TFA2-596

Addressable fire detection control panel 2 Loops

ADDRESSABLE



Addressable fire detection control panel with 2 detection Loops. Each detection Loop can manage 199 detectors and 99 modules. 2 RS485 serial buses for connecting expansion devices, up to 16 devices chosen from repeater panels and/or telecommunication devices.
The TFA2-596 control panel can be part of a network of Tecnofire control panels. The control panel manages 200 fire detection or technical Zones and 100 virtual detection Zones. Automated management: 100 alarm plans, 32 time bands, 200 formulas, cyclic server test and customisable or perpetual four-year calendar. Advanced management with logic based on formulas that dynamically relate the operating states of the system devices. The control panel is equipped with 4 dedicated signalling outputs and 6 freely programmable signalling outputs. TLC section: IP telecommunication vector, 4 communication channels: Local Server, Remote Server, Tecnoserver, Call back, 8 communicators for event notification, 2 destination IP addresses for each communicator, 5 communication protocols, 15 transmittable event categories. Attended operating mode.
User interface: 4.3" colour display, programming and management keypad, 16 signalling LEDs, speech synthesis and multifunction acoustic signalling buzzer. USB port. Serial printer management. RSC® System management: programming, remote management and control. Modular 5A switching power supply. Battery housing: 2 x 12V-12Ah. Aluminium and steel casing. Protection rating IP3x. Dimensions (L x H x D) 441 x 347 x 149mm.
EN 54-2: 1997+ A1:2006 - EN 54-4: 1997+ A1:2002 + A2:2006. Certificate of approval 0051-CPR-0389.
System compatibility EN 54-13:2020.

MODEL										
Name	Item no.		RSC	EN 54-2 54-4	2 LOOPS	IP	VOICE SYNTHESIS	COLOR DISPLAY 4.3"	24V 5.0A 5A POWER SUPPLY	STEEL ALUMINUM BOX
TFA2-596	TF1TFA2596-UK									

OBLIGATIONS AND WARNINGS

The Tecnofire TFA2-596 analogue addressable control panel has been designed and manufactured within an ISO 9001 quality management system, which requires a set of rules to be applied during the design phase and plans all the subsequent testing and inspection activities required for its production.
All components used have been selected for their intended purposes; their characteristics are guaranteed when the environmental conditions comply with those specified for class 3K5 of EN 60721-3-3:1995.
The control panel may only be installed indoors, in a position protected against accidental impacts; temperature and humidity control is not required in the installation environment.
For the best use of the product, all system design and installation activities must be carried out in compliance with the national regulations in force.

PHYSICAL STRUCTURE

The TFA2-596 detection control panel has a modular structure consisting of:
- Metal cabinet (can house 2 batteries 12V/12Ah)
- CPU board with integrated user interface
- Connection cable terminal board
- 24V - 5A fly-back switching power supply (ALSW285PFC)

LOGICAL STRUCTURE

The control panel manages 200 detection Zones that can be programmed as fire detection Zones or technical Zones; it can also manage one Default Zone and 100 virtual Zones.
A virtual zone is a logical zone made up of devices belonging to one or more detection Zones.
A virtual zone can also be subject to the programmed formulas that relate the operating states of the devices and of the logical entities managed by the control panel.

ADDRESSABLE

MANAGEMENT SOFTWARE

The System can be fully managed, locally or remotely, by software that allows programming and management via a telematic connection over a local area network (LAN) or wide area network (WAN).

SYSTEM CONFIGURATIONS

The TFA2-596 control panel can be programmed in Local, Master or Slave mode. Local mode allows a system managed by a single control panel to be created.
Master and Slave modes allow complex systems to be created, made up of several control panels networked together. The control panel network is managed by a Master control panel, to which up to 15 Slave control panels can be connected.

DETECTION LOOP

Each detection Loop manages 199 detectors and 99 modules. Programming of the devices connected to the LOOP is made easier by the auto-learn function.
The polling time of the devices on a fully loaded Loop is less than 1 sec. If necessary, priority can be given to polling certain devices by programming a higher polling frequency.

SYSTEM BUS

The control panel has two RS485 Bus lines called Master Bus and Slave Bus. The two Bus lines are used to connect the expansion devices (max. 16 devices). The same lines can be used to network several control panels together (max. 16 control panels). The two Buses can be connected in open line or closed line mode.

SIGNALLING OUTPUTS

The control panel is equipped with the mandatory dedicated signalling outputs: Alarm, Siren, Fault and Reset.
The control panel also has 3 relay outputs and 3 freely programmable open collector outputs, to which one of the 37 available functions can be assigned.

AUXILIARY POWER SUPPLY

The System power supply must be sized to ensure, even if the primary power supply is interrupted, the autonomous operation of the System for the time established by the standards.
If, in the absence of the primary power supply, the energy consumption of the System exceeds the current available from the battery housed in the control panel, the current resources of the secondary power supply must be increased.
The TFA2-596 control panel has an input dedicated to the connection of one or more auxiliary power sources.

AUTOMATED MANAGEMENT

The control panel manages a series of automatic functions based on the programming assigned to the 32 time bands and the four-year calendar. Further automatic functions can be managed by programming Boolean formulas. The alarm plans compiled and associated with the zones are automatically shown on the control panel display and on the System repeater panels.

ACCESS LEVELS

The control panel manages four access Levels.
Level 1 access is always available and allows the alarm to be silenced and the related detailed information to be displayed.
Access to the other control panel management functions and to the programming menus requires recognition of the passwords that grant access, according to the respective responsibilities, to the access Levels: 2-User, 3-Installer and 4-Manufacturer.

ATTENDED OPERATION

The control panel can be programmed to work in "Attended" operating mode. Attended operation can only be used when the fire System is under the direct control of authorised personnel.
In Attended operating mode the System signals alarm events in a different way.
For the Attended function, one of three operating modes can be chosen: STANDARD, DAY/NIGHT and HOTEL.

