TFSFC01

RS485-optical fiber converter

SERIAL BUS

TFSFC01	RS485 FIBER-OPTIC CONVERTER	POINT TO POINT CONNECTION 2KM	RING CONNECTION 4KM	ABS V0 BOX

RS485-optical fiber converter, for RS485 line long distance data transfer via an optical fiber backbone.
The converter can be used in point-to-point topology, with stretches up to 2 kilometres long or ring topology, up to 4 kilometers. The converter allows to increase the extent of the serial line beyond the physical boundaries of the RS485.
It is also highly recommended to transport data in environments with strong interferences, realizing connection backbones in the open field, immune to the effects of atmospheric discharges, eliminate ground loops between devices.
Master/slave operating modes Functional settings using dip-switches. Activity monitored by 3 LED: power supply, data receipt from optical fiber, data receipt from Bus 485. ABS V0 enclosure. Dimensions (L x H x P) 140 x 92 x 38mm. Red.

Item no. TF1TFSFC01

NOTES

The converter TFSFC01 is used to increase the extension of the Master and Slave Bus 485 serial lines of the Tecnofire control units models: TFA1-298, TFA2-596, TFA4-1192.
During design and installation, it is necessary to observe and apply the applicable regulations.

CONVERSION AND TRANSMISSION MEDIUM

The TFSFC01 module takes care of converting electrical communication signals of an RS485 serial line into electromagnetic waves in the visible and invisible light range. The device integrates a transmitter (encoder) and a receiver (decoder).
The electromagnetic waves generated are transferred to the optical fiber which acts as transmission medium.
With a pair of TFSFC01 devices, it is possible to create a bi-directional point-to-point data transmission link.

BENEFITS OF THE TRANSMISSION MEDIUM

The use of optical fiber as a transmission medium alternative to conventional copper, offers multiple benefits summarised in the table shown opposite.
Optical fiber enables to realize data transfer backbones completely immune to possible interferences of the surrounding environments, such as industrial environments. The characteristic not to radiate electromagnetic interference into the surrounding environment allows the use in complete safety, even in areas particularly susceptible to disturbances.

INSTALLATION AND CONNECTION NOTES

For optical fibre installation and connection, you need to pay attention to some details: optical cables tolerate a maximum radius of curvature and tractive force.
To learn and apply all necessary steps during installation, always refer to the technical data sheet of the fiber used. To avoid signal attenuation, before connecting the connector to the cable, carefully check the total absence of any kind of dirt or dust.

Key benefits
Galvanic separation of linked nodes
No shielding and grounding issues
No need of lightning protectors
High immunity to electromagnetic disturbance
No diffusion of electromagnetic disturbances

Convertitore RS485-Fibra ottica - RS485-Fiber optics converter - Convertisseur RS485-Fibre optique - Convertidor RS485-Fibra óptica

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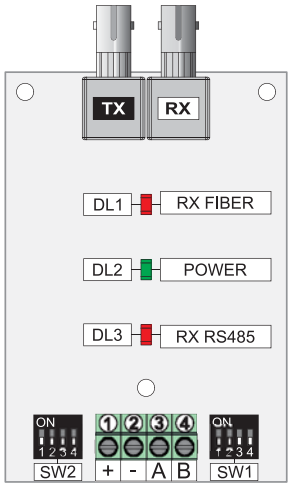
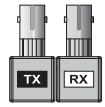
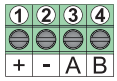
SETTING AND WIRING



Device Connection		
	**Optical fiber interface**	
	TX	Optical connector for transmission channel
	RX	Optical connector for receiving channel
	Connection Type - BFOC Female Connectors	
	**RS485 interface**	
	1	BUS line power supply positive
	2	BUS line power supply negative
	3	Communication channel A
	4	Communication channel B

SW1 - Setting of RS485 line termination					
	**Non-terminated**				Setting to be used if the connected network only includes SLAVES
	Dip 1	**Dip 2**	**Dip 3**	**Dip 4**	
	OFF	OFF	OFF	OFF	
	Termination A and B				
	Dip 1	**Dip 2**	**Dip 3**	**Dip 4**	
	OFF	**ON**	OFF	OFF	
	MASTER termination				
	Dip 1	**Dip 2**	**Dip 3**	**Dip 4**	
	OFF	**ON**	**ON**	**ON**	

