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DS-801

NMEA Converter/Distributor Unit

Installation and operating manual



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Thank you for purchasing of NMEA Converter / Distributor. His construction is made in accordance with industry standards for use in marine environments.

1. Introduction

NMEA Converter / Distributor Unit is designed for the distribution of the signal standard NMEA 0183 (IEC 61162-1, IEC 61162-2), or other signals in the serial transmission of data via the RS-232 and RS-422.

NMEA Converter / Distributor Unit to perform the following functions:

- Convert RS-232 signals to RS422,
- Distribute signals RS-232 / RS422 to the four directions

NMEA Converter / Distributor unit provides complete galvanic isolation for all input and output ports, protection devices from accidental short circuit and from damages related with the lack of connect between GND and Common wire.

The design of the unit provides protection against reverse voltage supply, as well as overload protection and the appearance of spurious emission generation output ports.

Three LEDs allow watch the active state of the supply chains and output signals.

Unit is easily configured using the four-way DIP-switch on the PCB.

NMEA Converter / Distributor unit is rugged, lightweight plastic casing, which can be mounted on the ceiling, bulkhead indoor.

On the inside of the lid there is a block diagram of connections and modes of operation.

2. Complete set

The package contains:

1. NMEA Converter/Distributor Unit 1 шт.
2. Installation and operating manual in English and Russian language..... 1 шт.

3. Technical characteristics

Electrical characteristics:

- Supply voltage 10..30 V
- Power Consumption no more 0,5 W
- Isolation from the mains yes
- Protection against reverse voltage yes
- Overvoltage Protection yes

Input characteristics:

- Number of input ports (CH1, CH2)
- Supports interfaces RS-232, RS-422
- Maximum speed of data received 115200 бит/с
- Optoisolation of inputs yes

Output characteristics:

- Number of output ports 5
- Number of output groups 2 (A and B)
- Optoisolation of outputs 1
- Support interfaces RS-232, RS-422
- Maximum speed of data transmitted 115200 bit/s

General characteristics:

- Dimensions 145 x 90 x 35 mm
- Ingress protection rating IP 22
- Storage Temperature -20° C..+70° C
- Operating Temperature -5° C..+55° C
- Weight not more 0,5 kg

4. Mounting

Installation is recommended in the following sequence:

1. Remove the cover of the unit;
2. The base unit to fasten with the self-tapping screws (see Fig. 2.)
3. Pass cables from external devices through the cable entries are located in the side walls of the block.
4. Power cable must be connected to J8.
5. Set the block by DIP-switch SW1 located on PCB (see Fig. 2). Setting shell be made in accordance with Table 1. (table printed inside of the lid).
6. Place lid on the basis after cable connection and check the tightness of its fit to the box.

Таблица 1

Pole SW1	RS232→4xRS232	RS232→4xRS422	RS422→4xRS232	RS422→4xRS422
	Mode 1	Mode 2	Mode 3 (RS232)	Mode 4 (RS422)
1	ON	ON	OFF	OFF
2	ON	ON	OFF	OFF
3	OFF	OFF	ON	ON
4	OFF	OFF	ON	ON

Attention

Simultaneous connection of two input channels INPUT CH1 (RS232) and INPUT CH2 (RS422) is forbidden (mutually exclusive).

Operation modes are determined according to the block diagram shown in Fig. 1.

