

User Manual

Revision 1.003
English

DeviceNet Master / Modbus Slave - Converter

(Order Code: HD67151-A1 – HD67151-B2)

for Website information:

www.adfweb.com?Product=HD67151

for Price information:

www.adfweb.com?Price=HD67151-A1
www.adfweb.com?Price=HD67151-B2

Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Low cost
- ▶ Rail mountable
- ▶ Wide supply input range
- ▶ Galvanic isolation between two buses
- ▶ Industrial temperature range:
-40°C / 85°C (-40°F / 185°F)



HD67151-A1



HD67151-B2

For other DeviceNet products see also the following link:

DeviceNet Master from/to

www.adfweb.com?Product=HD67152
www.adfweb.com?Product=HD67153
www.adfweb.com?Product=HD67154
www.adfweb.com?Product=HD67555

(Modbus TCP Server)
(CANopen)
(Ethernet)
(PROFIBUS)

For other Modbus products see also the following link:

Modbus Master from/to

www.adfweb.com?Product=HD67001
www.adfweb.com?Product=HD67012

(CANopen)
(CAN)

Modbus Slave from/to

www.adfweb.com?Product=HD67002
www.adfweb.com?Product=HD67011

(CANopen)
(CAN)

Do you have an your customer protocol?

See the following link:

www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?

Ask it to the following link:

www.adfweb.com?Cmd=helpme

INDEX:

	Page
INDEX	2
UPDATED DOCUMENTATION	2
REVISION LIST	2
WARNING	2
TRADEMARKS	2
SECURITY ALERT	3
CONNECTION SCHEME	4
CHARACTERISTICS	6
CONFIGURATION	6
POWER SUPPLY	7
FUNCTION MODES	8
LEDS	9
USE OF COMPOSITOR SW67151	10
NEW PROJECT / OPEN PROJECT	10
SET COMMUNICATION	11
DEVICENET NETWORK	12
DEFINE REGISTERS	13
UPDATE DEVICE	15
CHARACTERISTICS OF THE CABLES	16
MECHANICAL DIMENSIONS	17
ORDER CODE	17
ACCESSORIES	17
DISCLAIMER	18
OTHER REGULATIONS AND STANDARDS	18
WARRANTIES AND TECHNICAL SUPPORT	19
RETURN POLICY	19
PRODUCTS AND RELATED DOCUMENTS	19

UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own.

To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

With this "Document Code" go to web page www.adfweb.com/download/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the update.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	22/04/2010	FI	All	First release version
1.001	22/07/2011	FI	All	Software changed (v1.000)
1.002	20/03/2012	FI	All	Change Leds description
1.003	13/02/2013	Nt	All	Added new chapters

WARNING:

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TRADEMARKS:

All trademarks mentioned in this document belong to their respective owners.

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 support@adfweb.com or give us a call if you need it.

CONNECTION SCHEME:

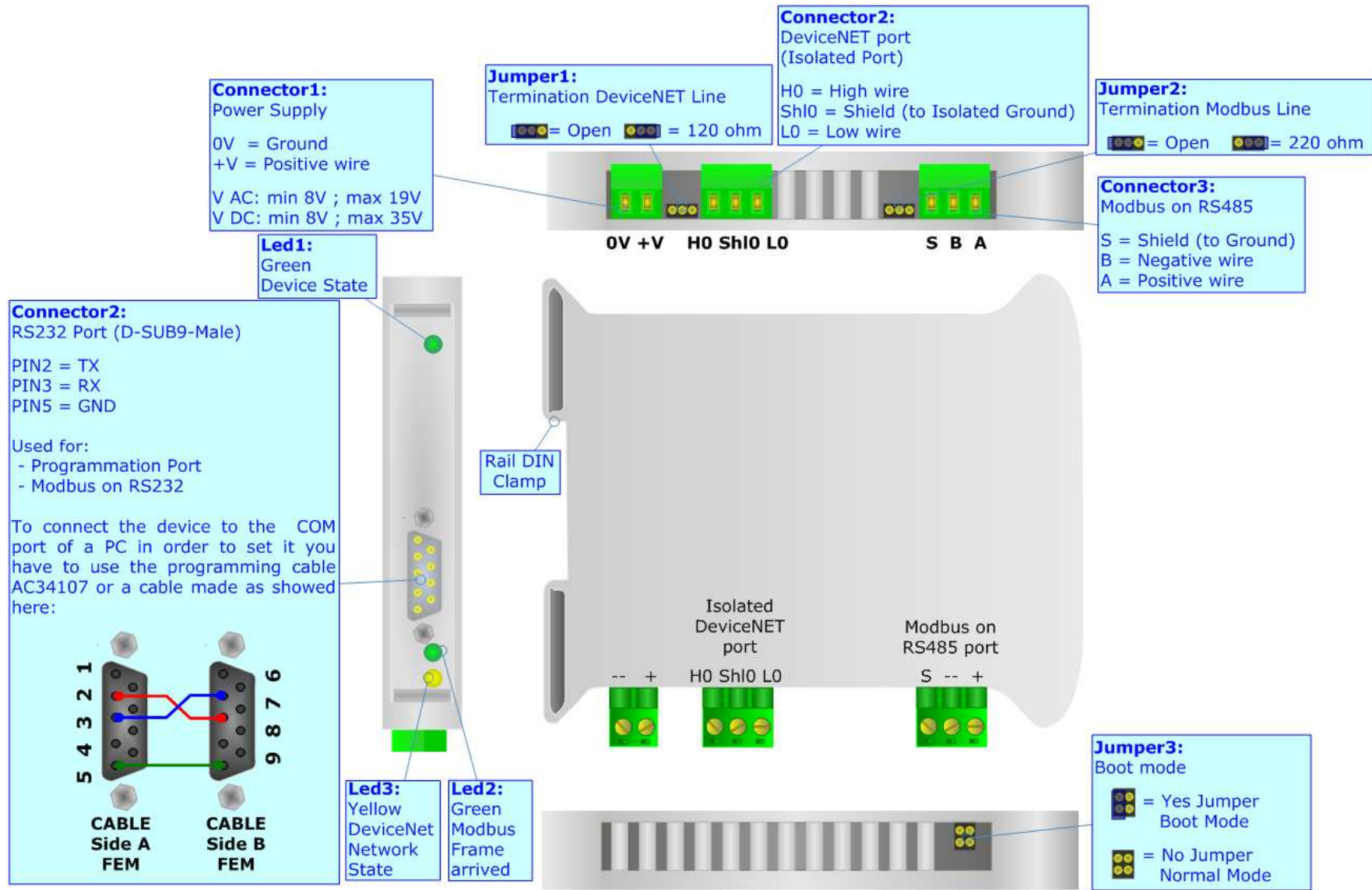


Figure 1: Connection scheme for HD67151-A1

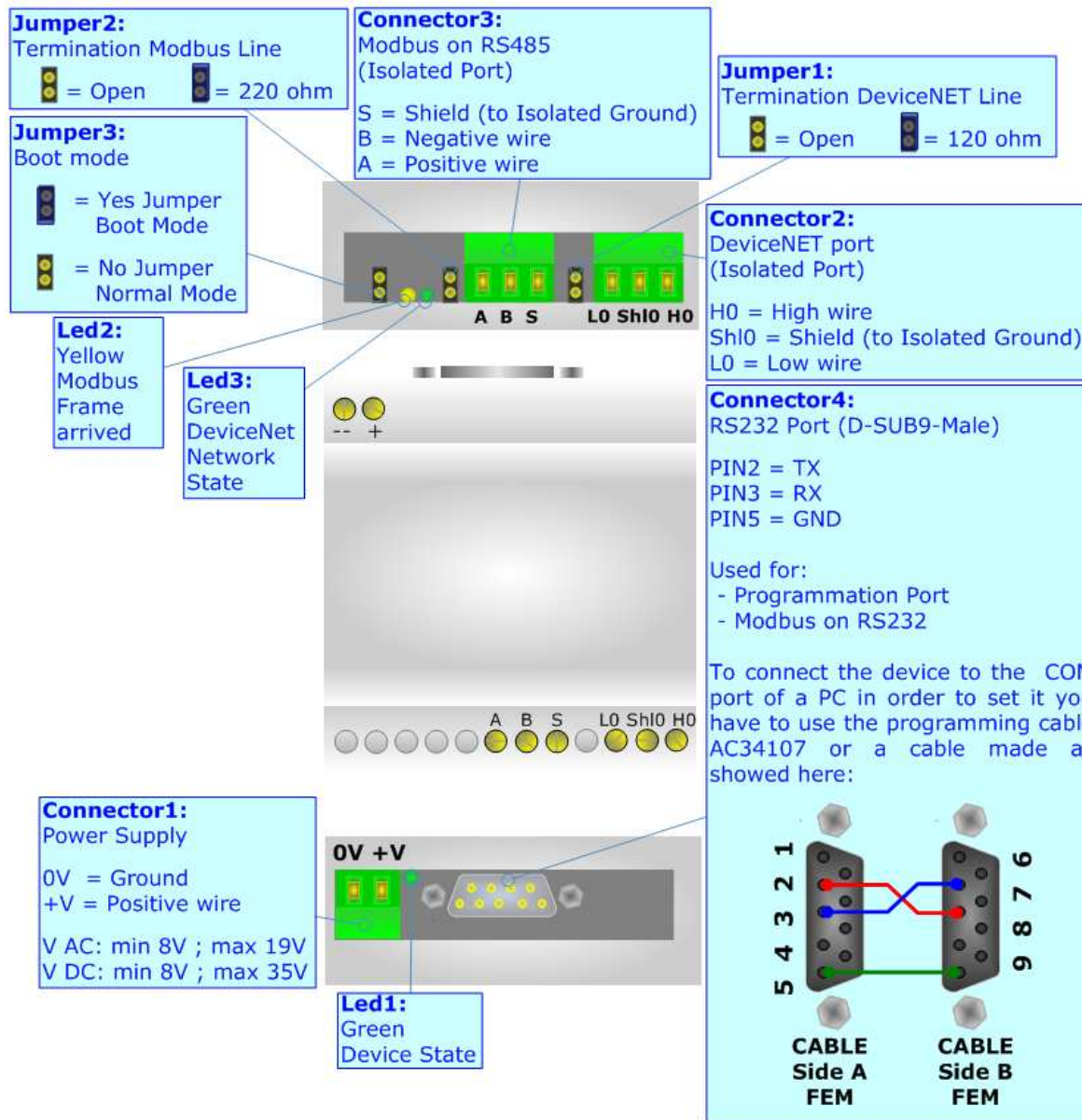


Figure 2: Connection scheme for HD67151-B2

CHARACTERISTICS:

The Modbus Slave from/to DeviceNet Master Gateway allows the following characteristics:

- Two-directional information between Modbus and DeviceNet bus;
- Electrical isolation between two buses;
- Power supply of 8...19 VAC 4VA or 8...35 VDC 4W;
- 35mm Rail DIN mounting;
- Temperature range -40°C to 85°C.

CONFIGURATION:

You need Compositor SW67151 software on your PC in order to perform the following:

- Define the parameters of Modbus;
- Define the parameters of DeviceNet;
- Define the read/write registers;
- Update the Firmware and/or the Project.

POWER SUPPLY:

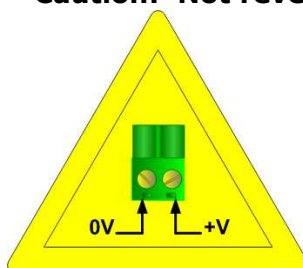