STANDARD mode
STANDARD Attended mode is enabled and disabled with the ATTENDED function key and by entering the Level 2 password. Alternatively, disabling can be associated with a time band.

DAY/NIGHT mode
DAY/NIGHT Attended mode is enabled and disabled when the associated Formula is verified.

HOTEL mode
HOTEL Attended mode is always active; the Zones monitored in this mode must be programmed with the Hotel attribute.

CENTRO SOFTWARE

The Centro software allows Tecnofire Systems to be programmed, monitored and remotely managed locally or from a remote station. The RSC® functions of the Centro software allow the following activities to be performed:

Hardware consistency
The check analyses and records the operating parameters and the hardware and software identification data of all devices; the collected data are correlated with the System programming data.

RSC® system analysis
The data recorded by the hardware consistency function are used as reference data for subsequent parametric analyses. The parametric analysis detects and reports any change in the operating parameters of the devices compared with the data recorded in previous analyses.

Device monitor
The function allows a single System device to be selected for dynamic real-time monitoring of its operating parameters.

Alarm trace snapshot
Alarms detected by Tecnofire optical smoke detectors are digitised and stored in graphic format in the control panel Event log. The graph shows the trend of the alarm signal.

Event recording
All events concerning the operation of the system are recorded in the control panel Event log file.
Sequential recording provides each event with date and time. Consulting the Event log provides useful information on the operation of the System.

Hardware layout
The Hardware layout tool provides a graphic representation of the Control panel, the detection Loops and the serial Bus.
For each Loop, a label shows the number of programmed and connected detectors and modules.
Another label shows the number of expansion devices programmed and connected on the serial Bus.
Clicking on the labels expands the hardware layout to show the devices in detail. Each device has a label showing its address and status (included or excluded).
The Hardware layout allows devices to be excluded/included, the dialogue monitor LEDs to be activated for identification and the module signalling outputs to be activated.

Programming report
The Centro program can generate a file documenting the programming of the Tecnofire System.

TEST FUNCTIONS

The control panel manages a series of Test functions that allow the operation of the System to be checked.
The available functions are listed in the following table.

OPERATION TEST MENU	
Versions	Shows the firmware version, serial number, MAC address and other information about the control panel equipment
Word test	Shows the list of words in the control panel vocabulary and allows them to be played back
Power supply monitor	Shows the status and electrical values of the control panel primary and secondary power sources
Loop monitor	Shows the enable status of the detection Loops and their connection mode
Single detector test	Allows a detector to be selected, its identification data to be displayed and a series of functional tests to be performed
Single module test	Allows a module to be selected, its identification data to be displayed and a series of functional tests to be performed
Active outputs test	Shows which and how many outputs are active at that moment
Loop resistance check	Allows a Loop to be selected and the number of connected devices and the end-of-loop resistance to be checked
Detector repeat check	Allows the detection Loop to be selected and the repeat LEDs to be checked
Repeater test	Allows a repeater device to be selected and its identification data and/or electrical values and statistics to be displayed
Slave panel test	Function available if the control panel acts as Master in a control panel network
Network analysis reset	Allows the counters that analyse and total the communication frames of the System devices to be reset
Light signal test	Allows the operation of the control panel LEDs and display to be tested
Zone test	Allows a System Zone to be selected and operation tests to be performed on its devices

TELECOMMUNICATION SECTION

The control panel integrates an IP telecommunication vector. The vector uses four TCP/IP communication channels that perform the functions shown in the "Communication channels" table.

Programming and Remote management
The System programming and remote management functions are handled by the LOCAL SERVER TECNOALARM and REMOTE SERVER TECNOALARM channels.

Report code notification
The TECNOSERVER TECNOALARM channel manages the 8 communicators that notify the System report codes. Each communicator notifies its associated report codes to the programmed destination IP address.
Report codes are transmitted with the communication protocol associated with the communicator.

Communication security
The proprietary communication protocol uses 128-bit AES encryption, and all incoming and outgoing communications can be authenticated by programmable passphrases.
Access to the LOCAL SERVER TECNOALARM and REMOTE SERVER TECNOALARM channels can be controlled with dedicated white lists listing the addresses allowed to access the channels.

Communication vector supervision
The operation of the communication vector can be supervised by the "Server cyclic test" function; the cyclic test interval (Reporting time) is programmable.

Telecommunication section expansion
The System telecommunication section can be expanded with other optional telecommunication devices, to extend the range of available services.

COMMUNICATION CHANNELS	
LOCAL SERVER TECNOALARM	Server channel for connection to the control panel over a local area network (LAN)
REMOTE SERVER TECNOALARM	Server channel for connection to the control panel over a WAN or VPN.
TECNOSERVER TECNOALARM	Client channel managing the 8 report code notification communicators and the Call back communicator
CALL BACK TECNOALARM	Client channel managing Call back communication and transmission of the Server cyclic test

COMMUNICATION PROTOCOLS						
Number	**Name**	**Description**	**Type**	**Classification**	**Encryption**	**Timestamp**
123	**SIA-IP**	SIA-IP Reporting (TCP-2007)	DATA	Standard	-	-
124	**SIA-IP-T**	SIA-IP-T Reporting (TCP-2007)			-	Managed
125	**C.ID-IP**	C.ID-IP Reporting (TCP-2007)			-	-
126	**C.ID-IP-T**	C.ID-IP-T Reporting (TCP-2007)			-	Managed
192	**TCPIP**	Tecnoalarm TCP/IP	DATA	High security	AES 128 BIT ENCRYPT	-

TFA2-596

ADDRESSABLE

MANAGEMENT INTERFACE

All the elements making up the System management interface are located on the front panel of the control panel.
The interface consists of: a 4.3" colour display showing the operating states and the management and programming menus, sixteen LEDs signalling operating states and faults, an extended keypad made up of a numeric keypad and command and management keys, and a loudspeaker emitting the acoustic signals.

