

# QUICK START INSTALLATION AND USE MANUAL

## ECHOS3 TELEMETRY

Edition 2  
Rev. 7 - 31/03/2009  
Cod. MAN0122



***EC Declaration of Conformity***  
According to Directive 1999/5/EC (R&TTE)



We: **ELENOS s.r.l.** - via G.Amendola, 9 - 44028 Poggio Renatico (FE) - Italy

Hereby declare that the product:

**ECHIOS 3**

Intended purpose: telemetry unit for broadcasting equipments  
Manufactured by: ELENOS s.r.l.

Complies with essential requirements of article 3 and other relevant provisions of the Directive 1999/5/EC, when used for its intended purpose.

Health and safety requirements pursuant to Article 3.1.a

Standards applied: EN60125

Protection requirements concerning electromagnetic compatibility pursuant to article 3.1.b

Standards applied: EN501489-1; EN501489-11

Measures for the efficient use of the radio frequency spectrum pursuant to article 3.2

Standards applied: EN302 018-2

Place and Date: Ferrara June 20, 2007

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## REVISION

|            |            |   |
|------------|------------|---|
| 14/11/2008 | Revision 6 | Updated digital output connection values<br>Updated digital input connection values<br>Inserted sms message list chapter  |
| 31/03/2009 | Revision 7 | Added dip switch configuration E2000DR<br>Added dip switch configuration E2000TR<br>Added dip switch configuration E5000C |

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# 1 TERM - COMMUNICATIONS SOFTWARE BETWEEN PC AND EQUIPMENT

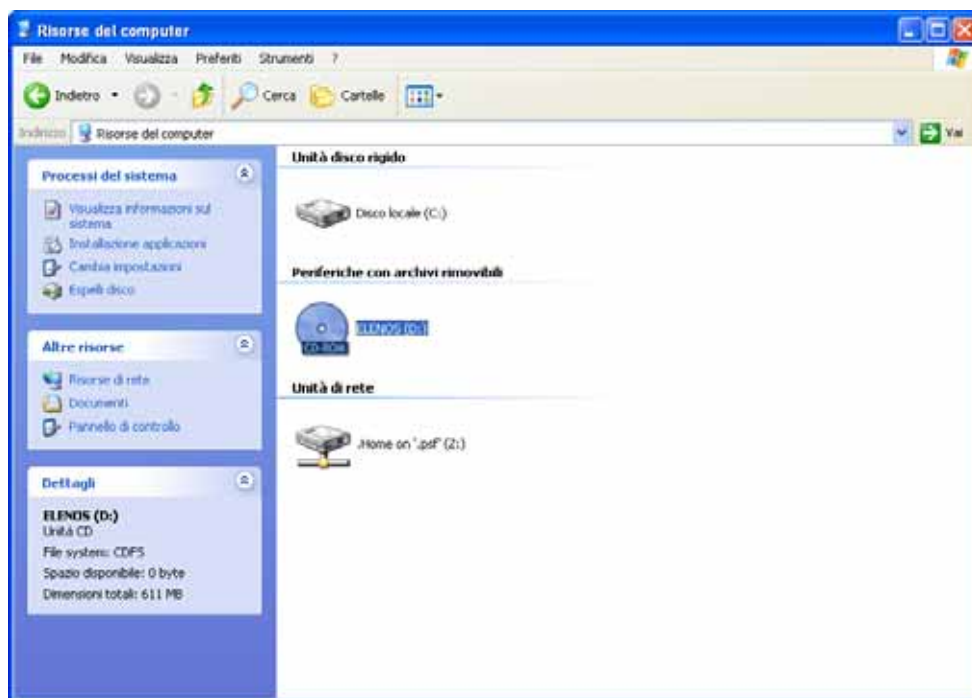
## 1.1 Description of TERM software

This software has been created to replace normal terminal programmes such as Hyperterminal. It offers the following improvements with respect to said normal terminal programmes:

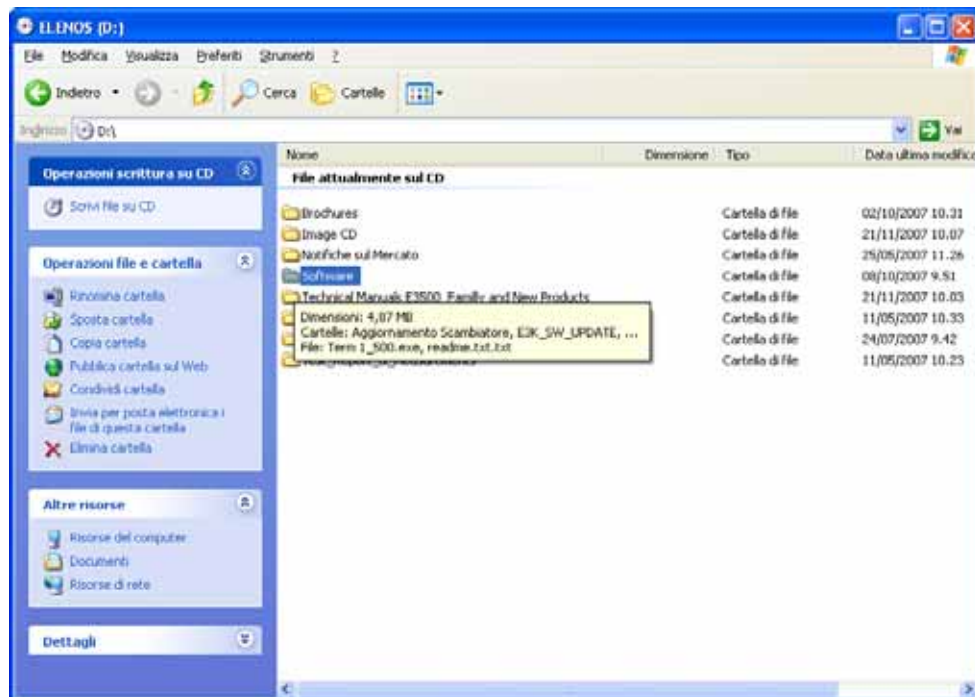
- Station management. A list of stations containing phone numbers and station configuration.
- Simply press the CALL key to select a station to connect to. The rest of the connection procedure shall be performed by the programme.
- Select the interrogation module using the keys or the list without having to type the address as with terminal programmes. This procedure is however also available.
- GSM management with the possibility of performing antenna pointing.
- Initialisation of GSM model to be entered in the Elenos equipment.

## 1.2 TERM Software Installation

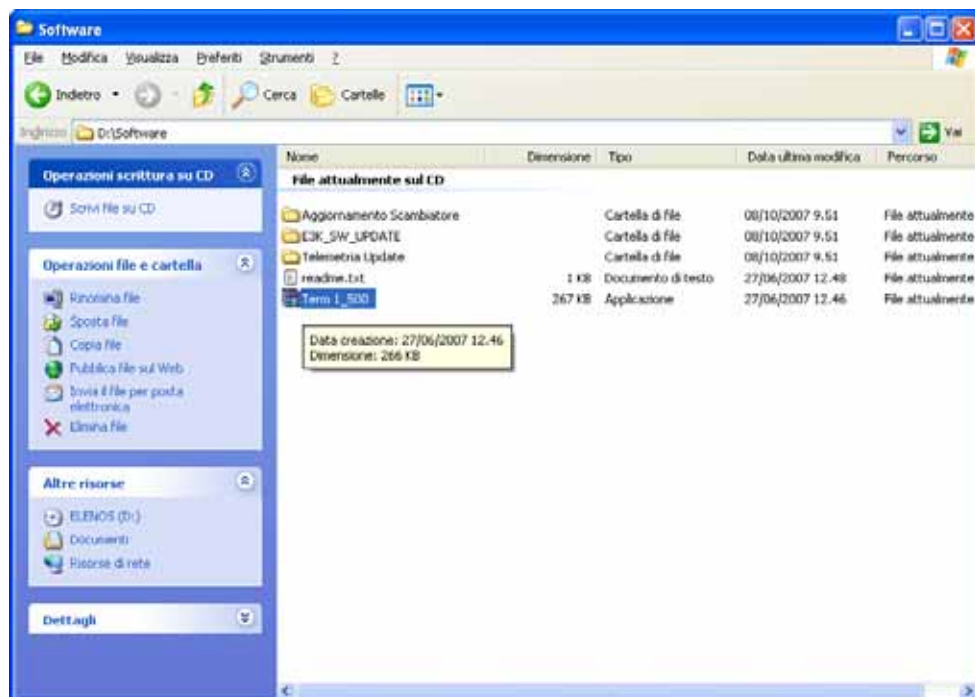
Enter the "ELENOS Technical Manuals And Catalogues" CD in the computer and click on the CD icon to open its folder



Open the "Software" folder

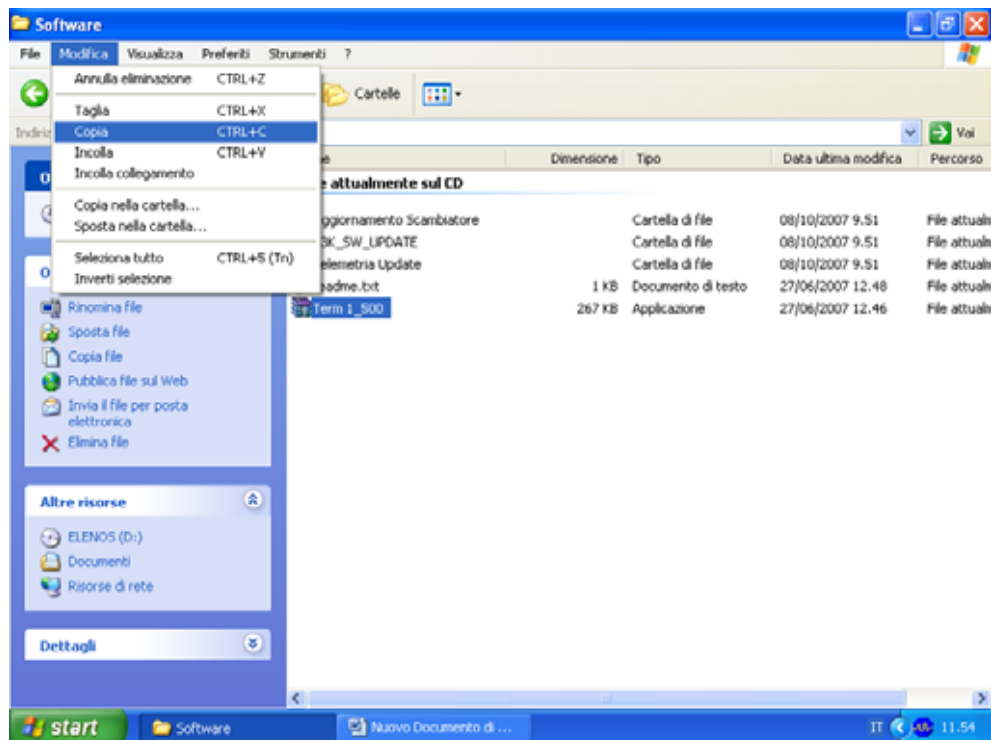


The file self-extracting Term\_1\_500.exe is found inside the "Software" folder (Attention: software release may evolve).  
Select the file.



Select the "Copy" command from the "Modify" menu

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Close the file, right-click with the mouse on the desktop and select the "Paste" command

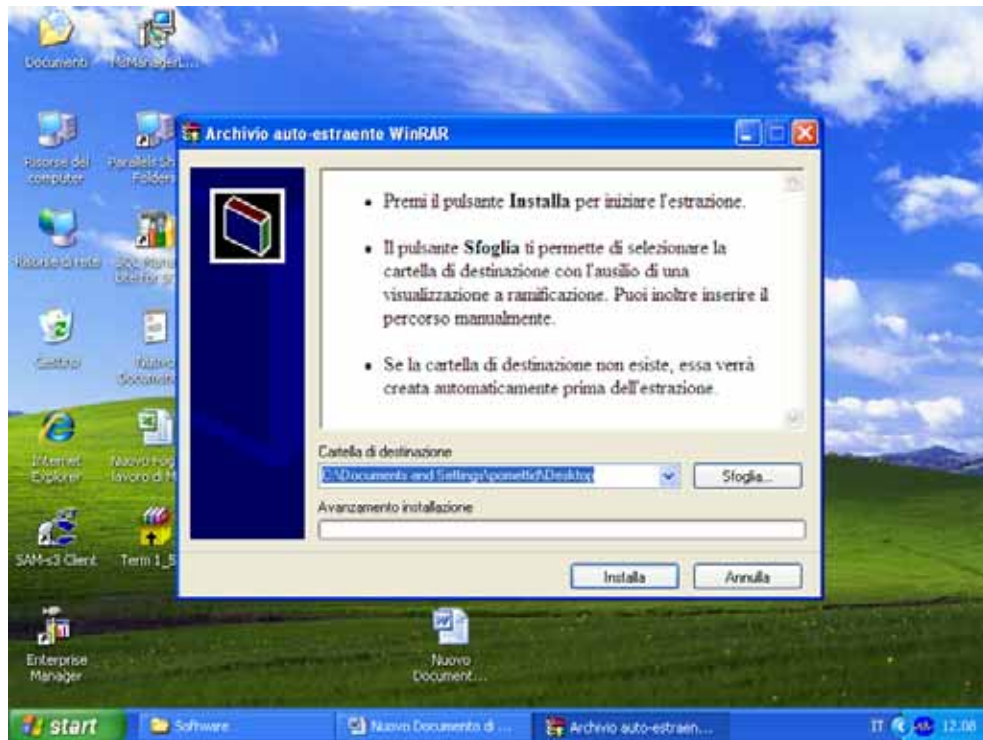


At this point the copy of the "Term\_1\_500.exe" programme will appear on the desktop



Double click on the self-extracting programme "Term\_1\_500.exe". A window with the figure below will open, click on the "Install" key

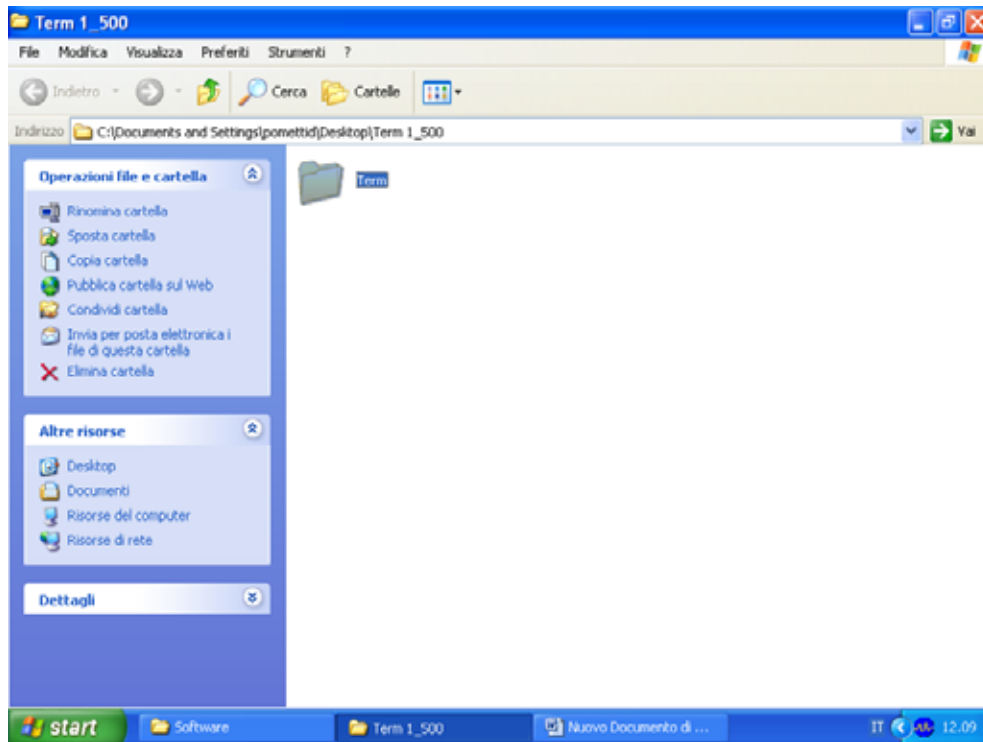




The folder "Term" will be created on the desktop. Open this folder

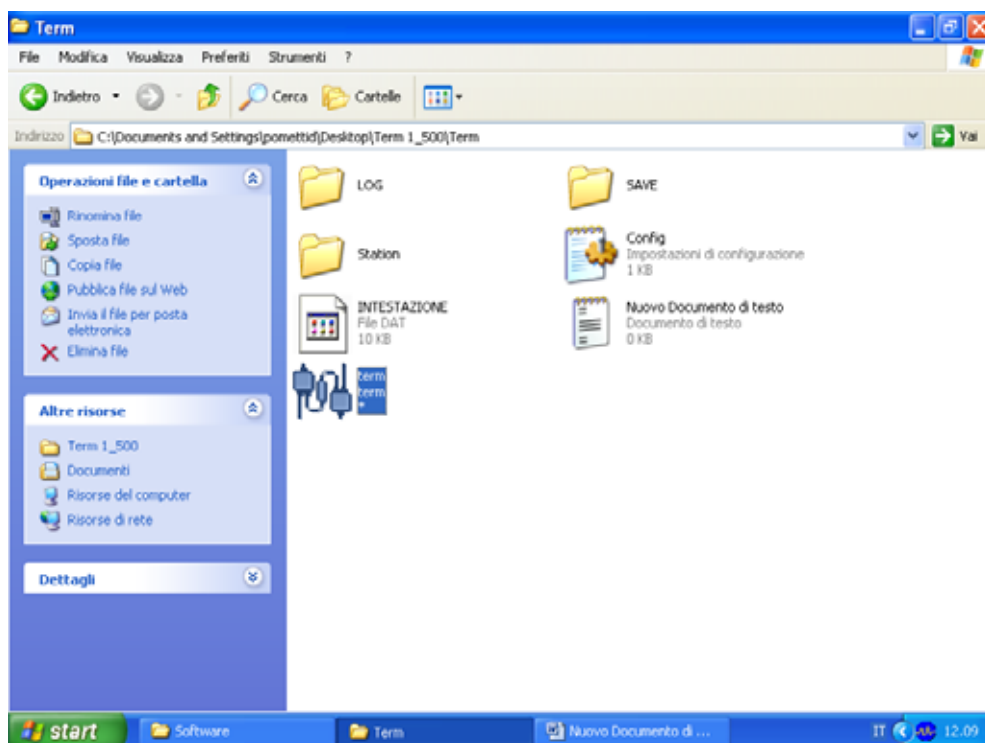


Inside you will find a folder entitled "Term." Open this folder

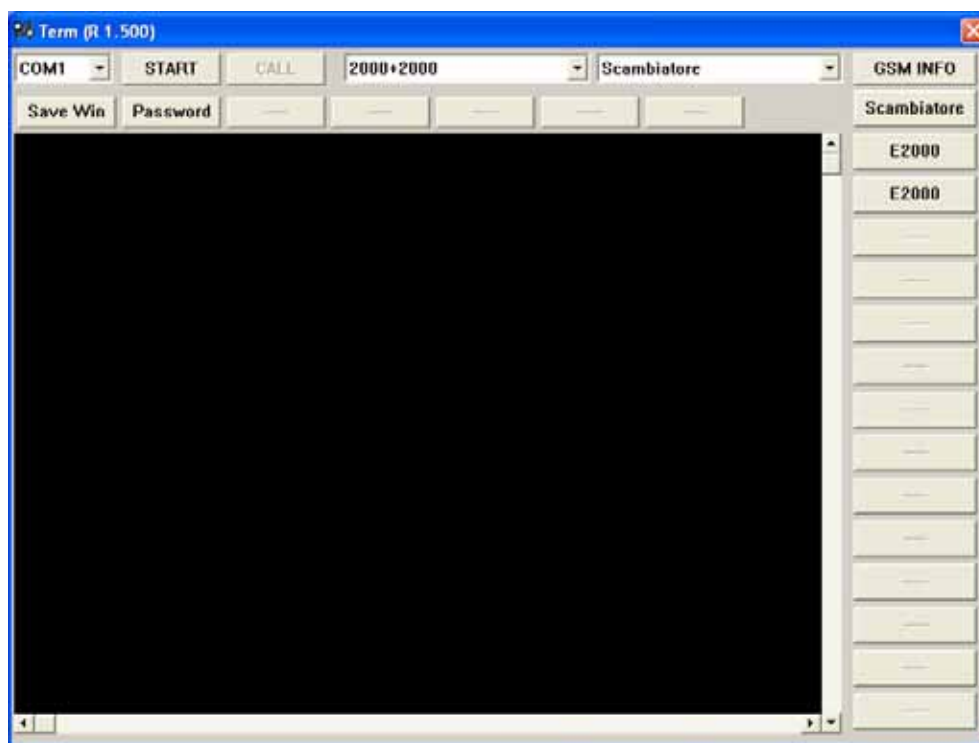


Inside you will find the Term programme. Click on the programme icon.

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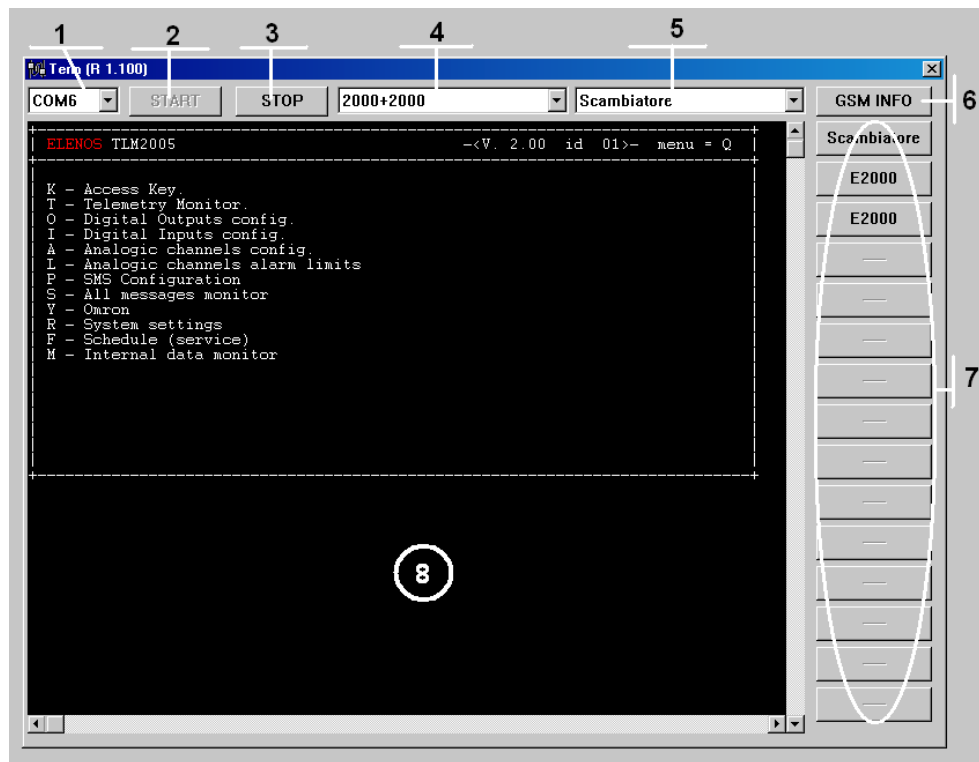
The Term software will open.



### 1.2.1 Description of Term.exe Main Window

The main window will appear as seen below.





1. Communication port selector.
2. START key. Open the serial and, if the selected station (4) has a modem, continue with the automatic call.
3. STOP key. Close the serial connection and, if the station selected has a modem, perform Hang up.
4. Select the station. The list of modules (5) and keys (7) will be updated when the station is changed. If the new station selected has a modem connection will be performed automatically. If the previously selected station was connected via modem, hang up will also be performed before the new connection.
5. Select the station. Select a module and the connection procedure to connect to it with, sending the address. This performs practically the same function as the keys (7). The difference is that all the station modules are contained in the list while the keys are only the first 15 station modules.
6. GSM information management key. Allows the user to enter into the second software window, described below, utilised for diagnosis and GSM initialisation.
7. Module selection keys. Allows the user to select the module to take information from, as with the modules (5) list
8. Terminal window in which telemetry pages are displayed.

Once connected to a selected module, the main window (8) displays the various telemetry windows and accepts pressed keys to enter into different menus. As you can see from the image, the first window pre-presents the list of submenus which can be selected by pressing one of the letters to the left of the description.

### 1.2.2 Programme Aspect

The software is structured as follows:

Term.Exe Main programme

Config.Ini General configuration file of Term.exe

Station Directory containing all Ini station files.

LOG Directory containing the file log if enabled in Config.INI.

### 1.2.3 A closer look at the INI files.

INI files are structured in sections and keys. For example, the config.ini is presented as follows:

[SERIAL\_PORT] ← Serial Port Settings (Section)

Com=5 ← Communication port number (Key)

Settings="9600 n 8 1" ← Baud rate values, parity, number of bit stop bits

ExtLine="" ← Characters in case of switchboard. Typically "0"

[GENERAL] ← Section of configuration window (do not modify)

Station=0

WinWidth=800

WinHeight=600

FontName="Courier"

FontWidth=8

FontHeight=8

WinTextWidth=81

WinTextHeight=40

WinTextMemWidth=100

WinTextMemHeight=200

TotStationButtn=15

[GSM\_INIT] ← GSM initialisation Parameters Section

CMD00="AT&F"

CMD01="AT+CSQ"

CMD02="AT+IPR=9600"

CMD03="ATV0"

CMD04="ATE0"

CMD05="ATQ0"

CMD06="ATX0"

CMD07="ATS0=1"

CMD08="AT+CMGF=1"

CMD09="AT+CNMI=1,1,0,0,1"

CMD10="AT&D0"

CMD11="AT&S0"

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CMD12="AT+SPEAKER=1"  
 CMD13="AT+CREG=1"  
 CMD14="AT&W"  
 CMD15="AT+CPBW=1"

CMD16="AT+CPBW=2"  
 CMD17="AT+CPBW=1,"  
 CMD18="AT+CPBW=2,"

[KEYBOARD] ← Definition of terminal special keys.

KeyUp="27,91,65"  
 KeyDown="27,91,66"  
 KeyLeft="27,91,68"  
 KeyRight="27,91,67"  
 KeyEnter="13"

[DOWNLOAD\_PARAM] ← LOG enabling section

Enable=0 ← Enable/Disable log (1/0)  
 Name="None"  
 Serial="None"  
 Order="None"

[STATION] ← Station list section

ST00000=2000+2000.ini  
 ST00001=5000+1000.ini  
 ST00002=5000+5000.ini  
 ST00003=default.ini

....  
 .....

The STATION list is automatically created by the programme at each re-start by reading the INI files present in the Station directory.

The format of INI station files found inside the STATION directory is:

[CONFIG] ← General configuration section

Name="5000+5000" ← Station name which also appears in the ListBox  
 Modem=0 ← Modem Presence/Absence. (1/0)  
 Init="ATDT" ← Text to send to the modem for calls (always ATDT)  
 Dial=" +393927874" ← Phone number to call if a modem is present

[MODULE] ← Station modules configuration section

Tot=3 ← Total number of modules  
 ModName000="Scambiatore" ← Name of first module appearing in the Listbox  
 ModCmd000="21I01" ← Command to be sent in order to direct module  
 ModName001="E5000" ← Second name as it appears in the Listbox  
 ModCmd001="21I02" ← Command to be sent in order to direct module  
 ModNamennnn="E5000" ← Name nnn module as it appears in the Listbox

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**ModCmdnnn="21I03"** ← Command to be sent in order to direct module

Each station must be composed of the preceding lines and the generated INI file must be contained within the Station directory.

## 2 TELEMETRY INSTALLATION (QUICK START)

The steps for telemetry installation are as follows:

- 1) Test the SIM to be installed in the telemetry utilising two cell phones
- 2) Unlock the PIN of the SIM to be installed in the telemetry
- 3) Insert the SIM in the telemetry GSM modem
- 4) Insert the F2 fuse (disconnected during manufacture to prevent battery discharge)
- 5) Install TERM communications software on the PC
- 6) Identify the communication port of your PC (COM1, COM2, etc.)
- 7) Set the TERM communication port
- 8) Connect the telemetry to the transmitter with the DB9 pin to pin cable
- 9) Continue with telemetry communications enabling procedure by pressing the key for connection with the telemetry (equivalent of typing 21i01) and set the new phone number
- 10) Set equipment connected remotely to the telemetry
- 11) Continue with communications enabling procedure with equipment connected to the telemetry by pressing the menu keys corresponding to each module (equivalent to pressing 21i00, 21i10 etc.) and programme phone numbers
- 12) Programme configuration (Menu R of the Telemetry): ETG100/151, ETG300, ETG500, ETG1000, E3000
- 13) Connect the PC to the telemetry modem connector and continue procedure to verify GSM antenna pointing
- 14) Disconnect the cable from the telemetry and wait a few seconds
- 15) Generate an alarm and verify correct SMS receipt
- 16) Attempt remote connection with the PC via a modem

### 2.1 *Components necessary for installation*

The components necessary for telemetry installation are as follows:

- 1) Telemetry Equipment
- 2) Connection cable between the telemetry and equipment
- 3) Connection cable between the telemetry and PC.
- 4) SIM to be inserted into the telemetry modem
- 5) PC To programme phone numbers and configuration
- 6) Modem to be connected to the PC which was utilised previously to test remote connection
- 7) The PC must have an RS232 serial port. If this is not present, use an USB-RS232 adapter
- 8) Your cell phone.
- 9) A second cell phone to test telemetry SIM

### 2.2 *Problems which may be experienced during installation*

Check that all above-mentioned procedures have been followed before terminating installation. Experience has shown us that whenever telemetry operation problems arise, the cause can be related to improper procedure followed for one of these points. The most common problems experienced include:

- 1) No response to SMS: the SIM is locked, the PIN has not been removed.
- 2) The GSM modem does not have a good signal level or is too disturbed.

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- 3) No messages, telemetry or equipment are sent: the phone number has not been entered.
- 4) No MAINS SMS or those relative to external alarms (RX1, RX2 etc.) are sent: no phone number has been entered in the telemetry.
- 5) MAINS message not sent: The battery is discharged, no fuse F2 has been entered
- 6) No equipment alarm messages are sent because no phone number has been entered in the equipment.
- 7) No -3dB alarm messages or those relative to the equipment are sent: The DB9 pin to pin RS485 communications cable between telemetry and equipment is not connected
- 8) SMS messages are not sent: the communications cable between the telemetries and the PC were not connected and therefore the communications port between telemetry and modem is busy with connection with the PC.

Note:

Keep in mind that when the telemetry has a PC connected, this uses the same serial port which it uses to communicate with the modem, therefore when the PC is connected, the GSM Modem cannot operate and SMS cannot be sent or received. The PC cable must be disconnected to send and receive messages.

When the PC cable is connected to the CPU connector and the TERM programme is activated, the green LED located under the connector switches on.

### **2.3 Alarm Inputs**

Default telemetry inputs are configured as follows:

Inp1: RX1

Inp2: RX2

Inp3: PRESSURISER

Inp4: UPS

Inp5: PORT

Inp6: AUX1

Inp7: AUX2

Inp8: AUX3

These inputs can later be re-configured on the basis of user needs.



## 2.4 GSM LED Function.

When the telemetry is switched on, the LED switches off for a short period and then it begins to flash. This indicates that the modem is initialising. The LED switches off when this has been completed.

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## **2.5 SIM function verification**

Enter the SIM in the test cell phone.

Switch on the phone and deactivate the SIM PIN.

Switch off and switch back on the phone to ensure that the PIN is not requested upon start-up.

Send an SMS message to your phone.

Respond to the message and verify its successful arrival.

Memorise the SIM phone number of the telemetry in your cell phone.

Enter the SIM in the telemetry GSM modem.

## **2.6 SMS message list**

- E3000/2000/3500

STBY,OFF,ON,PWR XXXX, RES, STS

- ETG3500/2000

STBY,OFF,ON,PWR XXXX,RES, STS, STS1

- E7000/10000/15000/30000

STBY,ON,OFF,PWR XXXXX,RES,STS,EXC1,EXC2

# **3 ACTIVATION PROCEDURE FOR CONNECTION TO EQUIPMENT FROM THE TERM**

## **3.1 Connection from the PC to the Telemetry**

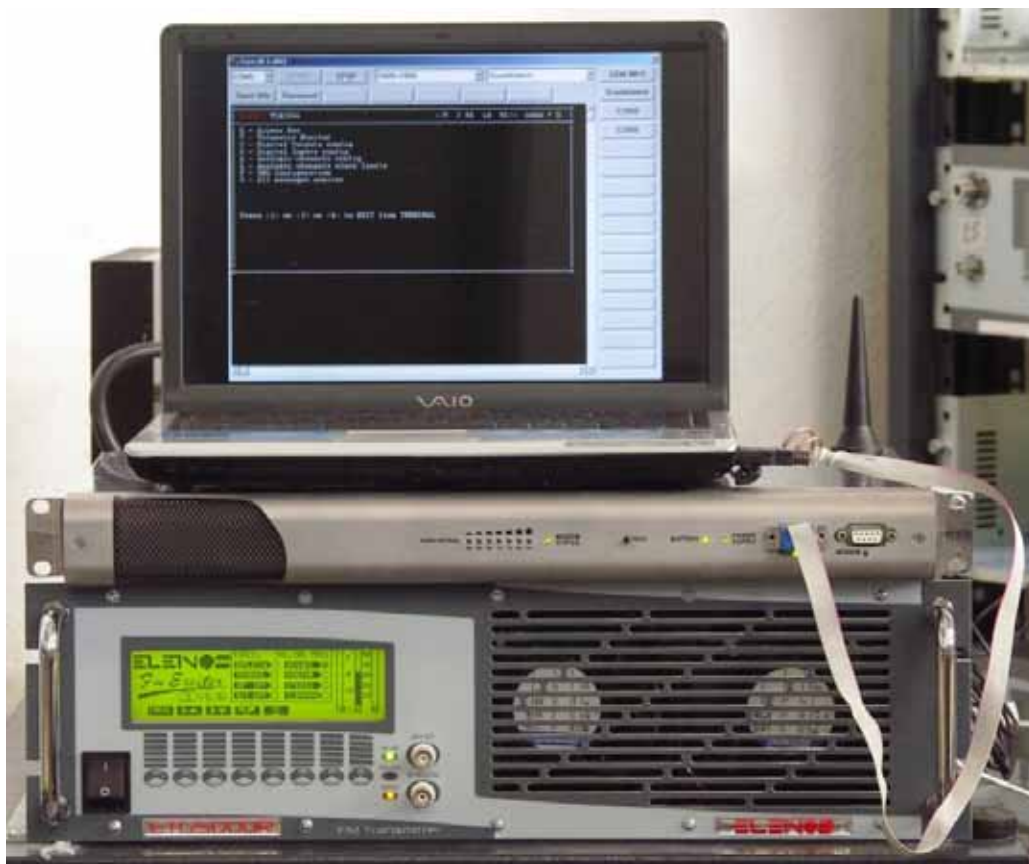
To programme phone numbers and select the transmitter type, connect the telemetry to the PC as indicated in the figure.

Launch the TERM programme.

With the TERM programme, select the COM port and press the "START" key. Verify that the LED located under the CPU connector switches on and that it "Modem Status" LED flashes.

Press the TELEMETRY key. The telemetry main menu will appear on the screen.

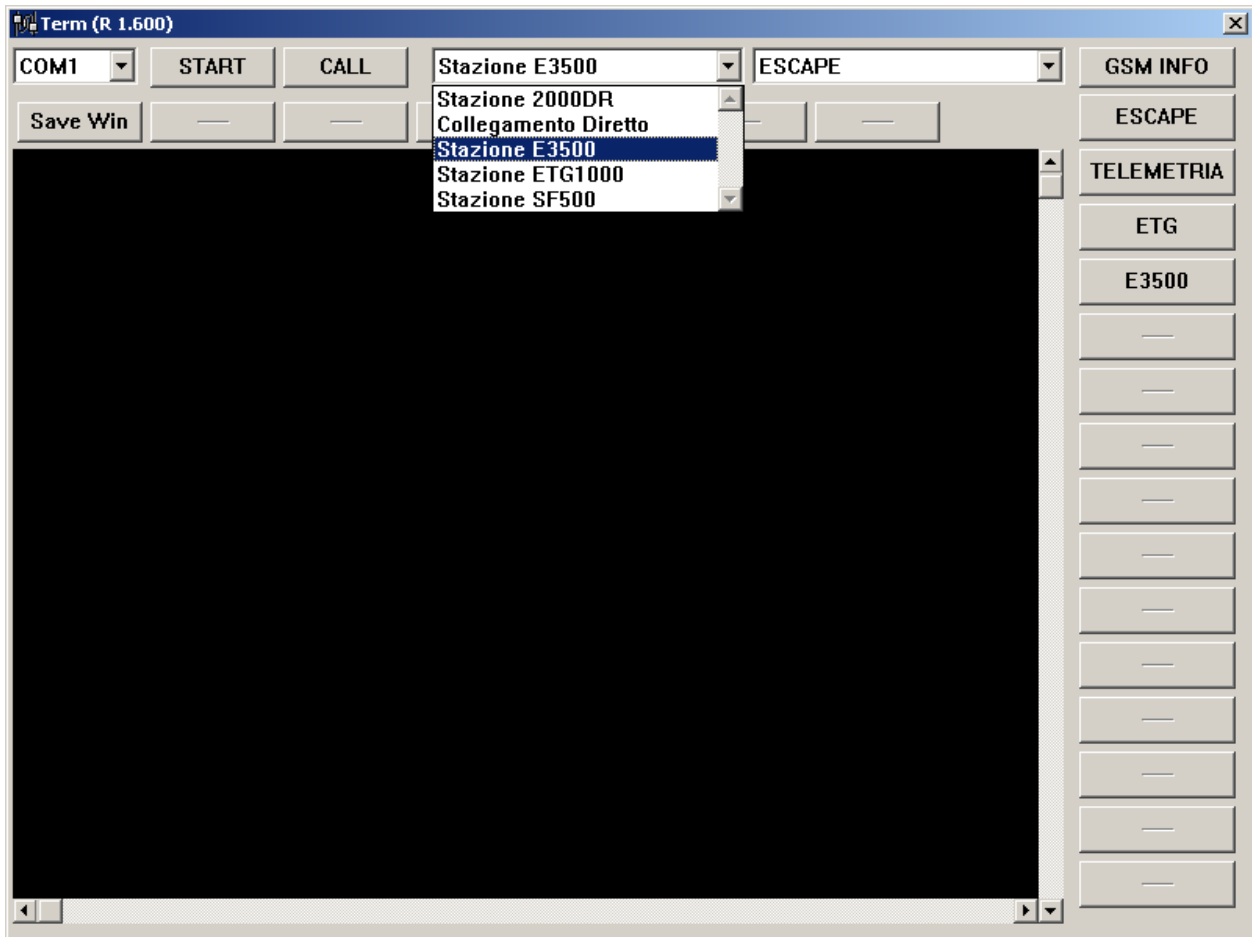




### 3.2 CONNECTION ON SITE

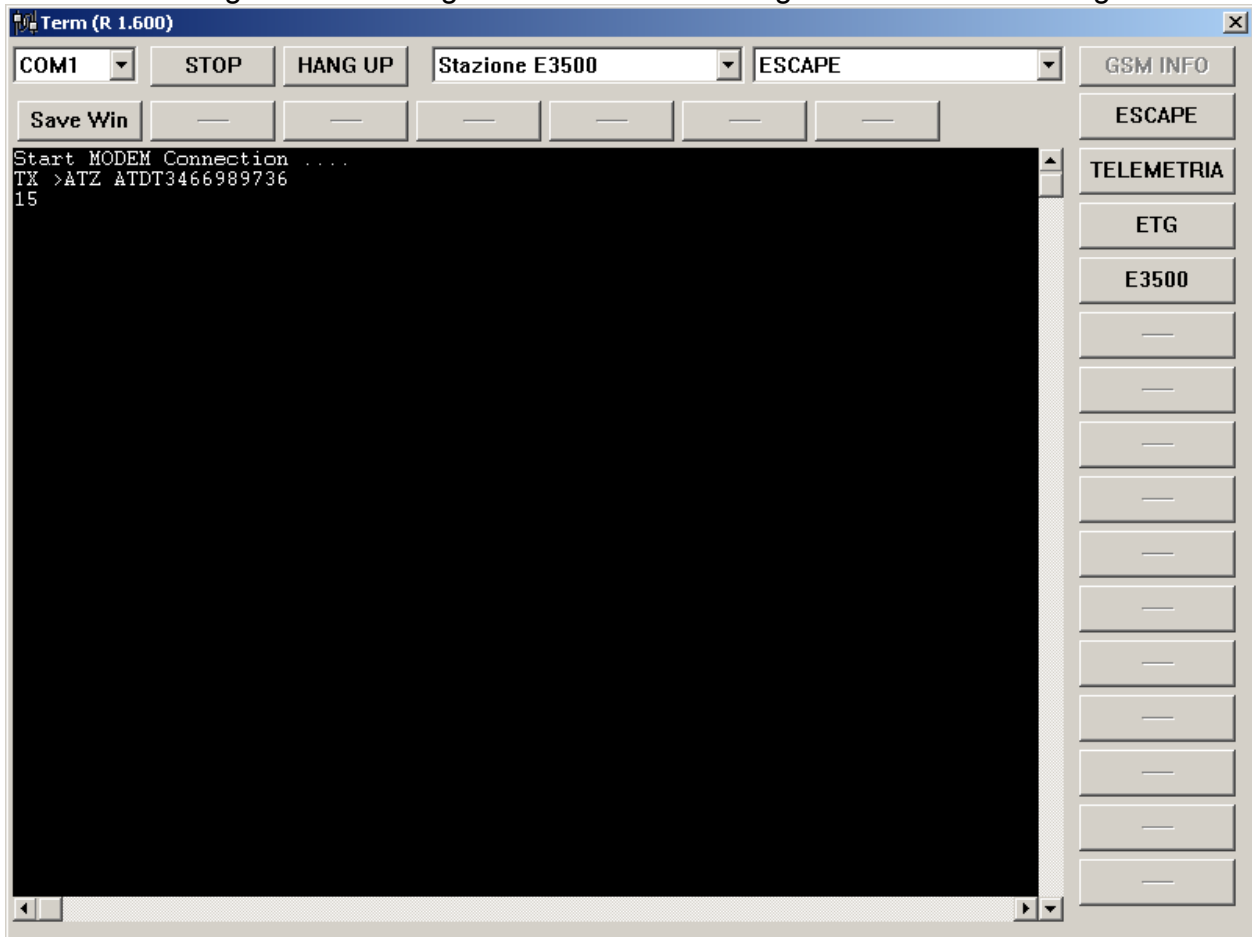
Proceed as follows to select a site and place a call:

#### 3.2.1 Selecting the site from the menu



### 3.2.2 Pressing the CALL key to place a call

Modules can begin to be interrogated when the modem gives the CONNECT signal.



### **3.3 MODULE SELECTION**

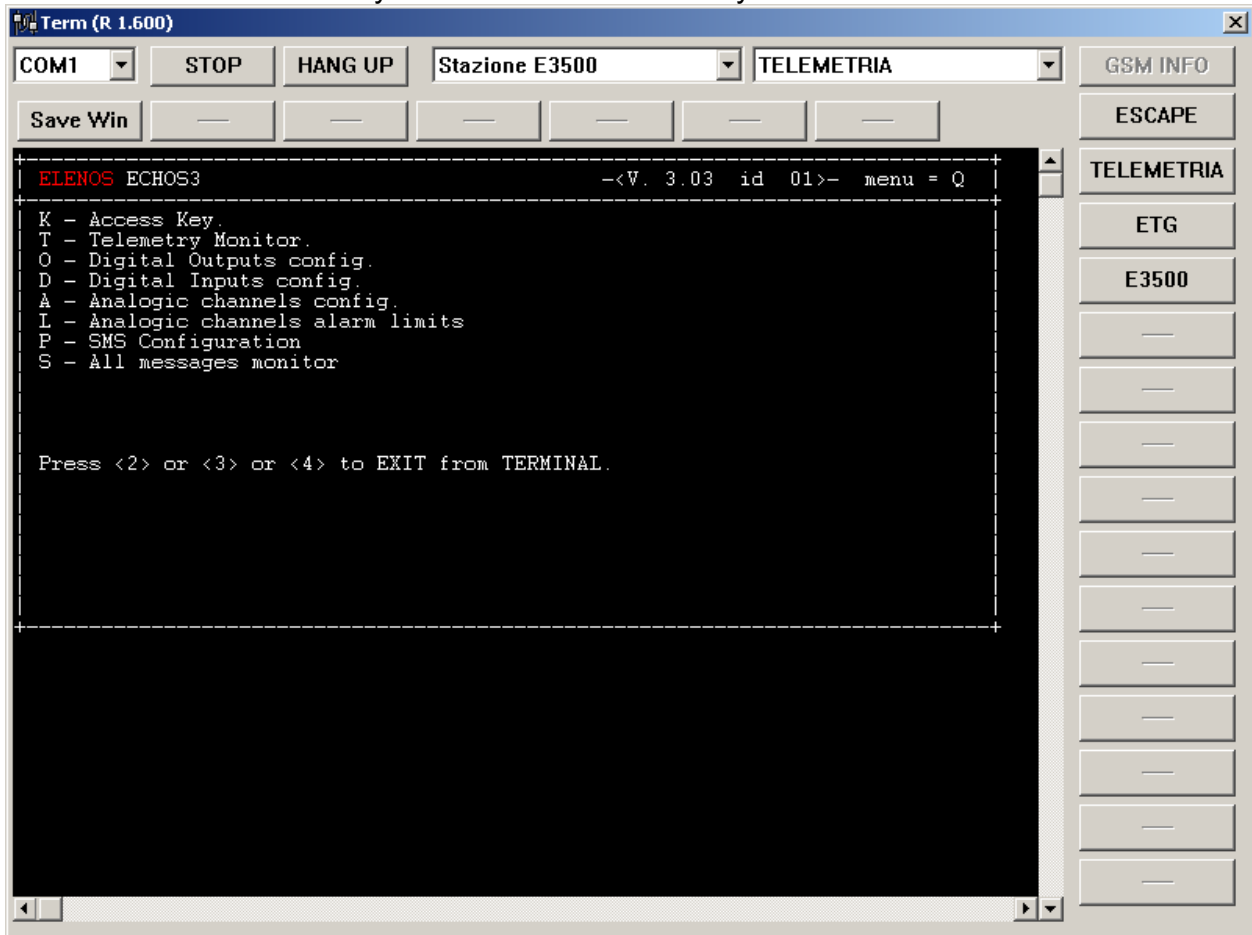
Keys corresponding to each module or system logic address are found on each single site. Once connected with the site either directly or via modem, keys with modules present on the site will appear to the right of the TERM window. These keys activate macros which sends a sequence of characters necessary for connection to the module, for example: "21I00" to connect to the transmitter or "21i10" to connect to the ETG, etc.

