# 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:**

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

**⚠ CAUTION**   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.

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

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

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

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

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**EXPLANATION OF ELECTRICAL AND SAFETY SYMBOLS :**

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

**Warning, danger of electric shock**   |   **Earth**

**Read carefully the Operating Manual and its instructions, pay attention to the safety symbols**   |   **Unit Earth Connection**

**Earth Protection**   |   **Equipotential**

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**KEY TO THE SYMBOLS USED IN THIS DOCUMENT:**

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

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

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

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

**☞NOTE**   **The NOTE sign draws attention to important information.**

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| II | Note and symbols |
|----|------------------|

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| ⚠ WARNING | *SAFETY RECOMMENDATIONS AND INSTRUCTIONS* |

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

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

**narda** ⚠
Safety Test Solutions

# Dichiarazione di Conformità
# *EU Declaration of Conformity*  CE

In accordo alla Decisione 768/2008/EC, conforme alle direttive EMC 2014/30/UE, Bassa Tensione 2014/35/UE e RoHS 2011/65/UE, ed anche alle norme ISO/IEC 17050-1 e 17050-2.
*In accordance with the Decision 768/2008/EC, compliant to the Directives EMC 2014/30/EU, Low Voltage 2014/35/EU and RoHS 2011/65/EU, also compliant to the ISO/IEC standard 17050-1 and 17050-2*

| | |
|---|---|
| Il costruttore<br>*The manufacturer* | **narda Safety Test Solutions S.r.l. Socio Unico** |
| Indirizzo<br>*Address* | **Via Benessea, 29 / B; I-17035 Cisano sul Neva (SV) - Italy** |

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

| | |
|---|---|
| EMC:<br>*EMC:* | **EN 301 489-1** (V2.2.3)**; EN 301 489-19** (V2.0.0)**; EN 301 489-52** (V1.1.2)<br>**IEC EN 61326-1** (2021) |
| Sicurezza:<br>*Safety:* | **IEC EN 62368-1** (2020); **EN 61010-1** (2010) |
| Radio:<br>*Radio:* | **EN 301 511** (V12.5.1); **EN 301 908-1** (V13.1.1); **EN 301 908-2** (V13.1.1);<br>**EN 301 908-13** (V13.1.1); **EN 303 413** (V1.2.1) |
| Salute:<br>*Health:* | **IEC EN 62311:2020** |

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

| | |
|---|---|
| Descrizione<br>*Description* | **STAZIONE DI MONITORAGGIO SELETTIVA**<br>***AREA MONITOR SELECTIVE*** |
| Modello<br>*Model* | **AMS-8061** |

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

| Apparecchiature Radio<br>*RED* | **2014/53/EU** | Compatibiltà Elettromagnetica<br>*EMC* | **2014/30/EU** |
|---|---|---|---|
| Bassa Tensione<br>*Low Voltage* | **2014/35/EU** | RoHS<br>*RoHS* | **2011/65/EU** |

**Cisano sul Neva, 06 December 2022**          **Egon Stocca**

**General Manager**

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# 1 – General information

**1.1 Documentation**

This Users Manual contains the following annexes:
- A form to be returned to NARDA with the device when requesting service.
- A checklist of the accessories included in the shipment.

**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.

AMS-8061 unit is equipped with solar panel (twin pair) and high capacity back-up batteries that ensure practically unlimited autonomy under conditions of normal sunlight. An external power supply is provided for continuous, indoor operation.

The system of acquisition allow to program each parameter and transfer to a PC the data saved into the unit. The recorded data can be viewed either as a graph or as a table.

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, AMS-8061, which includes a 4G GSM/GPRS modem, can be programmed to send a SMS, describing the alarm, to the user's mobile phone, and/or generate a point-to-point data call to the controller PC. Station set for Modem/FTP communication mode can be programmed to access the user's FTP server and download measurement results as soon as any alarm condition occurs.



**Fig. 1-1** AMS-8061 Field Monitoring System

**1.3 Standard accessories**    Standard accessories included with AMS-8061 unit are:

The baseplate includes:
- AMS-8061 Area Monitor Selective
- Air filter
- Radome with 4pcs. Torx screws M5x16mm and 4 pcs. plastic washer

Other accessories:
- Solar panels
- Support base (iron version);
- Battery Pack;
- Fuse
- USB Cable 1.8m - USB(A)/USB(B)
- AC/DC Converter with plug adapters;
- Certificate of Compliance;
- Software Media including user's manual;
- Torx Allen Key;
- Reversible screwdriver
- 13mm Combination Wrench
- 7mm Combination Wrench
- Mast;
- Weight bags;
- Mounting kit.

**1.4 Optional accessories**    Accessories supplied separately (on charge) for AMS-8061:
- RS232 cable
- Ethernet cable
- USB-RS232 Adapter
- External power supply
- Support base (aluminum version);

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

<table>
<tr><td colspan="2" align="center">**TABLE 1-1 Technical Specifications of AMS-8061**</td></tr>
<tr><td>**Frequency range**</td><td>100 kHz – 6 GHz (in accordance with antenna specifications)</td></tr>
<tr><td>**User-Programmable frequency bands**</td><td>Up to 20, individual start-stop frequency settings</td></tr>
<tr><td>**Sensor type**</td><td>Triaxial, isotropic antenna system</td></tr>
<tr><td>**Sensor dimensions (Ø)**</td><td>120 mm</td></tr>
<tr><td>**Sensor RF connection**</td><td>50 Ohm, N-male</td></tr>
<tr><td>**Sensor control**</td><td>Multi-pin connector</td></tr>
<tr><td>**Dynamic range**</td><td>> 60 dB in all settings of the attenuator</td></tr>
<tr><td>**Measurement range**<br>**Sensitivity**<br>**Overload**<br>**Resolution**<br>**Linearity**<br>**Frequency response (flatness)**<br>**Overall anisotropy (EN50383)**<br>**Unit**</td><td>Depending on the antenna<br>(please refer to the antenna specifications pag.1-5)</td></tr>
<tr><td>**Out of band attenuation**</td><td>>50 dB, depending on settings</td></tr>
<tr><td>**Rejection**</td><td>> 20 dB</td></tr>
<tr><td>**Calibration**</td><td>Performed in EA accredited laboratory: Accredia LAT nr.008</td></tr>
<tr><td>**Calibration interval**</td><td>2 years (recommended)</td></tr>
<tr><td>**Reading rate**</td><td>Down to 200 ms (depending on the band setting)</td></tr>
<tr><td>**Measuring parameters**</td><td>Settable bands and automatic configuration</td></tr>
<tr><td>**EMF stored values**</td><td>AVG or RMS, Max value</td></tr>
<tr><td>**Average**</td><td>Arithmetic (AVG) or RMS</td></tr>
<tr><td>**Average time**</td><td>1 – 15 minutes</td></tr>
<tr><td>**Storing rate**</td><td>1, 2, 6, 15 minutes</td></tr>
<tr><td>**Max. logging before overwriting**</td><td>18 months @ 6 minutes storing rate<br>3 months @ 1 minute storing rate.</td></tr>
<tr><td>**Alarms**</td><td>SMS and/or data download for: field over limit, open case, temperature, humidity, low battery, sensor failure.</td></tr>
</table>

| | |
|---|---|
| **GSM module** | Worldwide LTE, UMTS/HSPA+/GSM/GPRS/EDGE coverage [1] |
| **Data download** | FTP: automatic to server;      CSD: automatic or manual to PC |
| **SIM card type (not included)** | Enabled for CSD: Circuit Switched Data service or GPRS or both communication modes<br>Enabled for SMS & FTP: required |
| **SMS** | SMS to 10 mobile phones (daily report of max. EMF value, battery voltage) |
| **Battery management** | Every record includes Battery Voltage and Charge Current value |
| **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) |
| **Interfaces** | RS232, USB, Ethernet, Micro SD Card and 4G modem |
| **External memory** | Micro SD card (not included); max capacity up to 16 GB |
| **Power supply** | Solar panel 17.5 V, 2 x 40 W<br>Backup sealed Pb rechargeable battery, 12 V<br>AC power supply and battery charger 100-240 V, 50/60 Hz to 24 VDC, 1.25A<br>External DC 12 V – 3 A [2] |
| **Autonomy with battery only** | 48 to 60 Hours, setting depending |
| **Autonomy with Solar panel** | 24 hours/365 days for PSH (Peak Sun Hours) ≥ 2; equal to ≥2 kWh/m$^2$ per day |
| **Operating temperature** | -10 °C to 55 °C |
| **Humidity** | ≤ 95% |
| **Wind speed** | Max. 150 km/h (unit must be installed according to instructions) |
| **Protection grade** | IP55 |
| **Overall dimensions (LxHxD)** | 1100x1480x715 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 (with iron support base)<br>Approx. 29 kg (with aluminum support base) |

Note (1): AMS-8061 are equipped with 4G modem (for station which serial number starts with 141ZY…..); the previous serial number are equipped with 3G modem.

Note (2): Accessory supplied separately (on charge)

**1.6 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 |

The AMS-8061 system can be equipped with electric and magnetic antenna as reported in the following table:

| 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<br><3.5 dB up to 6 GHz | <2.0 dB | <2.5 dB up to 3 GHz<br><3.5 dB up to 6 GHz | <2.5 dB |
| **Unit** | V/m | A/m | V/m | V/m |

**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** HA-1B-01 antenna and EA antenna models

**1.7 AMS-8061 receiver panel**
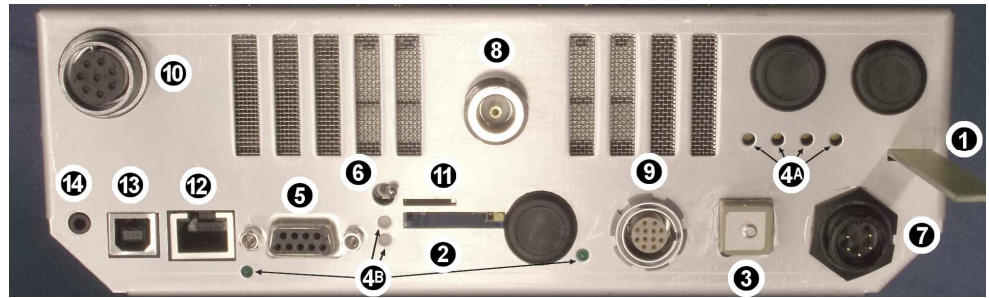


**Fig. 1-4** AMS-8061 receiver unit panel
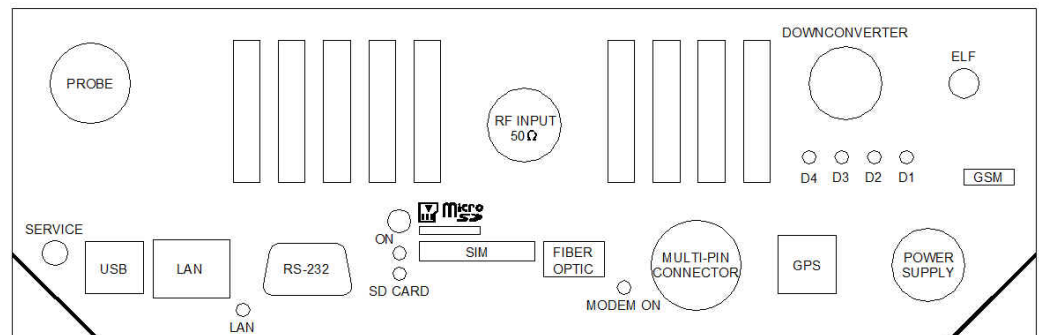


**Legend:**

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 – AMS-8061 Installation and first use with NardaAMConfigurator

**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.

**NOTICE**

**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              ≤ 95%

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              < 99%
- Altitude                       Up to 4000 m (a.s.l.)

**2.4 Return for repairs**

Any part of the instrument, including the battery, – with the sole exception of the air filters (see Service at chapter 7) and Radome - can only be replaced by NARDA, therefore, in case of damage to parts and/or malfunctions, please contact the NARDA Service Center.

When the instrument has to be returned to NARDA for repairs, please complete the form included in this User's 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.

**NOTE**

**Nowadays there are restrictions on the shipment of hazardous materials, eg. some types of lithium batteries.**
**Please, check the proper, safe, shipping mode, with the help of your courier, in the case the product is equipped with batteries.**

**2.5 Cleaning**

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

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

| NOTICE | **It is suggested to replace air filter at least once a year or more frequently if needed (see Service at chapter 7)** |

**2.6 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.

The AMS-8061 Field Monitoring System consist of a vertical housing with circular shape made of material 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.

☞ 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

Follow instructions below (from n°1 to n°34) to install the unit on the site; It is always better prepare the first installation on site with the help of a laptop or a tablet.

1) Install the Support base on the site to be monitored.
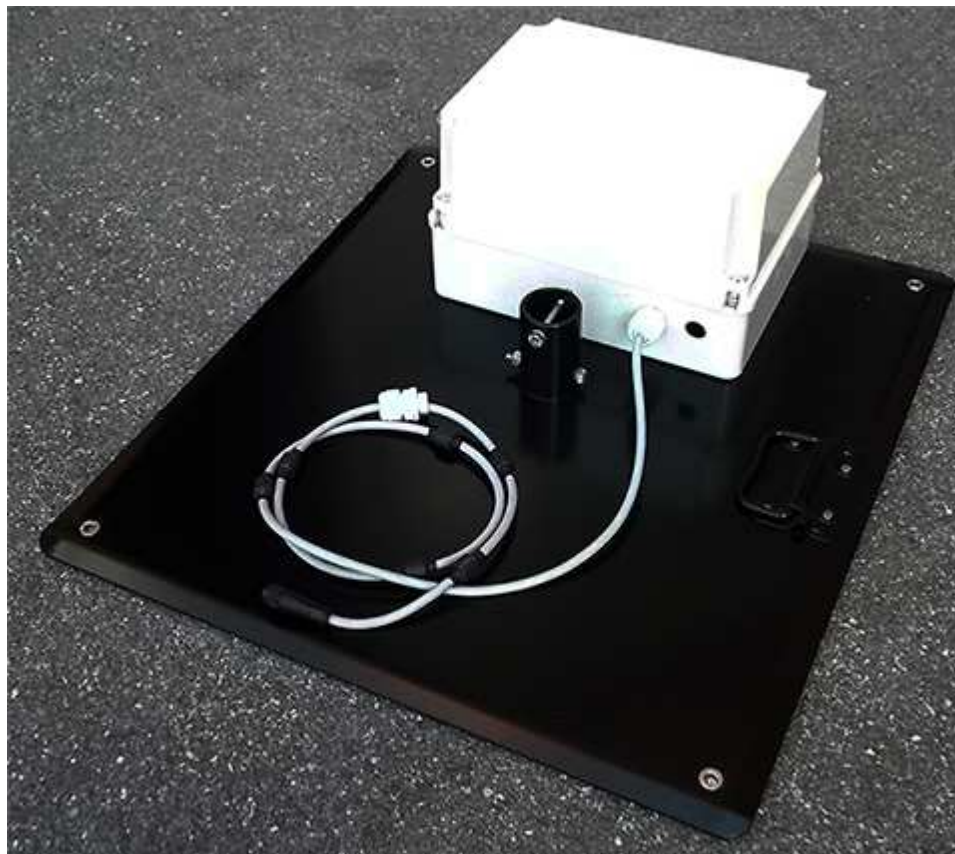


**NOTE**

**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.**

**NOTE**

**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.**

**NOTICE**

**Correct readings may be conditioned by the nature of the places in which the field monitoring system is installed.**
**The field sensor 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.**

**NOTICE** | **Prior to installing stations, make sure that the point at which the field monitor will be installed is adequately covered by the mobile phone service allowing remote data communication.**
**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.**

**NOTICE** | **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, Point to Point or both).**

**NOTICE** | **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.**

**NOTICE** | **If radiated by strong electromagnetic fields, the antenna can be damaged even if disconnected from the monitoring station, or connected to a monitoring station that is switched off.**

2) Screw the four adjustable feet under the support base.

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

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

4) Assembly the pair of solar panels as shown below:

The Solar panel mounting kit includes:
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.
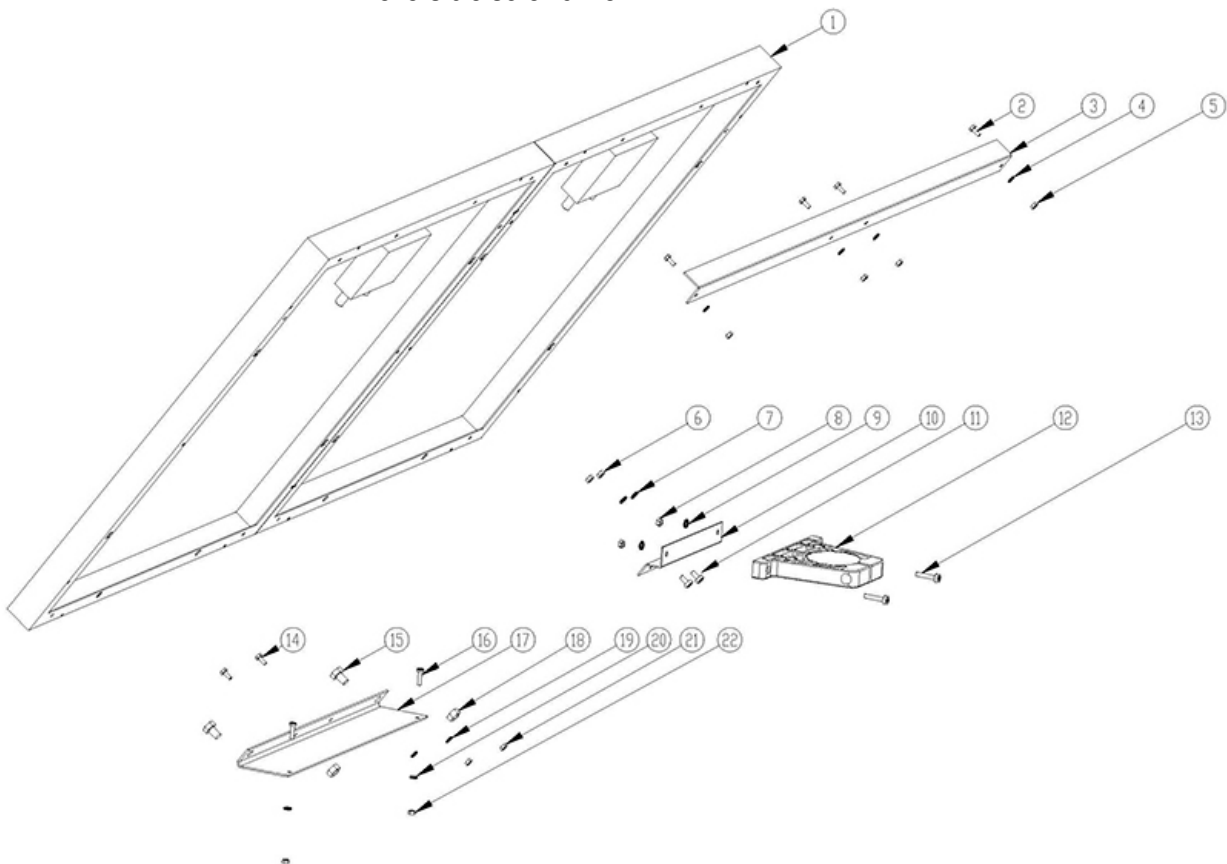
**40W Solar panels**
Position and align the two solar panels as indicated by the arrow sticker positioned on the side of each panel.
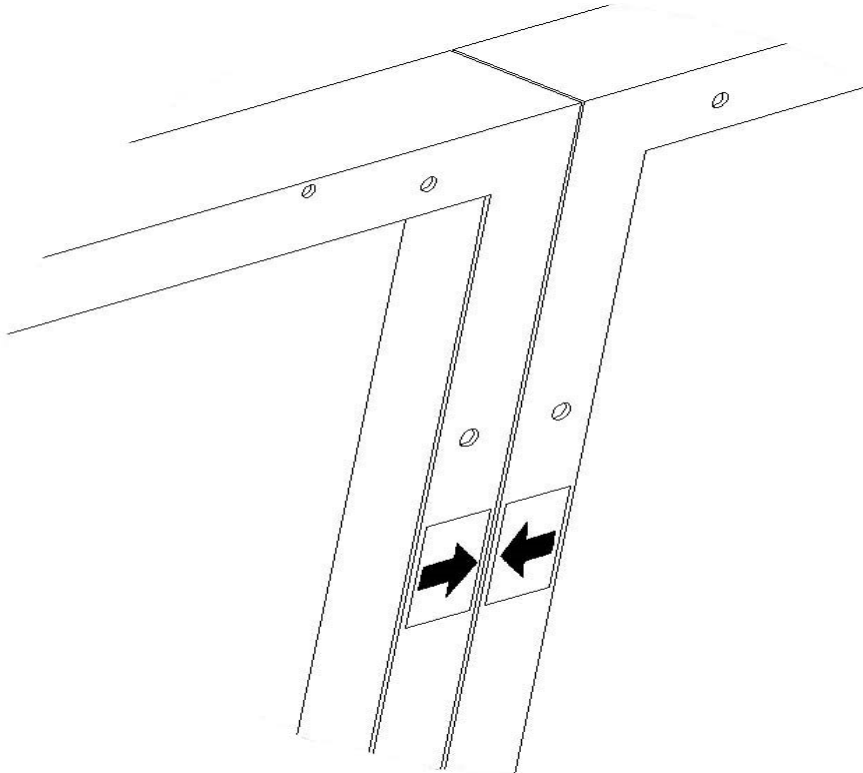
**Upper L shaped bracket**
Assembly the Upper L shaped bracket to the upper side of the panel indicated with "**UP**" label.
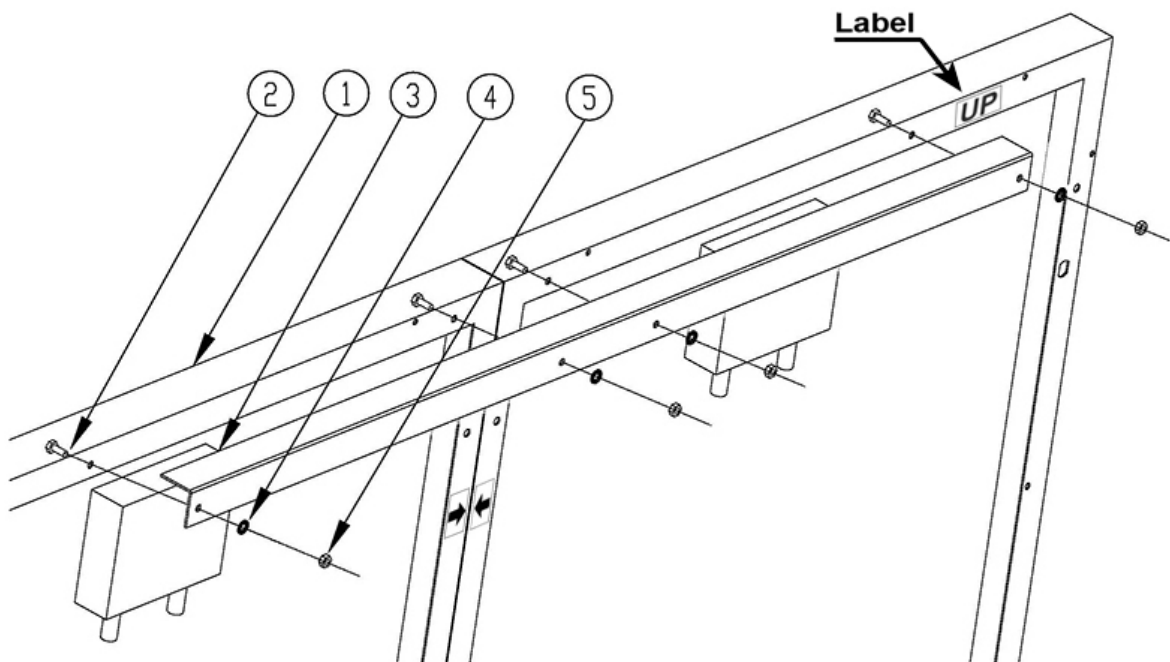
## S shaped bracket and PA6 black bracket
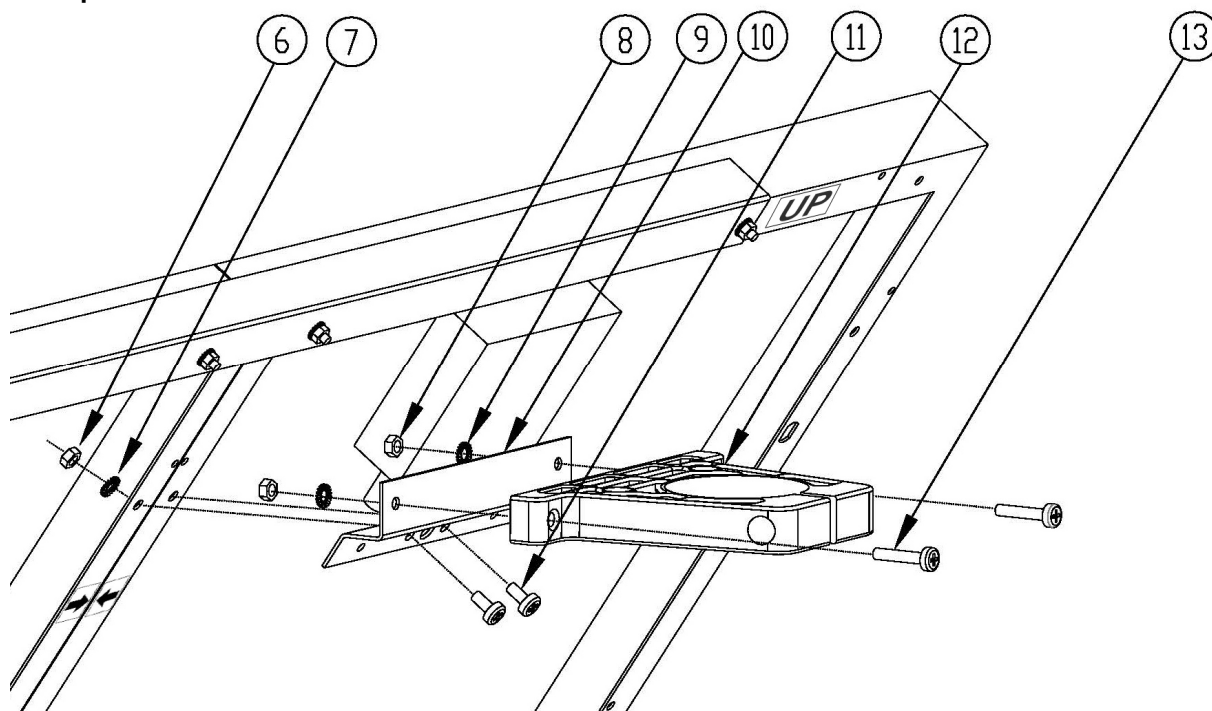


## 55deg lower support

Assembly the 55deg lower support to the lower side of the panels indicated with "**DOWN**" label
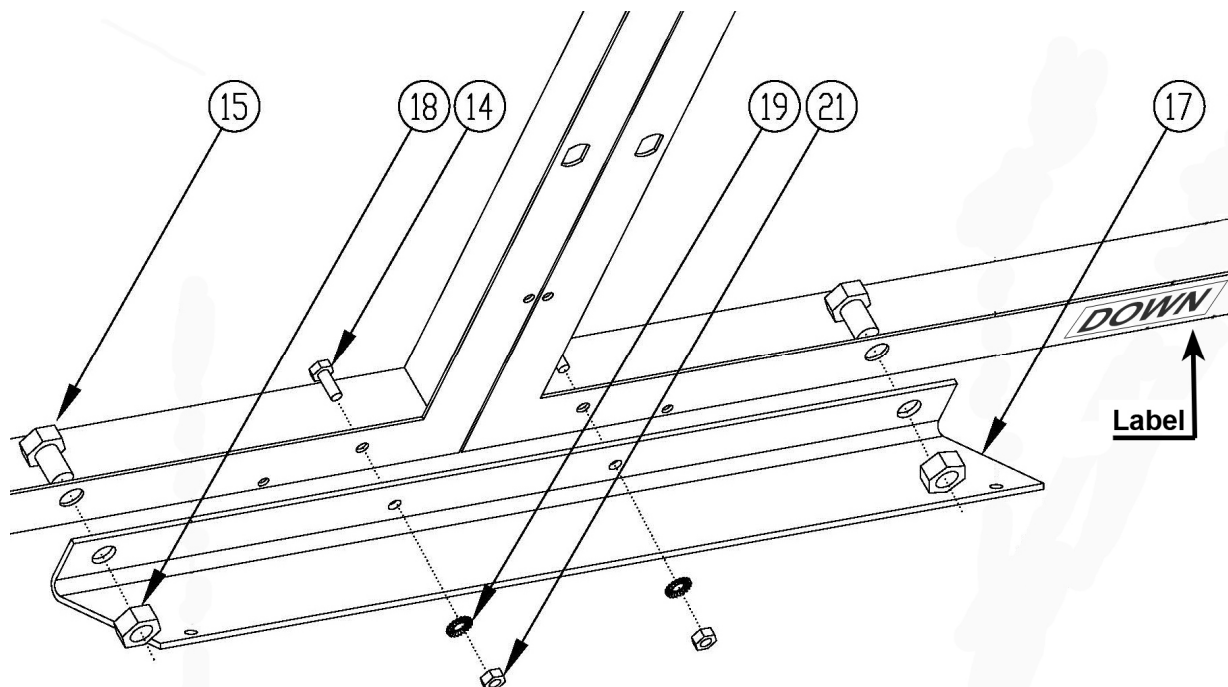
The solar panel is ready to be mounted on the support base.
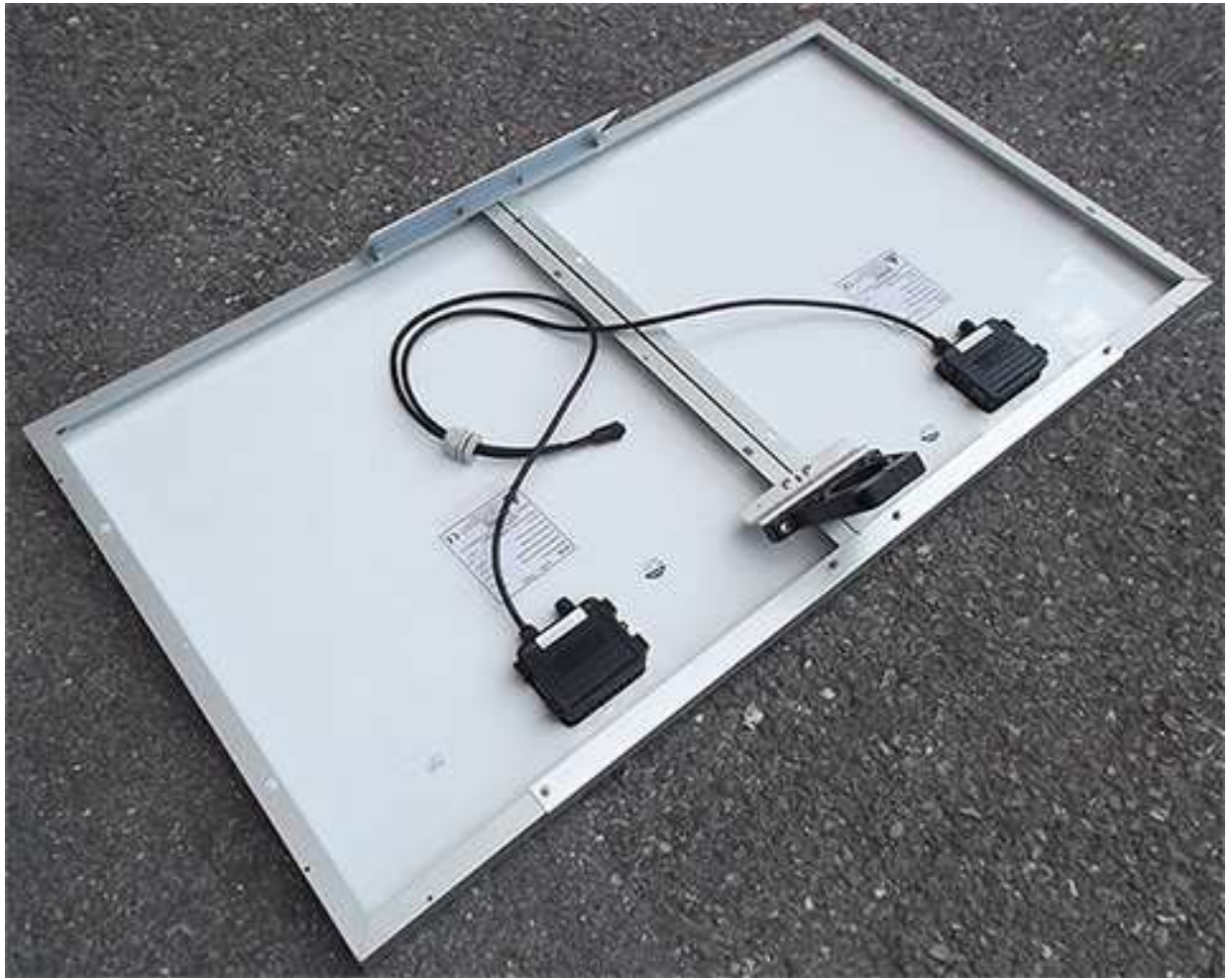


6) Unscrew the Pan head screw inside the PA6 black bracket without losing it completely.

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



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

9) 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.
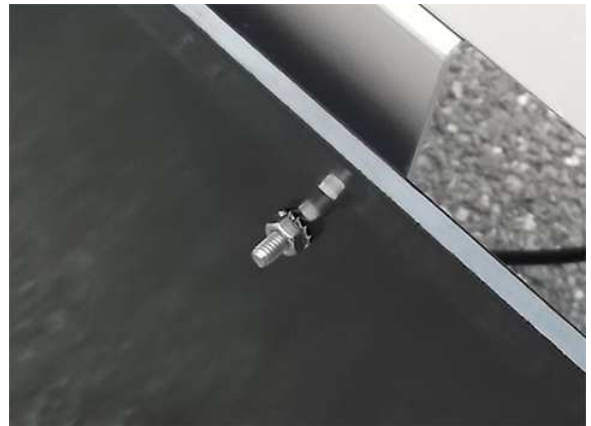


10) Position the Solar panel and the Support base on the ground as shown below.

11) Fasten the Solar panel by tightening the bracket screws



12) Remove the Power Pack cover.
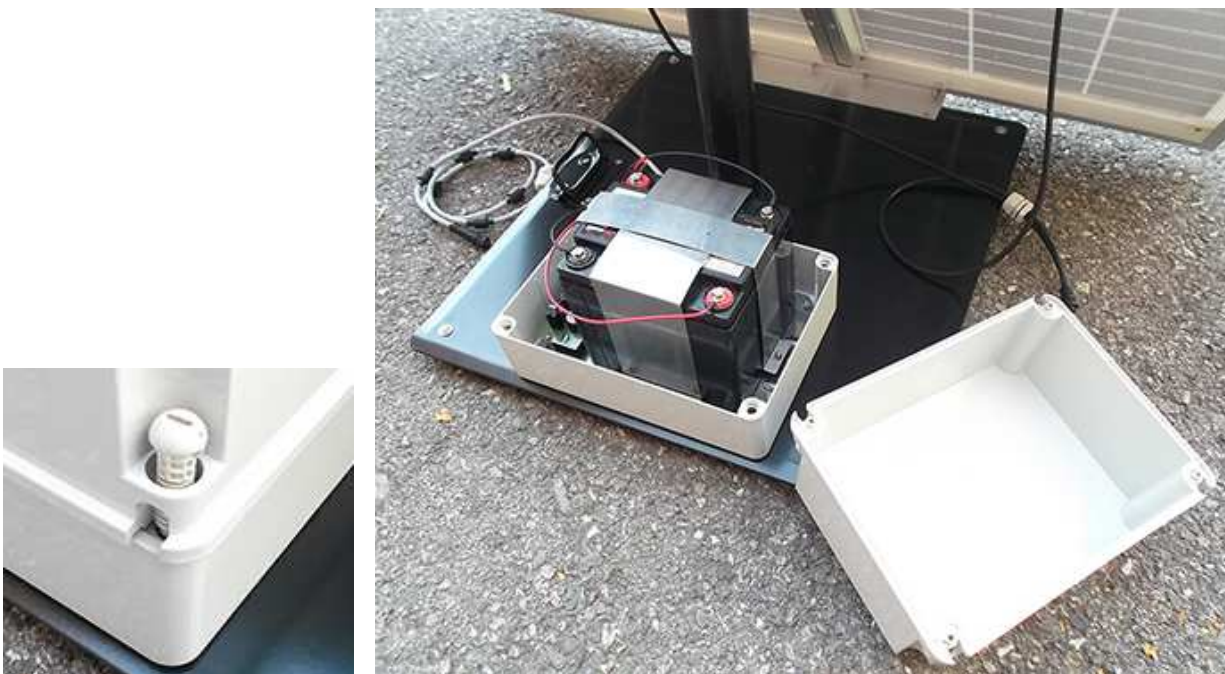
13) Remove the nut from the chock of the solar panel cable.



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



15) Place the fuse.

16) Plug the solar panel connector.
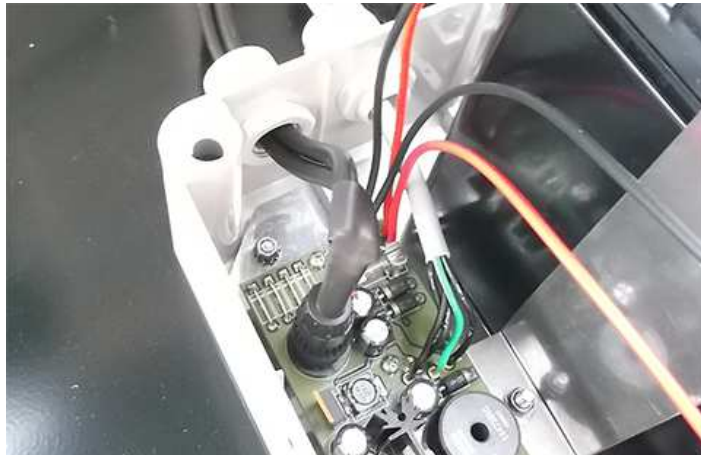


17) Close the Power Pack box.
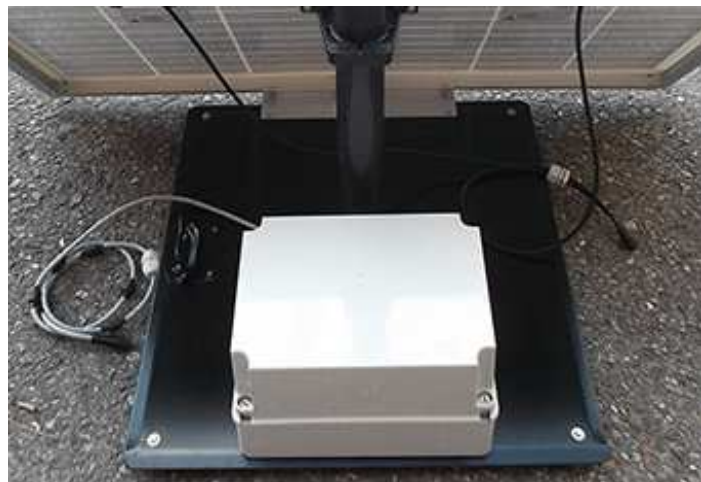


18) Before mounting the receiver unit on the pole, unscrew the Pan head screw inside the both PA6 black brackets without losing it completely.

19) Mount the receiver unit on the pole.



20) Fasten the unit by tightening the bracket screws



21) Remove the nut from the chock of the power cable.

22) 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.

23) Before installing the triaxial antenna, make sure the monitoring station is switched off. 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.





**NOTICE**

**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.**

24) <u>In the first connection</u> you must connect the USB port of the AMS-8061 to the PC (USB port) by USB(A)/USB(B) cable and configure the station with NardaAMConfigurator software. It must be make in this way even if the subsequent operations will be done via Ethernet or RS232 or 4G modem.

**The Ethernet connection cannot be used to configure the AMS-8061 station with NardaAMConfigurator software.**

**RS232 Cable and USB-RS232 adapter are accessories supplied separately (on charge)**

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

**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.**

Local data download through RS232, USB or Ethernet will be regularly required if no GSM signal is present in the installation place.
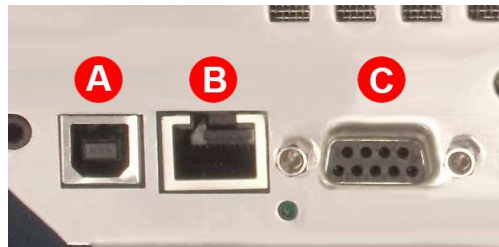


**- USB-B connector**.


**- ETHERNET connector**


- **RS232 connector**



**Fig. 2-2** DB9 Female front side view
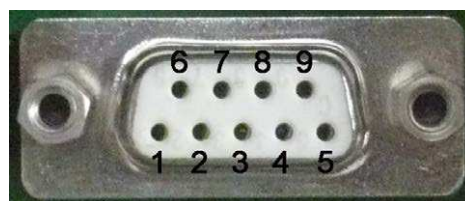
DB9 pin configuration:
**Pin 2** RX [Received Data]
**Pin 3** TX [Transmit Data]
**Pin 5** GND [Signal Ground]
**Pin 9** +3VD [Current limited]

**2.7 GSM Modem and SIM Card**

25) AMS-8061 is equipped with a 4G GSM modem (inside the main unit) and antenna that allows remote communication for programming and for the remote collection of the data recorded. The GSM modem requires a regular SIM Card (not provided) enabled for data communication (Point to Point, GPRS/FTP or both, depending on the preferred communication mode).



Insert the SIM card in its tray in the GSM modem of the unit or be sure that the tray is locked inside its slot **even if the GSM is not being used.** To extract it press the yellow button just beside the SIM tray

The SIM to be used must permit the transmission and reception of data calls



**Fig. 2-3** Slot for the SIM card

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.

| NOTICE | **To download the measurement data from the monitoring station through the RS232. USB, Ethernet port, the tray holding the SIM Card must be correctly fitted inside its slot even if no SIM Card is installed.** |
|---|---|
| NOTICE | **Before removing or inserting the SIM Card, switch off the AMS-8061.** |
| NOTICE | **If you use a rechargeable SIM Card, make sure it is charged.** <br> **Before using the SIM Card with the AMS-8061, disable the PIN code using the proper function available on any mobile phone.** |

**2.8 Micro SD Card**

![NOTE hand pointing icon]

**NOTICE**

26) 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 Card. It is solely intended for backing up data when no other way is accessible among the many present (RS232, USB, FTP, Ethernet and Modem). Therefore, for no reason should a Micro SD Card be left in the slot permanently or for a long time.

Moreover, GPS shares the same Micro SD Card port thus, when an Micro SD Card is present, the GPS is disabled.

**The station is able to accept a Micro SD card with 16 GB maximum capacity.**
**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 § 5.8 "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 data stored in SD CARD are in binary format; the download description is explained on §5.8 chapter".
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.

| | |
|---|---|
| **2.9 Switch the AMS-8061 on** | 27) Switch the unit on using the level switch of the AMS-8061 Area Monitor System. |
| **2.10 Check the LEDs status** | 28) Once switched the unit on, check the Led ON, Led ETHERNET, Led MICRO SD Card and Led MODEM status as follows: |
| **Led ON status** | 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. |



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 antenna to about 60 seconds after correct acknowledgement of the connection.

☞ **NOTE**

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

**Led ETHERNET status**     This Led let the user know about the Ethernet status as shown in the following table.



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

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



| TABLE 2-2 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:<br>• SD-card not formatted FAT or FAT32<br>• Damaged SD-Card |
| Steady ORANGE | SD Card ERROR | This can be caused by:<br>• File "SD8061.SD1" not present.<br>• 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.