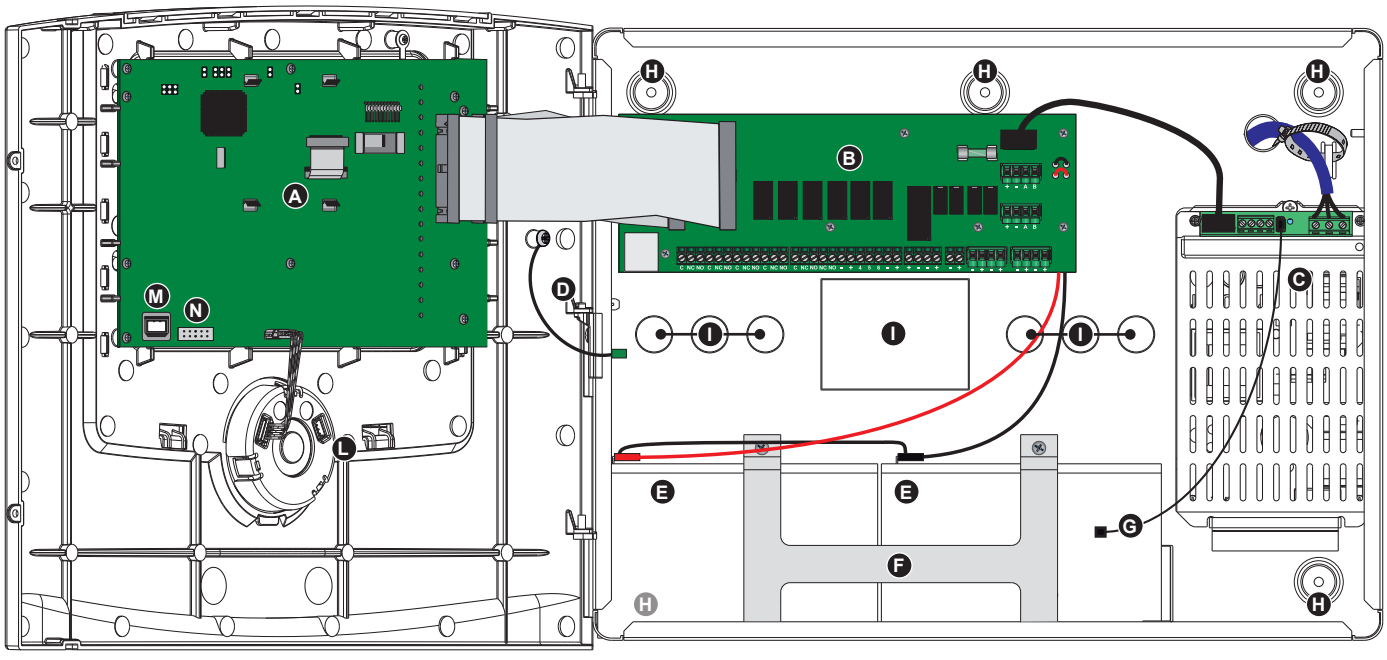
Visual and acoustic notification modes contextualised according to the relevance of the System operating states and the hierarchy of the signalled event.
Information displayed on several levels of detail allows quick classification of the signalled event and clear identification of its origin.
The Evacuation alarm signal is supplemented by the display of the associated alarm plan.

FRONT PANEL



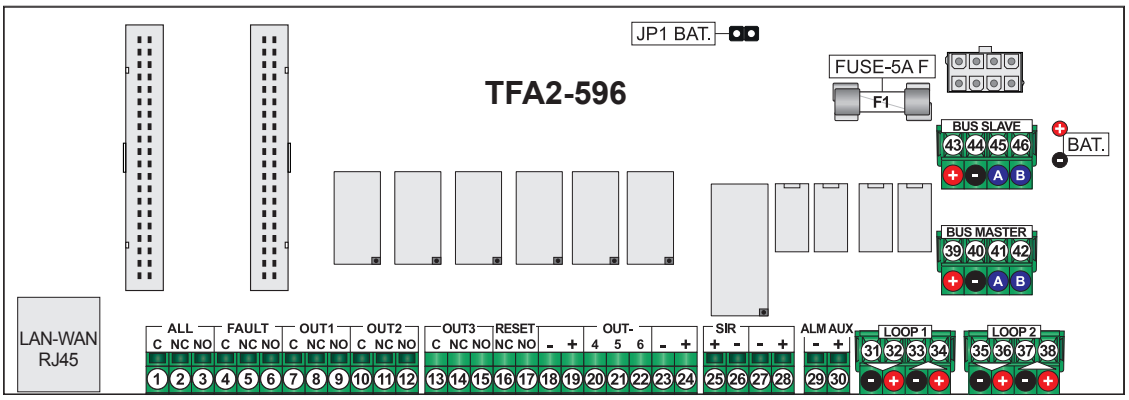
A	Signalling LED area	**B**	4.3" display	**C**	Management key area
D	Numeric key area	**E**	Acoustic signalling loudspeaker	**F**	Visual signalling diffuser

OVERALL VIEW



A	CPU board	**B**	Cable terminal board	**C**	ALSW285PFC power supply
D	Earth connection	**E**	12V 12Ah batteries	**F**	Battery retaining bracket
G	NTC battery temperature probe	**H**	Wall mounting holes	**I**	Cable entry slots
L	Acoustic signalling loudspeaker	**M**	USB port	**N**	TTL serial interface

CABLE TERMINAL BOARD



1	Alarm output Dedicated relay output Max 1A @ 30V DC	Common
2		Normally closed contact
3		Normally open contact
4	Fault output Dedicated relay output Max 1A @ 30V DC	Common
5		Normally closed contact
6		Normally open contact
7	Out 1 output Programmable relay output Max 1A @ 30V DC	Common
8		Normally closed contact
9		Normally open contact
10	Out 2 output Programmable relay output Max 1A @ 30V DC	Common
11		Normally closed contact
12		Normally open contact

