User Manual

Revision 1.001
English

HD67223-A1

HD67223-B2

Benefits and Main Features:

- Mountable on Rail DIN
- TCP/UDP protocols changeable with software
- Easy to use software configuration
- Industrial temperature range:
  -40°C / 85°C (-40°F / 185°F)

Similiar Products

INDEX:

UPDATED DOCUMENTATION:

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REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	09/07/2010	Dp	All	First release version
1.001	12/02/2013	Nt	All	Added new chapters

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SECURITY ALERT:

GENERAL INFORMATION

To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device are required for each individual application, legal and safety regulation. The same applies also when using accessories.

INTENDED USE

Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

QUALIFIED PERSONNEL

The device can be used only by qualified personnel, strictly in accordance with the specifications.
Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS

The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

This symbol indicates that non-observance of the safety instructions is danger for people to serious injury or death and / or the possibility of damage.

CE CONFORMITY

The declaration is made by us. You can send an email to or give us a call if you need it.

CONNECTION SCHEME:

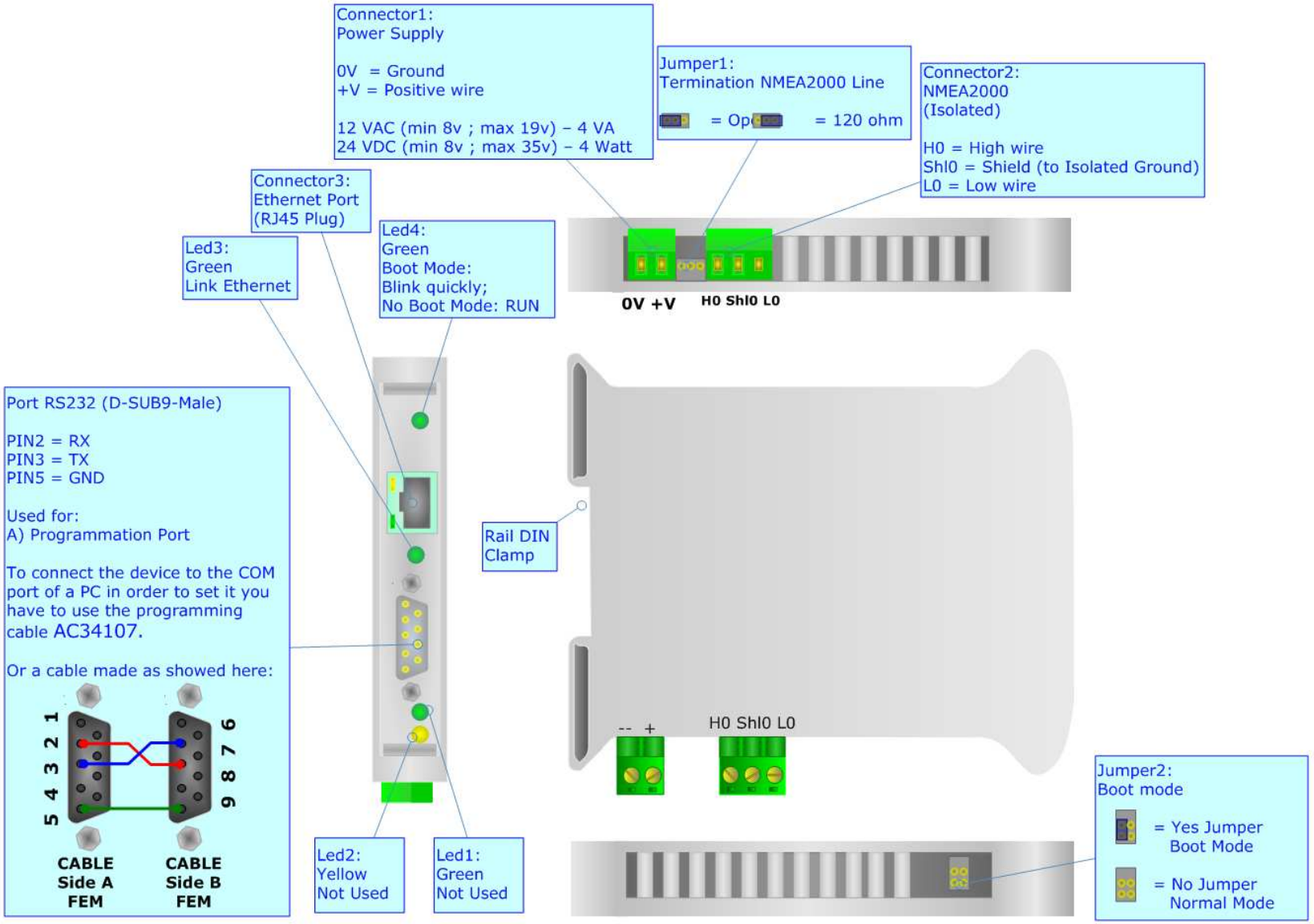


Figure 1: Connection scheme HD67223-A1

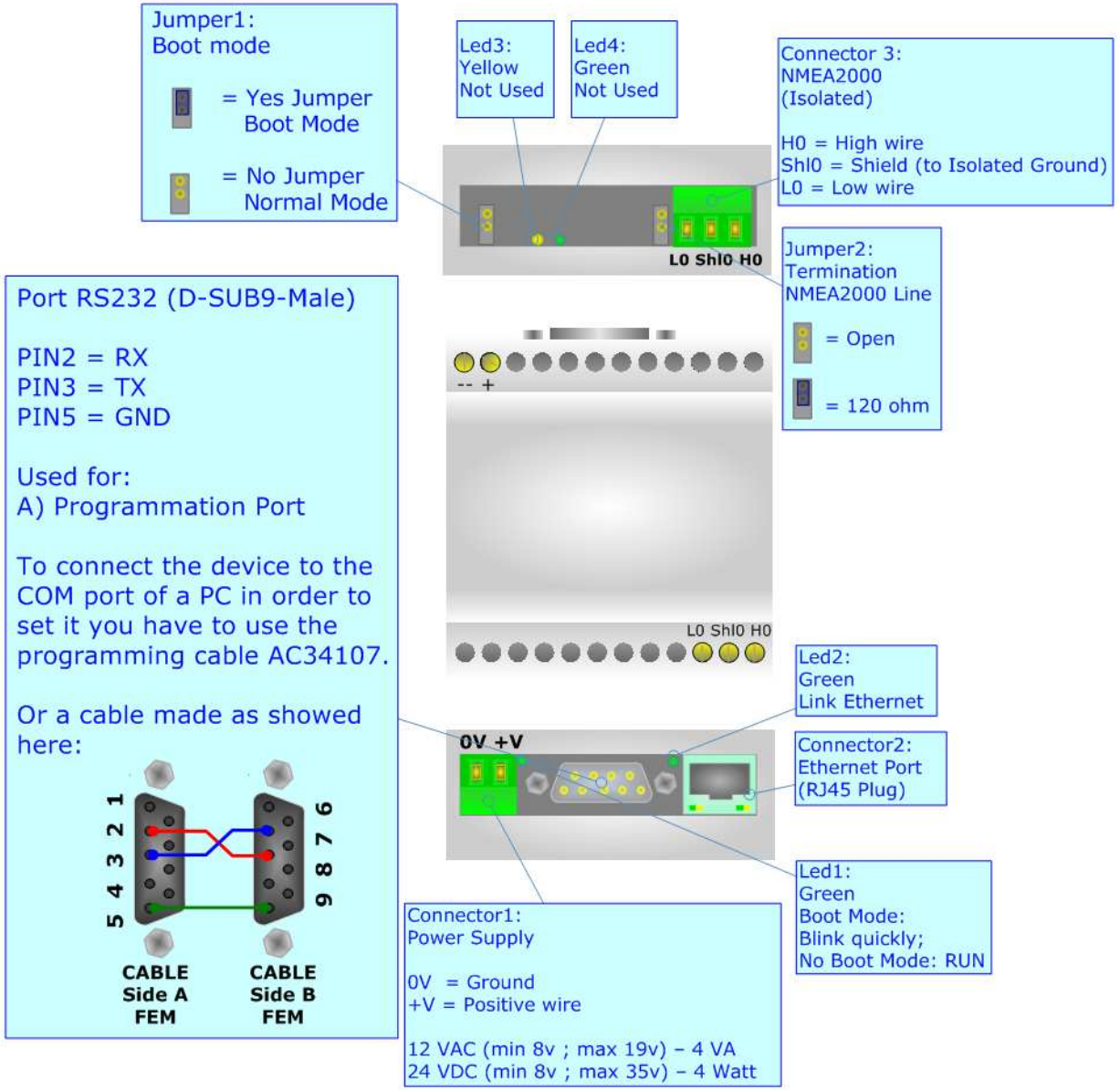


Figure 2: Connection scheme for HD67223-B2

CHARACTERISTICS:

The Configurable NMEA 2000 Slave to Ethernet gateway allow the following:

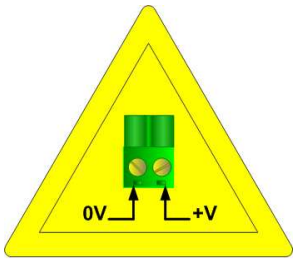
- TCP/UDP Ethernet protocols changeable with software;
- Mountable on Rail DIN;
- Temperature range -40°C to 85°C.