It is always possible to type the connection character sequence directly on the TERM control line without using the keys.

Typical selection windows for choosing different site modules are shown below.

### 3.3.1 SELECTING A TELEMETRY MODULE

Press the TELEMETRY key to enter into the telemetry main menu.



From the telemetry main menu it is possible to navigate through different menus to see the status of inputs and outputs or to set alarms or phone numbers.

The most used menus for consulting telemetry status are the "T" Telemetry Monitor and the "S" All Messages Monitor menus.

### T “Telemetry Monitor” Menu

A status summary of telemetry inputs and outputs can be seen in this menu.

COM4 STOP HANG UP Stazione E3500 TELEMETRIA GSM INFO

Save Win

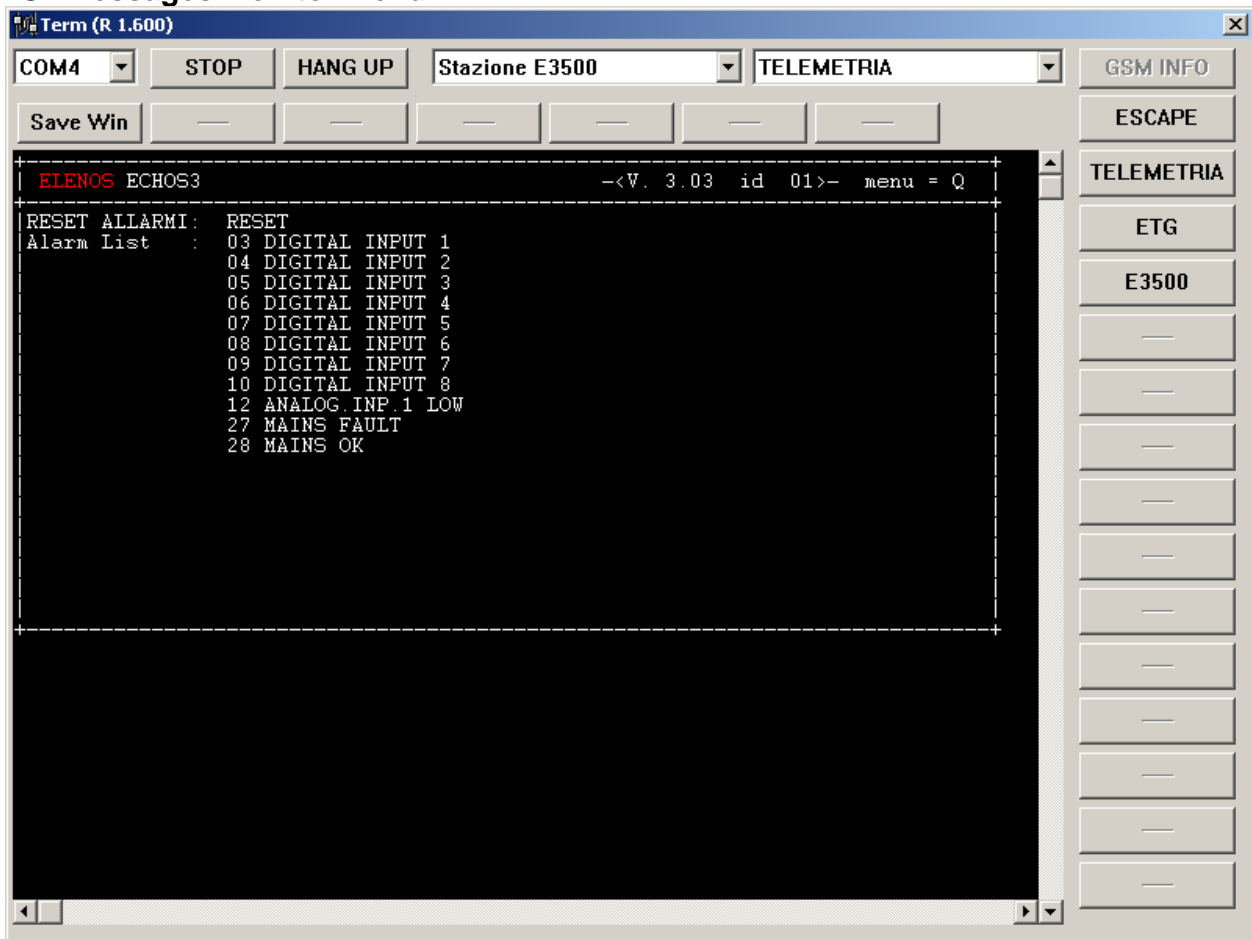
ELENOS ECHOS3 -<V. 3.03 id 01>- menu = Q

STATUS:====> 00 CORRECT WORKING

| ANALOG INPUT: |       |      | DIGITAL INPUT: |        | DIGITAL OUTPUT: |        |
|---------------|-------|------|----------------|--------|-----------------|--------|
| Name          | Value | M.U. | Name           | Status | Name            | Status |
| AI1: FWD      | 0.0   | W    | DI1: RX1       | -----  | DO1: INTLK      | -----  |
| AI2: RFL      | 0.0   | W    | DI2: RX2       | -----  | DO2: ON         | -----  |
| AI3: AIN.2    | 0.00  | V    | DI3: PRESS     | -----  | DO3: OFF        | -----  |
| AI4: AIN.3    | 0.00  | V    | DI4: UPS       | -----  | DO4: RESET      | -----  |
| AI5: AIN.4    | 0.00  | V    | DI5: DOOR      | -----  | DO5: DOU.4      | -----  |
| AI6: AIN.5    | 0.00  | V    | DI6: AUX1      | -----  | DO6: DOU.5      | -----  |
| AI7: AIN.6    | 0.00  | V    | DI7: AUX2      | -----  | DO7: DOU.6      | -----  |
| AI8: AIN.7    | 0.00  | V    | DI8: AUX3      | -----  | DO8: DOU.7      | -----  |

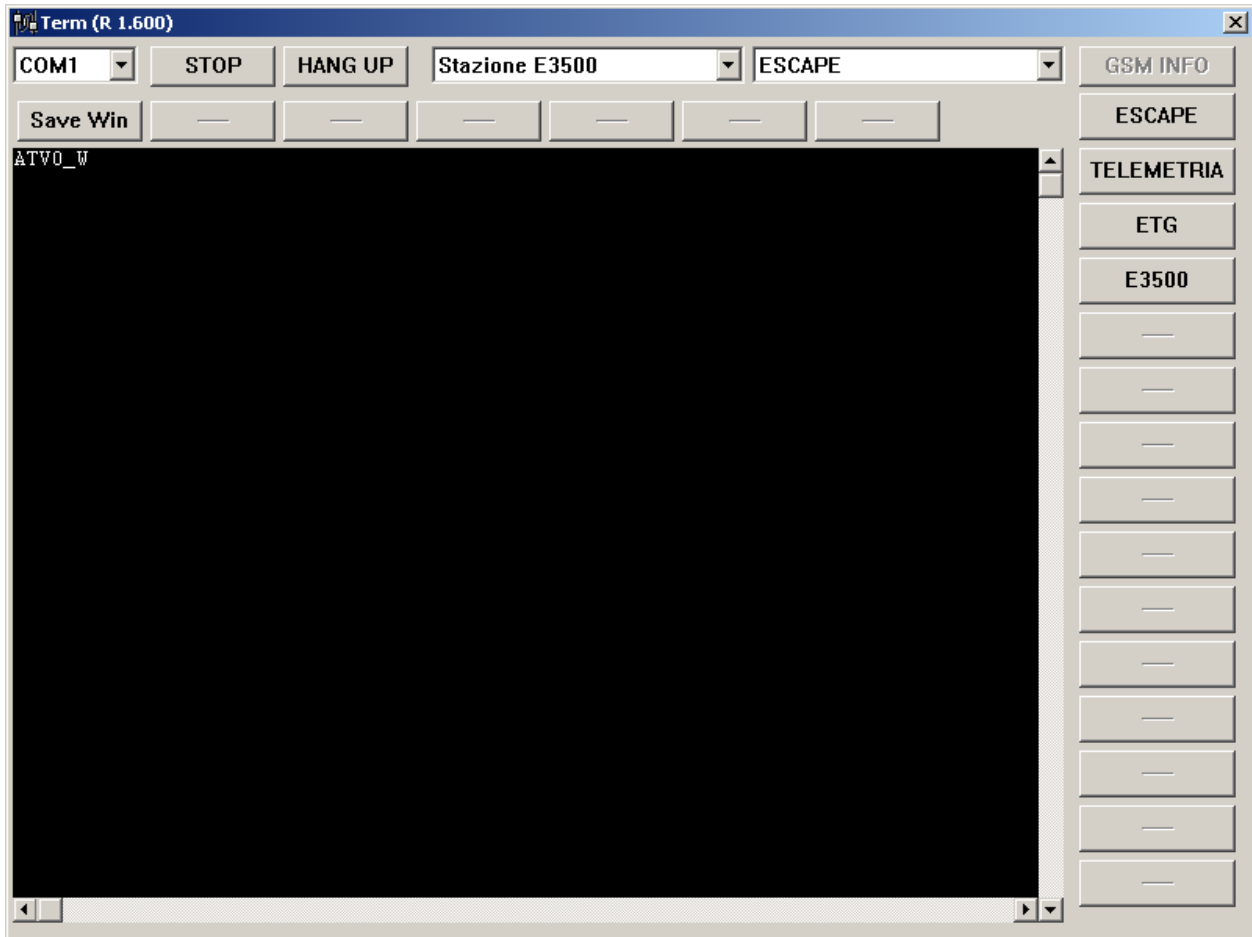
ESCAPE TELEMETRIA ETG E3500

## “S” Messages Monitor Menu



### Disconnect from the Telemetry with the ESCAPE key

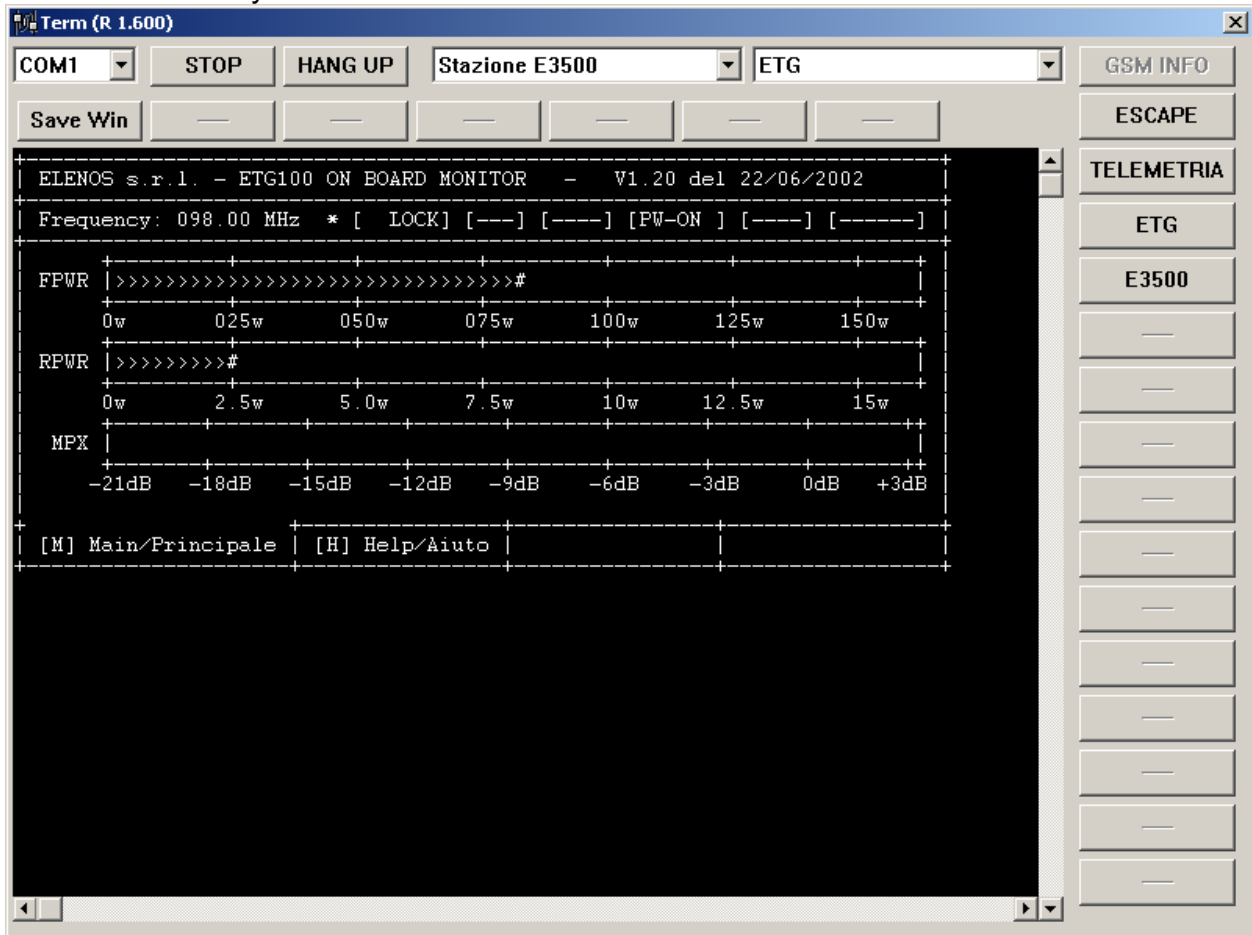
To exit from the telemetry before entering into another menu or before HANG UP, press the ESCAPE key and wait for the message ATV0\_W. This message indicates that the TELEMETRY has been disconnected and that the system has returned to transparent mode. Other modules can now be interrogated.





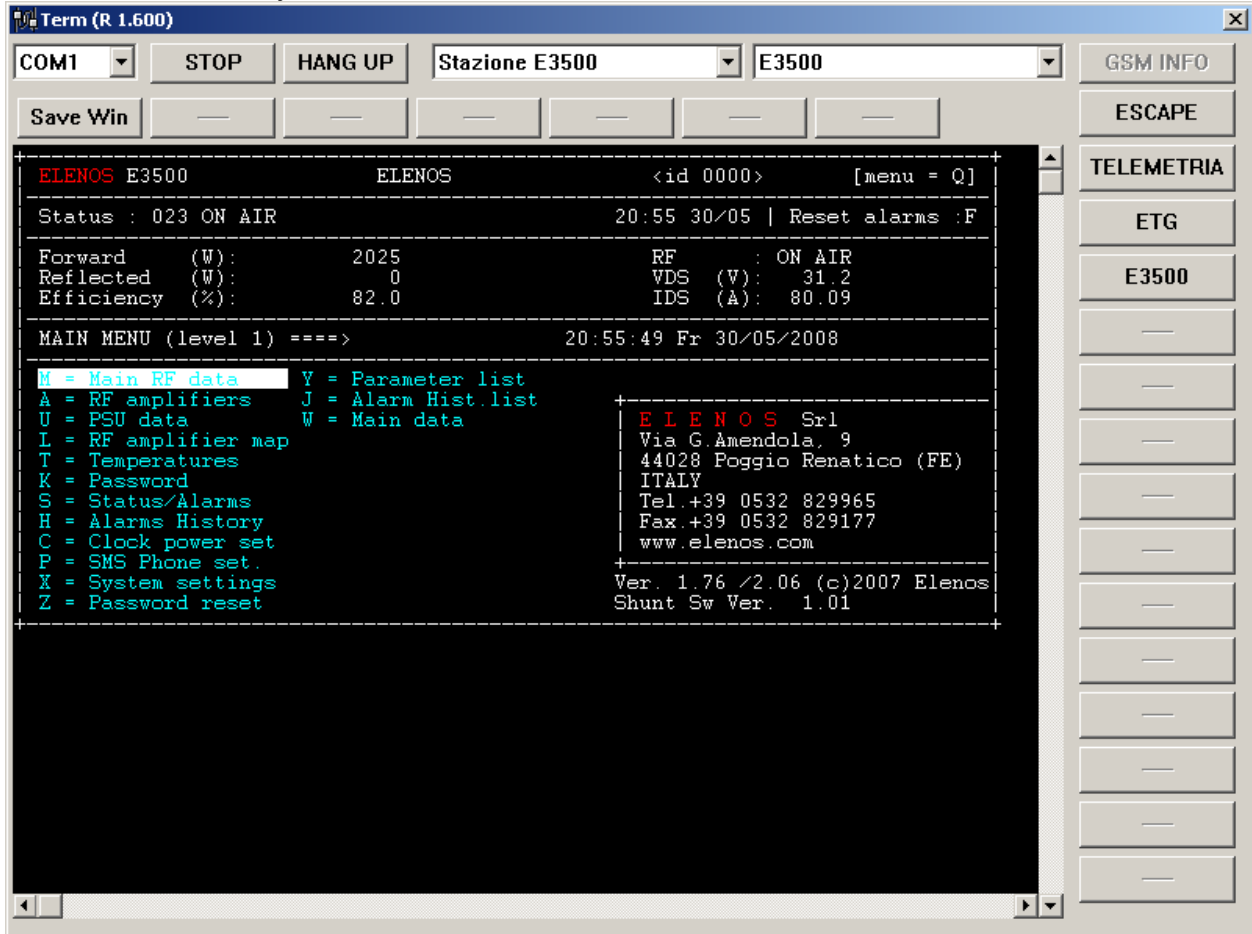
### 3.3.2 SELECTING THE ETG MODULE

Press the ETG key to enter into the ETG main menu.



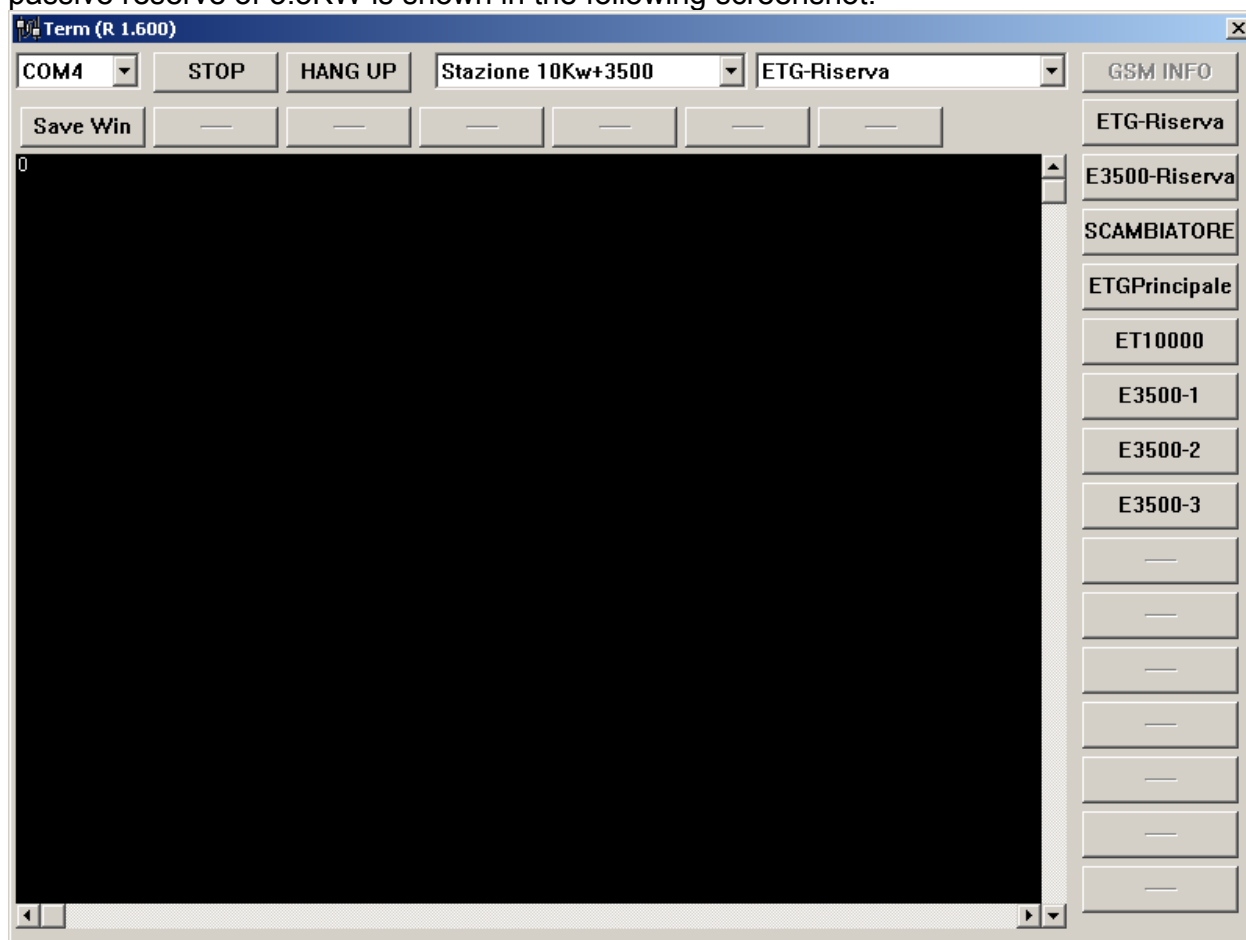
### 3.3.3 SELECTING THE E3500 MODULE

Press the E3500 key to enter into the E3500 main menu.



### 3.3.4 EXAMPLE OF OTHER SITE CONFIGURATIONS

An example of a site with an E10K+3.5K system composed of a 10KW transmitter with a passive reserve of 3.5KW is shown in the following screenshot.



### **3.4 PROCEDURE FOR ENTERING PHONE NUMBERS AND SMS PROGRAMMING**

Once you have been connected on site, either directly or via modem, the first thing to do is to set the phone numbers to which the system will send alarms via SMS messages.

For ETG, SF, HF systems or single telemetries, programme the phone numbers in the telemetry memory.

For E3500 systems or components of the same family and E2000DR or E5000K systems, also programme phone numbers in the transmitter memory.

The telemetry uses these phone numbers to send all external alarms or a Mains alarm.

The transmitter uses the phone numbers to send -3dB or exciter exchange alarms or other alarms managed by the internal telemetry.

Operations to perform to programme phone numbers are as follows:

Enable the type of phone used (i.e. GSM) and set controls which can be carried out in the SMS MESSAGE USE string.

Set the type of transmitter connected to the telemetry.

Verify that SMS CENTER phone number and signal level are present.

The first field to be configured is "ID STRING" which during production is set as "ELENOS". This must be set with a string identifying the equipment and/or the site (maximum 10 alphanumeric characters).

The next field to set is the "PHONE N. x" which must contain the phone number to be contacted. These numbers will be enabled to send and receive SMS messages.

#### **ATTENTION**

Enter phone numbers (leaving no empty spaces at the beginning) in the international format (i.e. +393371234567) and programme access privileges for each number.

"ENABLE THIS ACCOUNT" globally enables (TRUE) the transmission and receipt of SMS alarms from the telemetry.

"ENABLE STATUS REQUEST" enables (TRUE) the possibility of requesting status via SMS.

"ENABLE COMMAND EXECUTE" enables (TRUE) the possibility of carrying out controls sent via SMS.

"ENABLE GLOBAL ECHO RX" provides for sending any control echoes made by other users (TRUE).

"ENABLE DIG. SMS" provides for sending messages in ASCII hexadecimal format without descriptions (TRUE).

Once configuration has been completed, enable the SMS ENABLE field, setting it at TRUE.

The system will ignore any SMS received from phone numbers not entered in the list or entered but disabled in the "ENABLE THIS ACCOUNT" field.

### **3.5 Description of parameter modifications and video screen change for "Telemetry", "Scambio 1+1", "E2000", "E3000", "E5000".**

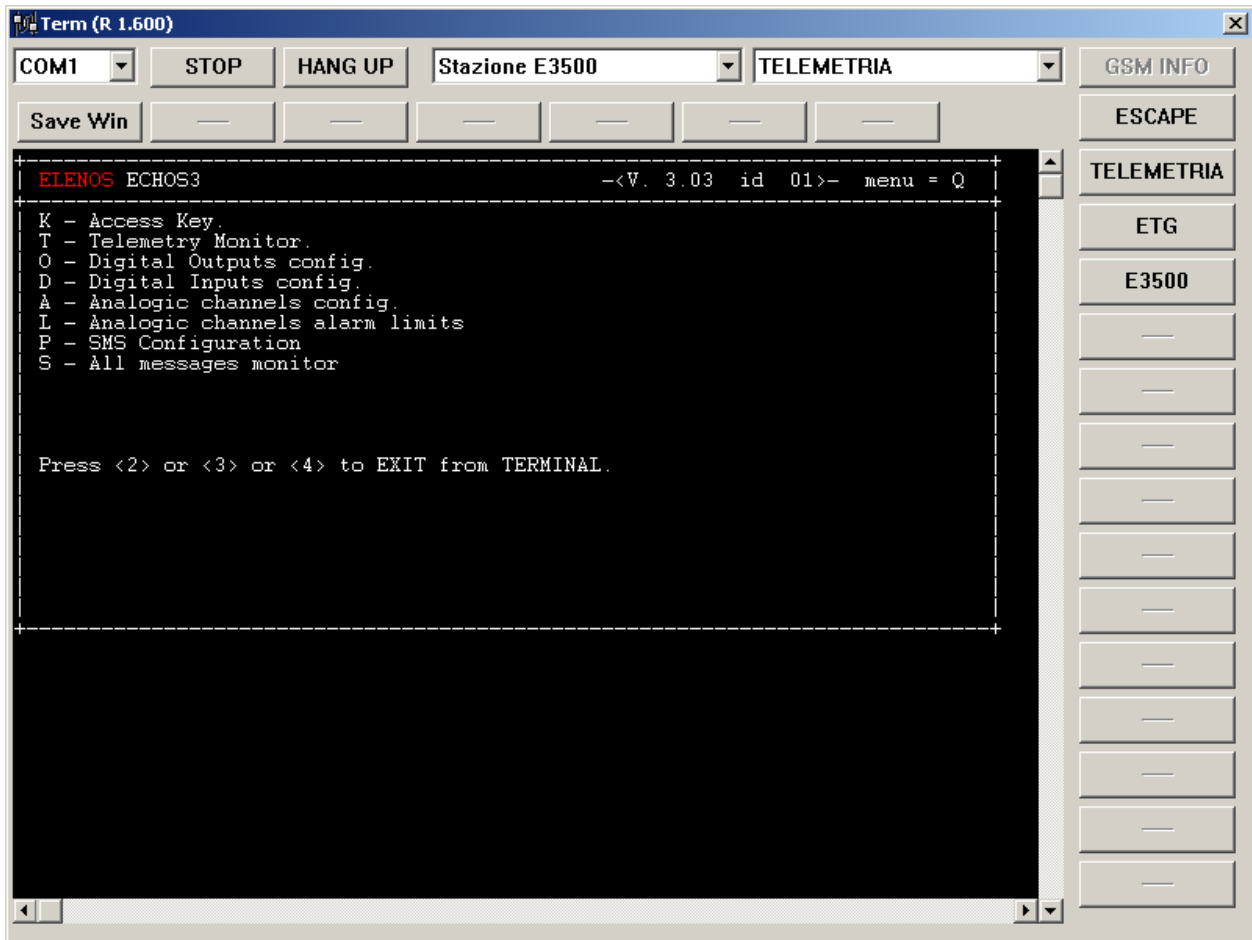
1. Enter the password to modify parameters:
2. Type the letter "K" in the main menu.
3. Press Enter.

4. Type the password with the numerical keys directly in the telemetry.
5. Select the first digit of the password via the cursor keys (arrows) in the other equipment. Selection is visible with the white background and blue text of the highlighted characters or parameters. 2. Then press the "Enter" key to modify the character. This can be verified by the change in colour of the text of the highlighted character which goes from blue to red.
6. Press the arrow keys up and down to set the desired number.
7. Once entering has been completed, press the "Enter" key to close modifications.
8. Move to the next password character by pressing the right cursor key, then modify the selection.
9. Repeat the procedure described in point 2, then press the "Enter" key for all password digits.
10. Once entry has been completed, exit from the screen and return to the main menu via the "Q" key.
11. It is now possible to modify parameters present in the various screens.

### **3.6 *Programming phone numbers in the Telemetry***

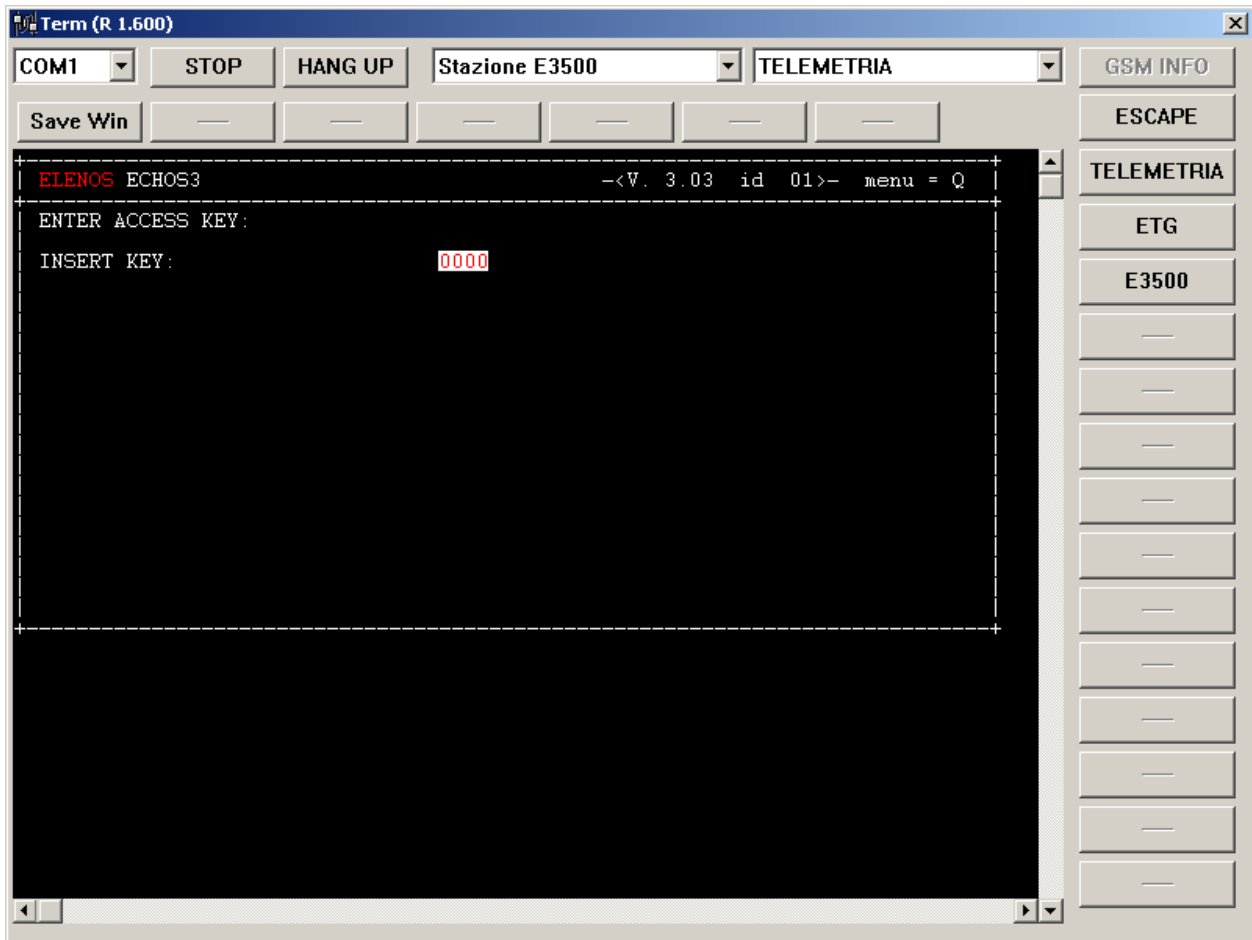
This is the main menu screen which appears after having pressed the TELEMETRY key or typing "21i01".

First press "K" from this menu to set the password, then select R to configure the transmitter type to be connected and then select "P" to set the phone numbers enabled for sending and receiving SMS.



Type the letter "K" in the main menu to enter into the "Access Key (PASSWORD)" menu.

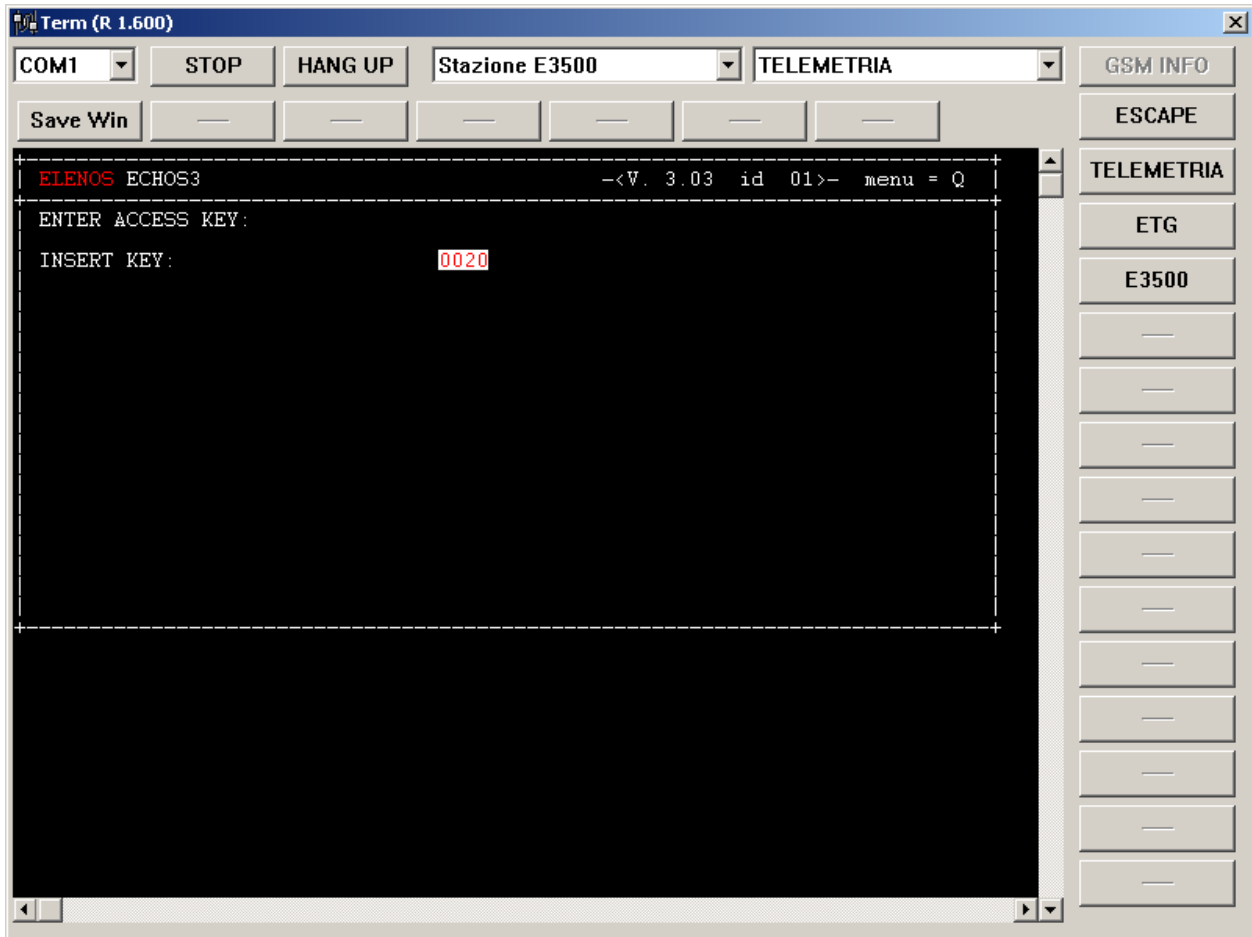
Press the ENTER key on the PC keyboard to enter into edition mode. The characters which were blue will become red which means that the system has gone into entry mode.



Enter the password set by the factory at 0020 or, if it has been changed, type in the new password.

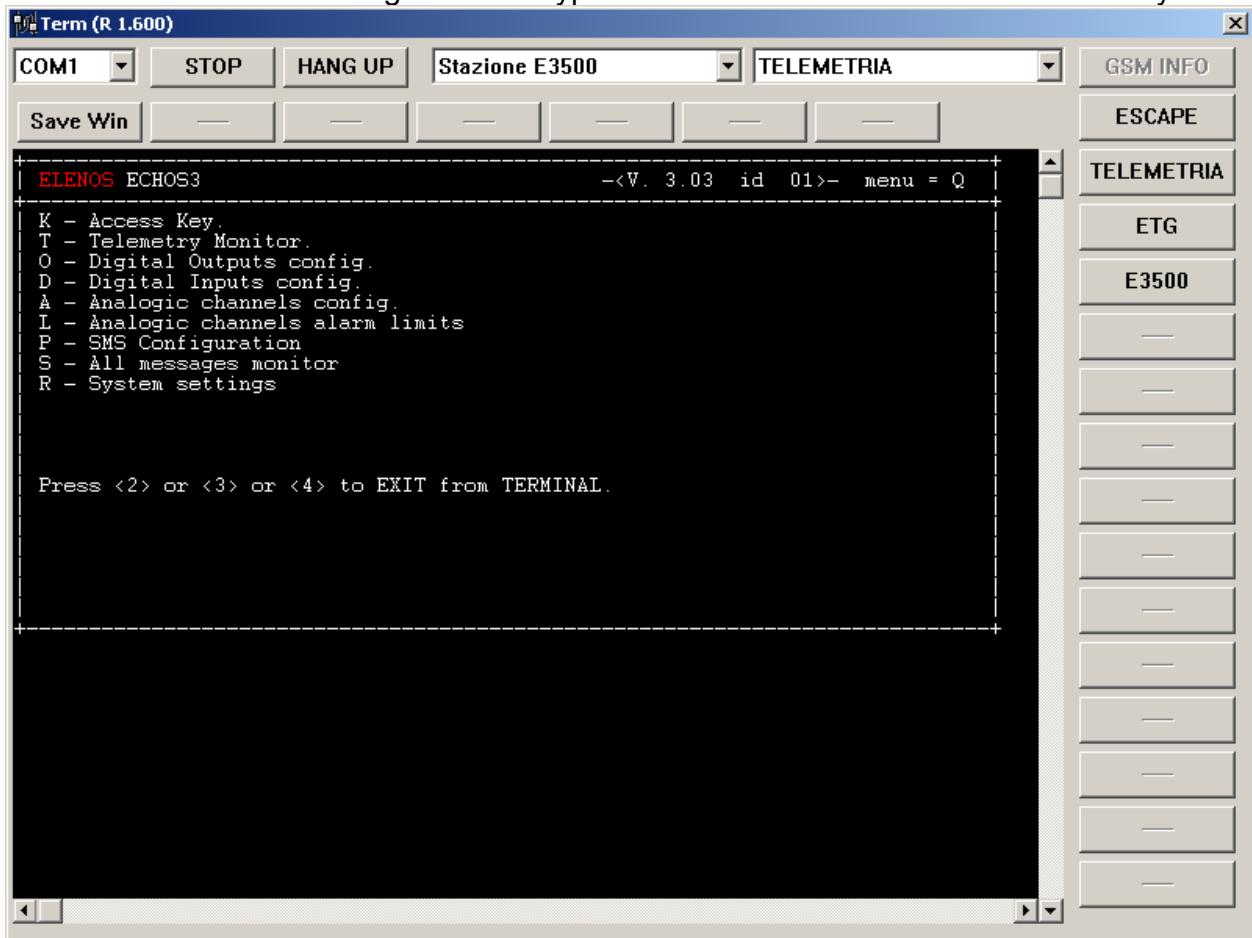
## TELEMETRY Use and maintenance manual

Press ENTER to confirm the password and return to the main menu. An "R" System Settings message, which was not present before the password was entered, will now appear on the main menu.



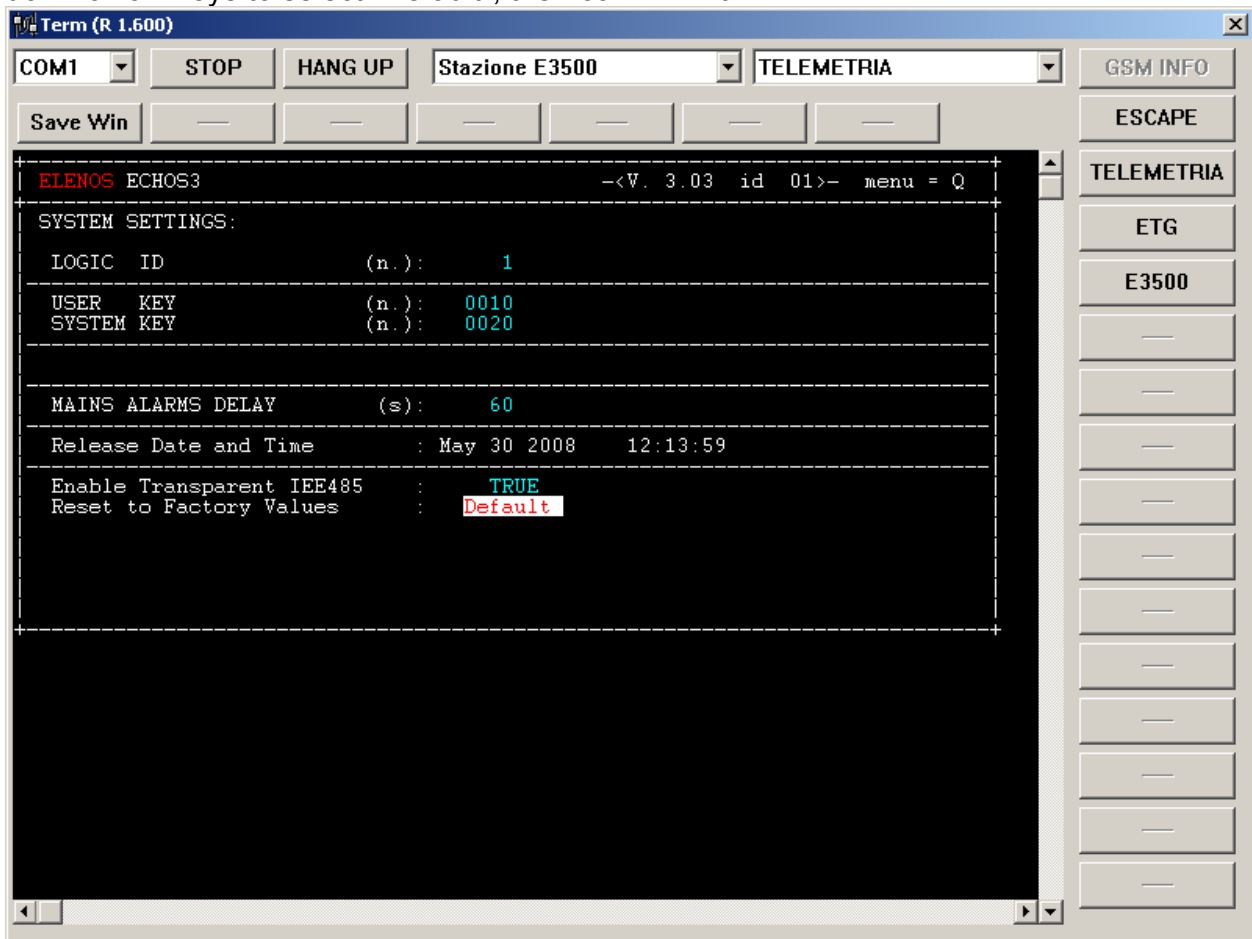


Choose the R menu heading to set the type of transmitter connected to the telemetry.