13	Out 3 output Programmable relay output Max 1A @ 30V DC	Common
14		Normally closed contact
15		Normally open contact
16	Reset output Dedicated relay output Max 1A @ 30V DC	Voltage normally absent
17		Voltage normally present (+24V DC)
18	Power supply output 24V DC 1.5A max.	Power supply negative output
19		Power supply positive output
20	Programmable open collector outputs Max 150mA @ 24V DC	Output 4 (negative or high impedance)
21		Output 5 (negative or high impedance)
22		Output 6 (negative or high impedance)
23	Power supply output 24V DC 1.5A max.	Power supply negative output
24		Power supply positive output

25	Siren output Monitored relay output Max 1A @ 30V DC	Positive output (negative in alarm)
26		Negative output (positive in alarm)
27	Power supply output 24V DC 1.5A max.	Power supply negative output
28		Power supply positive output

29	Input for 24V DC auxiliary power supply	Power supply negative input
30		Power supply positive input

31	Loop 1 24V DC max. 500mA	Power supply negative (branch A outgoing)
32		Power supply positive (branch A outgoing)
33		Power supply negative (branch B return)
34		Power supply positive (branch B return)

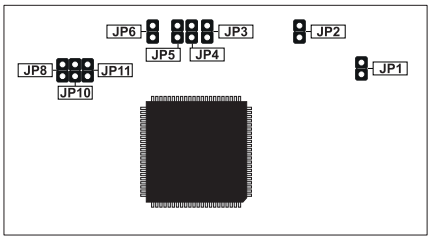
35	Loop 2 24V DC max. 500mA	Power supply negative (branch A outgoing)
36		Power supply positive (branch A outgoing)
37		Power supply negative (branch B return)
38		Power supply positive (branch B return)

39	BUS MASTER 24V DC max. 500mA	Power supply positive (max. 500 mA)
40		Power supply negative
41		RS485 channel A
42		RS485 channel B

43	BUS SLAVE 24V DC max. 500mA	Power supply positive max. 500mA
44		Power supply negative
45		RS485 channel A
46		RS485 channel B

JP1 - BATTERY DISCONNECTION JUMPER	
	Automatic battery disconnection for Vbat <18V DC
	The automatic battery disconnection function is disabled

CPU BOARD JUMPER AREA



KEY JUMPERS		
JP1	WDT	In normal operating conditions the jumpers must be left in the Open position. The jumper position is supervised. The jumpers are used to carry out the following procedures: Firmware update and Control panel configuration deletion.
JP2	RESET	
JP3	CLR	
JP4	BOOT	
JP5	PROG	
JP6	KEY	

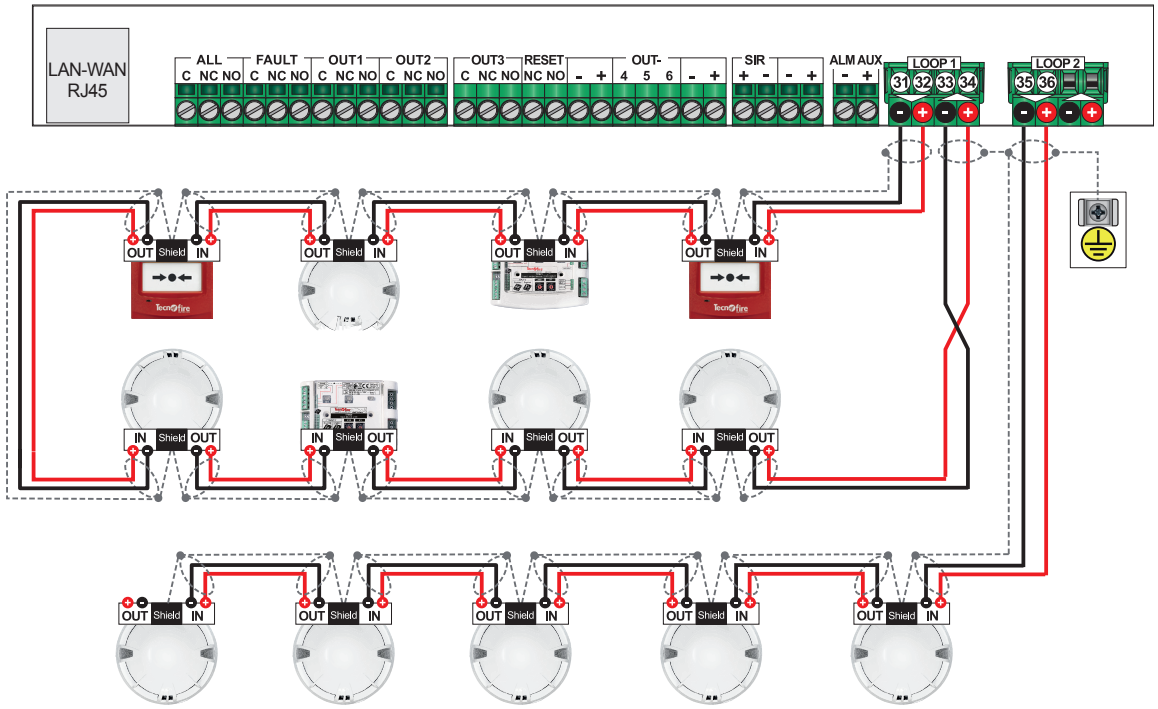
RS485 BUS BALANCING JUMPERS				
JP8 - JP10 - JP11		Open: Bus balanced on the last device		Closed: Bus balanced on the control panel