**Led MODEM status**     The Led let the user know about the Modem status as shown in the following table. It is located close to the antenna data connector.



| TABLE 2-3 Led Modem status ||
|---|---|
| **LEDs** | **Status Action** |
| Steady GREEN | Modem ON |

**2.11 Power supply/
battery charging
(standard accessory)**



NOTE

29) A complete battery charging should be completed (48 hours) before starting first connection and/or measurements.

**Execute the same procedure when the battery charger need to function as power supply 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.

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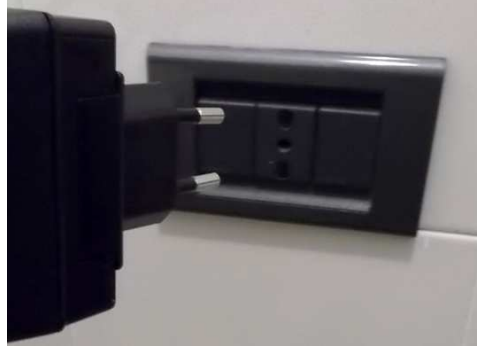


Fasten the cable to the strain relief.



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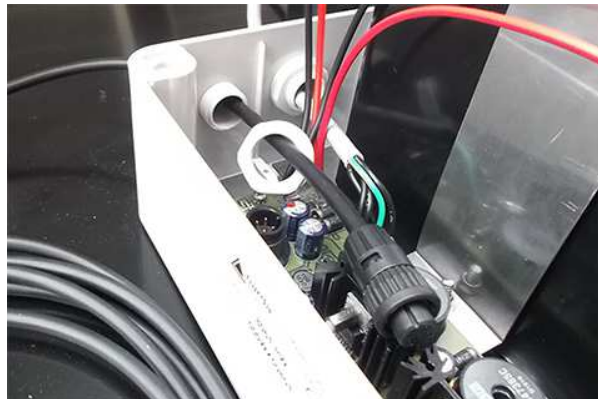


Plug the multipole power supply/battery charger connector to the Power pack
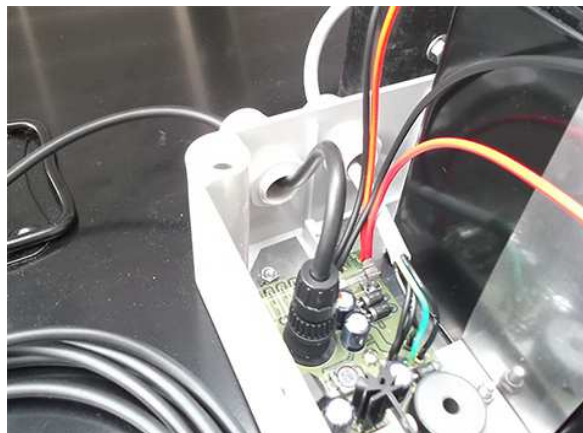
## 2.12 Controlling the internal battery

30) The battery level or the level of the charge can be checked locally or by remote using the 8061SW-02 program: there is a specific window which displays battery voltage and where a battery charge alarm can be set, if necessary.

The battery status of stations can be read from any mobile phone by sending an SMS with the code **#SM?BAT***.

**NOTICE**

**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.**

**NOTICE**

**Any part of the instrument, including the battery, – with the sole exception of the air filters (see Service at chapter 7) and Radome - can only be replaced by NARDA, therefore, in case of damage to parts and/or malfunctions, please contact the NARDA Service Center.**

**NOTE**

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

**2.13 External power supply (optional accessory)**

31) The external power supply optional accessory allows to connect the AMS-8061 directly to the mains power without needing solar panel and battery pack connection





Plug the multipole battery charger connector to the male panel connector of the external power supply.

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



Remove the nut from the chock of the external power supply.

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

**2.14 Use of NardaAMConfigurator**

32) The NardaAMConfigurator installation must be performed and the software icon is shown on desktop.
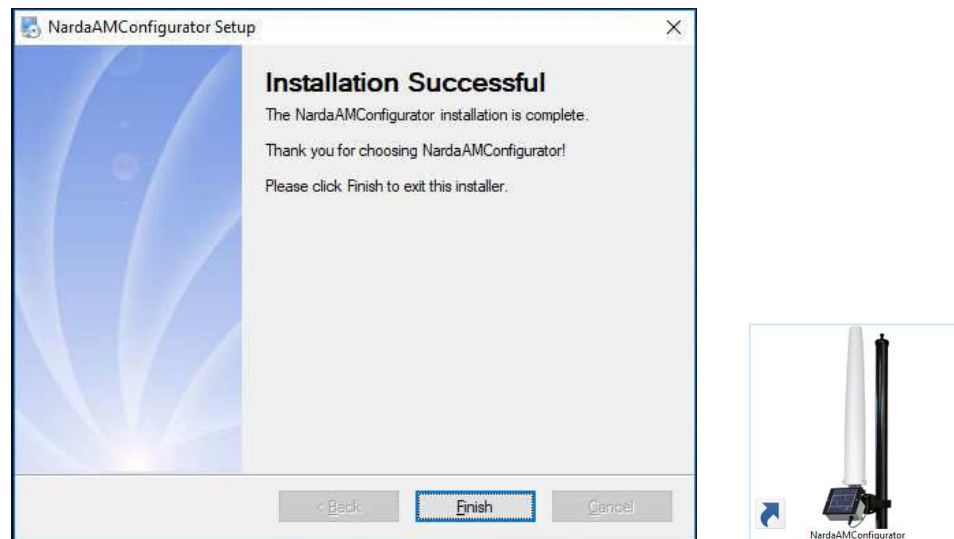


Double click on NardaAMConfigurator icon to run the configurator.



**Fig. 2-5** NardaAMConfigurator main window

Follow the instructions step-by-step.

The configuration wizard help you to configure AMS-8061 station:
- Auto-detect the connection of the station to the PC by RS232 or USB
- Check the status of battery and the version of the FW
- Choice of the connection mode and configuration (Point to Point or FTP)
- Make sure that internet connection (PC side) is established
- Send the demo credentials for FTP connection
- Configure the clock
- Configure the security settings
- Allows to check log files or identify errors during the configuration

☞ NOTE    **Each instructions is explained on the chapter 4 of this manual.**

**2.15 Radome**

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



**NOTE**

**Considering that the AMS-8061 has been designed for outdoor use and the main operations are generally performed remotely by means of an internal GSM modem, the station 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.**

A micro switch on the side of the main unit is tripped when the radome is opened. It is possible to activate an alarm, sent by AMS-8061 to any GSM mobile phone, warning of any attempts to tamper with the device.



**NOTICE**

**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.



**2.16 Bags**

34) 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.

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# 3 – 8061SW-02
# User's guide and Data Display

**3.1 Introduction**

The 8061SW-02 software is a control program fully integrated into the AMS-8061 Area Monitor System. It allows accessing all the remote stations to download data and modify station settings.

Downloaded data are filed within the controller PC and a calendar style search tool allows data displaying, printing and saving in graph and tabled form. The data transfer can be controlled by:
- USB or RS232 or Ethernet cable connection
- Line or GSM PC modem (AMS-8061 set for Point-to-Point data communication)
- Internet by means of the user's FTP server (AMS-8061 set for FTP data communication)

The software is based on the Windows™ operating system.
The 8061SW-02 software features the following basic functions:
- Querying and monitoring all the AMS-8061 installed;
- Programming different AMS-8061 Field Monitors individually with different acquisition modes;
- Querying the Field Monitors at user programmable times;
- Communicating via line modem, GSM modem, Internet FTP, RS232, USB or Ethernet;
- 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 or partial downloaded readings;
- Saving graphs and tables representing all or partial measured data;
- Downloading data with automatic generation of a text file .TXT to be used for easy data exchange with any "Office" applications;

**3.2 Hardware Requirements**

To ensure the proper operations of the 8061SW-02 software, the minimum hardware requirements of the Personal Computer are:

- Pentium processor or equivalent;
- at least 256 Mb RAM;
- at least 100 Mb of free space on your 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);
- GSM or line modem (for Point-to-point data communication);
- Full Internet access allowed for FTP (for FTP communication);
- Free USB or RS232 or Ethernet port;
- Operating System: Windows™ Win7, Win8.1, Win10.

☞ NOTE

**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.**
**Not 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.**

PC modem can be either internal or external, line modem or GSM. It must support the data transmission protocol.

☞ NOTE

**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 its manufacturer.

**3.3 Software installation**

To install the 8061SW-02 on PC from the supplied Software Media proceed as follows:

In Computer Resources, browse the Software Media.

To start the installation double click on the **8061NSTS Setup** icon.

8061NSTS Setup

**NOTE**

**The User must have administrator privileges to install the 8061SW-02 software in Windows 7, 8 etc.; right click on the 8061NSTS Setup icon and click on "Run as administrator" to temporarily install the program as an administrator until close it.**

Open
Open file location
Run as administrator
Scan for viruses...
Pin to Start Menu
Add to Quick Launch
Restore previous versions
Send To                                          ▶
Cut

**NOTE**

**Windows 7 or later also allows to mark the application so that it always be installed with administrator rights.**

**Select with right mouse button the 8061NSTS Setup on desktop, choose the voice "Properties" (should be the last one of the menu).**

**In the new window choose the card called "Compatibility, check the box "run the program as administrator" and push the OK to confirm.**

**At this point, every time the software runs, it will be in the mode Administrator.**
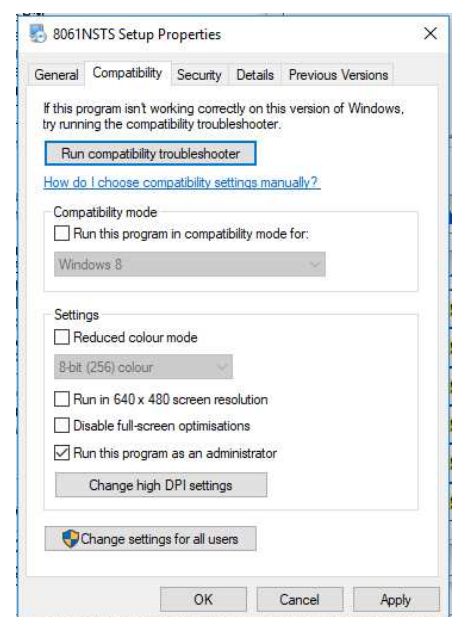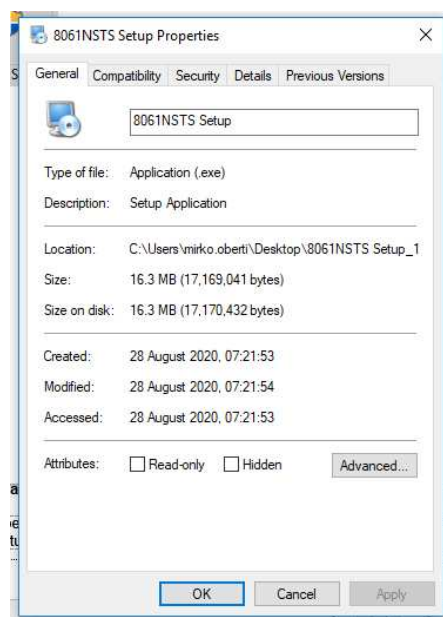
Follow set-up program instructions.
The installation can be aborted by clicking on **Cancel.**
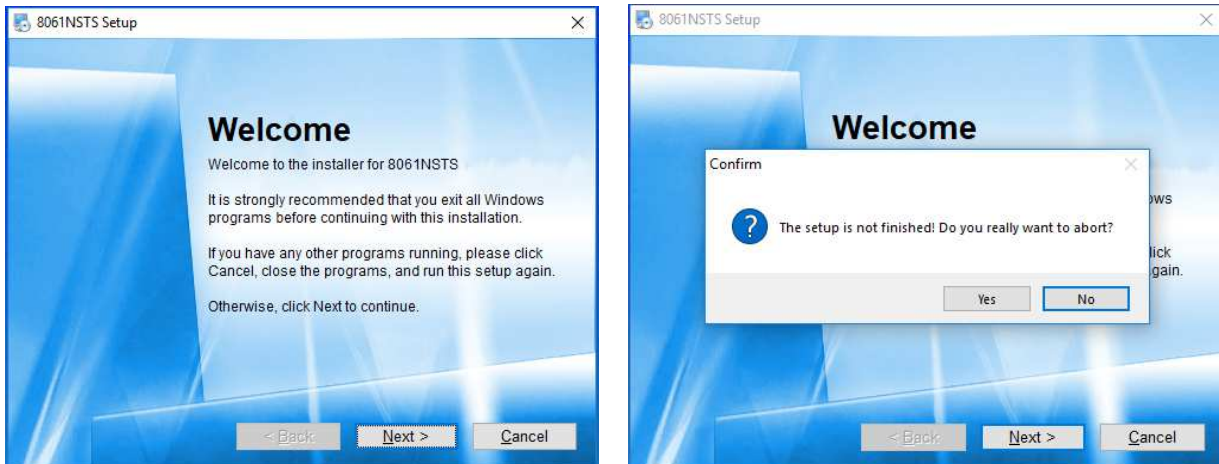


The installation folder must be specified. Click **Next** to confirm the default folder (recommended) or **Change** to modify.



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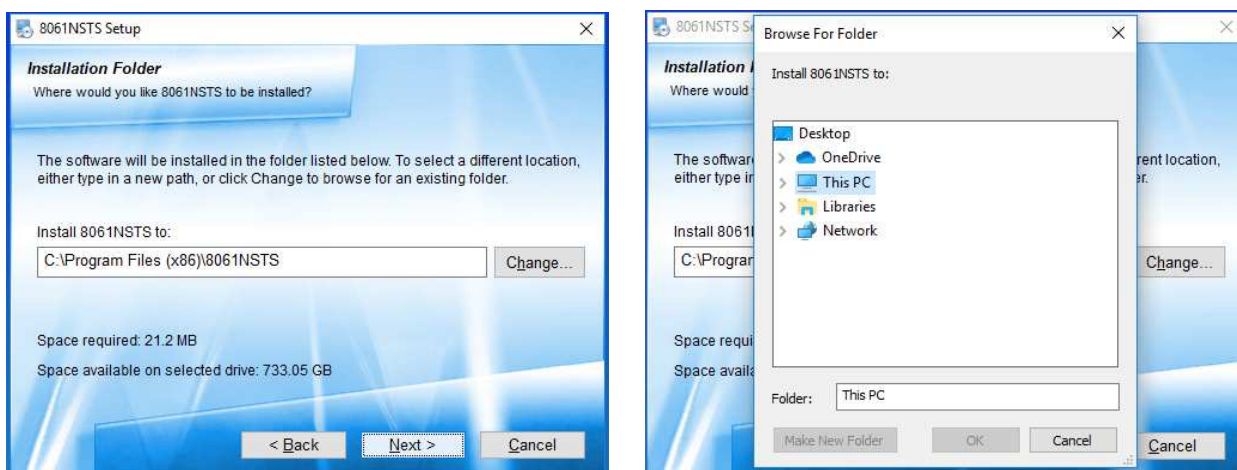
Click **OK** to confirm the directory**.** You can also type a different name**; in Windows 7 the maximum number of characters for the name is 24 (including spaces); a message will appear in case of error.**

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.
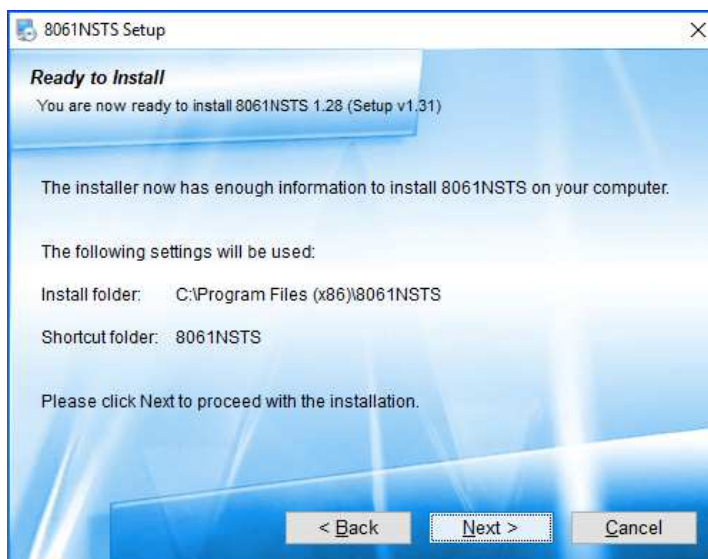


In case of existing installation, the software will ask the user if he wants to cancel all the Passwords.
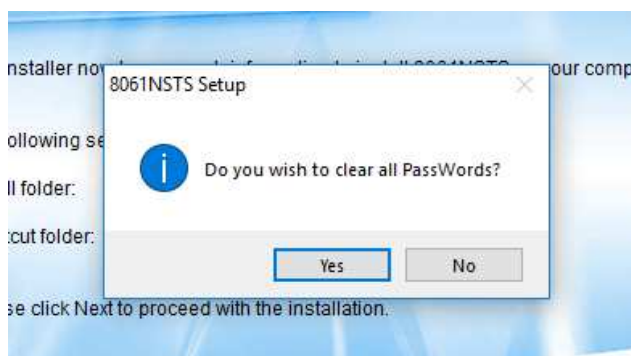


If the answer is **YES**, the following message will appear:
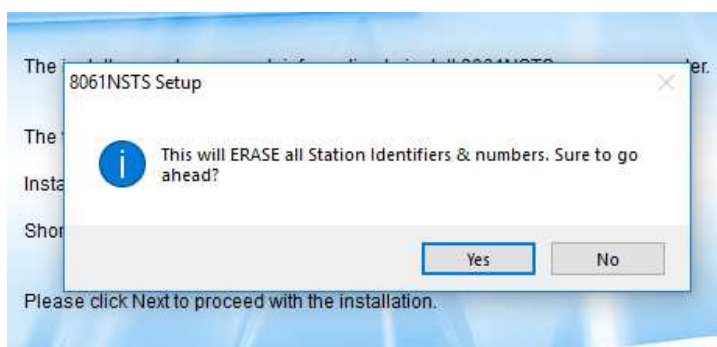


If select **YES,** all the stations and measurements already saved will be hidden, but still accessible by adding all the stations used and maintaining the original name (respecting upper and lower case letters) and phone number.
With this procedure, all hidden stations are made accessible to the User.

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:
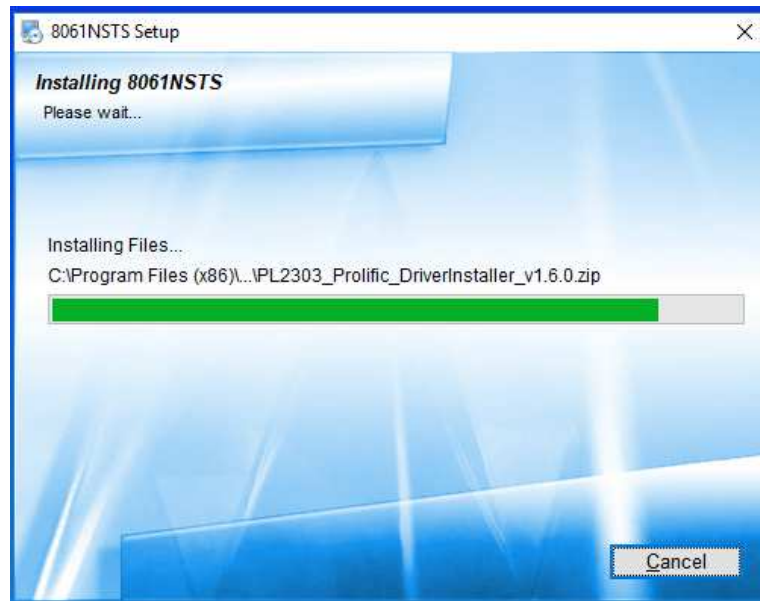


Click **Finish** to complete and exit the installer.

The folder **8061NSTS** is created under **Programs** with the icon **8061SW-02** on desktop.
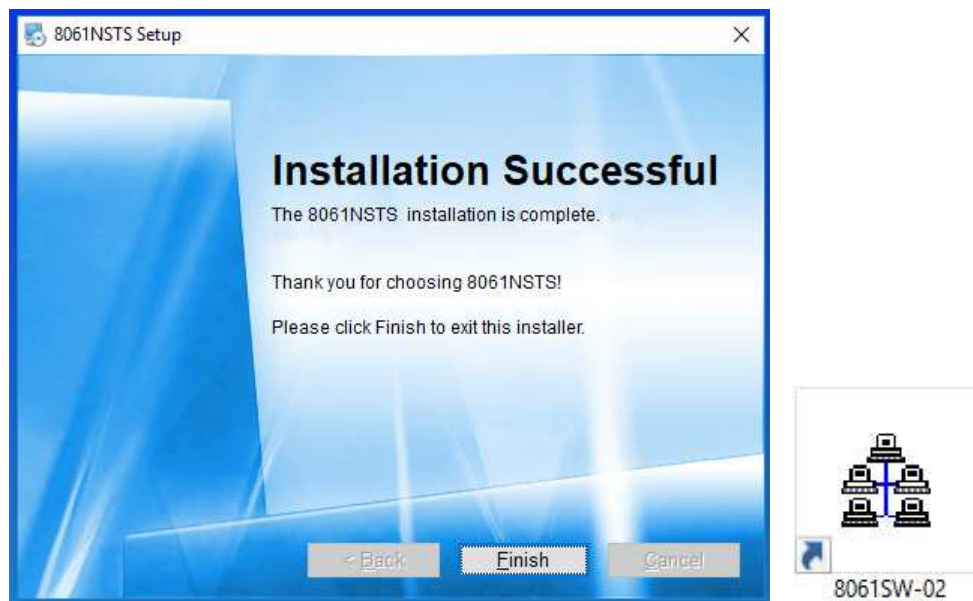
When asked for, reboot your system to complete installation



**NOTE**

**The User must have administrator privileges to run the 8061SW-02 software in Windows 7, 8 etc.; right click on the 8061SW-02 icon and click on "Run as administrator" to temporarily run the program as an administrator until close it.**



**NOTE**

**Windows 7 or later also allows to mark the application so that it always be used with administrator rights.**
**After the installation, select with right mouse button the 8061 NSTS icon on desktop, choose the voice "Properties" (should be the last one of the menu).**
**In the new window choose the card called "Compatibility, check the box "run this software as administrator" and push the OK to confirm.**
**At this point, every time the software runs, it will be in the mode Administrator.**
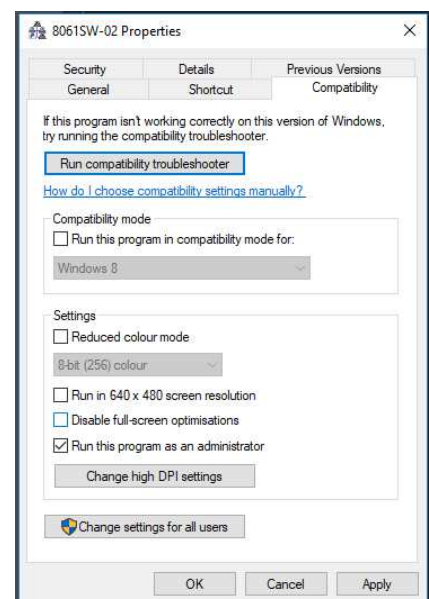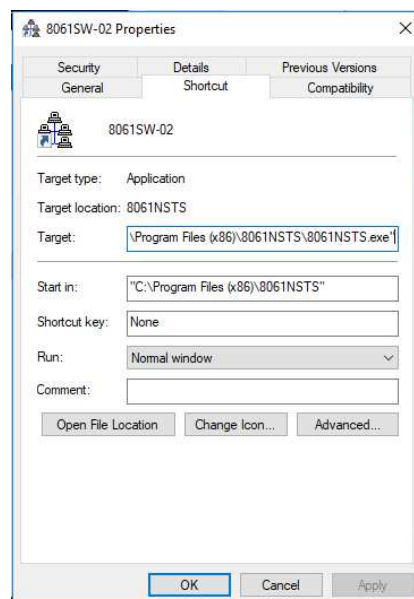


8061SW-02 software is now installed in your PC, you can remove it, if needed, simply running the **Uninstall 8061NSTS** application (see §3.16).

**3.4 Password management**

**3.4.1 Entering TERMINAL password**

8061SW-02 allows the user to create a list of all stations that are going to be used. The list include parameters, like telephone number, station name, ecc. needed by the software to access every single station. To avoid any improper modification of parameters included in the station list by non admitted personnel a **Terminal password** is needed.



Running the software for the first time after installation the user is allowed to define the password. The screen looks like this:



If the answer is **YES**, a window will be opened where it is possible to enter the Terminal PASSWORD for the management of the Station list parameters. If the answer is **NO**, the program will allow to enter the password later.

**NOTE**

**Every time you have to modify a field, the Terminal Password will be requested by the software. At the beginning, for the first setting operations, it would be helpful to leave these password blank, simply pressing enter on the keyboard.**
**Set a password only after all your area monitors will be correctly set, and just in case you need to have an higher security level.**

If the answer is **YES**, the screen looks like this:
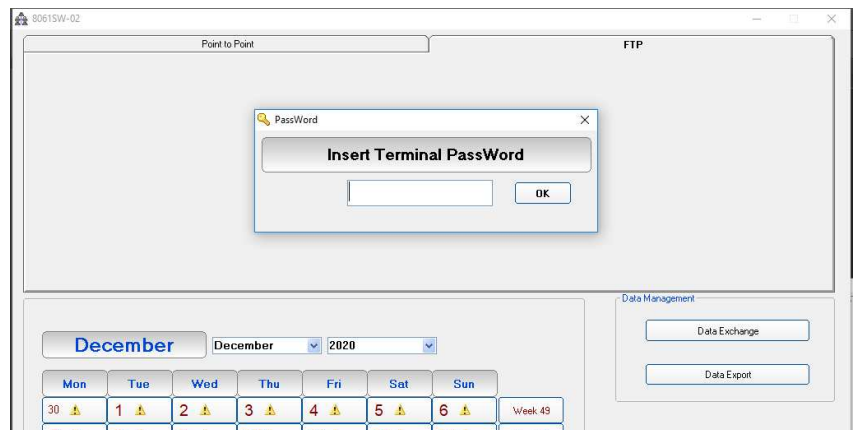


**NOTE**

**The User can enter any sequence of alphanumerical characters; any special characters are not allowed.**
**We recommend to take note of the Terminal PASSWORD entered**.

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:
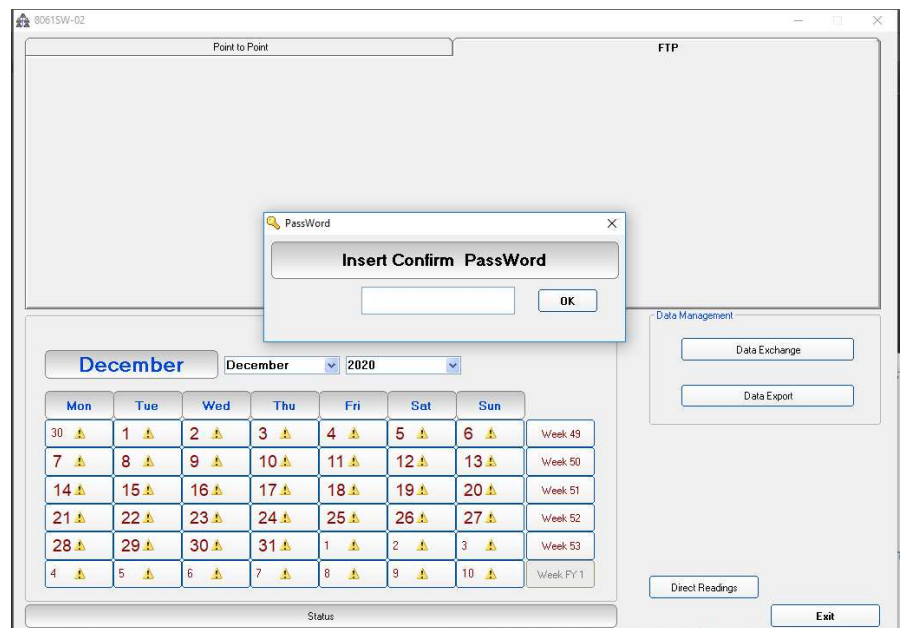


At this point, type the same **Password** again. In case of any mistake, the software will display the following message:
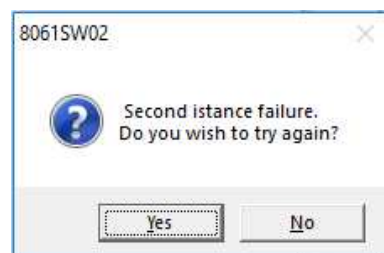


After the answer **YES** it is possible to re-enter the correct password; answering **NO** the procedure for the assignment of a new password starts over again.

### 3.4.1.1 Changing the TERMINAL password

**If it is necessary to change the Terminal Password, just press function key F10 while the software is displaying the main window that includes the station list. The software displays the message:**
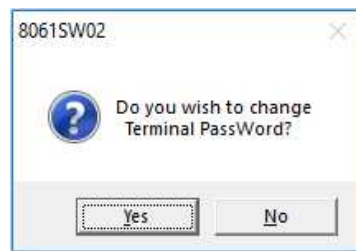


If the answer is **YES**, first enter the old **Terminal Password,** then enter the new one.
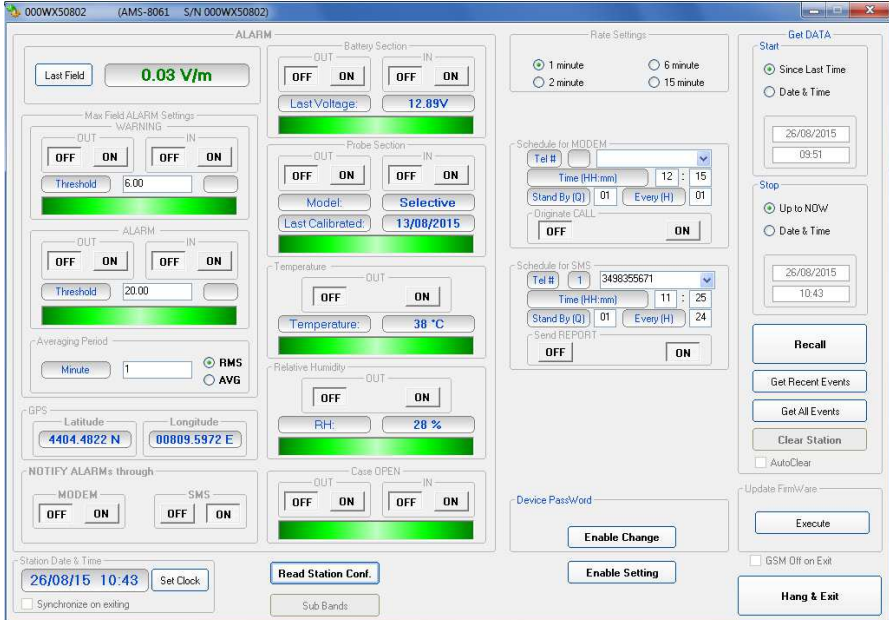
If a wrong **Terminal Password** is entered, the following message pops up:**:**



Press **OK** and try again.

**3.4.2 Entering the SETTING password**
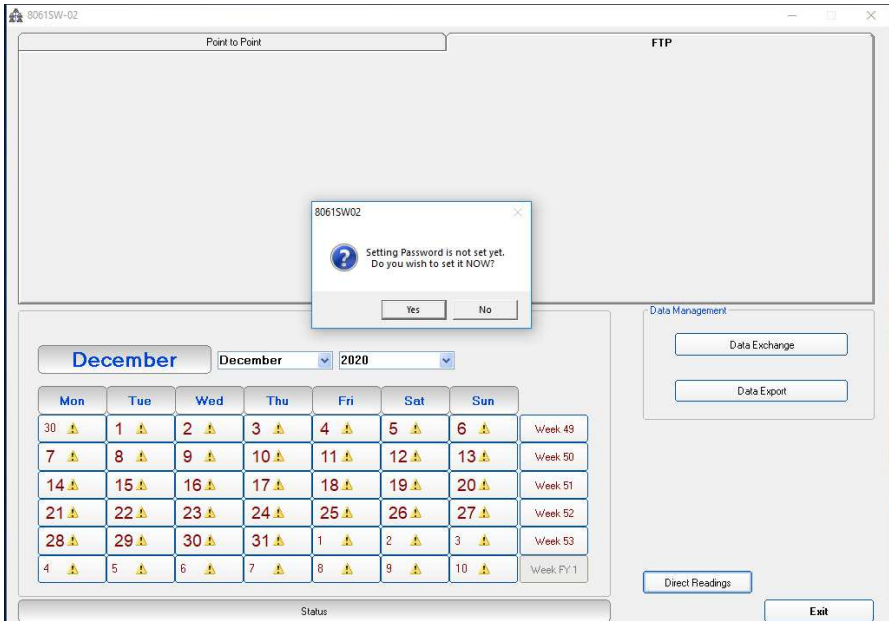
After entering the **Terminal Password** needed to ensure the secure management of the Field Monitors, the software asks to define a **Setting PASSWORD** which is needed to edit the station settings like storing Rate, station clock, thresholds for alarm, device password saved on the AMS-8061, etc.



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**

**Every time you have to modify a field, the Setting Password will be requested by the software. At the beginning, for the first setting operations, it would be helpful to leave these password blank, simply pressing enter on the keyboard.**
**Set a password only after all your area monitors will be correctly set, and just in case you need to have an higher security level.**

**NOTE**

**The User can enter any sequence of alphanumerical characters; any special characters are not allowed.**
**Always take note of the Setting Password entered**.

**3.4.2.1 Changing the SETTING password**

**If it is necessary to change the Setting Password, just press function key F10 while the software is displaying the station setting window. The software displays the message:**



If the answer is **YES**, first enter the old **Setting Password,** then enter the new one.

If a wrong **Setting Password** is entered, the following message pops up:**:**



Press **OK** and try again.

**3.4.3 Entering the DEVICE password**

Remote communication in Point-to-point mode is protected by a **Device Password** that is stored in every AMS-8061 Area Monitor; all the monitoring stations are initialized in the factory with the password "PASSPMM" that is advisable to replace during the first connection following these steps:

In Point-to-point communication mode, enter "PASSPMM" in the **Device Password** field in the station list provided by the control software.

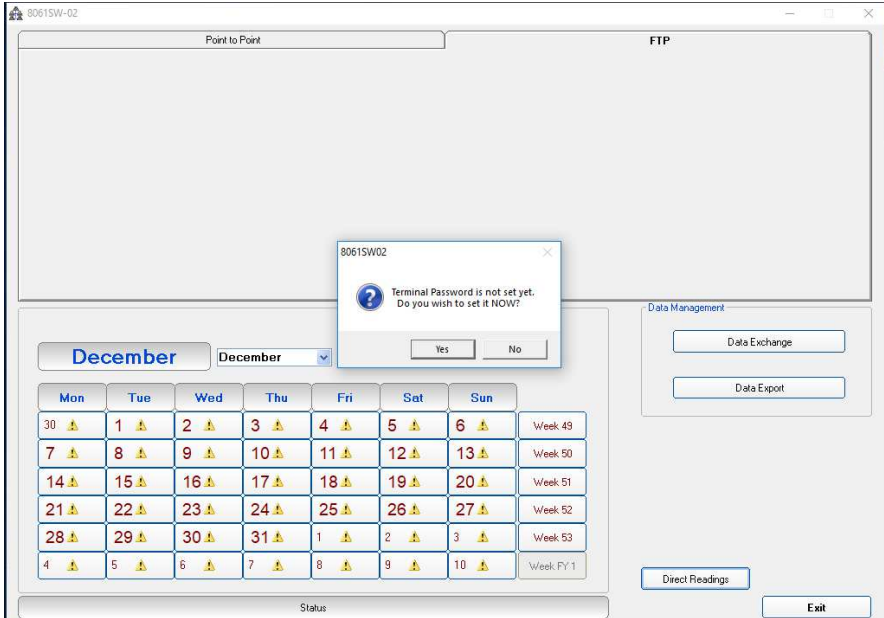| # | Station Identifier (Name) | Telephone Number | Last Link | Links | Alarm |
|---|---|---|---|---|---|
| 1 ↕ | New8061 | 0123456789 | 26/02/15 16.18 | 0/0 | ● Several |
| 2 ⊥ | 020WX50142 | 0123456789 | 27/02/15 11.16 | 0/0 | ● Battery |
| 3 ⊤ | Narda Safety Test | ########## | 27/02/15 11.17 | 0/0 | ● Several |

Edit Station # 3

Station Identifier (Name): Narda Safety Test

Telephone number: ##########

Scheduled Call
Time [ ] □ Generate Call

Device PassWord
########

Automatic DownLoad
□ PC Answering
☑ PC Calling

Remove Station

☑ Hide digits
□ Auto ASCII File
□ Autoload Events

Press the **CALL** button to establish the communication. 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 communication is not allowed.

**3.4.3.1 Changing the DEVICE password**

Once a link has been successfully established, the control window is opened and it is possible to change the Device Password memorized in the station with **Enable Change** button**.**

Enable
OFF          ON

Clear Station
□ AutoClear

ON

Device PassWord

Enable Change

Enable Setting

Update FirmWare
Execute

□ GSM Off on Exit

Hang & Exit
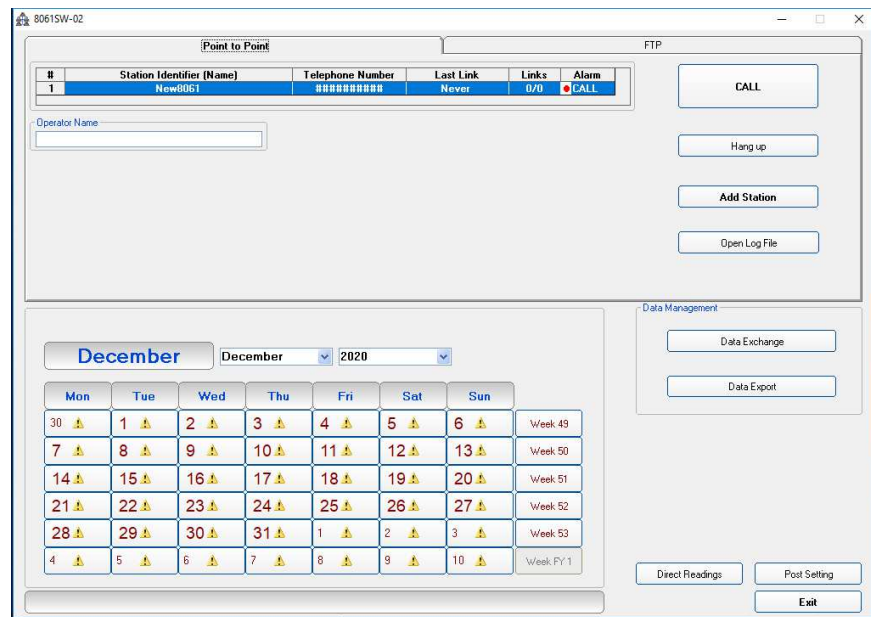
Once the device password has been successfully changed, the same password must be also entered in the station list provided by the control software to allow future communication.
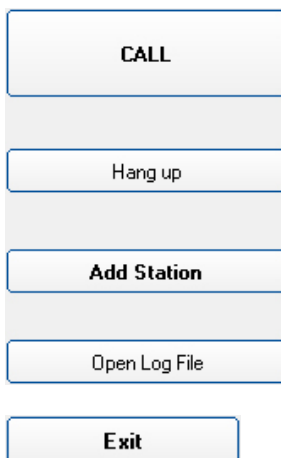
**NOTE**     **Device passwords are not checked during local RS232 or USB or Ethernet communication.**

## 3.5 Poin to Point Main window

Once set the station, run the 8061SW-02.

After entering the Passwords, the program displays the main window. Select the **Point to Point** tab:



The first part of the main window is used to select from the list the Field Monitor to be queried. The 8061SW-02 software automatically installs, as an example, a dormant station called "New8061".
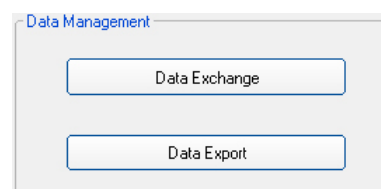


The following commands are also available:

- **CALL** to make a Point-to-Point call or start RS232, USB, Ethernet local connection to the station selected;
- **Hang up** to end the call/connection in progress;
- **Add Station** to add a new AMS-8061 Area Monitor to the list;
- **Open Log File** displays all settings and main activities automatically and manually downloaded from the station
- **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.

The list of remote stations contains the following information:

| # | Station Identifier (Name) | Telephone Number | Last Link | Links | Alarm |
|---|---|---|---|---|---|
| 1 | New8061 | 0123456789 | 26/02/15 16.18 | 0/0 | ● Several |
| 2 | 020WX50142 | 0123456789 | 27/02/15 11.16 | 0/0 | ● Battery |
| 3 | Narda Safety Test | 0123456789 | 27/02/15 11.17 | 0/0 | ● Several |

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

The status of alarms relative to latest link, in the last column, is normally empty if there are 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. If more alarms occurred, to avoid overcrowding the column the word "**Several**" is displayed: simply move the mouse cursor above the description 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.

## 3.6 Station management

## 3.6.1 Entering a new station

To make a call or download data from an existing Field Monitor, it is necessary to use the **Add Station** command and 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 **Telephone 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.**

- 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 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:**
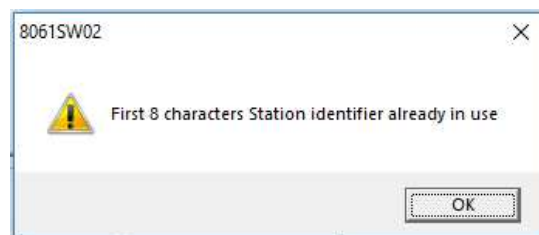


**The Terminal password will be requested for every operation.**
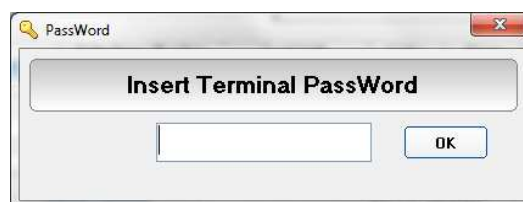
If a wrong **Device Password** is entered, the following message appears when trying to access the remote station in Point to Point mode:



**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).**

**Device Password** is request for every access through Modem or SMS, while it is not necessary when a direct connection via RS232 or USB is implemented. However, in particular conditions listed below, the Monitoring Station becomes inaccessible with direct RS232 or USB connection, even if the Password is entered, while it remains normally accessible, of course with Password authentication, via Modem.

These conditions are:

- Spontaneous call from the monitoring station (upon appointment or alarm) not successfully completed. In this case the station is not accessible via RS232 or USB for all the period in which the station try to make a connection. This period may last at most 30 minutes.

- Spontaneous transmission of SMS from the station (upon appointment or alarm). In this case the station is not accessible via RS232 or USB for additional 2 or 3 minutes after a successful sending of the SMS.

**3.6.2 Removing a station**

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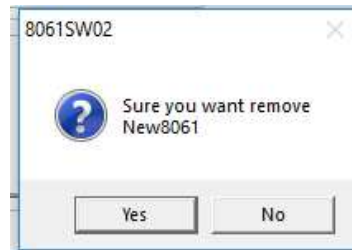


If the answer is **YES**, the software will require to enter the Terminal Password, and the station will be deleted; if the answer is **NO**, the operation will be aborted.


**NOTE**

**Removing stations from the station list does not erase measurement results that will be still available if the same Station Identifier (Name) is added again to the station list.**

**3.6.3 Editing a station**

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



It is now possible to edit the necessary data, enable or disable automatic download functions or automatic creation of .TXT files, or change the status of the function relative to data display (name and telephone number). For each of the above operations the program will require to enter the security *Terminal Password*.

