



CE 0051 ! 
IMQ-SISTEMI DI SICUREZZA
GSM[®]



EL.MO.
GLOBAL SECURITY SOLUTIONS

GSM/PSTN telephone dialers

TRH/GSM, TRH/COMBI and TRH/PLUS models

TECHNICAL MANUAL

FOREWORD

FOR THE INSTALLER:

Please follow carefully the specifications relative to electric and security systems realization further to the manufacturer's prescriptions indicated in the manual provided.

Provide the user the necessary indication for use and system's limitations, specifying that there exist precise specifications and different safety performances levels that should be proportioned to the user needs. Have the user view the directions indicated in this document.

FOR THE USER:

Periodically check carefully the system functionality making sure all enabling and disabling operations were made correctly.

Have skilled personnel make the periodic system's maintenance. Contact the installer to verify correct system operation in case its conditions have changed (e.g.: variations in the areas to protect due to extension, change of the access modes, etc...)

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This device has been projected, assembled and tested with the maximum care, adopting control procedures in accordance with the laws in force. The full correspondence to the functional characteristics is given exclusively when it is used for the purpose it was projected for, which is as follows:

GSM / PSTN Telephone Dialers

Any use other than the one mentioned above has not been forecasted and therefore it is not possible to guarantee its correct operativeness.

The manufacturing process is carefully controlled in order to prevent defaults and bad functioning. Nevertheless, an extremely low percentage of the components used is subjected to faults just as any other electronic or mechanic product.

As this item is meant to protect both property and people, we invite the user to proportion the level of protection that the system offers to the actual risk (also taking into account the possibility that the system was operated in a degraded manner because of faults and the like), as well reminding that there are precise laws for the design and assemblage of the systems destined to these kind of applications.

The system's operator is hereby advised to see regularly to the periodic maintenance of the system, at least in accordance with the provisions of current legislation, as well as to carry out checks on the correct running of said system on as regular a basis as the risk involved requires, with particular reference to the control unit, sensors, sounders, dialler(s) and any other device connected. The user must let the installer know how well the system seems to be operating, based on the results of periodic checks, without delay.

Design, installation and servicing of systems which include this product, should be made by skilled staff with the necessary knowledge to operate in safe conditions in order to prevent accidents. These systems' installation must be made in accordance with the laws in force. Some equipment's inner parts are connected to electric main and therefore electrocution may occur if servicing was made before switching off the main and emergency power. Some products incorporate rechargeable or non rechargeable batteries as emergency power supply. Their wrong connection may damage the product, properties and the operator's safety (burst and fire).

Your Dealer:

1. OVERVIEW

The TRH series telephone dialers are the most technologically advanced telephone dialers currently available on the security market. Each advanced model offers diverse features and performances which always supply safe, quick and flexible solutions.

Unless it is otherwise specified, the term "telephone dialer" in this manual will apply only to model TRH/PLUS.

2. FEATURES

2.1 TRH/PLUS overview

- GSM network telephone dialer and GSM/PSTN network interface.
- The unit is supplied with a 16-rubber key keyboard and LCD backlit display for message viewing, four LED indicators to show the unit's operating status and three additional LED indicators to show compatible RF devices signal strength. The user interface is also equipped with four additional programmable front panel keys: the S1, S2, S3 and S4. These keys operate with partitioning function only during the "Control unit" mode.
- Security coded access to the unit's operating and programming menus with separate user and installer codes.
- Supplied with an RS-232 interface for PC connection and programming via dedicated browser.
- The unit can be remotely controlled and monitored over the telephone line.
- Calls can be disabled from a remote site.
- Supplied with a compact plastic housing featuring a sophisticated design.
- Built-in Dual Band GSM module, fully compatible with rechargeable and 3V SIM service agreement cards supplied by TIM, VODAFONE and WIND.
- The GSM Dual Band Antenna is installed inside the housing.
- Supplied with 4 hard-wired inputs, expandable to 8 using the split function. The hard-wired inputs can be configured as NO, NC, balanced or split. Up to eight RF inputs for HELIOS System remote controls or sensors can be memorized allowing for a total of 16 controlled inputs. Suitable to be connected via serial line with compatible control units such as the CP80xx series, ET8/48x and ETR series.
- Supplied with 4 open collector outputs and 4 open collector selectable outputs. The selectable outputs can be remotely controlled over the telephone and be set by status or by pulse allowing for a total of 8 open collector outputs for each CP8/REL card and up to 8 outputs for UNIREL.
- Supplied with a relay output with dry contacts which can be set to relay different status signals or one of the selectable outputs.
- The TRH can be fully controlled via the control unit by connecting it to the transponder line with only two wires. This will enable the control of the 8 hard-wired inputs as well as to view the outputs and the RF inputs status.
- The telephone dialer can store up to 16 telephone numbers to send alarm events and/or the unit's operating status.
- Storage of two telephone number for digital transmission employing CONTACT-ID and Fast Format protocols.
- The telephone dialer can send up to 16 different voice messages (for a total of more than 200 sec.), more than 100 preset SMS messages and 15 fully customized SMS messages. Message transmission is triggered by alarm and reset events, messages can be differentiated for each kind of event. This unit can send voice messages reporting power supply events and SMS messages reporting power supply faults, RF inputs faults as well as to monitor the RF inputs.
- Individually selectable default network (GSM, PSTN or toggle) for each number.
- Both lines are supervised. The telephone dialer will automatically switch lines if the default line is not available. With the appropriate settings, the SIM card's credit balance (only for Vodafone or TIM cards) will be constantly monitored to report credit depletion and PSTN line switching.
- The unit is supplied with a dial-out monitoring function reporting input and output status, faults, arming and SIM card credit balance (this function is only available for Vodafone or TIM SIM cards) via SMS messages. The device can be controlled via SMS message to trigger the selectable outputs or to arm/disarm the system. The telephone dialer can forward SMS messages and is able to store up to 256 events.
- The telephone dialer can be configured to operate in "Control unit" mode so that it may be disarmed via input no. 4, remote control or keyboard.
- During the "Control unit" mode you can easily set the entry and exit delay, the exit route and the associations with the partitioned areas.
- Input no.4 of the telephone dialer can be configured as impulse/status/disable dialer.

2.2 TRH/GSM overview

- The unit is a GSM network telephone dialer.
- The unit features a 16 rubber-key keypad and a backlit LCD display to view messages. The four LED indicators display the unit's operating status. The user interface is also equipped with four additional programmable front panel keys: the S1, S2, S3, S4.
- Security coded access to the unit's operating and programming menus with separate user and installer codes.
- Supplied with an RS-232 interface for PC connection and programming via dedicated browser.
- The unit can be remotely controlled and monitored over the telephone line.
- Calls can be disabled from a remote site.
- Supplied with a compact plastic housing featuring a sophisticated design.
- Built-in Dual Band GSM module, fully compatible with rechargeable and 3V SIM service agreement cards supplied by TIM, VODAFONE and WIND.
- GSM Dual Band Antenna installed inside the housing,
- Supplied with 4 hard-wired inputs, expandable to 8 employing the split function. The hard-wired inputs can be configured as NO, NC, balanced or split and are expandable to 16 with a serial line connection. Suitable to be connected via serial line with compatible control units such as the CP80xx series, ET8/48x and ETR series.
- 8 additional trasponder outputs can be controlled via RS485.
- Supplied with an output relay with dry contacts which can be set to relay different status signals or one of the selectable outputs.
- Supplied with an RS-232 interface for trasponder or control unit emulation.
- The TRH can be fully controlled via the control unit by connecting it to the trasponder line with only two wires. In this case you will be able to control the 8 hard-wired inputs and the 8 serial inputs as well as read the status of the outputs.
- The telephone dialer can store up to 16 telephone numbers for alarm event and/or operating status reports.
- Storage of two telephone number for digital transmission employing CONTACT-ID and Fast Format protocols.
- The telephone dialer can send up to 16 different voice messages (for a total of more than 200 sec.), more than 100 preset SMS messages and 15 fully customizable SMS messages. Message transmission is triggered by alarm and reset events, messages can be differentiated for each kind of event. This unit can transmit voice messages also to report power supply events as well as SMS messages to report power faults.
- The line is supervised and the telephone dialer has the capability to reset itself automatically should the unavailable line become active again. With the appropriate settings, the SIM card's credit balance (only for Vodafone or TIM cards) will be constantly monitored to report credit depletion and PSTN line switching.
- The unit is supplied with a dial-out monitoring function reporting input and output status, fault, arming and SIM card credit balance (this function is only available for Vodafone or TIM SIM cards) via SMS messages. The device can be controlled via SMS to activate the selectable outputs or to arm/disarm the system.
- The telephone dialer can forward SMS messages and is able to store up to 256 events.
- The telephone dialer can be set to operate in "Control unit" mode to enable disarming via input no. 4, remote control or keypad.
- During the "Control unit" mode you can easily set: the exit/entry delays and the exit route.
- Input no.4 can be programmed as impulse/status/disable dialer.

2.3 TRH/COMBI overview

- GSM network telephone dialer and GSM/PSTN network interface.
- The unit features a 16 rubber-key keypad and a backlit LCD display to view messages. The four LED indicators display the unit's operating status. The user interface is also equipped with four additional programmable front panel keys: the S1, S2, S3, S4.
- Security coded access to the unit's operating and programming menus with separate user and installer codes.
- Supplied with an RS-232 interface for PC connection and programming via dedicated browser.
- The unit can be remotely controlled and monitored over the telephone line.
- Calls can be disabled from a remote site.
- Supplied with a compact plastic housing featuring a sophisticated design.
- Built-in Dual Band GSM module, fully compatible with rechargeable and 3V SIM service agreement cards supplied by TIM, VODAFONE and WIND.
- GSM Dual Band Antenna installed inside the housing.
- Supplied with 4 hard-wired inputs, expandable to 8 employing the split function. The hard-wired inputs can be configured as NO, NC, balanced or split and are expandable to 16 with a serial line connection. Suitable for the serial connection with compatible control units such as the CP80xx series, ET8/48x and ETR series.
- 8 additional trasponder outputs can be controlled via RS485.
- Supplied with an output relay with dry contacts which can be set to relay different status signals or one of the selectable outputs.
- Supplied with an RS-232 interface for trasponder or control unit emulation.
- The TRH can be fully controlled via the control unit by connecting it to the trasponder line with only two wires. In this case you will be able to control the 8 hard-wired inputs and the 8 serial inputs as well as read the status of the outputs.
- The telephone dialer can store up to 16 telephone numbers for alarm event and/or operating status reports.
- Storage of two telephone number for digital transmission employing CONTACT-ID and Fast Format protocols.
- The telephone dialer can send up to 16 different voice messages (for a total of more than 200 sec.), more than 100 preset SMS messages and 15 fully customizable SMS messages. Message transmission is triggered by alarm and reset events, messages can be differentiated for each kind of event. This unit can transmit voice messages also to report power supply events as well as SMS messages to report power faults.
- Individually selectable default network (GSM, PSTN or toggle) for each number.
- Both lines are supervised. The telephone dialer will automatically switch lines if the default line is not available. With the appropriate settings, the SIM card's credit balance (only for Vodafone or TIM cards) will be constantly monitored to report credit depletion and PSTN line switching.
- The unit is supplied with a dial-out monitoring function reporting input and output status, fault, arming and SIM card credit balance (this function is only available for Vodafone or TIM SIM cards) via SMS messages. It can be controlled via SMS to activate the selectable outputs exits or to arm/disarm the system.
- The telephone dialer can forward SMS messages and is able to store up to 256 events.
- The telephone dialer can be set to operate in "Control unit" mode to enable disarming via input no. 4, remote control or keypad.
- During the "Control unit" mode you can easily set: the exit/entry delays and the exit route.
- Input no.4 can be programmed as impulse/status/disable dialer.

2.4 Technical specifications

Model:	TRH/PLUS (TRH/COMBI) [TRH/GSM]	Custom SMS messages:	15 messages each formed by 64 characters (all messages have a common header formed by a string of 95 characters).
IP rating:	IP3X	Event log size:	256 events.
Performance level:	2 nd (1 st with NO/NC inputs)	Number of inputs:	4-8 hard-wired inputs or via trasponder/RS485 interface. The hard-wired inputs can be configured as NO, NC, balanced or split.
Power supply:	13.8 V  12V 1.3 Ah from battery.	Connection of the inputs:	1500 Ohm doubly balanced inputs. Possible configurations: split by doubling-up the single input, NC or NO.
Consumption @13.8V  :	100 mA on stand-by, 120 mA with backlit LCD display on, 100 mA during an alarm triggered by the built-in relay, 160 mA during an alarm with PSTN line dialing, 260 mA during an alarm with GSM line dialing.	NOTE:	None of the contacts is designed to be connected with dangerous voltage levels.
Flat battery status:	10,5V with reset at 10,9V.	RF section:	only for model TRH/PLUS and with an 80 meter open field operating range, subject to restrictions due to environmental conditions.
Standard operation:	from 9V to 15V  The unit must be powered solely with a short-circuit protected power supply unit.	Number of RF codes stored:	8 FM HELIOS system RF code devices (remote controls and sensors).
GSM module:	900/1800 MHz dual band. 2W @ 50 Ohm.	Special keys:	4 special keys located on the front panel, with partitioning function only for TRH/PLUS.
Antenna:	Dual band, installed into the plastic housing	Number of outputs:	4 default (status) open collector outputs, 4 selectable open coll. outputs (remotely controlled over the telephone), 1 selectable relay output.
Network compatibility:	with all the leading GSM mobile providers.	Open coll. outputs range:	100 mA
SIM card:	To be placed into the card reader tray, compatible with 3V SIM cards.	Selectable relay:	1A@24V  contact range, connect only to resistive loads.
Indicators:	LCD display, functional LED indicators, GSM RF signal strength LED.	Interfaces:	RS485 connecting terminal panel, RS232 Minidin for the connection to a PC.
User interface:	20 rubber-key keypad.	Programming browser:	each TRH model must be programmed employing the dedicated browser.
Voice recording messages:	Electret microphone and speaker, software by-passable.	Battery supported:	12V 1.3Ah
Recordable messages:	212 seconds total voice recording (can be split into two 22 sec. long messages and fourteen 12 sec. long messages).	Operating temperature:	+5 / +40 °C, 93% R. U.
Default SMS messages:	more than 100 variable length preset SMS messages. These SMS are always formed by a 95 character customized header as well as the customized name of the events.	Dimensions and weight:	refer to chapter mechanical features
		Supplied with:	eight 1500Ohm resistors, four 2200Ohm resistors, mounting screws and rivets, technical manual, WARBL039 CD containing the July 2005 ver. of the dedicated browser or a later version.

In compliance with the 89/336/EEC EMC directive, the TRH series units has been tested and found to comply with the EN 50130-4:1995 + A:1998 standards concerning electromagnetic immunity and the EN 50081-1:1992 standards concerning electromagnetic emission. The LVD73/23/EEC directive requirements concerning electrical safety have been complied with through tests performed in compliance with the EN 60950:2000-06 standard.

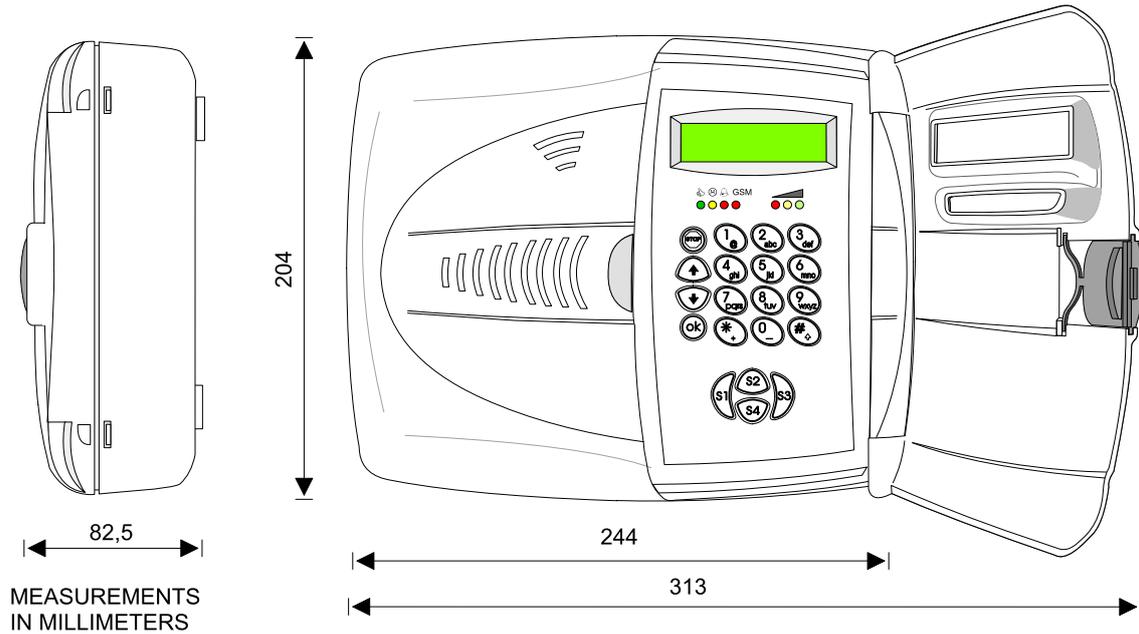
The telephone section compliance with standard TBR21 is supplied by the PTLM n° 10007 test report.

EL.MO. SpA hereby certifies that this device complies with the essential requirements and the other relevant regulations established by the 1999-5-EC directive.

Note: the TRH/PLUS model is not supplied with IMQ-ALARM mark.

2.5. Mechanic specifications

View of housing.



Weight: 0.82 Kg battery not included.

3. BLOCK DIAGRAM

Functional block diagram of the TRH/PLUS telephone dialer.

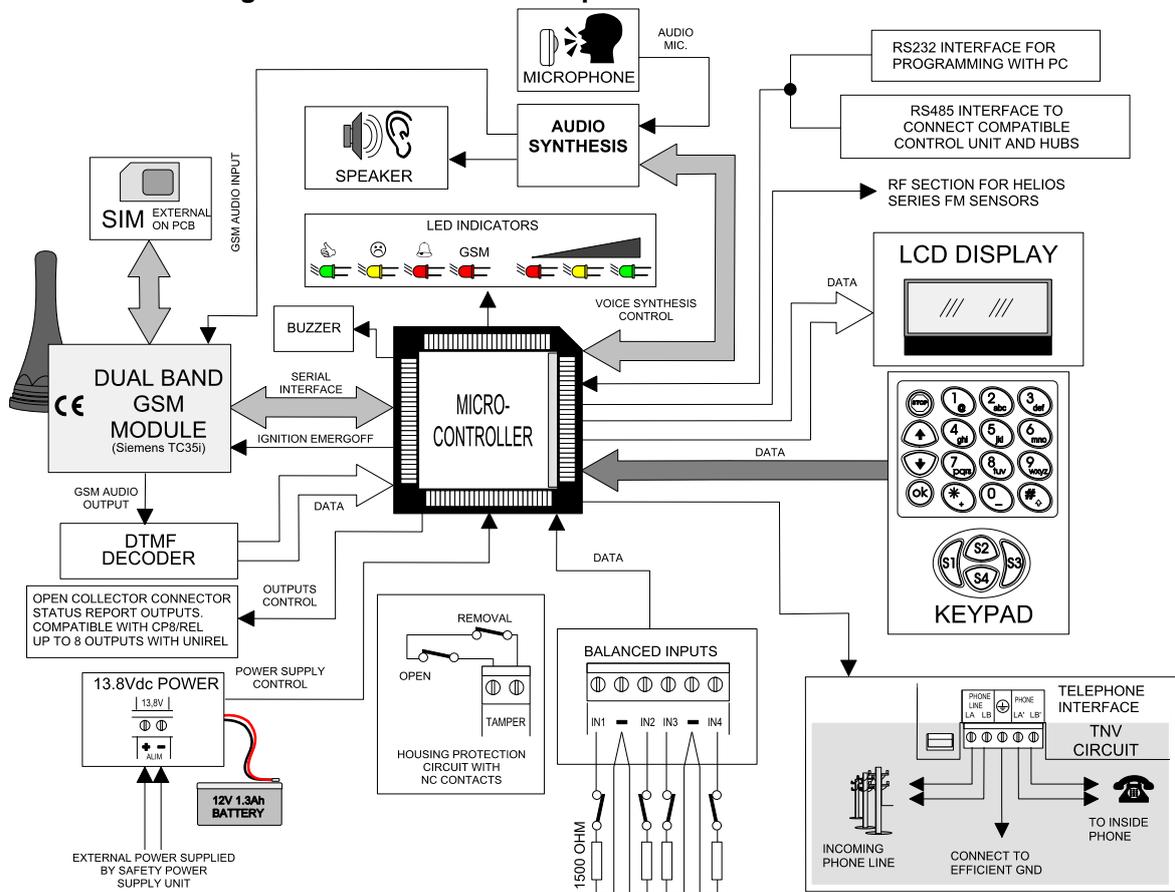
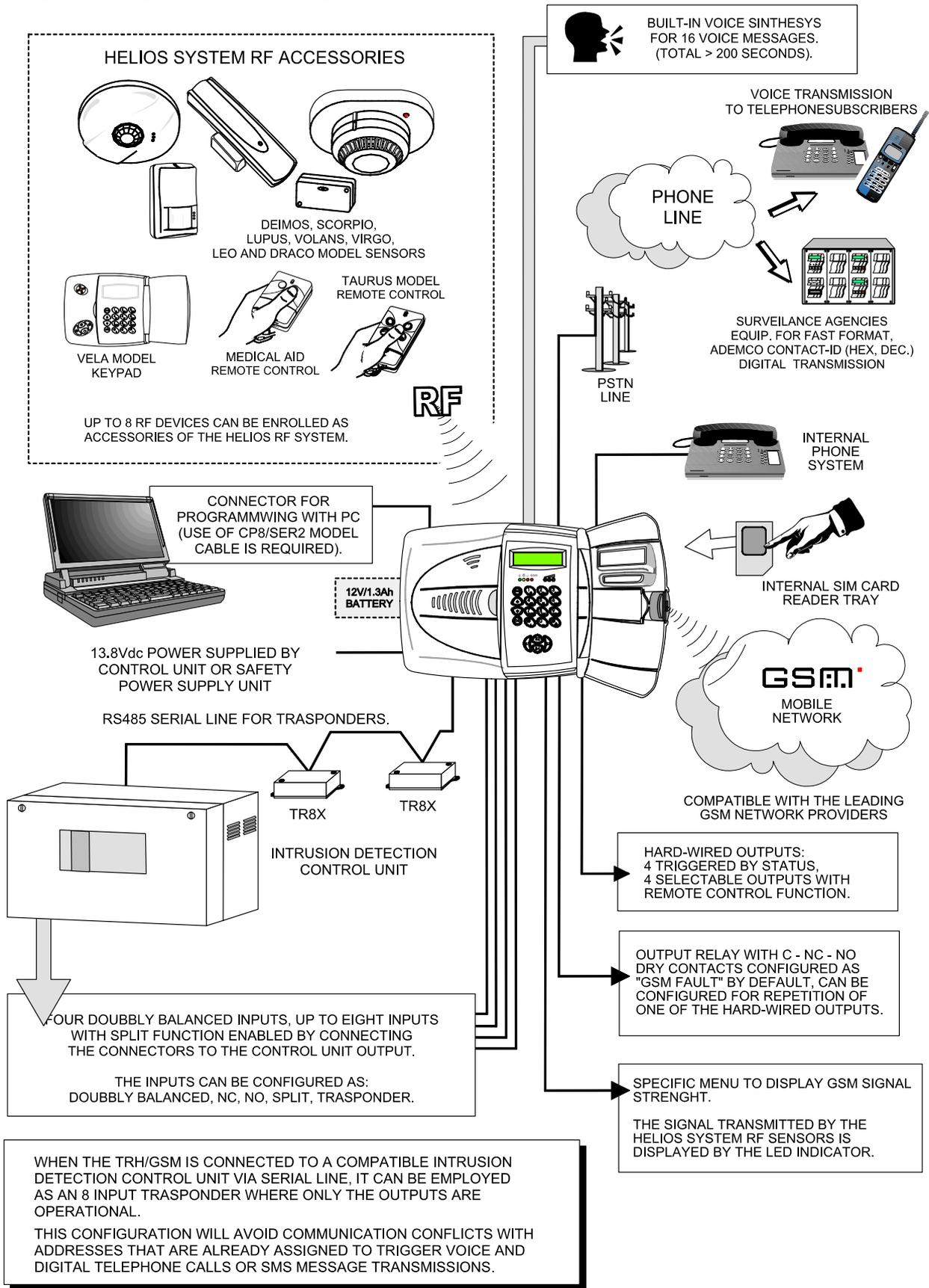


Diagram of a system controlled by the TRH/PLUS.

