TFSFC01

TFA-TSA SYSTEMS

RS485-Fiber optic converter

RS485-fiber optic converter for the data transfer of an RS485 line over long distances, via a fiber optic backbone.
The converter can be used in point-to-point topology, with sections of a maximum length of 2 kilometers, or in ring topology, up to 4 kilometers. The converter allows to increase the extension of the serial line, beyond the physical limits of the RS485; it is also particularly recommended for carrying data in high-interference environments, creating outdoor connection backbones immune to the effects of atmospheric discharges, and to galvanically isolate the devices. Master/Slave operating modes.
Functional programming settable via dip-switch. Activity monitored by 3 signaling LEDs: power supply, fiber optic data reception, RS485 Bus data reception. Casing ABS. Dimensions (L x H x D) 140 x 92 x 38mm. Color red.

MODEL			RS485 - FIBER OPTIC CONVERTER	POINT TO POINT 2KM	RING 4KM	ABS BOX
Name	**Item no.**					
TFSFC01	**TF1TFSFC01**					

OBLIGATIONS AND WARNINGS

The TFSFC01 converter has been designed within an ISO 9001 quality management system, which involves the application of a series of rules during the design phase and plans all subsequent testing and inspection activities necessary for its production.
The TFSFC01 converter is used to extend the range of the RS485 Master and Slave serial BUS lines of Tecnofire fire detection and extinguishing control panels. During the design and installation phases, it is necessary to observe and apply the regulations in force.

ADVANTAGES OF THE TRANSMISSION MEDIUM

The use of fiber optics as an alternative to copper infrastructure offers multiple advantages summarized in the following table.
Fiber optics allow for the creation of data transfer backbones that are completely immune to potential interference present in the surrounding environments, such as industrial environments.
The characteristic of not radiating electromagnetic interference into the surrounding environment allows for use in absolute safety, even in environments particularly susceptible to radiated disturbances.

Main advantages
Galvanic isolation of the connected nodes
No shielding or grounding issues
No need for lightning protection
High immunity to electromagnetic interference
No emission of electromagnetic disturbances

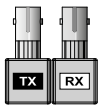
CONVERSION AND TRANSMISSION MEDIUM

The TFSFC01 module converts the electrical communication signals of an RS485 serial line into electromagnetic waves in the visible and invisible light spectrum.
The device integrates a transmission unit (encoder) and a reception unit (decoder).
The generated electromagnetic waves are transferred to the fiber optic, which acts as the transmission medium.
With a pair of TFSFC01 devices, it is possible to create a point-to-point bidirectional data transmission link.

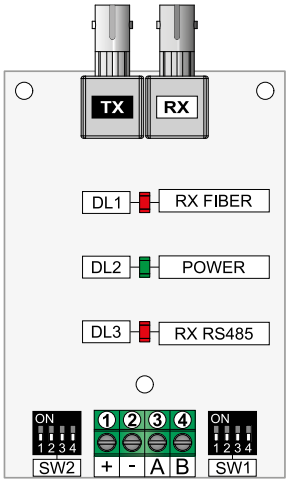
INSTALLATION AND CONNECTION WARNINGS

When laying and connecting the fiber optics, it is necessary to pay attention to certain precautions: optical cables tolerate a specific bending radius and a maximum tensile force; to know and apply the necessary measures during the installation phase, always refer to the technical data sheet of the fiber used.
To avoid signal attenuation phenomena, carefully check for the total absence of any kind of dirt or dust before terminating the cable with the connector.

