

Fire detection and extinguishing system



TSA1									
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Fire detection and extinguishing addressable control panel. Equipped with one detection loop and one extinguishing unit EDU [Extinguish Device Unit]. The detection loop can manage up to 199 detectors, 99 modules and 9 EDU extinguishing modules. Built-in 2 dedicated RS485 serial buses, for connecting expansion devices, up to 5 devices chosen among: repeater displays and / or communication devices. The serial buses also allow the connection to a master/slave network of Tecnofire control panels.

The control panel manages 150 detection zones that can be associated with 100 alarm plans. 8 time ranges. Advanced management with adaptive logic, determined by the application of algebraic formulas, which relate dynamically the functional states of the system devices. 100 algebraic formulas. 100 virtual detection zones.

Integrated EDU extinguishing unit, with automatic or manual operating mode. 3 inputs for conventional detection zones with single or double knock alarm, with detection logic programmable by the formula. 7 controlled management inputs. 4 controlled actuation outputs. Extinction cycle subject to 4 different strategies. 5 specialized signaling outputs. Centralized or local management of 10 independent EDU extinguishing units, with local or centralized extinguishing cycle control, even with sorting valves.

User interface: 4.3" color display for programming and management, soft touch keyboard, 33 signaling LEDs.

Complete RSC® management of the system: programming, remote management and control.

Customizable or perpetual four-year calendar management. Event memory managed in FIFO logic capacity 8192 events.

2.7A modular switching power supply. Battery compartment: 2 x 12V-7Ah. Metal housing with ABS front door. Degree of protection IP3x. Available in colors: White, Gray, Red, Yellow. Dimensions (W x H x D) 440 x 345 x 146mm.

Control panel compliant **EN 54-2**: 1997+ A1: 2006 - **EN 54-4**: 1997+ A2: 2006 - **EN 12094-1**: 2004.

Code: TF1TSA1-IT

OBLIGATIONS AND WARNINGS

The TSA1 addressed fire detection and extinguishing control panel has been designed as part of an ISO 9001 quality management system, that foresees the application of a series of rules for the project phase and plans all subsequent testing and control necessary for its production.

All the components used have been selected for the intended purposes, their characteristics are ensured when the environmental conditions outside the container cabinet correspond to those specified for class 3K5 of EN 60721-3-3: 1995.

Indoor use: the control unit must be installed in a location protected from bad weather, temperature and humidity control is not required in the installation environments.

For the best use of the product, all system design and installation activities must be carried out in compliance with current regulations.

RSC® FUNCTIONS

The RSC® functions of Tecnofire constitute the real added value of the TSA1 System. The RSC® functions allow you to program, monitor and manage all the devices of the TSA1 System, locally or remotely. Among the available functions, the most significant are:
Hardware consistency - The tool analyzes the programming of the System and records the operating parameters and the hardware and software identification data of the devices.

Parametric analysis - It uses the data recorded by the Hardware Coherence as a reference and reports any deviations from the values previously recorded.

Device Monitor - Selects the devices in the system to monitor their operating parameters.

With the RSC® functions it is also possible to automatically create a series of report files, which document the functional status of the system and certify the maintenance checks and complete compliance with the requirements.

Fire detection and extinguishing system

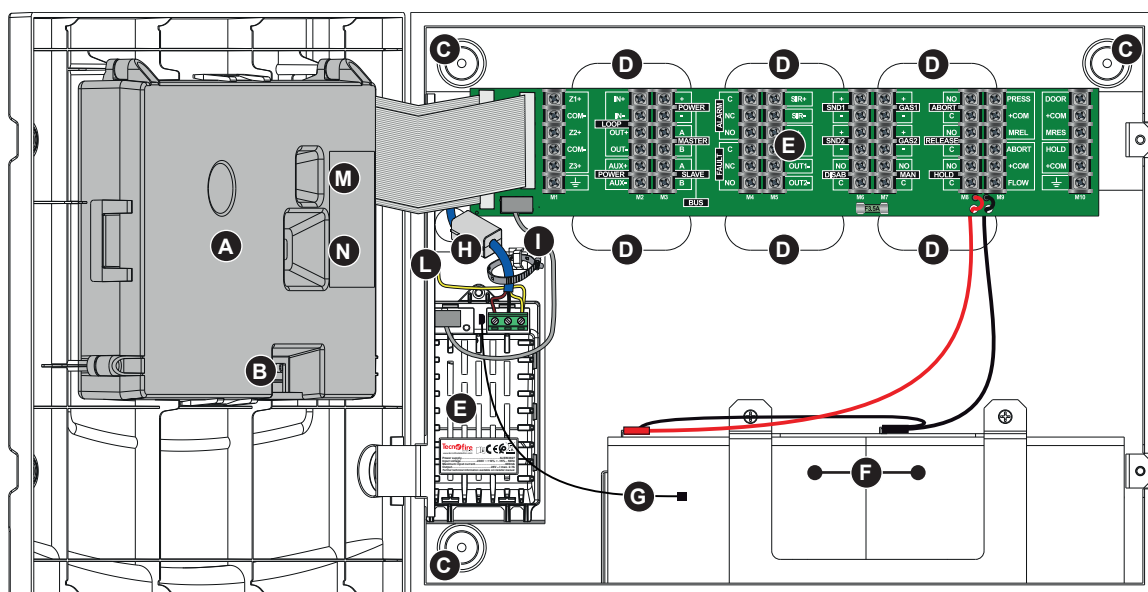
SOFTWARE LICENSES

The TSA1 control unit is available in three versions: TSA1 BASE, TSA1 LIMITED and TSA1 EXTENDED. The EXTENDED version is the most complete. Purchasing the software licenses, it is possible upgrading at any time the BASE control panel to a LIMITED or XTENDED version, to manage an improved number of devices, see table.

License from BASE to LIMITED	Code: TFABIL-LIM
License from LIMITED to EXTENDED	Code: TFABIL-EXT



A Display 4.3"	C Navigation Buttons	E Common Signaling LEDs
B Keyboard	D Control Buttons	F Extinguishing Signaling LEDs



A CPU protection cover	E Power Supply ALSW2827	I Support for cables anchors
B USB Port	F Batteries 2 x 12V-7.2Ah	L Housing earth connector
C Installation holes	G NTC battery temperature sensor	M Bus resistors jumpers
D Cables entries	H Ferrite protection	N Service jumpers

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USER INTERFACE

User interface consists of: color graphic display, 33 signaling LEDs, extended system programming and management keyboard, buzzer for acoustic signals, vocal synthesis provided by repetition panels.