POWER SUPPLY:

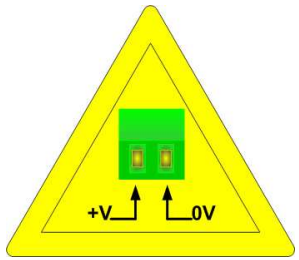
Recommended Power Supply	
VDC	**VAC**
24v	**12v**

VDC		VAC	
Vmin	**Vmax**	**Vmin**	**Vmax**
8v	**35v**	**8v**	**19v**

Caution: Not reverse the polarity power .



HD67223-A1



HD67223-B2

CONFIGURATION:

You need Compositor SW67223 software on your PC in order to perform the following:

- Define the parameter of the NMEA 2000 bus;
- Define the parameter of the Ethernet;

USE OF COMPOSITOR SW67223:

To configure the Gateway, use the available software that runs with Windows, called SW67223. It is downloadable on the site www.adfweb.com and its operation is described in this document.

When launching the SW67223 the right window appears (Fig. 3).

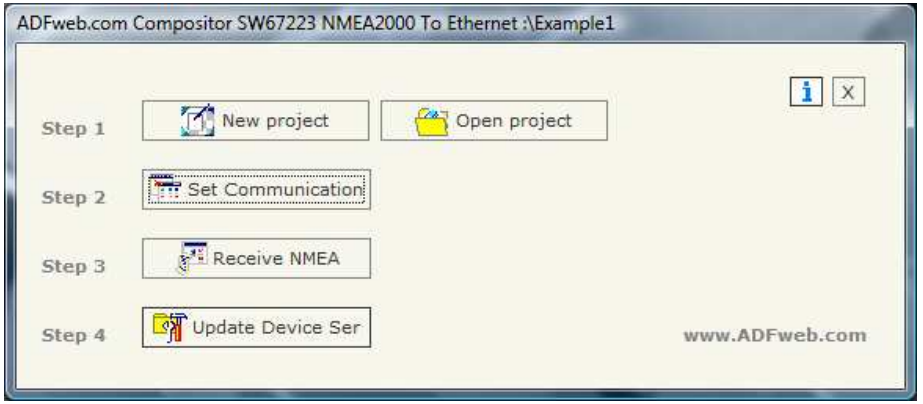


Figure 3: Main window for SW67223

NEW PROJECT / OPEN PROJECT:

The "New Project" button creates the folder which contains the entire device configuration.
A device configuration can also be imported and exported:

- To clone the configurations of a Programmable NMEA 2000 to Ethernet Gateway in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button "Open Project";
- When a new project is created or an existent project is open, it will be possible to access the various configuration section of the Software.

SET COMMUNICATION:

This section define the fundamental communication parameter of two buses, NMEA 2000 and Ethernet.

By pressing the "Set Communication" button from the main window for SW67223 (Fig. 3) the window "Set Communication" appears (Fig. 4).

The window is divided in two section, one for the NMEA 2000 and the other for the Ethernet.

The means of the fields for NMEA 2000 are:

- In the field "Baud rate" the baudrate for the NMEA 2000 is defined;
- If the field "CAN Bus 2.0A" is checked, the CAN with a CobID of 11Bit is used; otherwise if the field "CAN Bus 2.0B" is checked the CAN with a CobID of 29Bit is used;
- In the field "TimeOut Data" insert a time, when this time is elapsed the data isn't reliable, and in the Modbus register you can read "FFFF";
- If the field "Peer to Peer" is checked the gateway accept any ID that have the PGN inserted in the section "Receive NMEA;
- If the field "Filter FECA" is checked there is a filter to the alarms with PGN 0xFECA. If the device send first a message with PGN 0xFECA, after it would send a Transport Protocol frame for sending the alarms. If this frame arrives within the mS write in the box, the frame with 0xFECA is discarded and the Transport Protocol frame is held. Otherwise the frame with PGN 0xFECA is hold.

