User Manual

Revision 1.011
English

CANopen / DeviceNet Master - Converter

(Order Code: HD67153-A1 – HD67153-A3 – HD67153-A4)

for Website information:
www.adfweb.com?Product=HD67153

for Price information:
www.adfweb.com?Price=HD67153-A1
www.adfweb.com?Price=HD67153-A3
www.adfweb.com?Price=HD67153-A4

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)

HD67153-A1

For other DeviceNet products see also the following link:

DeviceNet Master from/to

www.adfweb.com?Product=HD67151 **(Modbus Slave)**
www.adfweb.com?Product=HD67152 **(Modbus TCP Server)**
www.adfweb.com?Product=HD67154 **(Ethernet)**
www.adfweb.com?Product=HD67555 **(PROFIBUS)**

For other Modbus products see also the following link:

Modbus Master from/to

www.adfweb.com?Product=HD67001 **(CANopen)**
www.adfweb.com?Product=HD67012 **(CAN)**

Modbus Slave from/to

www.adfweb.com?Product=HD67002 **(CANopen)**
www.adfweb.com?Product=HD67011 **(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:

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	26/04/2010	Fl	All	First release version
1.001	21/03/2011	Fl	All	Revision
1.010	26/05/2011	Fl	All	Software changed (v1.100)
1.011	13/02/2013	Nt	All	Added new chapters

WARNING:

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

CONNECTION SCHEME:

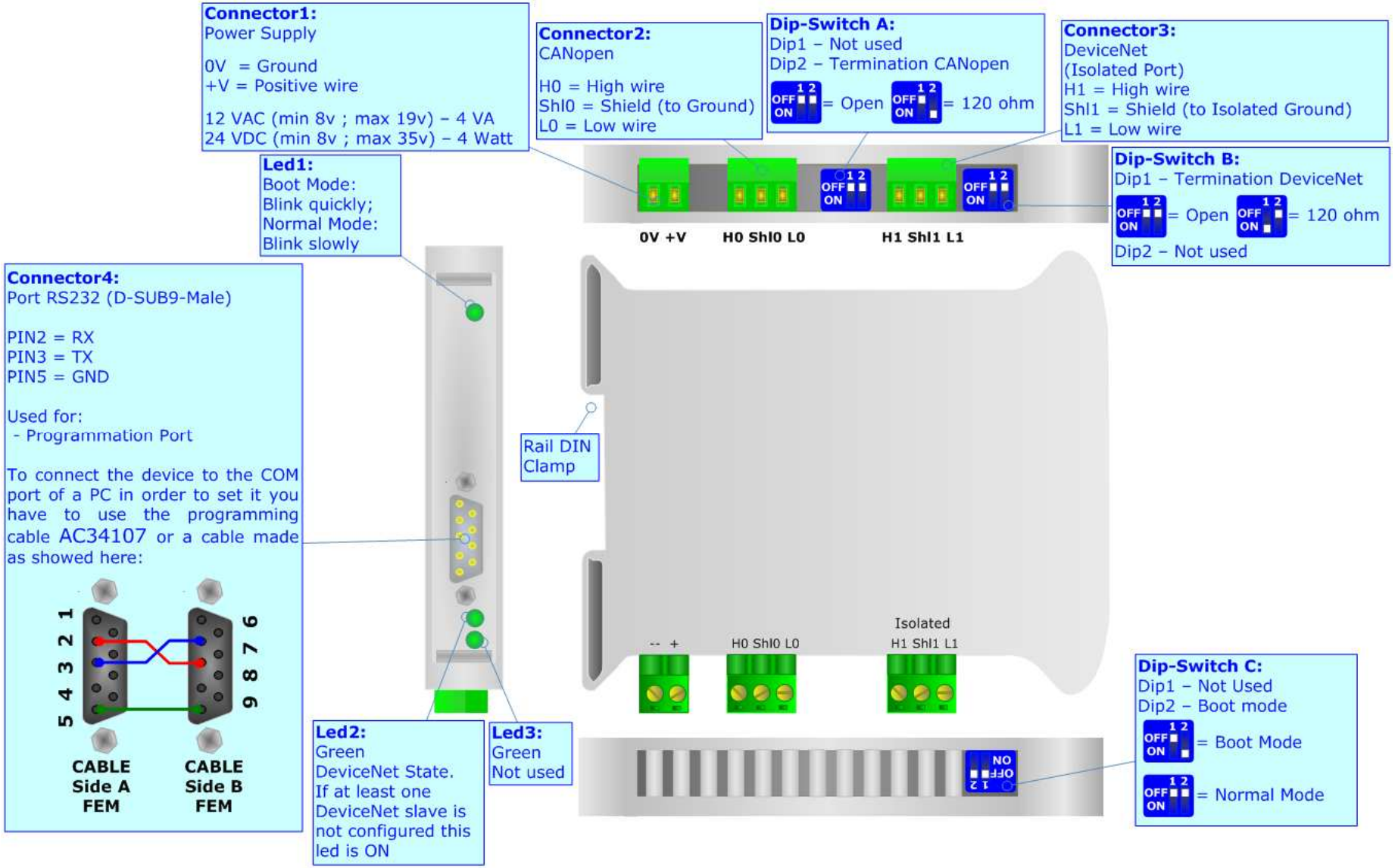


Figure 1: Connection scheme for HD67153-A1

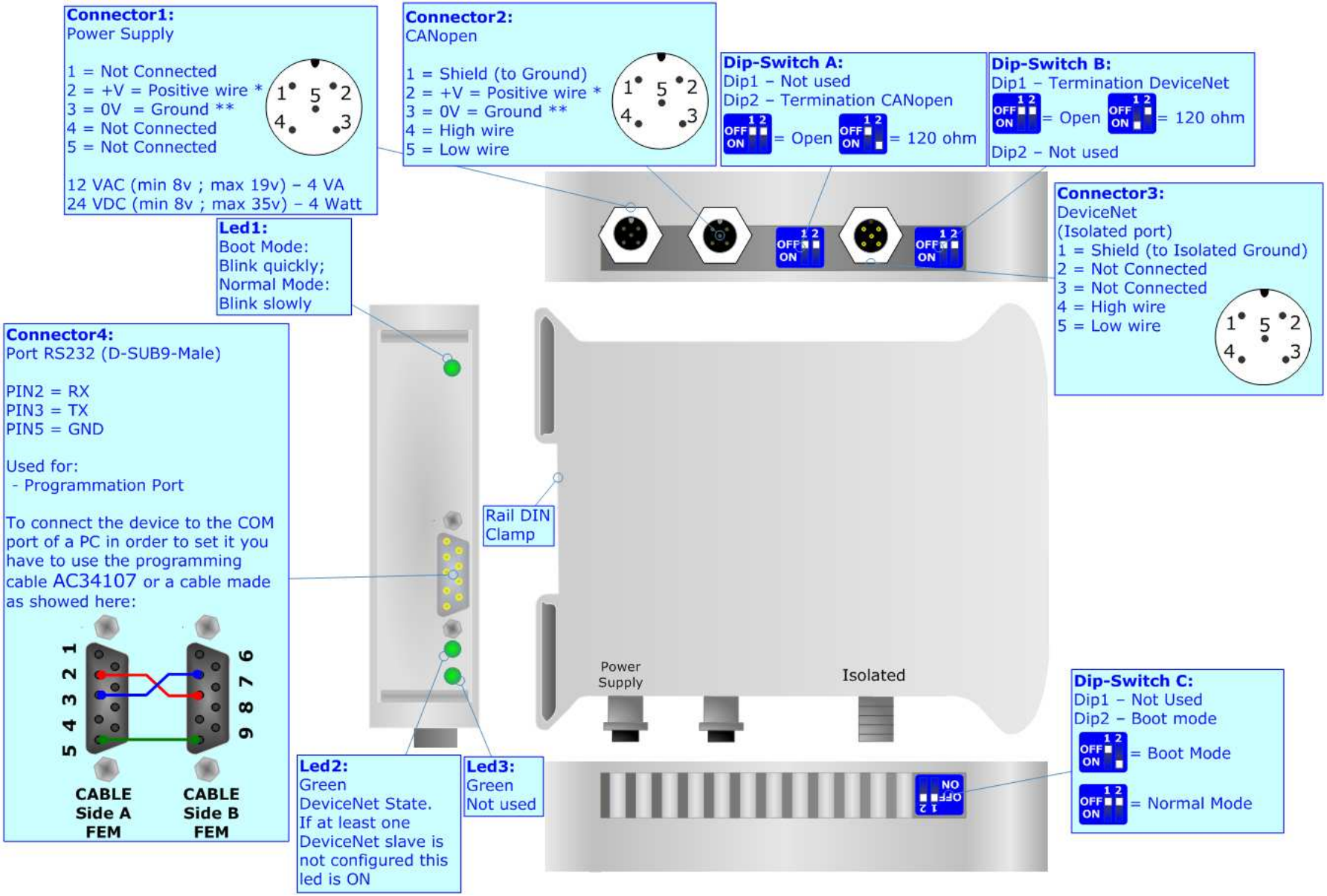


Figure 2: Connection scheme for HD67153-A3

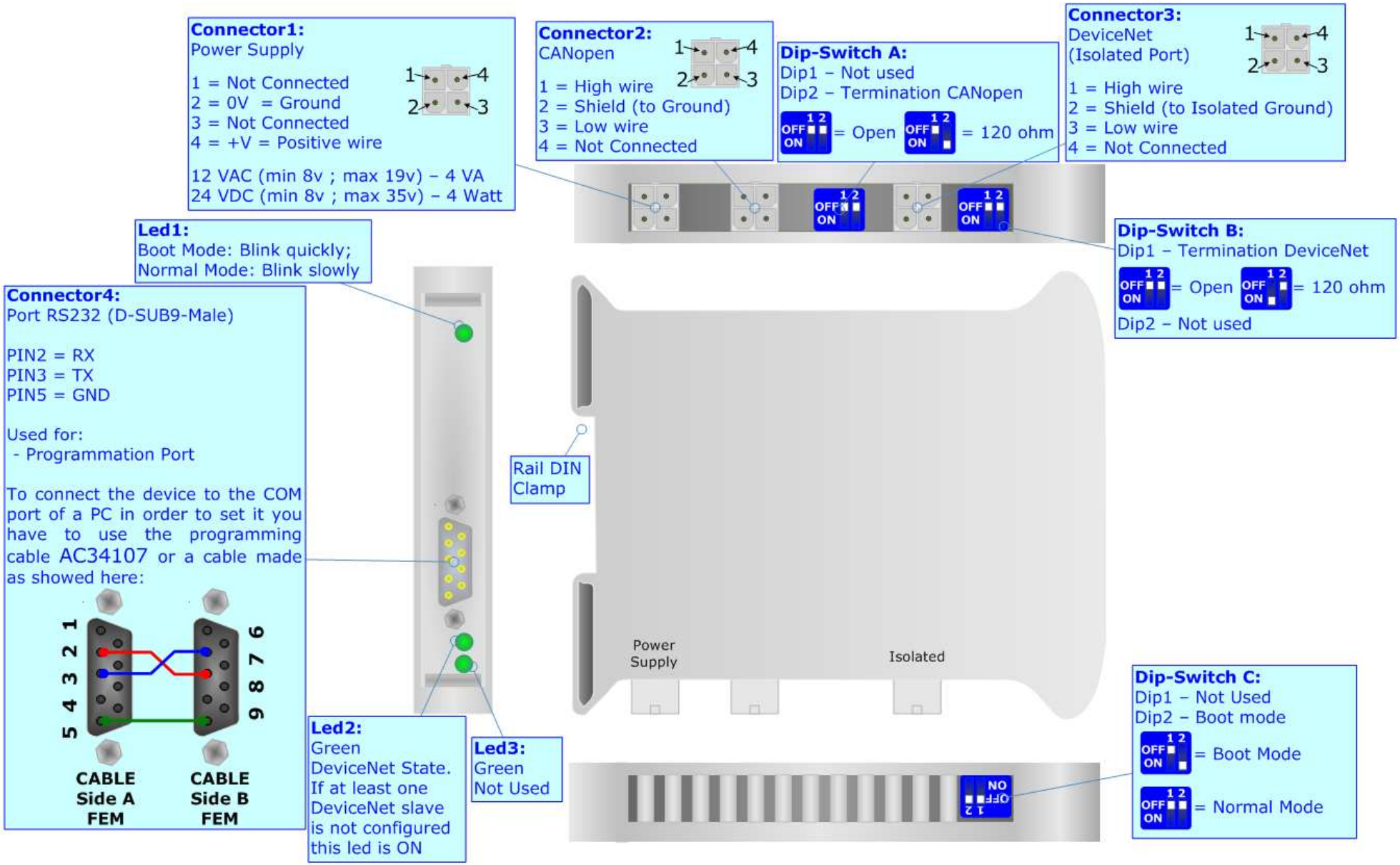


Figure 3: Connection scheme for HD67153-A4

CHARACTERISTICS:

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

- Two-directional information between CANopen 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 SW67153 software on your PC in order to perform the following:

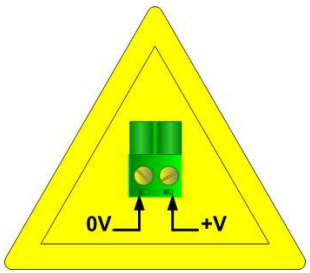
- Define the parameters of CANopen;
- Define the parameters of DeviceNet;
- Define the DeviceNet network;
- Define the SDO in read/Write that contains the DeviceNet IN/OUT informations;
- Define the PDO in read/Write that contains the DeviceNet IN/OUT informations;
- Create the .EDS file
- Update the Firmware and/or the Project.

POWER SUPPLY:

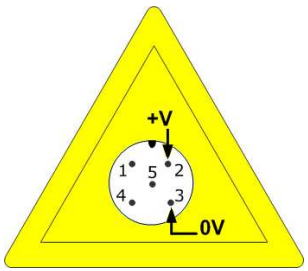