The graphic display shows the various functional states with dynamic icons referred to the single event, the information is displayed based on the priority of the event incoming.

The colors and the variable size of the graphic font are used to highlight the notifications based on the relevance. The display of alarm information, structured on multiple levels of detail, allows for quick classification and clear identification of the origin of the alarm; the data is integrated with the visualization of the alarm plan associated with the zone the event is detected.

Control panel icons meaning

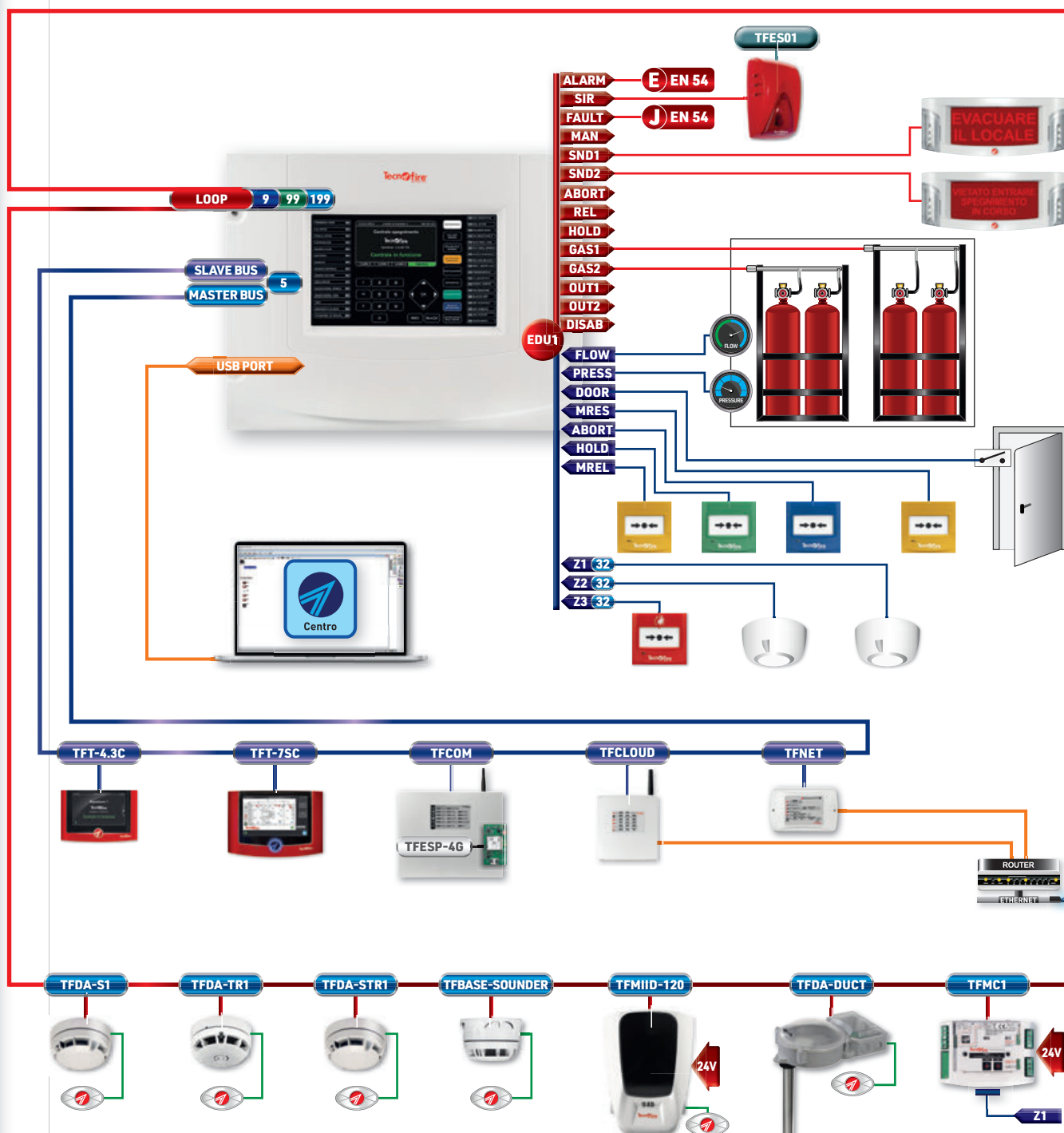
	The icon indicates the lack of power supply from the electrical network. The signal is displayed at the end of the delay programmed for the mains failure signal.		The icon indicates that the extinguishing agent release is in progress.
	Control unit battery power monitor. The icon indicates that the control unit battery charge current is insufficient.		The icon indicates that the extinguishing agent is being released from the reserve cylinder.
	Control unit battery power monitor. The icon indicates that the battery is disconnected or cannot be charged due to a high internal resistance.		The icon indicates that the extinguishing cycle has been blocked, with the "Block extinction" control (ABORT).
	Control panel main power monitor. The icon indicates that the control unit power supply is faulty and therefore it is not able to charge the battery.		Reconnaissance pause signal in progress. The icon indicates that the extinction cycle has been paused with the "Reconnaissance" control (HOLD).
	The icon indicates that a cable or a device of the System has an anomalous leakage towards the earth of the electrical system.		The icon indicates that the door that delimits the area subject to the release of the extinguishing agent is open.
	The icon indicates a System failure (see table "System Failure Events") and / or the activation of the evacuation command.		The icon indicates that the control panel signaling outputs are switched off.
	The icon indicates the presence of a system fault. In other words, all the Faults associated with generic events of the Control unit or System. See table "Fault events".		The icon indicates that the device indicated in the descriptive note is excluded from operation (device out of service).
	The icon indicates that the device or function specified has a fault state. See table "Fault events".		The icon indicates that the repetition outputs of the control panel are excluded from operation (outputs out of service).
	The icon indicates that the control unit is unable to communicate with the expansion devices connected on the System Bus.		The icon indicates that the auxiliary outputs of the internal EDU: DISAB, MAN, ABORT, REL HOLD, OUT1 and OUT2 are excluded from operation (outputs out of service).
	The icon indicates that the device indicated in the descriptive note is in the Prealarm state: Sensor, Module or Zone.		The icon indicates that the alarm panels and the extinguishing valves of the internal EDU are excluded from operation (devices out of service).
	The icon indicates that the device indicated in the descriptive note is in the Alarm state: Sensor, Module or Zone.		The icon indicates that the detector indicated in the descriptive note requires maintenance. Cleaning of the analysis chamber or of the optical detection devices.
	The icon indicates that the EDU (extinguishing unit) indicated in the descriptive note is in the Pre-activation state.		The icon indicates that the EDU indicated in the descriptive note has been forced into "manual operation mode", therefore the EDU extinguishing unit cannot activate automatically.
	The icon indicates that the EDU (extinguishing unit) indicated in the descriptive note is in the Activation state.		The icon indicates that the EDU indicated in the descriptive note has been disabled, excluded from operation (EDU out of service).
	The icon indicates that the "Main valve activation delay" time is counting down.		The icon indicates that an anomaly has been detected in the extinguishing agent delivery flow.
	The icon indicates that the extinction cycle has been manually activated.		The icon indicates that a cylinder pressure anomaly has been detected.
	The icon indicates that the main valve has been activated.		The icon indicates that the device under Test indicated in the descriptive note is triggered: Sensor, Module or Zone.

