC. Up to 10 different telephone numbers can be entered. In case the first one doesn't answer the station will call the other numbers, in sequence, until one answers and secure communication. The number which answers and secure a communication will receive the data. Data will be downloaded only to a PC that is switched on, with modem enabled and 8061SW02 software running.
- In the Time window enter the time when the call has to be made (obviously the PC and modem must be on at that time);
- In the Stand BY (H) window write for how many hours the GSM modem must stay on. It is not necessary to set the modem to be always on (24 hours), normally it should be on only few hours per day. When the modem is off the station cannot receive incoming calls;
- In the window Every (H) enter 24 or a submultiple of 24 hours defining the daily rate at which the operation has to be repeated (24 means the modem is programmed to switch on once a day);
- The function Originate CALL should be ON. If OFF is selected, the modem will be switched on but no call will be made.

On receiving a call via modem from a station, the software requests that the calling station identifies itself and on the basis of the response string, it proceeds as follows:

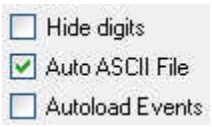
1. If the ID (Name assigned to the station) of the calling station is on the list of known stations, the SW02 prepares to receive the data in the corresponding directories;
2. If the ID is not in the list of known stations, the SW02 adds the new station to the list (entering the telephone number as 00000000) and creates the directories to receive the corresponding data;
3. If the ID is not provided or does not respect the protocol (e.g. a call by a telephone), the 8061-SW02 put itself in stand-by.

After having identified the calling station, all the parameters are requested in order to trace the call in the proper log, and after that all the field data since the latest successful link are requested, so as to ensure continuity of the downloaded data.
After the download of the data, the software sends the hang-up command to the station to minimize link time and make itself available for another call.

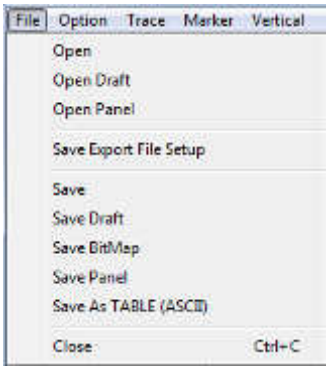
7.5.7 Calling

When the PC Calling function is enabled, every time the station is called using the CALL or "Scheduled Call" commands, the data present on the station - and recorded since the latest download - will be automatically downloaded to the PC.
This can be very useful because it makes unnecessary to remember the time of the latest download.
After having completed the automatic download, the station does not hang up immediately but remains linked until either the call is ended manually or for 2 minutes after the last operation.

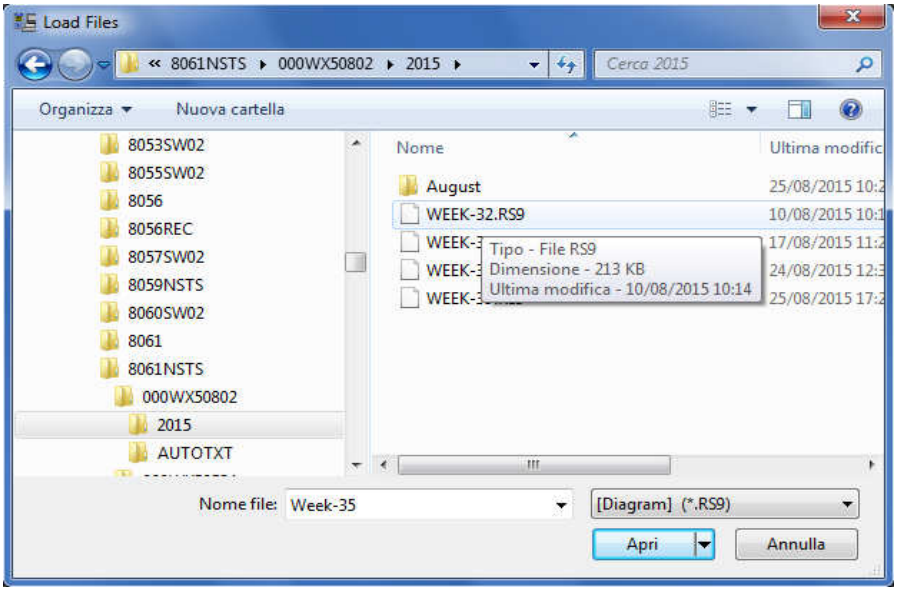
7.5.8 Auto ASCII File



Select **Auto ASCII File** to automatically generate an ASCII file and, if enabled, a .bmp file too, containing all the information relative to the data downloaded; the format will be the same adopted with the "**Save Export File Setup**" function, when displaying monitoring results starting from the calendar.
When displaying results, the function "**Save Export File Setup**" is available on the main menu, under the File menu command.



When a call, either incoming or outgoing, is reported by the station and the data are downloaded manually or automatically, all the files normally placed in the directory **Station Name\Year\Months\Day** are also copied in the special directory called **Station Name\AUTOTXT**.



NOTE

When all the data have been downloaded, the files in the directory **Station Name\AUTOTXT** are grouped in a single file **.RS9** which displays a graph having as its starting and ending date and time the date and time of the download. This will be used to create the file **.TXT** that, identified with a specific name containing the time and date of the download and the serial number of the station generating it, will be saved in a special directory called **AUTOFILE**, common for all the stations and placed at the same level as their specific directories.

The file name appears in the following format:
POSTAZIONEserialnumber_FROM_YYYY-MM-DD_HH-mm_TO_YYYY_MM_DD_HH-mm.TXT

NOTE

Every time a download is performed the last text file is overwritten by the new one. The autotext.txt file includes the data interval from "Date & Time Start" to "Date & Time Stop"
It is then possible to open the autotext.txt file using other applications (Word, Excel …) or directly from 8061-SW02 software. In this case the file will be displayed in graphical form where it will be possible to apply the zoom function or save it in other folders.

Every time the data are downloaded with the **AUTO ASCII FILE** function enabled, a new **.TXT** file will be created with a specific name, saved in the **AUTOFILE** directory and containing the data acquired by the station from the **Start** to the **Stop** time of the download.

If you enter the command /AUTOBMP in the destination field of the properties with the **AUTO ASCII FILE** function enabled, the software provide a **.txt** and **.bmp** file at the same time. The bitmap is created with the settings used to create the same file for the manual mode.
It will be saved in the **AUTOFILE** directory and placed at the same level of the txt file.

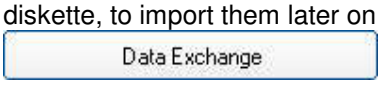
7.5.9 Autoload Events

The NARDA Area Monitor System can save a certain number of events in the permanent memory of the station, so as to ensure traceability (independent from the operations of the control center) with regard to the settings and main activities of the station. These events can be downloaded from the station, displayed in text format and copied into the mass memory of the control center to keep updated the station history.

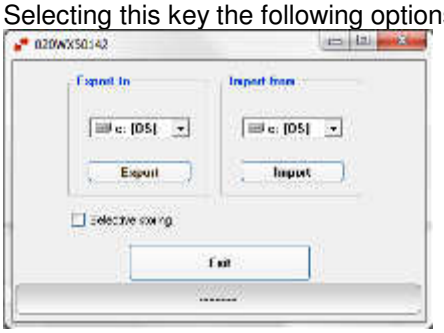
The option **Autoload Events** facilitates this task as, every time the station is contacted, it is automatically asked for all events not already downloaded. It is important to know that to increase the reliability in case of sudden interruption of the call, at each connection the events request is made at two separate times. The first request is made at the end of reception of the setting parameters and the second is made immediately before receiving the hang-up command. This ensure that all events are downloaded even in case of problems during the connection (which may be interrupted before all operations have been completed) and at the same time ensures that all events recorded after the connection in progress will also be received.

7.5.10 Filing data

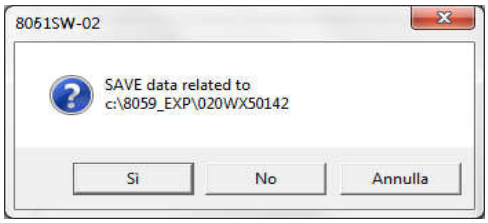
The **Data Exchange** key is used to file the data saved, for example on a diskette, to import them later on to other control centers.



Selecting this key the following options are displayed:



When exporting data, after the selection of the type of support, the data are automatically saved in a directory called 8059_EXP.
Select **Selective storing** to enable the program to select which data to export, as shown in the figure below, otherwise all the data found will be exported.



Exported data can be easily imported by the 8061SW-02 control software installed in a different PC by selecting device containing exported data and clicking the “Import” button.

NOTE

Importing data creates a directory which name correspond to the Station Identifier (Name) selected from the station list before exporting data.
If not already present, a new station, with the same Station Identifier (Name) should be added to the station list in order to be able, through the calendar, to display measurement results.

7.5.11 Exporting data

The **Data Export** function creates text files and, if enabled, .bmp files related to the time range specified by the user:

After selecting the desired time range (From date – To date) click the **Export** button to create, in the **AUTOFILE** directory, the following text files:

- A text file reporting the events relative to the control center in the selected period. This file is saved as AUTOFILE**PC_LOG.TXT**;
- A text file reporting the events relative to the station in the selected period. This file is saved as AUTOFILE**8061_LOG.TXT**;
- A text file and, if enabled, a .bmp file, reporting the data records (field strength, battery voltage, temperature, alarms, etc.) formatted as in the menu for the selected range. Indeed, the file is the same one produced automatically with the option Auto ASCII file except that, instead of referring to the period downloaded, the period can be specified manually. The file name appears in the following format:

POSTAZIONEserialnumber_FROM_YYYY-MM-DD_HH-mm_TO_YYYY_MM_DD_HH-mm.TXT

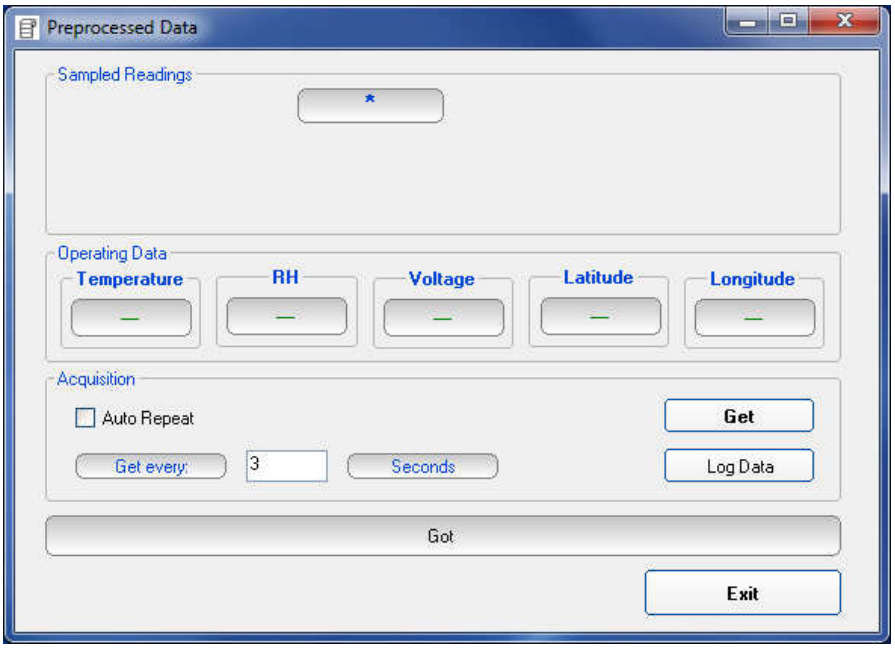
On opening the Data Export window, the initial date and time shown by default are the date and time of the latest export of the station: it is therefore possible to export in a very easy way all the data collected in the correct chronological sequence without having to remember the latest operation.

NOTE

The maximum time interval that can be processed by the Data Export function is one month.

7.5.12 Direct readings

When the station is connected to the controller PC through the RS232 or USB cable, the **Direct Readings** button is used to open a window where it is possible to immediately read the basic station data.
With this function the User can read the field values acquired by the station without post-processing them; that is, without any RMS or arithmetic average, or maximum. The data, which can be requested at any time, are updated by the station 20 times per minute (every 3 seconds) so a higher reading frequency will produce only redundant data.



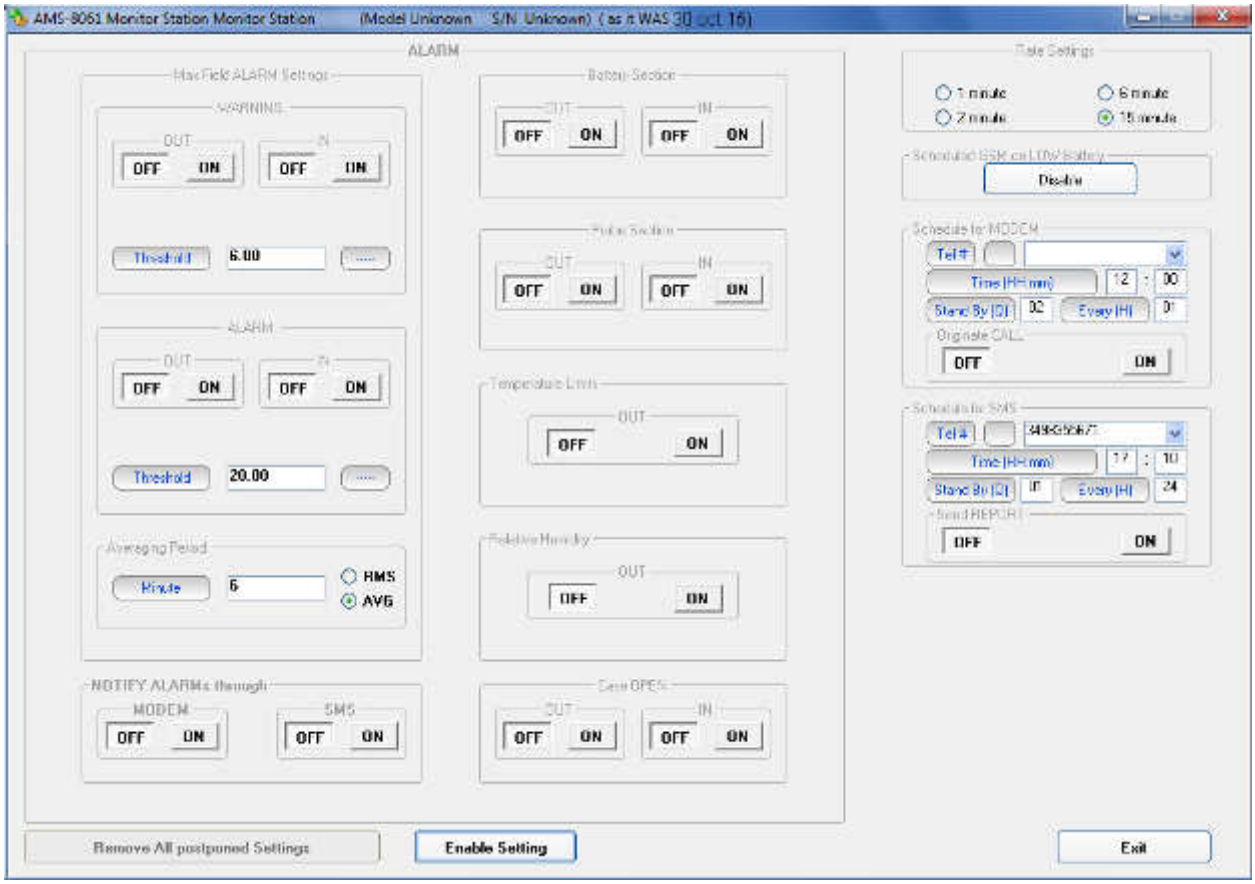
The "**Get**" button is used to request the field value of different frequency bands (depending on the probe), battery voltage and temperature.
The **Auto Repeat** option, with a value **nn** indicated in **Get every,** is used to request the values automatically every **nn** seconds.

The "**Log Data**" command allows to record the set of values read in a text file, in order to save the data to process them, if necessary, at a later time.
To start the save, press the Log Data button.
Press again to stop saving.
The actual status is shown in the window at the bottom (Getting Data)

7.5.13 Send settings

Post Setting

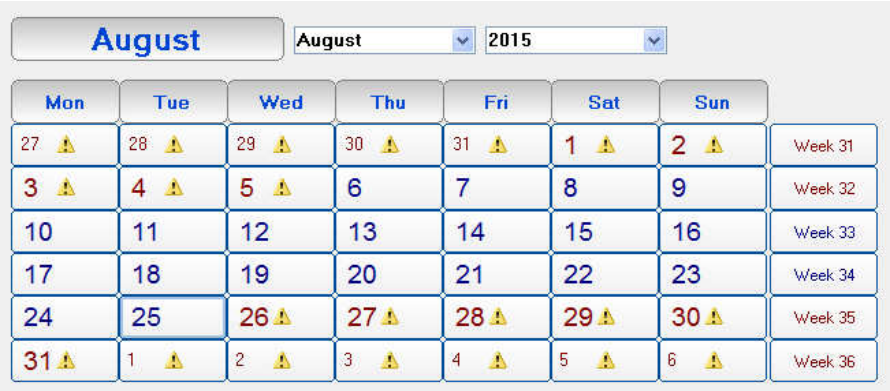
The **Post Settings** key is used to open a window where settings can be defined for the selected station.
This presetting operation allows to change the settings even if the station cannot be contacted at the specific moment, for any reason. All the settings are saved temporarily and sent to the station during the first link.



The pre-setting window shows the status of the station as it was during the last link or just after the latest modification of the parameters. Every change is saved in the order made, regardless of whether it may be redundant or contrary to the previous one. The command "**Remove All Postponed Settings**" cancels every setting saved and ready to be sent at the first available link. To prevent the data already stored in the memory of the station become meaningless because a change of settings, the presetting commands are sent to the station only immediately before the hang-up command.

7.5.14 Calendar of measurements

The calendar, created automatically by the software, always shows the current month and year and is used to select and display in graphical form the data downloaded from the selected Field Monitoring station, simply by clicking the button of the desired day or week.



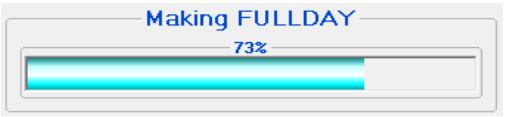
NOTE

Only the buttons with blue characters contain data, which has been previously downloaded from the station.

Days or weeks with red characters are empt; in this case the symbol ⚠ will be displayed close to the days.
When clicking one of them, the following message is displayed:

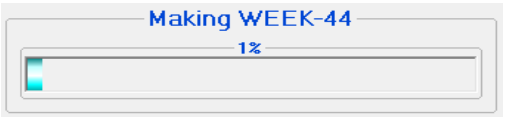
NOTE

The first time a button with blue characters is clicked an internal process for the generation of the graphic and all the necessary files will start.

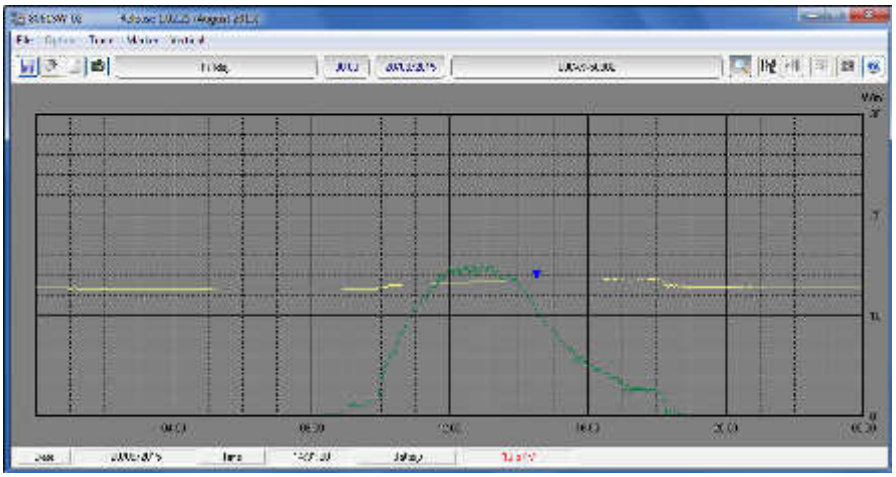


NOTE

The first time a specific week is selected the following picture is shown:



The last part of the main screen contains a status bar showing additional information relative to the operations in progress, and the program **Exit** button.



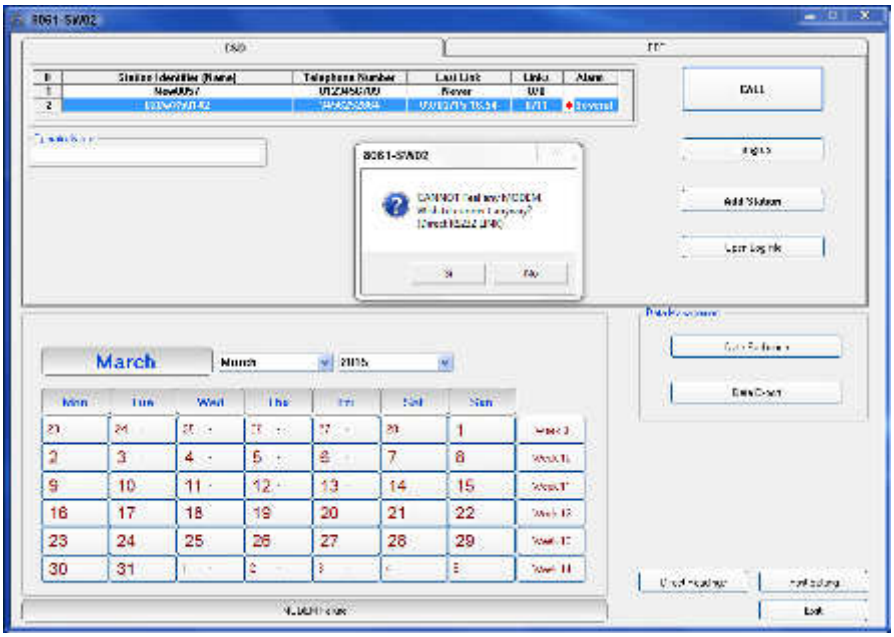
NOTE

Among the traces of the graph are also the ones showing the battery voltage and solar cells power balance.
This information is extremely important and allows the user to program the maintenance of the batteries or the power supply system.

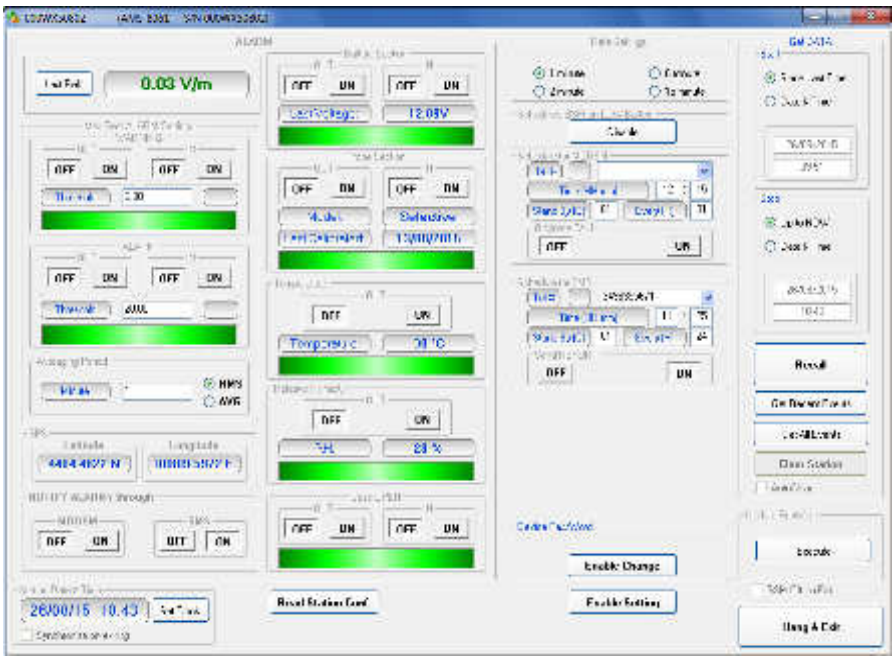
7.5.15 Calling a station via RS232 or USB

After the correct installation and configuration of the program 8061SW-02 as described in the paragraph "Software Installation" in this chapter, select the station to call and press the **CALL** button.
The status bar will show:
- The message “Checking MODEM”
- The message “MODEM Failure”

Moreover, a window will pop-up asking to continue via direct RS232 LINK.