The means of the fields for Ethernet are:

- In the field "IP ADDRESS" insert the IP address;
- In the field "SUBNET Mask" insert the Subnet Mask;
- In the field "Port" insert the number of port;
- If the field "TCP" is checked the Ethernet protocol used is the TCP, otherwise if the field "UDP" is checked the Ethernet protocol used is the UDP.

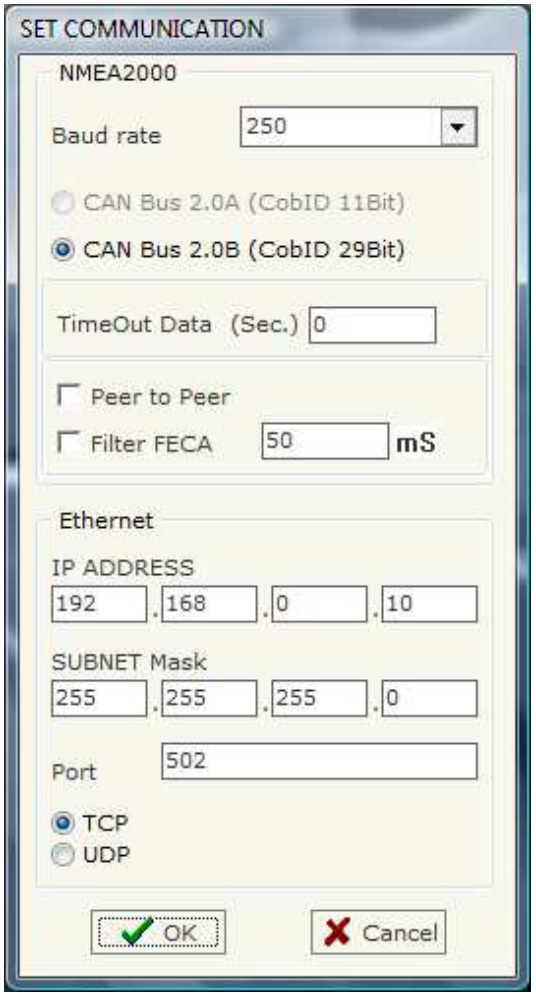


Figure 4: "Set Communication" window

RECEIVE NMEA

By pressing the "Receive NMEA" button from the main window for SW67223 (Fig. 3) the window "Receive NMEA 2000 Frame" appears (Fig. 5).

The means of the fields are:

- In the field "Data Page" insert the Data Page, in the NMEA 2000 protocol is 0 or 1;
- In the field "PGN" insert the PGN of the data you would to read from Ethernet to NMEA 2000 (it is an identifier);
- In the field "Source Address" insert the address of the device that send the frame;
- If the field "Multi Packet" is checked, the Transport Protocol is enabled for the frame otherwise is disable;
- If the field "Fast Packet" is checked the frame could use the Fast Packet Protocol functions;
- In the field "StartByte" insert the Start Byte of the Transport Protocol. Insert a value only if the Multi Frame is enabled;
- In the field "N° Byte" insert the number of bytes that composed the Transport Protocol. Insert a value only if the Multi Frame is enabled;
- If the field "Cancel Data" is checked, the data in the frame will be erased after the "TimeOut Data" is expired;
- In the field "Mnemonic" the description for the frame is defined.