ADDRESSABLE

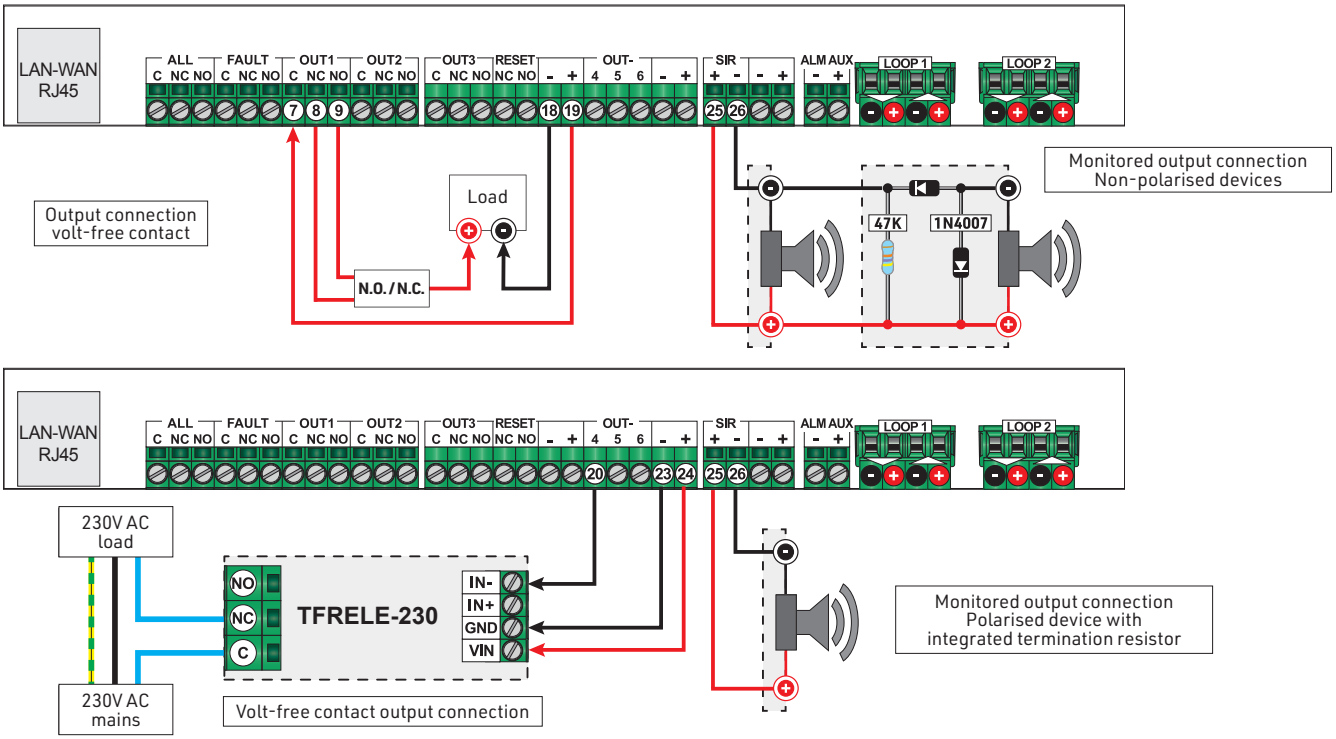
DETECTION LOOP CONNECTION

Up to 199 detectors and up to 99 modules can be connected on each detection Loop; the Loop can be connected in closed Loop or open Loop mode.
In open Loop mode, the EN 54 standard sets at 32 (detectors or modules) the maximum number of devices that can be connected on each branch of the detection Loop.
For the Loop connection, a two-core twisted shielded cable with flexible conductors is recommended; the conductor cross-section must be at least 0.5mm^2.
For electrical safety and rejection of induced interference, the cable shield must be connected so that it is never interrupted, always connecting, on each device, the shield of the input line to the shield of the output line. The cable shield must be connected to earth; the connection must be made at a single point, located inside the control panel cabinet, on the threaded stud for connecting the earth conductors, marked by the yellow sticker with the electrical earth symbol. The length of the detection Loop, made with cable of suitable cross-section, must never exceed 3000 metres.

