RS-FX-MM/RS-FX-SM40

FIBER OPTIC CONVERTERS

☐ MM
☐ SM40

Data Sheet

ISO 9001

1 Main Specifications

1.1 General

The RS-FX-MM/ RS-FX-SM40 fiber optic converters (hereinafter called "Converters") are meant for converting of the RS-232, RS-422, RS-485 signals to the optical singals and transmitting them at the distance of up to 40 kilometers.

The converters can transmit signals within Orion and other systems where RS-232, RS-422, RS-485 interfaces are used.

The ***RS-FX-MM*** converter is used with **multimode** fiber optic. The length of optic line is up to 2 kilometers. For the purpose of data exchange, **two fibers** shall be used - one for receiving and another for transmitting.

The ***RS-FX-SM40*** converter is used with a **single mode** fiber optic link. The length of optic line is up to 40 kilometers. For the purpose of communication, **two fibers** shall be used - one for receiving and another for transmitting.

The converters can be installed in unheated premises. The converters are designed for 24/7 operation. The converters are related to irreparable and regularly maintained products.

1.2 Specifications

1.2.1	Power supply:	– 5V
1.2.2	Power consumption:	– Max. 0.8 A
1.2.3	Communication speed:	– from 300 to 115,200 bit/s
1.2.4	Optic line length (max.):	
	• RS-FX-MM	– 2 km
	• RS-FX-SM40	– 40 km
1.2.5	Compatible optic cables:	
	• RS-FX-MM	– multi-mode 50/125 μm
	• RS-FX-SM40	– single-mode 9/125 μm
1.2.6	Fiber connector:	– SC/PC
1.2.7	Light emission wavelength:	– 1,310 nm
1.2.8	Maximal interface distance:	
	• RS-232	– 15 m
	• RS-422, RS-485	– 1,000 m
1.2.9	Devices on RS-485 line:	– up to 127
1.2.10	Working temperatures:	– from - 30 to +55 °C
1.2.11	Humidity:	– from 0 to 95 %
1.2.12	Protection class:	– IP20
1.2.13	Dimensions:	– 115mmx105mmx30 mm
1.2.14	Weight, max.:	– 0.3 kg

1.2.15 The content of precious materials: does not require accounting for storage, writing-off and disposal

1.3 Standard Delivery

1)	RS-FX-MM (RS-FX-SM40) Converter	x 1
2)	Data Sheet	x 1
3)	PSU AC/DC 5 B, 1 A	x 1
4)	Resistor C2-33H-0,25-620 Ohm±5%	x 1
5)	Screw	x 4
6)	Nail Plug	x 4
7)	Package	x 1

WARNING: *The converters include laser light emitting devices working in invisible infrared range.* ***Do not look directly at the optical port of the converter when it is powered*** *to avoid harming to your eye retina.*

2 USAGE INSTRUCTIONS

2.1 Getting Ready

Figure 1 shows the front and rear views of the converters as well as their LEDs descriptions.

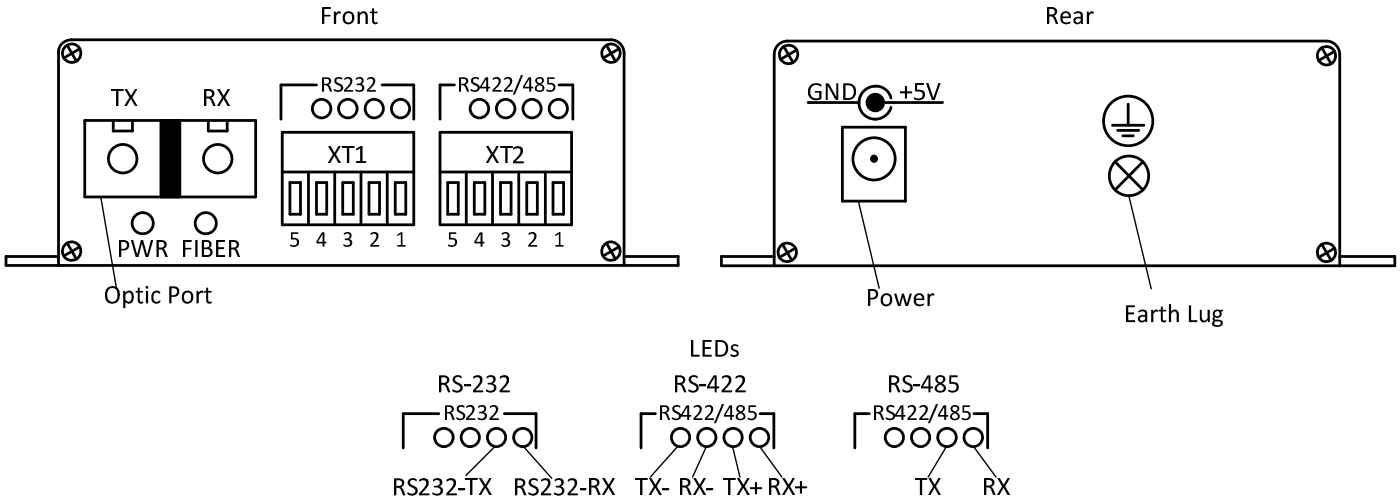

Figure 1

The converters do not require any settings before the usage and ready to work right after connecting external circuits and powering on. The communications rate over RS-232, RS-422, and RS-485 is defined automatically.