## TELEMETRY Use and maintenance manual

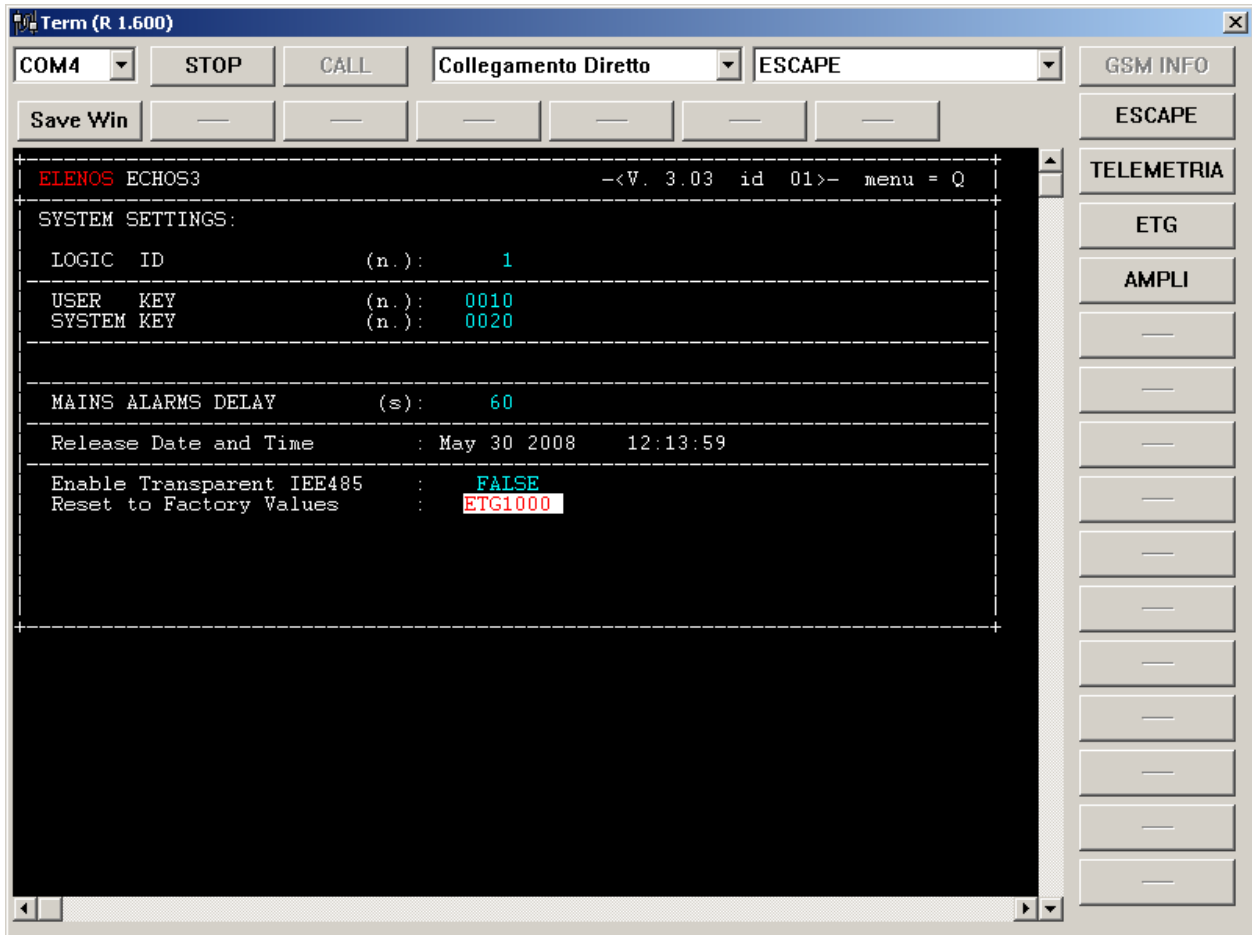
Move the cursor to "Reset to Factory Values" heading, press ENTER and use the up and down arrow keys to select "Default", then confirm with ENTER.



### Configuring different types of transmitters

It is possible to select configuration of different types of transmitters from the "Rest to Factory Values" heading in this menu. An example of an ETG1000 selection is shown in the screenshot below. Other possible configurations include:

EGTG30, ETG150, ETG300, ETG500, ETG1000, SF500, HF1000. Choose the DEFAULT configuration for all transmitters in the E3500 family, E2000DR or E5000K.



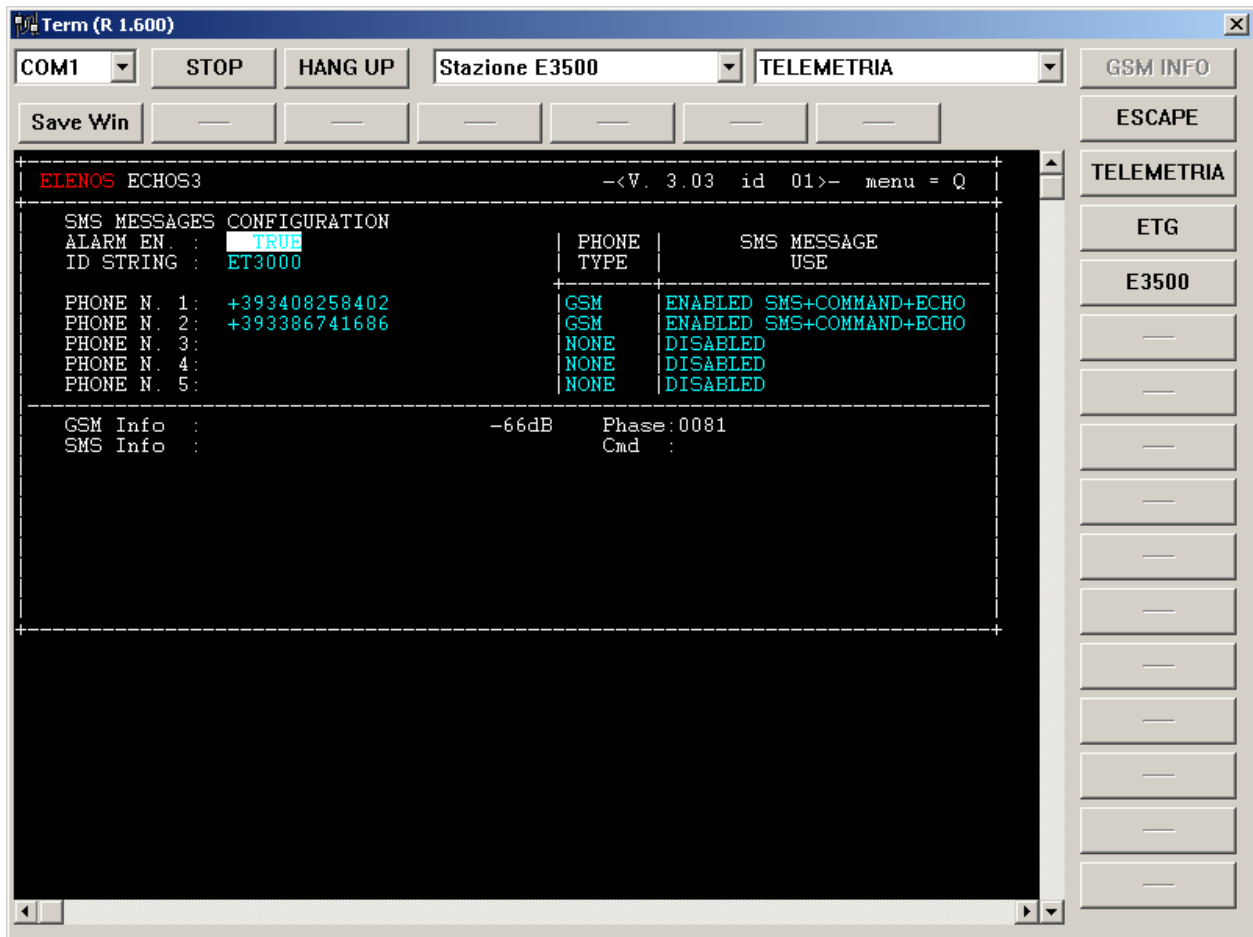
Press Q to return to the main menu.

Select the SMS Configuration menu heading by pressing the P key.

Within this menu, set:

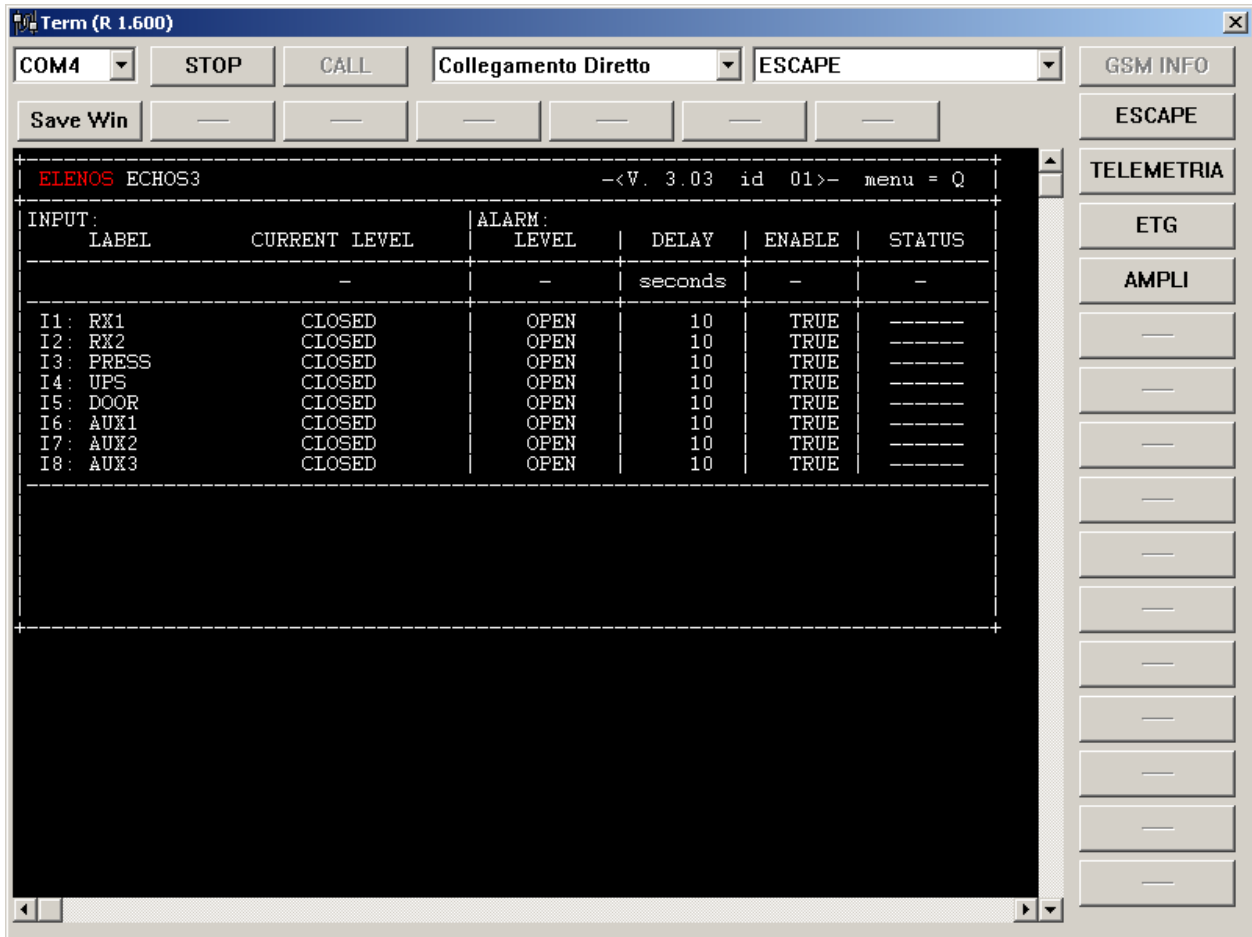
ALARM\_EN.= TRUE

Enter the name of the site in the "ID STRING" string



### Programming Digital Inputs

The TELEMETRY is reset during production with the following digital input programming. Programming of these inputs can be changed if necessary but remember that the TELEMETRY resets default values whenever transmitter configuration is changed with the menu heading Reset to Factory Values.

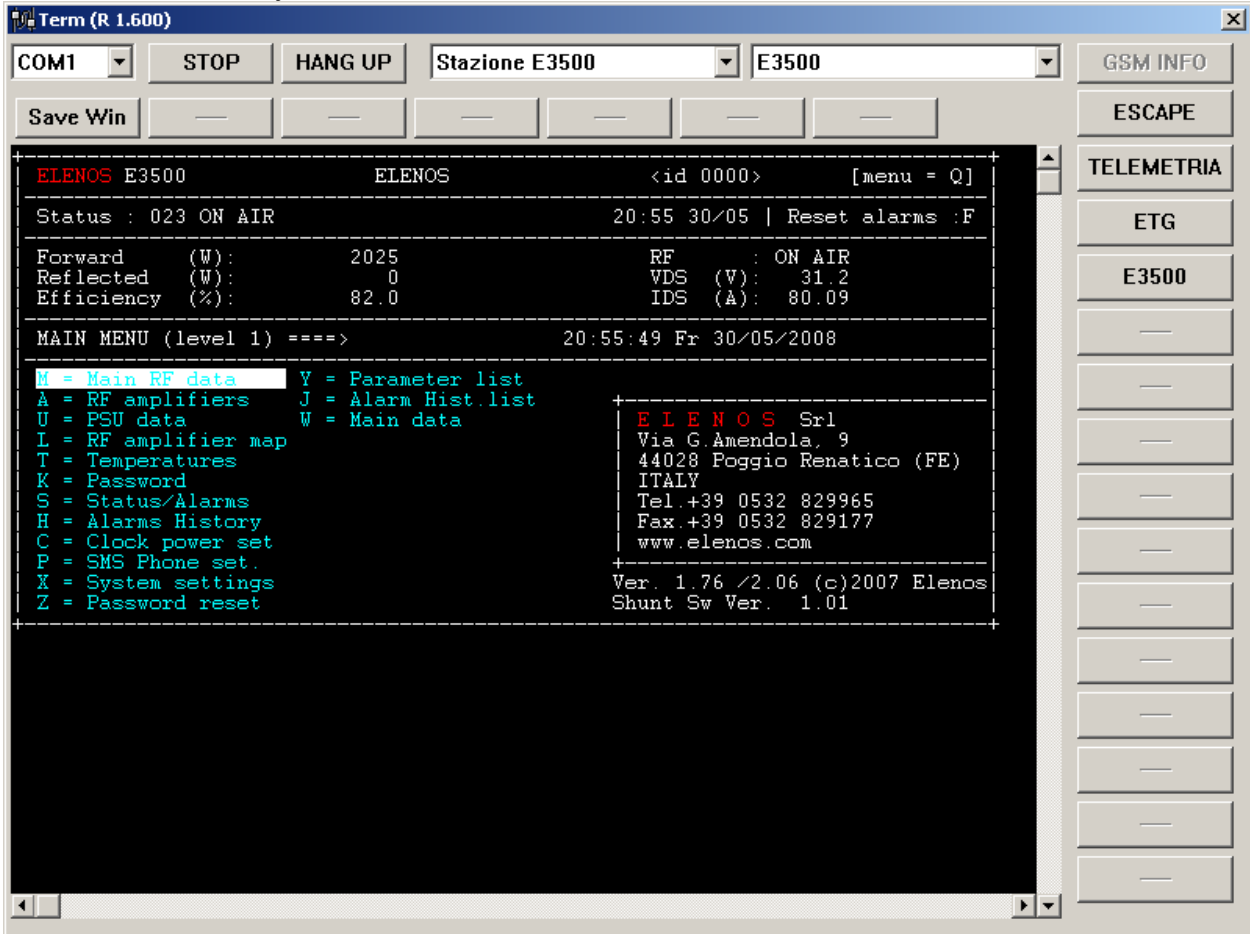


Once all parameters have been set, press q to return to the main menu and press the ESCAPE key to exit from telemetry.

Press ESCAPE to exit from the telemetry main menu.

### 3.6.1 Entering phone numbers in the E3500 or Family transmitters

Press the E3500 key to enter into the E3500 main menu.



Select the SMS Configuration menu heading by pressing the P key.

Term (R 1.600)

COM1 STOP HANG UP Stazione E3500 E3500 GSM INFO

Save Win

ESC

TELEMETRIA

ETG

E3500

Field Strength dBm: 0

Example : +393371234567890123

Phone N.1: FALSE

Phone N.2: FALSE

Phone N.3: FALSE

Phone N.4: FALSE

Phone N.5: FALSE

Id string: ELENOS

SMS enable: FALSE

Status : 023 ON AIR 20:57 30/05 | Reset alarms :F

Forward (W): 2050 RF : ON AIR

Reflected (W): 0 VDS (V): 31.2

Efficiency (%): 81.9 IDS (A): 80.17

SMS PHONE SET ==>

| Enable this account | Enable status request | Enable command execute | Enable global echo rx | Enable dig. SMS |
|---------------------|-----------------------|------------------------|-----------------------|-----------------|
| FALSE               | FALSE                 | FALSE                  | FALSE                 | FALSE           |
| FALSE               | FALSE                 | FALSE                  | FALSE                 | FALSE           |
| FALSE               | FALSE                 | FALSE                  | FALSE                 | FALSE           |
| FALSE               | FALSE                 | FALSE                  | FALSE                 | FALSE           |
| FALSE               | FALSE                 | FALSE                  | FALSE                 | FALSE           |

<id 0000> [menu = Q]

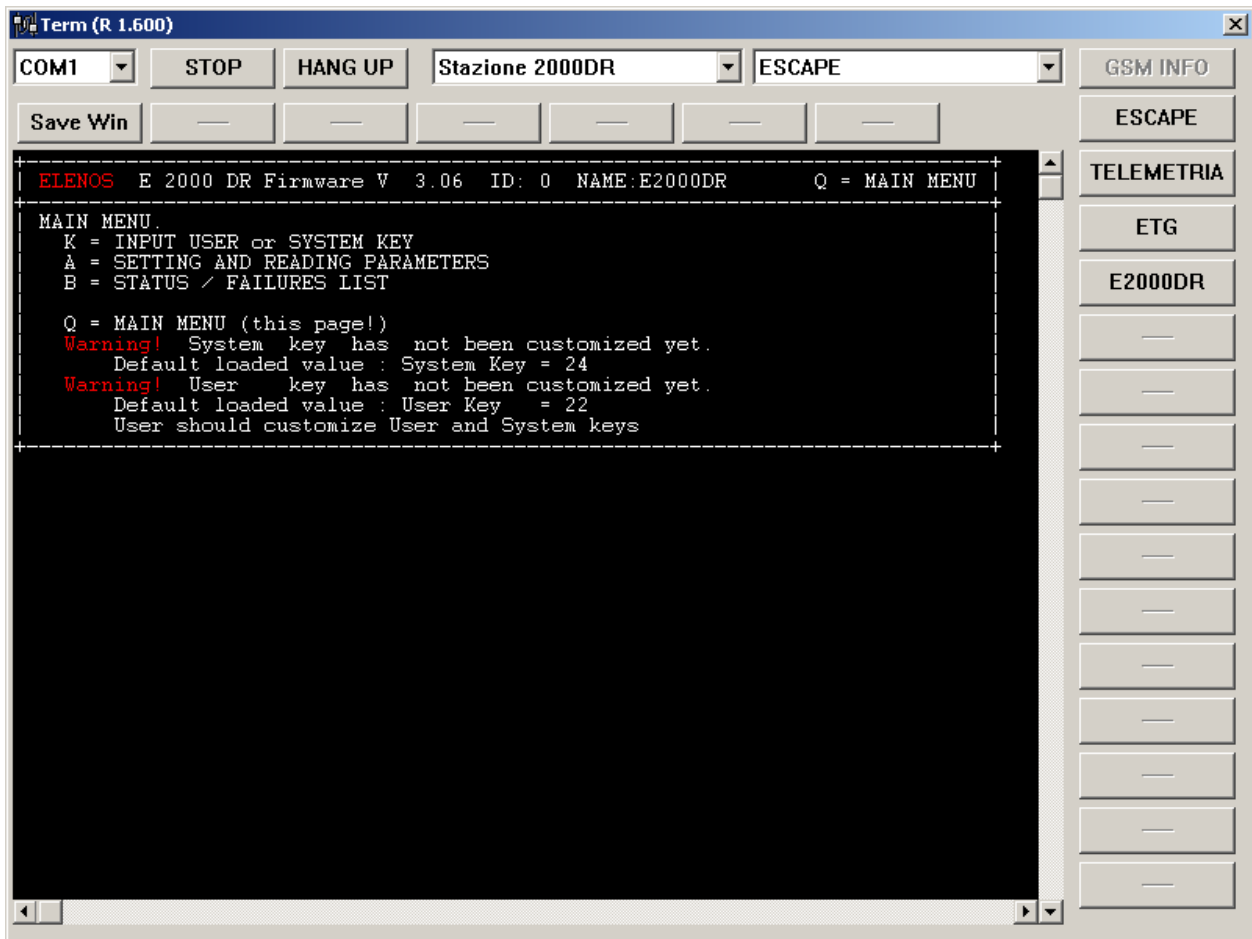
The programming procedure is now complete.

### 3.6.2 Entering phone numbers in the E2000DR or E5000K transmitters

To programme phone numbers of the E2000DR or E5000K transmitter memory, connect with the transmitter following the procedure for direct or modem connection. Once connected, connect with the E2000DR or E5000K modules pressing the corresponding key or by typing connection character sequence "21100".

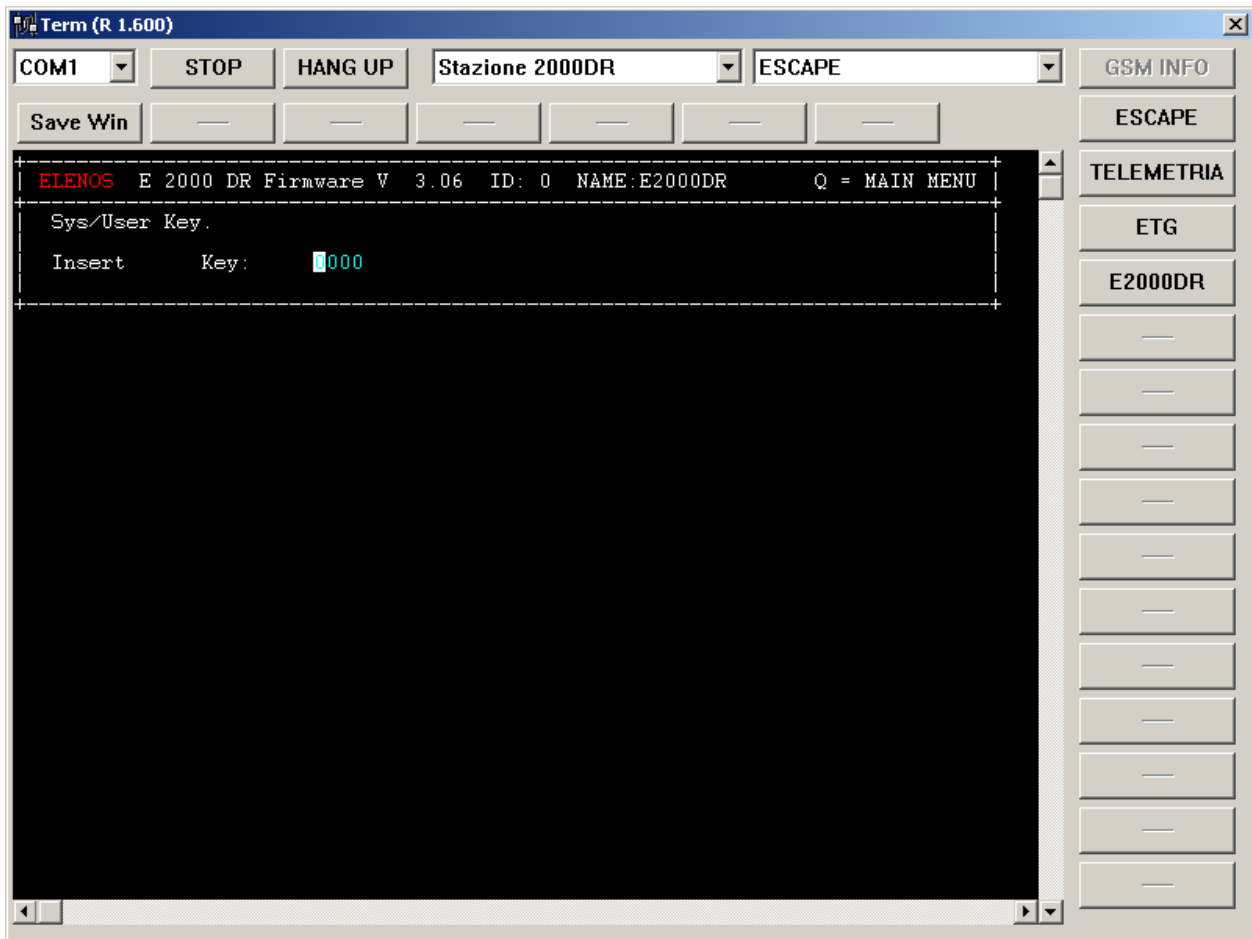
#### Transmitter E2000DR or E5000k main screen

To programme phone numbers of the E2000DR or E5000K transmitter memory, connect with the transmitter following the procedure for direct or modem connection. Once connected, connect with the E2000DR or E5000K modules pressing the corresponding key or by typing connection character sequence "21100".

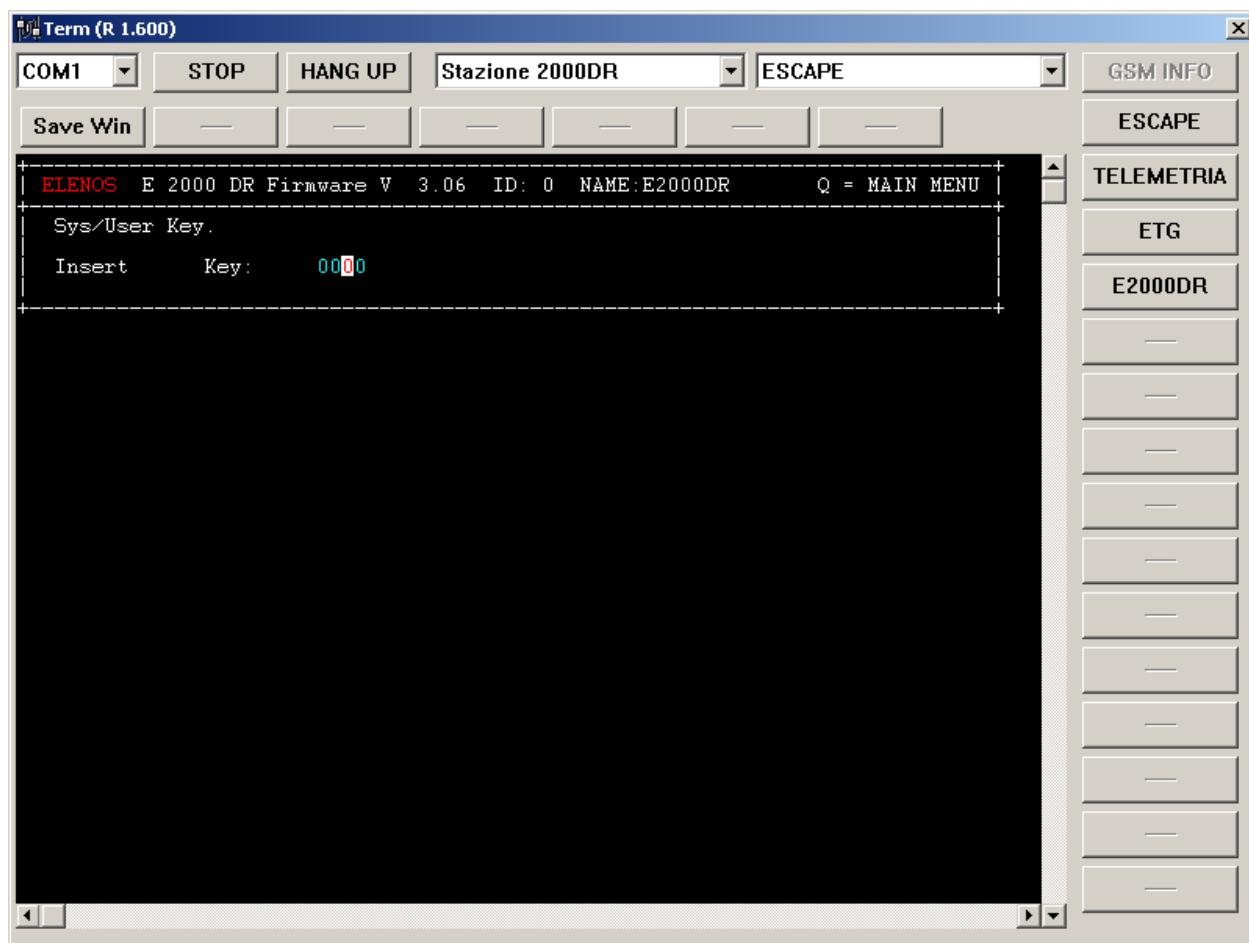




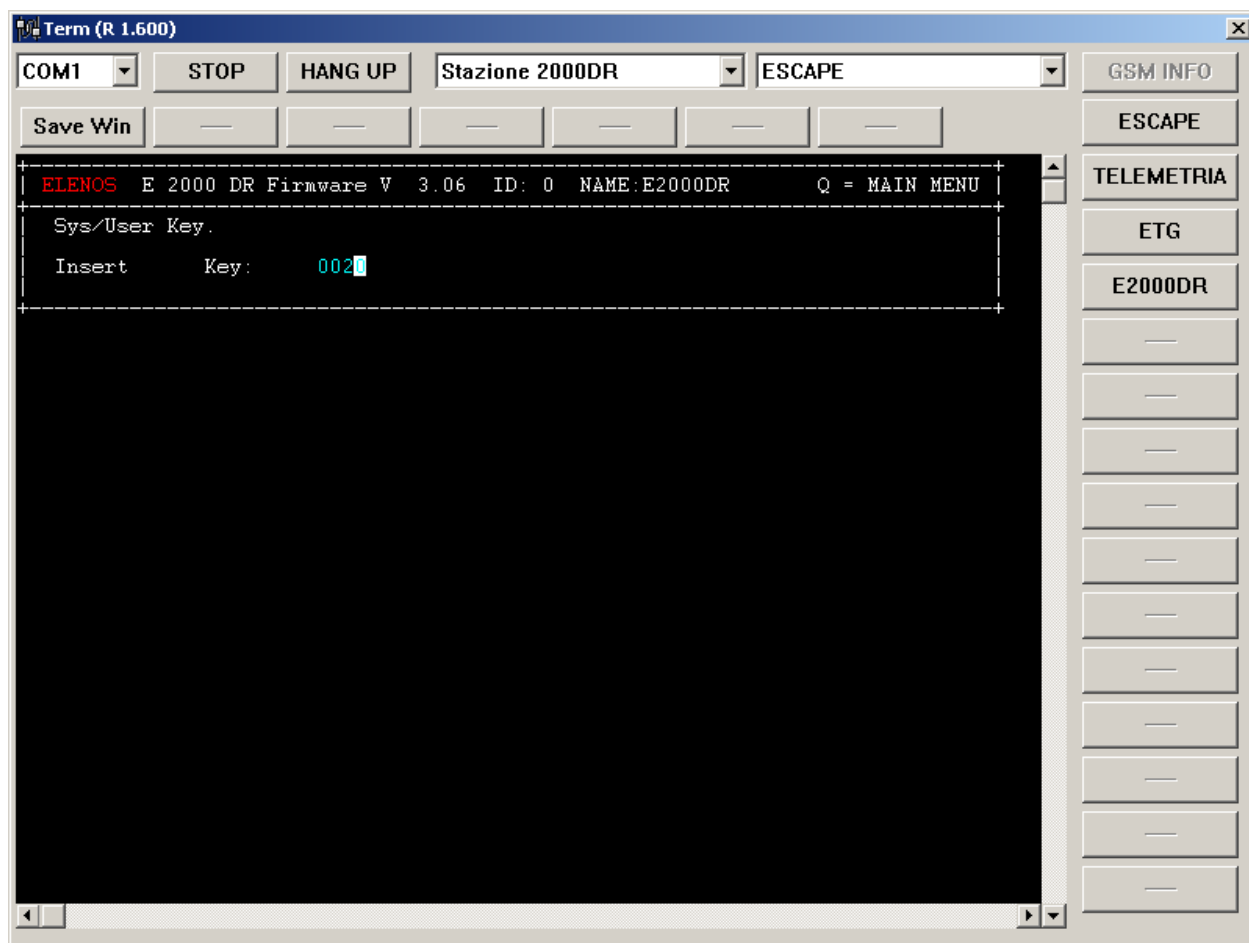
Enter the K menu to enter the password.



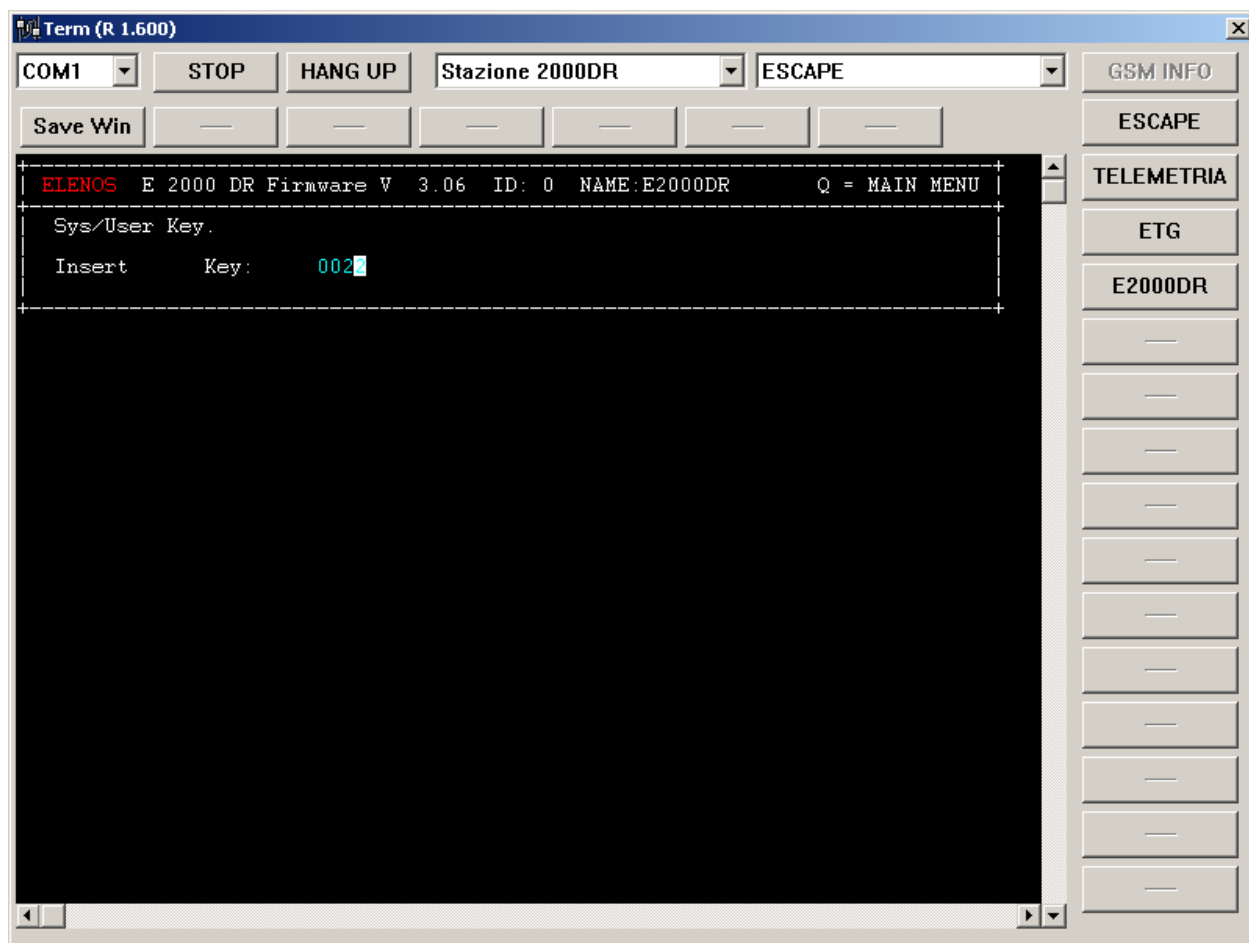
Use the arrow keys to move over the digits, select the digit you would like to change with the ENTER key. The digit will become red.



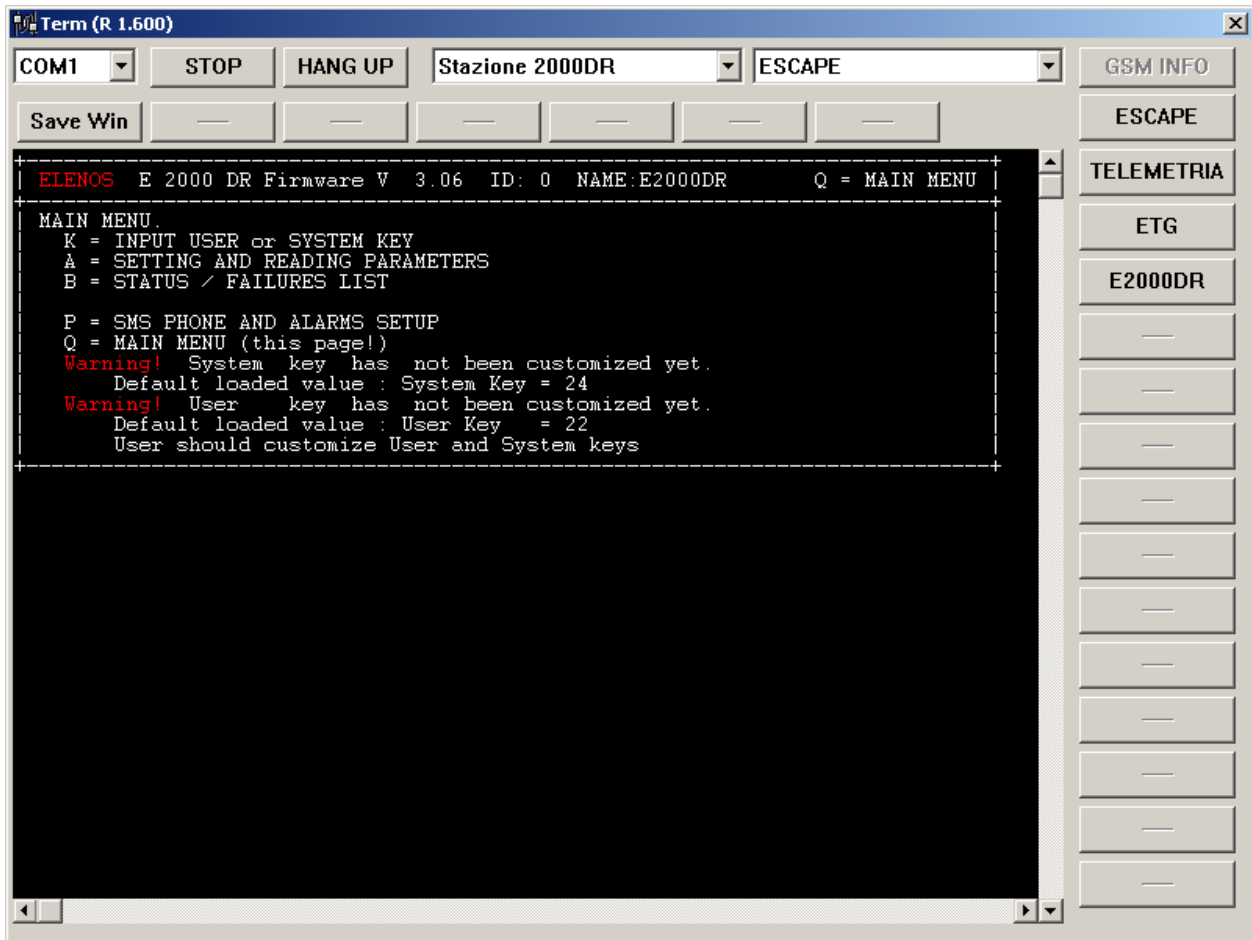
Move the UP and DOWN arrows to select the desired value and confirm with ENTER.



The default password for the E2000DR is 22 or 24.



Press Q to return to the main menu.



## Programming phone numbers and enabling alarms.

The screenshot shows the 'Term (R 1.600)' application window. At the top, there are dropdown menus for 'COM1', 'STOP', 'HANG UP', 'Stazione 2000DR', and 'ESCAPE'. Below these are several buttons, including 'Save Win' and several empty buttons. The main display area shows the 'ELENOS E 2000 DR Firmware V 3.06' status and a 'Q = MAIN MENU' prompt. The 'SMS CONFIGURATION' table is displayed with the following data:

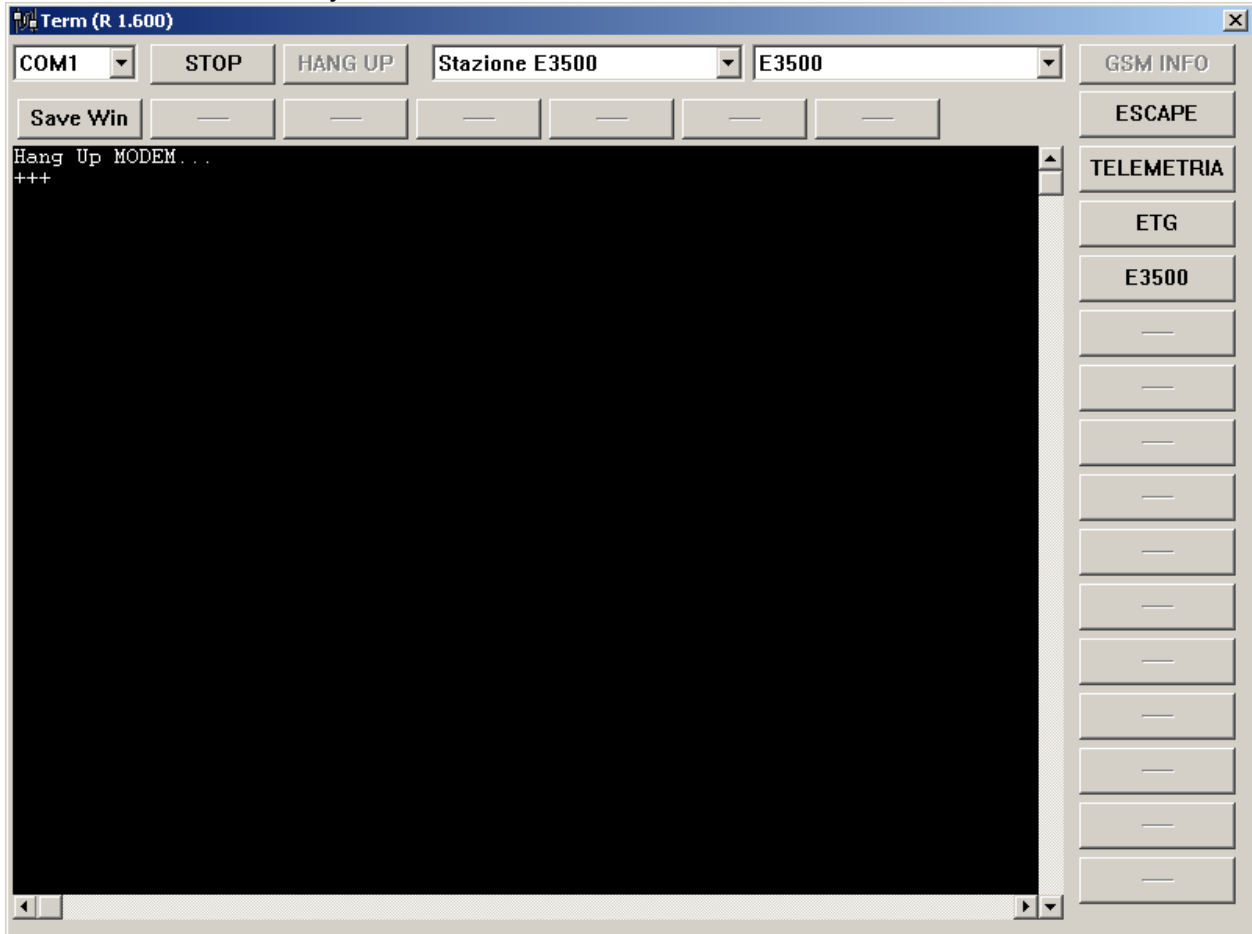
| SMS CONFIGURATION             | Enable this account | Enable status request | Enable command execute | Enable global echo rx |
|-------------------------------|---------------------|-----------------------|------------------------|-----------------------|
| Example : +393371234567890123 | TRUE                | TRUE                  | TRUE                   | TRUE                  |
| Phone N. 1: 393408258402      | TRUE                | TRUE                  | TRUE                   | TRUE                  |
| Phone N. 2: +393386741686     | FALSE               | FALSE                 | FALSE                  | FALSE                 |
| Phone N. 3:                   | FALSE               | FALSE                 | FALSE                  | FALSE                 |
| Phone N. 4:                   | FALSE               | FALSE                 | FALSE                  | FALSE                 |
| Phone N. 5:                   | FALSE               | FALSE                 | FALSE                  | FALSE                 |

Below the table, the 'PWR-UP ALARM' is set to '-3dB' and the 'ALARM' is set to 'TRUE'. The 'ID STRING' is 'E2000DR'. The 'Commands' section lists: PWR 1234 - set out pwr, ON - on air, STBY - stand-by, RES - reset alarms, and STS - status request. The 'COMMAND EXAMPLE' section provides instructions on how to use the commands, including the requirement to insert a space between PWR and the value required, and that commands are case insensitive.

