RSMUX3-FO - Optical multiplexer of 2x RS232/422/485 serial interfaces

- Multiplexer of 2x RS232/422/485 interfaces with screw connection over fiber links,
- The device has one or two optical interfaces
- Available configurations: POINT-POINT, RING, BUS or two independent converters in one housing
- The configuration of the device through DIP-switch
- Transmission speed up to 2Mbps for RS-485, to 230.4kbps for RS-232
- Support for the protocol **IEC103** (FO) only for the 'MM'
- Single alarm contact NC/NO
- Supply voltage range 110-260V DC or 100-240V AC

Description of the device

Functionality

RSMUX3-FO is a multiplexer of 2x RS232/422/485 streams into fiber. Multiplexer allows connection of RS232/422/485 serial interfaces over fiber links with the maximum distance of 100km and provides complete isolation between devices and resistance to disturbance occurring along transmission path. Depending on the specific versions, device can be connected using multi-mode or single-mode fiber. WDM and SFP versions also available. In basic version device is equipped with one fiber optic interface, version with two optical interfaces is also available.

Optimized and automatic tracking mechanisms continuity and its restoration after removing the failure allows maintenance-free operation for the lifetime.

RSMUX3-FO also performs the function of *converting any signals* involving the exchange, for example, RS-232 to RS-485 or RS-422, which is realized by means of two devices connected to each fiber.

RSMUX3-FO provides fully *transparent operation*. Each serial interface is sampled with a frequency of 20Mhz, which allows on data throughput of the RS to 230.4 Kbps (RS-232) and 2Mbps (RS-485/RS-422) with +/-60ns pulse time distortion. RS485 ports can be set up for 2-wire or 4-wire. Depending on the version of the device, multiplexer can work in point to point (with optical path protection), bus and ring topologies. Serial interfaces can be configured through DIP switches.

In addition, each port has two independent *LED*s activity data in the transmitter and receiver, which greatly simplifies the process of installation, commissioning and maintenance.

The unique power directly in the range of *110-260V DC* and *100-240V AC*.

The protection of connection

The device is available in versions with one or two optical interfaces. In the case of devices with two optical ports can create connections with protection for the fiber optic link. However, when building a ring on the basis of one optical port (it cannot be a version of the WDM) we have no redundancy. Fiber ports can be implemented by the built-in optical interfaces (single or dual fiber) or by SFP. In the case of the creation of the ring it is possible to simultaneously connect up to *64* devices.

However, after you select with the letter '*D*' (an option only for the version of the 'MM'), we obtain two independent converters in one chassis without protection, with common power supply and from the fiber we have support for the protocol *IEC103*. Generally, IEC103 protocol is for the 'MM', the only multimodowej allowing direct connection of fiber optic cable with a controller of another manufacturer that supports this standard.

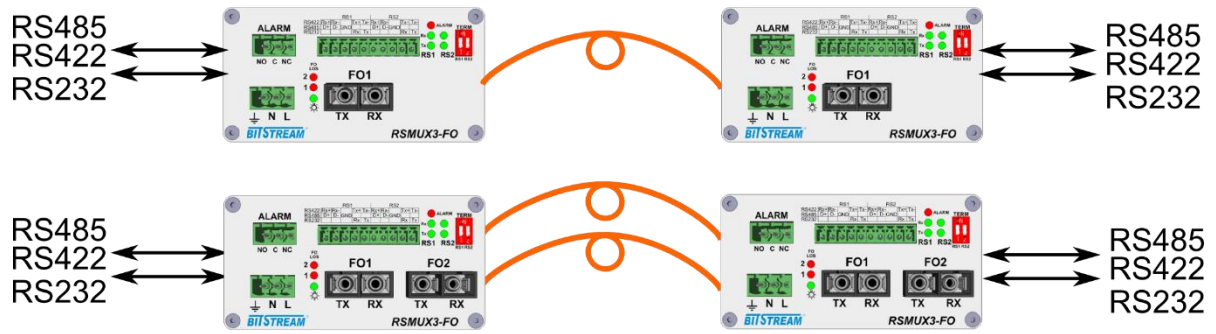**Example of such application is presented on the drawing below.**