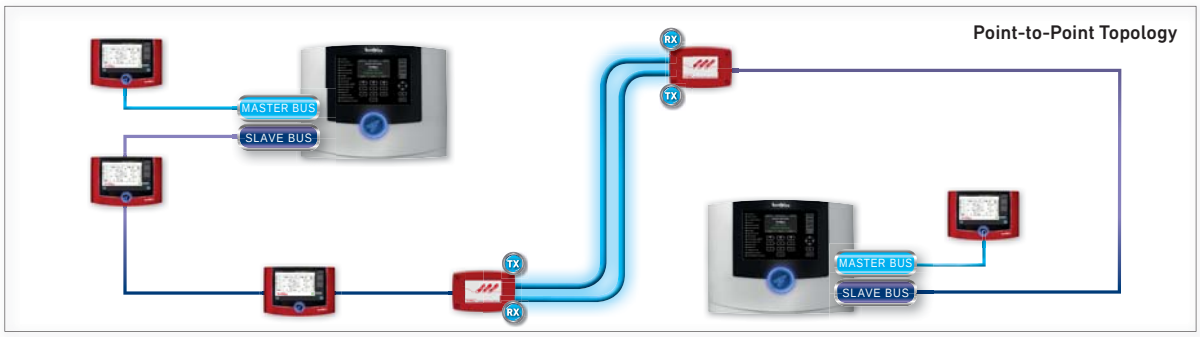
SW2 - Bus type setting					
	**SLAVE**				To be set if the connected network only includes SLAVES
	Dip 1	**Dip 2**	**Dip 3**	**Dip 4**	
	OFF	OFF	OFF	OFF	
	MASTER				To be set if the connected network includes the MASTER control unit
	Dip 1	**Dip 2**	**Dip 3**	**Dip 4**	
	OFF	OFF	OFF	**ON**	

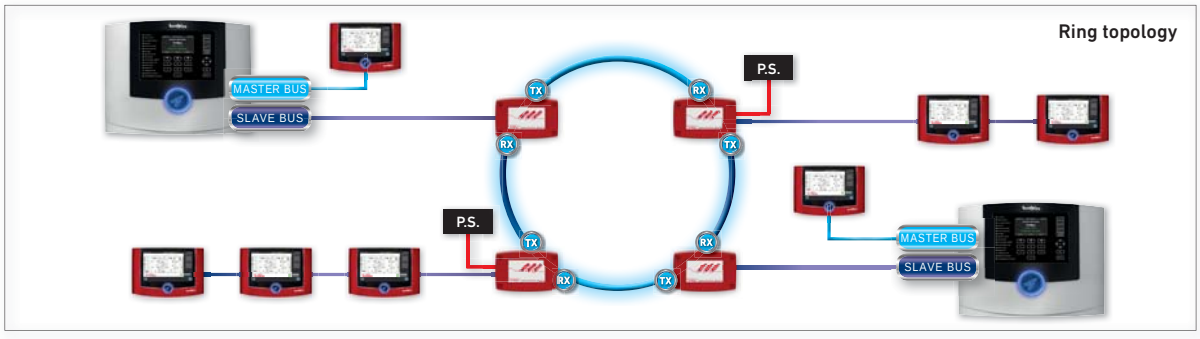
Indicator LED				
Led	**Colour**	**Name**	**Status**	**Signals**
DL1	**Red**	RX FIBER	Blinking	Data is currently received from optical fiber
DL2	**Green**	POWER	On	Correctly powered device
DL3	**Red**	RX RS485	Blinking	Data is currently received from RS485

USE TOPOLOGIES

With the TFSFC01 converter it can be used to achieve two different topologies of use called:
Point-to-Point or with ring, also called Point - Multipoint.