The right sidebar contains buttons for 'GSM INFO', 'ESCAPE', 'TELEMETRIA', 'ETG', and 'E2000DR'. Below these are several empty buttons.

### 3.7 DISCONNECTING FROM A SITE

Press the HANG UP key to disconnect.



The system is now ready to re-connect to a site.

### 3.8 Completing telemetry programming procedure and passing to normal functioning mode

Proceed as follows if telemetry programming is performed with a direct connection:

- 1) Disconnect connector cable from the front panel called "CPU".
- 2) Press the reset key on the rear panel and verify that the "Modem Status" LED on the front panel reacts as follows:
- 3) As soon as the reset key is released, the LED will remain off for approximately 15 seconds. During this time, the microprocessor carries out internal initialisation functions.
- 4) After this period of time, the LED will begin to flash rapidly for approximately 15 seconds. During this time, the microprocessor is performing GSM Modem initialisation.
- 5) The LED will remain fixed on.
- 6) The LED flashes every time the telemetry must send a message.

The telemetry is now configured to function with the ETG family transmitter.

Test system functionality sending a "TSTS" and an "STS" sms

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E-Mail: [info@elenos.com](mailto:info@elenos.com)

## 4 PROCEDURE FOR ACTIVATING EQUIPMENT CONNECTION FROM THE CONTROL LINE

### 4.1 *Procedure for opening communications via modem.*

- Type "AT" + <ENTER> and verify that modem response is "OK". If this does not appear, check the selected serial port and modem connections
- Type "ATZ" + <ENTER> and verify that modem response is "OK". This command resets the modem.
- Then type the command "ATDT XXXXXXXX" + <ENTER> entering the phone number of the machine to be called in place of X (i.e. "ATDT 0039053212345678").
- Wait for the successful modem connection response "CONNECTED". If no response occurs, re-enter the ATZ command, then the ATDT command followed by the number.

### 4.2 *Procedure for opening communications (direct connection via cable or modem once connection has been set)*

- Type "2" to interrupt the previous display.
- Type "1" to activate connection. These steps before connection are not essential but are useful when attempting to pass to a second machine present on the station. It is therefore useful to always perform these steps.
- Type the character "i" followed by the machine address (i.e. i03).
- The machine will respond by displaying the main menu.

*Note: Always type zero before addresses lower than 10 (01,02..09), otherwise there will be no response.*

*Attention with laptops: activation of the "BLOCK NUM" key will alter the "i" function and therefore check that it has been removed.*

In the following explanation, the characters "XX" must be replaced by the two numerical characters of the address or equipment ID.

It is important to describe why it is necessary to type the character sequence "iXX", which represents the machine address. The telemetry or the 1+1 exchange allows the connection of several Elenos machines in parallel to the same modem. Type the sequence "iXX" to activate data and desired equipment menu display. After display of the desired information and parameter modification, it is possible to select another piece of equipment without having to make another call typing the sequence "21iXX". Character "2" deactivates the current equipment connection, character "1" sets up a new connection, and the new display is activated with characters "iXX".

During this phase, after pressing key 2, no equipment has the telemetry active. Therefore, none of them will respond until the character sequence "iXX" of the address is completed. Unfortunately, this phase does not give the user feedback until the sequence has been completed, when the main



menu of the involved equipment disappears. In the event of a loss of response after about ten seconds, simply retry by rewriting the complete sequence "21iXX"

Once connection has been completed, navigation between menus and parameter modifications depend on the connected machine model. In any event, never directly type keys "2", "3", "4" which deactivate the display of equipment data for character "2" as shown previously.

Commands are sent by pressing the upper or lower case character key, for example indifferently "t" or "T".

### 4.3 Addresses

Machine addresses can be set by the user. However, numbering given by the manufacturer is as follows:

|                              |                                   |
|------------------------------|-----------------------------------|
| Telemetry:                   | 01 (21i01)                        |
| ETG Stand alone:             | 10 (21i10)                        |
| ETG in system:               | 17 and 18                         |
| Combiner:                    | 00                                |
| E3500 Stand Alone Amplifier: | 00                                |
| E3500 in system amplifier:   | 11 12 13 14 15 and 21 22 23 24 25 |

## 5 GSM MODEM

Verify proper communication with the modem by displaying the main procedure T screen (TELEMETRY) and reading the field level of the "GSM FIELD" parameter.

This function is also useful for correct antenna pointing and for this reason we recommend use of the directive antenna pointed on the closest GSM cell.

If the level remains stopped on the indication "-113dBm", there may be problems with serial connection from or toward the TLMTR or antenna problems or even problems with registering the modem on the network.

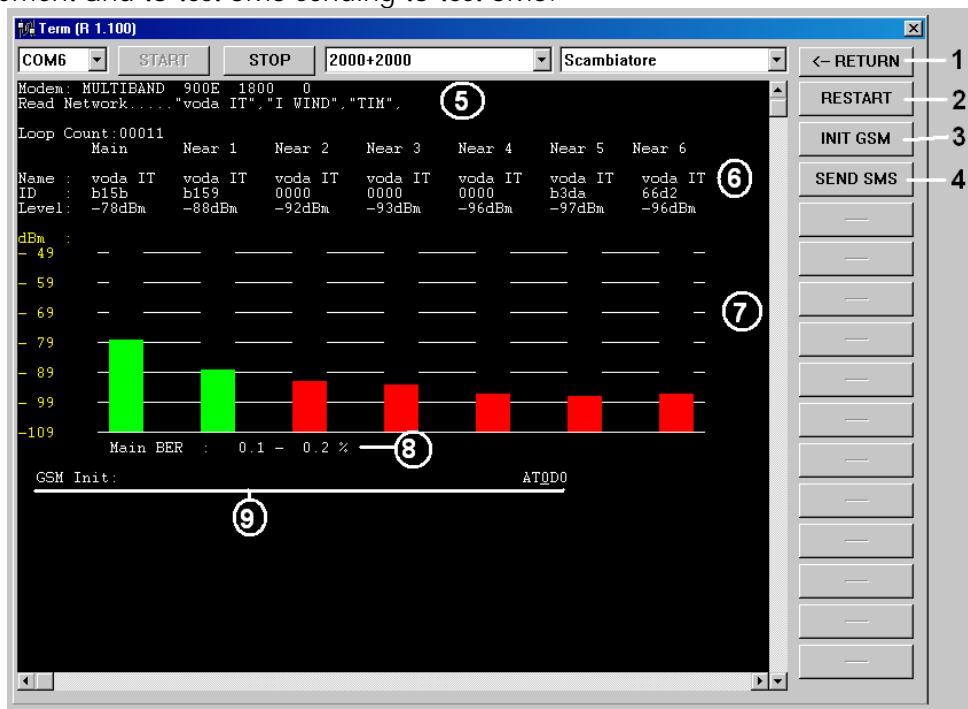
If you receive a satisfactory field (at least -80dBm), the equipment shall be ready for operation.

In the event of heavy traffic on the GSM network, obtaining connection via terminal may be very difficult and/or messages could be subject to delays. Unfortunately this inconvenience does not depend in any way on the equipment or modem utilised but are inconveniences of the GSM network itself and can take place differently depending on the administrator or cell serving the zone in which the modem is operating. It is therefore important to keep in mind that SMS notification is not immediate but depends on transit times and GSM network notification (mainly altered by instant traffic).

A non-quantifiable delay (generally brief) therefore exists for command completion and for echo message notification.

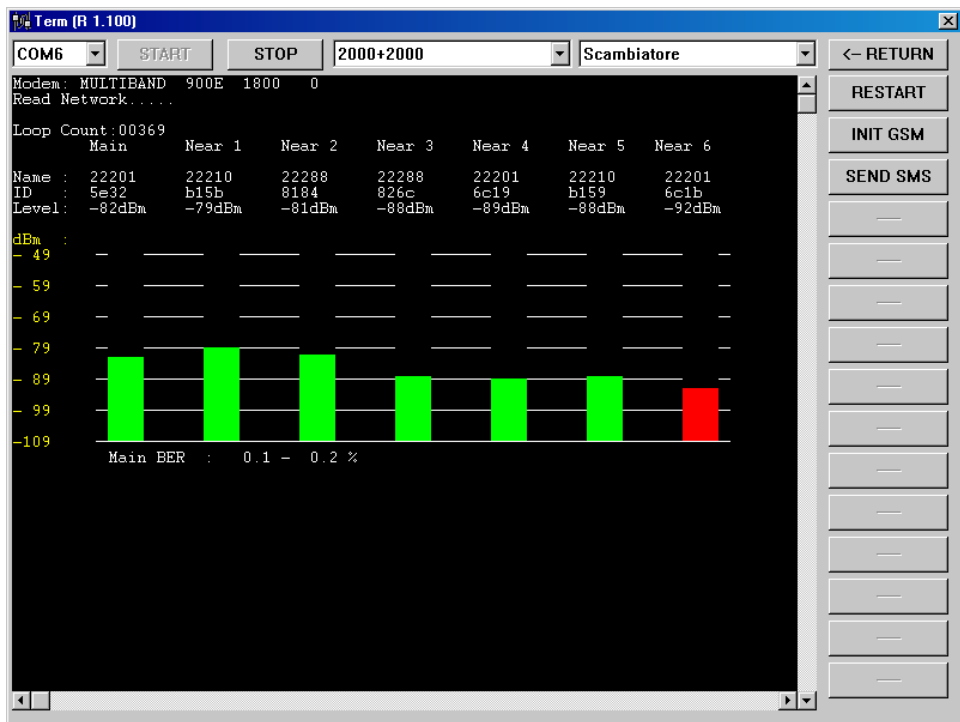
### 5.1.1 Window for GSM Modem management in TERM Software

The second software window permits GSM management. From this window, it is possible to test the GSM signal level in the main cell and of the 6 nearby cells, to initialise the GSM modem for use on Elenos equipment and to test SMS sending to test SMS.



1. Previous window return key.
2. Refresh display key. Clean the window and re-start search of nearby cells exactly like when passing from the main window to this window.
3. GSM modem initialisation key. !!! ATTENTION!!! This procedure initialises the GSM modem for function with ELENOS equipment and therefore may make the modem unusable for other programmes. Refer to the GSM\_INIT section present in the Config.ini file for initialisation parameters. The last two GSM initialisation phases require the entry of two phone numbers. This procedure is necessary only for ETG equipment while it has no effect on other equipment. During the initialisation phase, keys will be disabled and parameters sent to the GSM will appear on line 9. Keys will be enabled once again once procedure has been completed.
4. SMS sending key. The number where the test SMS is to be sent will be requested when this key is pressed. Once this number is entered, the test "SMS TEST Term Program" SMS will be sent.
5. Information lines. Information regarding the type of modem connected and possible operators to which it can be hooked shall appear on these lines. The modem will hook up to its own operator (SIM) and will attempt other in the event of possible Roaming and when its own operator cannot be found.
6. Description lines of the main cell and 6 nearby cells. In order, the abbreviated name of the operator, cell identification number and numerical level of the signal will appear. The Loop Count line represents the number of interrogations performed and varying in time indicates software functionality.
7. Graphic representation of the signal level of the main cell and nearby cells. The bars become red when below -90dB.
8. BER of the main cell. Bit error Rate of the main cell. It is not clear which is the max BER level for a good connection, but it is clear that the lower it is, the less connection problems there may be (the minimum is 0.1 – 0.2).
9. GSM initialisation status line if enabled by pressing key 3.

Simply remove the SIM from the modem to enter into the corresponding window for analysing cells other than your own operator. In this case, the software will display the 7 most powerful cells and, instead of the name of the operator, the identification number will appear.



In the example TIM = 22201, Wind = 22288 and Omnitel = 22210.

## 6 SMS.

### 6.1.1 Configuration

Attention: to enable equipment for sending an SMS, configure various user phone numbers and rights via the following procedure P window as described previously in the chapter:

#### PROCEDURE FOR ENTERING PHONE NUMBERS AND SMS PROGRAMMING

### 6.1.2 List of SMS managed by ECHOS3 telemetry:

SMS which can be sent to the telemetry include:

TRES, TSTS, TOUTONn, TOUTOFFn, TTXON, TTXOFF, TINTON, TONTOFF.

### 6.1.3 Commands

Commands currently implemented in the machine include:

|      |   |
|------|---|
| TRES | Cancellation of alarms not active on the alarms list    |
| TSTS | Request of equipment status via SMS (chapter 6.1.4.1.2) |

## TELEMETRY Use and maintenance manual

|          |  |
|----------|--|
| TOUTONn  | Logic activation of output n (where n = 1 .. 8), the current physical output status depends on configuration                                 |
| TOUTOFFn | Logic activation of output n (where n = 1 .. 8), the current physical output status depends on configuration                                 |
| TON      | It is possible to use this command which generates an O2 output impulse only if two outputs O2 and O3 are configured as impulsive, delay > 0 |
| TOFF     | It is possible to use this command which generates an O3 output impulse only if two outputs O2 and O3 are configured as impulsive, delay > 0 |
| TINTON   | Only if output O1 is status configured, delay = 0, can this command be used to generate the closing of said output                           |
| TINTOFF  | Only if output O1 is status configured, delay = 0, can this command be used to generate the opening of said output                           |

Remember to carefully follow indicated syntax, otherwise commands will not be performed. The system does not distinguish between upper and lower case.

### 6.1.4 Messages

The equipment sends three types of messages, described below:

#### 6.1.4.1.1 Alarm, abnormality message

The alarm or abnormality message summarises the logical status of alarms detected by the telemetry:

| <b>line</b> | <b>data</b>   |
|-------------|---------------|
| 1           | TLMTR ID 01   |
| 2           | DEFAULT       |
| 3           | DIN.0         |
| 4           | DIN.n         |
| 5           | AIN.0 : 5.00V |
| 6           | AIN.n : 2.95V |
| 7           | MAINS OK      |

|           |   |
|-----------|---|
| Line 1    | Equipment identification description with settable address (in example 01)  |
| Line 2    | "ID STRING" customized description  |
| Line 3..4 | List of digital alarms; the list of names associated to digital inputs with alarms  |
| Line 5..6 | List of analog alarms; composed of the name associated to the input followed by the value generated by it and the unit of measure |
| Line 7    | Presence (MAINS OK) or absence (MAINS_FAULE) of external power supply   |

**6.1.4.1.2 Status message**

The status message summarises the physical state of digital inputs and outputs and the converted value of analog inputs:

| <b>line</b> | <b>data</b> |
|-------------|-------------|
| 1           | TLMTR ID 01 |
| 2           | DEFAULT     |
| 3           | A1: 23.2 C  |
| 4           | A2: 38.4 V  |
| 5           | A3: 22.23 A |
| 6           | A4: 595 W   |
| 7           | A5: 0 -     |
| 8           | A6: 0 -     |
| 9           | A7: 0 -     |
| 10          | A8: 0 -     |
| 11          | I:01010101  |
| 12          | O:00000111  |

|         |   |
|---------|---|
| Line 1  | Equipment identification description with settable address (in example 01)                                      |
| Line 2  | "ID STRING" customized description  |
| Line 3  | Acquired value of analog input 1 with relative unit of measure  |
| Line 4  | Acquired value of analog input 2 with relative unit of measure  |
| Line 5  | Acquired value of analog input 3 with relative unit of measure  |
| Line 6  | Acquired value of analog input 4 with relative unit of measure  |
| Line 7  | Acquired value of analog input 5 with relative unit of measure  |
| Line 8  | Acquired value of analog input 6 with relative unit of measure  |
| Line 9  | Acquired value of analog input 7 with relative unit of measure  |
| Line 10 | Acquired value of analog input 8 with relative unit of measure  |
| Line 11 | Physical status of digital inputs; the first bit to the left corresponds with input 8 and the last with input 1 |
| Line 12 | Physical status of digital inputs; the first bit to the left corresponds with input 8 and the last with input 1 |

**6.1.4.1.3      Echo message to commands**

The echo message to commands communicates commands performed:

| <b>line</b> | <b>data</b>   |
|-------------|---------------|
| 1           | TLMTR ID 01   |
| 2           | DEFAULT       |
| 3           | +393371234567 |
| 4           | STS           |

|   |  |
|---|--|
| Line 1  | Equipment identification description with settable address (in example 01) |
| Line 2  | "ID STRING" customized description   |
| Line 3  | Phone number of GSM from which command is coming                           |
| Line 4  | Command performed  |
| SMS String  | 10 character personalisable string   |
| STBY, -3dB Alarm, RedPwr, Exc.exchange, Status, Command, Cmd not allowed, No mains xx m | status of amplifier and reason for SMS send                                |
| 000 CORRECT WORKING   | Reason for stop or main signal   |
| FWD 3000 W  | Direct power   |
| REFL 0 W  | Reflected power  |



### 6.1.5 Dip Switch configuration

This procedure describes the configuration of the Dip Switch, if one of the following equipment is connected to the Telemetry.

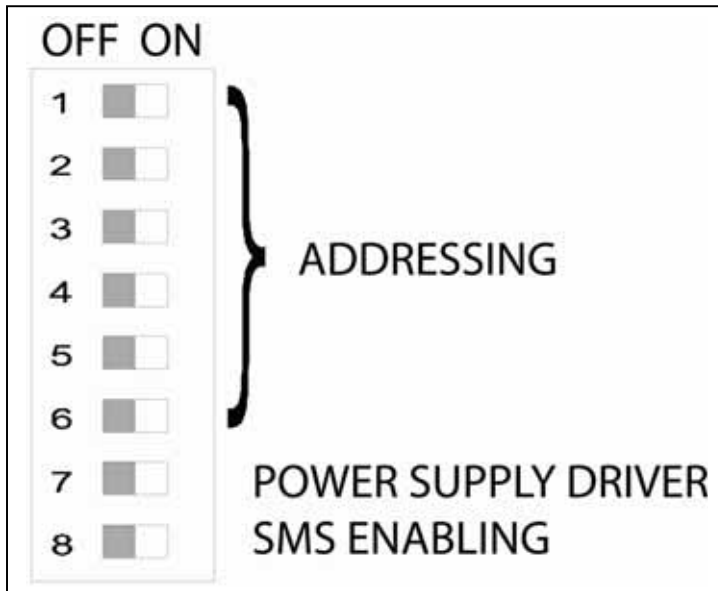
To proceed with this configuration manually, just remove the cover in the small of the front panel, as shown in the photos and go to act on the switch to its own dedicated machine, and subsequently shown in the layouts.



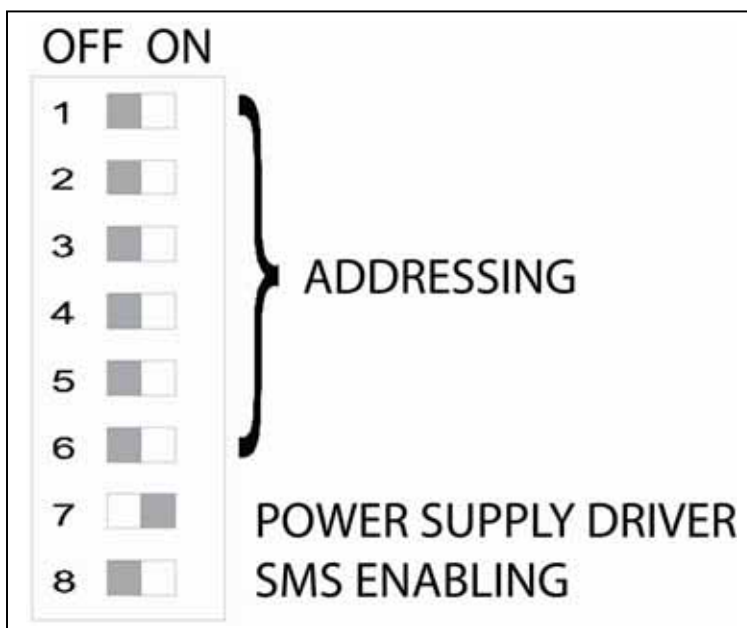
### Dip Switch configuration

Following the different configuration of the equipment E2000DR, E2000TR, E5000C:

#### 6.1.5.1.1 Configuration Dip Switch E2000TR



#### 6.1.5.1.2 Configuration Dip Switch E2000DR and E5000C



### Dip switch 1-6:

Dip switches from 1 to 6 are used for the addressing of the equipment when it operates in a combined system, or when the same modem is used to monitor several machines.

The address is inserted according to the binary code and the weight of every switch equals the power of 2 raised to n-1, where "n" corresponds to the switch number on the "ON" mode.

Therefore if one wants to set the equipment with 22 as address, one will have to programme the switches as follows:

1=OFF (weight  $2^0 = 1$ )  
2=ON (weight  $2^1 = 2$ )  
3=ON (weight  $2^2 = 4$ )  
4=OFF (weight  $2^3 = 8$ )  
5=ON (weight  $2^4 = 16$ )  
6=OFF (weight  $2^5 = 32$ )

-----  
Totale =  $2 + 4 + 16 = 22$

The address 0 (default) is the one of the equipment alone. For combined systems or for several machines connected to the same modem one will have to choose the addresses going from 1 to 63.

We would like to remember that the management of the equipment via text messages will be active only for single machines having the address "0".

### \*\*Dip switch 7:

Power supplier energy selection:

OFF = TR version

ON = DR switching version

### \*\*WARNING!

**This dip switch is set up at the factory according to the kind of power supplier that goes with the amplifier and must not be modified, unless the power supplier is changed.**

### Dip switch 8

Activation of text messaging management:

OFF = disabled SMS communication (default).

ON = Enabled SMS communication.

It is possible to disable the SMS communication whenever there is not a GSM modem connected to the equipment or in case one is not interested in this kind of service, so that there is no need to wait for the modem initialisation during the powering up of the machine.

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## 7 ELENOS EQUIPMENT DEFAULT PASSWORD SUMMARY

Passwords permit data modification on equipment and access to different screens. Typically, all machine operation parameters can be modified with the USER level password, while with SYSTEM level password it is possible to change machine configuration (Phone numbers for SMS, hardware settings, etc.).

| Model          | USER level | SYSTEM level |
|----------------|------------|--------------|
| 1 + 1 Exchange | 0010       | 0020         |
| ETG            |            | AAAA         |
| E2000          | 0022       | 0024         |
| E3000          | 0000       | 0000         |
| E5000          | 0022       | 0024         |
| E15000         | 0000       | 0000         |
| E30000         | 0000       | 0000         |

Note: These are default values and can be modified by the user.

## EQUIPMENT SCREENS

### 7.1 "ETG" Equipment Screen.

Telemetry data will be displayed once the main menu screen has appeared.  
Type the password letter sequence "AAAA" from the main menu to modify parameters.  
It will now be possible to modify equipment parameters.

Perform the following operations to modify frequency:

1. Type the character "T". If the command is accepted, the frequency value will flash, otherwise press "T" again.
2. Then press "]" to increase frequency, watching the frequency parameters.
3. Press "[" to decrease frequency.
4. Press "S" when the modification is complete to save frequency and close modification.




Perform the following operations to modify the target power:

1. Type the character "P".
2. Then press "]" to increase power, watching the power level.
3. Press "[" to decrease power.
4. Press "S" when the modification is complete to save the value and close modification.

Perform the following operations to modify STAND BY/ON AIR equipment status:

1. Type the character "PX", toggle command (no-off-on-off).

Never type numbers directly on the keyboard, modifying parameters. In any event, never directly type keys "2", "3", "4" which deactivate the display of equipment data for character "2" as shown previously.

|  |  |                |  |
|--|--|----------------|--|
| ELENOS - ETG500 ON BOARD MONITOR - V1.01 del 11/10/2000    |  |                |  |
| Frequency: 094.50 MHz * PLL is LOCKED * Preemphasys is OFF |  |                |  |
| FPWR   |  |                |  |
|  | 0w      100w      200w      300w      400w      500w      600w                     |                |  |
| RPWR   |  |                |  |
|  | 0w      10w      20w      30w      40w      50w      60w                           |                |  |
| MPX  |  |                |  |
|  | -21dB   -18dB   -15dB   -12dB   -9dB   -6dB   -3dB   0dB   +3dB                    |                |  |
| [M] Main/Principale  |  | [H] Help/Aiuto |  |

|  |  |                |  |
|--|--|----------------|--|
| ELENOS - ETG500 ON BOARD MONITOR - V1.01 del 11/10/2000  |  |                |  |
| <p>Page/Pagine:      [ H = Help/Aiuto ]      [ M = Main/Principale ]</p> <p>Power/Potenza: [P], [ + ] Up/Su, [ - ] Down/Giu, [S] = Save/Salva (EEPROM)</p> <p>Frequency/za: [F], [ + ] Up/Su, [ - ] Down/Giu, [S] = Save/Salva (EEPROM)</p> <p>End &amp; Quit / Fine ed Uscita : \$C</p> |  |                |  |
| [M] Main/Principale  |  | [H] Help/Aiuto |  |

## 7.2 E3500 Family Equipment Common Screens

All E2000/3000/3500/7000/10000/15000/30000/ETG3500 series equipment has common management and telemetry modes.

The structure of the screen is normally composed of three areas:

- Header bar common to all screens.  
Includes the machine model, customized client description which is "ELENOS" in default, the identifying address of the machine in communication, main alarm/signal of amplifier status and memorised alarm reset flags.

|                   |        |             |                 |
|-------------------|--------|-------------|-----------------|
| ELENOS EXXXXXX    | ELENOS | <id 0001>   | [menu = Q]      |
| Status : 004 STOP |        | 09:34 26/10 | Reset alarms :F |

- Summary of main information present on most amplifier screens.

|                 |             |          |        |
|-----------------|-------------|----------|--------|
| Forward (W):    | 3075 [3000] | RF :     | ON AIR |
| Reflected (W):  | 15          | VDS (V): | 44.7   |
| Efficiency (%): | 71.7        | IDS (A): | 95.83  |

- Summary of main information present on most screens of amplifiers combined with dual drive.

|                 |           |             |      |       |          |      |
|-----------------|-----------|-------------|------|-------|----------|------|
| Forward (W):    | 0 [10000] | Dualdrive : | MAN  | EXC.2 | Rf :     | STBY |
| Reflected (W):  | 0         | Exciter 1 : | STBY | FLT   | Vds (V): | 0    |
| Efficiency (%): | 0.0       | Exciter 2 : | STBY |       | Ids (A): | 0    |

- Summary of main information present on most exciter screens.

|  |     |         |                  |       |      |          |      |  |  |
|--|-----|---------|------------------|-------|------|----------|------|--|--|
| Summary of main information present on most driver boards: |     |         |                  |       |      |          |      |  |  |
| -----  |     |         |                  |       |      |          |      |  |  |
| Forward (W):   | 0   | [ 3000] | Frequency (MHz): | 98.00 | RF   | :        | STBY |  |  |
| Reflected (W):   | 0   |         | LOCK -3dB        | TEMP  | WRNG | VDS (V): | 0.0  |  |  |
| Efficiency (%):  | 0.0 |         | PREE CLIP        | NOAU  | STER | IDS (A): | 0.00 |  |  |
| -----  |     |         |                  |       |      |          |      |  |  |

- The lower part of the screen is specific and depends on context.

## TELEMETRY Use and maintenance manual

Equipment menus have many of the same headings in the various models. These common headings are listed below. The first letter indicates the key to press to access that window:

T = Temperatures  
K = Password  
S = Status/Alarms  
H = Alarms History  
C = Clock power set  
P = SMS Phone set.  
Z = Password reset  
X = System settings  
Y = Params x Term.exe  
J = Alarms x Term.exe



### 7.2.1 Common windows

### 7.2.2 (Key "K") PASSWORD

~

-----

PASSWORD ==>

-----

Password :           0000

-----

+

### 7.2.3 (Key "S") STATUS/ALARMS

~

-----

STATUS/ALARMS (1 - 17) ==>

ACTIVE 023 ON AIR

-----

+

### 7.2.4 (Key "H") ALARMS HISTORY

```

-----
ALARMS HISTORY ==>  ([-] prev.pag. [+] next pag. [arrow up/down] next/prev.)
3209) 017 PSU SHUNT COMM TIMEOUT                26/10 09:12:37
3208) 020 POWER UP                               26/10 09:12:33
3207) 021 POWER DOWN                             25/10 18:28:08
3206) 017 PSU SHUNT COMM TIMEOUT                25/10 17:10:24
3205) 020 POWER UP                               25/10 17:10:20
3204) 021 POWER DOWN                             25/10 17:08:58
3203) 017 PSU SHUNT COMM TIMEOUT                25/10 17:08:36
3202) 020 POWER UP                               25/10 17:08:32
3201) 021 POWER DOWN                             25/10 17:07:05
3200) 017 PSU SHUNT COMM TIMEOUT                25/10 17:04:38
3199) 020 POWER UP                               25/10 17:04:34
3198) 021 POWER DOWN                             25/10 17:03:08
3197) 017 PSU SHUNT COMM TIMEOUT                25/10 17:02:35
3196) 020 POWER UP                               25/10 17:02:31
3195) 021 POWER DOWN                             25/10 17:01:08
3194) 017 PSU SHUNT COMM TIMEOUT                25/10 16:58:51
3193) 020 POWER UP                               25/10 16:58:47
3192) 021 POWER DOWN                             25/10 16:57:16
3191) 017 PSU SHUNT COMM TIMEOUT                25/10 16:40:15  >>
-----

```

### 7.2.5 (Key "C") CLOCK POWER SET

```

-----
CLOCK POWER SET ==>
-----

```

```

Target power mode fixed for all the 24 hours: TRUE
Fixed target power                               (W): 3000
-----

```

```

Target power on the 24 hours
00:00 am to 00:59 am (W): 3000          00:00 pm to 00:59 pm (W): 3000
01:00 am to 01:59 am (W): 3000          01:00 pm to 01:59 pm (W): 3000
02:00 am to 02:59 am (W): 3000          02:00 pm to 02:59 pm (W): 3000
03:00 am to 03:59 am (W): 3000          03:00 pm to 03:59 pm (W): 3000
04:00 am to 04:59 am (W): 3000          04:00 pm to 04:59 pm (W): 3000
05:00 am to 05:59 am (W): 3000          05:00 pm to 05:59 pm (W): 3000
06:00 am to 06:59 am (W): 3000          06:00 pm to 06:59 pm (W): 3000
07:00 am to 07:59 am (W): 3000          07:00 pm to 07:59 pm (W): 3000
08:00 am to 08:59 am (W): 3000          08:00 pm to 08:59 pm (W): 3000
09:00 am to 09:59 am (W): 3000          09:00 pm to 09:59 pm (W): 3000
10:00 am to 10:59 am (W): 3000          10:00 pm to 10:59 pm (W): 3000
11:00 am to 11:59 am (W): 3000          11:00 pm to 11:59 pm (W): 3000
-----

```

### 7.2.6 (Key "P") SMS PHONE SET

|                     |                     |                           |                             |                              |                             |                       |
|---------------------|---------------------|---------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------|
| SMS PHONE SET ==>   |                     |                           |                             |                              |                             |                       |
| Field Strength dBm: | 0                   | Enable<br>this<br>account | Enable<br>status<br>request | Enable<br>command<br>execute | Enable<br>global<br>echo rx | Enable<br>dig.<br>SMS |
| Example :           | +393371234567890123 | -----                     | -----                       | -----                        | -----                       | -----                 |
| Phone N.1:          |                     | FALSE                     | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.2:          |                     | FALSE                     | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.3:          |                     | FALSE                     | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.4:          |                     | FALSE                     | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.5:          |                     | FALSE                     | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Id string: ELENOS   |                     | SMS enable: FALSE         |                             |                              |                             |                       |

OR

|                                    |                                      |                             |                              |                             |                       |
|------------------------------------|--------------------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------|
| SMS PHONE SET ==>                  |                                      |                             |                              |                             |                       |
| Field Strength dBm: - 51<br>#####> | Enable<br>this<br>account            | Enable<br>status<br>request | Enable<br>command<br>execute | Enable<br>global<br>echo rx | Enable<br>dig.<br>SMS |
| Example : +393371234567890123      | -----                                | -----                       | -----                        | -----                       | -----                 |
| Phone N.1:                         | FALSE                                | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.2:                         | FALSE                                | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.3:                         | FALSE                                | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.4:                         | FALSE                                | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
| Phone N.5:                         | FALSE                                | FALSE                       | FALSE                        | FALSE                       | FALSE                 |
|                                    |                                      |                             |                              |                             |                       |
| Id string: ELENOS                  | SMS enable : FALSE                   |                             |                              |                             |                       |
| Ok Bad                             | Mains alarm Enable : TRUE            |                             |                              |                             |                       |
| Sms sended 0 0                     | Mains alarm delay (m): 30            |                             |                              |                             |                       |
| Sms received 0 0                   | FWD over 2/3 TARGET (-1,76DB): FALSE |                             |                              |                             |                       |

See "SMS Configuration" chapter.

**7.2.7 (Key "X") SYSTEM SETTINGS**

```

-----
SYSTEM SETTINGS ==>
-----
Amplifier id      (n.):    1      Special SMS Enable
Host Link Id      (n.):    0      Mains alarm Enable           : TRUE
User password     (n.): 0000      Mains alarm delay        (m):   30
System password   (n.): 0000      FWD over 2/3 TARGET (-1,76DB): FALSE

LCD contrast      (n.): F128
Power adjust      (%):   100
SWR Foldback Enable      : FALSE
-----
Actual date       : 28/03/2006 02 12:16:05
New date          : 28/03/2006 02 12:16:02      UPDATE   : FALSE
-----

```

OR

```

-----
SYSTEM SETTINGS ==>
-----
Amplifier Id      (n.):    0
Host Link Id      (n.):    0
User Password     (n.): 0000
System Password   (n.): 0000
Temperature Unit   : CELSIUS
Internal Exciter Enable : TRUE      Put 0 on Trg. at Frq. change :TRUE
Pre Amplifier ALC Active : TRUE
Power adjust      (%):   100
SWR Foldback Enable      : FALSE
-----
Actual date       : 26/10/2007 05 09:34:34
New date          : 26/10/2007 05 09:34:28      UPDATE   : FALSE
-----

```

### 7.2.8 (Key "Z") PASSWORD RESET

Used to cancel user password and system password (see screen above). The proper procedure is as follows:

- 1) Take note of the Unlock Code.
- 2) Call ELENOS service assistance at +39 0532 829 965 and communicate the Unlock Code.
- 3) ELENOS will give you a value to be entered in the Password Recovery field with which all passwords will be reset as the system does not need password entry.
- 4) The Unlock Code and Password Recovery are linked to the data as the unlock operation must be carried out during that same day.

```
~
+-----+
| PASSWORD RESET ==> |
+-----+
|
| Unlock Code      : 0d1c
| Password Recovery : 0000
|
+-----+
+~
```

## 7.3 E2K/3K/E3.5K

### 7.3.1 E2K-3K-3.5K MAIN MENU

```

-----
MAIN MENU (level 1) ====>                               12:13:16 Tu 28/03/2006
-----
M = Main RF data      Y = Params x Term.exe
A = RF amplifiers     J = Alarms x Term.exe
U = PSU data          W = Main data
L = RF amplifier map
T = Temperatures
K = Password
S = Status/Alarms
H = Alarms History
C = Clock power set
P = SMS Phone set.
X = System settings
Z = Password reset

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Fax.+39 0532 829177
www.eLENOS.com

Ver. 1.47 /2.03 (c)2006 Elenos
Shunt Sw Ver. 1.01
-----

```

### 7.3.2 E2K-3K-3.5K (Key "M") MAIN RF DATA

```

-----
MAIN RF DATA ====>
-----
VDS      (V):      44.7
IDS      (A):      95.80
DC power (W):      4282
Efficiency (%) :    71.8
-----
Temperatures(C):    45.3
-----
Working Time   :    0:48:04
Fans Working T.: 105:33:06  Reset : F
-----
TARGET PWR (W) :    3100
-----

```

### 7.3.3 E2K-E3K-E3.5K (Key "T") RF AMPLIFIERS

Information between E2K/3K/3.5K differs slightly in the number of RF modules and temperature probes on RF dissipater.

|                   |         |      |       |      |      |      |            |      |      |       |      |     |      |
|-------------------|---------|------|-------|------|------|------|------------|------|------|-------|------|-----|------|
| RF AMPLIFIERS ==> |         |      |       |      |      |      |            |      |      |       |      |     |      |
| Currents          | (A):    | 1)   | 7.64  | 2)   | 8.19 | 3)   | 7.90       | 4)   | 8.91 | 5)    | 7.54 | 6)  | 8.28 |
|                   | :       | 7)   | 8.21  | 8)   | 7.88 | 9)   | 8.11       | 10)  | 7.94 | 11)   | 7.82 | 12) | 7.35 |
| DC power          | (W):    | 1)   | 341   | 2)   | 366  | 3)   | 353        | 4)   | 398  | 5)    | 337  | 6)  | 370  |
|                   | :       | 7)   | 366   | 8)   | 352  | 9)   | 362        | 10)  | 354  | 11)   | 349  | 12) | 328  |
| Temperatures(C):  |         | 40.8 | 45.3  | 37.6 | 43.7 | 37.8 | 43.5       | 38.7 | 43.8 | 40.3  | 43.7 |     |      |
|                   | : Max.: | 45.3 |       |      |      |      |            |      |      |       |      |     |      |
| VDS               | (V):    |      | 44.7  |      |      |      | Efficiency | (%): |      | 71.8  |      |     |      |
| IDS               | (A):    |      | 95.77 |      |      |      | VBias      | (V): |      | 10.20 |      |     |      |
| Power             | (W):    |      | 4280  |      |      |      |            |      |      |       |      |     |      |

### 7.3.4 E2K-E3K-E3.5K (Key "U") PSU DATA Power Supply Unit Data

The number of power supply units (PSU) present can differ.

| PSU DATA ==>     |      |    |        |    |      |    |      |        |     |  |  |  |
|------------------|------|----|--------|----|------|----|------|--------|-----|--|--|--|
| Enable           | (-): | 1) | TRUE   | 2) | TRUE | 3) | TRUE |        |     |  |  |  |
| Currents         | (A): | 1) | 0.0    | 2) | 0.0  | 3) | 0.0  | Total: | 0.0 |  |  |  |
| Voltages         | (V): | 1) | 0.0    | 2) | 0.0  | 3) | 0.0  |        |     |  |  |  |
| DC power         | (W): | 1) | 0      | 2) | 0    | 3) | 0    | Total: | 0   |  |  |  |
| Temperatures(C): |      | 1) | 0.0    | 2) | 0.0  | 3) | 0.0  | Max.:  | 0.0 |  |  |  |
| Vcc              | (V): |    | 5.06   |    |      |    |      |        |     |  |  |  |
| -12V             | (V): |    | -13.73 |    |      |    |      |        |     |  |  |  |
| +13V             | (V): |    | 11.49  |    |      |    |      |        |     |  |  |  |

### 7.3.5 E2K-E3K-E3.5K (Key "L") RF AMPLIFIERS MAP

Information between E2K/3K/3.5K differs slightly in the number of RF modules and temperature probes on RF dissipater.

