Limited Liability Company
“NPK Morsvyazavtomatica”

MULTIFUNCTIONAL CONVERTER NMEA

MFC-151

Operating manual

26E, Kibalchicha str., 192174,
St. Petersburg, Russia

Tel.: +7 (812) 622-23-10
Fax: +7 (812) 362-76-36

info@unicont.com
www.unicont.com

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This Operating Manual (hereinafter – OM) covers Multifunctional NMEA converter MFC-151 (hereinafter – the Converter), its structure, specifications and usage instructions, as well as repair instructions and storage information.

1 DESCRIPTION OF THE CONVERTER

1.1 PURPOSE

The Converter is designed to receive, combine, convert and multiply NMEA 0183 standard messages transmitted via RS-422, RS-485 interfaces, Ethernet and USB with customized operation algorithm.

1.2 TECHNICAL SPECIFICATIONS

Table 1 describes the technical specifications of the Converter.

Table 1 – Technical specifications of the Converter

Parameter	Value
Electrical specifications	
Input voltage, VDC	9.5 to 36.0
Max. power consumption, W	7
Galvanic isolation of supply mains	yes
Protection against reverse polarity connection	yes
Overvoltage protection	yes
Connectors	
Quantity and type of input connectors, pcs.	2 x RS-422
Quantity and type of combined (input and output) connectors, pcs.	4 x RS-485, 1 x Ethernet, 1 x USB
Supported protocols and standards	IEC 61162-1 (version 5, 2016), IEC 61162-2 (version 1, 1998), IEC 61162-450 (version 2, 2018), NMEA-0183 (version 4.11, 2018-11)
Max. baud rate, bit/s	115200
General specifications	
Weight, kg	0.46
Protection degree	IP22
Operating temperature, °C	−15 to +55

1.3 STRUCTURE AND OPERATION

Figure 1 describes the exterior of the Converter and designation of the connectors and terminals; for outline and installation dimensions, see appendix A. Table 2 describes the converter's terminals and connectors. Appendix B describes the general arrangement diagram.

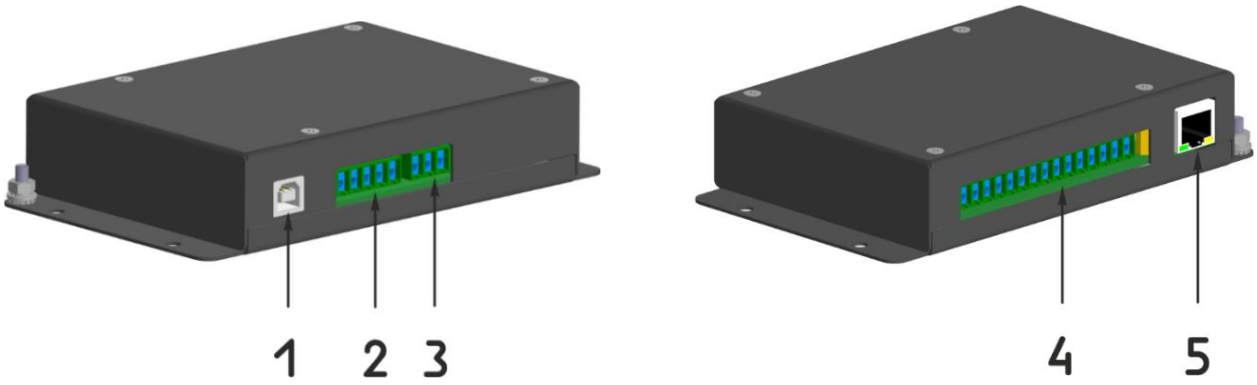

Figure 1 – The exterior of the Converter

Table 2 – Connectors and terminals

Designation	Name
1	USB connector
2	Terminals of RS-422 input connectors
3	Terminals to connect power supply
4	Terminals of RS-485 combined connectors
5	Ethernet connector

The converter receives data from several sources, processes it and sends to the assigned outputs. On our website unicont.com you can use the "MFC Studio" tool and create a schematic that sets data processing. For more detailed description of the Converter's settings and operation, see User manual.

The Converter may operate in the following modes:

a) multiplication – to receive data from one source and output to several transmitters;

b) combining – to combine two messages in one;

c) filtering – to receive and transmit messages with a particular headline;

d) conversion – to change headlines and frequency of messages transmission, to recalculate checksum.

2 SAFETY FEATURES

2.1 OPERATIONAL LIMITATIONS

The Converter is intended for application in dry indoor premises; select a place to install the Converter considering protection degree and operating temperature specified in table 1.