Topology	Devices used	Total extension	Stretch extension
Point-to-Point	2	Max. 2Km	
Ring	from 3 to x	Max. 4Km	Max. 2Km

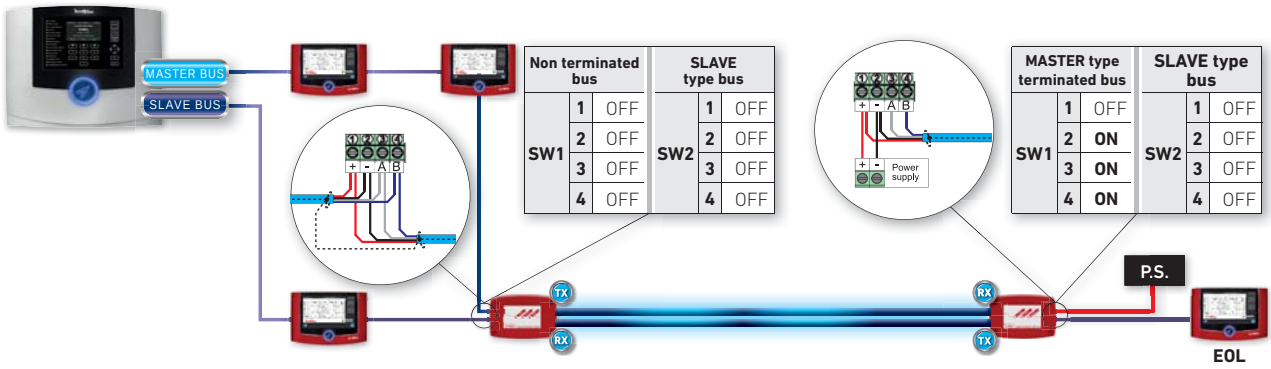




RS485-optical fiber converter

CLOSED-LOOP BUS CONFIGURATION - SCHEMATIC DIAGRAM

Bus in closed-loop configuration, with extension to a remote terminal. The extension is realized with a fiber backbone. To power the remote converter and the devices connected to it, you must use an additional power supply (PS). The extension of the serial line must be terminated on the last device connected to it (EOL).

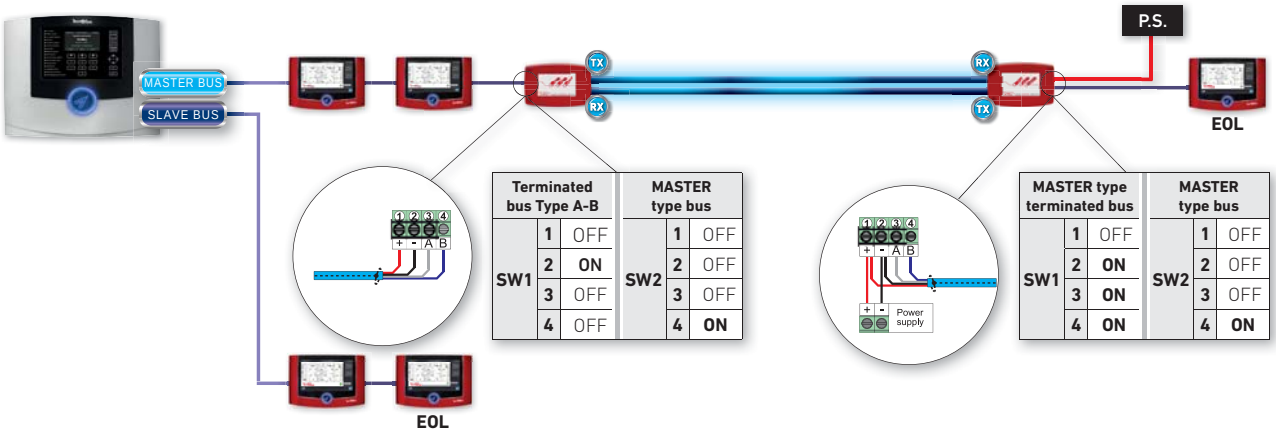


Non terminated bus			SLAVE type bus		
SW1	1	OFF	SW2	1	OFF
	2	OFF		2	OFF
	3	OFF		3	OFF
	4	OFF		4	OFF

MASTER type terminated bus			SLAVE type bus		
SW1	1	OFF	SW2	1	OFF
	2	**ON**		2	OFF
	3	**ON**		3	OFF
	4	**ON**		4	OFF

BUS IN CONFIGURATION OPEN LOOP EXTENSION OF THE MASTER BUS - SCHEMATIC DIAGRAM

Bus in open-loop configuration, with the Master Bus extended to a remote terminal. The Bus extension is realized with a fiber backbone. To power the remote converter and the devices connected to it, you must use an additional power supply (PS). The extension of the serial line must be terminated on the last device connected to it (EOL).

