

# User Manual

Revision 2.000  
English

## Gateway / Adapter CANopen to Ethernet

(Order Codes: HD67503-A1 – HD67503-B2)

for Website information:

[www.adfweb.com?Product=HD67503](http://www.adfweb.com?Product=HD67503)

for Price information:

[www.adfweb.com?Price=HD67503-A1](http://www.adfweb.com?Price=HD67503-A1)

[www.adfweb.com?Price=HD67503-B2](http://www.adfweb.com?Price=HD67503-B2)

### Benefits and Main Features:

- ▶ Mountable on Rail DIN
- ▶ TCP/UDP protocols changeable with software
- ▶ Easy to use software configuration
- ▶ Industrial temperature range:  
-30 °C / 70°C (-22°F / 158°F)

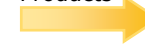


HD67503-A1



HD67503-B2

Similar  
Products



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**RS232 / RS485**

See also the following link:

[www.adfweb.com?Product=HD67118](http://www.adfweb.com?Product=HD67118)

**USB / RS485**

See also the following link:

[www.adfweb.com?Product=HD67119](http://www.adfweb.com?Product=HD67119)

Do you have an your customer protocol?

See the following link:

[www.adfweb.com?Product=HD67003](http://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](http://www.adfweb.com?Cmd=helpme)

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**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/](http://www.adfweb.com/download/) and search for the corresponding code on the page. Click on the proper “Document Code” and download the updates.

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/](http://www.adfweb.com/download/)

**REVISION LIST:**

Revision	Date	Author	Chapter	Description
1.001	17/02/2009	Fl	All	Software changed
1.002	09/10/2009	Fl	All	Revision
1.003	05/05/2010	Dp	All	Revision
2.000	10/11/2011	Fl	All	Codes changed