2.2 Indication

The PWR LED indicates the power supply status. If the power is On the LED indicates this by steady light.

The FIBER LED indicates the optic line status. The flashing LED indicates a missing signal. If a signal is OK, the LED is off.

The RS-232, RS-422/485 LEDs indicate (RX) receiving and (TX) transmitting over the corresponding lines. LED flashing indicates the process of receiving/transmitting over the corresponding lines where the flashing frequency depends on the communication intensity.

2.3 Connectivity

Descriptions of XT1and XT2 terminals:

No.	Sign	Description
XT1 (RS-232)		
1	RX	RS-232 Data In
3	GND	0 V
4	TX	RS-232 Data Out
2, 5	NC	Not used
XT2 (RS-422/485)		
1	A/TX+	RS-485 line A / RS-422 Data Out “+”
2	B/TX-	RS-485 линия B / RS-422 Data Out “ -“
3	GND	0 V
4	RX+	RS-422 Data In “+”
5	RX-	RS-422 Data In “-”

The Converter is designed only to convert the RS-232, RS-422 and RS-485 signals to optic signals. The product does not convert RS-232 to the RS-422/RS-485. But the device can provide simultaneous transmission of RS-232 and RS-422/RS-485 signals over an optic link.

Figure 2 shows the wiring diagram of converter connection to extend the RS-485 interface in the Orion system.

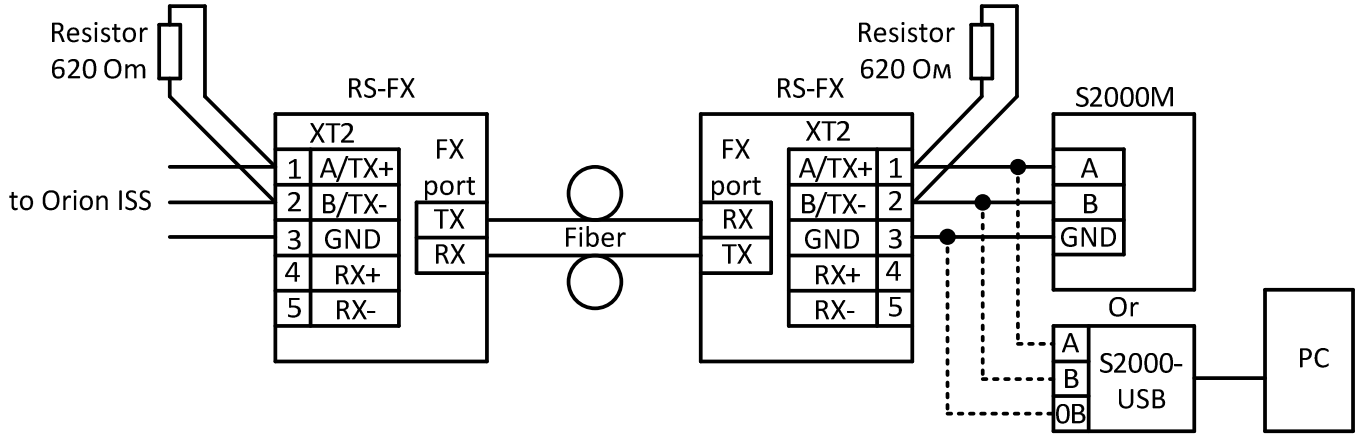

Figure 2

Figure 3 shows the wiring diagram of converter connection to extend the RS-232 interface.