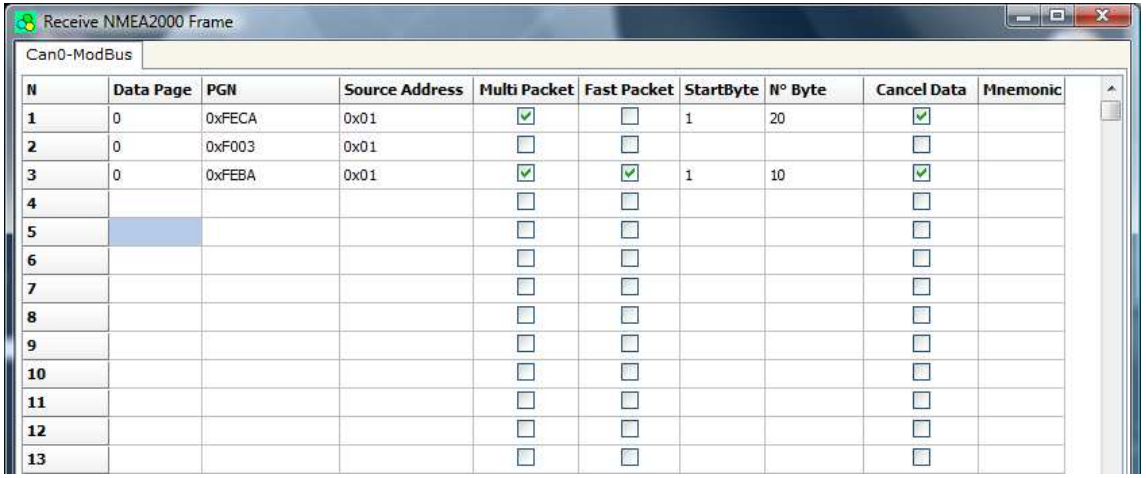


Figure 5: "Receive NMEA2000" window

UPDATE DEVICE VIA SERIAL

Section "Update Via Serial" (Fig. 6):

In order to load the parameters or update the firmware in the gateway, follow these instructions:

- Turn off the device;
- Connect the Null Modem cable from your PC to the gateway;
- Insert the Boot Jumper (see the Fig. 1 for more info);
- Turn on the device;
- Check the "BOOT Led". It must to blink quickly (See the Fig. 1 for more info);
- Select COM port and press the "Connect" button;
- Press the "Next" button;
- Select operations you want to do. Can select only Firmware or only Project or both;
- Press the "Execute update firmware" to start the upload;
- When all the operations are "OK" turn off the device;
- Disconnect the Boot jumper;
- Turn on the device.

At this point the configuration/firmware on the device is correctly updated.