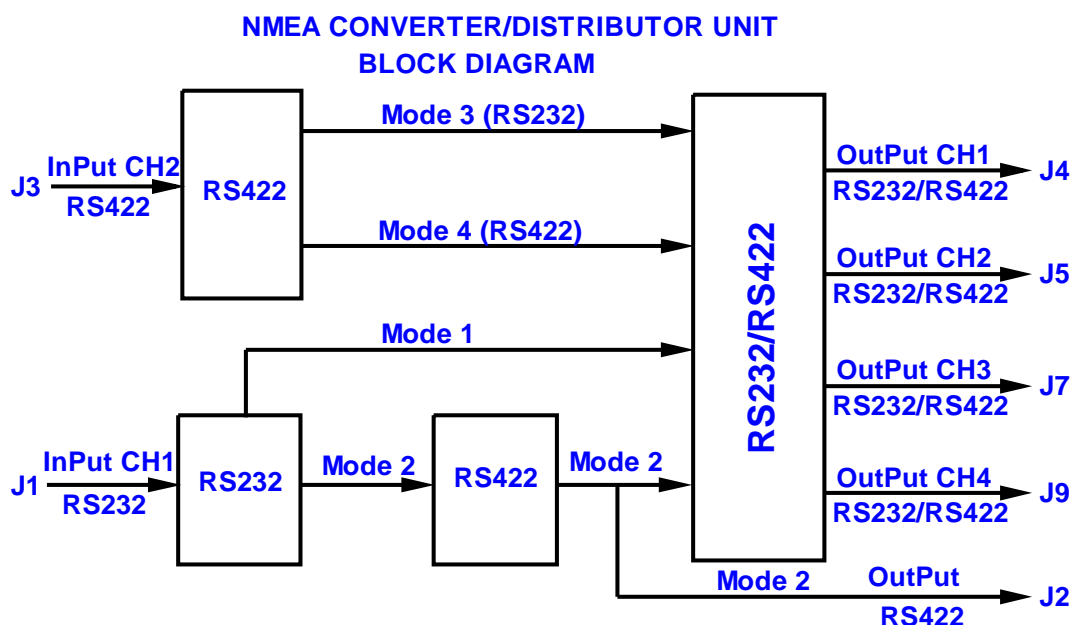


Fig. 1

Overall dimensions of the block NMEA Converter / Distributor unit, location of wiring terminals and DIP-switch on the PCB are shown in Fig. 2.

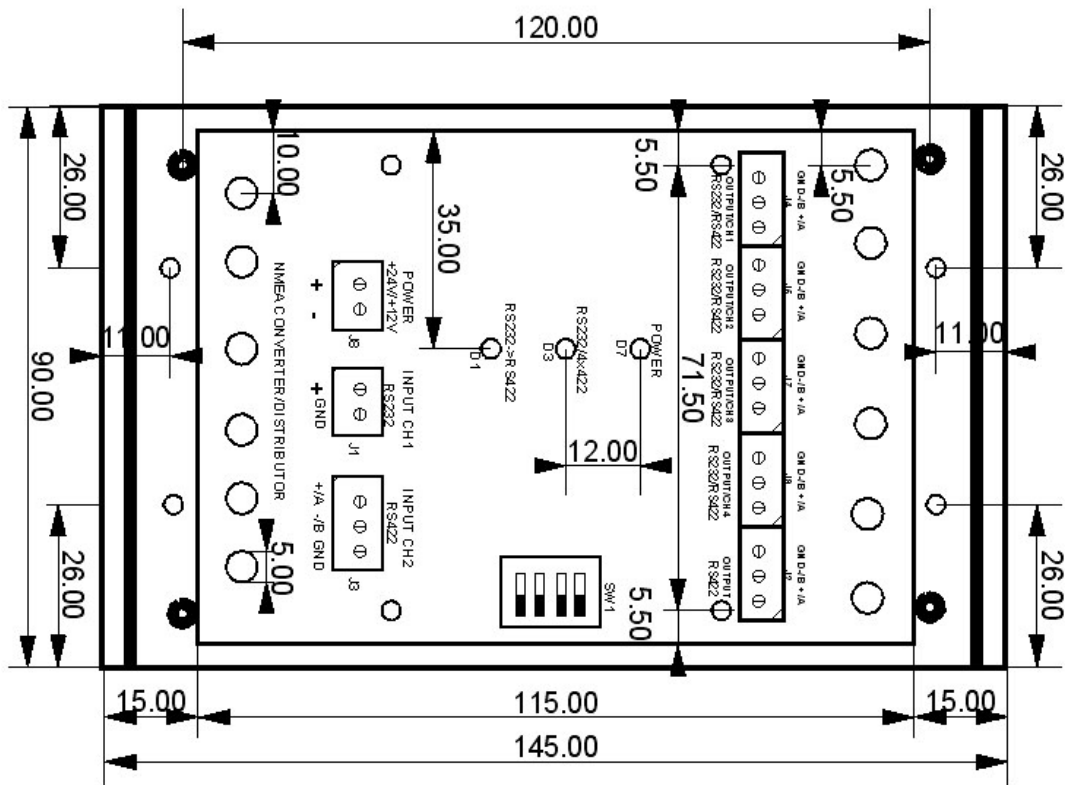


Fig. 2

4.1. Input Channels

The unit has two input ports optoisolated:

- INPUT CH1 asynchronous serial interface RS232 ;
- INPUT CH2 asynchronous serial interface RS422.

4.2. Output Channels

The unit has five output ports of which:

- One has an asynchronous serial interface RS422 (OUTPUT);
- Four have component asynchronous serial interface RS232 / RS422 (OUTPUT CH1 + OUTPUT CH4).