The devices can be powered at 8…19V AC and 8…35V DC.

VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
8V	**19V**	**8V**	**35V**

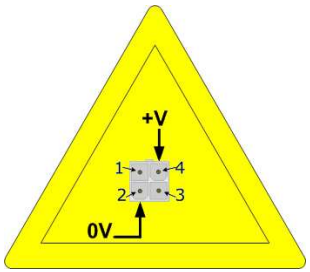
Caution: Not reverse the polarity power



HD67574-A1



HD67574-A3



HD67574-A4

USE OF COMPOSITOR SW67153:

To configure the Gateway, use the available software that runs with Windows, called SW67153. It is downloadable on the site www.adfweb.com and its operation is described in this document.

When launching the SW67153 the right window appears (Fig. 4).

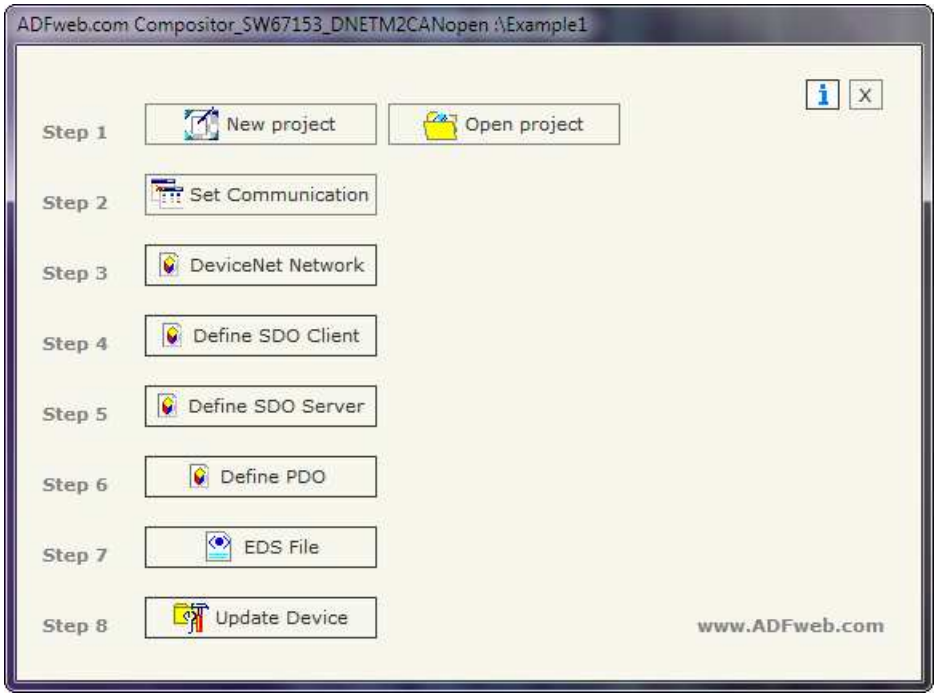


Figure 4: Main window for SW67153

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 CANopen 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 CANopen and DeviceNet.

By pressing the "**Set Communication**" button from the main window for SW67153 (Fig. 4) the "SET COMMUNICATION" window appears (Fig. 5).

