ADF web

Industrial Electronic Devices

User Manual

Revision 1.100
English

PROFINET / Modbus TCP Slave - Converter

(Order Code: HD67612-A1)

For Website information:
www.adfweb.com?Product=HD67612

For Price information:
www.adfweb.com?Price=HD67612-A1

Benefits and Main Features:

- ⊕ Electrical isolation
- ⊕ Two Ethernet ports (for Modbus TCP / PROFINET)
- ⊕ Temperature range: -40°C/+85°C (-40°F/+185°F)

User Manual

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For other PROFINET products see also the following link:

Converter PROFINET to
www.adfweb.com?Product=HD67078	**(M-bus)**
www.adfweb.com?Product=HD67090	**(M-bus Wireless)**
www.adfweb.com?Product=HD67178	**(SNMP Manager)**
www.adfweb.com?Product=HD67600	**(NMEA 2000)**
www.adfweb.com?Product=HD67601	**(Serial)**
www.adfweb.com?Product=HD67602	**(Modbus Master)**
www.adfweb.com?Product=HD67603	**(Modbus Slave)**
www.adfweb.com?Product=HD67604	**(PROFIBUS Master)**
www.adfweb.com?Product=HD67605	**(PROFIBUS Slave)**
www.adfweb.com?Product=HD67606	**(CAN)**
www.adfweb.com?Product=HD67607	**(CANopen)**
www.adfweb.com?Product=HD67608	**(DeviceNet Master)**
www.adfweb.com?Product=HD67609	**(DeviceNet Slave)**
www.adfweb.com?Product=HD67610	**(J1939)**
www.adfweb.com?Product=HD67611	**(Modbus TCP Master)**
www.adfweb.com?Product=HD67613	**(SNMP Agent)**
www.adfweb.com?Product=HD67614	**(DMX)**
www.adfweb.com?Product=HD67615	**(NMEA 0183)**
www.adfweb.com?Product=HD67633	**(S7comm)**
www.adfweb.com?Product=HD67659	**(EtherNet)**
www.adfweb.com?Product=HD67660	**(EtherNet/IP Slave)**
www.adfweb.com?Product=HD67661	**(EtherNet/IP Master)**
www.adfweb.com?Product=HD67679	**(BACnet Slave)**
www.adfweb.com?Product=HD67719	**(BACnet Master)**
www.adfweb.com?Product=HD67752	**(IEC 61850 Server)**
www.adfweb.com?Product=HD67778	**(IEC 61850 Client)**
www.adfweb.com?Product=HD67818	**(KNX)**
www.adfweb.com?Product=HD67848	**(DALI)**
www.adfweb.com?Product=HD67876	**(IO-Link Master)**
www.adfweb.com?Product=HD67912	**(HART)**
www.adfweb.com?Product=HD67952	**(MQTT)**
www.adfweb.com?Product=HD67984	**(IO-Link Slave)**
www.adfweb.com?Product=HD67B22	**(OPC UA Client)**
www.adfweb.com?Product=HD67B46	**(OPC UA Server)**
www.adfweb.com?Product=HD67C77	**(EnOcean)**
www.adfweb.com?Product=HD67D33	**(LoRaWAN)**
www.adfweb.com?Product=HD67E23	**(EtherCAT Slave)**
www.adfweb.com?Product=HD67E73	**(EtherCAT Master)**
www.adfweb.com?Product=HD67F33	**(LoRaWAN Gateway)**

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.

