



# BITSTREAM®

Leader in time synchronization and data transmission solutions



## Fibre optic teleprotection BS-MX-110

*Fiber optic multiplexer providing overvoltage protection.*



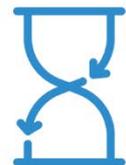
Safe



Elastic



Reliable



Protection

# BS-MX-110 - the perfect protection

## Fiber optic Interface Multiplexer 8x I/O and 1/2x RS232/422/485

- ✓ Transmission via fiber optic cable of states from 8 inputs to 8 NO/NC analog outputs
- ✓ Input trigger parameterization from 12V to 250V
- ✓ Galvanic isolation of inputs and outputs
- ✓ Noise filtering on four inputs according to ESI 48-4 EB2
- ✓ FAST and SECURE functions for handling inputs
- ✓ Alarm contact NO/NC
- ✓ RS232/485/422 serial interface
- ✓ Operation in ring or bus topology
- ✓ Possibility of addressing the receiving and transmitting part of the device
- ✓ Configuration via DIP-SWITCH or console via RS232
- ✓ Fiber interface: 1 or 2x SC/PC 1310, 1550nm, SM/MM, WDM
- ✓ Wide range of supply voltage

# Features of the BS-MX-110



## Solid

The BS-MX-110 is designed to withstand extreme environmental conditions. We made the device to meet the standards of PN-EN 60255-27: 2014 for data communication equipment, Additionally, we guarantee reliable operation in temperatures from  $-40^{\circ}$  to  $+70^{\circ}$  C



## Flexible

At the production stage for the four inputs, you can select the exact voltage values for these interfaces in the range of 12V to 250V DC. The other four parametric inputs have variable V trigger levels<sub>in</sub> = 12, 24, 48, 110, 125, 220, 250V DC and you can configure them via the CLI/RS232 console.



## Easy to use

Management is via DIPSWITCH configuration, while advanced filter parameter setting is done from the CLI/RS232 console.



## Just what you need

You choose from many versions of the device that we have created to meet the needs of our customers. There are 3 types of built-in optical interface to make the connection in the range of up to 100km, in addition, for security or building the bus, you can use the version with two optical ports. Such flexibility allows for peace of mind in building large networks, as well as their free expansion in the future.



## Safe

An additional feature is input noise filtering, which is of great importance when used in power grid surveillance applications. In addition, the isolation between inputs is greater than  $50\text{ M}\Omega / 500\text{V}$ .



## Providing protection

Thanks to an innovative solution, the BS-MX-110 can be connected in a ring topology as well as point-to-point over two optical interfaces.

## Technical specification

### Supported standards, recommendations and directives EMC, safety\*

<b>EMC 2014/30/EU</b>	EMC Electromagnetic Compatibility Directive.	
<b>LVD 2014/35/EU</b>	LVD Low Voltage Directive.	
<b>PN-EN 55011:2016</b>	Industrial, scientific and medical equipment	Radio frequency disturbance characteristics - Limits and methods of measurement
<b>PN-EN 60255-26:2014-01</b>	Measuring relays and protection devices	Part 26: Electromagnetic compatibility requirements
<b>PN-EN 60255-27:2014-06</b>	Measuring relays and devices	Part 27: Product safety requirements

\* - The scope and list of supported standards may change as the device evolves

### Inputs

- ✓ Screw connector for wires up to 3 mm in diameter<sup>2</sup>
- ✓ Four comparator inputs with fixed trigger threshold  $V_{in} = 154V$  DC or other - configured during production
- ✓ Four parametric inputs (configurable via CLI console) with variable trigger level  $V_{in} = 12, 24, 48, 110, 125, 220, 250V$  DC
- ✓ Operating range: between 0.8 and 1.1  $V_{in,nom}$  with disturbances up to 15%  $V_{in,nom}$
- ✓ Input power consumption:  
 $V_{in} = 12 \div 110V$  DC  $P=0,05W \pm 30\%$   
 $V_{in} > 110V$  DC  $V_{in} \times 1mA \pm 30\%$ , while in ESI 48-4 option there is a possibility to configure current consumption value on four inputs and then it is constant in the whole voltage range
- ✓ Isolation between inputs greater than  $50M\Omega/500V$
- ✓ Noise filtering on parametric inputs according to ESI 48-4 EB2

### Outputs

- ✓ Screw connector for cable diameter up to 3 mm<sup>2</sup>
- ✓ 8 outputs with NO/NC contacts
- ✓ Maximum rated contact voltage: 400V AC / 250V DC
- ✓ Continuous current: 8A/250V AC, 8A/24VDC, 0.4A/250V DC
- ✓ Maximum continuous current: 10A / 20ms
- ✓ Maximum switching power: 2000 W (VA)
- ✓ Category of use: AC1, AC15, AC3, DC1, DC13
- ✓ Switching capacity: 1000W (VA) at L/R=40 ms,
- ✓ Current Interruption:
  - for 220V DC and L/R=40 ms - 0.45A
  - for 230V AC and  $\cos = 0.4$  - 5.5A
- ✓ Two modes of operation
  - FAST (immediate response to signal change)
  - SECURE (acknowledgement response)
- ✓ NO/NC alarm connector

### Delay

- ✓ Input - output delay  $\leq 17$  ms,
- ✓ Delay with active load  $\leq 24$  ms, ESI 2,  $V_{in} < 250V$  10uF CDT