Answering **YES** the setting panels opens:



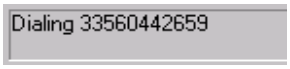
7.5.16 Calling a station via GSM modem (CSD mode)

To call an Area monitor, you should:

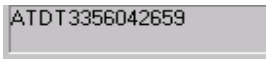
- Assign a station name or use an existing one (as described in the paragraph “Software Installation”)
- Assign the SIM card telephone number (if the area monitor is located outside your country, please add the prefix of the country called and check your SIM card is enabled for international data calls)
- The modem shall be correctly configured and switched on
- The right serial port where the modem is connected has to be selected. Please see Software installation chapter.
- The station modem should be ON.
- Push CALL button

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

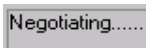
Modem testing



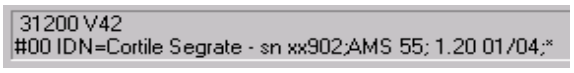
Dialing the Area Monitor



Sending modem commands

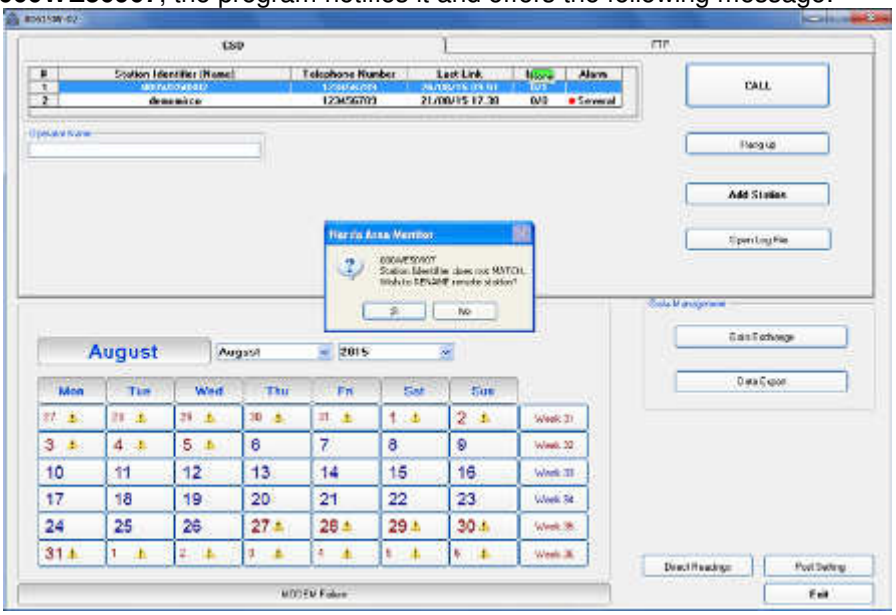


Provider data exchange



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 **democisano** while the internal name of the station is **000WE50907**, the program notifies it and offers the following message:

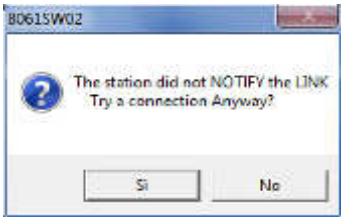


Answering **YES**, the software will rename the station with the new name **democisano** inside the station itself. That means that the PC has higher priority over the station. In this case all the downloaded data will be recorded under the directory **democisano.**

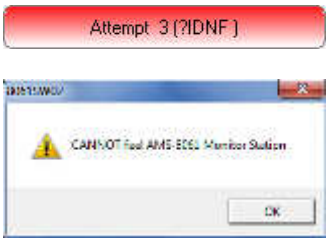
Answering **No**, another window opens:

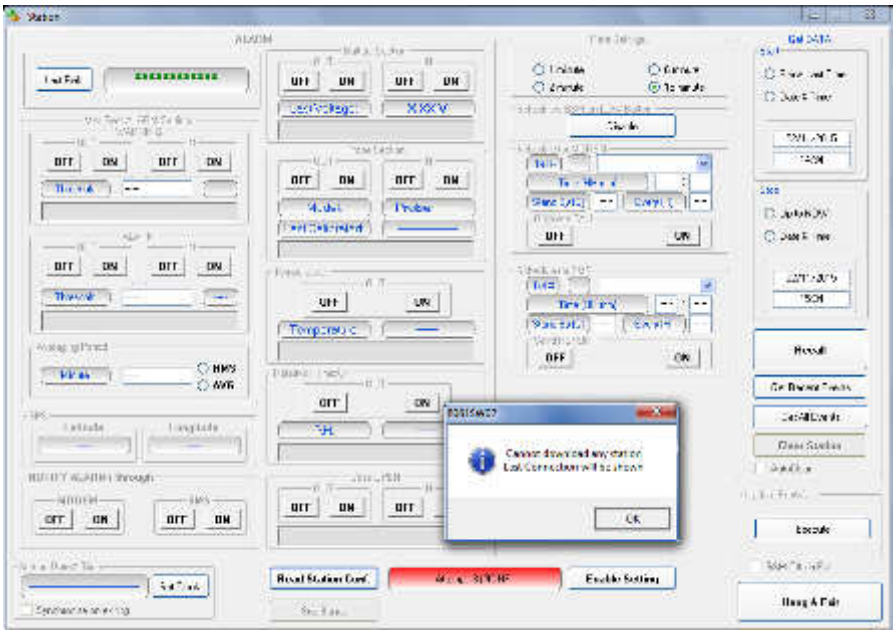
If the answer is **Yes**, the software allows access to the station and then the data download takes place, with these data saved in the relative directory named **000WE50907.** In this case the name saved in the station takes priority and the one in the list of the PC is updated.
If the answer is **No** the data will be downloaded temporarily in the directory democisano. Selecting Cancel no operation will be performed.

First, the match between the **Device Password** memorized in the PC and the one memorized in the station is checked. If they do not match, the status bar will display the string **#BM DENIED*** and the following message will appear on the screen:



If the answer is YES, the connection will not take place but it will be possible in any case to access the station set-up screen to check its status at the time of the latest successful link.



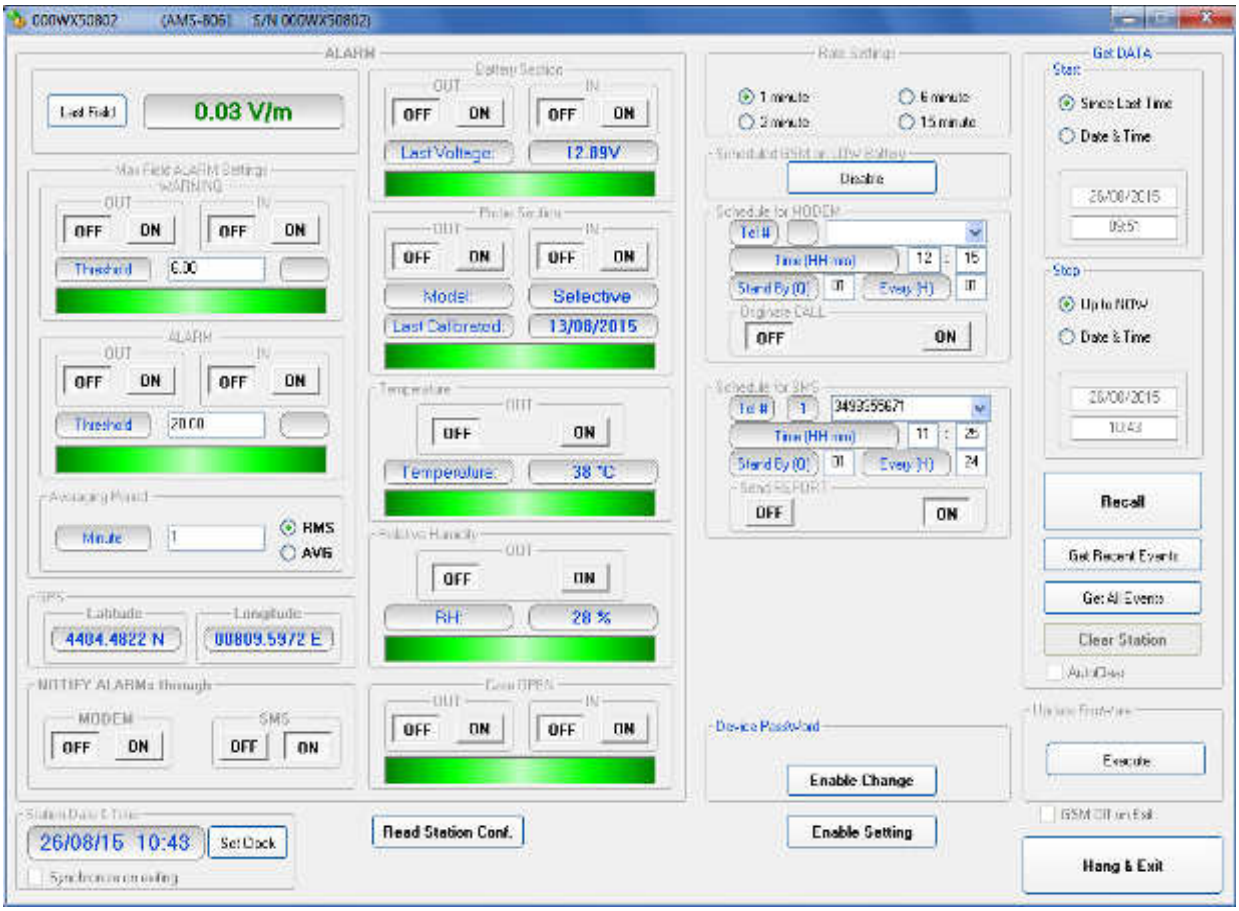


7.5.17 Control window

Once a link has been successfully established, in CSD mode or during local RS232, Ethernet or USB connection, the control window is opened for the selected station and it is possible to:

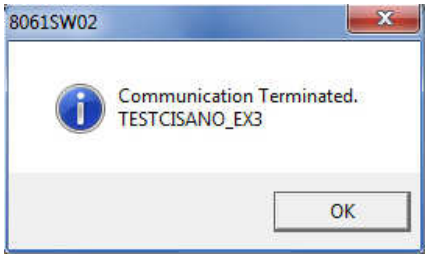
- check the settings and parameters of the station;
- edit the settings (function protected by the Setting Password);
- download measurement results to the PC;
- change the Device Password (needed for calls in CSD mode only).

The control window looks like this:



To close the communication push Hang & Exit.

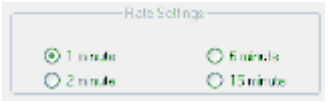
After two minutes of inactivity, the GSM link will be ended automatically. This will prevent keeping the line open due to a closing error or simple omission.



7.5.17.1 Description of controls

The control window is divided in different zones grouping the available commands by type and function. The main zones are:
ALARMS divided in:

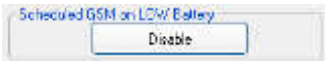
- Last Field
- WARNING
- ALARM
- Averaging Period
- Battery Section
- Device Section
- Over Heat
- Relative Humidity Limit
- Case OPEN
- NOTIFY ALARMs through



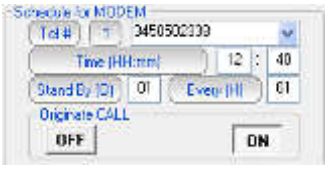
Rate Settings

The Storing Setting affects the battery duration and memory, before old data are overwritten.

P.Time: Processing time. It mainly depends on the Bands setting. The minimum Rate should be, at least, =10 x Processing time.



In the frame "**Scheduled GSM on Low Battery**" there is a "**Disable**" command. This command serves to disable the entire function of programmed switching on of the modem. If this command is selected, in order to prolong the battery duration all the programmed switches of the modem are disabled in case the battery voltage is lower than the minimum (factory preset), without interfering with the relative settings either as regards timing or modem status. However, this command does not disable sending SMS, if enabled, in case of unmasked alarms.
When the battery alarm status ceases, the command is automatically cancelled.



Schedule for MODEM divided in:

- Telephone number
- Time (HH:mm)
- Stand by (Q) indicated in number of quarters of an hour; this value affects battery duration
- Every (H)
- Originate CALL

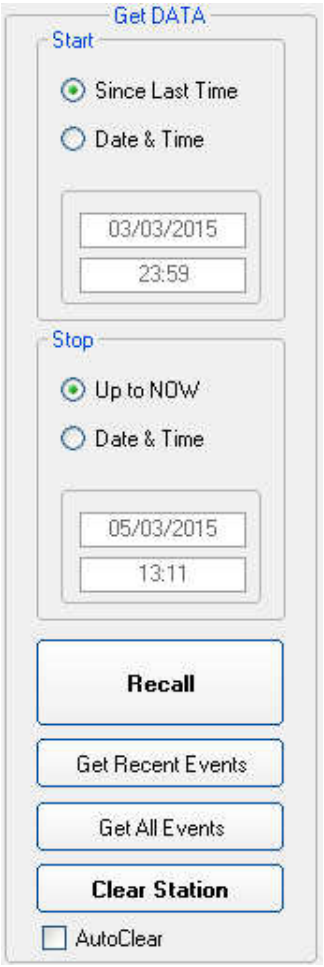
Up to 10 fixed phone numbers can be programmed. The first phone number which is free and allows the data download will interrupt the search for the other number.

If you desire to use this function, it is suggested to set the time of the programmed switching on, in the window "schedule for MODEM" at least 1 hour and 30 minutes after the monitor station was switched on.

Schedule for SMS divided into:

- Telephone number
- Time (HH:mm)
- Stand by (H); this value affects battery duration
- Every (H)
- Send REPORT

Up to 10 mobile phones can be programmed.
All the mobile phones will receive the daily report.

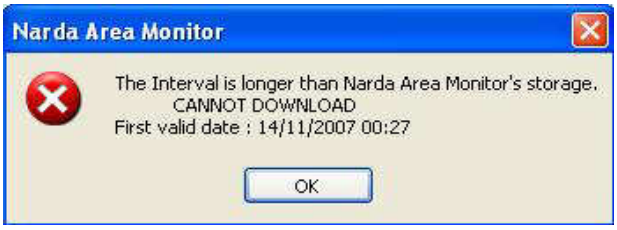


Get DATA divided in:

- **Start** with the subcommands
  - Since Last Time
  - Date & Time

The starting date must be not later than the Stop date.
Starting date cannot be before "First Valid Date" displayed on the lower left side of the control window:

The following message is displayed if trying to download data stored before the First Valid Date or an interval longer than memory capacity:



- **Stop** with the subcommands:
  - Up to NOW
  - Date & Time

The **Stop** date must be later than the Start date, otherwise an error message will appear.

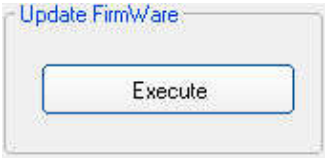
- **Recall**
  It is used to start downloading results acquired in the period from Start to Stop settings.

- **Get Recent Events**
  This command manually recalls all the events that have not yet been downloaded, and appends them at the end of the relative file.
  This command shall be considered the manual alternative to the option **Autoload Events**.

- **Get All Events**
  The command manually recalls all the events available on the station and appends them at the end of the relative file. Though this does not create any problems, no control of redundancy is made, so repeatedly selection of the command may lead to repetitive information.

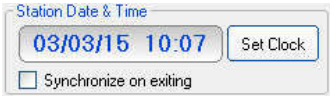
- **Clear Station**
  Cancels the internal memory of the station linked.
  If there are data which have not been transferred to a PC yet, the function is automatically disabled.

- **Auto Clear**
  Enables total cancellation of the data in the station memory after complete downloads. When this option is enabled, after every complete download up to the time and date indicated in **Get Data→ Stop**, the software sends a request of complete cancellation (SCAM) of the data in the memory and, if there are no errors, the request is accepted by the station, which clears its memory. Obviously, once the data have been cancelled they cannot be recalled anymore.



- **Update Firmware** to update the internal firmware of the station.

Information about station firmware (rel. number and upload date) are displayed in the lower right side of the control window:



- **Station Date & Time** with subcommand
  - **Set Clock**, to transfer the current date of the PC to the station
  - **Synchronize on exiting**, to make the above function (updating time and date at the end of every link) automatic.

It is recommended to check the station clock before starting any new monitoring campaign.
Be sure to download any useful data before clock setting as previously acquired field data will be no more downloadable.

- **Read Station Configuration** to read the electromagnetic field, status of alarms and configuration;

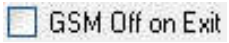
- **GPS** to show the position data;

Latitude and Longitude are expressed in degrees, minutes (and decimals of minutes). As for example, the Latitude in the picture corresponds to 44° 04’ 29” when indicated in degrees, minutes and seconds.

- **Enable Setting** to edit the setup (setting password required);

You will be asked to enter the security “Setting Password”.

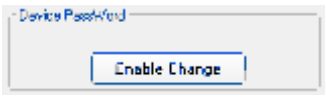
- **Band Analysis** to display and set the frequency bands parameters of the selective analysis



- The option **GSM OFF on Exit** sends to the field monitor the request to switch off the station modem in advance, in addition to the request to end the connection. When this option is enabled, at the end of the link (not made after a line break and not after the maximum time without dialogue) the station switches the GSM modem off after a time ranging from 1 to 2 minutes, regardless of the residual time set.

- **Hang & Exit** to end the link**.**

To edit the station settings , use the Enable Setting button.



- **Device Password** to edit the identification password saved on the station.
  The device password shall be composed by a number alphanumeric characters from 1 to 32.
  Uppercase and lowercase are considered different characters.

7.5.17.2 ALARM

Stations are able to notify alarm conditions by sending SMS and/or starting a CSD call to the controller PC. Alarm conditions are also recorded along with measurement results.
Measurement results downloaded from any station include therefore information of any alarm occurred during the monitoring activity.

Depending on the local laws, the place of installation, the climatic conditions, the availability of sunlight and the duration of measurement, certain alarms should be enabled for the control and proper operation of the field monitor. In addition, if the station is installed in what is defined as a "sensitive" locations as regards electromagnetic fields, the alarm for exceeding the threshold defined by law should be enabled to ensure control almost in real time.

Any alarm notification can be set on a dual threshold, with reference to the occurrence of an event (**OUT**): i.e. exceeding a threshold; and upon regaining normal conditions (**IN**).

OUT: enabled (**ON** pressed) or disabled (**OFF** pressed) notifies you of an alarm in the following cases:

1. On exceeding a threshold setting for attention (Warning)
2. On exceeding an alarm threshold (Alarm);
3. When battery voltage is too low (threshold is factory preset) or too high;
4. When one or more field probe parameters is faulty;
5. On exceeding the temperature limit inside the field monitor;
6. When the data memory is almost full
7. When the external container is opened.

Whenever an alarm occurs, the GSM modem will remain on for 30 minutes. It allows the AMS-8061 to send the proper SMS message and the operator to query the station and download the data.

IN: enabled (**ON** pressed) or disabled (**OFF** pressed) notifies you that normal conditions have been restored.

7.5.17.3 NOTIFY ALARMs through

Notification of alarms can be made with a message either via modem or SMS or both; the choice can be selected in the corresponding zone.
The alarm notification via SMS can be send up to 10 cellular phones.
Notification via modem will be sent to the first number that answers the call.

For each alarms there is a bar in the in control window that shows by its color the current status of the respective alarm, regardless of whether notice via modem or SMS is enabled or disabled:
RED: alarm condition activated;
GREEN: alarm not active.

7.5.17.4 Last Field

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

This field is refreshed each time you click the Last field button.

NOTE

This value can be remotely queried at any time from a mobile phone by sending the following SMS message to the station: #SM?IDNpassword*#SM?LFA*

7.5.17.5 Averaging Period

This command defines the time period on which the average of the field levels will be calculated. The average can be arithmetic (AVG) or quadratic (RMS).

In this example, with **Send REPORT** enabled, all the mobile phones in the list (max 10), will receive, every day, the maximum value averaged on a period of 6 minutes.

7.5.17.6 Max Field ALARM Settings

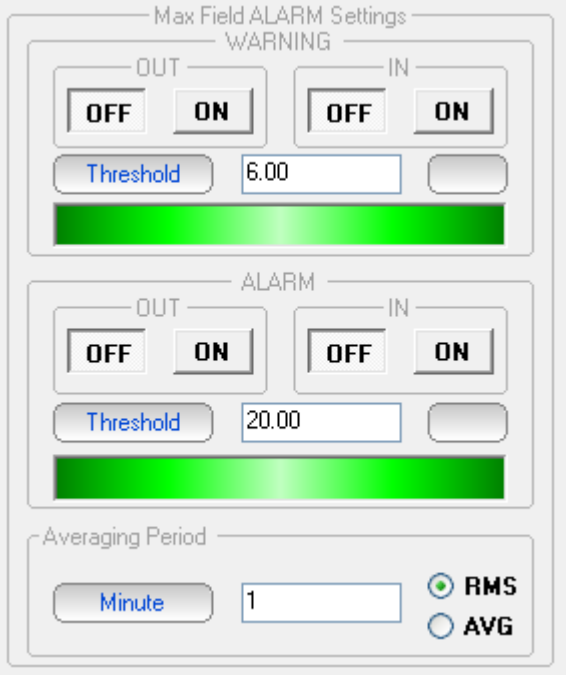
Field alarm

The field monitor features two thresholds of the field value readings, one for warning and one for alarm.

On exceeding one of these thresholds, a message is sent to the mobile phone or a call is done to the PC. This occurs only if the **ON** function is enabled in the **NOTIFY ALARMs through** window.

Select **ON** to enable the station to monitor the alarms and select **OFF** when no action shall be taken.

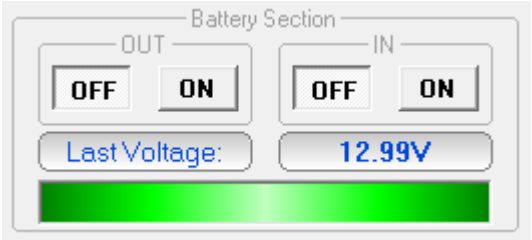
The **OUT** function is used to control the excedings of the alarm threshold; select **IN** to control the return of the electrical field values below the set value.



In this example an alarm will occur when the field exceeds 6 or 20 V/m averaged on the rate setting time period.
Thus, brief but intense field variations will not necessarily cause any alarm if the averaged value (in this example on 1 minutes) does not exceed 6 or 20 V/m.

7.5.17.7 Battery Section

Battery Alarm.
The internal control system of the Field Monitor features a voltmeter for measurement of the battery voltage. This function ensures constant control of the power situation for correct operation of the system.
Settings are made as for all the other alarms.



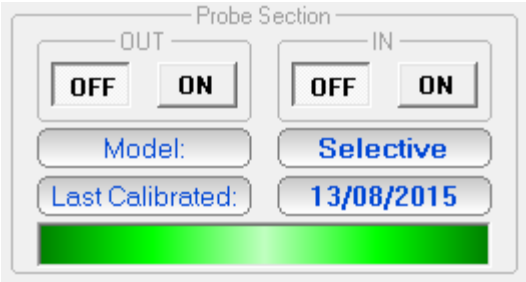
The bar turns red when the battery voltage is below the factory preset threshold.
The Warning bar turns red when the battery voltage is below 11,09V (the selective unit is automatically switched OFF in case of Battery warning or alarm) and if the alarm notification is enabled an appropriate message will be sent via SMS.
The Warning alarm is deactivated when the battery voltage reaches 11,97V.
The average power consumption of the station is approximately:
50 mW with GSM off and receiver off
200 mW with GSM in stand-by and receiver off
2 W with GSM transmitting and receiver off
6 W with GSM off and receiver on

NOTE

The battery voltage value can be remotely queried using a mobile phone and sending to the station the SMS message: #SM?IDNpassword*#SM?BAT*

7.5.17.8 Probe section

Alarm for devices in use.
The following section displays any device alarm.

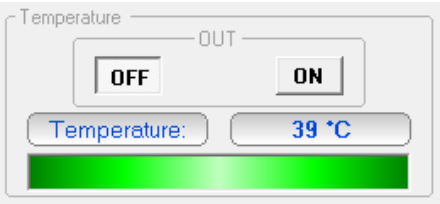


The type of antenna used by a specific station can be read by any mobile phone by sending the SMS message: **#SM?IDNpassword*#SM?PRB***.
Clicking the “Device info” button opens the following “device info” window

The RF components of the AMS-8061 are tested and calibrated individually after production. For best overall instrument accuracy the antenna factor is measured on the assembled AMS 8061, thus including all corrections of RF parts, if any. For this reason the certification date of the system and the last calibration date of the antenna are corresponding.

7.5.17.9 Over Heat

Temperature alarm.
An alarm is generated in case the internal temperature is > 60°C.

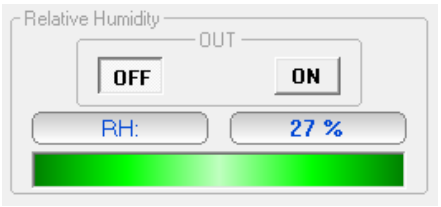


The actual internal temperature is also displayed.

The temperature and remote humidity can be remotely queried using a mobile phone and sending to the station the SMS message: #SM?IDNpassword*#SM?TMP*

7.5.17.10 Relative Humidity

Humidity alarm.
The monitoring station also features a hygrometer for the measurement of the internal Relative Humidity, in order to have constant control upon the environmental conditions affecting the correct operation of the system.
The setting is made as for the other alarms.
An alarm is generated in case the internal RH is over 90%.



The actual RH percentage is also displayed.

7.5.17.11 Case OPEN

Case open alarm.
Whenever the external protective case of the field monitor is opened, an alarm condition occurs. Like it happens in case of other alarm conditions, the status bar shown below the “Case OPEN” frame, when connected to the station, will be displayed in red colour.

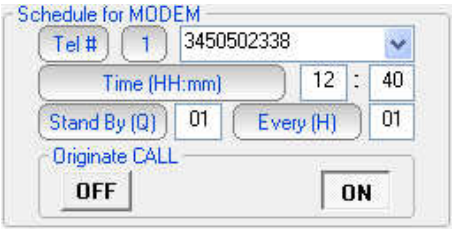
7.5.18 Schedule for MODEM

Programming the station for modem links.

To query the station by a remote PC linked to a line or GSM modem, the station modem must be on.

In addition, when an alarm occurs, the station can automatically call the telephone number of the modem used by the control PC.

Programming consists of setting a scheduled time for switching on the internal GSM modem, defining how much time the modem will stay ON (stand-by), repetition interval and whether or not a CSD call to the controller PC must be generated.



The parameter **Time (HH:mm)** specifies what time of day the Station modem has to be switched on and placed in Stand-By condition, while the parameter **Stand BY (Q)** determines how long the GSM stays on. The parameter **Every (H)** indicates the frequency of repetition or after how many hours from the latest start the Station modem has to be switched on again.
To prevent the schedule from changing every day, this parameter has to be programmed in submultiples of 24, so that only the following values are accepted: 1, 2, 3, 4, 6, 8, 12, 24.

If the command **Originate CALL** is **ON**, the station will automatically call the remote PC at the first phone number listed in the field “Tel #” at the time indicated in the **Time (HH:mm)** field, if this number does not answer or the line is busy, the station will try to communicate with the second phone number on the list.
The minimum Stand By time is 0; that means that the station makes the call at the time indicated and automatically switches the internal modem off.

NOTE

See chapter 2, for the different ways of switching on the modem.

NOTE

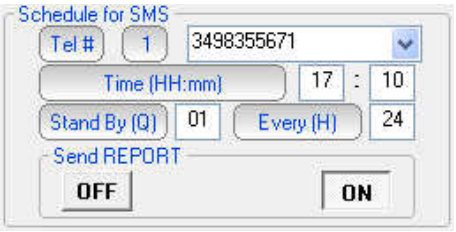
The “Schedule for MODEM” frame is disabled, and therefore cannot be set, if the station is set for FTP communication mode (factory default configuration). Please refer to the beginning of present paragraph for instructions to set the station to CSD/Serial mode.

7.5.19 Schedule for SMS

Querying the station with SMS messages.

Similarly to the “Schedule for MODEM” frame, the “Schedule for SMS” offers the opportunity to define an additional time period during which the station modem will be ON (stand-by mode) and therefore able to receive CSD calls and SMS query and setting commands. In addition, the “Schedule for SMS” frame allows defining two user’s mobile phone numbers that will receive alarm messages and/or daily reports.

Even in this case, the GSM modem switch ON/OFF time can be programmed as described in the previous paragraph.



With the **Send REPORT** command **ON**, at the time indicated in the window **Time (HH:mm)** the monitoring station automatically sends its daily report to all the mobile phones listed.

The minimum Stand By time (expressed in quarters of an hour) is 0; in this condition the station sends the Report via SMS at the time indicated and automatically switches off the internal GSM.

NOTE

It is possible to receive and read the daily report on any mobile phone (max field value, minimum battery voltage and status of station, telephone number of station, time and date) by sending the SMS message: #SM?IDNpassword*#SM?RPT*.