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.001	27/01/2015	Ff	All	New Software Interface
1.002	12/04/2017	Ff	All	Revision
1.003	12/04/2024	Ln	All	Revision
1.100	15/11/2024	Ln	All	New design

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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, legal and safety regulation are required for each individual application. 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 instruments can represent a potential hazard if they are inappropriately installed and operated by untrained personnel. These instructions refer to residual risks with the following symbol:

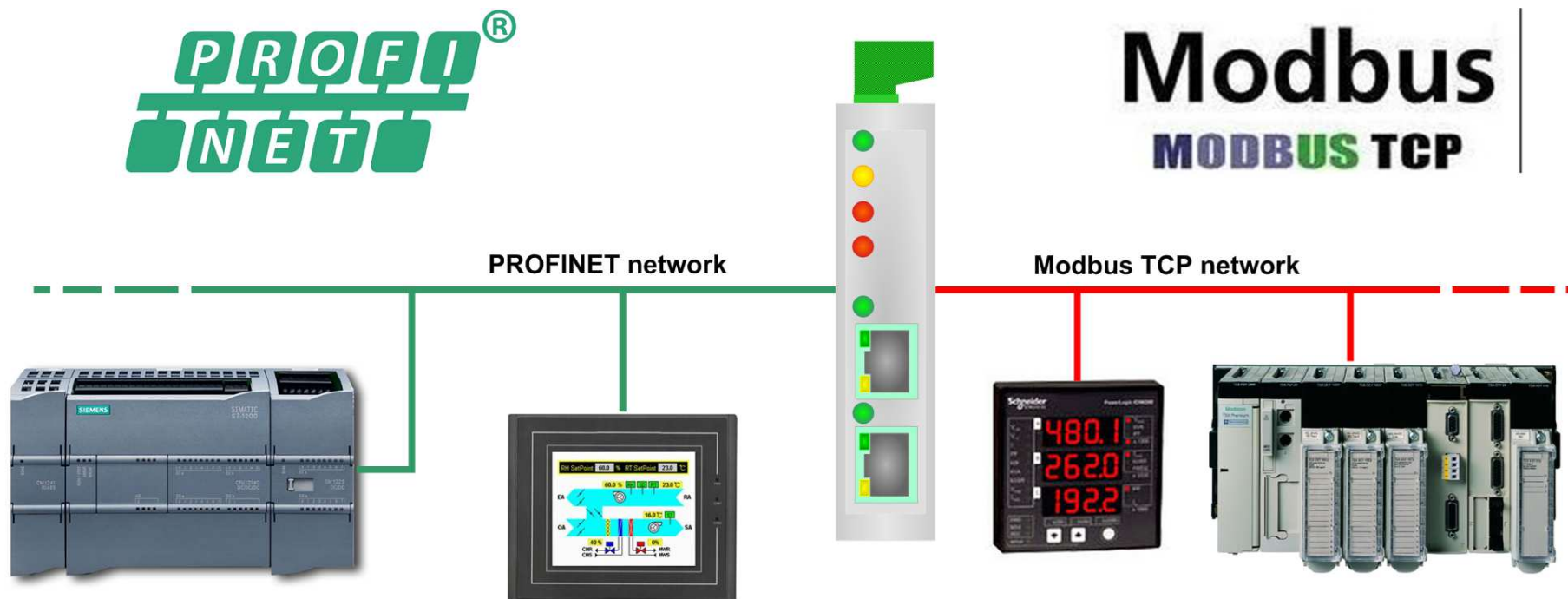⚠ This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY
The declaration is made by our company. You can send an email to support@adfweb.com or give us a call if you need it.

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EXAMPLE OF CONNECTION:

PROFINET network

Modbus TCP network

HD67612-A1

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CONNECTION SCHEME:

Dip-Switch A:
-Dip1 – Functioning Mode

= Normal   = Boot

Led1:
Green
ON

Led2:
Yellow
MT

Led3:
Red BF

Led4:
Red SF

Led5:
Green
Ethernet1 Tx

Connector3:
Ethernet1 Port
(RJ45 Plug)

Led6:
Green
Ethernet2 Tx

Connector4:
Ethernet2 Port
(RJ45 Plug)

□ LED1 ON
□ LED2 MT
□ LED3 BF
□ LED4 SF
□ LED5 Ethernet1 Tx
ETHERNET 1
□ LED6 Ethernet2 Tx
ETHERNET 2

+V 0V
Power Supply
8...24V AC
or
12...35V DC

PROFINET / Modbus TCP Slave - Converter
HD67612-A1
www.ADFweb.com   **Q.n.** _ _ _ _