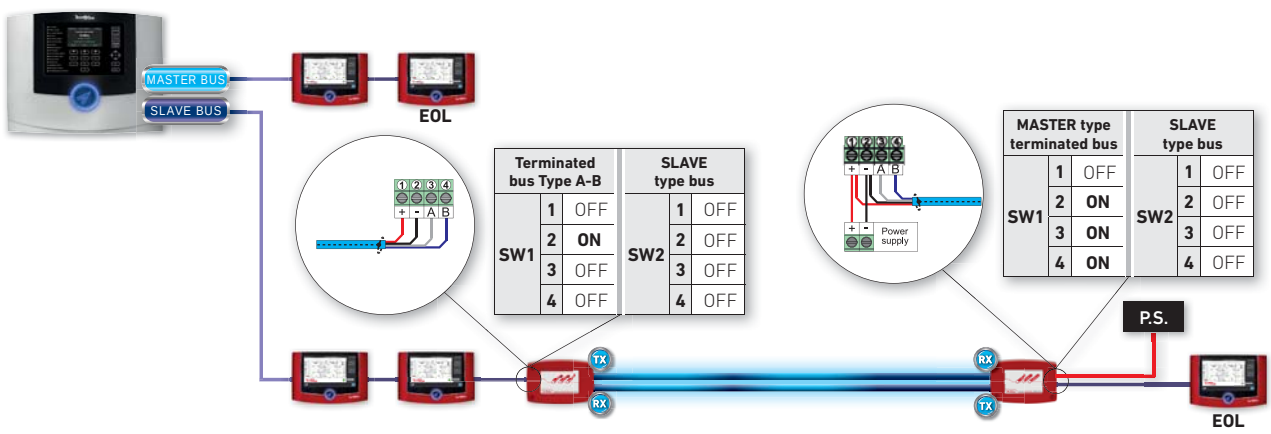


Terminated bus Type A-B			MASTER type bus		
SW1	1	OFF	SW2	1	OFF
	2	**ON**		2	OFF
	3	OFF		3	OFF
	4	OFF		4	**ON**

MASTER type terminated bus			MASTER type bus		
SW1	1	OFF	SW2	1	OFF
	2	**ON**		2	OFF
	3	**ON**		3	OFF
	4	**ON**		4	**ON**

BUS IN CONFIGURATION OPEN LOOP EXTENSION OF THE SLAVE BUS - SCHEMATIC DIAGRAM

Bus in open-loop configuration, with the Slave Bus extended to a remote terminal. The Bus extension is realized with a fiber backbone. To power the remote converter and the devices connected to it, you must use an additional power supply (PS). The extension of the serial line must be terminated on the last device connected to it (EOL).



Terminated bus Type A-B			SLAVE type bus		
SW1	1	OFF	SW2	1	OFF
	2	**ON**		2	OFF
	3	OFF		3	OFF
	4	OFF		4	OFF

MASTER type terminated bus			SLAVE type bus		
SW1	1	OFF	SW2	1	OFF
	2	**ON**		2	OFF
	3	**ON**		3	OFF
	4	**ON**		4	OFF

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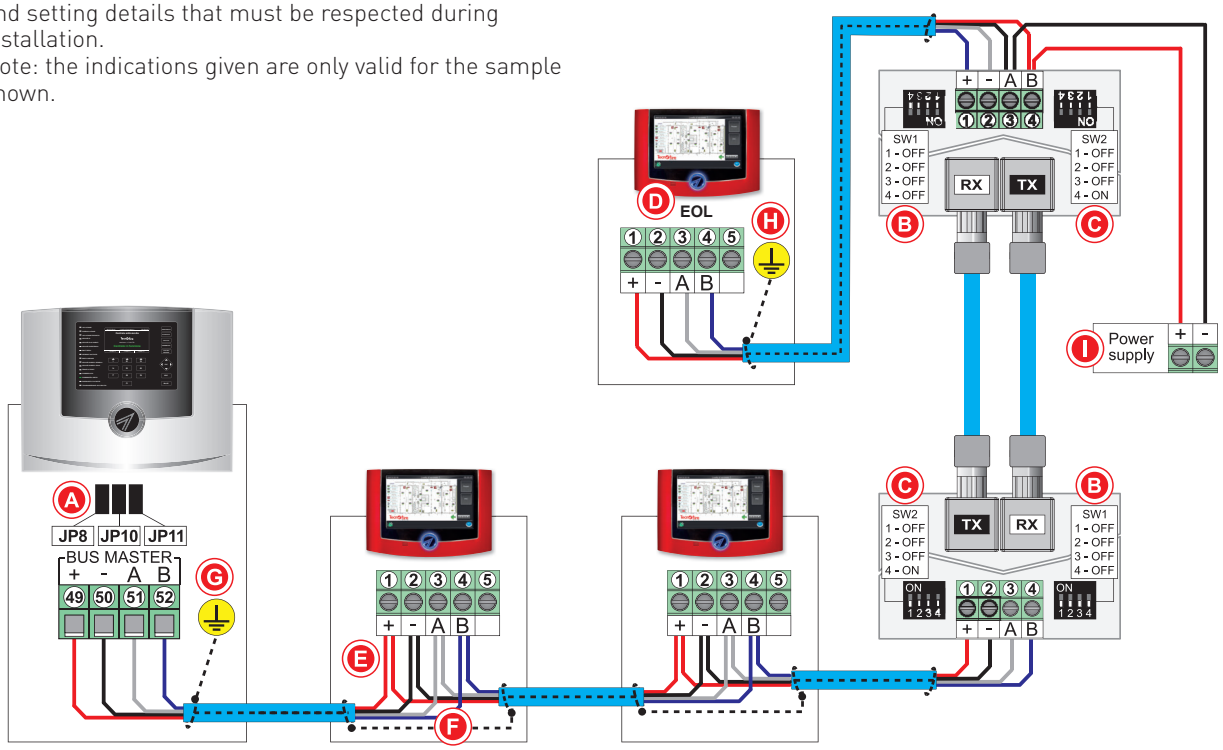
BUS IN CONFIGURATION OPEN LOOP EXTENSION OF THE MASTER BUS - MULTI-WIRE DIAGRAM

The diagram and related table indicate the connection and setting details that must be respected during installation.
Note: the indications given are only valid for the sample shown.



A	Setting of control unit balancing jumpers	F	Shield Connection - Continuous without interruption
B	Setting of SW1 converter - Bus line termination	G	Earth shield - At a single point (control unit side)
C	Setting of SW2 converter - Bus topology	H	Earth shield - At a single point or device side
D	Line end balancing on last device of the branch (EOL)	I	Power supply to power converter and branch devices
E	Serial line connection - Enters and exits from each device		

TFSFC01 - Technical and functional specifications

General features	Description	**Fiber optic converter**
	Input/output interface	**RS485-fiber optics**
Baud rate	Tecnofire Fire-Bus	**115,200bps**
Fiber optics	Multimode fiber optic cable	**50/125µm or 62.5/125µm**
	Wavelength	**850nm**
	Connector type	**ST**
	Connection	**Point-to-point (2km per track)**
		Loop (4km)
Status signaling	Power supply	✓
	RX RS485	✓
	RX fiber optics	✓

Electrical specifications	Rated voltage	**24V DC**
	Operating voltage	**8V...31V DC**
	Rated consumption	**50mA @ 12V DC**
		27mA @ 28V DC
Physical specifications	Environmental class	**II**
	Operating temperature	**-20°C...+70°C**
	Protection class	**IP42**
	Casing	**ABS V0**
	Dimensions (L x H x D)	**140 x 92 x 38mm**
	Weight	**130g**

N.B. The declarations of conformity and performance can be found at: www.tecnofiredetection.com

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