The Report shown on the phone display will indicate the highest field value, the lowest battery voltage since the last daily report and the date/time at which these parameters have been detected.
Therefore if at 9.00 a report is sent and at 10.00 the station is queried with the request of a new report, the display will show the highest field value and lowest battery voltage between 9.00 and 10.00.

NOTE

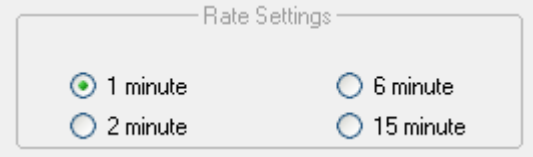
Chapter 5 of this Manual describes in detail all the commands and the messages available via SMS.

7.5.20 Rate Settings

Configuration of data memorization.

Data are saved in the station at a frequency (**Rate**) ranging from 1 to 15 minutes.

Example: if the rate of 1 minute is selected, the station will store, every minute, the average value of all the measurements taken during the last minute.



In addition to the average value it is possible to set the storing of the peak value (maximum total field occurred in the rate selected)

WARNING

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

NOTE

When the memory reaches its maximum storage capacity the new incoming data overwrites the oldest one, last period data are then always available. Any change in rate setting should be done only if all important field data has been already downloaded as they will not be still downloadable after setting has changed.

The following message will be displayed:

Answering **YES** the software will show a second message to prevent a wrong selection:

Answering yes you are allowed to change the storing settings but all the previously acquired data cannot be downloaded.

WARNING

The previously acquired data are lost changing one of the following settings:

- **Storing rate**
- **Selection or deselection of Peak option**
- **Selective mode timing**
- **Kind and number of bands**
- **Date and time of the monitoring station**

It is therefore suggested to download all the data before changing any of the listed settings.

NOTE

In general, great care shall be adopted in changing the timing or type of average or the saving rate.
Indeed, data recorded with the same station, relative to the same day but acquired with different settings will not be compatible. Only results acquired before changing setting will be displayed in the graph or table of the same day. Results acquired with the new setting will be displayed starting from the next day.
If it is really necessary to change the settings, NARDA recommends one of the following procedure:

- **Change the station name before making the settings change.**
  In this case the station with the new name is considered a new station with all data and results stored in a new station directory. The old station name will be still available in the station list allowing selection and display of all data acquired previously.

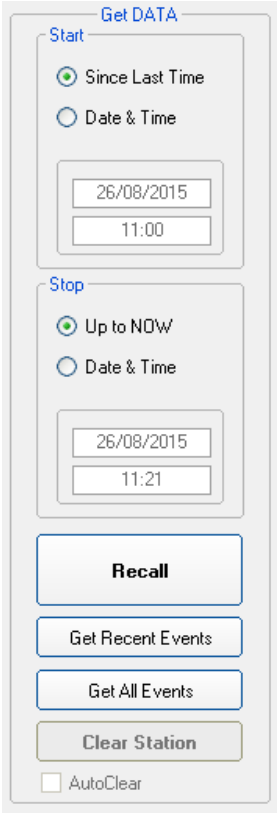
- **Change the name of the directory in which the previous data were saved before the settings change (or in any case before downloading the new data).**
  In this case the station maintains the same name but, even if not lost, no old data will be displayed.
  To display data acquired with the old setting it will be necessary to add a station in the list which Station ID (name) correspond to the changed name of the old directory.

- **Do not download the data acquired in the period of time between the settings change and the midnight of the same day if neither of the above suggestions is adopted and results of the same day are not needed.**

7.5.21 Get DATA

Downloading data from the monitoring station to the PC.

The data in the internal memory of the station can be downloaded after defining a Start and Stop event as follows:



The Start and Stop of the data download is done between the following commands, in any combination.

- **Since Last Time**: Automatically enters the time and date of the latest download;
- **Date & Time**: any date and time indicated;
- **Up to NOW**: actual date and time with reference to the station;

The "**Recall**" command starts downloading results to the controller PC.

The data downloaded will be assigned automatically to the relevant days of the calendar and those days will be marked with blue characters.

NOTE

The Start event must be earlier than the Stop event otherwise an error message will be displayed, as follows:

NOTE

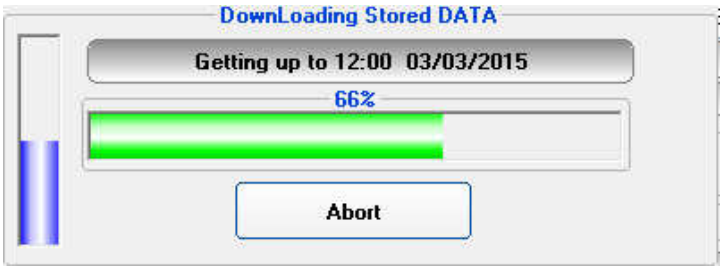
If the download period is longer than the memory available at the rate defined, the following message will appear:

NOTE

After downloading, click Hang & Exit to go back to the calendar to view the data downloaded.

NOTE

During the download of the data from the station a window is displayed with two bars indicating the progress of the download.



The vertical bar gives the percentage of the total amount of data to be downloaded while the horizontal shows the progress of the download for each subsequence six hours interval.

During data download in CSD mode, mainly due to poor reception or to poor quality of the GSM signal, some error messages may be received.
In these cases, repeat the **RECALL** command.

NOTE

The AMS-8061 station cannot operate without antenna even when downloading acquired field data.
In case the antenna is accidentally removed when station is ON a reset will be required: switch the station OFF, connect the triaxial antenna and switch ON again.

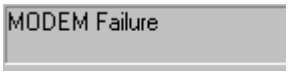
7.5.22 Examples of errors

Many phenomena can affect good communications between the GSM modem of the AMS-8061 station and the modem of the PC.
The selection of the port to which the modem is connected to, can generate a series of error messages.
If, for example, the station has a poor or disturbed GSM signal, we can get several kind of warnings.

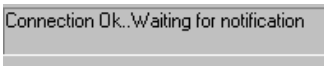
Possible problems from an Area monitor system could come from:

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

The message in the status window is:



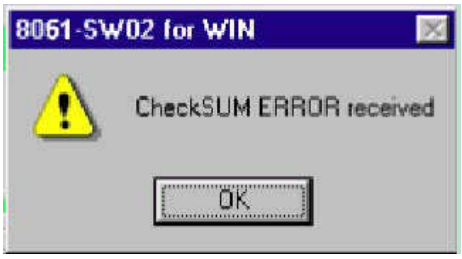
If the PC modem is off or the software is searching for the modem on a different serial port than the one to which the modem is physically connected, the message is:



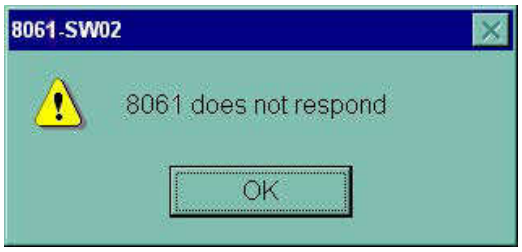
The software assumes that the station is locally connected to a serial port.
Answering **YES**, the software tries to connect the station via serial port, and if there is no connection the next message is:

Answering **YES** the software will try again to communicate with the station.
Trying to establish a local or remote connection, If the station does not answer because it is off or the internal GSM modem is off or the batteries are completely down the message will be:

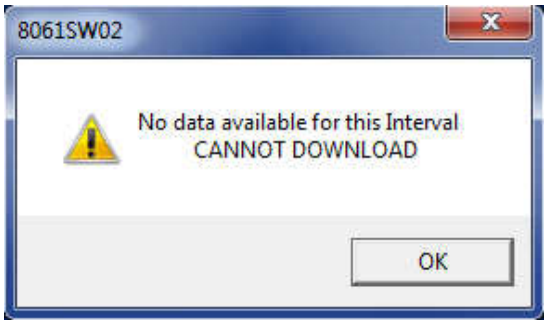
In case of error in data transmission this message will appear:



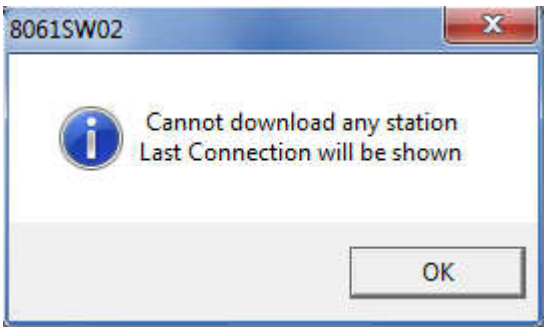
The control of the checksum guarantees the quality of the data received. When this error occurs, sometimes the software closes the application and exits.



No answer from the AMS-8061 station

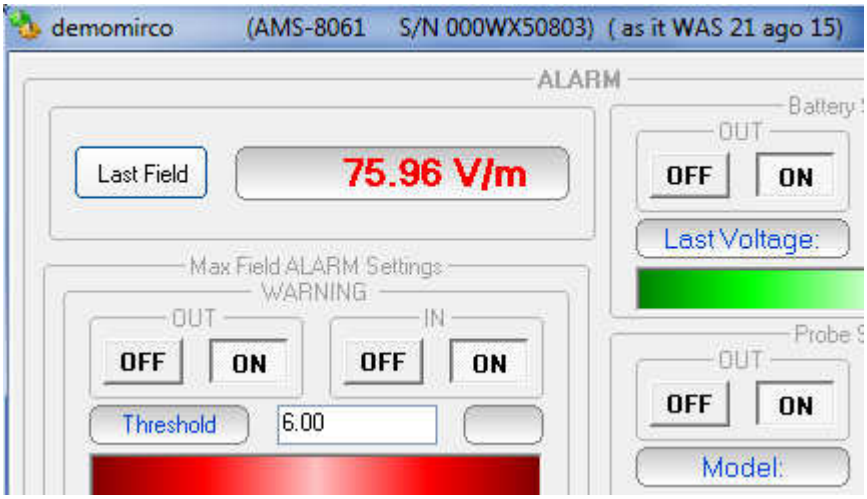


Message informing that data cannot be downloaded.



Data cannot be downloaded.

Click on **Read Station Conf.** to try and connect to the station and show its configuration. If the station does not answer, the configuration relative to the latest successful link is shown.



If there are communications problems in CSD mode between the servers of different GSM Service Providers, the message **LAST CALL DID NOT NEGOTIATE** appears in the Status frame of the main window. The same message can appear when there is heavy traffic or when the server is unable to perform roaming.

NO CARRIER

If the station is switched off or if the signal is insufficient, the message **NO CARRIER** appears in the **Status** frame of the main window.

If the software does not see any available serial port on the PC where it is installed, the following message appears:

See paragraph 3.4.2.

If a COM port is configured in a way that makes it not available on the computer or if there are no free ports, you can run the software in DEMO MODE to read the data already downloaded.

7.5.23 Updating Firmware

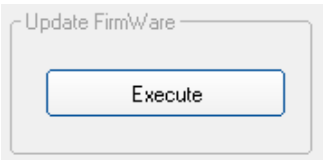
Update of internal Firmware

It is important to update the station firmware in order to use all the new functions added and eliminate any bugs in the software.

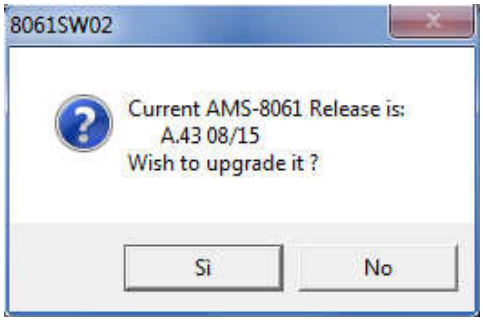
To update the firmware, use the **Execute** command.

The monitoring station will place the old firmware in its memory and will try to load a new one. A window with a coloured progress bar appears on the screen to indicate the firmware loading in progress.

The following steps will be carried out:



1. Example of request to confirm transfer;



2. Example of firmware transfer with progress bar.

3. Back writing (Internal copy of FW);

4. Reset and automatic startup of station with new version of Firmware

NOTE

The firmware upload process requires good condition of data communication as, in case of communication errors, the entire file should be uploaded again. For this reason it is recommended to upgrade locally the station firmware accessing the station by means of RS232 cable connection.

In case of errors, normally due to poor telephone connection, the following message will be displayed:

NOTE

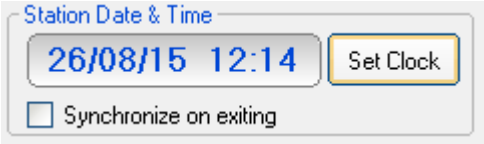
In case, for any reason, the new firmware is not completely and successfully transferred to the AMS-8061, the station will automatically restore the old firmware in order to prevent malfunctions or stops.

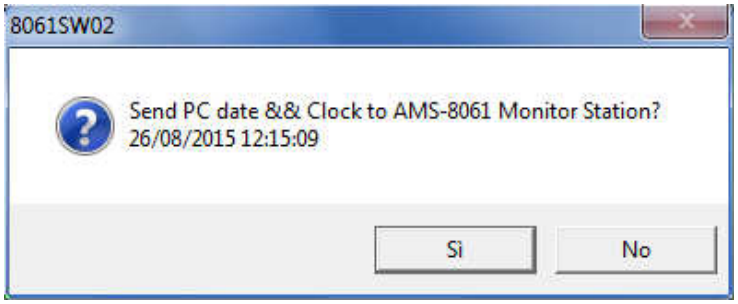
NOTE

The AMS-8061 firmware and software updates are available for downloading from the internet web site www.narda-sts.it

7.5.24 Station Date & Time

Use the Set Clock command to update or change the internal clock in the station and synchronize it with the time set in the PC.
The operation will be carried out automatically after every connection if the **Synchronize on exiting** option is enabled.





NOTE

The internal clock of the station is very accurate and in many cases much more accurate than the clock on the PC. The internal clock is not automatically updated to summer time and/or to standard winter time.
When the internal clock of the station is changed, some readings may no longer appear contiguous and gaps may be found.
For this reason NARDA recommend to use of this function sparingly

WARNING

It is recommended to check the station clock before starting any new monitoring campaign.
Be sure to download any useful data before clock setting as previously acquired field data will be no more downloadable.

7.5.25 General Commands

Four general commands are located at the bottom of the main window:

Read Station Conf
Enable Setting
Sub Bands
Hang & Exit

7.5.26 Read Station Conf.

To read the status of the AMS-8061 station, select **Read Station Conf.** Click on the button to start a new query of the station to update the control window.

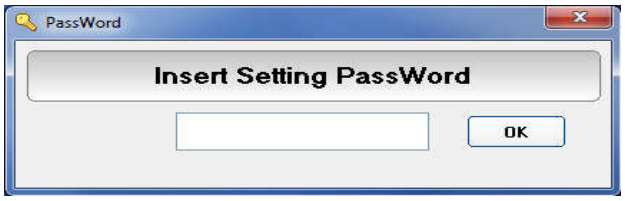
NOTE

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

7.5.27 Enable Setting

To enable settings on the monitoring station, click on the **Enable Setting** button**.**

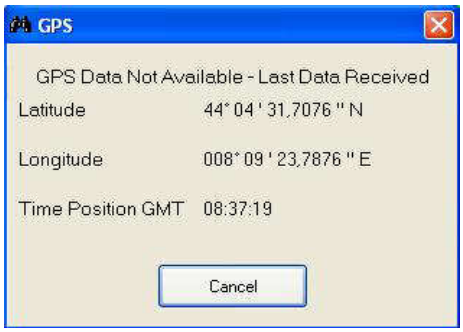
The software will ask to enter the Setting password:



7.5.28 GPS

This frame shows the GPS position information.

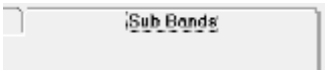
The GPS module takes the position data on regular basis and every time the modem switches ON. In case data are not available, for example when the station is installed indoor, the following message is displayed:



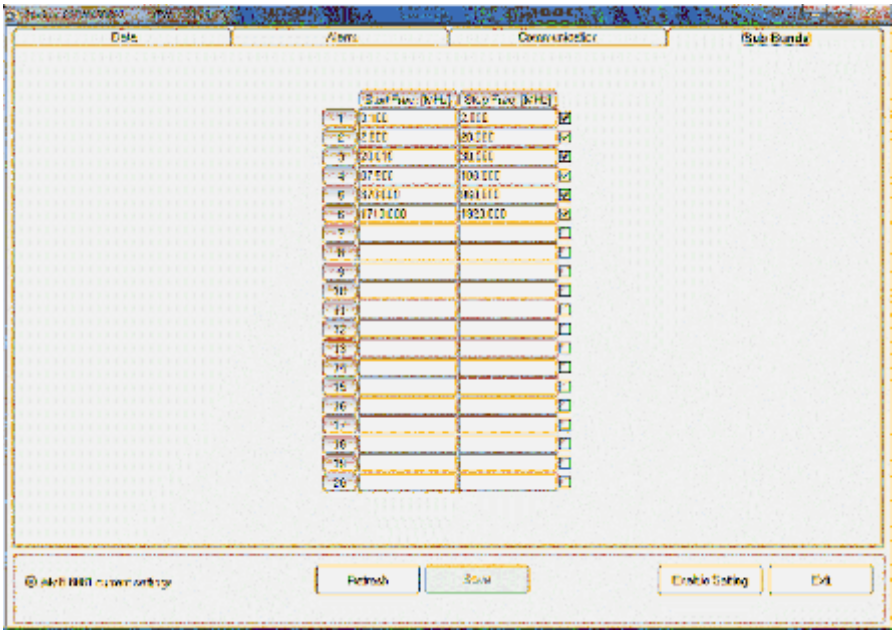
7.5.29 Hang & Exit

The Hang & Exit button ends the ongoing communication with the monitoring station and returns to the main window.

7.5.30 Sub Bands

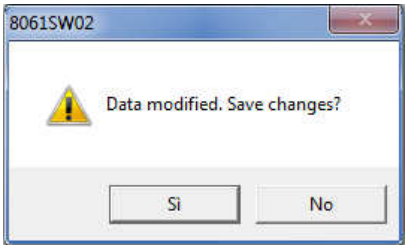


The **Sub Bands** window allows viewing and setting up to 20 frequency bands to be investigated. When the tab is opened, the actual bands configuration is shown.
Each band can be activated for the selective analysis by ticking the corresponding box.



After the band configuration has been downloaded you will see the list of the bands, each one indicated with its start and stop frequencies.
Click **Enable Setting**, and enter the proper password, to make any change.
The **Refresh** button can be used to restore readings.

If any parameter has been modified, pressing Exit the following message appears:



Press Yes to save changes or No to discard them and restore previous configuration.

Each frequency band can be selected and edited (pressing the Enable Setting button) as required, keeping in mind the following few rules:

- 20 frequency bands as maximum;
- in each band the **lower frequency** value must be smaller than the **upper frequency** one;
- no overlap between frequency bands;

NOTE

Very high fields, which frequency is out of the overall frequency range of the created table (from minimum frequency of first band to the maximum frequency of the last one) but within the receiver range (100 kHz – 6 GHz) may cause saturation of the receiver causing wrong measurements.

WARNING

Please consider the sweep time, and consequently the power consumption, is directly related to the number and size of the frequency bands.

NOTE

Frequencies are expressed in MHz.

Click on a specific band to edit band parameter as follows:

	Start Freq. [MHz]	Stop Freq. [MHz]	
1	3.500	3.800	☐
2	7.000	7.200	☑
3	14.000	14.350	☐
4	21.000	21.450	☑
5	144.000	146.000	☑
6			☐
7			☐
8			☐
9			☐
10			☐
11			☐
12			☐
13			☐
14			☐
15			☐
16			☐
17			☐
18			☐
19			☐
20			☐

NOTE

Even though it is not advisable to set overlapping bands, it can be done in specific situations, such as, for example, when a certain portion of the frequency spectrum must be deeply investigated.

NOTE

Process time depends on band configuration.
This parameter limits the **Rate** selection, as it is, obviously, not allowed having a number of frequencies that requires a sweep time longer than about a half of the rate selected.

NOTE

The minimum span (difference between stop and start frequencies) allowed is 110 kHz.

WARNING

It is not advisable to have a band crossing the frequency of 20.0 MHz since this is the frequency where the internal receiver switches between low-range module and high-range module.

Each data input or change can be confirmed clicking on the "**Save**" button. Eventual setting errors will be notified with a message.

NOTE

When using the AMS8061 EHA-2B dual band antenna, and, in general, when frequencies below 1 MHz are to be measured, the band table should be defined in order to avoid measuring the "0Hz" signal which exist in every spectrum analyzer.

NOTE

Every spectrum analyzer displays the 0 Hz signal every time the RBW filter is larger than half the minimum frequency to be measured.

NOTE

To achieve a good scanning speed without affecting the measurement accuracy, the AMS-8061 sets automatically the larger RBW filter, which allows at least 4 measurements during the scan of the narrowest band of the table.

The narrowest band of this table is 1.9 MHz wide (set1: from 0.100 MHz to 2.000 MHz).

The other bands, being very wide, would not activate a filter as narrow as the one for the first band.

Starting from 100 kHz with a 200 kHz (or wider) filter would cause the "0 Hz" signal to be measured…

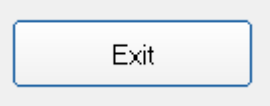
	Start Freq. [MHz]	Stop Freq. [MHz]	
1	0.100	2.000	☑
2	2.000	20.000	☑
3	20.010	30.000	☑
4	87.500	108.000	☑
5	876.000	960.000	☑
6	1710.000	1920.000	☑
7			☐
8			☐
9			☐
10			☐
11			☐
12			☐
13			☐
14			☐
15			☐
16			☐
17			☐
18			☐
19			☐
20			☐

WARNING

Since the system is very flexible and open, when setting the frequency bands, the User must be conscientious of what he is going to do.
Parameters incompatible with each other can cause system crashes and inconsistent readings.

7.5.31 Exit

The **Exit** button ends the ongoing communication with the station and returns to the main window.



7.5.32 Download data via serial port, RS232

In some situations where, for example, the GSM signal is very weak or there is no coverage of the network by the GSM Service Providers, it is possible to make an acquisition of long term data without downloading them daily via GSM. At the end of the desired acquisition period, or on regular basis for longer periods, the data can be downloaded to a PC using one of the station's serial ports and a direct RS232, USB or Ethernet link.
The procedure to follow is:

- Open the station by removing the radome
- Connect the serial cable supplied between the RS232/USB/Ethernet connector on the AMS-8061 station and the corresponding port of the PC
- If necessary, change the properties of the icon of 8061-SW02 entering the command COMM=N; where N is the number of the COM port on the PC where the RS232 is connected
- Run the software
- Call the station by pressing the **CALL** button

NOTE

Refer to chapter 1 and 2 for details regarding battery charging, station positioning and further information about installation.

With no modem in use, the software will promptly display the message:

Answer **YES** to enter the station menu to download the data or change its configuration.

7.5.32.1 Possible errors

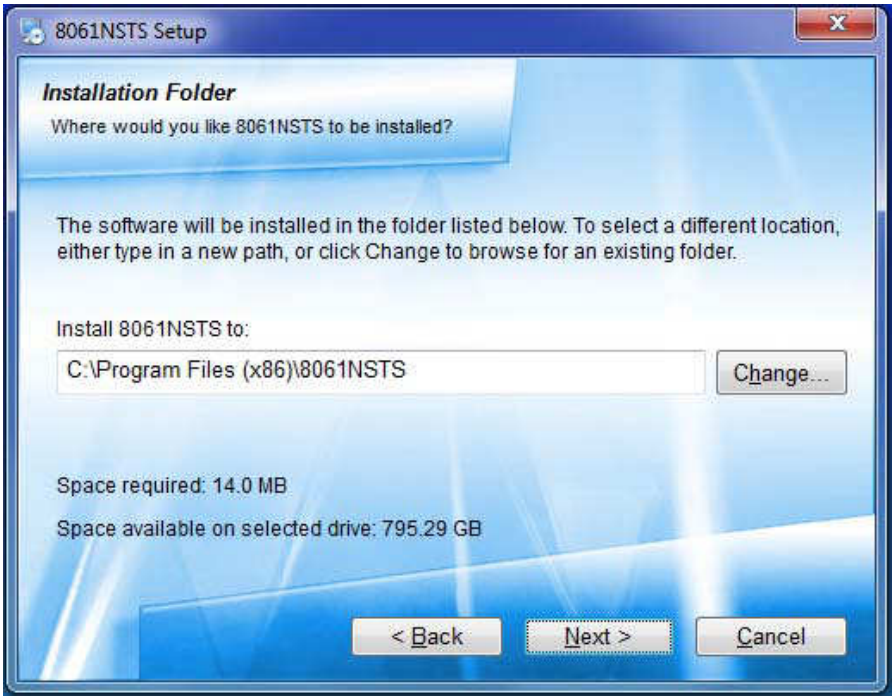
If the station is switched off, the serial communication cannot take place and the error message is:

Answer **NO** and try to solve the problem checking the conditions of the cable and if it has been connected to the port used by the software.

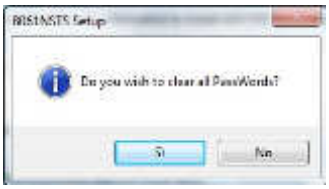
If the answer is **YES**, the software will show the existing communication at the time of the latest data download.

7.5.33 Software update

To update the software you can download, free of charge, the latest release from the NARDA website: www.narda-sts.it
Registration is required.
After you have saved it into the PC, you must decompress it to get the complete list of files to be installed. You can save them into a CD or into the PC hard disk.
The updating procedure is like the first installation one.



Press **Next** to complete the installation.



During the installation process the software will ask the User if he wants to cancel all the existing Passwords.
If the answer is **YES,** all the stations and measurements already saved will be hidden, but still accessible by adding all the stations used and maintaining the original name (respecting upper and lower case letters) and phone number.
With this procedure, all hidden stations are made accessible to the User.

Answering **NO**, all the stations, telephone numbers and the respective Device Passwords will be immediately visible to the User.

The **8061NSTS** folder and the **8061SW-02** icon will be updated.

7.6 FTP mode

FTP

FTP (File Trasnfer Protocol) is a standard network protocol used to transfer computer files between two hosts over a TCP-based network, such as, for example, the Internet.
In this operating mode, the data are stored in a server as it is for a cloud system.
The SIM card installed in the area monitor modem, must specifically be enabled for FTP/Internet communication mode.

The FTP connection between the remote station and the data server is available via Modem (wireless) only.

The first connection may take place either via GSM modem (if available, depending on station model) or via direct RS232, Ethernet or USB connection. The direct connection is much faster; therefore, it is advisable to make the first connection in this way even if the subsequent operations will be done via GSM modem. For more details, see chapter 2.