### 3.6.4 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 and others, after being called, will automatically transfer the data, while others again will automatically call (or be called by) the control PC at a certain time of day and download their data by themselves.

It is possible to enable every station for automatic download by selecting the flag **PC Answering** or **PC Calling** or both.
In this case three symbols appear at the left of the station name:
Arrow up = PC Answering
Arrow down = PC Calling
Both = both flags selected

| # | | Station Identifier (Name) | Telephone Number | Last Link | Links | Alarm |
|---|---|---|---|---|---|---|
| 1 | ↕ | New8061 | 0123456789 | 26/02/15 16.18 | 0/0 | ● Several |
| 2 | ⊥ | 020wX50142 | 0123456789 | 27/02/15 11.16 | 0/0 | ● Battery |
| 3 | ⊤ | Narda Safety Test | 0123456789 | 27/02/15 11.17 | 0/0 | ● Several |

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

NOTE

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

☑ Hide digits
☐ Auto ASCII File
☐ Autoload Events

| # | | Station Identifier (Name) | Telephone Number | Last Link | Links | Alarm |
|---|---|---|---|---|---|---|
| 1 | ↕ | New8061 | 0123456789 | 26/02/15 16.18 | 0/0 | ● Several |
| 2 | ⊥ | 020wX50142 | 0123456789 | 27/02/15 11.16 | 0/0 | ● Battery |
| 3 | ⊤ | Narda Safety Test | 0123456789 | 27/02/15 11.17 | 0/0 | ● Several |

Edit Station # 3
Station Identifier (Name): Narda Safety Test
Telephone number: ##########
Scheduled Call
Time [      ]  ☐ Generate Call
Device PassWord: ########
Automatic DownLoad
☐ PC Answering
☑ PC Calling
Remove Station
☑ Hide digits
☐ Auto ASCII File
☐ Autoload Events

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

Dialing ############

## 3.6.5 Answering
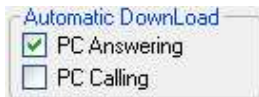
By enabling the command PC Answering, at the scheduled time, the station enabled for Point-to-point communication calls the modem connected to the PC and automatically downloads all its data.

To program the station to do that, 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;
- Eventually, in the window Schedule for MODEM, write the telephone number the station has to call (PC modem). Ten different telephone numbers can be entered, that will be called in sequence. The first of these number that will answer and secure a communication will receive the data. This means that the data will be downloaded only on a PC that is switched on, with the modem enabled, and that is running the software;
- In the Time window, enter the time when the call has to be made (of course the PC and modem must be on at that time);
- In the Stand BY (H) window write for how long the GSM modem must stay on. To save battery power, select the shortest possible time. Writing 00, the station switches the modem on, sends the data and switches it off immediately;
- In the window Every (H) enter a submultiple of 24 hours defining the daily rate at which the operation has to be repeated;
- 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 8061SW-02 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 8061SW-02 prepares to receive the data in the corresponding directories;
2. If the ID is not in the list of known stations, the 8061SW-02 adds the new station to the list (leaving the telephone number field empty) 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 8061SW-02 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.

### 3.6.6 Calling
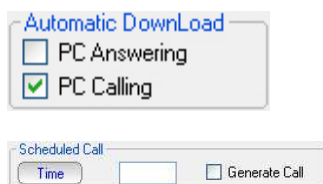
When the PC Calling function is enabled, every time the station is called using the CALL or "Scheduled CALL" commands, the data present on the station - and recorded since the latest download - will be automatically downloaded to the PC.

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.

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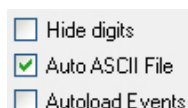
Select **Auto ASCII File** to automatically generate an ASCII file and, if enabled, a .bmp file too, containing all the information relative to the data downloaded; the format will be the same adopted with the "**Save Export File Setup**" function, when displaying monitoring results starting from the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

When displaying results, the function "**Save Export File Setup**" is available on the main menu, under the File menu command.
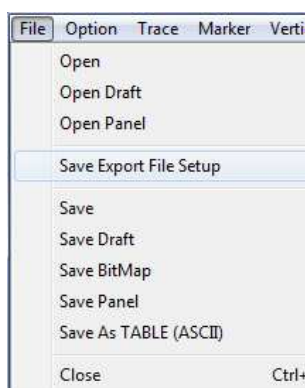
When a call, either incoming or outgoing, is reported by the station and the data are downloaded manually or automatically, all the files normally placed in the directory **Station Name\Year\Months\Day** are also copied in the special directory called **Station Name\AUTOTXT**.
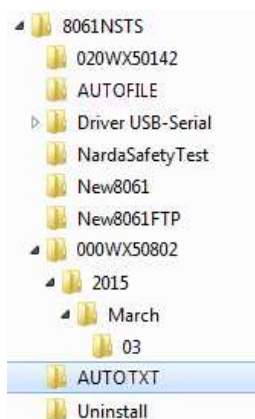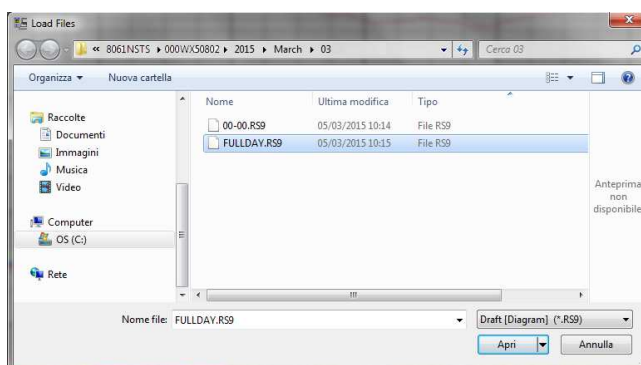
When all the data have been downloaded, the files in the directory **Station Name\AUTOTXT** are grouped in a single file **.RS9** which displays a graph having as its starting and ending date and time the date and time of the download. This will be used to create the file **.TXT** that, identified with 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**

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.

### 3.6.8 Autoload Events

Hide digits
Auto ASCII File
☑ Autoload Events

The AMS-8061 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.

### 3.7 Data management

### 3.7.1 Filing data

Data Management
Data Exchange
Data Export
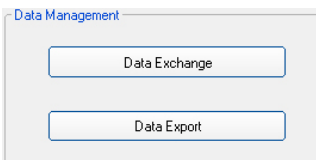
The **Data Exchange** key is used to file the data saved and import them later on to other control centers.

Data Exchange
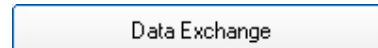
Selecting this key the following options are displayed:



When exporting data, after the selection of the type of support, the data are automatically saved in a directory called 8061_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.
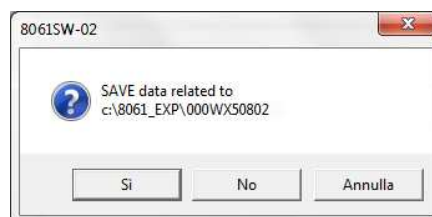


Exported data can be easily imported by the 8061SW-02 control software installed in a different PC by selecting device containing exported data and clicking the "Import" button.

**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.**

NOTE

**3.7.2 Exporting data**
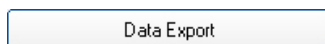
Data Export

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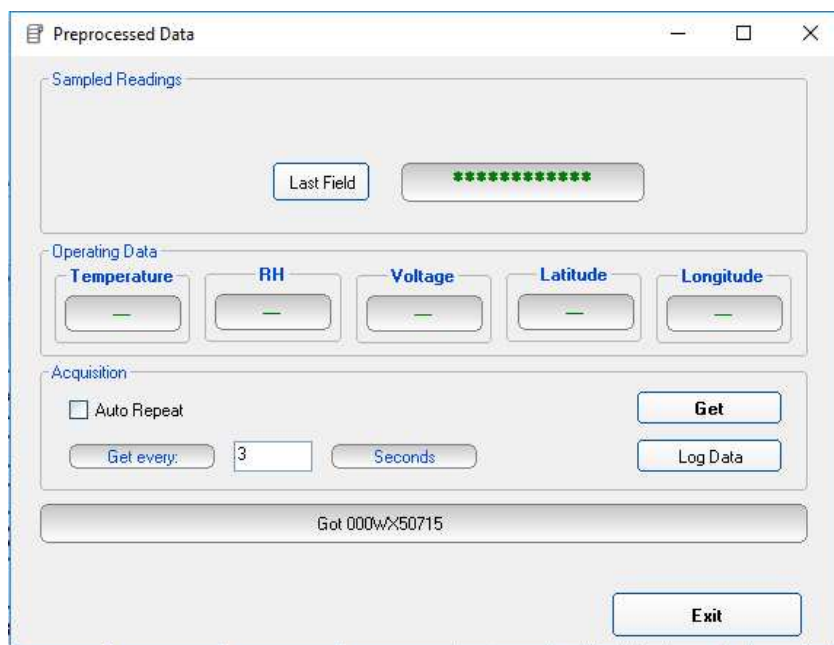
**The maximum time interval that can be processed by the Data Export function is one month.**

## 3.8 Direct readings

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.

Get

The "**Get**" button is used to request the field value of different frequency bands (depending on the antenna), battery voltage and temperature.

To request the values automatically every **nn** seconds, set the value **nn** indicated in **Get every** and enable √ **Auto Repeat** option. The "**Get**" button is disable.

Log Data

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)
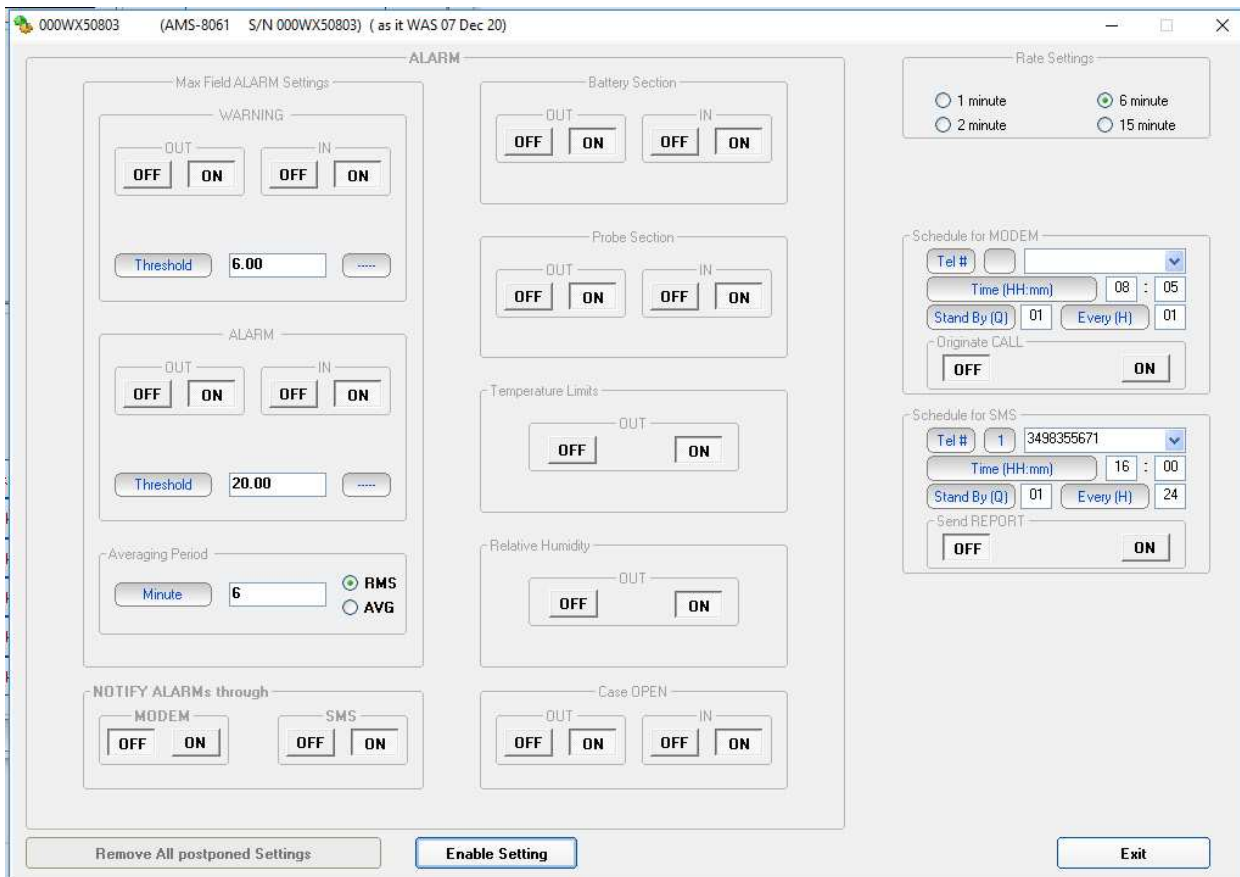
## 3.9 Post settings

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.

narda
Safety Test Solutions

**3.10 Calendar of measurements**

The calendar, created automatically by the 8061SW-02 software, always shows the current month and year and is used to select and display in graphical form the data downloaded from the Field Monitoring station, simply by clicking the button of the desired day or week.
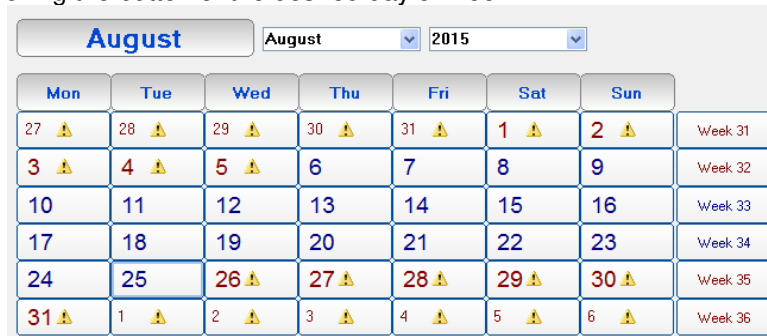
**NOTE**

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

**NOTE**

**Days or weeks with red characters are empty; in this case the symbol ⚠ will be displayed close to the days.**

By selecting a day with right click mouse, the User can delete the measurements downloaded on that day, week, month, year or all station data (the corresponding directory will be removed from the installation folder).
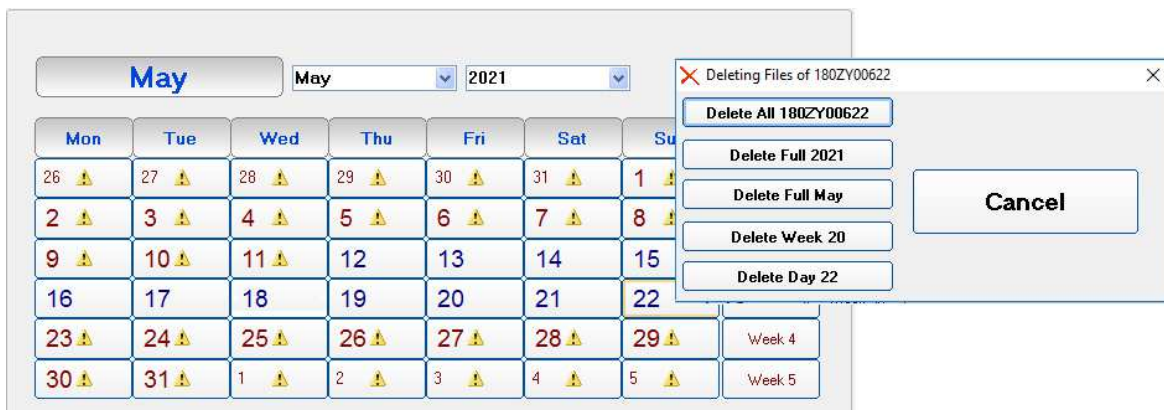
**NOTE**

**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.**
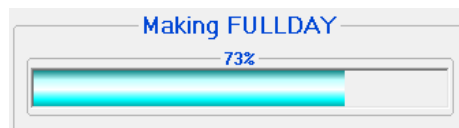
**NOTE**

**The first time a specific week is selected the following picture is shown:**
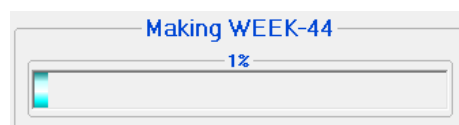
The last part of the main screen contains a status bar showing additional information relative to the operations in progress, and **Exit** button.
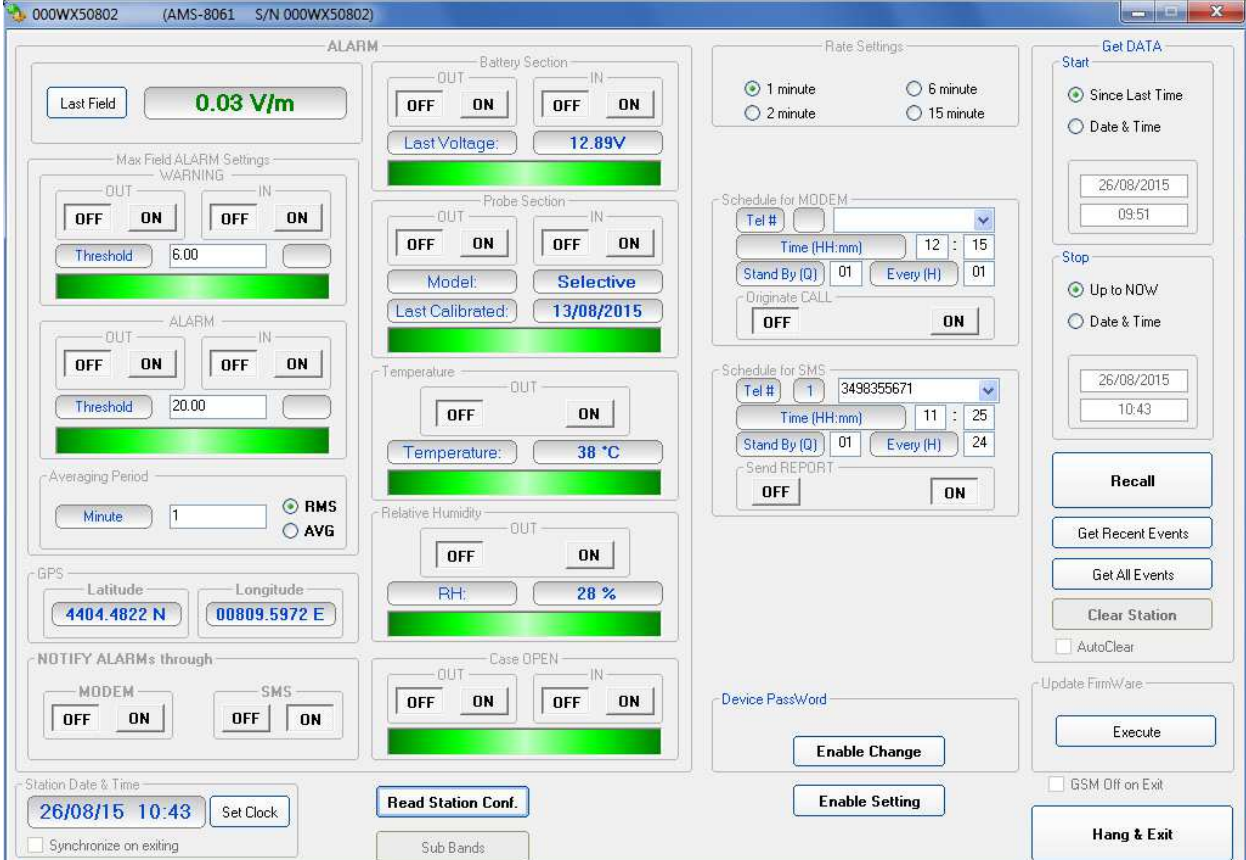
**3.11 Control window**    Once a link has been successfully established, in Point-to-point mode, the control window is opened for the selected station and it is possible to:
- Check the settings and parameters of the station;
- Edit the settings (function protected by the Setting Password);
- Download measurement results to the PC;
- Change the Device Password (needed for calls in CSD mode only).

The control window looks like this:



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.

### 3.12 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
- NOTIFY ALARMs through
- Battery Section
- Probe Section
- Temperature Limit
- Relative Humidity Limit
- Case OPEN

**The software is also enable to notify alarm to mobile phone via SMS (for further information see § Schedule for SMS on pag, 3-37). For each alarm a string is sent; for full list see ?STA command on the pag. 5-13.**
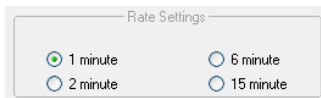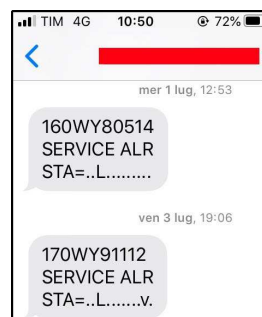
**Rate Settings** consisting of the options:
- 1 minute
- 2 minutes
- 6 minutes
- 15 minutes

The Rate Setting affects use of the memory and battery duration.

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

**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 ten 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 suggest to set the hour of programmed switching on in the window "schedule for MODEM" at least 1 hour and 30 minutes after the monitor station was switched on.**

**To prevent excessive battery consumption a limit of 24 quarters of hour for continuous modem ON condition was established.**

**Schedule for SMS** divided into:
- Telephone number
- Time (HH:mm)
- Stand by (Q) indicated in number of quarters of an hour; this value affects battery duration
- Every (H)
- Send REPORT

Up to ten mobile phones can be programmed.
Both phones will receive the daily report.

**NOTE**

**For each alarm a string is sent to mobile phones programmed; for full list see ?STA command on the pag. 5-13.**

**Get DATA** divided in:
- **Start** with the subcommands
  - Since Last Time
  - Date & Time

The starting date must be coherent with the Rate selected and not later than the Stop date.
If measurement results related to a period longer than the capacity of the memory, or data no longer contained in the memory (because overwritten) are requested, the software will show a warning message.

- **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.

- **GPS** to show the position data;
  The AMS-8061 has a built-in GPS which allows tracking its position. Data is reported in a NMEA RMC sentence according to NMEA 0183 ver 3.01. As for example, the Latitude in the picture corresponds to 44° 04' 29" when indicated in degrees, minutes and seconds

  The GPS position can be quiried at any time via direct connection or sending SMS (see **Schedule for SMS**) or by command protocol.
  In addition whenever the modem station is switched on at schedule time (see **Schedule for Modem**), the GPS get the position.



- **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.**

### 3.12.1 ALARM

Stations are able to notify alarm condition by sending SMS and/or starting a CSD call to the controller PC.

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 to enable the operator to send an SMS message and query the station and download the data.**

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

**When the monitoring station is off, the alarms are shown as off when the station is switched on again.**

**3.12.1.1 NOTIFY ALARMs through**

Notification of alarms via SMS will be sent to both mobile phones indicated. For each alarm a string is sent; for full list see ?STA command on the pag. 5-13.



Notification via modem will be sent to the first number that answers the call. When both Modem and SMS notifications are enabled, priority is given to the Modem.
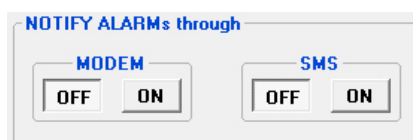




For each one of the 7 alarms there is a bar in the in control window that shows by its color the current status of the respective alarm, regardless of whether notice via modem or SMS is enabled or disabled:

**RED**: alarm condition activated;
**GREEN**: alarm not active.

**3.12.1.2 Last Field**

Displays the field averaged in the latest minutes as set in the **Averaging Period** field. This field is refreshed each time you click the **Last field** button.



NOTE
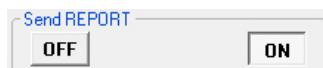
**AMS-8061 can be remotely queried for this value at any time from a mobile phone by sending the following SMS message to the station: #SM?IDNpassword*#SM?LFA***

**3.12.1.3 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 on **Schedule for SMS** section, all the mobile phones in the list (max 10), will receive, every day, the maximum value averaged on a period of 6 minutes.

**3.12.1.4 Max Field ALARM Settings**

**Field alarm.**
The field monitor features two warnings: field strength thresholds that can be set to define "WARNING" and "ALARM" conditions.
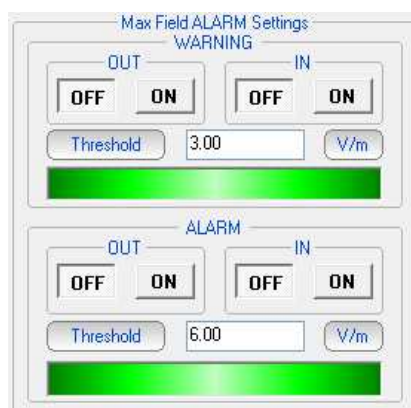
On exceeding one of these thresholds, a message is sent to the user mobile phone or to the controller PC from stations. This occurs only if the **ON** function is enabled in the **NOTIFY ALARMs through** window.

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

The **OUT** function is used to control the exceeding of the alarm threshold setting; 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 3 or 6 V/m averaged on the time period defined on **Averaging Period** .
Thus, brief but intense field variations will not necessarily cause any alarms if the averaged value (in this example on 6 minutes) does not exceed 3 or 6 V/m.

**3.12.1.5 Battery Section**

**Battery Alarm.**

The internal control system of the Field Monitor features a voltmeter for continuous 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.
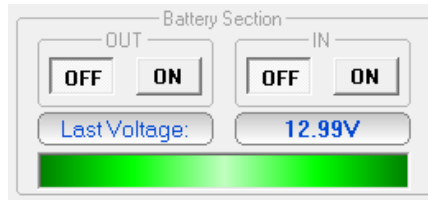
The bar turns red when the battery voltage is below the factory preset threshold.

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**

**Stations can be remotely queried for this value using a mobile phone and sending to the station the SMS message:**
**#SM?IDNpassword*#SM?BAT***

**3.12.1.6 Probe section**

**Alarm for probe in use.**

The following section displays the field probe in use and its calibration data. It is also possible to generate an alarm if any parameter does not function properly.
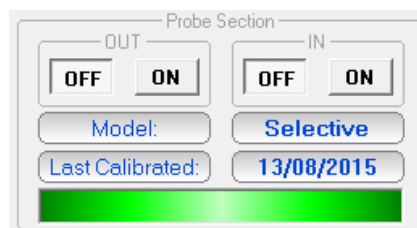
The type of antenna used by a specific station can be read by any mobile phone by sending the SMS message: **#SM?IDNpassword*#SM?PRB***.

**NOTE**

**The RF components of the AMS-8061 are tested and calibrated individually. 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.**

### 3.12.1.7 Temperature limit

**Temperature alarm.**

The station features a thermometer for the measurement of the internal temperature, 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 temperature is > 60°C.

The Temperature thresholds can not be changed.



**NOTE**

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

**It returns the response in the following format: #BM TMP=tt,rh***
**The first value read on the phone is the temperature expressed in degrees Centigrade.**

### 3.12.1.8 Relative Humidity limit

**Relative Humidity limit.**

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.

Relative Humidity alarm threshold > 95%.

The Relative Humidity threshold can not be changed.



**NOTE**

**The internal Relative Humidity of stations can be remotely queried using a mobile phone and sending to the station the SMS message:**
**#SM?IDNpassword*#SM?TMP***

**It returns the response in the following format: #BM TMP=tt,rh***
**The second value read on the phone is the relative humidity expressed in Percentage.**

### 3.12.1.9 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.

| 3.12.2 Schedule for MODEM | **Programming the station for modem links.** |
|---|---|

To query the monitoring station by a remote PC linked to a telephone or to a GSM modem, the proper Station modem must be on.

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

Programming consists of setting a scheduled time for switching on the internal modem, defining how much time the modem will stay ON (stand-by), repetition interval and whether or not a 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 modem stays on, expressed in quarters of hour (max 24). 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 4, page 4-22 and 4-23, for the different ways of switching on the modem.**

Setting for stations where the internal modem is not to be used should be as follows:
- Tel # : VOID
- Time (HH:mm) : 00:00
- Stand By (Q): 00
- Every (H) : 24
- Originate CALL : OFF

**☞ 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). See 4.2.4. for instructions to set the station to "Modem, Point-to-point" mode.**

**☞ NOTE** — **At the time the station modem is switched on, the GPS module takes the position**

### 3.12.3 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 calls and SMS query and setting commands. In addition, the "Schedule for SMS" frame allows defining ten user's mobile phone numbers that will receive alarm messages and/or daily reports.

The frame **Schedule for SMS** functions in the following way:
- in the blank part near the written **Tel#**, you have to add the telephone number of the modem connected to the PC, this just in case you want the area monitor originates an automatic call to the computer
- in the part **Time**, you have to decide when the modem has to be switched ON
- in the part **Stand By**, you have to decide for how many quarters of hours, starting from the hours of switching ON, the modem has to stay in stand by
- in the part **Every**, you have to decide the interval, expressed in hours, from every switching ON



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.

Recommended settings, for stations where the internal modem is not to be used, are the following:
- Tel # : VOID
- Time (HH:mm) : 00:00
- Stand By (Q): 00
- Every (H) : 24
- Send REPORT: OFF

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

The Report shown on the phone display will indicate the highest field value and the time at which it was read, and the lowest battery voltage and the relative time since the last time the report was sent or requested.
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.**

**3.12.4 Rate Settings**      **Configuration of data memorization.**

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

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.

As shown below, if an Averaging Period of 6min and a rate of 1min are selected the indication will represent, minute by minute, the field average calculated on the previous 6 minutes.



The selection of a different Averaging Period  as well as a different Rate will invalidate all the data stored with the previous settings that will be no more available for downloading, therefore the software will indicate this risk.

The following message appears:



If the answer is **YES**, the software will show another message asking whether to continue with the new setting, as follows:
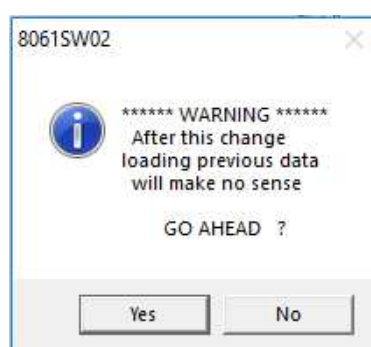


Answering **YES** again, the software will allow you to change the setting but all the data previously acquired will no longer be available for new downloads. It is therefore suggested to download any measurement result before changing settings.

**NOTICE**

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

- **Storing rate**
- **Average type (AVG or RMS) and/or Averaging period**
- **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.

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.

By selecting the same day on the calendar (marked with blue), the following warning message will appear (see chapter 7):



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:

**NOTE**

- **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.**

## 3.12.5 Get DATA

**Downloading data from the monitoring station to the PC.**
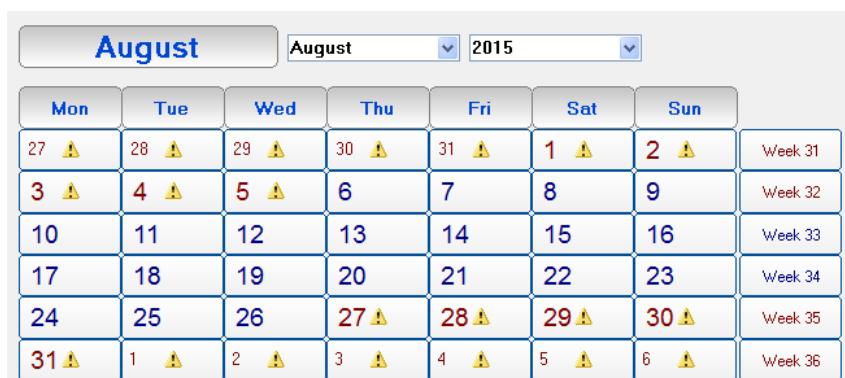
The data in the internal memory of the station can be downloaded after defining a Start and Stop event as follows:

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 that allowed by the memory available at the rate defined, the following message will appear:

**NOTE** After downloading the data, click Hang & Exit 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.**
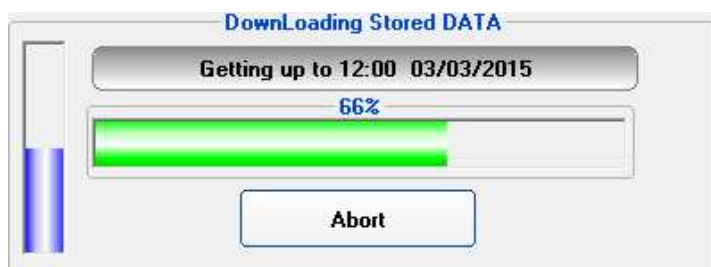


The vertical bar gives the percentage of the total amount of data to be downloaded while the horizontal shows the progress of the download for each subsequence six hours interval.

During data download in Point to Point 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.

**3.12.6 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**
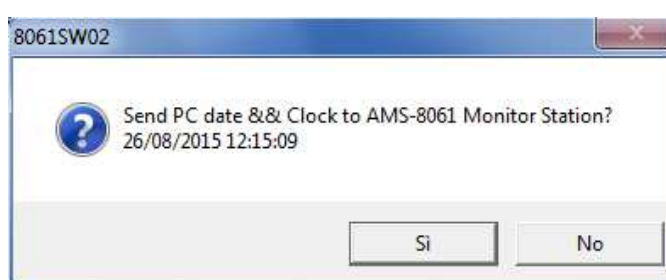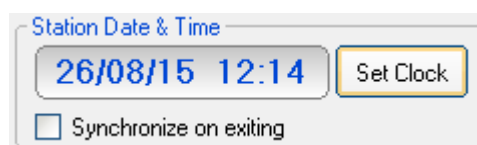
**The internal clock of the station is extremely accurate and in many cases much more accurate than the clock on the PC. The internal clock is not automatically updated to summer time and/or to standard winter time.**
**When the internal clock of the station is changed, some readings may no longer appear contiguous and gaps may be found.**
**For this reason NARDA recommend to use of this function sparingly**

**3.12.7 Firmware update**     **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:
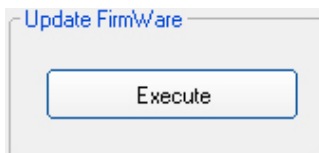
1) Request to confirm transfer

2) Firmware transfer in progress indicated by the progress bar

3) Back-up writing (Internal copy of FW)

4) Reset and automatic startup of station with new version of firmware

If any errors occur, or if there is a poor signal connection, or if for any reasons the new firmware is not completely and successfully transferred to the monitoring station, the station will automatically restore the old firmware in order to prevent malfunctions or stops.
It is also possible to update the firmware by connecting the PC to the station.

### 3.12.8 GSM Off on Exit

☐ GSM Off on Exit

- 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 its internal modem off after a time ranging from 1 to 2 minutes, regardless of the residual time set, in order not to waste energy.

### 3.12.9 Device Password

Device PassWord
[ Enable Change ]

- **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.

### 3.13 General Commands

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

**- Read Station Conf**
**- Enable Setting**
**- Hang & Exit**
**- Sub Bands**

### 3.13.1 Read Station Conf.

To read the status of the monitoring station, select **Read Station Conf**.
Click on the button to start a new query of the station.

[ Read Station Conf. ]

☞ NOTE

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

### 3.13.2 Enable Setting

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

[ Enable Setting ]

The software will ask to enter the Setting password:

PassWord
**Insert Setting PassWord**
[            ] [ OK ]

### 3.13.3 Hang & Exit
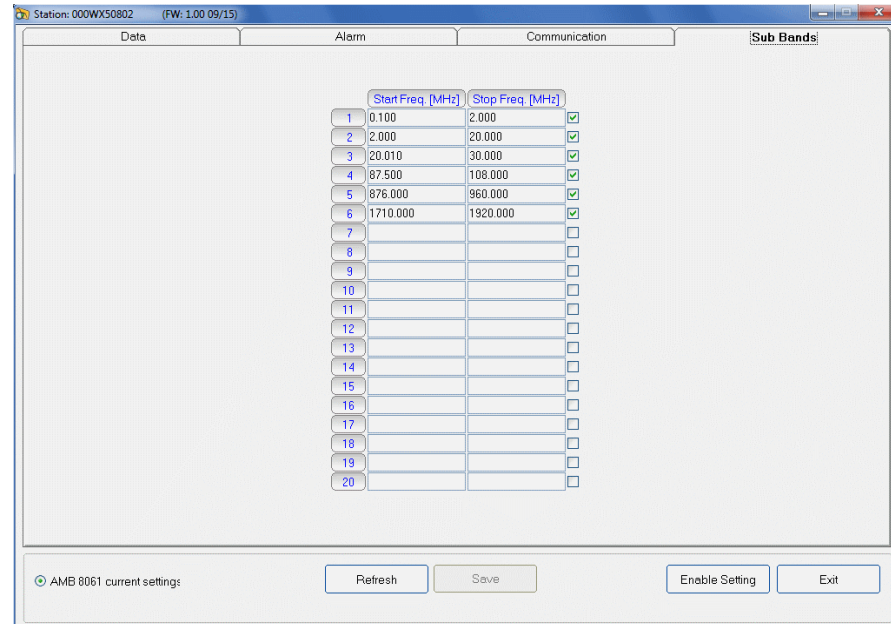
[ Hang & Exit ]

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

### 3.13.4 Sub Bands

| 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:
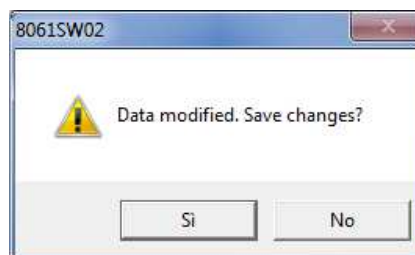


Press Yes to save changes or No to discard them and restore previous configuration.

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;

**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.**

**NOTE** **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.**

**NOTE** **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.**

**NOTICE**

In the low range part, a too narrow frequency range, could introduce a continuous component, falsifying in this way the measure.

**NOTICE**

At the same time, in the high range part, a too wide frequency range will activate a too wide filter, causing the raise of the noise floor. In this way a low signal could be confused with the noise floor itself.

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 | | | ☐ |

**NOTICE**

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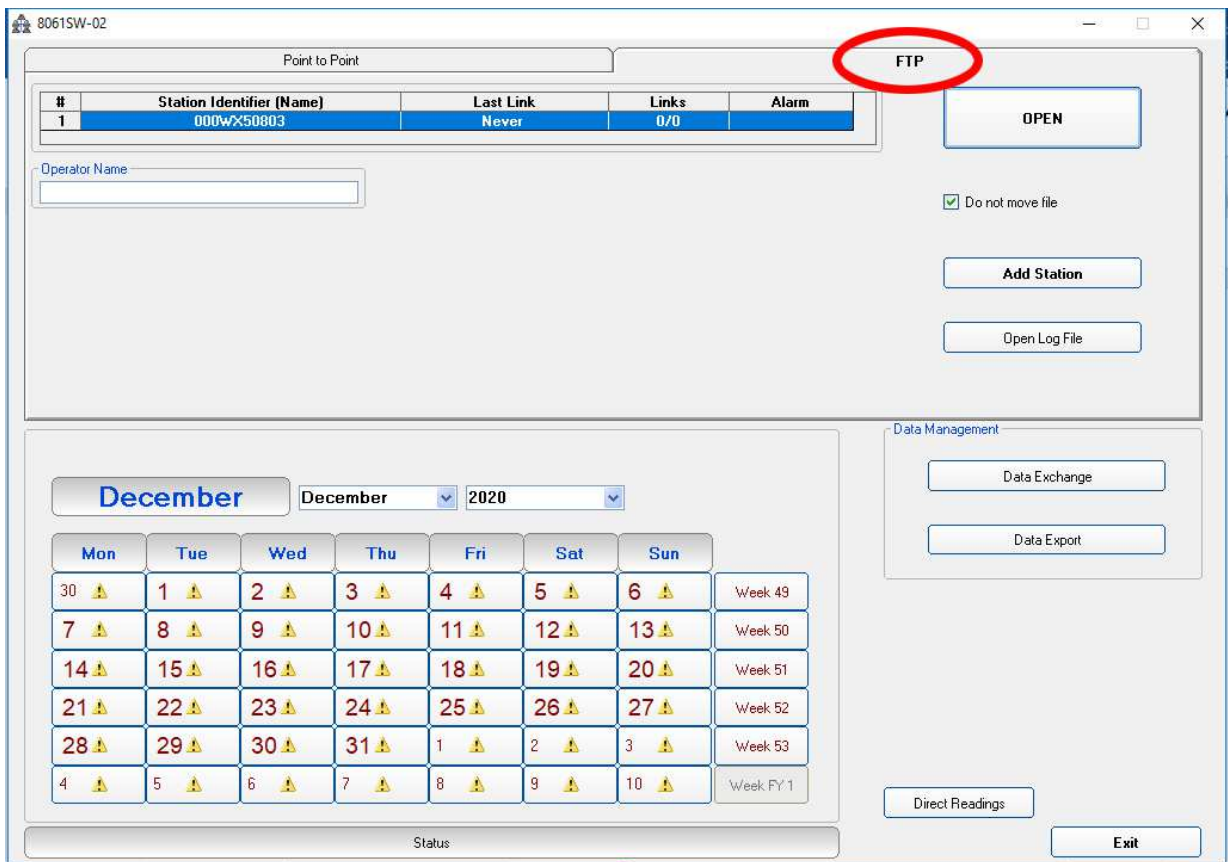
The **Exit** button ends the ongoing communication with the station and returns to the main window.

Exit

## 3.14 FTP Main window

Once set the station, run the 8061SW-02.

After entering the Passwords, the program displays the main window. Select the **FTP** tab:
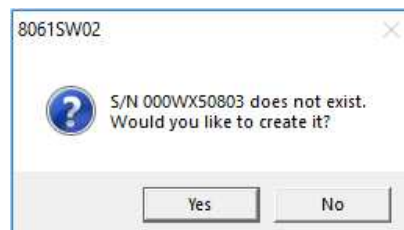


If the function "Do not move file" is enabled the data stored by the station in the ftp server will be still available for a future download, even from a different PC. If it is not ticked, the data are deleted from the FTP server after each download.

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.

**3.15 Data section**

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).
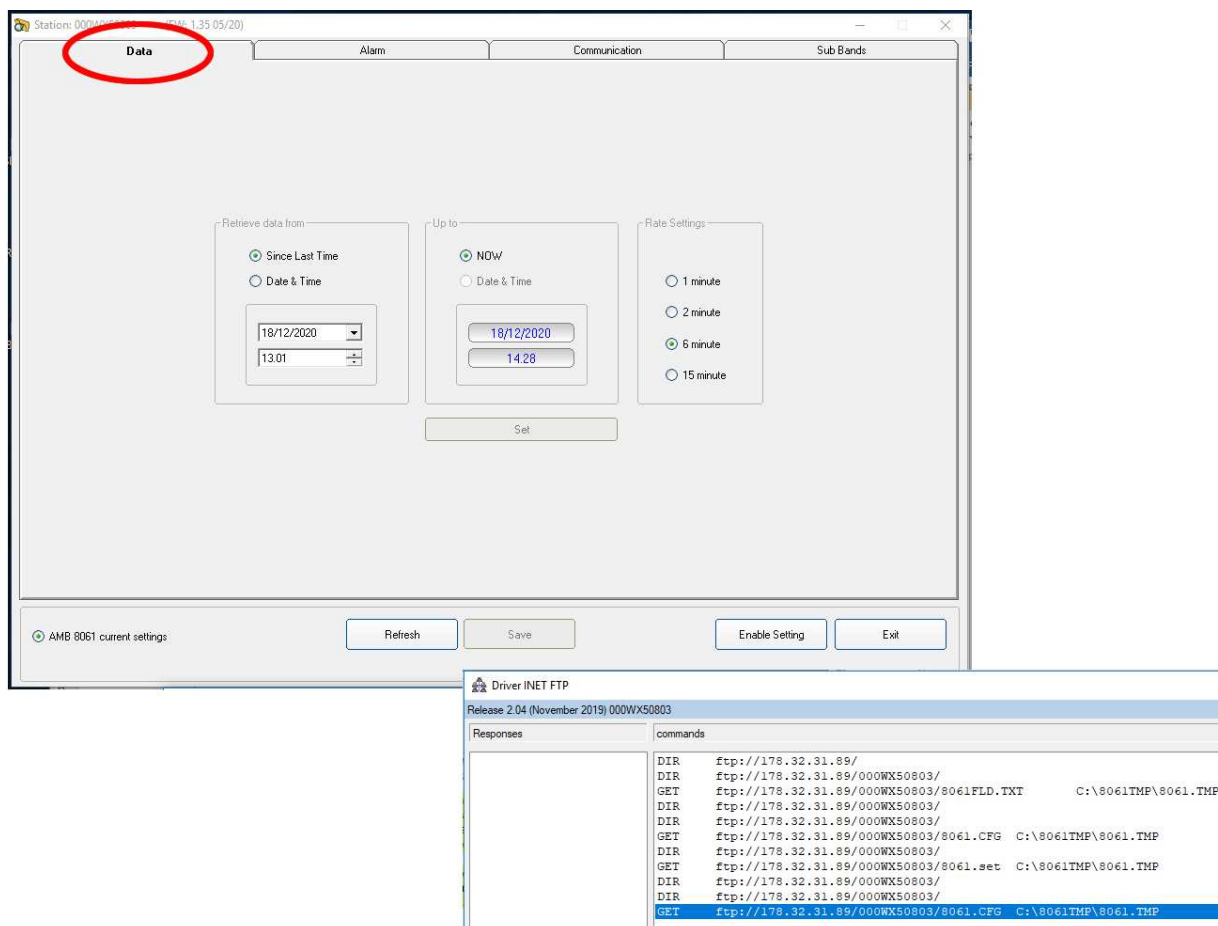


Meanwhile it will be shown the **DRIVER INET FTP** window; this driver manages the download and upload data in the ftp server.

