User Manual

Revision 1.001
English

PROFINET / CANopen - Converter

(Order Code: HD67607-A1)

for Website information:
www.adfweb.com?Product=HD67607

for Price information:
www.adfweb.com?Price=HD67607-A1

Benefits and Main Features:

- Very easy to configure
- Electrical isolation
- Two PROFINET ports
- Temperature range: -40°C/85°C (-40°F/185°F)

Other Products

For others PROFINET products see also the following link:

Converter PROFINET to

www.adfweb.com?Product=HD67600	**(NMEA2000)**
www.adfweb.com?Product=HD67601	**(Serial RS232)**
www.adfweb.com?Product=HD67601	**(Serial RS485)**
www.adfweb.com?Product=HD67602	**(Modbus Master RS232)**
www.adfweb.com?Product=HD67602	**(Modbus Master RS485)**
www.adfweb.com?Product=HD67603	**(Modbus Slave RS232)**
www.adfweb.com?Product=HD67603	**(Modbus Slave RS485)**
www.adfweb.com?Product=HD67604	**(PROFIBUS Master)**
www.adfweb.com?Product=HD67605	**(PROFIBUS Slave)**
www.adfweb.com?Product=HD67606	**(CAN)**
www.adfweb.com?Product=HD67608	**(DeviceNet Master)**
www.adfweb.com?Product=HD67609	**(DeviceNet Slave)**

Do you have an your customer protocol?
www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?
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 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	03/09/2012	Dp	All	First Release
1.001	29/07/2013	Fl	All	Revision

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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

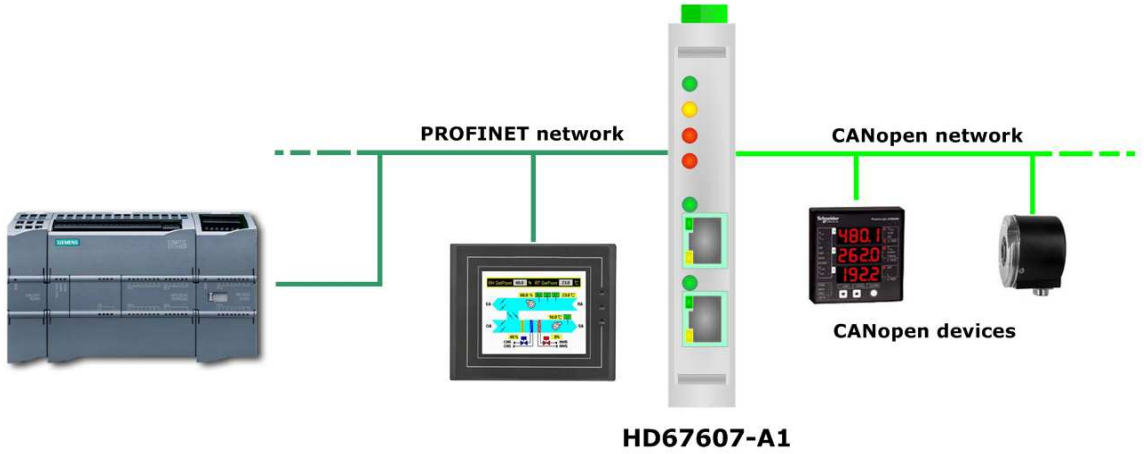
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

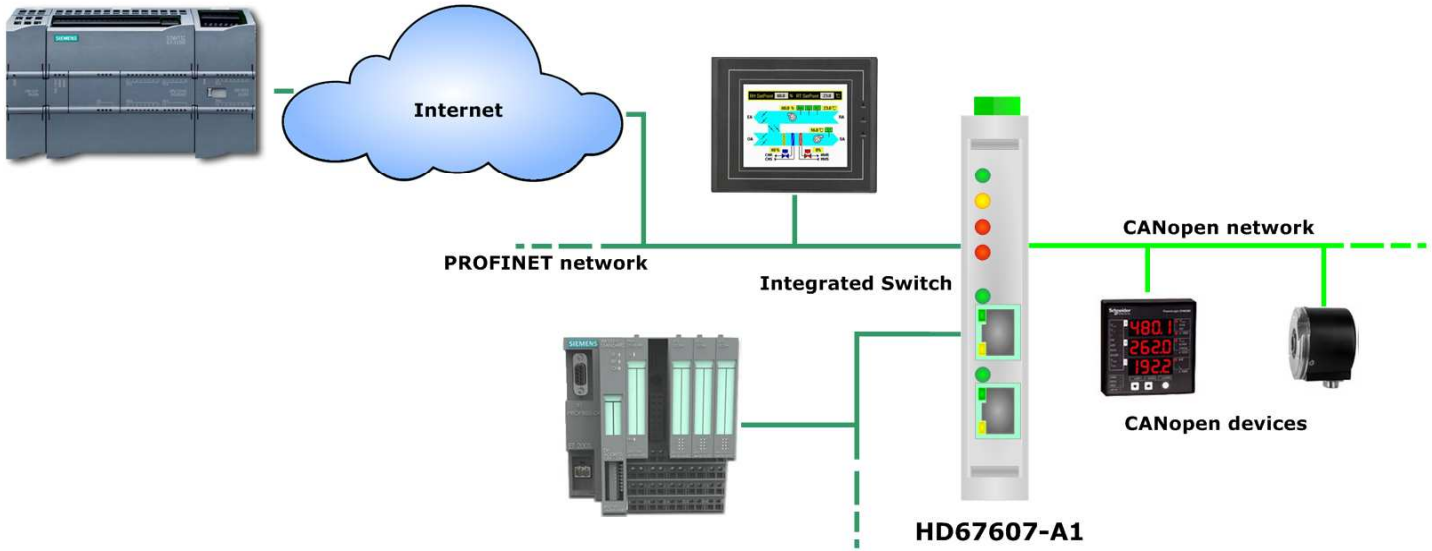
This symbol indicates that non-observance of the safety instructions is danger for people to serious injury or death and / or the possibility of damage.

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.

EXAMPLE OF CONNECTION:





CONNECTION SCHEME:

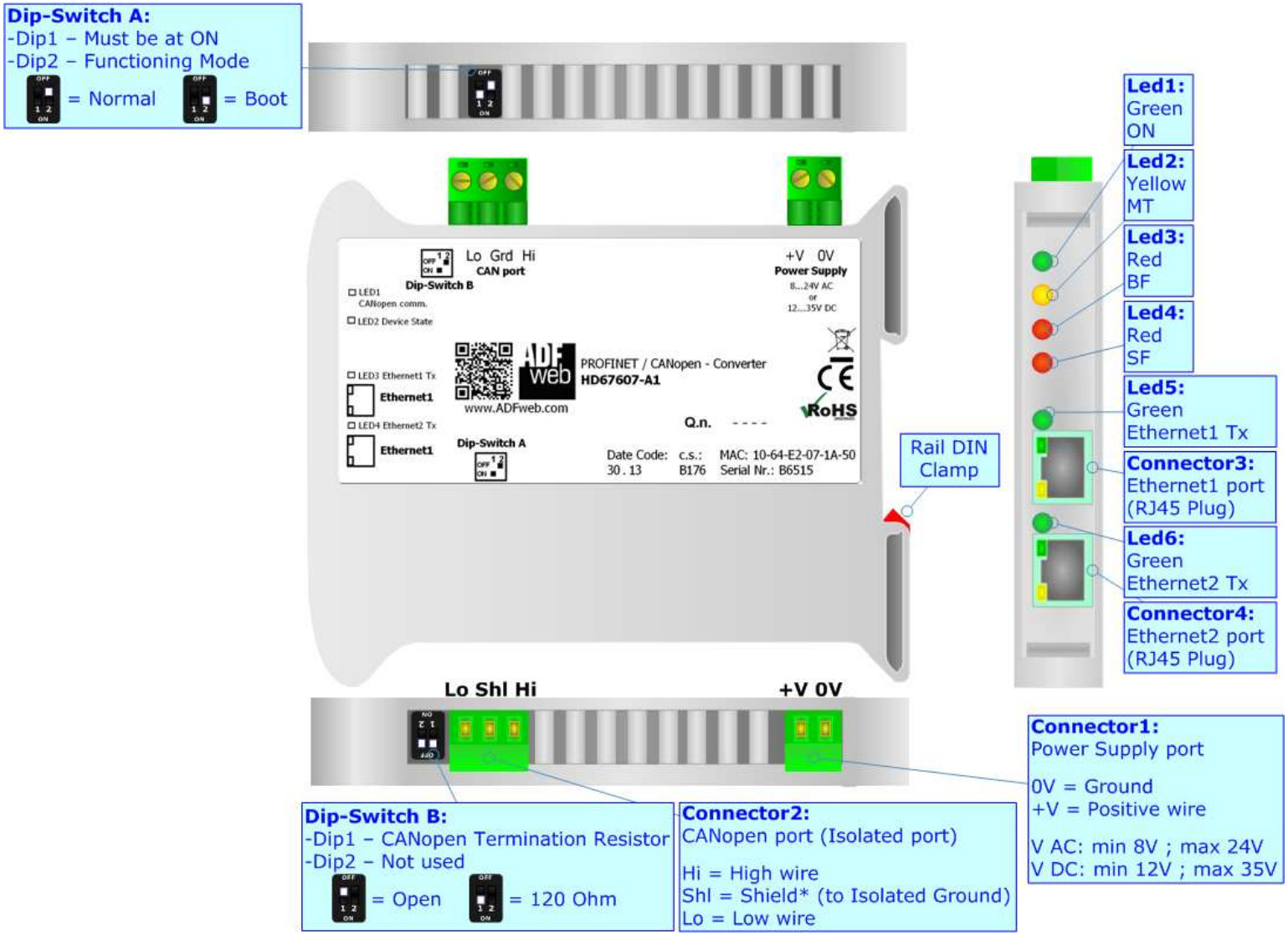


Figure 1: Connection scheme for HD67607-A1

CHARACTERISTICS:

The HD67607-A1 is a PROFINET / CANopen Converter.

It has the following characteristics:

- Up to 512 bytes in reading and 512 bytes in writing;
- Triple isolation between CAN - Power Supply, CAN - Ethernet, Power Supply - Ethernet.
- Two-directional information between CANopen bus and PROFINET bus;
- Mountable on 35mm Rail DIN;
- Wide power supply input range: 8…24V AC or 12…35V DC;
- Wide temperature range: -40°C / 85°C [-40°F / +185°F].

CONFIGURATION:

You need Compositor SW67607 software on your PC in order to perform the following:

- Define the parameter of PROFINET line;
- Define the parameter of CAN line;
- Define SDO Server information;
- Define SDO Client information;
- Define PDO information (RPDO/TPDO);
- Update the device.

POWER SUPPLY:

The devices can be powered at 8…24V AC and 12…35V DC. For more details see the two tables below.

VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
8V	**24V**	**12V**	**35V**

Consumption at 24V DC:

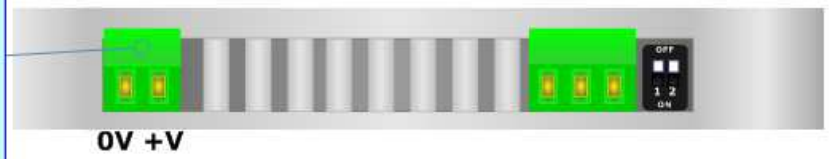
Device	Consumption [W/VA]
HD67607-A1	3.5

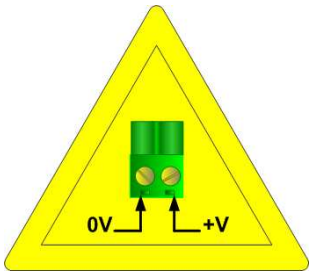
Caution: Not reverse the polarity power

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V AC: min 8V ; max 24V
V DC: min 12V ; max 35V





HD67607-A1

FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Dip2 of Dip-Switch A':

- The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip2 of Dip-Switch A' at "ON" position, is used for upload the Project and/or Firmware.

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

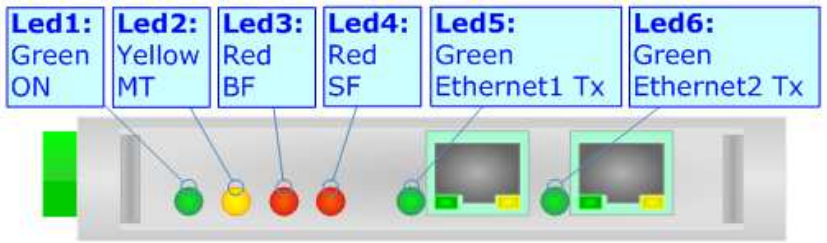
According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.

Warning:
Dip1 of 'Dip-Switch A' must be at ON position for working even if the Ethernet cable isn't inserted.

LEDS:

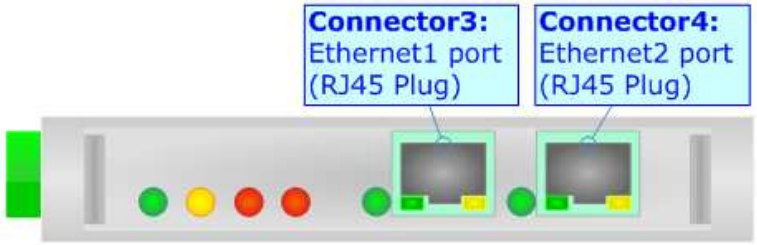
The device has got six LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: ON [supply voltage] (green)	**ON:** Device powered **OFF:** Device not powered	**ON:** Device powered **OFF:** Device not powered
2: MT [maintenance display] (yellow)	**ON:** Maintenance Problem is present **OFF:** No maintenance are present	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: BF [bus fault] (red)	**ON:** The Ethernet connection is defective; the IP address exists several times in the network; the own NameOfStation exists several times in the network; no IP address has been set **Flashing:** At least one configured AR is no longer in the data exchange **OFF:** No errors are present	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: SF [group error] (red)	**ON:** At least one AR is not in the data exchange **OFF:** No errors are present	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Ethernet1 Tx (green)	Blinks when is transmitting Ethernet frames	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
6: Ethernet2 Tx (green)	Blinks when is transmitting Ethernet frames	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress



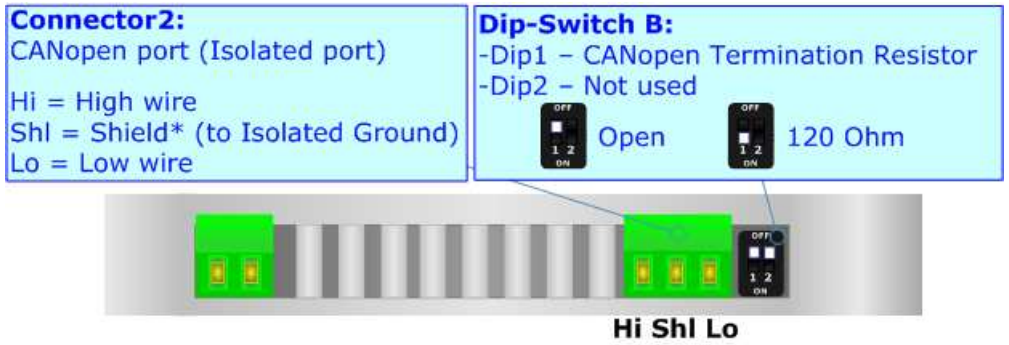
PROFINET:

The PROFINET connection must be made using Connector3 and/or Connector4 of HD67607-A1 with at least a Category 5E cable. The maximum length of the cable should not exceed 100m. The cable has to conform to the T568 norms relative to connections in cat.5 up to 100 Mbps. To connect the device to an Hub/Switch is recommended the use of a straight cable, to connect the device to a PC/PLC/other is recommended the use of a cross cable.