The device can be powered at 8...19V AC and 8...35V DC. For more details see the two tables below.

VAC		VDC	
Vmin	Vmax	Vmin	Vmax
8V	19V	8V	35V

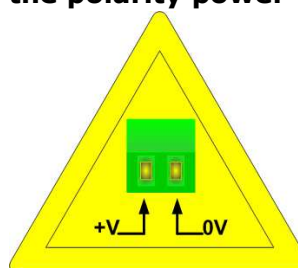
Consumption at 24V DC:

Device	W/VA
HD67151-A1	4
HD67151-B2	4

Caution: Not reverse the polarity power



HD67151-A1



HD67151-B2

Connector1:
Power Supply
0V = Ground
+V = Positive wire
V AC: min 8V ; max 19V
V DC: min 8V ; max 35V



Connector1:
Power Supply
0V = Ground
+V = Positive wire
V AC: min 8V ; max 19V
V DC: min 8V ; max 35V

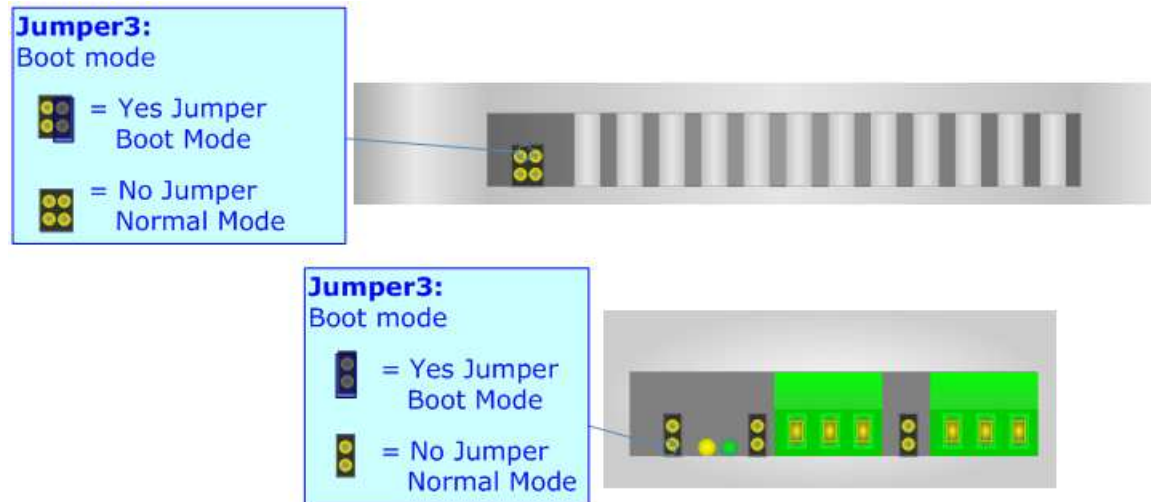
FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Jumper 3':

- The first, with 'Jumper 3' not inserted (factory setting), is used for the normal working of the device.
- The second, with 'Jumper 3' inserted, is used for upload the Project and/or Firmware.