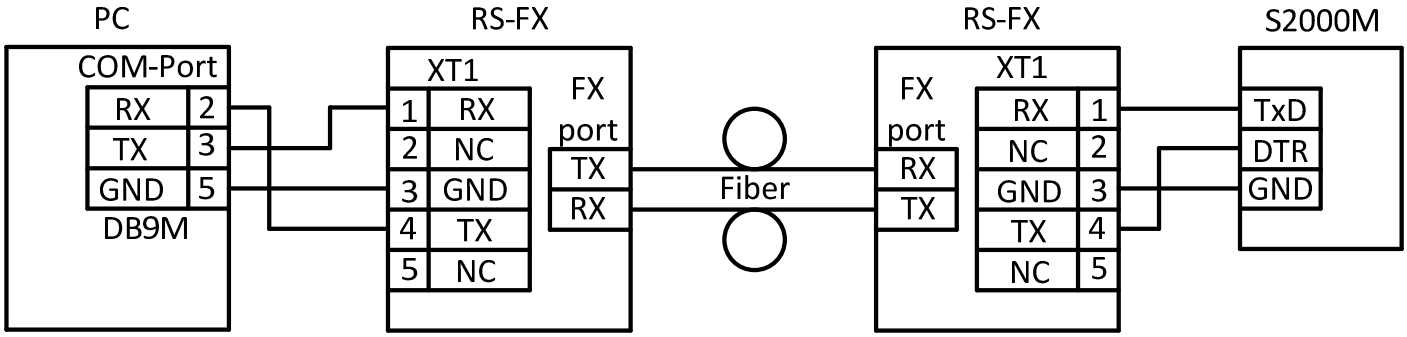

Figure 3

The TX and RX optical lines shall be connected in the **reverse order**, in other words, the TX line of a converter shall be connected to the RX line of another converter.

One RS-485 line cannot include more than 10 RX-FX converters. If the converter is the first or the last on the RS-485 line, the 620Ohm matching resistor (supplied) must be installed. The resistor shall be installed into the terminal strip XT2 between 1 (A/TX+) and 2 (B/TX-) terminals. Terminal 3 (GND) of XT2 terminal strip **must be** interconnected with GND (0V) contacts of devices which are connected to it via the RS-485 interface.

To connect the converter to PC Com port, the S2000M-PC cable is recommended.

If the RS-232 interface devices are connected to the converters, cross connection approach shall be used. In other words, the RX of the converter shall be connected to a device's TX, and a device's RX shall be connected to the TX of the converter, if otherwise is not specified for a specific device. Terminal 3 (GND) of XT1 terminal strip **must be** interconnected with GND (0V) contacts of devices connected to it via the RS-232 interface

The converters do not affect interface communication speed. Additional settings for timing parameters in Orion ISS are not required.

2.4 Installing Converters

Figure 4 shows the converter dimensions.