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 minutes.

### 3.16 Alarm section

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.
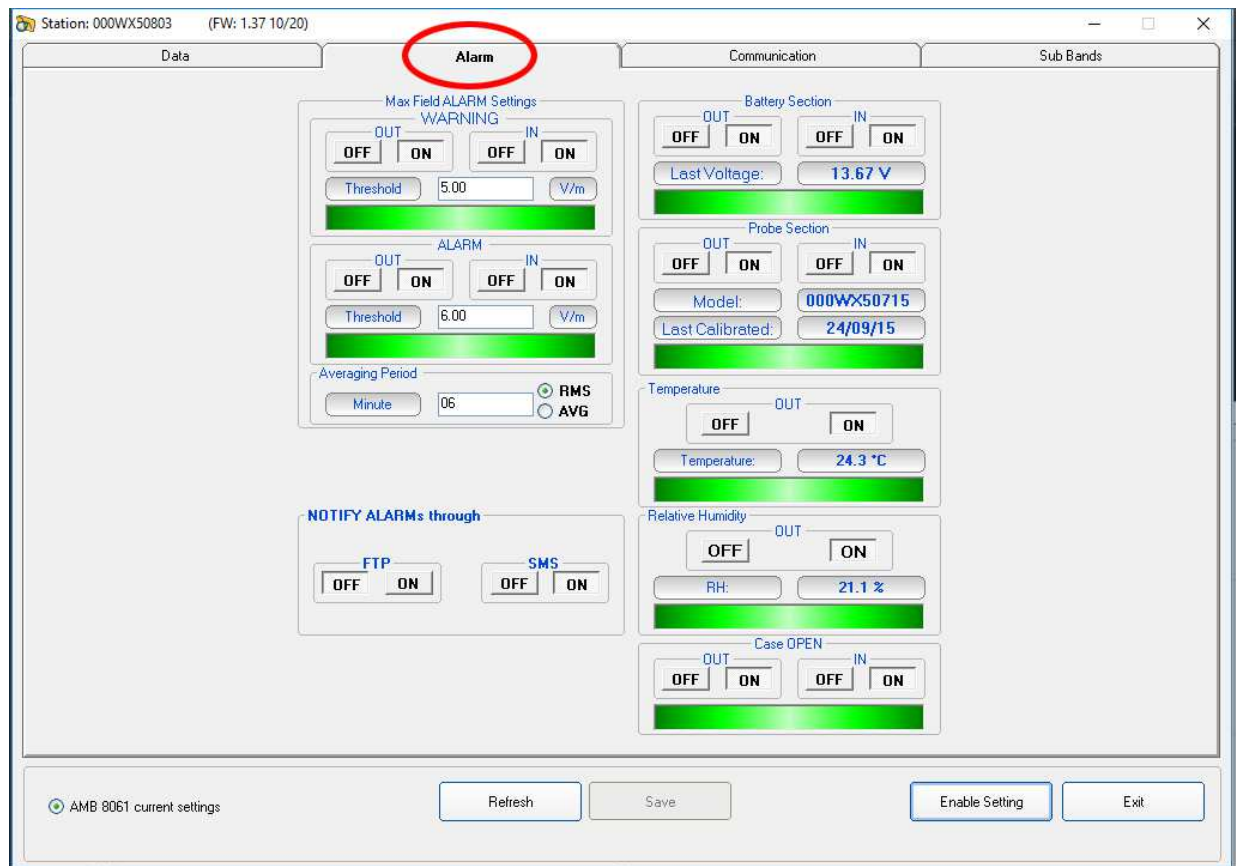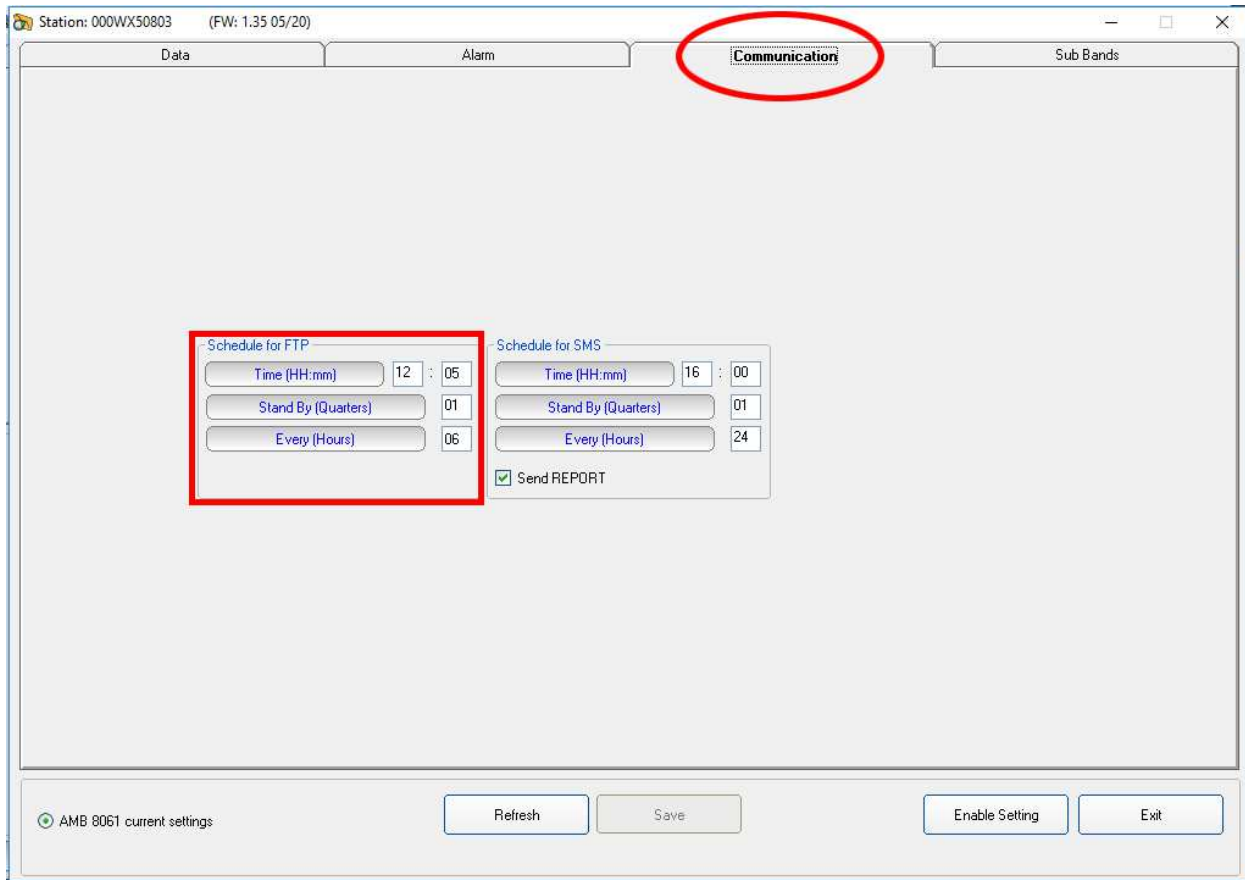


The same windows allows the user to set which average type should be performed on the acquired data, **AVG** or **RMS**, and the averaging period over which the average calculation is performed.
In the above example average type is AVG over 6 minutes time period.

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 or USB or Ethernet connection, through the **Point-to-point** section).

**3.17 Communication section**

The third section, named **Communication,** allows to change the **Schedule for FTP** and **Schedule for SMS** settings accordingly to your work



The first frame **Schedule for FTP** is in the following way:
- in the part Time, you have to decide when the modem has to be switched ON and send data to the FTP server
- in the part Stand By, you have to decide for how many quarters of hours, starting from the hours of switching ON, the modem has to stay in stand by and try to send all data
- in the part Every, you have to decide the interval, expressed in hours, from every switching ON

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 6 hours the loop will be repeated so that the modem will switch ON, and the station will download its data at 12:05, 18:05, 00:05, 06:05 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.
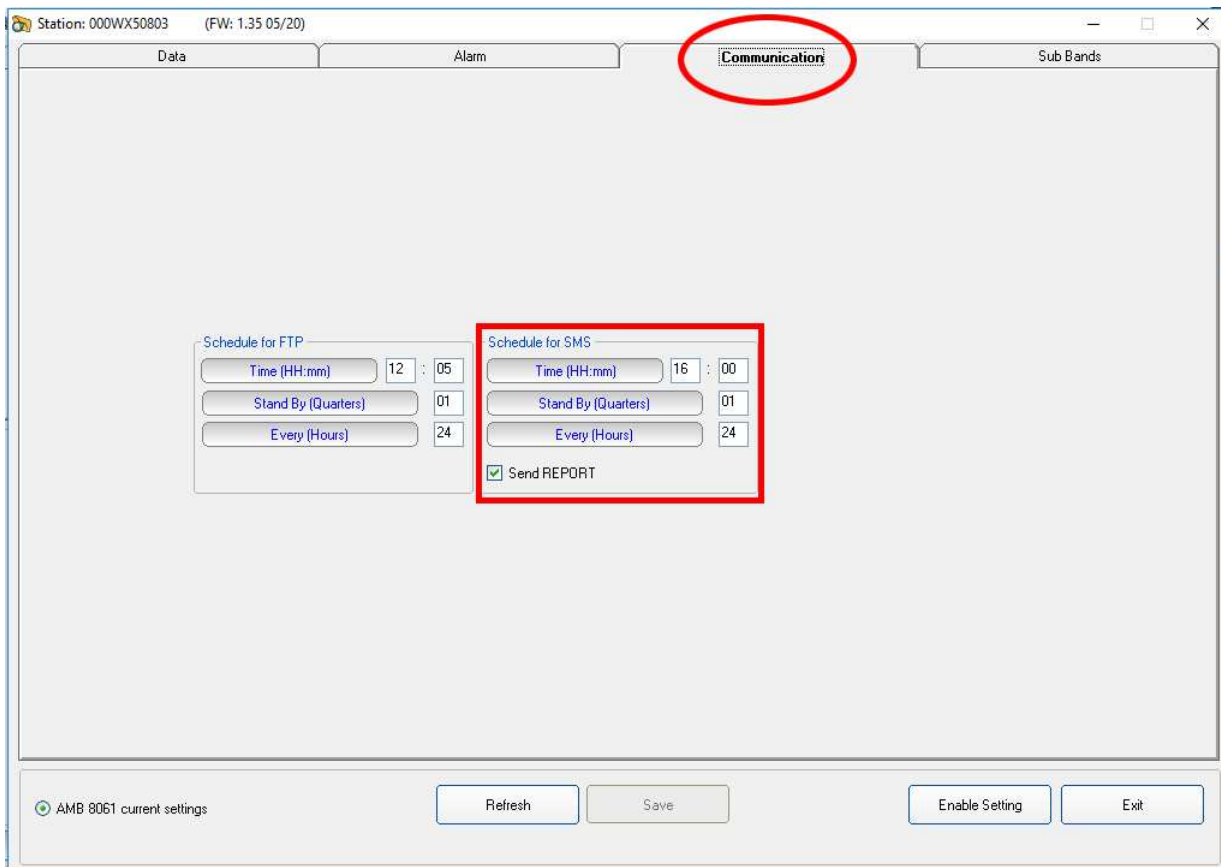
**To avoid affecting the energy balance between solar panel, back up battery and station consumption we recommend to set the modem to switch on only once a day, better during day time, for 1 quarter (15 minutes). This configuration assures station power autonomy even during long bad weather periods when the solar radiation could be not enough to supply the station modem for longer time.**

NOTE

The frame, **Schedule for SMS,** allows the user to set in the same way a second time period for the modem to be ON. This is not for FTP connections but it is provided to manage a stand-by period for SMS information exchange



The frame **Schedule for SMS** works in the following way:
- in the part Time, you have to decide when the modem has to be switched ON and able to receive calls and SMS query and setting commands.
- in the part **Stand By**, you have to decide for how many quarters of hours, starting from the hours of switching ON, the modem has to stay in stand by
- in the part **Every**, you have to decide the interval, expressed in hours, from every switching ON.
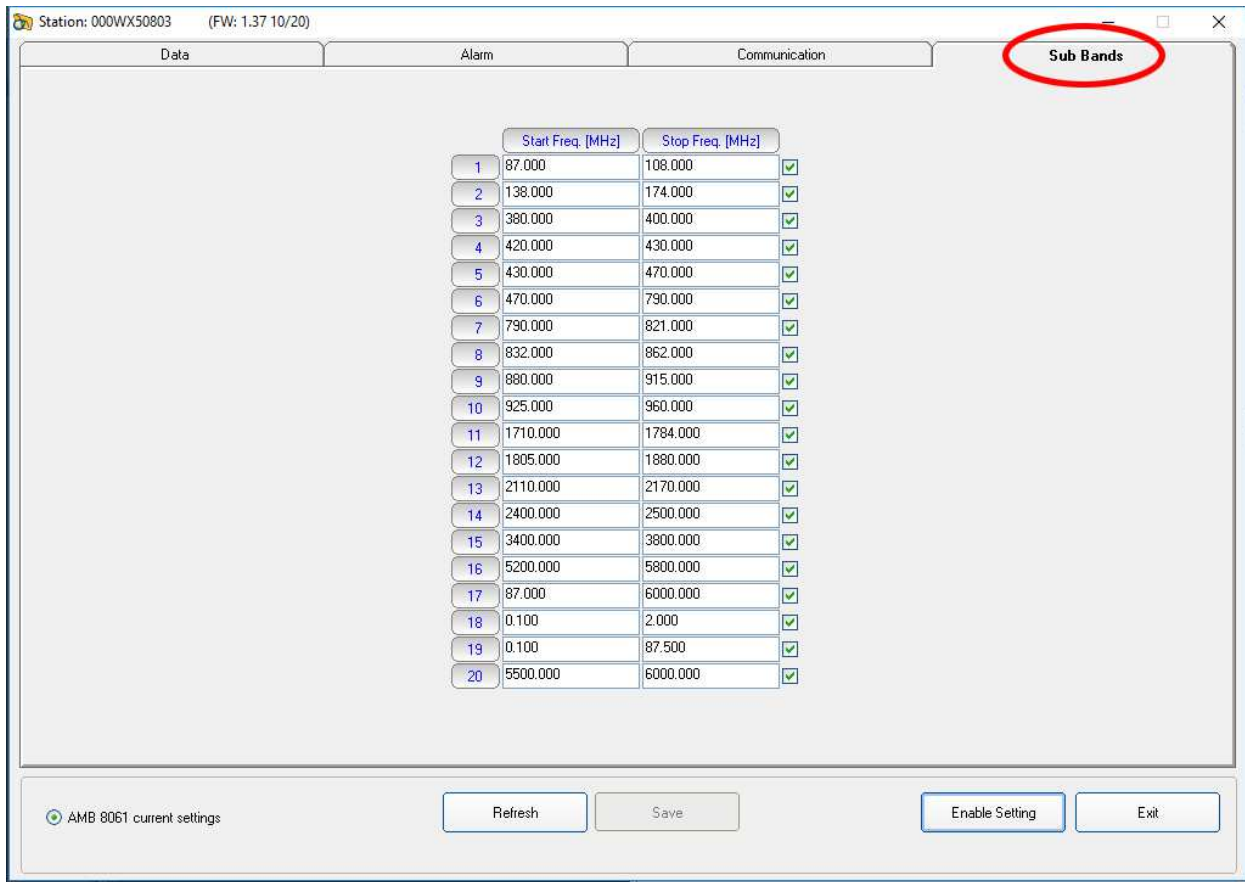
Example:
In the picture the modem will be switched ON at 16:00 and it will try to send all data to your FTP server for 1 quarters of hours.
This operation is repeated every 24 hours for a total of 1 connections every day at 16:00 o'clock

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).

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

**NOTE**   **For further information see §3.13.4**

**narda**
Safety Test Solutions

**3.19 Software update**   To update the software double click on the **8061NSTS Setup.**

Press **Next** and follow the installation steps on §**3.3 Software  installation**
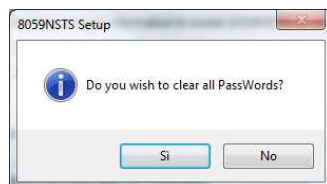
During the installation process the software will ask the User if he wants to cancel all the existing Passwords.
If the answer is YES, all the stations and measurements already saved will be hidden, but still accessible by adding all the stations used and maintaining the original name (respecting upper 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 **8059NSTS** folder and the **8059SW-02** icon will be updated

8061SW-02

**3.20 Uninstalling Software**

It is possible to remove the 8061SW-02 software from the PC according to the following procedure:

Run the **Uninstall 8061NSTS** utility.



Press **Next** to proceed.
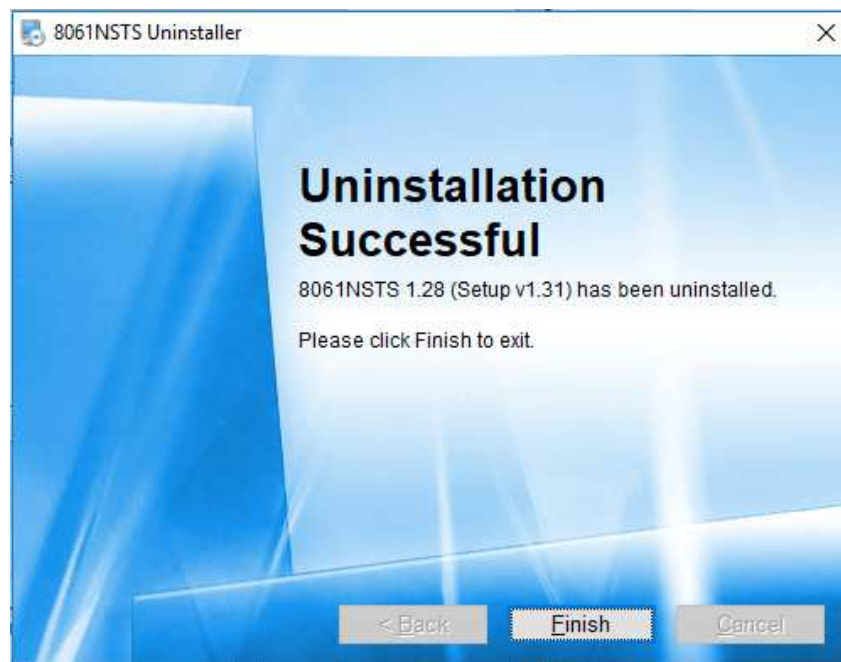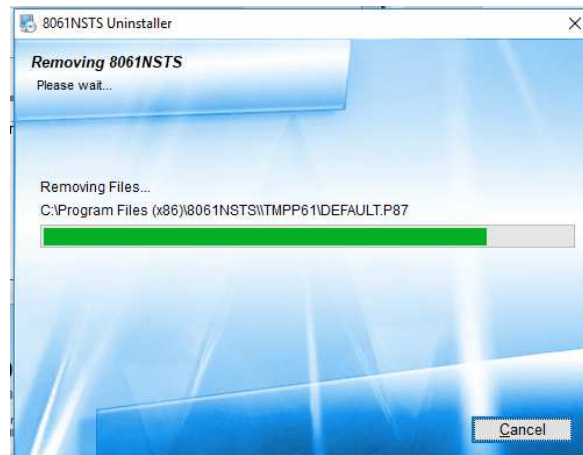






The software is now removed from the system; click **Finish** to close uninstaller utility

## 8061SW-02 – Data display

**3.21 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.**

**3.22 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:

| March | March ▾ | 2015 ▾ |
| --- | --- | --- |

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

**NOTICE**

**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.

| March ▾ | 2015 ▾ |
| --- | --- |
| March | 2012 |
| April | 2013 |
| May | 2014 |
| June | 2015 |
| July | 2016 |
| August | 2017 |
| September | 2018 |
| October | 2019 |

**NOTE**
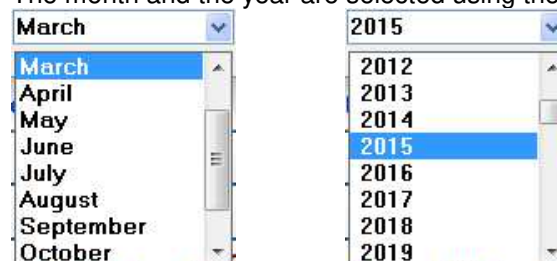
**Days and weeks containing data have the characters displayed in blue color, while those for which data have not been downloaded are shown in red color (the symbol ⚠ is displayed close to the days).**

**3.23 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 **?**);
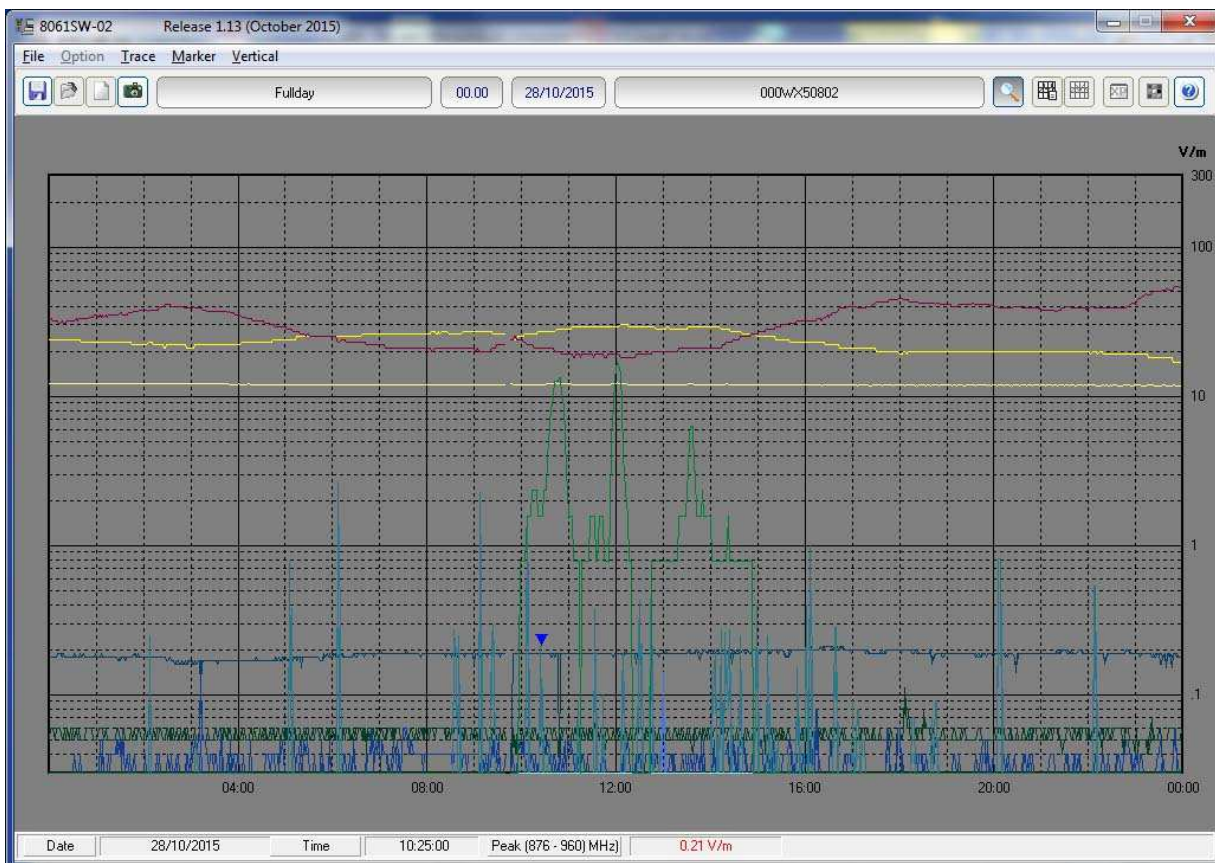
The data window presents the data for the selected day or week in a graphical form.

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.
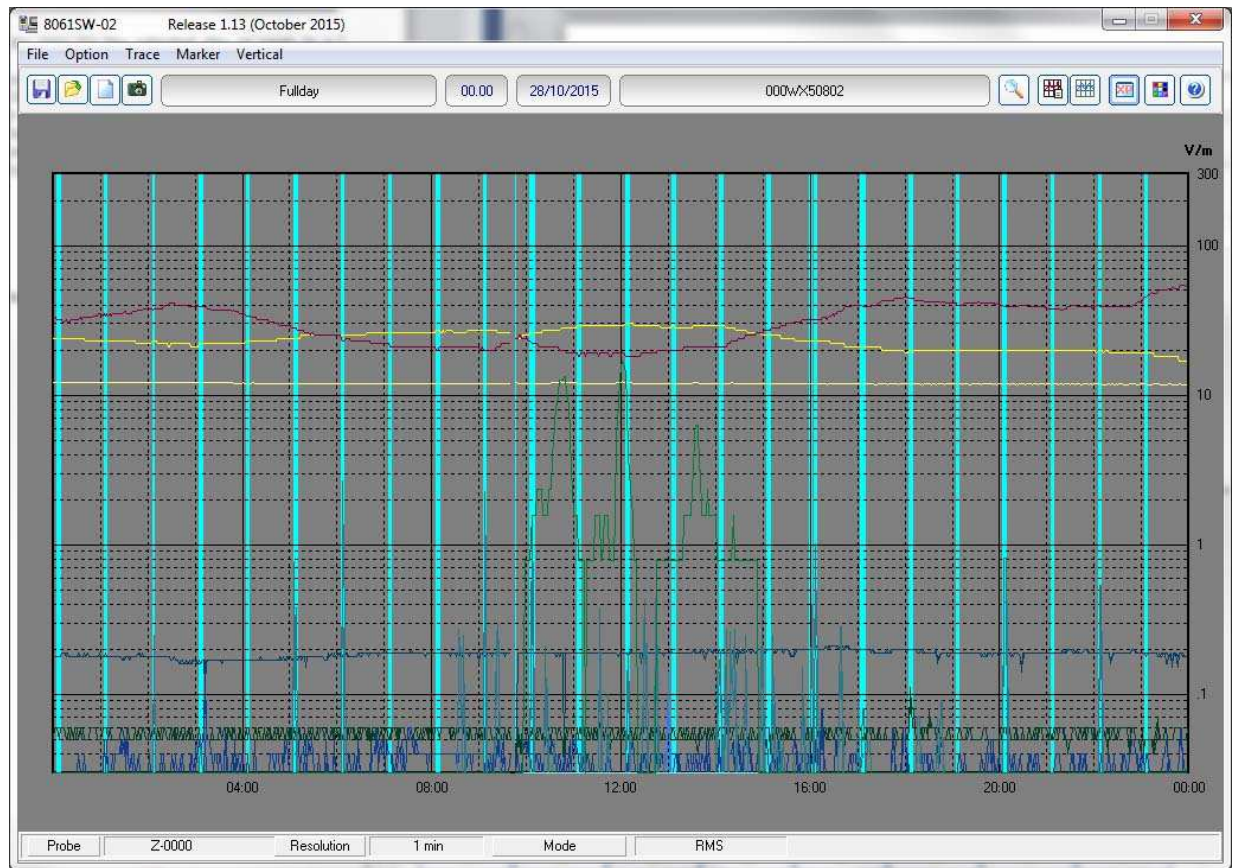
**3.24 Main Commands**   The main commands of the 8061SW-02 are:
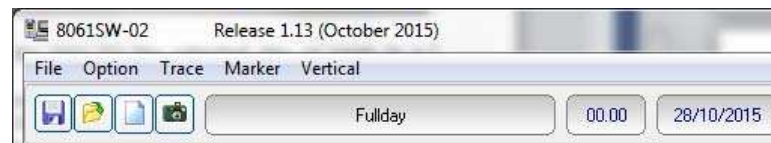


**3.24.1 File**   This command is used to open any files of any stations or to save the files downloaded.
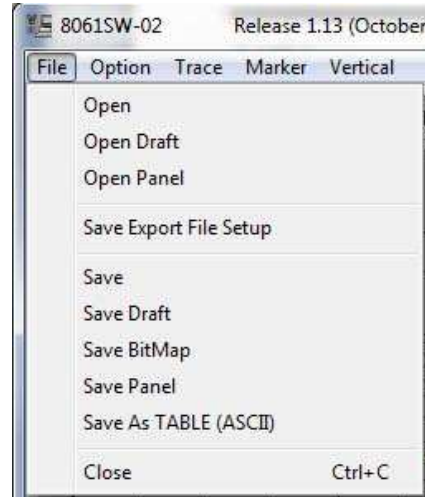


For a detailed description of its use see the paragraphs relative to the specific icons **Save** and **Open** here below

**NOTE**   **Some functions of the File command are not enabled when the Zoom function is ON**

**3.24.2 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:
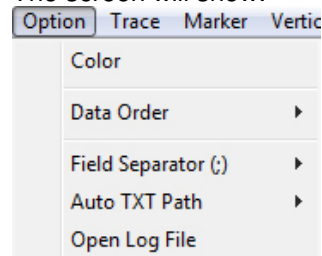
### 3.24.3 Trace



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);
  Any data affected by disturbance activity will be marked in the txt table with the asterisk (*) if **Global** is enable at the time of activating the Save Export File Setup function. The asterisk (*) is hide if **Global** is disable.

 Global enable

 Global disable

- **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.

**3.24.4 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:

| Marker | Vertical |
|---|---|
| ✓ Temperature | |
| Battery | |
| Charging current | |
| RH | |
| Peak ▶ | Peak (0,1 - 2) MHz |
| RMS ▶ | Peak (3 - 108) MHz |
| Marker & ZOOM OFF | Peak (108 - 174) MHz |
| | Peak (174 - 369) MHz |
| | Peak (369 - 470) MHz |
| | Peak (470 - 790) MHz |
| | Peak (790 - 876) MHz |
| | Peak (876 - 960) MHz |
| | Peak (1436 - 1710) MHz |
| | Peak (1710 - 1920) MHz |
| | Peak (1920 - 2170) MHz |
| | Peak (2170 - 2500) MHz |
| | Peak (2500 - 2690) MHz |
| | Peak (2690 - 3400) MHz |
| | Peak (3400 - 3770) MHz |
| | Peak (3770 - 5470) MHz |
| | Peak (2470 - 5725) MHz |
| | Peak (5725 - 5795) MHz |
| | Peak (5795 - 6000) MHz |
| | Peak (960 - 1436) MHz |

**NOTE**

**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.

| 10:25:00 | Peak (876 - 960) MHz | 0.21 V/m |
|---|---|---|
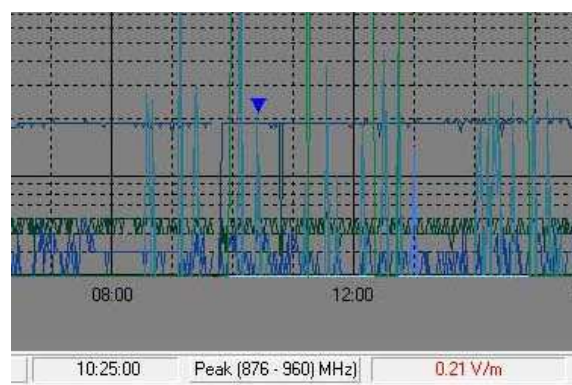
**3.24.5 Vertical**

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:
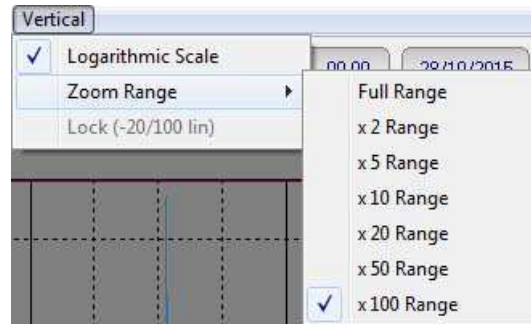


Selecting **x 100 Range** the maximum sensitivity is displayed.
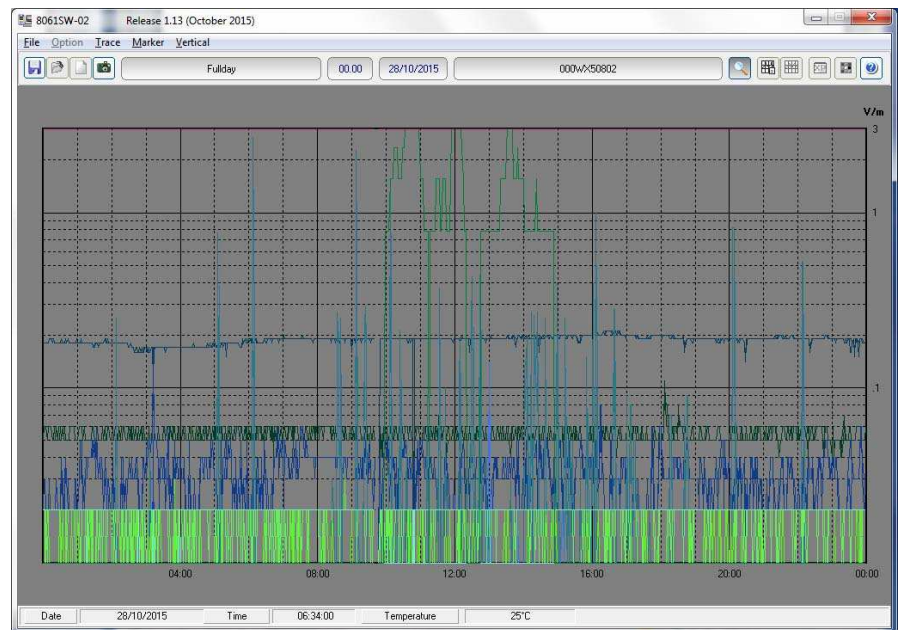


The function **Lock (-20/100 lin)** is activated when the User want to display on the graph both the temperature and the field trace. It forces the scale between -20 and 100 and shows everything in linear mode.

## 3.25 Secondary Commands

Description of command bar:



## 3.25.1 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:
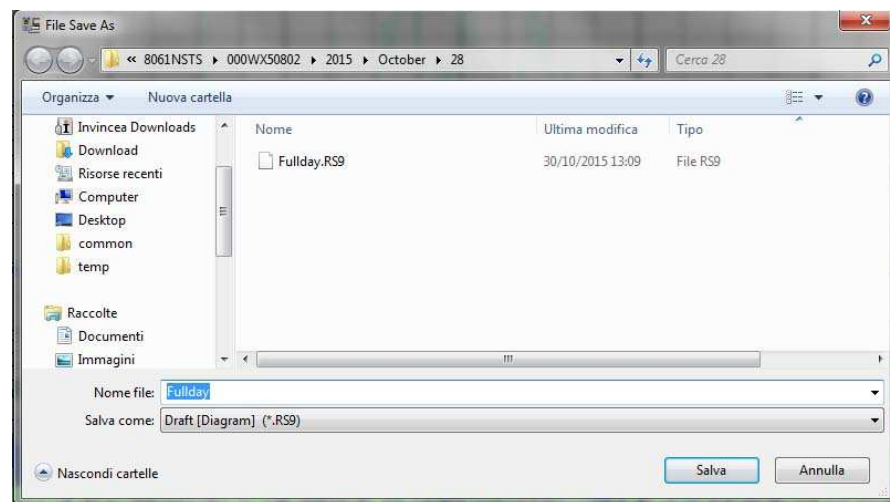


Measurements can be saved in any directories. During this procedure the software shows a list of the previously saved files.

### 3.25.1.1 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**

**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 "Global" disabled at the time of activating the Save Export File Setup function.**

👉 **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.
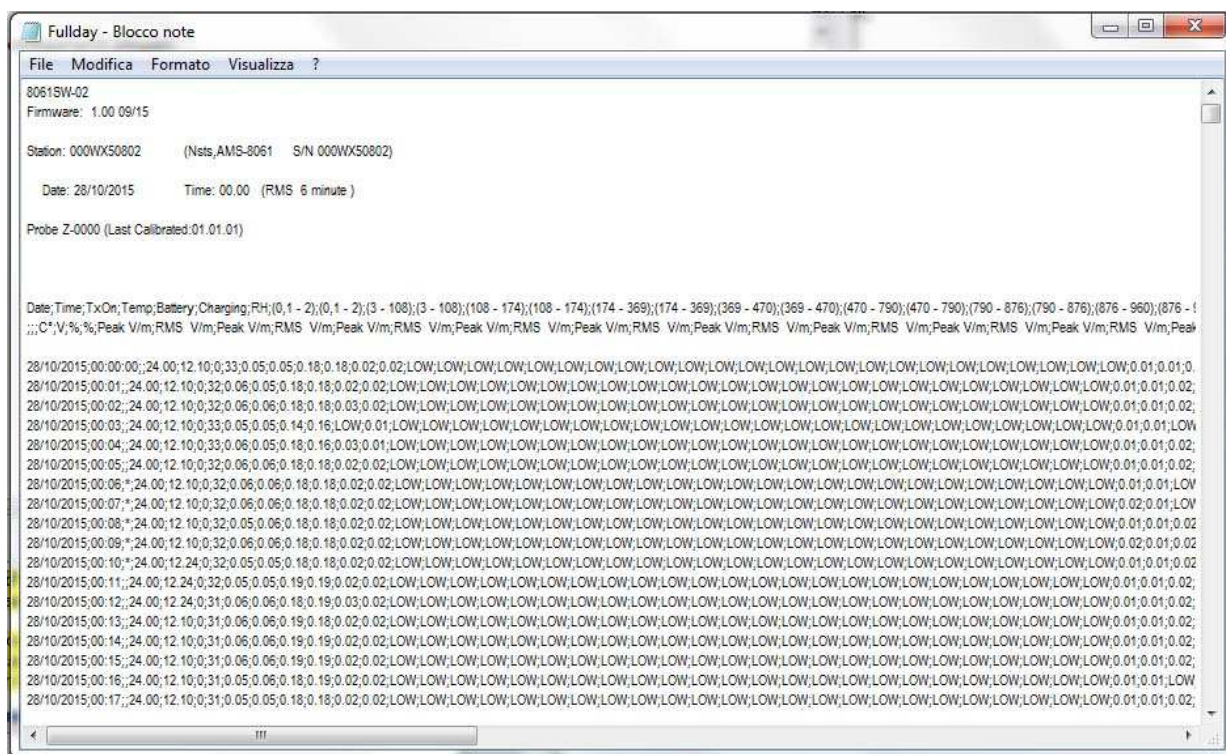
## 3.25.2 Open Files

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.
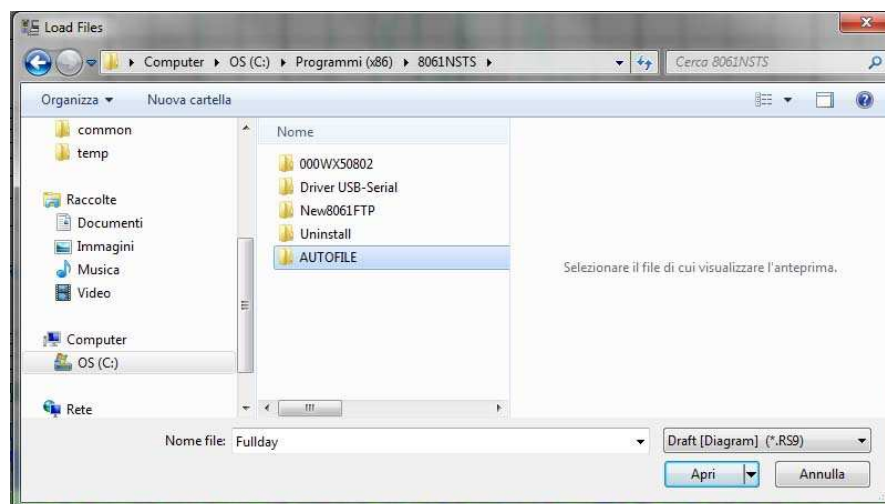


Selecting, for example, station **000WX50802**, it will display all the years relative to downloads and the directory "**AUTOTXT**":
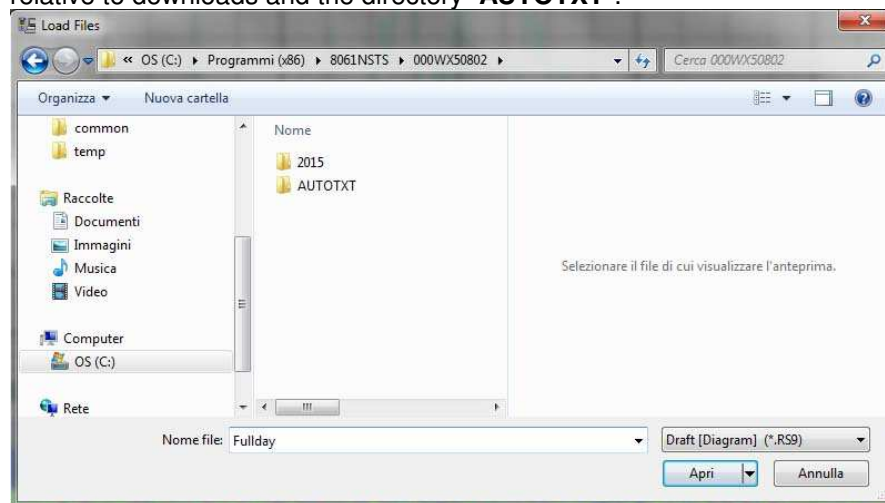


Associated with the name of each station, the software creates the directory of years (in this example 2015) and the directory "**AUTOTXT**" which contains all the data relative to the **Auto ASCII File** function.

Selecting the desired year, the menu will display all the months and weeks available:
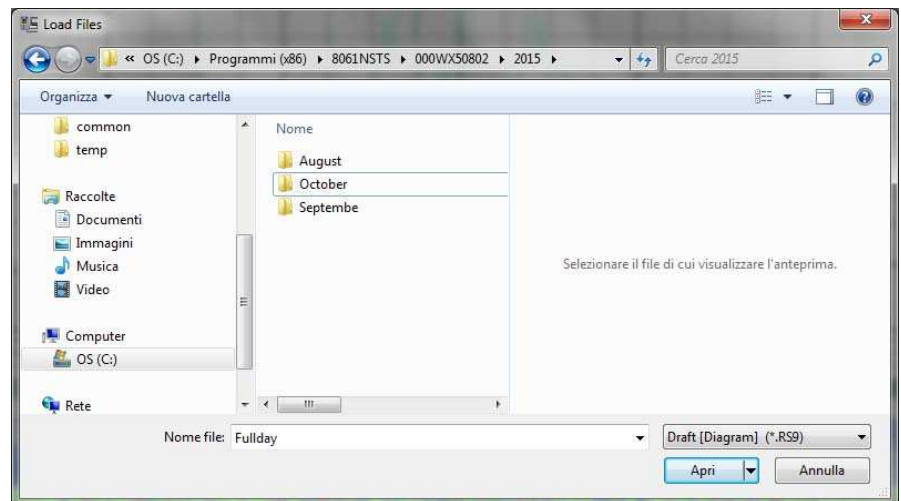


Selecting the month, the software will display the list of all the days containing data.