7.6.1 GPRS/FTP Introduction

AMS-8061 area monitors can be set to operate using two different remote communication modes, both using the GSM network: CSD (Circuit Switched Data) and GPRS (General Packet Radio Service).
The user should decide in advance the communication mode for each station as CSD communication mode is not allowed while a station is set for GPRS and vice versa.

This section provides operating instructions and suggestions to correctly use AMS-8061 area monitor set for GPRS communication mode.

Please refer to chapter 3 of this manual for remote CSD and local RS232 or USB or Ethernet communication.

Remote communication in CSD mode is protected by a "Device Password" that is stored in every AMS-8061 Area Monitor.
The same password must be set, by the user, in the CSD station list provided by the control software.
Remote communication in CSD mode is not allowed in case the two passwords do not match.
Device passwords are not checked during local RS232 or USB or Ethernet communication.
All the monitoring stations are initialized in the factory with the password "PASSPMM" that is advisable to replace during the first connection.

7.6.2 Brief description of GPRS communication

When a GPRS modem switches on, it links up with the GPRS network.
Assuming that parameters such as Access Point Name, User Name and Password are correctly set by the user, the modem accesses the Internet to establish packet data communication towards other devices identified by their IP addresses.

Unlike CSD data communication, there is no need to establish a direct connection between two devices by means of a call to a telephone number. Each data packet put in the network includes the receiver IP address so that any packet can be delivered efficiently.

In GPRS mode the telephone channel is not engaged continuously but only when some data have to be transmitted. In this way a single telephone channel can be shared between users or more channels can be used at the same time to improve the communication speed.

Usually there is no need to ask the provider for specific data service as SIM cards are often already enabled for GPRS.
An evident advantage using internet for data exchange is that it allows access to data from anywhere, at low cost, regardless distance.

7.6.3 Monitoring networks

The monitoring network is a system composed by one to several AMS-8061 remote monitoring stations and a controller PC running the 8061SW-02 control software.

Remote stations continuously perform field measurements and store results in their internal memory.
At programmed time, each station downloads the stored results to the controller PC in a different way depending on the communication method that have been decided in advance.
In this section GPRS communication method only is taken into consideration.

7.6.4 System operation in GPRS mode

After initial installation, there is no direct communication between remote stations set for GPRS mode and controller PC.
A user's FTP server, with a static IP address, must always be available, presuming availability of the GSM signal at the remote station installation site, for AMS-8061 to download data to the server itself.
When connecting to the server, the remote station will check for the existence of any request to modify its setting or to download results related to some specific time interval.
In case, the station will proceed accordingly by changing its setting or by downloading the requested data. If no special requests is found, the station downloads all measurement results which have been acquired since the previous access to the server.

To avoid generating undesired electromagnetic fields that would be measured by the station itself, the station GSM/GPRS modem, which allows communication with the FTP server, should be set to be off for the major part of the day.
At the programmed time, set by the user, the modem switches on and the station access the ftp server to download its results.
Depending on the setting decided by the user, various abnormal conditions regarding field strength and station operation, generate alarm events able to immediately switch on the modem to access the server and/or send SMS to the user's mobile phone.
Being the modem a power consuming component, it is advisable to avoid programming the station to access the server more than once a day to

avoid, specially during bad weather periods, affecting the energy balance between solar panel and battery backup.

The main interface to the system, from the operator side, is the controller PC.
When desired, through the control software 8061SW-02, the user can select a remote station from the station list and access the station folder opening an ftp connection to the server.
All data not already downloaded from the server to the controller PC are then downloaded and a new setting file, if requested by the user, is transferred to the server to be read by the station when it will access the server.
The controller PC needs a full internet connection allowed for File Transfer Protocol.

Due to the GSM network signal quality, it may happen, sometimes, that the station is not able to access the ftp server at the scheduled time. No data will be anyway loss, being downloaded at the next time connection.

7.6.5 Some advantages

Any remote unit (AMS-8061 area monitor) downloads its data to the FTP server, at scheduled time, according to the user setting.
The controller PC is able to retrieve them whenever desired without any need to establish a direct connection to the remote station.
Integrity check of transmitted data is automatically performed by the remote station.
In case of bad GSM signal quality, remote stations automatically try several times to access the network and download measurement results.
The small dimensions of data files normally transferred by our systems make it convenient to choose telephone charges based on data volume usually available for GPRS service.

7.6.6 Remote station

- A SIM card enabled for GPRS communication must be provided by the user and inserted in the SIM card slot according to instruction provided by this manual.
- The SIM card PIN code must be disabled using a mobile phone

Information required for GPRS communication:
- **APN** (Access Point Name)
- **UN** (User Name)
- **PW** (Password)

The above parameters are specific of the SIM card provider, it often happens that User Name and Password are not required.

Some examples:

Italy: APN for a Vodafone SIM card is: web.omnitel.it
User name and password are not required.

Greece: APN for a Cosmote SIM card is: internet
User name and password are not required.

China: APN for a China Mobile (Shanghai) SIM card is: cmnet
User name and password are not required.

Configuration of the above, as well as ftp server parameters must be done in advance, before on site installation, using the controller PC running the provided 8061SW-02 control software or, as an alternative, by means of specific messages (SMS) to be sent to the station telephone number.

A Narda STS ftp server is available to our customer for preliminary tests:
IP address: 109.233.121.232
User Name: 8057
Password: pmmpass

7.6.7 Minimum requirements of the controller pc

Minimum requirements of the controller pc
- Operating system: Windows XP, Vista, Win7, 8;
- Pentium processor;
- at least 256 MB RAM;
- at least 100 Mb of space free on your hard disk;
- Full Internet connection (**the PC and network firewall should not close the ports 20 and 21 normally used for FTP connection**)
- 8061SW-02 provided control software should be installed

8061SW-02 control software has been developed to operate properly with different Date /Time formats that can be selected through the Regional Settings of the Windows Control Panel.
Non all the possible combinations has been tested.
A functional test by setting European format (dd/MM/yyyy , HH:mm:ss) is suggested in case a malfunction is noticed.

7.6.8 FTP server requirements

FTP server requirements:

A STATIC IP address is required for the FTP server.

The following information regarding the ftp server must be available to set-up correctly remote units and controller PC:

IP address (it is the static IP address assigned to the ftp server)
User name and Password (to be allowed to exchange data with the ftp server)

Username and Password must only contain alphanumeric characters; any special characters are not allowed.

7.6.9 Brief operating description and file structure

Basically, at scheduled times, the AMS-8061 regularly establishes, via GPRS, a connection to the server through FTP:

- First it loads, if any, all the (new) settings which have been written by the (client) application.
- Then it writes all data that have been requested by the application.
- Finally it erases all previous required settings in order to avoid reloading them at the next connection. Note that data related to field measurements are never deleted by the station.

After that, the connection is terminated.

7.6.10 Structure

To avoid having multiple stations that store data in the same directory every data exchange is done on a directory named as the serial number of the monitoring station itself. Here, an example of directory structure:

FTP_Root
000WE41003
8061.CFG
8061.set
8061FLD.TXT
17_08_01_07_09_.D61

Directories are created by the control software, at the first connection to the server, after the station parameter set-up has been completed. Remote station will not create any directory. **The user must ensure that the directory have been created before operating the remote station.**

7.6.10.1 CFG File (configuration)

Whenever the AMS-8061 connects to GPRS and accesses to FTP server, it looks for a file named 8061.CFG in its directory (its serial number). If the file is present, the AMS-8061 retrieves it and calculates the checksum in order to use it and thus get the new configuration. If the checksum is wrong, the file is discarded otherwise the new configuration is taken.
Is important to note that the new setting will not take effect immediately but only after the connection is closed.

Please refer to chapter 3 of this manual for GPRS/FTP detailed information and communication protocol.

7.6.10.2 FLD File (Read)

After having dealt with the configuration file 8061.CFG, the AMS-8061 check for the presence of a file named 8061FLD.TXT.
This, is an ASCII file which contains the date of the first requested record and the number of them. The syntax is: **FLD HH:mm;GG/MM/YY; n** where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year
- n is the number of records required (if n="---" then all records starting from the date/hour up the last recorded record will be uploaded).

For example the string FLD **18:13;23/07/09;100**
Asks for 100 records from the 23th of July 2009 at 18:13 .

If, instead, the string would have been FLD **18:13;23/07/09;---**
It would ask for all records from the 23th of July 2009 at 18:13 up to now.

Note that, in case of "---" (up to now option), in order to avoid huge files and long transfer time, the number of records will be limited to about 5000.

Once the AMS-8061 has read the file 8061FLD.TXT, it deletes it. It will be replaced later with the newer self-created 8061FLD.TXT, which reflects the last uploaded record.
This solves the continuity of records even without any external intervention. Indeed, for every connection the AMS-8061 uploads the records and writes a new FLD file which reports the date/hour of last record so that next connection will continue from this having thus an uninterrupted series of records.

7.6.10.3 Record File (Write)

After having read the FLD file, which informs the AMS-8061 about which records have to be uploaded, it writes a file named HH_mm_GG_MM_YY.D61 where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year

This file, in binary format, contains the downloaded measurement results.

7.6.10.4 FLD File (Write)

After having written the record file HH_mm_GG_MM_YY.D61, the AMS-8061 writes the file named 8061FLD.TXT which replaces the old one.
This, is an ASCII file which contains the date of the last uploaded record and terminates with the string "---".
The content will be therefore: FLD HH:mm;GG/MM/YY;--- where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year

For example the string FLD 20:30;23/07/09;---
Says that the last updated record is related to the date of 23th of July 2009 at 20:30 .

If the user does not need a specific period but, as usual, a simple continuous data logger , there is no need to write any FLD File as the system is self-sufficient.

7.6.10.5 Event File (Write)

After having written the FLD file, the AMS-8061 writes a file named HH_mm_GG_MM_YY.TXT where:

- HH is hour of the day.
- mm is minute of the day.
- GG is the day.
- MM is the month.
- YY is the year

Which represents the events file.
This, is an ASCII file which contains all the new events since last connection.
Alternatively, soliciting a connection, by the SMS command, different event history can be retrieved as follows:

- SCGNA : all the stored events are written in EVENT.TXT file
- SCGNL : The last 20 events are written in EVENT.TXT file

The content of EVENT file is the chronological history of all events up to the time of connection (RTC setting assumed to be correct).

7.6.11 First installation and Parameter setting

First configuration of each station and its functional test should be performed before installing the station on site.
User must ensure that the GSM signal is available in the installation site.
Refer to chapter 1 and 2 for details regarding battery charging, station positioning and other information about installation.

Main steps:

1 - Set-up the remote unit and recharge batteries as explained in the chapter 1 and 2;

2 - Install 8061SW-02 control software in the controller PC by running 8061NSTS setup and follow on screen instructions (see chapter 3);

3 - Check the COM port number assigned to the RS232 or USB port (or USB/RS232 adapter)
It may happen, using USB port or USB/RS232 adapter, that the assigned COM port number exceed 09.
In this case change the setting of your port in the Windows control panel (advanced setting) to assign a COM port number between 01 and 09 (see chapter 3);.

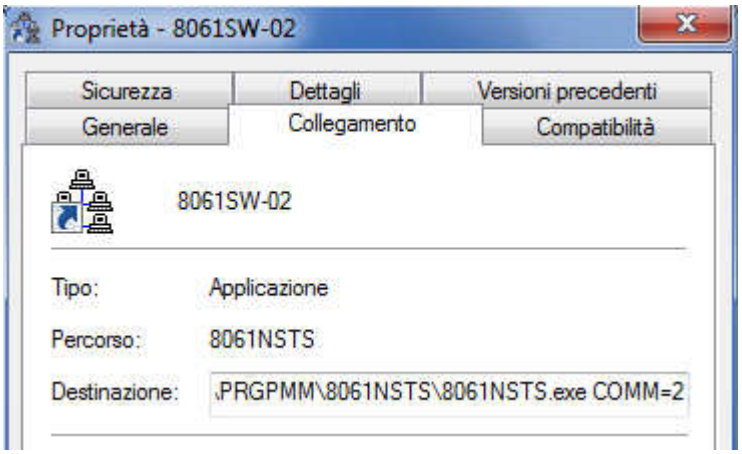
4 - Select the icon **8061SW-02** with the right mouse button;

5 - Select **Properties**

6 - Add the command COMM=N preceded by a space (in capital letters) at the end of the Destination field where N indicates the serial port to be used; for example, if the AMS-8061 Area Monitor is connected to port 2, add the command COMM=2.

NOTE

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



NOTE

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

7 - Then confirm by selecting **Apply**

8 - Connect the Area monitor to the PC with the provided cable, switch the station ON and run 8061SW-02 control software.

9 - Set Terminal and Setting passwords as requested by the software (If desired, Terminal and Setting passwords can be the same word). Take note of your passwords as they are needed to operate the application software.

10 - Select **FTP** section in the top side of the main window

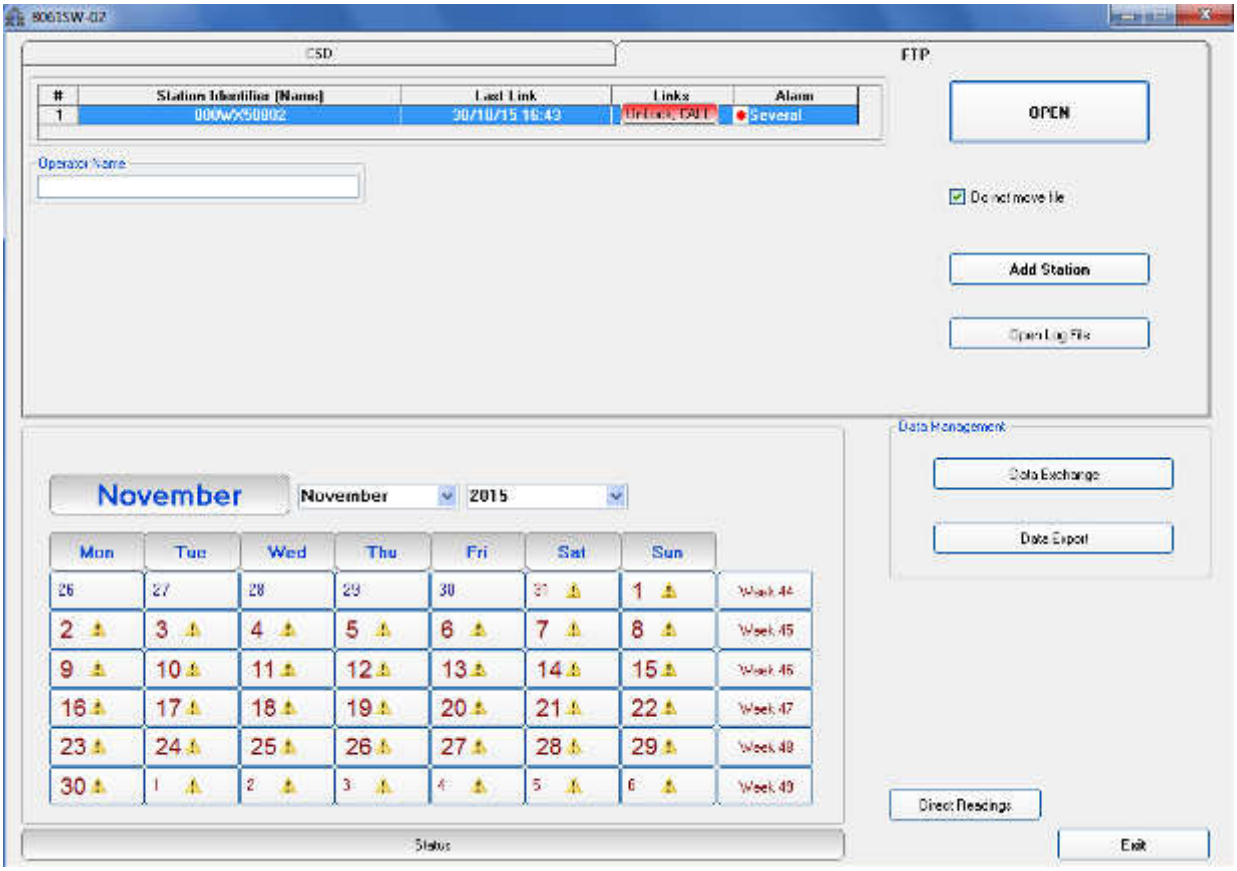
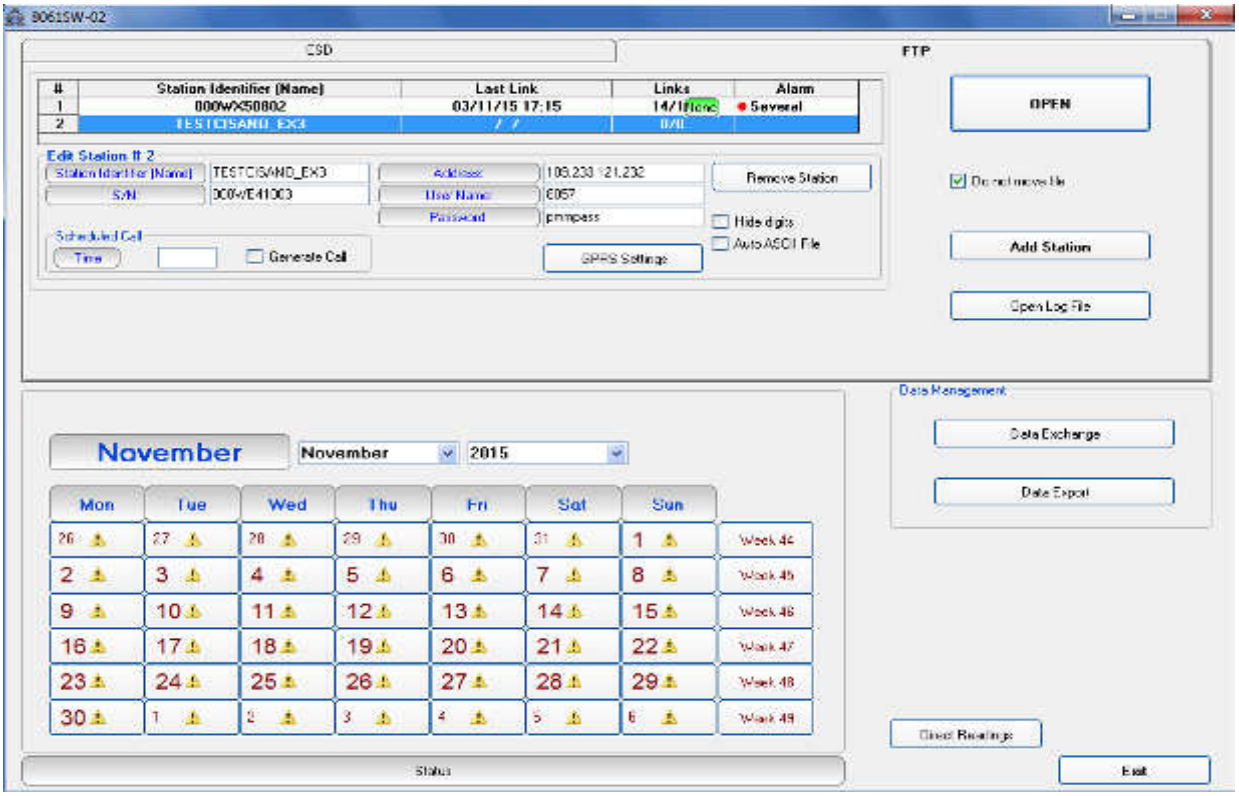


Fig. 7-1 FTP Main window

11 - The station list contains only one station as an example.

12 - Click **Add Station** button on the right side to add a new station to your list and fill the new form with requested parameters:



Station Identifier (Name):
"TESTCISANO_EX3" in this example, you can decide for any alphanumeric name.
The station list cannot contain two or more stations with the same name.
The folder containing all information and data of a specific station is created automatically by the control software. The folder name is the same assigned to the station in the station list.

S/N:
"**000WE41003**" in this example, is the serial number, different for any station.
By means of the control software a new directory with the same name will be created in the FTP server. It will be used for any data exchange between PC-server FTP and station-server FTP related to this specific station.

Address:
"109.233.121.232" in this example Narda STS ftp server IP address that can be used by user for preliminary tests. Be aware that data in this server are periodically removed.
User must set here the **static IP address** of his FTP server.

User Name and **Password:**
Respectively "8057" and "pmmpass" in this example to access the Narda STS ftp server for test.
User must set access parameters for his own ftp server.

NOTE

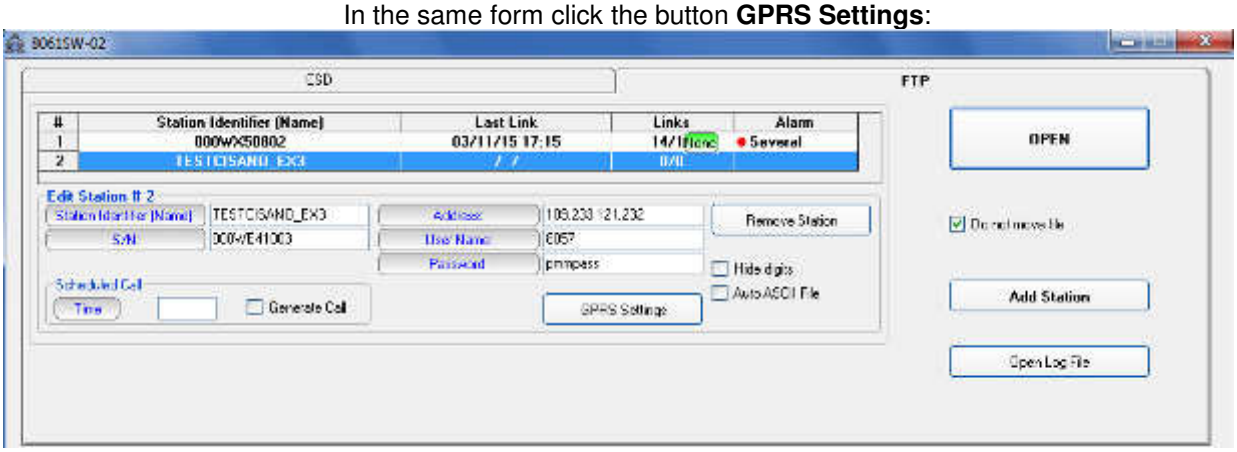
The above information S/N, Address, User name and password are necessary for the controller PC to access the ftp server for downloading station measurement results and change setting to the remote station.

NOTE

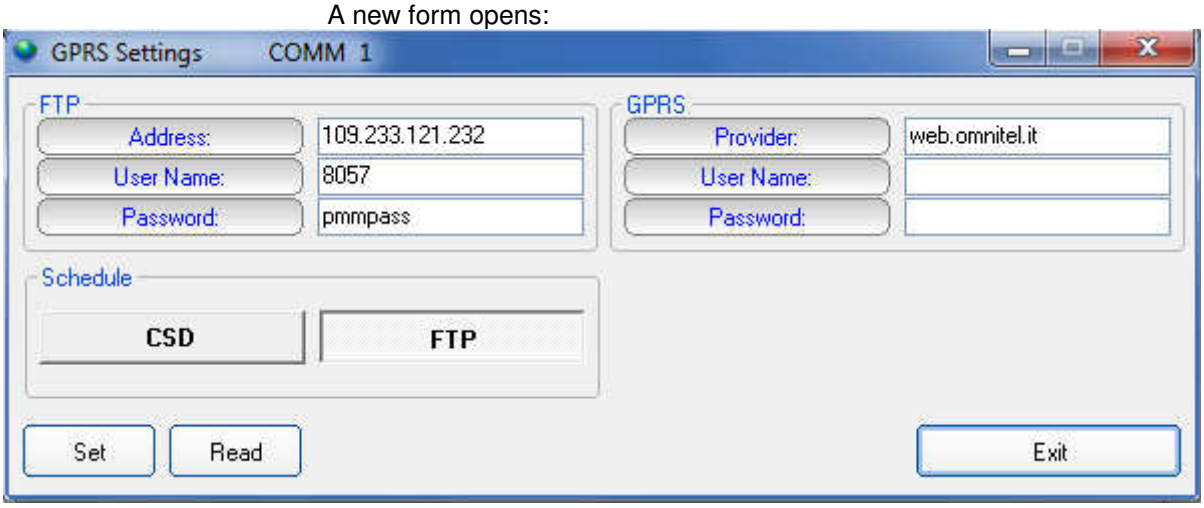
After typing, press "Return" key to set each single parameter. Every time a single parameter is set in this form the user will be asked to type the terminal password.

13 - GPRS parameters setting

In the same form click the button **GPRS Settings**:



A new form opens:



Select the button **FTP** in the frame **Schedule** if not already selected.
Fill the same parameters, Address, User Name and Password for the FTP server. These parameters will be transferred to the station and will be used by the station itself to access the ftp server for downloading measurement results and upload any new configuration file.
In this example, parameters for the Narda STS ftp server are set for preliminary test.
User should then set access parameters for his own ftp server.

Fill the **GPRS** section with parameters needed by the station to link the GPRS network.
In this example are set parameters for an Italian Vodafone SIM card (see the above paragraph **Remote station requirement** for details).

Click the button **Set** to store the above parameters in the station memory.

NOTE

Use the Read button to display GPRS parameter of a station connected by the RS232, Ethernet or USB cable.