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**CONNECTION SCHEME:**

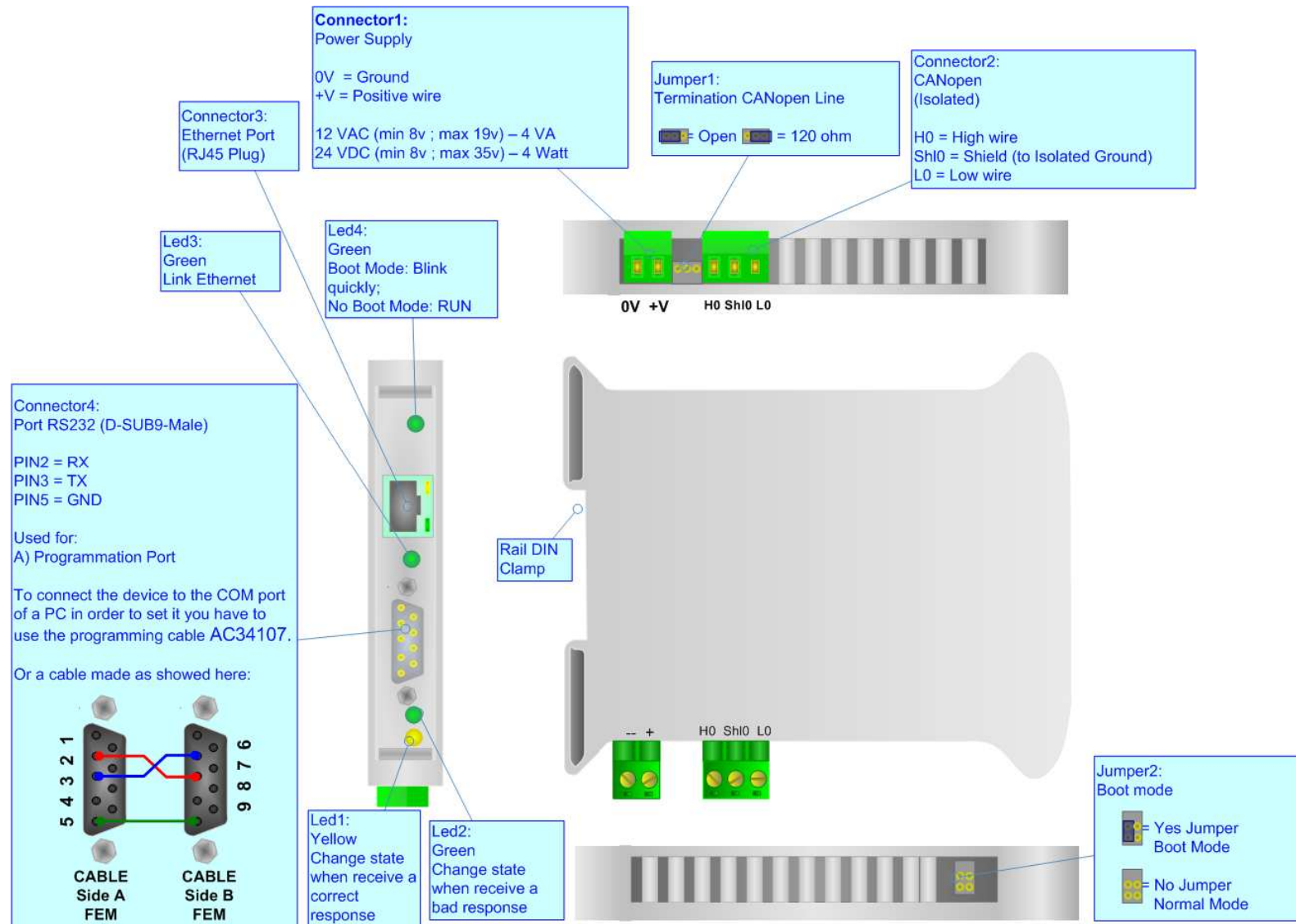


Figure 1: Connection scheme for HD67503-A1

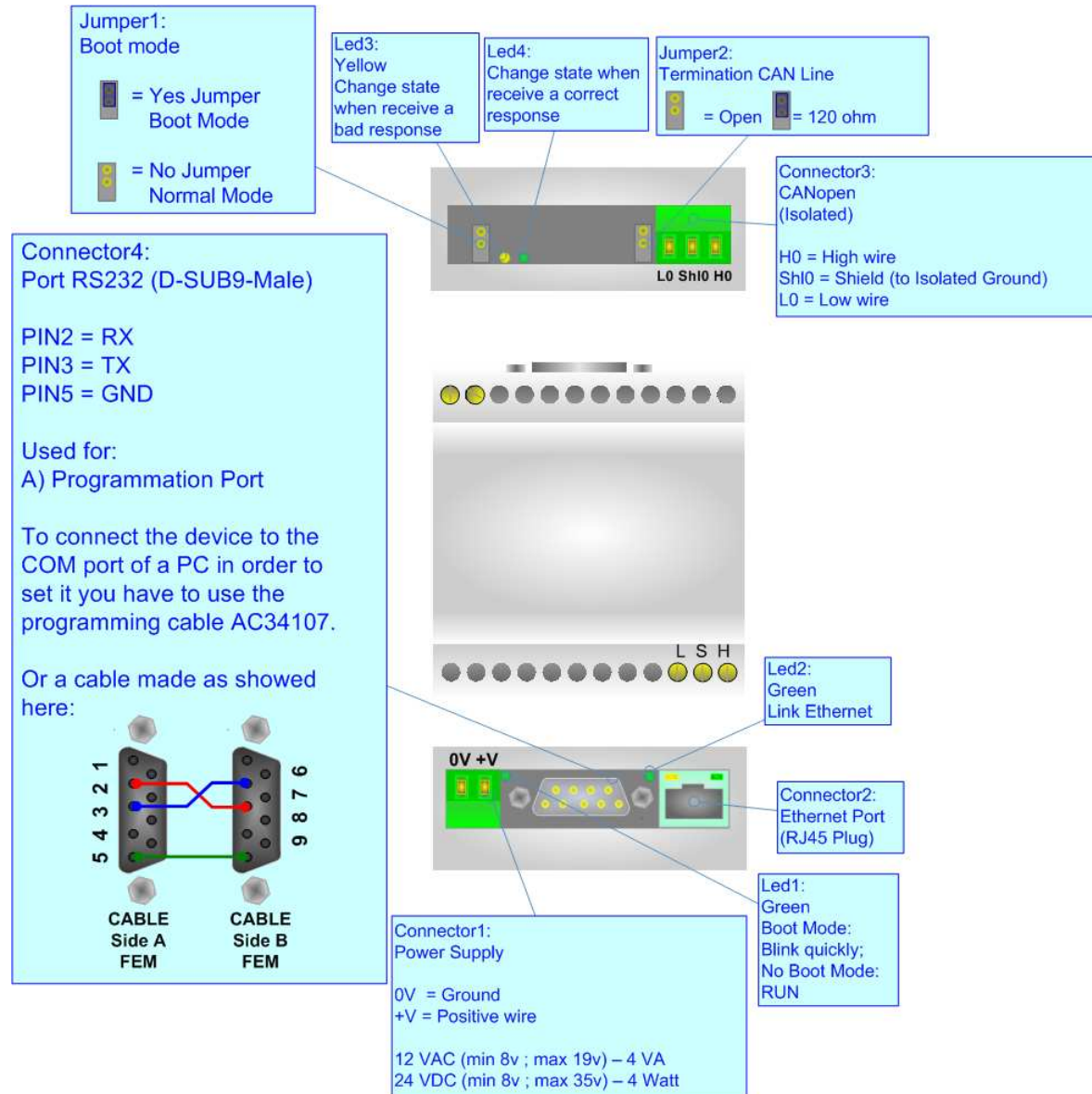




Figure 2: Connection scheme for HD67503-B2

**POWER SUPPLY:**

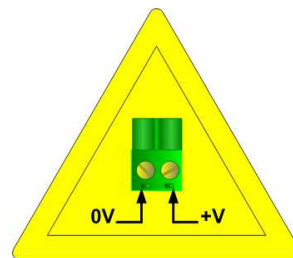
The devices can be powered at 8...19V AC and 8...35V DC. The consumption depends to the code of the device. For more details see the two tables below.

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

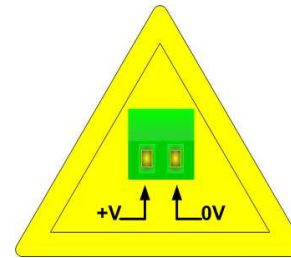
Consumption at 24V DC:

Device	Consumption [W/VA]
HD67503-A1	4
HD67503-B2	5

**Caution: Not reverse the polarity power**



HD67503-A1



HD67503-B2

### CHARACTERISTICS:

The Configurable CANopen to Ethernet gateway allows the following characteristics:

- TCP/UDP Ethernet protocols changeable with software;
- Mountable on Rail DIN;
- Temperature range -30°C to 70°C.

### CONFIGURATION:

You need Compositor SW67503 software on your PC in order to perform the following:

- Define the parameter of the CANopen bus;
- Define the parameter of the Ethernet;
- Define the RPDO and TPDO.

### USE OF COMPOSITOR SW67503:

To configure the Gateway use the available software that runs with Windows, called SW67503. It is downloadable on the site [www.adfweb.com](http://www.adfweb.com) and its operation is described in this document.

When launching the SW67503 the right window appears (Fig. 3).