Format the output signal:

- Standard NMEA0183.

Options format:

- Data – 8 bit;
- Maximum speed –115200 bit/s.

4.3. Cable connection

To connect the RS232 interface cable, wire Tx or Rx is connected to terminal "+". The common signal wire is connected to terminal «GND».

To connect the RS432 interface cable, wire Tx + or Rx + is connected to terminal "A +" (differential output). Wire Tx- or Rx- is connected to terminal "B -" (differential output). The common signal wire is connected to terminal «GND».

Use shielded cables is recommended. The cables can be fixed with a plastic stranglehold on the printed circuit board. Grounding should be done at the cable equipment side only.

Due to the fact that different manufacturers use different designations of wires, it is often necessary to change the polarity + / - A / B.

Note: This change of the wires polarity will not lead to the receiver or transmitter faulties or NMEA Converter / Distributor faulties.

4.4. RS232 Interface Description.

RS-232 - Interface for data transfer between two devices at a distance of 20 m. The information is transmitted by wires with signal levels other than 5V for greater interference immunity.

In the RS-232 uses two signal levels: logical «1» and «0». Logical «1» corresponds to negative voltage levels, and a logical «0» - positive one. The corresponding voltage values are shown in Table 2 (measurements should be made with a voltmeter pointer).

RS232 signal levels

Table 2

Level	Transmitter	Receiver
Logical «0»	from +5 V to +15 V	from +3 V to +25 V
Logical «1»	from -5 V to -15 V	from -3 V to -25 V
Not defined	from -3 V to +3 V	

4.5. RS422 Interface Description.

RS422 - interface that provides a serial balanced and differential one-way data transfer (not reversible), with the ability "point-to-point" information delivery.

Standard RS-422 defines the electrical characteristics of a symmetric digital interface. Standard on the RS-422 initially use of four wires (shielded twisted pair), but allows the use of 2-wire only.

RS-422 allows connections only as master / slave.

Maximum cable length:

- for the rate of 100 Kbit / sec - 1220 m;
- for the rate of 100 Mbit / sec - 15 m.

RS422 signal levels

The logical «1» means: the signal level «A +» to compare with the signal level «B-» is negative.

The logical «0» means: the signal level «A +» to compare with the signal level «B-» is positive.

For any binary state (logical «0» or logical «1»), the value of the differential voltage measured between the output connector pins (signals «+ A» and «B-») shall be more than 1,5 and less than 6, 0 V. The voltage on pins with signals «+ A» and «B-», measured relative to the ground, should be less than 6,0 V.

5. Safety

Keep in mind that the installation, removal and repair unit NMEA Converter / Distributor should be made only with the power OFF.

- Keep it dry.
- **It is forbidden:**
- Expose the unit shock and power cable tension;
- Operate a faulty unit;
- Connect the device are not intended for use with this unit;
- Set the unit at less than 1 meter away from the magnetic compass;
- Do not short-circuit;
- Use of organic solvents to avoid unit case damage.

6. NMEA Converter / Distributor Unit Operation

6.1. Switching ON

After switching on the unit, make sure that the LED «POWER» lighting. This indicates that voltage is going on to PCB.

The LEDs indicate the status of output signals («RS232 → RS422» and «RS232/4xRS232»). LEDs will flash when each signal comes through the appropriate channel.

If you have any doubts about the transmission of the signal on one of the output channels, it is possible to carry out effective verification. You may connect the LED (connected to the +5 V supply) to the checked output channel. If it flashes with the relevant LED «RS232 → RS422» or «RS232/4xRS232» simultaneously, it means that the interface is working properly.

6.2. Testing Unit

The most useful test to check read the data - the connection of personal computer (PC) to the output channel to checked output channel and receiving data using programs (Hyper Terminal, First Choice, Procom или Date Talk). It is necessary to select and configure the port of a PC.

NMEA Converter/Distributor unit has no data processing function, it can only repeat what is fed to its inputs.

6.3. Connecting the unit to a PC

To connect a PC should use the standard pinout signals of RS232 interface for connector DB9 (COM port): DB9 (F) on NMEA Converter side, DB9 (M) on PC side.

2=Received data RxD;

3=Transmitted data TxD;

5=Signal/Common Ground;

Note: In the absence of COM port connector in PC, RS232/USB converter is recommended. In case desktop PC use PC body must be connected to ship ground to avoid COM ports blow out.

To invoid COM port blow out, PC should be switched OFF before can port connector turn on or turn off.