Fig 1.   Example of the work in point-to-point also with protection
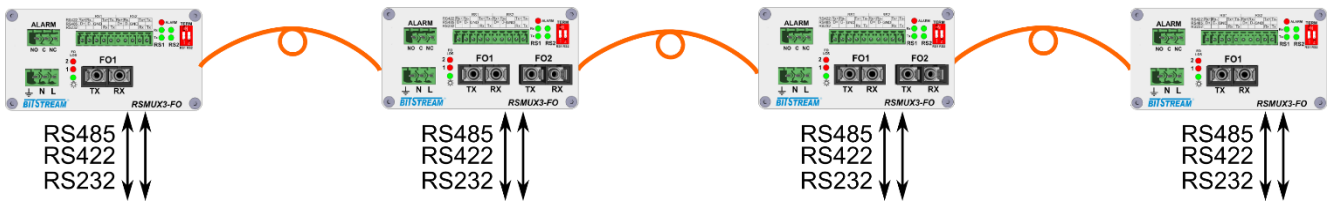
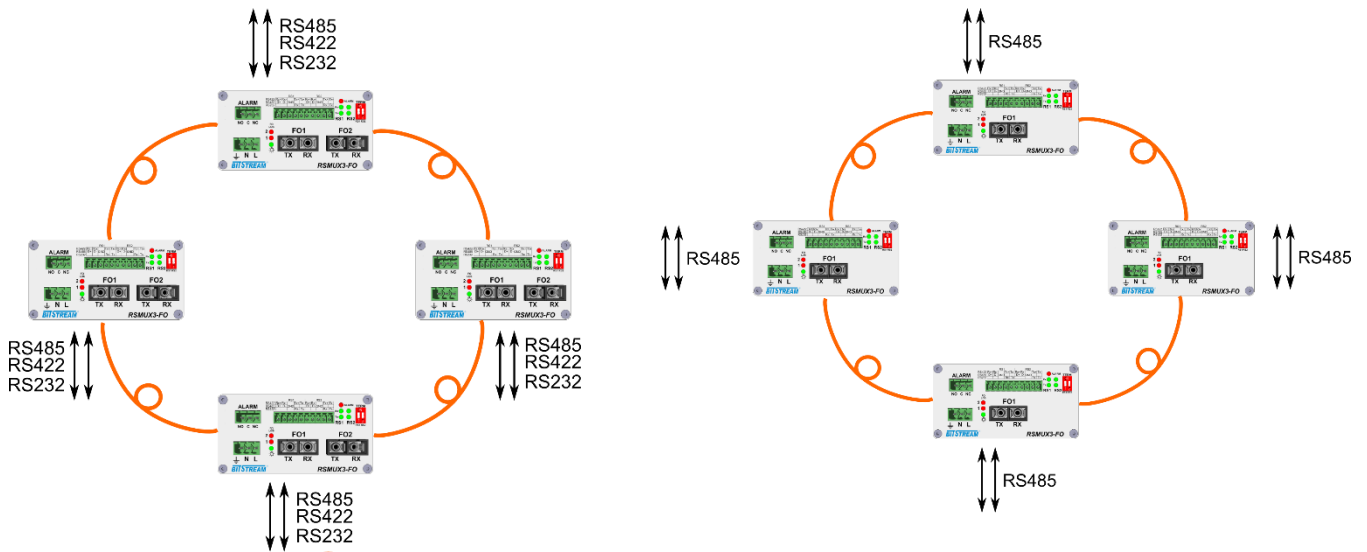

Fig.2 Example of the work in bus

Fig. 3 Example of work in the ring topologies with protection for the version with dual-port optical (single fiber WDM) and work in the ring topology without protection for the version with single-port optical
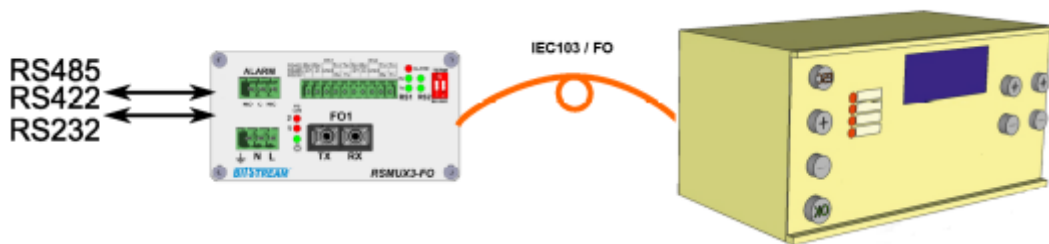

Fig.4 Example of the work using the standard IEC103 protocol to directly connect fiber optic cable with the controller (only for the 'MM')

Management

Management is done through the built-in *dip-switch*, which is used for the type of interface choices and topology operation.