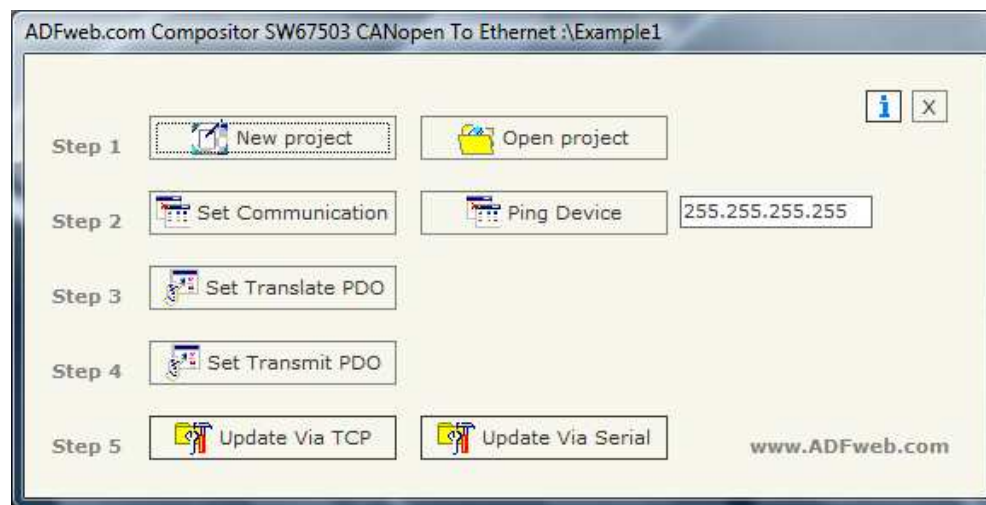


Figure 3: Main window for SW67503

**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 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 "Open Project" button;
- When a new project is created or an existent project is open, it will be possible to access the various configuration sections of the Software.

**SET COMMUNICATION:**

This section defines the fundamental communication parameter of two buses, CANopen and Ethernet.

By pressing the "Set Communication" button from the main window for SW67503 (Fig. 3) the window "Set Communication" appears (Fig. 4).

The window is divided in two sections: one for the CANopen and the other for the Ethernet.

The means of the fields for CANopen are:

- In the field "DevID" 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 start in Operational State, else it start in Pre-Operational;
- In the field "Network Start at Start-Up" the state of the CANopen network is defined. I.e. If it is checked the board send a command to set the Operational State of all the devices present in the network, after the time defined in the "Delay" field;
- In the field "Delay" the delay before send the network command for the CANopen is defined;
- "SDO Timeout" is the is the maximum time that the device attends for the answer from the Slave interrogated;

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 the 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.

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

**CANopen section:**

- DevID: 10
- Baud rate: 250
- Set Operational State at Start-Up
- Network Start at Start-Up
- Delay: 0 (range 0-255 sec.)
- SDO Timeout (1/10 ms): 10000

**Ethernet section:**

- IP ADDRESS: 192, 168, 2, 102
- SUBNET Mask: 255, 255, 255, 0
- Port: 10001
- TCP
- UDP

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

Figure 4: "Set Communication" window

**PING DEVICE:**

If it is necessary to do a Ping on the net, before pressing the "Ping Device" button insert a value in the field on the right and then press the button.

## SET TRANSLATE PDO

By pressing the "Set Translate PDO" button from the main window for SW67503 (Fig. 3) the window "RPDO" appears (Fig. 5).

The means of the fields are:

- In the field "COB-ID" insert the Cob\_ID of the CANopen Bus frame;
- In the field "Dimension" insert the number of bytes of the CANopen Bus frame (the maximum dimension is 8 bytes);
- In the field "Mnemonic" you can insert a brief description.