Selecting the desired day and clicking **OK** the data will be displayed; pressing **Cancel** to interrupt the operation

**3.25.2.1 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).
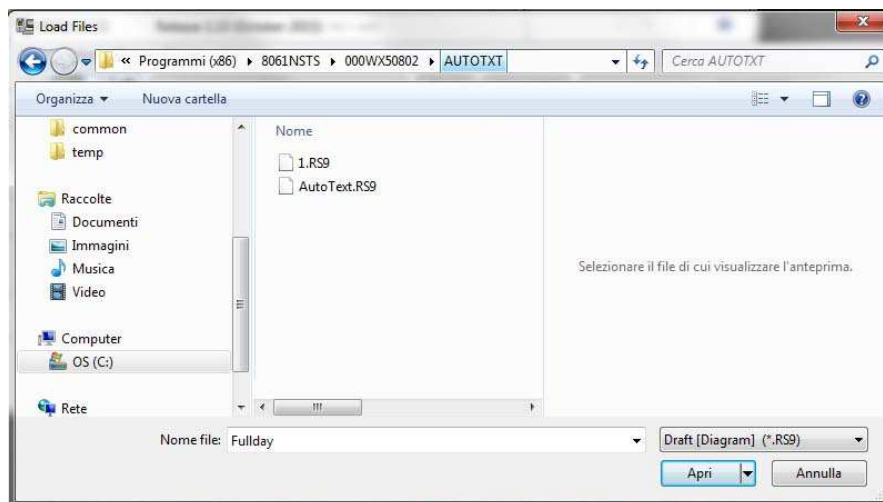


The time window between Start and Stop is defined by the conditions used during download.
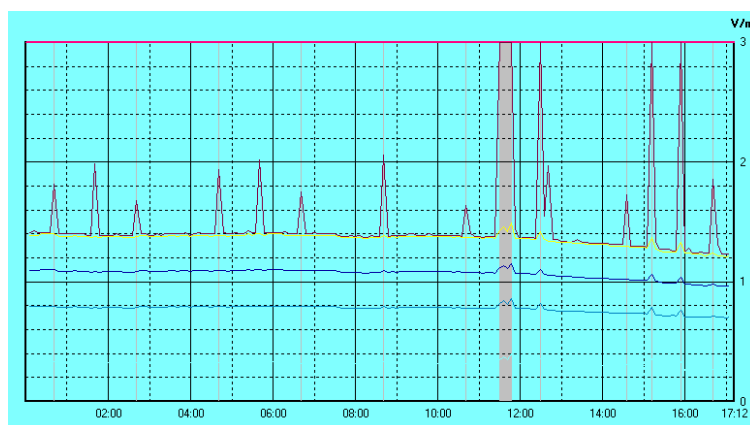


In this example, the software shows the graph from 00.00 to 16:00 of autotxt file .RS9.

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.
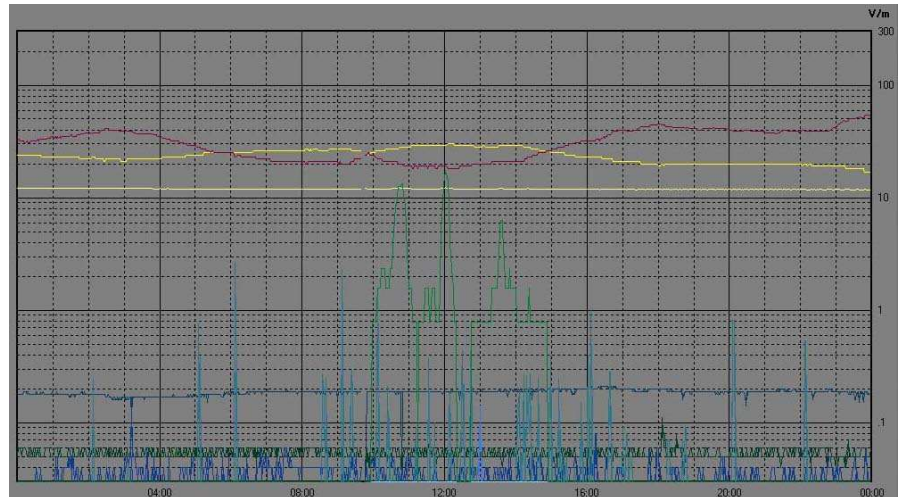
Therefore, with the function Auto ASCII File it is possible to create any graphs with a start and end period of measurement defined in any desired way. For example, from Friday to Monday, or between two months, etc.

Of course, this time period must be selected in the download data procedure.
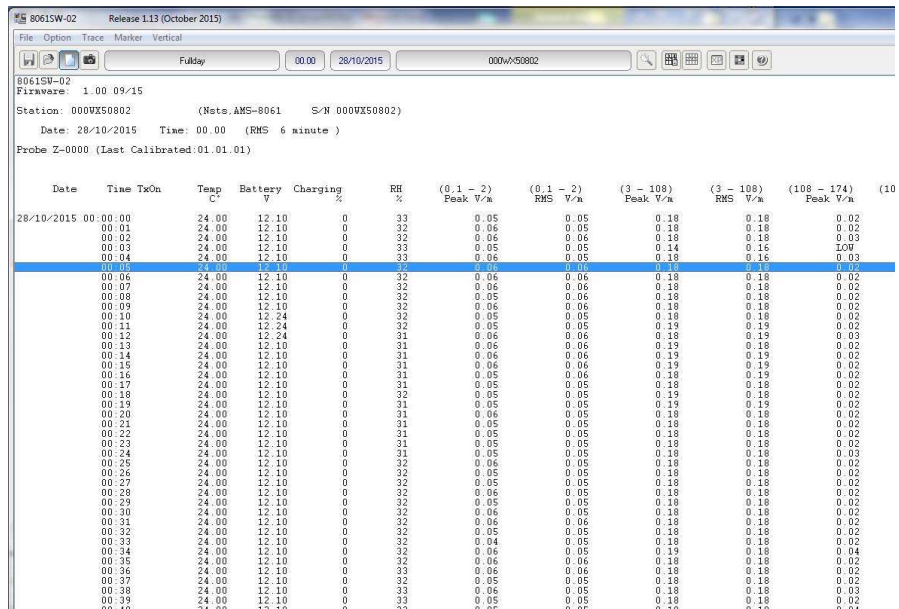
**3.25.3 Show Table File**

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.

```
8061SW-02        Release 1.13 (October 2015)
File  Option  Trace  Marker  Vertical

[icons]   Fullday   00.00  28/10/2015   000WX50802   [icons]

8061SW-02
Firmware:  1.00.09/15
Station: 000WX50802          (Nsts,AMS-8061   S/N.000WX50802)
  Date: 28/10/2015   Time: 00.00   (RMS  6 minute )
Probe Z-0000 (Last Calibrated:01.01.01)

     Date      Time TxOn  Temp   Battery Charging   RH    (0.1 - 2)  (0.1 - 2)  (3 - 108)  (3 - 108)  (108 - 174)  (10
                            C°     V        %        %    Peak V/m   RMS  V/m   Peak V/m   RMS  V/m   Peak V/m

28/10/2015 00:00:00        24.00  12.10     0        33    0.05      0.05       0.18       0.18       0.02
           00:01           24.00  12.10     0        32    0.06      0.05       0.18       0.18       0.02
           00:02           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.03
           00:03           24.00  12.10     0        33    0.05      0.05       0.14       0.16       LOW
           00:04           24.00  12.10     0        33    0.06      0.05       0.18       0.16       0.03
           00:05           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.02
           00:06           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.02
           00:07           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.02
           00:08           24.00  12.10     0        32    0.05      0.06       0.18       0.18       0.02
           00:09           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.02
           00:10           24.00  12.10     0        32    0.05      0.05       0.18       0.18       0.02
           00:11           24.00  12.24     0        32    0.05      0.05       0.19       0.19       0.02
           00:12           24.00  12.24     0        31    0.06      0.06       0.18       0.19       0.03
           00:13           24.00  12.10     0        31    0.06      0.06       0.19       0.18       0.02
           00:14           24.00  12.10     0        31    0.06      0.06       0.19       0.19       0.02
           00:15           24.00  12.10     0        31    0.06      0.06       0.19       0.19       0.02
           00:16           24.00  12.10     0        31    0.05      0.06       0.18       0.19       0.02
           00:17           24.00  12.10     0        31    0.05      0.05       0.18       0.18       0.02
           00:18           24.00  12.10     0        31    0.05      0.05       0.19       0.19       0.02
           00:19           24.00  12.10     0        31    0.05      0.05       0.19       0.19       0.02
           00:20           24.00  12.10     0        31    0.06      0.05       0.18       0.18       0.02
           00:21           24.00  12.10     0        31    0.05      0.05       0.18       0.18       0.02
           00:22           24.00  12.10     0        31    0.05      0.05       0.18       0.18       0.02
           00:23           24.00  12.10     0        31    0.05      0.05       0.18       0.18       0.02
           00:24           24.00  12.10     0        31    0.05      0.05       0.18       0.18       0.03
           00:25           24.00  12.10     0        32    0.06      0.05       0.18       0.18       0.02
           00:26           24.00  12.10     0        32    0.05      0.05       0.18       0.18       0.02
           00:27           24.00  12.10     0        32    0.05      0.05       0.18       0.18       0.02
           00:28           24.00  12.10     0        32    0.06      0.05       0.18       0.18       0.02
           00:29           24.00  12.10     0        32    0.05      0.05       0.18       0.18       0.02
           00:30           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.02
           00:31           24.00  12.10     0        32    0.05      0.05       0.18       0.18       0.02
           00:32           24.00  12.10     0        32    0.06      0.05       0.18       0.18       0.02
           00:33           24.00  12.10     0        32    0.04      0.05       0.18       0.18       0.02
           00:34           24.00  12.10     0        32    0.06      0.06       0.19       0.18       0.04
           00:35           24.00  12.10     0        32    0.06      0.06       0.18       0.18       0.02
           00:36           24.00  12.10     0        33    0.06      0.06       0.18       0.18       0.02
           00:37           24.00  12.10     0        32    0.05      0.05       0.18       0.18       0.02
           00:38           24.00  12.10     0        33    0.05      0.05       0.18       0.18       0.02
           00:39           24.00  12.10     0        33    0.05      0.05       0.18       0.18       0.02
           00:40           24.00  12.10     0        33    0.05      0.05       0.19       0.18       0.04
```

**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 "Global" disabled at the time of activating the Save Export File Setup function.**

**3.25.4 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**.

Fullday

The **File Name** field contains the name of the file displayed.
This is normally updated automatically with the **LOAD** command.

00.00  28/10/2015

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.

000WX50802

**3.25.5 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**.

**☞ NOTE**

**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.
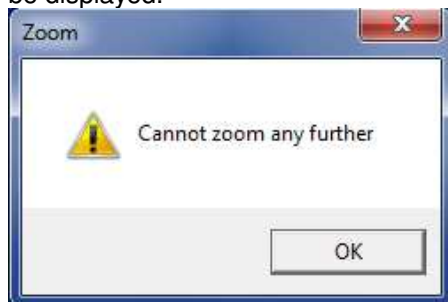


As already mentioned, the **Zoom Mode** key is used to enable the **Marker**, represented by a colored arrow which, using the mouse, can be positioned anywhere along the displayed trace. In this case, the time values will be reported on the status bar at the bottom of the screen (time from start of measurement) 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.

**☞ NOTE**

**When the Zoom Mode key is enabled, the other commands are automatically disabled except Save, ClipBoard and Help.**

**3.25.6 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:

| Probe | Z-0000 | Resolution | 1 min | Mode | RMS |

000WX50802

**☞ NOTE**
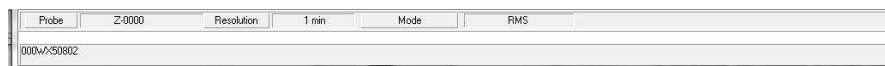
**In the bitmap, the comment is shown only when the Comment key is enabled.**

**3.25.7 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.

**3.25.8 Appearance**
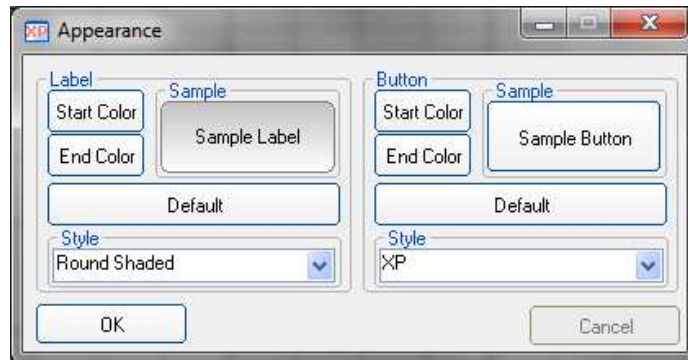
Button and label style can be selected from a **Style** list

**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

**3.25.9 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:
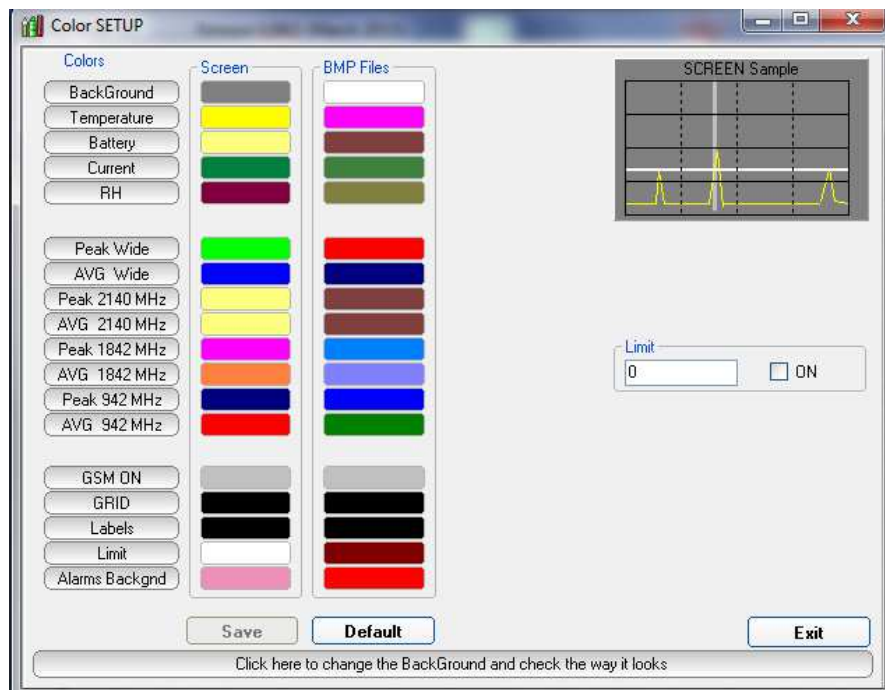


For each trace of the graph listed under **Colors**, the desired color can be selected, and these colors can be different for the **Screen** and for the **BMP Files** to better adapt to the viewing and printing needs of the User.

**3.25.9.1 Color Palette**

The choice is made by moving the mouse to the color to be changed and then using the Color Palette window.

**3.25.10 Limit**
The **Limit** field is used to set and enable a reference trace on the current screen.
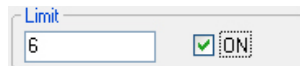


**3.25.10.1 SCREEN Sample**
The small graph on the upper right of the display gives a preview of the results in save or print obtained with the colors selected.
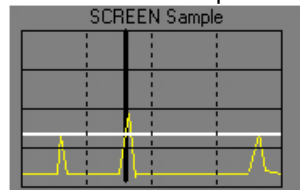


☞ NOTE

**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.**

**3.25.11 Software release**
Click this icon to display the software release currently installed on the PC.



About

8061SW-02

Release 1.28 (July 2020)

Setup Release: 1.31

OK
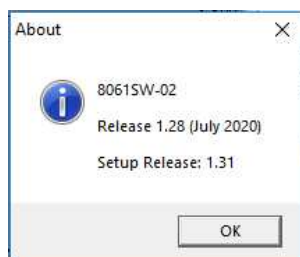
**3.26 Graph window**
The central part of the data window for the 8061SW-02 program displays the graph window containing the data presentation.
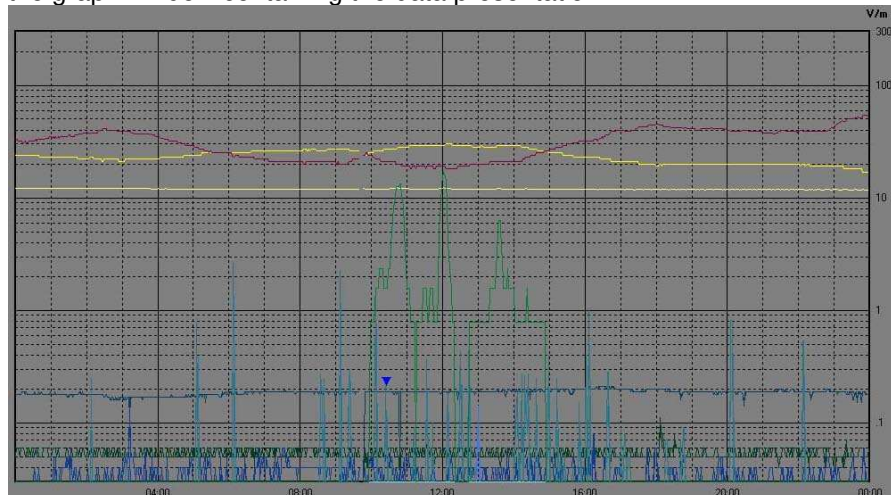


The graph window displays the traces saved on the basis of the settings made in the main window of the **Storing Settings** section.
When **Zoom Mode** is enabled, a triangle with its apex pointing downward highlights the position of the **Marker**.
A horizontal line, of the color chosen with **Setup**, highlights the limit set, permitting easy comparison with the values shown on the graph.

**3.27 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:

| Probe | Z-0000 | Resolution | 1 min | Mode | RMS |
|-------|--------|------------|-------|------|-----|

Actual operating mode

| Date | 28/10/2015 | Time | 12:29:00 | Peak (876 - 960) MHz) | 0.23 V/m |
|------|------------|------|----------|-----------------------|----------|

Values relative to **Marker** position

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

Display of description of the **Clip Board** key

**3.28 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.

**This page has been left blank intentionally**

# 4 – First connection -
# Point to Point and FTP communication

**4.1 General Information**

**This chapter describes the manual procedure for the Point to Pint or FTP configuration of the AMS-8061 Area Monitor. Both can be automatically set by using the NardaAMConfigurator (see §2.14).**

The AMS-8061 Area Monitor has been developed to be mainly used in FTP mode with the use of a SIM card.
Is it possible to use it also in other modalities like Point to Point but with some limitations.

With this area monitor you can work in **Point-to Point** mode or **FTP** mode, using the 4G modem or also via USB/RS232/Ethernet cable.

**FTP** means File Transfer Protocol, in this mode there is no direct connection between the area monitor and the computer. The area monitor will send all data on a FTP server where they lies up to the user will use the software to download them.

To work in this mode you need a FTP server and a SIM card in the area monitor modem with an internet data subscription. Make sure the PIN code of the SIM card in use has been removed.

☞ NOTE

**Please refer to chapter 3 of this manual for further information of using 8061SW-02 software**



**Fig. 4-1** FTP communication mode

Point to Point is a direct connection between the area monitor and the computer using the **RS232/USB** cable or the **Modem.**
The Point to Point with Modem connection, you need a PC modem, a SIM card in the area monitor modem and another SIM car for the PC modem but only if it is GSM. Beware, the SIM card for this way of communication need to be specifically enabled for CSD communication mode. This kind of specific SIM card is normally called M2M Machine to Machine. Make sure the PIN code of the SIM card in use has been removed.



**Fig. 4-2** Point to Point communication modes

**4.2 First connection –
Setting stations to Point-
to-point mode**

The AMS-8061 station is equipped with a GSM/GPRS modem and is
initially set, at the factory, for FTP communication mode.
Stations set for FTP communication are intended to be configured by
means of the user's FTP server through the Internet connection but can be
accessed, locally, by connecting the RS232, USB or Ethernet cable.

Some commands, specially related to the modem activity, are not enabled
for the real time setting that can be done in wired serial connections, if the
station is set for FTP communication.

The first connection may take place either **via modem** or **via direct RS232**
or **USB** or **Ethernet** connection. The direct connection is much faster and
the first connection must be make in this way even if the subsequent
operations will be done via 4G modem.
AMS-8061 is equipped with an USB port which can be connected to the PC
through the supplied USB cable.

In **Windows 10**: When connecting an AMS-8061 to the PC USB port for
the first time, a message informing that new hardware "**Dispositivo seriale
USB (COMn)**" has been found appears and It should be automatically
installed on your computer.
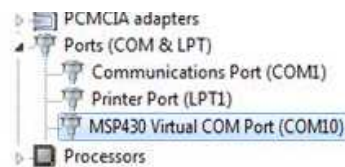


In **Windows 7**: When connecting an AMS-8061 to the PC USB port for the
first time, a message informing that new hardware has been found
appears. To install the new hardware enter in **Peripheral management**
(**Start** > **Control Panel** > **Device Manager).** In **Other Devices,** the device
will be shown with a yellow exclamation point next to it



The 8061SW-02 installation folder includes the file requested for the driver
installation. Select the device with the right mouse button, click **Upgrade
driver software** and **Browse my computer for driver software**. Select
**Browse,** locate the file **MSP430_CDC.inf** on C:\Program Files (x86)\(folder
installation)\, select **Next** and allow Windows to install the driver program.
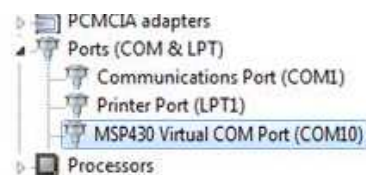
In case of use of USB-RS232 Adapter (accessory supplied separately on charge), the converter appears among the devices as a "**Prolific USB-to-Serial Comm Port (COMn)**".

**In Windows 10:** it should be automatically installed on your computer.

**In Windows 7:** a message informing that new hardware has been found appears. To install the new hardware enter in **Peripheral management** (**Start** > **Control Panel** > **Device Manager).** In **Other Devices,** the device will be shown with a yellow exclamation point next to it.
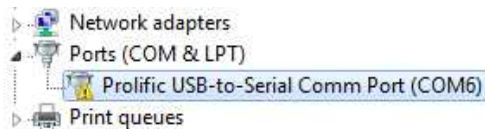


The 8061SW-02 installation folder includes the file requested for the driver installation on path C:\Program Files (x86)\(folder installation)\Driver USB-Serial
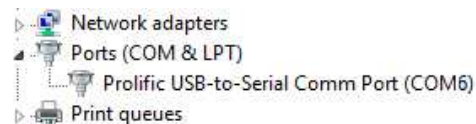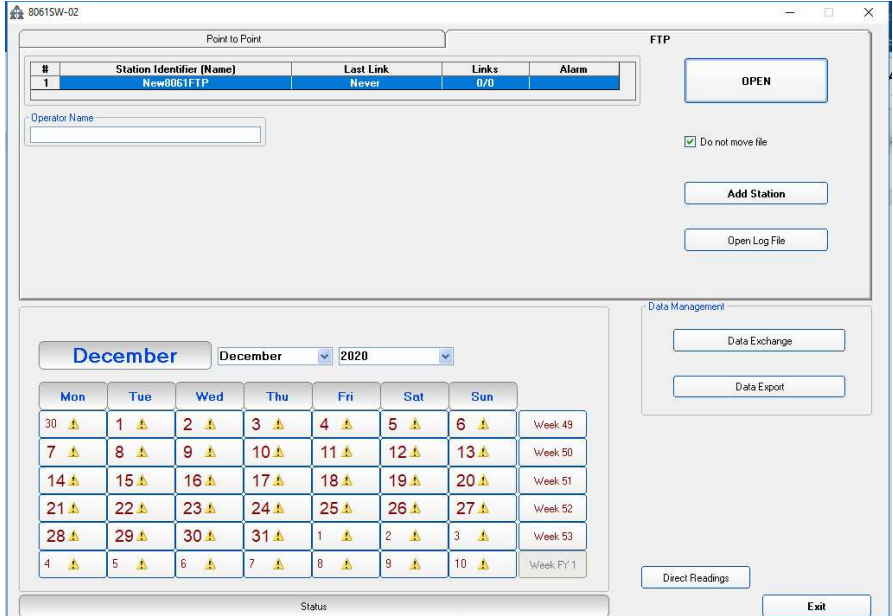


Click twice on the 8061SW-02 icon to start the software. First a window appears displaying the software release and the port COM assigned.
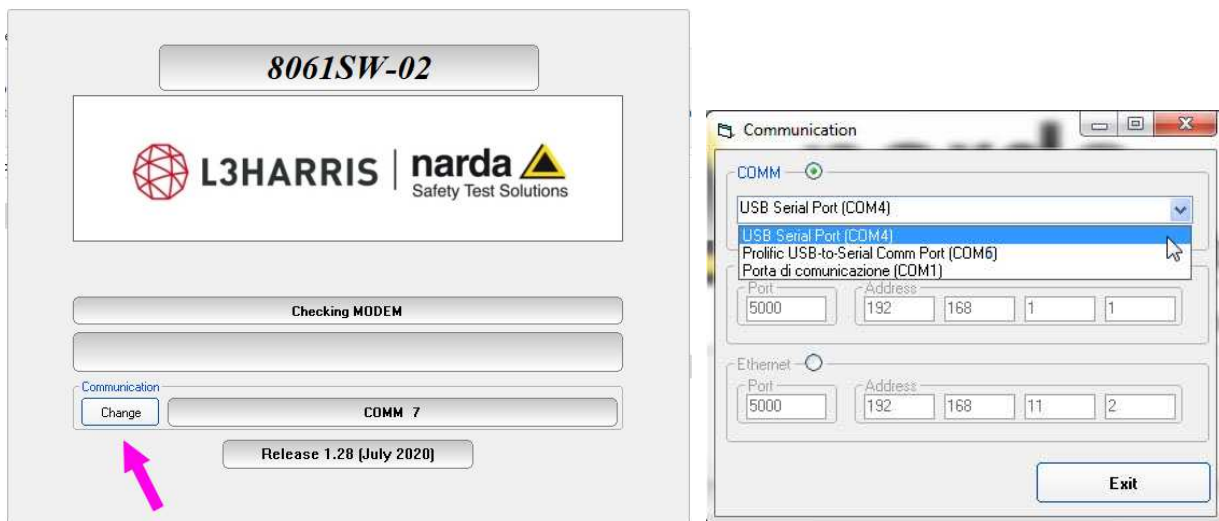


The User can quickly change the desired communication port by clicking onto the **Change** button located in the Communication frame of the first displayed window. The starting screen lasts for about 4 seconds, then it is automatically closed and the program enters its main view.

When the **Change** button is clicked, the communication port selector appears. A specific port must be selected to drive the control software to the AMS-8061 Area Monitor:

- Run 8061SW-02 and the main window appears as follows. The software ask you to enter a Terminal and Setting password (see §3.4.1, §3.4.1.1, §3.4.2, §3.4.2.1).



- Double click the first station listed in the FTP station list (new software installations show the "New8061FTP" station, on the list, as an example).
  A new area monitor must be added to the list as follow (all field are necessary).
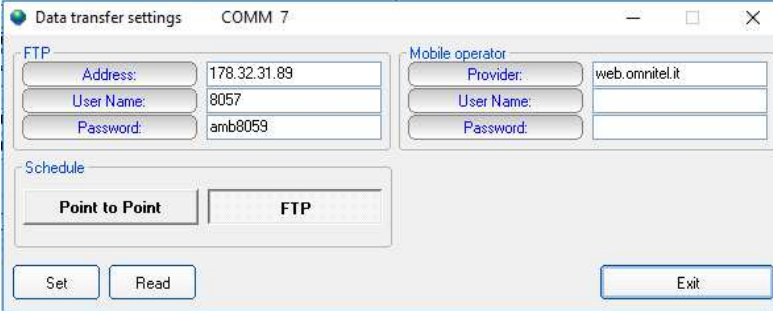


- Insert the Station Identifier: it is the name you decide to give to your monitor station.
- Insert the Serial Number of the station.
- Insert the Address, User Name and Password: these parameters are of our FTP server for preliminary test. Beware that our FTP server is periodically cleaned, do not use it in a definitive way.

☞ NOTE    **For every field the computer will request the Terminal Password (see §3.4.1 and §3.4.1.1).**

- Click the button "Data transfer settings".

- The Data transfer settings window allows to set stations for FTP or Point-to-point



**Schedule:** Here you have to set if the area monitor has to work in Point to Point or FTP mode.

**FTP:** These parameters depending on the FTP server you are using. As default, every Narda area monitor is set to work in FTP mode and the parameters you can find in this section are of our FTP server that can be used for preliminary test.
Beware that our FTP server is periodically cleaned do not use it in a definitive way.

**Mobile operator:** These parameters depending on the service provider of the used SIM.
Provider is the APN (Access Point Name)
User name used for GPRS connection
Password used for GPRS connection

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.

- 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 Point-to-point mode select "Point to Point" in the "Schedule" frame, click the "Set" button and type the Terminal password when requested.



- The "Read" button to check that the Point to Point mode has been correctly enabled in the station connected to the controller PC.

- Now choose in which way to use the station: "**RS232/USB, Point to Point** " (see §4.2.1) or "**Modem, Point to Point"** (see §4.2.4)

**4.2.1 RS232/USB,**
**Point to Point**

Via direct USB/RS232 connection is the easiest way to communicate with the area monitor.



**Fig. 4-3** USB/RS232, Point to Point

Click twice on the 8061SW-02 icon to start the software. First a window appears displaying the software release and the port COM assigned.

☞ **NOTE**

**These are the basic operations to follow to work with the AMS-8061. All additional information and explanations can be found on chapter 3**



When the **Change** button is clicked, the communication port selector appears. A specific USB or RS232 port must be selected to drive the control software to the AMS-8061 Area Monitor.



**Point to Point and FTP Communication** | **4-7**
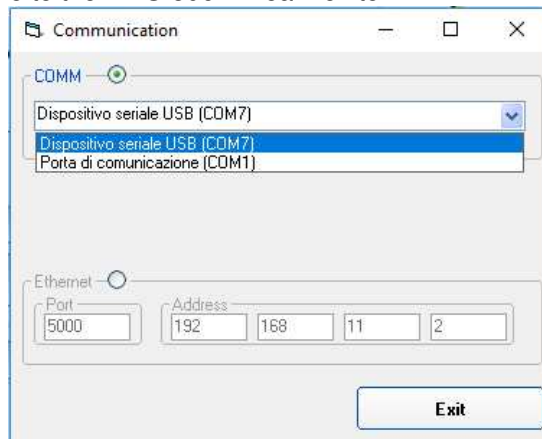
- Click the "Exit" button to go back to the main window and select the Point to Point section and use the function direct readings to immediately receive data from the area monitor. For further explanation consult §3.8
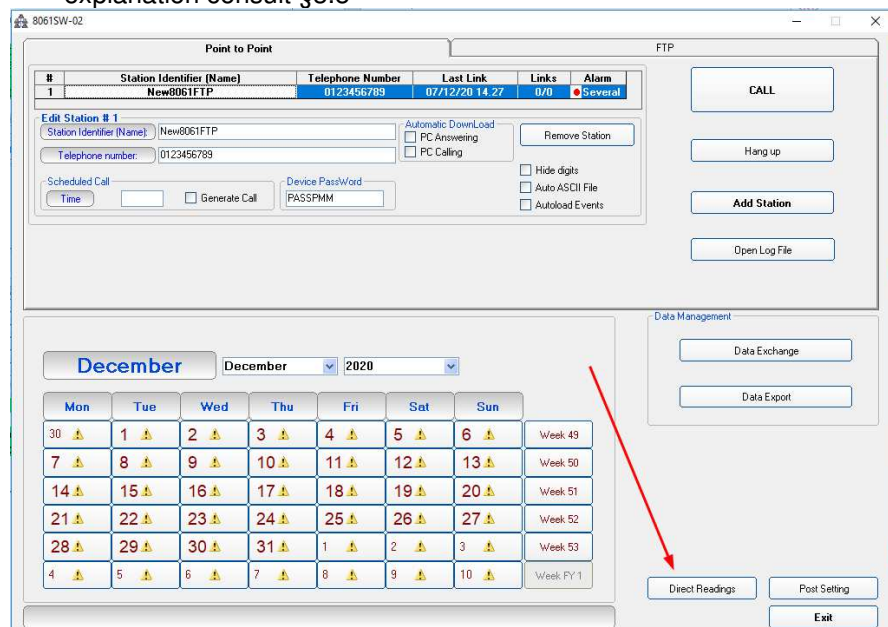


**Fig. 4-4** "Direct readings" button

Direct USB/RS232 communication can also be used for downloading of measurement results where the remote communication is not desired, for example, the GSM signal is very weak or there is no coverage of the network by the GSM Service Providers.

Use the **CALL** button to enter in the control window where is possible to check/edit station settings and download measurement results to the PC. For further explanation consult §3.11, §3.12 and §3.13
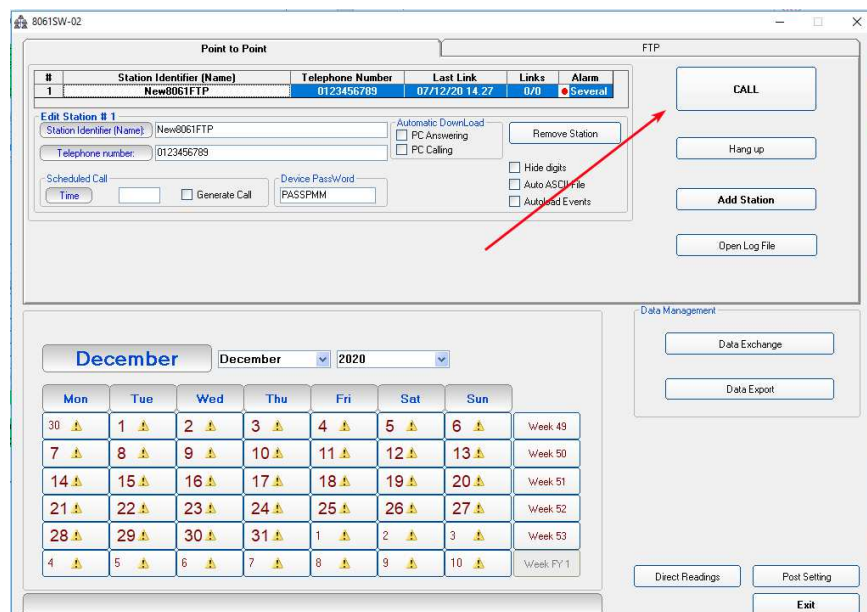


**Fig. 4-5** "CALL" button

**4.2.2 Modem,
point to point**

This modality allows you to directly communicate with area monitor. All you need is a PC modem, a SIM card in the area monitor modem and another SIM car for the PC modem but only if it is GSM. Beware, the SIM card for this way of communication need to be specifically enabled for CSD communication mode. This kind of specific SIM card is normally called M2M Machine to Machine.
Make sure the PIN code of the SIM card in use has been removed.
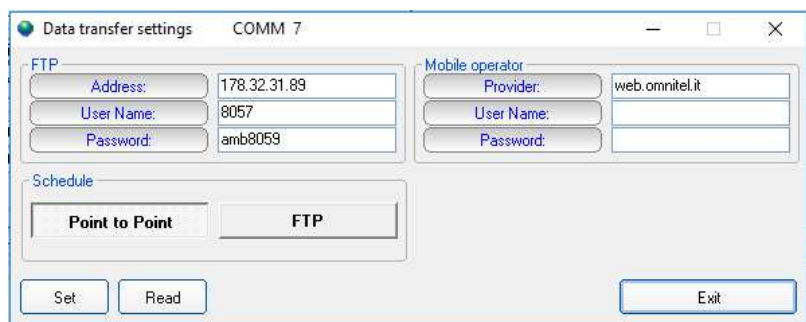


**Fig. 4-6** Modem, Point to Point

To work in this way the area monitor has to be set in this way:
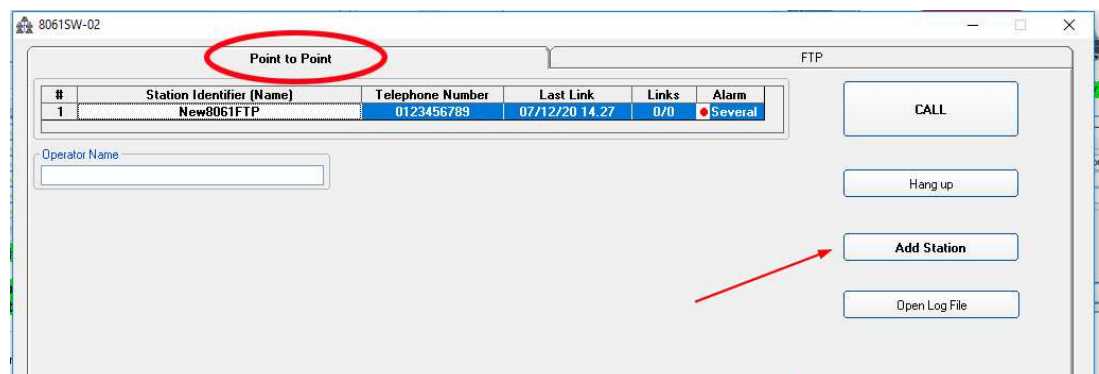
**NOTE**

**These are the basic operations to follow to work with the AMS-8061. All additional information and explanations can be found on chapter 3**



**Fig. 4-7** ""Modem, Point to Point" settings

Schedule: Point to Point,
All other field can be left blank
Press SET

Now switch the main panel of the software into Point to Point mode and add a new station. It always better add and remove stations instead of change an existing one.

- Insert the Station Identifier: it is the name you decide to give to your monitor station. As default it is the serial number of the station.
- Insert the Telephone Number: it is the phone number associated to the SIM card in the area monitor
- Insert the Device Password: as default it is PASSPMM

NOTE

**For every field the computer will request the Terminal Password (see §3.4.1 and §3.4.1.1).**

Now your area monitor should be added to the list.
Click once on its row and then press the button **Call**.



Every time, the software will try to have a connection with the modem. Because of the area monitor is directly connected to the PC you will see the following window:



Press YES (SI)
Now the software will verify if the name you gave to the station is the same registered in the station's memory. In case they are not matching the software will ask you if you want to change the name of the area monitor, stored in the internal memory, with that one you wrote in the grid, with the following window:



If you press YES the name inside the station will be changed.
This name it is just a label, the serial number of the area monitor will be always the same and cannot be changed.
If you press NO, the software will ask you if you want to replace the name in the grid with that one stored in the area monitor.

👉 **NOTE**

The main window of the software show you all possible information about the area monitor and the antenna. Now passages to do are:
- Push the button Enable Settings
- Push the button Set Clock
- Push the button Sub Bands
- Decide how many time and for how long the modem has to be switched on in the frame Schedule MODEM

**For every field the computer will request the Setting Password (see §3.4.2 and §3.4.2.1).**

| **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 can be set with a good accuracy (the PC clock is used).
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.
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.

The internal clock can also be set automatically by GPS sending the **#SMSGCSA*x*\*** command; in this case the internal clock updating depends on the GPS strength. For further information see pag. 5-18 .

The picture (on the previous page) shows the "000WX50803" station. Please note that the station clock (RTC) has not been set as it shows the date, in the "Station Date & Time" frame on the left bottom side, 5th Mar 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.

PassWord ×

**Insert Setting PassWord**

[            ]    OK

Type the setting password to be allowed to change RTC.

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

8061SW02 ×

? Send PC date && Clock to AMS-8061 Monitor Station?
17/12/2020 16:20:43

Yes      No

Click **Yes** to synchronize the station clock with your PC.

Station Date & Time
17/12/20 16:20   Set Clock
☐ Synchronize on exiting
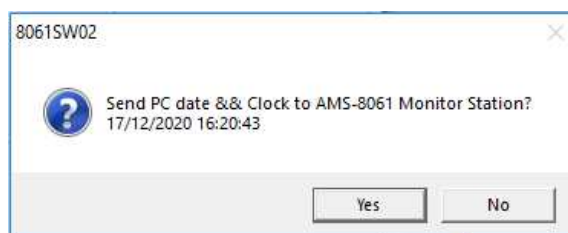
The station clock is now set.

**Setting Sub Bands**      Push the **Sub Bands** button. It shows the frequency range setting for measurement in a table form.



| | Start Freq. [MHz] | Stop Freq. [MHz] | |
|---|---|---|---|
| 1 | 87.000 | 108.000 | ☑ |
| 2 | 138.000 | 174.000 | ☑ |
| 3 | 380.000 | 400.000 | ☑ |
| 4 | 420.000 | 430.000 | ☑ |
| 5 | 430.000 | 470.000 | ☑ |
| 6 | 470.000 | 790.000 | ☑ |
| 7 | 790.000 | 821.000 | ☑ |
| 8 | 832.000 | 862.000 | ☑ |
| 9 | 880.000 | 915.000 | ☑ |
| 10 | 925.000 | 960.000 | ☑ |
| 11 | 1710.000 | 1784.000 | ☑ |
| 12 | 1805.000 | 1880.000 | ☑ |
| 13 | 2110.000 | 2170.000 | ☑ |
| 14 | 2400.000 | 2500.000 | ☑ |
| 15 | 3400.000 | 3800.000 | ☑ |
| 16 | 5200.000 | 5800.000 | ☑ |
| 17 | 87.000 | 6000.000 | ☑ |
| 18 | 0.100 | 2.000 | ☑ |
| 19 | 0.100 | 87.500 | ☑ |
| 20 | 5500.000 | 6000.000 | ☑ |

**NOTE**      **Please refer to paragraph 3.13.4 of this manual for further information of using Sub Bands function**

**How to switch the GSM modem on**

AMS-8061 is equipped with a 4G GSM modem, which power consumption, especially while transmitting, is very high, if compared with the station overall consumption.

Additionally, modem transmissions, including communications between terminal (modem) and network that are not under the user control, generate E.M. fields that affect the measurement results.

For the reasons above, the modem activity of an E.M field monitoring device should be reduced to the minimum by switching the modem OFF whenever convenient.

The GSM modem of AMS-8061 is therefore switched ON/OFF depending on the user settings and other conditions.

When the modem is OFF it neither consumes power nor generates any E.M. field. On the other hand, it is not able to receive calls or messages.

It is suggested to program the modem to be OFF for the major part of the day except times, usually one hour per day or less, to download results and be able to receive calls and messages. Abnormal situations, like alarm conditions, will be able, anyway, to switch the modem ON to allow automatic activities like alarm notifications.

A modem ON, but not communicating, is defined here as to be in "Stand-by" mode. It consumes some power but it is able to receive calls and messages.

Short transmissions due to communications between the modem and the GSM network occur usually every few hours when the modem is in Stan-by mode.

During transmission the modem power consumption is high and, in the case of the GSM module, it depends on the quality of the network signal.