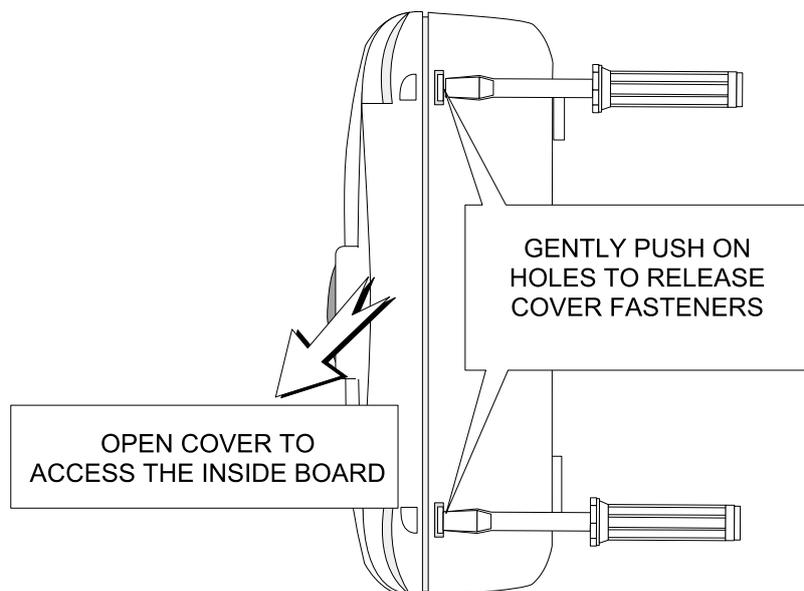


4. INSTALLATION

4.1 Installation tips

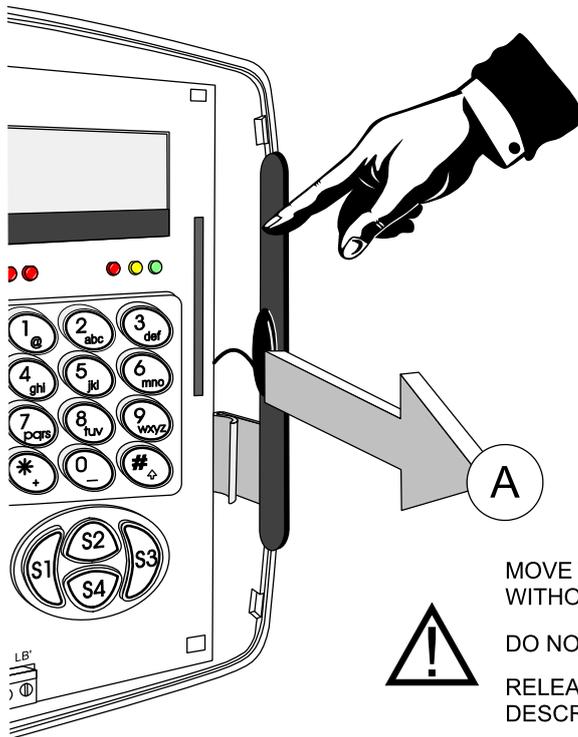
- Install the telephone dialer in an environment that can assure the specified humidity and temperature operating conditions. The device may be installed only indoors and is not designed for outdoor use.
- Open the housing of the dialer following the instructions supplied in this manual.
- Insert the SIM card to be used with the dialer into a cellular phone to check that it is not programmed to request a PIN code when it is switched on. Remove any optional services.
- Insert the SIM card into the GSM module following the procedure illustrated by the diagram on page 10.
- Temporarily power the dialer using a 12V 1.3Ah battery.
- Reset the unit by pressing the reset key.
- Press the ↑ and OK keys to view the GSM signal strength.
- Take advantage of the indications on the display to locate the best position for the installation. Make sure that the antenna of the combiner (located on the right inside the housing) is not positioned too close to other electronic devices susceptible to interference; the antenna should also not be positioned too close to metallic surfaces that could seriously alter the impedance of the antenna and affect the device's proper functioning.
- Disconnect the Faston cable connectors from the battery and set battery aside. Release the electronic card with great care and according to the indications supplied in this charter.
- Ensure that the front opening of the telephone dialer may be easily opened from the selected location of installation.
- Mount the back of the combiner on the selected support making sure that it is sturdy and not subject to vibrations. Make sure that the wall behind the unit does not yield under the pressure of the tamper-proof spring.
- Use the four holes located on the bottom of the housing as a drilling template.
- Secure the telephone dialer using screws and rivets able to bear the weight of the device and the battery.
- Use the holes illustrated in the diagrams to feed the system's connecting cables making sure that they are not live wires.
- Insert the card according to the procedure illustrated in this chapter. Be very careful to properly insert the spring extension of the housing's tamperproof micro switch.
- As an accessory to an intrusion detection control unit or to another device to which it must be connected, the telephone dialer must be powered by such unit and **must be supplied with its own 12V 1,3Ah battery** (not standard supply).
- Remove the two fuses from the board and set them aside.
- Refer to the diagrams in this manual to make all the necessary connections.
- Check the accuracy of the connections, connect the 12V 1.3Ah battery and the supply power from The control unit or power supply unit.

Opening the housing.



Dismantling the card.

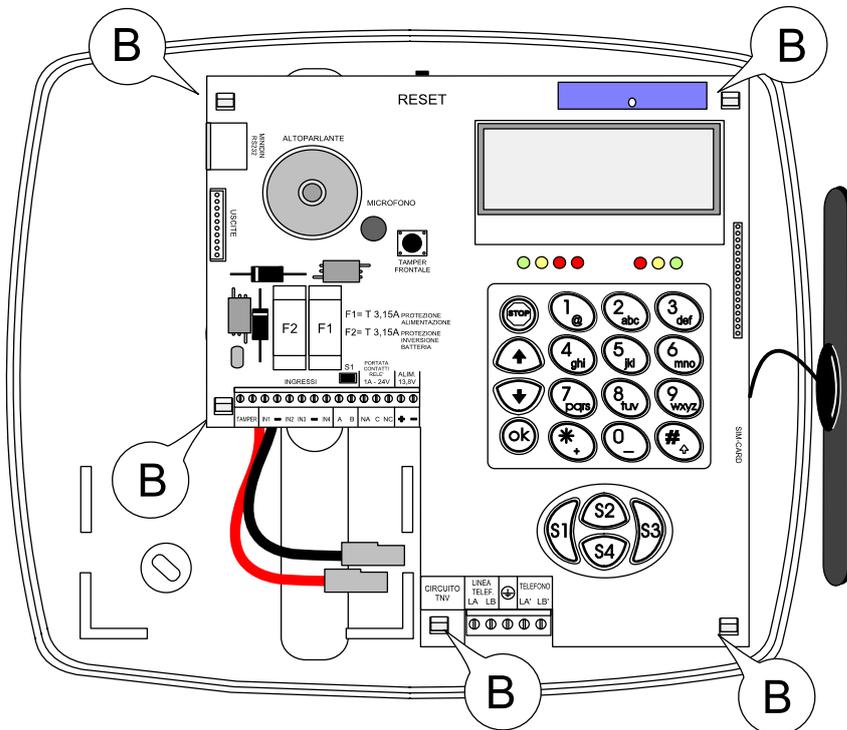
GENTLY RELEASE THE ANTENNA FROM THE SUPPORTING ADHESIVE CLIP



MOVE THE ANTENNA SLIGHTLY FROM THE SUPPORT WITHOUT PULLING THE CABLE ABRUPTLY.

DO NOT BENT THE CABLE, IT COULD DAMAGE IT.

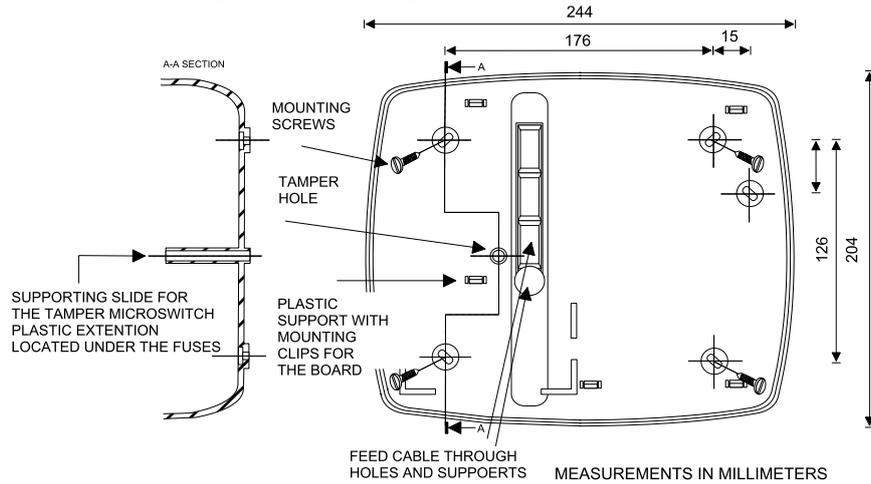
RELEASE THE BOARD FOLLOWING THE STEPS DESCRIBED IN THE FOLLOWING FIGURE.



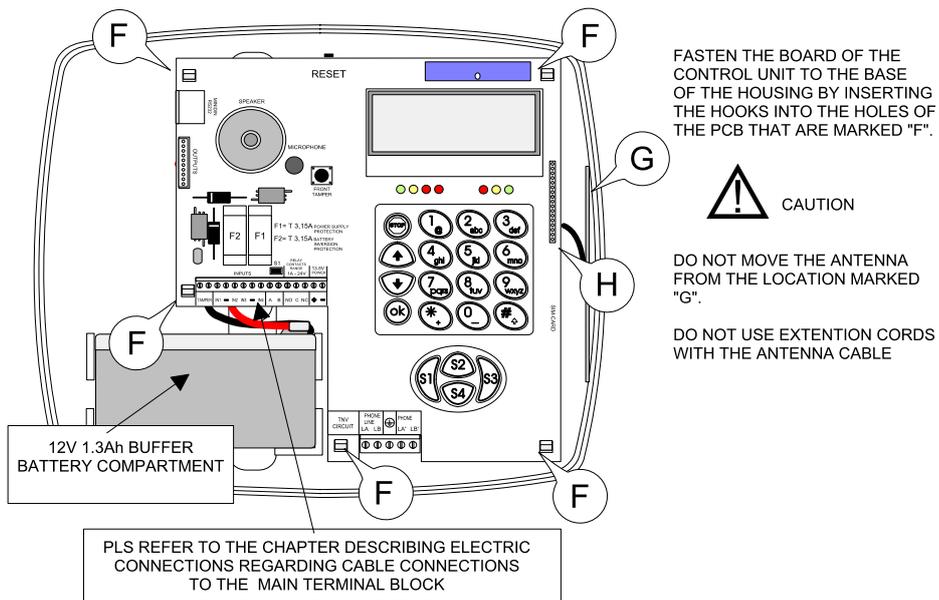
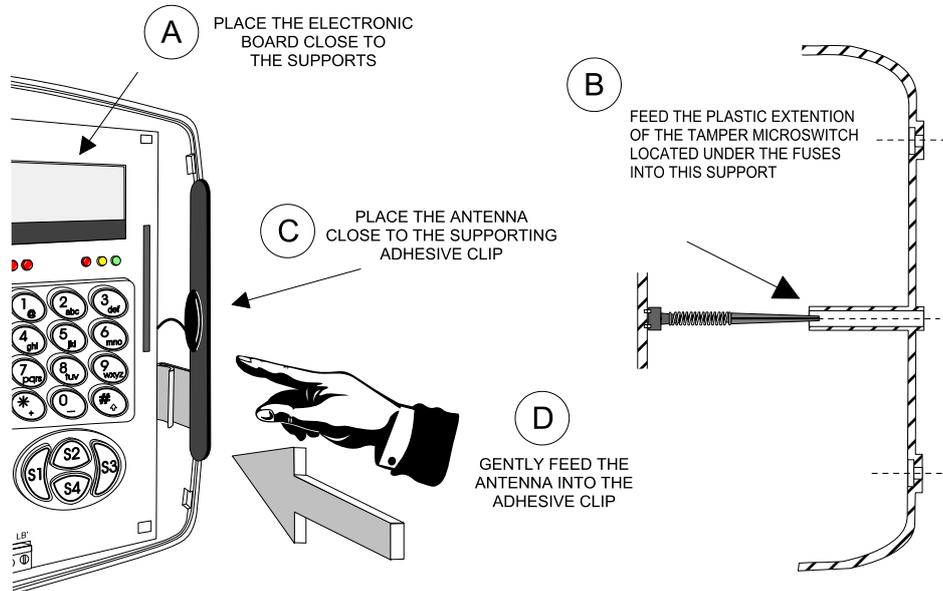
RELEASE THE BOARD BY GENTLY PUSHING ON THE SUPPLIED HOOKS (MARKED AS "B") AND CAREFULLY EXTRACT THE BOARD FROM THE BASE.

SET THE BOARD AND THE ANTENNA ASIDE TO FASTEN THE BASE ON THE SUPPORT SELECTED FOR THE INSTALLATION OF THE UNIT.

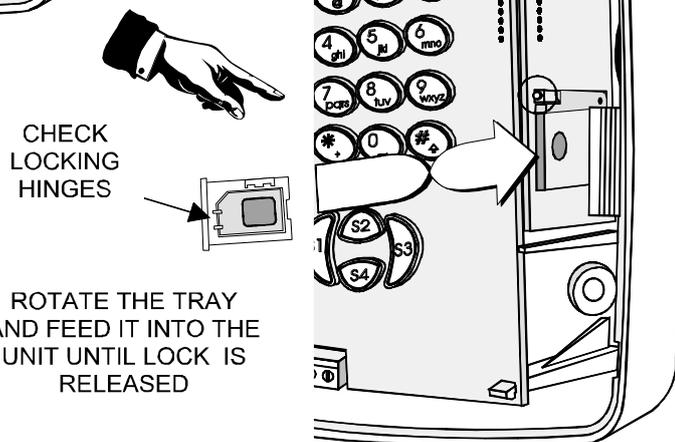
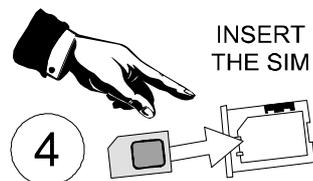
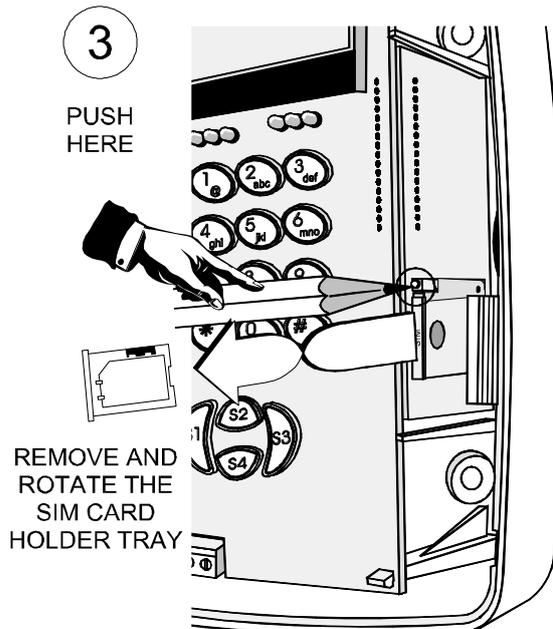
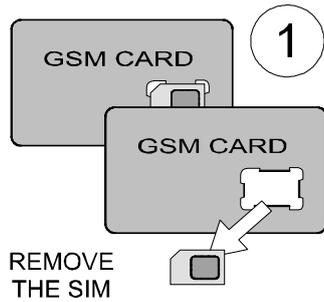
Drilling measurements and mounting of the housing.



Reassembly of the card.

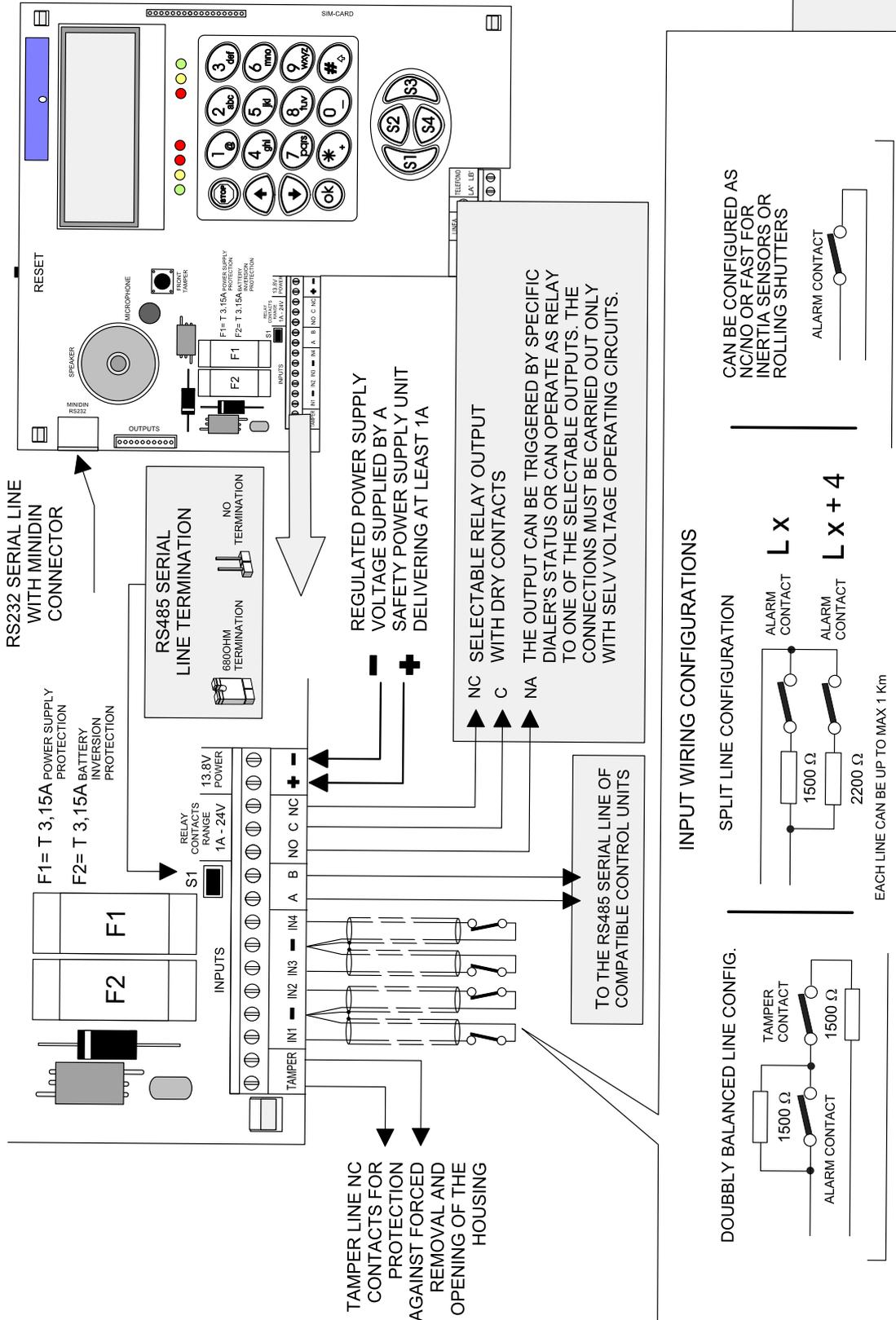


SIM card, GSM service enabling and dialer positioning.