CANOPEN:

For terminate the CANopen line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch B' is at ON position.



Cable 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

USE OF COMPOSITOR SW67607:

To configure the Converter, use the available software that runs with Windows, called SW67607. It is downloadable on the site www.adfweb.com and its operation is described in this document. *(This manual is referenced to the last version of the software present on our web site)*. The software works with MSWindows (MS 2000, XP, Vista, Seven, 8; 32/64bit).

When launching the SW67607 the right window appears (Fig. 2).

Note:
It is necessary to have installed .Net Framework 4.

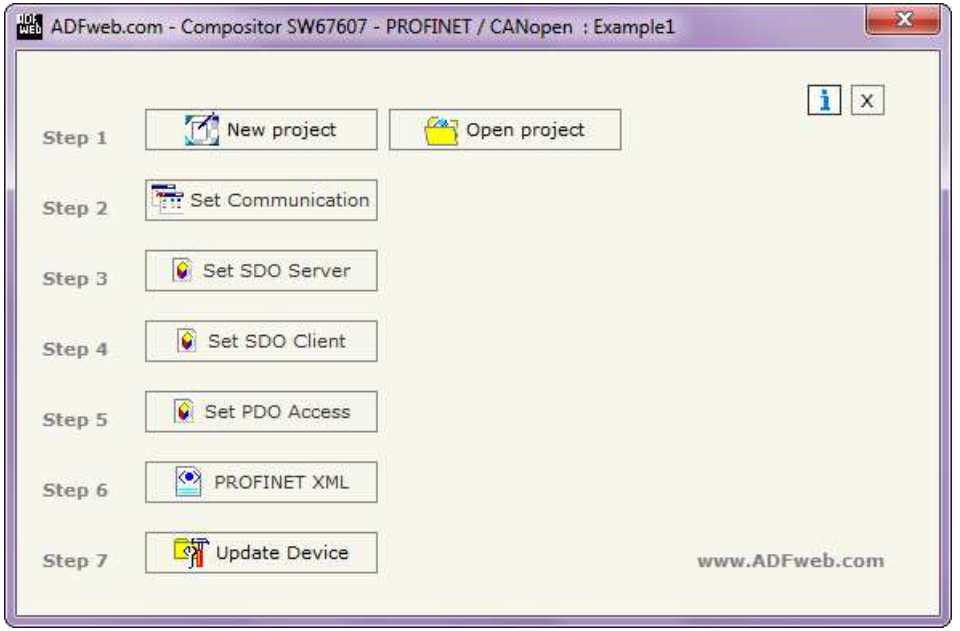
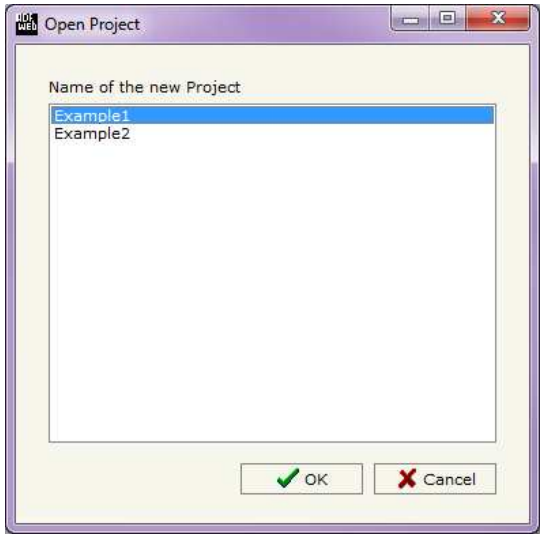


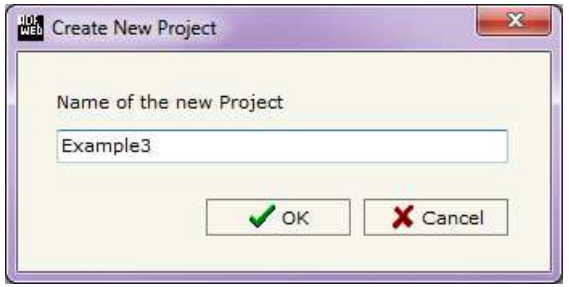
Figure 2: Main window for SW67607

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 "PROFINET / CANopen – Converter" 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 define the fundamental communication parameters of two buses, PROFINET and CANopen.
By Pressing the "**Set Communication**" button from the main window for SW67607 (Fig. 2) the window "Set Communication" appears (Fig. 3).
The window is divided in two sections, one for the PROFINET and the other for the CANopen.

The means of the fields for "PROFINET" are:

- In the fields "**IP ADDRESS**" insert the IP address that you want to give to the Converter;
- In the fields "**SUBNET Mask**" insert the SubNet Mask;
- In the fields "**GATEWAY**" insert the default gateway that you want to use. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net;
- In the field "**Port**" the port used for PROFINET communication is defined. The port has a fixed value of 34964;
- In the field "**PROFINET Name of Station**" is possible to assign a name to the PROFINET node;
- In the fields "**Number Byte IN**" insert the number of input byte of the slave station;
- In the fields "**Number Byte Out**" insert the number of output byte of the slave station.

The means of the fields for the "CANopen" section are:

- In the field "**Device ID**" the address for the CANopen side is defined;
- In the field "**Baudrate**" 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 at 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;
- If 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.

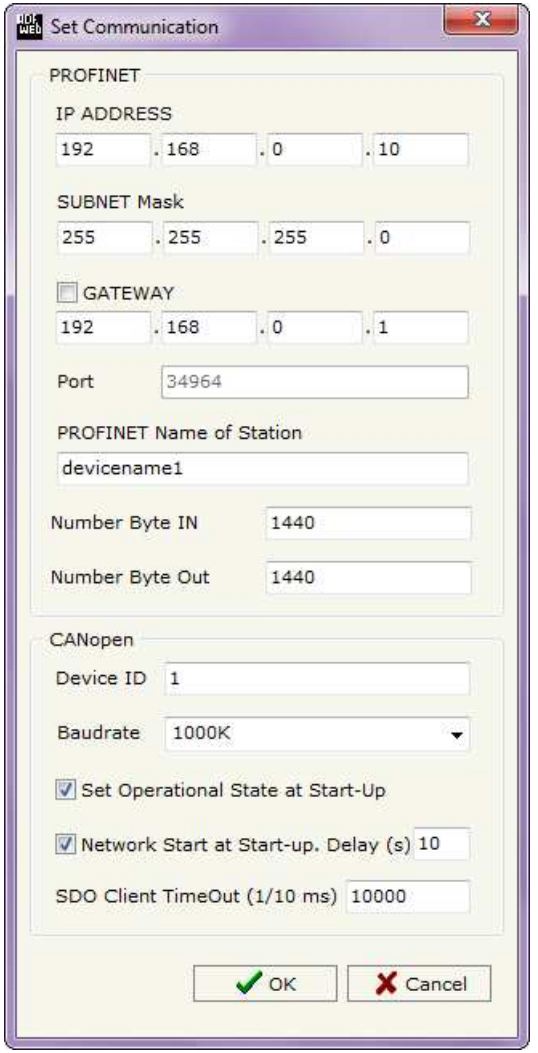


Figure 3: "Set Communication" window

SET SDO SERVER:

By pressing the "**Set SDO Server**" button from the main window for SW67607 (Fig. 2) the window "Set SDO Server Access" appears (Fig. 4).

