User Manual

Revision 1.002
English

PROFINET / Serial - Converter

(Order Code: HD67601-232-A1, HD67601-485-A1)

for Website information:
www.adfweb.com?Product=HD67601

for Price information:
www.adfweb.com?Price=HD67601-232-A1
www.adfweb.com?Price=HD67601-485-A1

Benefits and Main Features:

- Very easy to configure
- Triple 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=HD67608	**(DeviceNet Master)**
www.adfweb.com?Product=HD67609	**(DeviceNet Slave)**
www.adfweb.com?Product=HD67610	**(J1939)**
www.adfweb.com?Product=HD67600	**(NMEA2000)**
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=HD67631	**(Modbus Slave RS485)**
www.adfweb.com?Product=HD67604	**(PROFIBUS Master)**
www.adfweb.com?Product=HD67605	**(PROFIBUS Slave)**
www.adfweb.com?Product=HD67606	**(CAN)**

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

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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	03/09/2012	Dp	All	First Release
1.001	15/05/2013	Fl	All	Revision
1.002	08/10/2013	Fl	All	Revision

WARNING:

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

TRADEMARKS:

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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

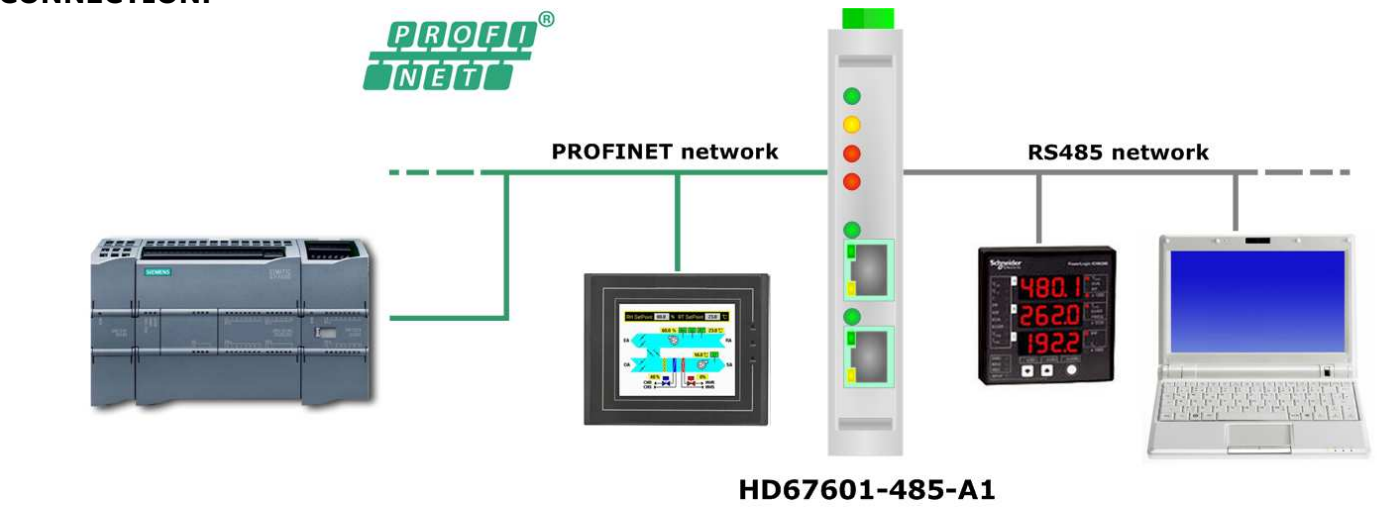
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

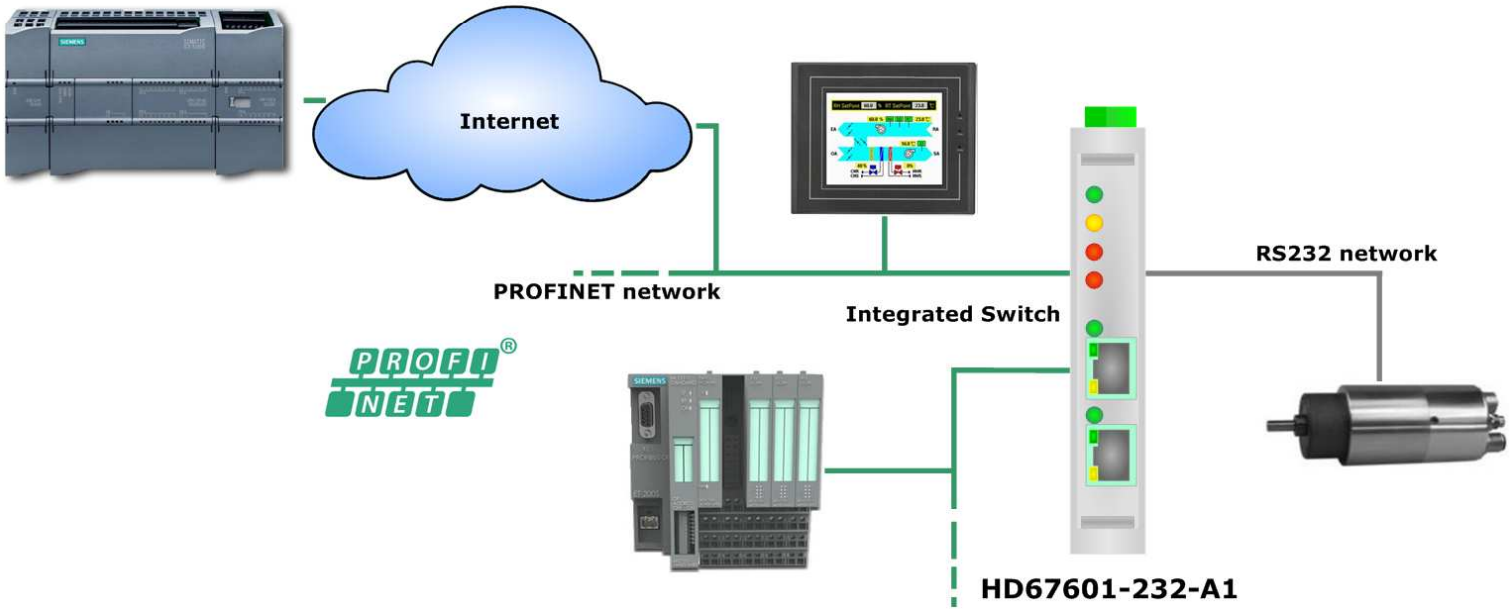
This symbol indicates that non-observance of the safety instructions is danger for people to serious injury or death and / or the possibility of damage.

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:

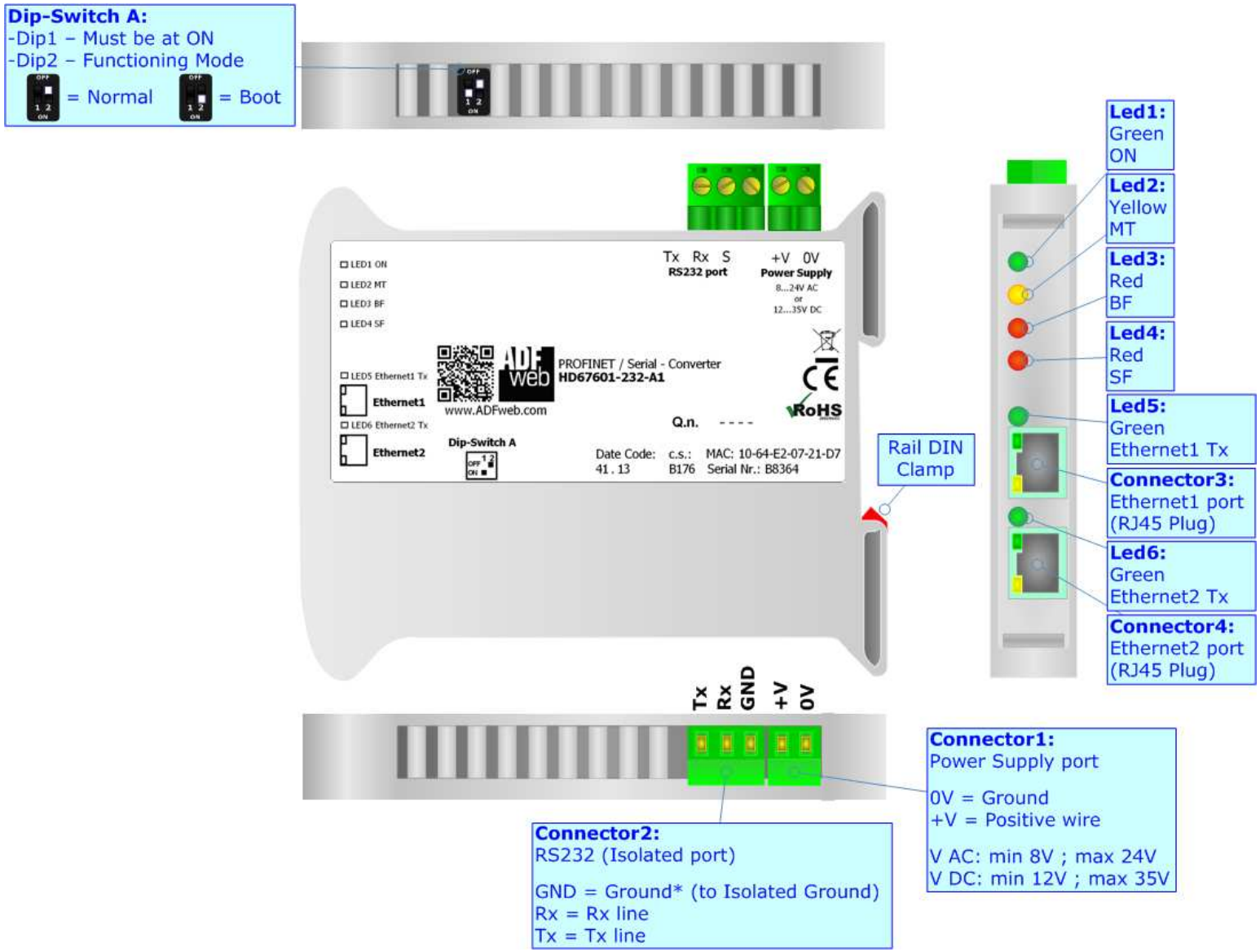


Figure 1a: Connection scheme for HD67601-232-A1

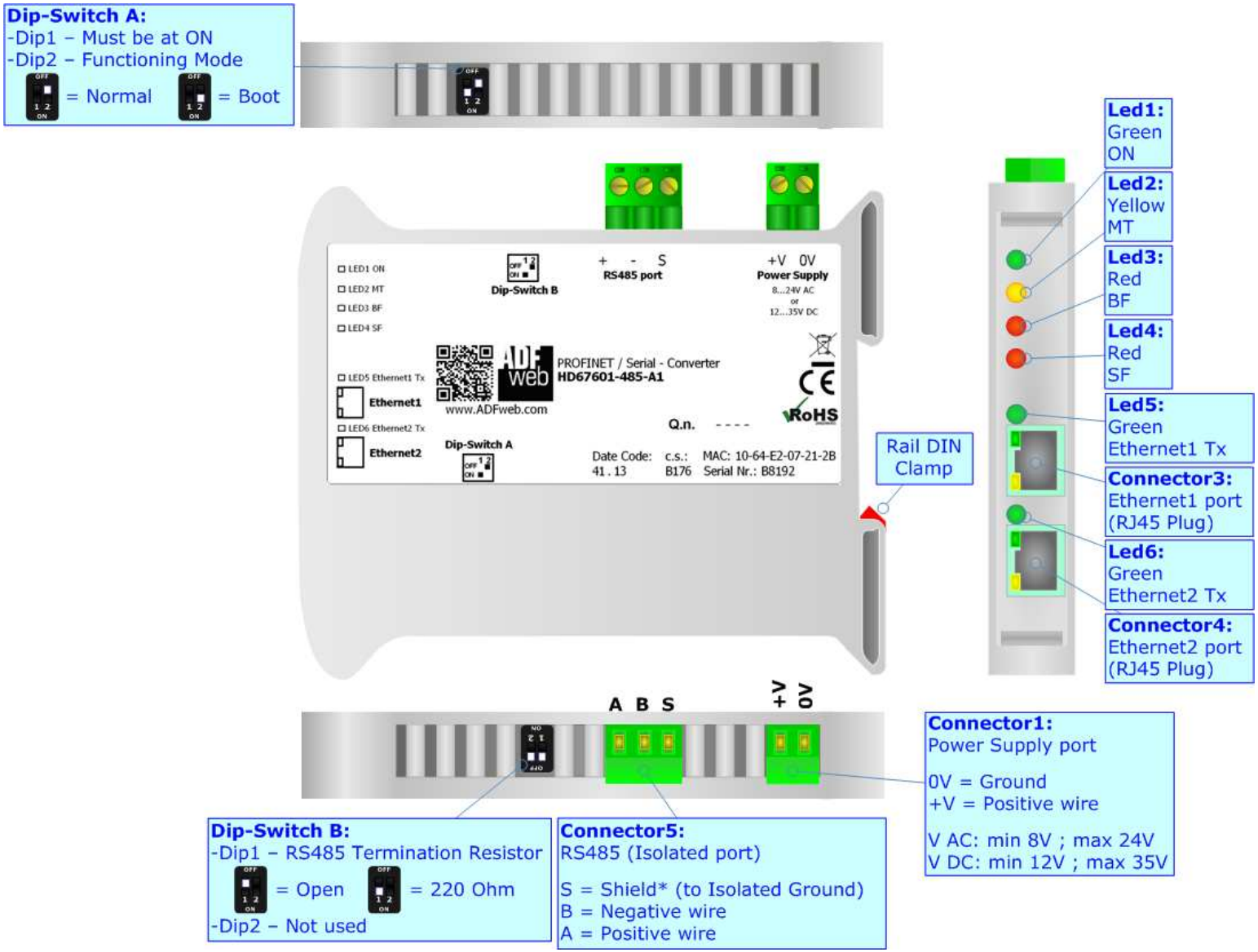


Figure 1b: Connection scheme for HD67601-485-A1

CHARACTERISTICS:

The HD67601-232-A1 and HD67601-485-A1 are a PROFINET / Serial Converter.

It allows the following characteristics:

- Up to 498 bytes in reading and 498 bytes in writing;
- Triple isolation between Serial - Power Supply, Serial - Ethernet, Power Supply - Ethernet.
- Two-directional information between Serial and PROFINET;
- 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 SW67601 software on your PC in order to perform the following:

- Define the parameters of PROFINET line;
- Define the parameters of Serial line;
- Generate the XML file to be imported on the master PROFINET;
- Update the device.

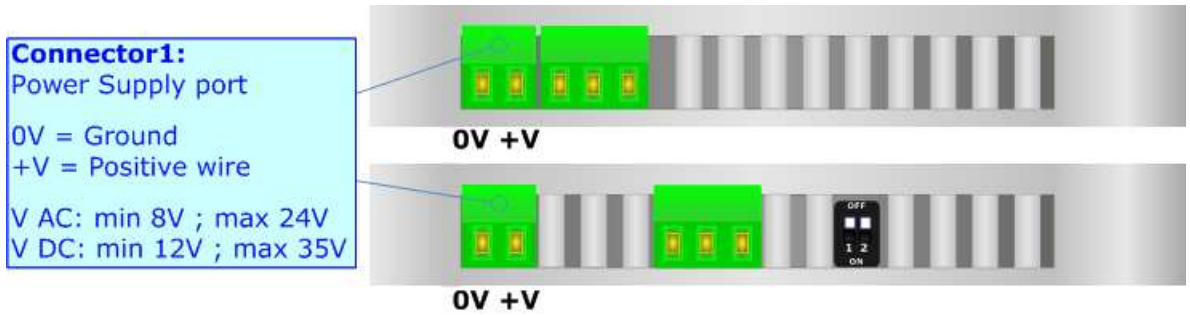
POWER SUPPLY:

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

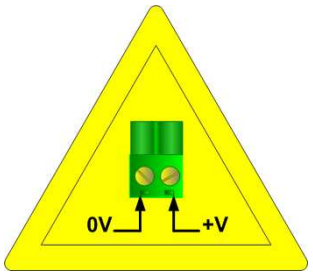
VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
8V	**24V**	**12V**	**35V**

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67601-232-A1	3.5
HD67601-485-A1	3.5



Caution: Not reverse the polarity power



HD67601-xxx-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.

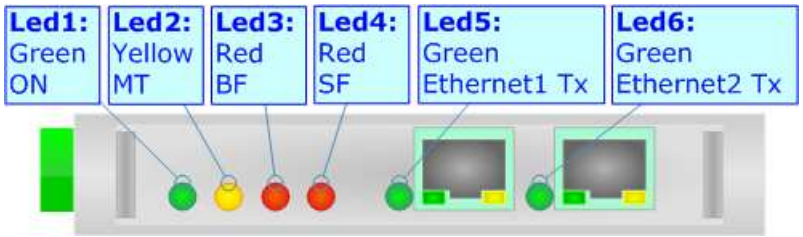
According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.

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

LEDS:

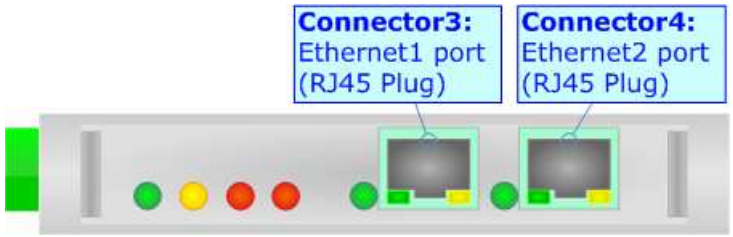
The device has got six LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

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



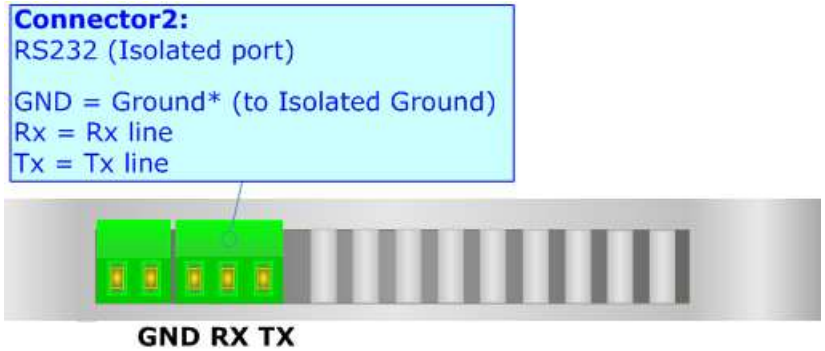
PROFINET:

The PROFINET connection must be made using Connector3 and/or Connector4 of HD67601-xxx-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.



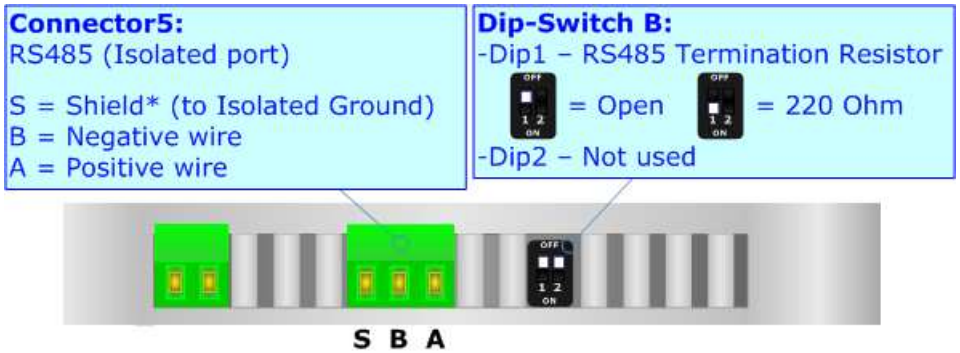
RS232:

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 RS232 cable not exceed 15 meters.



RS485:

For terminate the RS485 line with a 220Ω resistor it is necessary to put ON dip 1, like in figure.



The maximum length of the cable should be 1200m (4000 feet).

Here some codes of cables:

- Belden: p/n 8132 - 2x 28AWG stranded twisted pairs conductor + foil shield + braid shield;
- Belden p/n 82842 - 2x 24AWG stranded twisted pairs conductor + foil shield + braid shield;
- Tasker: p/n C521 - 1x 24AWG twisted pair conductor + foil shield + braid shield;
- Tasker: p/n C522 - 2x 24AWG twisted pairs conductor + foil shield + braid shield.

USE OF COMPOSITOR SW67601:

To configure the Converter, use the available software that runs with Windows, called SW67601. 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 SW67601 the right window appears (Fig. 2).

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

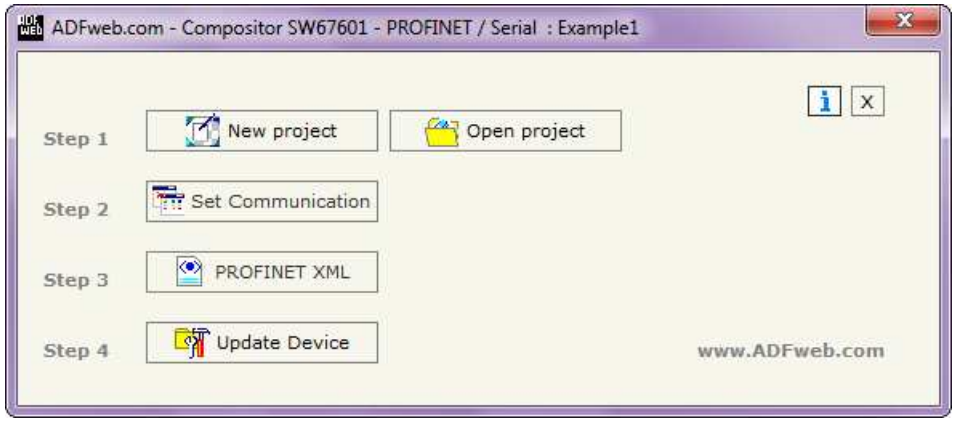
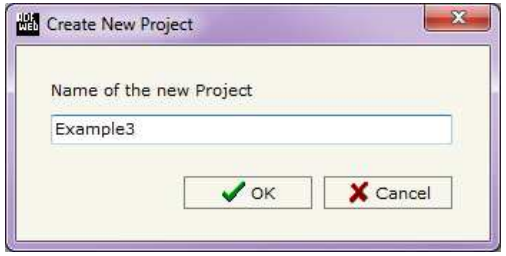
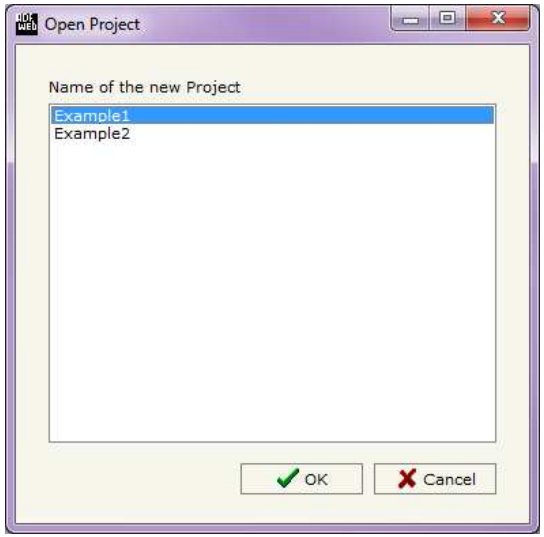


Figure 2: Main window for SW67601

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 / Serial – 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 Serial.

By Pressing the "**Set Communication**" button from the main window for SW67601 (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 Serial.

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 "Serial" section are:

- In the field "**Serial**" the serial to use is defined (RS232 or RS485);
- In the field "**Baudrate**" the baudrate for the serial line is defined;
- In the field "**Parity**" the parity of the serial line is defined.

Note:
In the fields "**Number Byte IN**" and "**Number Byte Out**" insert the number of maximum bytes are sent/received plus 2. The value can be maximum 500 (498 data bytes + 2 fixed).

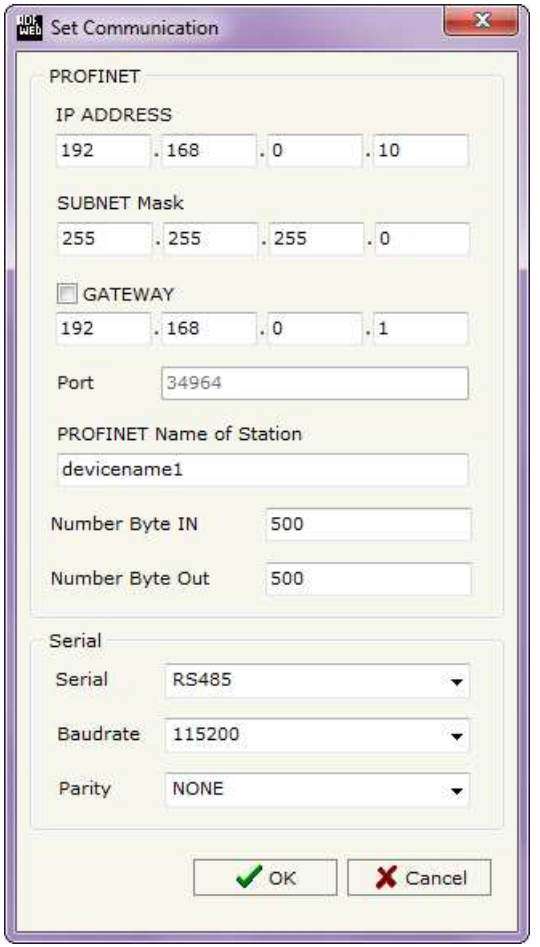


Figure 3: "Set Communication" window

XML FILE:

By Pressing the "**PROFINET XML**" button from the main window for SW67601 (Fig. 2) is possible to generate the xml file to be imported in the master PROFINET.

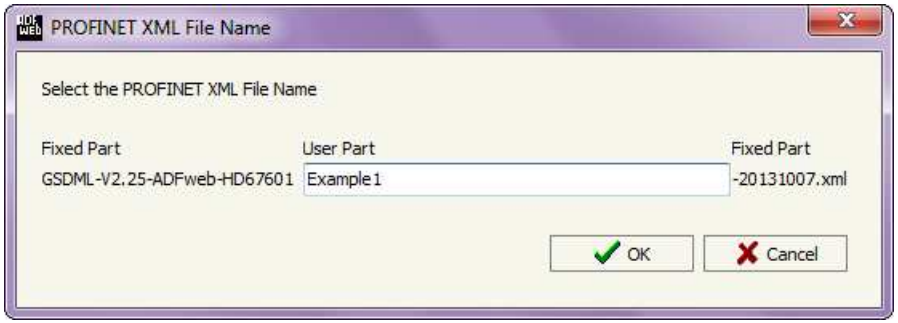


Figure 4: "PROFINET XML File Name" window

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.

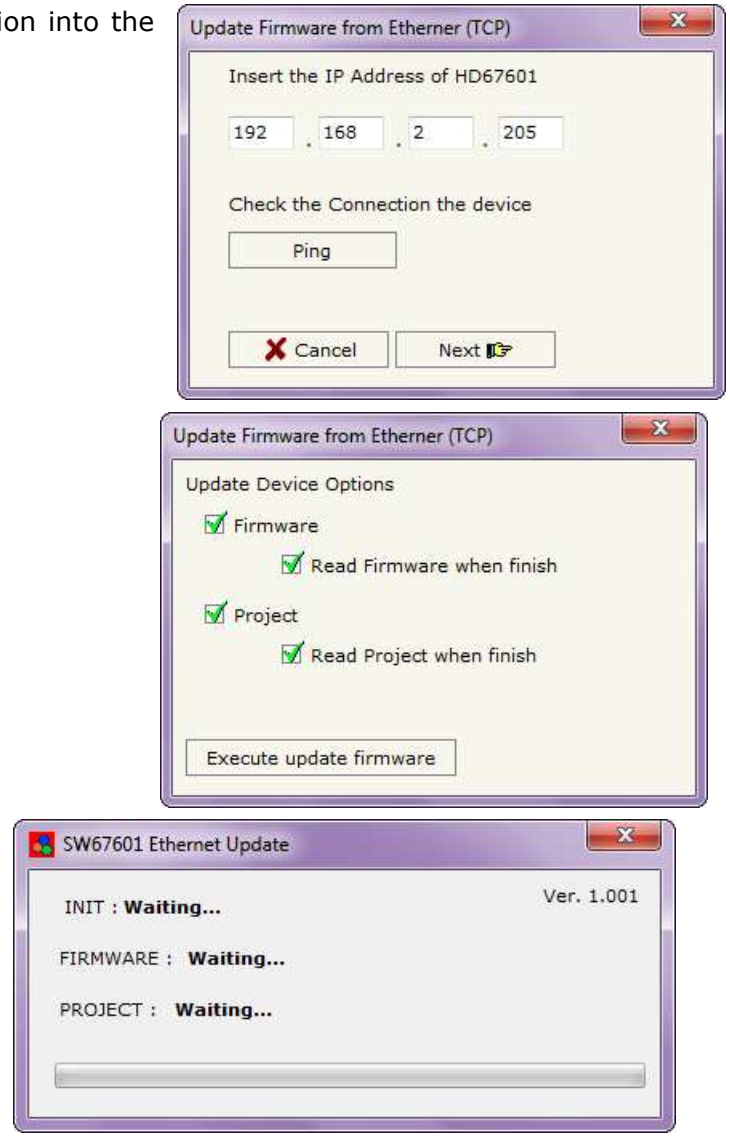


Figure 5: "Update device" windows

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 HD67601-232-A1 or HD67601-485-A1 device.

Note:
When you receive the device, for the first time, you have to update also the Firmware in the HD67601-232-A1 or HD67601-485-A1 device.

Warning:
If the Fig. 6 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 6: "Protection" window

In the case of HD67601-232-A1 or HD67601-485-a1 you have to use the software "SW67601":
www.adfweb.com\download\filefold\SW67601.zip.

SERIAL PROTOCOL:

For send/receive PROFINET data from a master device, is necessary to follow these instructions:

Master PROFINET → HD67601-xxx-A1

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
YY	ZZ	Data…	…	…	…	…data

In the byte ZZ and the less significant bit of YY must be written the length of data that follow; the most significant bit of YY must be toggled every time a new message must be sent on serial.

Byte 0 (YY)								Byte 1 (ZZ)							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	0	0	0	0	0									

	Toggle between 0 and 1
	0…498 (number of bytes to send on serial)
0	Must be written 0

Examples:

- Send on serial 4 bytes: 00 04 01 02 03 04
- Send again the same 4 bytes: 80 04 01 02 03 04
- Send 8 bytes: 00 08 05 06 07 08 09 0A 0B 0C

HD67601-xxx-A1 → master PROFINET

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 7	Byte 6
YY	ZZ	Data…	…	…	…	…data

In the byte ZZ and the less significant bit of YY are written the length of data that follow; the other bits are used for send a progressive number .

Byte 0 (YY)								Byte 1 (ZZ)							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

0…127 (counter incremented after every frame received)
0…498 (number of bytes received from serial)

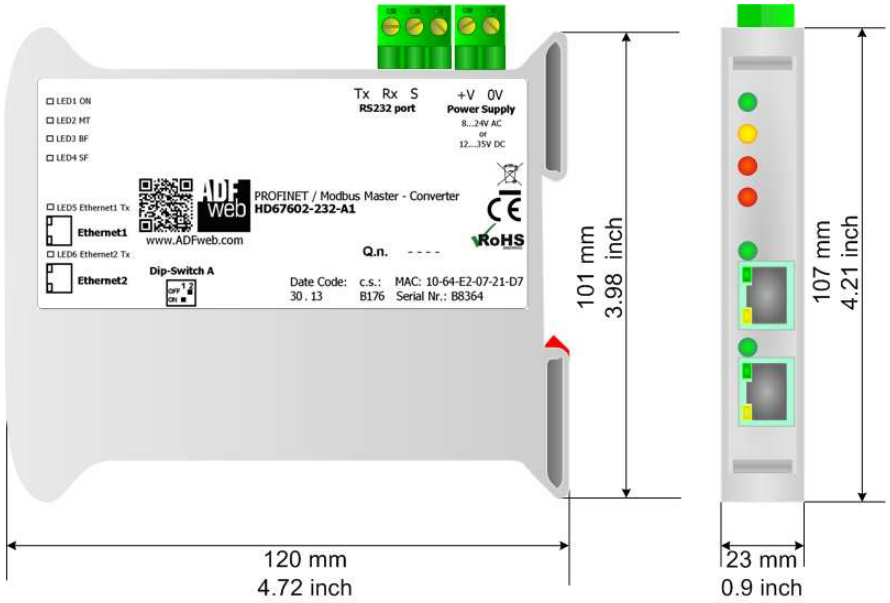
Examples:

- Received on serial 4 bytes: 02 04 01 02 03 04
- Received again the same 4 bytes: 04 04 01 02 03 04
- Received 8 bytes: 06 08 05 06 07 08 09 0A 0B 0C

Note:
The time for considering the receiving frame finished is when there is a idle time between bytes of 2tbit.

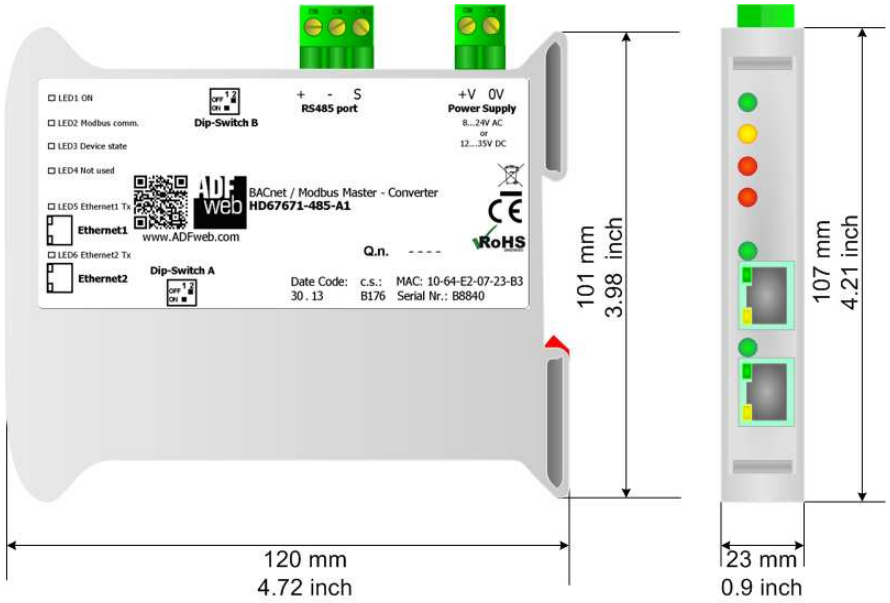
Note:
If the Converter receives in a single frame more than 498 bytes, the remaining are deleted and are sent to the master PROFINET only the firsts 498.

MECHANICAL DIMENSIONS:



Housing: PVC
Weight: 200g (Approx)

Figure 7a: Mechanical dimensions scheme for HD67601-232-A1



Housing: PVC
Weight: 200g (Approx)

Figure 7b: Mechanical dimensions scheme for HD67601-485-A1

ORDERING INFORMATIONS:

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

HD67601 - 232 – A 1

Connectors Type
1: Removable 5mm Screw Terminal

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

Serial Line
232: RS232
485: RS485

Device Family
HD67601: PROFINET / Serial - Converter

Order Code: **HD670601-232-A1-** PROFINET / Serial - Converter (RS232 serial)
Order Code: **HD670601-485-A1-** PROFINET / Serial - Converter (RS485 serial)

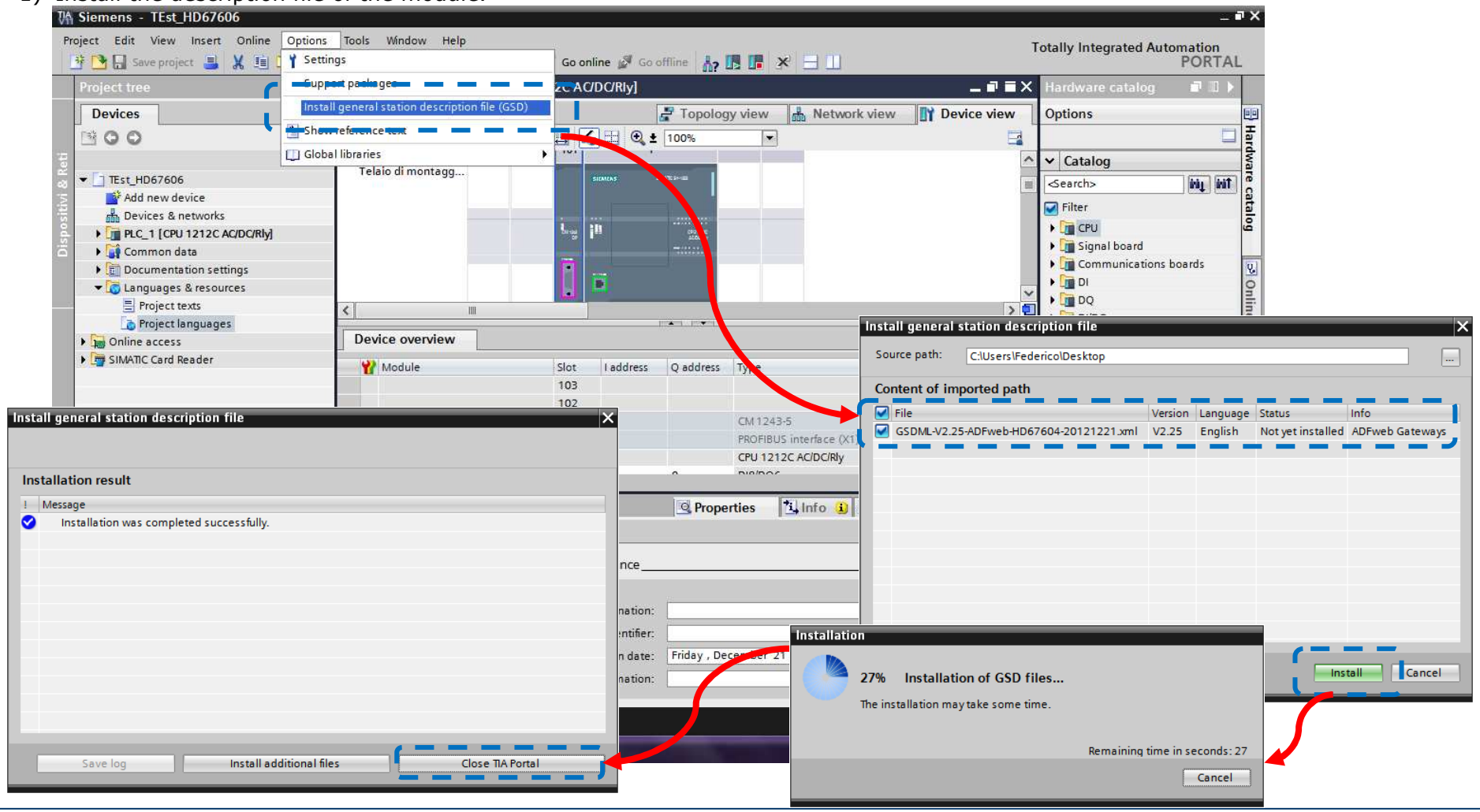
ACCESSORIES:

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:

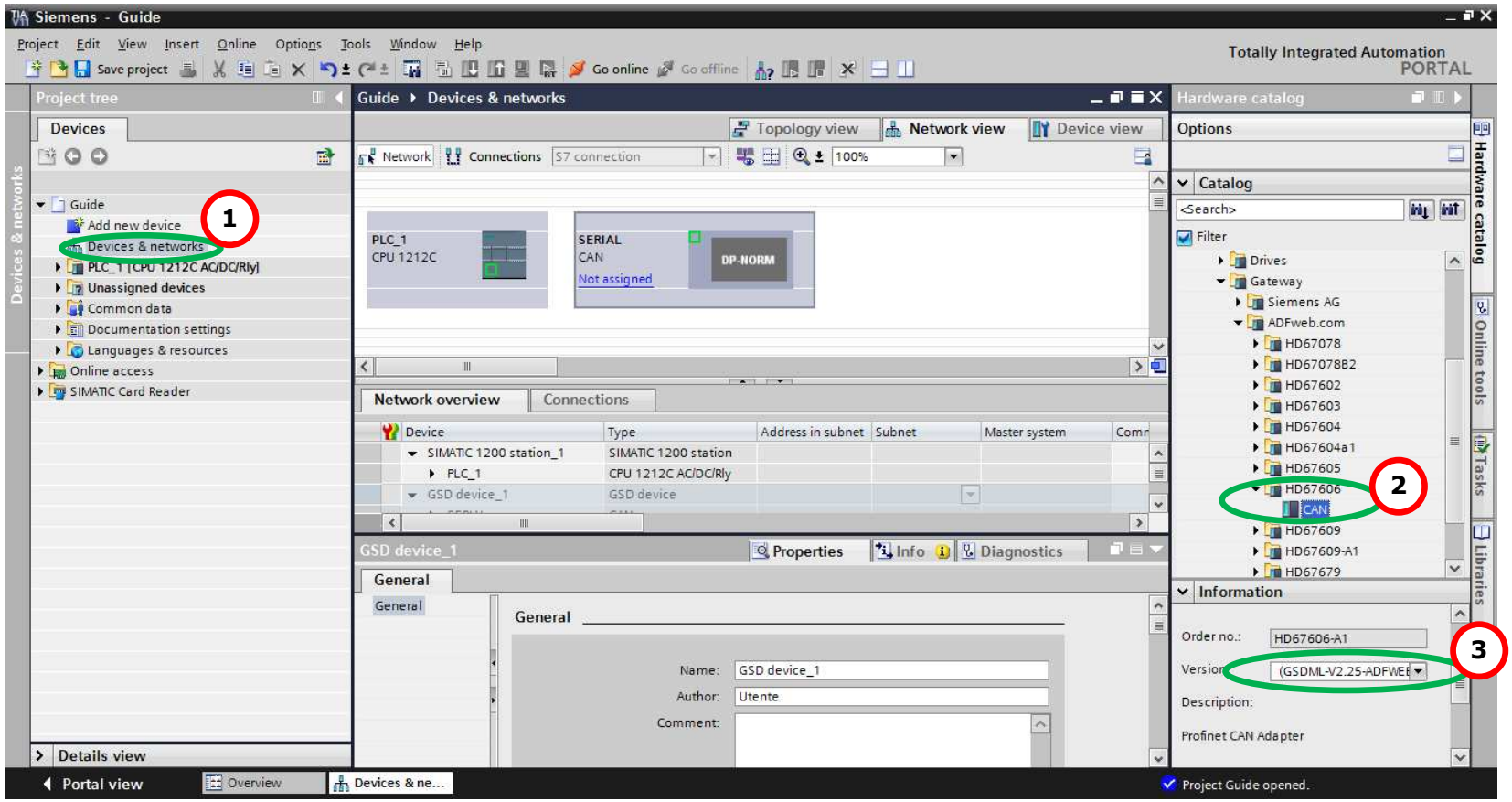
The configuration and commissioning of the PROFINET Converter as described on the following pages was accomplished with the help of the TIA Portal V11-software of Siemens. In case of using a control system from another supplier please attend to the associated documentation. These are the steps to follow:

1) Install the description file of the module.

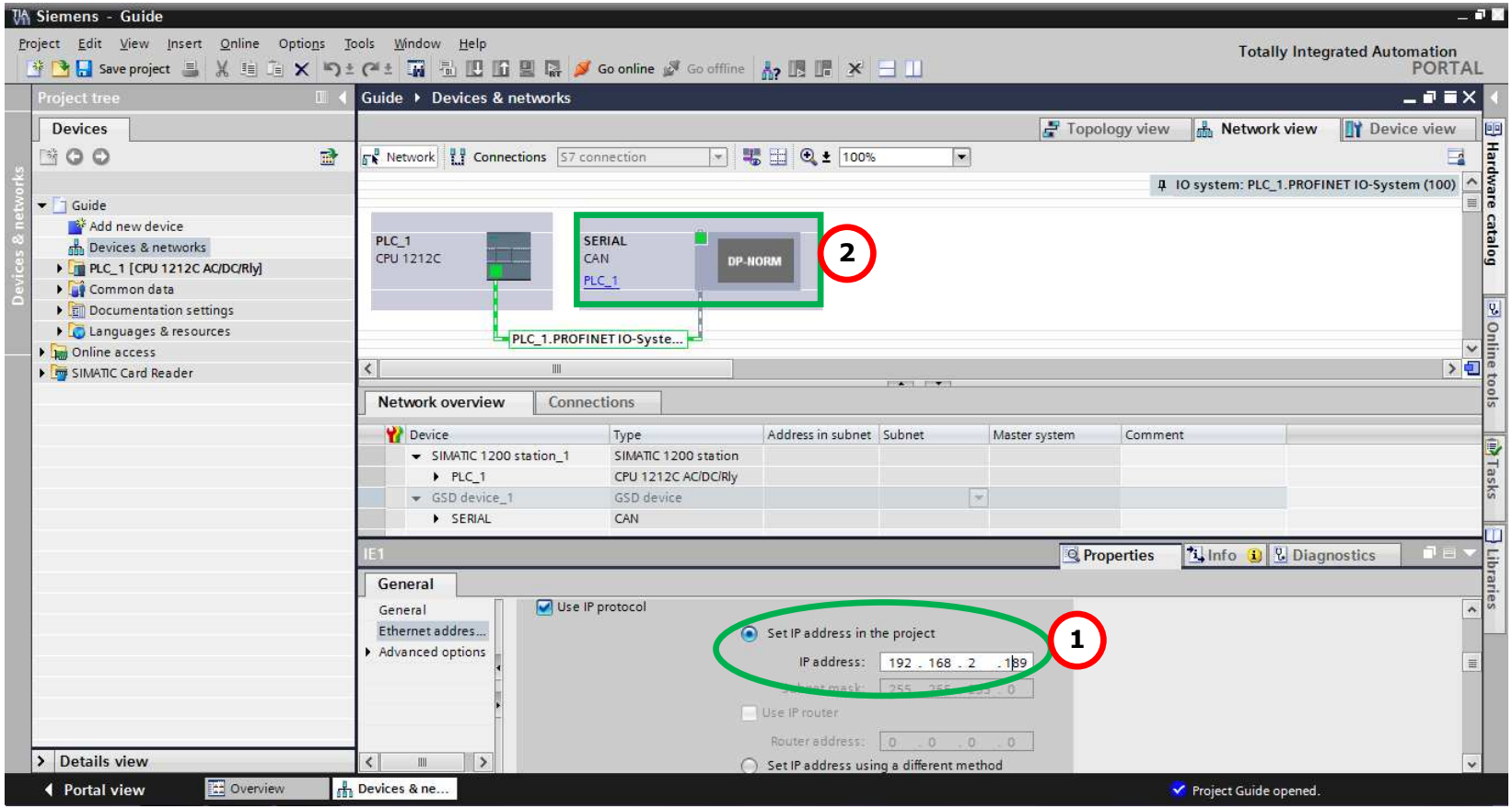


2) Press the "**Devices and networks**" button ***(1)***, from the right drop-down menu, under "Other field devices→PROFINET IO→Gateway→ADFWEB.com→HD67606" press twice on "CAN" module ***(2)***.

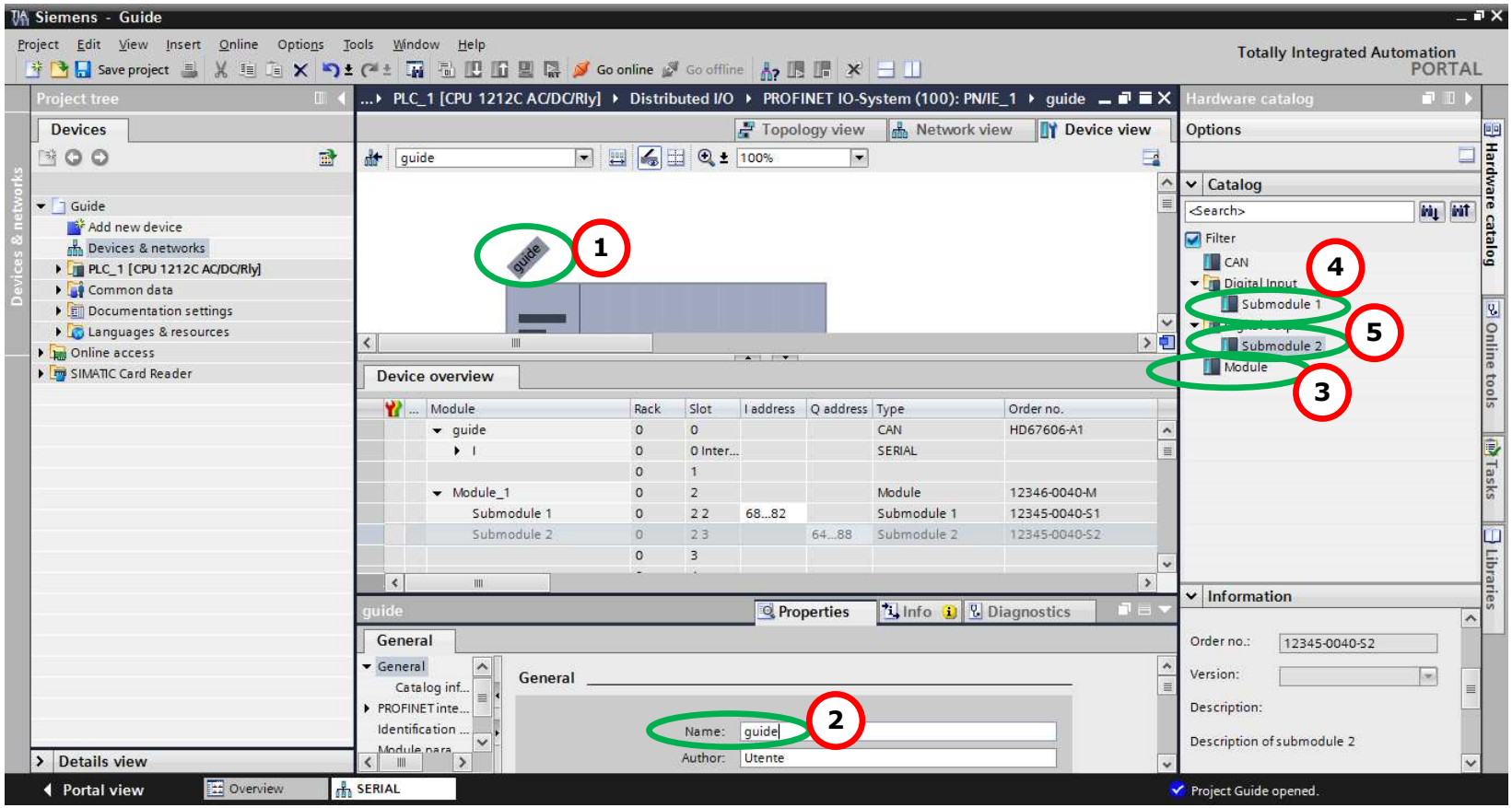
Note:
If you have installed more than one GSD file, go to Information section and in the "Version" field select the correct gsd file ***(3)***, before do the double click on "Serial" module



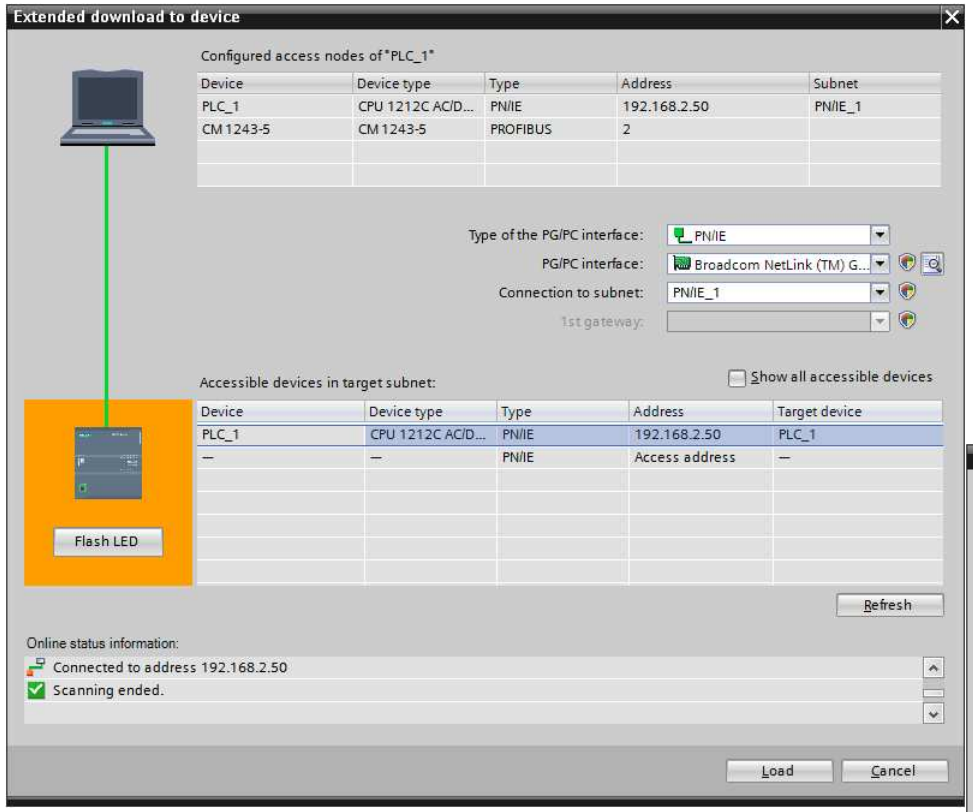
3) Connect the PLC to the HD67606 module by drawing the Ethernet wire between the two Ethernet ports. Then assign to the HD67606 the IP Address ***(1)*** defined in the Compositor_SW67606. And press twice the "Module" ***(2)***.

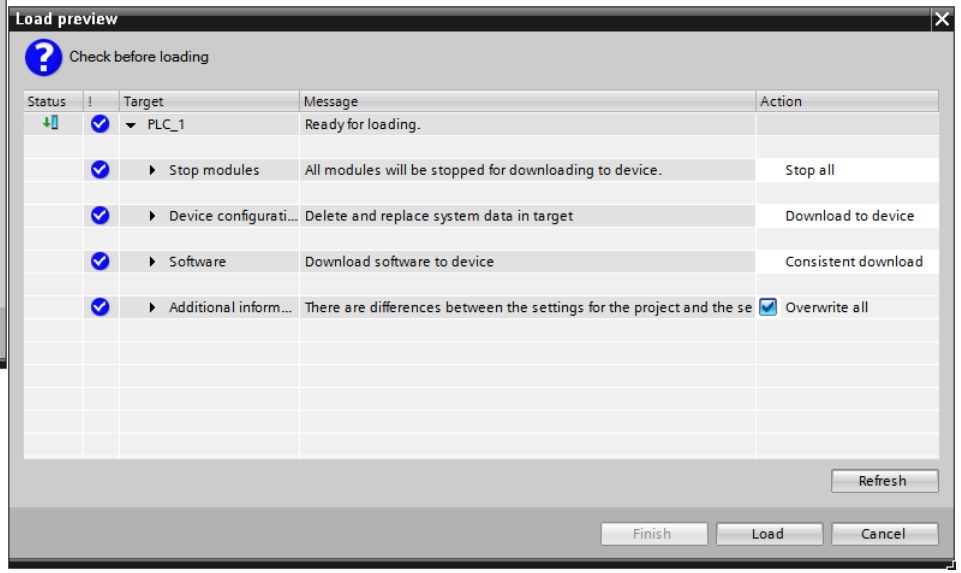


4) Then press twice the "Serial" label ***(1)*** and in the field name change it accordingly the name defined in the Compositor_SW67606 ***(2)***. Then add the main module "Module" and the sub-modules of "Digital Input" and "Digital Output" by pressing twice the three items in this order "Module" ***(3)***, "Submodule 1" ***(4)***, "Submodule 2" ***(5)***.



5) Load the configuration into the PLC.





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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.