Attention! Distance between the installation site and magnetic compass shall not be less than *1 m*

Only those who have read and understood the System's operational documentation shall be permitted to operate with the System.

Only those who have read and understood this document and those who have had special training shall be permitted to service the System according to the applicable regulations.

2.2 SAFETY FEATURES

After unpacking, inspect the Converter and make sure that it does not have any mechanical damage.

Ground the Converter before connection of de-energized cable of external power network.

External power supply shall comply with the requirements specified in table 1.

Replacing damaged parts, modules is **prohibited** if power supply of the repaired unit is on

3 POTENTIAL MALFUNCTIONS

To provide diagnostics of the converter's malfunctions, use information in table 3. If you cannot detect a malfunction, contact the Manufacturer's service center.

Table 3 – The list of potential malfunctions and troubleshooting

Malfunction	Potential reasons	To be done
The Converter does not switch on	Power cable is not connected	Connect the cable
	No supply mains	Provide power supply
	Fuse is blown	Replace the fuse
No output data	Input data source is not connected	Connect the data source
	Operation schematic was not uploaded, or it is not correct	Connect the Converter to a PC and upload correct operation schematic to the Converter

4 STORAGE

The Converter shall be stored in the packaging inside the areas complying with the required storage conditions (*+5* to *+40 °C*) with the concentration of dust, oil, moisture and aggressive impurities in the air within the required limits for the working areas of production facilities.

After storage or transportation of the Converter below *+10 °C*, it shall be unpacked only in the heated premises and left in normal climate conditions for *12 hours* beforehand.

5 WARRANTY

The Manufacturer shall be liable for the warranty obligations only if the Converter was used correctly according to the OM. The Manufacturer will not consider damage claims if the operating conditions have been violated.