This window is made to create the SDO in read or write in the CANopen side, and to indicate which byte are associated to these SDOs.

It is divided in two parts, the "SDO in read" and the "SDO in Write".
The first part is used to read, using the SDO, the data arrived from the PROFINET devices. The second is used to write, using SDO, the data that will be sent to the PROFINET devices.

The data of the columns have the following meanings:

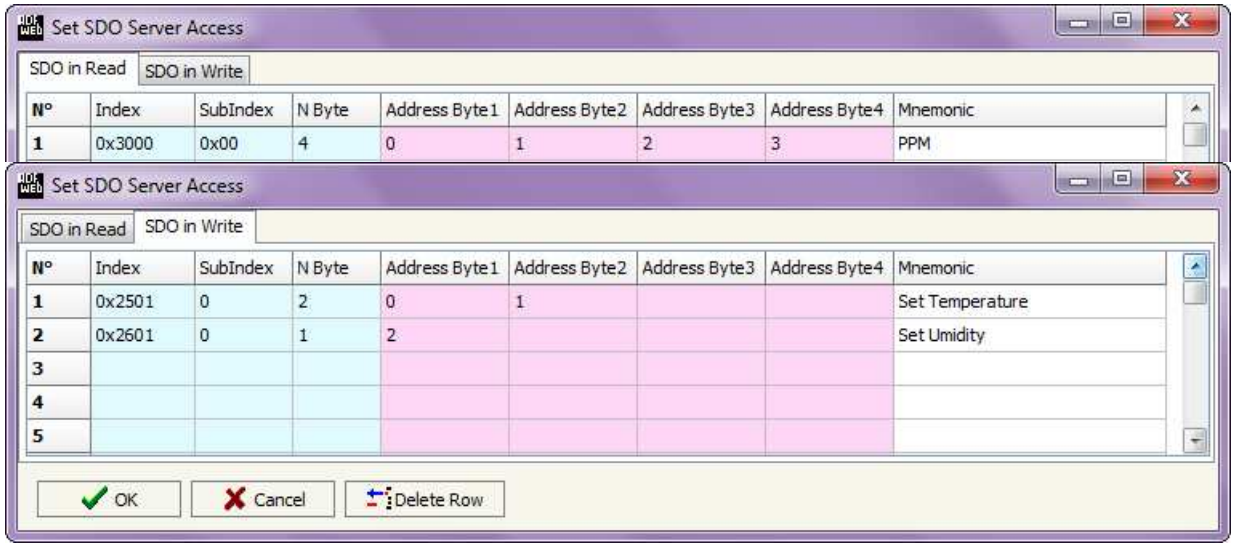


Figure 4: "Set SDO Server Access" window

- In the field "**Index**" the address of the SDO is defined;
- In the field "**SubIndex**" the second address of the SDO is defined;
- If the field "**N Byte**" the dimension of the SDO is defined (it can be 1, 2 or 4);
- If the field "Fast Packet" is checked the frame use the Fast Packet Protocol;
- In the field "**Address Byte1**" insert the address of the PROFINET arrays where read/write first byte of the SDO;
- In the field "**Address Byte2**" insert the address of the PROFINET arrays where read/write second byte of the SDO (only if N Byte is 2 or 4);
- In the field "**Address Byte3**" insert the address of the PROFINET arrays where read/write third byte of the SDO (only if N Byte is 4);
- In the field "**Address Byte4**" insert the address of the PROFINET arrays where read/write fourth byte of the SDO (only if N Byte is 4);
- In the field "**Mnemonic**" the description for the SDO is defined.

It is possible to configure a maximum of 1000 SDOs (500 in read and 500 in write) in the "Set SDO Server Access" section.

SET SDO CLIENT:

By pressing the "**Set SDO Client**" button from the main window for SW67607 (Fig. 2) the window "Set SDO Client Access" appears (Fig. 5a and 5b).

With the SDO Client the HD67607 Gateway can read and/or write the data from other devices connected in the network CANopen.

It is divided in two parts, the " SDO Read" and the "SDO Write". The first part is used to read, using the SDO, the data in another device and then put this data in the PROFINET array. The second part is used to write, using the SDO, the data present in the PROFINET array to other CANopen devices.

The data of the columns in the "SDO Read" have the following meanings:

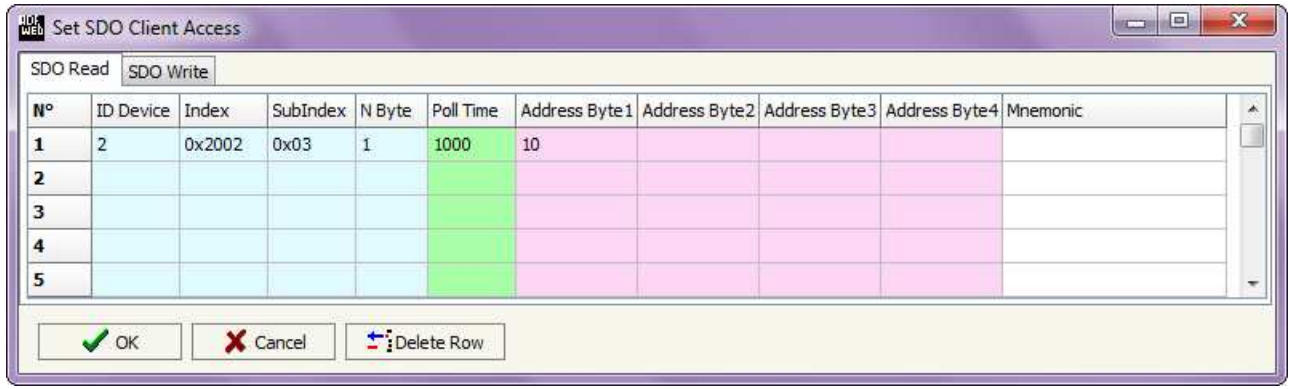


Figure 5a: "Set SDO Client Access – SDO Read" window

- In the field "**Device ID**" insert the ID of the device used to read the data;
- In the field "**Index**" the address for the SDO is defined;
- In the field "**SubIndex**" the second address for the SDO is defined;
- In the field "**N Byte**" the dimension of the SDO is defined (it can be 1, 2, or 4);
- In the field "**Poll Time**" insert the time to make this request;
- In the field "**Address Byte1**" the address of the PROFINET array where to copy the first byte of the SDO read is defined;
- In the field "**Address Byte2**" the address of the PROFINET array where to copy the second byte of the SDO read is defined (only if N Byte is 2 or 4);
- In the field "**Address Byte3**" the address of the PROFINET array where to copy the third byte of the SDO read is defined (only if N Byte is 4);
- In the field "**Address Byte4**" the address of the PROFINET array where to copy the fourth byte of the SDO read is defined (only if N Byte is 4);
- In the field "**Mnemonic**" the description for the SDO is defined.