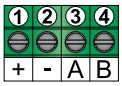
PROGRAMMING AND WIRING



Fiber optic interface	
TX	Transmission channel connection
RX	Reception channel connection
Connector type: Female BFOC	



SW1 - RS485 line termination				
Line not terminated	Dip 1	Dip 2	Dip 3	Dip 4
	OFF	OFF	OFF	OFF
A and B termination	Dip 1	Dip 2	Dip 3	Dip 4
	OFF	ON	OFF	OFF
Bus Master termination	Dip 1	Dip 2	Dip 3	Dip 4
	OFF	ON	ON	ON



RS485 Interface	
1	BUS line power supply positive
2	BUS line power supply negative
3	Communication channel A
4	Communication channel B

SW2 - Bus type				
Converter connected to the SLAVE control panel	Dip 1	Dip 2	Dip 3	Dip 4
	OFF	OFF	OFF	OFF
Converter connected to the MASTER control panel	Dip 1	Dip 2	Dip 3	Dip 4
	OFF	OFF	OFF	ON

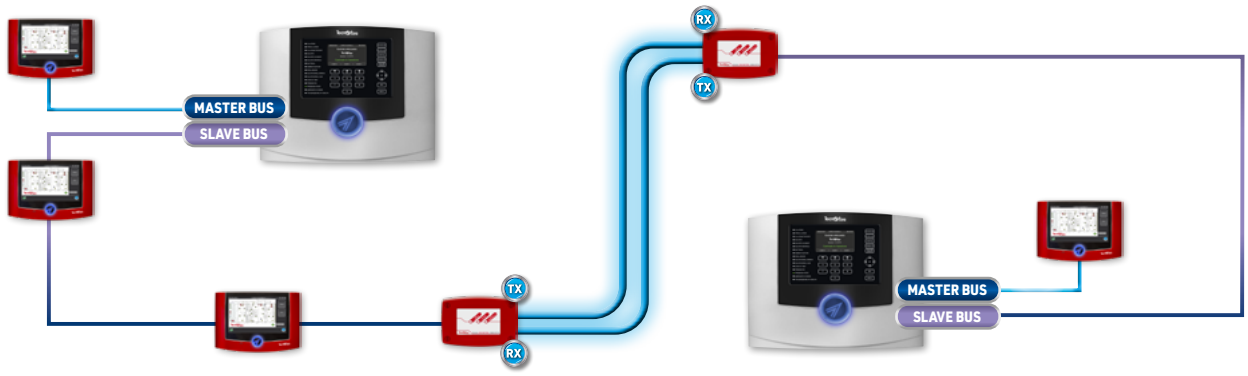
Status LEDs				
LED	Color	Name	Status	Signaling
DL1	Red	RX FIBER	Blinking	Fiber optic data reception in progress
DL2	Green	POWER	On	Device powered
DL3	Red	RX RS485	Blinking	RS485 data reception in progress

USE TOPOLOGIES

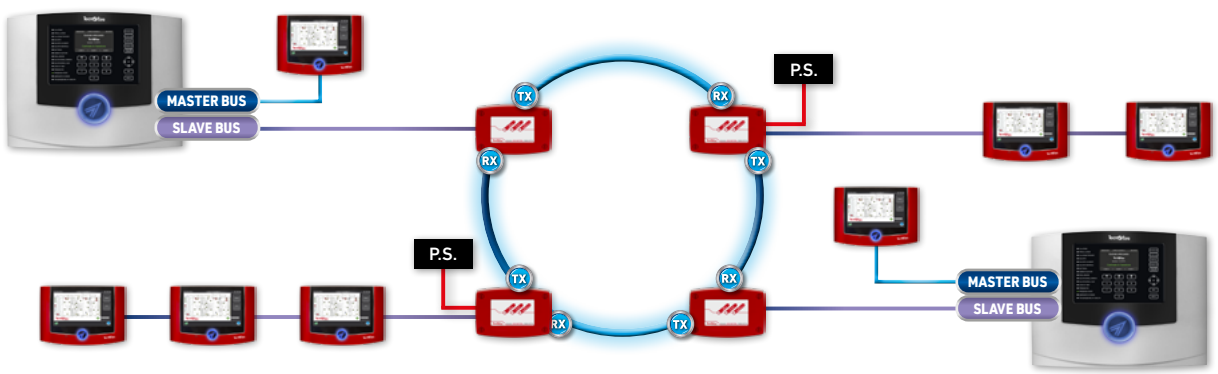
The TFSFC01 converter can be used to create two different use topologies: Point-to-Point and Ring (also known as Point-to-Multipoint).