On the monitoring station 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 monitoring station switches the modem on whenever there is an alarm)
3. **Automatic** (the monitoring station switches the modem on and off automatically when certain conditions arise)

**Programmed mode**   The internal modem will remain on and in Stand-by for 60 minutes after the monitor station was switched on. Afterwards, the modem will be switched on and off depending on the "**Schedule for MODEM**" settings:



![NOTE]

**For further information see paragraph 3.12.2**

The above picture shows the "schedule for MODEM" setting to place the modem in stand-by mode at 12:05 for 1 hour (4 quarters) every 24 hours.
It means that every day the monitor station is able to receive, or to originate, calls from 12:05 to 13:05.
If the monitor station is switched on at 11:30 the modem will be switched in stand-by mode until 12:30.
At 12:30 it will be switched off until 12:05 of the next day. No communications will be possible in this window time.

Instead, in case the monitor station is switched on at 10:50 the modem will be switched in stand-by mode until 11:50. Then OFF for 15 minutes until, at 12:05 of the same day, switched again in stand-by mode for 4 quarters by the "schedule for MODEM" settings.

**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 modem is switched on directly by the monitoring station 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 10 minutes.

**Automatic mode**   Certain particular conditions - apart alarms - can cause the modem to be switched on and off regardless of the programming time:

If both Stand-By parameters ("Schedule for Modem" and "Schedule for SMS") are set to zero, the modem would never be switched on and therefore the monitoring station would be unreachable. To avoid this condition, at 11 a.m. of the internal clock, every day the modem is placed on Stand-By for 30 minutes (the GSM modem where available).

Once set the GSM modem you can disconnect the station from the computer and put it in the place choose for monitoring.

Connect the modem to the computer to start working in "Modem, Point to Point" mode with the area monitor.

**NOTE**

**Remember that the modem needs to work with a baud-rate of 115200.**

Click twice on the 8061SW-02 icon to start the software. First a window appears displaying the software release, the port COM assigned and the presence and the status of the modem will be checked.



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

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



If the software 8061SW-02 does not detect any modem or you are not sure about the connection with the PC or its working conditions, proceed as follows:

**NOTICE**

**To use the "Modem, Point to Point" communication, the baud rate of the Modem must be set to 115200.**

**NOTICE**

**When using a GSM Modem, make sure the PIN code of the SIM card in use has been removed.**

**NOTICE**

**Preferably, a GSM PC modem should be used for calling remote stations in "Modem, Point to Point" mode. A line modem can be used but it 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.).**

- 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 one selected.

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

**NOTE**

**Every time the Area monitor is switched OFF, and the battery pack disconnected from it, the internal clock has to be set. It is always better prepare the first installation on site with the help of a laptop or a tablet to verify that internal clock has the right hour and date**

**This page has been left blank intentionally**

**4.3 General information**

**4.3.1 Introduction**

AMS-8061 area monitor can be set to operate using two different remote communication modes, both using one of the internal modem network: Point-to-point and FTP (File Transfer Protocol).

**The user should decide in advance the communication mode for each station as Point-to-point communication mode is not allowed while a station is set for FTP and viceversa.**

NOTE

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

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

NOTE

**4.3.2 Brief description of FTP communication**

When a GSM modem switches on it links up with the proper 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 address.

Unlike the Point-to-point 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 GSM/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 4G GPRS.
An evident advantage using internet for data exchange is that it allows accessing data from anywhere, at low cost, regardless the distance.

**4.3.3 Monitoring networks**

The monitoring network is a system composed by one to several AMS-8061 remote 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.

**4.3.4 System operation in FTP mode**

After initial installation, there is no direct communication between remote stations set for FTP mode and controller PC.

A User's FTP server with a static IP address (or, at least, with a numeric alias if dynamic) is always necessary, presuming availability of the 4G 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 settings or to download results related to some specific time interval.

In case, the station will proceed accordingly, by changing its settings or by downloading the requested data. If no special requests are found, the station downloads all measurement results, which have been acquired since the previous access to the server.

To avoid energy wasting, and generating undesired electromagnetic fields, that would be measured by the station itself, the station 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 (where available).

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, especially during bad weather periods, affecting the energy balance between solar panel (where installed) 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 one of the remote stations from the list and access its folder opening a ftp connection to the server.

All data not already downloaded from the server to the controller PC are then downloaded, and eventually 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 FTP (File Transfer Protocol).

**NOTE**

**Due to the 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: it will be downloaded at the next connection.**

**4.3.5 Some advantages**

Any remote unit (AMS-8061 area monitor) downloads its data to the FTP server, at scheduled time, according to the User settings.

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 network bad 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 GSM/GPRS service.

## 4.4 General Requirements

**Remote station:**

### 4.4.1 Remote station

- A SIM card enabled for 4G GSM/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 FTP 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 Customers, for preliminary tests only:**
**IP address: 178.32.31.89**
**User Name: 8057**
**Password: amb8059**

**NOTICE**

**Be aware that data in this server are periodically removed.**

**4.4.2 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.**

**4.4.3 Brief operating description and file structure**

Basically, at scheduled times, the AMS-8061 regularly establishes, via the selected channel, 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.

**4.4.4 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.**

**4.4.4.1 CFG File (configuration)**

Whenever the AMS-8061 connects to the GSM network 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.

**4.4.4.2 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.

**4.4.4.3 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.

**4.4.4.4 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.

| | |
|---|---|
| **4.4.4.5 Event File (Write)** | After having written the FLD file, the AMS-8061 writes a file named HH_mm_GG_MM_YY.TXT where:<br><br>• HH is hour of the day.<br>• mm is minute of the day.<br>• GG is the day.<br>• MM is the month.<br>• YY is the year<br><br>Which represents the events file.<br>This is an ASCII file which contains all the new events since last connection.<br>Alternatively, soliciting a connection, by the SMS command, different event history can be retrieved as follows:<br><br>• SCGNA : all the stored events are written in EVENT.TXT file<br>• SCGNL : The last 20 events are written in EVENT.TXT file<br><br>The content of EVENT file is the chronological history of all events up to the time of connection (RTC setting assumed to be correct). |
| **4.5 First connection – Setting stations to FTP mode** | First configuration of each station and its functional test should be performed before installing the station on site.<br>User must ensure that the GSM signal is available in the installation site.<br><u>First connection must be done via **RS232** or **USB** or **Fiber** or **Ethernet** connection to allow proper setting of FTP and modem parameters.</u><br><br>Follow the step from to n°1 to n°18:<br>1) Set-up the remote unit and recharge batteries (if necessary) as explained in the chapter 1 and 2.<br><br>2) Install 8061SW-02 control software in the controller PC with administration privileges (see paragraph 3.3).<br><br>3) When connecting an AMS-8061 to the PC USB port for the first time, a message informing that new hardware "**MSP430 Virtual COM Port (COMn)**" has been found appears (see paragraph 4.2).<br><br>4) If the USB-RS232 adapter is used, it appears among the devices as a "**Prolific USB-to-Serial Comm Port** " (see paragraph 4.2).<br><br>5) Run 8061SW-02 PC with administration privileges (see paragraph 3.3) and select the correct COMM port. (see paragraph 4.2).<br><br>6) Select the **FTP** 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). |
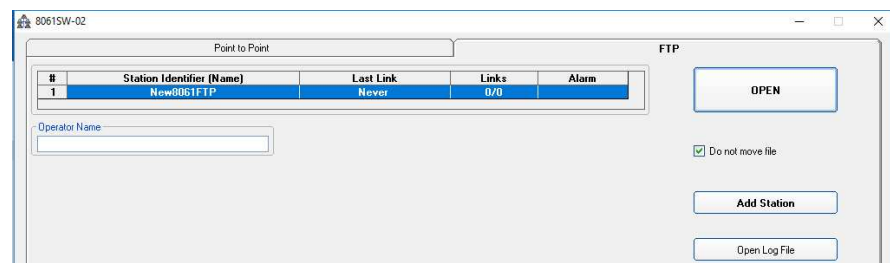


**NOTE** — **These are the basic operations to follow to work with the AMS-8061. All additional information and explanations can be found on chapter 3**

7) 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)**:
"New8061FTP" 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:**
"140WY60901" 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:**
"178.32.31.89" 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 "amb8059" in this example to access the Narda STS ftp server for test.
User must set access parameters for his own ftp server.

**Downloading data from FTP server to PC.**
If disable the data in FTP server will be downloaded on PC since the latest download up to actual date and time

If enabled (√) the data in FTP server can be downloaded on PC in the data interval set on "Start" to "Stop" at the time indicated.

**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.**

**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.**

8) Click the button **Data transfer settings**:



A new form opens:



Use the **Read** button to display the parameters of a station connected via RS232, USB or Ethernet cable.

**4.5.1 Modem, FTP**

9) Set the station in **FTP mode.**
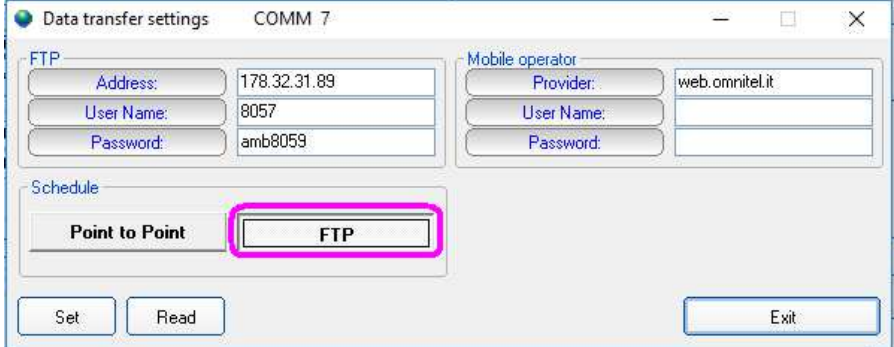
In **FTP mode**, the area monitor will send all data to an FTP server where they lie up. All you need is a PC modem, a SIM card in the area monitor modem and another SIM card for the PC modem but only if it is GSM. Beware, the SIM card for this way of communication is a standard SIM card with an internet subscription activated. Make sure the PIN code of the SIM card in use has been removed
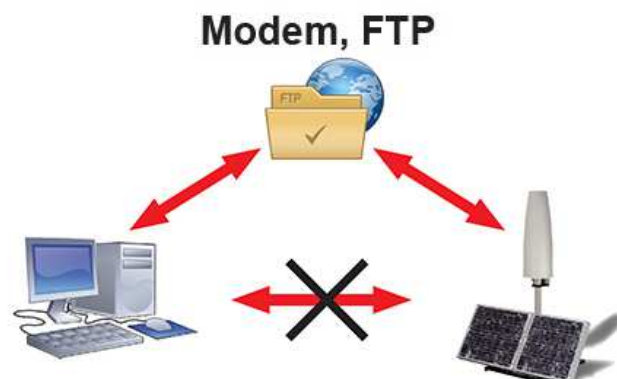


**Fig. 4-8** Modem, FTP

To work in this way the area monitor has to be set in this way:

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 testing.

User should then set access parameters for his own ftp server.



**Fig. 4-9** "FTP mode" settings

**FTP**:
- **Address**: the static IP of the FTP server you intend to use
- **User Name**: the user name to enter in the FTP server
- **Password**. the password to enter in the FTP server

**Mobile operator**: these parameters depending on the service provider of the used SIM.
- **Provider**: the APN (Access Point Name)
- **User name**: user name used for GPRS connection
- **Password**: password used for GPRS connection

Press **SET** and then **Exit**

10) 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 can be set with a good accuracy (the PC clock is used).
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.
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.

The internal clock can also be set automatically by GPS sending the **#SMSGCSA***** command; in this case the internal clock updating depends on the GPS strength. For further information see pag. 5-18 .

Select the **Point-to-point** 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):



Insert the Station Identifier: it is the name you decide to give to your monitor station. As default it is the serial number of the station.

Insert the Telephone Number: it is the phone number associated to the SIM card in the area monitor

Insert the Device Password: as default it is PASSPMM

For every field the computer will request the Terminal Password

Hit the button **Call**, on the right, to access the station connected by cable.
As the Point-to-point 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 RS232, USB or Ethernet cable:
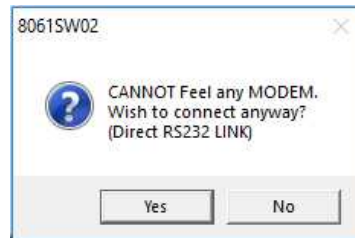


The station name is always stored within the station and it is expected that it matches the name, in your station list, that have been selected before calling.
The user station have not been added to the Point-to-point stations list as the FTP communication mode has been decided, in advance, for this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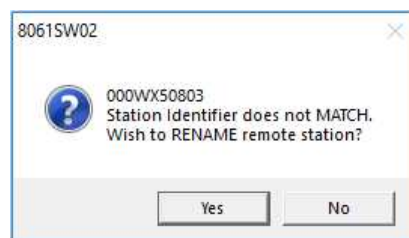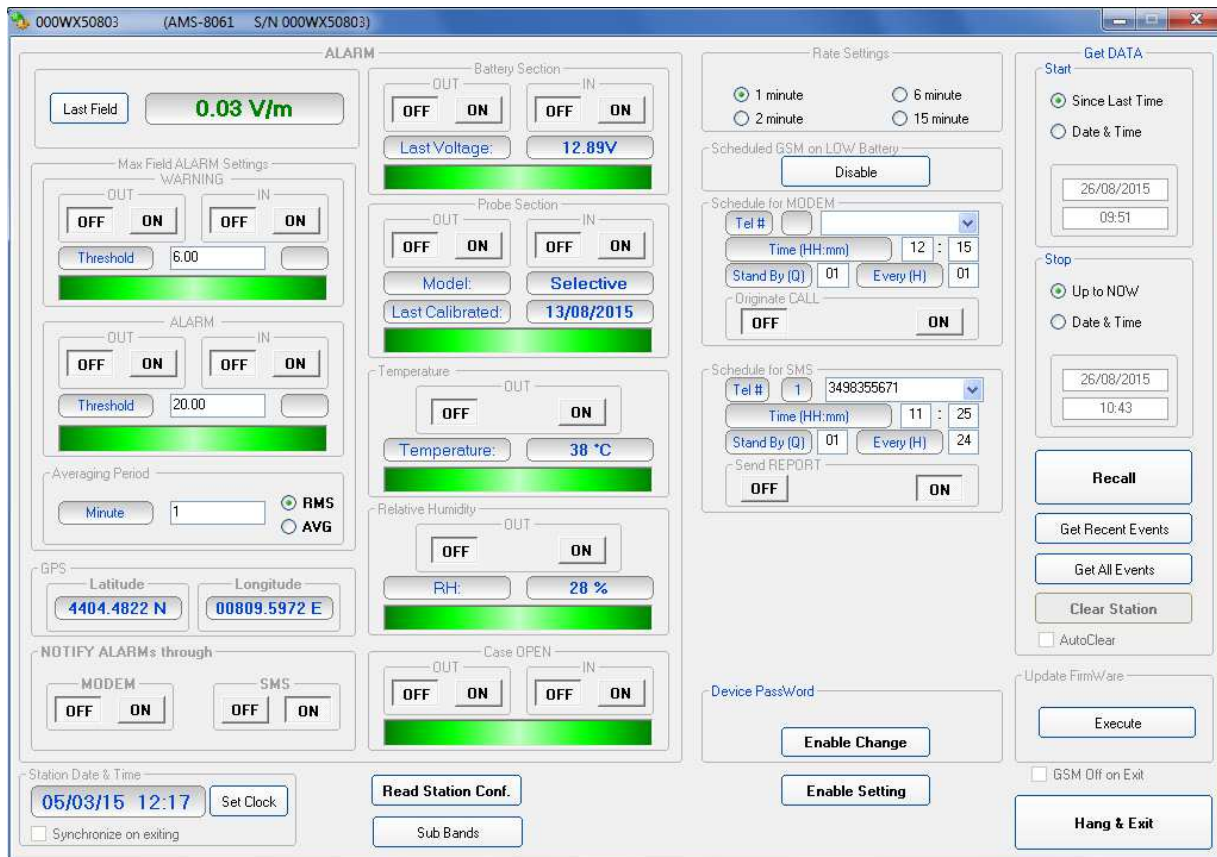


Answer **No** as you do not wish to change the name stored within your station.
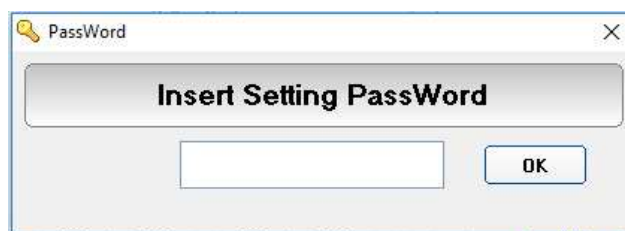


Answer **No** as you do not need to add this station to the Point-to-point stations list, you are going to use it in FTP mode. This station is in your FTP stations list.

The station Setting window will be shown:



The above picture shows the "000WX50803" station. Please note that the station clock (RTC) has not been set as it shows the date, in the "Station Date & Time" frame on the left bottom side, 5th Mar 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:
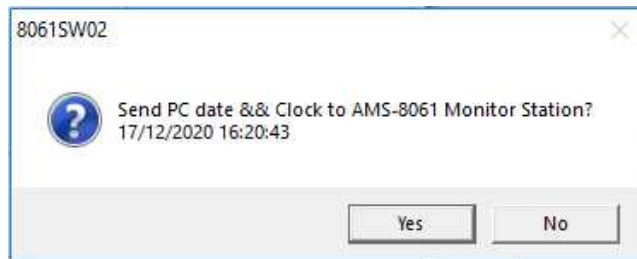


Click **Yes** to synchronize the station clock with your PC.
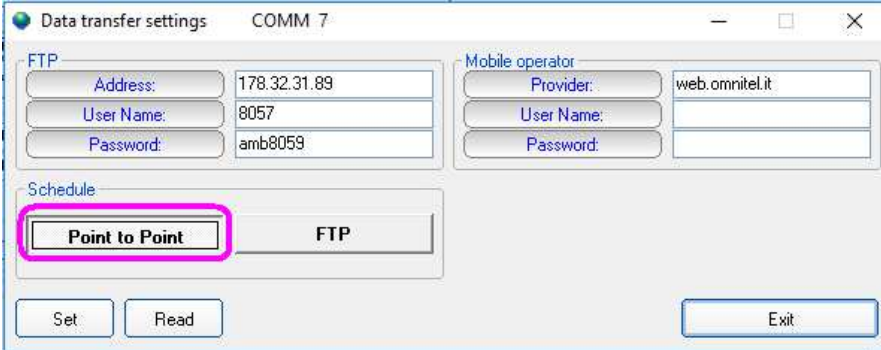
The station clock is now set.



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

Since the station is set to FTP communication mode, some parameters could be not available for modification, if their prevalent meaning is designed for Point-to-point mode.

If, for example, the User wishes to preset the Schedule for MODEM, that is to say the time plan for ftp data download, it is possible to temporary set the station to Point-to-point communication mode (in the Data transfer settings window)



Then, connect the station in the Point-to-point section, as already explained, and set all the desired paremeters.
After that, go back to the Data transfer settings window, and restore the final FTP mode in the Schedule frame.
From now on the station is ready to work as desired, with all the parameters set before of its first FTP connection.
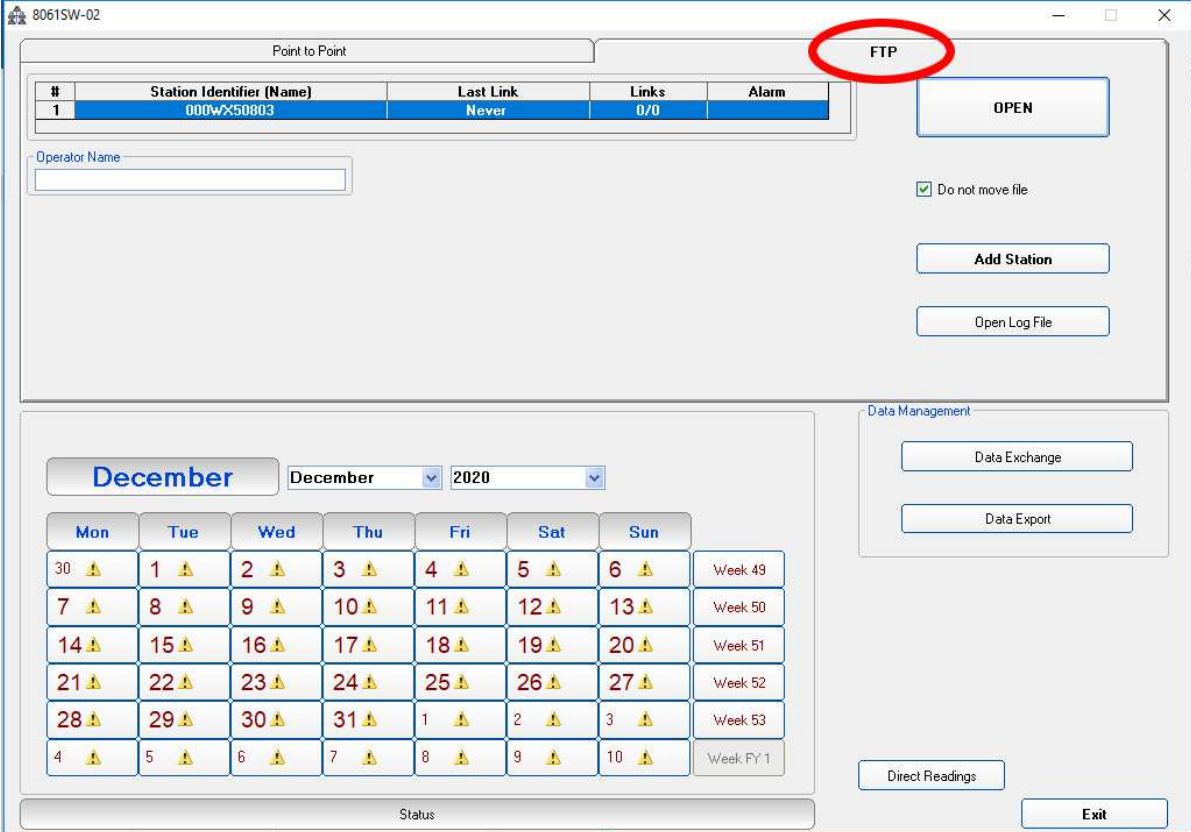
11) Accessing the FTP server

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 (the executable is called DRIVERIN.exe)

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

NOTE

**These are the basic operations to follow to work with the AMS-8061. All 8061SW-02 additional information and explanations can be found on chapter 3 (see §3.15, §3.16, §3.17, §3.18 and §3.19).**
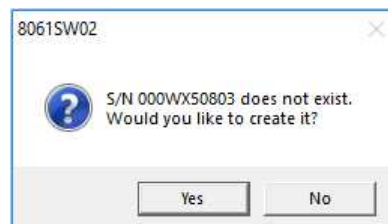


Enable or disable the "Do not move file" function

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

At the first connection, the software will advise you that there is no folder on FTP server with that serial number. The following message will appear:



The station folder, into the ftp server, has not been created yet, answer **Yes** to create it.

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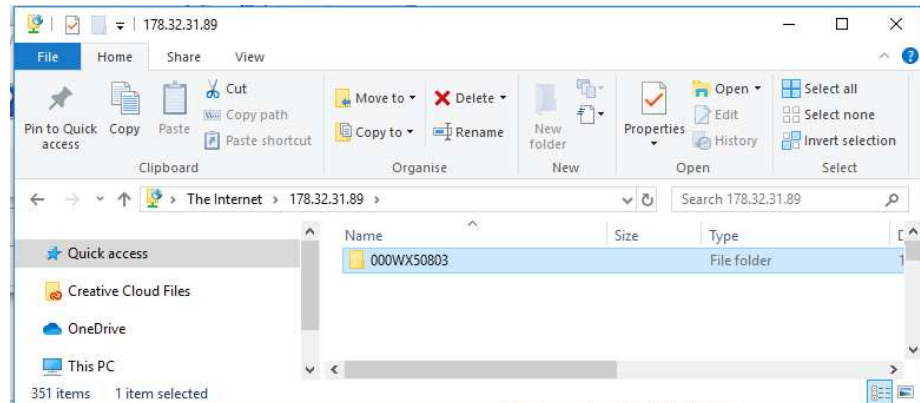


IP address, User Name and Password are to be set to access the ftp server through the Windows Explorer.

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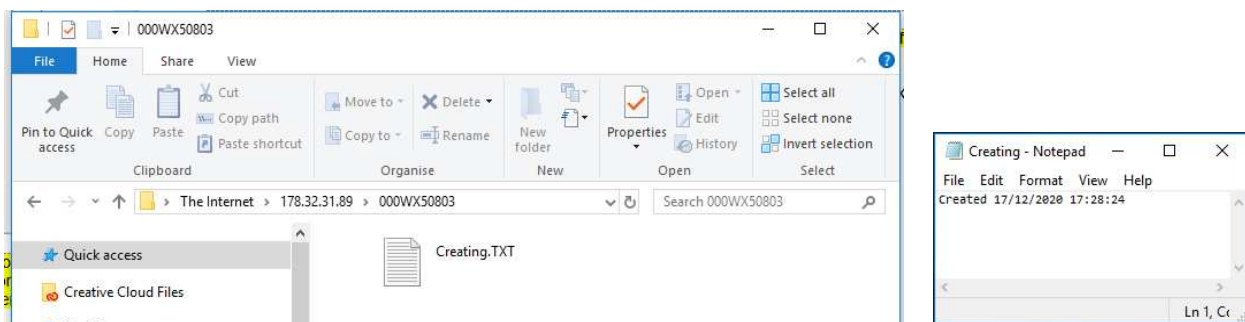


Next message shown by the software just ask you whether you wish to display a default setting which should be saved or modified by the user to save the first setting file ".cfg" which will be read and used by the station at its first connection to the server:
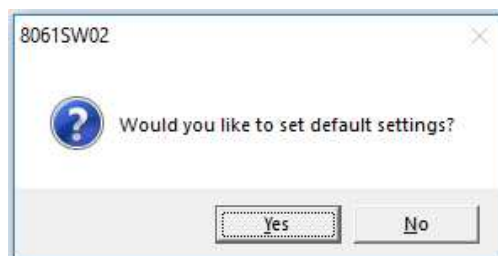


Answer **Yes** to display default setting.

12) 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).



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.

**NOTE**
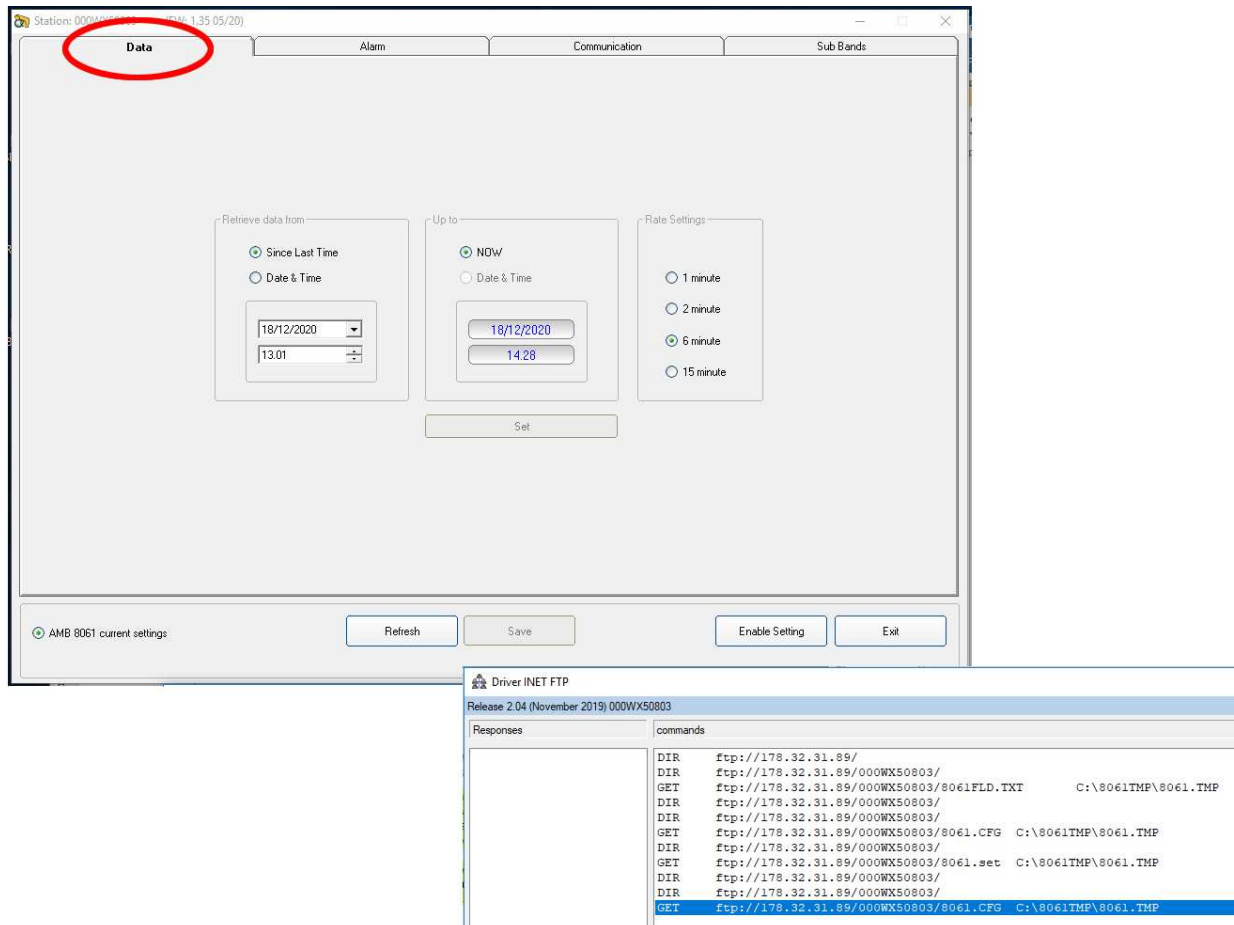
**Please refer to paragraph 3.16 of this manual for further information of using Data function**

☞ **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).**
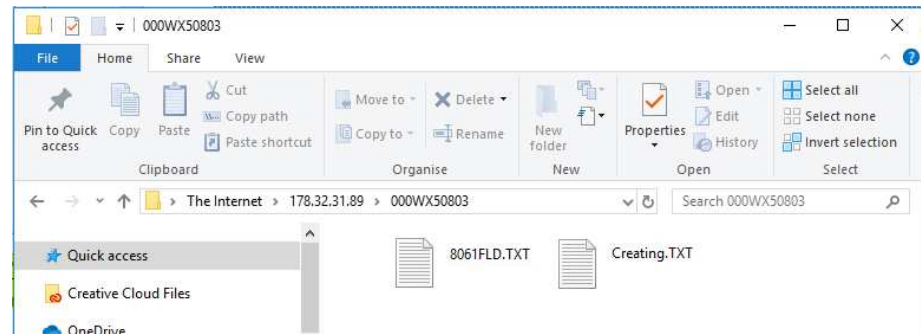


8061FLD.txt file contains information related to the next data the station should download when accessing the ftp server:
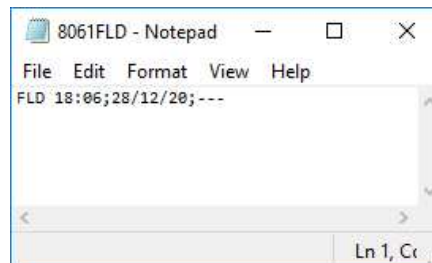


The above picture shows the content of 8061FLD file. After reading this file the station will download data starting from the 28th December 2020 at 18:06.
Last information, "---"in this case, shows how many records have to be downloaded.
"---" means "up to now" so: all data that have been acquired since the 28th December 2020 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" December 28th at 18:06 "Up to" December 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 accesses the server, it downloads all data that have been acquired since the last access to the ftp server.**
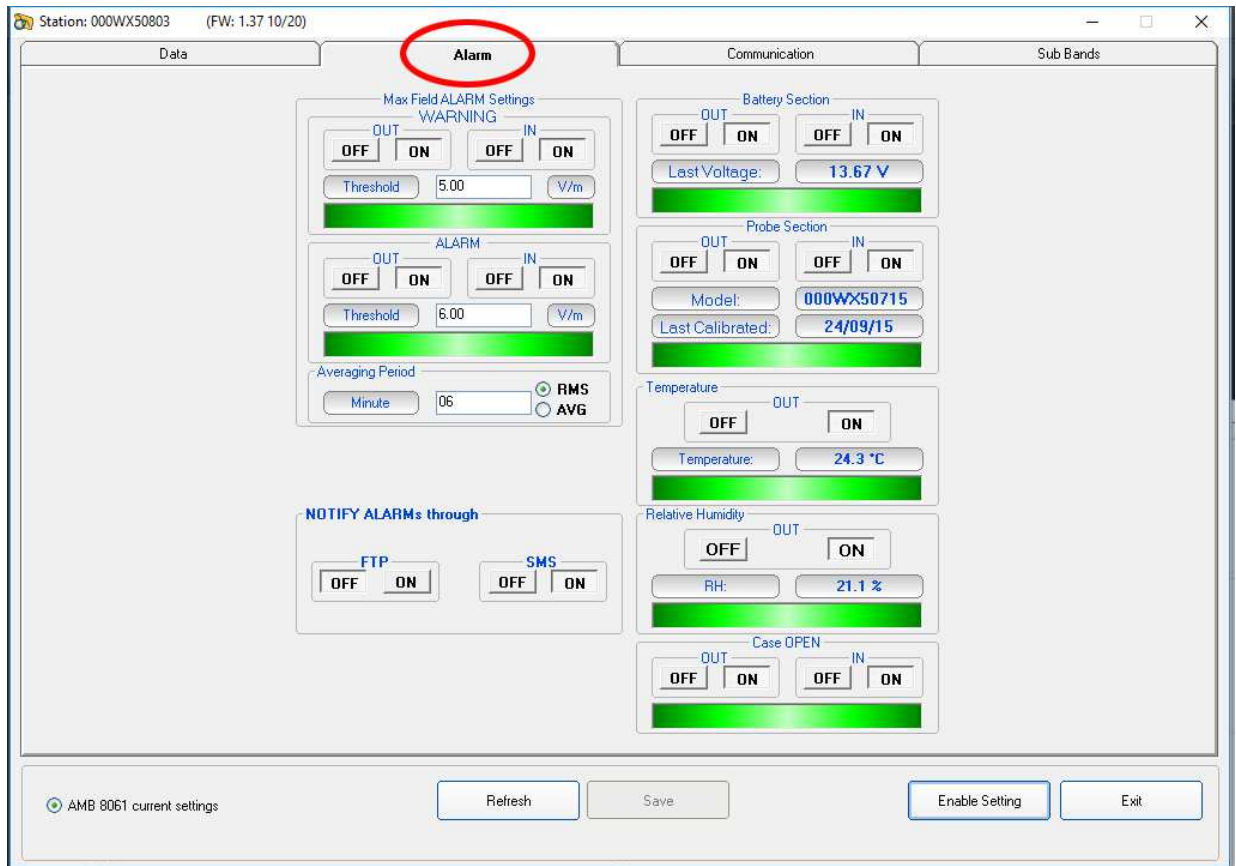
☞ **NOTE**    **In case, due to some special need, a specific time period should be downloaded by setting the parameters "Retrieve Data From – Date&Time / Up to – Date&Time", continuity of data to be downloaded later cannot be resolved automatically and a gap will be shown since last data already downloaded 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.**

13) 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.



**Please refer to paragraph 3.17 of this manual for further information of using Alarm function**

14) The third section, named **Communication,** allows to change the **Schedule for FTP** and **Schedule for SMS** settings accordingly to your work.





**NOTE**     **Please refer to paragraph 3.18 of this manual for further information of using Communication function**

15) The last section, named **Sub Bands,** shows the frequency range setting for measurement in a table form.

| Station: 000WX50803    (FW: 1.37 10/20) | | | | – □ ✕ |
|---|---|---|---|---|
| Data | Alarm | Communication | **Sub Bands** | |

| | Start Freq. [MHz] | Stop Freq. [MHz] | |
|---|---|---|---|
| 1 | 87.000 | 108.000 | ☑ |
| 2 | 138.000 | 174.000 | ☑ |
| 3 | 380.000 | 400.000 | ☑ |
| 4 | 420.000 | 430.000 | ☑ |
| 5 | 430.000 | 470.000 | ☑ |
| 6 | 470.000 | 790.000 | ☑ |
| 7 | 790.000 | 821.000 | ☑ |
| 8 | 832.000 | 862.000 | ☑ |
| 9 | 880.000 | 915.000 | ☑ |
| 10 | 925.000 | 960.000 | ☑ |
| 11 | 1710.000 | 1784.000 | ☑ |
| 12 | 1805.000 | 1880.000 | ☑ |
| 13 | 2110.000 | 2170.000 | ☑ |
| 14 | 2400.000 | 2500.000 | ☑ |
| 15 | 3400.000 | 3800.000 | ☑ |
| 16 | 5200.000 | 5800.000 | ☑ |
| 17 | 87.000 | 6000.000 | ☑ |
| 18 | 0.100 | 2.000 | ☑ |
| 19 | 0.100 | 87.500 | ☑ |
| 20 | 5500.000 | 6000.000 | ☑ |
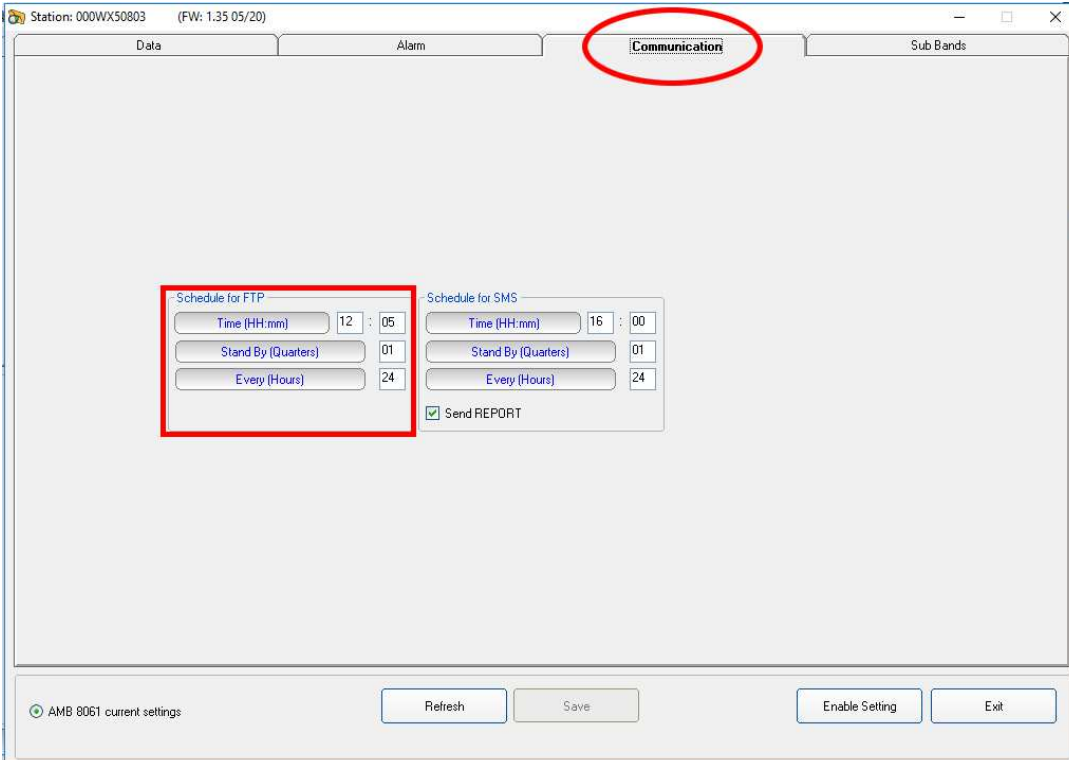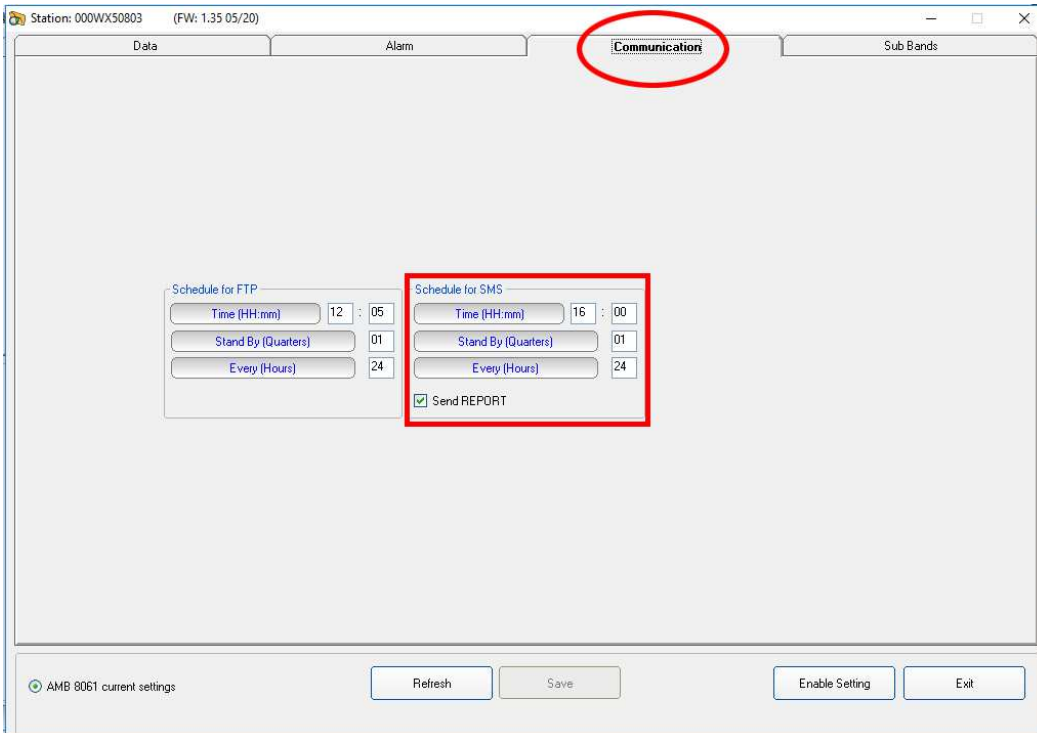
⊙ AMB 8061 current settings        Refresh     Save        Enable Setting    Exit

**☞ NOTE**   **Please refer to paragraph 3.13.4 of this manual for further information of using Sub Bands function**

After all four sections, **Data**, **Alarm, Communication** and **Sub Bands** 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.

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

| access | [■] Paste shortcut | folder | ▾ | ⟳ History | 🖧 |
|---|---|---|---|---|---|
| Clipboard | | Organise | New | Open | |

← → ⌄ ↑ 📁 › The Internet › 178.32.31.89 › 000WX50803          ⌄ ⟲    Search 000WX50803

⭐ Quick access                    📄 8061FLD.TXT        📄 Creating.TXT        📄 8061.CFG

🔴 Creative Cloud Files

☁ OneDrive
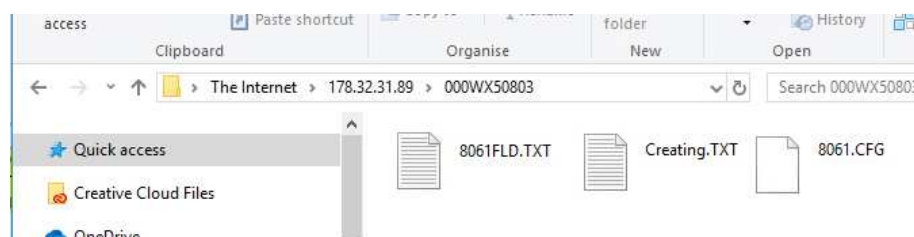
16) Switch OFF the station and insert the SIM card as follows:



**Fig. 4-10** SIM card installation

17) Switch the station ON

Now you have to force the first connection between the AMS-8061 and the FTP server sending a SMS with a mobile phone as follows:
**#SM?IDN(space)password*(space)#SMSCGN***

Where:
- **(space)** means you have to leave a space
- **password** is the Device Password (see §3.4.3 and §3.4.3.1). As default is PASSPMM.