It is possible to configure a maximum of 256 read SDOs in the "Set SDO Client Access – SDO Read" section.

The data of the columns in the "SDO Write" have the following meanings:

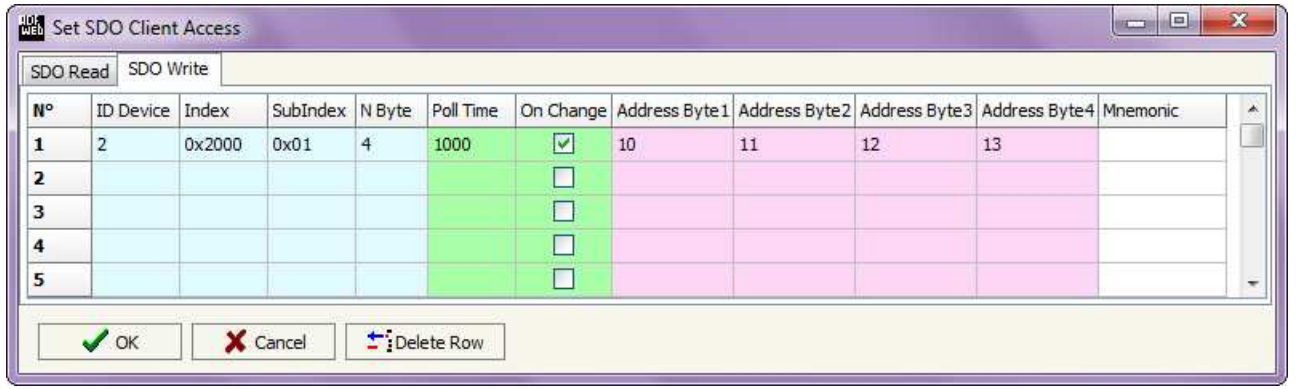


Figure 5b: "Set SDO Client Access – SDO Write" window

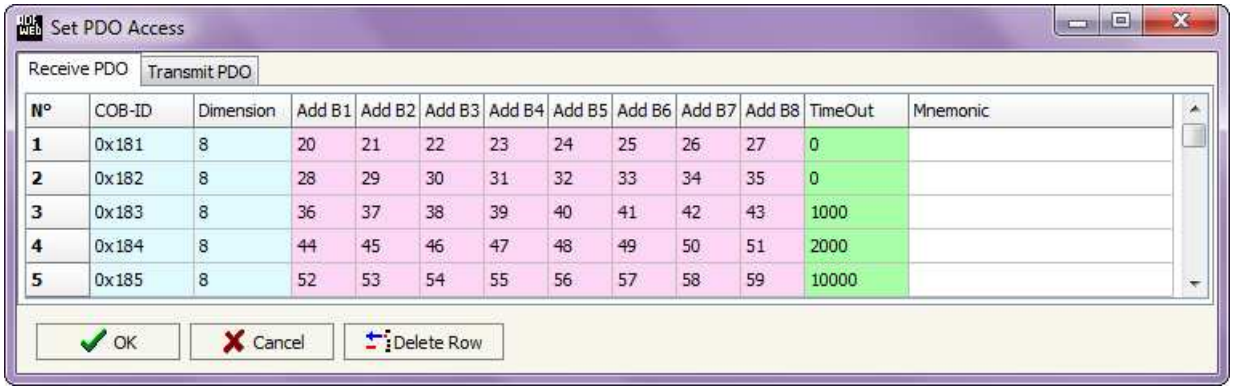
- In the field "**Device ID**" insert the ID of the device used to write the data;
- In the field "**Index**" the address for the SDO is defined;
- In the field "**SubIndex**" the second address for the SDO is defined;
- In the field "**N Byte**" the dimension of the SDO is defined (it can be 1, 2, or 4);
- In the field "**Poll Time**" insert the time to make this request;
- If the field "**On Change**" is checked, the gateway send the Write SDO request when the data change the value
- In the field "**Address Byte1**" the address of the PROFINET array where to read the first byte of the SDO write is defined;
- In the field "**Address Byte2**" the address of the PROFINET array where to read the second byte of the SDO write is defined (only if N Byte is 2 or 4);
- In the field "**Address Byte3**" the address of the PROFINET array where to read the third byte of the SDO write is defined (only if N Byte is 4);
- In the field "**Address Byte4**" the address of the PROFINET array where to read the fourth byte of the SDO write is defined (only if N Byte is 4);
- In the field "**Mnemonic**" the description for the SDO is defined.

It is possible to configure a maximum of 256 write SDOs in the "Set SDO Client Access – SDO Write" section.

SET PDO ACCESS:

By pressing the "**Set PDO Access**" button from the main window for SW67607 (Fig. 2) the window "Set PDO Access" appears (Fig. 6a and 6b).

This window is made to create the Receive and the Transmit PDO in the CANopen side, and to indicate which bytes are associated to these PDO.
It is divided in two parts, the " Receive PDO" and the " Transmit PDO ". The first part is used to receive PDO in the CANopen network and copy the data in the PROFINET array. The second part is used to transmit PDO in the CANopen network with the data of PROFINET array.



N°	COB-ID	Dimension	Add B1	Add B2	Add B3	Add B4	Add B5	Add B6	Add B7	Add B8	TimeOut	Mnemonic
1	0x181	8	20	21	22	23	24	25	26	27	0	
2	0x182	8	28	29	30	31	32	33	34	35	0	
3	0x183	8	36	37	38	39	40	41	42	43	1000	
4	0x184	8	44	45	46	47	48	49	50	51	2000	
5	0x185	8	52	53	54	55	56	57	58	59	10000	

Figure 6a: "Set PDO Access – Receive PDO" window

The data of the columns in the "Receive PDO" have the following meanings:

- In the Field "**Cob-ID**" the address for the PDO is defined;
- In the Field "**Dimension**" the dimension of the PDO is defined (it can be between 1 and 8);
- In the Field "**Add B1**" the first byte where the data will be saved in the PROFINET array is defined;
- In the Field "**Add B2**" the second byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 1);
- In the Field "**Add B3**" the third byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 2);
- In the Field "**Add B4**" the fourth byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 3);
- In the Field "**Add B5**" the fifth byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 4);
- In the Field "**Add B6**" the sixth byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 5);
- In the Field "**Add B7**" the seventh byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 6);
- In the Field "**Add B8**" the eighth byte where the data will be saved in the PROFINET array is defined (only if **Dimension** > 7);
- The field "**TimeOut**" is used for put at zero the data into PROFINET if the PDO doesn't arrive with a frequency less than the time expressed in the field. If the value in the field is 0, means that you don't want to use this feature, and so the value is never deleted;
- In the field "**Mnemonic**" the description for the PDO is defined.