For the operations to follow for the updating (see 'UPDATE DEVICE' section).

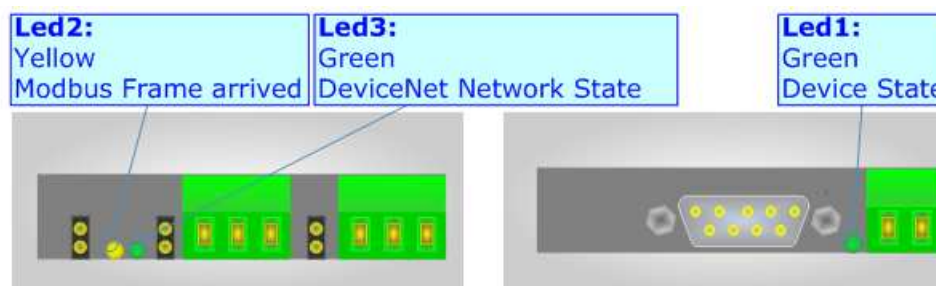
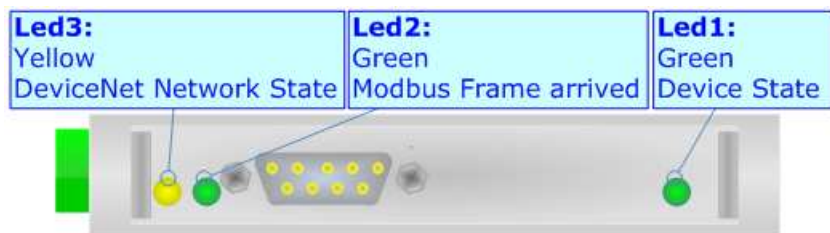
According to the functioning mode, the LEDs will have specifics functions (see 'LEDS' section).



LEDS:

The device has got three green LEDs that are used to give information of the functioning status. The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device State	Blink slowly	Blink quickly
2: Modbus Frame Arrived	Change state when a Modbus frame, addressed to the Gateway, arrives	Off
3: DeviceNet Network State	Off: All DeviceNet Slaves Nodes are present On: At least one DeviceNet Slave Node isn't present	Off



USE OF COMPOSITOR SW67151:

To configure the Gateway, use the available software that runs with Windows, called SW67151. It is downloadable on the site www.adfweb.com and its operation is described in this document.

When launching the SW67151 the right window appears (Fig. 3).

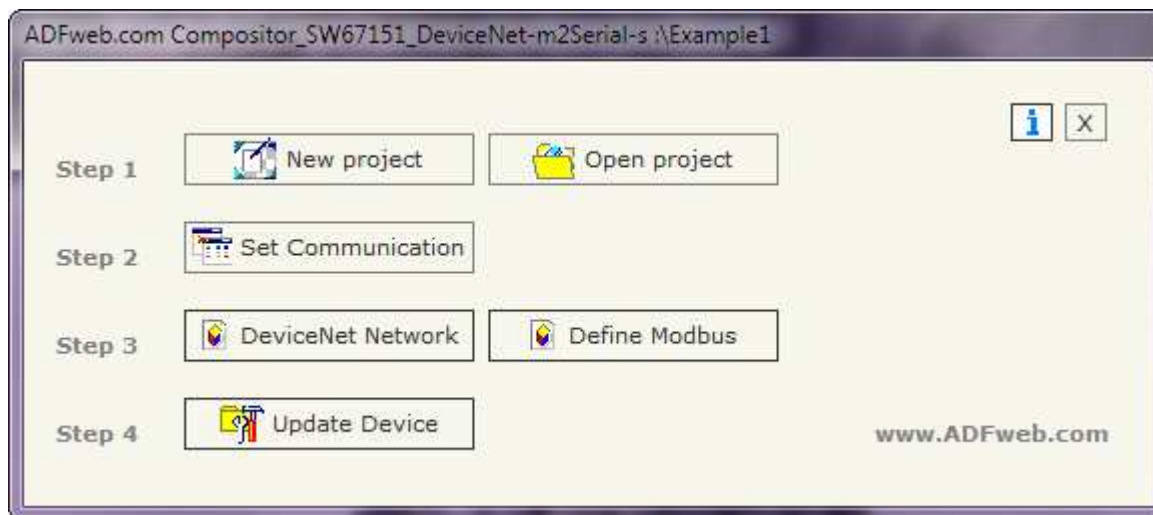


Figure 3: Main window for SW67151

NEW PROJECT / OPEN PROJECT:

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

- To clone the configurations of a Programmable Modbus Slave from/to DeviceNet Master 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**".