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

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 "CANopen" are:

- In the field "**ID Dev.**" the address for the CANopen side is defined;
- In the field "**Baud rate**" the baudrate for the CANopen is defined;
- In the field "**Set Operational State at Start-Up**" the state of the CANopen is defined. I.e. if it is checked the board starts in Operational State, else it starts in Preoperational;
- In the field "**Network Start ar Start-Up**" the state of the network CANopen is defined. I.e. if it is checked the board sends a command to set the Operational State of all the devices present in the network;
- In the field "**Delay**" the delay before sending the network command for the CANopen is defined;
- In the field "**TimeOut SDO (1/10 ms)**" insert a time. It is the maximum time that the device attends for the answer from the Slave interrogated;
- In the field "**Delay between polls (ms)**" insert a delay time used for the request of SDO;
- If the "**Write only when data change**" field is checked, the CANopen frame is written only when the data change; otherwise the CANopen frame is written after the delay indicated in the "Delay between polls (ms)" field;
- In the field "**Producer Time (mS)**" insert a delay time for sending the Heartbeat in the Network. If the value of this field is zero the gateway send only one Heartbeat when the gateway starts, otherwise it sends this every xx mS;
- In the subsection "TPDO" the functioning of Transmit PDO is defined. I.e. if "**Send on change data**" is checked the gateway sends the PDO only when it's data are changed; otherwise if "**Send cyclically**" is checked the gateway sends the PDO with the defined interval of the time expressed in mS.

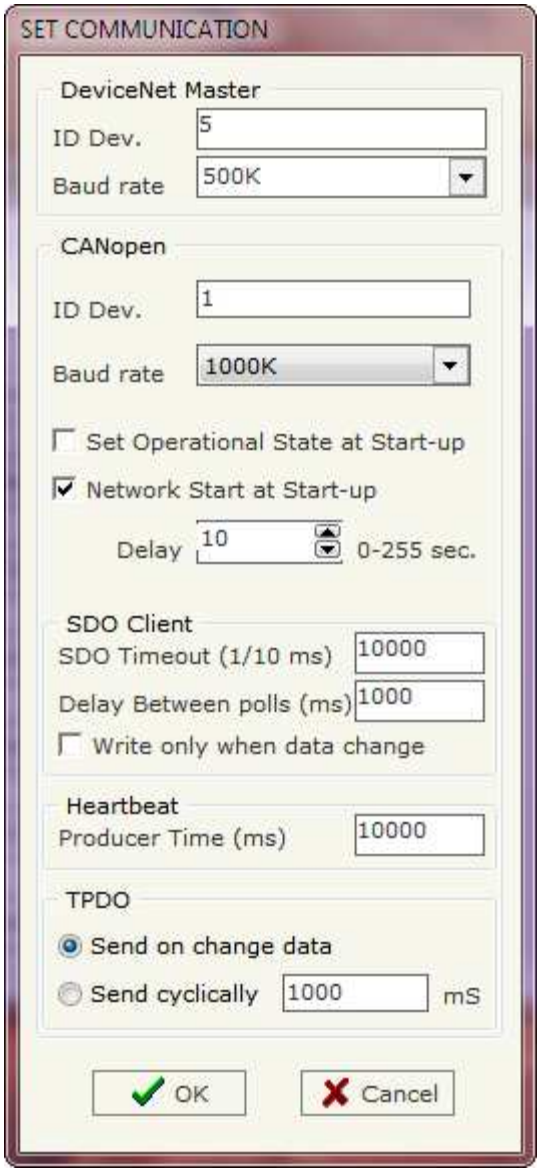


Figure 5: "Set Communication" window

DEVICENET NETWORK:

By pressing the "**DeviceNet Network**" button from the main window for SW67153 (Fig. 4) the window "DeviceNet Network" appears (Fig. 6).

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;
- By checking the field "**DELETE**" it is possible to clear the data received from a Slave interrogated if it is disconnected. In this way If a slave DeviceNet is not present the data of CAN frames are cleared (putted to the value 0);
- In the field "**MNEMONIC**" is possible to insert a description. It isn't necessary compiling this field, is only a label.

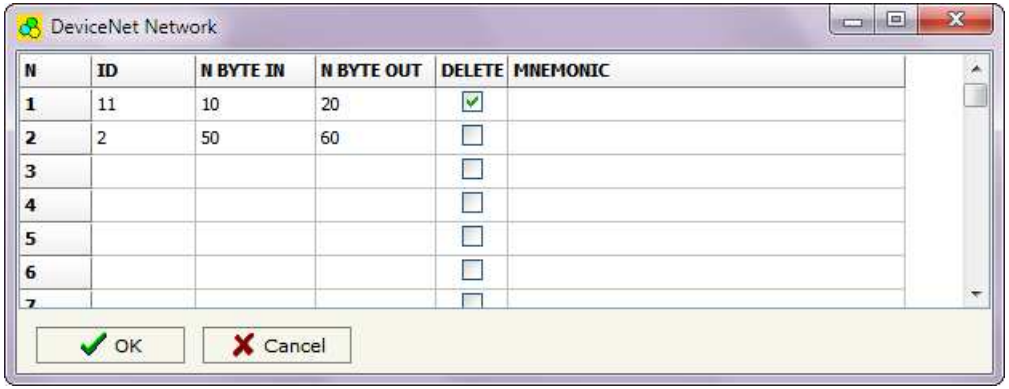


Figure 6: "Set Access" window

SDO CLIENT:

By pressing the "**Define SDO Client**" button from the main window for SW67153 (Fig. 4) the window "SDO Client" appears (Fig. 7).

The window is divided in two sections: the first part (Fig. 7) "SDO in Write" is used to write, using the SDO, the data that will be sent to the Slaves DeviceNet. These values going to be the Input data of the Slaves DeviceNet. The second part (Fig. 8) "SDO in Read" is used to read, using the SDO, the data that arrived from the Slaves DeviceNet into the Master.

The fields in the two sections are the same:

- In the field "**Correlated**" there are ID and N Byte IN/N Byte OUT who you have defined in the list of DeviceNet devices (DeviceNet Network);
- In the field "**SDO**" there are the SDO frames created in this section;
- In the field "**ID CANopen**" you have to insert the ID of CANopen device that replies to the SDO request;
- In the field "**Index SDO**" you have to insert the address of the SDO;
- In the field "**SubIndex SDO**" you have to insert the SubIndex of SDO;
- In the field "**Dimension SDO**" is possible to select the dimension of the SDO (1,2,4 bytes);
- Depending on the dimension of SDO it is possible to enter from one to four byte of DeviceNet frame;
- With "**Delete**, **New**, **Modify**, **Copy**, **Paste**" buttons it is possible to delete, add, modify, copy and paste a SDO.