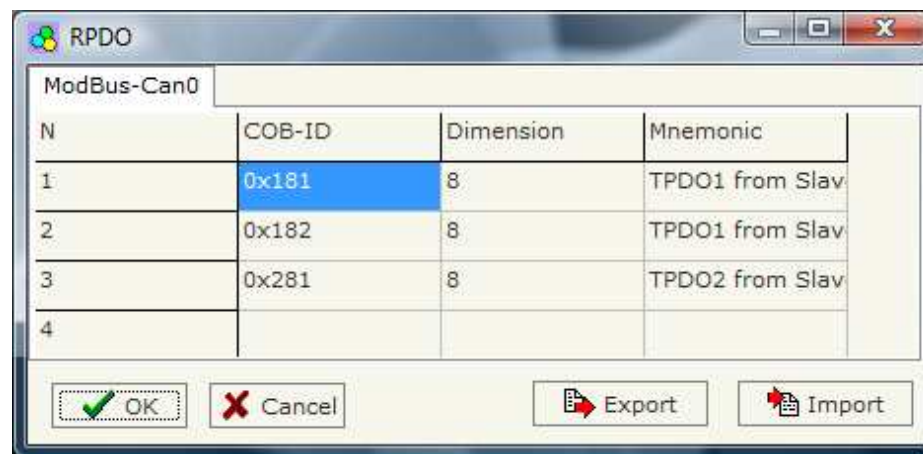


Figure 5: "RPDO" window

## SET TRANSMIT PDO

By pressing the "Set Transmit PDO" button from the main window for SW67503 (Fig. 3) the window "Transmit PDO" appears (Fig. 6).

The means of the fields are:

- In the field "COB-ID" insert the Cob\_ID of the CANopen Bus frame;
- In the field "Dimension" insert the number of bytes of the CANopen Bus frame (the maximum dimension is 8 bytes);
- In the field "Mnemonic" you can insert a brief description.

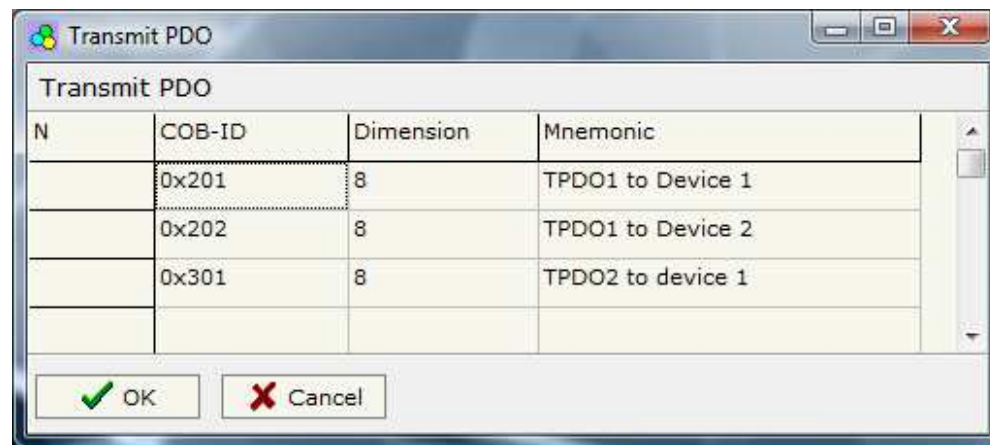


Figure 6: "Transmit PDO" window

**UPDATE VIA TCP:**

Section "Update Via TCP" (Fig. 7):

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

- Connect the Ethernet cable to the Gateway;
- Insert the IP address of the Gateway;
- Press the "Ping" button for check the connection of the Gateway;
- Press the "Next" button;
- Select the operations you want to do. You can select only "Firmware", only "Project" or both of them;
- Press the "Execute update firmware" button to start the upload.

When all the operations are "OK" the configuration/firmware on the device is correctly updated.

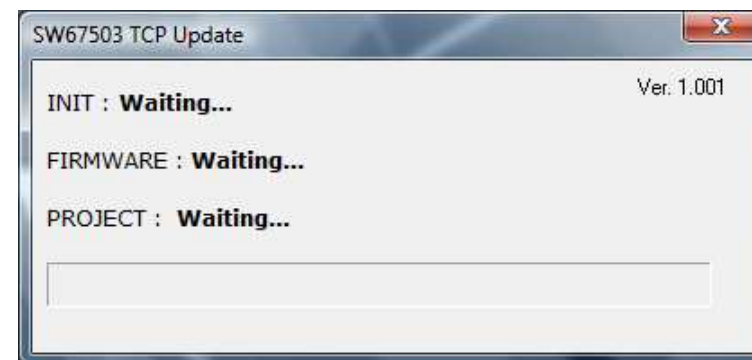
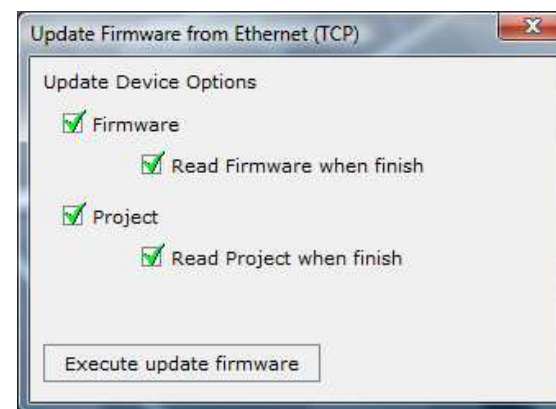
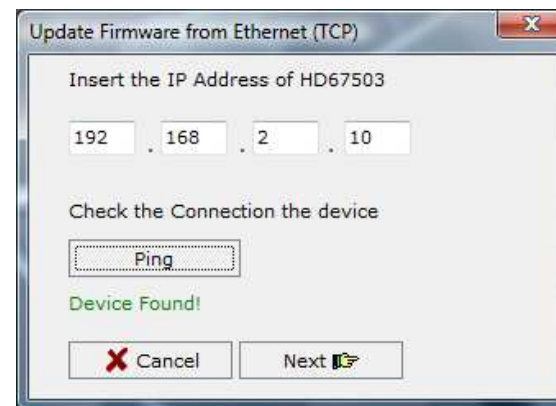


Figure 7: "Update Via TCP" windows

## UPDATE VIA SERIAL

Section "Update Via Serial" (Fig. 8):

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 (For more info see the "Connection scheme");
- Turn ON the device;
- Check the "BOOT Led". It must blink quickly (more info see the "Connection scheme");
- Select the COM port and press the "Connect" button;
- Press the "Next" button;
- Select the operations you want to do. You can select only "Firmware", only "Project" or both of them;
- Press the "Execute update firmware" button 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.

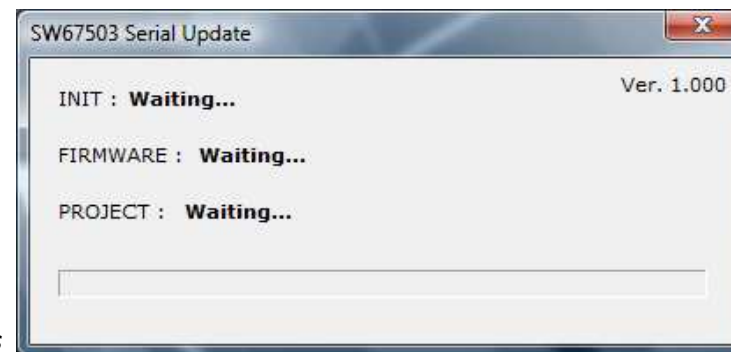
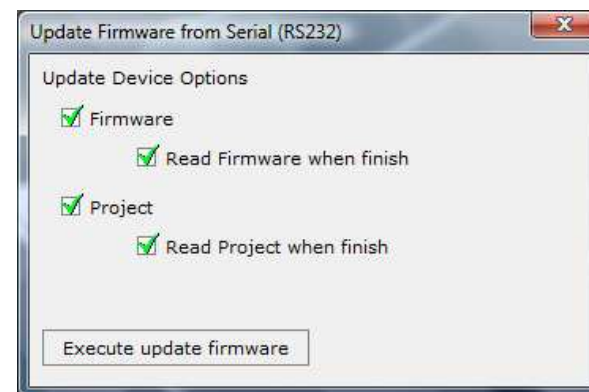


Figure 8: "Update Via Serial" windows

**CHARACTERISTICS OF THE CABLES:**

The connection with the Ethernet socket must be with an 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.

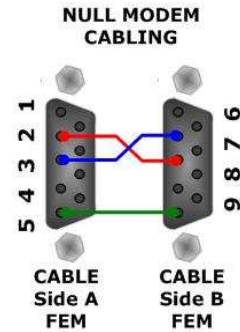


Figure 9: Null modem cabling

## ETHERNET PROTOCOL:

For the CANopen it is possible to use two types of data: SDO and PDO. It is possible to have no more than ten PDO, which must be declared in the "SW67503 Compositor", while SDO should not be reported.

### Write Frames

#### Pdo

The transmission of PDO is very simple: it has a fixed structure that consist in a maximum of eleven bytes:

Byte Number	Description
1	Write Identifier (0x02)
2	Type of Data (PDO=0x01)
3	Number of frame to send (number of row of "SW67503 compositor")
4÷n+3	Data

n=number of byte defined in the Compositor

The Byte that compose the respons is only one:

Byte Number	Description
1	Ok=0x01 / Error in sending=0x02

Example:

We want to write the frame number one of SW67503 Compositor:

- Type of Data: PDO; Number of frame to send: 1; Data: 0x01020304

So the string of hexadecimal numbers is:

REQ:[02][01][01][01][02][03][04]

RES:[01]

### Sdo

The transmission of SDO is very simple: it has a fixed structure that consist in a maximum of eleven bytes.

Byte Number	Description
1	Write Identifier (Write=0x02)
2	Type of Data (SDO=0x02)
3	Address of CANopen device connect to the HD67503
4	Index SDO Hi
5	Index SDO Lo
6	SubIndex SDO
7	Number of byte of frame to send (n)
8÷n+7	Data

The Number of byte of frame to send (Byte 7) can have three values:

- 0x01: Send one byte;
- 0x02: Send two byte;
- 0x04: Send four byte.

The Byte that compose the respons are this:

Byte Number	Description
1	Ok=0x01 / Parameter Error=0x02 / Error in sending=0x03

Example:

We want to write:

- Address of CANopen device: 0x14; Type of Data: SDO; Index: 0x2000; SubIndex: 0x01; Number of byte of frame to send: 2; Data: 0x1122

So the string of hexadecimal numbers is:

REQ:[02][02][14][20][00][01][02][11][22]

RES:[01]

## Read Frames

### Pdo

The Bytes that compose the request are three:

Byte Number	Description
1	Read Identifier (Read=0x01)
2	Type of Data (PDO=0x01)
3	Number of frame to send (number of row of "SW67503 Compositor")

The Bytes that compose the respons are:

Byte Number	Description
1	Ok=0x01 / Parameter Error=0x02
2÷n+1	Data

n=number of byte declared in the Compositor for the selected frame

Example:

We want to read the first PDO configured in the "SW67503 Compositor". This PDO contains six bytes. So the string of hexadecimal numbers is:

REQ:[01][01][01]

RES:[01][11][22][33][44][55][66]

**Sdo**

The Bytes that compose the request are seven:

Byte Number	Description
1	Read Identifier (Read=0x01)
2	Type of Data (SDO=0x02)
3	Address of CANopen device connect to the HD67503
4	Index SDO Hi
5	Index SDO Lo
6	SubIndex SDO
7	Number of byte of frame to read

The Byte that compose the respons is:

Byte Number	Description
1	Ok=0x01 / Parameter Error=0x02 / Error in sending=0x03
2÷n+1	Data

n=number of byte for the selected frame

Example:

We want to read:

- Address of CANopen device: 0x14; Type of Data: SDO; Index: 0x2000; SubIndex: 0x01; Number of byte: 4.

So receive the value 0x1A2B3C4D.

The string of hexadecimal numbers is:

REQ:[01][02][14][20][00][01][04]

RES:[01][1A][2B][3C][4D]