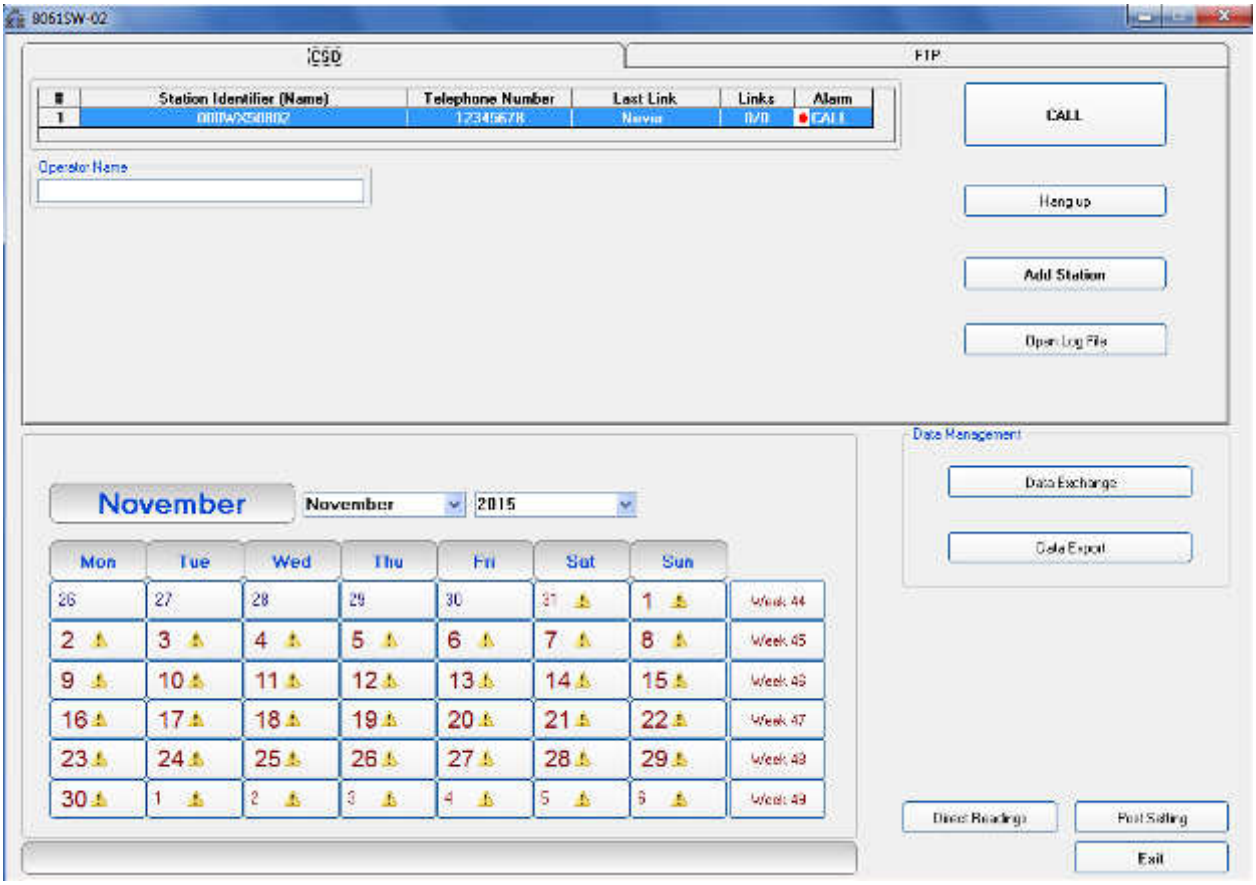
Click **Exit** to close this form.

14 – Setting station RTC (Real Time Clock)

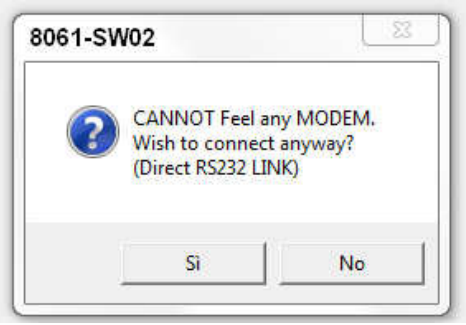
The station clock is very important as every field data stored by the station is related to time taking, as a reference, the station RTC.

Being connected through the cable the station clock will be set.
After on site installation, having no direct connection between controller PC and remote station, RTC will be set, if required, by means of a cell phone, sending an SMS to the station.

Select the **CSD** section of the 8061SW-02 control software and select one station from the stations list (the first installation will show only one station set by the software as an example):



Select the station (**000WX50802** in the example) and hit the button **Call**, on the right, to access the station connected by cable.
As the CSD mode normally operates through a modem, a message will inform that no modem has been detected on your COM port. It will ask whether you wish to access a station connected by cable. Being this the case, you will answer **Yes** to access your station through the Serial or USB cable:



The station name is always stored within the station and it is expected that it matches the name, in your station list, that have been selected before calling.
The user station have not been added to the CSD station list as the GPRS communication mode has been decided, in advance, for this station.
Answer **No** to the next messages as you neither wish to change the station name, nor add in the CSD station list the station you are using:

Answer **No** as you do not wish to change the name stored within your station.

Answer **No** as you do not need to add this station to the CSD station list, you are going to use it in GPRS mode. This station is in your GPRS station list.

The station Setting window will be shown:

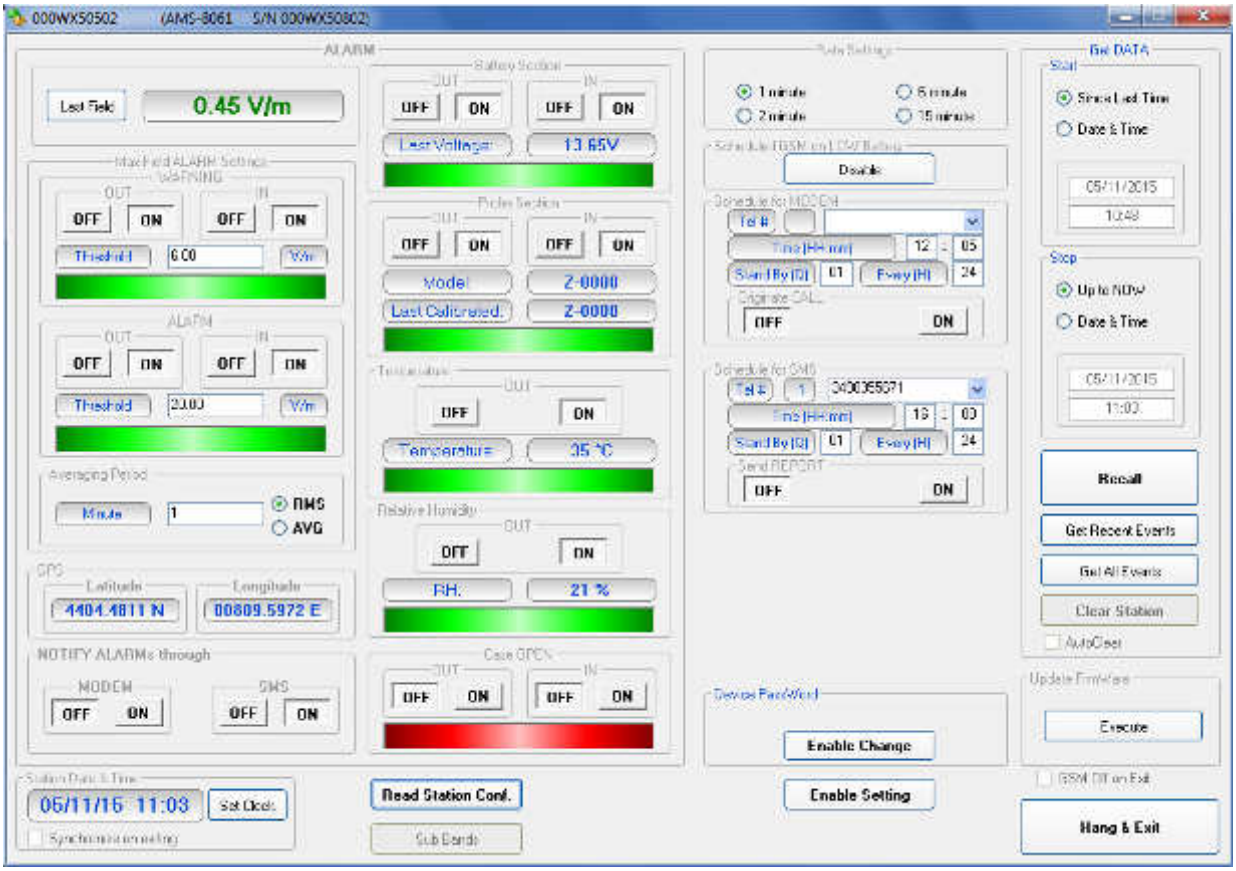


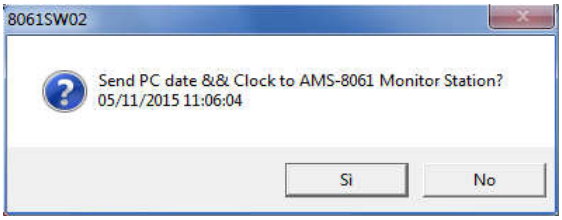
Fig. 7-2 Setting window

The above picture shows the “000WX50502” station. Please note that the station clock (RTC) has already been set, as it shows the date, in the “Station Date & Time” frame on the left bottom side, 5th November 2015.

Hit the button **Enable Setting**, on the bottom right side, to modify the settings of your station.
You should remember the setting password that have been set the first time this software has been run. You will be asked to type it to be allowed to modify the station settings.

Type the setting password to be allowed to change RTC.

Hit the **Set Clock** button (left bottom side), the following message will be displayed:



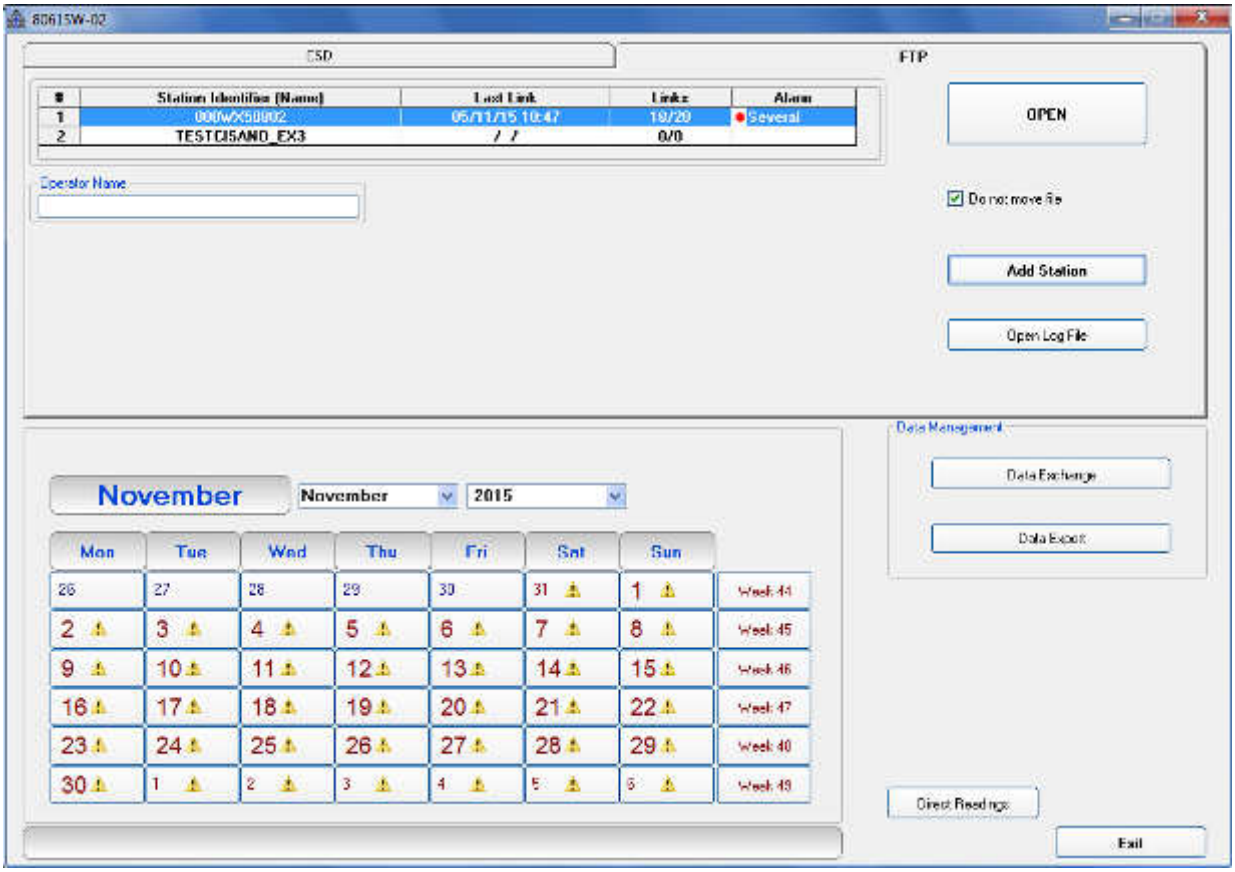
Click suddenly **Yes** to synchronize the station clock with your PC.
The station clock is now set.

Hit the **Hang & Exit** button on the right bottom side of the setting window.

15 – Accessing the FTP server

Be sure a full internet connection is available for the controller PC. The firewall, if active, should not close ports 20 and 21 usually used for ftp communication.

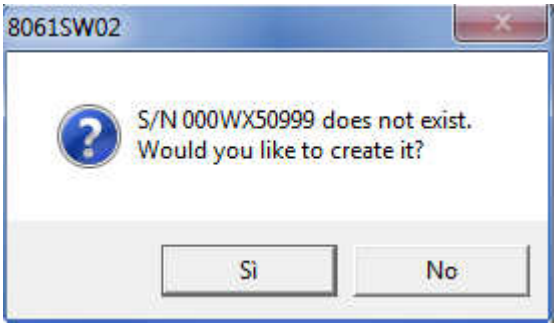
From the 8061SW-02 main window, select the **FTP** label, your GPRS station list will be shown.



☐ Do not move file

If the function “Do not move file” is enabled (default) the data stored in the ftp server by the station will be still available for a future download even from a different station.

Select your station and hit **Open** to access the ftp server.

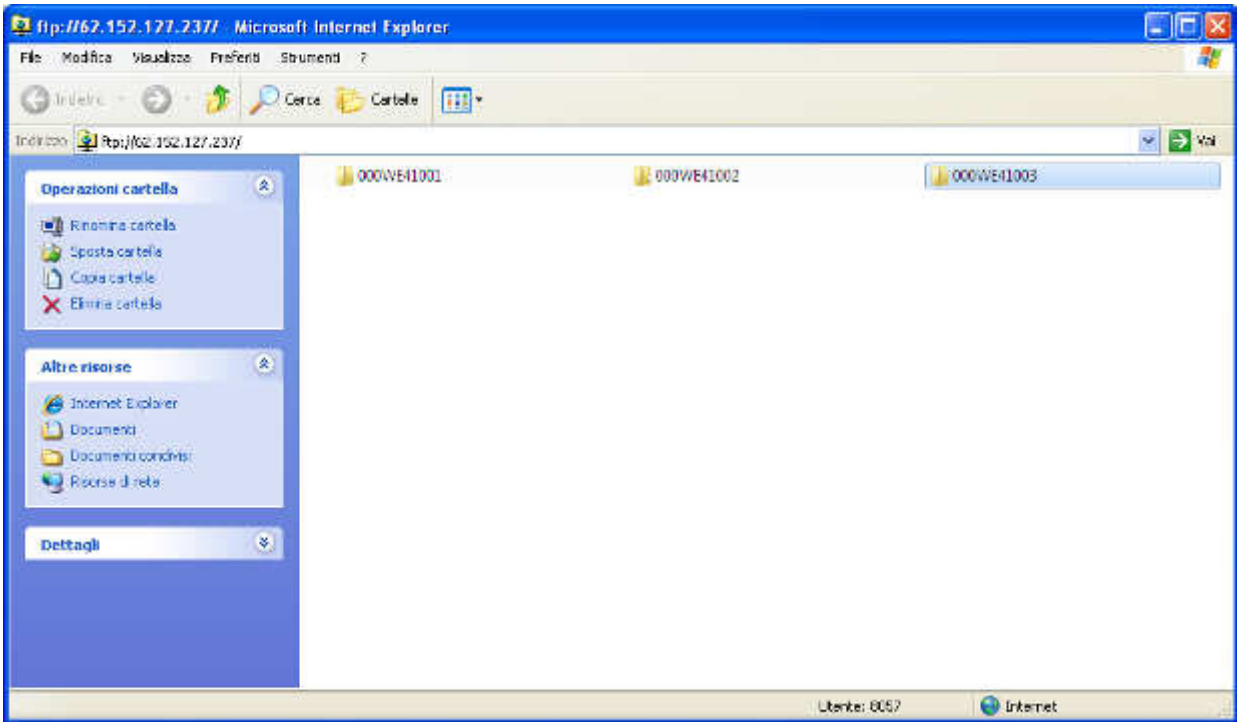


The station folder, into the ftp server, has not been created yet, answer **Yes** to create it.
The name of this folder will be the same as the station serial number that you already set; it will be used for any data exchange between Controller PC – FTP server and Remote Station – FTP server.

Hit **Yes**, the folder will be created.

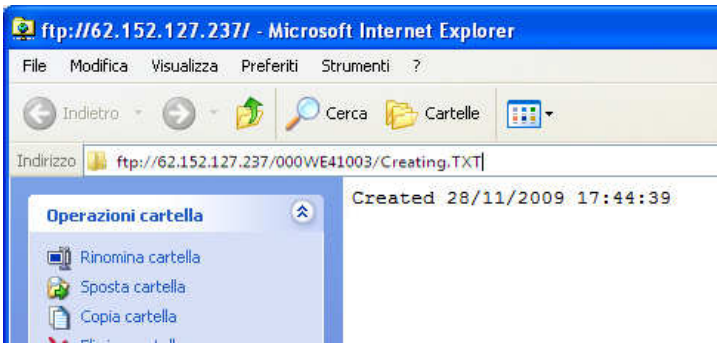
NOTE

You can check it just accessing your ftp server using Windows Explorer.

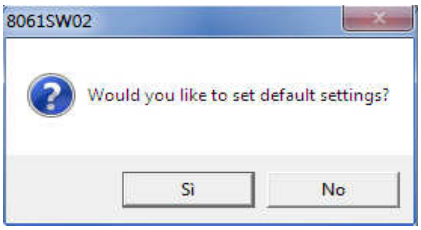


IP address, User Name and Password are to be set to access the ftp server through the Windows Explorer.

The only file you should find within the new folder is the “Creating.TXT” which contains information about creation date and time:

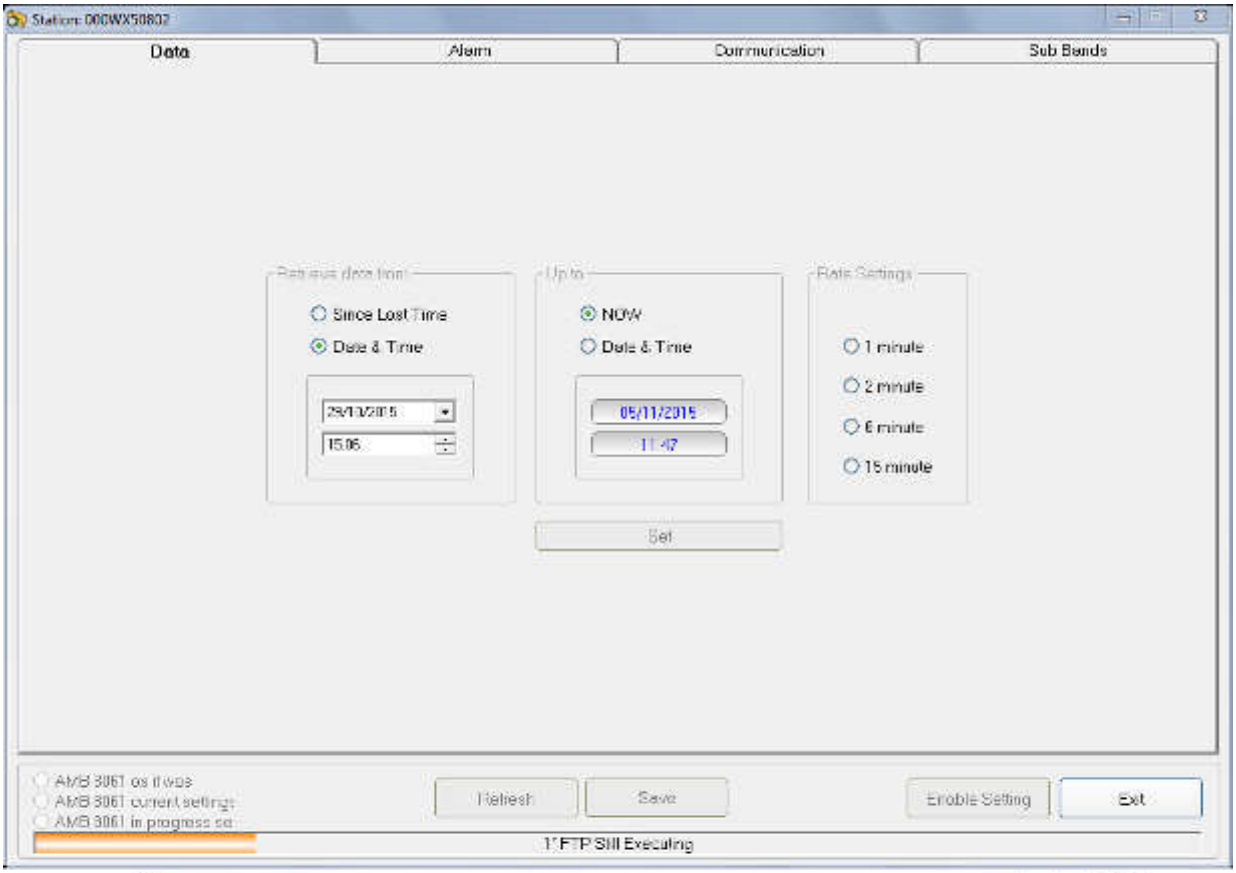


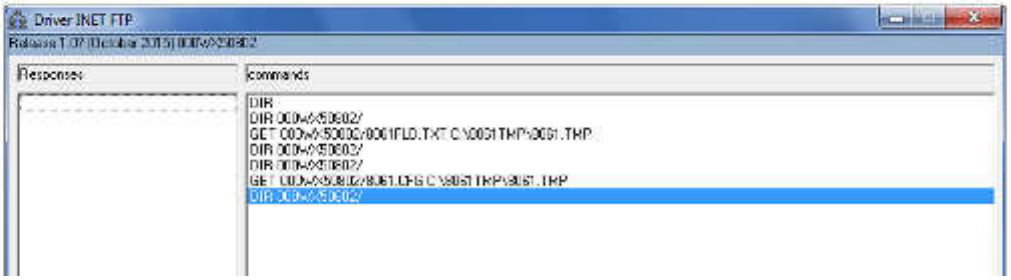
Next message shown by the software just ask you whether you wish to display a default setting which should be saved or modified by the user to save the first setting file ".cfg" which will be read and used by the station at its first connection to the server:



Answer **Yes** to display default setting.

The first section **Data** will show which data will be downloaded by the station at the next connection. The default setting is "Since" date-time (your PC clock) – "Up to" now (when the station will access the server).





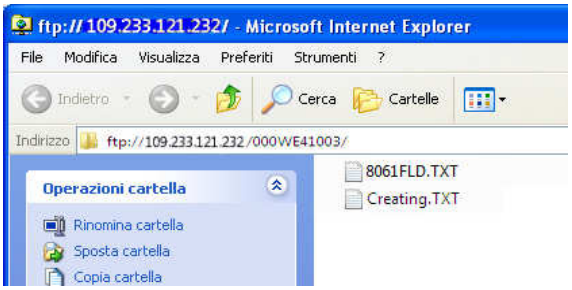
Meanwhile it will be shown the **DRIVER INET FTP** window; this driver manages the download and upload data in the ftp server.

Hit **Enable setting** and type the Setting Password to be allowed to hit the **Set** button to create the first .FLD file that will be read by the station, at its first connection to the server, to know which data have to be downloaded.

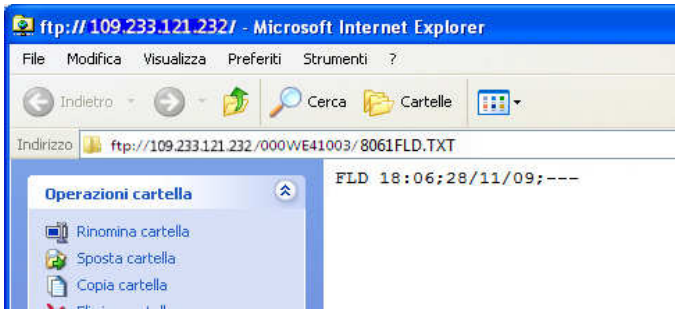
The Rate Setting frame, on the right, allows you to set the rate setting. It is the **storing rate** of the station. In the above example the station will store the field measurement, in its internal memory, every 6 minute.

NOTE

You can check that the 8061FLD file has been created by accessing the ftp server using Windows Explorer. Open the station folder (the name is its serial number).



8061FLD.txt file contains information related to the next data the station should download when accessing the ftp server:



The above picture shows the content of 8061FLD file. After reading this file the station will download data starting from November 28th at 18:06.
Last information, "---"in this case, shows how many records have to be downloaded.
"---" means "up to now" so: all data that have been acquired since November 28th at 18:06.

A different information, let's say "80" instead of "---" means 80 records.
In which case the time period depends on the **storing rate** that have been set for this station.
If the storing rate was 6min, 80 records means 6 x 80 minutes = 480 minutes that means 8 hours:
Downloaded data will be: "Since" November 28th at 18:06 "Up to" November 29th at 02:06.

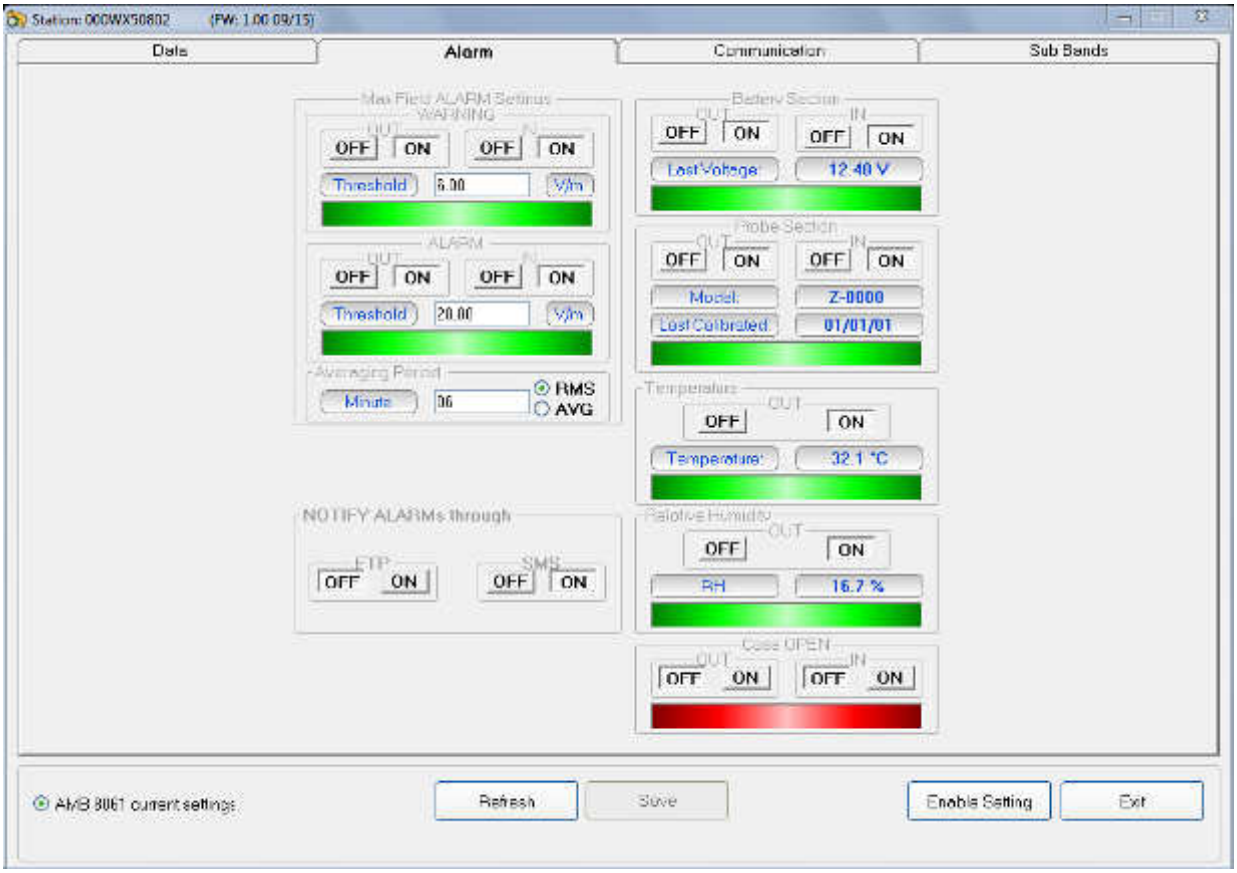
NOTE

It is usual to set any monitoring station to download data "Since last time" – "Up to now" so that everytime the station access the server it downloads all data that have been acquired since the last access to the ftp server.