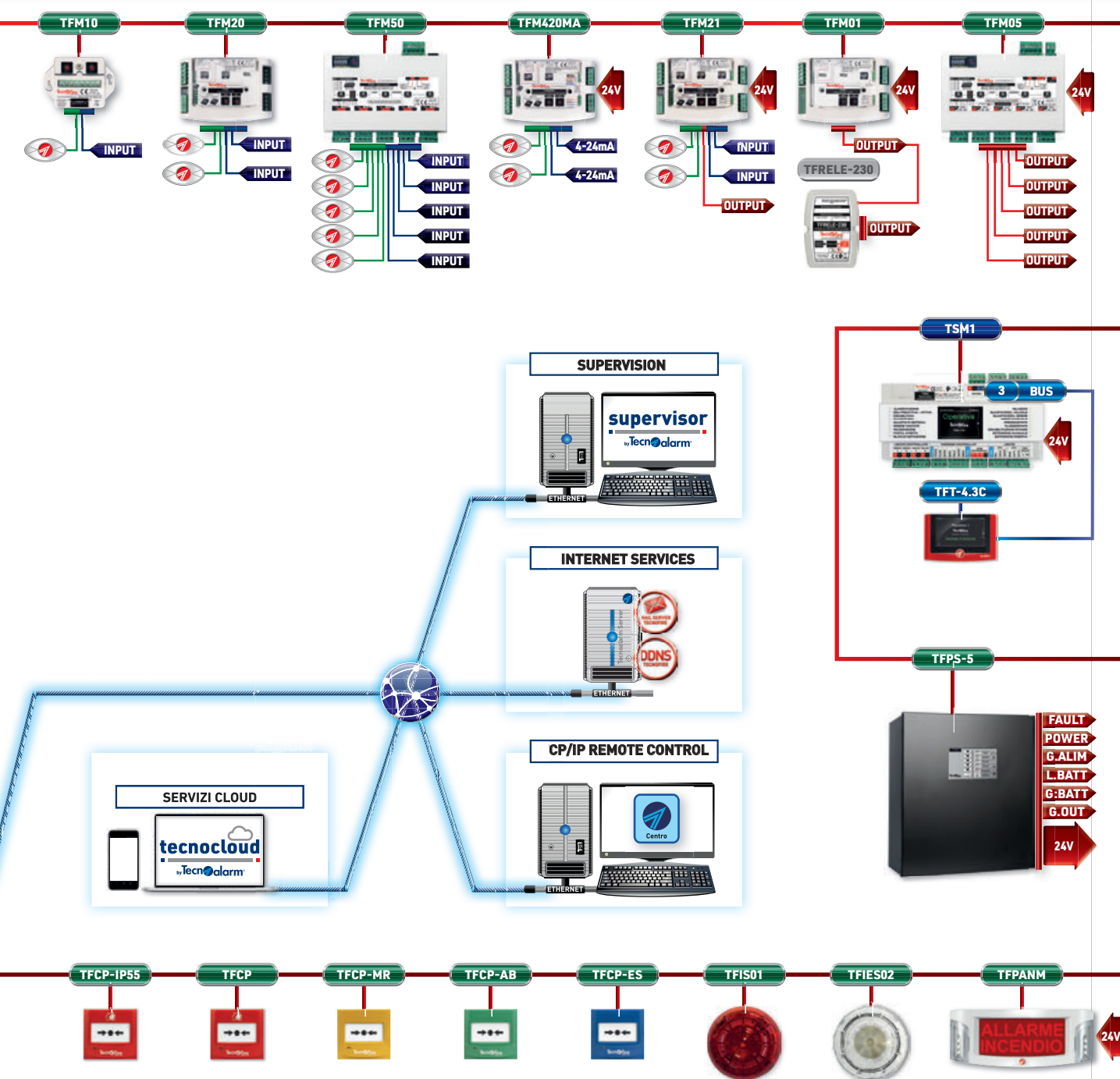
TSA1 System Configuration

EN
54-13

System Compliant to
UNI EN 54-13:2020

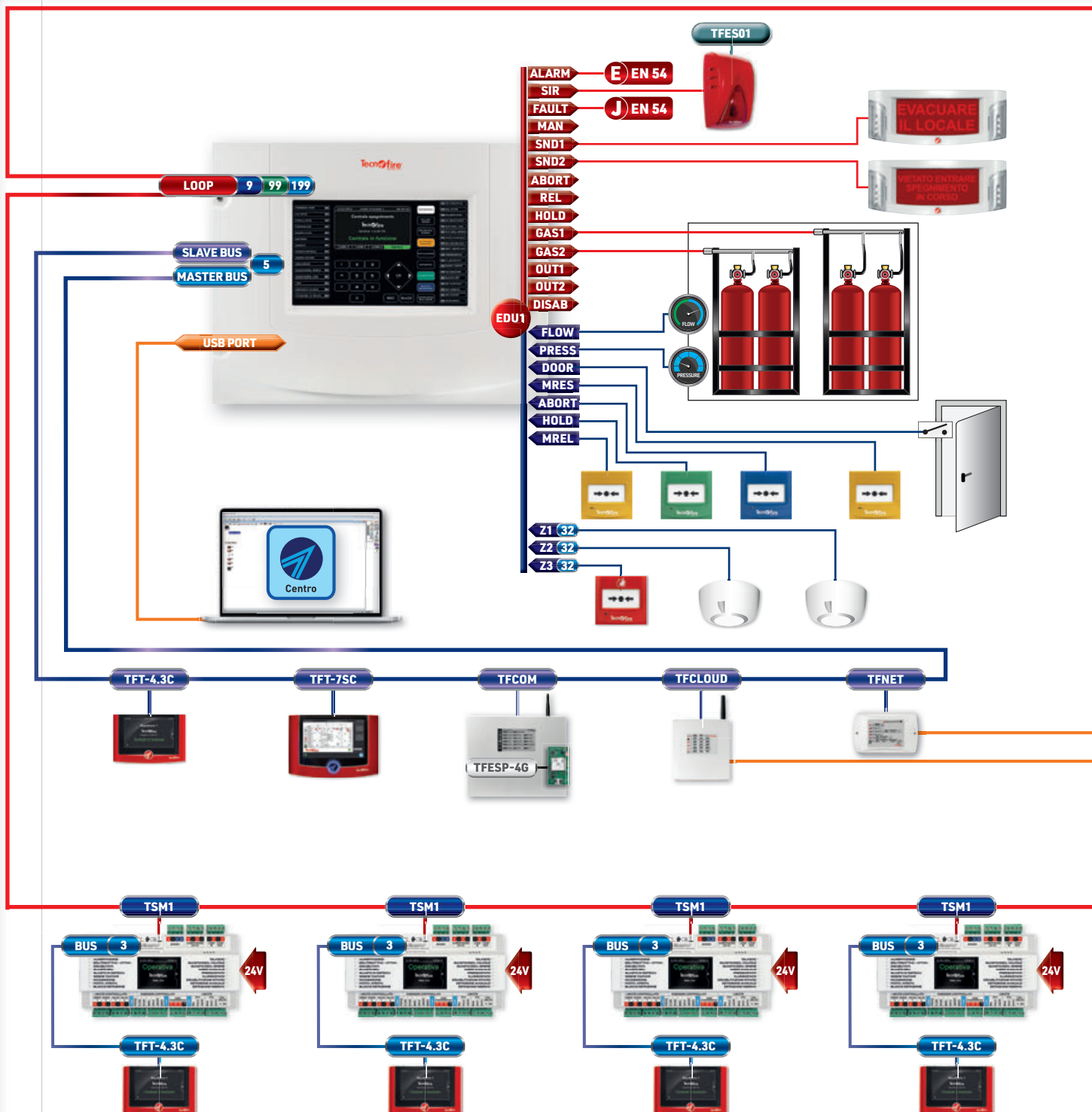
	TSA1 BASE	TSA1 LIMITED	TSA1 EXTENDED
Detection loop lines	1	1	1
Integrated EDU	1	1	1
Detectors supported	32	64	199
Modules supported	16	32	99
TSM1 supported	-	5	9
System Zones	5	50	150
System Virtual Zones	5	50	100
Extension Bus devices	5	5	5