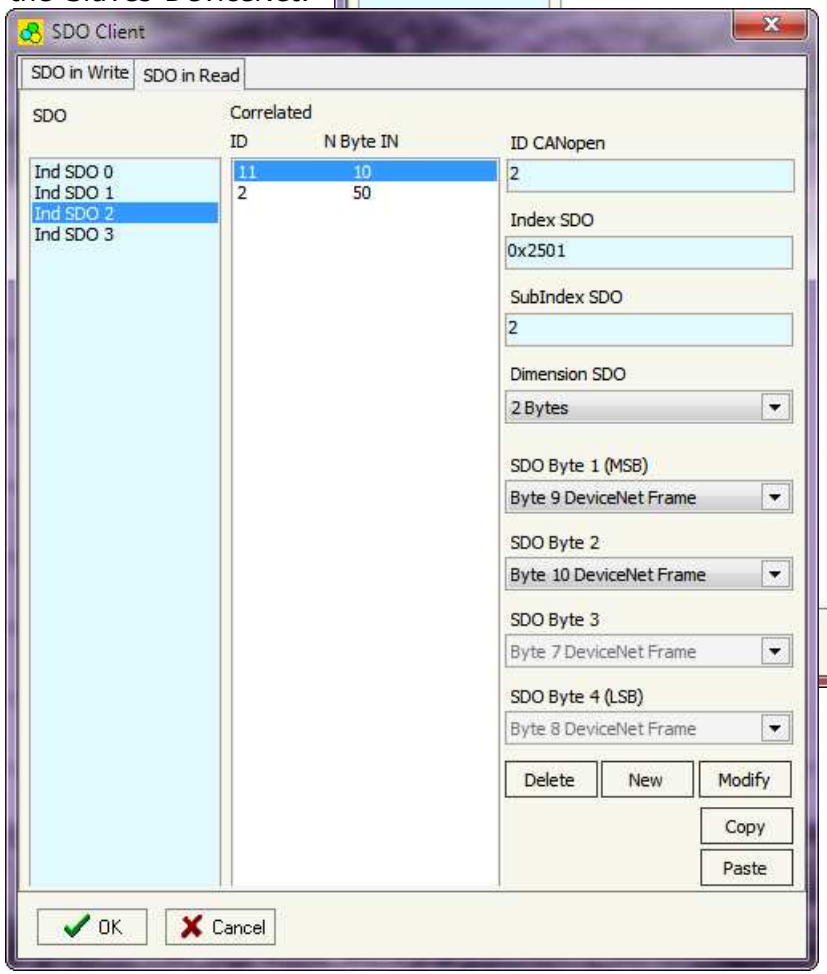


Figure 8: "SDO in Read" window

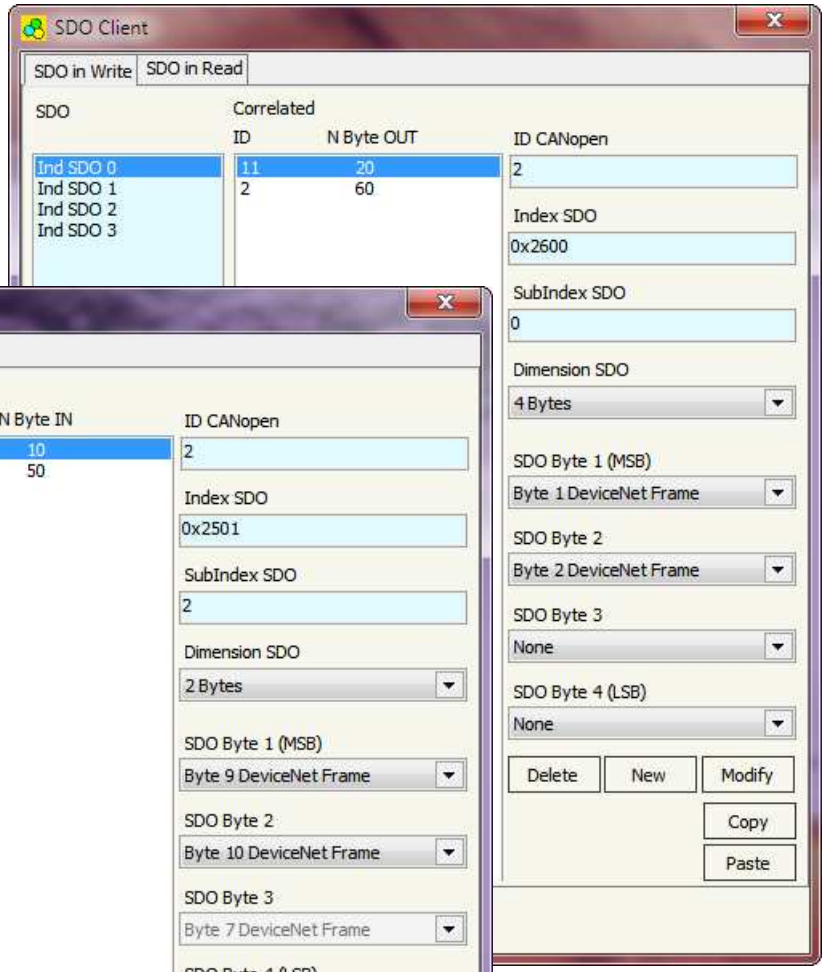


Figure 7: "SDO in Write" window

SDO SERVER:

By pressing the "**Define SDO Server**" button from the main window for SW67153 (Fig. 4) the window "SDO Server" appears (Fig. 9).

The window is divided in two sections: the first part (Fig. 9) "SDO in Read" is used to read, using the SDO, the data that arrived from Slaves DeviceNet; the second part (Fig. 10) "SDO in Write" is used to write, using the SDO, the data that will be sent to the Slaves DeviceNet.
For all of these SDO is a Client in the line that must make the requests of Read/Write.