NOTE

In case, due to some special need, a specific time period should be downloaded by setting the parameters "Retrieve Data From – Date&Time / Up to – Date&Time", continuity of data to be downloaded later cannot be resolved automatically and a gap will be shown since last data already downloaded up to the time of next connection.
After downloading the requested specific time period the parameter "Up to" will be automatically set to "Now".
The parameter "Retrieve Data From – Date&Time" should be then set manually to recover data not downloaded automatically.

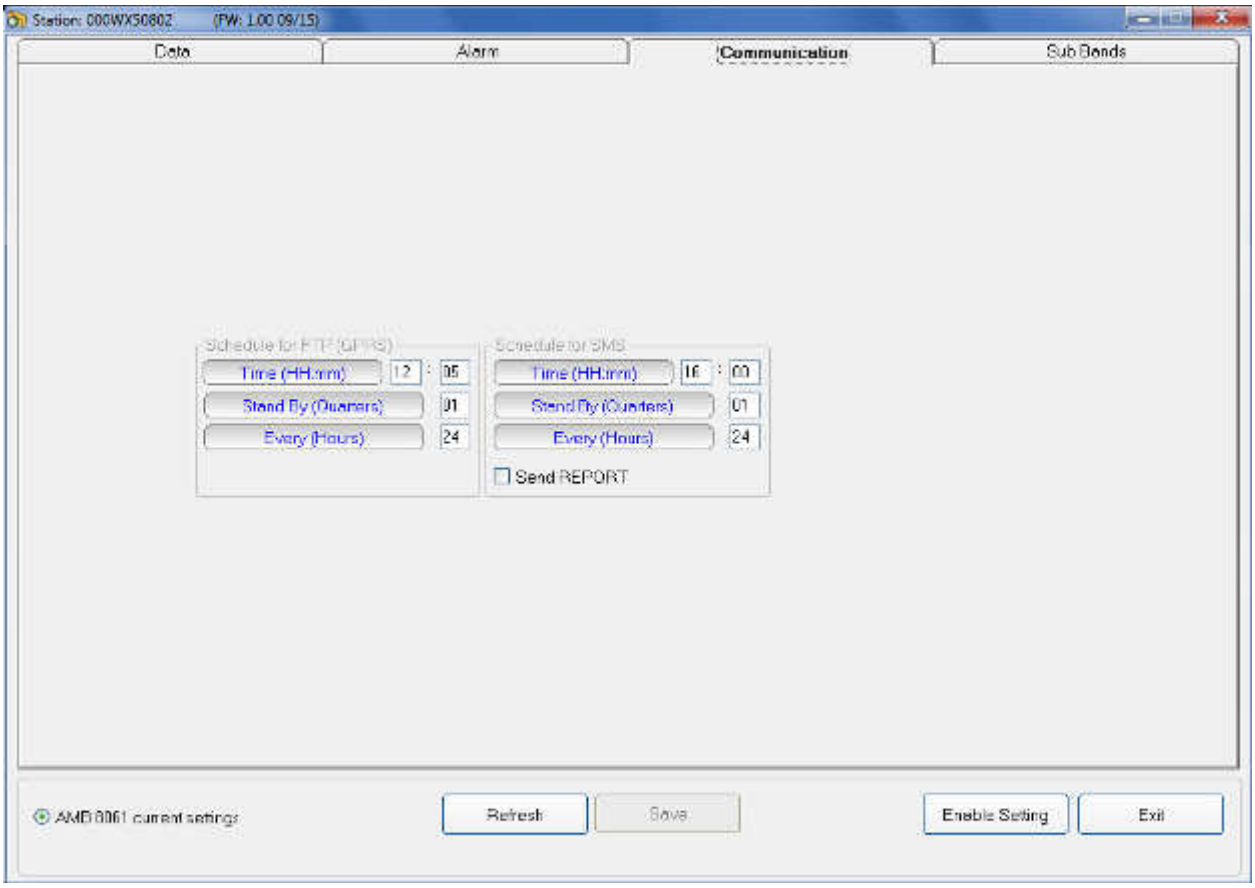
The second section, named **Alarm,** allows the user to set which alarm should be notified, if through FTP connection or SMS to the user mobile phone.



The same windows allows the user to set which average type should be performed on the acquired data, **AVG** or **RMS**, and the averaging period over which the average calculation is performed.
In the above example average type is AVG over 6 minutes time period.

Both **Warning** and **Alarm** thresholds are set to be notified by an **SMS** to the user's mobile phone (telephone number should be set through an SMS sent to the station or, during RS232, Ethernet or USB connection, through the **CSD** section).

Third section named **Communication** shows the station modem schedule.
As explained above, the station modem should be off for the major part of the day. In this window you can decide, in two frames, when the station modem has to switch ON, how much time should stay in stand by mode and every how many hours this operation should repeat.



The above example shows that the station modem will switch ON for an FTP connection to the server at 12:05, it will stay ON for 15 minutes (1 quarter). Every 24 hours; the loop will be repeated so that the modem will switch ON, and the station will download its data at 12:05 every day.
So frequent connections are set for test purpose only, if the parameter **Every (Hours)** was set to 01, the station downloaded its data every hour.

NOTE

To avoid affecting the energy balance between solar panel, back up battery and station consumption we recommend to set the modem to switch on only once a day, better during day time, for 1 quarter (15 minutes). This configuration assures station power autonomy even during long bad weather periods when the solar radiation could be not enough to supply the station modem for longer time.

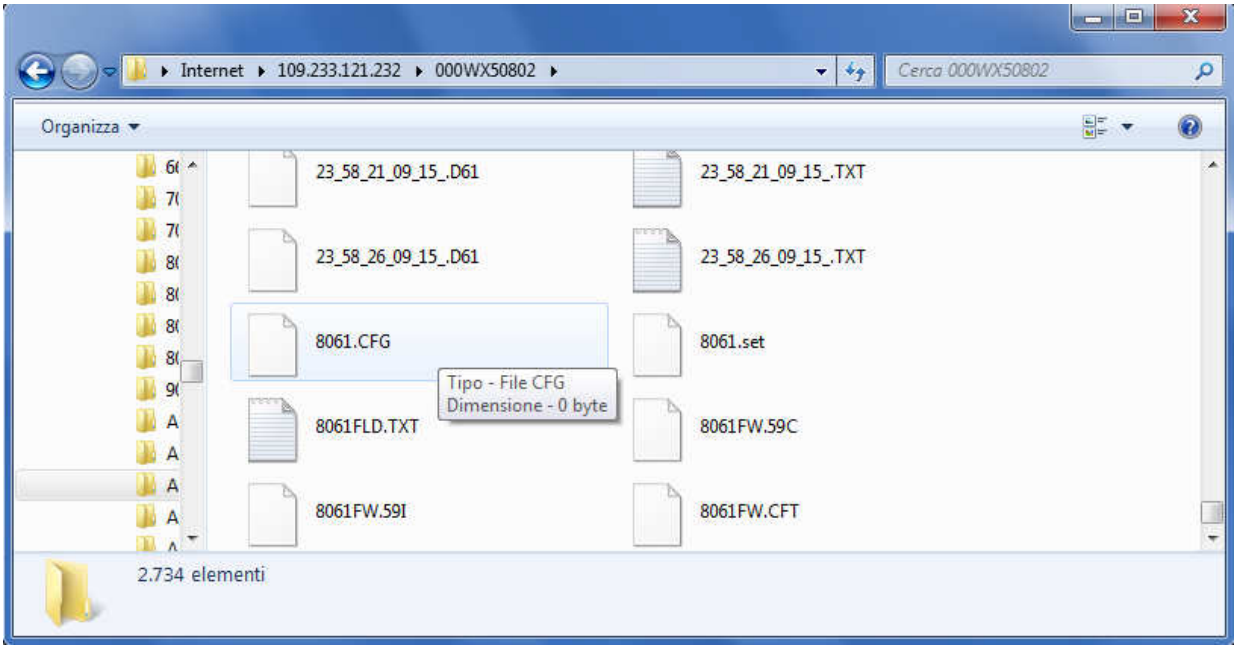
The second frame, **Schedule for SMS,** allows the user to set in the same way a second time period for the modem to be ON. If the command **Send Report** is checked, an SMS informing about maximum field strength measured and lowest battery voltage of the day is sent to the user mobile phone (telephone number to be set by SMS to the station or direct local connection during preliminary installation and test).

After all three sections, Data, Alarm and Communication are set as desired, hit the **Save** button, on the bottom side to store your settings. A **.CFG** file will be created in the station folder within the ftp server. It will be read by the station, when accessing the server, to set itself as requested.

Hit **Exit** to come back to the 8061SW-02 main window.

NOTE

The existence of 8061.CFG file can be checked by accessing the station folder, in the ftp server, through the Windows Explorer:



Other files and folders may be present in case the station already accessed the server.

Last section, named **Sub Bands,** shows the frequency range setting for measurement in a table form.

The station can manage up to 20 frequency bands.
Each frequency range is set indicating its start and stop frequency (in MHz).
The stop frequency must be higher than the start.
The small tick box on the right is to activate measurements on the specific band.
It is advisable to set consecutive, and not recursive bands.

16 – Switch OFF the AMS-8061 and insert the SIM card as follows:

Fig. 7-3 SIM card installation (please refer to Chapter 2 for further details)

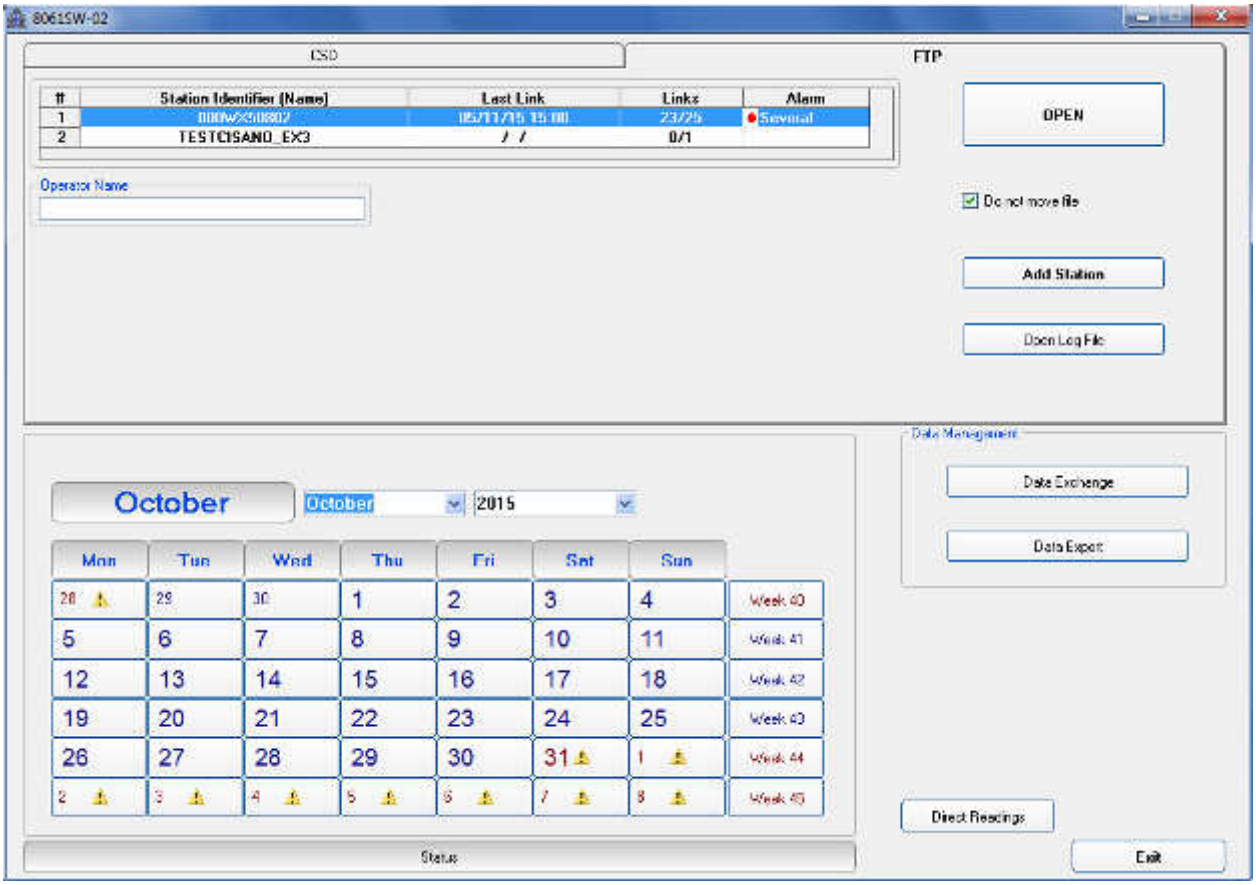
17 - Switch the station ON

18 - Displaying measurement results

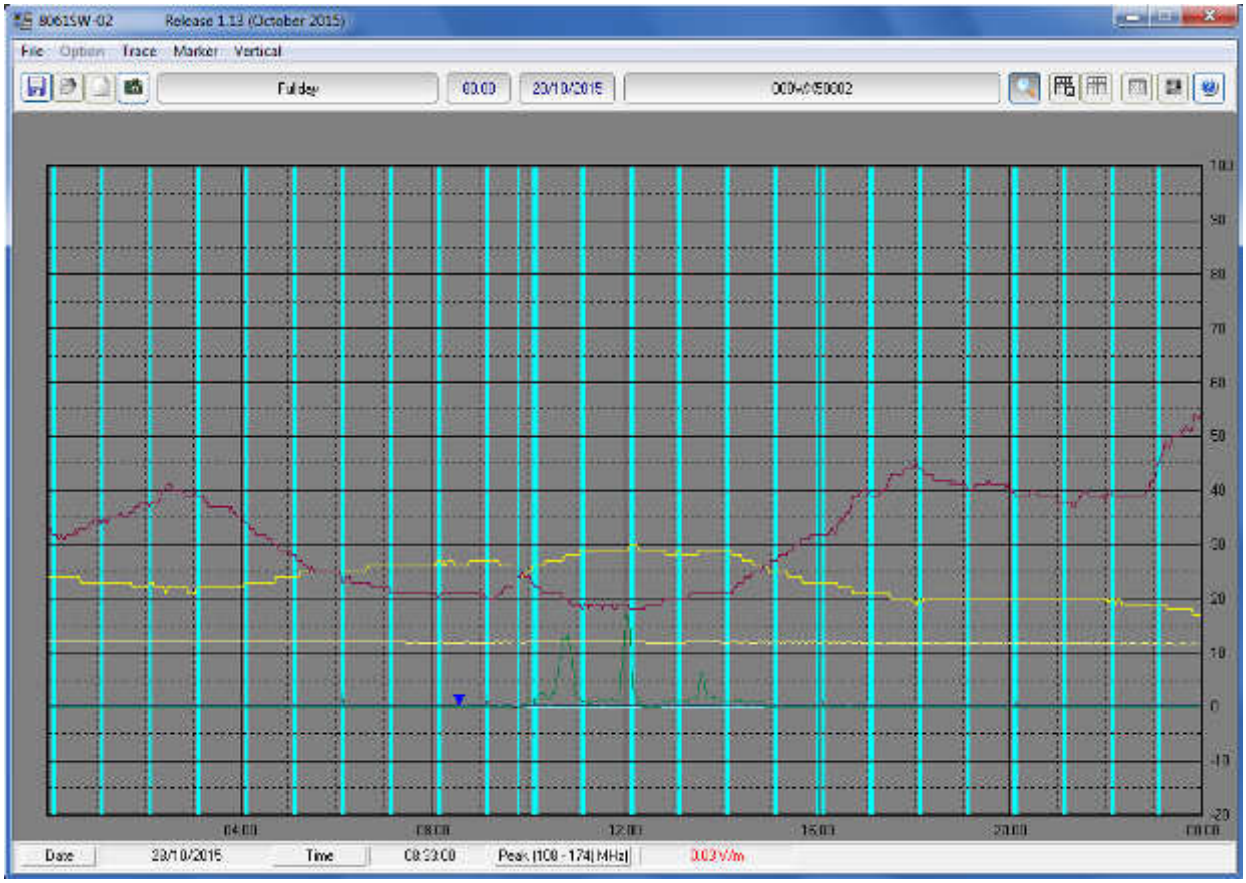
As soon as the station accesses the ftp server, it downloads measurement results.

When desired, from the 8061SW-02 main window, FTP side, select your station and hit **Open** to access the station folder in the FTP server.

New data, if present, will be downloaded to the controller PC. After all automatic tasks have been completed and the bottom bar shows no operation, hit **Exit** to come back to the main window. If some data have been downloaded, the calendar will show the related day number in blue, indicating that some data is available.



Hit the blue day in the calendar to open a graph showing downloaded data.

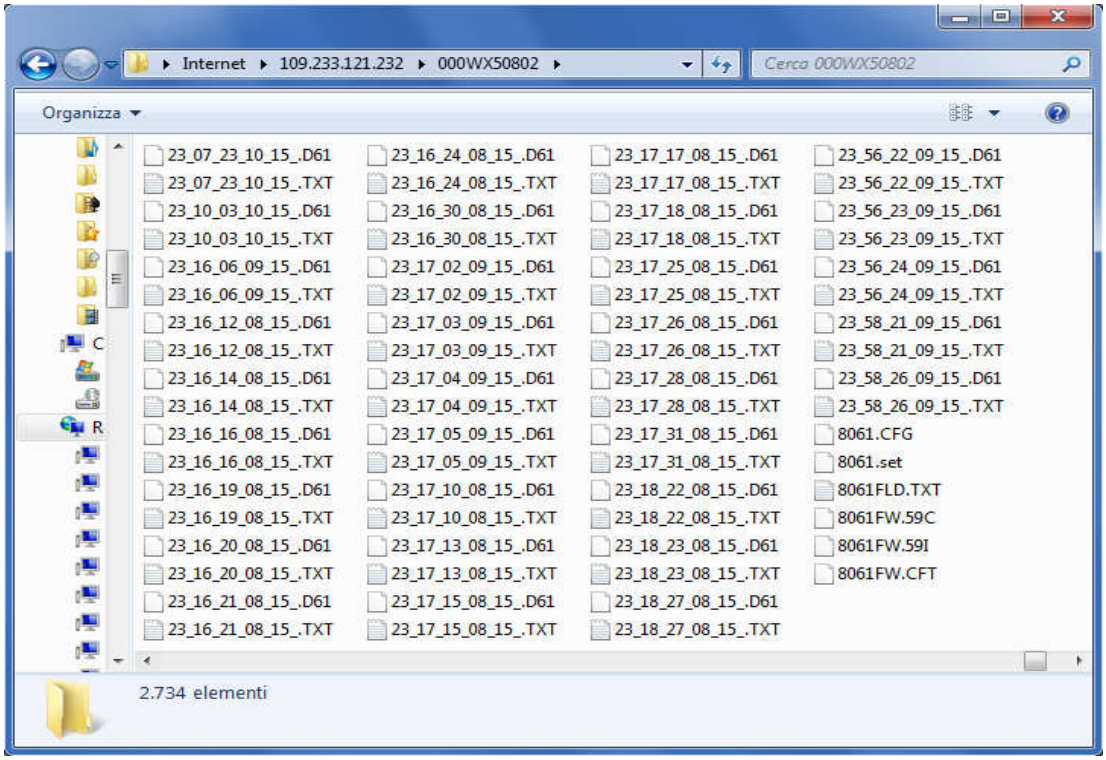


NOTE

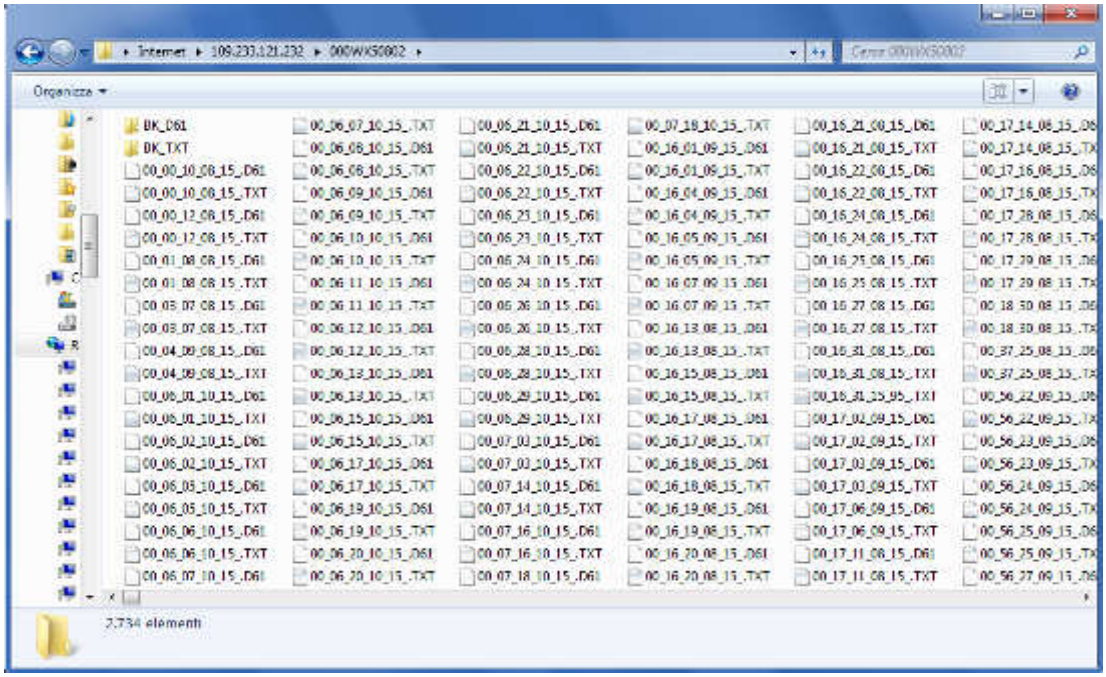
Please refer to the chapter 8 of this manual for details regarding data presentation, saving and related commands.

NOTE

It is possible to check whether some new data is present in the station folder by accessing it using Windows Explorer.
Two different kind of data file are downloaded at each connection: files with .txt extensions contains all Events related to the station, file with extension .D61 contains measurement result in binary format.



If the function "Do not move file" is disabled, all data already downloaded to the controller PC are transferred to back-up folders (one for the .txt files, one for the .D61 ones) and will not be available for a future download even from different station.



19 - Setting RTC of a remote station

As explained above there is never a direct connection between remote station and controller PC except when a local connection, using the provided cable, is established, generally during preliminary operation before installing the remote monitor on site.

The clock setting of a remote station, if needed, can be performed by means of SMS sent by the user.

As the SMS delivery time is not known, the SMS command sent by the user generate a message, sent by the station, to itself. If, as usual, the station receives its message within 30 seconds it takes the time information coming within the message as the time reference to be used to set its clock.
A confirmation message is then sent to the user mobile phone.

7.6.12 FPT-GPRS COMMANDs

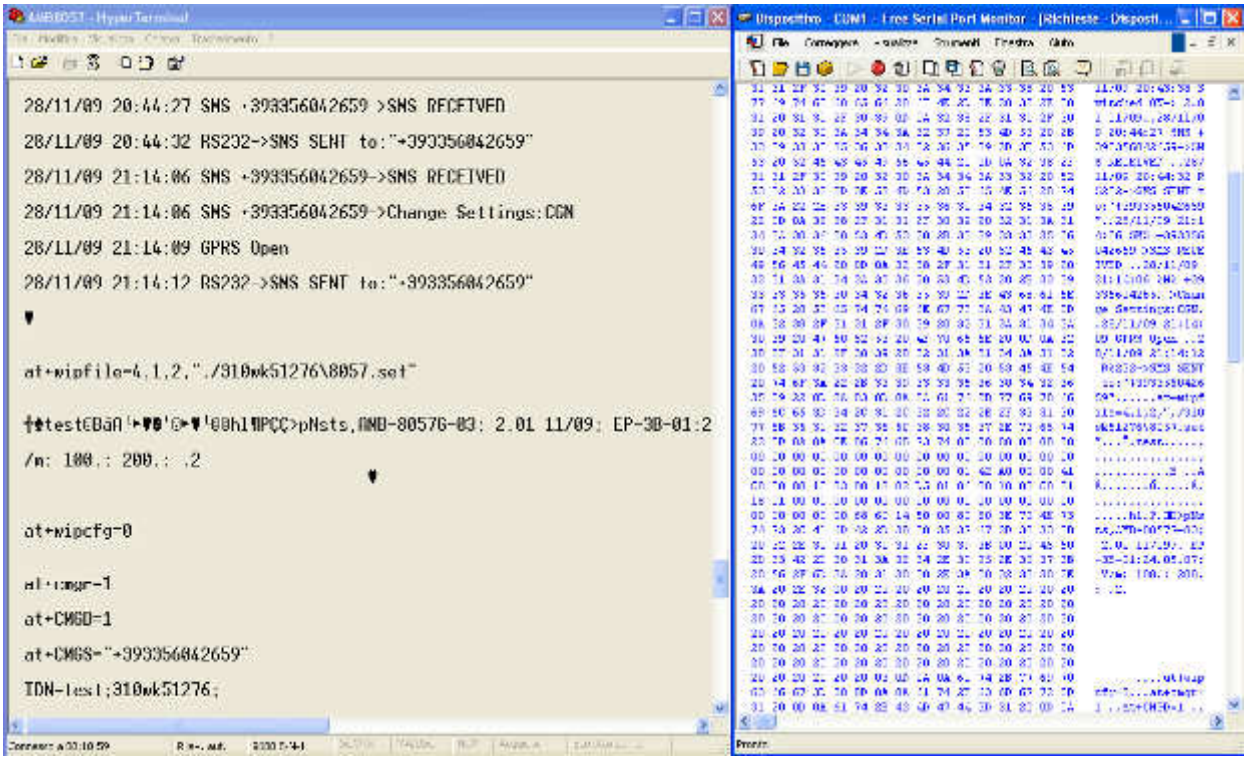
These commands are used by the user to establish a connection with an Access Point or FTP server, to enable the GRPS or point-to-point CSD connection and to set time/date using the SMS provider's information. Each field cannot be more than 31 characters.
These commands cannot be executed via FTP/GPRS (because they would need to be already correctly set).
The GPRS commands are characterized by the presence of the character **GPR** in the string.
Please refer to Chapter 3 for communication protocol description.