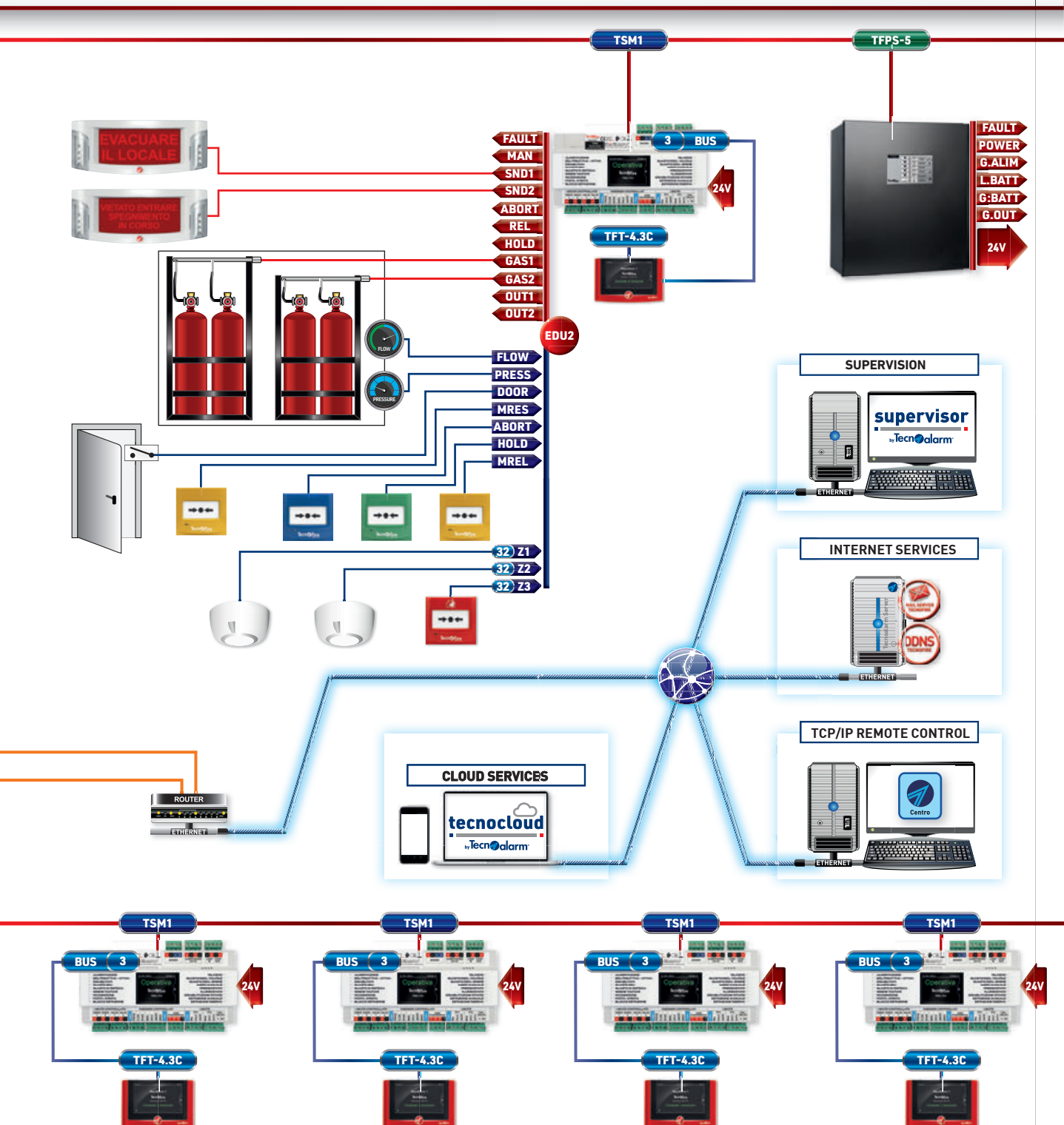
TSA1 System Configuration

	TSA1 BASE	TSA1 LIMITED	TSA1 EXTENDED
EDUs supported	1	1 + 5 TSM1 modules	1 + 9 TSM1 modules
System Zones	5	50	150
System Virtual Zones	5	50	100
Conventional Zones	3	3 for each EDU	3 for each EDU
Controlled inputs	7	7 for each EDU	7 for each EDU
Valves and Sounds outputs	2 + 2	2 + 2 for each EDU	2 + 2 for each EDU
Bus displays	3	3	3



Extinguishing Modules EDU

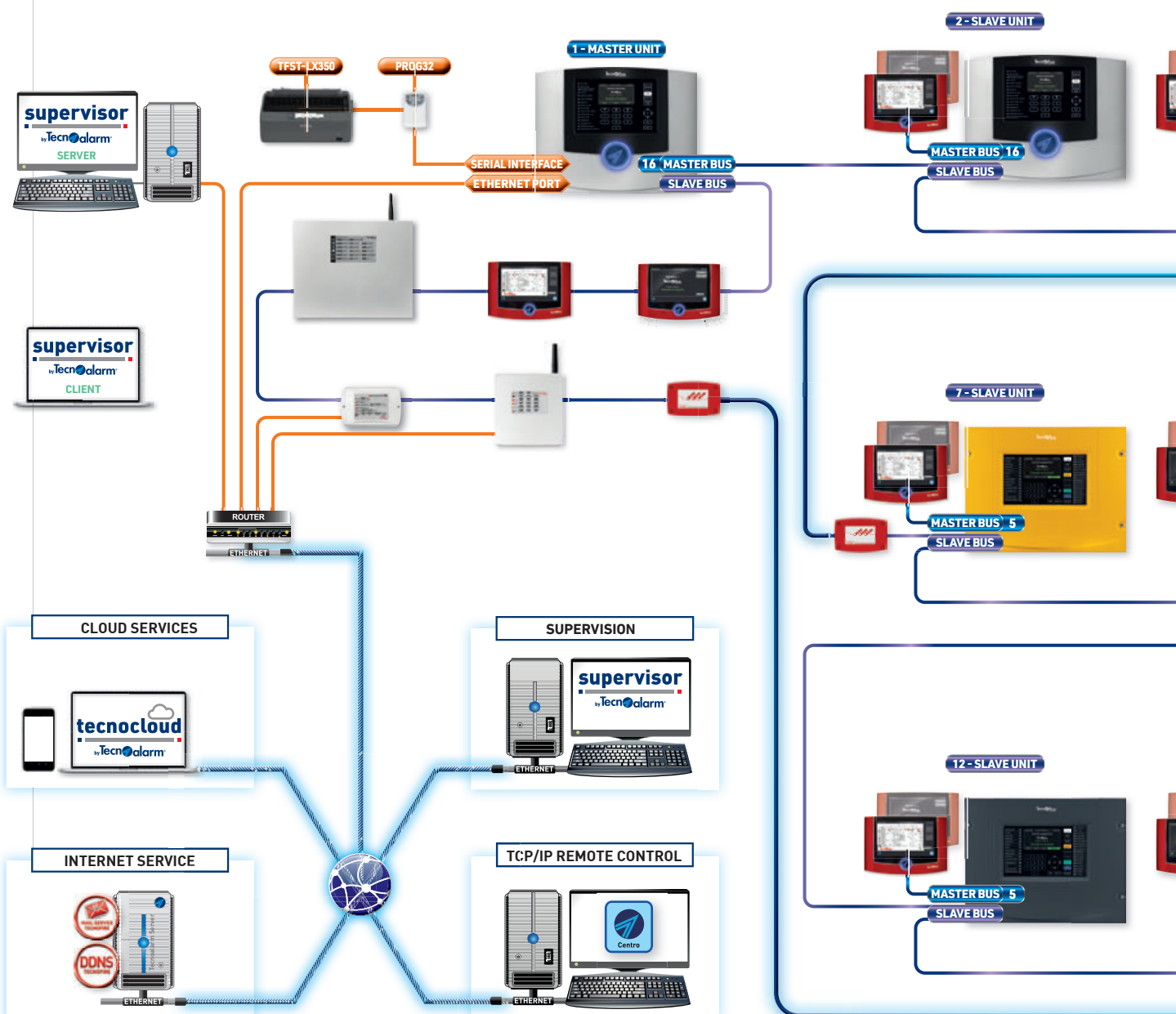
The TSA1 control unit is available in three versions: Base, Limited, Extended.
All versions integrate an EDU extinguishing unit.
The Limited and Extended version can manage additional extinguishing modules TSM1 (EDU), connected through the detection loop line.
The Limited version manages the integrated EDU plus 5 over 5 TSM1 modules.
The Extended version manages the integrated EDU plus 9 over 9 TSM1 modules.
Each EDU extinguishing unit is equipped with 3 conventional detection zones.
In configuration phase the conventional zones can be replaced with any system detection zone composed of detectors and / or addressed modules.