The fields in the two sections are the same:

- In the field "**Correlated**" there are ID and N Byte IN/N Byte OUT who you have defined in the list of DeviceNet devices (DeviceNet Network);
- In the field "**SDO**" there are the SDO frames created in this section;
- In the field "**Index SDO**" you have to insert the address of the SDO;
- In the field "**SubIndex SDO**" you have to insert the SubIndex of SDO;
- In the field "**Dimension SDO**" is possible to select the dimension of the SDO (1,2,4 bytes);
- Depending on the dimension of SDO it is possible to enter from one to four byte of DeviceNet frame;
- With "**Delete**, **New**, **Modify**, **Copy**, **Paste**" buttons it is possible to delete, add, modify, copy and paste a SDO.

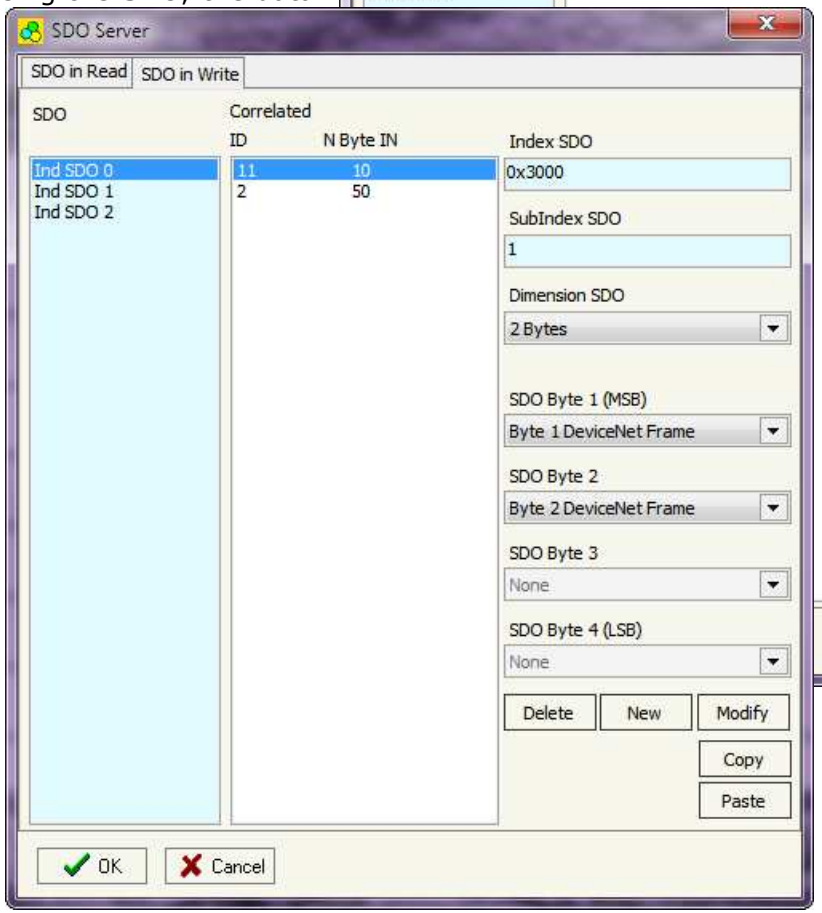


Figure 10: "SDO in Write" window

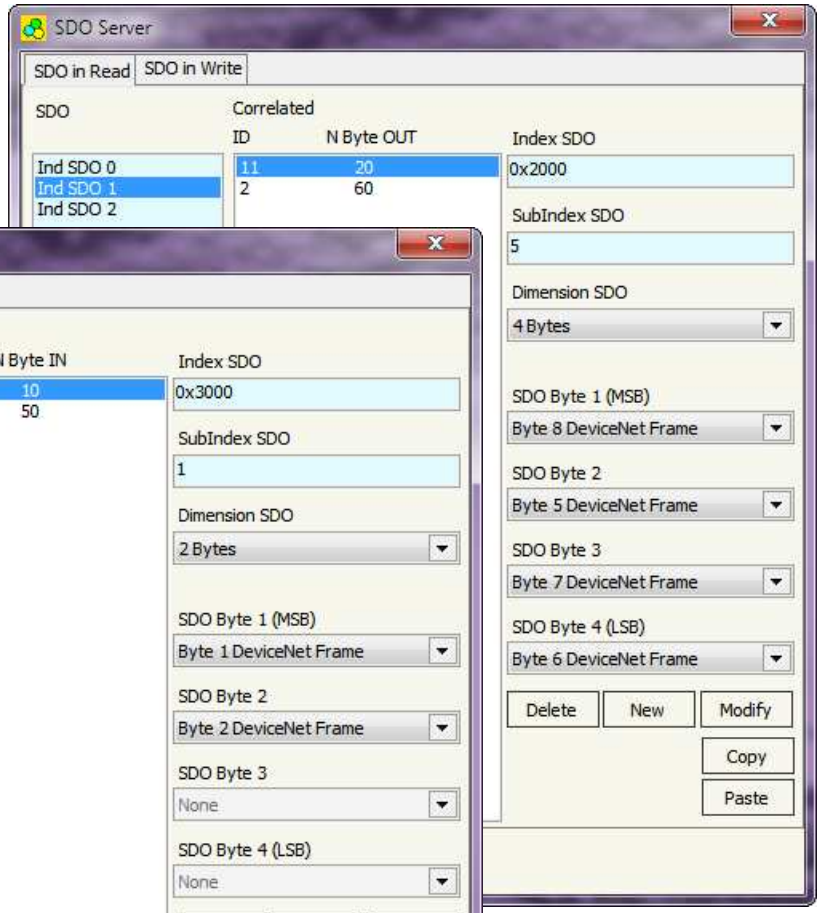


Figure 9: "SDO in Read" window

PDO:

By pressing the "**Define PDO**" button from the main window for SW67153 (Fig. 4) the window "PDO" appears (Fig. 11).

This window is made to create the Receive and the Transmit PDO in the CANopen side, and to indicate which bytes of DeviceNet are associated to these PDO.