In this case, with factory settings, the message will be:
**#SM?IDN PASSPMM* #SMSCGN***

Here an example about what you should have on your FTP server:
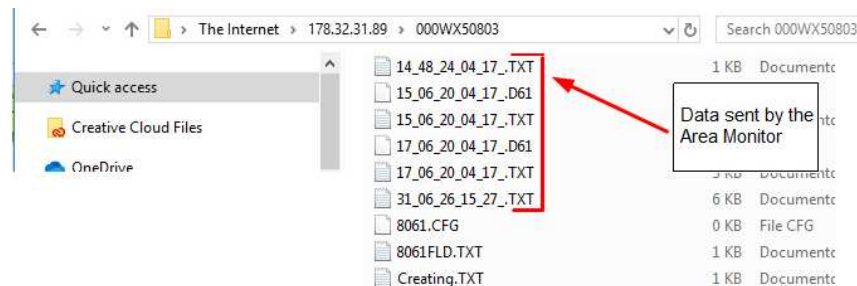


As you can see the CFG file is 0 kB; this means that the area monitor has correctly taken the settings and is ready to work in total autonomy.

**We strongly suggest to avoid free FTP storing services in general because of the many limitations and poor stability they exhibit. Overall features are not sufficient to guarantee a completely automatic system as Narda monitoring station.**
**Free web-hosting services are used to offer only passive FTP communication, whereas Narda monitoring station is designed for active FTP communications. Free web-hosting services have normally a limited number of connections (per time). This limitation, more often than not, stops FTP communication in the middle of data up- and down-load even on the same TCP session between the server and the same client. Free web-hosting services, often, exhibit very long reply times which trigger Narda monitoring station TO procedures.**
**To try Narda monitoring stations and setup a first working setup, we can provide you FTP space on our private server. However, for a future actual installation, you will need to arrange your own FTP server without the above mentioned limitations.**

**NOTICE**

Everytime a new setting is changed, the .CFG file will be modified and it will be read by the station, when accessing the server, to set itself as requested. The area monitor change its internal settings and at the end it will leave a new file called 8061.SET. This new file is used by the software to show the last area monitor settings.

👉 NOTE

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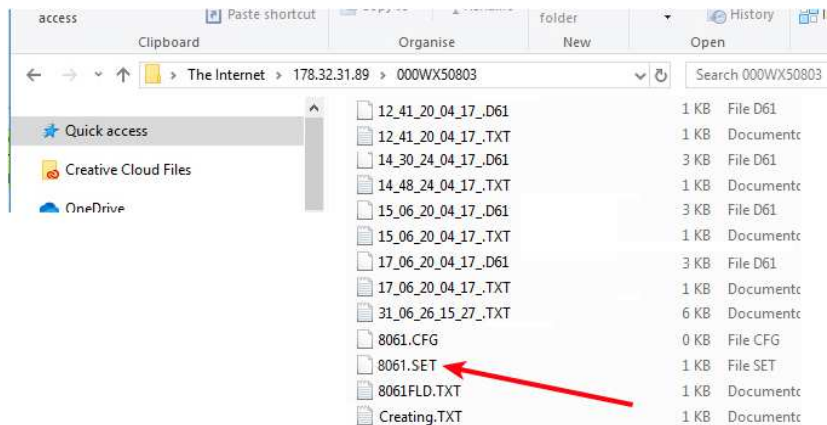


In case the .CFG file has been modified and the station is called <u>before accessing to the server as modem schedule</u>, it will be displayed the following warning message.
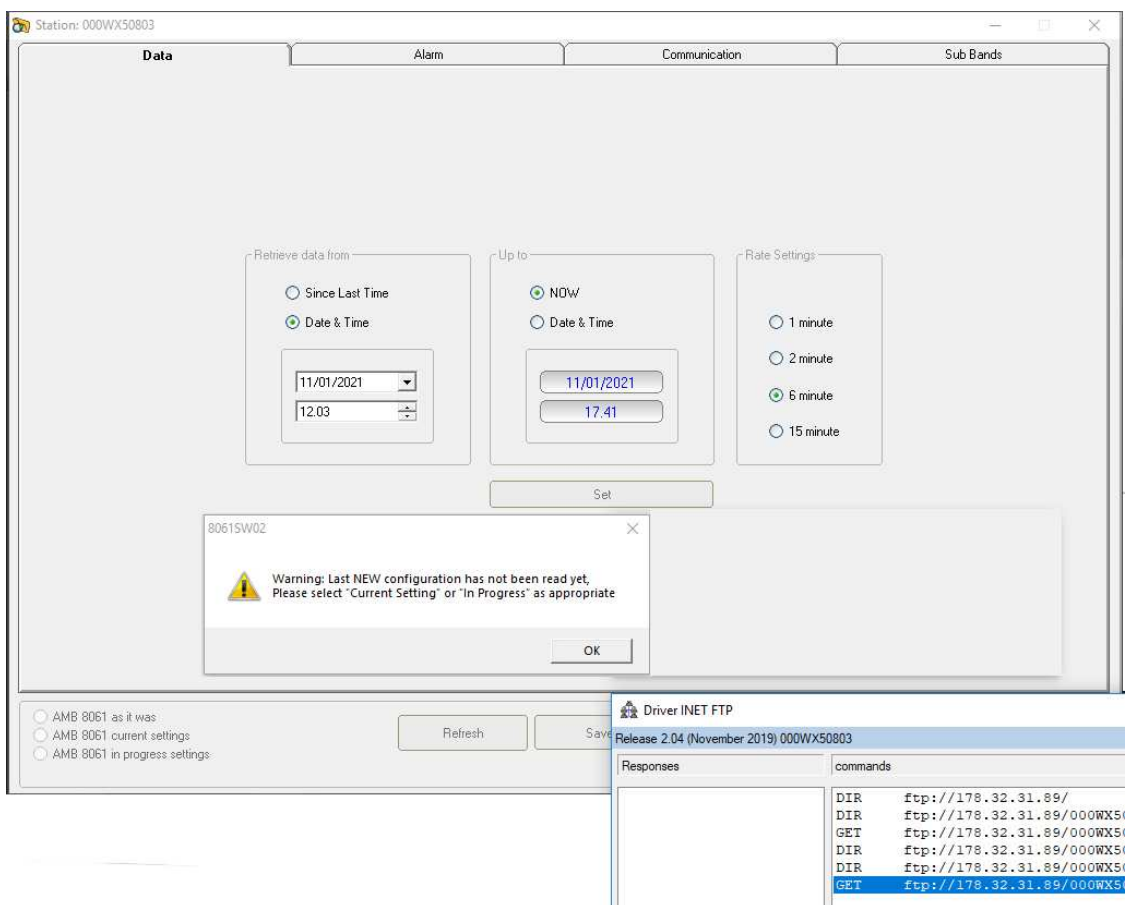
The message informs that the new configuration has not been stored in the station yet. Confirm with **OK**.

**AMS-8061 currents settings** and **AMS-8061 in progress settings** function are enable on the left bottom of each section**.**

The software allow reading the current settings (**AMS-8061 currents settings**) or the settings that are going to be store at the next modem connection (**AMS-8061 in progress settings**).
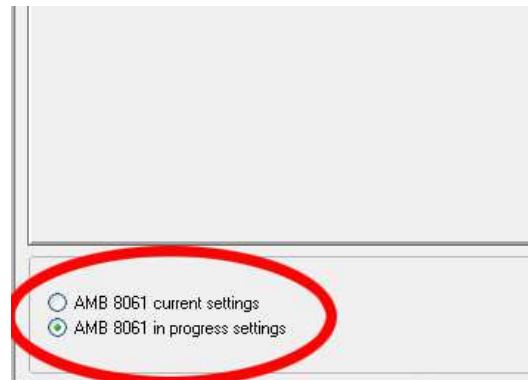


18) Displaying measurement results

After all automatic tasks have been completed and the bottom bar shows no operation, hit **Exit** to go back to the main window. If some data have been downloaded, the calendar will show the related day number coloured in blue, showing that some data is available.
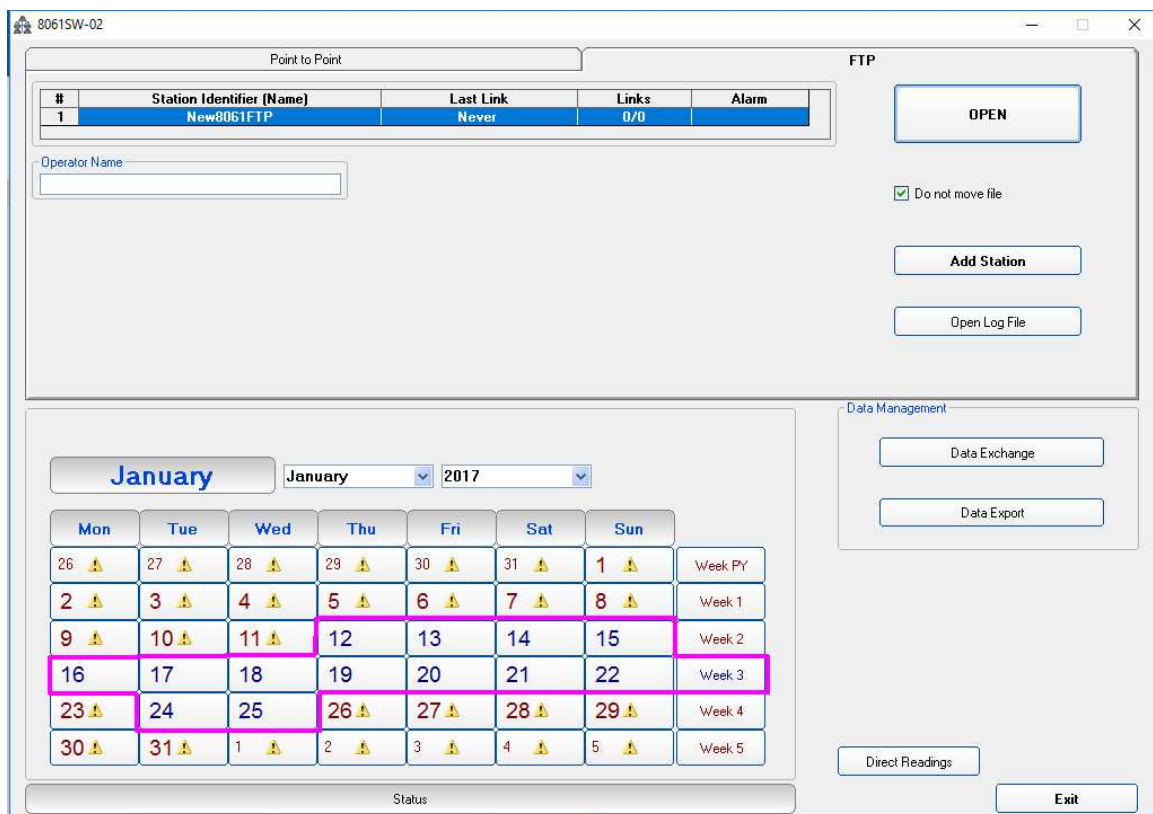
Hit the blue day in the calendar to open a graph showing downloaded data.
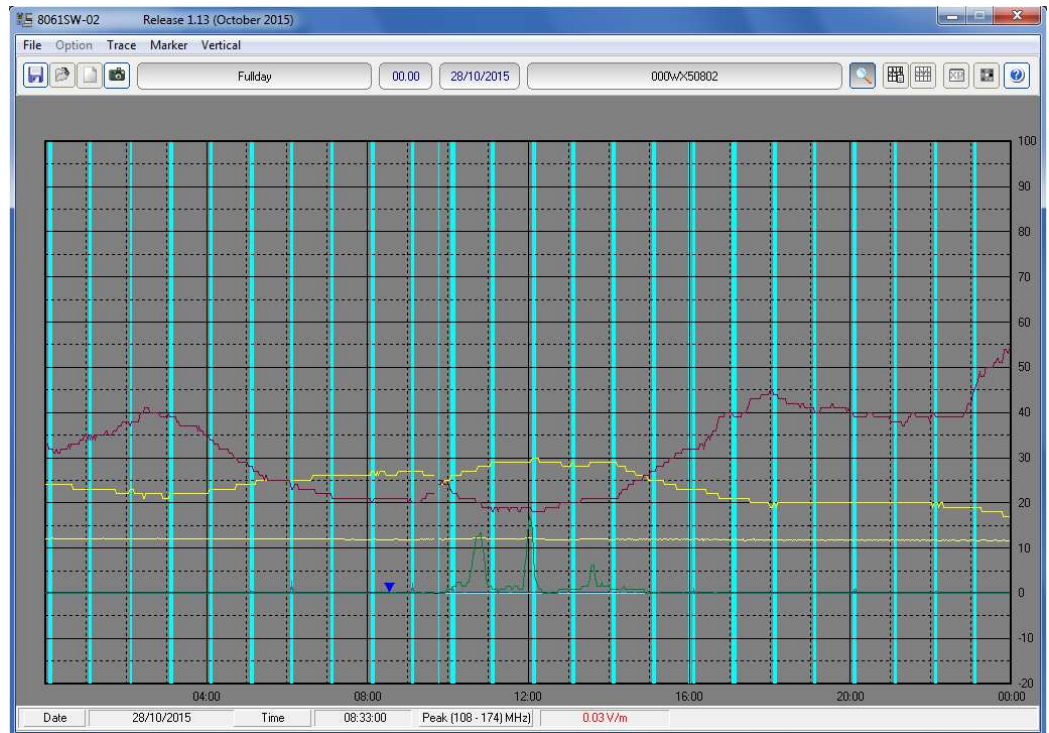


NOTE **Please refer to the chapter 3 of this manual for details regarding data presentation, saving and related commands (see §3.22, §3.23, §3.24, §3.25, §3.26, §3.27, §3.28 and §3.29)..**

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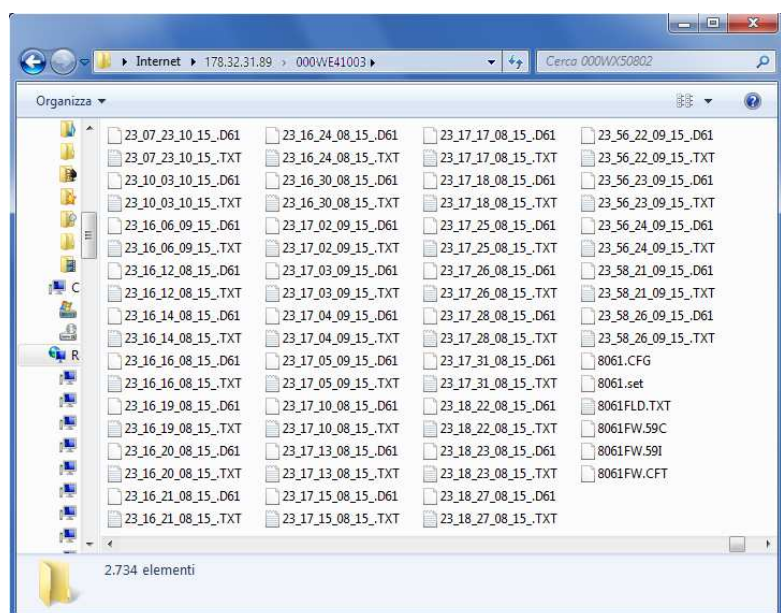
**If the function "Do not move file" (on the main window) is disabled, all data already downloaded to the controller PC are transferred to back-up folders (one for the .txt files, one for the .D61 ones) and will not be available for a future download even from different station.**
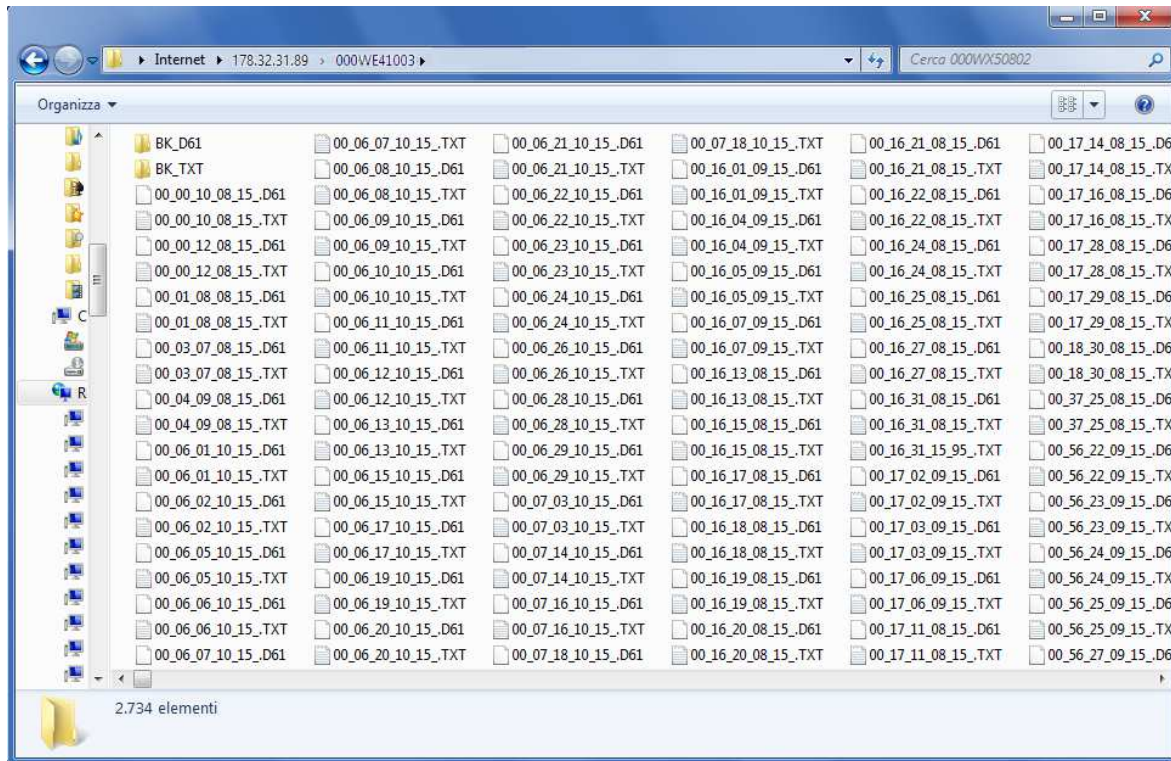


## 4.6 AMS-8061 Firmware updates in FTP mode

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 station firmware can be updated by connecting the station to the controller PC via serial port. Once the communication has been successfully established with the program 8061SW-02, press the **Execute** button (see §3.12.6).

The firmware update can be performed also for remotely situated stations both via Point-to-point connection, or via FTP (depending on service availability and station setting).
To update a station working in FTP mode, please copy the firmware files, called **8061FW.59I, 8061FW.59C** and **8061FW.CFT**, in the station's folder present on the FTP server.

Firmware files are normally located in the following path:
**C:\Program Files (x86)\8061NSTS**

Now, it is possible sending the command **CGNFW** or **CGNFWI** via SMS, in agreement with the modem programming, to have the station updated.
In order to achieve the remote update for the stations working in FTP mode, it is necessary to have previously configured the GPRS network.

# 5 – Command protocol

**5.1 Introduction**

This chapter provides information about the communications protocol of the AMS-8061 Area Monitor System via mobile phone using SMS (Short Message System) or through RS232, USB, Ethernet by means of Windows Hyper Terminal or similar applications.

The AMS-8061 station can be reached by any GSM mobile phone and the commands sent via SMS will enable the User to change the settings or query various functions of the station.

The commands have the following general format:

## #SMQCommand(parameters)* where:

**#** = opens the command string;
**SM** = string always included;
**Q** = **?** for query commands;
    **S** for setting commands ;
**Command** = command string;
**(parameters)** = value of setting parameters (if any);
**\*** = closes the command string.

The commands available via SMS message are divided into three main categories:

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

**Expect of "EVN", "EVNL", "EVNR" and "BNDALL" (not present on SMS) all the commands are available on SMS, Modem, RS232, USB, Ethernet.**

**Every SMS sent to the AMS-8061 must contain as a first command the invitation to authenticate the device password. This is to protect the station for undesired access.**

Therefore every SMS, to be processed correctly, must start with the string:
**#SM?IDN psw\***

Where psw is the device password set for the station (the default password is <u>PASSPMM</u>).

*Example*: to request the last reading (average value) the SMS message to be sent to the AMS-8061 with the password set by the factory is as follows:
**#SM?IDN PASSPMM\*#SM?LFA\***

**Any command sent via RS232, USB, Ethernet immediately rouses the microcontroller. However, because of the peculiarity of the stop status, in this case the command is lost and must be sent again in order to be carried out. This is done automatically by the 8061SW-02 software and should be taken into consideration by the User in developing any custom software.**
**Obviously, this does not occur in case of commands issued via SMS or in case of connection via modem, as the microcontroller is always on when the GSM is on stand-by.**

### 5.2 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
**#BM?CIMI\***       Request the International Mobile Subscriber Identity (IMSI)
**#SM?CLK\***        Station internal clock query command.
**#SM?CPIN\***       Request the SIM card PIN's status.
**#SM?CSQ\***        Request the modem signal strength (RSSI) and the bit error rate (BER) value.
**#SM?EVN**          Events query command
**#SM?EVNL**         Last 20 Events query command
**#SM?EVNR**         Not yet read Events query command
**#SM?FTP\***        Request FTP status
**#SM?GCS\***        Request internal clock updating mode
**#SM?GPS\***        GPS position data query command.
**#SM?HFTP\***       Request User, Password and IP address hidden status on the RS232 port sniffer
**#SM?IDN\***        Identifier query command.
**#SM?IDNF\***       Full Identifier query command.
**#SM?LFA\***        Last mean value query command.
**#SM?MDM\***        Request Modem status
**#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.

**NOTE**

**?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 |
| **#SMSGCS (parameters)\*** | Set internal clock updating mode |
| **#SMSGOI\*** | GPS On Immediately |
| **#SMSGOIF\*** | GPS ON Immediately with Feedback |
| **#SMSHFTP (parameters)\*** | Show or hide User, Password and IP address on the RS232 port sniffer |
| **#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. |

**FTP-GPRS Setting COMMANDs**

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

| Syntax | Function |
|---|---|
| **#SMSGPR0 (parameter)\*** | Set Access Point Name for GPRS. |
| **#SMSGPR1 (parameter)\*** | Set User Name for GPRS access network. |
| **#SMSGPR2 (parameter)\*** | Set Password for GPRS access. |
| **#SMSGPR3 (parameter)\*** | Set User Name for FTP access server. |
| **#SMSGPR4 (parameter)\*** | Set Password for FTP access. |
| **#SMSGPR5 (parameter)\*** | Set IP Address of the FTP server. |
| **#SMSCGN\*** | Start a GPRS connection and access the FTP server. |
| **#SMSCGNA\*** | Start a GPRS connection, access the FTP server and upload txt file including all events available. |
| **#SMSCGNFW\*** | Start a GPRS connection with update firmware and reboot. |
| **#SMSCGNFWI\*** | Start a GPRS connection with update firmware and reboot without uploading any records. |
| **#SMSCGNL\*** | Start a GPRS connection, access the FTP server and upload txt file including last 20 events. |
| **#SMSNETD\*** | Set the station to the Point-to-point communication mode. |
| **#SMSNETE\*** | Set the station to the FTP communication mode. |

**FTP-GPRS Query COMMANDs**

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

| Syntax | Function |
|---|---|
| **#SM?GPR0\*** | Request Access Point Name for GPRS |
| **#SM?GPR1\*** | Request User Name for GPRS access network |
| **#SM?GPR2\*** | Request Password for GPRS access |
| **#SM?GPR3\*** | Request User Name for FTP access server. |
| **#SM?GPR4\*** | Request Password for FTP access |
| **#SM?GPR5\*** | Request IP Address of the FTP server |

**5.3 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*** <br> Response: **ALR=20 V/m; 1** |
| **?AQ_** <br><br> 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_*** <br> Response: **AQ_=40A** <br><br> It means that the Stations is storing a measurement every 15 minutes and the mean calculation is Average. <br><br> The alias command can be used in the same way. <br><br> Example: **#SM?AQP*** <br> 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*** <br> 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. <br> 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*** <br> Response:**BND 1=0.100,1.000** <br>          **BND 2=1.000,20.00** |
| **?CIMI** (IMSI) | Request the value of the International Mobile Subscriber Identity (IMSI) stored in the SIM Card. The response in the format **"#BM CIMI xxxxxxxxxxx*.** If the SIM is not inserted, the command returns ERROR. | Query: **"#BM?CIMI"** <br> Reply: **#BM CIMI=450050209516643*** |
| **?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*** <br> Response: **CLK=13.32.57;23.11.07** |

| Command | Description | Example |
|---|---|---|
| **?CPIN** | Request the SIM card PIN's status.<br>The response in the format #SM +CPIN: SIM <s>*<br>Where <s> can be either<br>- **READY**: contains the last string obtained by the "AT+CPIN?" command sent to the modem<br><br>- **PIN**: PIN is present<br><br><br>- **PUK**: wrong PIN entered three times | Example: **#SM?CPIN***<br><br><br>Response:<br>**#SM +CPIN: SIM READY***<br><br>Another response:<br>**#SM +CPIN: SIM PIN***<br><br>Another response:<br>**#SM +CPIN: SIM PUK*** |
| **?CSQ** | Request the modem signal strength (RSSI) and the bit error rate (BER) value. The value is related to the last modem connection.<br><br>The format is:<br>**#SM CSQ= x,y (dd/mm/yy hh:mm:ss)***<br><br>The first value **x** indicates the modem signal strength (RSSI):<br>0:       -113 dBm or less<br>1:       -111 dBm<br>2...30: -109... -53 dBm<br>31:      -51 dBm or greater<br>99:      Not known or not detectable<br>(or RSSI [dBm] = −113 + RSSI [id] *2)<br><br>The second value **y** indicates the bit error rate (BER):<br>0:   Less than 0,1 %<br>1:   0,26 % to 0,30 %<br>2:   0,51 % to 0,64 %<br>3:   1,0 % to 1,3 %<br>4:   1,9 % to 2,7 %<br>5:   3,8 % to 5,4 %<br>6:   7,6 % to 11,0 %<br>7:   Greater than 15,0 %<br>99:  Not known or not detectable<br><br>The **(dd/mm/yy hh:mm:ss)** indicates Date and Time of the measured RSSI and BER value.<br><br>Example **#SM?CSQ *** returns the response:<br>**#SM CSQ= 4,99 (24/04/18 14:11:45)*** | |
| **?EVN** | All Events list request.<br>The reply shows the complete list of all the available events, stored by the Station.<br>This command is not available via SMS. | Example: **#SM?EVN*** |
| **?EVNL** | Last 20 Events list request.<br>The reply shows the list of latest 20 available events, stored by the Station.<br>This command is not available via SMS. | Example: **#SM?EVNL*** |

| Command | Description | Example |
|---------|-------------|---------|
| **?EVNR** | Not yet read Events list request.<br>The reply shows the complete list of all the available events, that are not yet been read before, stored by the Station.<br>This command is not available via SMS. | Example: **#SM?EVNR*** |
| **?FTP** | Request of internal code related to the last FTP status. The response in the format **#SM FTP=x***, where <x> is the internal code | Example: **#SM?FTP***<br>Response: **FTP=2** (start sequence) |
| **?GCS** | Request the internal clock updating mode. | The response in the format:<br><br>**#SM GCS=M*** the internal clock updating is set in manual mode by commands (see SCLT and SCLD).<br><br>or<br><br>**#SM GCS=A:x*** the internal clock updating is set by GPS; x represents the time zone (the value is from -12 to +12) |
| **?GPS** | This query command **#SM?GPS*** requests the latest RMC NMEA phrases (NMEA 0183 ver 3.01) detected by the GPS module.<br>RMC NMEA strings are reported in full, starting with **$GPRMC** and ending with the checksum followed by CR LF.<br><br>When a position has not yet been acquired, the reply is:------VOID<br><br>Example of reply:<br>**$GPRMC,154452.000,A,4404.4843,N,01047.9412,E,0.28,152.18,270122,,,A*6E**<br><br>The format for NMEA coordinates is ddmm.mmmm (d=degrees and m=minutes); The NMEA degrees minutes can be convert to decimal degree as follows:<br>4404.4843 → Take the NMEA Latitude position.<br>0.4843 * 60 = 29.058 → Multiply by 60 the NMEA Latitude second part.<br>440429.058 → The product is added to the NMEA Latitude first part for making 6 digits long first part.<br>04 * 60 = 240 → Take the second two digits of the first part and multiply by 60.<br>(240+29.058)/3600=0.074738 → The product is added to the last first part and the total divided by 3600.<br>44+0.074738 → Add the result to the first two digits. The total is Latitude expressed in decimal degree. |

| Command | Description | Example |
|---|---|---|
| **?HFTP** | Request User, Password e IP address hidden status (FTP mode) on the RS232 port sniffer.<br><br>**OFF:** User, Password e IP address are shown on RS232 sniffer.<br><br>**ON**: User, Password e IP address are hidden on RS232 sniffer.<br><br>In FTP communication mode the command and feedback response are replaced by "@@@". This status also affects ?GPR3, ?GPR4, ?GPR5, ?GPR7 and ?GPRA commands. | Example: **#SM?HFTP***<br>Response:<br>**SM HFTP=OFF***<br><br><br>Another example: **#SM?HFTP***<br>Response:<br>**#SM HFTP=ON*** |
| **?IDN** | **Identifier** request with password authentication.<br>The answer displays the Station identifier (that can be set by the SIDN command) followed by the serial number (factory preset).<br><br>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.<br>Via SMS, it is advisable to send this message, instead of ?IDNF, to make the password authentication.<br>Please look at the SPSW command to find information about how to save the password in the Station. | Example: **#SM?IDN***<br>Response:<br>**IDN=democisano;000WX50802;**<br><br><br>Another Example: **#SM?IDN PASSWORD* #SM?BAT***<br>Response:<br>**IDN=democisano;000WX50802; BAT=13.07**<br><br>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.<br><br>Format:<br>**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;**<br>Where:<br>**identifier** is the name of the Station, stored by SIDN command.<br>**R.rr** is the release and MM/YY the date of the internal firmware.<br>**Serial Number** is written in factory.<br>**Date of calibration** is the last calibration date, as dd.MM.YY.<br>**Originate Call** can be ON, OFF or NET to indicate the Station call mode.<br>**HH:mm (Xq) each Yh** shows the Modem status for first interval, same as ?TSM command.<br>**Send Report** can be ON or OFF to indicate if the SMS report sending is active or not.<br>**HH:mm (Zq) each Wh** shows the Modem status for second interval, same as ?TSS command.<br>ALARM is a symbolic string to show the alarms states, as for ?ALR command<br>.<br>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.<br>Via SMS, it is advisable to send the ?IDN command, instead, to make the password authentication.<br>Please look at the SPSW command to find information about how to save the password in the Station. | Example: **#SM?IDNF***<br>Response:<br>**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;------------;**<br><br>Another Example: **#SM?IDNF PASSWORD* #SM?BAT***<br>Response:<br>**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**<br>Where:<br>**democisano** is the Station identifier<br>**Nsts** is the narda brand<br>**AMS-8061** is the model<br>**A.46** is the fw release and<br>**08/15** means August 2015<br>**000WX50802** is the Station's S/N<br>**21.07.15** means July 21th 2015 and is the latest calibration date<br>**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)<br>**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)<br>**------------** means no Alarm is active<br><br>**BAT=13.07** is the reply to the second command and means the internal battery voltage is 13.07 V<br><br>The reply to an incorrect password is: **DENIED** |
| ☞ NOTE | If the **#BM?IDNF psw*** is sent with the command **?TDS,** the expected response string is more than 160 characters allowed and the command returns the following message error: "CMS ERROR 305 Invalid text mode parameter. | |
| **?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***<br>Response: **LFA=0.46**<br>It means 0,46 V/m is the mean value for last rate interval. |

| Command | Description | Example |
|---------|-------------|---------|
| **?MDM** | Request Modem status<br>The response in the format **#SM MDM=x\***,<br>Where <x> can be either:<br><br>- **0**: modem OFF<br>- **1:** modem in activation process<br>- **5:** modem 2G is actived (may not be connected to the network but it works and ready to receive commands)<br>- **6:** modem 3G/4G is actived (may not be connected to the network but it works and ready to receive commands) | Example **#SM ?MDM\***<br><br>Response:<br>**#SM MDM=0\***<br><br>Another response:<br>**#SM MDM=6\*** |
| **?MSK** | **Alarm mask** query command.<br>The answer displays a string containing the alarm setting mask and selected method of notification in the following format:<br>**MSK=AWLVPTCawlvp MODEM SMS**<br>Each character represent an enabled alarm. Type of alarm as described below in the **?STA** command explanation.<br>The character "**-** " shows an alarm **not** enabled.<br>When MODEM is displayed, any alarm is notified by a call to the controller PC.<br>When SMS is displayed, any alarm is notified by SMS to mobile phone. | Example1: **#SM?MSK\***<br>Response: **MSK=A-L---------**<br>Description: alarms enabled are: (field) Alarm OUT, Case Open OUT. Even if activated, alarms will not be notified.<br><br>Example2: **#SM?MSK\***<br>Response: **MSK=AW-----aw--- MODEM**<br>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).<br><br>Example3: **#SM?MSK\***<br>Response: **MSK=---V-T----v- SMS**<br>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).<br><br>Example4: **#SM?MSK\***<br>Response: **MSK=AWLVPTCawlvp MODEM SMS**<br>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.<br>The answer displays the antenna model, last calibration date, unit, divisor, level range and frequency range. | Example: **#SM?PRB\***<br>Response:<br>**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 **I**= 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*** |
| ☞NOTE | If the **?TDS** is sent with the command **#BM?IDNF psw*,** the expected response string is more than 160 characters allowed and the command returns the following message error: "CMS ERROR 305 Invalid text mode parameter | |
| **?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.<br>It returns the internal temperature in °C and the RH % in the format:<br>TMP=TT,RH. | Example: **#SM?TMP***<br>Response: **TMP=39.08,30.4**<br>Which means that the internal Temperature is 39.08°C and the RH is 30.4% |
| **?TSE** | **Ethernet** programming time setting query command.<br>Answer returns information (as set by the STSE command) with the following format:<br>**TSE=ON\|OFF HH:mm each XXh**<br>HH:mm is the time when the LAN port switches on<br>XXh is the repetition interval in hours | Example: **#SM?TSE***<br>Response:<br>**TSE=OFF 00:00 each 00h**<br>It means that the LAN port is set to be always OFF. |
| **?TSM** | **Modem** programming time setting query command.<br>Answer returns information (as set by the STSM command) with the following format:<br>**TSM=ON\|OFF\|NET HH:mm ( Xq) each YYh (DIS)**<br>Where:<br>**HH:mm** is the time when the Modem switches on<br>**(Xq)** is the stand-by time, in quarters of hour (maximum 24, that is to say 6 hours)<br>**YYh** is the repetition interval in hours<br>**(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***<br>Response:<br>**TSM=NET 12:15 ( 4q) each 01h**<br>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)**<br><br>**HH:mm** is the time when the Modem switches on<br>**(Xq)** is the stand-by time, in quarters of hour (maximum 24, that is to say 6 hours)<br>**YYh** is the repetition interval in hours<br>**(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***<br>Response:<br>**TSS=ON 17:26 ( 1q) each 24h**<br>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***<br>Response: **WRN=4.00 V/m;6** |

**5.4 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.<br>The parameter xx.x is the threshold value in the format:<br>**#SMSALR xx.x***<br>(same response as **?ALR** command) | Example: **#SMSALR6.0***<br>Response: **ALR= 6.00 V/m; 6** |
| **SAQ_**<br><br>Alias command:<br>**SAQP** | Acquisition mode setting command.<br>The syntax is:<br>**#SMSAQ_LTR***<br>where:<br>**L** is an index to indicate the storing rate<br>1 for 1 min<br>2 for 2 min<br>3 for 6 min<br>4 for 15 min<br>**T** must be "0" (reserved)<br>**R** indicates the averaging mode which can be A for AVG and R for RMS.<br>The reply is the same to ?AQ_ command. | Example: **#SMSAQ_10R***<br>Response: **AQ_=10R**<br><br>It means that the Stations is storing a measurement every 1 minute, and the mean calculation is RMS.<br><br>The alias command can be used in the same way.<br><br>Example: **#SMSAQP40A***<br>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***<br>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***<br>Response is always: **ATH=OK** |
| **SAVGx** | Mean Time for Alarm and Warning threshold setting.<br>The parameter **x** is in minutes.<br>(same response as **?ALR** command) | Example: **#SMSAVG6***<br>Response: **ALR=  6.0; 6** |

| Command | Description | Example |
|---|---|---|
| **SBND n, start,stop** | Specified band frequency setting<br>Format: SBND n,start,stop<br>Where:<br>n is the band index, between 1 and 20<br>Start and Stop are the corresponding frequencies, expressed in MHz.<br>It is mandatory that Start is lower than Stop.<br>It is not recommended to set a Start frequency lower than another one before, in order not to waste time.<br>Set Start = 0 to cancel a band<br>The reply is:<br>BND=OK if command granted<br>BND=ERR when there are errors and the command is rejected<br>BND=VOID when the band has been deleted. | Example: **#SMSBND 1,21,80***<br>Response: **BND=OK**<br><br>The first band (#1) is set starting at 21 MHz and ending at 80 MHz |
| **SCLD** | Clock date setting.<br>Format: **SCLD DD.MM.YY**<br>The response is the same as in the ?CLK command. | Example: **#SMSCLD 12.08.15***<br>Response:**CLK=11.55.57;12.08.15** |
| **SCLT** | Clock time setting.<br>Format: **SCLT HH.MM.SS**<br>The response is the same as in the ?CLK command.<br><br>☞ **NOTE**<br>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***<br>Response:**CLK=12.13.40;12.08.15** |
| **SCNL** | This command enable a deferred call to the number **nnnnnnnn**<br>The call is initiated **d** minutes later.<br>The format is:<br> **#SMSCNL d nnnnnnnn ***<br>where **d** is in minutes between 1 and 9 and **nnnnnnnn** is the remote phone number to be called. | Example: **#SMSCNL 5 5550101***<br>Response: **CNL=5550101**<br>The station will call that phone number after 5 minutes. |
| **SDIC** | This command disables the station's outgoing calls.<br>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.<br>(same response as **?TSM** command). | Example: **#SMSDIC***<br>Response:<br>**TSM=OFF 14:53 ( 1q) each 24h**<br>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.<br>If disabled, the LAN port stays permanently off independently from the time schedule set via the STSE command.<br>(same response as **?TSE** command). | Example: **#SMSDIE***<br>Response:<br>**TSE=OFF 12:00 each 24h**<br>confirming the LAN port is disabled (**OFF**). |
| **SDIG** | This command disables the GPS module.<br>If disabled, the GPS stays permanently off to save energy.<br>(same response as **?TSG** command). | Example: **#SMSDIG***<br>Response:<br>**TSG=OFF 12:00 each 24h**<br>confirming the GPS is disabled (**OFF**). |
| **SDIR** | SMS Report send disabling.<br>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.<br>(same response as **?TSS** command). | Example: **#SMSDIR***<br>Response:<br>**TSS=OFF 16:15 ( 2q) each 24h**<br>Confirm the station is disabled to send SMS report. The "schedule for SMS" is showed too. |
| **SDMO** | Modem disabling command.<br>This is accepted only in case of Battery Alarm (low voltage).<br>When disabled the GSM modem will power off, until the battery alarm ends.<br>(same response as ?TSM command). | Example: **#SMSDMO***<br>Response:<br>**TSM=16:15 ( 1q) each 24h**<br>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.<br>The time of call shall be set with STSM command.<br>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.<br>Note that only call is enabled and not also the modem power on.<br>(same response as **?TSM** command). | Example: **#SMSENC***<br>Response:<br>**TSM=ON 14:53 ( 1q) each 24h**<br>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.<br>The time of call shall be set with STSE command.<br>The station power on the LAN port and it remains on for 10 minutes.<br>(same response as **?TSE** command). | Example: **#SMSENE***<br>Response:<br>**TSE=ON 12:00 each 24h**<br>Confirm the LAN port is enabled (**ON**) to be ready at the programmed time. |

| Command | Description | Example |
|---------|-------------|---------|
| **SENR** | SMS Report send enabling.<br>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.<br>Note that only message sending is enabled and not also the GSM power on.<br>(same response as **?TSS** command). | Example: **#SMSENR***<br>Response:<br>**TSS=ON 12:00 ( 2q) each 24h**<br>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.<br>It is recommended to switch the Ethernet port OFF as soon as it becomes no more necessary.<br>The reply is **ETH=OK** | Example: **#SMSETH***<br>Response: **ETH=OK**<br>confirming the command has been granted. |
| **SGCS** | Set internal clock updating mode:<br><br>Set the internal clock in manual mode sending **#SMSGCSM*** command; change time and date by SCLT and SCLD command.<br><br>Set the internal clock by GPS sending the **#SMSGCSAx*** command (x represents the time zone and the value must be between -12 and 12 hours).<br><br>The automatic internal clock updating depends on the GPS strength; in case of success all events available are updated with the string "Auto Set:*hh:mm:ss; dd/mm/hh*". | Example: **#SMSGCSM***<br>Response: **#SM OK***<br>confirming the command has been granted.<br><br>Example: **#SMSGCSA*2***<br>Response: **#SM OK***<br>confirming the command has been granted.<br>Otherwise with **#SM GCS ERROR*** and turns the internal clock in manual mode. |
| **SGOI** | This command enables immediately the GPS module.<br>It remains on until the first FIX or the timeout (4 minutes).<br>The reply is **GOI=OK**. | Example: **#SMSGOI***<br>Response:<br>**GOI=OK**<br>confirming the command has been granted. |

| Command | Description | Example |
|---------|-------------|---------|
| **SGOIF** | This command enables immediately the GPS module.<br>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).<br>The reply is **GOI Feedback=OK**. | Example: **#SMSGOIF***<br>Response:<br>**GOI Feedback=OK**<br>confirming the command has been granted. |
| **SHFTP** | Shows (**0**) or hide (**1**) the User, Password and IP Address (FTP mode) on the RS232 port sniffer.<br><br>**0:** User, Password e IP address are shown on RS232 sniffer.<br><br><br><br>**1**: User, Password e IP address are hidden on RS232 sniffer.<br><br><br><br>In FTP communication mode the command and feedback are replaced by "@@@". This status also affects ?GPR3, ?GPR4, ?GPR5, ?GPR7 and ?GPRA commands. | <br><br><br><br>Example: **#SMSHFTP0***<br>Response: **#SM OK***<br>confirming the command has been granted.<br><br><br>Example: **#SMSHFTP1***<br>Response: **#SM OK***<br>confirming the command has been granted. |
| **SIDN** | Station identifier setting.<br>Max 20 characters.<br>The response is the same as for the ?IDN command.<br>The command format is:<br>**#SMSIDN Station Name***<br><br>👉 **NOTE**<br><br>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***<br>Response:<br>**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.<br>The mask contains mnemonic symbols representing each alarm as in the following table. Symbols can be in each order.<br>**W**= (field)Warning threshold exceeded<br>**A**= (field)Alarm threshold exceeded<br>**w**= (field)Warning threshold re-entered<br>**a**= (field)Alarm threshold re-entered<br>**P**= Device section alarm<br>**p**= Device section alarm re-entered<br>**V**= Low battery alarm<br>**v**= Low battery alarm re-entered<br>**L**= Case open alarm<br>**I**= Case open alarm re-entered<br>**T**= Overtemperature alarm<br>**C**= Relative Humidity alarm<br><br>**S=** notify alarm through **SMS,** enable<br>**M=** notify alarm through **MODEM,** enable<br><br>(same response as ?MSK command) | Example:<br>**#SMSMSK AL S*** enables field and case open alarms to be notified by SMS.<br><br>Response:<br>**MSK= A-L--------- SMS**<br><br><br><br>**To get a notification of the alarm, also Modem or SMS should be enabled.** |
| **SPSW** | New Password setting.<br>Format: **SPSW password**<br>Where password is the alphanumeric string that will be stored and used as password by the Station.<br>At least one blank space is required between the command and the password.<br><br>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***<br>Response: **PSW0=PASSPMM** |
| **SRST** | Reset to default configuration.<br>The command restores the main parameters as following:<br>- Alarms are all masked<br>- Scheduled Modem calls disabled<br>- Scheduled SMS sending disabled<br>- Averaging period = 6 minutes<br>- Running average zeroed<br>- Averaging method = RMS<br>- Interval 1: Modem ON at 12:05 for 1 hour every 24 hours<br>- Interval 2: Modem ON at 16:00 for ½ hour every 24 hours<br>The reply is **RST=OK** | Example: **#SMSRST***<br>Response: **RST=OK**<br>confirming the command has been granted. |

| Command | Description | Example |
|---|---|---|
| **SRSTR** | Reset to both default configuration and storing rate.<br>Similar to SRST command, in addition to its default settings, resets also the storing rate to 6 minutes.<br>![WARNING hand symbol] **WARNING**<br>Pay attention this command invalidates any data already stored in the Station.<br>The reply is **RST RATE=OK** | Example: **#SMSRSTR***<br>Response: **RST RATE=OK**<br>confirming the command has been granted. |
| **STDM** | **Modem** phone number setting.<br>In the following format:<br>**#SMSTDMn xxxxxxxxxx***<br>where: **n** is the list # between 0 and 9,<br>**xxxxxxxxxx** is the phone #.<br>To replace simply rewrite the number, to cancel write down **00000**.<br>(same response as **?TDMn** command). | Example: **#SMSTDM2 987654321***<br>Response: **TDM2=987654321** |
| **STDS** | **SMS** phone number setting.<br>In the following format:<br>**#SMSTDSn xxxxxxxxxx***<br>where: **n** is the list # between 0 and 9,<br>**xxxxxxxxxx** is the phone #.<br>To replace simply rewrite the number, to cancel write down **00000**.<br>(same response as **?TDSn** command). | Example: **#SMSTDS2 0000000***<br>Response:**TDS2=VOID*** |
| **STSE** | **Ethernet** programmed time setting.<br>In the following format:<br>**#SMSTSE HH.mm.xx.ee***<br>where: **HH.mm** is the Ethernet port power on time.<br>**xx** on time period (must be 01 fixed, which means 10 minutes).<br>To save energy it is recommended to switch the LAN port off as soon as it is not needed anymore, via the SETH command.<br>**ee** repetition interval in hours (the value can be 12 or 24). | Example: **#SMSTSE 12.10.01.24***<br>Response:<br>**TSE=ON 12:10 each 24h**<br>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.<br>In the following format:<br>**#SMSTSM HH.mm.xx.ee***<br>where: **HH.mm** is the MODEM power on time (switched on and in Stand-By).<br>**xx** on time period in quarters of hour (max 24).<br>**ee** repetition interval in hours.<br><br>xx and ee must always be 2 numerals without spaces, and submultiples of 24.<br>(same response as **?TSM** command). | Example: **#SMSTSM 14.53.01.24***<br>Response:<br>**TSM=OFF 14:53 ( 1q) each 24h**<br>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.<br>In the following format:<br>**#SM STSS HH.mm.xx.ee***<br>where: **HH.mm** is the MODEM power on time (switched on and in Stand-By).<br>**xx** on time period in hours.<br>**ee** repetition time in hours.<br><br>xx and ee must always be 2 numerals without spaces, and submultiples of 24.<br>(same response as **?TSS** command). | Example: **#SMSTSS 12.00.02.24***<br>Response:<br>**TSS=OFF 12:00 ( 4q) each 24h***<br>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.<br>The parameter xx.x is the threshold value in the format:<br>**#SMSWRN 4.0***<br>(same response as **?WRN** command) | Example: **#SMSWRN4.0***<br>Response: **WRN= 4.0 V/m; 6** |

**5.5 FTP-GPRS COMMANDs**

These commands are used by the user to establish a connection with an Access Point or FTP server, to enable the Modem or Point-to-point 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.