Network Configuration

	TFA2-596	TFA4-1192	TSA1 BASE	TSA1 LIMITED	TSA1 EXTENDED
System Role	Master / Slave	Master / Slave	Slave	Slave	Slave
Extension Bus Devices	16	16	5	5	5
Detection Loop Lines	2	4	1	1	1
Integrated EDU	-	-	1	1	1
Detectors supported	398 (199 x 2)	796 (199 x 4)*	32	64	199
Modules supported	198 (99 x 2)	396 (99 x 4)	16	32	99
EDU Modules supported	-	-	-	5	9
System Zones	300	300	5	50	150

*The EN 54-2 standard allow to connect up to 512 detection devices and / or manual alarm points on a single control panel. Therefore, the maximum number of detection points that can be managed by a network of Tecnofire control panels is 8.192 points (512 points for 16).





Control Panels Network

The Tecnofire system can be designed with several control units, up to a maximum of 16 units, connected one to each other in the network via RS485 Fire-Bus.

The infrastructure of the network can support copper or fiber optic multimode cables. The network roles include a Master (main) control panel and up to 15 Slave (sub) control panels.

The Master control unit has complete control of the Slave control units, all information and signals generated by the Slave control units are conveyed to the Master control unit.

The role of Master control panel can only be assumed by the detection control panels: TFA2-596 or TFA4-1192.

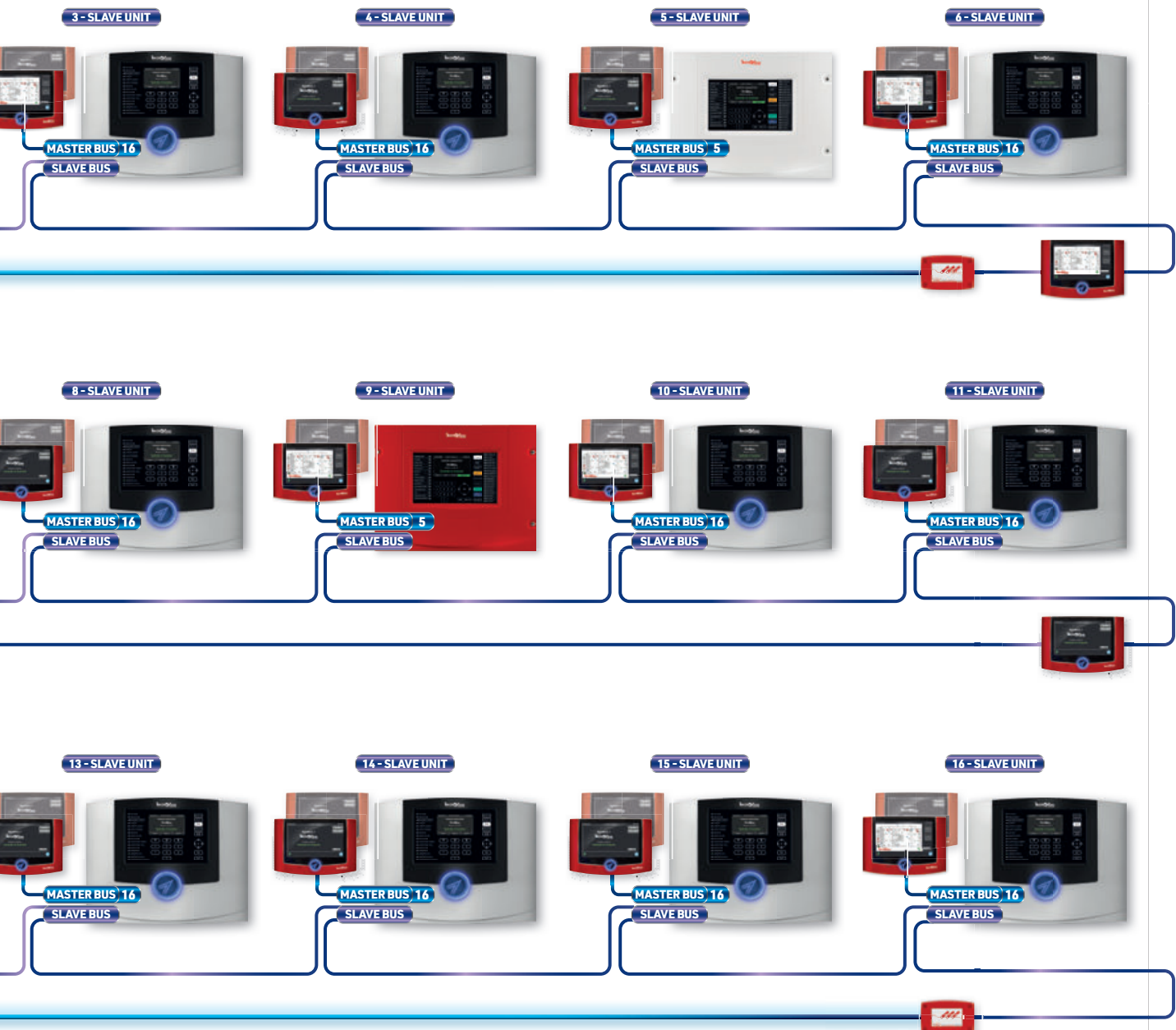
The role of Slave control panel can be assumed by the detection control panels TFA2-596, TFA4-1192 and the TSA1 detection and extinction control panel.

The operation of the Control units in network mode complies with the current EN 54-13 standard.

Restriction: EN 54-2 chapter 13.6 provides 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 the EN 54-2 standard, it is not possible to connect more than 512 detection devices and / or manual call points on a single control unit.

Therefore, the maximum number of detection points that can be managed by a network of Tecnofire control panels is 8.192 points (512 points maximum for each of the 16 control panels).



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WIRING METHODS

The cables used for connecting the devices must comply with the European regulation CPR EU 302/2011. During wiring phase, it is necessary to comply with the installation rules established by the local standards. It is the installer's responsibility to inquire about the rules and obligations that must be respected. The European directive of reference is the LVD 2006/95 / EC low voltage directive.