LOOP CONNECTION



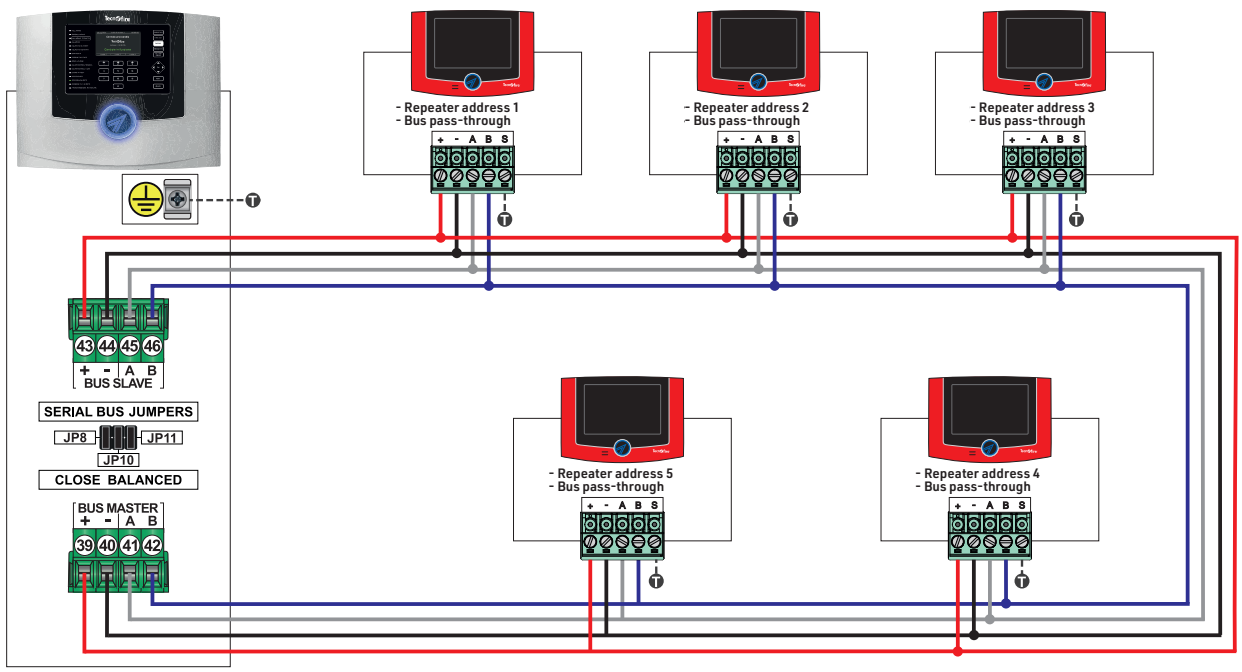
OUTPUT CONNECTION



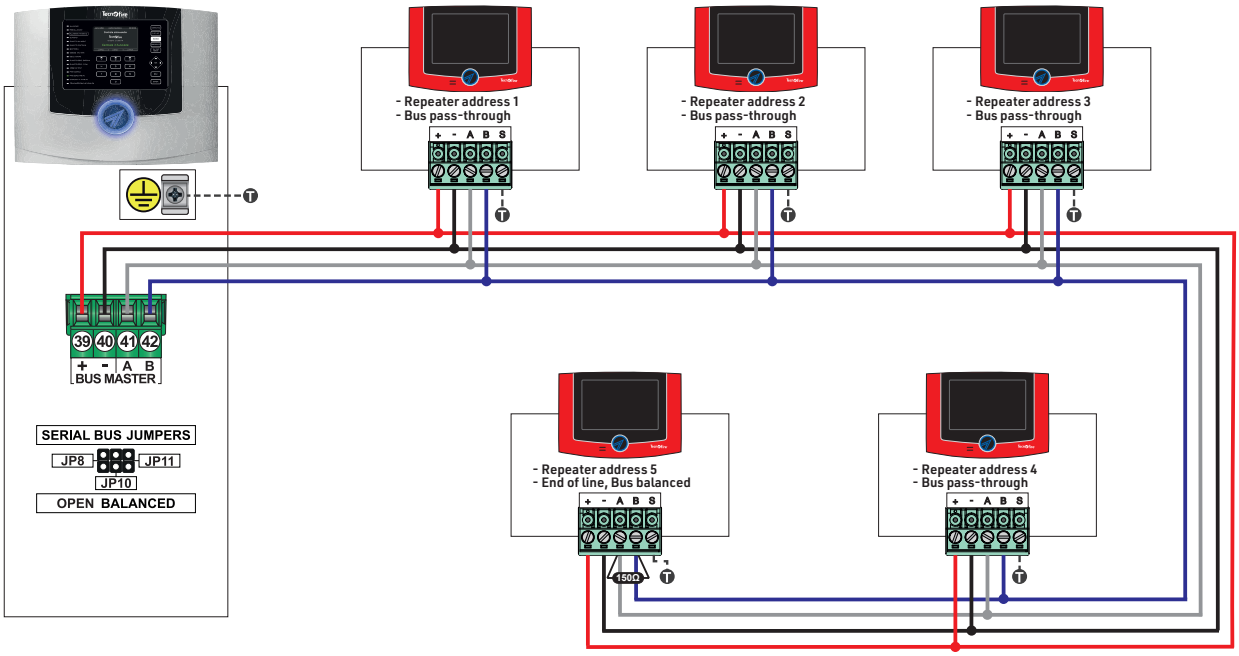
EXPANSION DEVICE CONNECTION

The control panel has two RS485 Bus lines, Master Bus and Slave Bus, used to connect the expansion devices, up to 16 devices. The two Buses can be connected in closed loop mode (the Master Bus closes on the Slave Bus) or in open loop mode (devices connected only on the Master Bus).
In the closed loop configuration the Bus must be balanced on the control panel; in the open loop configuration the Bus must be balanced on the last device connected on the line.
For the Bus line connection, a multicore twisted shielded cable with flexible conductors is recommended; the conductor cross-section must be proportional to the length of the line and to the current draw of the connected devices. For electrical safety and rejection of induced interference, the cable shield must be connected so that it is never interrupted, always connecting, on each device, the shield of the input line to the shield of the output line.
The cable shield must be connected to earth at a single point inside the control panel cabinet.
The maximum permitted length of the Bus line is 1000m; greater distances can be reached by using a fibre optic connection instead of the electrical cable.

RS485 BUS CONNECTION - CLOSED LOOP



RS485 BUS CONNECTION - OPEN LOOP



TFA2-596

Addressable control panel 2 Loops

TFA - SYSTEMS

Basic equipment	2 LOOPS · 8 RADIO SLOT · 300 ZONES · 100 VIRTUAL ZONES
Manageable devices	16 EXPANSION DEVICE · 396 DETECTORS · 198 MODULES · PRINTER
Automated management	200 FORMULAS (AND & NOT OR) · 100 ALARM PLANS · 32 ACCESS PERIODS (08:00 FROM 20:00 TO) · 4 CALENDAR YEARS