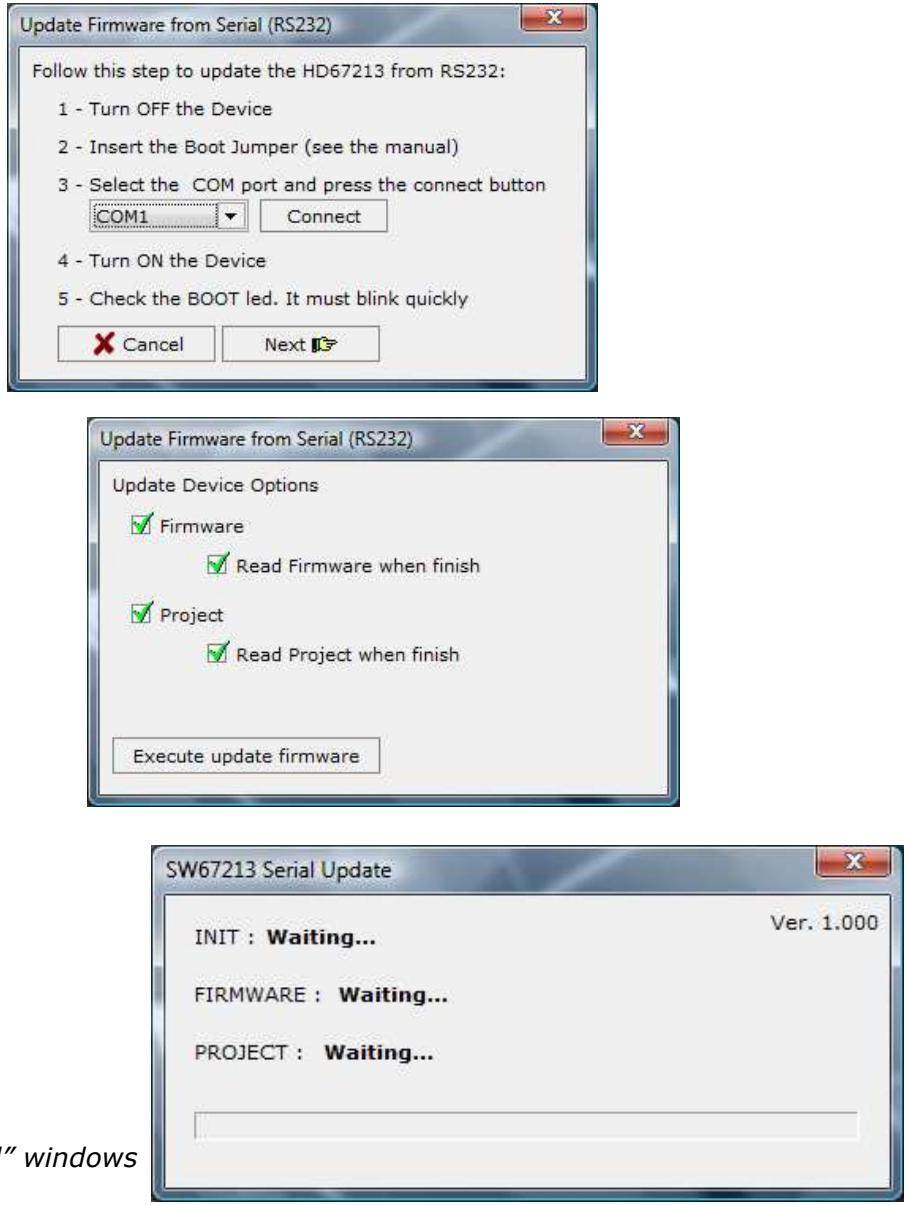


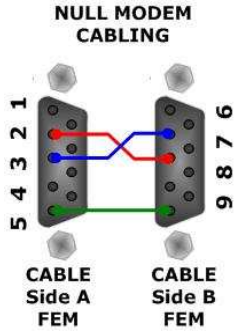
Figure 6: "Update Via Serial" windows

CHARACTERISTICS OF THE CABLES:

The connection at Ethernet socket must be with a Ethernet Cable with a RJ45 Plug

The connection from RS232 socket to a serial port (example one from a personal computer), must be made with a Null Modem cable (a serial cable where the pins 2 and 3 are crossed).

It is recommended that the RS232C Cable not exceed 15 meters.



ETHERNET PROTOCOL

This protocol is able to read and write frames in the NMEA 2000 net.

Write Frames

The transmission is very simple, it require only what are the packets to send. In a single request it is possible to write at maximum 19 frames in the NMEA 2000 net. The Bytes that composed the request are these:

Byte Number	Description
1	Read / Write Identifier (Read=0x01 / Write=0x02)
2	Number of frames to send
3	Priority
4	Data Page
5	PGN Hi
6	PGN Lo
7	Source Address
8÷15	Data (Byte 8 is the higher, byte 15 is the lower)

A single frame is composed by 13 bytes (byte 3 to byte 15). Now if the "Number of frame to send" (Byte Number 2) has got a value greater than one the next frame is composed from byte 3 to byte 15 and so for all the frames.

The response is composed by only one byte. It can have two values:

- 0x00: No Errors;
- 0x01: Parameter Error.

Example:

We want to write two frames with the following characteristics:

Frame 1: Priority=6; Data Page=0; PGN=FECA; Source Address=1; Data=0x0102030405060708;
Frame 2: Priority=6; Data Page=0; PGN=FFCA; Source Address=2; Data=0x1122334455667788.

So the string of hexadecimal numbers is:
REQ:[02][01][06][00][FE][CA][01][01][02][03][04][05][06][07][08][06][00][FF][CA][02][11][22][33][44][55][66][77][88]
RES:[01]

Read Frames

For reading Data it is necessary to have a map in the RAM memory that contains the Data that passing in the bus. This map is implemented in the "Compositor SW67223" but it has some standard address given by the software. It is possible to see this map in Fig. 5.

The Bytes that composed the request are these:

Byte Number	Description
1	Read / Write Identifier (Read=0x01 / Write=0x02)
2	Starting Address Hi
3	Starting Address Lo
4	Number of Byte to read Hi
5	Number of Byte to read Lo

The Bytes that composed the respons are these:

Byte Number	Description
1	Error
2	TimeOut
3÷n+2	Data

n=Number of Byte

The Error Byte (Byte 1) can have three values:

- 0x00: No error;
- 0x01: Starting Address doesn't exist;
- 0x02: Too many Data to read.

The TimeOut Byte (Byte 2) can have three values:

- 0x00: TimeOut not used;
- 0x01: Data consistent;
- 0x02: Data not consistent.