For reasons of electrical safety, the connection of the cable shield must maintain electrical continuity in its own path, without interruptions, one of the two ends of the shield must be connected to the earth of the electrical system, the connection must be made inside the fire detection control panel housing.

For the Loop line it is recommended to use a bipolar, twisted cable, shielded with flexible conductors. The cable section must be fitted for the length of the line and the consumption of the connected devices. The maximum length of the detection loop must not exceed 3.000 meters. For sizing of 24 V power lines, calculate the electrical load and the voltage drop due to the extension of the line.

The maximum length of the RS485 bus line is 1000 meters. It is possible to reach longer distances using a multimode fiber optic connection, through RS485 Fiber converters type TFSFC01.

Loop length / Section	
Length	Minimum section of wires
1000m	1 mm ²
1500m	1,5 mm ²
3000m	2,5 mm ²

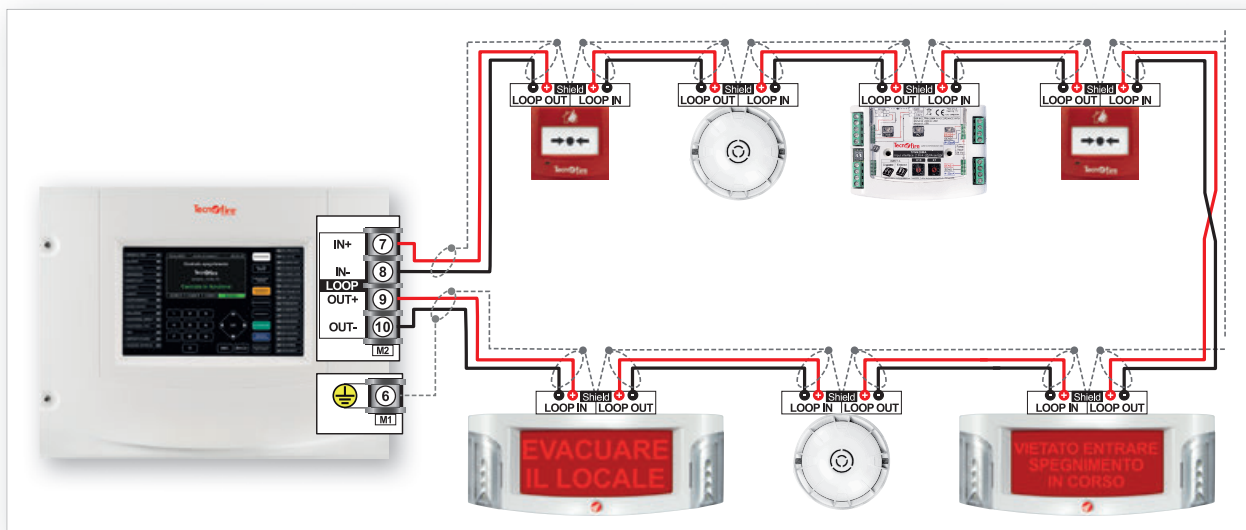
Note - Indicative data, for a correct sizing of the cable it is necessary to calculate the consumption of the devices

CONNECTION OF THE DETECTION LINE

it is possible connect to the Loop Line: 199 detectors, 99 modules and 9 TSM1 extinguishing modules.

The detection loop can be connected in open loop or closed loop mode.

The local installation regulations define the methods and limitations of use of the open loop connection configuration.



Available Colors



Code: TF1TSA1G-IT



Code: TF1TSA1R-IT



Code: TF1TSA1Y-IT

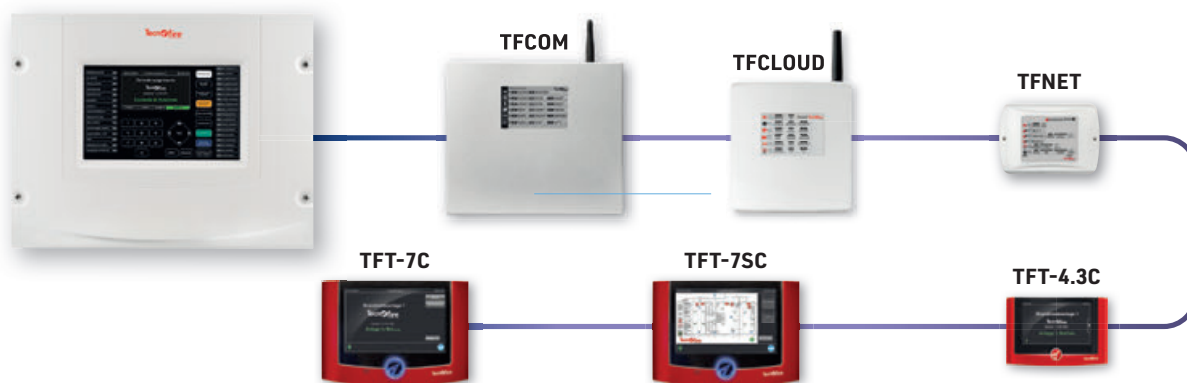


Code: TF1TSA1-IT

Fire detection and extinguishing system

EXPANSION DEVICES

The TSA1 control panel can manage up to 5 expansion Bus devices. The expansion devices managed can be indifferently: Display panels, Synoptic repeater panels, Telephone dialers, Communication devices.



TFT-4.3C	Small Display repeater with interactive controls	Max. 5 devices
TFT-7C	Large Display repeater with interactive controls	
TFT-7SC	Synoptic repeater panel with graphic maps and interactive controls	
TFCOM	Telephone dialer PSTN and GSM 4G	
TFNET	LAN communicator over IP	
TFCLLOUD	CLOUD communicator over IP and GSM 4G	

MANAGEMENT SOFTWARE

The TSA1 system can be programmed and managed with several software modules. To be able to manage remotely, the TSA1 system must be equipped with a TFNET or TFCLLOUD telecommunication device.