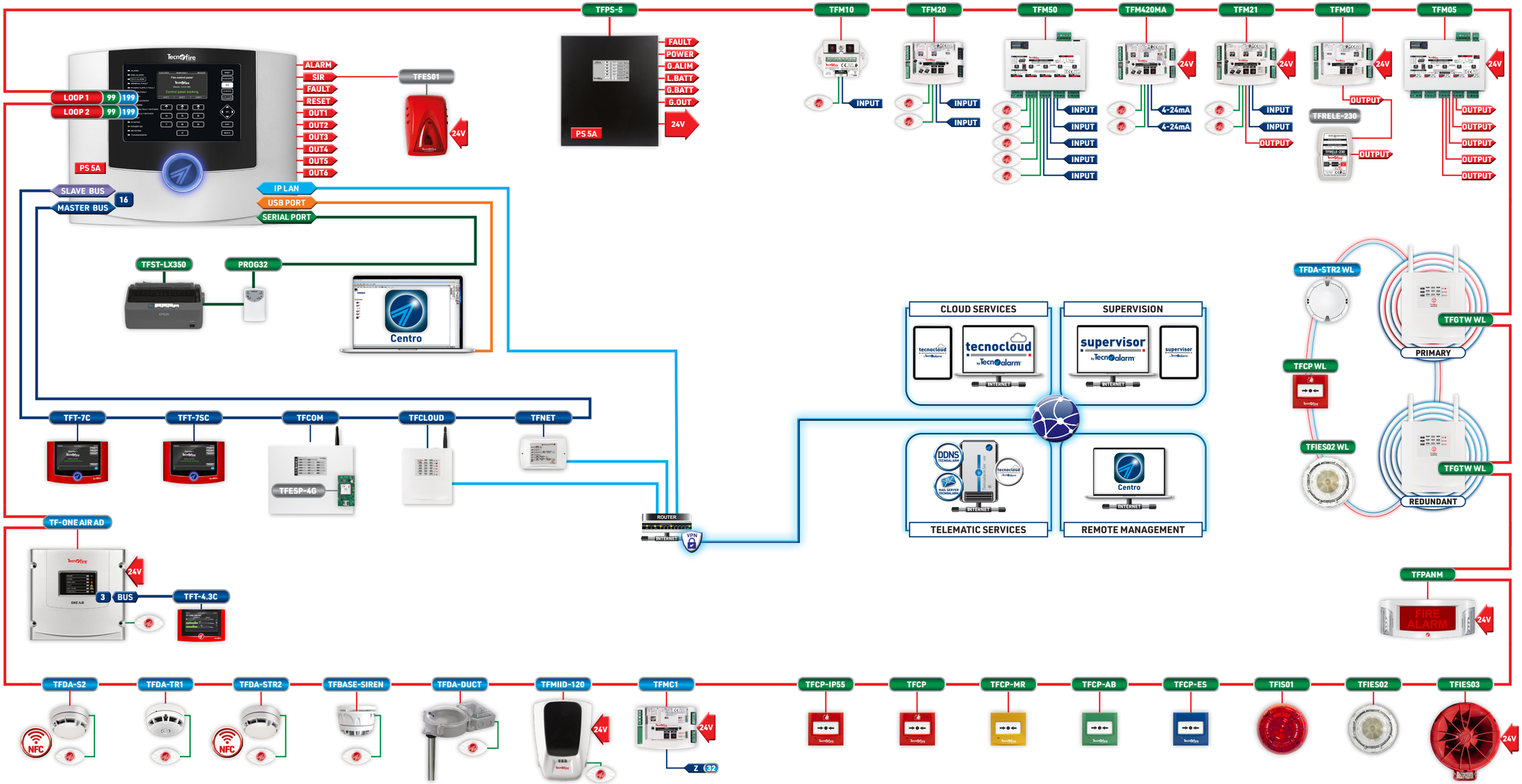
System configuration

Technologies	RSC
Advanced Management Services	tecnocloud · supervisor
Services	DDNS TECNOALARM · MAIL SERVER TECNOALARM · SNTP

Tecnofire DETECTION

IMQ EN 54-13 CERTIFIED

EN 54-13:2020 Compatibility and connectivity of system components

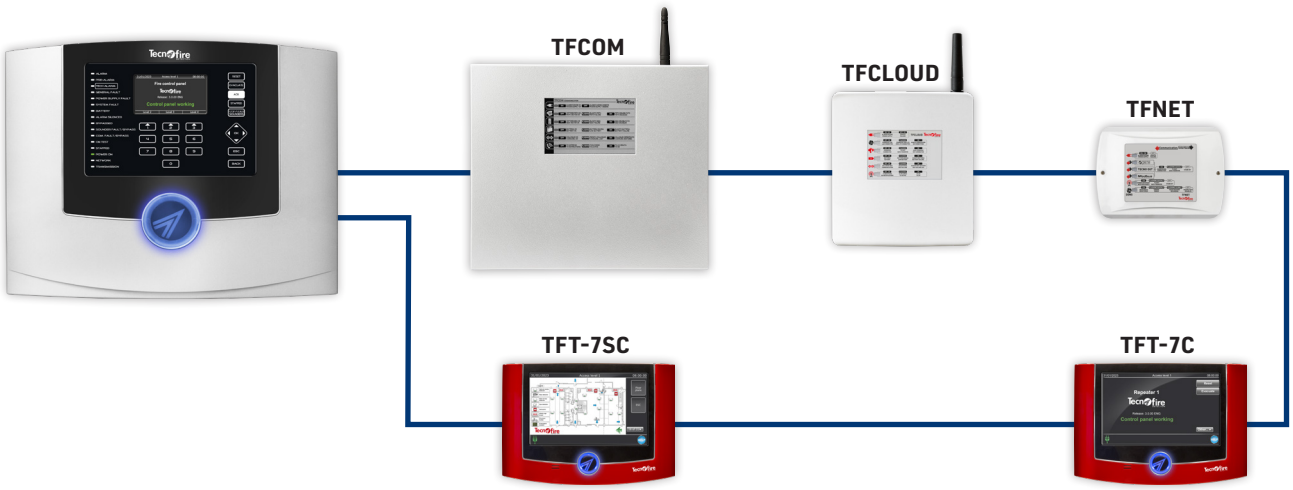


Expansion devices

MANAGED DEVICES

The TFA2-596 System can manage up to 16 expansion devices, connected on the control panel RS485 Buses.