The window is divided in two sections: the first part (Fig. 11) "RPDO" is used to receive a PDO and put the received data into the DeviceNet Input data of the correlated Slave; the second part (Fig. 11) "TPDO" is used to send a PDO with the Slave DeviceNet Output data.

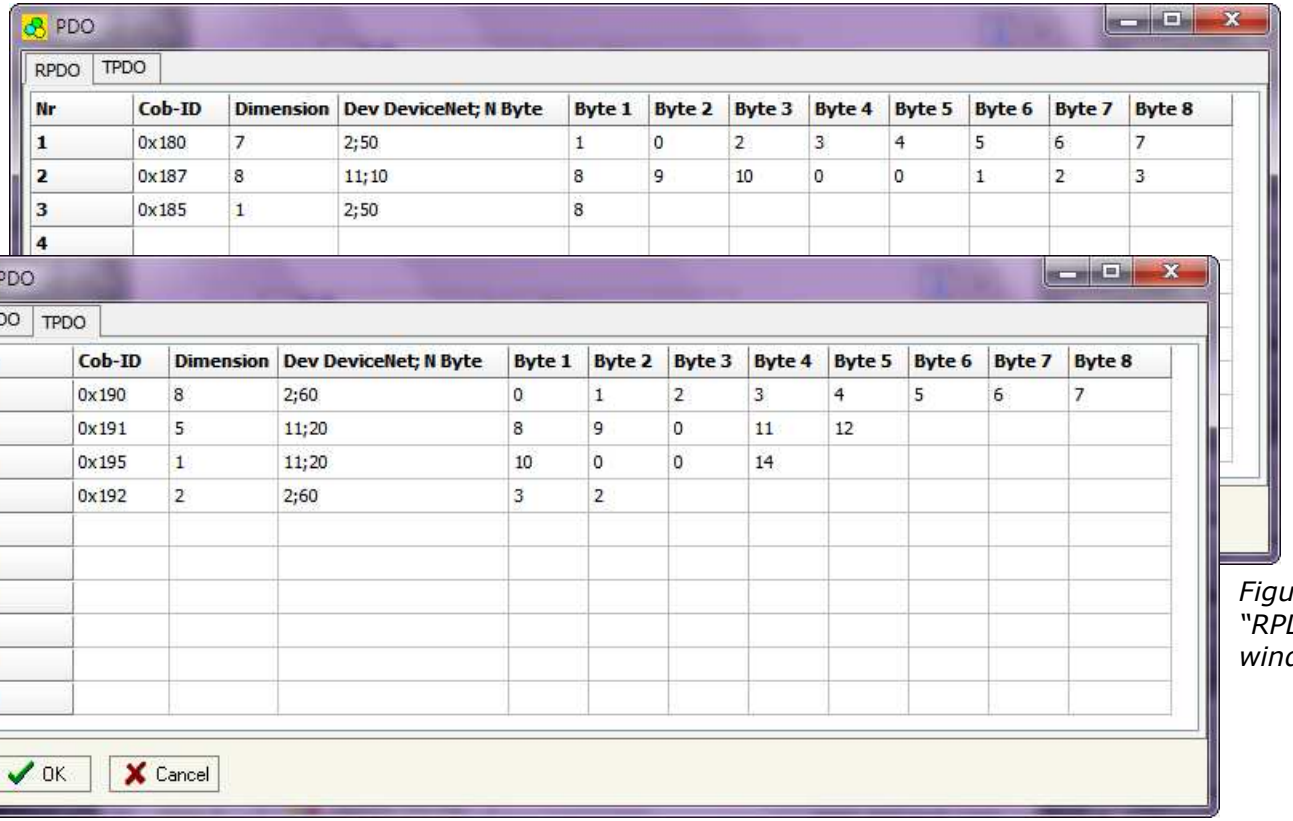


Figure 11: "RPDO" window

Figure 12: "TPDO" window

- In the Field "**Cob-ID**" the address for the PDO is defined;
- In the field "**Dimension**" it is possible to insert the number of Byte (Max=8 Byte) of the PDO frame;
- In the field "**Dev DeviceNet; NByte**" it is possible to select which DeviceNet Node use for the RPDO/TPDO;
- In the fields "**Byte 1**" … "**Byte 8**" it is possible to select which DeviceNet Byte use for the RPDO/TPDO. If you select 0 the byte remain empty.

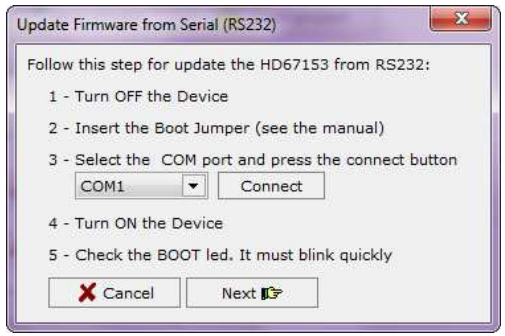
EDS FILE:

By pressing the "**EDS File**" button it is possible to save the EDS file for the CANopen side.
With this feature you can save the configuration of the gateway of the CANopen side.

UPDATE DEVICE:

Section "Update Firmware" (Fig. 13):
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 form 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 or Fig. 3);
- 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.



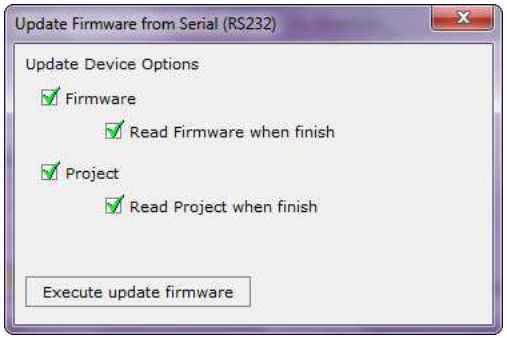
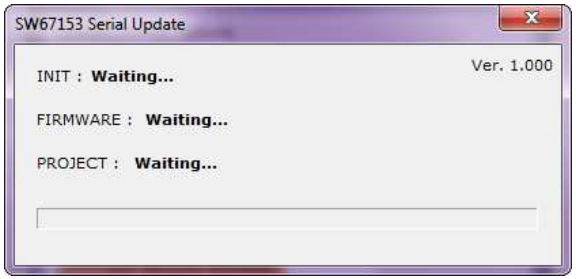


Figure 13: "Update Device" windows

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 HD67153-xx device.