It is possible to configure a maximum of 30 Receive PDO in the "Set PDO Access – Receive PDO"

The data of the columns in the "Transmit PDO" have the following meanings:

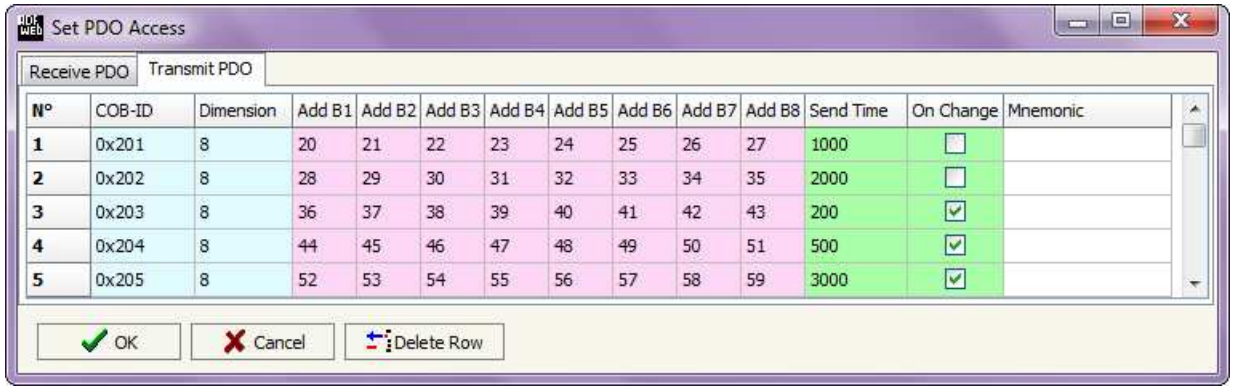


Figure 6b: "Set PDO Access – Transmit PDO" window

- In the Field "**Cob-ID**" the address for the PDO is defined;
- In the Field "**Dimension**" the dimension of the PDO is defined (it can be between 1 and 8);
- In the Field "**Add B1**" the first byte where the data will be loaded in the PROFINET array is defined;
- In the Field "**Add B2**" the second byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 1);
- In the Field "**Add B3**" the third byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 2);
- In the Field "**Add B4**" the fourth byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 3);
- In the Field "**Add B5**" the fifth byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 4);
- In the Field "**Add B6**" the sixth byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 5);
- In the Field "**Add B7**" the seventh byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 6);
- In the Field "**Add B8**" the eighth byte where the data will be loaded in the PROFINET array is defined (only if **Dimension** > 7);
- In the Field "**Send Time** " insert the interval used to send the PDO. The time is in milliseconds;
- If the field "**On Change**" is checked, the gateway send the Transmit PDO when the data change the value;
- In the field "**Mnemonic**" the description for the PDO is defined.

It is possible to configure a maximum of 30 Transmit PDO in the "Set PDO Access – Transmit PDO"

UPDATE DEVICE:

By pressing the "**Update Device**" button it is possible to load the created Configuration into the device; and also the Firmware, if is necessary.

If you don't know the actual IP address of the device you have to use this procedure:

- Turn off the Device;
- Put Dip2 of 'Dip-Switch A' at ON position;
- Turn on the device
- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- Press the "**Ping**" button, must appear "Device Found!";
- 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;
- Put Dip2 of 'Dip-Switch A' at OFF position;
- Turn on the device.

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

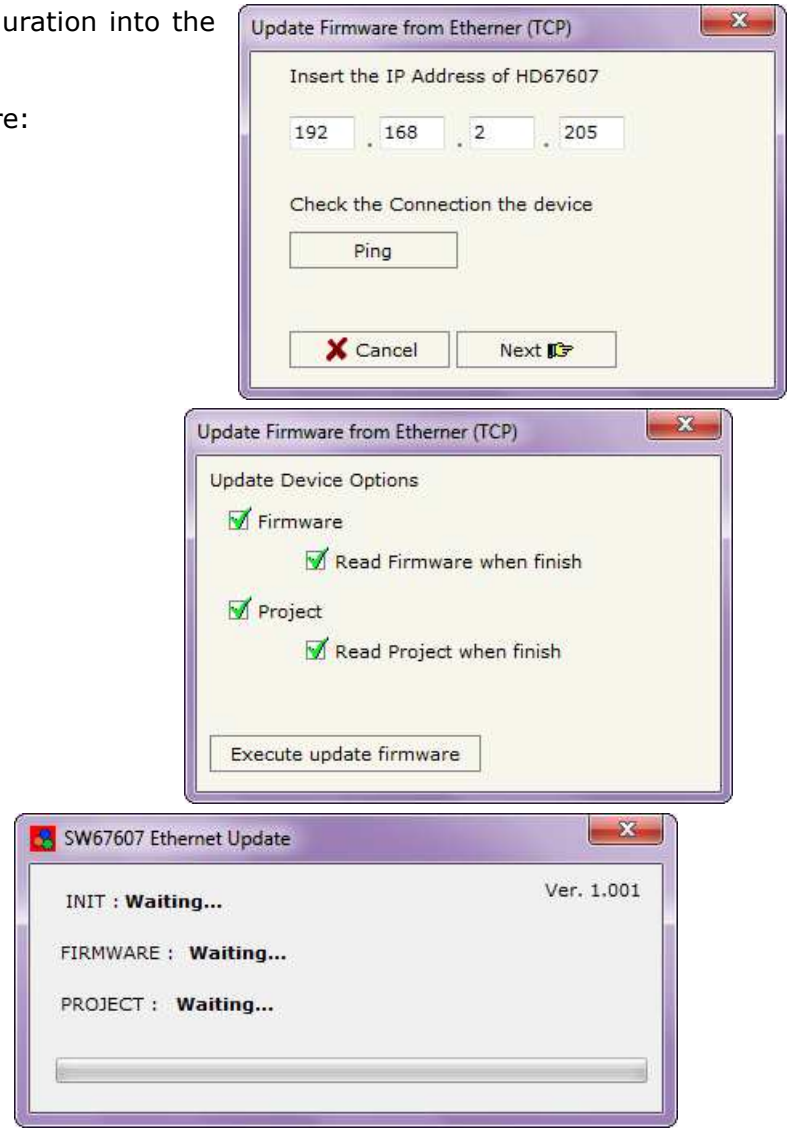


Figure 7: "Update device" windows

If you know the actual IP address of the device you have to use this procedure:

- Turn on the Device with the Ethernet cable inserted;
- Insert the actual IP of the Converter;
- Press the "**Ping**" button, must appear "Device Found!";
- 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" the device automatically goes at Normal Mode.

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 HD67607-A1 device.

Note:
When you receive the device, for the first time, you have to update also the Firmware in the HD67607-A1 device.

Warning:
If the Fig. 8 appears when you try to do the Update before require assistance try these points:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven or Vista or 8, make sure that you have the administrator privileges;
- Take attention at Firewall lock;
- Check the LAN settings.

Figure 8: "Protection" window

In the case of HD67607-A1 you have to use the software "SW67607": www.adfweb.com\download\filefold\SW67607.zip.