-----

Forward (W):3075

RF : ON AIR

Reflected (W):15

VDS (V): 44.7

Efficiency (%):71.8

IDS (A): 95.79

-----

RF AMPLIFIERS MAP (Module number, Current, DC power, Temperature) ==>

-----

Internal environment (C): 29.0

12

10

8

6

4

2

+-----+

+-----+

+-----+

+-----+

+-----+

+-----+

| 7.3A| 10

| 7.9A| 8

| 7.8A| 6

| 8.2A| 4

| 8.9A| 2

| 8.1A|

| 328W| 43 C

| 354W| 43 C

| 352W| 43 C

| 370W| 43 C

| 398W| 45 C

| 366W|

+-----+

+-----+

+-----+

+-----+

+-----+

+-----+

11

9

7

5

3

1

+-----+

+-----+

+-----+

+-----+

+-----+

+-----+

| 7.8A| 9

| 8.1A| 7

| 8.2A| 5

| 7.5A| 3

| 7.9A| 1

| 7.6A|

| 349W| 40 C

| 362W| 38 C

| 366W| 37 C

| 337W| 37 C

| 353W| 40 C

| 341W|

+-----+

+-----+

+-----+

+-----+

+-----+

+-----+

-----

### 7.3.6 E2K-E3K-E3.5K (Key "T") TEMPERATURES

Information between E2K/3K/3.5K differs slightly in the number of RF modules and temperature probes on RF dissipater. They can also differ in the number of power supply units (PSU) presents and relative temperature probes.

|                  |           |      |      |      |      |      |      |      |      |      |
|------------------|-----------|------|------|------|------|------|------|------|------|------|
| TEMPERATURES ==> |           |      |      |      |      |      |      |      |      |      |
| Max              | (C): 56.1 |      |      |      |      |      |      |      |      |      |
| RF               | (C):      |      |      |      |      |      |      |      |      |      |
|                  | 41.0      | 45.5 | 37.7 | 43.9 | 37.9 | 43.6 | 38.7 | 43.8 | 40.4 | 43.7 |
| PSU              | (C):      |      |      |      |      |      |      |      |      |      |
|                  | 1)        | 56.1 | 2)   | 54.5 | 3)   | 54.0 |      |      |      |      |
| Int. env.        | (C): 29.0 |      |      |      |      |      |      |      |      |      |
| Fan Speed        | ( % ): 80 |      |      |      |      |      |      |      |      |      |



### 7.3.7 E2K-E3K-E3.5K (Key “W”) MAIN DATA

Information between E2K/3K/3.5K differs slightly in the number of RF modules and temperature probes on RF dissipater. They can also differ in the number of power supply units (PSU) present.

|                 |      |      |               |           |      |            |            |                  |      |        |        |        |      |      |
|-----------------|------|------|---------------|-----------|------|------------|------------|------------------|------|--------|--------|--------|------|------|
| -----           |      |      |               |           |      |            |            |                  |      |        |        |        |      |      |
| RF CURRENTS (A) |      |      |               | Max: 8.91 |      | Sum: 95.81 |            | Min: 7.35        |      |        |        |        |      |      |
| Mod n:          | 1    | 2    | 3             | 4         | 5    | 6          | 7          | 8                | 9    | 10     | 11     | 12     |      |      |
| Id:             | 7.65 | 8.19 | 7.91          | 8.91      | 7.55 | 8.29       | 8.21       | 7.88             | 8.11 | 7.94   | 7.82   | 7.35   |      |      |
| -----           |      |      |               |           |      |            |            |                  |      |        |        |        |      |      |
| MAIN PSU        |      |      |               | AUX PSU   |      |            | STAND-BY : |                  |      | FALSE  |        |        |      |      |
| Psu 1 (A):      | 31.1 |      | Vcc (5V):     |           |      | 5.03       |            | RESET :          |      |        | FALSE  |        |      |      |
| Psu 2 (A):      | 31.0 |      | V+ (13V):     |           |      | 13.98      |            | TARGET PWR (W):  |      |        | 3100   |        |      |      |
| Psu 3 (A):      | 31.5 |      | V- (12V):     |           |      | 12.21      |            | -----            |      |        |        |        |      |      |
| Ids (A):        | 93.6 |      | VBias (V):    |           |      | 10.20      |            | TEMPERATURES (C) |      |        | Rf 1 : | 40.7   |      |      |
| [Vds_PSU](V):   | 43.6 |      | Vds (V):      |           |      | 44.7       |            | Max RF :         |      |        | Rf 2 : | 45.4   |      |      |
| -----           |      |      |               |           |      |            | Int.Env:   |                  |      | 28.5   | Rf 3 : | 37.5   |      |      |
| RF SECTION      |      |      |               |           |      |            | Max PSU:   |                  |      | 56.3   | Rf 4 : | 43.8   |      |      |
| Fwd (W):        | 3075 |      | Eff (%) :     |           |      | 71.8       |            | Psu 1 :          |      |        | 56.3   | Rf 5 : | 37.7 |      |
| Ref (W):        | 15   |      | [Ef_PSU](%) : |           |      | 75.5       |            | Psu 2 :          |      |        | 54.5   | Rf 6 : | 43.6 |      |
| -----           |      |      |               |           |      |            | Psu 3 :    |                  |      | 54.0   | Rf 7 : | 38.6   |      |      |
|                 |      |      |               |           |      |            | Fan s. %:  |                  |      | 80     | Rf 8 : | 43.8   |      |      |
| WORKING TIME :  |      |      |               |           |      |            | 0:51:11    |                  |      | Rf 9 : |        |        |      | 40.3 |
| FAN WORKING T.: |      |      |               |           |      |            | 105:36:13  |                  |      | Rf10 : |        |        |      | 43.8 |
| -----           |      |      |               |           |      |            |            |                  |      |        |        |        |      |      |

## 7.4 ETG3.5K

### 7.4.1 ETG3.5K MAIN MENU

```

-----
MAIN MENU (level 1) ====>                                09:39:18 Fr 26/10/2007
-----
M = Main RF data      X = System settings
E = Exciter monitor   Z = Password reset
D = Exciter settings  Y = Params x Term.exe
A = RF amplifiers     J = Alarms x Term.exe
U = PSU data          W = Main data
L = RF amplifier map
T = Temperatures
K = Password
S = Status/Alarms
H = Alarms History
C = Clock power set
P = SMS Phone set.

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-----

```

### 7.4.2 ETG3.5K (Key "M") MAIN RF DATA

```

-----
MAIN RF DATA ====>
-----
VDS      (V):      44.7
IDS      (A):      95.80
DC power (W):      4282
Efficiency (%) :    71.8
-----
Temperatures(C):    45.3
-----
Working Time   :    0:48:04
Fans Working T.: 105:33:06  Reset : F
-----
TARGET PWR (W) :    3100  Frequency (MHz):    98.0    98.00
-----

```

### 7.4.3 ETG3.5K (Key "E") EXCITER STATUS/SETTING

```

-----
0(kHz)  15      30      45      60      75      90      105     115
Mpx---[  0.35][  78.2]-----+-----+-----+-----+-----+-----+
#####>
-20(dB)      -15      -12      -9      -6      -3      0      3
Right+[  0.42][  78.7]-----+-----+-----+-----+-----+-----+
#####>
Left +[  0.35][  78.0]-----+-----+-----+-----+-----+-----+
#####>
0(kHz) 10.0     20.0     30.0     40.0     50.0     60.0     70.0
Aux---[  0.0]-----+-----+-----+-----+-----+-----+
>
-----
Tx Frequency(MHz): 98.00   Level(%):10.00   Phase:  0.0 |Limiter:5.00 V
-----|170.5 kHz/ 7.13 dB
Gain level R      (dB):   0.0 | Mode           :Stereo +-----+
Gain level L      (dB):   0.0 | Coder Enabled  :FALSE | No audio  FALSE
Level L = R       :      FALSE | Preenphasys (uS): 0   | Level(dB): -50.00
Aux1 (%) : 100.0 Aux2 (%) : 100.0 | Unlock         :FALSE | Time (s):   600
-----

```

### 7.4.4 ETG3.5K (Key "D") EXCITER SETTING

```

-----
Tx Frequency      (MHz):   98.0   98.00
Mode              : Stereo
Preenphasys      (uS):      0
-----
Coder Enable      : FALSE
Level             (%):   10.00 Phase :   0.0
Limiter           (Clipper):   5.00 V 170.5 kHz 7.13dB
-----
No audio level    (dB):  -50.00   Time (s):   600
Over modul. level (dB):  -50.00   Time (s):   600
-----
Gain level R      (dB):   0.0      Level L = R      :   FALSE
Gain level L      (dB):   0.0
Aux1              (%):   100.0     Aux2 (%)          :   100.0
-----

```

### 7.4.5 ETG3.5K (Key "T") RF AMPLIFIERS

|                      |       |      |                |     |      |       |      |       |      |        |      |
|----------------------|-------|------|----------------|-----|------|-------|------|-------|------|--------|------|
| RF AMPLIFIERS ==>>>> |       |      |                |     |      |       |      |       |      |        |      |
| Currents             | (A):  | 1)   | 0.00           | 2)  | 0.00 | 3)    | 0.00 | 4)    | 0.00 | 5)     | 0.00 |
|                      | :     | 7)   | 0.00           | 8)  | 0.00 | 9)    | 0.00 | 10)   | 0.00 | 11)    | 0.00 |
| DC power             | (W):  | 1)   | 0              | 2)  | 0    | 3)    | 0    | 4)    | 0    | 5)     | 0    |
|                      | :     | 7)   | 0              | 8)  | 0    | 9)    | 0    | 10)   | 0    | 11)    | 0    |
| Temperatures(C):     |       | 0.0  | 0.0            | 0.0 | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0    | 0.0  |
|                      | Max.: | 0.0  |                |     |      |       |      |       |      |        |      |
| Pre ampl. PWR        | (W):  | 0.0  |                |     |      |       |      | VDS   | (V): |        |      |
| Pre ampl. RFL        | (W):  | 0.0  |                |     |      |       |      | VBias | (V): | -10.24 |      |
| Pre ampl. VDS        | (V):  | 0.00 | Efficiency (%) | :   | 0.0  | Power | (W): | 0     |      |        |      |

### 7.4.6 ETG3.5K (Key "U") PSU DATA Power Supply Unit Data

|                  |      |    |        |    |      |    |      |        |     |  |  |
|------------------|------|----|--------|----|------|----|------|--------|-----|--|--|
| PSU DATA ==>>>>  |      |    |        |    |      |    |      |        |     |  |  |
| Enable           | (-): | 1) | TRUE   | 2) | TRUE | 3) | TRUE |        |     |  |  |
| Currents         | (A): | 1) | 0.0    | 2) | 0.0  | 3) | 0.0  | Total: | 0.0 |  |  |
| Voltages         | (V): | 1) | 0.0    | 2) | 0.0  | 3) | 0.0  |        |     |  |  |
| DC power         | (W): | 1) | 0      | 2) | 0    | 3) | 0    | Total: | 0   |  |  |
| Temperatures(C): |      | 1) | 0.0    | 2) | 0.0  | 3) | 0.0  | Max. : | 0.0 |  |  |
| Vcc              | (V): |    | 5.06   |    |      |    |      |        |     |  |  |
| -12V             | (V): |    | -13.73 |    |      |    |      |        |     |  |  |
| +13V             | (V): |    | 11.49  |    |      |    |      |        |     |  |  |

### 7.4.7 ETG3.5K (Key "L") RF AMPLIFIER MAP

| RF AMPLIFIERS MAP (Module number, Current, DC power, Temperature) ==> |      |         |      |         |      |         |      |         |      |         |  |
|---|------|---------|------|---------|------|---------|------|---------|------|---------|--|
| Internal environment (C): 29.0  |      |         |      |         |      |         |      |         |      |         |  |
| 12  |      | 10      |      | 8       |      | 6       |      | 4       |      | 2       |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |
| 7.3A  | 10   | 7.9A    | 8    | 7.8A    | 6    | 8.2A    | 4    | 8.9A    | 2    | 8.1A    |  |
| 328W  | 43 C | 354W    | 43 C | 352W    | 43 C | 370W    | 43 C | 398W    | 45 C | 366W    |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |
| 11  |      | 9       |      | 7       |      | 5       |      | 3       |      | 1       |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |
| 7.8A  | 9    | 8.1A    | 7    | 8.2A    | 5    | 7.5A    | 3    | 7.9A    | 1    | 7.6A    |  |
| 349W  | 40 C | 362W    | 38 C | 366W    | 37 C | 337W    | 37 C | 353W    | 40 C | 341W    |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |

### 7.4.8 ETG3.5K (Key "T") TEMPERATURES

|                  |           |      |      |      |      |      |      |      |      |      |
|------------------|-----------|------|------|------|------|------|------|------|------|------|
| TEMPERATURES ==> |           |      |      |      |      |      |      |      |      |      |
| Max              | (C): 56.1 |      |      |      |      |      |      |      |      |      |
| RF               | (C):      |      |      |      |      |      |      |      |      |      |
|                  | 41.0      | 45.5 | 37.7 | 43.9 | 37.9 | 43.6 | 38.7 | 43.8 | 40.4 | 43.7 |
| PSU              | (C):      |      |      |      |      |      |      |      |      |      |
|                  | 1)        | 56.1 | 2)   | 54.5 | 3)   | 54.0 |      |      |      |      |
| Int. env.        | (C): 29.0 |      |      |      |      |      |      |      |      |      |
| Fan Speed        | ( % ): 80 |      |      |      |      |      |      |      |      |      |

## 7.4.9 ETG3.5K (Key "W") MAIN DATA

|                 |      |      |          |        |        |                  |      |      |        |        |      |        |       |      |      |      |      |
|-----------------|------|------|----------|--------|--------|------------------|------|------|--------|--------|------|--------|-------|------|------|------|------|
| RF CURRENTS (A) |      |      |          |        |        |                  |      |      |        |        |      | Max:   | 0.00  | Sum: | 0.00 | Min: | 0.00 |
| Mod n:          | 1    | 2    | 3        | 4      | 5      | 6                | 7    | 8    | 9      | 10     | 11   | 12     |       |      |      |      |      |
| Id:             | 0.00 | 0.00 | 0.00     | 0.00   | 0.00   | 0.00             | 0.00 | 0.00 | 0.00   | 0.00   | 0.00 | 0.00   |       |      |      |      |      |
| Psu 1           | (A): | 0.0  | Vcc      | (5V):  | 5.06   | STAND-BY         |      |      | :      |        |      |        | TRUE  |      |      |      |      |
| Psu 2           | (A): | 0.0  | V+       | (13V): | 11.48  | RESET            |      |      | :      |        |      |        | FALSE |      |      |      |      |
| Psu 3           | (A): | 0.0  | V-       | (12V): | 13.70  | TARGET PWR (W):  |      |      |        |        |      | 3000   |       |      |      |      |      |
| Ids             | (A): | 0.0  | VBias    | (V):   | -10.24 |                  |      |      |        |        |      |        |       |      |      |      |      |
| Vds_PSU         | (V): | 0.0  | Vds      | (V):   | 0.0    | TEMPERATURES (C) |      |      | Rf 1 : |        |      | 0.0    |       |      |      |      |      |
| Bias pre        | (V): |      |          |        |        | Max RF :         |      |      | 0.0    | Rf 2 : |      |        | 0.0   |      |      |      |      |
|                 |      |      |          |        |        | Int.Env:         |      |      | 0.0    | Rf 3 : |      |        | 0.0   |      |      |      |      |
| Fwd             | (W): | 0    | PreA Fwd | (W):   | 0.0    | Max PSU:         |      |      | 0.0    | Rf 4 : |      |        | 0.0   |      |      |      |      |
| Ref             | (W): | 0    | PreA Rfl | (W):   | 0.0    | Psu 1 :          |      |      | 0.0    | Rf 5 : |      |        | 0.0   |      |      |      |      |
| Eff             | (%): | 0.0  | PreA Trg | (W):   | 92.6   | Psu 2 :          |      |      | 0.0    | Rf 6 : |      |        | 0.0   |      |      |      |      |
|                 |      |      |          |        |        | Psu 3 :          |      |      | 0.0    | Rf 7 : |      |        | 0.0   |      |      |      |      |
|                 |      |      |          |        |        | Fan s. %:        |      |      | 101    | Rf 8 : |      |        | 0.0   |      |      |      |      |
| WORKING TIME :  |      |      |          |        |        | 9:05:44          |      |      |        |        |      | Rf 9 : |       |      | 0.0  |      |      |
| FAN WORKING T.: |      |      |          |        |        | 9:05:50          |      |      |        |        |      | Rf10 : |       |      | 0.0  |      |      |

## 7.5 E6K-E10K-15K-30K

### 7.5.1 E6K-10K-15K-30K MAIN MENU

```

-----
MAIN MENU (level 1) ====>                               11:42:47 Tu 28/03/2006
-----
M = Main RF data      E = Rf Mod. menu...
T = Temperatures      W = Status
K = Password
S = Alarms/Status
H = Alarms History
C = Clock power set
P = SMS Phone set.
X = System Settings
Z = Password reset
Y = Params x Term.exe
J = Alarms x Term.exe
D = Dual drive

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Shunt Sw Ver.      1.00
-----

```

### 7.5.2 E6K/10K (Key "M") MAIN RF DATA

```

-----
MAIN RF DATA ====>
-----
Temperatures(C):           0.0
-----
Working Time      :           0:00:00
-----
Fan working Time   0:00:00  Reset : F
-----
TARGET PWR (W) :           10000
-----

```

### 7.5.3 E6K/10K (Key "T") TEMPERATURE

```

-----
TEMPERATURES ====>
-----
Max          (C):    0.0
-----
DUMMY LOAD   (C):    0.0    0.0    0.0
SPLITTER     (C):    0.0          COMBINER (C):    0.0
EXCITER RES. LOAD (C):    0.0
-----
3000 W       (C):
0.0    0.0    0.0
-----
Internal environment (C):    0.0
-----
Fan Speed   (%):    0
-----
+

```

### 7.5.4 E6K-10K (Key "E") RF MODULES MENU

```

-----
E3000 MENU (level 2) ====>          15:30:17 Fr 26/10/2007
-----
S = E3K status
W = E3K data
A = E3K 1 data
B = E3K 1 modules
C = E3K 2 data
D = E3K 2 modules
E = E3K 3 data
F = E3K 3 modules
Q = Exit

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-----
+

```



### 7.5.5 E15K (Key “M”) MAIN RF DATA

```

-----
MAIN RF DATA ==>
-----
Temperatures(C):          39.3
-----
Working Time   :          0:50:09
-----
Fan working Time
Dummy load    :          17:10:21  Reset : F
Combiner      :          4:21:26  Reset : F
Splitter      :          7:25:24  Reset : F
-----
TARGET PWR (W) :          15500
-----
+-----+

```

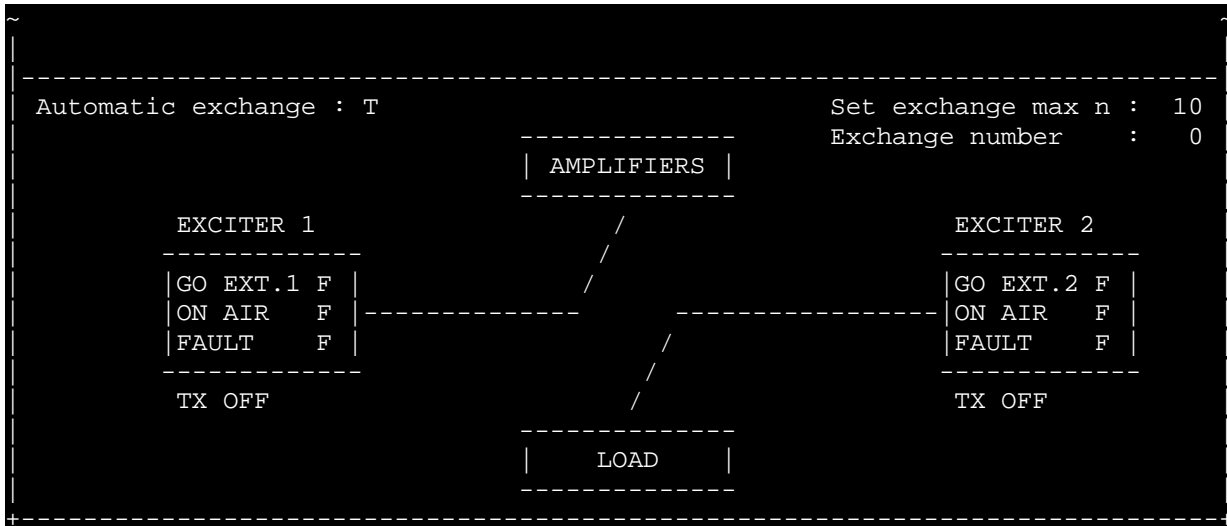
### 7.5.6 E15K (Key “T”) TEMPERATURES

```

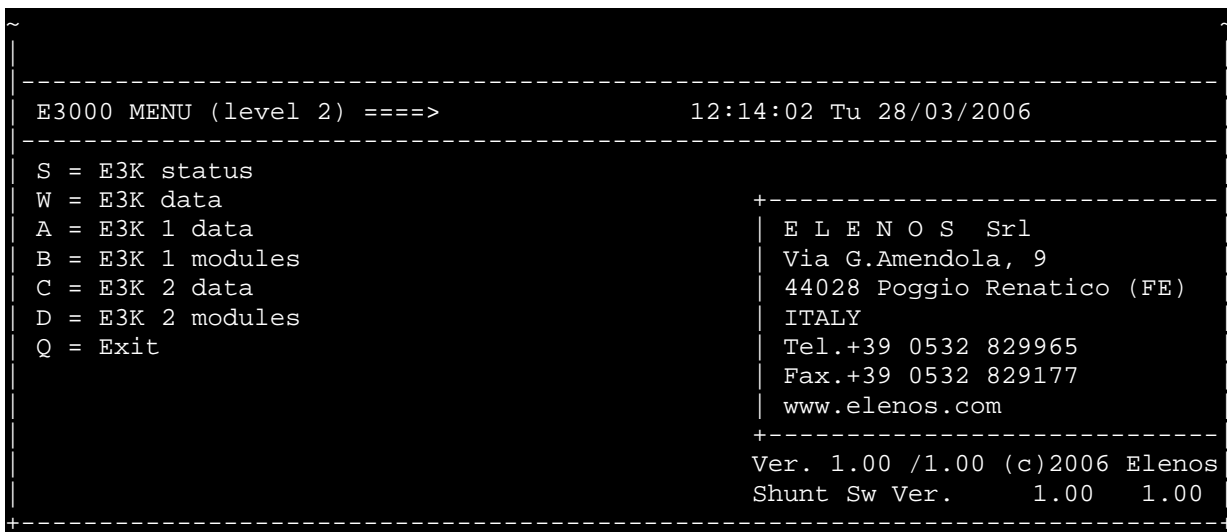
-----
TEMPERATURES ==>
-----
Max          (C):   49.9
-----
DUMMY LOAD   (C):   47.2   46.8   47.6   46.7   46.3
SPLITTER     (C):   49.9                                COMBINER (C):   48.9
-----
3000 W       (C):
  50.4   48.1   48.1   49.7   49.7
-----
Internal environment (C):   43.5
-----
+-----+

```

### 7.5.7 E6K-10K-15K-30K (Key "D") DUAL DRIVE



### 7.5.8 E6K (Key "E") E3.5K MENU



### 7.5.9 E6K (Key "S"[E3500 MENU]) E3.5K Status

|           | Pwr Fwd (W) | Pwr Refl (W) | FAULT | ON AIR | STBY  | LOCAL | LINK |
|-----------|-------------|--------------|-------|--------|-------|-------|------|
| E15KW 1 : | 14950       | 40           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 1:   | 3075        | 5            | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 2:   | 3100        | 10           | FALSE | TRUE   | FALSE | FALSE | TRUE |

### 7.5.10 E6K (Key "E"[E3500 MENU]) E3.5K Data

|                 |             |             |
|-----------------|-------------|-------------|
| Pwr Fwd (W)     | 3100        | 3075        |
| Pwr Refl (W)    | 45          | 5           |
| Vcc(13/-12) (V) | 5.0(13/-12) | 5.0(13/-12) |
| Ids (A)/Vds (V) | 92.81/47.7  | 97.11/44.1  |
| Efficiency (%)  | 70.0        | 71.8        |
| Temp.Env. (C)   | 32.0        | 33.0        |
| Temp.Max. (C)   | 60.1        | 61.4        |
| RF T.Max. (C)   | 49.5        | 49.1        |
| PSU T.Max. (C)  | 60.1        | 61.4        |
| Fan Speed (%)   | 87          | 89          |
| RF DC Power (W) | 4427        | 4282        |
| Working Time    | 0:49        | 0:47        |
| Stop Code       | 23          | 23          |
| Remote Enable   | T           | T           |

### 7.5.11 E6K (Key "W") Status

| -----               |  |         |          |        |         |         |         |          |    |     |  |
|---------------------|--|---------|----------|--------|---------|---------|---------|----------|----|-----|--|
|                     |  | Fwd (W) | Refl (W) | UNB    | IDS (A) | VDS (V) | EFF.(%) | TEMP.(C) | DC | PWR |  |
| E10KW 1 :           |  | 0       | 0        | 0.0(C) | 0       | 0       | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.1:           |  | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.2:           |  | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.3:           |  | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| -----               |  |         |          |        |         |         |         |          |    |     |  |
| Y = Parameters list |  |         |          |        |         |         |         |          |    |     |  |
| J = Alarm Hist.list |  |         |          |        |         |         |         |          |    |     |  |
| -----               |  |         |          |        |         |         |         |          |    |     |  |

### 7.5.12 E10K (Key "E") E3.5K MENU

```
-----
E3000 MENU (level 2) ==>                               12:14:02 Tu 28/03/2006
-----

S = E3K status
W = E3K data
A = E3K 1 data
B = E3K 1 modules
C = E3K 2 data
D = E3K 2 modules
E = E3K 3 data
F = E3K 3 modules
Q = Exit

+-----
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| 44028 Poggio Renatico (FE)
| ITALY
| Tel.+39 0532 829965
| Fax.+39 0532 829177
| www.elenos.com
+-----

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Shunt Sw Ver.      1.00    1.00
-----
```

### 7.5.13 E10K (Key "S" [E3500 MENU]) E3.5K Status

|           | Pwr Fwd (W) | Pwr Refl (W) | FAULT | ON AIR | STBY  | LOCAL | LINK |
|-----------|-------------|--------------|-------|--------|-------|-------|------|
| E15KW 1 : | 14950       | 40           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 1:   | 3075        | 5            | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 2:   | 3100        | 10           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 3:   | 3100        | 45           | FALSE | TRUE   | FALSE | FALSE | TRUE |

### 7.5.14 E10K (Key "E" [E3500 MENU]) E3.5K Data

|                 |             |             |             |
|-----------------|-------------|-------------|-------------|
| Pwr Fwd (W)     | 3100        | 3100        | 3075        |
| Pwr Refl (W)    | 5           | 45          | 5           |
| Vcc(13/-12) (V) | 5.0(13/-12) | 5.0(13/-12) | 5.0(13/-12) |
| Ids (A)/Vds (V) | 98.56/43.6  | 92.81/47.7  | 97.11/44.1  |
| Efficiency (%)  | 72.1        | 70.0        | 71.8        |
| Temp.Env. (C)   | 32.0        | 32.0        | 33.0        |
| Temp.Max. (C)   | 57.8        | 60.1        | 61.4        |
| RF T.Max. (C)   | 48.4        | 49.5        | 49.1        |
| PSU T.Max. (C)  | 57.8        | 60.1        | 61.4        |
| Fan Speed (%)   | 83          | 87          | 89          |
| RF DC Power (W) | 4297        | 4427        | 4282        |
| Working Time    | 0:51        | 0:49        | 0:47        |
| Stop Code       | 23          | 23          | 23          |
| Remote Enable   | T           | T           | T           |

### 7.5.15 E10K (Key "W") Status

| -----     |  |         |          |        |         |         |         |          |    |     |  |  |
|-----------|--|---------|----------|--------|---------|---------|---------|----------|----|-----|--|--|
|           |  | Fwd (W) | Refl (W) | UNB    | IDS (A) | VDS (V) | EFF.(%) | TEMP.(C) | DC | PWR |  |  |
| E10KW 1 : |  | 0       | 0        | 0.0(C) | 0       | 0       | 0.0     | 0.0      |    | 0   |  |  |
| E3KW 1.1: |  | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |  |
| E3KW 1.2: |  | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |  |
| E3KW 1.3: |  | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |  |

Y = Parameters list  
J = Alarm Hist.list

### 7.5.16 E15K (Key "E") E3K MENU

```
-----
E3000 MENU (level 2) =====>                               12:14:02 Tu 28/03/2006
-----
S = E3K status      Q = Exit
W = E3K data
A = E3K 1 data
B = E3K 1 modules
C = E3K 2 data
D = E3K 2 modules
E = E3K 3 data
F = E3K 3 modules
G = E3K 4 data
H = E3K 4 modules
I = E3K 5 data
L = E3K 5 modules

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-----
```

### 7.5.17 E15K (Key "S" [E3500 MENU]) E3.5K Status

|           | Pwr Fwd (W) | Pwr Refl (W) | FAULT | ON AIR | STBY  | LOCAL | LINK |
|-----------|-------------|--------------|-------|--------|-------|-------|------|
| E15KW 1 : | 14950       | 40           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 1:   | 3075        | 5            | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 2:   | 3100        | 10           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 3:   | 3100        | 45           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 4:   | 3100        | 10           | FALSE | TRUE   | FALSE | FALSE | TRUE |
| E3KW 5:   | 3075        | 5            | FALSE | TRUE   | FALSE | FALSE | TRUE |

### 7.5.18 E15K (Key "E" [E3500 MENU]) E3.5K Data

|                 | 3100        | 3100        | 3100        | 3075        | 3075        |
|-----------------|-------------|-------------|-------------|-------------|-------------|
| Pwr Fwd (W)     | 3100        | 3100        | 3100        | 3075        | 3075        |
| Pwr Refl (W)    | 5           | 10          | 45          | 10          | 5           |
| Vcc(13/-12) (V) | 5.0(13/-12) | 5.0(13/-12) | 5.0(13/-12) | 5.0(13/-12) | 5.0(13/-12) |
| Ids (A)/Vds (V) | 98.56/43.6  | 100.14/42.0 | 92.81/47.7  | 95.92/43.5  | 97.11/44.1  |
| Efficiency (%)  | 72.1        | 73.7        | 70.0        | 73.6        | 71.8        |
| Temp.Env. (C)   | 32.0        | 32.0        | 32.0        | 31.0        | 33.0        |
| Temp.Max. (C)   | 57.8        | 60.1        | 60.1        | 60.9        | 61.4        |
| RF T.Max. (C)   | 48.4        | 45.3        | 49.5        | 46.6        | 49.1        |
| PSU T.Max. (C)  | 57.8        | 60.1        | 60.1        | 60.9        | 61.4        |
| Fan Speed (%)   | 83          | 87          | 87          | 88          | 89          |
| RF DC Power (W) | 4297        | 4205        | 4427        | 4172        | 4282        |
| Working Time    | 0:51        | 0:50        | 0:49        | 0:48        | 0:47        |
| Stop Code       | 23          | 23          | 23          | 23          | 23          |
| Remote Enable   | T           | T           | T           | T           | T           |

### 7.5.19 E15K (Key "W") Status

|           | Fwd (W) | Refl (W) | UNB    | IDS (A) | VDS (V) | EFF.(%) | TEMP.(C) | DC PWR |
|-----------|---------|----------|--------|---------|---------|---------|----------|--------|
| E15KW 1 : | 0       | 0        | 0.0(C) | 0       | 0       | 0.0     | 0.0      | 0      |
| E3KW 1.1: | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      | 0      |
| E3KW 1.2: | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      | 0      |
| E3KW 1.3: | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      | 0      |
| E3KW 1.4: | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      | 0      |
| E3KW 1.5: | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      | 0      |

Y = Parameters list  
J = Alarm Hist.list

### 7.5.20 E6K/10K/15K/30K (Keys "A, C, E, G, I" [E3500 MENU]) E3.5K MAIN DATA

|                 |      |               |      |         |      |                  |      |            |        |        |       |      |       |      |       |      |      |
|-----------------|------|---------------|------|---------|------|------------------|------|------------|--------|--------|-------|------|-------|------|-------|------|------|
| RF CURRENTS (A) |      |               |      |         |      |                  |      |            |        |        |       | Max: | 8.73  | Sum: | 98.56 | Min: | 7.64 |
| Mod n:          | 1    | 2             | 3    | 4       | 5    | 6                | 7    | 8          | 9      | 10     | 11    | 12   |       |      |       |      |      |
| Id:             | 7.74 | 8.11          | 7.70 | 8.62    | 8.16 | 8.73             | 8.56 | 8.61       | 8.63   | 8.33   | 7.64  | 7.73 |       |      |       |      |      |
| MAIN PSU        |      |               |      | AUX PSU |      |                  |      | STAND-BY : |        |        |       |      | FALSE |      |       |      |      |
| Psu 1 (A):      | 32.5 | Vcc (5V):     |      | 5.03    |      | RESET :          |      |            |        |        | FALSE |      |       |      |       |      |      |
| Psu 2 (A):      | 31.9 | V+ (13V):     |      | 13.12   |      | TARGET PWR (W):  |      |            |        |        | 3100  |      |       |      |       |      |      |
| Psu 3 (A):      | 32.6 | V- (12V):     |      | 12.25   |      |                  |      |            |        |        |       |      |       |      |       |      |      |
| Ids (A):        | 97.0 | VBias (V):    |      | 10.20   |      | TEMPERATURES (C) |      |            | Rf 1 : | 40.3   |       |      |       |      |       |      |      |
| [Vds_PSU](V):   | 42.6 | Vds (V):      |      | 43.7    |      | Max RF :         |      |            | 48.4   | Rf 2 : | 44.8  |      |       |      |       |      |      |
|                 |      |               |      |         |      | Env :            |      |            | 32.0   | Rf 3 : | 38.2  |      |       |      |       |      |      |
| RF SECTION      |      |               |      |         |      | Max PSU:         |      |            | 57.8   | Rf 4 : | 45.3  |      |       |      |       |      |      |
| Fwd (W):        | 3100 | Eff (%) :     |      | 71.9    |      | Psu 1 :          |      |            | 53.8   | Rf 5 : | 41.4  |      |       |      |       |      |      |
| Ref (W):        | 5    | [Ef_PSU](%) : |      | 75.0    |      | Psu 2 :          |      |            | 57.8   | Rf 6 : | 46.1  |      |       |      |       |      |      |
|                 |      |               |      |         |      | Psu 3 :          |      |            | 56.8   | Rf 7 : | 42.5  |      |       |      |       |      |      |
|                 |      |               |      |         |      | Fan s.%:         |      |            | 83     | Rf 8 : | 48.4  |      |       |      |       |      |      |
| ELAPSED TIME :  |      |               |      |         |      |                  |      |            | 0:51   | Rf 9 : | 43.0  |      |       |      |       |      |      |
|                 |      |               |      |         |      |                  |      |            |        | Rf10 : | 47.4  |      |       |      |       |      |      |



### 7.5.21 E6K/10K/15K/30K (Keys "B, D, F, H, L" [E3500 MENU]) RF AMPLIFIERS MAP

|   |      |         |      |         |      |         |      |         |      |         |  |
|---|------|---------|------|---------|------|---------|------|---------|------|---------|--|
| RF AMPLIFIERS MAP (Module number, Current, DC power, Temperature) ==> |      |         |      |         |      |         |      |         |      |         |  |
| Internal environment (C): 32.0  |      |         |      |         |      |         |      |         |      |         |  |
| 12  |      | 10      |      | 8       |      | 6       |      | 4       |      | 2       |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |
| 7.7A  | 10   | 8.3A    | 8    | 8.6A    | 6    | 8.7A    | 4    | 8.6A    | 2    | 8.1A    |  |
| 337W  | 47 C | 364W    | 48 C | 376W    | 46 C | 381W    | 45 C | 376W    | 44 C | 354W    |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |
| 11  |      | 9       |      | 7       |      | 5       |      | 3       |      | 1       |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |
| 7.6A  | 9    | 8.6A    | 7    | 8.5A    | 5    | 8.1A    | 3    | 7.7A    | 1    | 7.7A    |  |
| 333W  | 42 C | 377W    | 42 C | 374W    | 41 C | 356W    | 38 C | 336W    | 40 C | 338W    |  |
| +-----+   |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |      | +-----+ |  |

### 7.5.22 E30K (Key "M") MAIN RF DATA

|                              |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| MAIN RF DATA ==>             |  |  |  |  |  |  |  |  |  |  |  |
| Temperatures(C): 36.6        |  |  |  |  |  |  |  |  |  |  |  |
| Working Time : 0:11:37       |  |  |  |  |  |  |  |  |  |  |  |
| Fan working Time             |  |  |  |  |  |  |  |  |  |  |  |
| UNB PWR (W) : 100            |  |  |  |  |  |  |  |  |  |  |  |
| Splitter : 7:26:41 Reset : F |  |  |  |  |  |  |  |  |  |  |  |
| TARGET PWR (W) : 31000       |  |  |  |  |  |  |  |  |  |  |  |

### 7.5.23 E30K (Key "E") E15K/E3.5K MENU

```

-----
E15K MENU (level 2) ====>                               12:08:43 Tu 28/03/2006
-----
S = E15K status
E = E15K data
A = E3K data
Q = Exit
+-----+
| E L E N O S Srl
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| 44028 Poggio Renatico (FE)
| ITALY
| Tel.+39 0532 829965
| Fax.+39 0532 829177
| www.elenos.com
+-----+
Ver. 1.00 /1.00 (c)2006 Elenos
Shunt Sw Ver.      1.00
-----

```

### 7.5.24 E30K (Key "S" [E15K MENU]) E15K/E3.5K STATUS

```

-----
E30KW      : Pwr Fwd (W)  Pwr Refl (W)  FAULT  ON AIR  STBY  LOCAL  LINK
E15KW 1    : 30250      60             FALSE  TRUE    FALSE TRUE    TRUE
E3KW 1.1   : 14950      40             FALSE  TRUE    FALSE FALSE   TRUE
E3KW 1.2   : 3075       5              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 1.3   : 3075      10              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 1.4   : 3075      45              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 1.5   : 3100      10              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 1.6   : 3100       5              FALSE  TRUE    FALSE FALSE   TRUE
E15KW 2    : 15200      0              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 2.1   : 3075      15              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 2.2   : 3100      20              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 2.3   : 3075      50              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 2.4   : 3100      20              FALSE  TRUE    FALSE FALSE   TRUE
E3KW 2.5   : 3100      15              FALSE  TRUE    FALSE FALSE   TRUE
-----

```

**7.5.25 E30K (Key "E" [E15K MENU]) E15K DATA**

|                   |       |                |  |  |  |  |       |          |  |  |  |
|-------------------|-------|----------------|--|--|--|--|-------|----------|--|--|--|
| -----             |       |                |  |  |  |  |       |          |  |  |  |
| Pwr Fwd           | (W)   | 14950          |  |  |  |  |       | 15200    |  |  |  |
| Pwr Refl          | (W)   | 40             |  |  |  |  |       | 0        |  |  |  |
| Vcc (12)          | (V)   | 5.0 (11)       |  |  |  |  |       | 5.1 (11) |  |  |  |
| RF DC Power       | (W)   | 21300          |  |  |  |  |       | 22322    |  |  |  |
| Efficiency        | (%)   | 70.1           |  |  |  |  |       | 68.0     |  |  |  |
| Working Time      |       | 0:47           |  |  |  |  |       | 0:46     |  |  |  |
| Int.Temp.Env.     | (C)   | 35.5           |  |  |  |  |       | 36.0     |  |  |  |
| Temp.Max.         | (C)   | 38.9           |  |  |  |  |       | 49.2     |  |  |  |
| Dummy Load T.Max. | (C)   | 34.0           |  |  |  |  |       | 49.2     |  |  |  |
| Combiner Temp.    | (C)   | 38.9           |  |  |  |  |       | 43.1     |  |  |  |
| Splitter Temp.    | (C)   | 34.7           |  |  |  |  |       | 47.3     |  |  |  |
| Dummy Load Temp.  | (C)   | 34 33 33 32 32 |  |  |  |  | 44 46 | 47 47 49 |  |  |  |
| Stop Code         | (n)   | 23             |  |  |  |  |       | 23       |  |  |  |
| Remote Enable     | (T/F) | T              |  |  |  |  |       | T        |  |  |  |
| -----             |       |                |  |  |  |  |       |          |  |  |  |

**7.5.26 E30K (Key "A" [E15K MENU]) E3.5K DATA**

|              |     |            |            |             |             |            |  |  |  |  |  |
|--------------|-----|------------|------------|-------------|-------------|------------|--|--|--|--|--|
| -----        |     |            |            |             |             |            |  |  |  |  |  |
| Pwr Fwd      | (W) | 3075       | 3075       | 3075        | 3100        | 3100       |  |  |  |  |  |
| Pwr Refl     | (W) | 5          | 10         | 45          | 10          | 5          |  |  |  |  |  |
| Ids (A)/Vds  | (V) | 98.57/43.4 | 99.94/41.7 | 92.67/47.4  | 96.02/43.5  | 97.22/44.1 |  |  |  |  |  |
| Efficiency   | (%) | 71.8       | 73.7       | 70.0        | 74.2        | 72.3       |  |  |  |  |  |
| Temp.Max.    | (C) | 55.3       | 57.6       | 57.7        | 58.9        | 59.1       |  |  |  |  |  |
| RF DC Power  | (W) | 4277       | 4167       | 4392        | 4176        | 4287       |  |  |  |  |  |
| Working Time |     | 0:46       | 0:45       | 0:44        | 0:43        | 0:42       |  |  |  |  |  |
| Stop Code    |     | 23         | 23         | 23          | 23          | 23         |  |  |  |  |  |
| -----        |     |            |            |             |             |            |  |  |  |  |  |
| Pwr Fwd      | (W) | 3075       | 3100       | 3075        | 3075        | 3075       |  |  |  |  |  |
| Pwr Refl     | (W) | 15         | 20         | 50          | 20          | 15         |  |  |  |  |  |
| Ids (A)/Vds  | (V) | 96.06/44.7 | 99.77/45.7 | 100.08/44.2 | 104.13/42.2 | 99.51/46.7 |  |  |  |  |  |
| Efficiency   | (%) | 71.6       | 67.9       | 69.5        | 69.9        | 66.1       |  |  |  |  |  |
| Temp.Max.    | (C) | 53.5       | 53.9       | 54.6        | 56.3        | 55.4       |  |  |  |  |  |
| RF DC Power  | (W) | 4293       | 4559       | 4423        | 4394        | 4658       |  |  |  |  |  |
| Working Time |     | 0:41       | 0:40       | 0:39        | 0:39        | 0:38       |  |  |  |  |  |
| Stop Code    |     | 23         | 23         | 23          | 23          | 23         |  |  |  |  |  |
| -----        |     |            |            |             |             |            |  |  |  |  |  |

### 7.5.27 E30K (Key "W") Status

| -----     |   |         |          |        |         |         |         |          |    |     |  |
|-----------|---|---------|----------|--------|---------|---------|---------|----------|----|-----|--|
|           |   | Fwd (W) | Refl (W) | UNB    | IDS (A) | VDS (V) | EFF.(%) | TEMP.(C) | DC | PWR |  |
| E30KW     | : | 0       | 0        | 0(W)   | 0       | 0       | 0.0     | 0.0      |    | 0   |  |
| E15KW 1   | : | 0       | 0        | 0.0(C) | 0       | 0       | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.1: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.2: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.3: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.4: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 1.5: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E15KW 2   | : | 0       | 0        | 0.0(C) | 0       | 0       | 0.0     | 0.0      |    | 0   |  |
| E3KW 2.1: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 2.2: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 2.3: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 2.4: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| E3KW 2.5: |   | 0       | 0        |        | 0.00    | 0.0     | 0.0     | 0.0      |    | 0   |  |
| -----     |   |         |          |        |         |         |         |          |    |     |  |

## 8 ECHOS3 REMOTE CONTROL DEVICE

The front panel of the telemetry is as seen in the below image:



Starting from the left, the following parts can be identified:

- 7 LEDs which show the GSM signal level (GSM SIGNAL). To access said LEDs, press the TEST key on the centre front panel which, in addition to powering the LEDs, activates the rapid detection functionality of the signal level (approximately one sample per second). If the GSM modem inside the telemetry is not able to hook onto a GSM cell due to problems related to the antenna or other, the signal level cannot be displayed. Consult the below MODEM STATUS LED meanings to understand if a cell is hooked up or not. The scale indicates the level in dB.
- 1 LED, MODEM STATUS, indicates the modem status and can have the following meanings:
  - LED OFF. Modem not ready. Can be linked to the absence of a connection with a GSM cell or to MODEM initialisation problems.
  - LED ON. Modem initialised correctly and in STAND-BY status.
  - LED FLASHING. Indicates modem activity which can be SMS transmission or receipt, GSM connection via modem, data connection via front serial port.
- TEST key for switching on and sampling of GSM signal level.
- 1 LED BATTERY. The LED shows the status of the internal battery charge. The battery is being charged if RED and is completely charged if GREEN.
- 1 LED POWER SUPPLY. Indicates the presence of a connection to the electrical network.
- 2 DB9 connectors for connection to the internal CPU or MODEM. The former allows connection, via a terminal programme such as Term, to the CPU for configuration and parameter management of the Telemetry as described below. The latter allows internal GSM connection for management of the same as described below.

### 8.1 *Equipment connection activation procedure.*

The equipment has its own modifiable address which by default is 1. To establish a connection with the CPU, address the machine by typing the following command sequence:

'2' '1' '1' '0' '1' where

'2' Output command from the preceding.

'1' Attention command.

'1' Address Identifying Character.

'01' Machine address from 01 to 99.

The first telemetry window will appear if the procedure has been performed successfully (see next chapt.).

It is important to perform all parts of the sequence as it is utilised by the control logic to recognise protocol.

We recommend use of the TERM programme which correctly implements said sequences.

### 8.2 *Commands and data entry.*

Equipment telemetry is structured in menus and sub-menus. The Main Menu appears upon connection. From this Menu, it is possible to access different sub-menus by entering the character shown to the left of the name. The system accepts both upper and lower case characters. Characters utilised by the telemetry which correspond to keys pressed on the keyboard are:

| Keyboard             | Character Code | Description   |
|----------------------|----------------|---|
| Q                    | H'51           | Sub-menu return key. Allows the user to return the main menu.   |
| ENTER                | H'13           | Enter Key. Allows the user to enable/disable field modifications. Modifiable fields are indicated with data on a blue background. The data is Red when the modification has been enabled. |
| ↓                    | H'1B+H'42      | DOWN cursor key. Allows cursor movement toward the bottom of the terminal window.   |
| ↑                    | H'1B+H'41      | UP cursor key. Allows cursor movement toward the top of the terminal window.  |
| →                    | H'1B+H'43      | RIGHT cursor key. Allows cursor movement toward the right of the terminal window.   |
| ←                    | H'1B+H'44      | LEFT cursor key. Allows cursor movement toward the left of the terminal window.   |
| BACK SPACE           | H'08           | Delete key. Allows the user to delete the character at the far right of the field being modified. (command possible only if the modification is enabled).                                 |
| A..B<br>a..b<br>0..9 |                | Normal ASCII keys utilised for input and navigation.  |

Data entry is performed according to the following procedure:

1. Select the field to be modified via the cursor keys. The cursor is indicated in the field with a blue background and white characters.
2. Press the <ENTER> key to modify. The cursor changes colour to a blue background with red characters.
3. It will now be possible to modify data, adding characters or numbers (pressing a...z and 0...9) or deleting the first to the right pressing <BACK SPACE>. Use the arrow keys to change status for ON/OFF value fields. Use the UP and DOWN keys to change the value for pre-defined value fields. See for example the full scale and limits in analog.
4. Once data modification has been completed, press <ENTER> again to confirm and exit from modifications.

The system presents 3 access levels which can be selected by entering the key in the "K" menu (Access Key):

- "GUEST"      Key not entered
- "USER"        Key not entered
- "SYSTEM"     System administrator key entered.

On the basis of the key entered, it may or may not be possible to modify data. It is only possible to see measurements without modifying enabled camps in GUEST mode. In the other two, it is possible to modify them with some restrictions for USER mode. All modifications are accessible in SYSTEM mode.

### NOTE:

*The system password is preset as 20 during production ("SYSTEM" level).*

*The user password is preset as 10 during production ("USER" level).*

*The user must personalise these values!*

There are three types of fields which can be edited:

- TEXT    - Text field where it is possible to enter characters A...B, a...b, 0...9 and symbols.
- NUMBER    - Numerical value which only accepts characters from 0...9.
- LIST        - List of possible values which can be selected via the arrow keys.
- TOGGLE    - Values 0 or 1 which can be selected via the arrow keys.

### 8.2.1 Main menu.

"MAIN MENU" machines having a "01" address.

To activate the various procedures, press the keys indicated. To exit from the pages, press the "Q" key (QUIT). To end the Telemetry session and free up the equipment, press 2 in this first menu. On the basis of the access selected in the 'K' menu, the following windows are given:

### 8.2.2 GUEST and USER LEVEL

```
+-----+
| ELENOS TLMTR                                -<V. x.xx id 01>- menu = Q |
+-----+
| K - Access Key.                             |
| T - Telemetry Monitor.                      |
| O - Digital Outputs config.                 |
| D - Digital Inputs config.                 |
| A - Analogic channels config.              |
| L - Analogic channels alarm limits          |
| P - SMS Configuration                      |
| S - All message monitor                    |
|                                             |
| Press <2> or <3> or <4> to EXIT from TERMINAL |
|                                             |
+-----+
```



### 8.2.3 SYSTEM LEVEL

```

+-----+
| ELENOS TLMTR                                -<V. x.xx id 01>- menu = Q |
+-----+
| K - Access Key.                             |
| T - Telemetry Monitor.                     |
| O - Digital Outputs config.                 |
| D - Digital Inputs config.                 |
| A - Analogic channels config.              |
| L - Analogic channels alarm limits         |
| P - SMS Configuration                      |
| S - All message monitor                    |
| R - System settings                        |
|
| Press <2> or <3> or <4> to EXIT from TERMINAL
|
+-----+

```

How the two levels differ due to the presence of the System settings.

#### 8.2.4 Procedure K (KEY)

In order to edit parameters, enter the "K" procedure numerical access key, typing the letter "K" (KEY).

```

ELENOS TLMTR                                -<V. x.xx id 01>- menu = Q
ENTER ACCESS KEY:
INSERT KEY: 0000

```

The steps for entry are as follows:

1. Press ENTER. The field will become :

| INSERT KEY: 0000 |

2. Enter the number of the four digits using the keys from 0 to 9 or the BACK SPACE key to delete the first digit to the right.

| INSERT KEY: 0020 |

3. Once entry has been completed, press ENTER to return to the main menu.

Once the correct password has been entered, it will be possible to perform functions associated with it.

### 8.3 First system configuration

It is necessary to configure analog and digital connection signals via the configuration menu in order to use the system.

Enter the "SYSTEM" key via the "K" procedure, as seen previously.

### 8.4 Procedure D (INPUTS) - Digital input signal configuration

Activate procedure "D" typing the letter "D" (INPUTS) from the main menu.