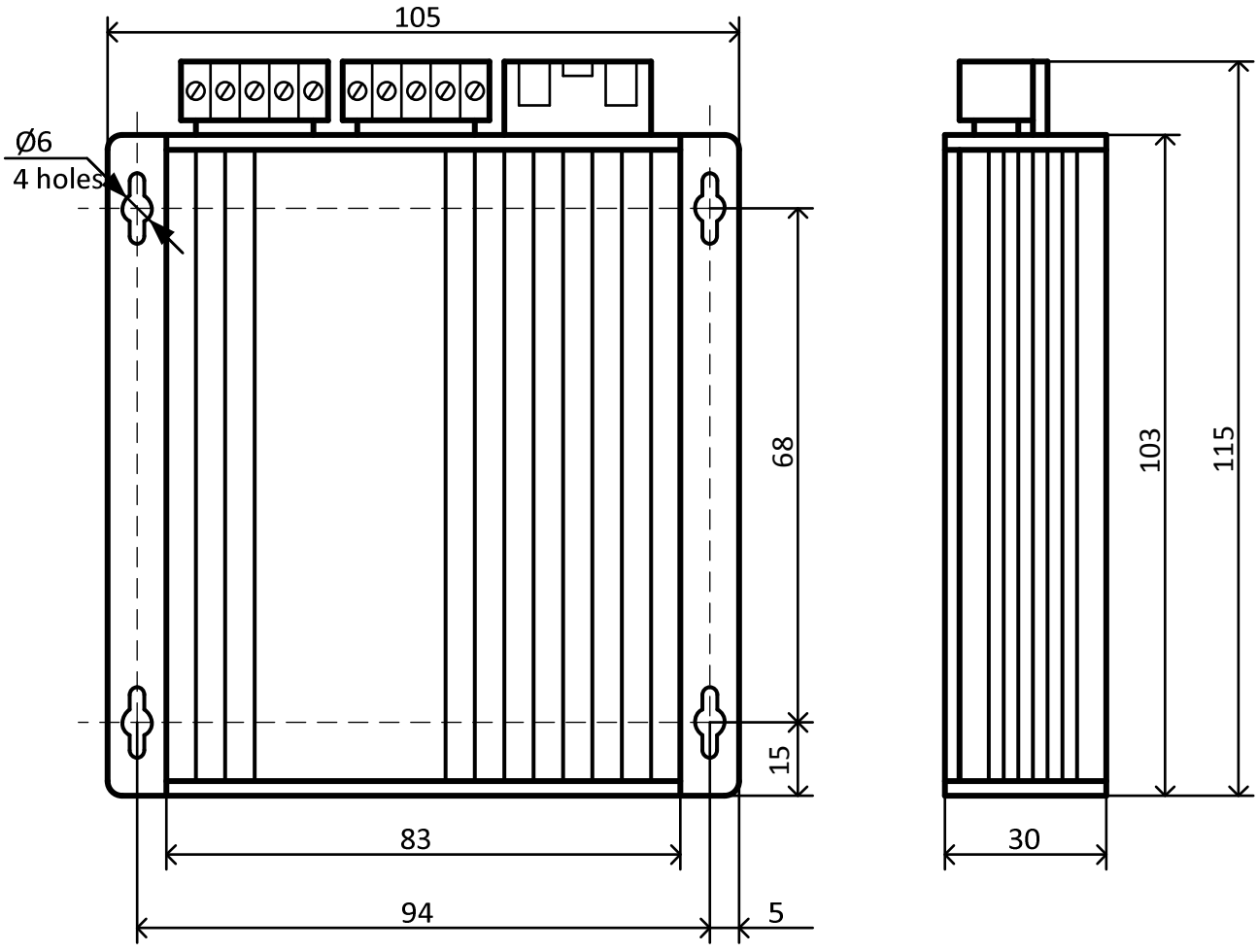

Figure 4

Four mounting holes are provided for the converter installation.

To connect to the optical port, please use SC connectors. To reduce the loss of optical signal, please use connectors with UPC (SC/UPC) polishing, also SC/PC and SC/SPC connectors can be used. **Do not use SC/APC connectors.**

Out of the box, the optical port of the converter is protected with a rubber plug to prevent dust. This plug must not be removed until installation is completed. Remove the plug only when you are going to connect optical connectors.

When connecting an optical line to the converter, please avoid bending a fiber. When the fiber is bent, the light may be lost (reflected) or leak out.

The converter is powered from AC/DC 5V power adapter (supplied) via the cylindrical two-contact connector (5.5 mm outer diameter, 2.5 inner diameter, and 10mm long). To provide backup power, please use the RIP-12 or RIP-24 power supply and MP 24/5V converter module with 5V output voltage. When connecting, please observe the polarity (See Fig. 1).

2.5 Functionality Test

When the power is on, the PWR LED is lit. The Fiber LED shall be off. If the Fiber LED is flashing, please check the optical connections and cable. When the communication starts, the LEDs of corresponding lines start flashing.

3 MAINTENANCE

The maintenance service for the Converter shall be provided by professionals qualified for Electrical Safety of Level III or higher.

The maintenance of the converter shall include the following:

- Inspection for physical damage, reliability of fastening , and terminals tightening;
- Cleaning of the converter terminals and enclosure from dust, grease and corrosion;
- Functionality tests according to para 2.5 of this datasheet.

The maintenance for the converter shall be provided once per year at least.

4 WARRANTY

4.1 The manufacturer guarantees that the converter meets with technical requirements if the user follows the instructions for shipment, storage, installation, and usage.

4.2 The average life time is ten years at least.

4.3 Warranty period is 18 months but no more than 24 months from the manufacturer's date of issue.

4.4 In case of any issue related to setting and use of the product, please contact with the technical support: +7 (495) 775-71-55 or e-mail: *support@bolid.ru*.

4.5 When submitted for repair, the product shall be accompanied with the description of possible faults.

All claims are submitted to the following address:

Bolid Company, # 4, Pionerskaya str, Koroljov city, Moscow Region, , 141070, Russian Federation

Tel./fax: +7 (495) 775-71-55 **(multiline).** E-mail: info@bolid.ru**,** http://bolid.ru**.**

5 CERTIFICATION

5.1 The production of the RS-FX-MM and RS-FX-SM40 fiber optic converters is certified in accordance with GOST ISO 9001-2011 № РОСС RU.ИК32.К00153.

5.2 The RS-FX-MM and RS-FX-SM40 convereters comply with requirements of Technical Regulation for Fire Safety (Federal Law No. 123-FZ) and have Conformity Certificate No C-RU.ЧС13.В.00517.

5.3 The RS-FX-MM and RS-FX-SM40 convereters comply with requirements of Technical Regulation of Customs Union TR CU 004/2011, 020/2011 and had the Declaration of Conformity No.: TC No. RU Д-RU.ME61.B.00551.

6 ACCEPTANCE AND PACKAGING

Reference No.	Product Name	Serial No.	Packager	Day, month, year
ACDR.426469.045	RS-FX-MM			
ACDR.426469.045-01	RS-FX-SM40			

Accepted in accordance with mandatory requirements of national standards and effective technical documentation, approved as ready to work, and packaged by the Bolid Company.