For NMEA Converter check:

- Connect TALKER with NMEA Converter input;
- Connect NMEA Converter output to PC;
- Run terminal software on PC (for example Hyper terminal).

This procedure is performed as follows:

1. On the computer sequentially open windows Start> Programs> Accessories> Communications> Hyperterminal and there is a shortcut to Hyperterminal.exe;
2. Starts the program Hyperterminal.exe and consistently follow the windows: The new connection> name (for example GPS)> connect (you must select the COM port on your computer, which will come the signal from the GPS receiver).
3. Installed the connection settings – control panel> system> equipment> device manager> ports > Serial port (for example COM1) > Setting the Port > Speed (for example 4800 bits / s)> data bit (for example-8) > parity (for example-not)> Flow management (for example - hardware).

As a result of installations on the screen of the program you will see strings of NMEA sentences. It means that NMEA Converter / Distributor is working properly.

6.4. Connecting AIS to computer via NMEA Converter/Distributor Unit

NMEA Converter / Distributor unit can be used to connect the AIS equipment to navigational equipment (ECDIS, PC, etc.). You can use the AIS Pilot Plug (see Figure 3)

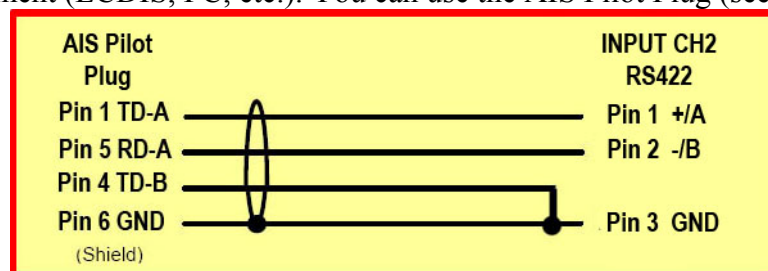


Fig. 3 Connecting NMEA Converter / Distributor unit to AIS equipment

Such signals can not connect to the COM-port (build in PC) directly because this may lead to the blowing out of the COM-port. To avoid this conversion RS422 interface signals to RS232 (is strictly recommended). AIS pilot plug uses NMEA format RS422. Optionally you can use RS232 to USB converter if build in to PC COM port is absent. The scheme of such connection is shown in Fig.4.

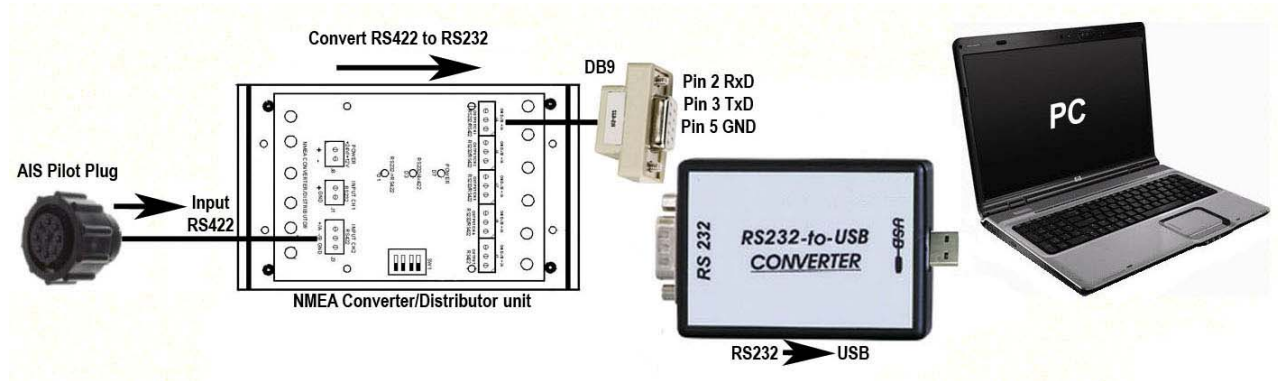


Fig. 4 Scheme of connecting equipment AIS to computer

Note: Also, you can make a connection GYRO converter output to PC (RS422 output).

7. Warranty

The warranty period is 1 year for labour and parts from the date of purchasing. This warranty is valid if the product fails during normal and proper use within the warranty period.

Note:

Get consultations on the use of block NMEA Converter / Distributor you can by contacting the manufacturer. Please see details on the website (<http://www.uranis.net>) in section Contacts.

You can send your questions and get detailed information on them

8. QA Mark

Serial number _____

Test, QA Passed

Tested by

Position, name _____ Signature _____

Checked by

Position, name _____ Signature _____

Date _____
(year, month, date)