The following window will appear:

|              |               |                            |         |        |        |
|--------------|---------------|----------------------------|---------|--------|--------|
| ELENOS TLMTR |               | -<V. x.xx id 01>- menu = Q |         |        |        |
| INPUT:       |               | ALARM:                     |         |        |        |
| LABEL        | CURRENT LEVEL | LEVEL                      | DELAY   | ENABLE | STATUS |
|              | -             | -                          | seconds | -      | -      |
| I1: DIN.0    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I2: DIN.1    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I3: DIN.2    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I4: DIN.3    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I5: DIN.4    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I6: DIN.5    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I7: DIN.6    | OPEN          | OPEN                       | 10      | FALSE  | -----  |
| I8: DIN.7    | OPEN          | OPEN                       | 10      | FALSE  | -----  |

Parameters can be modified only from the "SYSTEM" user level.

Use the PC cursor keys to move between the various editable fields, selecting the field to be modified. Below is a detailed description of the single fields.

### 8.4.1 LABEL field

Allows the user to enter a name of max 5 characters, used both for alarm display and for SMS messages after an alarm. The steps to take to modify said field are as follows:

Press ENTER to modify.

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | DIN.0 | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

Press keys <A..Z> <a..z> <0..9> to change data or ← (BACK SPACE) to delete the character to the right. When deleted, the character will be replaced by the symbol # to indicate the presence of an empty space.

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | DIN## | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | ##### | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | PROVA | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

Once input has been completed, press ENTER to exit and save data.

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | PROVA | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

### 8.4.2 CURRENT LEVEL field

Shows the current status of digital inputs. Said inputs are normally open (OPEN) if not connected and are detected as closed if ground-connected. Cannot be edited.

### 8.4.3 Alarm LEVEL field.

Allows the user to set the logic level for which the system will generate an alarm and then, if enabled, the SMS message. Said field can have two states, OPEN and CLOSED. Follow the procedure below to modify this field.

Press ENTER to modify.

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | PROVA | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

Use the UP or DOWN arrows to change the field.

|     |       |        |        |    |       |       |
|-----|-------|--------|--------|----|-------|-------|
| I1: | PROVA | CLOSED | CLOSED | 10 | FALSE | ----- |
|-----|-------|--------|--------|----|-------|-------|

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | PROVA | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

Press ENTER at the end to finish.

|     |       |        |        |    |       |       |
|-----|-------|--------|--------|----|-------|-------|
| I1: | PROVA | CLOSED | CLOSED | 10 | FALSE | ----- |
|-----|-------|--------|--------|----|-------|-------|

### 8.4.4 DELAY field

Allows the user to set the time delay in seconds before an alarm is generated. The value can go from 0 to 240 and the procedure is as follows.

Press ENTER to modify.

|     |       |        |      |    |       |       |
|-----|-------|--------|------|----|-------|-------|
| I1: | PROVA | CLOSED | OPEN | 10 | FALSE | ----- |
|-----|-------|--------|------|----|-------|-------|

Use keys <0..9> or the ← (BACK SPACE) key to delete the first digit to the right. Enter the new value.

|     |       |        |      |   |       |       |
|-----|-------|--------|------|---|-------|-------|
| I1: | PROVA | CLOSED | OPEN | 5 | FALSE | ----- |
|-----|-------|--------|------|---|-------|-------|

Press ENTER at the end to finish.

|           |        |        |   |       |       |
|-----------|--------|--------|---|-------|-------|
| I1: PROVA | CLOSED | CLOSED | 5 | FALSE | ----- |
|-----------|--------|--------|---|-------|-------|

#### 8.4.5 ENABLE field

Allows the user to enable/disable alarm generation for the selected input. The procedure for modification is the same as that seen in point 3.1.3, being a field with two states. The value can change between TRUE (alarm enabled) and FALSE (alarm disabled).

#### 8.4.6 STATUS field

Shows current alarm status. Can assume the ACTIVE value ----- indicating that the alarm is active (ACTIVE) or not active (-----)

The following window shows an example of digital input signal configuration.

| ELENOS TLMTR |               | -<V. x.xx id 01>- menu = Q |         |        |        |
|--------------|---------------|----------------------------|---------|--------|--------|
| INPUT:       |               | ALARM:                     |         |        |        |
| LABEL        | CURRENT LEVEL | LEVEL                      | DELAY   | ENABLE | STATUS |
|              | -             | -                          | seconds | -      | -      |
| I1: ALM 1    | CLOSED        | OPEN                       | 5       | TRUE   | -----  |
| I2: T.MAX    | OPEN          | OPEN                       | 10      | TRUE   | ACTIVE |
| I3: ROS      | CLOSED        | CLOSED                     | 20      | TRUE   | ACTIVE |
| I4: DIN.3    | CLOSED        | OPEN                       | 10      | FALSE  | -----  |
| I5: DIN.4    | CLOSED        | OPEN                       | 10      | FALSE  | -----  |
| I6: DIN.5    | CLOSED        | OPEN                       | 10      | FALSE  | -----  |
| I7: DIN.6    | CLOSED        | OPEN                       | 10      | FALSE  | -----  |
| I8: DIN.7    | CLOSED        | OPEN                       | 10      | FALSE  | -----  |

As you can see, the first three digital signals I1, I2, I3 are enabled.

Signal I1 is called "ALM 1" and is enabled (ENABLE) to generate an alarm if the signal goes low (OPEN) for 5 seconds (DELAY). The alarm is currently not active (STATUS) as the digital signal is high (CLOSED) as visible in the "CURRENT LEVEL" field.

Signal I2 is called "T.MAX" and is enabled (ENABLE) to generate an alarm if the signal goes low (OPEN) for 10 seconds (DELAY). Currently the alarm is active (STATUS) as the digital signal is low (OPEN) as visible in the "CURRENT LEVEL" field.

Signal I3 is called "ROS" and is enabled (ENABLE) to generate an alarm if the signal goes high (CLOSED) for 20 seconds (DELAY). Currently the alarm is active (STATUS) as the digital signal is high (CLOSED) as visible in the "CURRENT LEVEL" field.

All other signals are not assigned by are however visible as current levels in the various telemetry windows, though they do not generate alarms.

### 8.5 Procedure O (OUTPUTS) - Output digital signal configuration

Activate procedure "O", typing the letter "O" of OUTPUTS in the main menu.

The telemetry outputs are created by means of relays, therefore excited relay status will as follows be indicated as CLOSED (NC contact = OPEN, NO contact = CLOSED), while OPEN for non-excited relay status (NC contact = CLOSED, NO contact = OPEN).

The following window will appear:

ELENOS TLMTR

-<V. x.xx id 01>- menu = Q

OUTPUT:

| LABEL     | COMMAND | LOGIC  | DELAY   | STATUS |
|-----------|---------|--------|---------|--------|
|           | -       | -      | seconds | -      |
| 01: DOU.0 | -----   | DIRECT | 0       | OPEN   |
| 02: DOU.1 | -----   | DIRECT | 0       | OPEN   |
| 03: DOU.2 | -----   | DIRECT | 0       | OPEN   |
| 04: DOU.3 | -----   | DIRECT | 0       | OPEN   |
| 05: DOU.4 | -----   | DIRECT | 0       | OPEN   |
| 06: DOU.5 | -----   | DIRECT | 0       | OPEN   |
| 07: DOU.6 | -----   | DIRECT | 0       | OPEN   |
| 08: DOU.7 | -----   | DIRECT | 0       | OPEN   |

Parameters can be modified only from the "SYSTEM" user level, while it is only possible to modify the "COMMAND" field from the "USER" level.

Use the PC cursor keys to move between the various editable fields, selecting the field to be modified. Below is a detailed description of the single fields.

#### 8.5.1 LABEL field

Allows the user to modify the output name. It is used only for visualisation of the various windows in which it appears. Follow the same procedure described in point 3.1.1 for Digital Inputs to modify this field.

#### 8.5.2 COMMAND field.

Allows the user to work with the digital output selected from the terminal programme. On the basis of the later field settings (LOGIC and DELAY), it is possible to work with the output, changing status from ACTIVE (output takes on the LOGIC set status) e ----- (output takes on the LOGIC negative set status) . Follow the same procedure described in point 3.1.3 for Digital Inputs to modify this field.

### 8.5.3 LOGIC field

Allows the user to set output logic based on the command (COMMAND).

To summarise:

If LOGIC = DIRECT  
 COMMAND = ACTIVE → Output Closed  
 COMMAND = ---- → Output Open

If LOGIC = NOT  
 COMMAND = ACTIVE → Output Open  
 COMMAND = ---- → Output Closed

Follow the same procedure described in point 3.1.3 for Digital Inputs to modify this field.

### 8.5.4 DELAY field

This field has a dual function:

- DELAY = 0. Outputs become level bistable and therefore it is possible to set the two levels CLOSED/OPEN by means of COMMAND or via the corresponding SMS commands.
- DELAY > 0. The outputs become monostable, in which the position of stability is defined by the LOGIC field. Therefore, it is possible to perform a DELAY duration impulse by means of COMMAND. If LOGIC = DIRECT, the position of stability of the output is OPEN, therefore in COMMAND execution the output is closed for a DELAY time, after which it is opened again. If LOGIC = NOT, the position of stability of the output is CLOSED, therefore in COMMAND execution the output is opened for a DELAY time, after which is closed again.

### 8.5.5 STATUS field

Shows current output status. If the output is closed it will be reported as OPEN. If it is closed, it will be reported as CLOSED.

The following window shows an example of digital output signal configuration.

ELENOS TLMTR

-<V. x.xx id 01>- menu = Q

OUTPUT:

| LABEL     | COMMAND | LOGIC  | DELAY   | STATUS |
|-----------|---------|--------|---------|--------|
|           | -       | -      | seconds | -      |
| 01: INTLK | ACTIVE  | DIRECT | 0       | CLOSED |
| 02: ON    | -----   | DIRECT | 1       | OPEN   |
| 03: OFF   | -----   | DIRECT | 1       | OPEN   |
| 04: DOU.3 | -----   | DIRECT | 0       | OPEN   |
| 05: DOU.4 | -----   | DIRECT | 0       | OPEN   |
| 06: DOU.5 | -----   | DIRECT | 0       | OPEN   |
| 07: DOU.6 | -----   | DIRECT | 0       | OPEN   |
| 08: DOU.7 | -----   | DIRECT | 0       | OPEN   |

This configuration was created for HW piloting of an ETG. As can be noted, the first output is used as an Interlock for which the signal is defined at level (DELAY = 0) and is kept closed (COMMAND = ACTIVE) to allow the interlock to enable ETG. To then be able to command switching on and off of the ETG, two other outputs have been utilised, 2 and 3, defined as monostable (DELAY > 1) and with an active status of OPEN. The NO contacts of the three outputs and commons are utilised with regards to the ETG connection (2b-3b for interlock, 5b-6b for ON command and 2°-3° for OFF command).

NOTE:

Outputs do not influence telemetry alarm status.

## 8.6 Procedure A (ANALOG) - Analog input signal configuration

Activate procedure "A", typing the letter "A" of ANALOG from the main menu.

The following window will appear:

| ELENOS TLMTR  |      | -<V. x.xx id 01>- menu = Q |      |         |           |        |
|---------------|------|----------------------------|------|---------|-----------|--------|
| ANALOG INPUTS |      | VALUE                      | GAIN | LIN/LOG | FULLSCALE | AD.VAL |
| LABEL         | U.M. |                            |      |         |           |        |
| A1: AIN.0     | A    | 0                          | 1.00 | LIN     | 10.00     | 0      |
| A2: AIN.1     | dBm  | 1023                       | 1.00 | LIN     | 100.0     | 0      |
| A3: AIN.2     | KW   | 1023                       | 1.00 | LIN     | 1000      | 0      |
| A4: AIN.3     | W    | 0                          | 1.00 | LIN     | 10000     | 0      |
| A5: AIN.4     | V    | 0                          | 1.00 | LIN     | 50000     | 0      |
| A6: AIN.5     | C    | 0                          | 1.00 | LIN     | 5000      | 0      |
| A7: AIN.6     | %    | 0                          | 1.00 | LIN     | 500.0     | 0      |
| A8: AIN.7     | -    | 0                          | 1.00 | LIN     | 50.00     | 0      |

Parameters can be modified only from the "SYSTEM" user level.

Use the PC cursor keys to move between the various editable fields, selecting the field to be modified. Below is a detailed description of the single fields.



### 8.6.1 LABEL field

Allows the user to modify the analog input name. It is used only for visualisation of the various windows in which it appears and to generate alarms. Follow the same procedure described in point 3.1.1 for Digital Inputs to modify this field.

### 8.6.2 U.M. (unit of measure) field

Represents the unit of measure to utilise in visualisation and in alarms. The file is a List type and therefore it is possible to select the unit of measure from a pre-defined list. The possible values for selection are: mA,A,mV,V,W,KW,dBm,C,%,-. The procedure to change data is as follows:

Press ENTER to modify.

|           |   |   |      |     |       |   |
|-----------|---|---|------|-----|-------|---|
| A1: AIN.0 | A | 0 | 1.00 | LIN | 10.00 | 0 |
|-----------|---|---|------|-----|-------|---|

Use the arrows to modify the field.

|           |   |   |      |     |       |   |
|-----------|---|---|------|-----|-------|---|
| A1: AIN.0 | A | 0 | 1.00 | LIN | 10.00 | 0 |
|-----------|---|---|------|-----|-------|---|

|           |    |   |      |     |       |   |
|-----------|----|---|------|-----|-------|---|
| A1: AIN.0 | mV | 0 | 1.00 | LIN | 10.00 | 0 |
|-----------|----|---|------|-----|-------|---|

|           |   |   |      |     |       |   |
|-----------|---|---|------|-----|-------|---|
| A1: AIN.0 | V | 0 | 1.00 | LIN | 10.00 | 0 |
|-----------|---|---|------|-----|-------|---|

|           |   |   |      |     |       |   |
|-----------|---|---|------|-----|-------|---|
| A1: AIN.0 | W | 0 | 1.00 | LIN | 10.00 | 0 |
|-----------|---|---|------|-----|-------|---|

Once input has been completed, press ENTER to exit and save data.

|           |   |   |      |     |       |   |
|-----------|---|---|------|-----|-------|---|
| A1: AIN.0 | W | 0 | 1.00 | LIN | 10.00 | 0 |
|-----------|---|---|------|-----|-------|---|

### 8.6.3 VALUE field

Represents the converted analog input value utilising the following parameters GAIN, LIN/LOG and FULLSCALE.

### 8.6.4 GAIN field

Gain value to be used for measurement conversion. Values from 0.50 to 20.00 can be entered. Used in calculating the converted measurement as a multiplier. Follow the same procedure described in point 3.1.4 for Digital Inputs to modify this field.

### 8.6.5 LIN/LOG field

Allows the user to set the type of conversion, between LINear and LOGarithmic. Logarithmic conversion uses a table which follows the progress of Elenos directional couplers and can therefore be used for measuring non-linear powers. Follow the same procedure described in point 3.1.3 for Digital Inputs to modify this field.

### 8.6.6 FULLSCALE field

The full scale measurement value. The file is a List type and therefore it is possible to select the unit of measure from a pre-defined list. Refer to previous paragraph 3.3.2 to modify the value. The possible values which can be taken are: 10.00, 12.00, 25.00, 50.00, 75.00, 100.0, 125.0, 250.0, 500.0, 750.0, 1000, 1250, 2500, 5000, 7500, 10000, 12500, 25000, 50000.

### 8.6.7 AD.VAL field

The number of AD converter points is displayed. Said value can be from 0 to 1023.

The following window shows an example of analog input signal configuration.

| ELENOS TLMTR  |      | -<V. x.xx id 01>- menu = Q |      |         |           |        |  |
|---------------|------|----------------------------|------|---------|-----------|--------|--|
| ANALOG INPUTS |      |                            |      |         |           |        |  |
| LABEL         | U.M. | VALUE                      | GAIN | LIN/LOG | FULLSCALE | AD.VAL |  |
| A1: TEMP      | C    | 232                        | 1.22 | LIN     | 100.0     | 109    |  |
| A2: VDS       | V    | 384                        | 1.00 | LIN     | 50.00     | 768    |  |
| A3: IDS       | A    | 2223                       | 1.00 | LIN     | 50.00     | 445    |  |
| A4: PWR       | W    | 595                        | 1.00 | LOG     | 1000      | 727    |  |
| A5: AIN.4     | -    | 0                          | 1.00 | LIN     | 1000      | 0      |  |
| A6: AIN.5     | -    | 0                          | 1.00 | LIN     | 1000      | 0      |  |
| A7: AIN.6     | -    | 0                          | 1.00 | LIN     | 1000      | 0      |  |
| A8: AIN.7     | -    | 0                          | 1.00 | LIN     | 1000      | 0      |  |

As can be noted, the first four Analog signals A1, A2, A3, A4 are enabled.

The A1 signal is called "TEMP". Its unit of measure "U.M." is in Celsius degrees and its "GAIN" of correction is 1.22 (22 %). It is a linear quantity with a full scale 100.0, and will therefore be shown in other windows as "23.2 C".

The A2 signal is called "VDS." Its unit of measure "U.M." is in volts and its "GAIN" of correction is 1.00 and therefore has no correction. It is a linear quantity with full scale 50.00 and therefore will be shown in other windows as "38.4 V".

The A3 signal is called "IDS." Its unit of measure "U.M." is in amperes and its "GAIN" of correction is 1.00 and therefore has no correction. It is a linear quantity with full scale 50.00 and therefore will be shown in other windows as "22.23 A".

The A4 signal is called "PWR." Its unit of measure "U.M." is in W and its "GAIN" of correction is 1.00 and therefore has no correction. It is a logarithmic quantity with full scale 1000 and therefore will be shown in other windows as "595 W".

The remaining analog inputs are not configured and will be visualised with a full scale of "1000" and a unit of measure of null "-".

## 8.7 Procedure L (LIMITS) - Analog input alarm signal threshold configuration

Activate procedure "L", typing the letter "L" of LIMITS from the main menu.

The following window will appear:

| ELENOS TLMTR  |      | -<V. x.xx id 01>- menu = Q |        |       |        |       |       |              |       |
|---------------|------|----------------------------|--------|-------|--------|-------|-------|--------------|-------|
| ANALOG INPUTS |      | CURRENT                    | LIMITS |       |        |       |       | ALARM STATUS |       |
| LABEL         | U.M. | VALUE                      | ENABLE | LOWER | ENABLE | UPPER | DELAY | LOWER        | UPPER |
| A1: TEMP      | C    | 73.2                       | FALSE  | 0.0   | TRUE   | 70.0  | 1     | FALSE        | TRUE  |
| A2: VDS       | V    | 38.4                       | TRUE   | 30.0  | TRUE   | 50.0  | 1     | FALSE        | FALSE |
| A3: IDS       | A    | 22.23                      | FALSE  | 0.00  | TRUE   | 25.00 | 1     | FALSE        | FALSE |
| A4: PWR       | W    | 595                        | TRUE   | 300   | FALSE  | 0     | 30    | FALSE        | FALSE |
| A5: AIN.4     | -    | 0                          | FALSE  | 0     | FALSE  | 0     | 1     | FALSE        | FALSE |
| A6: AIN.5     | -    | 0                          | FALSE  | 0     | FALSE  | 0     | 1     | FALSE        | FALSE |
| A7: AIN.6     | -    | 0                          | FALSE  | 0     | FALSE  | 0     | 1     | FALSE        | FALSE |
| A8: AIN.7     | -    | 0                          | FALSE  | 0     | FALSE  | 0     | 1     | FALSE        | FALSE |

Parameters can be modified only from the "SYSTEM" user level.

From this window, it is possible to modify most of the parameters present in the window, previously described as LABEL, U.M.

The other parameters allow enabling of maximum or minimum alarms on analogs according to the following descriptions.

### 8.7.1 LIMITS ENABLE

The two ENABLE fields allow the user to enable/disable (TRUE/FALSE) the alarm corresponding to maximum (UPPER) or minimum (LOWER). Follow the same procedure described in point 3.1.3 for Digital Inputs to modify this field.

### 8.7.2 LIMITS LOWER, LIMITS UPPER

Allows the user to set minimum (LOWER) or maximum (UPPER) limits on the selected analog measurement alarm. As said value is linked to the type of conversion selected in the previous window (LIN/LOG), the modification of said field is allowed only by means of cursor arrows. When the UP cursor is pressed, the value will be increased by a minimum unit relative to the selected conversion, and vice-versa when the DOWN arrow is pressed, where the value will be decreased. Naturally, as with all modifications, press ENTER to modify and press it again to save modifications.

### 8.7.3 DELAY

Allows the user to set the time to delay before generating an alarm related to the selected measurement. Refer to the previous chapter 3.1.4 to modify said field.

### 8.7.4 ALARM STATUS

Shows current alarm status. If TRUE signifies that an alarm is present, the opposite is true for FALSE. The field is divided into two columns, LOWER and UPPER, which refer to the respective alarms.

## 8.8 Procedure P (PHONE)

Configure user phone numbers and rights from the following procedure P window. To activate procedure, type "P" (PHONE).

```

+-----+
| ELENOS TLMTR                                -<V. 2.00 id 01>- menu = Q |
+-----+
| SMS MESSAGES CONFIGURATION                  |
| ALARM EN. : TRUE                           |
| ID STRING : Prova TLC                      |
|
| PHONE N. 1: +393123444444                  |
| PHONE N. 2: +391233424455                  |
| PHONE N. 3:                               |
| PHONE N. 4:                               |
| PHONE N. 5:                               |
|
+-----+
| SMS CENTER : +393492000200                  |
+-----+
| GSM Info : I OMNI                          -78dB |
| SMS Info : +39353...                        |
+-----+

```

| PHONE N.         | PHONE TYPE | SMS MESSAGE USE          |
|------------------|------------|--------------------------|
| 1: +393123444444 | GSM        | ENABLED SMS+COMMAND      |
| 2: +391233424455 | PSTN       | ENABLED SMS+COMMAND+ECHO |
| 3:               | NONE       | DISABLED                 |
| 4:               | NONE       | DISABLED                 |
| 5:               | NONE       | DISABLED                 |

The edited fields, shown in blue, are respectively:

- |   |  |
|---|--|
| ALARM_EN  | - General enabling of SMS alarm send.  |
| ID STRING   | - Identifying name to appear in the SMS message. (10 characters)   |
| PHONE N. 1..5   | - Phone numbers to send or receive SMS to and from.  |
| TYPE  | - Configuration column of the type of modem to be called. The possibilities are: <ul style="list-style-type: none"><li>• NONE - Disable number.</li><li>• PSTN - Traditional modem for phone lines.</li><li>• PAGER - Pager for number receipt.</li><li>• GSM - GSM modem.</li></ul> |
| The difference between the two types exists in the telemetry message sent. For the GSM, this message is an SMS. For the PSTN, it is a line of text, while for the PAGER it is a numerical station ID. |  |
| SMS MESS. USE   | - Behaviour following SMS receipt or alarm management. The system can: <ul style="list-style-type: none"><li>• Send an alarm SMS.</li><li>• Receive a command SMS</li><li>• Send a received command echo on another number</li></ul>   |

For this reason, for each number it is possible to enable one or more of these functions. If this field is set on DISABLED, nothing is possible on this phone number. ENABLE SMS enables alarm SMS transmission for the number but not command or command echo receipt. If the user selects ENABLE\_SMS+COMMAND, the number is enabled for alarm SMS and to receive a command SMS but does not manage an echo.

If the user selects ENABLE SMS+COMMAND+ECHO all functions are enabled. The ECHO can be used if the user would like to know if another number has sent commands to the system.

SMS CENTER - Operator SMS service centre number (for example Omnitel)

The system will ignore any SMS received from phone numbers not entered in the list or entered but disabled in the "ENABLE ACCOUNT" field.

### ATTENTION

*Enter phone numbers (leaving no empty spaces at the beginning) in the international format (i.e. +393371234567).*

The GSM Info read-only field shows the name of the operator and the signal level.

The GSM Info read-only field shows the phone number of the last SMS received and the command associated with it.

## 8.9 Telemetry use

Once the telemetry system has been configured, it automatically sends an SMS to registered and enabled users. This SMS warns of the presence of any alarms or malfunctions.

It is possible to see information acquired via the following windows by connecting to a serial cable or via an equipment modem.

As indicated in chapter "8.1 Equipment connection activation procedure.", it is necessary to access equipment (login).

If any modifications are necessary, enter the appropriate access key via procedure K (KEY), described in paragraph "8.2.4 Procedure ".

The previously described main menu will be displayed as follows.

## 8.10 Procedure T (TELEMETRY)

Type T (TELEMETRY) to enter into the window summarising the logical status of digital inputs and outputs as well as the converted value of analog inputs.

|                             |       |      |                            |        |                 |        |
|-----------------------------|-------|------|----------------------------|--------|-----------------|--------|
| ELENOS TLMTR                |       |      | -<V. x.xx id 01>- menu = Q |        |                 |        |
| STATUS:====> 27 MAINS FAULT |       |      |                            |        |                 |        |
| ANALOG INPUT:               |       |      | DIGITAL INPUT:             |        | DIGITAL OUTPUT: |        |
| Name                        | Value | M.U. | Name                       | Status | Name            | Status |
| AI1: AIN.0                  | 0.00  | V    | DI1: DIN.0                 | -----  | DO1: DOU.0      | -----  |
| AI2: AIN.1                  | 0.00  | V    | DI2: DIN.1                 | -----  | DO2: DOU.1      | -----  |
| AI3: AIN.2                  | 0.00  | V    | DI3: DIN.2                 | -----  | DO3: DOU.2      | -----  |
| AI4: AIN.3                  | 0.00  | V    | DI4: DIN.3                 | -----  | DO4: DOU.3      | -----  |
| AI5: AIN.4                  | 0.00  | V    | DI5: DIN.4                 | -----  | DO5: DOU.4      | -----  |
| AI6: AIN.5                  | 0.00  | V    | DI6: DIN.5                 | -----  | DO6: DOU.5      | -----  |
| AI7: AIN.6                  | 0.00  | V    | DI7: DIN.6                 | -----  | DO7: DOU.6      | -----  |
| AI8: AIN.7                  | 0.00  | V    | DI8: DIN.7                 | -----  | DO8: DOU.7      | -----  |

Parameters can be modified from the "SYSTEM", "USER" user levels.

The "STATUS" field displays text describing the most priority active alarm present in the system.

All "LABEL" columns show the previously described set descriptive text.

"VALUE" shows the converted values of analog inputs.

"U.M." shows the unit of measure of the previously set analog quantities.

The "STATUS" columns show the logical status of digital inputs and outputs.

Press key Q (QUIT) to exit from the window.

### 8.11 Procedure S (SECONDARY ALARMS)

From the main menu, the user can activate the list of the active and textually memorised alarms present by pressing the key S (**SECONDARY ALARMS**).

```
| ELENOS TLMTR                                     -<V. x.xx id 01>- menu = Q  
|-----  
| RESET ALLARMI: RESET  
| Alarm List   : 27 MAINS FAULT
```

***a. Procedure R (RESERVED) – Reserved parameter settings***

It is possible from the main menu to activate a list of reserved parameters for configuration by pressing the key R (**RESERVED**).

```
+-----+
| ELENOS TLMTR                                     -<V. 2.00   id   01>-    menu = Q |
+-----+
| SYSTEM SETTINGS:                                |
|                                                    |
| LOGIC ID                      (n.):              1 |
|-----+-----+
| USER KEY                     (n.):             0010 |
| SYSTEM KEY                    (n.):             0020 |
|-----+-----+
|                               |
|-----+-----+
| MAINS ALARMS DELAY           (s):               60 |
|-----+-----+
| Release Date and Time        : Jan 18 2006      10:35:34 |
|-----+-----+
| Enable Transparent IEE485    : FALSE            |
| Reset to Factory values     : Default          |
|-----+-----+
```

Procedure only accessible and parameters modifiable only from the "SYSTEM" user level.

The "LOGIC ID" field defines the equipment address code. (See chapter **Errore. L'origine riferimento non è stata trovata.** – **Errore. L'origine riferimento non è stata trovata.**).

"USER KEY" defines the key value for visualisation and modification of non-reserved parameters.

"SYSTEM KEY" defines the key value for the visualisation and modification of all parameters.

"MAINS ALARM DELAY" defines the activation and deactivation delay time of alarms when no network power is present. (See chapter **Errore. L'origine riferimento non è stata trovata.** - Alarms).

"Enable Transparent ..." enables transparent function between the internal modem and the rear telemetry IEE485. This option allows use of the telemetry by systems already autonomously managing the GSM modem. In systems like the E3000, E10K, etc., in which modem management has already been arranged, the user will have to enable said telemetry functionality in such a way to allow direct equipment management of alarms and connections. It is understood that all telemetry alarms, such as mains or analog/digital inputs loss, continue to be managed by the telemetry itself. This means that with systems like those mentioned above, the user will have to memorise phone numbers both in the telemetry and on the system to which it is connected. In the case of old equipment or equipment without autonomous GSM management, said function will be disabled to allow the telemetry complete management of the internal modem.

"Reset to Factory..." Allows the user to reset factory configuration of the telemetry. The user can select between different types of equipment in order to allow automatic configuration of parameters necessary for management.

For example, if "ETG or ETG+E3000" are selected, the first two analog inputs become direct and reflected power, the first 4 digital inputs will report the status of equipment and therefore also for digital outputs. Connection with said equipment however requires use of suitable wiring to connect inputs and outputs from the telemetry to its rear connectors. If said wiring is not set, the use of this function will not lose significance.



### 8.12 Access rights procedures

Various procedures are enabled for visualisation and modifications, based on various user access rights, depending on the key entered in procedure K (chapter 8.2.4 Procedure K (KEY)).

#### Visualisation

| Procedure | GUEST | USER | SYSTEM |
|-----------|-------|------|--------|
| T         | √     | √    | √      |
| I         | √     | √    | √      |
| O         | √     | √    | √      |
| A         | √     | √    | √      |
| L         | √     | √    | √      |
| P         | √     | √    | √      |
| R         |       |      | √      |
| S         | √     | √    | √      |
| F         |       |      | √      |

#### Modify

| Procedure | GUEST | USER | SYSTEM |
|-----------|-------|------|--------|
| T         |       | √    | √      |
| I         |       |      | √      |
| O         |       | √    | √      |
| A         |       |      | √      |
| L         |       |      | √      |
| P         |       |      | √      |
| R         |       |      | √      |
| S         |       |      |        |
| F         |       |      | √      |

### 8.13 Alarms

|                      |  |
|----------------------|--|
| 00 CORRECT WORKING   | No alarm present   |
| 01 CHECKSUM ERROR    | Erred configuration data, configure system (chapter 8.3)                       |
| 02 RESET ACTIVE      | Reset command in progress  |
| 03 DIGITAL INPUT 1   | Digital input 1 alarm  |
| 04 DIGITAL INPUT 2   | Digital input 2 alarm  |
| 05 DIGITAL INPUT 3   | Digital input 3 alarm  |
| 06 DIGITAL INPUT 4   | Digital input 4 alarm  |
| 07 DIGITAL INPUT 5   | Digital input 5 alarm  |
| 08 DIGITAL INPUT 6   | Digital input 6 alarm  |
| 09 DIGITAL INPUT 7   | Digital input 7 alarm  |
| 10 DIGITAL INPUT 8   | Digital input 8 alarm  |
| 11 ANALOG.INP.1 HIGH | Analog input 1 value over maximum set limit                                    |
| 12 ANALOG.INP.4 LOW  | Analog input 1 value under minimum set limit                                   |
| 13 ANALOG.INP.2 HIGH | Analog input 2 value over maximum set limit                                    |
| 14 ANALOG.INP.2 LOW  | Analog input 2 value under minimum set limit                                   |
| 15 ANALOG.INP.3 HIGH | Analog input 3 value over maximum set limit                                    |
| 16 ANALOG.INP.3 LOW  | Analog input 3 value under minimum set limit                                   |
| 17 ANALOG.INP.4 HIGH | Analog input 4 value over maximum set limit                                    |
| 18 ANALOG.INP.4 LOW  | Analog input 4 value under minimum set limit                                   |
| 19 ANALOG.INP.5 HIGH | Analog input 5 value over maximum set limit                                    |
| 20 ANALOG.INP.5 LOW  | Analog input 5 value under minimum set limit                                   |
| 21 ANALOG.INP.6 HIGH | Analog input 6 value over maximum set limit                                    |
| 22 ANALOG.INP.6 LOW  | Analog input 6 value under minimum set limit                                   |
| 23 ANALOG.INP.7 HIGH | Analog input 7 value over maximum set limit                                    |
| 24 ANALOG.INP.7 LOW  | Analog input 7 value under minimum set limit                                   |
| 25 ANALOG.INP.8 HIGH | Analog input 8 value over maximum set limit                                    |
| 26 ANALOG.INP.8 LOW  | Analog input 8 value under minimum set limit                                   |
| 27 MAINS FAULT       | No network power, all alarms derived from analog and digital inputs are masked |
| 28 MAINS OK          | Correct equipment function, correct network power                              |

#### NOTE

Alarm 27 MAINS FAULT, masks and blocks activation of all alarms relative to digital or analog inputs.

## 8.14 HARDWARE CONNECTIONS

Rear view of equipment

Digital outputs

| 12a | 11a | 10a | 9a | 8a | 7a | 6a | 5a | 4a | 3a | 2a | 1a |
|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| O   | o   | o   | o  | o  | o  | o  | O  | o  | o  | o  | o  |
| 12b | 11b | 10b | 9b | 8b | 7b | 6b | 5b | 4b | 3b | 2b | 1b |
| O   | o   | o   | o  | o  | o  | o  | o  | o  | o  | o  | o  |

Digital Inputs

| 12a | 11a | 10a | 9° | 8a | 7a | 6a | 5a | 4a | 3a | 2a | 1a |
|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| o   | O   | O   | O  | O  | O  | o  | o  | O  | o  | o  | o  |
| 12b | 11b | 10b | 9b | 8b | 7b | 6b | 5b | 4b | 3b | 2b | 1b |
| o   | o   | o   | O  | o  | o  | o  | o  | O  | o  | o  | o  |

### 8.14.1.1.1 Digital Outputs connections

| Pin | Description  | Pin | Description  |
|-----|--------------|-----|--------------|
| 1a  | OUT 3 NC     | 1b  | OUT 1 NC     |
| 2a  | OUT 3 COMMON | 2b  | OUT 1 COMMON |
| 3a  | OUT 3 NO     | 3b  | OUT 1 NO     |
| 4a  | OUT 4 NC     | 4b  | OUT 2 NC     |
| 5a  | OUT 4 COMMON | 5b  | OUT 2 COMMON |
| 6a  | OUT 4 NO     | 6b  | OUT 2 NO     |
| 7a  | OUT 5 NC     | 7b  | OUT 7 NC     |
| 8a  | OUT 5 COMMON | 8b  | OUT 7 COMMON |
| 9a  | OUT 5 NO     | 9b  | OUT 7 NO     |
| 10a | OUT 6 NC     | 10b | OUT 8 NC     |
| 11a | OUT 6 COMMON | 11b | OUT 8 COMMON |
| 12a | OUT 6 NO     | 12b | OUT 8 NO     |

### 8.14.1.1.2 Digital output relay characteristics.

Manufacturer: Omron

Contact type SPDT

Resistive load 0.5A at 125 VAC, 1 A at 24 VDC

Maximum switchable power 62.5 VA, 30 W

Mechanical life 5,000,000 operations minimum

Electrical life 100,000 operations minimum

Operating temperature from -40° to 70°

Insulation resistance 1,000 MOhm min (at 500 VDC between coil and contacts, at 250 VDC between contacts of the same polarity)

Dielectric test 1,000 VAC, 50/60 Hz per 1 minute between coil and contacts

400 VAC, 50/60 Hz per 1 minute between contacts of the same polarity

Elenos outputs are set for use with currents between 1 and 500mA, on resistive load, for voltage lower than 30V.

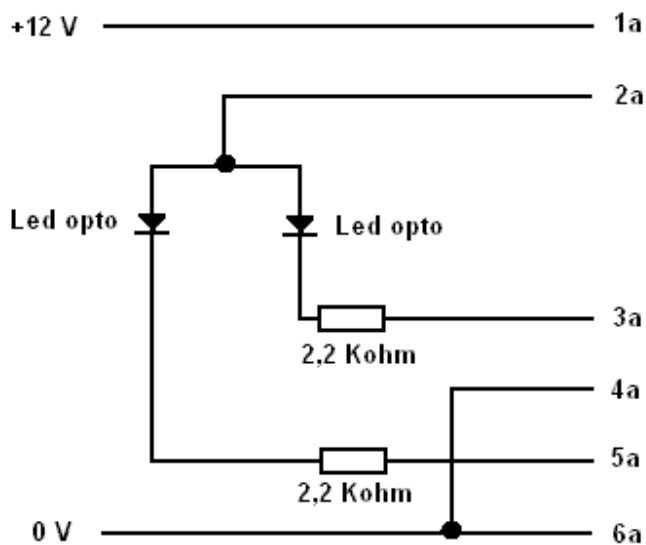
Technical Office TEL: +39 0532 829 965 - FAX: +39 0532 829 177

E-Mail: [info@elenos.com](mailto:info@elenos.com)

**8.14.1.1.3 Digital inputs connections**

| Pin  | Description | Pin | Description |
|------|-------------|-----|-------------|
| 1a   | +12 V       | 1b  | +12 V       |
| 2a   | + IN 7 – 8  | 2b  | + IN 3 – 4  |
| 3a   | IN 8        | 3b  | IN 4        |
| 4a   | 0 V         | 4b  | 0 V         |
| 5a   | IN 7        | 5b  | IN 3        |
| 6a   | 0 V         | 6b  | 0 V         |
| 7a   | +12 V       | 7b  | +12 V       |
| 8a   | + IN 5 – 6  | 8b  | + IN 1 – 2  |
| 9a   | IN 6        | 9b  | IN 2        |
| 10a  | 0 V         | 10b | 0 V         |
| 11 a | IN 5        | 11b | IN 1        |
| 12 a | 0 V         | 12b | 0 V         |

The input circuit has been constructed as per the below base drawing.



In total, 4 groups of 2 inputs each are present. each group is floating with respect to the equipment and to ground.

Inputs can be powered by external sources with direct currents with positives connected to terminal 2a and must be re-closed (when the power supply returns) by means of a clean contact with the relay. Consider the circuits identical starting from 7a, from 1b, and from 7b for other input couples.

## TELEMETRY Use and maintenance manual

Nominal power voltage for inputs must be 12V, the current is less than 6mA for each input. As can be deduced from the base drawing, the external contact closing powers the LED diode of an optical coupler by means of a resistance of 2200Ohm which limits the circulating current.

It is therefore possible to use power supply voltages over 12V, adding a further resistance series of a suitable value to each input line (externally). For example, if the power voltage on inputs is 24V, add a resistance series of 2200 Ohm, 0.25W.

A direct current power supply of 12V on each input connector is provided for to increase function flexibility. The connection must be performed externally, short-circuiting terminals 1a and 2a between themselves via a wire jump.

At this point, input 1 is activated, short-circuiting terminals 3a and 4a between themselves. 2 is activated short-circuiting terminals 5a and 6a between themselves.

It is possible to connect all 4 input groups in this way. Keep in mind that, in this case, all groups connected are not floating among themselves, as they refer to a single power supply. The group of remaining 8 inputs remains floating however with respect to the power supplies of the equipment and ground.

In fact, the power supply (+12V, unregulated voltage and unprotected current) supplied from the equipment is floating (generated from the dedicated isolated DC/Dc converter).

The available current is 70 mA total, enough however to simultaneously activate all inputs and, if necessary, to power some external circuits (in this case, be very careful as an overcharge or short-circuit can damage or break the DC/DC converter).

**8.14.1.1.4 Analog Input connections**

| Pin | Description     |
|-----|-----------------|
| 1   | + VBatt         |
| 2   | Analog in 1 (5) |
| 3   | Analog in 2 (6) |
| 4   | Analog in 3 (7) |
| 5   | Analog in 4 (8) |
| 6   | Ground          |
| 7   | Ground          |
| 8   | Ground          |
| 9   | Ground          |

Connectors are "DB9" male (D-type), located on the rear side. The one heads analog inputs from 1 to 4, the other from 5 to 8. The connections are identical.

No analog signal conditioning is present on this prototype.

The current characteristics are:

- +10 V = 1000 analog/digital converter division
- maximum resolution 10 bit
- input impedance approx. 5000 Ohm.

In production, the telemetry shall be equipped with analog signal conditioning with the following characteristics:

- selectable input sensibility +2.5V, +5V, +10V per 1000 conv. divisions A/D
- maximum resolution 10 bit
- input impedance approx. 100KOhm
- best hardware filtration of radio frequency

Input sensitivities shall be singularly settable via jumps (or equivalent) located inside equipment.

**8.14.1.1.5 Connector expansion/programming**

| Pin | Description |
|-----|-------------|
| 1   | +TXData     |
| 2   | -TXData     |
| 3   | +RXData     |
| 4   | -RXData     |
| 5   | Ground      |
| 6   | Ground      |
| 7   | Ground      |
| 8   | Ground      |
| 9   | Ground      |

The connector is "DB9" female (D-type), located on the front panel.

This refers to serial port IEE485 full-duplex, 9600 Baud, 8 bit data, 1 bit stop, no parity. This is in compliance with Elenos standards and therefore can be directly connected to any equipment (multiple equipment also) of Elenos production via a 1 to 1 connection cable (i.e. a flat cable) as long as it is equipped with an analog port.

In the event of multiple connections, verify that no equipment connected on bus IEE485 responds to ID logic = 0.

We recommend assigning ID = 1 to the telemetry, then proceeding in order using criteria to assign addresses based on the physical position of the cable (highest address to equipment furthest from the telemetry, address 2 to closest equipment).

The same connection described makes access possible to all equipment connected to the bus IEE485 in "telemetry ASCII" mode, making use of the same modem (the one physically installed in the TLMTR box).

Service via SMS remains circumscribed to the TLMTR box.

To set data on the TLMTR or modem, connect the supplied adapter via cable. Keep in mind that, when the terminal (or PC) is connected, a conflict exists between the TXdata line of the modem and the same line of the terminal when the selector is in a central position. Avoid operating in these conditions. This problem will later be resolved (see foreseen repairs).

Once all operations and/or checks have been completed, disconnect the adapter cable and bring the selector to the central position (green LED signal). Operation shall be regular only in these conditions.

A toggle switch which switches off the system is set on the front panel (to the left). This switch completely isolating the battery (sealed lead battery) from all charges. This shall be normally switched on and will be switched off only in case of disuse of the equipment (storage, etc.) to preserve a maximum accumulator charge.

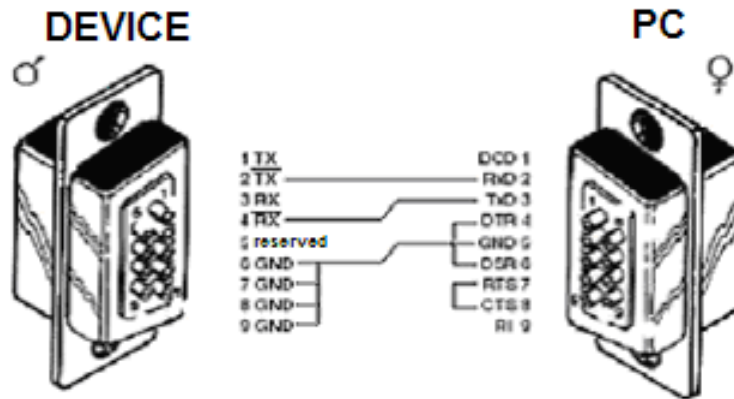
A toggle switch cutting off network power is located in the rear (right side).