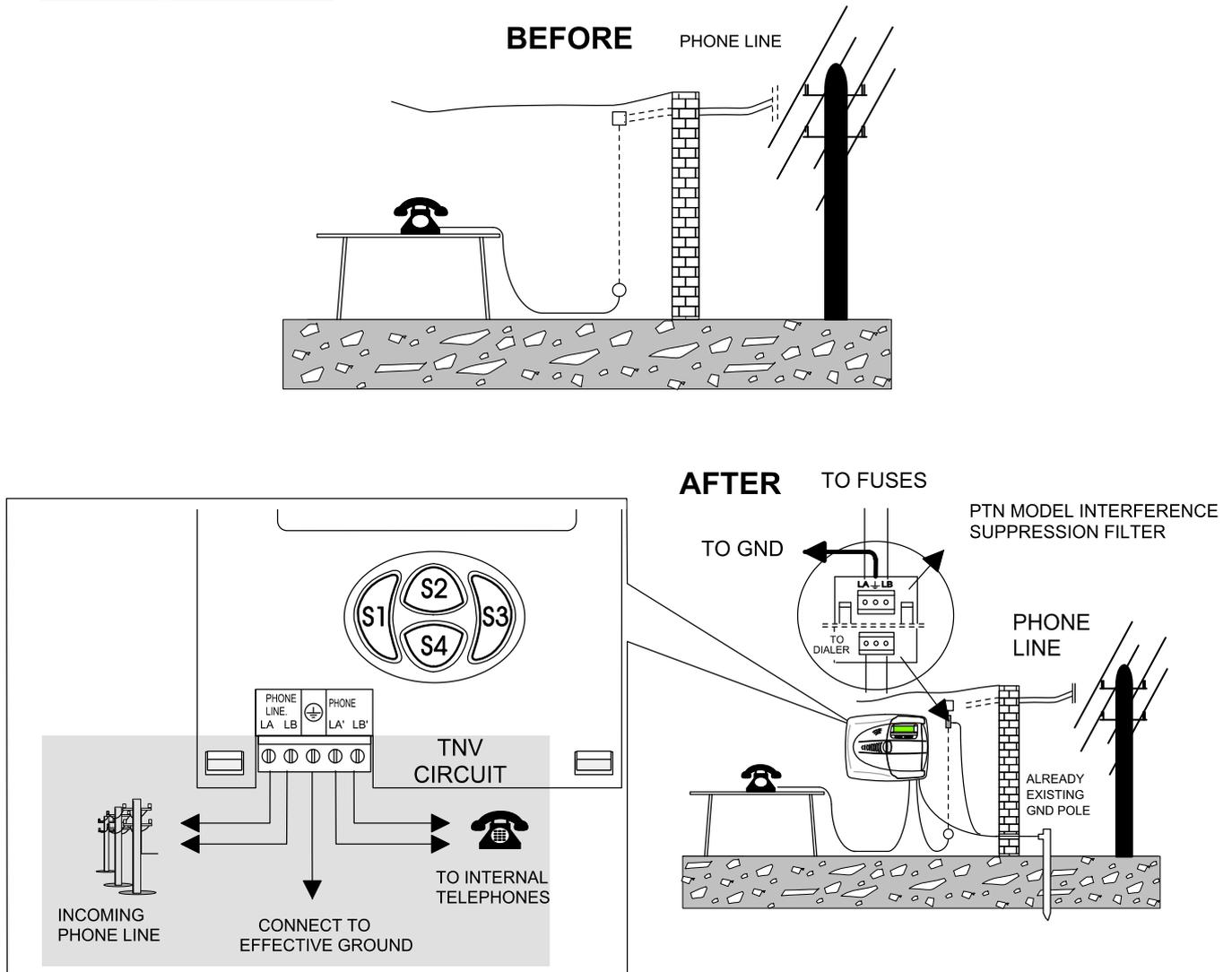


5. ELECTRIC CONNECTIONS

5.1 Connecting the inputs.



5.3 Connecting the PSTN line.



THE DIALER'S PROTECTION SYSTEMS REQUIRE GROUND CONNECTION. AVOID ANY CONNECTION IF GROUND'S SYSTEMS PROPER OPERATION IS NOT ASSURED.

CAUTION: THE DIALER'S INTERFACE IS NOT DESIGNED FOR ISDN TRANSMISSION. IF THE ISDN IS AVAILABLE WHEN THE DIALER IS INSTALLED, AN EXTENTION TO PLUG NO. 1 OF THE ISDN DEVICE (FOR EXAMPLE THE NT1PLUS) EQUIPPED WITH A SEPARATE PHONE POWER SUPPLY MUST BE CREATED.

MOVE THE TELEPHONE CONNECTIONS TO PLUG NO. 1 IF THE NT1PLUS UNIT IS INSTALLED WHEN THE DIALER IS ALREADY OPERATIONAL.

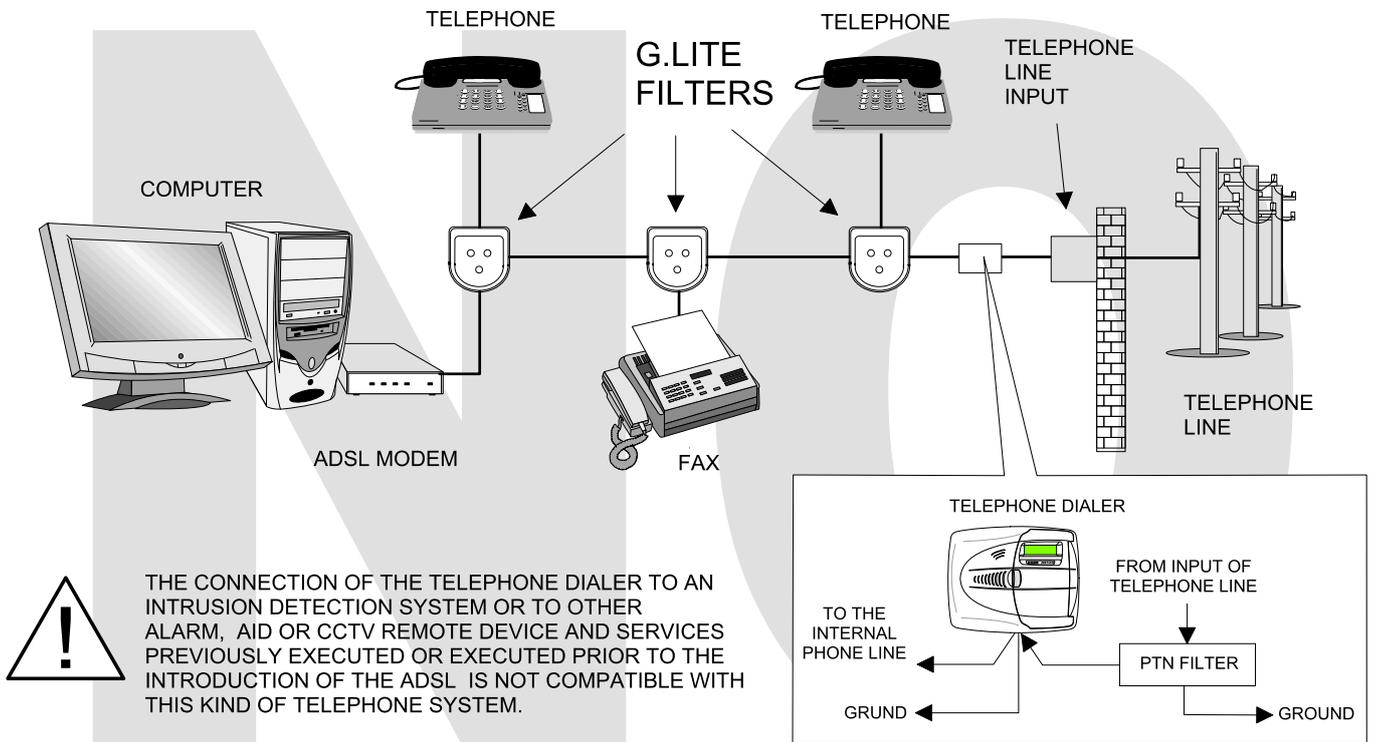
MAKE SURE THAT HIGH TONES ARE CONFIGURED FOR THE NT1PLUS UNIT (REFER TO THE NT1PLUS MANUAL).

THE DIALER MUST BE PROGRAMMED TO EMPLOY DTMF PULSE.

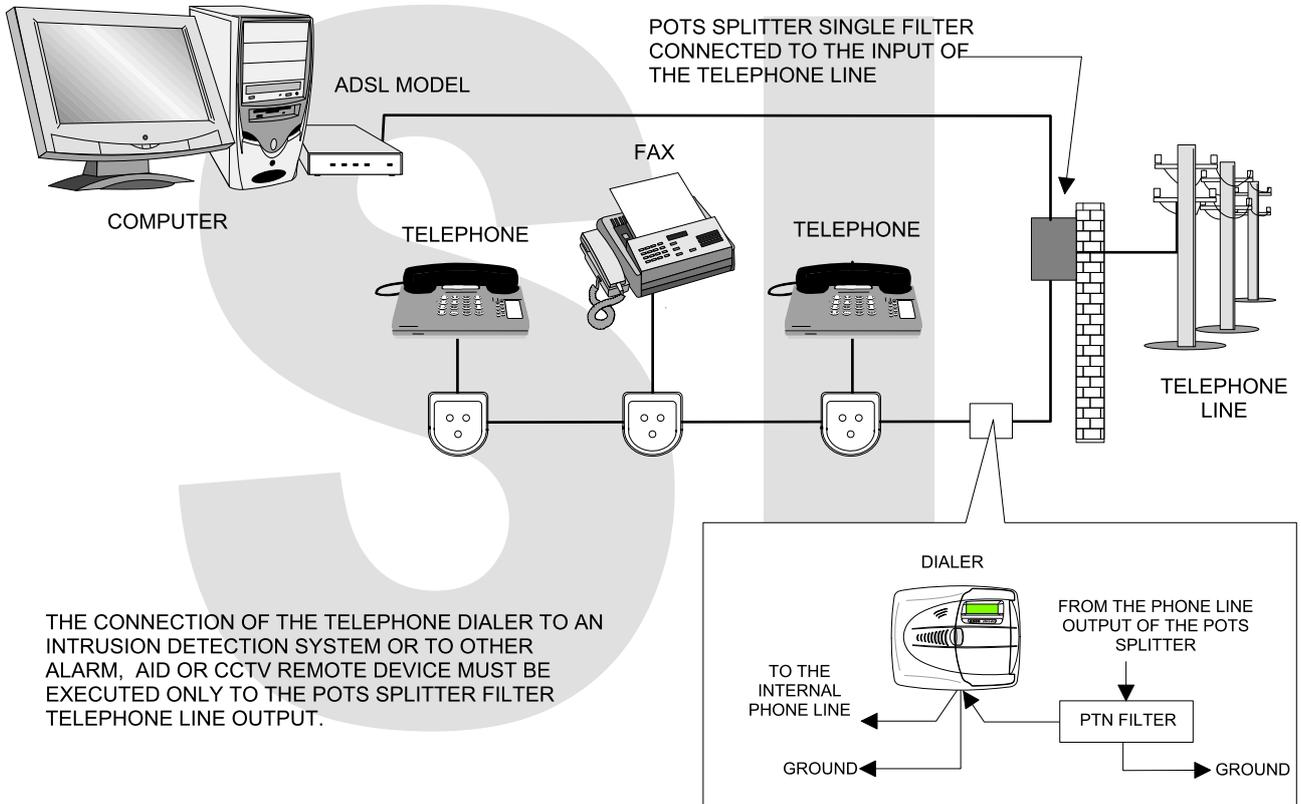
5.4 Connecting the ADSL line.

Connect the telephone dialer with care and following the instructions supplied in the two sample diagrams.

SIMPLE TELEPHONE SYSTEM

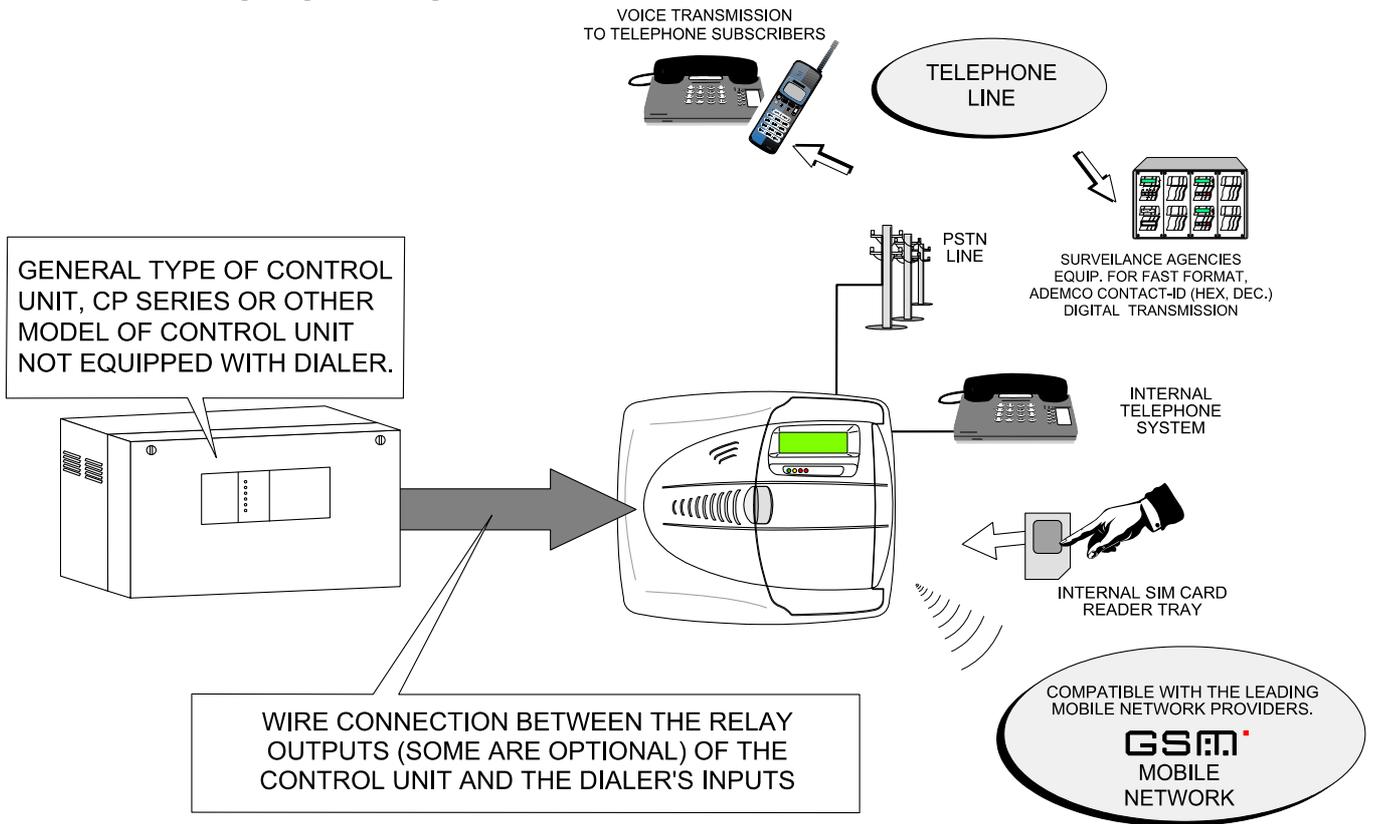


COMPLEX TELEPHONE SYSTEM

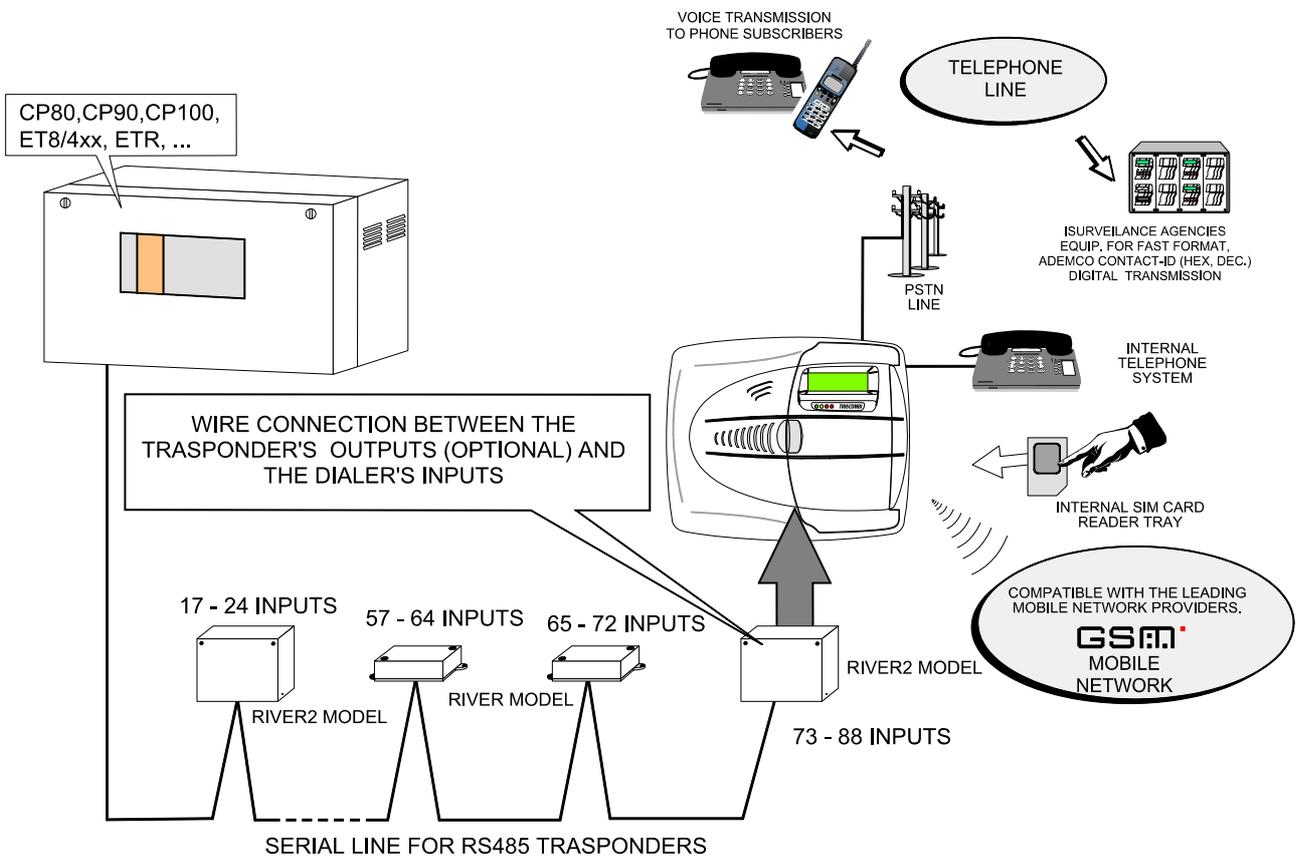


5.5 Wiring block diagrams

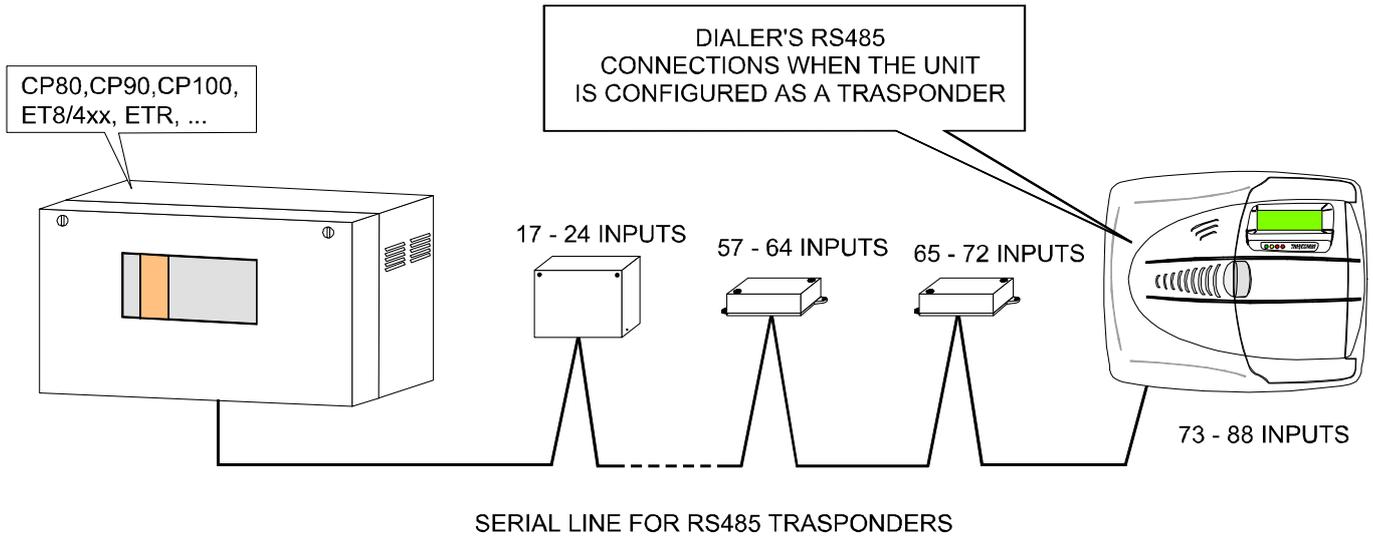
5.5.1 General wiring diagram using a control unit



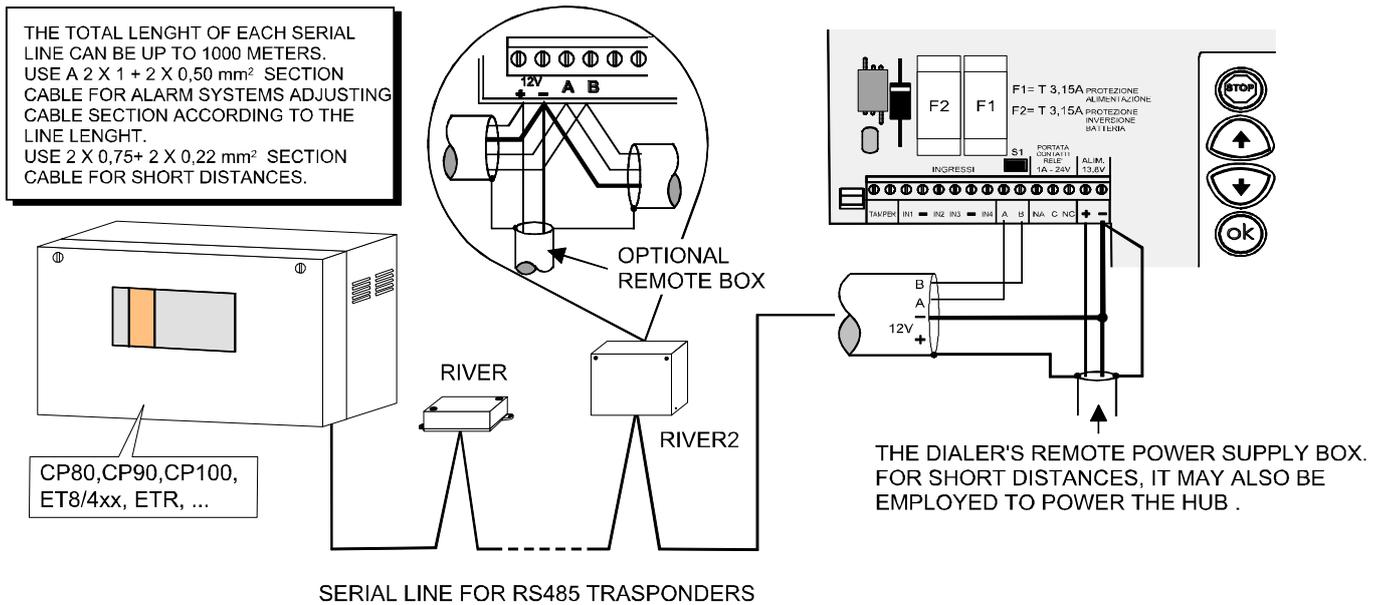
5.5.2 General wiring diagram using a trasponder.