SET COMMUNICATION:

This section defines the fundamental communication parameters of two Buses Modbus and DeviceNet.

By pressing the "**Set Communication**" button from the main window for SW67151 (Fig. 3) the "SET COMMUNICATION" window appears (Fig. 4).

This window is divided in two sections, one for the DeviceNet and the other for the Modbus.

The means of the fields for the "DeviceNet Master" section are:

- In the "**ID Dev.**" field the Gateway address of the DeviceNet is defined.
- In the "**Baud rate**" field the DeviceNet baud rate is defined.

The means of the fields for "Serial" are:

- If the field "**RS232**" is checked, the serial line in use is the RS232, otherwise if the field "**RS485**" is checked, the serial line in use is the RS485;
- In the field "**Baud Rate**" the baudrate for the serial line is defined;
- In the field "**Parity**" the parity of the serial line is defined;
- In the field "**ID Dev.**" insert the ID of the Modbus Slave device;
- In the subsection "**Protocol**" it is possible to select the protocol that you wish to use between the following:
 - "**Modbus RTU**";
 - "**Modbus ASCII**";
 - "**JBUS**";
 - Simple "**Binary**" Protocol;
 - Simple "**ASCII**" Protocol.

The screenshot shows a dialog box titled "SET COMMUNICATION". It is divided into two main sections: "DeviceNet Master" and "Serial".

DeviceNet Master section:

- ID Dev.: 11
- Baud rate: 250K

Serial section:

- RS232 (selected), RS485
- Baudrate: 9600
- Parity: EVEN
- ID Dev.: 12

Protocol section:

- Modbus RTU
- Modbus ASCII (selected)
- JBUS
- Binary
- ASCII

At the bottom, there are "OK" and "Cancel" buttons.

Figure 4: "Set Communication" window

DEVICENET NETWORK:

By pressing the "**DeviceNet Network**" button from the main window for SW67151 (Fig. 3) the window "DeviceNet Network" appears (Fig. 5).

Here it is possible to define the Slaves DeviceNet Devices with their ID, number of Input and number of Output bytes.

The data of the columns have the following meanings:

- In the field "**ID**" the ID of a slave DeviceNet device is defined;
- In the field "**N BYTE IN**" the number of input byte of the slave DeviceNet is defined;
- In the field "**N BYTE OUT**" the number of output byte of the slave DeviceNet is defined;
- In the field "**Mnemonic**" is possible to insert a description. It isn't necessary compiling this field, is only a label.

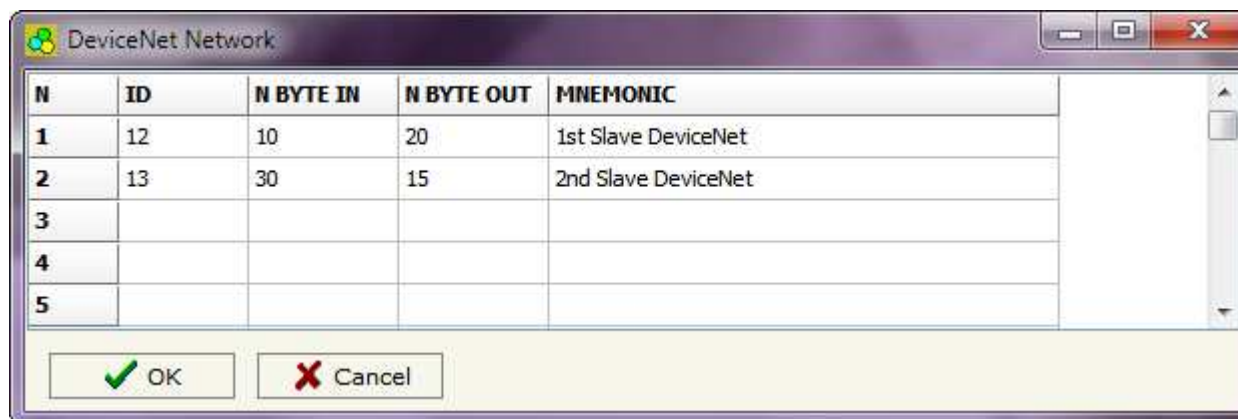


Figure 5: "Set Access" window

DEFINE REGISTERS:

By pressing the "**Define Modbus**" button from the main window for SW67151 (Fig. 3) the window "Modbus Registers Definition" appears (Fig. 6).