Warning:
If the Fig. 14 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 14: "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.

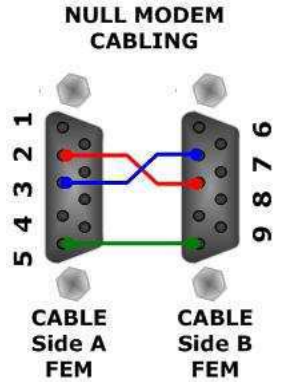


Figure 15: Null modem cabling

MECHANICAL DIMENSIONS:

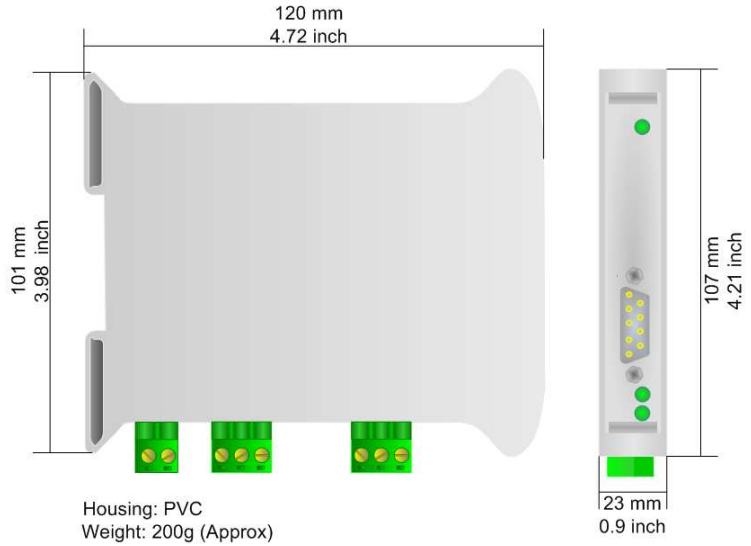


Figure 16: Mechanical dimensions scheme for HD67152-A1

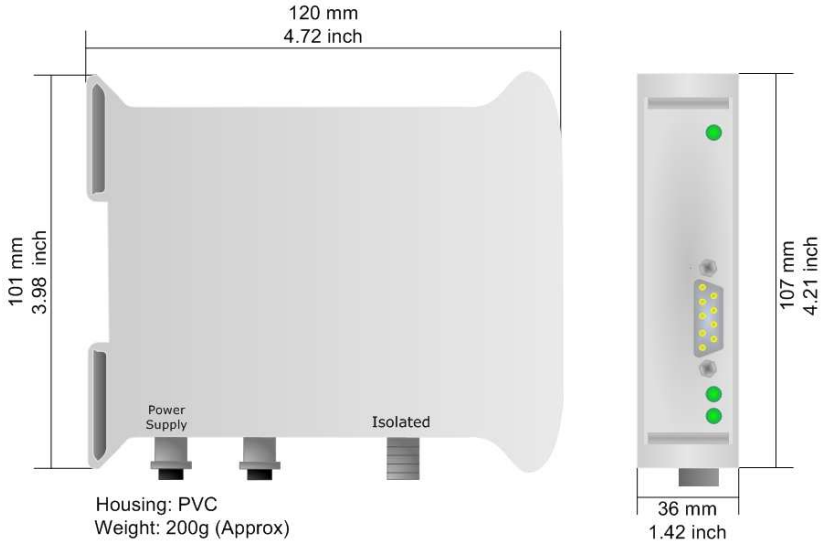


Figure 17: Mechanical dimensions scheme for HD67153-A3

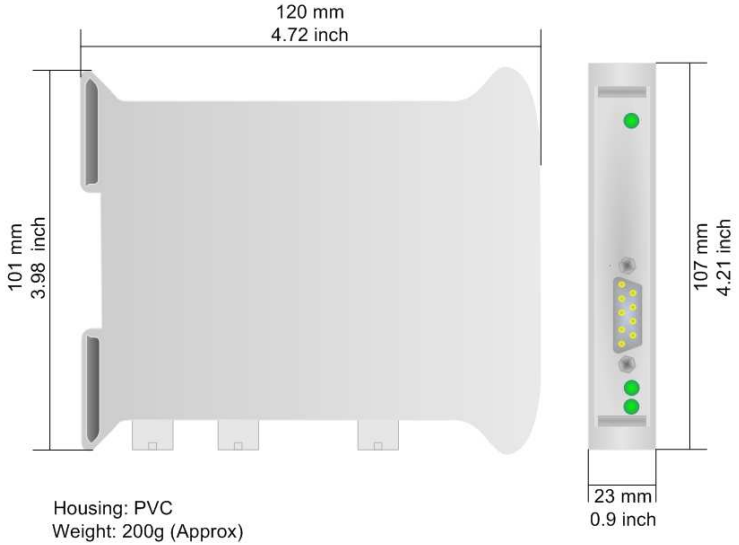


Figure 18: Mechanical dimensions scheme for HD67153-A4

ORDER CODE:

Order Code:	**HD67153-A1-**	CANopen / DeviceNet Master - Converter (Terminal Block connectors)
Order Code:	**HD67153-A3-**	CANopen / DeviceNet Master - Converter (M12 connectors)
Order Code:	**HD67153-A4-**	CANopen / DeviceNet Master - Converter (Mini-Fit connectors)

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
Order Code:	**AC34001**	**-**	Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 VAC
Order Code:	**AC34002**	**-**	Rail DIN - Power Supply 110V AC 50/60Hz – 12 VAC

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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
HD67216	Can Analyzer	www.adfweb.com?Product=HD67216
HD67221	Translate CAN bus Gateway	www.adfweb.com?Product=HD67221