7.6.13 Additional tests and hints

Windows HyperTerminal and a serial port monitor could be useful tools to check the station operation when connected to the controller PC through the RS232 or USB cable.
You can check attempts of the station to connect to the GPRS network and its operation.

Hyper Terminal and Serial Port Monitor show activity of the station being it connected to the PC RS232 or USB port.

The example below shows that the station received an SMS from the user's mobile phone and, executes the received CGN command by connecting immediately to the ftp server.



Please be aware that GPRS service, as well as, generally, all mobile services, may be sometimes not available depending on the station installation site and on the GSM service condition.
Everytime a station is not able, for any reason, to access the ftp server, no measurement result will be lost, as soon as the station will be able to establish a connection to the server it will download all data that have not been downloaded till then.

7.6.14 AMS-8061 Firmware updates

Whenever a new software / firmware version is released it is available in our Web site for free downloading.
The new software includes the remote station firmware and commands to update it.

The remote station firmware can be updated by connecting the station to the controller PC by the RS232, Ethernet or USB cable.
Updating procedure is described in the AMS-8061 user's manual.

Unlike in CSD mode, firmware of station set for GPRS communication cannot be updated remotely.

7.6.15 Data download volume calculation and space occupied in the FTP server

The quantity of the data downloaded per day from the station depends mainly on the storing rate.
Even the number of the events (alarms, etc.) slightly effects the size of the data downloaded.

Supposing just a daily download, the quantity of the data is the following:

Rate 1 min ➔ 720 kB
Rate 2 min ➔ 360 kB
Rate 6 min ➔ 120 kB
Rate 15 min ➔ 48 kB

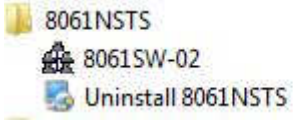
In this case the space occupied on the hard disk does not differ a lot from the amount of the data downloaded.

Differently, if the station was set for accessing to the server each hour (24 downloads per day), and with a low storing rate, because of the minimum memory occupied by every single file (hard disk clusters dimension used), the space daily occupied on the server FTP disk, with cluster of 4kB, could be even the double of the actual data.

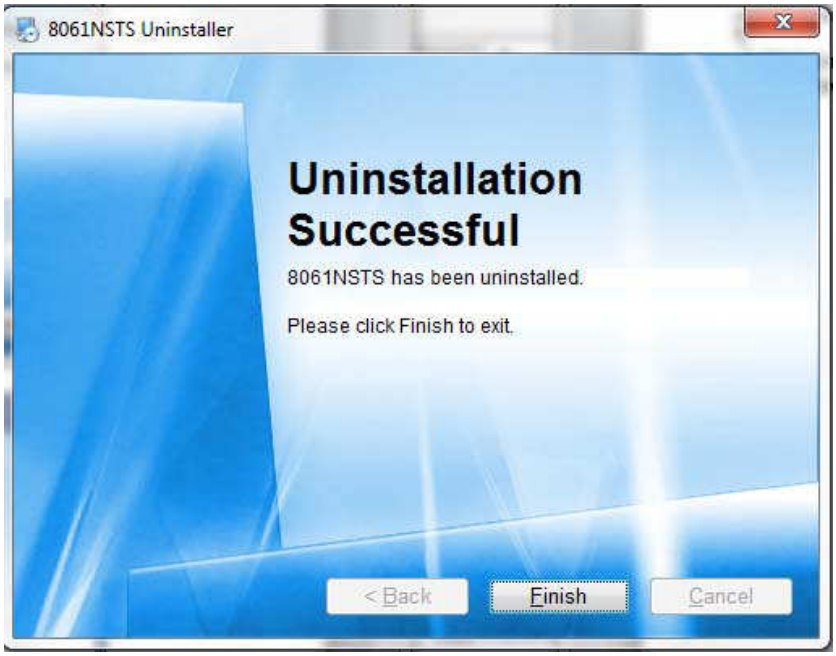
7.7 Uninstalling Software

It is possible to remove the 8061SW-02 software from the PC according to the following procedure:

Run the **Uninstall 8061NSTS** utility.



Follow the uninstaller instructions.



The software is now removed from the system; click **Finish** to close uninstaller utility

8 – Data display

8.1 Introduction

This section provides information for correct display and interpretation of the data downloaded from the AMS-8061 Area Monitor System using the 8061SW-02 software.

When a new monitoring station is installed, a new folder is created in the main program directory, among those listed in the main window of the program 8061SW-02, which will receive the data downloaded from that specific station.

The new folder is automatically named assigning the first 20 characters of the full name entered for the station (excluding spaces and special characters which should not be used).

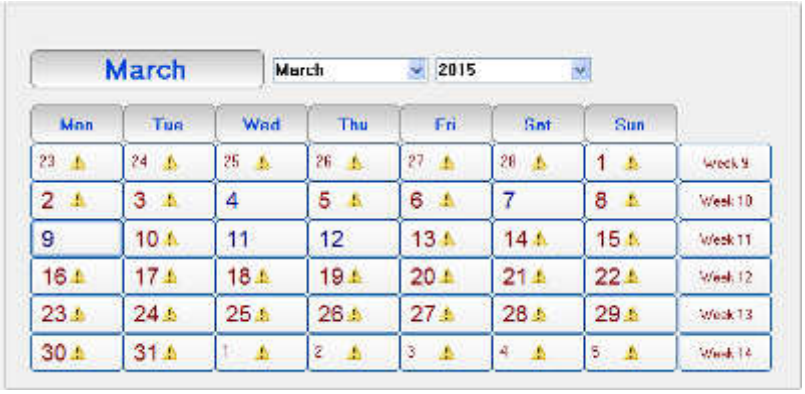
Example: for a station called NUOVA CENTRALINA CISANO the directory name will be NUOVACENTRALINACISAN.

NOTE

For station name use only alphanumerical ASCII characters.

8.2 Calendar

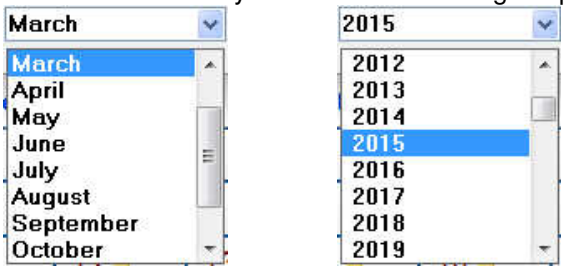
The new folder is created to collect the data every time the AMS-8061 station is queried, dividing them by day, month and year. The data are then automatically called up by the program on the basis of the day or week chosen in the Calendar tool in the main window of the 8061SW-02:



WARNING

To ensure the program runs correctly it is important not to rename or move the saved files.

Using the Calendar it is possible to select the day or the week to be presented in graph form, simply by pressing the corresponding key.
The month and the year are selected using the pulldown menu.



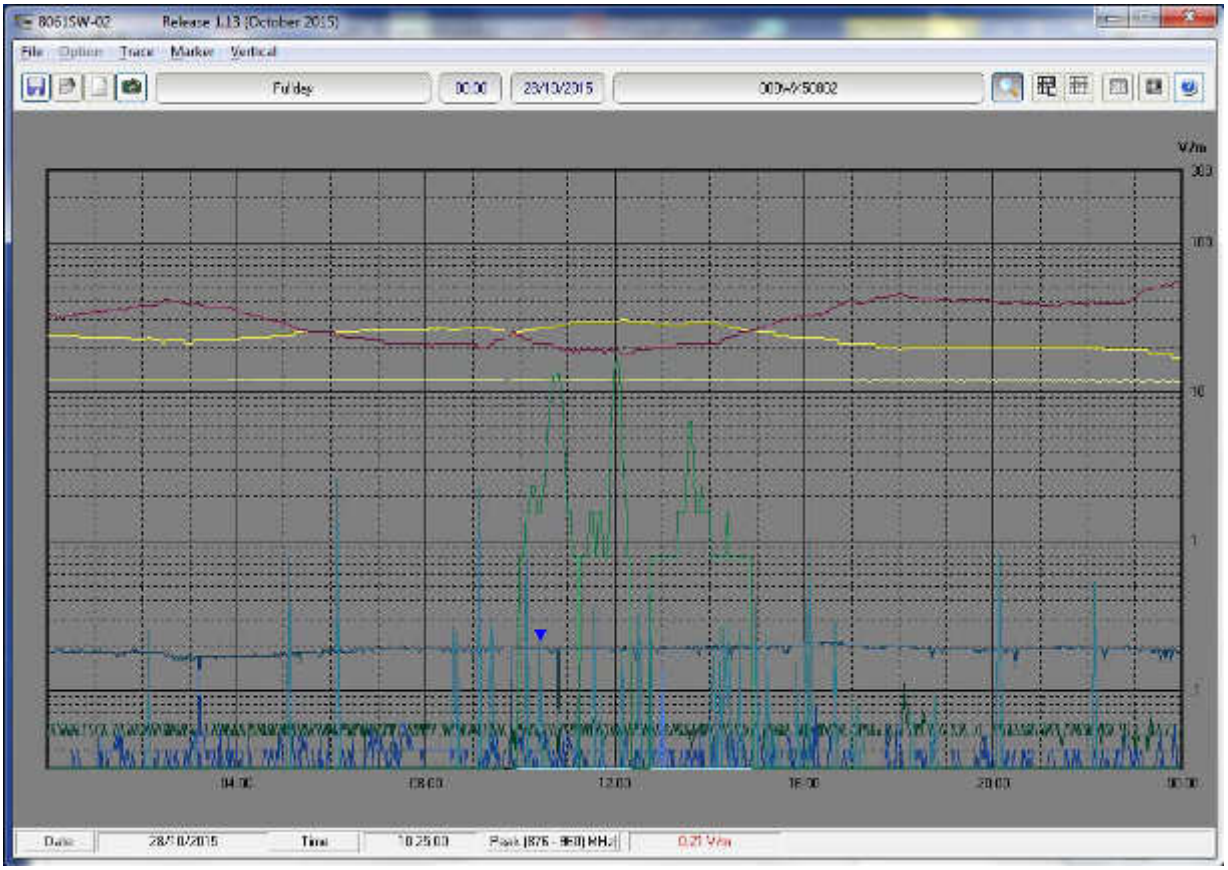
NOTE

Days and weeks containing data have the characters displayed in blue color, while those for which data have not been downloaded are shown in red color (the symbol ⚠ is displayed close to the days).

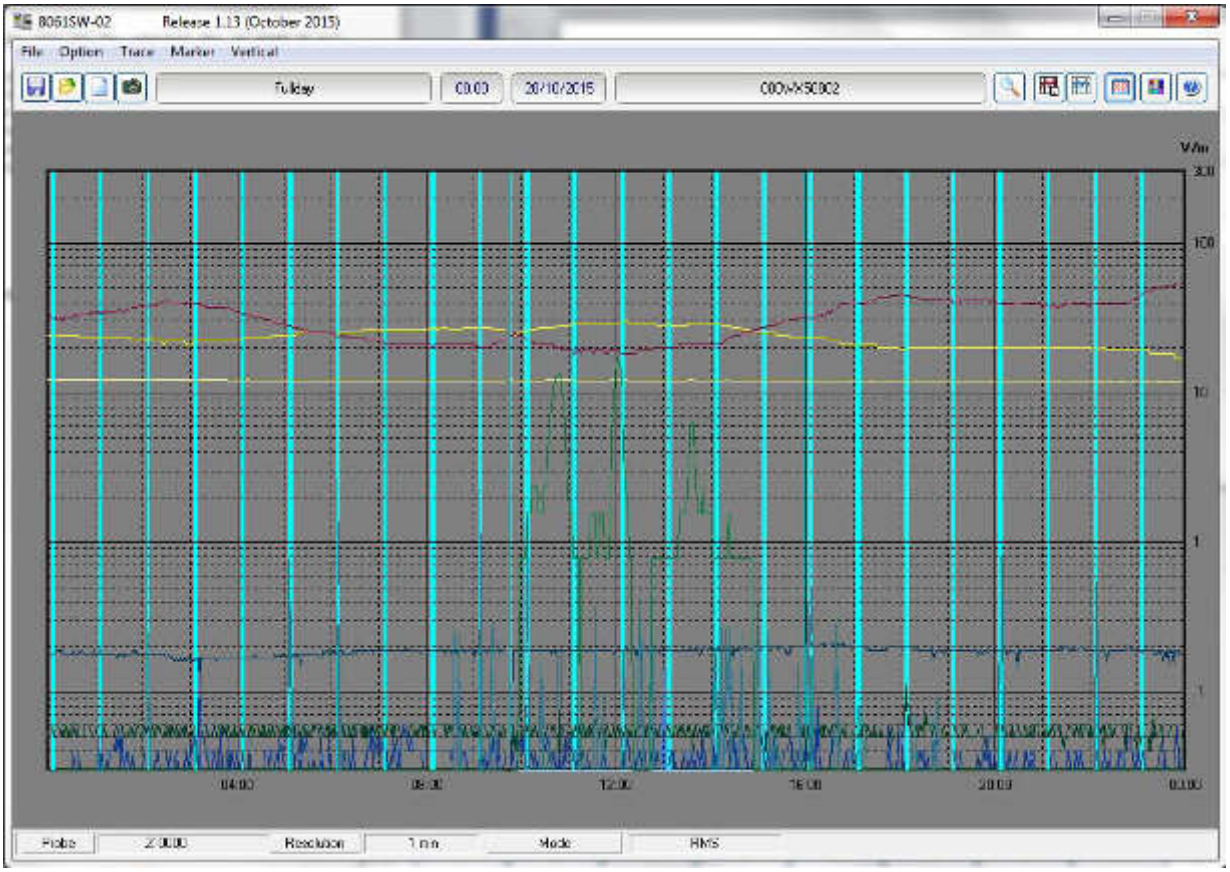
8.3 Data window

By selecting a day or a week shown in blue, the User can access the main menu for graphic representation. Using this menu it is also possible

- Display any graphs belonging to any stations (using **Open Files**);
- Select the colors and the order of display for the different traces (using **Option**);
- Save the graphs (using **Save Files**);
- Save the graphs displayed as a BITMAP image on the clipboard for insertion in other applications such as a Word Processor or Image Editor (using **Clipboard**);
- Add or amend a comment (using **Comment**);
- Modify the appearance of the status window and the icons (using **Appearance**)
- Select the limits and the colors (using **Setup**);
- Highlight or remove the highlight for the time the GSM and/or others disturbance band is on, or when any of the alarms is active, or select traces to be displayed (using **Trace**);
- Position the marker (using **Marker**);
- Expand graphs horizontally (using **ZOOM**);
- Expand graphs vertically (using **Vertical**);
- Display a table containing the data shown in the graphs (using **Show Table File**);
- Display the software release (using **?**);

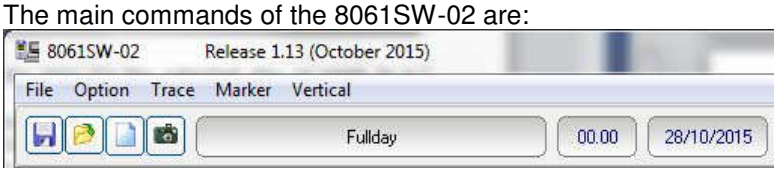


The data window presents the data for the selected day or week in a graphical form.
In the example below, it is possible to notice the narrow cyan vertical bands (the color can be set by the User), indicating that the internal GSM modem was transmitting either on the provider request (periodical querying of the phone number), or by the User request, calling the station to make any queries. This indication is used to discriminate fields generated by the internal GSM modem from any environmental field.



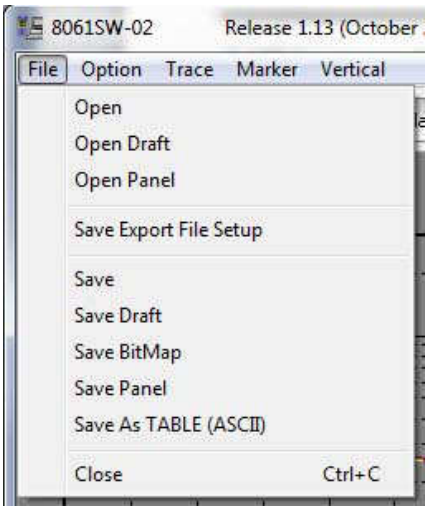
8.4 Main Commands

The main commands of the 8061SW-02 are:



8.4.1 File

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



For a detailed description of its use see the paragraphs relative to the specific icons **Save** and **Open** here below

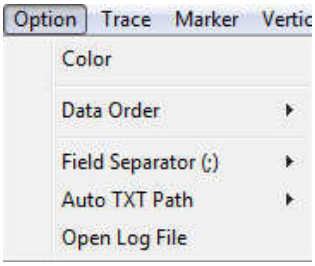
NOTE

Some functions of the File command are not enabled when the Zoom function is ON

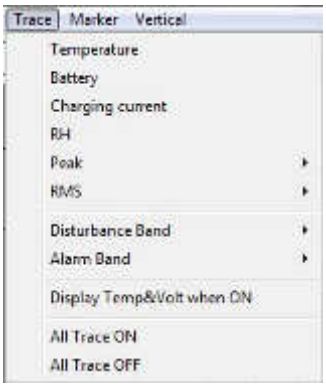
8.4.2 Option

This command is used to define the colors of the traces (**Color**, as well as **Setup** described below); the order of priority for display of traces (**Data Order**); the character used as data separator when required by the form of table (**Field Separator (;)**); ~~the~~ path and the name that are used for the **AUTO ASCII FILE** (**Auto TXT Path**); to display all settings and main activities automatically and manually downloaded from the station (**Open Log File).**

The screen will show:



8.4.3 Trace



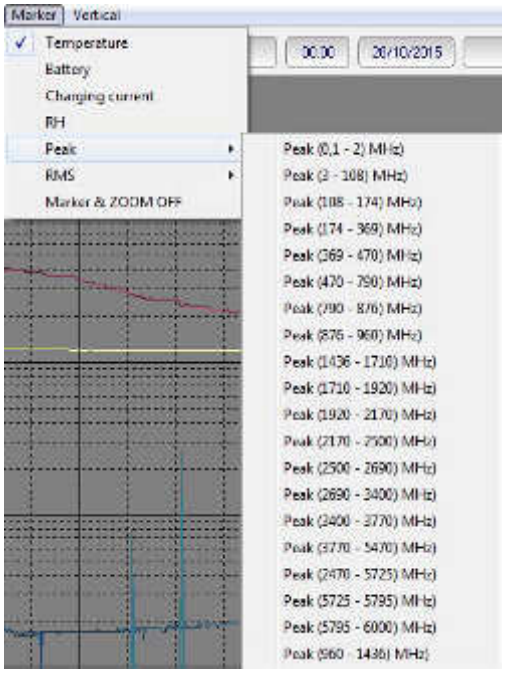
The **Trace** command allows to select which traces will be displayed in the graph.
The possible choices are:

- **Temperature**; indicates the temperature of the environment for each data reading;
- **Battery**; provides the voltage of the batteries whenever the field data are stored;
- **Charging current**; provides the consumption current of the station whenever the field data are stored;
- **RH**; indicates the Relative Humidity of the environment for each data reading;
- **Peak**; used to hide or display the peak trace for each band using vertical bars (which can be selected individually);
- **RMS**; used to hide or display the RMS trace for each band using vertical bars (which can be selected individually);
- **Disturbance Band**; used to hide or display any disturbance activity using vertical bars (which can be selected individually);
- **Alarm Band**; used to hide or display any activity of alarms with vertical bars (which can be selected individually);
- **Display Temp&Volt when ON**; shows traces of the temperature and voltage on the graph when enabled;
- **All Traces ON**; shows all traces;
- **All Trace OFF**; hides all traces.

8.4.4 Marker

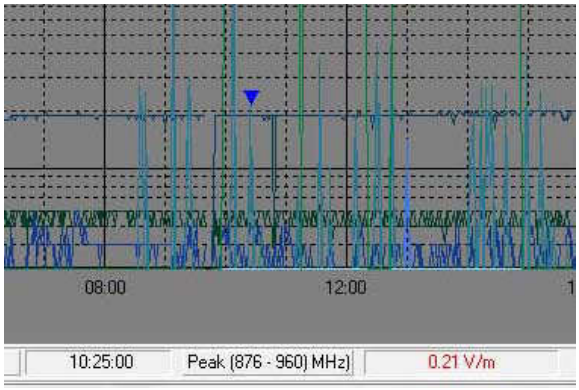
When the field monitor has been set up to display all data, the graph contains many traces. To ensure accurate measurement of each trace it is possible to enable a marker that will show the value of the electrical or magnetic field, or temperature, or batteries, etc depending on the trace for which it is selected.

The screen will look like this:



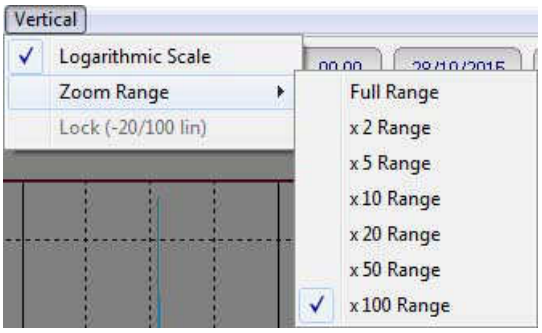
The marker is made visible also by activating the ZOOM function.

Using the mouse it is possible to scroll the entire time axis and stop on the trace and in the point for which the exact value is desired.

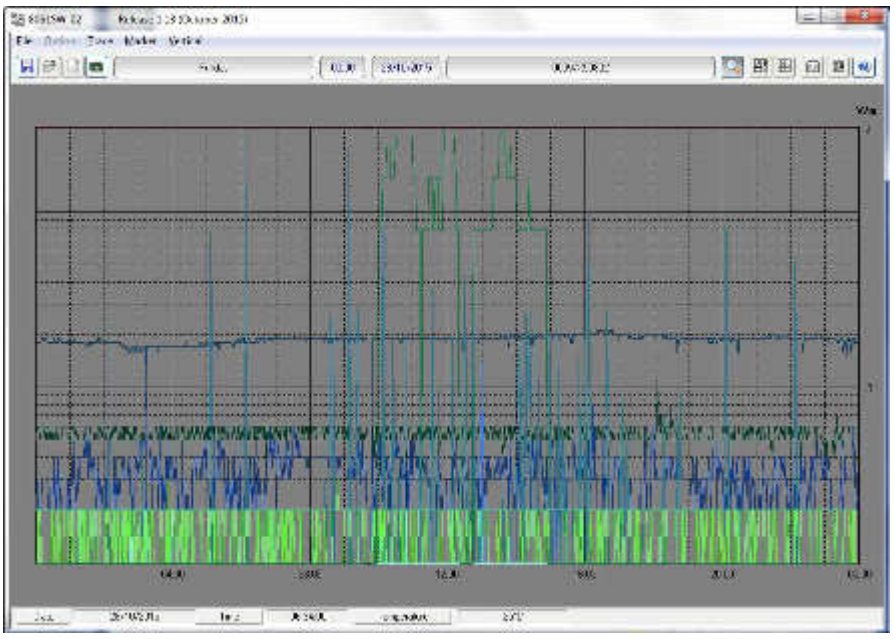


8.4.5 Vertical

This function is used to select the vertical scale with a linear or logarithmic view and also serves to define the scale range. The screen looks like this:



Selecting **x 100 Range** the maximum sensitivity is displayed.



The function **Lock (-20/100 lin)** is activated when the User want to display on the graph both the temperature and the field trace. It forces the scale between -20 and 100 and shows everything in linear mode.

8.5 Secondary Commands

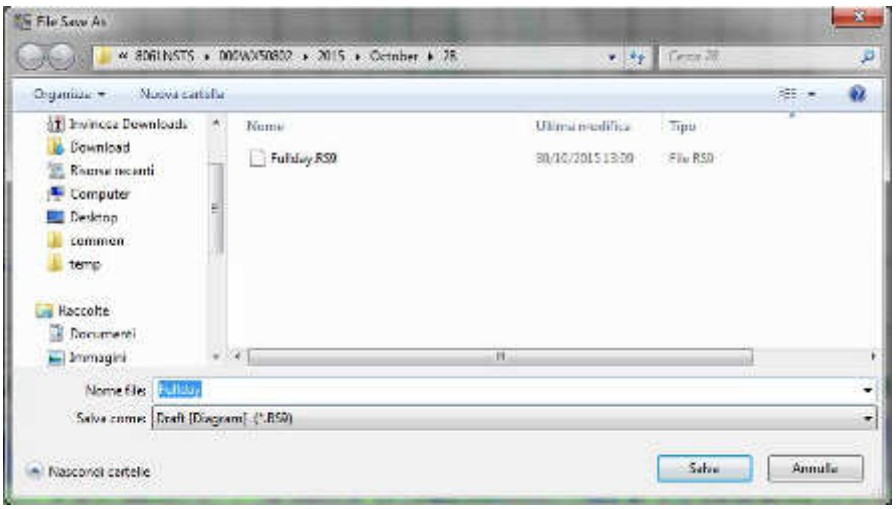
Description of command bar:

8.5.1 Save Files

Used to save files of measurements in the following formats:

1. **Draft (Diagram) (*.RS9)** (Default) Archive for future processing of readings;
2. **Panel (*.P87)** A file with the extension ***.P87** is saved, containing the current settings selected with the **Setup** key, so that the operator can readily restore the preferred settings at a later date. (Normally the program starts with the setting in the file **default.P87**)
3. **BitMap (*.BMP)** A graphic bitmap file is saved which is identical to the diagram displayed on the screen at the time of the request.
4. **ASCII (*.TXT)** A text file is saved containing the data of the configuration, saved with the function **Save Export File Setup**.