The window is defined in two sections: the first (Fig. 6) is "**Modbus Register in Read**" and allows to insert the modbus registers that a master read for knowing the values of Output data of a DeviceNet slave device; the second (Fig. 7). is "**Modbus Register in Write**" and allows to insert the Modbus registers that a master writes. The values of these registers going to be the Input data of the Slaves DeviceNet.

MODBUS REGISTER IN READ

In the list "**Correlated**" there are the IDs of the slaves DeviceNet who you have defined in the section "DeviceNet Network" with their number of OUT byte.

In the field "**MODBUS**" there are the Modbus registers that you have created for the selected slave DeviceNet.

After selecting a DeviceNet ID you have to add the various Modbus registers that contains the OUT data of a slave DeviceNet. For doing this you have to fill the fields at the right side of the window; the means of that fields are:

- In the field "**Index Modbus**" the address of the register to be read is defined;
- In the field "**Translate in High MODBUS Byte**" you have to select which DeviceNet byte occupy the highest position of the Modbus Register;
- In the field "**Translate in Low MODBUS Byte**" you have to select which DeviceNet byte occupy the lowest position of the Modbus Register.

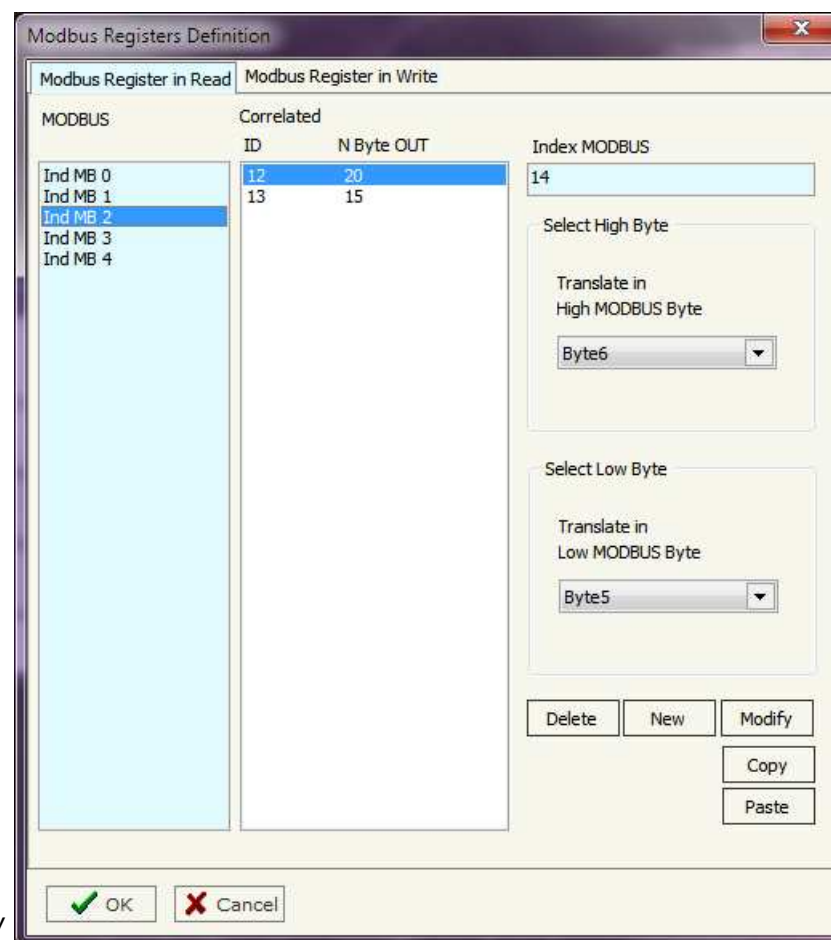


Figure 6: "Modbus Registers Definition" window

MODBUS REGISTER IN WRITE

In the field "**Correlated**" there are the IDs of the slaves DeviceNet who you have defined in the section "DeviceNet Network" with their number of IN byte.

In the field "**MODBUS**" there are the Modbus registers that you have created for the selected slave DeviceNet.

After selecting a DeviceNet ID you have to add the various Modbus registers that contains the IN data of a slave DeviceNet. For doing this you have to fill the fields at the right side of the window; the means of that fields are:

- ➔ In the field "**Index Modbus**" the address of the register to be write is defined;
- ➔ In the field "**Translate in High MODBUS Byte**" you have to select where the highest position of the Modbus Register go in the DeviceNet IN array;
- ➔ In the field "**Translate in Low MODBUS Byte**" you have to select where the lowest position of the Modbus Register go in the DeviceNet IN array.