Technical specifications

Supported transmission standards
- EIA-232
- EIA-422
- EIA-485

Supported protocols
- Profibus
- Modbus

Supported standards, recommendations and directives EMC Security*:

- PN-EN 55011:2012 - Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
- PN-EN 55022:2010/AC:2011 - Information technology equipment - Radio disturbance characteristics – Limits and methods of measurement
- PN-EN 55024:2011/A1:2015-08 – Electromagnetic compatibility (EMC) - Information technology equipment immunity characteristics - Limits and methods of measurement
- PN-EN 60950-1:2007/A2:2014-05- Information technology equipment–Safety– Part 1: General requirements
- EMC 2004/108/WE – Electromagnetic Compatibility Directive
- LVD 2006/95/WE – Low Voltage Directive
- PN-EN 60825-1:2014-11 – Safety of laser products Part 1: Equipment classification and requirements
- IEC 61000-4-2 Electromagnetic compatibility (EMC)- Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test
- IEC 61000-4-3 Electromagnetic compatibility (EMC)- Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test
- IEC 61000-4-4 Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test
- IEC 61000-4-5 Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test
- IEC 61000-4-6 Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
- IEC 61000-4-8 Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test
- IEC 61000-4-11 Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests
- IEC 61000-4-12 Electromagnetic compatibility (EMC) – Part 4-12: Testing and measurement techniques – Ring wave immunity test
- IEC 61000-4-29 Electromagnetic compatibility (EMC) – Part 4-29: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations on DC input power port immunity tests
  *- list of supported standards may vary with the development of the device

RS interface

- 2x screw connection (cable 1.5mm^2)
- RS-232 - transmission speed 0-230.4kbps
- RS-422/485 - transmission speed 0-2Mbps

Optical interface

- One or two optical interfaces:
- SM, MM, WDM, CWDM, DWDM
- Fiber type: 9/125um, 50/125um, 62.5/125um
- Connector: SC/PC or SFP, for 850nm only ST/PC
- Ranges depending on the type of optical port

Physical design

- Dimensions: 103x84x53mm
- Weight: 0.5 kg
- DIN rail mounting

Management

- DIP-SWITCHES

Power supply

- Supply voltage range:
  - 100 - 240V AC
  - 110 - 260V DC
- Power Consumption: up to 4W
- galvanic isolation of power supply
- Galvanically isolated input
- Power connector - terminal block, angular screw on the wire to 3 mm^2

Environmental requirements:

- IP 30 rated metal enclosure
- Operating temperature: +5 to +40°C
- Operating humidity (non-condensing): 5%-95%
- Location Type: Class C according to PN-EN 60870-2-2 - sheltered locations

Mechanical drawing

view - front   view - aside   view - back
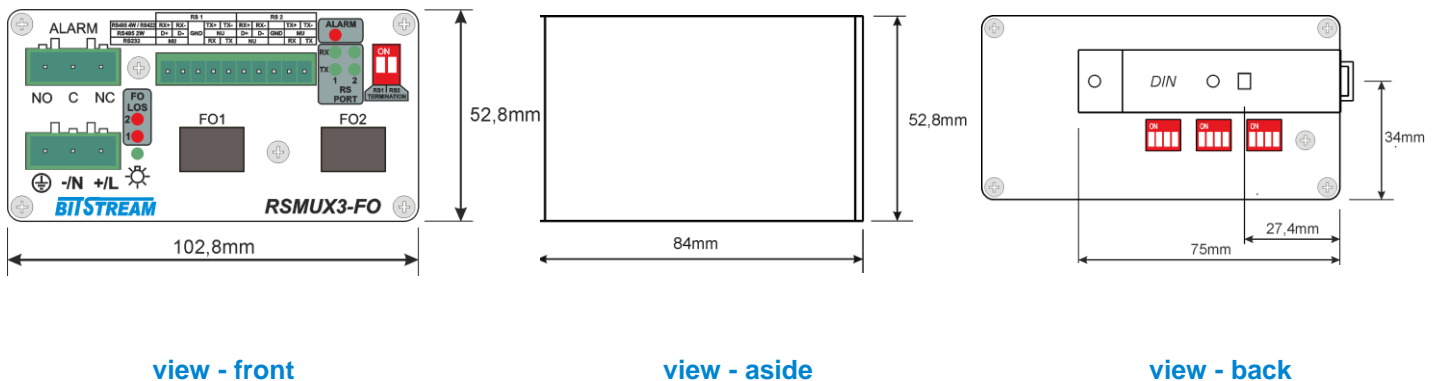
Code