Example:
We want to read ten frames from Starting Address 1. So the string of hexadecimal numbers is:
REQ:[01][00][00][00][10]
RES:[00][01][01][02][03][04][05][06][07][08][09][0A][0B][0C][0D][0E][0F][10]

MECHANICAL DIMENSIONS:

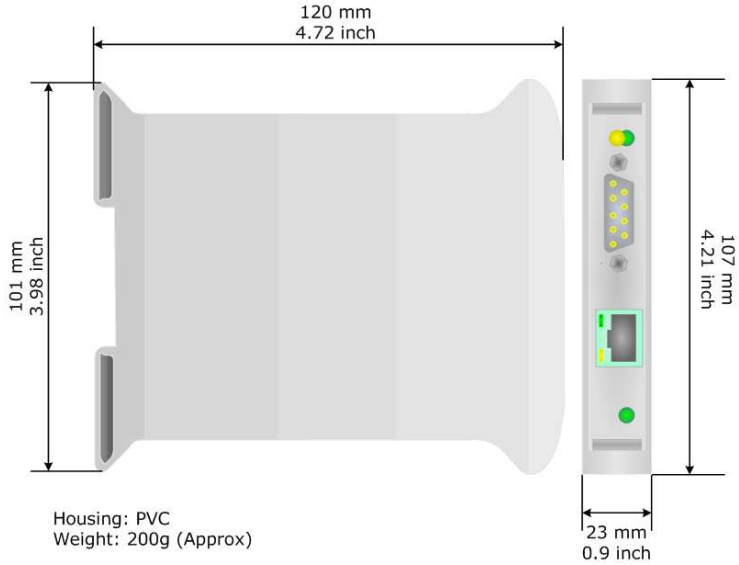


Figure 7: Mechanical dimensions scheme for HD67223-A1

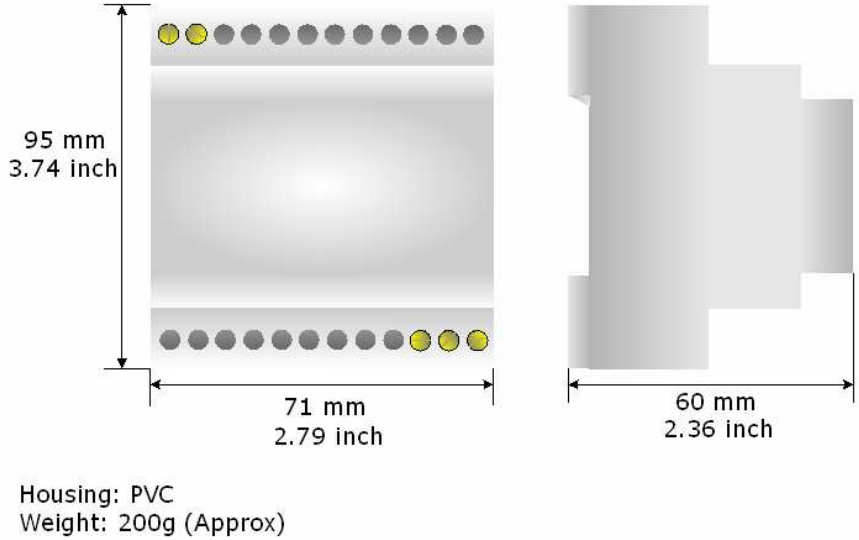


Figure 8: Mechanical dimensions scheme for HD67223-B2

ORDER CODE:

Order Code: **HD67223-A1** **-** NMEA 2000 / Ethernet - Converter

Order Code: **HD67223-B2** **-** NMEA 2000 / Ethernet - Converter

ACCESSORIES:

Order Code: **AC34001** **-** Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V AC

Order Code: **AC34002** **-** Rail DIN - Power Supply 110V AC 50/60Hz – 12 V AC

Order Code: **AC34104** **-** European Input - Power Supply 230V AC 50Hz – 12 V DC

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OTHER REGULATIONS AND STANDARDS

WEEE INFORMATION

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).
This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

CE MARKING

The product conforms with the essential requirements of the applicable EC directives.

WARRANTIES AND TECHNICAL SUPPORT:

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at www.adfweb.com.
Otherwise contact us at the address support@adfweb.com

RETURN POLICY:

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

1) Obtain a Product Return Number (PRN) from our internet support at www.adfweb.com. Together with the request, you need to provide detailed information about the problem.
2) Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67118	Converter RS232 to RS485 Isolated	www.adfweb.com?Product=HD67118
HD67119	Converter USB 2.0 to RS485 Isolated	www.adfweb.com?Product=HD67119
HD67007	Gateway Modbus TCP Server to RTU Master	www.adfweb.com?Product=HD67007
HD67010	Gateway Modbus TCP Client to RTU Slave	www.adfweb.com?Product=HD67010