Topology	Number of devices	Total extension	Segment extension
Point-to-Point	2	Max. 2Km	-
Ring	From 3 to x	Max. 4Km	Max. 2Km

POINT-TO-POINT TOPOLOGY

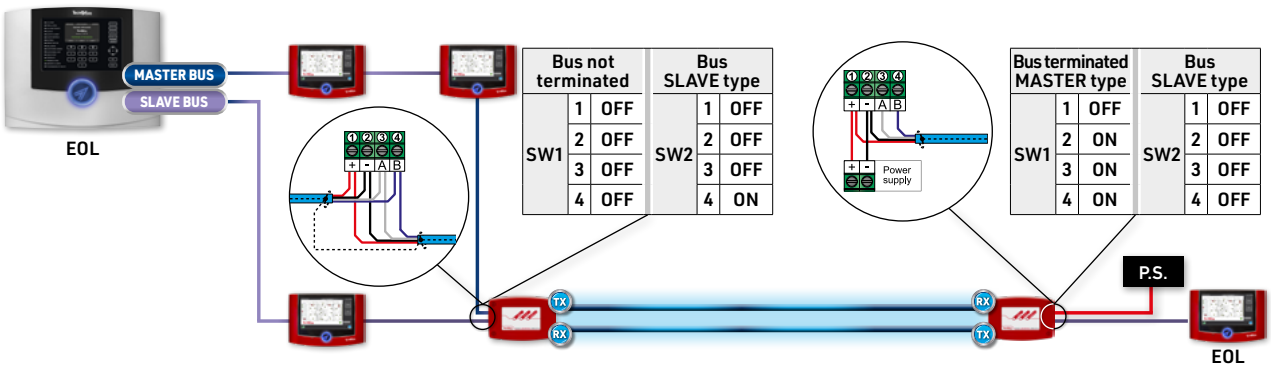


RING TOPOLOGY



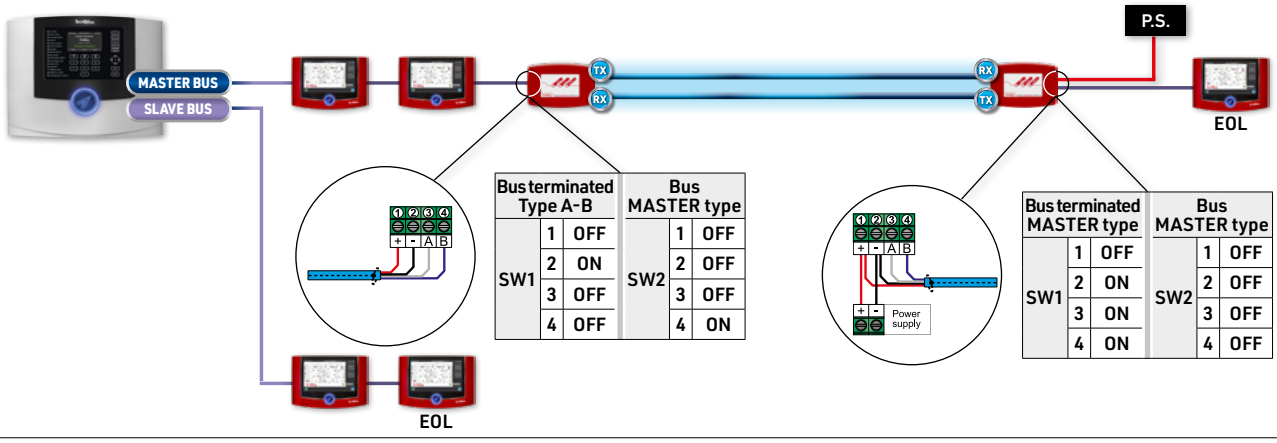
BUS IN CLOSED RING CONFIGURATION

Bus in closed ring configuration with extension to a remote terminal; the extension is created using a fiber optic backbone.
To power the remote converter and its connected devices, an additional power supply (PS) must be used.
The serial line extension must be terminated at the last device connected to it (EOL).