RSMUX3-FO–(S)–(X)–(P)–(Z)–(B)–(T)–(U)

Power supply:
C – 100-240V AC /110-260V DC

Working temperature:
Without symbol – range 0° to +50°C
T – range -40° to +75°C

Support **Bi- Phase** interface
Without symbol – standard version
B – Support **Bi-Phase** interface

Type of serial interface connectors:
Without symbol – version with four RJ45 connectors
Z – version with two screw connectors

Optional converter functions:
Without symbol – standard version
P – version with protection
D** – double, two independent converters in one housing without protection only for version 'MM'

Optional for WDM for **Wx**
1 – final only - 1310/1550nm WS/WM/WL or 1550/1570nm WLL
2 – final only - 1550/1310nmWS/WM/WL or 1570/1570nm WLL
3 – **P** only- 1310/1550 and 1550/1310nmWS/WM/WL or 1550/1570 and 1570/1550nm WLL

Interface type:
- **SFP** – interface SFP
- **MM** – 850 nm MM – range 2 km*/**, support for *IEC103*
- **S –** 1310nm SM/MM – range 15/5 km*
- **M –** 1310nm SM – range 50 km
- **L** – 1550nm SM – range 100 km

Interface WDM for **X**
- **WS –** 1310/1550 and 1550/1310 nm SM/MM – range 20/5 km*
- **WM –** 1310/1550 and 1550/1310nm SM – range 40 km
- **WL –** 1310/1550 nad 1550/1310 nm SM – range 60 km
- **WLL –** 1550/1570 and 1570/1550nm SM – range 100 km

* - Range for MM fiber orientation is dependent on the actual parameters of the fiber. The range can go up to 10km using SLOW-MODE function.

** - No version of 'P' only option 'D' - no ring, working only as two independent converters, with one port FO1 only one RS1 or respectively FO2 / RS2, the alarm on loss of power, additional advantage is from the FO support IEC103 protocol.

Examples of code:

RSMUX3-FO-SFP-Z-B-T-4   RSMUX3-FO version with 1x FO SFP module, with two screw terminals, with Bi-Phase interface, operating temperature from -40°C to +70°C, power supply 36-60V DC

Additional accessories:

- **BTP-8503-02TD** 155M, 850nm, MM, 2km, SFP, LC, -40~85°C
- **BTP-3103-L2TD** 155M, 1310nm, MM/SM, 2/20km, SFP, LC, -40~85°C
- **BTP-3103-L4TD** 155M, 1310nm, SM, 40km, SFP, LC, -40~85°C
- **BTP-5503-L8TD** 155M, 1310nm, SM, 80km, SFP, LC, -40~85°C
- **BTP-5503-12TD** 155M, 1310nm, SM, 120km, SFP, LC, -40~85°C
- **BTPB-3503L-L2TD** 155M, 1310/1550nm, SM, 20km, SFP, WDM, LC, -40~85°C
- **BTPB-5303L-L2TD** 155M, 1550/1310nm, SM, 20km, SFP, WDM, LC, -40~85°C
- **BTPB-3503S-L2TD** 155M, 1310/1550nm, SM, 20km, SFP, WDM, SC, -40~85°C
- **BTPB-5303S-L2TD** 155M, 1550/1310nm, SM, 20km, SFP, WDN, SC, -40~85°C
- **BTPB-3503L-L4TD** 155M, 1310/1550nm, SM, 40km, SFP, WDM, LC, -40~85°C
- **BTPB-5303L-L4TD** 155M, 1550/1310nm, SM, 40km, SFP, WDM, LC, -40~85°C
- **BTPB-3503S-L4TD** 155M, 1310/1550nm, SM, 40km, SFP, WDM, SC, -40~85°C
- **BTPB-5303S-L4TD** 155M, 1550/1310nm, SM, 40km, SFP, WDM, SC, -40~85°C

- **LT-19-01** mounting rail for four RSMUX2 devices in the 19"/2U rack (horizontal installation)

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