Dip-Switch A
OFF 1
ON

Date Code: C.S.: MAC: 10-64-E2-08-27-11
14. 20   B278 Serial Nr.: I3207

Rail DIN
Clamp

+V 0V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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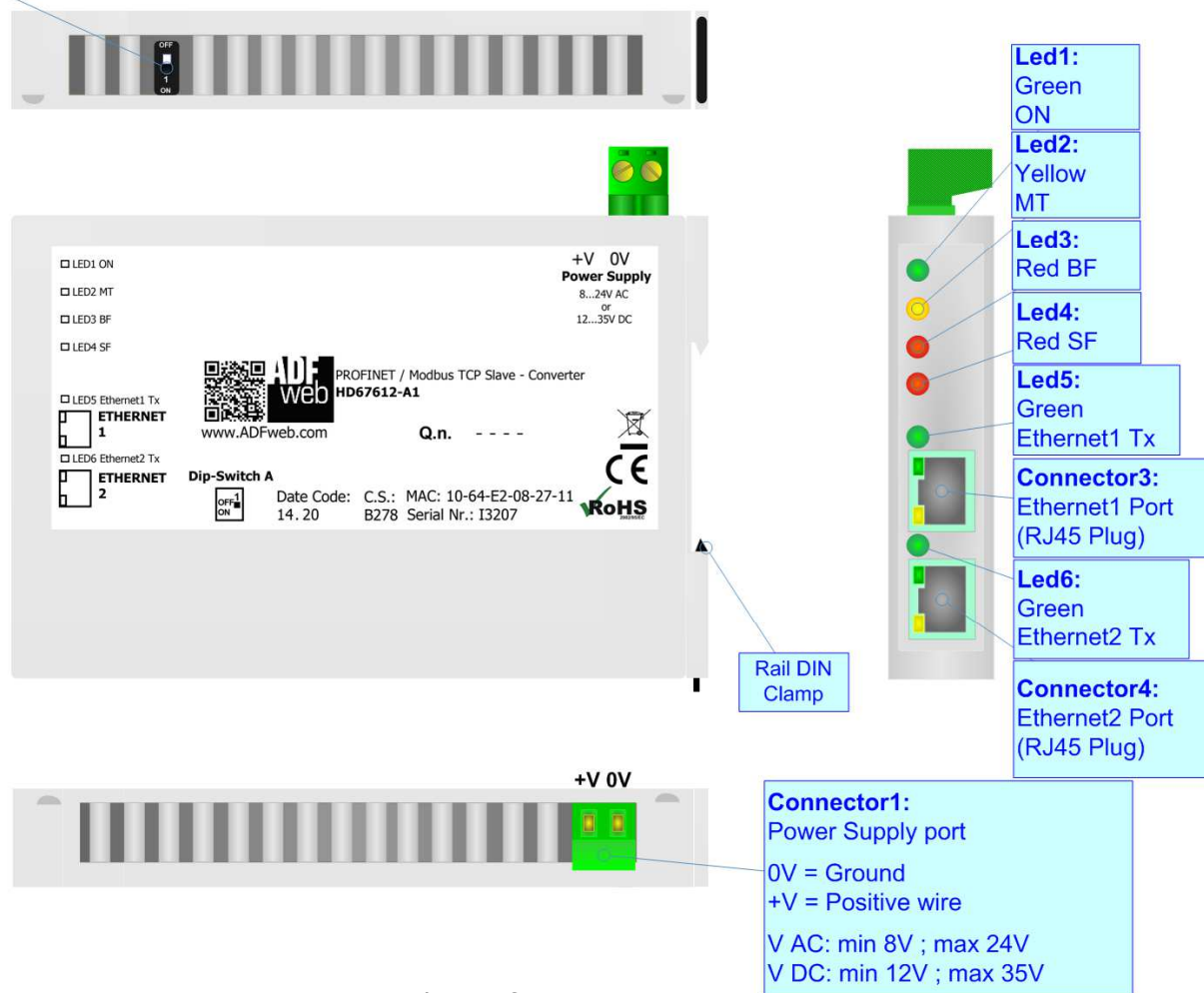V DC: min 12V ; max 35V

Figure 1: Connection scheme for HD67612-A1

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CHARACTERISTICS:

The HD67612-A1 is a PROFINET / Modbus TCP Slave - Converter.