MECHANICAL DIMENSIONS:

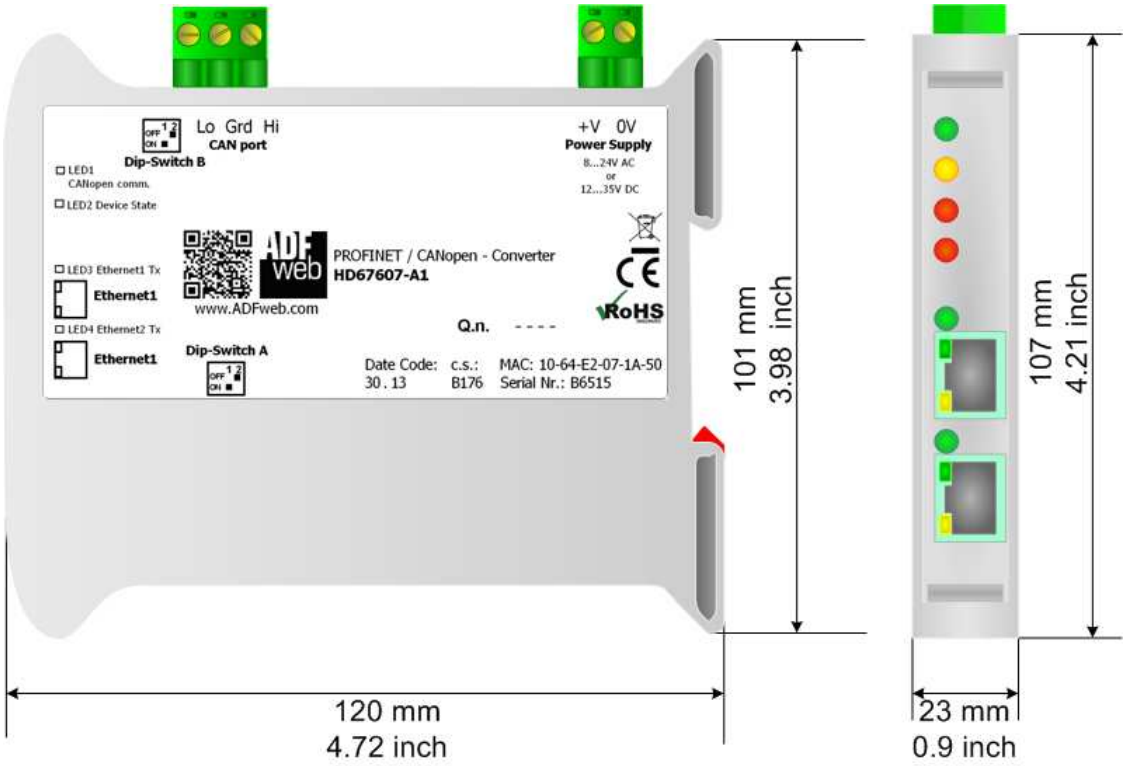


Figure 9: Mechanical dimensions scheme for HD67607-A1

ORDERING INFORMATIONS:

The ordering part number is formed by a valid combination of the following:

HD67607 – A 1

Connectors Type
1: Removable 5mm Screw Terminal

Enclosure Type
A: 1M, 35mm DIN Rail mounting

Device Family
HD67607: PROFINET / CANopen - Converter

Order Code: **HD67607-A1** **-** PROFINET / CANopen - Converter

ACCESSORIES:

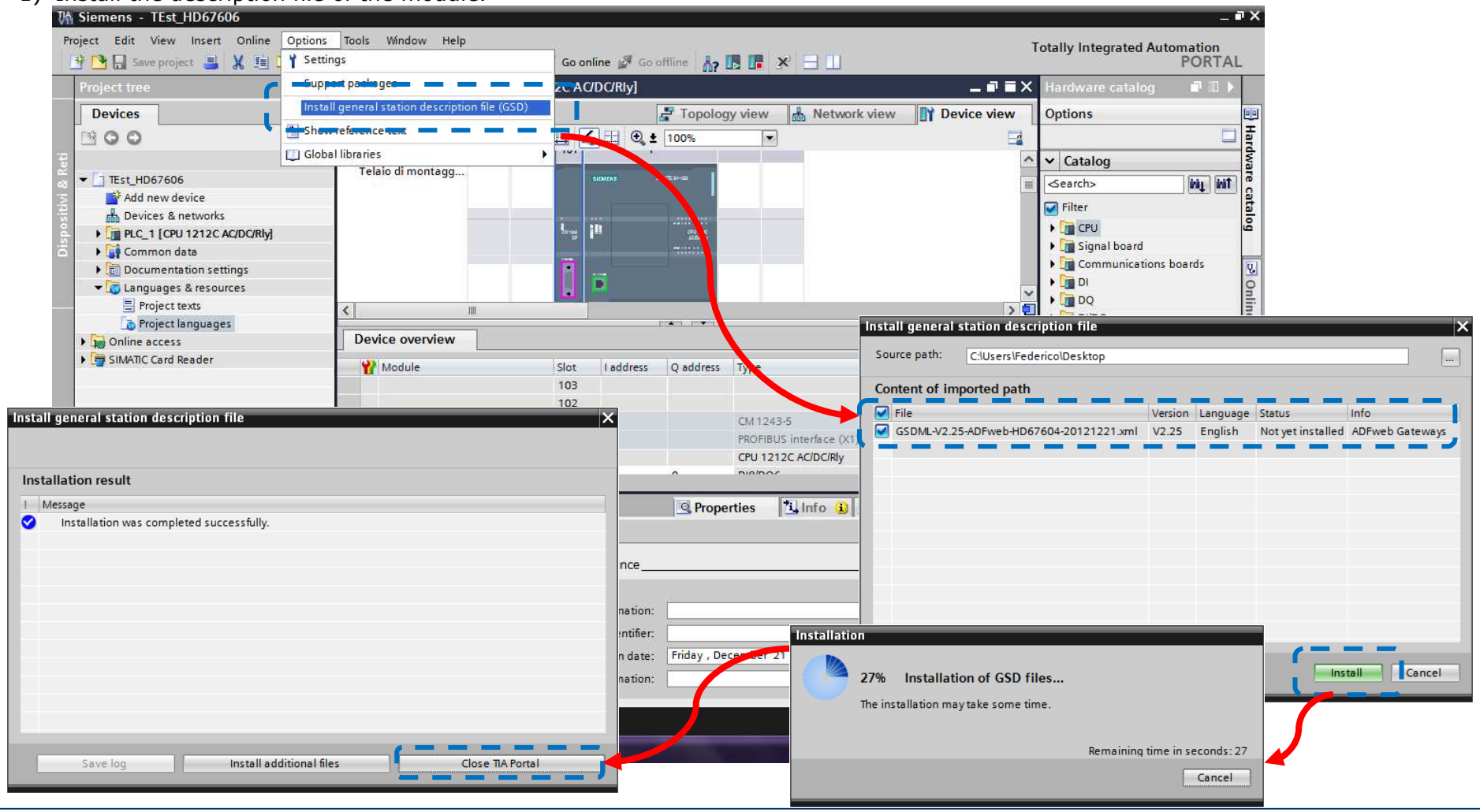
Order Code: **AC34001** **-** 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V AC

Order Code: **AC34002** **-** 35mm Rail DIN - Power Supply 110V AC 50/60Hz – 12 V AC