Programming

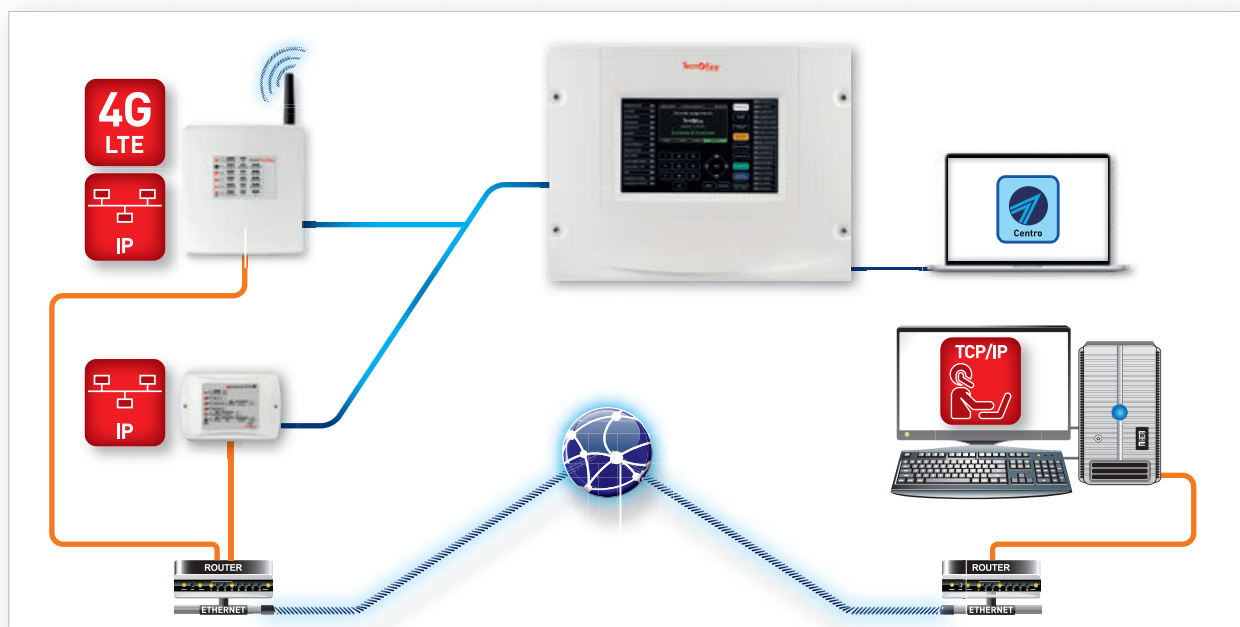
The Centro software allows you to program and manage Tecnofire Systems locally via USB port or remotely via LAN network connection.

TCP / IP remote management

The TCP / IP remote management software allows you to program and manage Tecnofire Systems from a remote location, via Ethernet WAN network connection.

Supervisor

The Supervisor software is a supervision platform, with modular architecture, suitable for any application area, from simple systems to more complex systems.



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TSA1 - Technical and functional specifications

Generic information	Fire detection and extinguishing panel	TSA1 EXTENDED	Communication protocols	Detection loop	FIRE-SPEED
	EDU extinguishing module supported	1 integrated + 9 modules		BUS Master and Slave	FIRE-BUS
Control unit provisions	Detection Loop	1	Built-in	Configuration interface	USB port
	EDU extinguishing channel	1	System expandability	Extention devices supported	5
	System bus	Bus Master Bus Slave		Panel displays and repeaters	TFT-4.3C TFT-7C TFT-7SC
	Graphic display	True Color TFT4.3" 480 x 272 pixel		Communication interfaces	TFCOM TFNET TFCLOUD
	Voice synthesis	Customizable Vocabulary		TSA1 network role	Slave panel only
	Event memory capacity	8.192	Electrical specifications	CPU power requirements	200mA @ 24V DC
Detection	Addressable detectors	199		Electrical outputs	Max. 50mA
	Addressable modules	99		Loop power supply	20V...27,6V DC
	Addressable EDU modules	9		BUS power supply	
	Detection zones	150		Sounders power supply	
	Virtual detection zones	100	Power supply	Modular power supply	Type A (switching)
	Default zone	1		Supply voltage	230V AC +10% -15% 50Hz
	Specialized outputs relays	Alarm Fault		Max current requirements	600mA AC
	Controlled output	sounder		Nominal values	2.7A @ 27,6V DC
	Open collector outputs	2 programmable		Max current deliverable	I max 2.7A
EDU extinguishing channel	Management mode	Automatic or manual		Max Ripple	≤230mVpp
	Dedicated detection zones	3 conventional zones	Battery	Protection	Fuse T-1A
	Alternative detection zones	Control panel zones		Battery housing	2 x 12V-7,2Ah
	Controlled inputs	Pressione sensor Flow sensor Opened door Manual release Extinction hold Extinction abort Reserve release		Flammability class	UL94-V2 or upper
	Controlled outputs	Evacuation notification Extinction notification Release valve 1 Release valve 2		Internal resistor	Max. 1.5Ω
	Specialized outputs relays	Release in progress Extinction hold Extinction abort Manual mode EDU switched off		Cut-off voltage	Per Vbat <17,6V
Extinguishing cycle	Activation commend	Local Centralized	Physical specifications	Recharge time (2 x 12V-7,2Ah)	100% in 24h
	Activation Mode Programmable options	Standard Pilot Secondario extinction Reserve release Directional valves		Environmental class	3K5 EN 60721-3-3:1995
Management modes	Access levels	4		Operating temperature	-5°C...+40°C
	Access codes	10		Relative humidity	10%...93% (non condensing)
Automated controls	Formulas	100		Protection degree	IP3x
	Alarm plans	100	Conformity	Housing	ABS - Steel
	Time ranges	8		Dimensions (W x H x D)	440 x 345 x 146mm
	Calendar years	4 programmable		Weight (without battery)	6,2kg
Conformity	Detection	EN 54-2: 1997+ A1:2006		Detection	EN 54-2: 1997+ A1:2006
	Extinction	EN 12094-1: 2004		Extinction	EN 12094-1: 2004
	Power supply	EN 54-4:1997+ A2:2006		Power supply	EN 54-4:1997+ A2:2006
	Certification nr	0051-CPR-xxxx		Certification nr	0051-CPR-xxxx
	Year of CE marking	22		Year of CE marking	22
Conformity	Number of declaration of performance	xxx_TSA1	Conformity	Number of declaration of performance	xxx_TSA1
	Notified body	IMQ		Notified body	IMQ