MANAGEMENT DEVICES	TFT-7C	Repeater panel - System command management	Max. 16 devices
	TFT-7SC	Synoptic repeater panel - Zone repeater - System command management	
TELECOMMUNICATION DEVICES	TFCOM	Telephone communicator - PSTN and GSM 4G communication vectors	
	TFNET	Communication Interface - IP communication vector	
	TFCLOUD	Communication Interface - IP and LTE communication vectors	



Telecommunications: services and functions

Devices	Vectors	DDNS	PWA Tecnofire	Notifications	Voice	Digital	Remote management	Supervisor	Tecno out	Modbus	CMS
Integrated	IP	-	-	-	-	✓	✓	-	-	-	✓
TFCOM	PSTN	-	-	-	✓	-	-	-	-	-	-
TFESP-4G	GSM-LTE	-	-	SMS	VoLTE	✓	✓	-	-	-	✓
TFNET	IP	✓	-	E-Mail	-	✓	✓	✓	✓	✓	✓
TFCLOUD	IP / LTE	-	✓	-	-	-	-	-	-	-	-

Control panel network

NETWORK CONFIGURATION

The Tecnofire System can consist of several control panels, up to a maximum of 16 units, networked together via the RS485 Fire-Bus. The control panel network infrastructure can be made with copper or fibre optic cables.
The network hierarchy consists of one Master (main) control panel and up to 15 Slave (subordinate) control panels. The Master control panel has full control of the Slave control panels; all information and signals generated by the Slave control panels are conveyed to the Master control panel. Only TFA2-596 or TFA4-1192 control panels can act as Master.
TFA2-596, TFA4-1192 and TSA1 control panels can act as Slave.
The operation of the Control panels in network mode complies with the current EN 54-13 standard.
Regulatory restriction: EN 54-2, clause 13.6, requires that, in the event of a fault, no more than 512 fire detection points and/or manual call points and their mandatory functions are affected.
Consequently, to maintain compliance with EN 54-2, no more than 512 detection devices and/or manual call points can be installed on each control panel. Therefore, the maximum number of detection points that can be managed by a network of Tecnofire control panels is 8,192 points (maximum 512 points for each of the 16 control panels).



Networked control panels: managed devices and functions

	TFA2-596	TFA4-1192	TSA1 BASE	TSA1 LIMITED	TSA1 EXTENDED
Role in the System	**Master / Slave**	**Master / Slave**	**Slave**	**Slave**	**Slave**
Expansion devices	16	16	5	5	5
Detection loops	2	4	1	1	1
Integrated EDU	-	-	1	1	1
Managed detectors	398 (199 x 2)	796 (199 x 4)*	32	64	199
Managed modules	198 (99 x 2)	396 (99 x 4)	16	32	99
Managed EDU modules	-	-	-	5	9
Managed zones	200	300	5	50	150

TFA2-596

Addressable control panel 2 Loops

Technical and functional specifications

General information	Addressable fire detection control panel	**TFA2-596**
Control panel equipment	Detection loops	**2**
	Managed radio slots	**8**
	System bus	**Master Bus Slave Bus**
	Display	**Colour 4.3" TFT 480 x 272 pixel**
	Voice synthesis	**Vocabulary customisable**
	Event buffer capacity	**8.192**
Detection and signaling	Addressable detectors	**396 (199 x Loop)**
	Addressable modules	**198 (99 x Loop)**
	Detection zones	**200**
	Virtual detection zones	**100**
	Default Zone	**1**
	Specialised relay outputs Max 1A @ 30V DC	**Alarm Fault Reset**
	Monitored relay output Max 1A @ 30V DC	**Siren**
	Relay outputs Max 1A @ 30V DC	**3 programmable**
	Open collector outputs Max 150mA @ 24V DC	**3 programmable**
System management	Access levels	**4**
	Access codes	**10**
	Monitored system mode	**Programmable**
Automated management	Formulas	**200**
	Alarm plans	**100**
	Time periods	**32**
	Programmable calendar	**Quadrennial or perpetual**
	Cyclic communication test	**Programmable**
Communication protocols	Detection loop	**FIRE-SPEED**
	Master and Slave Bus	**FIRE-BUS**
Equipment	Management interface	**USB port**
TLC features	Telecommunication vector	**IP**
	TCP/IP Server channels	**Local Server Remote Server Tecnoserver Call back**
	TCP/IP Client channels	**8 + 1**
	IP addresses	**8 + 8 (24 characters)**
	Report codes	**15 categories**
	Call event queue	**64 events**
	Communication protocols	**5**
	Encryption	**AES 128 bit**
	Passphrase authentication	**32 characters**

System expandability	Expansion devices	**Max. 16**
	Management devices	**TFT-7C TFT-7SC**
	Telecommunication devices	**TFCOM TFNET TFCLOUD**
	Serial printer	**TFST-LX350**
	Role in a network of control panels	**Master or Slave**
Electrical specifications	Consumption	**200mA @ 24V DC**
	Supply voltage for external devices	**20V...27.6V DC**
Power supply	Modular power supply	**Type A (switching flyback)**
	Operating voltage	**230V AC +10% -15% 50Hz**
	Max. consumption	**700mA AC**
	Nominal values	**5A @ 27.6V DC**
	Maximum output current	**I max 5A**
	Ripple max	**≤150mVpp (<1%)**
	Protection fuse	**T-1.6A**
Battery	Capacity	**2 x 12V-12Ah**
	Flammability class	**UL94-V2 or higher**
	Internal resistance	**Max. 1.5Ω**
	Release voltage	**Vbat <17.6V**
	Charging time (2 x 12V-12Ah)	**100% in 24h**
Physical specifications	Environmental class	**3K5 EN 60721-3-3:1995**
	Operating temperature	**-5°C...+40°C**
	Relative humidity (non-condensing)	**10%...93%**
	Protection class	**IP3x**
	Casing	**Aluminium - Steel**
	Dimensions (L x H x D)	**441 x 347 x 149mm**
	Weight	**6.2kg**
Conformity	Fire detection control panel	**EN 54-2: 1997 + A1:2006**
	Power supply	**EN 54-4:1997 + A1:2002 + A2:2006**
	System compatibility	**EN 54-13:2020**
	Certification number	**0051-CPR-0389**
	Year of CE marking	**14**
	Number of declaration of performance	**003_TFA2-596**
	Notified body	**IMQ**

N.B. Declarations of conformity and performance are available at www.tecnofiredetection.com

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Product specifications are subject to change without notice.