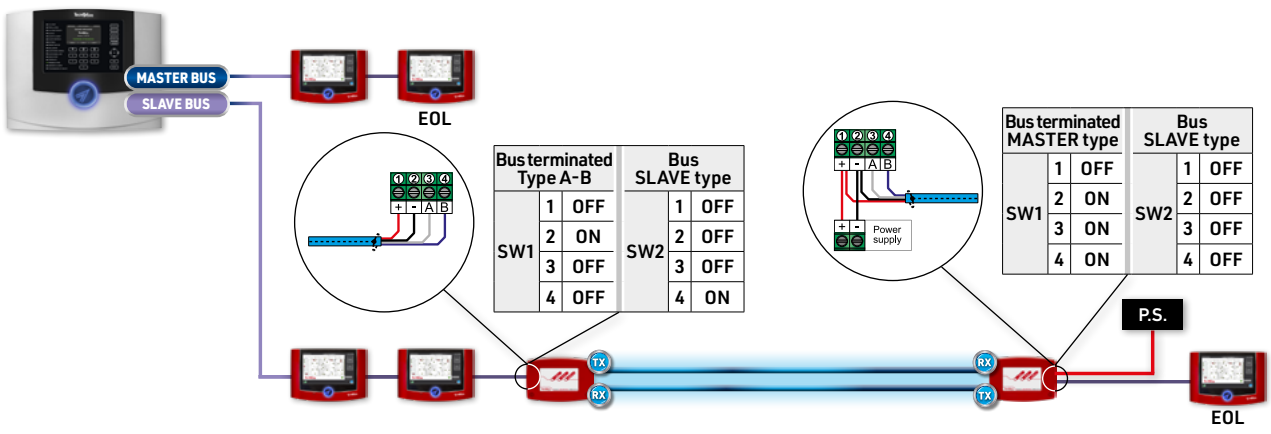
BUS IN OPEN RING CONFIGURATION - MASTER BUS EXTENSION

Bus in open ring configuration, with the Master Bus extended to a remote terminal; the Bus extension is created using a fiber optic backbone. To power the remote converter and its connected devices, an additional power supply (PS) must be used.
The serial line extension must be terminated at the last device connected to it (EOL).