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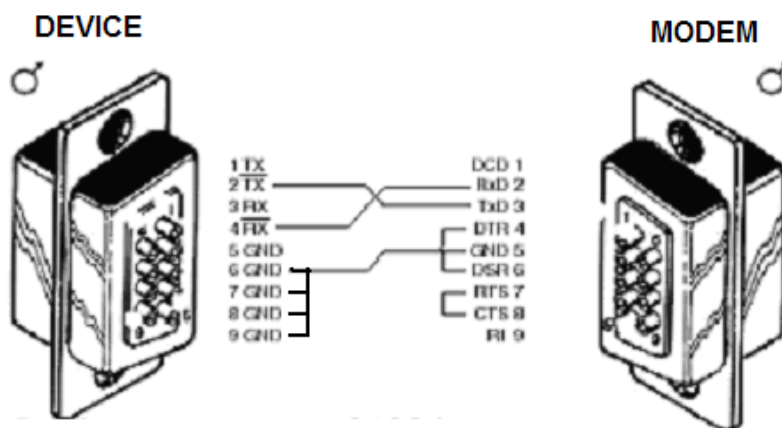
E-Mail: [info@elenos.com](mailto:info@elenos.com)

## 9 CONNECTION CABLES BETWEEN EQUIPMENT

### 9.1 *Direct Connection Cable Between PC and Equipment:*

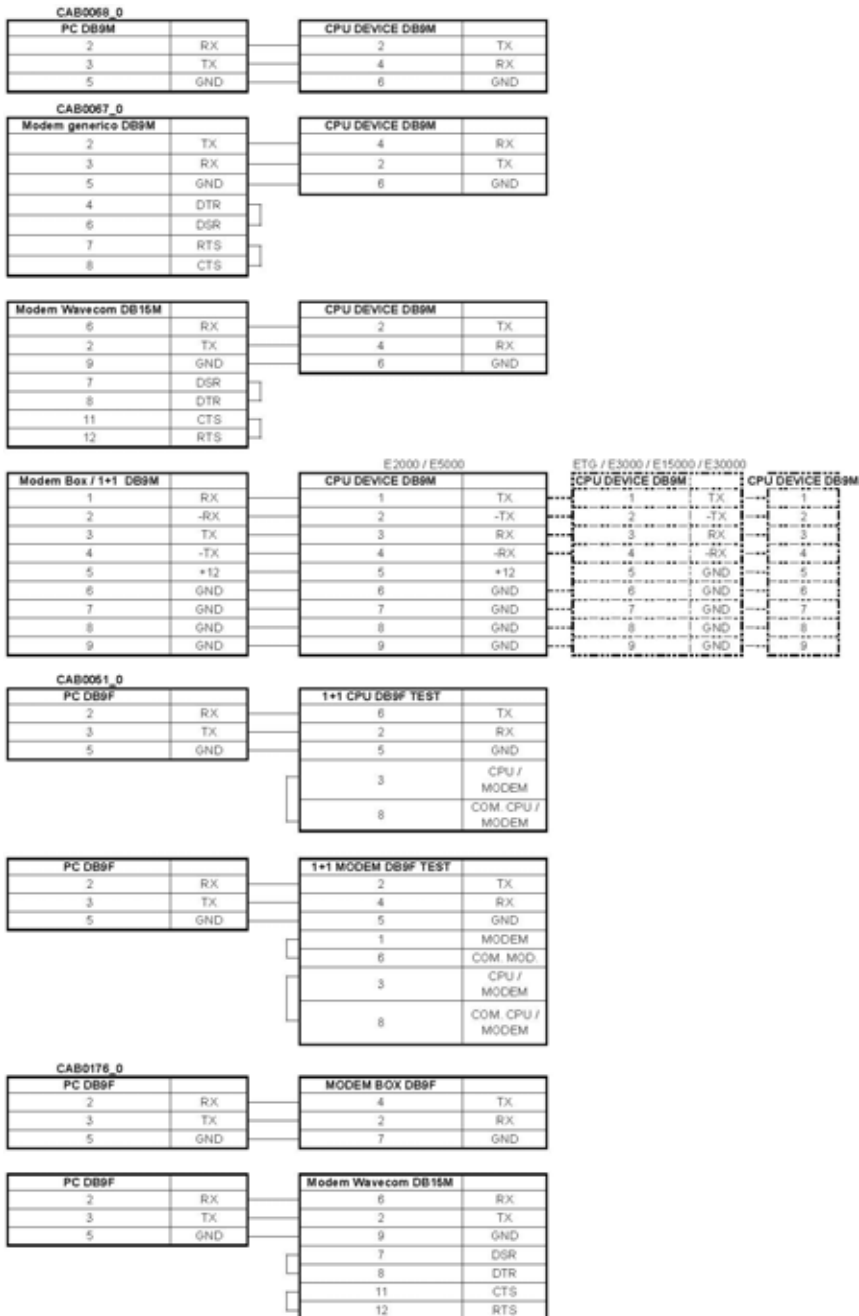


Modem and equipment connection cable:

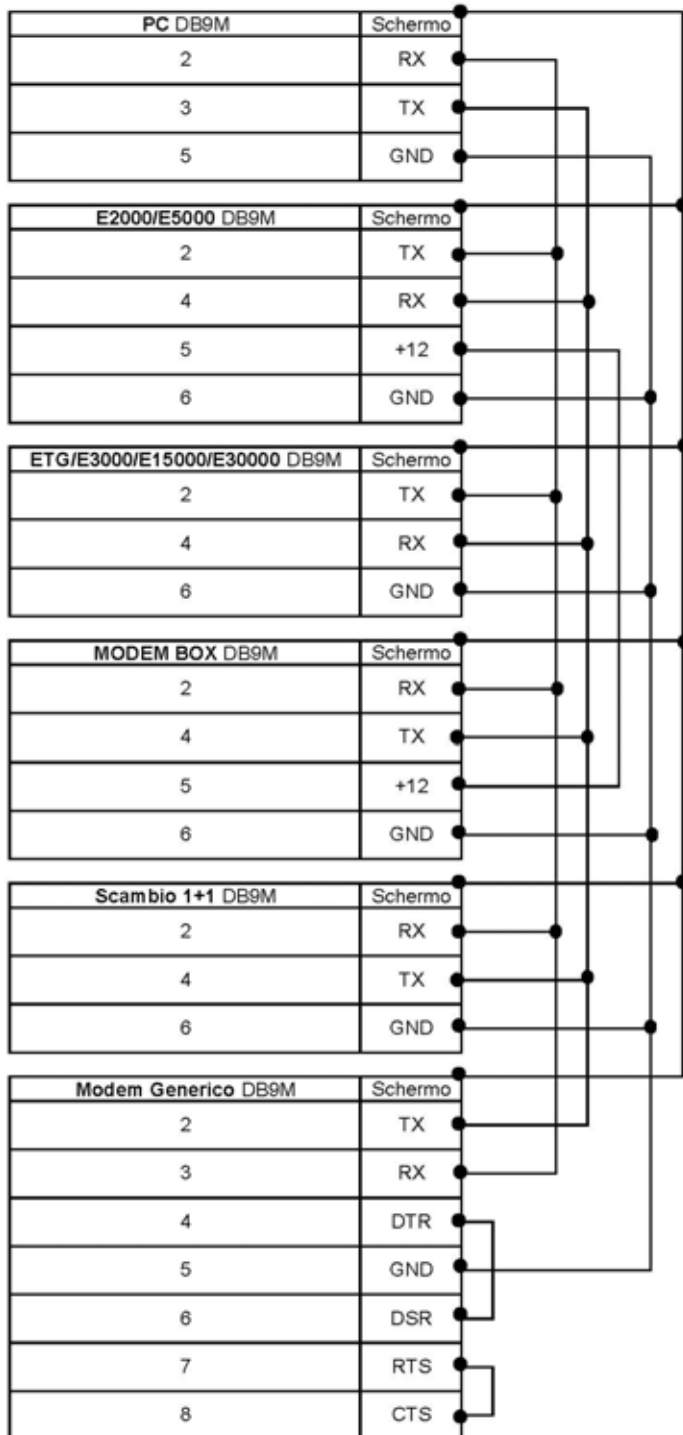




### 9.1.1 CABLES AND SERIAL RS232 - RS485 CONNECTORS FOR DIFFERENT EQUIPMENT



### 9.1.2 UNIVERSAL PIN OUT CABLE



## 10 Programming Telemetry Firmware.

It is possible to re-programme internal telemetry firmware utilising the front serial port of the telemetry. The following accessories are necessary for this operation:

- PC with RS232 serial port
- 9 pole pin to pin serial cable to connect between the CPU port of the telemetry and the serial of the PC.
- Software Download.exe and relative writable firmware, downloadable from the Elenos website.

Proceed as follows once the PC has been connected to the telemetry via a 9 pole serial cable:

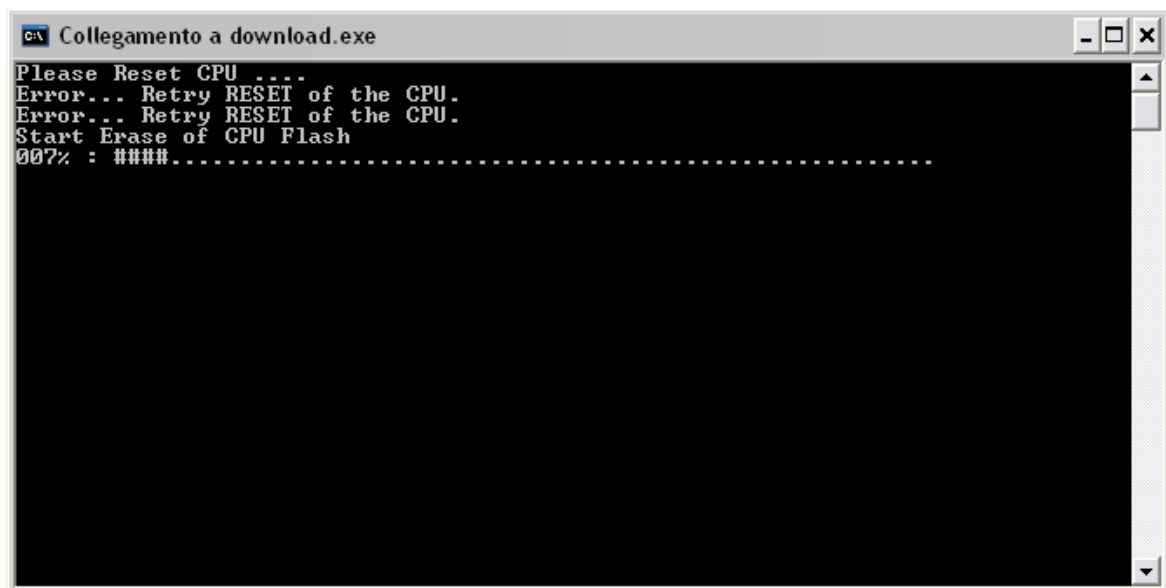
- Switch off the telemetry. Since power is supplied by a battery, it is necessary to first disconnect the battery and then push the rear shutdown key. If the telemetry is of recent make, it should have a small red key to the left of the 220V outlet. This key acts as a RESET for which it can be utilised to start programming procedures. !!! ATTENTION!!! Press lightly and quickly on this key to start up programming.\_

- Launch the programme from the control line as follows:

**download.exe 1 38400 main.hex**

where:

|          |   |                           |
|----------|---|---------------------------|
| 1        | → | Number of COM             |
| 38400    | → | Baud Rate (do not change) |
| main.hex | → | File to be written        |



```

C:\> Collegamento a download.exe
Please Reset CPU ....
Error... Retry RESET of the CPU.
Error... Retry RESET of the CPU.
Start Erase of CPU Flash
007% : #####.....
  
```

- When the message “Please Reset CPU....” appears, re-start the telemetry or press the RESET key as previously described. Programming starts and a status bar will appear. Wait for 100% to be reached. If the bar does not appear after some seconds (about 10 seconds per step), exit from the programme closing the window and repeat operations.
- The telemetry will start back up at the end of programming.

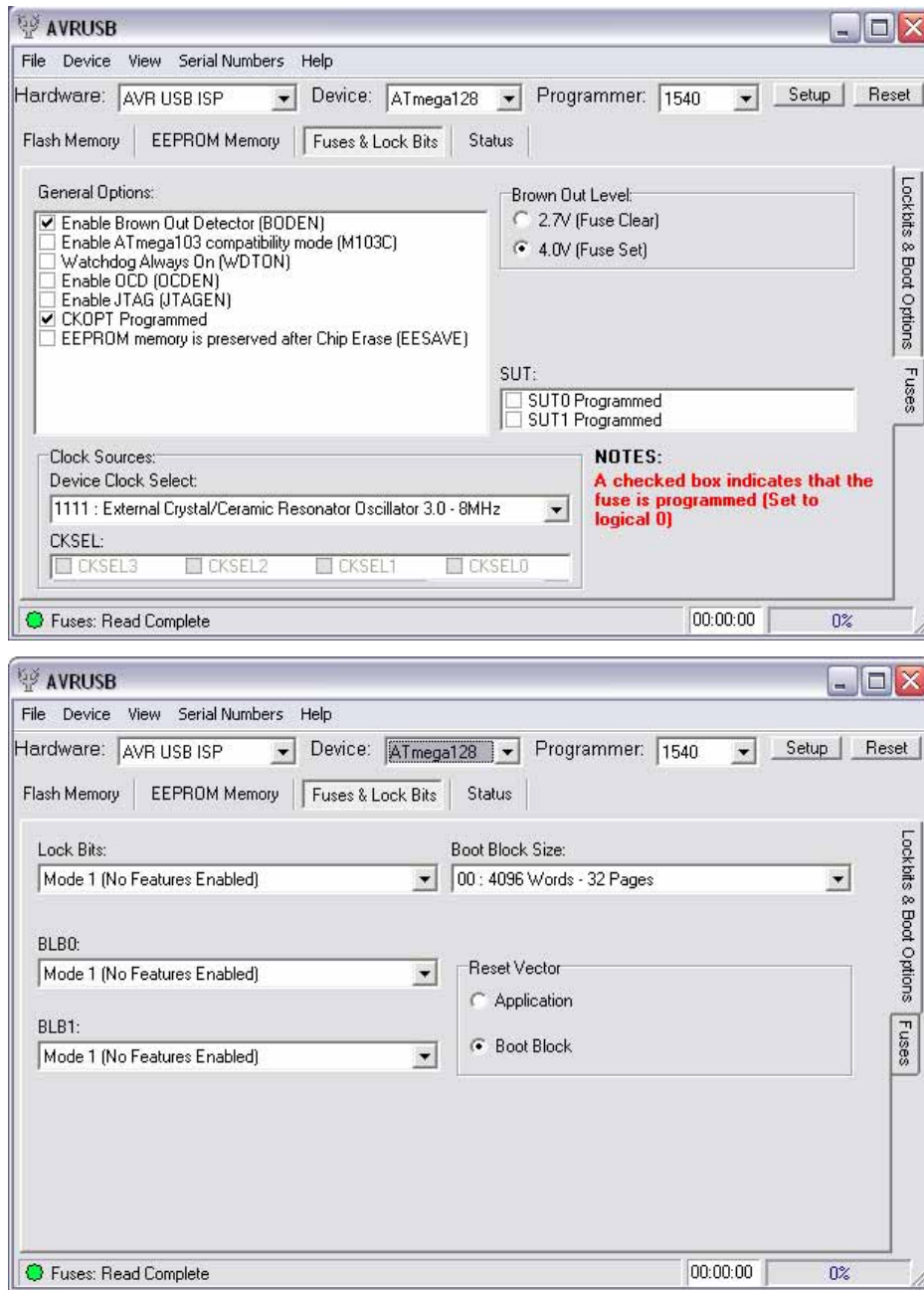
If programming procedure does not start up, check:

- The LED under the CPU communications port must switch on when programming starts. At the same time, a relay click should be heard which indicates connection between the PC and Telemetry serials. If this does not happen, check that:
  1. The cable is connected properly and is Pin to Pin.
  2. Check that the communications port inserted in the control line of the programme Download.exe is correct.
- Correctly switch on the telemetry, disconnecting the battery or pressing the Reset key quickly.

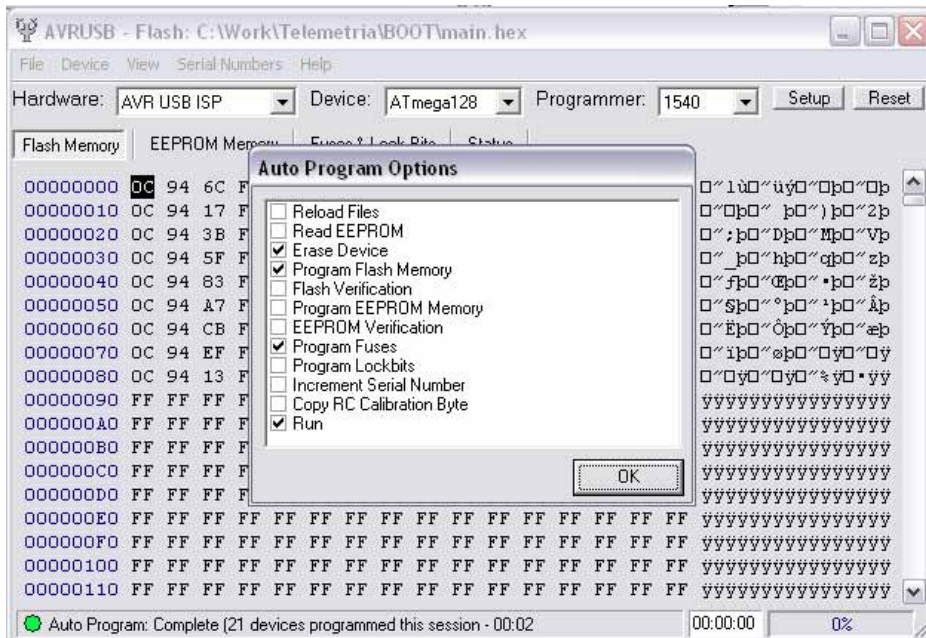
If desired, you can create a connection to the Download.exe programme in windows and introduce a control line in the connection or else create a Batch file to launch to start programming.

## 11 Telemetry testing procedure

1. Launch AVRUSB flash programming software.
2. Modify the Fuses & Lock Bits menu settings as per images:



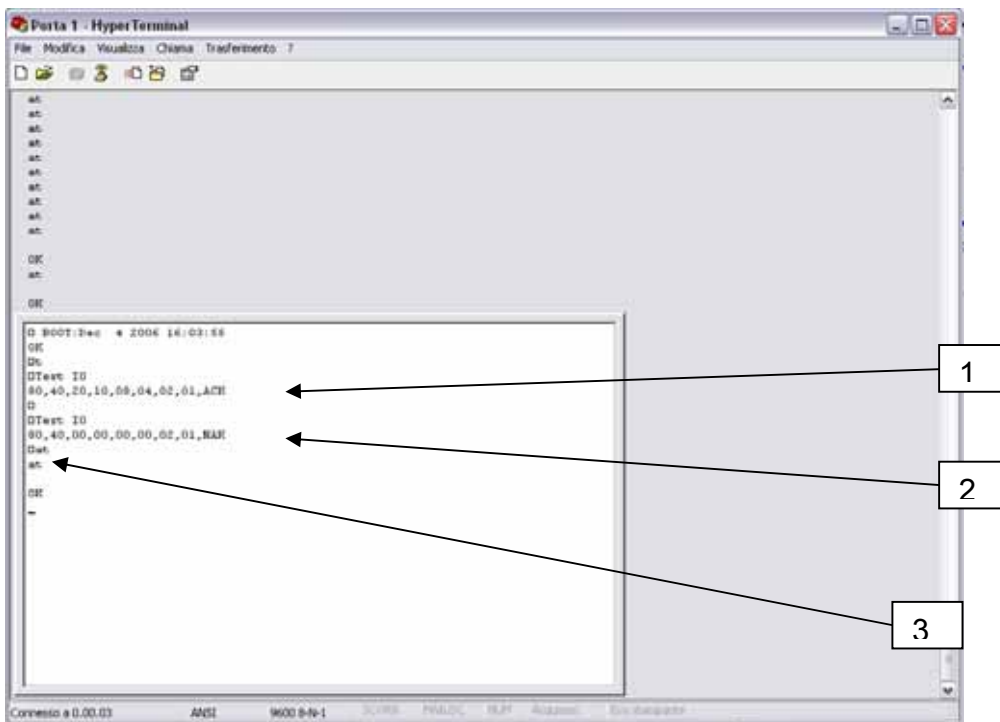
3. From the File menu, select File→Load→Flash (or press CTRL-O) and load the file **main.hex** present on the server
4. From the Device menu select Device→Auto Program Options.. and select as per the image:



5. At the end of these operations, press F5 to start up programming. The programming status and final outcome will appear on the bar at the bottom.
6. Once the boot has been programmed, it will be possible to perform a maximum TEST of digital outputs/inputs.

## I/O testing.

- Connect the testing cable to the 4 rear Phoenix connectors in the correct order. Look behind the telemetry to connect connectors marked with IN to the right of those marked with OUT to the left. Those with A (high) in the High connector and vice-versa for those marked with B (low).
- Launch Hyperterminal and configure the baud rate at 38400,n,8,1.
- Connect the serial cable to the CPU port of the telemetry and switch on.



- The message "Boot" will appear.....
- At this point, press t and <ENTER>. The test will start and if everything is OK, line 1 will appear, from which it will be possible to see the various outputs in sequence. The message ACK indicates a correct test. If the test is not correct, a window like that seen in 2, in which some outputs/inputs as well as the message NAK, will appear.
- At this point it is possible to also test the modem, then the cable. Reset Hyperterminal at 9600baud, type AT and press <ENTER>. If the connection is OK, OK or 0 should appear to indicate the control received by the Modem.

At completion of this test, the two CPU and MODEM communication ports, digital inputs and outputs will have been tested.

## Software Programming.

Once the boot has been programmed, it is possible to programme telemetry firmware via the DOWNLOAD serial programme using the above-described procedure.

## Notes

It is less costly in production to transfer the code together with the boot.

The boot procedure must be activated only if the "CPU" connector is busy (LED on) to prevent the sending of characters to the modem. This will not operate correctly at times.

The digital I/O test procedure during the boot phase must be removed. as it shall not work if the executable is present and can be conveniently performed otherwise by the operator during the testing phase.

Current characterisation of the CPU card during the pre-testing phase would be best.

## Testing procedure.

CPU Card = CPU, CHG14B753\_0.

PSU card = PSU, BKU0A803\_0.

### ***Preparation.***

#### Hardware modifications.

In addition to CPU card and front panel modifications (documented separately), it is necessary to verify that each connection cable between the CPU card and the DB9 male analog input connectors (two cables, code CAB0257\_0 or CAB0257\_1) are without any connection wiring uniting pin 1 of the AMP MODU connector to pin 1 of the male DB9 connector (+12V). If this connection exists, remove it by cutting the cable.

The telemetry is not "case sensitive". Therefore, access to the menu and other can be performed with both upper and lower case characters. Use of the lower case character "i" in the following document is simply to avoid confusion between upper case "i" (I) and lower case "L" (l).

#### 1. Initial procedure.

- Set up and check all electrical connections except for the CN10 (CPU card) of the modem power connector and of the positive battery pole.
- Check the calibre of the 3 fuses on the rear panel. They must all be T2A.
- Give power (220VAC).



2. Power supply card calibration (PSU card):
  - RV1 (battery charge regulation) regulates as the table. Position with tester between the ends of the cable which goes to the battery.
  - RV2 (main feeder voltage) 14.6 V between GND and D10 anode.
  - Verify battery charge current putting the tester (in Amperes) between the mass and the positive of the battery charging cable, with a protection resistance series of 10 Ohm 5 Watt. Rated current approximately 0.27 A.
  - Connect the positive battery pole.
  
3. Microcontroller card calibration (CPU card):
  - Power the card inserting CN10, verifying that the yellow power LED (DL18) is on.
  - Regulate trimmer R82 for +4.095V on pin 4 of U24.
  
4. Telemetry testing (modem excluded):
  - Load boot and executable in the CPU (see previous pages). This should be done previously to the CPU card testing phase.
  - Connect connector for serial test on the rear port (IEC485).
  - Connect testing cable to I/O connectors located on the rear of the telemetry, respecting the order (IN and OUT and keeping in mind that the connector A is the one situated at the highest and B is the lowest).
  - Connect the testing cable to one of the 2 analog connectors (+10.00V).
  - By means of a standard IEC232 serial cable, connect to the appropriately set HyperTerminal terminal to DB9 "CPU" connector.
  - Open communication (HyperTerminal), verifying that the corresponding LED on the front panel switches on.
  - Type the sequence "21i01" to open communications with the CPU, which will respond sending the "Menu" window.
  - Open "Key" procedure typing "K" then bring to maximum grant typing "20" in the "KEY" field.
  - Perform digital I/O test, closing outputs (procedure "O", outputs) in sequence, verifying input parity (procedure "D", inputs) each time. Repeat for all 8 lines.
  - In procedure "A", analog, verify that all inputs are at a value of 0. Then supply +10.00V to each input (couple DB9 male, rear panel), verifying corresponding reading (maximum error permissible +/-2%). Testing must be carried out with linear outputs in unity gain.
  - Go to the menu (Q), then disconnect the telemetry sending character "2", wait for a response (screen clean).
  - Once the telemetry is disconnected, send a series of characters at random, checking the echo on the terminal (rear IEC485 serial function testing). Attention: this type of test guarantees port function but not the possible pair reversal of TX wiring (+ e -) with RX wiring(+ e -). Perform further sight tests or with connected equipment (i.e. E3000).

5. Telemetry testing (modem ):

- Insert card in the modem.
- Connect antenna to modem (on-line).
- Connect modem power.
- Connect testing cables on digital I/O.
- Initialise modem with suitable power cable and procedure (A. Tomassini). If Tomassini modifies procedure (high control line), use normal IEC232 serial cable.

**End of procedure.**

These will be added to the present:

1. Battery charger voltage/temperature table.
2. Manual modem initialisation table.
3. Description and function of modem initialisation programme (Tomassini or TERM, to be decided).
4. Testing cable diagram.

**01.02.2007,**

*Contains information for testing cables.*

#### ANALOG INPUT TESTING

-Using a 9PM D-type connector, link cables with pins 2,3,4,5 and connect to one of the two analog in connectors. Enter into command A of the HyperTerminal and verify that gain = 1.00 and LIN/LOG= LIN. With a feeder, supply exactly 10 V to one of the wires and verify with the computer that the powered analog input passes to 10.00 (tolerance of 0.2 percent, therefore with a voltage of 10 V tolerance =  $a + o - 0.2$  V). First test the 4 inputs of the first connector and then the 4 inputs on the second connector.

NOTE: precision depends very much on the precision with which R82 was previously calibrated at 4,095 V

NOTE 2: verify that R11 has not been mounted, otherwise the value will be completely wrong, even without powering any inputs.

#### SERIAL 485 TESTING

Short-circuit pins 2-4 and 1-3 of a 9PF D-type connector and connect to a 485 serial. Type 2 on the PC to exit from communication and type a fake address (for example 21i03) to connect to the telemetry with serial 485. Wait a few moments and check that the digits types at random appear exactly on the computer as typed (i.e. press a and a appears on the screen). Press 2 to exit from communications once this has been verified.

## 11.1 PROTOCOLS

### 11.2 PSU feeder and Shunt Card management module.

### 11.3 General communications.

Communication between the equipment control system (master) and the power systems (slave) and SHUNT current acquisition cards takes place via standard serial link IEEE485 then half duplex. Serial data is transmitted at 9600 baud, 8 bit data, no parity, one bit stop. No control lines of any kind are provided for.

Each PSU/SHUNT is a slave with respect to the control unit which is the master. Up to a maximum of 15 feeders and 15 SHUNT cards can be connected. Each device is equipped with dip switch hardware to set logic address (from 0 to 15). Feeder outputs are parallelable (to increase system current).

### 11.4 Protocol.

Fixed length strings are utilised. Slaves respond to the master no earlier than 5 ms from the end of command string sending and however within 10 ms. The master does not call the slave before 5 ms from the receipt of a response from any slave.

With the exception of start and end string characters, all data are ASCII hexadecimal format (0123456789ABCDEF, upper case characters).

The protocol and frame of the data are differentiated between PSU and SHUNT.

### 11.5 PSU Protocol

The master sends the following command frame:

mP==>Power Supply Units

| Data       | Nibble | Description                  | Processing    |
|------------|--------|------------------------------|---------------|
| TX:        |        |                              |               |
| [          |        |                              |               |
| 1 ID       | 1      | Id power supply unit         |               |
| 2 VDS      | 3      | Required voltage (broadcast) | $y=x*250/200$ |
| 3 ON       | 1      | On/Off (broadcast)           |               |
| 4 ENABLE   | 1      | Enabling                     |               |
| 5 RESET    | 1      | Reset                        |               |
| 6 CHECKSUM | 2      |                              |               |
| ]          |        |                              |               |

Command 4 (enabled/disabled) is priority with respect to command 3 (on/off). If the power supply unit is not enabled, the on command cannot be carried out (it remains off until it is enabled and then switched on; these commands can be simultaneous). The power supply unit is off and disabled at start-up.

The command string is performed by all power supply units connected independently from the address contained in the string, except parameters 4 and 5 which are processed only by the power supply unit with the address corresponding to the one contained in the string itself.

The slaves respond with the following frame:

Power supply units ==>mP

| Data           | Nibble | Description          | Processing     |
|----------------|--------|----------------------|----------------|
| RX:            |        |                      |                |
| [              |        |                      |                |
| 1 V OUT        | 3      | Output voltage       | $y=x*125/1000$ |
| 2 I OUT        | 3      | Output current       | $y=x*125/1000$ |
| 3 V MAINS      | 3      | Power supply voltage | $y=x$          |
| 4 TEMPERATURES | 3      | Temperature          | $y=x*25/100$   |
| 5 FLAGS        | 2      |                      |                |
| 6 CHECKSUM     | 2      |                      |                |
| ]              |        |                      |                |

If the command string contains the address 0 (which cannot be set on any power supply unit for polling serial command, see "notes on power supply function") all commands are performed from the connected power supply units without any of these responding.

#### **Flags alarm.**

Specifications will now follow.

#### **Time out.**

A time-out on serial communication is provided. Whenever the master stops interrogations for a time exceeding 500 ms, power supply units will take on the status of:

- no variation on on/off, no variation on operating voltage, no variation on alarms, no variation on enabling.

Alternatively (provide a source with a compilation option):

- off, minimum level operating voltage, no variation on alarms, no variation on enabling.

Power supply units will re-start regular operation whenever communication is reset.

## 11.6 SHUNT Protocol

The master sends a command frame:

mP==>Shunt

|   | Data     | Nibble | Desc.            | Processing    |
|---|----------|--------|------------------|---------------|
|   | TX:      |        |                  |               |
|   | (        |        |                  |               |
| 1 | ID       | 1      | Id Shunt         |               |
| 2 | Flag1    | 1      |                  |               |
| 3 | Flag2    | 1      |                  |               |
| 4 | VDS      | 3      | Required voltage | $y=x*250/200$ |
| 5 | Checksum | 2      |                  |               |
|   | )        |        |                  |               |

The command string is performed by the SHUNT cards connected on the basis of the address selected on the dip switch of the card.  
Only one SHUNT card has been mounted in this amplifier.

Flag 1 and 2 specifications will now follow.

The slaves respond with the following frame:

|    | Data         | Nibble | Desc. | Processing |
|----|--------------|--------|-------|------------|
|    | RX:          |        |       |            |
|    | (            |        |       |            |
| 1  | Ids [0]      | 3      |       | $y=x/4$    |
| 2  | Ids [1]      | 3      |       | $y=x/4$    |
| 3  | Ids [2]      | 3      |       | $y=x/4$    |
| 4  | Ids [3]      | 3      |       | $y=x/4$    |
| 5  | Ids [4]      | 2      |       | $y=x/4$    |
| 6  | Ids [5]      | 3      |       | $y=x/4$    |
| 7  | Ids [6]      | 3      |       | $y=x/4$    |
| 8  | Ids [7]      | 3      |       | $y=x/4$    |
| 9  | Ids [8]      | 3      |       | $y=x/4$    |
| 10 | Ids [9]      | 3      |       | $y=x/4$    |
| 11 | Ids [10]     | 3      |       | $y=x/4$    |
| 12 | Ids [11]     | 3      |       | $y=x/4$    |
| 13 | TempEnv      | 3      |       | $y=x/4$    |
| 14 | VDS          | 3      |       | $y=x/8$    |
| 15 | TempAux1     | 3      |       | $y=x/4$    |
| 16 | TempAux2     | 3      |       | $y=x/4$    |
| 17 | Checksum_PSU | 2      |       |            |
|    | )            |        |       |            |

### 11.7 Time out.

A time-out on serial communication is provided. Whenever the master stops interrogations for a time exceeding 500 ms, power supply units will take on the status of:

- no variation on on/off, no variation on operating voltage, no variation on alarms, no variation on enabling.

Alternatively (provide a source with a compilation option):

- off, minimum level operating voltage, no variation on alarms, no variation on enabling.

Power supply units will re-start regular operation whenever communication is reset.

**11.8 ET3500 – TELEMETRY PARAMETERS**

| Description            | Word Address | Type | Min. | Max. | Decimal N. | U.M.    | Origin | Read Only |
|------------------------|--------------|------|------|------|------------|---------|--------|-----------|
| STBY                   | 100          | word | 1    | 0    | 0          | on/off  | user   | FALSE     |
| ResetAlarm             | 101          | word | 1    | 0    | 0          | on/off  | user   | FALSE     |
| SetPointTargetPwr      | 102          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| TerminalWatchdog       | 103          | word | ?    | ?    | 0          | -       | user   | FALSE     |
| DateSet.weekday        | 104          | word | 0    | 6    | 0          | -       | user   | FALSE     |
| DateSet.day            | 105          | word | 1    | 31   | 0          | Days    | user   | FALSE     |
| DateSet.month          | 106          | word | 1    | 12   | 0          | Months  | user   | FALSE     |
| DateSet.year           | 107          | word | 0    | 99   | 0          | Hears   | user   | FALSE     |
| DateSet.hours          | 108          | word | 0    | 11   |            |         | user   | FALSE     |
| DateSet.minuts         | 109          | word |      |      |            |         | user   | FALSE     |
| DateSet.seconds        | 110          | word |      |      |            |         | user   | FALSE     |
| DateSet.Update         | 111          | word | 1    | 0    | 0          | on/off  | user   | FALSE     |
| Fixed target           | 113          | word | 1    | 0    | 0          | on/off  | user   | FALSE     |
| Target for time 00     | 114          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 01     | 115          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 02     | 116          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 03     | 117          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 04     | 118          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 05     | 119          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 06     | 120          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 07     | 121          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 08     | 122          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 09     | 123          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 10     | 124          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 11     | 125          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 12     | 126          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 13     | 127          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 14     | 128          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 15     | 129          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 16     | 130          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 17     | 131          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 18     | 132          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 19     | 133          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 20     | 134          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 21     | 135          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 22     | 136          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| Target for time 23     | 137          | word | 50   | 3300 | 0          | W       | user   | FALSE     |
| No mains time          | 138          | word | 1    | 3600 | 0          | seconds | user   | FALSE     |
| No mains SMS enable    | 139          | word | 1    | 0    | 0          | On/off  | user   | FALSE     |
| SMS enable             | 140          | word | 1    | 0    | 0          | On/off  | user   | FALSE     |
| GSM Fast field request | 141          | word | 1    | 0    | 0          | on/off  | user   | FALSE     |
| Max target power       | 142          | word | 100  | 3500 | 0          | on/off  | user   | FALSE     |
| TerminalAddress        | 143          | word | 0    | 69   | 0          | -       | user   | FALSE     |

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## TELEMETRY Use and maintenance manual

|                   |     |       |   |            |   |              |               |      |
|-------------------|-----|-------|---|------------|---|--------------|---------------|------|
| PwrForward        | 200 | word  | 0 | 3500       | 0 | W            | On Card<br>AD | TRUE |
| PwrReflected      | 201 | word  | 0 | 3500       | 0 | W            | On Card<br>AD | TRUE |
| Vcc               | 202 | word  | 0 | 600        | 2 | V            | On Card<br>AD | TRUE |
| Plus12            | 203 | word  | 0 | 1200       | 2 | V            | On Card<br>AD | TRUE |
| Minus12           | 204 | word  | 0 | 1200       | 2 | V            | On Card<br>AD | TRUE |
| Efficiency        | 205 | word  | 0 | 1000       | 1 | %            | Computed      | TRUE |
| EfficiencyPSU     | 206 | word  | 0 | 1000       | 1 | %            | Computed      | TRUE |
| WorkingTimeMinuts | 207 | word  | 0 | 59         | 0 | minuts       | Internal      | TRUE |
| WorkingTimeHours  | 208 | dword | 0 | 4294967295 | 0 | hours        | Internal      | TRUE |
| AlarmN_Active     | 210 | word  | 0 | 31         | 0 | n.           | Internal      | TRUE |
| PSU_Avg_V         | 211 | word  | 0 | 600        | 1 | V            | Computed      | TRUE |
| PSU_I_sum         | 212 | word  | 0 | 1300       | 1 | A            | Computed      | TRUE |
| PSU_I_Max         | 213 | word  | 0 | 500        | 1 | A            | Computed      | TRUE |
| PSU_V_Max         | 214 | word  | 0 | 600        | 1 | V            | Computed      | TRUE |
| PSU_TempMax       | 215 | word  | 0 | 1000       | 1 | °C           | Computed      | TRUE |
| RF_TempMax        | 216 | word  | 0 | 1000       | 1 | °C           | Computed      | TRUE |
| RF_IdsTot         | 217 | word  | 0 | 13000      | 2 | A            | Computed      | TRUE |
| RF_IdsMax         | 218 | word  | 0 | 5000       | 2 | A            | Computed      | TRUE |
| RF_VDS            | 219 | word  | 0 | 600        | 1 | V            | Shunt AD      | TRUE |
| RF_Temperature1   | 220 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature2   | 221 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature3   | 222 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature4   | 223 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature5   | 224 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature6   | 225 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature7   | 226 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature8   | 227 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature9   | 228 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_Temperature10  | 229 | word  | 0 | 1000       | 1 | °C           | Shunt AD      | TRUE |
| RF_ModulesNumber  | 230 | word  | 0 | 12         | 0 | n.           | Computed      | TRUE |
| PSUCommandVDS     | 231 | word  | 0 | 4095       | 0 | step DA<br>* | Computed      | TRUE |
| DRVCommandVBIAS   | 232 | word  | 0 | 255        | 0 | step DA      | Computed      | TRUE |
| PSU_Temp1         | 233 | word  | 0 | 1000       | 1 | °C           | PSU           | TRUE |
| PSU_Temp2         | 234 | word  | 0 | 1000       | 1 | °C           | PSU           | TRUE |
| PSU_Temp3         | 235 | word  | 0 | 1000       | 1 | °C           | PSU           | TRUE |
| RF_IDS_1          | 236 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_2          | 237 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_3          | 238 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_4          | 239 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_5          | 240 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_6          | 241 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_7          | 242 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_8          | 243 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_9          | 244 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_10         | 245 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_11         | 246 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |
| RF_IDS_12         | 247 | word  | 0 | 5000       | 2 | A            | Shunt AD      | TRUE |

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|                          |            |      |        |      |   |        |          |       |
|--------------------------|------------|------|--------|------|---|--------|----------|-------|
| PSU_VOut1                | 248        | word | 0      | 600  | 1 | V      | PSU      | TRUE  |
| PSU_VOut2                | 249        | word | 0      | 600  | 1 | V      | PSU      | TRUE  |
| PSU_VOut3                | 250        | word | 0      | 600  | 1 | V      | PSU      | TRUE  |
| PSU_IOut1                | 251        | word | 0      | 500  | 1 | A      | PSU      | TRUE  |
| PSU_IOut2                | 252        | word | 0      | 500  | 1 | A      | PSU      | TRUE  |
| PSU_IOut3                | 253        | word | 0      | 500  | 1 | A      | PSU      | TRUE  |
| PSU_Enable1              | 254        | word | 1      | 0    | 0 | on/off | Internal | TRUE  |
| PSU_Enable2              | 255        | word | 1      | 0    | 0 | on/off | Internal | TRUE  |
| PSU_Enable3              | 256        | word | 1      | 0    | 0 | on/off | Internal | TRUE  |
| TempEnv                  | 257        | word | 0      | 1000 | 1 | °C     | Shunt AD | TRUE  |
| PSU_on                   | 258        | word | 0      | 1    | 0 | -      | Internal | TRUE  |
| RF_IdsMin                | 259        | word | ?      | ?    | 2 | A      | Computed | TRUE  |
| FanSpeedDAPerc           | 260        | word | 60     | 120  | 0 | %      | Computed | TRUE  |
| Remote enable            | 261        | word | 1      | 0    | 0 | On/off | internal | TRUE  |
| Hostlink editable field  | 262        | word | 1      | 0    | 0 | On/off | Internal | TRUE  |
| Led status               | 263        | word | 0xFFFF | 0    | 0 | flags  | Internal | TRUE  |
| FAULT LED                | 263 bit 01 | Bit  | 1      | 0    | 0 | on/off | Remote   | TRUE  |
| FAULT BLINK LED          | 263 bit 02 | Bit  | 1      | 0    | 0 | on/off | Remote   | TRUE  |
| ON AIR BLINK LED         | 263 bit 03 | Bit  | 1      | 0    | 0 | on/off | Remote   | TRUE  |
| ON AIR LED               | 263 bit 04 | Bit  | 1      | 0    | 0 | on/off | Remote   | TRUE  |
| LOCAL LED                | 263 bit 05 | Bit  | 1      | 0    | 0 | on/off | Remote   | TRUE  |
| STBY LED                 | 263 bit 06 | Bit  | 1      | 0    | 0 | on/off | Remote   | TRUE  |
|                          |            |      |        |      |   |        |          |       |
| Temp max                 | 264        | word | 109    | 0    | 1 | °C     | Internal | TRUE  |
| RF_DC_Power              | 265        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_1       | 266        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_2       | 267        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_3       | 268        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_4       | 269        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_5       | 270        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_6       | 271        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_7       | 272        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_8       | 273        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_9       | 274        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_10      | 275        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_11      | 276        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
| RF_DC_Power_Ampl_12      | 277        | word | ?      | 0    | 0 | W      | Computed | TRUE  |
|                          |            |      |        |      |   |        |          |       |
| Device Model Id          | 400        | word | 3000   | 3000 | 0 | -      | Fixed    | TRUE  |
| Software version n.      | 401        | word | ?      | ?    | 2 | -      | Fixed    | TRUE  |
| Data map version n.      | 402        | word | ?      | ?    | 2 | -      | Fixed    | TRUE  |
| Current max target power | 403        | word | 1      | 3500 | 0 | W      | Internal | TRUE  |
|                          |            |      |        |      |   |        |          |       |
| PhoneN1                  | 450        | char | -      | -    | 0 | -      | User     | FALSE |
|                          |            | [20] |        |      |   |        |          |       |
| PhoneN2                  | 460        | char | -      | -    | 0 | -      | User     | FALSE |
|                          |            | [20] |        |      |   |        |          |       |
| PhoneN3                  | 470        | char | -      | -    | 0 | -      | User     | FALSE |
|                          |            | [20] |        |      |   |        |          |       |
| PhoneN4                  | 480        | char | -      | -    | 0 | -      | User     | FALSE |
|                          |            | [20] |        |      |   |        |          |       |

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|                         |            |          |      |     |   |        |          |       |
|-------------------------|------------|----------|------|-----|---|--------|----------|-------|
| PhoneN5                 | 490        | char     | -    | -   | 0 | -      | User     | FALSE |
|                         |            | [20]     |      |     |   |        |          |       |
| PhoneEnableN1           | 500        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneEnableN2           | 501        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneEnableN3           | 502        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneEnableN4           | 503        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneEnableN5           | 504        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN1        | 505        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN2        | 506        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN3        | 507        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN4        | 508        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN5        | 509        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN1        | 510        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN2        | 511        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN3        | 512        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN4        | 513        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN5        | 514        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN1     | 515        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN2     | 516        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN3     | 517        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN4     | 518        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN5     | 519        | word     | 1    | 0   | 0 | on/off | User     | FALSE |
| SMS_Str                 | 520        | char     | -    | -   | 0 | -      | User     | FALSE |
|                         |            | [10]     |      |     |   |        |          |       |
| PhoneDigitalSmsN1       | 525        | word     | 1    | 0   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN2       | 526        | word     | 1    | 0   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN3       | 527        | word     | 1    | 0   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN4       | 528        | word     | 1    | 0   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN5       | 529        | word     | 1    | 0   | 0 | On/off | user     | FALSE |
| SMS Command text        | 530        | Char     | -    | -   | - | -      | user     | FALSE |
|                         |            | [160]    |      |     |   |        |          |       |
| SMS Status text         | 610        | Char     | -    | -   | - | -      | User     | FALSE |
|                         |            | [160]    |      |     |   |        |          |       |
| SMS status ready        | 690        | Char     | -    | -   | - | -      | User     | FALSE |
|                         |            | [160]    |      |     |   |        |          |       |
| SMS status Ready        | 770        | word     | 1    | 0   | 0 | On/off | User     | FALSE |
| GSM Rx level            | 771        | word     | -113 | -51 | 0 | dBm    | Internal | FALSE |
| PackedAlarm             | 800        | word [3] | -    | -   | 0 | -      | Internal | TRUE  |
| 000 CORRECT WORKING     | 800 bit 01 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 001 SYSTEM RESET        | 800 bit 02 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 002 EEPROM CHKSUM ERROR | 800 bit 03 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 003 BLOCKED             | 800 bit 04 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 004 STOP                | 800 bit 05 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 005 -3dB CARRIER        | 800 bit 06 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 006 HIGH REF PWR        | 800 bit 07 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 007 MIN 12V             | 800 bit 08 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 008 RF AMP. FAULT       | 800 bit 09 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 009 RF AMP. DERATING    | 800 bit 10 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 010 RF THERMAL DERATING | 800 bit 11 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |
| 011 RF OVER TEMPERATURE | 800 bit 12 | bit      | 1    | 0   | 0 | on/off | Internal | TRUE  |

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|                        |            |            |   |   |   |        |          |      |
|------------------------|------------|------------|---|---|---|--------|----------|------|
| 012 PSU FAULT          | 800 bit 13 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 013 PSU CURRENT        | 800 bit 14 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| DERATING               |            |            |   |   |   |        |          |      |
| 014 PSU OVER CURRENT   | 800 bit 15 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 015 PSU THERMAL        | 801 bit 01 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| DERATING               |            |            |   |   |   |        |          |      |
| 016 PSU OVER TEMPERAT  | 801 bit 02 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 017 UNBAL OVER         | 801 bit 03 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| TEMPERATURE            |            |            |   |   |   |        |          |      |
| 018 PSU SHUNT COMM     | 801 bit 04 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| TIMEOUT                |            |            |   |   |   |        |          |      |
| 019 EXT DRIVER ENABL   | 801 bit 05 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 020 EXT COM TIMEOUT    | 801 bit 06 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 021 EXTERNAL INTERLOCK | 801 bit 07 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 022 DERATING FOR       | 801 bit 08 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| COOLING                |            |            |   |   |   |        |          |      |
| 023 ON AIR             | 801 bit 09 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 024 POWER UP           | 801 bit 10 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 025 POWER DOWN         | 801 bit 11 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 026 PSU THERMAL FAULT  | 801 bit 12 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 027 PSU LOW POWER      | 801 bit 13 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 028 PSU RF OFF         | 801 bit 14 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| 029 WORKING MODE       | 801 bit 15 | bit        | 1 | 0 | 0 | on/off | Internal | TRUE |
| COMBINED               |            |            |   |   |   |        |          |      |
| .....                  |            | <b>bit</b> |   |   |   |        |          |      |

