

User Manual

Revision 1.010
English

Gateway / Bridge CANopen from/to Modbus TCP Client (to connect Modbus Servers)

(Order Code: HD67504-A1, HD67504-B2)

for Website information:

www.adfweb.com?Product=HD67504

for Price information:

www.adfweb.com?Price=HD67504-A1

www.adfweb.com?Price=HD67504-B2

Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Low cost
- ▶ Rail mountable
- ▶ Wide supply input range
- ▶ Galvanic isolation
- ▶ Industrial temperature range:
-30°C / 70°C (-22°F / 158°F)



HD67504-A1



HD67504-B2

For other Gateways / Bridges:

CANopen to Modbus / DeviceNET

See also the following links:

www.adfweb.com?product=HD67001 (Modbus RTU Master)
www.adfweb.com?product=HD67002 (Modbus RTU Slave)
www.adfweb.com?Product=HD67505 (Modbus TCP Server)
www.adfweb.com?product=HD67134 (DeviceNET)

CAN bus to Modbus

See also the following links:

www.adfweb.com?product=HD67011 (Modbus RTU Master)
www.adfweb.com?product=HD67012 (Modbus RTU Slave)
www.adfweb.com?product=HD67514 (Modbus TCP Master)
www.adfweb.com?product=HD67515 (Modbus TCP Server)

Do you have an your customer protocol?

See the following links:

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

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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/ 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/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	09/07/2004	Dp	All	First release version
1.010	14/11/2011	FI	All	Software changed (v1.100)

WARNING:

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ADFweb.com is not responsible for any error this manual may contain.

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CONNECTION SCHEME:

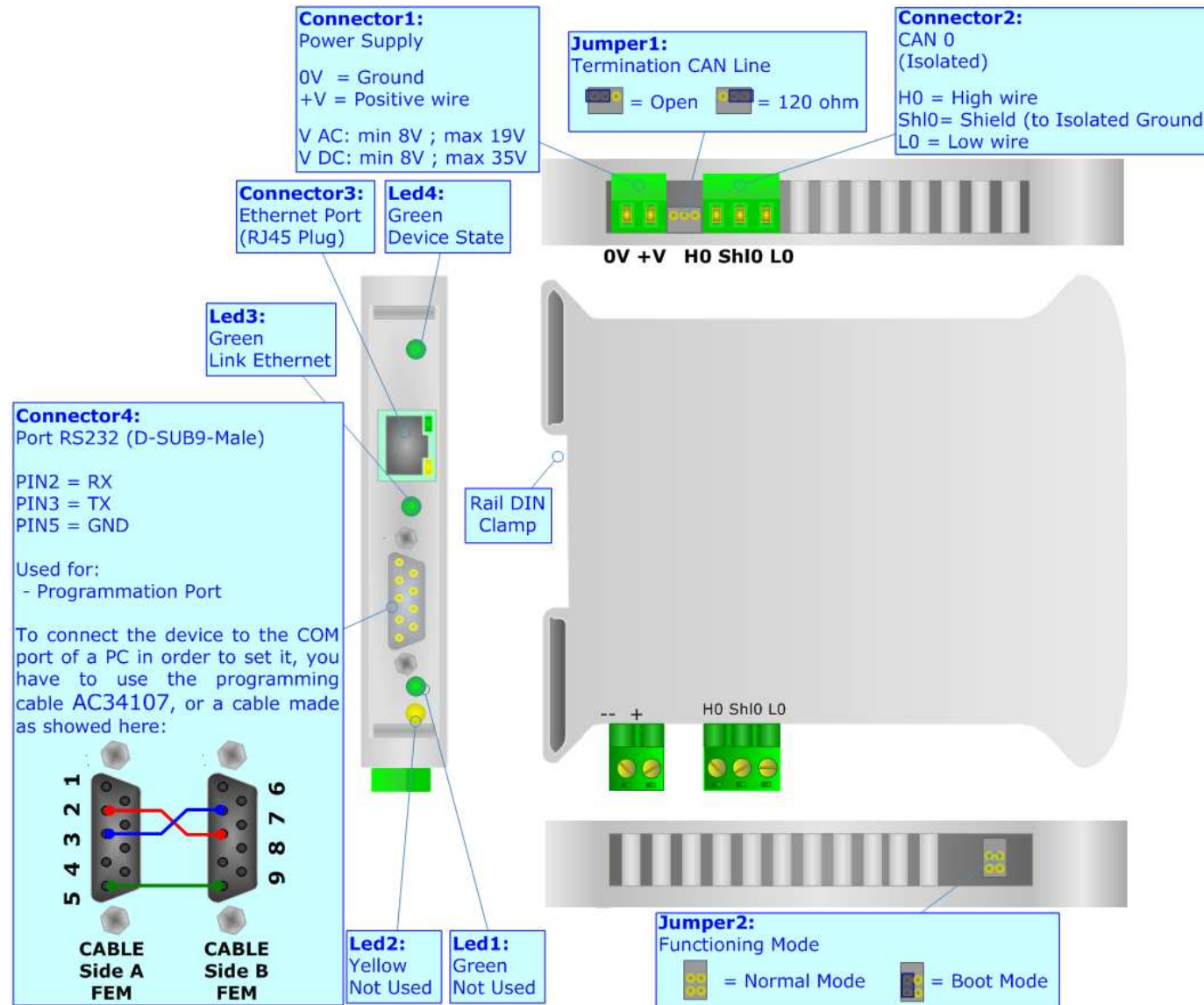


Figure 1: Connection scheme for HD67504-A1

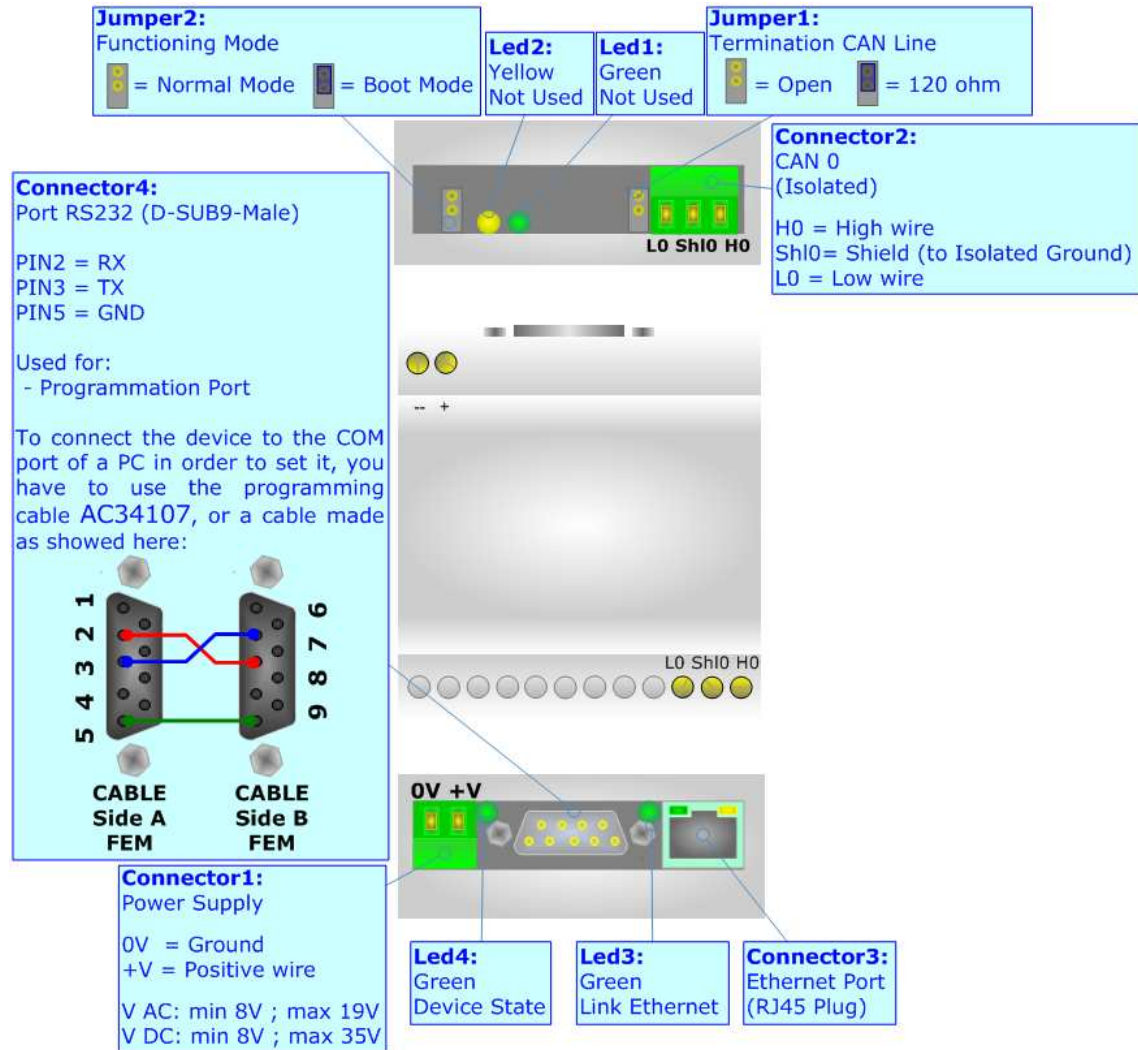


Figure 2: Connection scheme for HD67504-B2

EXAMPLE OF CONNECTION:

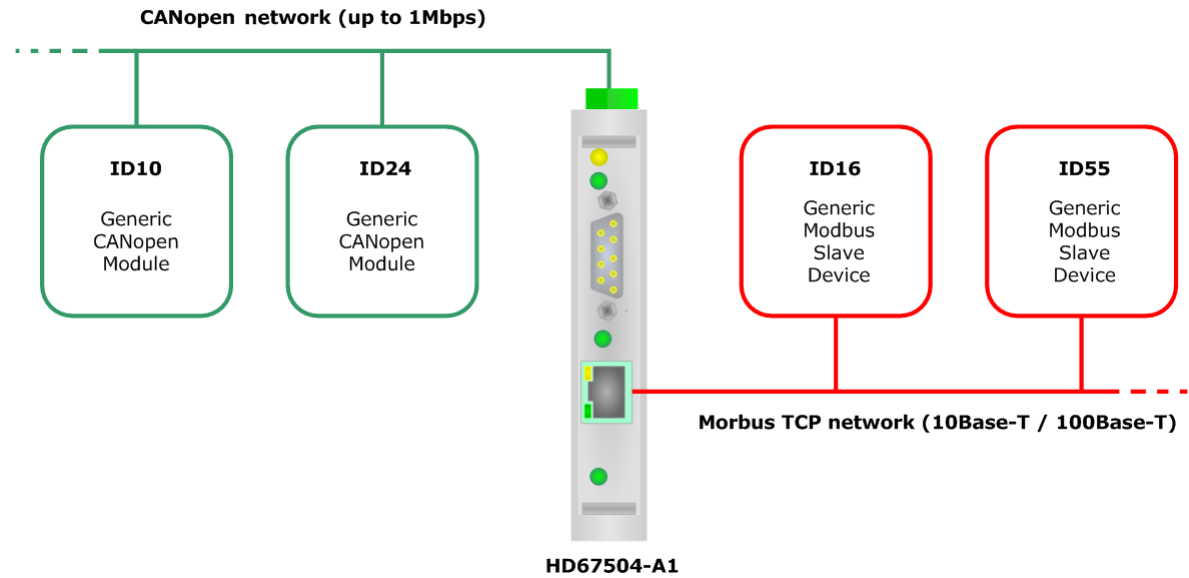


Figure 3: Connection example of HD67504-A1 used between a CANopen and a Modbus TCP network

CHARACTERISTICS:

The CANopen Modbus TCP Master Gateway allows the following characteristics:

- two-directional information between networks CANopen and Modbus;
- Electrical isolation between two buses;
- SDO and PDO;
- Communication Ethernet Modbus;
- Temperature range -30°C to 70°C.

The Gateway can be configured up to a maximum 1400 SDO , 4 TPDO and 4 RPDO.

POWER SUPPLY:

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

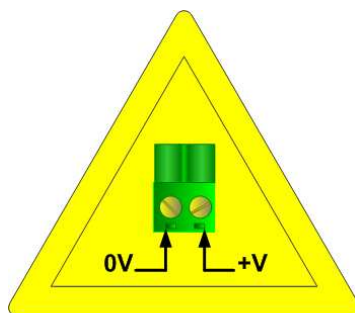
VAC		VDC	
Vmin	Vmax	Vmin	Vmax
8V	19V	8V	35V

Consumption at 24V DC:

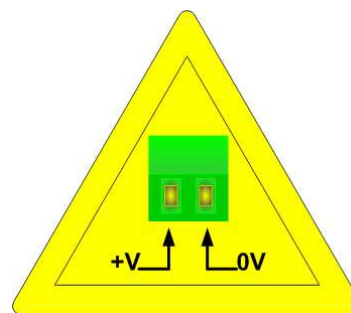
Device	W/VA
HD67504-A1, HD67504-B2	4



Caution: Not reverse the polarity power

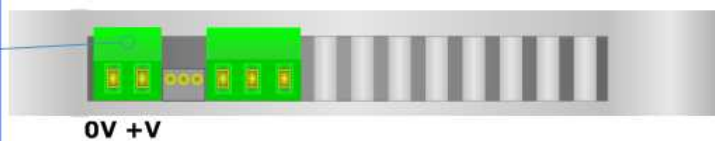


HD67504-A1



HD67504-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

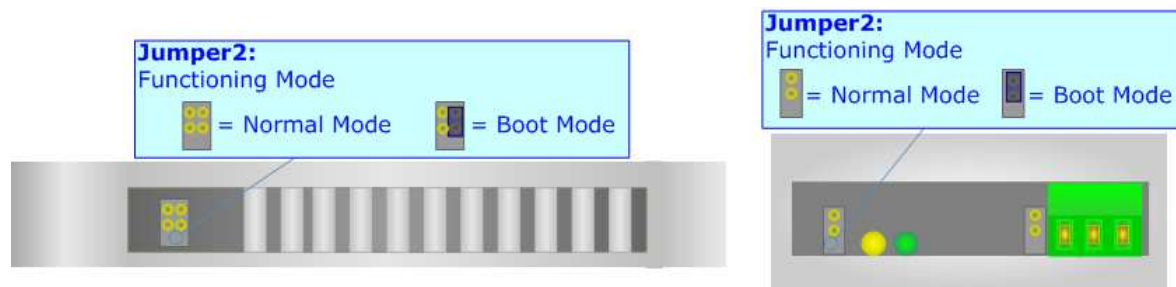
FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Jumper2':

- The first, without any jumper inserted, is used for the normal working of the device.
- The second, with the jumper inserted, is used for upload the Project.

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 four 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: Not used (Green)	Off	Off
2: Not used (Yellow)	Off	Off
3: Link Ethernet (Green)	ON: Ethernet Cable connected OFF: Ethernet Cable disconnected	ON: Ethernet Cable connected OFF: Ethernet Cable disconnected
4: Device State (Green)	Blinks slowly (~1Hz)	Blinks quickly

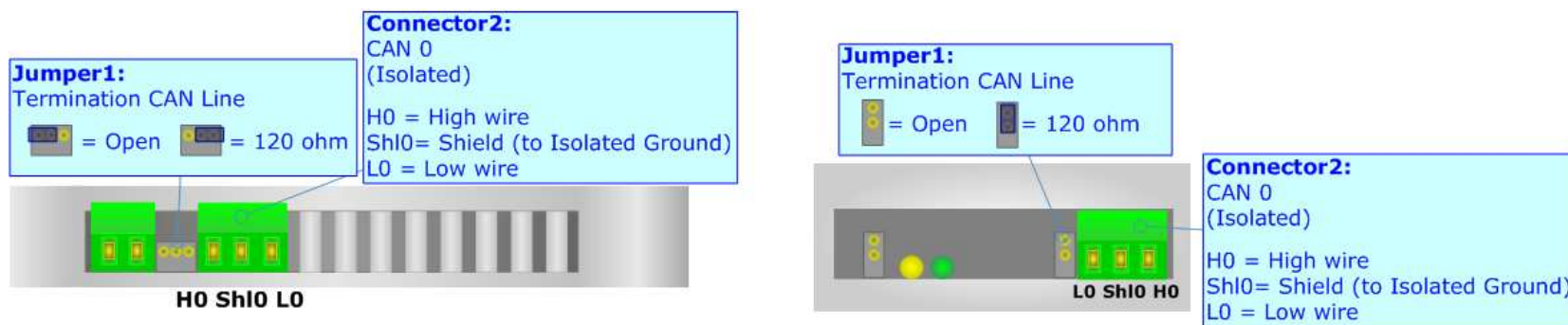


CANOPEN:

The connection from CAN socket must be made with a cable with these characteristics:

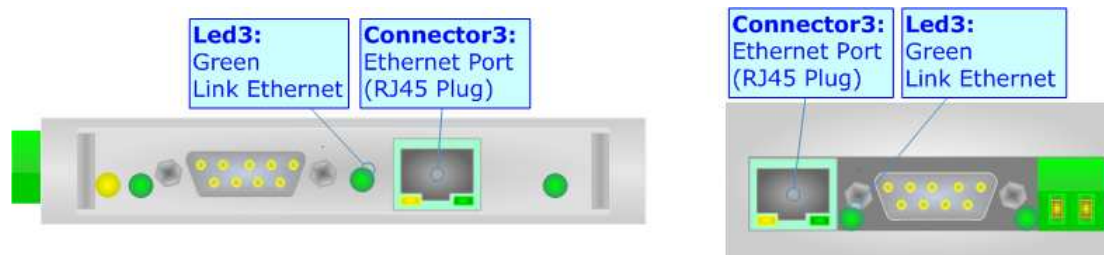
DC parameter:	Impedance	70 Ohm/m
AC parameters:	Impedance	120 Ohm/m
	delay	5 ns/m
Length	Baud Rate [bps]	Length MAX [m]
	10 K	5000
	20 K	2500
	50 K	1000
	100 K	650
	125 K	500
	250 K	250
	500 K	100
	800 K	50
	1000 K	25

For terminate the CAN line with a 120Ω resistor it is necessary to insert the 'Jumper1' like in figure.



ETHERNET:

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

**RS232:**

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.

The serial port is used only for the programming of the device.

CONFIGURATION:

The "Gateway CANopen to Modbus", allows a CANopen network to communicate with a Modbus network.

You need Compositor SW67504 software on your PC in order to perform the following:

- Define that the CANopen frame of the CANopen are reading from Modbus;
- Define that the CANopen frame of the CANopen are writing from Modbus.

USE OF SW67504 SOFTWARE:

When launching the SW67504 the following window appears

(The SW67504 is downloadable on the site:

<http://www.adfweb.com/home/download/download.asp>

This manual is referenced to the last version of the software present on our web site).

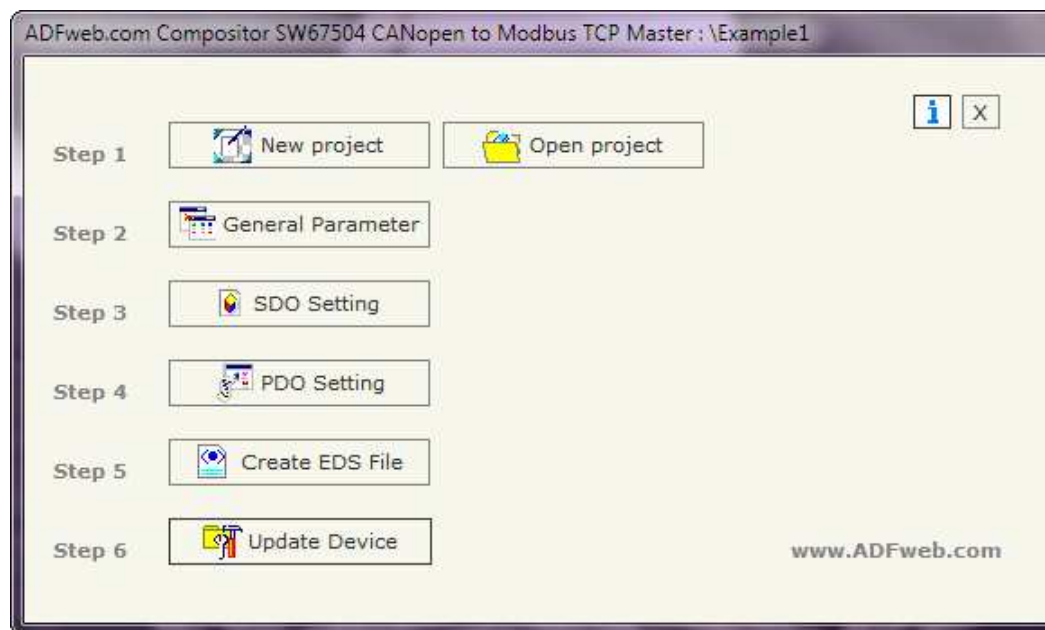


Figure 4: Main window for SW67504

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 "CANopen from/to Modbus TCP 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**".

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**";
- "**SDO Setting**";
- "**PDO Setting**".

GENERAL PARAMETER:

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

By pressing the **General parameter** button from the main window for SW67504 (Fig. 4) the window "General parameter" appears (Fig. 5):

- In the field **Device ID**, the CANopen address is defined;
- In the field **Baud Rate**, the velocity of the CANopen bus is defined;
- The check box **Set Operational State at Start-Up** is used to set the operational state of the device at start-up;
- The check box **Network Start at Start-Up** is used to send the command of the operational to the CANopen Network (i.e. when the device start up send in CANopen Network a command and all device will be in operational);
- In the field **Delay** the delay before send the network command for the CANopen is defined;
- **Send TPDOs on SYNC**, if you select this choice when a SYNC command is on the network the device send PDOs;
- The field **Transmission type** define the type of transmission of PDO;
- **Send TPDOs on change** of status. To allow TPDOs automatic transmission when there is a change of the TPDO's variable;
- In the field **IP** insert the IP address that you want to give at master Modbus;
- In the field **SubNet Mask**, insert the SubNet Mask;
- In field **Gateway** insert the Default Gateway IP address for use the gateway in WAN or Internet. For enable this feature is necessary to check the Gateway option.
- In the field **Port**, insert the number of port;
- **Timeout** is the maximum time that the device attends for the answer from the Slave interrogated;
- In the field **Delay TPDO ModReq**, the delay between two modbus request for the TPDO is defined.

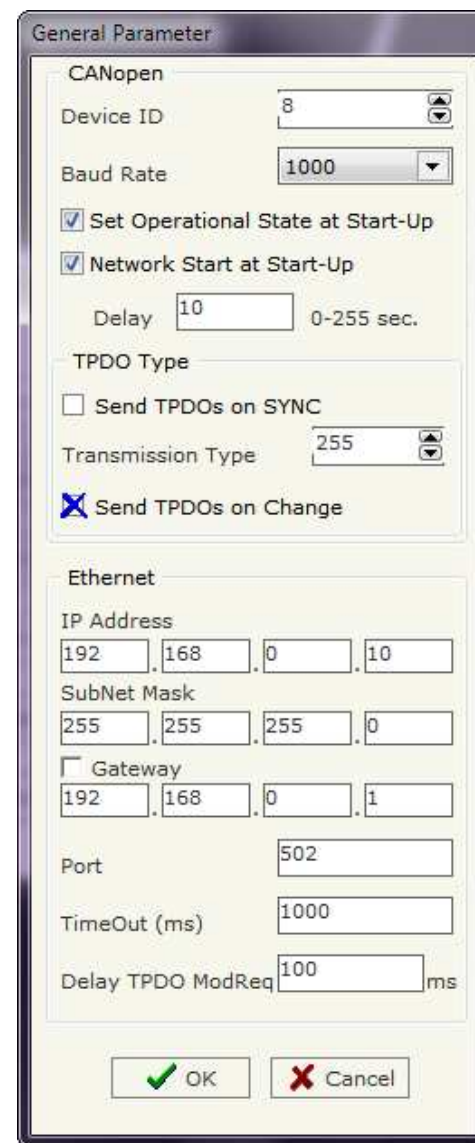


Figure 5: "General Parameter" window

SDO SETTING:

By pressing the “**SDO Setting**” button from the main window for SW67504 (Fig. 4) the window “SDO Setting” appears (Fig. 6):

In the right scenario:

- In the field “**CANOpen Index**”, insert the index of the CANopen frame;
- In the field “**Address Device TCP**”, insert the IP of Modbus device that contains the Modbus data;
- In the field “**Address word**”, insert the Modbus word that contains the Modbus data;
- In the field “**Quantity**”, insert the number of consecutive words you configured;
- In the field “**Read/Write**”, is defined if the SDO is in reading or in writing;
- In the field “**Mnemonic**” it is possible to insert a brief description.

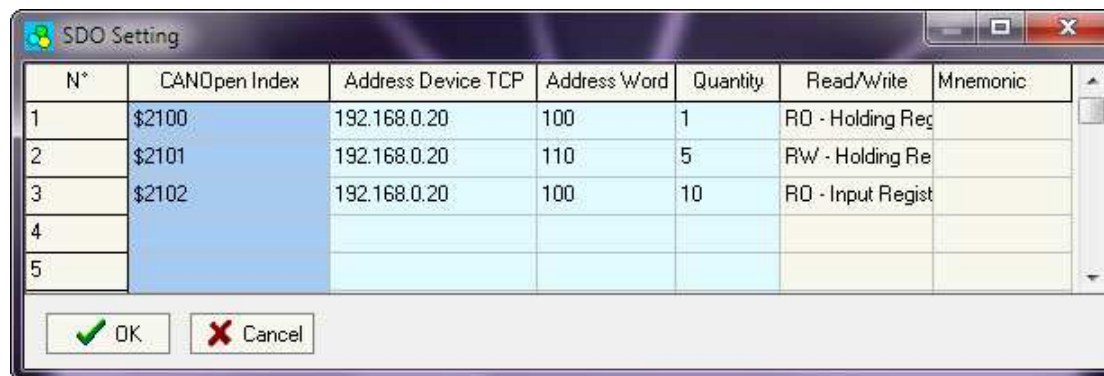


Figure 6: “SDO setting” window

The SDO objects between \$2000 and \$5FFF are permitted.

All data will be retrived on event read of specific SDO. The master CANopen need to have a timeout higher than 500 ms. The reply time is the time for a serial inquiry plus the serial response.

Example:

If I want to read data from the Modbus network but I’m in a CANopen network :

I’ll define a SDO index (\$2101) and this will be associated with an area inside Modbus network (address 110 inside device with IP Address 192.168.0.20).

For reading word 110 on device at IP address 192.168.0.20 you have to read SDO index \$2101 subindex 1.
 For reading word 111 on device at IP address 192.168.0.20 you have to read SDO index \$2101 subindex 2.
 Etc.

PDO SETTING:

The gateway permit to use 4 Receive PDO and 4 Trasmit PDO. All PDO are mapped to specific object for TPDO1 (\$2100,\$2101,\$2102,\$2103). A PDO has 8 bytes lenght and these are divided in 4 words. Each word is linked to a word in serial bus.

Writing an RPDO of gateway, the data will be written into ethernet device to the specific address. Requesting a TPDO this PDO will contain the data read from ethernet , from a specific device and address.

By pressing the “**PDO Setting**” button from the main window for SW67504 (Fig. 4) the window “SDO Setting” appears (Fig. 7).

In the right scenario:

- The field “**Index**” is already compiled and is not possible modify it;
- The field “**Description**” is already compiled and is not possible modify it;
- In the field “**Add Dev TCP**” insert the IP address of Modbus device;
- In the field “**Add Data**” insert the address of Modbus register;
- In the filed “**Delta Send**” insert a value that have to be suppered before to send the TPDO (only for Tramsmit PDO);
- In the field “**Mnemonic**” it is possible to insert a brief description.

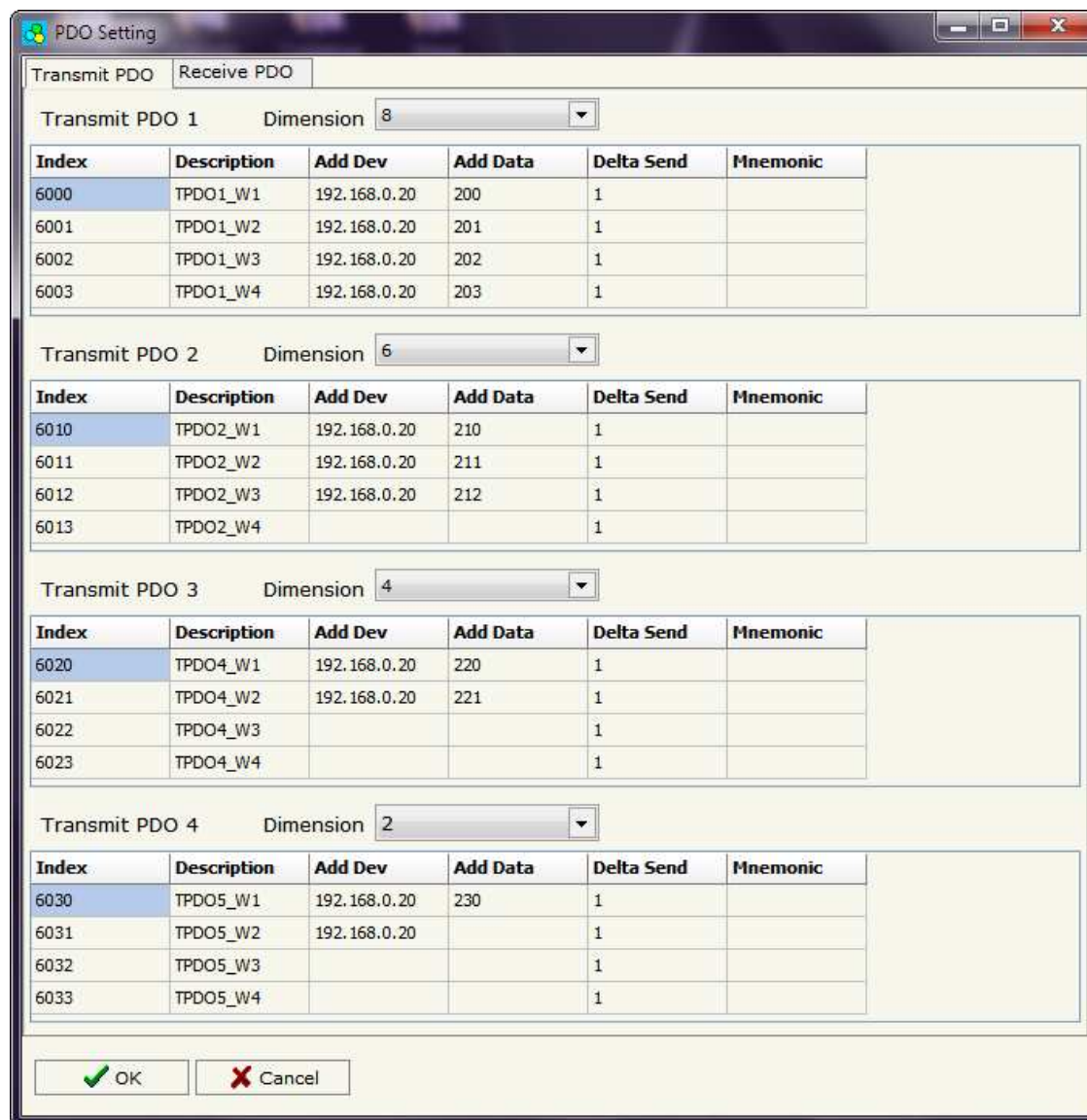


Figure 7: "PDO Setting" window

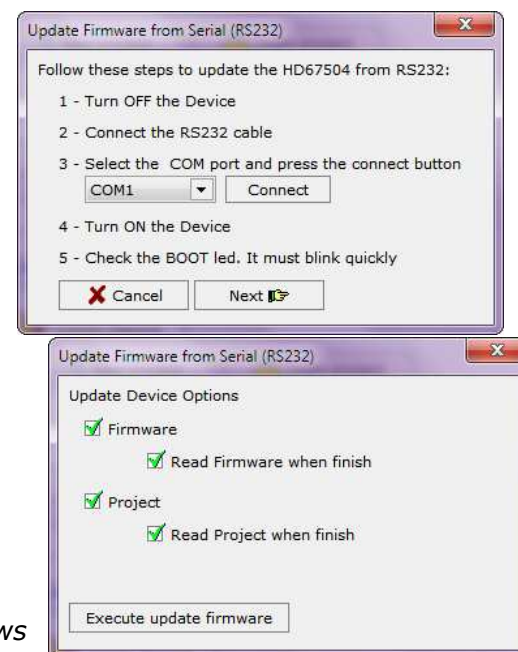
UPDATE DEVICE:

By pressing the **Update device** button from the Main Window for SW67504 (Fig. 4) the right window appears (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 form your PC to the Gateway;
- Insert the Boot Jumper (For more info see Fig. 1,2);
- 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. 1,2);
- Press the **Next** button;
- Select which 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;
- 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 HD67504-A1 or HD67504-B2 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;
- Try to restart the PC.