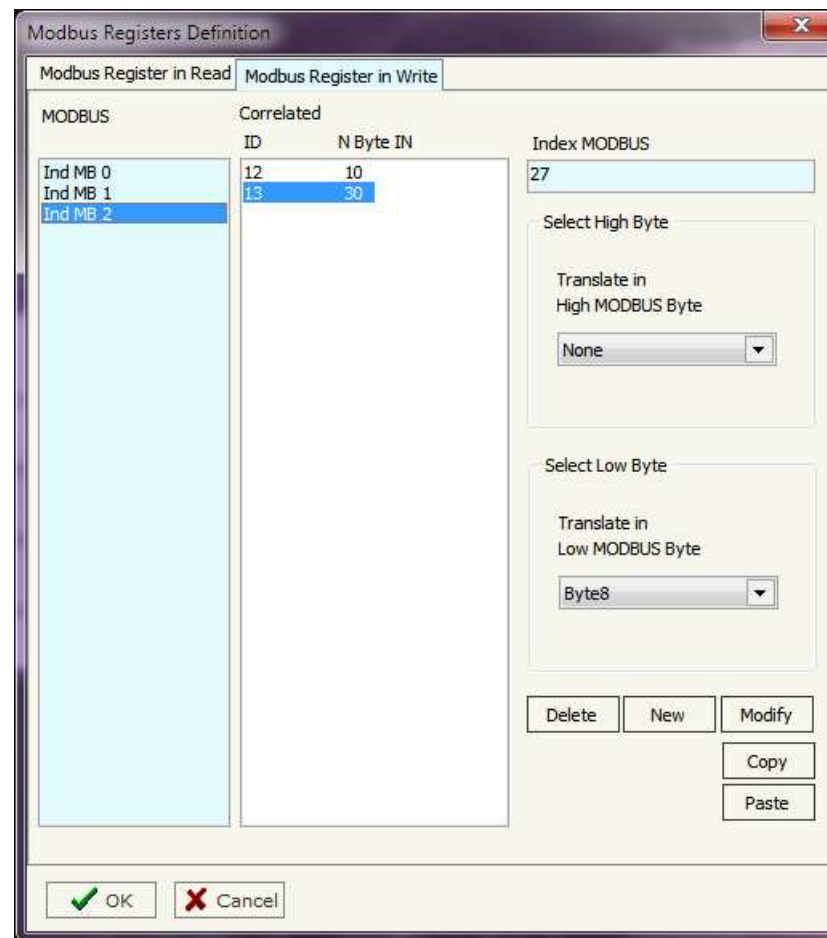


Figure 7: "Define Registers" window

UPDATE DEVICE:

Section "Update Firmware" (Fig. 8):

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

- Turn off the Device;
- Connect the Null Modem Cable from your PC to the Gateway;
- Insert the Boot Jumper (For more info see Fig. 1 or Fig. 2);
- Select the COM port and press the "Connect" button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (For more info see Fig. 1 or Fig. 2);
- Press the "Next" button;
- Select which operations you want to do.
- Press the "Execute update firmware" button to start the upload;
- When all the operations are "OK" turn off the device;
- Disconnect the Boot jumper;
- Disconnect the RS232 Cable;
- Turn on the device.

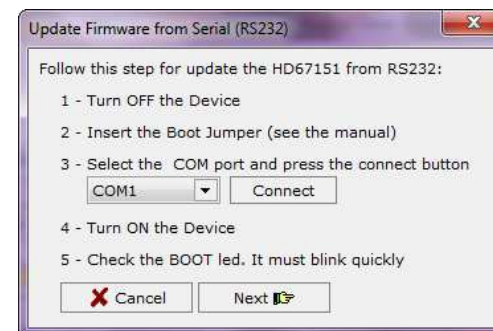


Figure 8: "Update Device" windows

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



Note:

When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67151-xx device.



Warning:

If the Fig. 9 appears when you try to do the Update before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- Try with another PC.

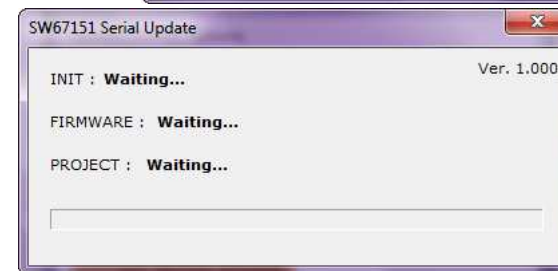


Figure 9: "Protection" window

CHARACTERISTICS OF THE CABLES:

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.