NOTE

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

| GPRS Connection Data | | |
|---|---|---|
| **Field** | **Description** | **Setting command** Command to be issued by either SMS or RS232,USB,Ethernet |
| 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,USB,Ethernet |
| 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**<br>Command to be issued<br>by either SMS or<br>RS232,USB,Ethernet |
| **CGN**<br>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* |
| **CGNA**<br>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* |
| **CGNFW**<br>Connect GPRS Now and update Firmware | This command starts a GPRS connection immediately as for CGN. Additionally, if the two firmware files are found, it updates the firmware and reboots. | #SMSCGNFW* |
| **CGNFWI**<br>Connect GPRS Now and Immediately update Firmware | This command starts a GPRS connection immediately as for CGN. Additionally, if the two firmware files are found, it updates the firmware and reboots without uploading any records.<br>The difference from CGNFW is that it does not upload the data before updating the FW thus all unloaded records are lost. | #SMSCGNFWI* |
| **CGNL**<br>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* |
| **NETD**<br>Disable GPRS protocol | This command disables the AMS-8061 GPRS and enables point-to-point GSM-MODEM connection.<br>The reply is the same as for command ?TSM | #SMSNETD* |
| **NETE**<br>Enable GPRS protocol | This command enables the AMS-8061 to connect via GPRS instead of point-to-point GSM-MODEM connection.<br>The reply is the same as for command ?TSM | #SMSNETE* |
| **STS id**<br>Set Timedate SMS | This command sets the internal real clock time by using the SMS provider's information.<br>To use it **id** (the AMS-8061 telephone number) must be sent.<br>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*<br>where nnnnnnnn is the telephone number of AMS-8061 |

**5.6 FTP on Area Monitor System AMS-8061**

These commands are used to make settings on the monitoring station so that the unit can respond with an SMS message containing the corresponding information or confirmation.

The setting commands are characterized by the presence of the character **S** in the string.

**5.6.1 Fundamentals**

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.

**5.6.2 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

**NOTE**

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

### 5.6.3 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.

**NOTE**

**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<br><br>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.<br>0x0001-> MAX threshold Field OUT.<br>0x0002-> Warning threshold Field OUT.<br>0x0010-> LOCK OUT.<br>0x0080-> Low Battery Voltage OUT<br>0x0004-> Antenna OUT<br>0x0020-> Temperature<br>0x0040-> Relative Humidity<br>0x0008-> MAX threshold Field IN.<br>0x0100-> Warning threshold Field IN.<br>0x0400-> LOCK IN.<br>0x0800-> Low Battery Voltage IN<br>0x0200-> Antenna 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<br>"1" ->1 minute<br>"2" ->2 minutes<br>"3" ->6 minutes<br>"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.<br>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.<br>If bit 0x01 is '1' and one or more unmasked alarm is set, a GPRS connection is done as it was for schedule.<br>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.<br>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.<br>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.<br>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.<br>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<br>When "Ethernet Schedule Active" = 0x02 the Ethernet activity is regulated by "Ethernet Sched".<br>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 |

**NOTE**

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

### 5.6.4 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.

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 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.

### 5.6.5 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 §3.11 "D61 Structure, Download description". Please refer to it for the correct interpretation of data.

### 5.6.6 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.

### 5.6.7 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).

**5.6.8 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.

☞NOTE

**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<br><br>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.<br>0x0001-> MAX threshold Field OUT.<br>0x0002-> Warning threshold Field OUT.<br>0x0010-> LOCK OUT.<br>0x0080-> Low Battery Voltage OUT<br>0x0004-> Antenna OUT<br>0x0020-> Temperature<br>0x0040-> Relative Humidity<br>0x0008-> MAX threshold Field IN.<br>0x0100-> Warning threshold Field IN.<br>0x0400-> LOCK IN.<br>0x0800-> Low Battery Voltage IN<br>0x0200-> Antenna 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<br>"1" ->1 minute<br>"2" ->2 minutes<br>"3" ->6 minutes<br>"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.<br>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<br><br>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.<br>0x0001-> MAX threshold Field OUT.<br>0x0002-> Warning threshold Field OUT.<br>0x0010-> LOCK OUT.<br>0x0080-> Low Battery Voltage OUT<br>0x0004-> Antenna OUT<br>0x0020-> Temperature<br>0x0040-> RH<br>0x0008-> MAX threshold Field IN.<br>0x0100-> Warning threshold Field IN.<br>0x0400-> LOCK IN.<br>0x0800-> Low Battery Voltage IN<br>0x0200-> Antenna 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 |

### 5.6.9 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).

**5.7 D61 Structure, Download description**

This paragraph describes the structure of a multiband record.

These records are created by either FTP enabled (files D61) or "?FLS" command.

### 5.7.1 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.<br><br>For example, the command **#SM ?FLS 13:00,01/08;60\*** asks for 60 measures starting from 13:00 of the 1st of August<br>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.

**5.7.2 FTP Mode**

At FTP schedule a file named HH_mm_dd_MM_yy_.D61 is created (see §5.6 FTP on Area Monitor System AMS-8061).
This file contains ( **32** + 16\* Number of Bands ) \* **n** bytes (where n is the number of requested records).

NOTE

**All figures in this document are LITTLE ENDIAN**

**5.7.3 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<br>Byte 17 | minute<br>Byte 18 | Byte 19 | Byte 20 | degree<br>Byte 21 | minute<br>Byte 22 | Byte 23 | Byte 24 |

| NOB | Reserved | | | | | | |
|---|---|---|---|---|---|---|---|
| Byte 25 | Byte 26<br>SelRate | Byte 27<br>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.

NOTE    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 <u>little</u>-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

### 5.7.4 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 <u>little</u>-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 <u>little</u>-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**]

### 5.7.5 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<br>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<br>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<br>+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 FTP enabled, through the file 8061FLD.TXT (see §5.6 FTP on Area Monitor System AMS-8061).

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.

FTP mode (8061FLD.TXT file).

At modem schedule a file named HH_mm_dd_MM_yy_.D61 is created (see §5.6 FTP on Area Monitor System AMS-8061).

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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# 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.

**NOTICE**

**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**



**Fig. 6-1** AMS-8061 Field Monitoring System

## 6.2 AMS-8061

| Wind speed [km/h] | Wind speed [m/s] | Aerodynamic form | Air density [N/mc] | Wind pressure [N/m²] | 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 | |

Table 6-1 Wind resistance of the AMS-8061

**6-2**     **Action of the wind on the AMS-8061**

**WEIGHT BALLAST VARIATION IN COMPARISON TO THE WIND SPEED**

Weight Ballast [N]



**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** |

**NOTICE**

It is necessary to calculate the speed and pressure of the wind in the place of installation; through the table 7-1 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.
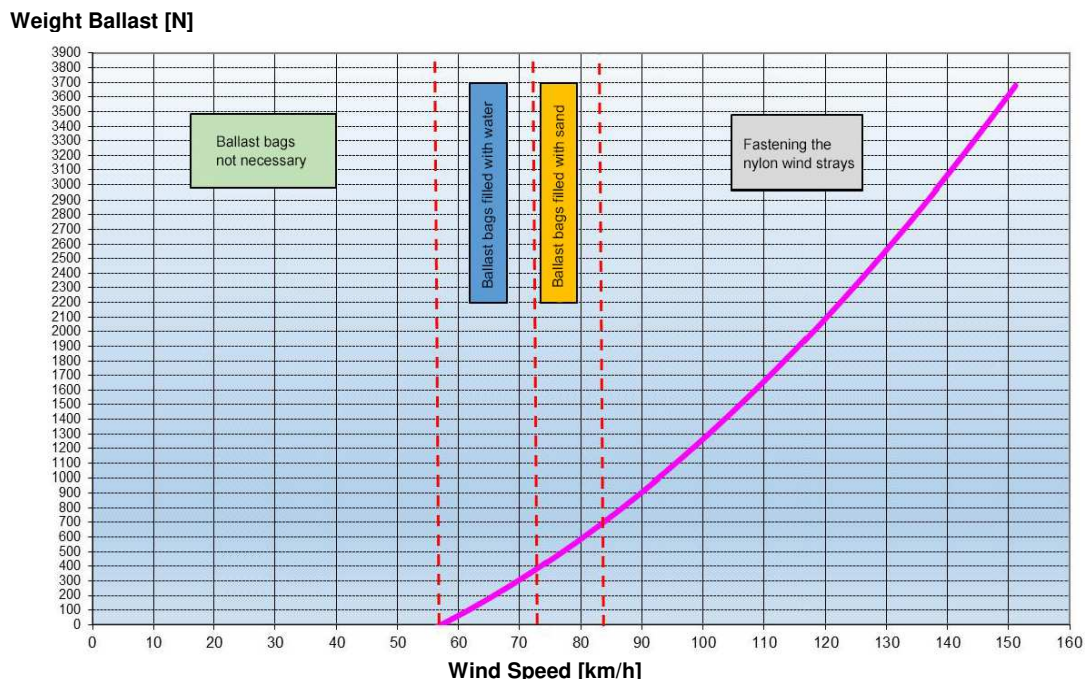
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# 7 – Service & Troubleshooting & F.A.Q.

## Service

**7.1 Service**

**Air Filters replacement**

The two filters have a crucial role in the efficiency and performance of your AMS-8061 system. The filters (the receiver filter is housed on the bottom of the unit self) provide protection from dust and dirt and prevent damage to the unit and its components; when filters become dirty, your receiver unit may experience reduced airflow and increased significantly its internal temperature. Clean air filters can preserve the AMS-8061 from damage and potentially expensive repairs; to protect the unit, new filters are essential.
The replacement interval for both filters depends on the cleanliness of the operating environment.

Item includes (refer to Fig.7-1 on page 7-2):
1) Button head cap M5 screw (3 pcs.)
2) Plastic washer Ø5mm (3 pcs.)
3) Radome
4) Baseplate
5) Power supply connector
6) Antenna
7) Pan head M5 screw (4 pcs.)
8) Tooth washer Ø5mm (4 pcs.)
9) Receiver unit
10) Receiver filter
11) Plastic receiver filter grid
12) Pan head M3 screw (2 pcs.)
13) Tooth washer Ø3mm (2 pcs.)
14) Shield filter
15) Plastic baseplate filter grid
16) Baseplate filter

This section performs your filters replacements and keep your AMS-8061 working optimally:

1 – 2 – 3 - 4) Unscrew the screws from the receiver baseplate and **remove along its axis the protective case; to avoid damage the interlock do not turn the radome of the monitoring station when opening.**

5) Unplug the power supply connector from the receiver unit holding by the plastic part.

6) Carefully disconnect the antenna output to the receiver RF input and unplug the antenna data connector.

7 – 8 - 9) To remove the receiver unit, unscrew the Pan head screw housed on the bottom of the baseplate.

10 – 11) Remove filter and plastic grid from the receiver unit; clean the air filter housing before replacing the filter with a new one.

12 – 13 - 14) To remove the shield filter from the baseplate, unscrew the Pan head screw housed on the top of the shield self.

15 – 16) Remove plastic grid and filter from the shield; clean the air filter housing before replacing the filter with a new one.

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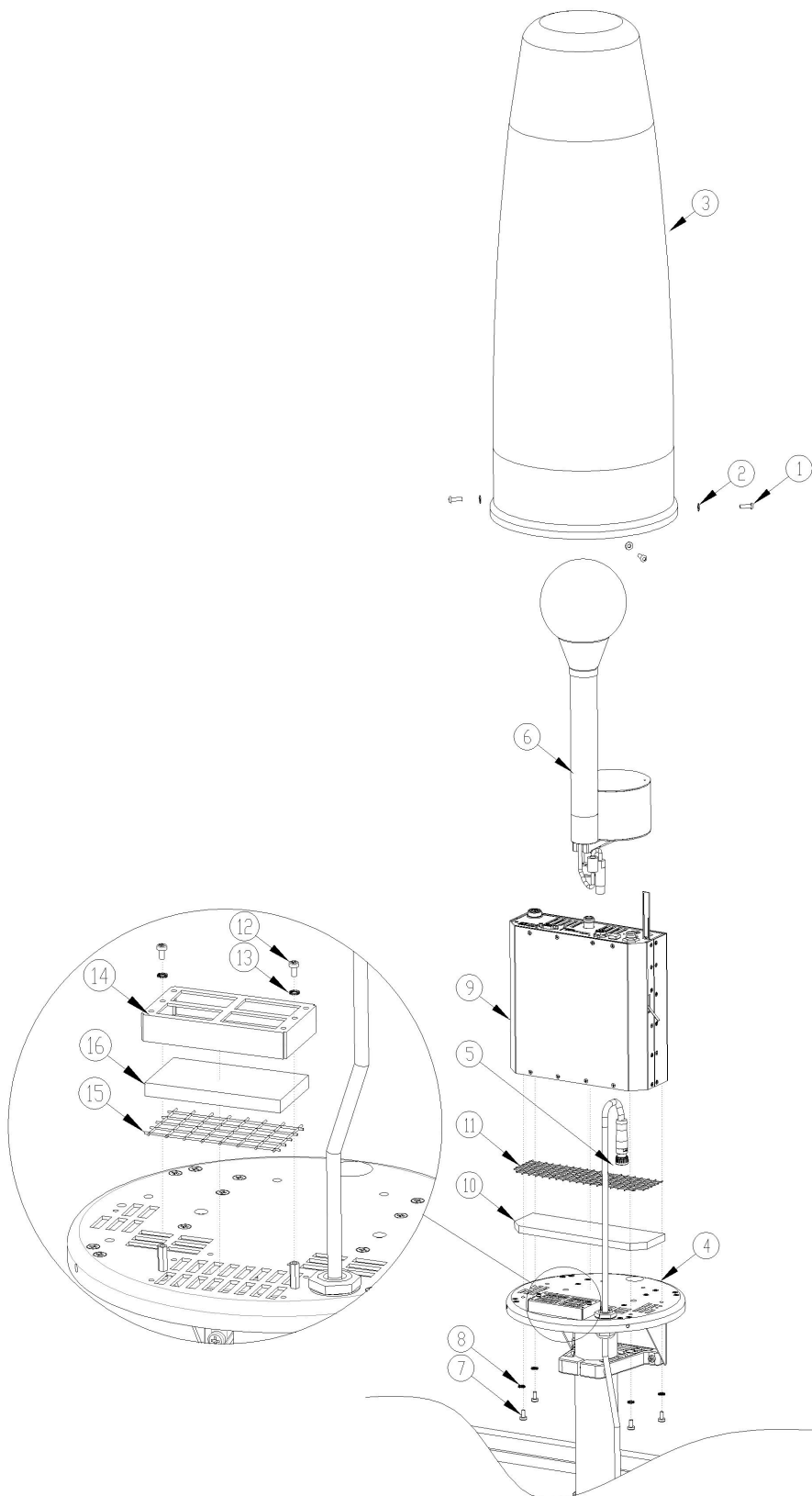


**Fig. 7-1** Air filters replacement

# Troubleshooting

**7.2 Troubleshooting**

**CSD communication problem.**

- Verify that the SIM card is enabled for M2M communication (Machine to Machine)

- Verify that the SIM card has the PIN code disabled

- In case there is a modem connected to the PC, verify that it is set with a baud rate of 115200, to do this , use a software like hyper terminal, connect it to the modem and send the command:
AT+IPR?
The answer must be 115200, in case of a different answer, set the software hyper terminal on another baud rate, probably 9600, send the command
AT+IPR=115200
Then set again Hyper Terminal on a baud rate of 115200 and send the command
AT&W to save new settings

- In case there is a modem 3G/4G GSM connected to the computer, verify that the communication is set on 2G, to do this, use a software like hyper terminal, connect it to the modem and send the command:
AT+WS46?
The answer must be 12, in case of a different answer, send the command
AT+WS46=12 to set the modem only on the 2G network
and the digit
AT&W to save new settings

- Remember that when the area monitor is switched on, the modem will remain ON for 60 minutes.
After this period there is a forced shutdown.
From this moment the area monitor will switch ON and OFF the modem according to its programming settings.
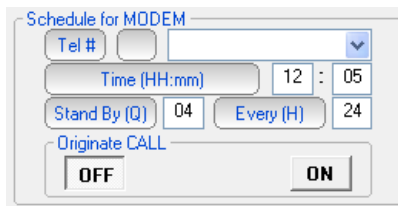
However, this situation may exist:
The area monitor is switched ON and its programming starts within 60 minutes before the forced shutdown. In this case, the modem will be switch OFF in any case and will switch back ON at the next programming cycle.

Take this example:
In this case the control unit remains ON for 1 hour (4 quarters of an hour) every 24 hours starting at 12:05 every day



The area monitor is switched ON at 11:30.
In this case, at exactly 12:30, the control unit modem will be forced to shut down.
If you try to contact her at 13:00 you would not be able to, because the area monitor has turned OFF the modem (60 minutes have passed since it was switched on) and will turn it back ON only the following day at 12:05, and then perform the same operation every day.
Instead, if the same unit had been turned ON at 10:50 there would be no problems. Because the forced shutdown would occur at 11:50 and the next programming cycle requires that it be turned back on at 12:05. Then contacting her from 12:05 to 13:05, even the same day, you would find the modem ON and ready for communication.
All this is correct if the control unit is not faulty, there is a good GSM coverage, the SIM you are using is enabled to send and receive DATA and you do not have any PIN enabled.

**Check the station operation.**

Windows HyperTerminal (or similar programs like Putty or TeraTerm) and a serial port monitor could be useful tools to check the station operation when connected to the controller PC through any wired connection (RS232, USB Ethernet cable).
You can also check attempts of the station to connect to the GPRS network and its operation.
Any terminal and Serial Port Monitor show activity of the station being it connected to the PC RS232 or USB port.

To allow communication between the Hyper Terminal software and the area monitor, its has to be set with following configuration:
Baud-rate: 115200
Data: 8 bit
Parity: None
Stop: 1 bit
Flow control: None

In this way it is possible to send all commands described in the user's manual chapter 5 and also verify the answer from the monitor station.

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.**

**What happen when I do not use the option "Run Administration"**

The User might have the need of administrator privileges to install and use the software 8061SW-02.
From last Windows versions (after XP) every software must be installed with the option "Run as Administrator". Also to be used, you have always to choose the option "Run as Administrator". This is a security control introduced in Windows.
When you do not use this option, all program files are created in a parallel folder.

So with the option "Run as Administrator" the program folder used has the following path:
C:\Program Files (x86)\(folder program)

Without this option the folder used is:
C:\Users\(nome utente)\AppData\Local\VirtualStore\Program Files (x86)\(folder program)
In addition, on some computer, the folder AppData is not visible, it is hidden.

Without the correct installation and use the program could not find some important file and have some problems during the normal utilization

For installing and running the software with administration privileges see paragraph 3.3 .

**When I open the software, some sections are not active.**

- Verify to have pushed the button Enable setting.

- Verify the area monitor is correctly set to work in Point to Point mode or in FTP mode. The choice of one mode can exclude some parts of the software when used in the other mode.

Example:
When the AMS-8061 is set to work in FTP mode and you use the software in Point to Point mode, via cable, the section "Schedule for modem" is not active.

**The software is not able to have a connection with the FTP server.**

- Verify to have put correct IP address, user name and password for the FTP connection.

- Try to enter in the FTP server with a browser (Mozilla, Safari, Internet Explorer, etc.).

- Verify that a firewall, or an anti-virus, is not blocking the connection, try to temporarily disable them just to try once.

**Sometimes, when I download data, I receive the window message: "Non homogeneous data file".**
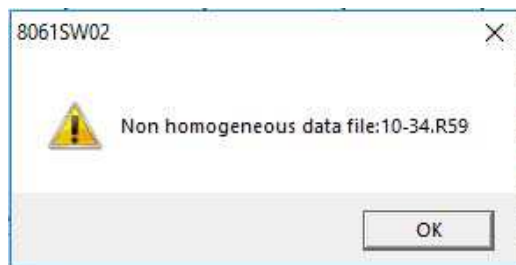


This happens because one of the following settings have been changed:
- Storing rate
- Average type (AVG or RMS) and/or Averaging period
- Kind and number of bands
- Date and time of the monitoring station

The software 8059SW-02 is not able to manage, in the same day different settings. When, in the same day one of these parameters change we have a not homogeneous data in that specific day.
The software will show you only data before the settings change.
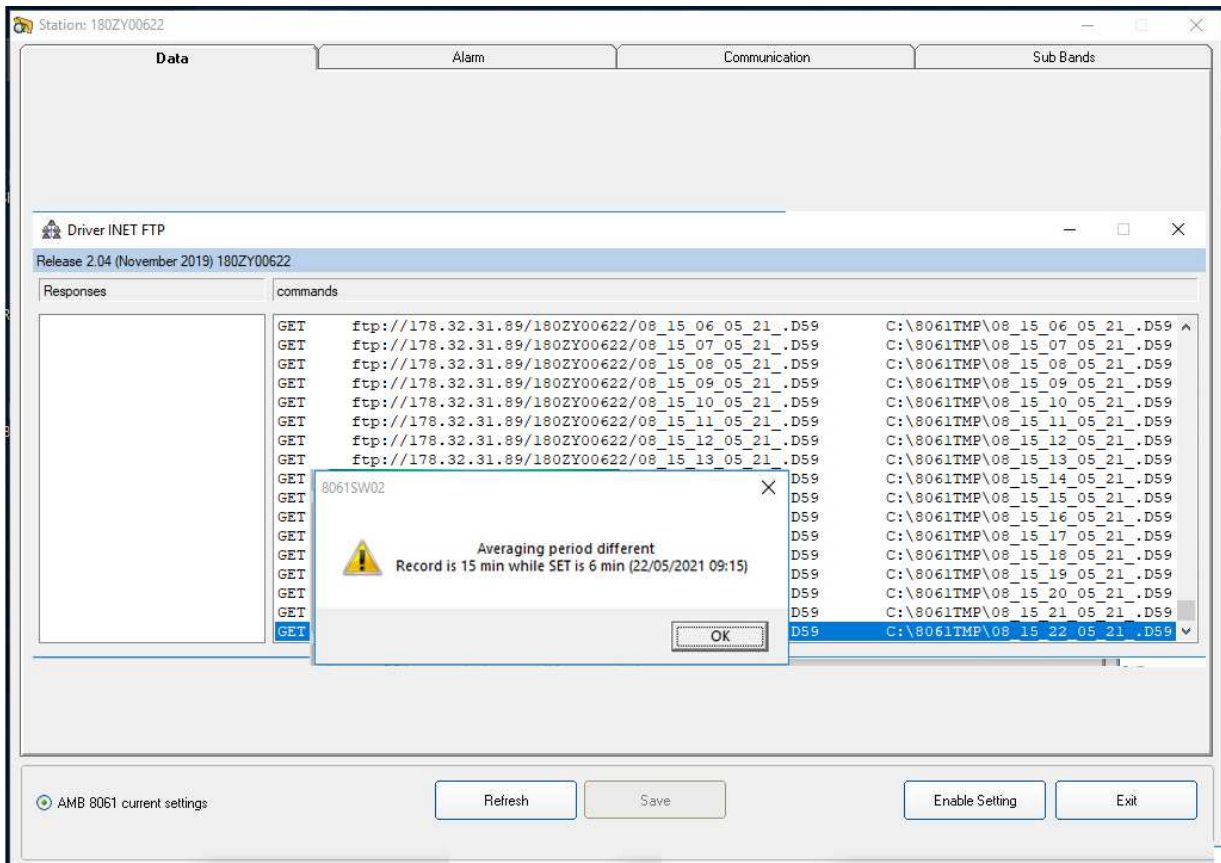Data will be correctly available only from the next day.
To avoid this it would be better download all possible data before any change.

To download the data acquired in the period of time between the settings change and the midnight of the same day, you must delete all data acquired on that day using the **Calendar tool** (see §3.10) and set the desired interval data on **Data section** (see §3.15).

**Sometimes, when I download data, I receive the window message: "Averaging period different".**

When the station download the data from the server and a change of averaging period was performed on the acquired data, it will be shown the following message.



In the above example, a new 6 minutes averaging period was set on the 22nd may 2021 at 9:15am.

The software is not able to manage, in the same day different averaging period. When, in the same day this parameter change we have a not homogeneous data in that specific day; the software will show you only data before the settings change.
Data will be correctly available only from the next day.

To download the data acquired in the period of time between the settings change and the midnight of the same day, you must delete all data acquired on that day using the **Calendar tool** (see §3.10) and set the desired interval data on **Data section** (see §3.15).
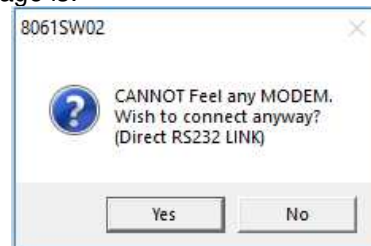
**8061SW-02 Examples of error and information messages**

Many phenomena can affect good communications between the modem of the monitoring station and the PC.
The selection of the port on which the modem is connected can generate a series of error messages.

The message in the status window is:

MODEM Failure

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:

> 8061SW02 ✕
>
> ❓ CANNOT Feel any MODEM.
> Wish to connect anyway?
> (Direct RS232 LINK)
>
> [ Yes ]    [ No ]

Connection Ok..Waiting for notification

The same message also appears when the User wish to make a local wired connection to the monitoring station.

Answering **YES**, the software tries to connect the station via serial RS232, USB, Ethernet port, and if there is no connection, the next message is:

> 8061SW02 ✕
>
> ❓ The station did not NOTIFY the LINK
> Try a connection Anyway?
>
> [ Yes ]    [ No ]

If the station does not answer because it is off or the batteries are completely down the message will be:

> 8061SW02 ✕
>
> ⚠ CANNOT feel AMS-8061 Monitor Station
>
> [ OK ]

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

> 8061SW02 ✕
>
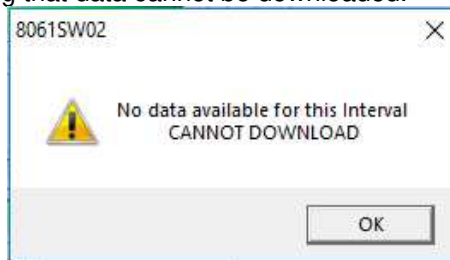> ⚠ CheckSUM ERROR received
>
> [ OK ]

The control of the checksum guarantees the quality of the data received. When this error occurs, sometimes the 8061SW-02 software closes the application and exits.
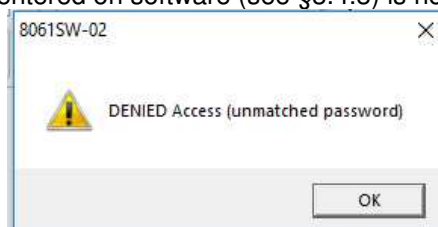
No answer from the monitoring station

8061SW02 ✕

⚠ AMS-8061 Monitor Station does not respond

OK
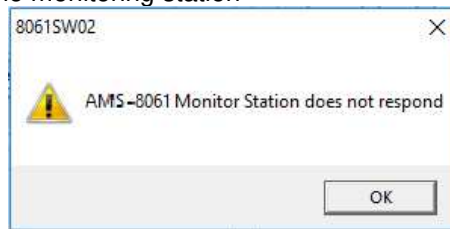
Message informing that data cannot be downloaded.

8061SW02 ✕

⚠ No data available for this Interval
CANNOT DOWNLOAD

OK

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

8061SW02 ✕

ⓘ Cannot download any station
Last Connection will be shown

OK
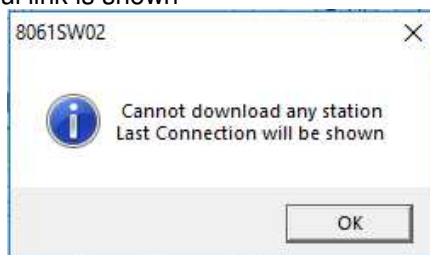
Device Password entered on software (see §3.4.3) is not correct:

8061SW-02 ✕

⚠ DENIED Access (unmatched password)

OK

Last Call did not manage to negotiate

If there are communications problems in Point to Point 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 or when the Telephone number of the SIM card entered on software is not correct or GSM signal is low.

#BM DENIED*

If the Device Password entered on software (see §3.4.3) does not match with the one memorized in the station, the message **#BM DENIED** appears in the Status frame of the main window.

NO ANSWER

If the Telephone number of the SIM card entered on software is not correct, the message **NO ANSWER** appears in Status frame of the main window

NO CARRIER

The message **NO CARRIER** appears in the Status frame of the main window:
- If the monitoring station is switched off
- if the signal is insufficient for a Point to Point call

If the 8061SW-02 software does not see any available port on the PC where it is installed, the following message appears:



See paragraph 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.

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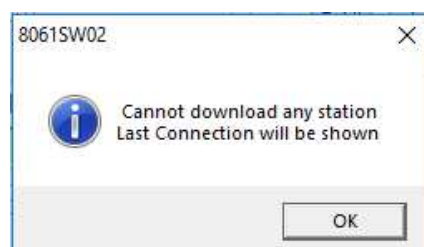


Answer **NO** and try to solve the problem checking the conditions of the cable and if it has been connected to the port used by the 8061SW-02 software.

If the answer is **YES**, the following message appears:



Confirm with **OK** and the following message appears



Confirm with **OK.** The software will show the existing communication at the time of the latest data download.

# F.A.Q.

**7.3 F.A.Q**     Some further questions and doubts may be raised during the Area Monitor operation.

**Where to place an area monitor?**
The placement of an area monitor is a compromise between a non-easy access site, to avoid possible vandalism, and a place that requires continuous monitoring.
Normally a roof, a very large terrace, an open place and on a straight surface, is the place that is most advisable.

**For example, in case of a hospital or a kindergarten, why not put the instrumentation where people are?**
As already explained, the instrumentation must be in a place not easy to access.
This is to avoid accidental damages from children's games such a balls or something else, possible signal influences caused by the passage of people with special equipment or who simply speak on the cell phone. Possibly avoid placing the control unit where it can be easily subjected to vandalism.
We also have to consider that signals we are going to monitor come from antennas, high voltage trellis, a technology that radiate even for miles. If the signal, we are detecting, on a roof is already low, it will be even more inside the building or at a distance greater than the emission point.
Instead, if the detected signal is near or exceeds the limits that is the area where we will have to investigate with more specific, selective equipment.

**Exactly, once on a roof or a terrace, where and how does the control unit be installed?**
First of all we must remember that the area monitor is powered by batteries that are recharged during the day thanks to its solar panel. Then the first thing to do is to choose a sunny place and point the solar panel in the SUD direction, if possible, or at least avoid positioning it completely toward NORTH.
Verify the presence of any objects or constructions around them does not create a shadow that will undermine the work of the solar panel.
Avoid places too close to large metal objects, or any objects that may interfere with the electromagnetic field, invalidating the measurement.
Where possible, it is good to install the area monitor at a certain distance from walls, palaces, pillars, high voltage trellis or other similar objects.

**What is the minimum distance I should keep from a wall or any other object?**

Much depends on the type of material it is made, its density, how the environmental factors affect it.

If we take the example of an area monitor mounted on a wall bracket, we must also consider how the latter will act on the signal that it is going to measure. If the wall was made of polystyrene, the control unit could also be attached to it, but in reality the density of the materials with which the wall is made, affects the signal.

It is also necessary to consider the atmospheric phenomena which, in conjunction with the structures around the control unit, can affect the signal.

During a rain, with the slightly wet wall, will the reflected signal be the same? And if instead of just being slightly wet it was completely covered with water? How does the refraction of the signal change?

It should be remembered that the area monitor measures a true value. If in a point the antenna marks 10 V/m, it is because in that precise point there are actually 10 V/m, which is the result of the sum of all vectorial components, so both the direct and the reflected signals.

**How do I know what is the most suitable point?**

Good sense says that at least 3 to 4 meters away help minimize possible perturbations of the signal that you go to measure.

The best approach would be to use a wide bandwidth meter and make pads in some parts of the area chosen for installation, trying to locate an area where the signal is more homogeneous.

You do not just have to consider radio frequency though. Area monitors are programmed to send data using a SIM card. So also the presence of the 3G/4G GSM signal is important. We recommend using a cell phone to evaluate the presence and quality of cell signal.

**When set the internal clock?**

Every time the Area monitor is switched OFF, and the battery pack disconnected from it, the internal clock has to be set.

It is always better prepare the first installation on site with the help of a laptop or a tablet to verify that internal clock has the right hour and date

**How can verify GSM signal quality in the place where the monitor is?**

CSQ command (Check Signal Quality) allows verifying the GSM signal quality in the place where the area monitor is. In addition to the possibility to send this command, with the syntax **#SM?CSQ\***, in the log file, every time the area monitor switch the modem ON, before than its switching OFF, a verification of the GSM covering, is done.
For very connection there will be a string like this:

17/05/18 15:06:36 +CSQ: 19,99

There is the date, hour, the command and a result expressed with 2 numeric values.
The first value, 19 in this example, corresponds to the signal quality value (RSSI) expressed in dBm.

| Values | dBm | Quality |
|---|---|---|
| from 2 to 9 | from -109 to -101 | Poor |
| from 10 to 14 | from -93 to -85 | Enough |
| from 15 to 19 | from -83 to -75 | Good |
| from 20 to 30 | from -73 to -53 | Excellent |
| 31 | -51 or higher | Excellent |

The second value, 99 in this example, is the bit rate error

| Values | Meaning |
|---|---|
| 0 | less than 0.1% |
| 1 | from 0.26% to 0.30% |
| 2 | from 0.51% to 0.64% |
| 3 | from 1.0% to 1.3% |
| 4 | from 1.9% to 2.7% |
| 5 | from 3.8% to 5.4% |
| 6 | from 7.6% to 11.0% |
| 7 | more than 15% |
| 99 | non detectable |

**How calculate the size of the data downloaded and the space occupied in the FTP server?**

The quantity of the data downloaded per day from the station depends mainly on the storing rate and, marginally, on the number of downloads. Even the number of the events (alarms, etc.) slightly effects the size of the data downloaded.

Supposing just a daily download and using EHA-2B-01 antenna the quantity of the data downloaded 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), 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.

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# 8 – Packaging Instructions

**8.1 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.

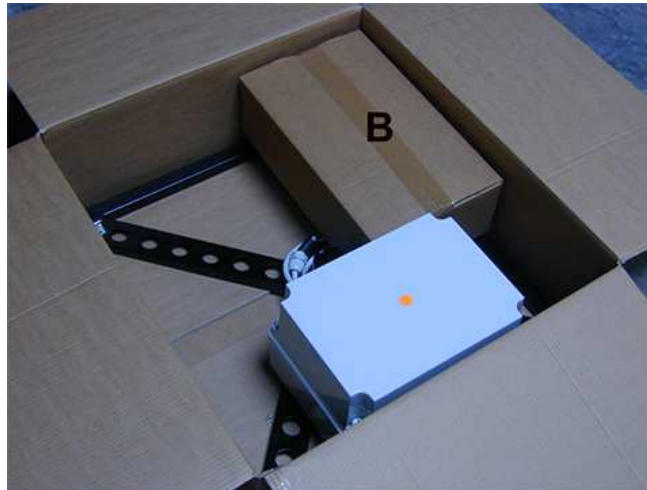**8.2 Packaging instructions**

Box **A** contains the solar panel.



Box **B** contains accessories

Box **C** inside view


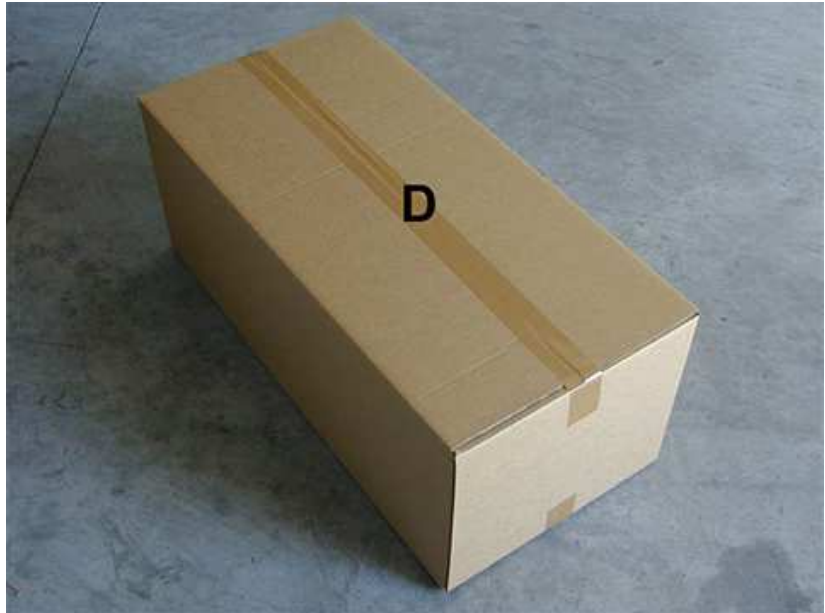
Box **C** contains power pack and **box B**



Box **F** contains the receiver unit

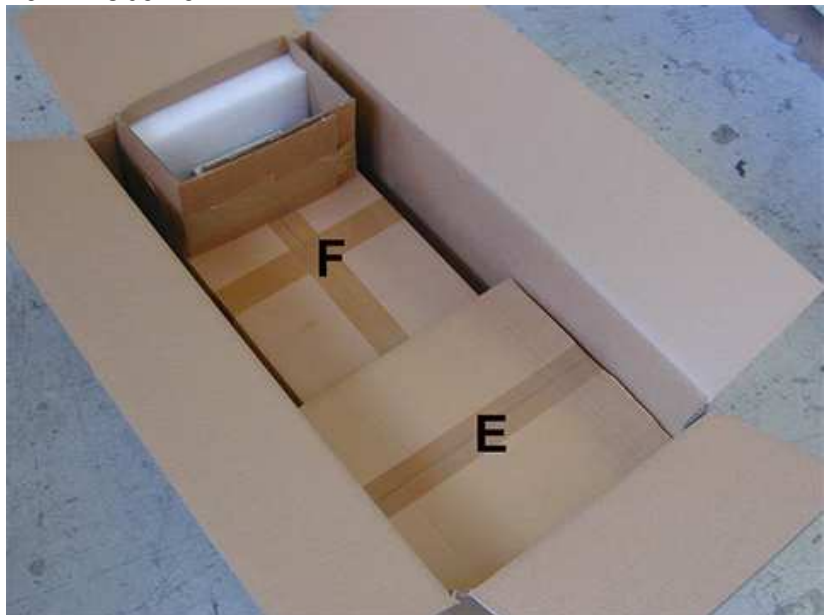Box **E** contains antenna



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**

**Packaging Instructions**

**Box H ( Main )**



**Use pallet and straps for the final packing.**

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**Caro cliente**

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

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

**Dear Customer**

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

Nevertheless, even this product will become obsolete. When that time comes, please remember that electronic equipment must be disposed of in accordance with local regulations. This product conforms to the WEEE Directive of the European Union

(2002/96/EC) and belongs to Category 9 (Monitoring and Control Instruments). You can return the instrument to us free of charge for proper environment friendly disposal. You can obtain further information from your local NARDA Sales Partner or by visiting our website at **www.narda-sts.it**.

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☑ **Servizio richiesto:** ☑ *Service needed*:

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

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**Ditta:**
*Company:*

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**Indirizzo:**
*Address:*

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**Persona da contattare:**      **Telefono:**
*Technical contact person:*      *Phone n.*

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**Modello:**      **Numero di serie:**
*Equipment model:*      *Serial n.*

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

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☑ *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:*

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*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:*

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**Suggerimenti / Commenti / Note:**
*Suggestions / Comments / Note:*