BUS IN OPEN RING CONFIGURATION - SLAVE BUS EXTENSION

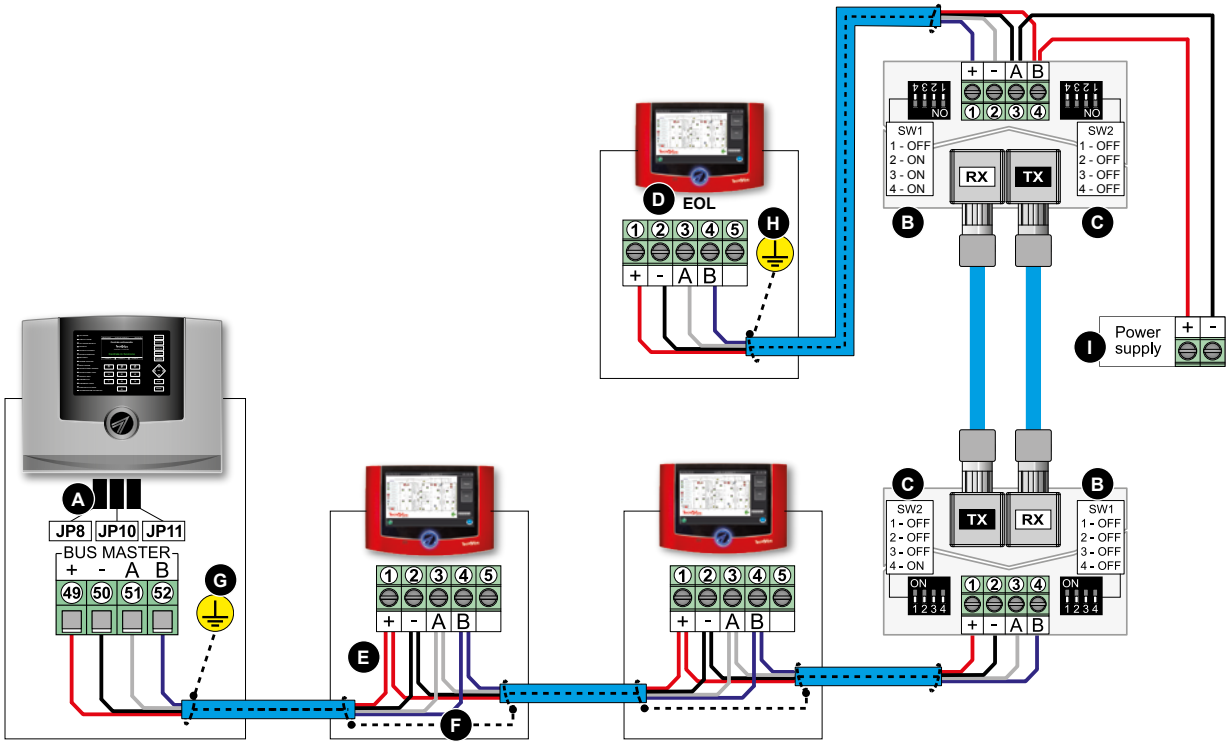
Bus in open ring configuration, with the Slave Bus extended to a remote terminal; the Bus extension is created using a fiber optic backbone. To power the remote converter and its connected devices, an additional power supply (PS) must be used.
The serial line extension must be terminated at the last device connected to it (EOL).



TFSFC01

BUS IN OPEN RING CONFIGURATION - MASTER BUS EXTENSION - WIRING DIAGRAM

The diagram and the relative table indicate the connection and programming details that must be strictly followed during installation. Warning: the information provided is valid only for the illustrated example.



A	**Control panel balancing jumpers programming**	**F**	**Shield connection - Continuous without interruptions**
B	**Converter SW1 programming - Bus line termination**	**G**	**Shield grounding - At a single point on the control panel side**
C	**Converter SW2 programming - Bus type**	**H**	**Shield grounding - At a single point on the first or last device**
D	**End-of-line balancing on the last device of the branch (EOL)**	**I**	**Power supply unit to power the converter and branch devices**
E	**Serial line connection - In/Out on each device**		

Technical and functional specifications

General information	Serial converter	**RS485-optical fiber**
	Data interface	**RS485**
	Transfer vector	**Fiber optic**
Supported bus	Tecnofire Fire-Bus	**115.200 baud**
Fiber optics	Multimode glass fibre cable	**50/125µm o 62,5/125µm**
	Wavelength	**850nm**
	Connection type	**ST connector**
	Topology and extension	**Point-to-pointo 2km Ring 4km**
Status signaling	Power	**Power supply**
	RX485	**RS485 receiving**
	RX Fiber optic	**Fiber optic reception**

Electrical specifications	Rated voltage	**24V DC**
	Operating voltage	**8V...31V DC**
	Consumption	**50mA @ 12V DC 27mA @ 28V DC**
Physical specificatons	Environmental class	**3K5 EN 60721-3-3:1995**
	Operating temperature	**-20°C...+70°C**
	Relative humidity (without condensation)	**10%...93%**
	Protection class	**IP42**
	Casing	**ABS**
	Dimensions (L x H x D)	**140 x 92 x 38mm**
	Weight	**130g**
Conformity	System compatibility	**EN 54-13:2020**

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

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