Figure 9: "Protection" window



MECHANICAL DIMENSIONS:

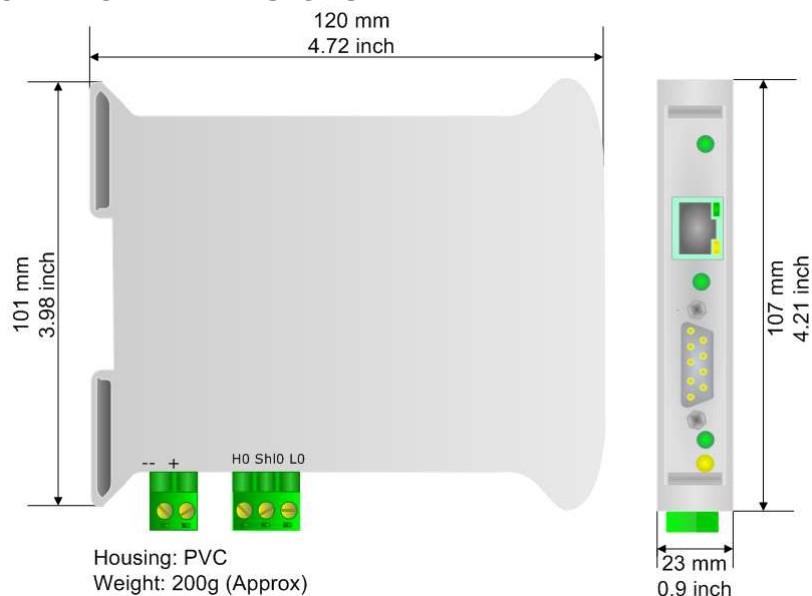


Figure 10: Mechanical dimensions scheme for HD67504-A1

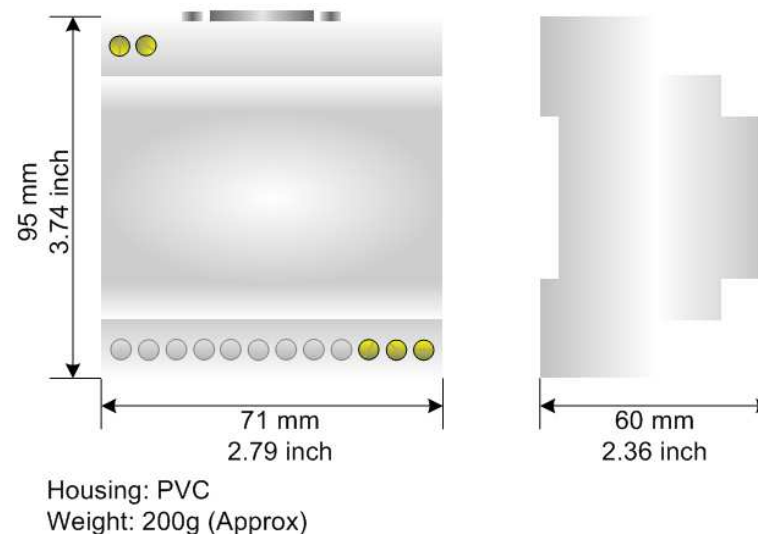


Figure 11: Mechanical dimensions scheme for HD67504-B2

ORDER CODES:

- Order Code: **HD67504-A1** - Gateway – CANopen from/to Modbus TCP Client (i.e. Master)
- Order Code: **HD67504-B2** - Gateway – CANopen from/to Modbus TCP Client (i.e. Master) (different enclosure/connectors)

ACCESSORIES:

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

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
HD67121	Gateway CANopen / CANopen	www.adfweb.com?product=HD67121
HD67001	Gateway CANopen / Modbus – RTU Master	www.adfweb.com?product=HD67001
HD67505	Gateway CANopen / Modbus – Ethernet TCP	www.adfweb.com?product=HD67505
HD67134	Gateway CANopen / DeviceNet	www.adfweb.com?product=HD67134
HD67117	CAN bus Repeater	www.adfweb.com?product=HD67117
HD67316	CAN bus Analyzer	www.adfweb.com?product=HD67316