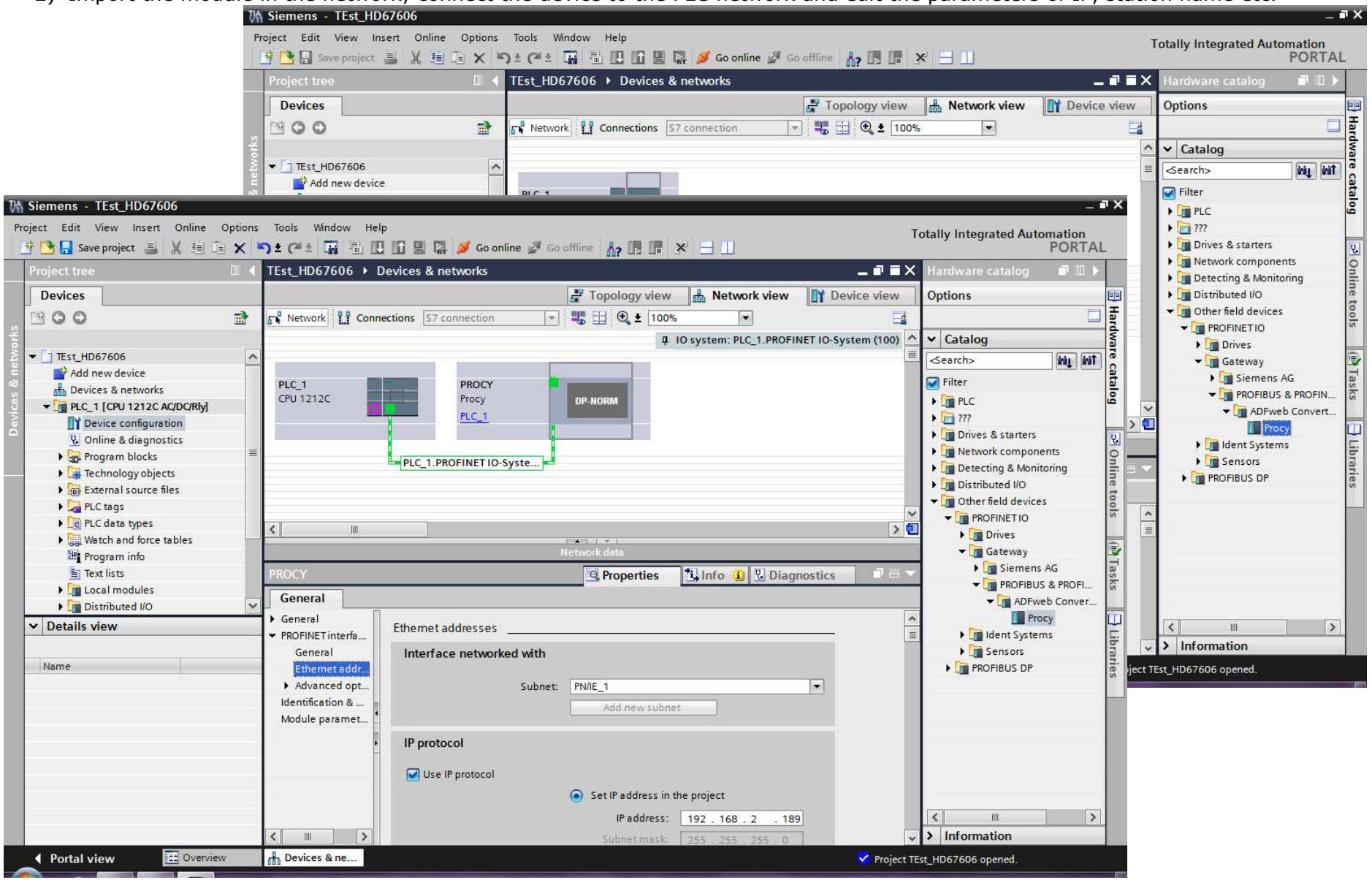
PLC CONFIGURATION:

The configuration and commissioning of the PROFINET Converter as described on the following pages was accomplished with the help of the TIA Portal V11-software of Siemens. In case of using a control system from another supplier please attend to the associated documentation. These are the steps to follow:

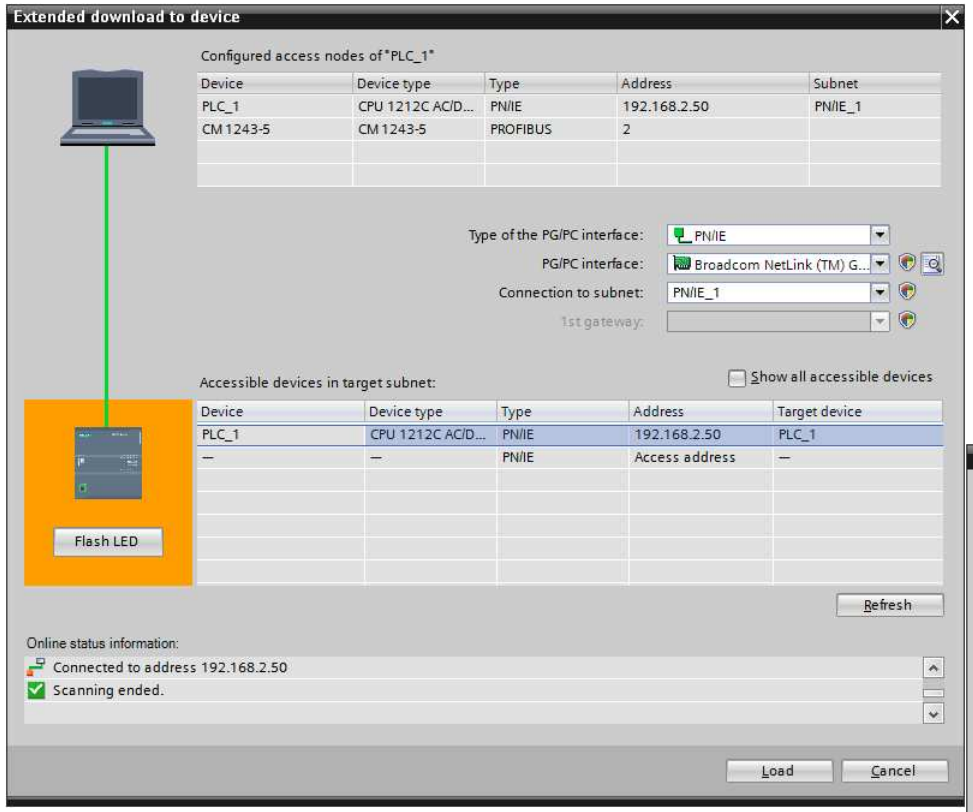
1) Install the description file of the module.

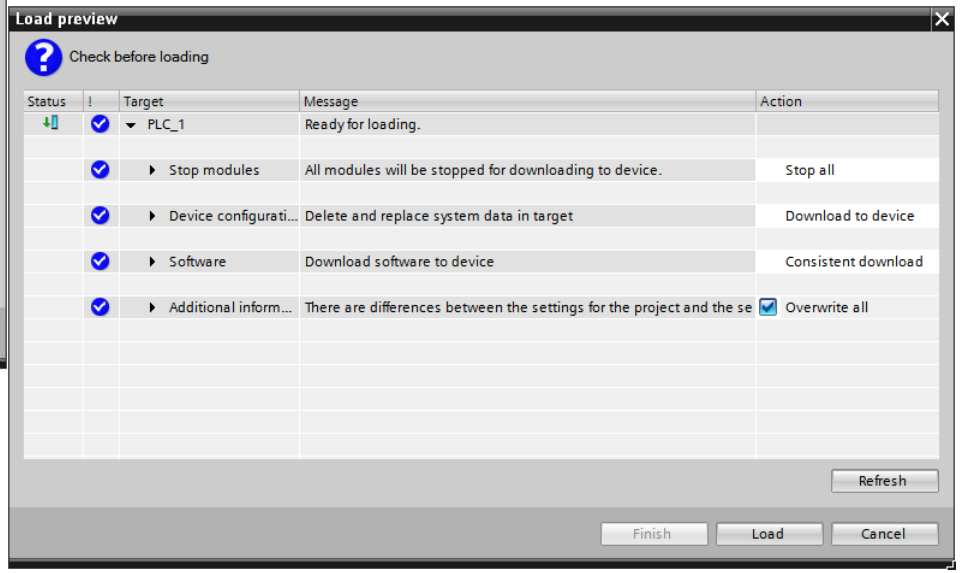


2) Import the module in the network; connect the device to the PLC network and edit the parameters of IP, station name etc.



3) Load the configuration into the PLC.





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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.