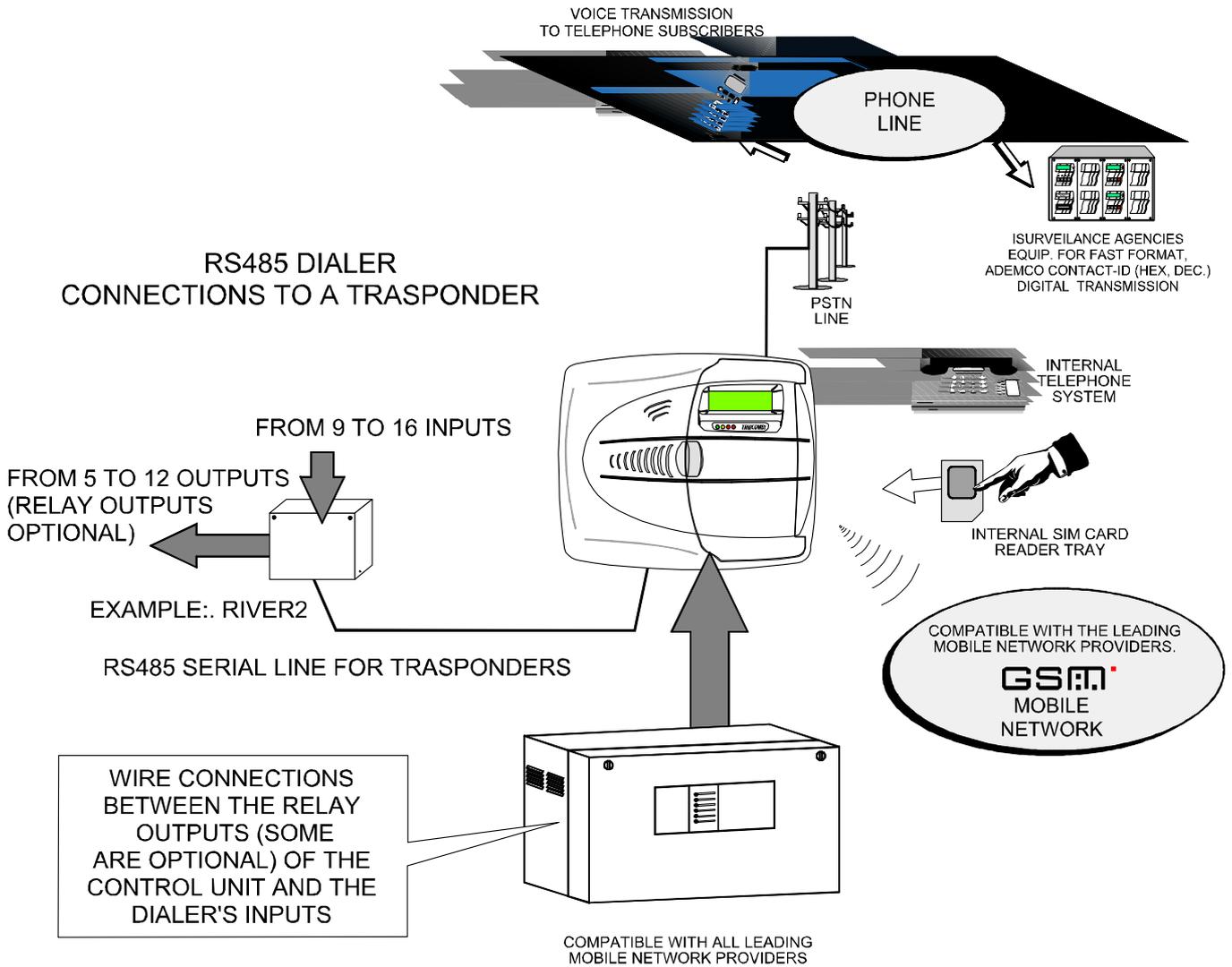
5.5.3 RS485 wiring diagram with trasponder set as SLAVE.



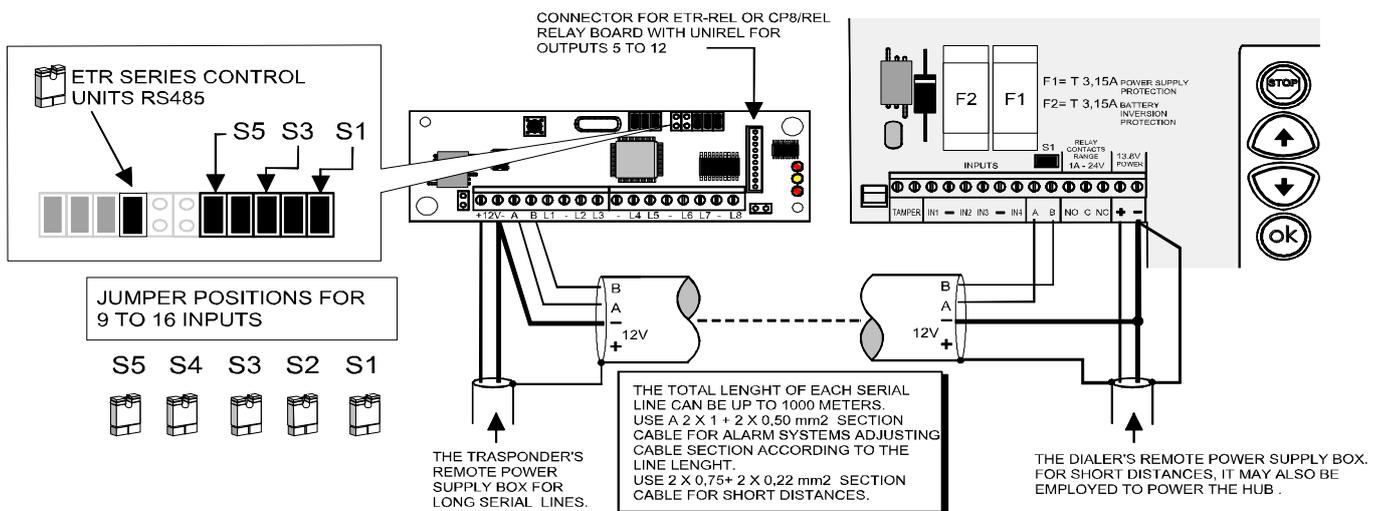
The terminal panel connections for this configuration are as follows:



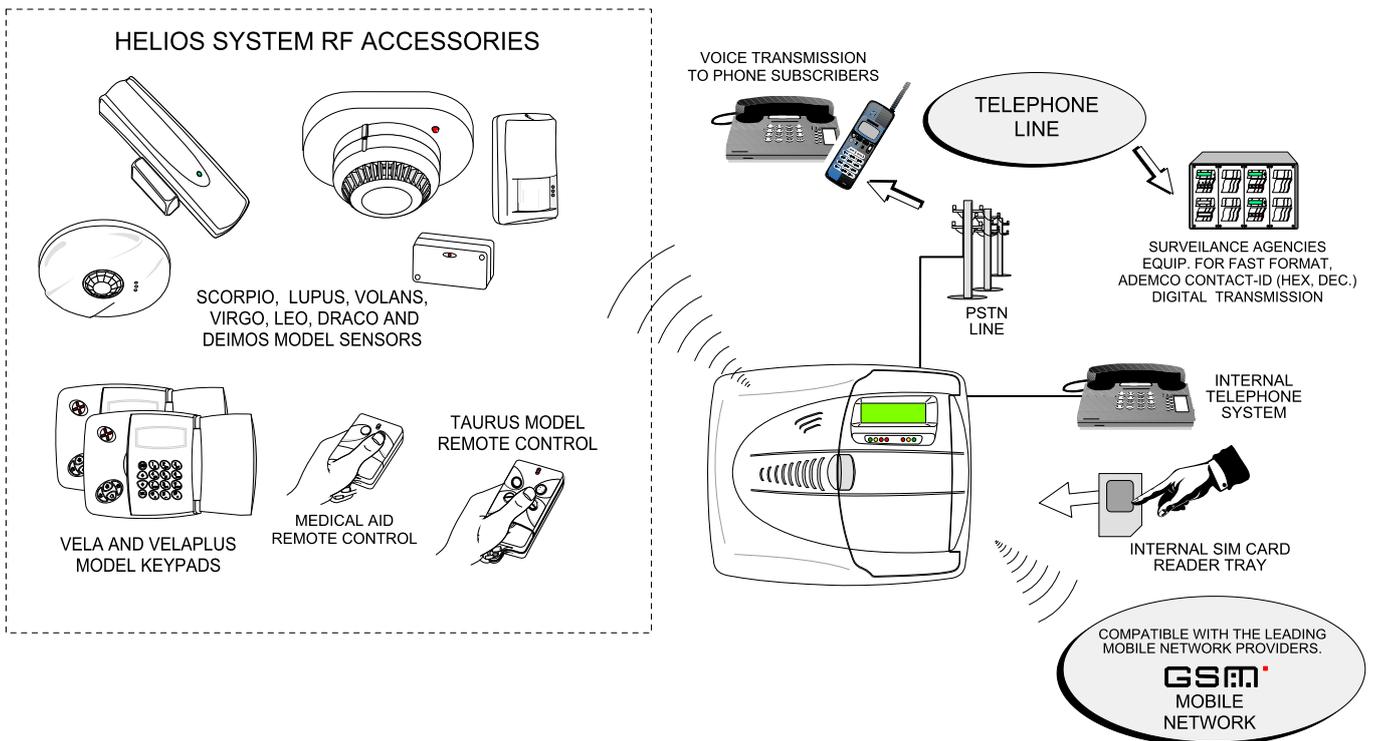
5.5.4 Wiring diagram with telephone dialer set as MASTER.



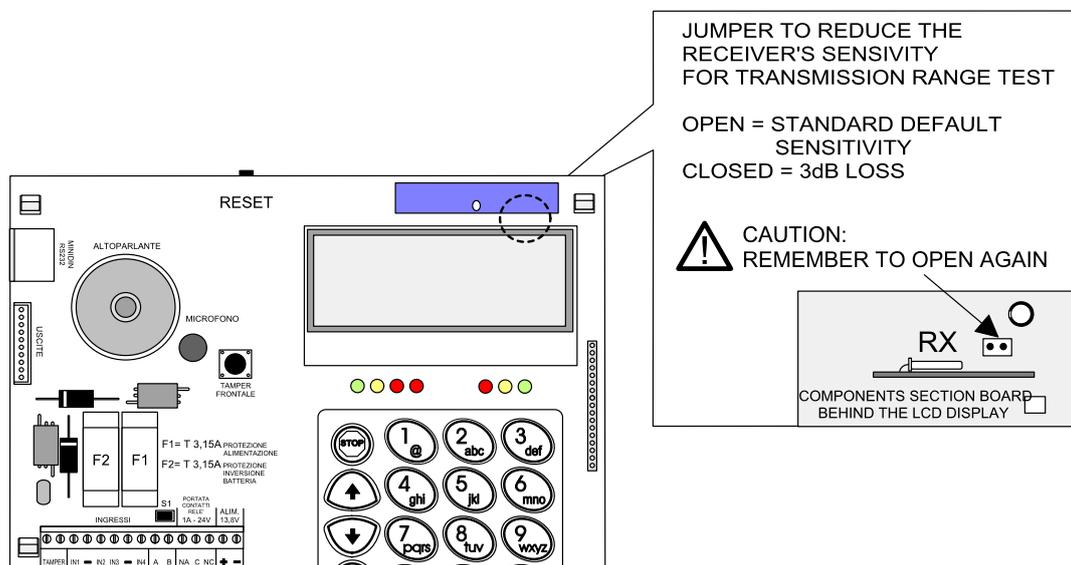
The terminal panel connections for this configuration are as follows:



5.5.5 TRH/PLUS RF section block diagram



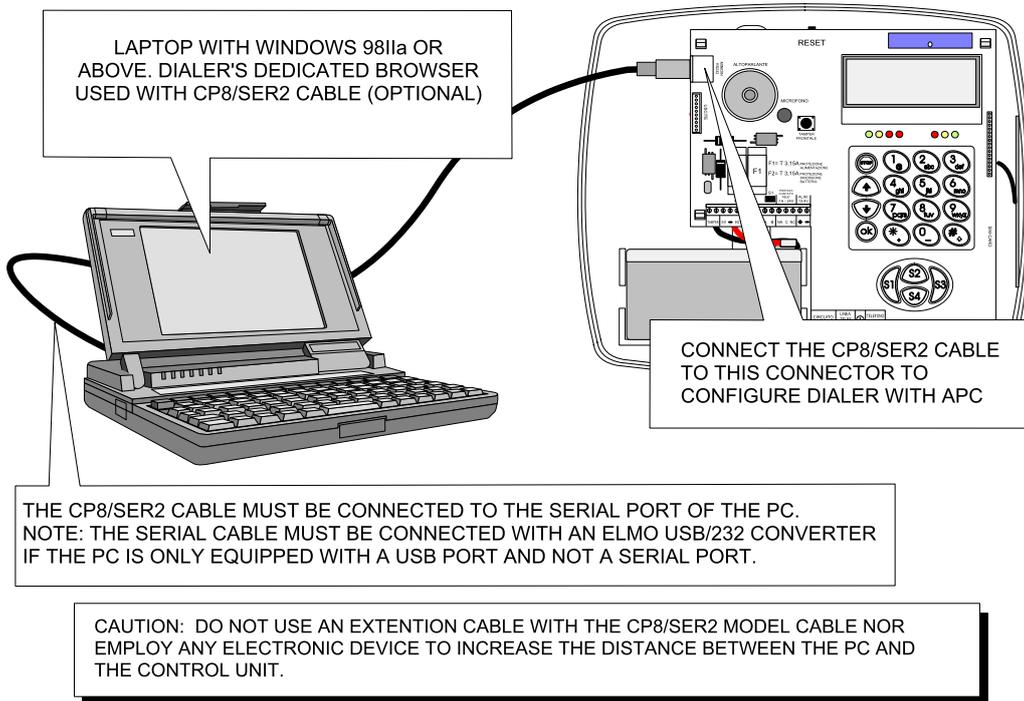
5.5.6 TRH/PLUS RF section sensibility jumper setting.



CAUTION: the same installation instructions supplied for all of the HELIOS system sensors and remote controls which form the system's set of accessories apply also for the installation of the TRH/PLUS RF section.

5.5.7 Programming the telephone dialer with the aid of a PC and the dedicated browser.

Connecting a PC to program the telephone dialer.



NOTE: The telephone dialer cannot be programmed remotely over the telephone line using Winassist. Programming can be carried out **only with the CP8/SER2 cable direct connection** and the dedicated browser. Each telephone dialer has its dedicated browser which is compatible with Winassist.

Telephone dialer	Browser
TRH/PLUS v. 3.0	WABL0048 v. 3.0
TRH/COMBI v. 2.1	WABL0047 v. 2.0
TRH/GSM v. 2.1	WABL0046 v. 2.0

The browser is located in the WARBL039 CD, July 2005 (or following) version supplied with each telephone dialer.

The new browser versions will support also the TRH units carrying a previous firmware versions. The existing configuration, the saving of appropriate format and the appropriate writing of the new board will be possible should the old board need to be replaced by one with the updated firmware.

Older versions of the browser will not enable the programming of TRH units with the current firmware versions.

CAUTION: The RS485 serial line terminals and the RS232 serial line Minidin connector cannot be employed for simultaneous transmission.

This is only possible if the RS485 interface is connected to the trasponder (set as MASTER) or through the control unit (set as SLAVE). A PC with the dedicated browser as well as a direct connection using the CP8/SER2 cable is also necessary.

The RS485 serial line will not operate since it does not have priority and the telephone dialer will carry out phone transmissions using the PSTN or GSM network.

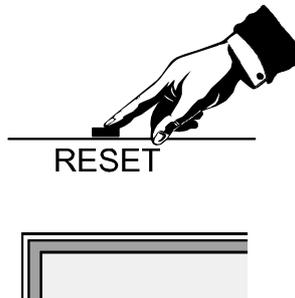
Select "end connection" in the browser without unplugging the CP8/SER2 cable connector from the Minidin in order to reset standard operation.

6. RESETTING THE TELEPHONE DIALER

6.1 Standard reset

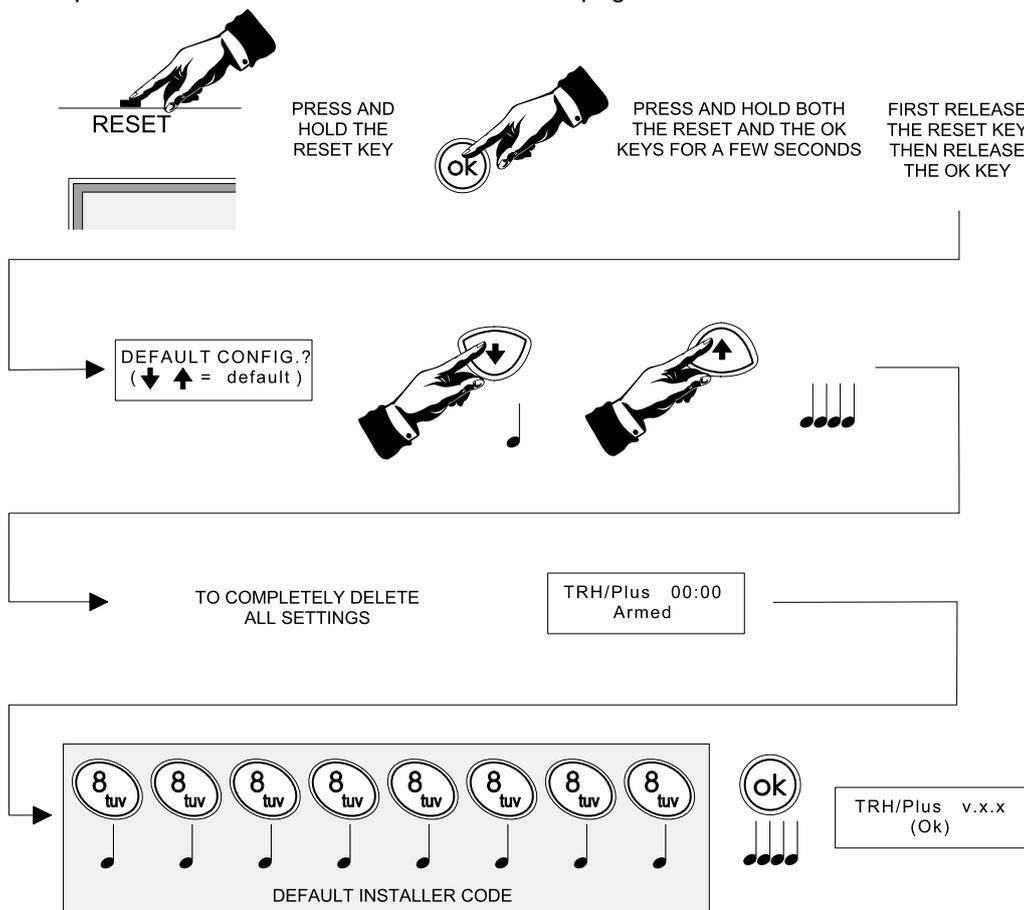
The standard reset procedure will reboot the telephone dialer's system software applying the operating conditions configured before the reset.