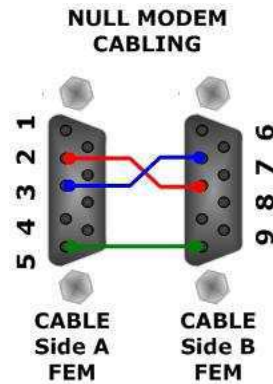


Figure 10: Null modem cabling

MECHANICAL DIMENSIONS:

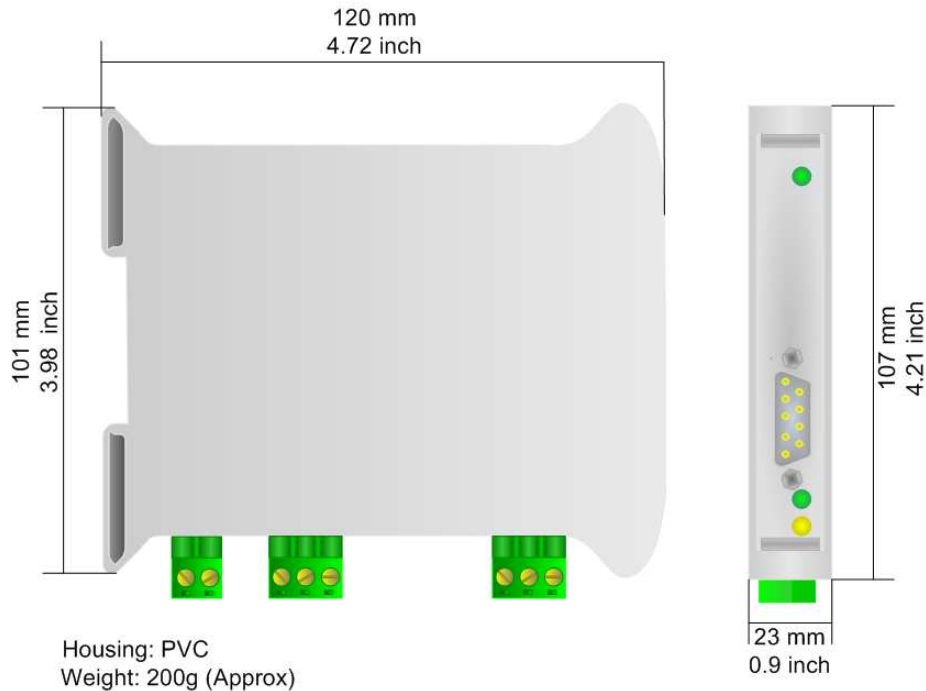


Figure 11: Mechanical dimensions scheme for HD67151-A1

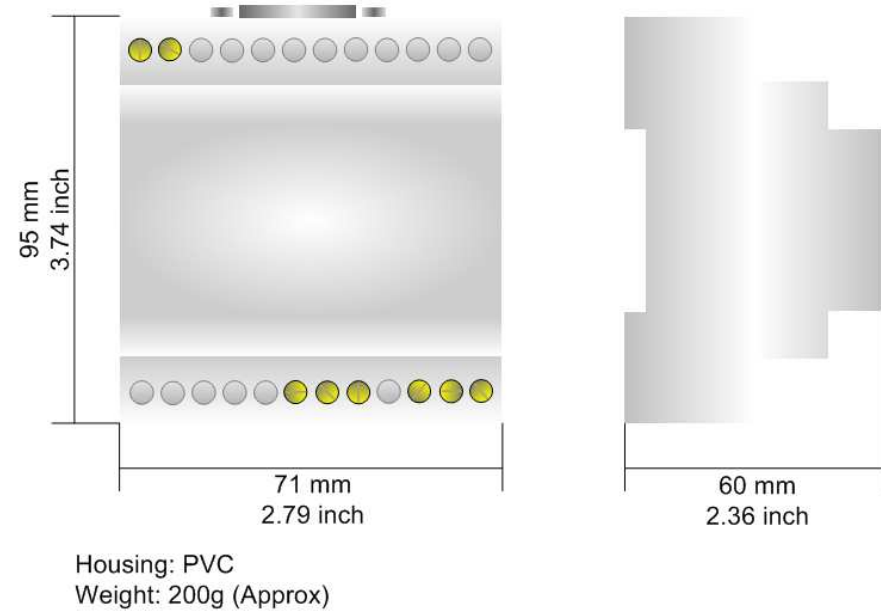


Figure 12: Mechanical dimensions scheme for HD67151-B2

ORDER CODE:

Order Code: **HD67151-A1-** DeviceNet Master / Modbus Slave - Converter

Order Code: **HD67151-B2-** DeviceNet Master / Modbus Slave - Converter

ACCESSORIES:

Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m

Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m

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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).
- 3) 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
HD67117	CAN Repeater/Isolator	www.adfweb.com?Product=HD67117
HD67221	Translate CAN bus Gateway	www.adfweb.com?Product=HD67221
HD67316	CAN, CANopen, J1939, DeviceNet, NMEA2000 Analyzer	www.adfweb.com?Product=HD67316