**11.9 ET15000 - TELEMETRY PARAMETERS**

| Description         | Word Address | Type | Min. | Max.  | Decimal N. | U.M.    | Origin | Read Only |
|---------------------|--------------|------|------|-------|------------|---------|--------|-----------|
| STBY                | 100          | word | 0    | 1     | 0          | on/off  | user   | FALSE     |
| ResetAlarm          | 101          | word | 0    | 1     | 0          | on/off  | user   | FALSE     |
| SetPointTargetPwr   | 102          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| TerminalWatchdog    | 103          | word | ?    | ?     | 0          | -       | user   | FALSE     |
| DateSet.weekday     | 104          | word | 0    | 6     | 0          | -       | user   | FALSE     |
| DateSet.day         | 105          | word | 1    | 31    | 0          | Days    | user   | FALSE     |
| DateSet.month       | 106          | word | 1    | 12    | 0          | Months  | user   | FALSE     |
| DateSet.year        | 107          | word | 0    | 99    | 0          | Years   | user   | FALSE     |
| DateSet.hours       | 108          | word | 0    | 11    | 0          | Hours   | user   | FALSE     |
| DateSet.minuts      | 109          | word | 0    | 59    | 0          | Minutes | user   | FALSE     |
| DateSet.seconds     | 110          | word | 0    | 59    | 0          | Seconds | user   | FALSE     |
| DateSet.Update      | 111          | word | 0    | 1     | 0          | on/off  | user   | FALSE     |
| Exciter reset       | 112          | word | 0    | 1     | 0          | on/off  | user   | FALSE     |
| Fixed target        | 113          | word | 0    | 1     | 0          | on/off  | user   | FALSE     |
| Target for time 00  | 114          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 01  | 115          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 02  | 116          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 03  | 117          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 04  | 118          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 05  | 119          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 06  | 120          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 07  | 121          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 08  | 122          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 09  | 123          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 10  | 124          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 11  | 125          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 12  | 126          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 13  | 127          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 14  | 128          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 15  | 129          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 16  | 130          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 17  | 131          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 18  | 132          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 19  | 133          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 20  | 134          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 21  | 135          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 22  | 136          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| Target for time 23  | 137          | word | 125  | 16500 | 0          | W       | user   | FALSE     |
| No mains time       | 138          | word | 1    | 3600  | 0          | seconds | user   | FALSE     |
| No mains SMS enable | 139          | word | 0    | 1     | 0          | On/off  | user   | FALSE     |
| SMS enable          | 140          | word | 0    | 1     | 0          | On/off  | user   | FALSE     |

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|                              |            |       |     |            |   |        |               |       |
|------------------------------|------------|-------|-----|------------|---|--------|---------------|-------|
| GSM Fast field request       | 141        | word  | 0   | 1          | 0 | on/off | user          | FALSE |
| Max target power             | 142        | word  | 125 | 16500      | 0 | on/off | user          | FALSE |
| TerminalAddress              | 143        | word  | 0   | 69         | 0 | -      | user          | FALSE |
| Activation exciter 1         | 144        | word  | 0   | 1          | 0 | on/off | user          | FALSE |
| Activation exciter 2         | 145        | word  | 0   | 1          | 0 | on/off | user          | FALSE |
|                              |            |       |     |            |   |        |               |       |
| PwrForward                   | 200        | word  | 0   | 18000      | 0 | W      | On Card<br>AD | TRUE  |
| PwrReflected                 | 201        | word  | 0   | 1800       | 0 | W      | On Card<br>AD | TRUE  |
| Vcc                          | 202        | word  | 0   | 600        | 2 | V      | On Card<br>AD | TRUE  |
| Plus12                       | 203        | word  | 0   | 1200       | 2 | V      | On Card<br>AD | TRUE  |
|                              |            |       |     |            |   |        |               |       |
| Efficiency                   | 205        | word  | 0   | 1000       | 1 | %      | Computed      | TRUE  |
| RF IDS tot                   | 206        | word  | 0   | 6500       | 1 | A      | Computed      | TRUE  |
| WorkingTimeMinuts            | 207        | word  | 0   | 59         | 0 | minuts | Internal      | TRUE  |
| WorkingTimeHours             | 208        | dword | 0   | 4294967295 | 0 | hours  | Internal      | TRUE  |
| AlarmN_Active                | 210        | word  | 0   | 31         | 0 | n.     | Internal      | TRUE  |
| RF VDS Average               | 211        | word  | 0   | 600        | 1 | V      | Computed      | TRUE  |
|                              |            |       |     |            |   |        |               |       |
| Remote Enable                | 213        | word  | 0   | 1          | 1 | on/off | Computed      | TRUE  |
| Host Link editable field     | 214        | word  | 0   | 1          | 1 | on/off | Computed      | TRUE  |
| Led status                   | 215        | word  | 0   | 65535      | 0 | -      | Computed      | TRUE  |
| FAULT LED                    | 215 bit 01 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| FAULT BLINK LED              | 215 bit 02 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| ON AIR BLINK LED             | 215 bit 03 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| ON AIR LED                   | 215 bit 04 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| LOCAL LED                    | 215 bit 05 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| STBY LED                     | 215 bit 06 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| COMMUNICATION NOISE LED      | 215 bit 15 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| COMMUNICATION LOST LED       | 215 bit 16 | Bit   | 1   | 0          | 0 | on/off | Remote        | TRUE  |
| Temperature max              | 216        | word  | 0   | 1000       | 1 | °C     | Computed      | TRUE  |
| RF DC power                  | 217        | word  | 0   | 30000      | 0 | W      | Computed      | TRUE  |
| Env. external<br>temperature | 218        | word  | 0   | 1300       | 1 | °C     | AD            | TRUE  |
| Dummy load temp.<br>max      | 219        | word  | 0   | 1000       | 1 | °C     | Computed      | TRUE  |
| Combiner temperature         | 220        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
| Splitter temperature         | 221        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
| Dummy load temp. 1           | 222        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
| Dummy load temp. 2           | 223        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
| Dummy load temp. 3           | 224        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
| Dummy load temp. 4           | 225        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
| Dummy load temp. 5           | 226        | word  | 0   | 1000       | 1 | °C     | AD            | TRUE  |
|                              |            |       |     |            |   |        |               |       |
| Coax position 1              | 244        | word  | 0   | 1          | 0 | on/off | Field input   | TRUE  |
| Coax position 2              | 245        | word  | 0   | 1          | 0 | on/off | Field input   | TRUE  |

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|                         |     |            |     |       |   |        |             |             |
|-------------------------|-----|------------|-----|-------|---|--------|-------------|-------------|
| Exciter 1 on air        | 246 | word       | 0   | 1     | 0 | on/off | Field input | TRUE        |
| Exciter 2 on air        | 247 | word       | 0   | 1     | 0 | on/off | Field input | TRUE        |
| Exciter 1 fault         | 248 | word       | 0   | 1     | 0 | on/off | Field input | TRUE        |
| Exciter 2 fault         | 249 | word       | 0   | 1     | 0 | on/off | Field input | TRUE        |
| E3k n 1 forward pwr     | 250 | word       | 0   | 3500  | 0 | W      | Remote      | TRUE        |
| E3k n 2 forward pwr     | 251 | word       | 0   | 3500  | 0 | W      | Remote      | TRUE        |
| E3k n 3 forward pwr     | 252 | word       | 0   | 3500  | 0 | W      | Remote      | TRUE        |
| E3k n 4 forward pwr     | 253 | word       | 0   | 3500  | 0 | W      | Remote      | TRUE        |
| E3k n 5 forward pwr     | 254 | word       | 0   | 3500  | 0 | W      | Remote      | TRUE        |
| E3k n 1 reflected pwr   | 255 | word       | 0   | 350   | 0 | W      | Remote      | TRUE        |
| E3k n 2 reflected pwr   | 256 | word       | 0   | 350   | 0 | W      | Remote      | TRUE        |
| E3k n 3 reflected pwr   | 257 | word       | 0   | 350   | 0 | W      | Remote      | TRUE        |
| E3k n 4 reflected pwr   | 258 | word       | 0   | 350   | 0 | W      | Remote      | TRUE        |
| E3k n 5 reflected pwr   | 259 | word       | 0   | 350   | 0 | W      | Remote      | TRUE        |
| E3k n 1 VDS             | 260 | word       | 0   | 600   | 1 | V      | Remote      | TRUE        |
| E3k n 2 VDS             | 261 | word       | 0   | 600   | 1 | V      | Remote      | TRUE        |
| E3k n 3 VDS             | 262 | word       | 0   | 600   | 1 | V      | Remote      | TRUE        |
| E3k n 4 VDS             | 263 | word       | 0   | 600   | 1 | V      | Remote      | TRUE        |
| E3k n 5 VDS             | 264 | word       | 0   | 600   | 1 | V      | Remote      | TRUE        |
| E3k n 1 IDS             | 265 | word       | 0   | 12000 | 2 | V      | Remote      | TRUE        |
| E3k n 2 IDS             | 266 | word       | 0   | 12000 | 2 | V      | Remote      | TRUE        |
| E3k n 3 IDS             | 267 | word       | 0   | 12000 | 2 | V      | Remote      | TRUE        |
| E3k n 4 IDS             | 268 | word       | 0   | 12000 | 2 | V      | Remote      | TRUE        |
| E3k n 5 IDS             | 269 | word       | 0   | 12000 | 2 | V      | Remote      | TRUE        |
| E3k n 1 Temp max        | 270 | word       | 0   | 1200  | 0 | °C     | Remote      | TRUE        |
| E3k n 2 Temp max        | 271 | word       | 0   | 1200  | 0 | °C     | Remote      | TRUE        |
| E3k n 3 Temp max        | 272 | word       | 0   | 1200  | 0 | °C     | Remote      | TRUE        |
| E3k n 4 Temp max        | 273 | word       | 0   | 1200  | 0 | °C     | Remote      | TRUE        |
| E3k n 5 Temp max        | 274 | word       | 0   | 1200  | 0 | °C     | Remote      | TRUE        |
| E3k n 1 Status          | 275 | word       | 0   | 65535 | 0 | -      | Remote      | TRUE        |
| FAULT LED               |     | 275 bit 01 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| FAULT BLINK LED         |     | 275 bit 02 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| ON AIR BLINK LED        |     | 275 bit 03 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| ON AIR LED              |     | 275 bit 04 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| LOCAL LED               |     | 275 bit 05 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| STBY LED                |     | 275 bit 06 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| COMMUNICATION NOISE LED |     | 275 bit 15 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| COMMUNICATION LOST LED  |     | 275 bit 16 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| E3k n 2 Status          | 276 | word       | 0   | 65535 | 0 | -      | Remote      | TRUE        |
| FAULT LED               |     | 276 bit 01 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| FAULT BLINK LED         |     | 276 bit 02 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| ON AIR BLINK LED        |     | 276 bit 03 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| ON AIR LED              |     | 276 bit 04 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| LOCAL LED               |     | 276 bit 05 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| STBY LED                |     | 276 bit 06 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| COMMUNICATION NOISE LED |     | 276 bit 15 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| COMMUNICATION LOST LED  |     | 276 bit 16 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| E3k n 3 Status          | 277 | word       | 0   | 65535 | 0 | -      | Remote      | TRUE        |
| FAULT LED               |     | 277 bit 01 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |
| FAULT BLINK LED         |     | 277 bit 02 | Bit | 1     | 0 | 0      | on/off      | Remote TRUE |

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|                         |            |     |            |   |        |        |        |      |
|-------------------------|------------|-----|------------|---|--------|--------|--------|------|
| ON AIR BLINK LED        | 277 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 277 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 277 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 277 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 277 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 277 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 4 Status          | 278 word   | 0   | 65535      | 0 | -      | Remote | TRUE   |      |
| FAULT LED               | 278 bit 01 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| FAULT BLINK LED         | 278 bit 02 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 278 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 278 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 278 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 278 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 278 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 278 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 5 Status          | 279 word   | 0   | 65535      | 0 | -      | Remote | TRUE   |      |
| FAULT LED               | 279 bit 01 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| FAULT BLINK LED         | 279 bit 02 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 279 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 279 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 279 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 279 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 279 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 279 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 1 Alarm code      | 280 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 2 Alarm code      | 281 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 3 Alarm code      | 282 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 4 Alarm code      | 283 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 5 Alarm code      | 284 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 1 DC power        | 285 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 2 DC power        | 286 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 3 DC power        | 287 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 4 DC power        | 288 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 5 DC power        | 289 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 1 work time       | 290 dword  | 0   | 4294967295 | 0 | hours  | Remote | TRUE   |      |
| hours                   |            |     |            |   |        |        |        |      |
| E3k n 2 work time       | 291 dword  | 0   | 4294967295 | 0 | hours  | Remote | TRUE   |      |
| hours                   |            |     |            |   |        |        |        |      |
| E3k n 3 work time       | 292 dword  | 0   | 4294967295 | 0 | hours  | Remote | TRUE   |      |
| hours                   |            |     |            |   |        |        |        |      |
| E3k n 4 work time       | 293 dword  | 0   | 4294967295 | 0 | hours  | Remote | TRUE   |      |
| hours                   |            |     |            |   |        |        |        |      |
| E3k n 5 work time       | 294 dword  | 0   | 4294967295 | 0 | hours  | Remote | TRUE   |      |
| hours                   |            |     |            |   |        |        |        |      |
| E3k n 1 work time min   | 295 word   | 0   | 59         | 0 | minuts | Remote | TRUE   |      |
| E3k n 2 work time min   | 296 word   | 0   | 59         | 0 | minuts | Remote | TRUE   |      |
| E3k n 3 work time min   | 297 word   | 0   | 59         | 0 | minuts | Remote | TRUE   |      |
| E3k n 4 work time min   | 298 word   | 0   | 59         | 0 | minuts | Remote | TRUE   |      |
| E3k n 5 work time min   | 299 word   | 0   | 59         | 0 | minuts | Remote | TRUE   |      |
| E3k n 1 Efficiency      | 300 word   | 0   | 0          | 1 | %      | Remote | TRUE   |      |
| E3k n 2 Efficiency      | 301 word   | 0   | 0          | 1 | %      | Remote | TRUE   |      |

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|                          |     |            |       |       |   |        |          |       |
|--------------------------|-----|------------|-------|-------|---|--------|----------|-------|
| E3k n 3 Efficiency       | 302 | word       | 0     | 0     | 1 | %      | Remote   | TRUE  |
| E3k n 4 Efficiency       | 303 | word       | 0     | 0     | 1 | %      | Remote   | TRUE  |
| E3k n 5 Efficiency       | 304 | word       | 0     | 0     | 1 | %      | Remote   | TRUE  |
|                          |     |            |       |       |   |        |          |       |
| Device Model Id          | 400 | word       | 15000 | 15000 | 0 | -      | Fixed    | TRUE  |
| Software version n.      | 401 | word       | ?     | ?     | 2 | -      | Fixed    | TRUE  |
| Data map version n.      | 402 | word       | ?     | ?     | 2 | -      | Fixed    | TRUE  |
| Current max target power | 403 | word       | 125   | 16500 | 0 | W      | Internal | TRUE  |
|                          |     |            |       |       |   |        |          |       |
| PhoneN1                  | 450 | char [20]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneN2                  | 460 | char [20]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneN3                  | 470 | char [20]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneN4                  | 480 | char [20]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneN5                  | 490 | char [20]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneEnableN1            | 500 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneEnableN2            | 501 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneEnableN3            | 502 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneEnableN4            | 503 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneEnableN5            | 504 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneStsEnableN1         | 505 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneStsEnableN2         | 506 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneStsEnableN3         | 507 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneStsEnableN4         | 508 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneStsEnableN5         | 509 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN1         | 510 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN2         | 511 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN3         | 512 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN4         | 513 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN5         | 514 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN1      | 515 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN2      | 516 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN3      | 517 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN4      | 518 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN5      | 519 | word       | 0     | 1     | 0 | on/off | User     | FALSE |
| SMS_Str                  | 520 | char [10]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneDigitalSmsN1        | 525 | word       | 0     | 1     | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN2        | 526 | word       | 0     | 1     | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN3        | 527 | word       | 0     | 1     | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN4        | 528 | word       | 0     | 1     | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN5        | 529 | word       | 0     | 1     | 0 | On/off | user     | FALSE |
| SMS Command text         | 530 | Char [160] | -     | -     | - | -      | user     | FALSE |
| SMS Status text          | 610 | Char [160] | -     | -     | - | -      | User     | FALSE |

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|                              |            |       |                     |     |   |        |          |       |
|------------------------------|------------|-------|---------------------|-----|---|--------|----------|-------|
| SMS status ready             | 690        | Char  | -                   | -   | - | -      | User     | FALSE |
|                              |            | [160] |                     |     |   |        |          |       |
| SMS status Ready             | 770        | word  | 0                   | 1   | 0 | On/off | User     | FALSE |
| GSM Rx level                 | 771        | word  | -113                | -51 | 0 | dBm    | Internal | FALSE |
| PackedAlarm                  | 800        | word  | -                   | -   | 0 | -      | Internal | TRUE  |
|                              |            | [5]   |                     |     |   |        |          |       |
| 000 CORRECT WORKING          | 800 bit 01 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 001 SYSTEM RESET             | 800 bit 02 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 002 EEPROM CHKSUM ERROR      | 800 bit 03 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 003 BLOCKED                  | 800 bit 04 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 004 STOP                     | 800 bit 05 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 005 -3dB CARRIER             | 800 bit 06 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 006 HIGH REF PWR             | 800 bit 07 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 007 MIN 12V                  | 800 bit 08 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 008 RF AMP. FAULT            | 800 bit 09 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 009 RF AMP. DERATING         | 800 bit 10 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 010 RF THERMAL DERATING      | 800 bit 11 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 011 RF OVER TEMPERATURE      | 800 bit 12 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 012 PSU FAULT                | 800 bit 13 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 013 PSU CURRENT DERATING     | 800 bit 14 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 014 PSU OVER CURRENT         | 800 bit 15 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 015 PSU THERMAL DERATING     | 800 bit 16 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 016 PSU OVER TEMPERAT        | 801 bit 01 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 017 UNBAL OVER TEMPERATURE   | 801 bit 02 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 018 PSU SHUNT COMM TIMEOUT   | 801 bit 03 | Bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 019 EXT DRIVER ENABL         | 801 bit 04 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 020 EXT COM TIMEOUT          | 801 bit 05 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 021 EXTERNAL INTERLOCK       | 801 bit 06 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 022 DERATING FOR COOLING     | 801 bit 07 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 023 ON AIR                   | 801 bit 08 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 024 POWER UP                 | 801 bit 09 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 025 POWER DOWN               | 801 bit 10 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 026 TEMPERATURE INTERLOCK    | 801 bit 11 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 027 EXCITER EXCHANGE         | 801 bit 12 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 028 EXCITER SYNC             | 801 bit 13 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 029 INCORRECT COAX WORK      | 801 bit 14 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 030 SLAVE AMPLIFIER ON LOCAL | 801 bit 15 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 031 SLAVE AMPLIFIER TIMEOUT  | 801 bit 16 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 032 EXCITER 1 FAULT          | 802 bit 01 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| 033 EXCITER R FAULT          | 802 bit 02 | bit   | 0                   | 1   | 0 | on/off | Internal | TRUE  |
| .....                        |            | bit   |                     |     |   |        |          |       |
| E3K selector                 | 998        | word  | 0                   | 4   | 0 | n.     | User     | FALSE |
| Selected E3K data            | 2100-2999  | word  | See E3k address map |     |   |        |          |       |

**11.10 ET31000 - TELEMETRY PARAMETER**

| Description            | Word Address | Type | Min. | Max.  | Decimal N. | U.M.    | Origin  | Read Only |
|------------------------|--------------|------|------|-------|------------|---------|---------|-----------|
| STBY                   | 100          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| ResetAlarm             | 101          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| SetPointTargetPwr      | 102          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| TerminalWatchdog       | 103          | word | ?    | ?     | 0          | -       | user    | FALSE     |
| DateSet.weekday        | 104          | word | 0    | 6     | 0          | -       | user    | FALSE     |
| DateSet.day            | 105          | word | 1    | 31    | 0          | Days    | user    | FALSE     |
| DateSet.month          | 106          | word | 1    | 12    | 0          | Months  | user    | FALSE     |
| DateSet.year           | 107          | word | 0    | 99    | 0          | Years   | user    | FALSE     |
| DateSet.hours          | 108          | word | 0    | 11    | 0          | Hours   | user    | FALSE     |
| DateSet.minuts         | 109          | word | 0    | 59    | 0          | Minutes | user    | FALSE     |
| DateSet.seconds        | 110          | word | 0    | 59    | 0          | Seconds | user    | FALSE     |
| DateSet.Update         | 111          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| Exciter reset          | 112          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| Fixed target           | 113          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| Target for time 00     | 114          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 01     | 115          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 02     | 116          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 03     | 117          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 04     | 118          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 05     | 119          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 06     | 120          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 07     | 121          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 08     | 122          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 09     | 123          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 10     | 124          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 11     | 125          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 12     | 126          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 13     | 127          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 14     | 128          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 15     | 129          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 16     | 130          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 17     | 131          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 18     | 132          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 19     | 133          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 20     | 134          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 21     | 135          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 22     | 136          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| Target for time 23     | 137          | word | 250  | 33000 | 0          | W       | user    | FALSE     |
| No mains time          | 138          | word | 1    | 3600  | 0          | seconds | user    | FALSE     |
| No mains SMS enable    | 139          | word | 0    | 1     | 0          | On/off  | user    | FALSE     |
| SMS enable             | 140          | word | 0    | 1     | 0          | On/off  | user    | FALSE     |
| GSM Fast field request | 141          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| Max target power       | 142          | word | 250  | 33000 | 0          | on/off  | user    | FALSE     |
| TerminalAddress        | 143          | word | 0    | 69    | 0          | -       | user    | FALSE     |
| Activation exciter 1   | 144          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| Activation exciter 2   | 145          | word | 0    | 1     | 0          | on/off  | user    | FALSE     |
| PwrForward             | 200          | word | 0    | 35000 | 0          | W       | On Card | TRUE      |

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|                           |     |            |     |            |   |        |             |        |      |
|---------------------------|-----|------------|-----|------------|---|--------|-------------|--------|------|
|                           |     |            |     |            |   |        | AD          |        |      |
| PwrReflected              | 201 | word       | 0   | 3500       | 0 | W      | On Card     | TRUE   |      |
|                           |     |            |     |            |   |        | AD          |        |      |
| Vcc                       | 202 | word       | 0   | 600        | 2 | V      | On Card     | TRUE   |      |
|                           |     |            |     |            |   |        | AD          |        |      |
| Plus12                    | 203 | word       | 0   | 1200       | 2 | V      | On Card     | TRUE   |      |
|                           |     |            |     |            |   |        | AD          |        |      |
|                           | 204 | word       |     |            |   |        |             |        |      |
| Efficiency                | 205 | word       | 0   | 1000       | 1 | %      | Computed    | TRUE   |      |
| RF IDS tot                | 206 | word       | 0   | 13000      | 1 | A      | Computed    | TRUE   |      |
| WorkingTimeMinuts         | 207 | word       | 0   | 59         | 0 | minuts | Internal    | TRUE   |      |
| WorkingTimeHours          | 208 | dword      | 0   | 4294967295 | 0 | hours  | Internal    | TRUE   |      |
| AlarmN_Active             | 210 | word       | 0   | 31         | 0 | n.     | Internal    | TRUE   |      |
| RF VDS Average            | 211 | word       | 0   | 600        | 1 | V      | Computed    | TRUE   |      |
|                           | 212 | word       |     |            |   |        |             |        |      |
| Remote Enable             | 213 | word       | 0   | 1          | 1 | on/off | Computed    | TRUE   |      |
| Host Link editable field  | 214 | word       | 0   | 1          | 1 | on/off | Computed    | TRUE   |      |
| Led status                | 215 | word       | 0   | 65535      | 0 | -      | Computed    | TRUE   |      |
| FAULT LED                 |     | 215 bit 01 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| FAULT BLINK LED           |     | 215 bit 02 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| ON AIR BLINK LED          |     | 215 bit 03 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| ON AIR LED                |     | 215 bit 04 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| LOCAL LED                 |     | 215 bit 05 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| STBY LED                  |     | 215 bit 06 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| COMMUNICATION NOISE LED   |     | 215 bit 15 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| COMMUNICATION LOST LED    |     | 215 bit 16 | Bit | 1          | 0 | 0      | on/off      | Remote | TRUE |
| Temperature max           | 216 | word       | 0   | 1000       | 1 | °C     | Computed    | TRUE   |      |
| RF DC power               | 217 | word       | 0   | 60000      | 0 | W      | Computed    | TRUE   |      |
| Env. external temperature | 218 | word       | 0   | 1000       | 1 | °C     | AD          | TRUE   |      |
| Dummy load temp. max      | 219 | word       | 0   | 1000       | 1 | °C     | Computed    | TRUE   |      |
| Combiner temperature      | 220 | word       | 0   | 1000       | 1 | °C     | AD          | TRUE   |      |
| Splitter temperature      | 221 | word       | 0   | 1000       | 1 | °C     | AD          | TRUE   |      |
| Dummy load temp. 1        | 222 | word       | 0   | 1000       | 1 | °C     | AD          | TRUE   |      |
|                           |     |            |     |            |   |        |             |        |      |
| Unbalance power           | 227 | word       | 0   | 7500       | 1 | W      | Field input | TRUE   |      |
|                           |     |            |     |            |   |        |             |        |      |
| Coax position 1           | 244 | word       | 0   | 1          | 0 | on/off | Field input | TRUE   |      |
| Coax position 2           | 245 | word       | 0   | 1          | 0 | on/off | Field input | TRUE   |      |
| Exciter 1 on air          | 246 | word       | 0   | 1          | 0 | on/off | Field input | TRUE   |      |
| Exciter 2 on air          | 247 | word       | 0   | 1          | 0 | on/off | Field input | TRUE   |      |
| Exciter 1 fault           | 248 | word       | 0   | 1          | 0 | on/off | Field input | TRUE   |      |
| Exciter 2 fault           | 249 | word       | 0   | 1          | 0 | on/off | Field input | TRUE   |      |
| E15k n 1 forward pwr      | 250 | word       | 0   | 3500       | 0 | W      | Remote      | TRUE   |      |
| E15k n 1 reflected pwr    | 251 | word       | 0   | 350        | 0 | W      | Remote      | TRUE   |      |
| E15k n 1 Vcc              | 252 | word       | 400 | 600        | 2 | V      | Remote      | TRUE   |      |
| E15k n 1 +12              | 253 | word       | 0   | 1400       | 2 | V      | Remote      | TRUE   |      |
| E15k n 1 work time min    | 254 | word       | 0   | 59         | 0 | minuts | Remote      | TRUE   |      |
| E15k n 1 work time hours  | 255 | dword      | 0   | 4294967295 | 0 | hours  | Remote      | TRUE   |      |
| E15k n 1 Alarm code       | 257 | word       | 0   | 30         | 0 | W      | Remote      | TRUE   |      |
| E15k n 1 Remote           | 258 | word       | 0   | 1          | 0 | on/off | Remote      | TRUE   |      |
| E15k n 1 editable field   | 259 | word       | 0   | 1          | 0 | on/off | Remote      | TRUE   |      |
| E15k n 1 Status           | 260 | word       | 0   | 65535      | 0 | -      | Remote      | TRUE   |      |

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|                         |            |      |   |       |   |        |        |      |
|-------------------------|------------|------|---|-------|---|--------|--------|------|
| FAULT LED               | 260 bit 01 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| FAULT BLINK LED         | 260 bit 02 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 260 bit 03 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR LED              | 260 bit 04 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| LOCAL LED               | 260 bit 05 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| STBY LED                | 260 bit 06 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 260 bit 15 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 260 bit 16 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| E15k n 1 Temp max       | 261        | word | 0 | 1000  | 0 | °C     | Remote | TRUE |
| E15k n 1 DC power       | 262        | word | 0 | 30000 | 0 | W      | Remote | TRUE |
| E15k n 1 Efficiency     | 263        | word | 0 | 1000  | 1 | %      | Remote | TRUE |
| E15k n 1 env. Temp.     | 264        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| E15k n 1 Unb. load      | 265        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| T.max                   |            |      |   |       |   |        |        |      |
| E15k n 1 Combiner       | 266        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| temp                    |            |      |   |       |   |        |        |      |
| E15k n 1 Splitter temp  | 267        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| E15k n 1 VDS            | 268        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E15k n 1 IDS            | 269        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
|                         |            |      |   |       |   |        |        |      |
| E3k n 1 forward pwr     | 275        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 2 forward pwr     | 276        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 3 forward pwr     | 277        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 4 forward pwr     | 278        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 5 forward pwr     | 279        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 1 reflected pwr   | 280        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 2 reflected pwr   | 281        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 3 reflected pwr   | 282        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 4 reflected pwr   | 283        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 5 reflected pwr   | 284        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 1 VDS             | 285        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 2 VDS             | 286        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 3 VDS             | 287        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 4 VDS             | 288        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 5 VDS             | 289        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 1 IDS             | 290        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 2 IDS             | 291        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 3 IDS             | 292        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 4 IDS             | 293        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 5 IDS             | 294        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 1 Temp max        | 295        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 2 Temp max        | 296        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 3 Temp max        | 297        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 4 Temp max        | 298        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 5 Temp max        | 299        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 1 Status          | 300        | word | 0 | 65535 | 0 | -      | Remote | TRUE |
| FAULT LED               | 300 bit 01 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| FAULT BLINK LED         | 300 bit 02 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 300 bit 03 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR LED              | 300 bit 04 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| LOCAL LED               | 300 bit 05 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| STBY LED                | 300 bit 06 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 300 bit 15 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 300 bit 16 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| E3k n 2 Status          | 301        | word | 0 | 65535 | 0 | -      | Remote | TRUE |

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|                         |            |     |            |   |        |        |        |      |
|-------------------------|------------|-----|------------|---|--------|--------|--------|------|
| FAULT LED               | 301 bit 01 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| FAULT BLINK LED         | 301 bit 02 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 301 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 301 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 301 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 301 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 301 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 301 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 3 Status          | 302 word   | 0   | 65535      | 0 | -      | Remote | TRUE   |      |
| FAULT LED               | 302 bit 01 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| FAULT BLINK LED         | 302 bit 02 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 302 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 302 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 302 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 302 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 302 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 302 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 4 Status          | 303 word   | 0   | 65535      | 0 | -      | Remote | TRUE   |      |
| FAULT LED               | 303 bit 01 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| FAULT BLINK LED         | 303 bit 02 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 303 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 303 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 303 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 303 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 303 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 303 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 5 Status          | 304 word   | 0   | 65535      | 0 | -      | Remote | TRUE   |      |
| FAULT LED               | 304 bit 01 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| FAULT BLINK LED         | 304 bit 02 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 304 bit 03 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| ON AIR LED              | 304 bit 04 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| LOCAL LED               | 304 bit 05 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| STBY LED                | 304 bit 06 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 304 bit 15 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 304 bit 16 | Bit | 1          | 0 | 0      | on/off | Remote | TRUE |
| E3k n 1 Alarm code      | 305 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 2 Alarm code      | 306 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 3 Alarm code      | 307 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 4 Alarm code      | 308 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 5 Alarm code      | 309 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E3k n 1 DC power        | 310 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 2 DC power        | 311 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 3 DC power        | 312 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 4 DC power        | 313 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E3k n 5 DC power        | 314 word   | 0   | 5000       | 0 | W      | Remote | TRUE   |      |
| E15k n 2 forward pwr    | 325 word   | 0   | 3500       | 0 | W      | Remote | TRUE   |      |
| E15k n 2 reflected pwr  | 326 word   | 0   | 350        | 0 | W      | Remote | TRUE   |      |
| E15k n 2 Vcc            | 327 word   | 400 | 600        | 2 | V      | Remote | TRUE   |      |
| E15k n 2 +12            | 328 word   | 0   | 1400       | 2 | V      | Remote | TRUE   |      |
| E15k n 2 work time min  | 329 word   | 0   | 59         | 0 | minuts | Remote | TRUE   |      |
| E15k n 2 work time      | 330 dword  | 0   | 4294967295 | 0 | hours  | Remote | TRUE   |      |
| hours                   |            |     |            |   |        |        |        |      |
| E15k n 2 Alarm code     | 332 word   | 0   | 30         | 0 | W      | Remote | TRUE   |      |
| E15k n 2 Remote         | 333 word   | 0   | 1          | 0 | on/off | Remote | TRUE   |      |
| E15k n 2 editable field | 334 word   | 0   | 1          | 0 | on/off | Remote | TRUE   |      |
| E15k n 2 Status         | 335 word   | 0   | 65535      | 0 | -      | Remote | TRUE   |      |

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|                         |            |      |   |       |   |        |        |      |
|-------------------------|------------|------|---|-------|---|--------|--------|------|
| FAULT LED               | 335 bit 01 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| FAULT BLINK LED         | 335 bit 02 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 335 bit 03 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR LED              | 335 bit 04 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| LOCAL LED               | 335 bit 05 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| STBY LED                | 335 bit 06 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 335 bit 15 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 335 bit 16 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| E15k n 2 Temp max       | 336        | word | 0 | 1000  | 0 | °C     | Remote | TRUE |
| E15k n 2 DC power       | 337        | word | 0 | 30000 | 0 | W      | Remote | TRUE |
| E15k n 2 Efficiency     | 338        | word | 0 | 1000  | 1 | %      | Remote | TRUE |
| E15k n 2 env. Temp.     | 339        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| E15k n 2 Unb. load      | 340        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| T.max                   |            |      |   |       |   |        |        |      |
| E15k n 2 Combiner       | 341        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| temp                    |            |      |   |       |   |        |        |      |
| E15k n 2 Splitter temp  | 342        | word | 0 | 1000  | 1 | °C     | Remote | TRUE |
| E15k n 2 VDS            | 343        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E15k n 2 IDS            | 344        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
|                         |            |      |   |       |   |        |        |      |
| E3k n 6 forward pwr     | 350        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 7 forward pwr     | 351        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 8 forward pwr     | 352        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 9 forward pwr     | 353        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 10 forward pwr    | 354        | word | 0 | 3500  | 0 | W      | Remote | TRUE |
| E3k n 6 reflected pwr   | 355        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 7 reflected pwr   | 356        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 8 reflected pwr   | 357        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 9 reflected pwr   | 358        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 10 reflected pwr  | 359        | word | 0 | 350   | 0 | W      | Remote | TRUE |
| E3k n 6 VDS             | 360        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 7 VDS             | 361        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 8 VDS             | 362        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 9 VDS             | 363        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 10 VDS            | 364        | word | 0 | 600   | 1 | V      | Remote | TRUE |
| E3k n 6 IDS             | 365        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 7 IDS             | 366        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 8 IDS             | 367        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 9 IDS             | 368        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 10 IDS            | 369        | word | 0 | 12000 | 2 | V      | Remote | TRUE |
| E3k n 6 Temp max        | 370        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 7 Temp max        | 371        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 8 Temp max        | 372        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 9 Temp max        | 373        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 10 Temp max       | 374        | word | 0 | 1200  | 0 | °C     | Remote | TRUE |
| E3k n 6 Status          | 375        | word | 0 | 65535 | 0 | -      | Remote | TRUE |
| FAULT LED               | 375 bit 01 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| FAULT BLINK LED         | 375 bit 02 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR BLINK LED        | 375 bit 03 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| ON AIR LED              | 375 bit 04 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| LOCAL LED               | 375 bit 05 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| STBY LED                | 375 bit 06 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION NOISE LED | 375 bit 15 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |
| COMMUNICATION LOST LED  | 375 bit 16 | Bit  | 1 | 0     | 0 | on/off | Remote | TRUE |



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|                          |     |            |       |       |   |        |          |       |
|--------------------------|-----|------------|-------|-------|---|--------|----------|-------|
| E3k n 7 Status           | 376 | word       | 0     | 65535 | 0 | -      | Remote   | TRUE  |
| FAULT LED                |     | 376 bit 01 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| FAULT BLINK LED          |     | 376 bit 02 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR BLINK LED         |     | 376 bit 03 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR LED               |     | 376 bit 04 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| LOCAL LED                |     | 376 bit 05 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| STBY LED                 |     | 376 bit 06 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION NOISE LED  |     | 376 bit 15 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION LOST LED   |     | 376 bit 16 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| E3k n 8 Status           | 377 | word       | 0     | 65535 | 0 | -      | Remote   | TRUE  |
| FAULT LED                |     | 377 bit 01 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| FAULT BLINK LED          |     | 377 bit 02 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR BLINK LED         |     | 377 bit 03 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR LED               |     | 377 bit 04 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| LOCAL LED                |     | 377 bit 05 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| STBY LED                 |     | 377 bit 06 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION NOISE LED  |     | 377 bit 15 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION LOST LED   |     | 377 bit 16 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| E3k n 9 Status           | 378 | word       | 0     | 65535 | 0 | -      | Remote   | TRUE  |
| FAULT LED                |     | 378 bit 01 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| FAULT BLINK LED          |     | 378 bit 02 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR BLINK LED         |     | 378 bit 03 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR LED               |     | 378 bit 04 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| LOCAL LED                |     | 378 bit 05 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| STBY LED                 |     | 378 bit 06 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION NOISE LED  |     | 378 bit 15 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION LOST LED   |     | 378 bit 16 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| E3k n 10 Status          | 379 | word       | 0     | 65535 | 0 | -      | Remote   | TRUE  |
| FAULT LED                |     | 379 bit 01 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| FAULT BLINK LED          |     | 379 bit 02 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR BLINK LED         |     | 379 bit 03 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| ON AIR LED               |     | 379 bit 04 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| LOCAL LED                |     | 379 bit 05 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| STBY LED                 |     | 379 bit 06 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION NOISE LED  |     | 379 bit 15 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| COMMUNICATION LOST LED   |     | 379 bit 16 | Bit   | 1 0   | 0 | on/off | Remote   | TRUE  |
| E3k n 6 Alarm code       | 380 | word       | 0     | 30    | 0 | W      | Remote   | TRUE  |
| E3k n 7 Alarm code       | 381 | word       | 0     | 30    | 0 | W      | Remote   | TRUE  |
| E3k n 8 Alarm code       | 382 | word       | 0     | 30    | 0 | W      | Remote   | TRUE  |
| E3k n 9 Alarm code       | 383 | word       | 0     | 30    | 0 | W      | Remote   | TRUE  |
| E3k n 10 Alarm code      | 384 | word       | 0     | 30    | 0 | W      | Remote   | TRUE  |
| E3k n 6 DC power         | 385 | word       | 0     | 5000  | 0 | W      | Remote   | TRUE  |
| E3k n 7 DC power         | 386 | word       | 0     | 5000  | 0 | W      | Remote   | TRUE  |
| E3k n 8 DC power         | 387 | word       | 0     | 5000  | 0 | W      | Remote   | TRUE  |
| E3k n 9 DC power         | 388 | word       | 0     | 5000  | 0 | W      | Remote   | TRUE  |
| E3k n 10 DC power        | 389 | word       | 0     | 5000  | 0 | W      | Remote   | TRUE  |
|                          |     |            |       |       |   |        |          |       |
| Device Model Id          | 400 | word       | 30000 | 30000 | 0 | -      | Fixed    | TRUE  |
| Software version n.      | 401 | word       | ?     | ?     | 2 | -      | Fixed    | TRUE  |
| Data map version n.      | 402 | word       | ?     | ?     | 2 | -      | Fixed    | TRUE  |
| Current max target power | 403 | word       | 250   | 33000 | 0 | W      | Internal | TRUE  |
|                          |     |            |       |       |   |        |          |       |
| PhoneN1                  | 450 | char [20]  | -     | -     | 0 | -      | User     | FALSE |
| PhoneN2                  | 460 | char [20]  | -     | -     | 0 | -      | User     | FALSE |

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|                          |            |               |      |     |   |        |          |       |
|--------------------------|------------|---------------|------|-----|---|--------|----------|-------|
| PhoneN3                  | 470        | char [20]     | -    | -   | 0 | -      | User     | FALSE |
| PhoneN4                  | 480        | char [20]     | -    | -   | 0 | -      | User     | FALSE |
| PhoneN5                  | 490        | char [20]     | -    | -   | 0 | -      | User     | FALSE |
| PhoneEnableN1            | 500        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneEnableN2            | 501        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneEnableN3            | 502        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneEnableN4            | 503        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneEnableN5            | 504        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN1         | 505        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN2         | 506        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN3         | 507        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN4         | 508        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneStsEnableN5         | 509        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN1         | 510        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN2         | 511        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN3         | 512        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN4         | 513        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneCmdEnableN5         | 514        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN1      | 515        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN2      | 516        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN3      | 517        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN4      | 518        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| PhoneGlobalEnableN5      | 519        | word          | 0    | 1   | 0 | on/off | User     | FALSE |
| SMS_Str                  | 520        | char [10]     | -    | -   | 0 | -      | User     | FALSE |
| PhoneDigitalSmsN1        | 525        | word          | 0    | 1   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN2        | 526        | word          | 0    | 1   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN3        | 527        | word          | 0    | 1   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN4        | 528        | word          | 0    | 1   | 0 | On/off | user     | FALSE |
| PhoneDigitalSmsN5        | 529        | word          | 0    | 1   | 0 | On/off | user     | FALSE |
| SMS Command text         | 530        | Char<br>[160] | -    | -   | - | -      | user     | FALSE |
| SMS Status text          | 610        | Char<br>[160] | -    | -   | - | -      | User     | FALSE |
| SMS status ready         | 690        | Char<br>[160] | -    | -   | - | -      | User     | FALSE |
| SMS status Ready         | 770        | word          | 0    | 1   | 0 | On/off | User     | FALSE |
| GSM Rx level             | 771        | word          | -113 | -51 | 0 | dBm    | Internal | FALSE |
| PackedAlarm              | 800        | word<br>[5]   | -    | -   | 0 | -      | Internal | TRUE  |
| 000 CORRECT WORKING      | 800 bit 01 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 001 SYSTEM RESET         | 800 bit 02 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 002 EEPROM CHKSUM ERROR  | 800 bit 03 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 003 BLOCKED              | 800 bit 04 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 004 STOP                 | 800 bit 05 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 005 -3dB CARRIER         | 800 bit 06 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 006 HIGH REF PWR         | 800 bit 07 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 007 MIN 12V              | 800 bit 08 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 008 RF AMP. FAULT        | 800 bit 09 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 009 RF AMP. DERATING     | 800 bit 10 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 010 RF THERMAL DERATING  | 800 bit 11 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 011 RF OVER TEMPERATURE  | 800 bit 12 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 012 PSU FAULT            | 800 bit 13 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |
| 013 PSU CURRENT DERATING | 800 bit 14 | Bit           | 0    | 1   | 0 | on/off | Internal | TRUE  |

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|------------------------------|------------|-----|---|---|---|--------|----------|------|
| 014 PSU OVER CURRENT         | 800 bit 15 | Bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 015 PSU THERMAL DERATING     | 800 bit 16 | Bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 016 PSU OVER TEMPERAT        | 801 bit 01 | Bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 017 UNBAL OVER TEMPERATURE   | 801 bit 02 | Bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 018 PSU SHUNT COMM TIMEOUT   | 801 bit 03 | Bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 019 EXT DRIVER ENABL         | 801 bit 04 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 020 EXT COM TIMEOUT          | 801 bit 05 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 021 EXTERNAL INTERLOCK       | 801 bit 06 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 022 DERATING FOR COOLING     | 801 bit 07 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 023 ON AIR                   | 801 bit 08 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 024 POWER UP                 | 801 bit 09 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 025 POWER DOWN               | 801 bit 10 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 026 TEMPERATURE INTERLOCK    | 801 bit 11 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 027 EXCITER EXCHANGE         | 801 bit 12 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 028 EXCITER SYNC             | 801 bit 13 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 029 INCORRECT COAX WORK      | 801 bit 14 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 030 SLAVE AMPLIFIER ON LOCAL | 801 bit 15 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 031 SLAVE AMPLIFIER TIMEOUT  | 801 bit 16 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 032 EXCITER 1 FAULT          | 802 bit 01 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| 033 EXCITER R FAULT          | 802 bit 02 | bit | 0 | 1 | 0 | on/off | Internal | TRUE |
| .....                        |            | bit |   |   |   |        |          |      |

|               |     |      |   |   |   |    |      |       |
|---------------|-----|------|---|---|---|----|------|-------|
| E15K selector | 997 | word | 0 | 1 | 0 | n. | User | FALSE |
| E3K selector  | 998 | word | 0 | 4 | 0 | n. | User | FALSE |

|                    |           |      |                      |  |  |  |  |  |
|--------------------|-----------|------|----------------------|--|--|--|--|--|
| Selected E3K data  | 2100-2999 | word | See E3k address map  |  |  |  |  |  |
| Selected E15K data | 3100-3999 | word | See E15k address map |  |  |  |  |  |