**MECHANICAL DIMENSIONS:**

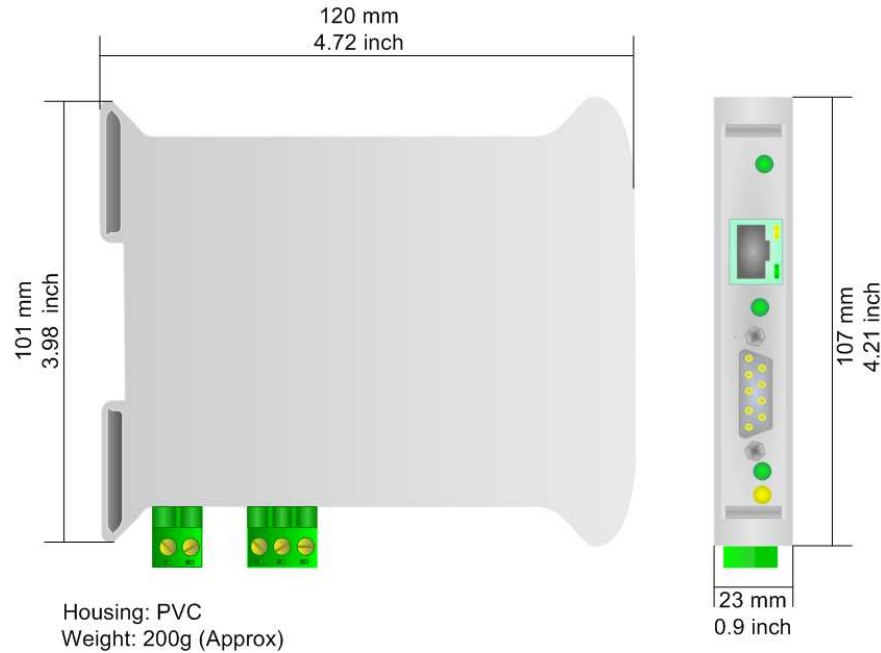


Figure 10: Mechanical dimensions scheme for HD67503-A1

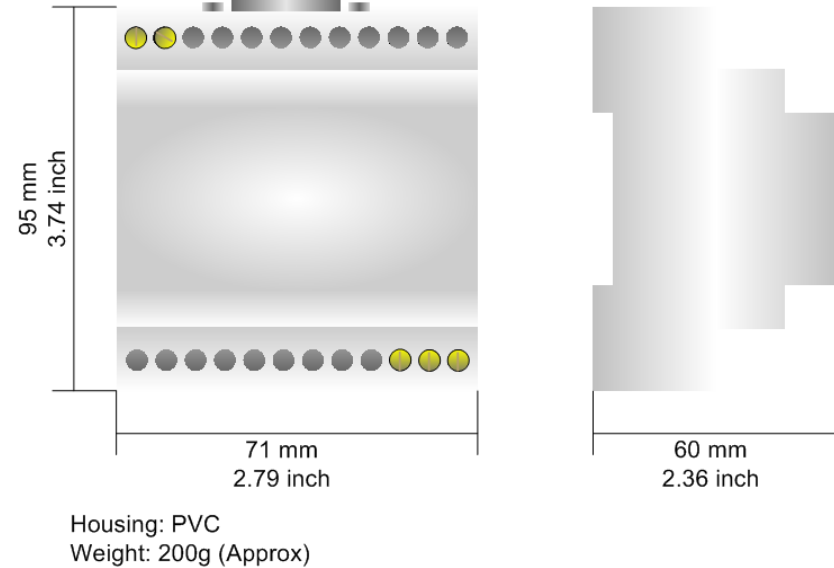


Figure 11: Mechanical dimensions scheme for HD67503-B2

**ORDER CODE:**

Order Code: **HD67503-A1-** Gateway – CANopen to Ethernet

Order Code: **HD67503-B2-** Gateway – CANopen to Ethernet (different enclosure)

**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

**WARRANTIES AND TECHNICAL SUPPORT:**

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at [www.adfweb.com](http://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](http://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	<a href="http://www.adfweb.com?Product=HD67118">www.adfweb.com?Product=HD67118</a>
HD67119	Converter USB 2.0 to RS485 Isolated	<a href="http://www.adfweb.com?Product=HD67119">www.adfweb.com?Product=HD67119</a>
HD67507	Gateway Modbus TCP Server to RTU Master	<a href="http://www.adfweb.com?Product=HD67507">www.adfweb.com?Product=HD67507</a>
HD67510	Gateway Modbus TCP Client to RTU Slave	<a href="http://www.adfweb.com?Product=HD67510">www.adfweb.com?Product=HD67510</a>