APPENDIX A
(MANDATORY)
OUTLINE AND INSTALLATION DIMENSIONS

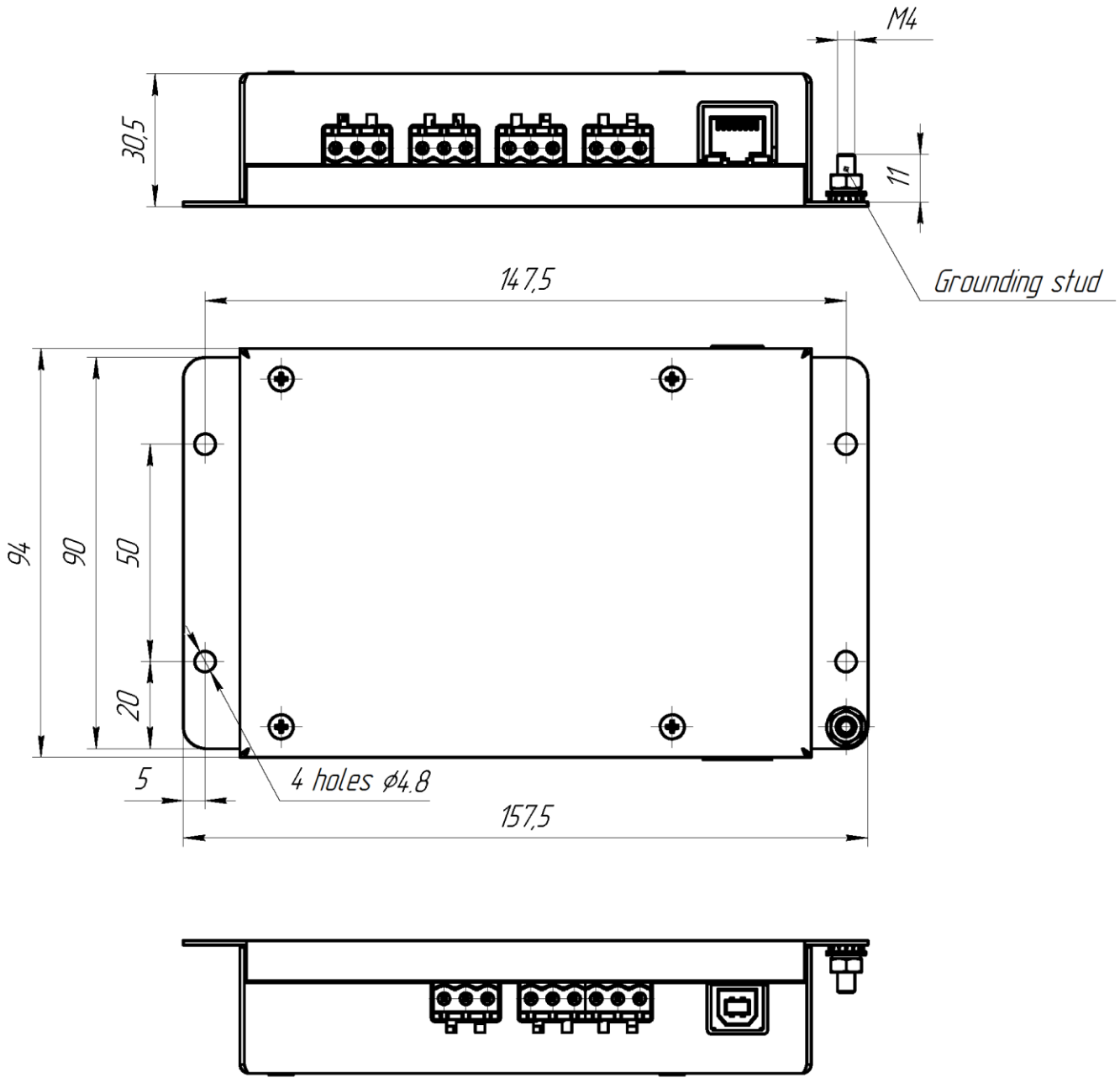

Figure A.1 – Outline and installation dimensions of the Converter

APPENDIX B
(MANDATORY)
CONNECTION DIAGRAM

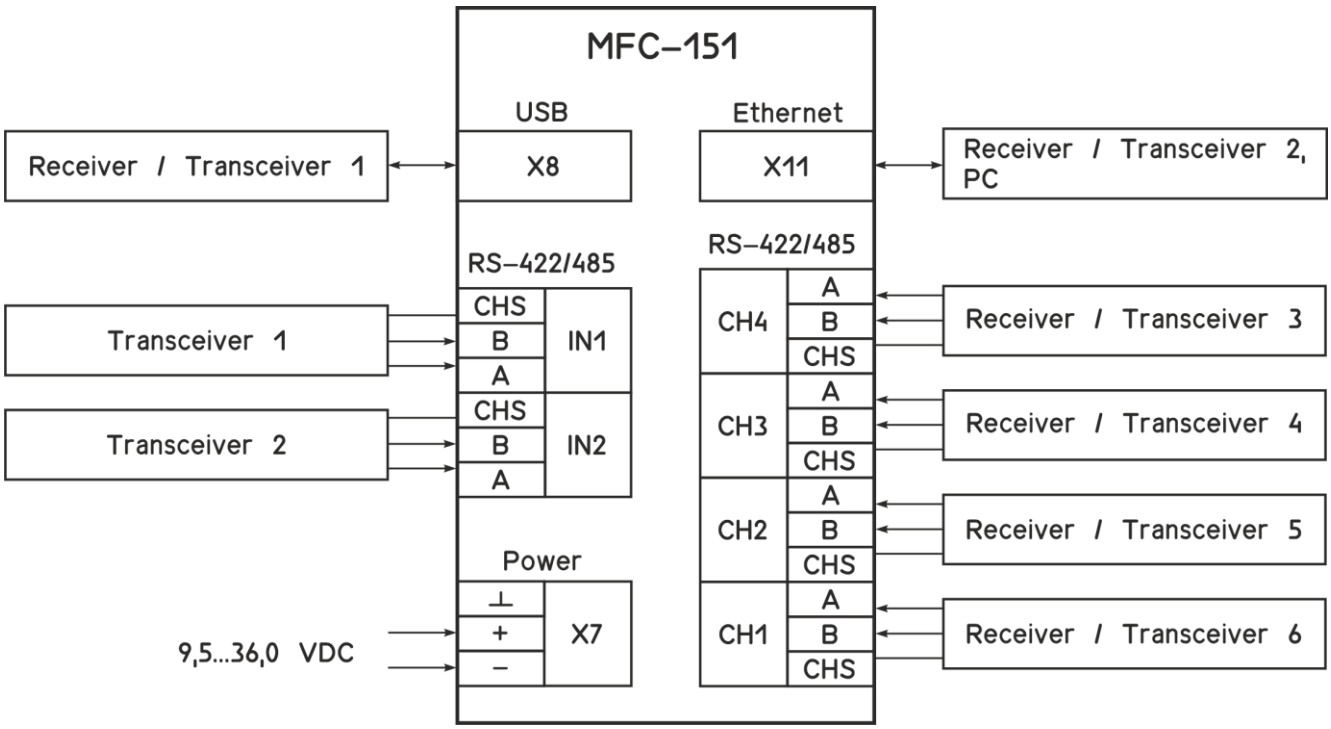

Figure B.1 – Connection diagram