Open the telephone dialer's housing and push as shown in the figure below in order to execute the standard reset of the unit.



6.2 Total reset and resetting default parameters.

Please refer to the following procedure to execute the total reset of the system which will delete any configuration changes and reset default configuration. Details of the telephone dialer default configuration is described in the chapter "FACTORY DEFAULT SETTING" on page 59.



At this stage the TRH operated in the telephone dialer mode. In this mode the system can be accessed only using the installer code, the user code will not be accepted by the system. The user code will be accepted by the unit once it is programmed to operate in the control unit mode.

7. WARNING

The use of the term TRANSPONDER in the configuration menus of the telephone dialer and in this manual must be identify with the term TRASPONDER.

CAUTION: The function for the detection of a busy number is based on a digital transmissions received by the GSM module about the outcome of the call.

This function is therefore not operational if the GSM provider replaces the digital transmissions with voice messages.

In view of this, it is best not to completely rely on this function since its operation is based on the services offered by the provider which could change without prior notice.

We recommend setting the number of voice calls to a value greater than 1 to ensure the transmission's greater reliability.

CAUTION: Digital communication over the GSM network is strongly influenced by factors that do not have any bearing with the device such as GSM signal strength, GSM network structure and other possible sources of external interference.

The extent of the interference cause by these factors will depend on the particular characteristics of the installation site and may vary over time.

Whenever possible, we therefore recommend setting the PSTN telephone line as the line with priority for digital transmissions.

8. PROGRAMMING

In order to be fully operational, the TRH series of GSM telephone dialers must be appropriately configured. The unit offers two programming methods:

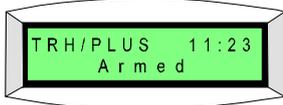
A = via the keypad and the build-in display Programming is carried out thanks to the device's menu system.

B = via a PC connected with the CP8/SER2 cable and set with the dedicated browser.

Any configuration is stored in a non volatile memory as protection against power failure.

8.1 User interface

The user interface consists in the 2x16 LCD display, 20-key keypad, LED indicator and buzzer.



The display of the telephone dialer shows the unit's operation at all times with clear 16 characters/2 lines messages. The backlighting allows for an easy reading of the display while entering the various commands and is activated together with the backlighting of the keypad by pressing the STOP key or any other key. Backlighting will automatically turn off 6 seconds after key activity has ceased.



Rubber keys. During the programming stage, the 12 rubber keys used to enter the user code are employed to enter number or names such as special keys or other programming steps.



The STOP key is used to activate the backlighting of the display and to exit the menus.



The ↑ and ↓ keys are used to navigate through the display and menu options as well as the various menu items.



The Ok key is used to confirm the selection that is shown on the display.



The customized special keys trigger by default the manual alarm of the corresponding input (S1 input 1).

The special keys can also be configured to trigger other transmissions. Press this keys for at least one second to enable the action.

On the TRH/PLUS these keys are used only for partitioning.

The arming LED (green), when does it turn on and meaning:

On = no alarmed input

Blinking = dialer disarmed, at least one alarmed input.

Off = dialer armed, at least one alarmed input.



The fault LED (yellow), when does it turn on and meaning:

On = no fault detection.

Blinking = fault detection or alarm history log fault.

Fast blinking = display of fault in progress.



The alarm LED (red), when does it turn on and meaning:

On = no alarm taking place or event logged.

Blinking = alarm history log registration.

Fast blinking = transmission taking place or display of the input status/alarm history log.



GSM

The GSM LED (red), when does it turn on and meaning:

Off = standard operation.

On = GSM communication disabled.

Slow blinking = weak GSM signal or SIM's card credit depletion.

Fast blinking = display of GSM signal strength.



RF SENSOR INTENSITY LED (red), meaning (only for the TRH/PLUS):

The LED will turn on to display the intensity of the RF signal received by the TRH/PLUS. This function is very useful during for the installation and servicing of the unit.

8.2 Information displayed during normal operation

The telephone dialer displays the following information without the need to access the programming mode:

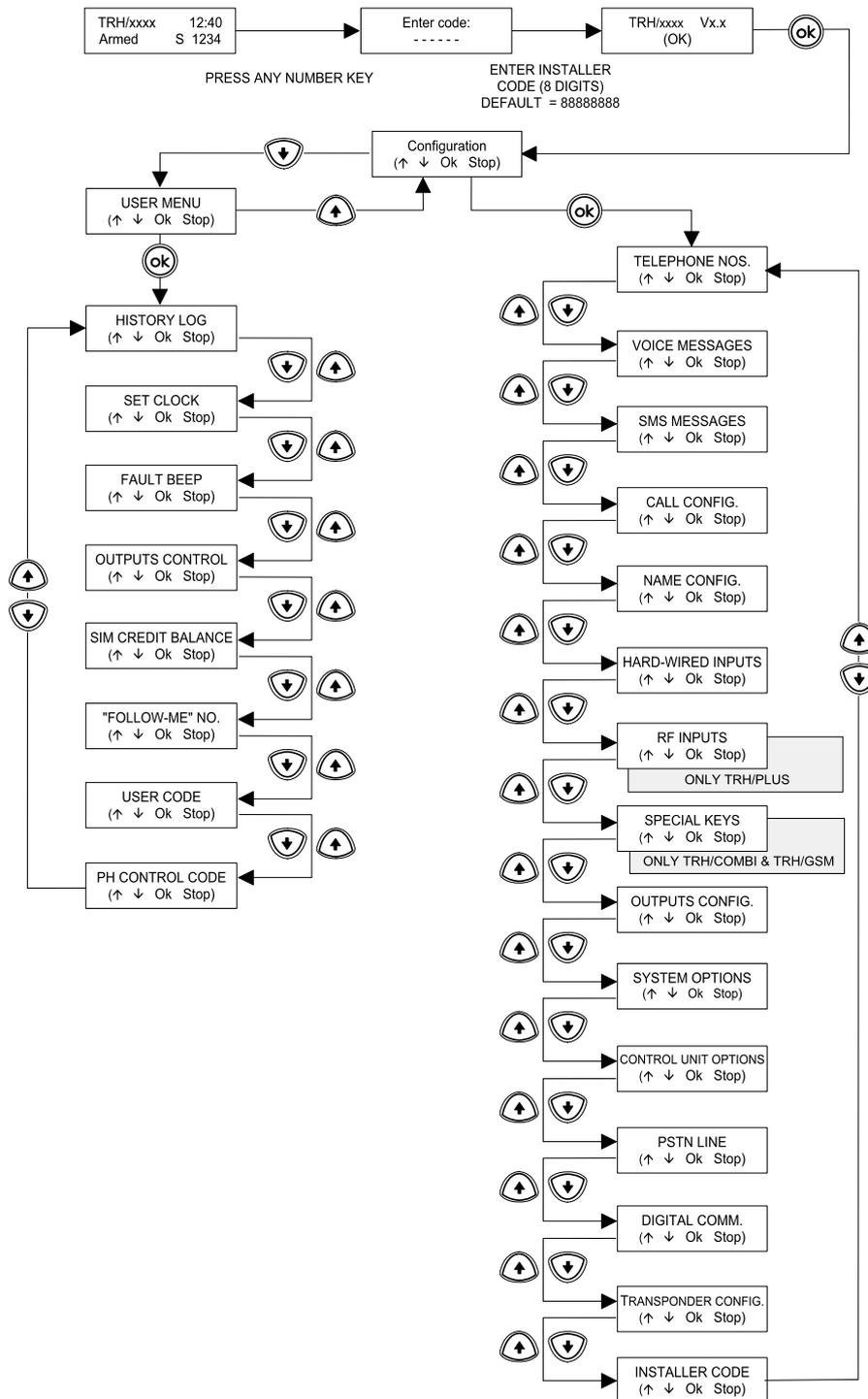
- **GSM signal strength,**
- **alarm history log,**
- **fault events log,**
- **input status and mimic status.**

To view this information, press the ↑ and ↓ keys while logged out. A condensed menu containing a list of the available items will turn on. Continue to press the ↑ and ↓ keys to scroll the items. Press the OK to select required item.

- **GSM SIGNAL**, press OK to display the GSM signal strength and the name of the provider used to access the network.
- **ALARM HYSTORY LOG**, press Ok to display the alarm events stored in the history log. Press the ↑ and ↓ keys to scroll the history log. Press STOP to exit the from the menu, press OK to delete the events and to return to previous logout screen.
- **FAULT HISTORY LOG**, press Ok to display the fault events stored in the history log. Press ↑ and ↓ keys to scroll the history log. Press STOP to exit from the menu, press OK to delete the events and to return to the previous logout screen.
- **INPUTS STATUS**, press OK to display the status of the configured alarm inputs. Press the ↑ and ↓ keys to scroll the inputs. Press STOP to exit from the menu, press OK to delete the events and to return to the previous logout screen.
- **MIMIC STATUS**, press OK to display the mimic status of the inputs. The number of the input is displayed on the first line, while its status is displayed on the second row. Status is displayed as follows: '-' for input on stand-by, 'A' for input on alarm and 'M' for input tampering.

8.3 Programming via the keypad

The telephone dialer can be configured using the keypad and the LCD display. The following diagram illustrates the programming structure:



Use the \uparrow , \downarrow , OK and STOP keys to navigate the menus. The display is divided into two sections: the current submenu is displayed on the first row, while the second row displays the available navigation keys or the option to edit the item between parenthesis. Press the \uparrow and \downarrow keys to change items, the OK key to select the current item and the STOP key to return to the previous item in the menu structure.

The available navigation keys are usually displayed on the second row (not always). The keys to change menu are displayed between parenthesis (). The OK key will be displayed between angle brackets <Ok>, when it can be used to change the item without accessing the submenu.

Press <Ok> several time to return to a requested item if the <Ok> key is selected by mistake changing current item.

- Remote control over the telephone: each of the 4 selectable outputs of the telephone dialer can be enabled/disabled via SMS message.
- Monitoring over the telephone line. SMS messages containing input and output statuses (as well as the general status of the device) can be sent by the telephone dialer thanks to remote control operations over the telephone line.

9. COMMUNICATION METHOD

The communication method of the telephone dialer is divided into 7 different priority levels. Those transmissions that are not directed towards digital receivers (voice and SMS calls) are structured into dialing sequences.

9.1 Dialing sequences and transmission cycles

A dialing sequences is a set of transmission cycles carried out to transmit an event to the users.

Each transmission cycles is divided into three main phases:

- 1) sending SMS messages,
- 2) sending voice transmissions,
- 3) pause between cycles.

During the SMS messages transmission phase, SMS messages are sent to the telephone numbers that have been configured to receive them starting from SMS no. 1 to SMS no. 16. There is a pause of 5 seconds in the transmission of each SMS messages.

The voice call transmission phase immediately follows the SMS transmission phase starting from voice call no. 1 to voice call no. 16. There is a pause of 5 seconds in the transmission of each voice call.

The voice call transmission phase is followed by the pause between cycles. The length of the pause is selectable. Transmissions dealing with lower priority events can be executed during this pause.

The transmission cycles are repeated until all the configured SMS messages and voice calls are sent. If the number of SMS messages and voice calls to be carried out does not match, the system skips the phase with less repetitions until the end of the sequence once it is completed.

An additional transmission cycle is added after a 3 minutes pause, if at the end of the sequence the dialer detects that all of the voice calls made to one or more telephone numbers have not gone through due to a busy signal.

This function is enabled only for calls made to PSTN numbers employing the GSM network.

9.1.1 Call confirmation

The subscriber that receives the dialer's voice call can press the 0 (zero) dial on the DTMF telephone to terminate the dialing sequence or press the 5 dial of the DTMF telephone to stop receiving calls during the call session carried out by the dialer as programmed for an event that occurred.

9.2 Network selection method

Effective only for TRH/PLUS and TRH/COMBI.

The telephone dialer transmits using both the PSTN and the GSM network. The criteria employed by TRH to determines which network to use take into account the configurations parameters and the condition of the two networks when transmission takes place.

10. PROGRAMMING MENUS

The telephone dialer features two programming interfaces, one for the installer and one for the user. Upon first activation or after resetting, you must enter the installer code in order to access the programming mode.

10.1 Installer mode programming.

In order to configure the unit during the programming mode, please enter the 8 digit installer code.

The default code is: **88888888**.

When code has been entered, the firmware version is displayed. Press OK to enter the menu selection interface.

The menu selection interface contains two items:

- 1) **PROGRAMMING** to access the installer menu,
- 2) **USER MENU** to access the user menu.

10.1.1 CONFIGURATION menu

The CONFIGURATION menu is reserved to the installer and contains the following submenus:

- **TELEPHONE NUMBERS**, to display/edit the telephone numbers and to set their proprieties.
- **VOICE MESSAGES**, to playback/record voice messages.
- **SMS MESSAGES**, to display/edit custom SMS messages.
- **CALL CONFIGURATION**, to display/edit the main parameters of the calls.
- **NAME CONFIGURATION**, to display/edit the title of the inputs and the outputs.
- **HARD-WIRED INPUTS**, to display/edit the hard-wired inputs configuration.

Only for TRH/PLUS:

- **RF INPUTS**, to display/edit the RF inputs configuration.

Only for TRH/COMBI and TRH/GSM:

- **SERIAL INPUTS**, to display/edit the serial inputs configuration.
- **SPECIAL KEYS**, only for TRH/COMBI and TRH/GSM, to display/edit the keypad inputs configuration.
- **OUTPUTS CONFIG.**, to display/edit the selectable outputs and relay output configuration..
- **SYSTEM OPTIONS**, to display/edit the system's main operating options.
- **CONTROL UNIT OPTIONS**, to display/edit the operating options of the Control Unit mode.

Only for TRH/PLUS and TRH/COMBI:

- **PSTN LINE**, to display/edit the standard telephone options.
- **DIGITAL COMM.**, to display/edit the digital communication configuration.
- **TRANSPONDER CONFIG.**, to display/edit the trasponder emulation configuration.
- **INSTALLER CODE**, to edit the installer code.

10.1.2 CONFIGURATION menu → TELEPHONE NUMBERS

This menu allows you to manage the telephone numbers. Enter the menu to select which of the 16 user telephone numbers to edit. Press ↑ and ↓ to select the telephone number, press OK to confirm the selection.

Press OK to confirm and to enter the selected telephone number programming menu. There are two items in this menu:

- **The edit menu**, to display/edit the number
- **The priority selection menu**, to edit the network priority linked to the number.

• Edit menu:

Press Ok on this item to access the telephone numbers editor. Use the numbered keys, the 4 special keys, the OK key and the STOP key to edit phone numbers.

TELEPHONE NUMBER EDITOR	
Key	Description
0, 1... 9	To enter the selected digit where the cursor is placed. The number can be up to 20 digits.
*, #	To enter the asterisk and pound signs.
↑	To enter a 2 seconds pause 'P' during the dialing.
S1	To move the cursor to the left.
S3	To move the cursor to the right.
S2	To toggle between arming and overwriting.
S4	To delete the character under the cursor and move the following characters one digit to the left.
Ok	To store changes on a non-volatile memory.
Stop	To cancel changes.

When the number is longer than the LCD display width, the digits are moved to the left and the '<' character will display on the first digit to indicate that the number continues beyond the screen. In the same manner, by moving the cursor to the left on the first digit, the numbers are moved to the right and the '>' character will display on the last digit to indicate that the number continues beyond the screen.

• Network priority selection menu (only TRH/PLUS and TRH/COMBI)

Use this menu to select which network has priority to transmit data to the selected telephone number. Press <Ok> to display the following three options:

- **PSTN Prior.**, to select the PSTN network (standard telephone line) as the one with priority.
- **GSM Prior.**, to select the GSM network as the one with priority.
- **Toggle Calls**, to toggle the calls: the networks will be switched at each cycle when calling the telephone number. Initial calling will be carried out using the PSTN line.

A value equal to or greater than 2 must be set for the number of voice calls in order for this option to be effective.

10.1.3 CONFIGURATION menu → VOICE MESSAGES

This menu allows you to manage the voice messages. Enter the menu to select which of the 16 voice messages to edit. Press the ↑ and ↓ keys to select the telephone number, press OK to confirm the selection.

- Press OK to confirm and to enter the voice message recording menu. There are two items in this menu:
- **Playback**, to listen to the recorded message.
 - **Record**, to record the message. Press STOP to stop recording.

10.1.4 CONFIGURATION menu → SMS MESSAGES

This menu allows you to manage the custom SMS messages. Enter the menu to select which headers and which of the 15 custom messages to edit. Press ↑ and ↓ to select the telephone number, press OK to confirm the selection.

Press OK to confirm and to enter the SMS message editor. Use the numbered keys, the 4 special keys, the OK key and the STOP key to edit SMS messages.

SMS MESSAGE EDITOR	
Key	Description
0, 1... 9	To enter an alphanumeric character where the cursor is located. Press the alphanumeric key several time to enter the character. The cursor will automatically move to the right 2 seconds after key activity has ceased.. The cursor will immediately move to the right if another key is pressed.
S1	To move the cursor to the left.
S3	To move the cursor to the right.
S2	To toggle between arming and overwriting.
S4	To delete the character under the cursor and move the following characters one digit to the left.
OK	To store the changes on a non-volatile memory.
STOP	To cancel the changes.

The header of the SMS message is formed by a string that can be up to 95 character long. **The string is sent at the beginning of every SMS message transmitted by the THR unit.**

During monitoring operations over the telephone, the dialer may sometimes need to send more than one SMS message since the header string takes up the space of the information that it sends. A lengthy string should therefore be avoided when monitoring commands over the telephone are frequently employed.

10.1.5 CONFIGURATION menu → CALL CONFIG.

The main parameters of the call are configured with this menu. Access the menu to display the following 5 items:

- **VOICE CALLS**, press <Ok> to enter the number of voice calls triggered by an event to be carried out to the same number. The system accepts values between 1 and 9.
- **CALL LENGHT**, press <Ok> to enter the length of a voice call. The following values are accepted: 15 sec, 30 sec, 60 sec, 90 sec.
- **COMMON MESSAGE**, press <Ok> to enable the transmission of the common voice message. When the common voice message is enabled, message 1 will be played after each voice message of the calls is played back. The message 1 follows the repetition of the message linked to the information during the call.

- **SEND SMS**, press <Ok> to select the number of the SMS message triggered by an event to be sent to a specific number. The system accepts values between 1 and 9.
- **SEQUENCE PAUSE**, press <Ok> to enter the length of the pause between two dialing transmission cycles within the same sequence. The following values are available: none, 15 sec, 30 sec, 60 sec, 90 sec, 120 sec, 180 sec, 240 sec.

10.1.6 CONFIGURATION menu → NAME. CONFIG.

The name of each input and output can be edited from this menu. Enter the menu and press the ↑ and ↓ keys to select the name of the input/output to edit. Press OK to access the name editor.

The same steps described to edit custom SMS messages are employed also to edit names.

10.1.7 CONFIGURATION menu → HARD-WIRED INPUTS

The configuration of the hard-wired inputs can be changed from this menu. Enter the menu and press the ↑ and ↓ keys to select the input to configure. Press OkOk to access the configuration menu of the selected input.

This menu supplies the following 9 items:

- **INPUT TYPE**, press <Ok> to define the input's type. The following options are available: Not Conn., NO, NC, Balanced, Split, Transponder. If an input is set as split, this setting will also apply to the other input of the pair. The split input pairs are: 1-4, 2-5, 3-7, 4-8. If the configuration of a split input is changed, the status of the other input of the pair will become balanced or Not Connected depending on the group to which it belongs (1, 2, 3, 4 or 5, 6, 7, 8).
- **INPUT DELAY**, press <Ok> to enter the input delay period. The following values are accepted: Instant, 5 sec. delay, 15 sec. delay, 30 sec. delay, 60 sec. delay, 90 sec. delay. When an input is configured as delayed, the alarm condition must continue for the specified length of time before it is evaluated as effective.
- **24H CONFIG.**, press <Ok> to enable the 24H capability. A 24h input will trigger an alarm signal even when the telephone dialer is disarmed.
- **EXIT/ENTRY ROUTE**, the properties of each input can be defined by setting its association with the entry/exit route. The programming procedure is as follows:
When the telephone dialer is disarmed: the alarm condition of an input which is not part of the entry/exit route, inhibits dialer arming (the only exception being when input 4 is programmed for arm/disarm by status). The alarm condition of an input which is part of the entry/exit route, does not inhibit dialer arming. An alarm event will be triggered by an alarmed input if the alarm is still active at the end of the exit delay.
When the telephone dialer is armed: the alarm condition of an input which is not part of the entry/exit route, instantly triggers an alarm event. The alarm condition of an input which is part of the entry/exit route, triggers a pre-alarm event and the countdown of the entry delay. An alarm event is triggered by each pre-alarmed input if the telephone dialer is not disarmed by the end of the entry delay.
- **AREAS**, the S1, S2, S3 and S4 keys of the TRH/PLUS are partitioning keys to be used when the telephone dialer is in the control unit mode. Press one of the S1, S2, S3, S4 area keys to partially arm the telephone dialer during this mode. During the configuration process, each input is associated to one or more areas. When an input receives an alarm signal, it will trigger the alarm only if at least one of the corresponding areas is enabled. Partial arming is executed via the keypad and/or the remote control, **it cannot be carried out via the telephone remote control function.**

- **ALARM VOICE MESSAGE**, press (Ok) to select the voice message associated with the input's alarm (from 1 to 16).The voice message will be played back during the voice calls when the input is triggered by an alarm or tamper signal.
- **ALARM SMS**, press (Ok) to select the SMS message associated with the alarm of the input (from 1 to 15 or Auto). The custom SMS messages are identified by a numeric value. The AUTO option indicates that an automatically set SMS will be transmitted.
- **RESET VOICE MESSAGE**, press (Ok) to select the voice message associated with the input's (from 1 to 16 or NONE) reset. The voice message will be played back during the voice calls when the input is reset. When the option NONE is selected, no voice calls reporting reset events will be dialed.
- **RESET SMS**, press (Ok) to select the SMS associated with the alarm of the input (from 1 to 15, or AUTO or NONE). The custom SMS messages are identified by a numeric value. The AUTO option indicates that an automatically set SMS will be transmitted. The NONE option indicated that no SMS message will be transmitted for reset events.
- **SEND VOICE**, press (Ok) to select which telephone numbers are to be dialed for voice calls pertaining to the input. Press S1 and S3 to move the cursor to the left and to the right. Press S2 or ↑ to select the telephone number, press S4 or ↓ to deselect the telephone number.
- A hyphen '-' indicates that the telephone number stored in that location will not be dialed. An asterisk '*' indicates that the telephone number stored in that location will be dialed. A double hyphen '=' indicates that the telephone number cannot be dialed because no number is stored in that location.
- **SEND SMS**, press (Ok) to select which telephone numbers are to be dialed for SMS messages pertaining to the input. Press S1 and S3 to move the cursor to the left and to the right. Press S2 or ↑ to select the telephone number, press S4 or ↓ to deselect the telephone number. A hyphen '-' indicates that no SMS messages will be sent to the telephone number stored in that location. An asterisk '*' indicates that SMS messages will be sent to the telephone number stored in that location. A double hyphen '=' indicates that SMS messages cannot be sent to the telephone number in that location because no number is stored.

10.1.8 CONFIGURATION menu → RF INPUTS (TRH/PLUS)

The configuration of the RF inputs can be changed from this menu. Enter the menu and press the ↑ and ↓ keys to select the input to configure. Press Ok to enter the programming menu of the selected input.

The item **AQUIRE** (Ok) will display If the RF code corresponding to the input has not yet been stored. Press (Ok) to display **RF ENABLE** . At this stage, the TRH unit will wait for a valid RF code.

Once the valid RF code is received, the TRH will display the kind of device received. Press the ↑ and ↓ keys to edit the following items of the RF input:

- **DELETE CODE**, press (Ok) to display the TRH's prompt to confirm if the stored code needs to be deleted.
- **INPUT DELAY**, press <Ok> to enter the input delay period. The following values are accepted: Instant, 5 sec. delay, 15 sec. delay, 30 sec. delay, 60 sec. delay, 90 sec. delay. When an input is configured as delayed, the dialing sequence will be triggered only after the specified alarm delay period has elapsed. **This option is available only for sensors that trigger alarm/reset events.**
- **24H CONFIG**, press <Ok> to enable the 24h capability. A 24h input will trigger a dialing sequence even when the telephone dialer is disarmed. This option is non available for 24h sensors (24H sensor are always detected as 24H).

- **ENTRY/EXIT ROUTE**, the proprieties of each input can be defined by setting its association with the entry/exit route. The operating procedure is as follow:
When the telephone dialer is disarmed: the alarm condition of an input which is not part of the entry/exit route, inhibits dialer arming (the only exception being when input 4 is programmed for arm/disarm by status).
The alarm condition of an input which is part of the entry/exit route, does not inhibit dialer arming. An alarm event will be triggered by an alarmed input if the alarm is still active at the end of the exit delay.
When the telephone dialer is armed: the alarm condition of an input which is not part of the entry/exit route, instantly triggers and alarm event.
The alarm condition of an input which is part of the entry/exit route, triggers a pre-alarm event and starts the entry delay.
An alarm event is triggered by each pre-alarmed input if the telephone dialer is not disarmed by the end of the entry delay.

- **AREAS**, the S1, S2, S3 and S4 keys of the TRH/PLUS are partitioning keys to be used when the telephone dialer is in the control unit mode. Press one of the S1, S2, S3, S4 area keys to partially arm the telephone dialer during this mode.
During the configuration process, each input is associated to one or more areas. When an input receives an alarm signal, it will trigger the alarm only if at least one of the corresponding areas is enabled. Partial arming is executed via the keypad and/or the remote control, it cannot be carried out over the telephone lines.
For remote control enrolment, please refer to paragraph "CONFIGURATION Menu -> CONTROL UNIT OPTIONS" on page. 40.

- **SUPERVISION CONFIG.**, press <Ok> to enable the sensor supervision option. Select the supervision time frame in the SISTEM OPTIONS.

- **ALARM VOICE MESSAGE**, press (Ok) to select the voice message associated with the input's alarm (from 1 to 16).The message will be played for voice transmission when the input is triggered by an alarm or tamper signal.

- **ALARM SMS**, press (Ok) to select the SMS message associated with the alarm of the input (from 1 to 15 or Auto).Custom SMS messages are identified by a numeric value. The AUTO option indicates that an automatically set SMS will be transmitted.

- **RESET VOICE MESSAGE**, press (Ok) to select the voice message associated with the input's (from 1 to 16 or NONE) reset. The message will be played back for the voice calls when the input is reset. When the option NONE is selected, no voice calls reporting reset events will be dialed.
This item is available only for alarm/reset triggering sensors and for 24H sensors.

- **RESET SMS**, press (Ok) to select the SMS associated with the alarm of the input (from 1 to 15, or AUTO or NONE).Custom SMS messages are identified by a numeric value. The AUTO option indicates that an automatically set SMS will be transmitted. The NONE option indicated that no SMS message will be transmitted for reset events.
This item is available only for alarm/reset triggering sensors and for 24H sensors.

- **SEND VOICE**, press (Ok) to select which telephone numbers are to be dialed for voice calls pertaining to the input. Press S1 and S3 to move the cursor to the left and to the right. Press S2 or ↑ to select the telephone number, press S4 or ↓ to deselect the telephone number. A hyphen '-' indicates that the telephone number stored in that location will not be dialed. An asterisk '*' indicates that the telephone number stored in that location will be dialed. A double hyphen '=' indicates that the telephone number cannot be dialed because no number is stored in that location.

- **SEND SMS**, press (Ok) to select which telephone numbers are to be dialed for SMS messages pertaining to the input. Press S1 and S3 to move the cursor to the left and to the right. Press S2 or ↑ to select the telephone number, press S4 or ↓ to deselect the telephone number. A hyphen '-' indicates that no SMS messages will be sent to the telephone number stored in that location. An asterisk '*' indicates that SMS messages will be sent to the telephone number stored in that location. A double hyphen '=' indicates that SMS messages cannot be sent to the telephone number in that position because no number was stored.

10.1.9 Tyros medical aid remote control usage

The Tyros medical aid remote control can be used to trigger the dialer's alarm. An alarm signal sent by the medical aid remote control is not automatically handled as 24 hours. To set the 24 hours function, the appropriate option for the associated input must be set.

If a medical aid remote control is stated as operational for 24 hours/day and is not associated to any area, the alarm triggered will be silent and will not activate the general alarm relay during the control unit mode.

When the remote control operates in a silent mode, the TRH/PLUS must be configured to send digital and/or voice and/or SMS transmissions triggered by the alarm of the RF input associated with the remote control.

10.1.10 CONFIGURATION Menu → SERIAL INPUTS (TRH/Combi and TRH/GSM)

This menu is the same as the one for the hard-wired inputs except of the option "Split" which is not selectable.

10.1.11 CONFIGURATION Menu → SPECIAL KEYS (TRH/Combi and TRH/GSM)

Use this menu to edit the configuration of the S1, S2, S3, S4 special keys. Enter the menu and press the ↑ and ↓ keys to select the required special key. Press Ok to enter the configuration menu of the selected special key.

- **ALARM VOICE MESSAGE**, press (Ok) to select the voice message associated with the input's alarm (from 1 to 16). The message will be played during the voice transmission when the special key is pressed.
- **ALARM SMS**, press (Ok) to select the SMS associated with the alarm of the input (from 1 to 15 or Auto). The custom SMS messages are identified by a numeric value. The AUTO function indicates that an automatically set SMS will be transmitted.
- **SEND VOICE**, press (Ok) to select which telephone numbers are to be dialed for voice calls pertaining to the selected special key. Press S1 and S3 to move the cursor to the left and to the right. Press S2 or ↑ to select the telephone number, press S4 or ↓ to deselect the telephone number. A hyphen '-' indicates that the telephone number stored in that location will not be dialed. An asterisk '*' indicates that the telephone number stored in that location will be dialed. A double hyphen '=' indicates that the telephone number cannot be dialed because no number is stored in that location.
- **SEND SMS**, press (Ok) to select which telephone numbers are to be dialed for SMS messages pertaining to the special key. Press S1 and S3 to move the cursor to the left and to the right. Press S2 or ↑ to select the telephone number, press S4 or ↓ to deselect the telephone number. A hyphen '-' indicates that no SMS messages will be sent to the telephone number stored in that location. An asterisk '*' indicates that SMS messages will be sent to the telephone number stored in that location. A double hyphen '=' indicates that SMS messages cannot be sent to the telephone number in that position because no number was stored.

To trigger an alarm, the special keys must be pressed and held for one second. The special keys are always 24h ones. The special keys do not activate the general alarm relay during the control unit mode.

10.1.12 CONFIGURATION Menu → OUTPUTS CONFIG.

Use this menu to edit the configuration of the selectable outputs and the built-in relay. Enter the menu and select the output to edit by pressing the ↑ and ↓ keys. Press OK to enter the configuration menu of the output.

SELECTABLE OUTPUTS OPTIONS:

- **OUTPUT TYPE**, press <Ok> to select the output type. The following options are available: hold, 5 sec. pulse, 15 sec. pulse, 30 sec. pulse, 60 sec. pulse, 90 sec. pulse. The "hold" output preserves the set status until a new command is received. The "pulse" output is activated for the specified time period before resuming the stand-by status.
- **PULSE TYPE**, press <Ok> to select the pulse type. Two options are available: normally enabled and normally disabled. This configuration defines the stand-by status of the output. This option is available only with outputs set for pulse.

RELAY OUTPUT OPTIONS:

- **OUTPUT TYPE**, press <Ok> to select the output type. The following options are available:

GSM or PSTN, Only GSM, RF status, Fault, Output 1, Alarm/Gen. Tamper.

- When the GSM or PSTN option is selected, the relay output switches to NO when one of the networks is not operative or due to flat battery. The relay is set with positive driver contacts: should there be a power loss, the relay switches to NO.
- When only the GSM option is selected, The relay output switches to NO only when the GSM network is not operative or due to flat battery. The relay is set with positive driver contacts: should there be a power loss, the relay switches to NO.
- When the RF STATUS option is selected, the relay output switches to NO when one of the RF sensors is alarmed based on the armed status of the TRH. The relay is set with positive driver contacts: should there be a power loss, the relay switches to NO.
- When the FAULT option is selected, the relay output switches to NO when a fault is detected. The relay is set with positive driver contacts: should there be a power loss, the relay switches to NO.
- When the OUTPUT 1 option is selected, the relay will match the status of output 1. If output 1 is active, the relay switches to NC, if output 1 is disabled the relay switches to NO.
In this case the relay is NOT set with positive driver contacts: should there be a power loss, the relay switches to NO (output disabled).
- When the ALARM/GEN. TAMPER option is selected, the relay output triggered by alarm/general tamper events switches to NO. The relay is set with positive driver contacts: should there be a power loss, the relay switches to NO.
This configuration is operative only during the control unit mode since during the dialer mode, the alarm/general tamper events are never triggered.

10.1.13 CONFIGURATION Menu → SYSTEM OPTIONS

Use this menu to change the configuration of the system in general. Enter the menu and select the item to edit by pressing the ↑ and ↓ keys. Press Ok to edit the item or to enter the item's configuration submenu.

- **INPUT 4 CONFIGURATION**, press <Ok> to witch option. The following options are available::

Normal, dialer disable, Arm/Disarm, by status or by pulse.

1 = when the NORMAL option is selected, input 4 will operate as any other dialer's inputs.

2 = when the DISABLE DIALER option is selected, the dialer will be disabled when input 4 receives an alarm signal.

3 = when the ARM/DISARM **by status option is selected, the dialer is armed when input 4 is in the alarm status and disarmed when input 4 is on stand-by.**

4 = when the ARM/DISARM by pulse option is selected, any change of input 4 from the stand-by status to alarm status will correspond to a change in the armed status of the dialer (switching from disarmed to armed and from armed to disarmed).

NOTE: When pulse is selected for input 4, the dialer will deny the arming command pulse when an input which is not part of entry/exit route is in the alarm condition. Input 4 must be configured for arming/disarming by **status** if you need to "force" the dialer's arming.

Pulse operation is useful when the input 4 is connected to an electronic key for manual arming/disarming of the dialer by the user.

The operation by status is useful when the dialer is connected to another automatic device that controls arming/disarming any avoiding any loss of synchronization is required.

- **INPUT 1 PRIORITY**, press <Ok> to access the item. The following options are available: RF, hard-wired for TRH/PLUS or serial/hard-wired for TRH/COMBI and TRH/GSM. This option allows you to define if the RF/serial input 1 or the hard-wired input 1 has priority.
- **ALARM BEEP**, press <Ok> to switch option. Use this option to configure if the TRH must beep when an alarm signal is received by one of the inputs. The unit will report the event by beeping three times.
- **COMMANDS REPORT**, press <Ok> to switch option. Use this option to configure if the TRH should report (via SMS) the output enabling/disabling and arming/disarming commands only to the phone number that has carried out the remote commands (choose NO) or to all of the phone numbers receiving system report SMS (choose YES).
This option pertains only to remote commands transmitted over the telephone, keypad commands do not trigger SMS transmissions.
- **ALARM HYSTORY LOG**, press <Ok> to switch option. Use this option to configure if the dialer must display an alarm history log by flashing the red alarm LED.

Only for TRH/PLUS:

- **RF SUPERVISION**, press <Ok> to switch option. Use this option to configure the time RF supervision time period. The following options are available: 1.5 hours, 3 hours, 12 hours, 24 hours.
Use the appropriate option for each individual RF input to disable the RF supervision function.
- **RECHARGIABLE SIM**, press <Ok> to switch option.
NOTE: always set "NO" for this option since it does not apply outside of Italy.

- **GSM REGISTRATION FAILURE**, used to configure the delay report for GSM failure. This option only delays the report and does not effect the network selection method.
You can select between a 1 minute to a 10 minute delay. The unit notifies the event via the fault LED and by recording it into the history log. The unit can be set also to transmit telephone transmissions.
- **CHECK CREDIT BALANCE SMS**, press <Ok> to switch option. Use this option to configure the time period in which the periodic credit balance and agreement termination date check SMS message should be sent. The following options are available: NONE , 1 month, 2 months, 3 months, 4 months, 5 months. the period credit balance and agreement termination date check SMS message is sent to the phone numbers enabled to receive system SMS messages.
- **FOWARD SMS**, press (Ok) to enable the SMS forwarding function. If the function is enabled, the SMS received by the TRH will be forwarded. Each forwarded SMS message is preceded by the programmed SMS header and the symbol '>>>'. When available, the sender's phone number will be added at the end of the SMS. The received SMS messages are forwarded to the phone numbers defined in the option SEND SYSTEM SMS. The TRH unit forwards up to 5 SMS messages per day. Any additional SMS message received is ignored.
- **SEND SYSTEM SMS**, press (Ok) to select to the telephone numbers that will be dialed for system SMS message transmission. The system SMS messages include the SMS messages pertaining to: RF sensor flat battery, lack of RF sensor supervision, RF sensor fault, remote control operations over the telephone (only when the report command option is enabled), SMS forward (only if the option is enabled), 230 power supply failure, dialer's flat battery, 230 power supply reset, periodic credit balance and agreement termination date check SMS message, credit balance SMS message, PSTN fine fault, PSTN line reset. The procedure to select the telephone numbers is the same as the one described for the inputs.
- **TEST CALL**, press (Ok) to access the test call submenu. This submenu is formed by the following 3 items:
 - INTERVAL**, press (Ok) to select to time interval for the test call. The following options are available: disabled, 30 min, 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, 7 days. Press (Ok) again to confirm the selection.
 - CALL TYPE**, press <Ok> to switch option. The following options are available:
 - Voice, Digital.**
 - VOICE TELEPHONE NUMBER**, press (Ok) to select to which telephone number the voice test call should be sent (if enabled). Press (Ok) again to confirm the selection.
The voice call test always plays back the message no. 16.
- **POWER SUPPLY**, press (Ok) to access the power supply submenu. This menu is formed by the following 5 items:
 - POWER FAILURE DELAY**, press <Ok> to select to the delay period for the power failure report. The following options are available: immediate, 5 min. delay, 15 min. delay, 30 min. delay, 60 min. delay, 90 min. delay.
 - POWER FAILURE ALARM VOICE MESSAGE**, press (Ok) to select the voice message to be transmitted for power failure. Select NONE if no voice message is to be sent. Press (Ok) again to confirm the selection.
 - POWER RESET VOICE MESSAGE**, press (Ok) to select the voice message to send in the event of power reset. Select NONE if no voice message is to be sent. Press (Ok) again to confirm the selection.
 - FLAT BATTERY VOICE MESSAGE**, press (Ok) to select the voice message to be transmitted when the telephone dialer's battery is flat. Select NONE no voice message is to be sent. Press (Ok) again to confirm the selection.

SEND VOICE MESSAGES, press (Ok) to select to which numbers power supply voice messages should be sent. The selection procedure is the same as the one described for the inputs.

10.1.14 **CONFIGURATION Menu** → **CONTROL UNIT OPTIONS**

Use this menu to change the configuration of the control unit mode operation. Enter the menu and select the item to edit by pressing the ↑ and ↓ keys. Press Ok to edit the item or to enter the item's configuration submenu.

- **CONTROL UNIT MODE**, press <Ok> to access this function. Use this option to configure if the dialer should operate in the control unit mode (options can be disabled). During the control unit mode, the TRH's operation can be compared to the operation of an intrusion detection control unit with decreased functions. When the TRH does not operate in the control unit mode, it operates like a standard dialer.

NOTE: During the control unit mode, the user can enable/disable the TRH by entering:

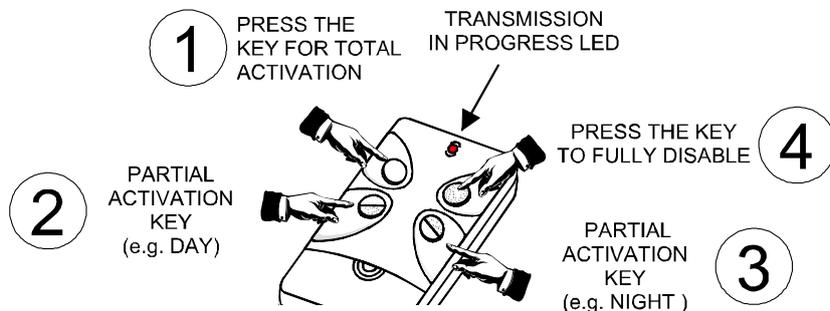
UUUUUU + 

Where U = user code digits. The default user code is: 1 1 1 1 1 1.

Partitioning via the keypad (only for TRH/PLUS): after having entered the user code, press the S1, S2, S3 and S4 keys to select which areas to arm. Pressing a key will arm the corresponding area. Press OK to confirm the selection. The dialer will automatically confirm the selection 5 seconds after key activity has ceased.

If the telephone dialer is armed, disarming it will at any rate disarm all areas.

Partitioning via the remote control (only for TRH/PLUS): the Taurus model remote control can be used to arm/disarm the telephone dialer. It can be used also to partially arm the unit after enrollment of the remote control code is carried out. For more information, please refer to the paragraph "CONFIGURATION Menu -> RF INPUTS (TRH/ PLUS)" on page 34.



Press the total arming key (KEY 1) to arm only all areas, and only those areas, that are associated with the remote control.

Press the partition-1 arming key (KEY 2) to arm only the first area associated with the remote control (example: if areas S2, S3 and S4 have been associated with the remote control, pressing the key will arm only the S2 area).

Press the partition-2 arming key (KEY 3) to arm only the second area associated with the remote control (example: if areas S2, S3 and S4 have been associated with the remote control, pressing the key will arm only the S3 area).

Press the disarm key (KEY 4) to disarm only all areas that are associated with the remote control.

Operation of the TRH/PLUS telephone dialer during the control unit mode vs. conventional control units with comparable characteristics:

- The individual armed or disarmed areas are not stored in the history log. An arming event is instead stored when the first area is armed and a disarming event is stored when all areas are disarmed.
 - The arming digital transmission is carried out only when the first area is armed and it does not supply information on the armed areas.
 - The disarming digital transmission is carried out only when all the areas are disarmed.
 - When arming/disarming is carried out via the remote control, the name of the individual remote control is not stored in the history log but only the generic information that the operation was carried out via a remote control.
 - It is not possible to disarm or partially arm the dialer via SMS message with the remote control, even though an armed status, even a partial one, can be reported by monitoring the system over the telephone. Nevertheless, total arming and total disarming of the unit is possible.
-
- **ALARM DURATION/GENERAL TAMPER**, press <Ok> to switch option. The following options are available: disabled, 5 sec, 15 sec, 30 sec, 60 sec, 90 sec, 120 sec, 180 sec, 240 sec.
 - **ENTRY DELAY**, press <Ok> to switch option. This option allows you to configure the entry delay of all the inputs that are not defined as 24h. The following values are available: 0 sec, 5 sec, 15 sec, 30 sec, 60 sec, 90 sec, 120 sec, 180 sec, 240 sec. The entry delay is activated when one of the inputs (except for the 24h ones), receives the alarm signal while the dialer is armed. During the entry delay all of the inputs (except for the 24h ones) trigger a pre-alarm event. An alarm event is triggered by each pre-armed input if the telephone dialer is not disarmed by the end of the entry delay period.
 - **EXIT DELAY**, press <Ok> to enable the option. This option allows you to program the exit delay of all the inputs that are not defined as 24h. The following values are available: 0 sec, 5 sec, 15 sec, 30 sec, 60 sec, 90 sec, 120 sec, 180 sec, 240 sec. The exit delay is triggered by arming the telephone dialer. During the exit delay none of the inputs (except for the 24h ones) will trigger an alarm event.
 - **ENTRY/EXIT BEEP**, press <Ok> to switch option. This option allows you to configure if the TRH unit should produce one beep per second during the entry/exit delay period.
 - **ALARM/GENERAL TAMPER MESSAGE**, press (Ok) to select the voice message for the alarm/general tamper event. Press (Ok) again to confirm the selection.
 - **SEND ALARM/GENERAL TAMPER VOICE**, press (Ok) to select which telephone numbers are to be dialed for voice calls triggered by alarm/general tamper events. The selection procedure is the same as the one described for the input's alarms.
 - **SEND ALARM/GENERAL TAMPER SMS**, press (Ok) to select which telephone number to be dialed for SMS messages triggered by alarm/general tamper events. The selection procedure is the same as the one described for the input's alarms.

10.1.15 CONFIGURATION Menu → PSTN LINE (TRH/PLUS and TRH/COMBI only)

Use this menu to change the configuration of the standard PSTN telephone line. Enter the menu and select the item to edit by pressing the ↑ and ↓ keys.

Press Ok to edit the item or to enter the item's configuration submenu.

- **ENABLE PSTN**, press <Ok> to switch option. Use this option to enable/disable the PSTN line. If the PSTN line is disabled the TRH will always use only the GSM line and the dialer will not report PSTN events.
- **PSTN AREA CODE DIALING**, press <Ok> to switch option. This option allows you to configure how the PSTN area code must be dialed. The options available are: DTMF, Decadic.
- **WAIT FOR TONE BEFORE PSTN AREA CODE**, press <Ok> to switch option. This option allows you to configure if the TRH unit must wait for the dial tone before dialing the PSTN area code. The TRH will trigger a PSTN line fault event if this item is enabled and no dial tone is detected.
- **NUMERO DIALING**, press <Ok> to enable the option. This option allows you to configure how the calls over the PSTN line should be dialed. The following options are available: DTMF, Decadic.
- **WAIT FOR TONE BEFORE NUMBER**, press <Ok> to switch option. This option allows you to configure if the TRH unit must wait for the dial tone before dialing the telephone number over the PSTN line. The TRH will trigger a PSTN line fault event if this item is enabled and no dial tone is detected.
- **PSTN LINE CUT TEST**, press <Ok> to switch option. This option allows you to configure if the TRH should periodically test if the PSTN line is cut. This test is carried out every 10 seconds and detects if the PSTN line has been cut without engaging the PSTN line.
- If the PSTN line cut is detected the TRH unit will switch to the GSM line. The PSTN line will be used again after it becomes regularly operational for one minute.
- **PSTN AREA CODE**, press (Ok) to edit the PSTN area code. The PSTN area code is dialed before any number when using the standard telephone line. This field can be used to enter the digit to bypass a switchboard and/or the number to dial for the operator.

10.1.16 Menu CONFIGURATION → DIGITAL COMM.

This menu allows you to edit the digital configuration setting. Enter the menu and select the item to edit by pressing the ↑ and ↓ keys.

Press Ok to edit the option or to enter the option's configuration submenu.

- **PROTOCOL**, press <Ok> to enable the item. This option allows you to specify the protocol used for digital communication. The following options are available: None , Cont.ID Hex, Cont.ID Dec, Fast Format. Digital communication is disabled when the option NONE is selected.

When the digital communication protocol is changed, the TRH automatically sets the default report codes of the selected protocol.

- **REPORT**, press <Ok> to switch option. This option allows you to select the report type. The following options are available: single, double.

For TRH/PLUS and TRH/COMBI only:

- **LINE PRIORITY**, press <Ok> to switch option. This option allows you to select which line has priority for digital communication. The following options are available: PSTN Prior, GSM Prior . The priority will automatically change after three consecutive failed attempts.

- **PRIMARY CODE**, press (Ok) to edit the primary user code. 4 digits can be entered for CONTACT ID protocol, 6 digits for FAST FORMAT protocol. When the first two digits of the Fast Format protocol's primary code are 0, a 4 digit code will be employed bypassing the first two null digits.
- **SECONDARY CODE**, press (Ok) to edit the secondary user code. 4 digits can be entered for CONTACT ID protocol, 6 digits for FAST FORMAT protocol. When the first two digits of the Fast Format protocol's primary code are 0, a 4 digit code will be employed bypassing the first two null digits.
- **PRIMARY NUMBER**, press (Ok) to edit the primary telephone number. The editor operates in the same manner previously described for voice telephone numbers. If no number is stored for the primary number, the digital communication to this number will be disabled.
- **SECONDARY NUMBER**, press (Ok) to edit the secondary telephone number. The editor operates in the same manner previously described for voice telephone numbers. If no number is stored for the secondary number, the digital communication to this number will be disabled.
- **REPORT CODES**, press (Ok) to configure the report codes. Press the ↑ and ↓ keys to select the event for which the report code is configured. Press STOP to cancel the last change and to return to the previous menu. Press Ok to confirm the last change and to return to the previous menu. Using Contact ID protocol, the report codes are displayed in the X/YYY format with X being the type code and YYY the event code. Using Fast Format protocol, the report codes are displayed in the X/Y format with X being the type code and Y the channel. Once a report code is changed, used the ↑ and ↓ keys to change the event.

10.1.17 CONFIGURATION Menu → TRANSPONDER SETTING

This menu allows you to edit the configuration for the emulation of the trasponders. Enter the menu and select the item to edit by pressing the ↑ and ↓ keys.

Press Ok to edit the option or to toggle the option's configuration submenu.

- **PROTOCOL**, press <Ok> to enable the item. This option allows you to configure the protocol to be used for the trasponder emulation. The following options are available: CP/ET8, ETR.
- **CONTROLLING TRANSPONDER**, press <Ok> to switch option. This option allows you to specify the response of the controlling trasponder. The following options are available:

disabled, on stand-by, outputs, relay only

- For the applications and the pertaining configuration, please refer to the examples supplied in the chapter "DIALER'S TRANSPONDER INTERFACE USAGE NOTES" on page 62.

For TRH/PLUS only:

- **RF TRANSPONDER**, press <Ok> to switch option. This option allows you to configure the RF trasponder operation. The following options are available:

disabled, enabled

- For the applications and the pertaining configuration, please refer to the examples supplied in the chapter: "DIALER'S TRANSPONDER INTERFACE USAGE NOTES" on page62.

For TRH/COMBI and TRH/GSM only:

- **SERIAL TRANSPONDER**, press <Ok> to switch option. This option allows you to configure the serial trasponder operation. The following options are available:

disabled, enabled

- For the applications and the pertaining configuration, please refer to the examples supplied in chapter "DIALER'S TRANSPONDER INTERFACE USAGE NOTES" on page 62.
- **TRANSPONDER ADDRESS**, press (Ok) to edit the address of the virtual trasponders emulated by the TRH. The system accepts values between 1 and 255. The TRH trasponder emulation is carried out simulating the connection of 2 trasponders to 8 inputs. The address defined in this option is the initial address of this pair of trasponders (please refer to the following tables).

10.1.18 Inputs/outputs table of the trasponder emulated with the TRH/COMBI and the TRH/GSM.

TRH/PLUS TRANSPONDERS EMULATION			
Emulated trasponder	Emulated trasponder address	The emulated trasponder inputs report:	The emulated trasponder outputs control:
Controlling trasponder	XXX	1) Armed status 2) GSM registration status 3) Fault status 4) RF alarm status 5) Selectable output 1 6) Selectable output 2 7) Selectable output 3 8) Selectable output 4	1) Wired input 1 2) Hard-wired input 2 3) Hard-wired input 3 4) Hard-wired input 4 5) Hard-wired input 5 6) Hard-wired input 6 7) Hard-wired input 7 8) Hard-wired input 8
RF trasponder	XXX + 1	1) RF input 1 2) RF input 2 3) RF input 3 4) RF input 4 5) RF input 5 6) RF input 6 7) RF input 7 8) RF input 8	

Note: XXX is the TRH/PLUS trasponder address.

10.1.19 Inputs/outputs table of the trasponder emulated with the TRH/COMBI and the TRH/GSM.

TRH/COMBI AND TRH/GSM TRASPONDERS EMULATION			
Emulated trasponder	Emulated trasponder address	The emulated trasponder inputs report:	The emulated trasponder outputs control:
Controlling trasponder	XXX	1) Armed status 2) GSM registration status 3) Fault status 4) Power supply status 5) Selectable output 1 6) Selectable output 2 7) Selectable output 3 8) Selectable output 4	1) Hard-wired input 1 2) Hard-wired input 2 3) Hard-wired input 3 4) Hard-wired input 4 5) Hard-wired input 5 6) Hard-wired input 6 7) Hard-wired input 7 8) Hard-wired input 8
Serial trasponder	XXX + 1	1) Selectable output 5 2) Selectable output 6 3) Selectable output 7 4) Selectable output 8 5) Selectable output 9 6) Selectable output 10 7) Selectable output 11 8) Selectable output 12	1) Serial input 9 2) Serial input 10 3) Serial input 11 4) Serial input 12 5) Serial input 13 6) Serial input 14 7) Serial input 15 8) Serial input 16

Note: XXX is the TRH/COMBI or TRH/GSM trasponder address.

10.1.20 Trasponder addresses - compatible control unit association table

Telephone dialer address - control unit inputs association table

TRASPONDER EMULATION			
Control unit	TRH trasponder address	RF or serial trasponder lines	Controlling trasponder lines
CP	1	1-8	9-16
	2	9-16	17-24

	26	201-208	209-216
	27	209-216	-
ET8/480	1	17-24	25-32
	2	25-32	33-40

	7	65-72	73-80
	8	73-80	
ET8/48SE	1	9-16	17-24
	2	17-24	25-32
	3	25-32	33-40
	4	33-40	41-48
	5	41-48	-
	1	17-24	25-32
	2	25-32	33-40

ETR	61	497-504	505-512
	62	505-512	-

NOTE: for more information, please refer to the configuration table of the trasponder addresses listed in the technical manuals of the compatible control units or of the RIVER or RIVER2 trasponders.

10.1.21 TRH/PLUS trasponder configuration example

The TRH/PLUS trasponder interface can be used only to connect the TRH/PLUS to an intrusion detection control unit **and cannot be interfaced with external trasponders**.

When the TRH/PLUS is connected to a control unit, the dialer simulates the operation of one or two 8 input trasponders .

Please carry out the following procedure to connect the TRH/PLUS to a CP series control unit so that it detects the controlling trasponder as connected to the 65-72 inputs and the RF trasponder as connected to the 73-80 inputs:

- Select the "CP/ET8" protocol.
- Enable the controlling trasponder (stand-by, outputs, relay only) based on the kind of information that the TRH should transmit to the control unit.
- Enable the RF trasponder.
- Enter 9 as the trasponder address.

10.1.22 TRH/COMBI and TRH/GSM trasponder configuration example

The TRH/COMBI and TRH/GSM trasponder interface can be used to connect the TRH/PLUS to an intrusion detection control unit **only if a RIVER (RIVER2) model trasponder is employed**.

In the first instance, the TRH simulates the operation of one or two 8 input trasponder to define the serial inputs status.

Please carry out the following procedure to connect the TRH/COMBI and TRH/GSM to a CP series control unit so that it detects the controlling trasponder as connected to the 65-72 inputs and the RF trasponder as connected to the 73-80 inputs:

- Select the "CP/ET8" protocol.
- Enable the controlling trasponder (stand-by, outputs, relay only) based on the kind of information that the TRH should transmit to the control unit with reference to the first 8 inputs.
- Enable the serial trasponder (in order to control 8 additional inputs).
- Enter 9 as the trasponder address.

Please carry out the following procedure to connect the TRH/COMBI and TRH/GSM to an external trasponder in order to employ the serial inputs:

- Disable the controlling trasponder
- Enable the serial trasponder
- Configure the ETR protocol and address 1 (all address jumpers closed) for the external trasponder

10.1.23 Configuration with an ET8/480 control unit - Functional example no. 1

You want to receive the following reports from the telephone dialer: tamper event, intrusion event and dialer disabling when disarmed.

Carry out the following procedure:

A) In the TRH browser Inputs screen:

- Check that the "Inputs" tab was selected/opened.
- Rename hard-wired input 1 as "Tamper", input 2 as "Intrusion" and input 4 as "disable".
- Set the hard-wired inputs 1, 2 and 4 as transponder, set all the other inputs as NC (not connected).
- Remove the entry/exit route setting for 1, 2 and 4 inputs.
- Set the hard-wired input n. 4 as DISABLE.

No.	Name	Type	24 Hrs	Supervision	Delay	Entry-Exit Path	
1	Tamper	Trasponder	No		Instantaneous Input	No	
2	Inrusion	Balanced	No		Instantaneous Input	No	
3	Input 3	Balanced	No		Instantaneous Input	Yes	
4	Disable	Balanced	No		Instantaneous Input	No	
5	Input 5	Not Connected	No		Instantaneous Input	Yes	
6	Input 6	Not Connected	No		Instantaneous Input	Yes	
7	Input 7	Not Connected	No		Instantaneous Input	Yes	
8	Input 8	Not Connected	No		Instantaneous Input	Yes	
9	Radio 9		No		Instantaneous Input	Yes	
10	Radio 10		No		Instantaneous Input	Yes	

The screenshot shows the configuration interface for 'Wired Input 1'. The 'Name' field is set to 'Tamper', 'Informations' to 'Info Input 01', and 'Delay' to 'Instantaneous Input'. Under 'Wired Detectors', 'Trasponder' is selected. The 'Radio Inputs' section has 'Supervision' checked with a 'Supervision Interval' of '01:30 (h:min)'. In 'General Settings', 'Radio input 9 has priority over wired input 1' is selected, and 'Wired input 4 setting' is set to 'BLOCK'.

- Select the "Transponder emulation" tab.
- Select the CP/ET8 protocol for the transponder.
- Leave the RF (TRH/PLUS) or the serial (TRH/COMBI and TRH/GSM) transponder disabled.
- Set address n. 1 (which corresponds to 17-24 outputs, please refer to table 10.1.19 on page 45 of this manual).
- In the settings, select "reset inputs on stand-by".

B) in the ET8/480 browser outputs screen:

- Rename output 17 as "Tamper", output 18 as "Intrusion" and output 20 as "Disable".
- Assign MFT1 to output 17, MFT2 to output 18 and MFT3 to output 20. Remove the other settings for the associated MFTs.

C) in the ET8/480 browser MFT screen:

- Remove all of the events associated with the MFT1 (by default, aggression and coercion) the MFT2 (by default, fire) and the MFT3 (by default, power supply failure).
- Set The relay alarm tamper+ event as a clock event for the MFT1.
- Set MFT1 timer as positive pulse NRT and to 10 seconds.
- Set The relay alarm tamper+ event as a clock event for the MFT2.
- Set the MFT2 timer as positive pulse NRT and at 10 seconds.
- Set the disarm and 1, 2, 3, 4 areas system access events as clock events for the MFT3.
- Set the MFT3 timer as positive pulse NRT and at 10 seconds.

Code) Signal	MFT1	MFT2	MFT3	MFT4	MFT5	MFT6	MFT7	MFT8	MFT9	MFT10	MFT11	MFT12	MFT13	MFT14	MFT15
183) Dialler stop	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
184) Duress alarm	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
185) Panic alarm	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
186) General alarm relay+	---	C	---	---	---	---	---	---	---	---	---	---	---	---	---
187) General alarm relay-	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
188) Tampering alarm relay+	C	---	---	---	---	---	---	---	---	---	---	---	---	---	---
189) Tampering alarm relay-	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
190) Statistical alarm	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

MFT 1 | MFT 2 | MFT 3 | MFT 4 | MFT 5 | MFT 6 | MFT 7 | MFT 8 | MFT 9 | MFT 10 | MFT 11 | MFT 12 | MFT 13 | MFT 14 | MFT 15

Event

Set

Reset

Clock

MFT

MFT1 Code) Signal 188) Tampering alarm relay+

Timer

ON OFF  RT Positive Pulse

ON OFF  RT Negative Pulse

ON OFF  NRT Positive Pulse

ON OFF  NRT Negative Pulse

10 Timer (sec)

ON → OFF TOGGLE

OFF → ON

Assigned outputs

Output 17 (Tamper)

10.1.24 Configuration with an ETR512 control unit - Functional example no. 2

You want to receive the following reports from the telephone dialer: tamper event, intrusion event and dialer disabling when disarmed.

Carry out the following procedure:

A) In the TRH browser Inputs screen:

- Make sure that the "Input" tab is selected.
- Rename the hard-wired input 1 as "Tamper", input 2 as "Intrusion" and input 4 as "disable".
- Set the hard-wired inputs 1, 2 and 4 as transponder, set all the other inputs as NC (not connected).
- Remove the entry/exit route setting for inputs 1, 2 and 4.
- Set hard-wired input 4 as DISABLE.
- Select the "Transponder emulation" tab.
- Select the ETR protocol for the transponder.
- Leave the RF (TRH/PLUS) or the serial (TRH/COMBI and TRH/GSM) transponder disabled.
- Set the address n. 1 (which corresponds to 17-24 outputs, please refer to table 10.1.19 on page 5 of this manual)
- In the settings, select "reset inputs on stand-by".

The screenshot shows the 'Input' configuration screen for 'Transponder Emulation'. The 'Transponder Protocol' is set to 'ETR'. The 'Radio Transponder Active' checkbox is unchecked. Under the 'Control Transponder' section, the 'Address' is set to '1'. The 'Settings' dropdown menu is open, showing 'Restore Inputs' as the selected option.

B) In the ETR browser MFTs screen:

- Remove all of the events associated with the MFT1 (by default, aggression and coercion) the MFT2 (by default, fire) and the MFT3 (by default, power supply failure).
- Rename the MFT1 as "Tamper" and set the tamper relay event+ as clock event for the MFT.
- Set MFT1 timer as positive pulse NRT and to 10 seconds.
- Rename the MFT2 as "Intrusion" and set the intrusion relay event+ as clock event for the MFT.
- Set the MFT2 timer as positive pulse NRT and at 10 seconds.
- Rename the MFT3 as "call disable" and set the disarm and the 1, 2, 3, 4, 5, 6, 7, 8 areas system access events as clock events for the MFT.
- Set the MFT3 timer as positive pulse NRT and at 10 seconds.

No	Signal	Event
46	Low Radio Battery	---
47	No Radio Supervision	---
48	Duress Alarm	---
49	Panic Alarm	---
50	General Alarm Relay+	---
51	General Alarm Relay-	---
52	Tamper Relay+	--C
53	Tamper Relay-	---
54	Access Attempts OK	---
55	Guard Round Alarm	---
56	GSM Anomaly	---
57	PSTN Anomaly	---

MFT

Event	MFT	Name	Signal
SET <input type="checkbox"/> RESET <input type="checkbox"/>	1	Tamper	52) Tamper Relay+

Time Schedule

CLOCK

Timer (sec)

ON → OFF
 OFF → ON

TOGGLE (Modify Output Status)

NRT Positive Pulse

RT Positive Pulse

NRT Negative Pulse

RT Negative Pulse

C) In the ETR browser Inputs screen:

- Select/open the tab "Outputs assignment"
- Assign MFT1 to output 17 and disable any input duplicates.
- Assign MFT2 to output 18 and disable any input duplicates.
- Assign MFT3 to output 20 and disable any input duplicates.

Output #	MFT/Technological/Presence simulation
010	
011	
012	
013	
014	
015	
016	
017	MFT 1
018	MFT 2
019	
020	MFT 3
021	

Output Assigned

Assign MFT to the output 17

MFT/Technological/Presence simulation

Repeat Zone 17 on Output 17

To Panel:

Enabled

Disabled

10.1.25 CONFIGURATION menu → INSTALLER CODE

This menu allows you to edit the installer code. Access the menu and enter the new installer code twice.

10.2 User mode programming

Access the USER menu by entering:

UUUUUU + 

Where U = user code digits. The default user code is: 1 1 1 1 1 1.

The user menu can also be accessed from the installer menu.

10.2.1 USER menu

The user menu contains the following submenus:

- **HYSTORY LOG**, to view the event history log.
- **SET CLOCK**, to set the time.
- **FAULT BEEP**, to enable/disable the fault buzzer.
- **OUTPUT CONTROL**, to set the selectable outputs status.
- **SIM CREDIT BALANCE**, to display the Vodafone or TIM rechargeable SIM card's credit balance.
- **"FOLLOW ME" NUMBER**, to change the number of telephone 1.
- **USER CODE**, to change the user code.
- **CODE FOR REMOTE CONTROL OVER THE PHONE**, used to change the code for the remote control of the unit over the telephone.

10.2.2 USER menu → HISTORY LOG

This menu allows you to change/display the event history log. Press the ↑ and ↓ keys to scroll the events. Press '*' or '#' to switch from parameter display and event number + time display. The parameter is displayed in the first row while the event is displayed in the second row.

10.2.3 USER menu → SET CLOCK

This menu allows you to set the time clock. Press S1 and S3 to move the cursor to the left, press S3 to move the cursor to the right and press the numeric keys to set the time digits.

10.2.4 USER menu → FAULT BEEP

Press <Ok> to switch option. This option allows you to configure if the TRH must produce a periodic beep when a fault is detected. The unit will report the event with a beep every 15 seconds. In this menu the user can enable or disable beeping as required.

10.2.5 USER menu → OUTPUT CONTROL

This menu allows you to control the selectable outputs. Enter the menu and press the ↑ and ↓ keys to select which input to control.

The input status is displayed on the second row. Press <Ok> to switch option.

10.2.6 USER menu → SIM CREDIT BALANCE

This menu allows you to check the SIM card's credit balance. The amount is stated in Euros. When "???" is displayed, ??? the TRH has not yet received the SIM card's credit balance data.

The SIM card's credit balance function is available only for rechargeable Vodafone or TIM SIM cards.

10.2.7 USER menu → "FOLLOW ME NUMBER"

This menu allows you to edit telephone number 1. The editor operates in the same way previously described in the installer menu section.

10.2.8 USER menu → USER CODE

This menu allows you to edit the user code. Please input the 6-digit user code twice in order to change it.

10.2.9 USER menu → CODE FOR TELEPHONE REMOTE CONTROL

This menu allows you to edit the code for the remote control of the unit over the telephone. Please input the 6-digit code for this function twice in order to change it.

When all of the code digits are equal to "0", the remote control operations over the telephone are automatically disabled.

11. SYSTEM SMS MESSAGES

The telephone dialer can be set to send a specific number of system SMS messages. These SMS messages are sent to the configured phone numbers.

The SMS messages will be sent for the programmed number of times with the exception of the credit balance SMS message which is always sent only once to each number.

SYSTEM SMS MESSAGES	
Event	SMS message text
Network failure	POWER SUPPLY FAILURE!
Flat battery	FLAT BATTERY TELEPHONE DIALER!
Network reset	POWER SUPPLY RESET!
PSTN line failure (TRH/PLUS and TRH/COMBI only)	PSTN PHONE LINE FAILURE!
PSTN line reset (TRH/PLUS and TRH/COMBI only)	PSTN TELEPHONE LINE RESET!
Flat battery RF sensor (Only TRH/PLUS)	" INPUT-NAME " FLAT BATTERY!
RF sensor supervision failure (Only TRH/PLUS)	" INPUT-NAME " SUPERVISION FAILURE!
RF sensor fault (Only TRH/PLUS)	" INPUT-NAME " SENSOR FAULT!
Periodic credit balance check SMS	CHECK AGREEMENT TERMINATION DATE AND SIM CARD'S CREDIT BALANCE!
SIM credit depletion	SIM CREDIT BALANCE DEPLETION!
Unable to establish SIM card's credit balance.	SIM CARD CREDIT BALANCE CANNOT BE ESTABLISHED!

The "**INPUT-NAME**" definition stands for the actual name configured for the telephone dialer.

12. CONTROL AND MONITORING OVER THE TELEPHONE LINE

The telephone dialer can be controlled and monitored over the telephone line via SMS message.

When the telephone dialer receives a valid control/monitoring SMS message, it will carry out the commands it contains and reply by sending a confirmation SMS to the sender's number. If the command report function is enabled, an SMS report will be sent also to all the numbers that are able to receive system SMS messages.

A report is always supplied only to the number that demanded it.

Only the SMS messages sent by the numbers stored in the configuration of the TRH are able to control/monitor the unit over the telephone line.

12.1 SMS message syntax

Although the control/monitoring SMS messages are not case sensitive, a few syntax rules must be used for the messages to be accepted as valid.

All control/monitoring SMS messages must begin with:

C.XXXXXX

Where XXXXXX is the code for the remote control of the unit over the telephone (000000 is not recognized as valid and disables all telephone control/monitoring operations).

The code for the remote control of the unit over the telephone must always be followed by a blank space. The following commands are available:

I.ON	to arm
I.OFF	to disarm
A.outputname	to enable the output
D.outputname	to disable the output
R.I	for inputs report
R.U	for outputs report
R.C	for telephone dialer report
R.T	for system report

More than one command can be sent with the same SMS message as long as the commands are separated by a blank space. If contradictory commands are sent, the dialer will carry out the first valid command.

The "**outputname**" definition stands for the actual name configured for the telephone dialer.

FOR EXAMPLE:

c.123456 a.output 1 d.output 4 i.on r.t

This command enables the output denominated "Output 1", disables the output denominated "Output 4", arms the dialer and asks for a system report.

12.1.1 Arming command - I.ON

The arming command "I.ON" arms the TRH and begins the exit delay countdown (if configured). The sender receives the "TRH armed" confirmation SMS message.

If the TRH is in the telephone dialer mode, this command will simply be ignored and, if there are no other valid commands. The sender receives the following SMS: "INVALID COMMAND!".

12.1.2 Telephone dialer disarming and disabling command - I.OFF

The disarming command "I.OFF" disarms the TRH and disables any current dialer operation (if configured). The sender receives the following SMS: "TRH disarmed".

If the TRH is in the telephone dialer mode, this command disables the telephone dialer without disarming it. In this case the sender receives the following confirmation SMS: "TRH disabled".

12.1.3 Enable output command - A.outputname

The command to enable the output "A.outputname", allows the sender to enable the selectable output denominated "outputname". The sender receives the following confirmation SMS: "outputname enabled".

12.1.4 Output disable command - D.outputname

The command to disable the output "D.outputname", allows the sender to disable the selectable output denominated "outputname".

The sender receives the following confirmation SMS: "outputname disabled".

If the specified output is not set by the status, this command is simply ignored and, unless there are other valid commands, the sender received the SMS message: "INVALID COMMAND!".

12.1.5 Inputs report command - R.I

The inputs report command "R.I" allows to monitor the TRH regarding the status of the configured inputs. The TRH responds to this command by sending one or more SMS messages containing the requested information.

The TRH's reply consist in an "inputname inputstatus" list separated by commas where "inputname" is the name of the input and "inputstatus" is the status of the input.

The inputs report is sent only for the configured inputs. As far as RF inputs are concerned, it will only be sent for the double or 24h type sensor.

FOR EXAMPLE:

TRH: Input 1 on stand-by, Input 2 in alarm, RF 9 tampered
RF 10 in alarm for flooding.

12.1.6 Outputs report command - R.U

The outputs report command "R.U", allows to monitor the TRH regarding the status of the selectable outputs. The TRH responds to this command by sending one or more SMS messages containing the requested information.

The TRH's reply consist in an "inputname inputstatus" list separated by commas where "inputname" is the name of the input and "inputstatus" is the status of the input.

FOR EXAMPLE:

TRH: Output 1 enabled, Output 2 disabled, Output 3 disabled,
Output 4 by pulse

12.1.7 Telephone dialer report command - R.C

The telephone dialer report command "R.C" allows to monitor the TRH regarding the status of the telephone dialer. This includes the following dialer's statuses: arming, SIM card's credit balance, external power supply, dialer's battery, PSTN line status, RF sensors supervision failure, RF sensor flat battery, RF sensors fault.

The arm status is reported only when the telephone dialer operates in the control unit mode. The SIM card's credit balance is transmitted only for rechargeable SIM cards with the credit balance reading enabled.

FOR EXAMPLE:

TRH: TRH armed, credit balance:33.20, power supply Ok,
battery Ok, RF battery flat.

12.1.8 System report command - R.T

The system report command "R.T" will supply a report con all the items described above. The TRH responds to the system report command by sending one or more SMS messages containing all the information available on the inputs, outputs and dialer status.

13. EVENTS STORED IN THE HISTROY LOG

The system's operation and events are stored in the history log without any time reference. The field information pertaining to the day, month and year are therefore always equal to zero.

14. FACTORY DEFAULT SETTINGS

The telephone dialer's factory default settings are as follows:

Hard-wired inputs name:	"Input 1"... "Input 8"
RF inputs name (TRH/PLUS):	"RF 9"... "RF 16"
Serial inputs name (TRH/COMBI and TRH/GSM):	"Serial 9"... "Serial 16"
Special keys name (TRH/COMBI and TRH/GSM):	" S1 key "... " S4 key "
Outputs name:	"Output 1"... "Output 4" and "Output 5"... "Output 12" for TRH/COMBI and TRH/GSM
SMS header:	TRH
Custom SMS messages:	Empty
Telephone numbers and PSTN area code:	Empty
Installer code:	88888888
User code:	111111
Remote control over the telephone code:	000000 (telephone remote control disabled)
Telephone number dialing method:	PSTN priority
Voice call length:	30 seconds
Pause between two transmission cycles:	15 seconds
Number of repetitions for voice messages:	1
Number of repetitions for SMS messages:	1
Alarm voice messages:	Message 1
Alarm SMS messages:	Auto set
Reset voice messages:	Disabled
Reset SMS messages:	Disabled
Power supply voice messages:	Disabled
Power supply delay:	5 min.
GSM failure delay:	1 min.
Entry delay:	5 seconds
Exit delay:	5 seconds
Hard-wired/RF priority:	RF for TRH/PLUS / serial for TRH/COMBI and TRH/GSM
Alarm Beep:	No
Fault Beep:	No
Commands Notification:	No
Supervision time interval:	1.5 hours, only for TRH/PLUS
Control unit mode:	No
Selectable outputs:	by status, disabled
Relay output:	GSM or PSTN, only for TRH/PLUS and TRH/COMBI
RF codes:	Empty, only for TRH/PLUS
PSTN line cut test:	Yes, only for TRH/PLUS and TRH/COMBI
Wait for dial tone before dialing PSTN area code:	Yes, only for TRH/PLUS and TRH/COMBI
PSTN area code dialing:	DTMF, only for TRH/PLUS and TRH/COMBI

Wait for dial tone before dialing number:	Yes, only for TRH/PLUS and TRH/COMBI
PSTN number dialing:	DTMF, only for TRH/PLUS and TRH/COMBI
Digital communication protocol:	NONE (digital communication disabled)
Report:	Single
Digital communication priority:	PSTN, only for TRH/PLUS and TRH/COMBI
Primary digital ID code:	000000
Secondary digital ID code:	000000
Test call:	Disabled, digital
Periodic credit balance check SMS:	Disabled
Entry/exit delay beep:	Yes
ALARM HYSTORY LOG:	Yes
Voice header:	No
PSTN line enabling:	Yes, only for TRH/PLUS and TRH/COMBI
Forwarding of received SMS messages:	No
Rechargeable SIM credit balance check:	No
Input 4:	Normal
Trasponder protocol:	CP/ET8
Controlling trasponder:	Disabled
RF trasponder:	Disabled, serial trasponder only for TRH/GSM and TRH/COMBI
Trasponder address:	1
24 hours inputs:	None
RF sensor supervision:	None, only for TRH/PLUS
Inputs delay:	Hard-wired 1-4 inputs are immediate
Hard-wired 5-8 inputs are balanced	Not connected
Call Bitmap:	Empty
Serial Inputs:	Not connected, only for TRH/GSM and RH/COMBI
Area input keys (TRH/PLUS):	S1, S2, S3, S4
Entry/exit route inputs:	All

15. DIALER'S TRASPONDER INTERFACE USAGE NOTES

As previously described, the telephone dialer can be connected to an intrusion detection control unit, such as the CP80, CP90, CP100, ET8/48xx or ETR via the RS485 and simulate the operation of one to two 8 input trasponders.

By connecting the control unit and the negative terminal of the power supply with only two wires and setting the TRH/PLUS, TRH/COMBI, TRH/GSM as slave, the telephone dialer will be fully controlled by the control unit..

CAUTION: The RS485 serial line terminals and the RS232 serial line Minidin connector cannot be employed for simultaneous transmission.

This is only possible if the RS485 interface is connected to the trasponder (set as MASTER) or through the control unit (set as SLAVE) and by using the PC with the dedicated browser as well as the CP8/ SER2 cable direct connection.

The RS485 serial line will not operate since it does not have priority and the telephone dialer will carry out phone transmissions via PSTN or GSM.

To reset all parameters to normal, select "end connection" in the browser without unplugging the CP8/SER2 cable connector from the Minidin.

15.1 TRH/PLUS

The TRH/PLUS can emulate the operation of two 8 input trasponders connected to the control unit, these virtual trasponders are denominated controlling trasponders and RF trasponders.

Via the controlling trasponder, the control unit can pilot the hard-wired inputs and detect the TRH/PLUS outputs status. The control unit can this way enable the dialer and report its operation status. With this configuration, the control unit can also be controlled and monitored over a remote telephone line.

The control unit will be able to read the TRH/PLUS inputs status employing the RF trasponder. In this way, the TRH/PLUS will operate and all accounts as an RF trasponder and will provide up to 8 RF inputs to those control units that are not equipped with such inputs.

Please carry out the following procedure on the TRH to connect via RS-485 the TRH/PLUS to a control unit:

- Configure the dialer's hard-wired inputs to be employed as serial:
- Select the interface protocol (CP/ET8 or ETR)
- Enable the controlling trasponder to employ its functions. The kind of reply that you wish the TRH to transmit to the control unit can also be defined during this step.
- Enable the RF trasponder to employ its functions.
- Set the address of the two trasponders.
- Connect the TRH to the RS485 serial line of the control unit (terminal panel A and B)
- Connect the control unit's and the dialer's negative terminal of the power supply with a cable.

15.1.1 The TRH/PLUS controlling trasponder

The controlling trasponder will allow the control unit to pilot the hard-wired inputs of the TRH/PLUS that have been configured as trasponder since by enabling the "/" output of the controlling trasponder, the control unit actually enables the "/" input of the TRH/PLUS. The telephone dialer will transmit the appropriate data according to its configuration.

As far as the data to be transmitted to the control unit, the TRH/PLUS controlling trasponder can be configured to operate in three different ways:

- **On stand-by**, during this mode, the TRH/PLUS will always transmit to the control unit the on stand-by status of the controlling trasponder's virtual inputs. This operating mode is useful when you do not wish the control unit to handle the data transmitted by the telephone dialer.
- **Outputs**, during this mode the TRH/PLUS transmits to the control unit the status of its outputs (armed, GSM registration, fault, RF inputs alarm, status of the selectable outputs 1-4. This operating mode is useful when you want the control unit to handle the data concerning the status of the TRH/PLUS in order to report, for example, a faulty condition. During this mode, the TRH/PLUS can also transmit the status of the selectable outputs to the control unit and configure the control unit to act according to the status. If you do not wish to employ all inputs, configure the control unit's corresponding input as NOT CONNECTED.
- **Relay only**, during this mode the TRH/PLUS will not send any information to the control unit. This operating mode is useful when you do not wish the control unit to handle the data concerning the status of the TRH/PLUS and you prefer not to engage 8 inputs: by programming a standard trasponder with the same address of the

controlling trasponder, you will be able to use the trasponder's inputs and send to the TRH/PLUS only its inputs enabling commands.

15.1.2 TRH/PLUS RF trasponder

The RF trasponder allows the control unit to detect the TRH/PLUS RF inputs status. This configuration will actually provide 8 RF inputs to the control unit.

Enable the appropriate option to activate the RF trasponder.

If the TRH/PLUS is always armed, the alarm signals sent by the RF sensors when the system is disarmed (also those that do not trigger dialing sequences) will be stored in the dialer's history log which will become useless once its capacity is filled.

In these instances, it is best to avoid that the RF sensors alarm signals are stored in the history log of the TRH/PLUS when the intrusion detection control unit is disarmed.

For an appropriate management, please apply one of the two following methods:

- 1) Set the TRH/PLUS to be armed when the system is armed and disarmed with the system is disarmed during the control unit mode. This operation is configured by setting: input 4 of the TRH/PLUS with arming/disarming by status and the control unit's corresponding output with a MFT in SET when the system is armed and RESET when it is disarmed. In this case, all of the TRH/PLUS inputs employed by the control unit to enable the dialer must be configured as 24h (enabling transmission also when the system is disabled which is necessary, for example, in the instance of tramper reports).
Such configuration will also allow to easily identify the system's armed status by monitoring the TRH over the telephone while disabling the dialer when the system is disarmed.
- 2) Only the 3.0 version of the TRH/PLUS v3.0 offers a second possibility that does not disable the disarmed telephone dialer. Set the TRH/PLUS in the dialer mode (always armed) and remove all of the areas associated with the TRH's RF inputs. With this configuration, the alarm signals sent by the RF inputs will never be stored in the TRH history log even when the system is armed.
To allow the control unit to disable the dialer, simply configure the input 4 of the TRH as the disabling input and the corresponding output of the control unit with a MFT by pulse of 10 sec. in the required condition.

15.1.3 TRH/COMBI and TRH/GSM

The TRH/COMBI and TRH/GSM can emulate the operation of two 8 input trasponders much like the TRH/PLUS (set as slave).

These two telephone dialer versions can also monitor a trasponder connected to the RS-485 line thereby expanding to 16 the number of the hard-wired inputs (set as master).

CAUTION: the TRH/COMBI and TRH/GSM are not able to operate in both modes at the same time. The units can either be connected to the RS485 serial line of a compatible control or monitor a trasponder connected to the TRH's 485 line.

The TRH/COMBI and TRH/PLUS can emulate two 8 input trasponders denominating controlling trasponder and serial trasponder when the units are connected to the RS485 serial line of a compatible control unit. The controlling trasponder operates in the same manner described for the TRH/PLUS while the serial trasponder offers functions that differ from the TRH/PLUS' RF trasponder.

Carry out the following procedure to connect via RS-485 the TRH/COMBI and TRH/GSM to a control unit:

- Configure the hard-wired inputs to be employed as serial inputs:
- Select the interface protocol (CP/ET8 or ETR)
- Enable the control trasponder. The kind of reply that you wish the TRH to transmit to the control unit can also be defined during this step.
- Enable the serial trasponder in order to employ its functions.
- Set the address of the two trasponders
- Connect the dialer to the serial line of the compatible control unit (terminal panel A and B) following the diagrams supplied in this manual.

CAUTION: the controlling trasponder must be activated when connecting the dialer to a control unit.

15.1.4 TRH/COMBI and TRH/GSM serial trasponder

The TRH/COMBI and TRH/GSM serial trasponder is used to expand to 16 the dialer's inputs even when connected to a control unit (set as slave). With this configuration, also the status of the dialer's 5 to 12 selectable outputs can be transmitted to the control unit.

The serial inputs 9 to 16 and the selectable outputs 5 to 12 are associated to the TRH/COMBI and TRH/GSM serial trasponder.

CAUTION: the controlling trasponder must always be activated in order to use the serial trasponder during the connection with a control unit. During the connection with a control unit, you cannot activate only the serial trasponder (as opposed to the TRH/PLUS with the RF trasponder).

When the serial trasponder is configured for the connection with a control unit, the 9 to 16 serial inputs type (balanced, NO or NC) is ignored: the input is enabled by simply setting one of these options.

The serial trasponder operation, as far as data transmission to the control unit, depends on the configuration of the controlling trasponder (that must be enabled) based on the following options:

- **On stand-by**, during this mode, the TRH/COMBI and the TRH/GSM always send the serial trasponder virtual inputs stand-by status to the control unit. This operating mode is useful when you do not wish the control unit to handle the data transmitted by the telephone dialer on programmable outputs 5 to 12.
- **Outputs**, during this mode the TRH/COMBI and the TRH/GSM transmit to the control unit the status of outputs 5 to 12. This operating mode is useful when you want the control unit to handle the data concerning the status of the selectable outputs of the telephone dialer. If you do not wish to employ all inputs, configure the control unit's corresponding input as NOT CONNECTED.

- **Relay only**, during this mode the TRH/COMBI and TRH/GSM will not send any data to the control unit. This operating mode is useful when you do not wish the control unit to handle the data concerning the status of the TRH/PLUS and you prefer not to engage 8 inputs. By programming a standard trasponder with the same address of the controlling trasponder, you will be able to use the trasponder's inputs and send to the TRH only the commands to enable its inputs.

15.1.5 Master connection (TRH/COMBI and TRH/PLUS)

TRH/COMBI and TRH/PLUS can monitor a trasponder connected to the 485 serial line to expand its hard-wired inputs with the eight 9 to 16 serial inputs and its outputs with the eight 5 to 12 selectable outputs.

CAUTION: this function cannot be used when the telephone dialer is connected to a control unit via the RS-485.

If you need the control unit to detect some of the trasponder's outputs, the required outputs must be wired to the control unit's inputs appropriately.

You must disable the controlling trasponder and enable the serial trasponder in order to configure the TRH/COMBI and TRH/GSM as MASTER.

During this mode (set as master), the protocol selection parameter is ignored (protocol is always ETR) as is the trasponder's address value (the monitored trasponder's address is always address 1).

Carry out the following procedure to connect a trasponder to the TRH/Combi or the TRH/GSM:

- Configure ETR as the protocol for the external trasponder (River model) and set as address 17 (all address jumpers closed)
- Configure the TRH serial inputs that you wish to employ
- Disable the TRH control trasponder
- Enable the TRH serial trasponder
- Connect the external trasponder to the TRH (terminal panel A and B)

15.1.6 Address Table

To appropriately set the dialer's address for the serial line transmission, please refer to the appropriate table "Telephone dialer - compatible control unit equivalency table" on page. 44.

17. CLEANING TIPS

Clean the telephone dialer using a damp cloth. Use only detergents that will not corrode plastic surfaces. Do not spray the detergent directly on the housing.

18. DISPOSAL INSTRUCTIONS

Dispose of the TRH/GSM telephone dialers in compliance with the current city regulations and by employing a dumping ground that is authorized for the disposal of electronic products. If required, please contact the appropriate city office for additional information.

Battery warning

A battery must also be connected to each telephone dialer in order to assure is proper operation. Replace the flat batteries only with new ones that offer the same characteristics. Make sure that the old battery is disposed of in a dumping ground that is authorized for battery disposal.

The employed materials are highly harmful and polluting if dispersed in the environment.

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