## Serial interfaces

- ✓ Connector 1x RJ45
- ✓ 2x RS232 with transmission speed up to 230kbps
- ✓ RS422/485 with transmission rates up to 2Mbps
- ✓ Latency for RS232 <400ns
- ✓ RS485 delay <400ns
- ✓ DIP-SWITCH configuration

## Optical ports

- ✓ SM, MM, WDM, 1310nm, 1550nm
- ✓ Fiber type 9/125um, 50/125um, 62.5/125um
- ✓ SC/PC connector
- ✓ Ranges depending on optical port type 15km, 50km, 120km (1550nm), 20km WDM, 40km WDM, 60km WDM
- ✓ Available with one or two optical ports
- ✓ Bus or ring operation with up to 4 devices

## Management

- ✓ DIP-SWITCH
- ✓ CLI/ RS232, 9600bps

## Power supply

- ✓ Supply voltage ranges (depending on version):
  - 12-36 V DC
  - 30-113V AC / 40-160V DC
  - 85-264 AC / 100-370V DC
- ✓ Power consumption up to 5W

## Physical characteristics

- ✓ Housing 166x286x50mm
- ✓ DIN rail mounting option
- ✓ Can be mounted to wall
- ✓ Weight 1.3 kg

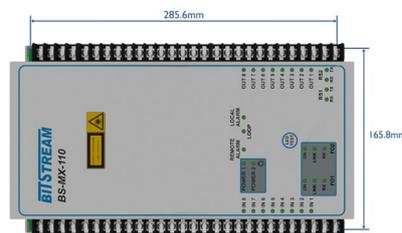
## Environmental requirements

- ✓ Standard operating temperature: -40 to +70°C
- ✓ Standard ambient humidity during operation: 0 to 95 % (non-condensing),
- ✓ Location type: class C according to the standard
- ✓ EN 60870-2-2 - sheltered locations
- ✓ Degree of protection according to IP-30

## Mechanical drawing



view - front/side



view - top



front view

## BS-MX-110-S-(3)-(P)-T-U-(E)-A-(V)

BS-MX-110	S	(3)	(P)	T	U	(E)	A	(V)
Interface type:								
1310 nm SM/MM* - range 15/5 km	S							
1310 nm SM - range up to 50 km	M							
1550 nm SM - range up to 100 km	L							
WDM interfaces (additional field required for transceiver)								
1310/1550 and 1550/1310 nm SM/MM* - range up to 20/1 km	WS							
1310/1550 and 1550/1310 nm SM - range up to 40 km	WM							
1310/1550 and 1550/1331 nm SM - range up to 60 km	WL							
1550/1570 and 1550/1570 nm SM - range up to 100 km	WLL							
Optional field valid only if WDM interface is selected in the preceding field								
for versions S, M, L		-						
Final - 1310/1550 nm for WS/WM/WL versions or 1550/1570 nm for WLL versions		1						
Final - 1550/1310 nm for WS/WM/WL versions or 1570/1550 nm for WLL versions		2						
Protection - 1310/1550 and 1550/1310 nm for WS/WM/WL versions or 1550/1570 and 1570/1550 nm for WLL versions		3						
Connection protection								
Without protection			-					
Optional			P					
Extended temperature range								
standard				T				
Power supply								
12 - 32 V DC						6		
12 - 36 V DC(dual)						66p		
30 - 113V AC/40-160V DC						A		
30 - 113V AC/40-160V DC (dual)						AAp		
85 - 264V AC/100-370V DC						B		
85 - 264 V AC/100-370V DC (dual)						BBp		
Compliance of 4 parametric inputs with ESI- 48-4 EB2								
Standard version							-	
Optional							E	
Alarm function - Comm Link Ready								
Standard								A
Trigger threshold level for inputs 1-4. Specify a trigger voltage value between 12V and 250VDC. No number indicates default value of 154V DC.								
No designation corresponds to the default value of 154V DC								-
Optional								V

\* - the range for MM fiber is approximate and depends on actual fiber parameters

### Example designations

**BS-MX-110-WS-3-P-T-A-A** Fiber optic multiplexer of I/O interfaces and RS232/485/422 ports with 1310/1550nm + 1550/1310nm protection WDM optical interface, with range up to 20km using SM fiber. Operation in extended temperature range. Alarm function - Comm Link Ready. Power supply 12-36V DC. Trigger voltage on inputs 1-4 is 154V DC

**BS-MX-110-M-T-B-A** Fiber optic multiplexer of I/O interfaces and RS232/485/422 ports with 1310nm optical interface, with range up to 50km using SM fiber. Operation in extended temperature range. Alarm function - Comm Link Ready. Power supply 85-264V AC/100-370V DC. Trigger voltage on inputs 1-4 is 154V DC



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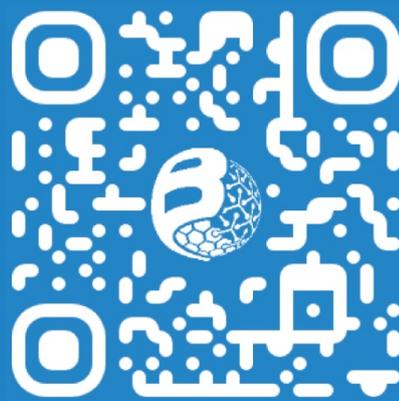
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