The screen looks like this:



Measurements can be saved in any directories. During this procedure the software shows a list of the previously saved files.

8.5.1.1 Save File in ASCII format

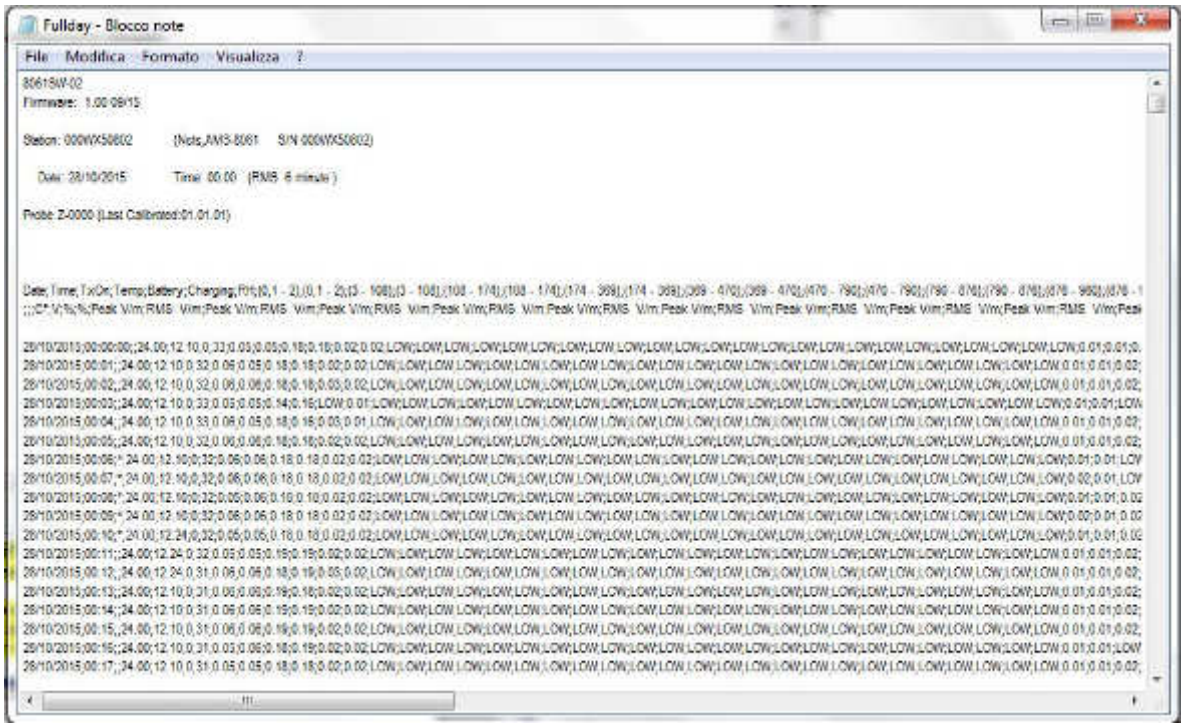
Files in ASCII format with the .TXT extension contain an * (asterisk) marking any data, and averaged value, affected by the internal modem and others disturbance activity.
The structure of data tables saved in the default .TXT format is as follows:

- All traces enabled;
- All alarms or disturbance enabled;
- All marker enabled;
- Separation character: ";" (semicolon);
- Data sorted according to AVG and then Peak or viceversa.

NOTE

This structure can be changed with the Save Export File Setup function. This also applies to alarms and disturbances marking.

The actual settings can be viewed by pressing **Show Table File**. This function automatically creates the table of data relative to the graph on view, and reflects the default settings listed above or those saved with the **Save Export File Setup** function.
Lastly, columns are shown indicating all the active alarms.



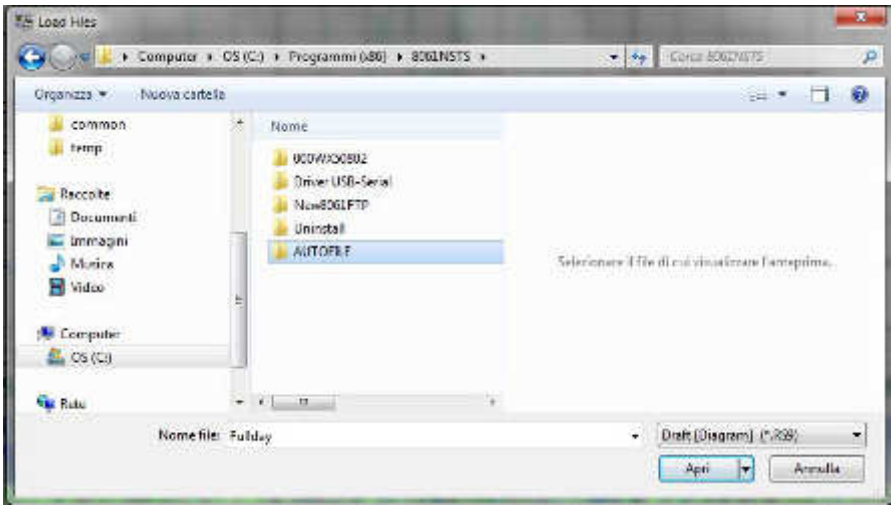
NOTE

Like every other item listed in the table, the asterisk (*) of the GSM, Charging, USB and Ethernet Band on will not be shown if the Trace Menu has this item disabled at the time of activating the Save Export File Setup function.

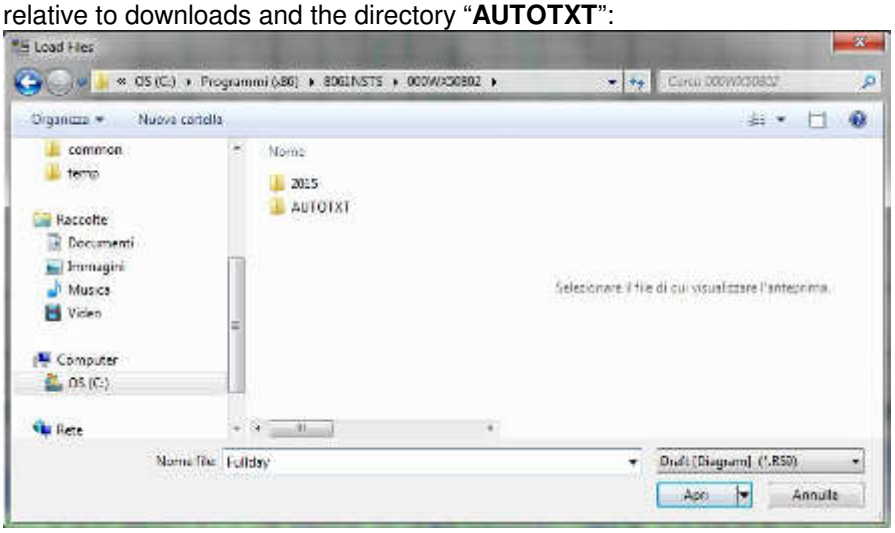
8.5.2 Open Files

Used to download and view measurement files previously saved (*.RS9). Also serves to load files of settings (*.P87).

If the software is already in graph mode, clicking on **Open Files** will display all the stations available and also the directory **AUTOFILE,** containing only the **.TXT** files created automatically with the **AUTO ASCII FILE** function.

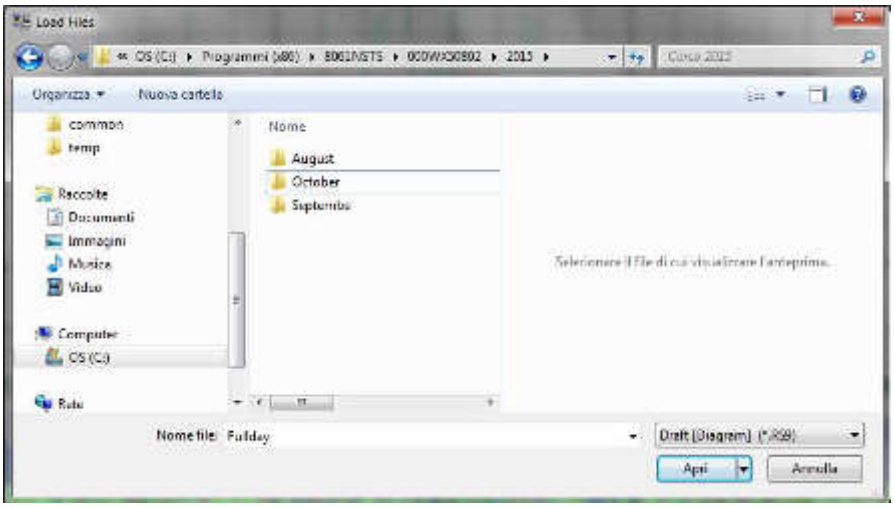


Selecting, for example, station **000WX50802**, it will display all the years relative to downloads and the directory "**AUTOTXT**":



Associated with the name of each station, the software creates the directory of years (in this example 2015) and the directory "**AUTOTXT**" which contains all the data relative to the **Auto ASCII File** function.

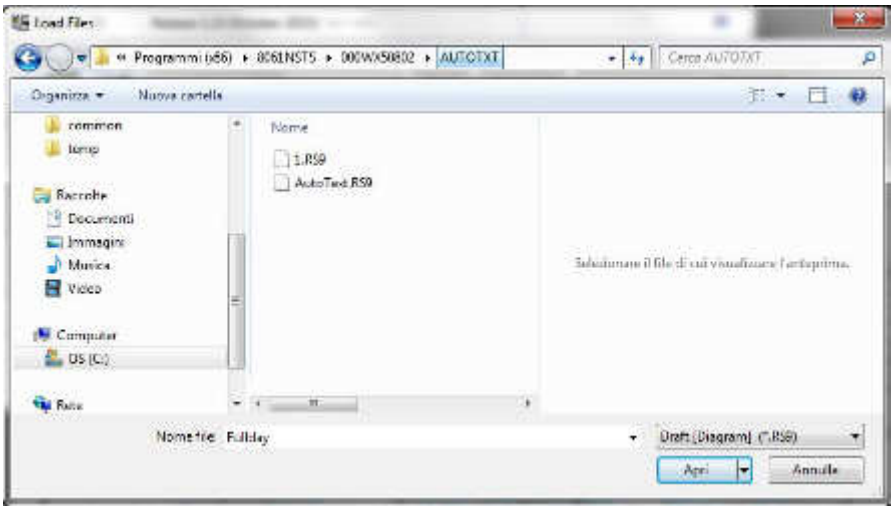
Selecting the desired year, the menu will display all the months and weeks available:



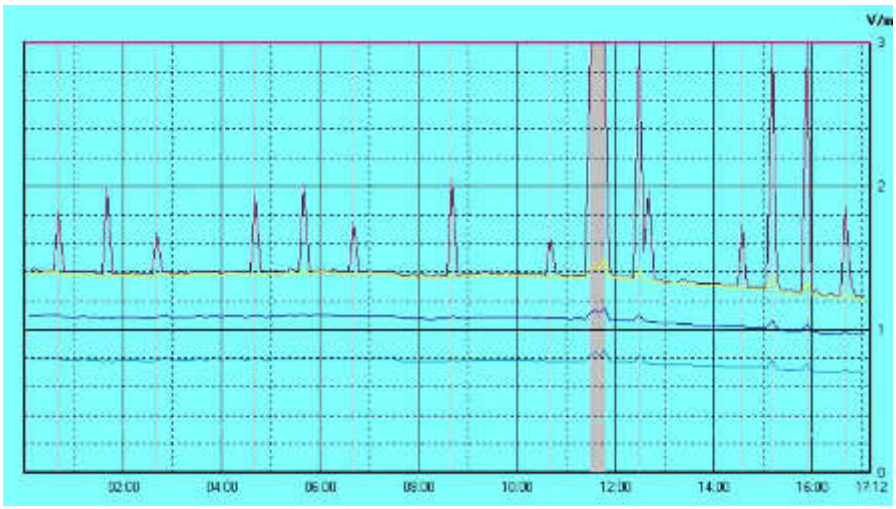
Selecting the month, the software will display the list of all the days containing data.
Selecting the desired day and clicking **OK** the data will be displayed; pressing **Cancel** to interrupt the operation

8.5.2.1 Open Autotext file

The files in the **AUTOFILE** directory are saved in .TXT format, while the files in the **AUTOTXT** directory are saved in **.RS9** format. The former are created so as to be readily exported into Windows Office programs, and cannot be opened using 8061SW-02 software. The latter can be viewed because they are saved in the proprietary graph form of AMS-8061 (.RS9).

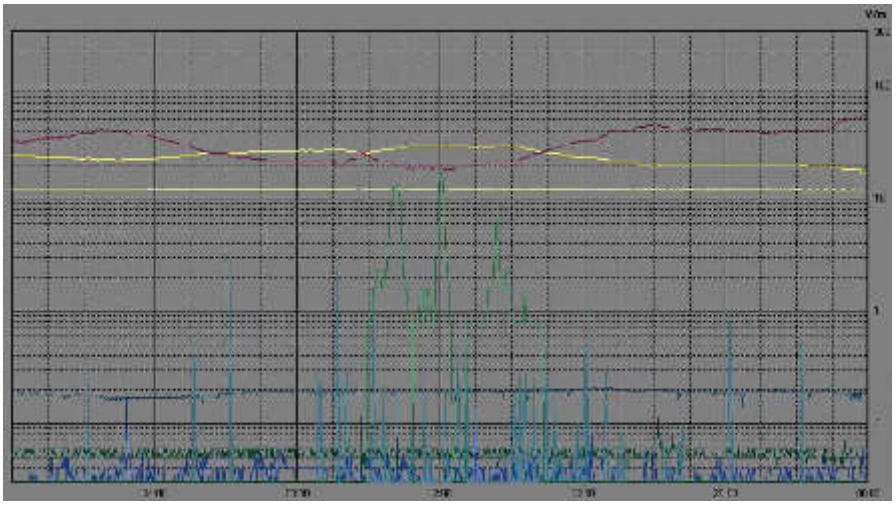


The time window between Start and Stop is defined by the conditions used during download.



In this example, the software shows the graph from 00.00 to 16:00 of autotxt file .RS9.

If, however, you open the file Fullday.RS9 (created automatically in the Month/Day directory), the same graph displays the data for the 24 hour period, from 00.00 to 24.00.



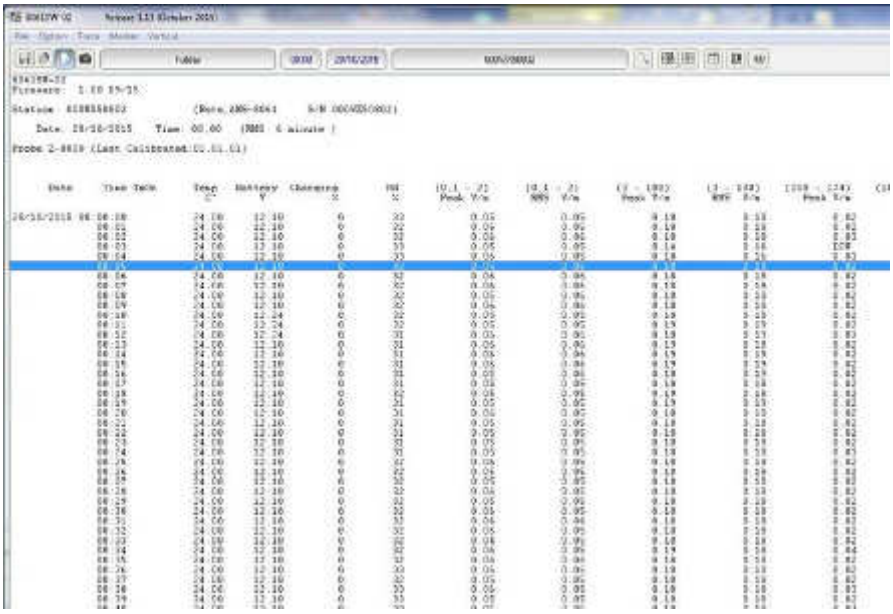
NOTE

Therefore, with the function Auto ASCII File it is possible to create any graphs with a start and end period of measurement defined in any desired way. For example, from Friday to Monday, or between two months, etc.
Of course, this time period must be selected in the download data procedure.

8.5.3 Show Table File

This is used to automatically display a table report containing the data relative to the set of traces saved with the Save Export File Setup function.

When the Show Table File function is enabled, every other function is disabled. The screen looks like this.



8.5.4 Clipboard

Used to make the bitmap corresponding to the actual measurement displayed on the Windows Clipboard. That makes it possible to perform operations of cutting and pasting images directly on other programs without constructing exchange files. This operation can be useful to integrate test reports or other documents written with a Word Processor, such as Word for Windows™, inserting the graphic image of the taken readings.
Each single trace is converted into bitmap format and copied with the colors taken from the palette selected in **Setup**.

The **File Name** field contains the name of the file displayed.
This is normally updated automatically with the **LOAD** command.

Fields **Status 1** and **Status 2** show the time and date of start of the display.

The next field contains the name of the Field Monitor unit.

8.5.5 Zoom Mode

This is used for horizontal expansion of the actual measurement displayed (ZOOM) to observe the measurement with better definition. When the ZOOM function is on, the **Marker** function is enabled as well. A small blue triangle appears on the display and can be moved with the mouse to any point on the graph. The window at the bottom will show the amplitude marked and the time of occurrence.

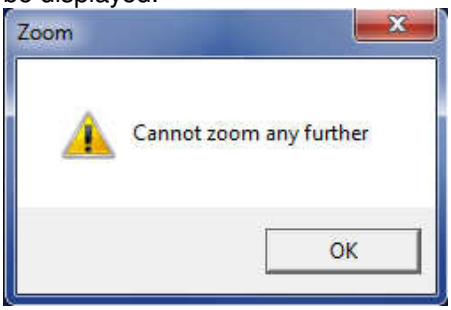
To enable the **Zoom** function proceed as follows:

- select the **Zoom Mode** key;
- position the mouse on the **Marker** triangle at the starting point;
- holding the left mouse key down, drag the **Marker** to the point at the end of the trace you wish to expand. Release the mouse key and the selected trace will be expanded immediately.

During this operation an orange cross and two vertical bars are displayed to aid in selection of the area to expand. To return to normal display unselect **Zoom Mode**.

The smallest selectable trace is 120 seconds (2 minutes). A greater enlargement would only put more space between the two measurement points without adding any significant information.

If you try to zoom on a trace of less than 2 minutes an error message will be displayed.



As already mentioned, the **Zoom Mode** key is used to enable the **Marker**, represented by a colored arrow which, using the mouse, can be positioned anywhere along the displayed trace. In this case, the time values will be reported on the status bar at the bottom of the screen (time from start of measurement) and the amplitude will be displayed with respect to the actual position of the **Marker**. This function is used for a detailed analysis of the graph and of the relative values saved.

When the Zoom Mode key is enabled, the other commands are automatically disabled except Save, ClipBoard and Help.

8.5.6 Comment

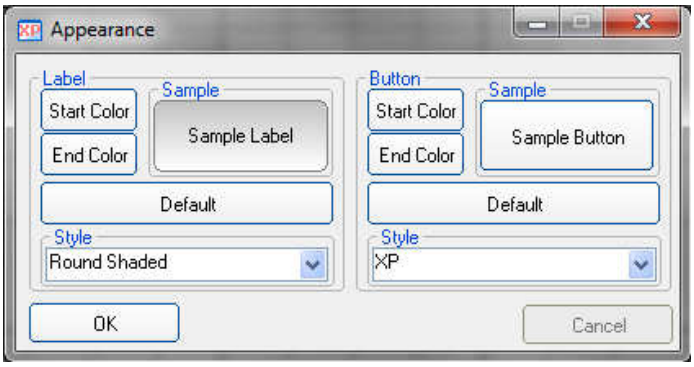
When this icon is selected, it is possible to enter or display the field containing the comment, which can be written or edited up to a **maximum of 1024 characters**. The screen looks like this:

In the bitmap, the comment is shown only when the Comment key is enabled.

8.5.7 Redraw

Used to refresh the screen and redraw the diagram.
This operation is necessary in particular when the PC does not have much memory and/or many applications are running at the same time.

8.5.8 Appearance



Button and label style can be selected from a **Style** list

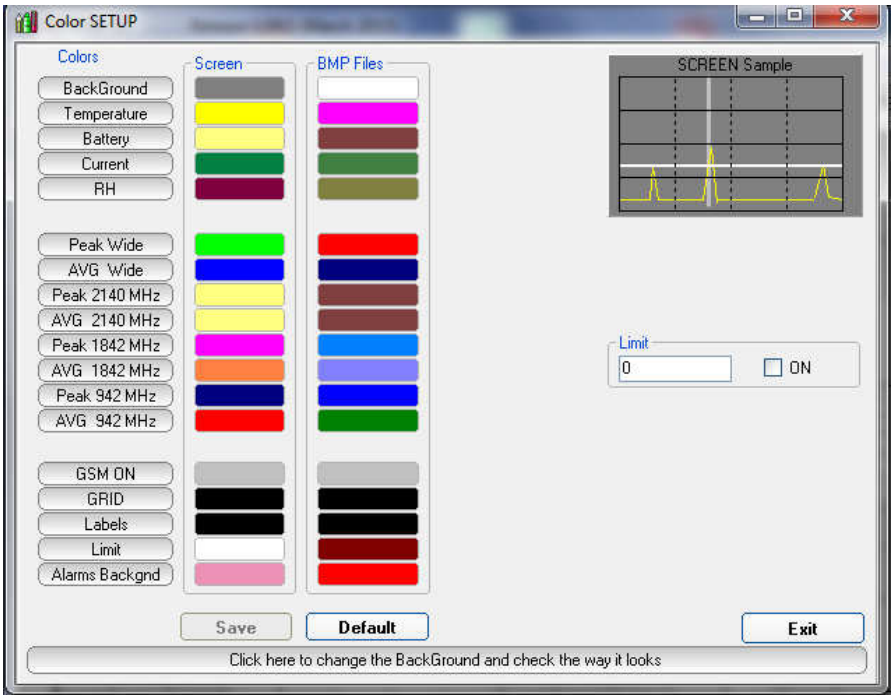
Start and **End Color** button allow selection from a color palette

Sample Button and **Sample Label** show the appearance preview

Default button to set appearance to the default parameters

8.5.9 Setup

The use of the **Setup** key allows to access the window for setting the colors of the graph.
It is possible to change the current settings at any time, and the new settings can be saved in a file and restored later.
The **Setup** window looks like this:



For each trace of the graph listed under **Colors**, the desired color can be selected, and these colors can be different for the **Screen** and for the **BMP Files** to better adapt to the viewing and printing needs of the User.

8.5.9.1 Color Palette

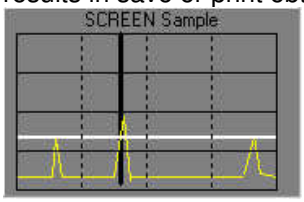
The choice is made by moving the mouse to the color to be changed and then using the Color Palette window.

8.5.10 Limit

The **Limit** field is used to set and enable a reference trace on the current screen.

8.5.10.1 SCREEN Sample

The small graph on the upper right of the display gives a preview of the results in save or print obtained with the colors selected.



NOTE

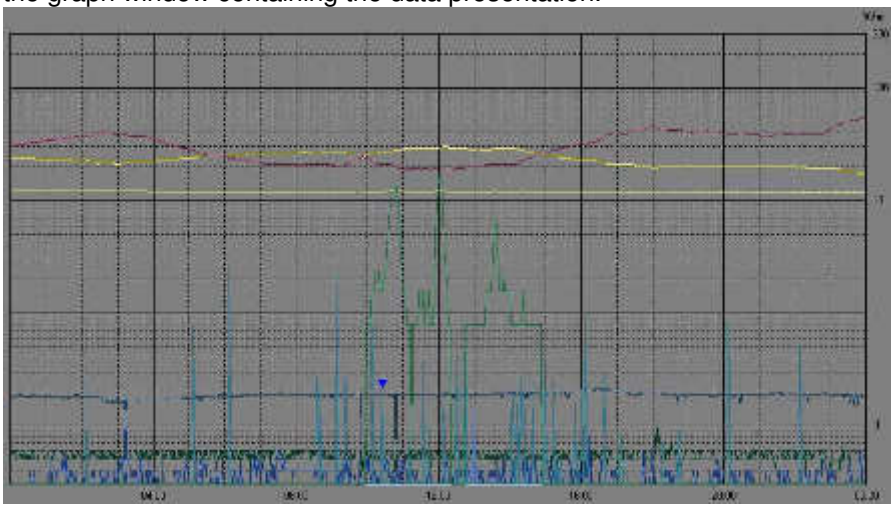
Click Exit to close the Setup window without saving the new setting, to maintain the current settings for the graphs displayed after opening the program again. The new configuration can be saved in a relevant file by clicking Save.

8.5.11 Software release

Click this icon to display the software release currently installed on the PC.

8.6 Graph window

The central part of the data window for the 8061SW-02 program displays the graph window containing the data presentation.



The graph window displays the traces saved on the basis of the settings made in the main window of the **Storing Settings** section.

When **Zoom Mode** is enabled, a triangle with its apex pointing downward highlights the position of the **Marker**.

A horizontal line, of the color chosen with **Setup**, highlights the limit set, permitting easy comparison with the values shown on the graph.

8.7 Status window

The bottom section of the data window in the 8061SW-02 program displays the status window.

This window provides useful information about the program functions and also gives extended and immediate help with the meaning of the commands and options on which the mouse is positioned.

A few examples are shown below:

Actual operating mode

Values relative to **Marker** position

Display of description of the **Clip Board** key

8.8 Importing data to Word or Excel

All the graphs saved in .TXT format can be displayed by other programs. If Word or Excel are used, the saved file can be searched with the Open file command and selected using **File type: All files (*.*).** Search for the file in the 8061SW-02 directory and follow the path (Station Name, year, month and day) to select the desired file to open.

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Mod. 18-1

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☐ Calibration only ☐ Repair ☐ Repair & Calibration ☐ Certified Calibration ☐ Other:

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Company:

Indirizzo:
Address:

Persona da contattare: *Technical contact person:*
Telefono: *Phone n.*

Modello: *Equipment model:*
Numero di serie: *Serial n.*

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

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

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

Descrizione del guasto/condizioni di funzionamento:
Failure symptoms/special control settings description:

Se l'unità è parte di un sistema descriverne la configurazione:
If unit is part of system please list other interconnected equipment and system set up:

Suggerimenti / Commenti / Note:
Suggestions / Comments / Note: