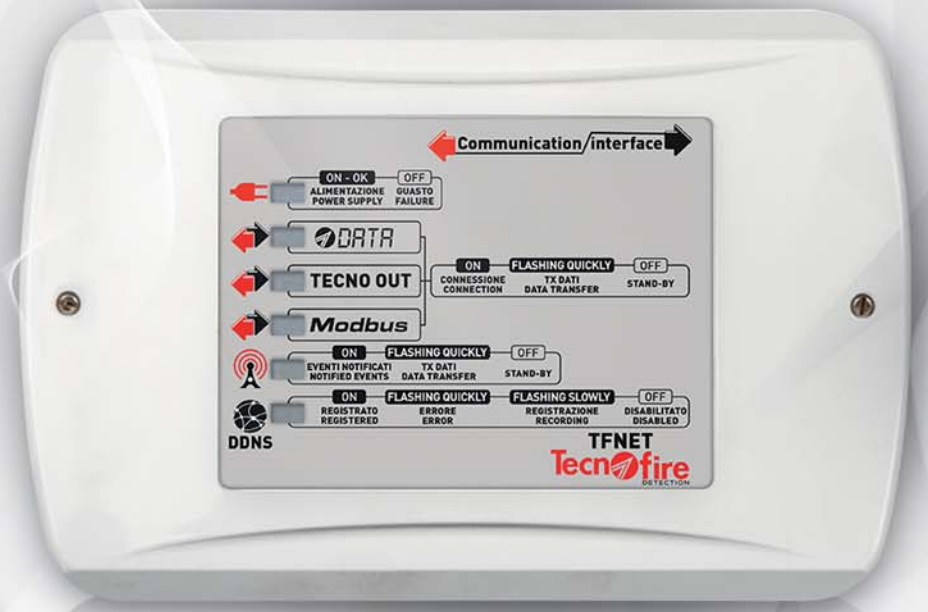
TFNET
Communication interface



Installation

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FW version	1.0.00
HW version	TFNET
Setup SW version	5.2
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Language	English

Tecnofire DETECTION
by Tecnoalarm

Centro 5.2	TFNET - TFAXFIRE Systems Compatibility					
	TFA1-298	Ver. 1.3.09	**TFA2-596**	Ver. 1.3.09	**TFA4-1192**	Ver. 1.3.09

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1 - OBLIGATIONS AND REQUIREMENTS

Introduction
Attention: Before installing the TFNET communication interface: carefully read this manual; it contains important information and warnings on the installation modes which must be observed.

Operating limits and purposes of the fire detection systems
It is essential to know that a fire detection system does not ensure protection and immunity against damage of any kind and amount, generated by or deriving from fires.
It is essential to begin by stating that any fire system in charge of detection, extinguishing, actuations, evacuation etc. must be installed and maintained in its best working order, according to the instructions provided by the manufacturer and/or by the designer.
Tecnofire fire detection systems can promptly notify the personnel in charge about the occurrence of dangerous fires. The system can also automatically handle the events and then, according to the setup mode: broadcast messages urging the evacuation of the premises, enable automatic remote control systems, CCTV systems, extinguishing systems, stop all situations and events that may feed the fire, in order to preserve the safety of persons and of the premises and assets contained in them.

Cautions and warnings
This document contains the procedures required to perform a successful installation of the product. However, the interpretation and correct application of its contents cannot be separated from the necessary training of the technical staff, responsible for the installation of the products covered by this manual.
In particular, the technical staff in charge of installation should have the necessary basic technical preparation, should know and properly apply the regulations in force, relating to the installation of fire protection systems, and more generally should know all the regulations in force concerning plant standards, installation, maintenance and electrical safety.
Moreover, the technical staff must have a thorough knowledge of the product, acquired attending specific training courses, at the premises of Tecnofire (fire systems division of Tecnoalarm S.r.l.).

Environmental requirements
The TFNET communication interface must be installed within structures or buildings with climate characteristics of temperature and humidity (non condensing), that do not exceed the values reported in the homologation of the products. The specific values of operating temperature and humidity of the Tecnofire products can be found in the relevant technical specifications tables.

Usage requirements
To avoid damage, or even risky malfunctions, in the management of the devices designed to control devices and systems operationally dependent from the TFNET communication interface, it is compulsory to use only the components and devices indicated by Tecnofire. The interface with complementary systems manufactured by third parties must be realized with Tecnofire input and output modules, making sure each time of the correct functional fit. If in doubt, always refer to the Tecnofire technical support service.

Technical service
The Tecnofire technical service is always at your disposal to solve technical issues related to installation, clarify product features and application of Tecnofire products.

Power sources
During system planning, it is important to take into account that the autonomy of operation required by the legislation is respected, properly sizing the primary power source (from mains) and the secondary power source (backup batteries). Please note that in case of mains power outage, the system ensures its operation using the backup batteries for a limited time.

Induced damage
Before working on any component of the System, to avoid damage to the equipment during installation and in all subsequent maintenance works, it is always necessary to disconnect all primary power sources (mains) and secondary power sources (backup batteries) of the system. To avoid damage caused by electrostatic voltage, always carefully handle the electronic cards of the devices, avoiding touching the electronic components directly.

2 - MAINTENANCE

Periodic maintenance of the system

For perfect efficiency of the fire detection system, the customer shall provide for a preventive maintenance program. The frequency of inspections depends on several factors; it is recommended to perform an inspection on average every 6 months (unless specifically required otherwise). Maintenance should be carried out by specialized personnel provided with the necessary know-how and equipment to perform adequate maintenance work. It is assumed that the information needed to perform a proper maintenance can be provided by the designers and/or manufacturers the fire detection system.
The maintenance guidelines are provided in the Italian standard UNI 11224.
The most significant checks should include at least:

- Functional state of power supply units and accumulators (APS) of the control panel and of the system power supply modules.
- State of the batteries of the self-powered devices (sirens, communicators).
- Functional tests of the sensors that make up the system.
- Checks about the state of cleanliness of the analysis chambers of the optical sensors.
- Efficiency of the control organs of the control panel and repeaters.
- Functional and operational efficiency of the acknowledgement, evacuation and system recovery procedures.
- Efficiency of manual alarm button module.
- Efficiency of optical and acoustic notification module.
- Efficiency of phone communicators (phone call tests).
- Verification of system actuations entrusted to input and output interface modules, etc.
- Check for correct tightening of the terminals wires.
- Final drafting of a test report signed by the maintainer and by the customer for acceptance.

3 - TECHNICAL SPECIFICATIONS AND FUNCTIONS

General specifications	Model	**TFNET**
	Description	**Ethernet interface**
	Protocol	**Fire-Bus**
	Address programming	**Dip-switch**
	Connection	**RS485**
IP node	Class	**Standard 803.2 - ATE4**
	Ethernet channels	**Server 1**
		Server 2
		Tecnoserver Tecnoalarm
		Service Tecnoalarm
		Tecno Out (optional)
		Modbus (optional)
	Channels	**8**
	Transmittable events	**33 categories**
	Transmittable zone events	**5**
	Telephone numbers/ IP address	**2 per channel (max. 24 digits)**
	Call event queue	**64 events**
	Communication protocols	**10**
Automation	Test call with TCP/IP	✓

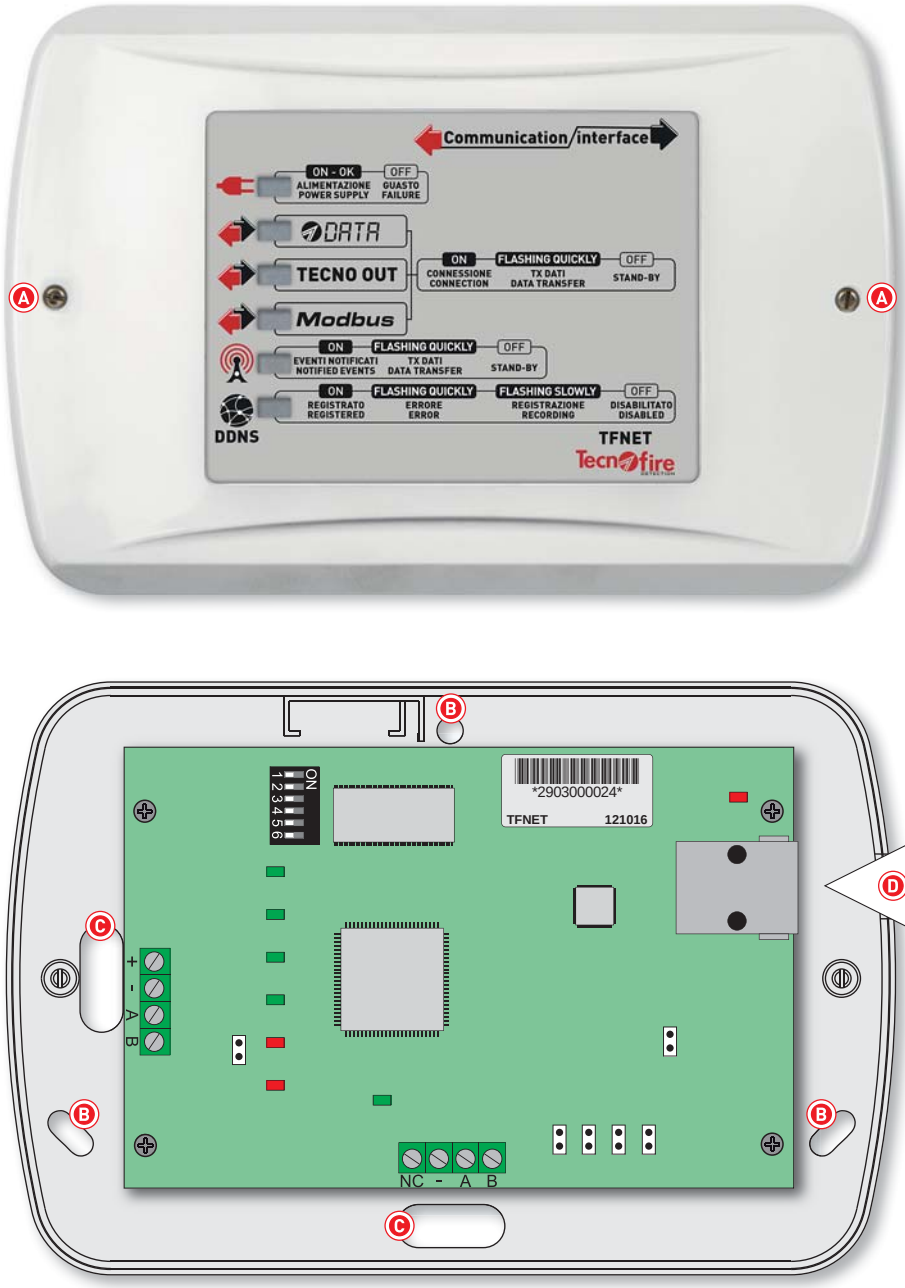
Electrical specifications	Power supply	**Over serial bus**
	Rated voltage	**24V DC**
	Operating voltage	**20V...27.6V DC**
	Stand-by consumption	**90mA @ 24V DC**
	Max. consumption	**140mA @ 24V DC**
Physical specifications	Operating temperature	**-5°C...+40°C**
	Relative humidity (non-condensing)	**10%...93%**
	Protection class	**IP30**
	Casing	**ABS V0**
	Dimensions (L x H x D)	**165 x 110 x 41mm**
	Weight	**200g**
Conformity	Directive	**R&TTE 1999/05/EC class 1/TTE**
	Standards	**EN 50136-1-1 EN 50136-2-1**
	Approved for use with TFA1-298, TFA2-596 and TFA4-1192 control panels	

4 - INSTALLATION NOTES

Introduction

In Italy the installation of this device is regulated by UNI and national standards, including DM 37 of 22 Jan 2008 which requires that fire protection systems are installed exclusively by licensed companies and operators, provided with professional technical requirements (items 3-4-5) regarding "executive design", "installation", and "maintenance".

4.1 - Assembly view

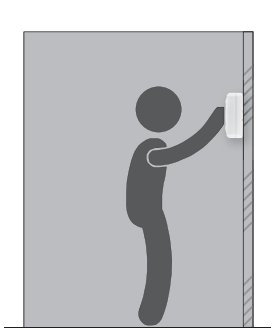


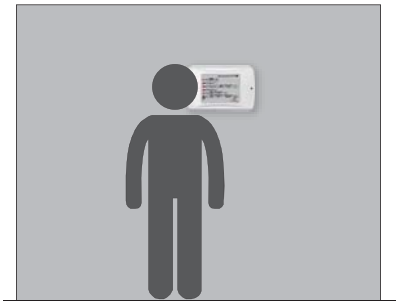
A	Screws to close the container	**C**	Cable entry slots
B	Holes and slots for fixing on the surface	**D**	Open wall for the passage of the RJ45 network connector

4.2 - Installation

Installation notes
As required for any electrical equipment, the TFNET communication interface must not be subjected to water drops or water-splashing, no objects filled with liquids should be placed in its direct vicinity.
The TFNET communication interface should be installed at a safe distance from heat sources (radiators, etc.).
Moreover, the device must be installed at a suitable distance from any source that can radiate electromagnetic interferences, such as radio transmission bridges or similar devices. The device must be properly ventilated, its enclosure must not be covered by objects that prevent proper thermal dissipation.

Fastening of the casing
The casing of the TFNET communication interface must be installed in a position protected from accidental collisions, at a height that allows full visibility of the signalling LED to operators and authorized staff.
Fasten the casing, level, using screw anchors with 5mm diameter.







4.3 - Connection cables

The cables to be used for the connections are regulated by installation standards and rules.
The installer shall ascertain the current legislative requirements for each country. These are flame retardant, low smoke emission and halogen free cables.
The (Italian) standards UNI 9795 specify in detail the various national and European regulations related to the cables to be used for the construction of fire detection systems.
Among these standards we mention (non-exhaustive list):
CEI 20-105; EN 50200; EN 60228; CEI 20-29; CEI 20-11; EN 50363; CEI 20-36; CEI 20-35; EN 60332; CEI 20-37; EN 50267; IEC 60332; IEC 61034; IEC 6754.

The TFNET communication interface is an expansion device for the TFAXFIRE control panels and is connected to them via the Master and/or Slave RS485 BUSES. The BUS can be connected in open loop or closed loop mode.
In the case of open loop connection, the RS485 BUS ring must be terminated on the last device connected to the serial line. On the TFNET communication interface, the BUS can be terminated by closing the JP6 jumper.
Connection configurations vary. For details, see the examples in the relevant installation manuals for the control panels TFA1-298, TFA2-596 and TFA4-1192.
For connecting the RS485 BUSES of the system, it is recommended to use a twisted, shielded, multipole cable with flexible wires.
The maximum length allowed for the RS485 Bus lines (Slave and Master) is 1000 mt. You can achieve greater distances using a fibre optic connection instead of an electric cable. For the sizing of the cables to be used for wiring, refer to the table that reports, based on the extent of the Bus, the minimum sections that must be observed.

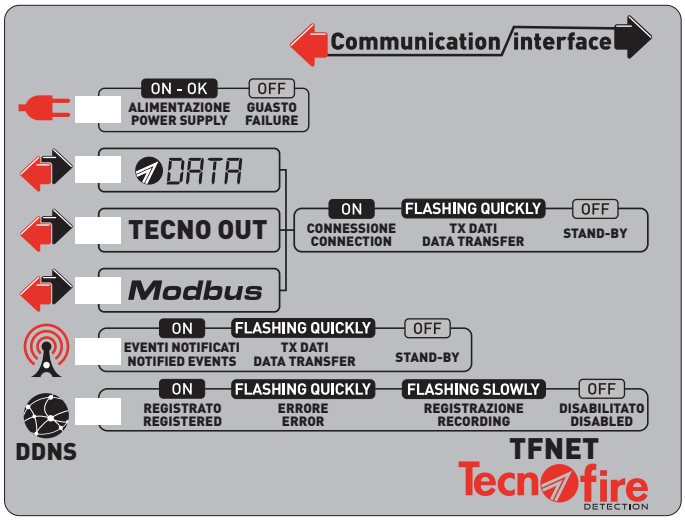
Bus extension / cable section		
Bus Extension	**Power supply wires**	**Signal wires (twisted pair)**
1000 meters	**Minimum required section 2x1.5mm²**	**Minimum required section 2x1mm²**
>1000 meters	**Locate a power source downstream the fiber connection**	**Use a fibre optic connection**

For reasons of electrical safety and induced interference rejection, the cable shield must be connected in such a way as to never be interrupted, always connecting on every device the shield of the input line with the shield of the output line.
The cable shield must be grounded, the connection must be made only at one point, inside the casing of the control panel.
The output can be interfaced only to other circuits that are within the "SELV" safety voltages.

5 - USER INTERFACE

5.1 - Front panel

The signalling interface of TFNET consists of 6 LED, which can be used by the user to understand the functional states of the communicator.



5.2 - LED

The table describes the functions and reporting modes of the LED on the front panel of the communication interface.
As required by EN 54-2 regulations concerning light signals, the ON/OFF flashing frequency of the LED is:
• 2.5 sec ON / 2.5 sec. OFF (slow flashing)
• 0.5 sec ON / 0.5 sec. OFF (fast flashing)

Notification	Colour	Type of notification	Notification modes	
POWER SUPPLY	Green	Reports the power supply status of the device	**Off**	Power supply off
			On	Power supply on
DATA	Green	Indicates the status of the connections of the channels: SERVER 1 - SERVER 2 TECNOALARM TECNOSERVER TECNOALARM SERVICE	**Off**	No communication in progress
			Slow flashing	Data transfer in progress
			On	Ongoing communication
TECNO OUT	Green	Displays the connection status of the channel: TECNO OUT	**Off**	No communication in progress
			Slow flashing	Data transfer in progress
			On	Ongoing communication
Modbus	Green	Displays the connection status of the channel: MODBUS	**Off**	No communication in progress
			Slow flashing	Data transfer in progress
			On	Ongoing communication
NOTIFIED EVENTS	Red	Reports the transmission states of the notifications to remote receiving devices	**Off**	No transmission in progress
			Quick flashing	Notification transmission in progress
			On	Notification transmission performed successfully
DDNS REGISTERED	Red	Status of the Dynamic DNS service	**Off**	DDNS disabled
			Slow flashing	DDNS registration in progress
			Quick flashing	DDNS registration error
			On	DDNS registered

6 - OPERATING MODES OF THE SYSTEM

Attention: The operations described in this chapter illustrate functions accessible at System level.
Therefore, these operations can only be performed by accessing the Central Unit that manages the System on which the TFNET communication interface operates.
None of the operations described in this chapter may be performed via the equipment described in this manual.

6.1 - Access levels and codes

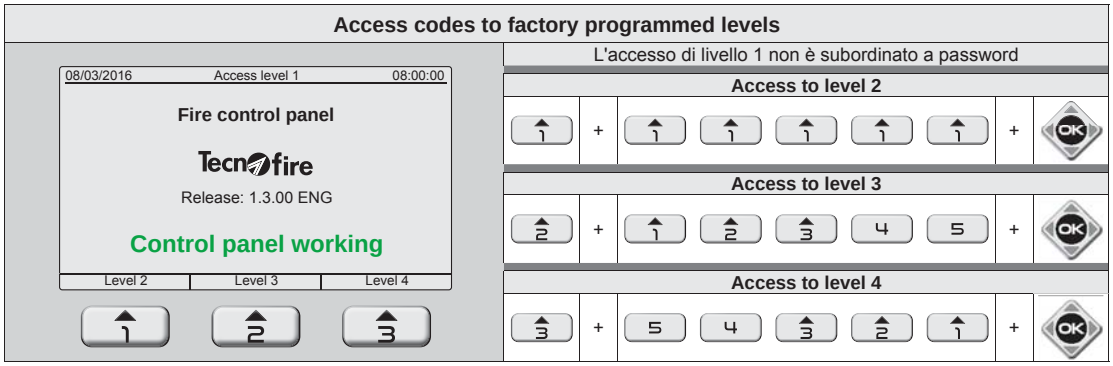
The TFAXFIRE Systems provide 4 access levels and 10 access codes.
The levels are: Level 1, Level 2, Level 3 and Level 4.
The table "Factory set access codes to levels" illustrates the sequence of keys used to access the Levels.
Access key to the level + Code + Confirmation Key.

Level 1
The control panel, in standby mode, provides access to the functions reserved to Level 1. Without having to enter a code, you can perform the following operations:
A - Access the upper levels with the keys: 1 or 2 or 3 and the relevant password
B - Acknowledge the alarm pressing the ACKNOWLEDGE key
C - Display the previously acknowledged ongoing alarms, stored in the event categories folders.

Level 2
It is possible to access Level 2 by pressing the key 1 and entering the relevant User Code.
At level 2, it is possible to perform all the operations of the previous level and the following operations:
A - Reset the unit pressing the RESET key.
B - Switch the unit operating state: manned to Unmanned and vice versa.
C - Manually activate an Evacuation alarm.
D - Access the list of menus reserved to Level 2.

Level 3
It is possible to access Level 3 by pressing the key 2 and entering the relevant "Installer/maintainer" code of the staff authorized to edit important operating parameters. At level 3 it is possible to perform all the operations of the previous levels and to access the menus reserved to Level 3.

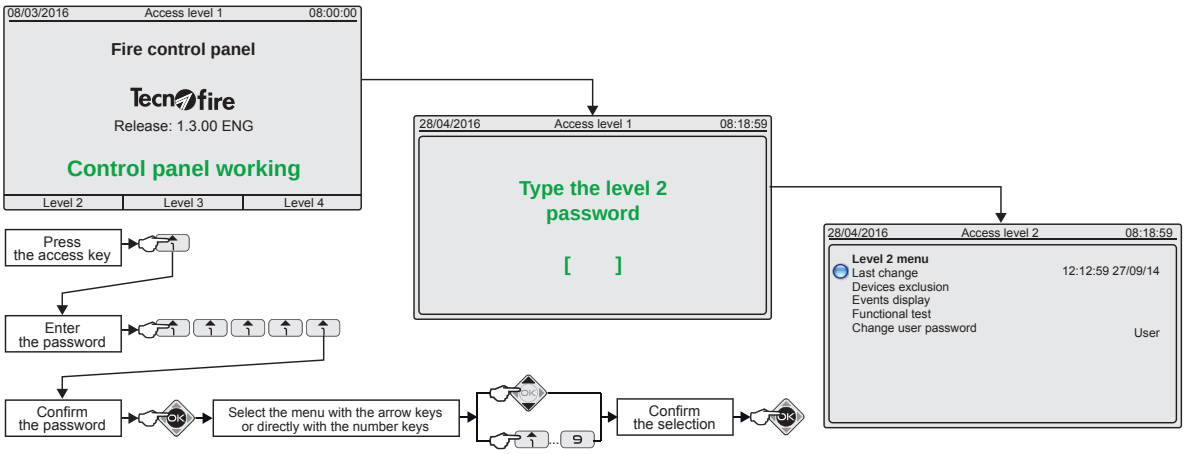
Level 4
It is possible to access Level 4 by pressing the key 3 and entering the code of the "Staff authorized by the manufacturer", that is highly qualified personnel authorised by the manufacturer to carry out technical services of particular importance.
To access level 4 it is also necessary to close the "KEY" jumper of the control panel.
At level 4 it is possible to perform all the operations of the previous levels and to access the menus reserved to Level 4.



6.2 - Access level 2

Access Mode

To access the menus follow the operating sequence illustrated in the diagram, or read the following instructions.
The password used in the example is the one set at the factory. Replace the numerical sequence shown with your password.
The password consists of five digits; after entering, confirm it with the OK button.
The blue cursor displayed on the left side of the menu list is the selection pointer. The pointer can be moved using the arrow keys up or down. The choice of the menus can also be done by entering the quick selection number.



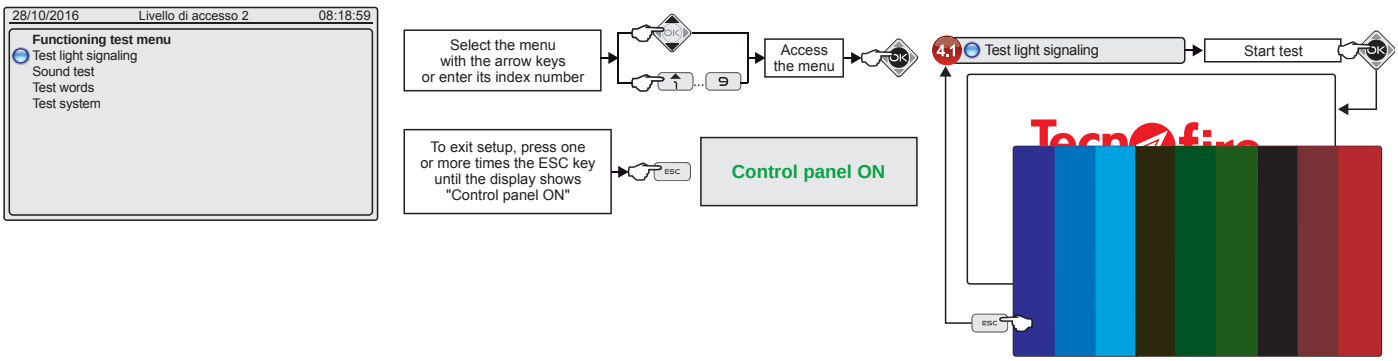
Menus which can be accessed at level 2

Level 2 access allows authorized users provided with password to browse and use the appropriate menus.
For each available menu, the table shows the quick selection number (index number), the menu name and its function.

6.3 - Functioning test

The control panel, via the test menu, allows to perform the functioning test of the LED of the TFNET communication interface.
The test menu includes 4 sub-menus with which it is possible to perform a few simple functioning tests. The first menu allows to check the display and the LED of the control panel as well as the LED of the TFNET communication interface.

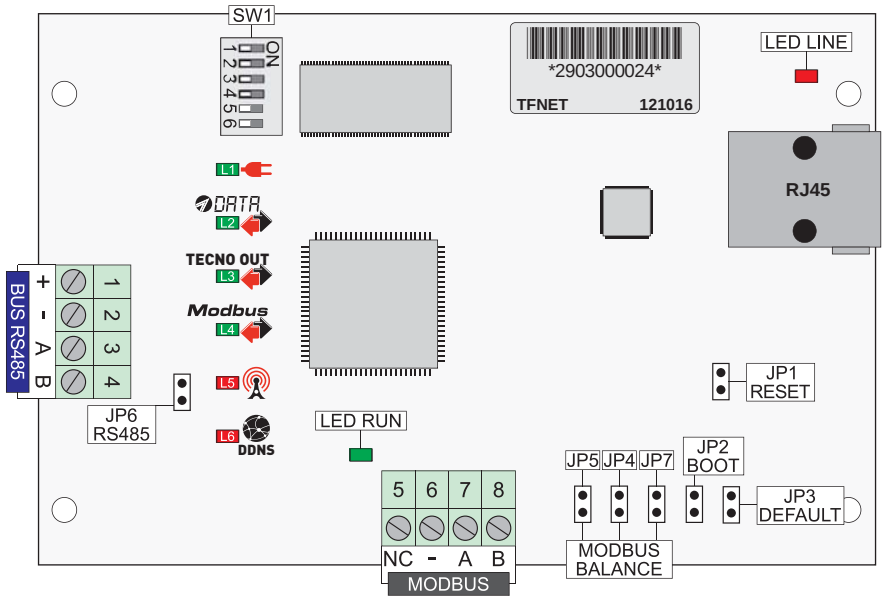
	Menu name	Menu function
4.1	Test light signaling	The menu starts a test procedure of the display and of the signalling LED of the control panel
4.2	Sound test	The menu allows to test the operation of the centre speaker in siren mode
4.3	Test words	The menu allows to test the operation of the centre speaker in speaker mode
4.4	Test system	The menu allows to select the programmed Zones to submit them to the functional test procedure

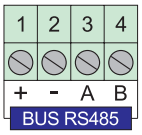


4.1 - Test light signaling

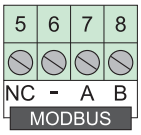
The light signaling test is used to check the operation of the display and the LED of the control panel as well as the LED of the TFNET communication interface. At test start, the control panel turns on steadily all the LED of its front panel, the display alternates between two sample images to prove its functionality.
At the same time the System turns on steadily all the LED of the front panel of the TFNET device.

7 - ELECTRONIC BOARD

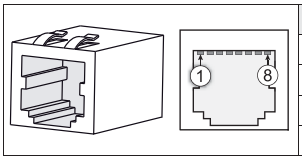




RS485 BUS		
1	+	Supply positive
2	-	Supply negative
3	A	Communication channel A
4	B	Communication channel B



RS485 MODBUS BUS		
5	NC	Not connected (terminal not used)
6	-	Reference negative of RS485 BUS output
7	A	Communication channel A
8	B	Communication channel B

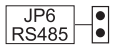


Ethernet RJ45 connector			
1	White / Green	5	White / Blue
2	Green	6	Orange
3	White / orange	7	White / Brown
4	Blue	8	Brown

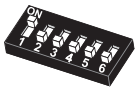
Identification	Colour	Function
RUN LED	Green	LED monitoring the functional state of the device. Flashing: normal operation state
LINE LED	Red	LED signalling that the device is using the Ethernet line

Identification	Normal condition	Function
JP1 - RESET	Open	Hardware reset
JP2 - BOOT	Open	Used to update the firmware of the product (RJ45 port Ethernet connection)
JP3 - DEFAULT	Open	No function (reserved for future developments)

Identification		MODBUS BUS balance			
JP4	MODBUS BALANCE	Open	RS485 MODBUS line not terminated	Closed	RS485 MODBUS line terminated
JP5		Open		Closed	
JP7		Open		Closed	



Jumper JP6 - Termination of RS485 serial line	
Open	With the jumper open, the Bus is not terminated. Open the jumper when the device is not the last device connected on the Bus. Condition valid for both wiring configurations of the line Bus: open or closed
Closed	With the jumper closed, the Bus is terminated. Close the jumper when the device is the last device connected on the Bus. Of course only if the connection Bus is in open line configuration.

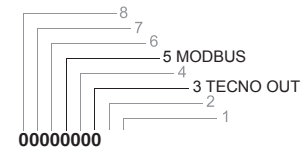


SW1 Serial address setup													
Address	Dip 1	Dip 2	Dip 3	Dip 4	Dip 5	Dip 6	Address	Dip 1	Dip 2	Dip 3	Dip 4	Dip 5	Dip 6
0	OFF	OFF	OFF	OFF	OFF	OFF	9	ON	OFF	OFF	ON	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	10	OFF	ON	OFF	ON	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	11	ON	ON	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	12	OFF	OFF	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	13	ON	OFF	ON	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	14	OFF	ON	ON	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	15	ON	ON	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	16	OFF	OFF	OFF	OFF	ON	OFF
8	OFF	OFF	OFF	ON	OFF	OFF							

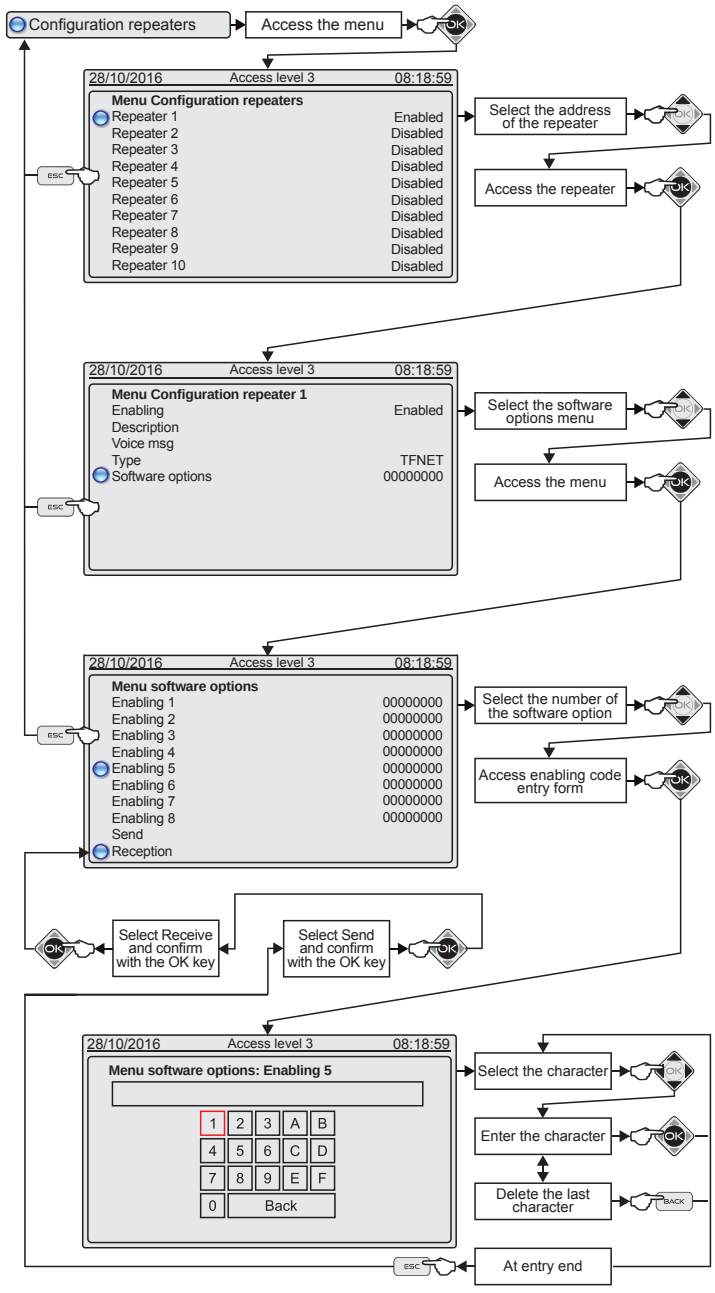
Notes: setting address 0 disables the operation of the communicator. Accepted addresses range from 1 to 16.
All other logic combinations are reserved.

8 - SOFTWARE OPTIONS

Software licenses that allow to extend the capabilities of the device TFNET can be purchased at any time. At the time of purchase a code is issued that must be entered in the configuration menu of the repeater. When a valid code is recognized, the device enables the related functions.



TFNET - Software options			
Option	**Description**	**Name**	**Item no.**
3	TECNO OUT protocol management	**TFABIL-TECNO**	**TF2TFABILTECNO**
5	MODBUS protocol management	**TFABIL-MODBUS**	**TFTFABILMODBUS**
Note: The option numbers not mentioned have not yet been assigned			



Enabling of software options
Enabling of software options can only be performed from the control panel setting menu "Repeaters".

Select and access the menu, select the address of the repeater on which you want to assign the software option.
Access the setting menu of the Repeater.

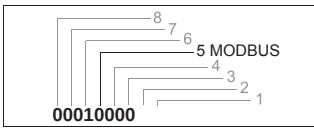
Select "Software options" and access the menu.

Select a row. e.g. select option 1 and access its entry form.

Enter the alphanumeric enabling code and exit the menu.

Send the enabling code to the device.
Select the item Send and confirm with the OK key.
Receive from device the status of its software options.
Select the item Receive and confirm with the OK key.

Check the mask of the software options of the device and exit setup

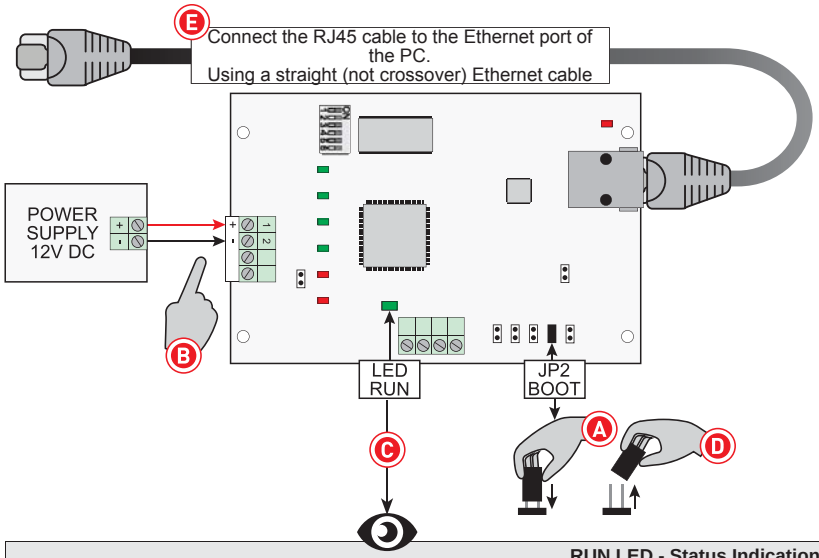


Sosftware options
The enabling code consists of 8 numbers (either 0 or 1). Number 0 indicates that the corresponding option is not active on the device, number 1 indicates that the corresponding option is active on the device. In the opposite example the only active option is number 5.

9 - FIRMWARE UPGRADE

Procedure to update the firmware of the device TFNET. The step by step operations that must be performed to carry out the update are described here.
The device is equipped with an bootloader which can be executed over ethernet and can be used when you need to upgrade the product firmware. In the bootloader procedure, the device presents itself to the network in Server mode at port 10001 with identification address 192.168.0.10.
Before you begin the bootloader procedure, it is necessary to check that the PC used owns an address in class 192.168.0.XX and, if the procedure is carried out in the context of a network, that no device in the network is identified with the same address of the TFNET 192.168.0.10.

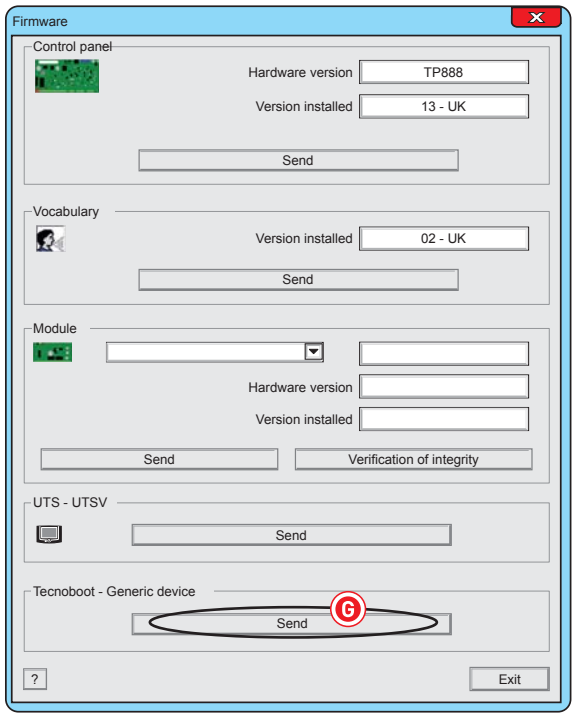
Attention: before proceeding please be sure to have the file required for the update. The file is available from the site www.tecnofiredetection.com.



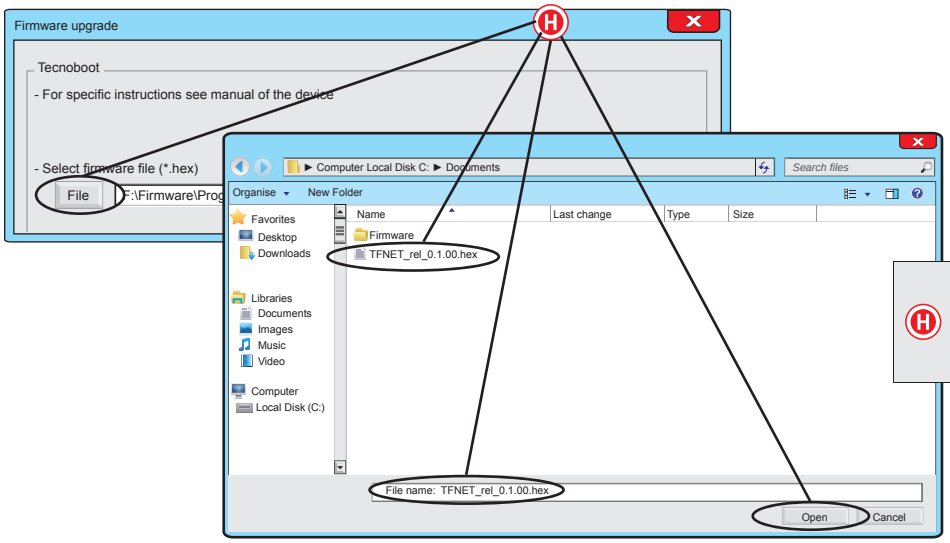
A	Close the jumper JP2 BOOT
B	Power the device
C	Watch the flashing of the LED RUN; if the LED flashes once per second or 2 times per second you can proceed
D	Open the jumper JP2 BOOT
E	Connect the RJ45 cable to the PC

RUN LED - Status Indications		
Flashes		**Status**
	One per second	The TFNET is in bootloader state and has verified that its firmware is healthy
	Two per second	The TFNET in bootloader state has verified the integrity of its firmware finding that it is missing or corrupt
	Three per second	The three flashes per second indicate that firmware transfer from the PC to the TFNET is in progress

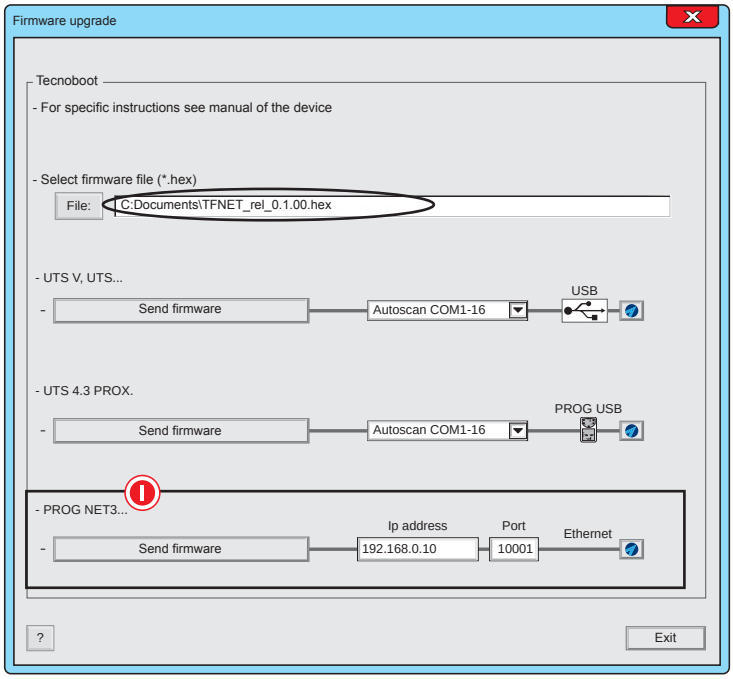




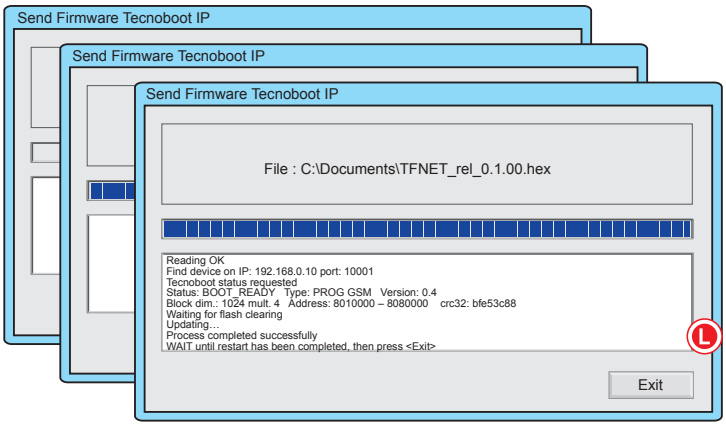
F	Open the software CENTRO Select any control panel and enter setup mode Click on the icon Firmware
G	Click the enter key of Tecnoboot Generic device



H — The Firmware update window opens
Click on the File button
Browse and select the update file
Click the Open button



I — Go to the PROG NET3 pane, check that the IP address is 192.168.0.10
The update starts, click Send Firmware



L — Wait for the end of the update process, click the Exit button

At the end of the firmware update procedure, the device TFNET wakes up automatically.

NOTES

21ISTR10842

CE

Tecnofire DETECTION
by Tecnoalarm

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