It allows for the following characteristics:

- Up to 1440 bytes in reading and 1440 bytes in writing;
- Isolation between Modbus/PROFINET - Power Supply;
- Two-directional information between Modbus TCP 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 SW67612 software on your PC in order to perform the following:

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

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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]
HD67612-A1	3.5

Caution: Do 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

0V +V

HD67612-A1

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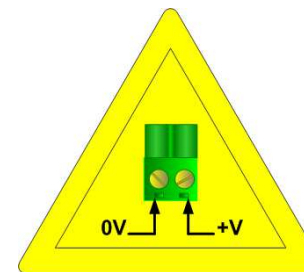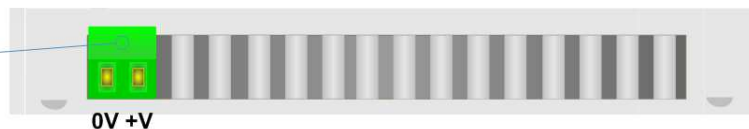
FUNCTION MODES:

The device has got two functions mode depending of the position of the Dip1 of 'Dip-Switch A':

- The first, with Dip1 in Off position (factory setting), is used for the normal working of the device.
- The second, with Dip1 in On position, is used for upload the Project/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).

Dip-Switch A:
-Dip1 – Functioning Mode

= Normal   = Boot
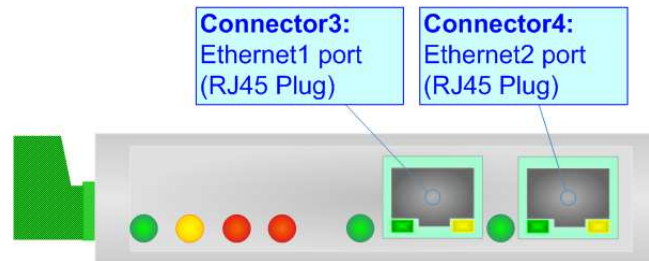
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LEDS:

The device has got six LEDs that are used to give information about 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 problems 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 Ethernet frames are transmitted	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
6: Ethernet2 Tx (green)	Blinks when Ethernet frames are transmitted	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

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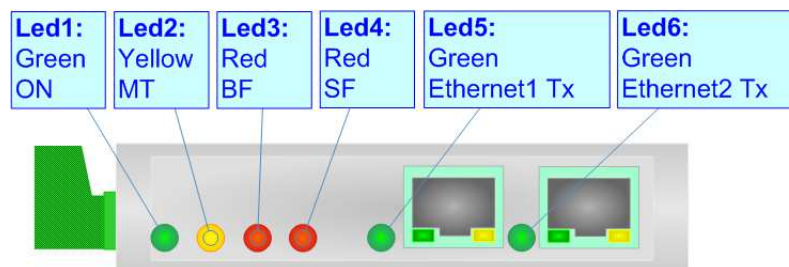
PROFINET / MODBUS TCP:

The PROFINET and Modbus TCP connection must be made using Connector3 and/or Connector4 of HD67612-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 a Hub/Switch the use of a straight cable is recommended. To connect the device to a PC/PLC/other the use of a cross cable is recommended.

Connector3:
Ethernet1 port
(RJ45 Plug)

Connector4:
Ethernet2 port
(RJ45 Plug)

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USE OF COMPOSITOR SW67612:

To configure the Converter, use the available software that runs with Windows called SW67612. 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 (XP, Vista, Seven, 8, 10 or 11; 32/64bit).

When launching the SW67612, the window below appears (Fig. 2).
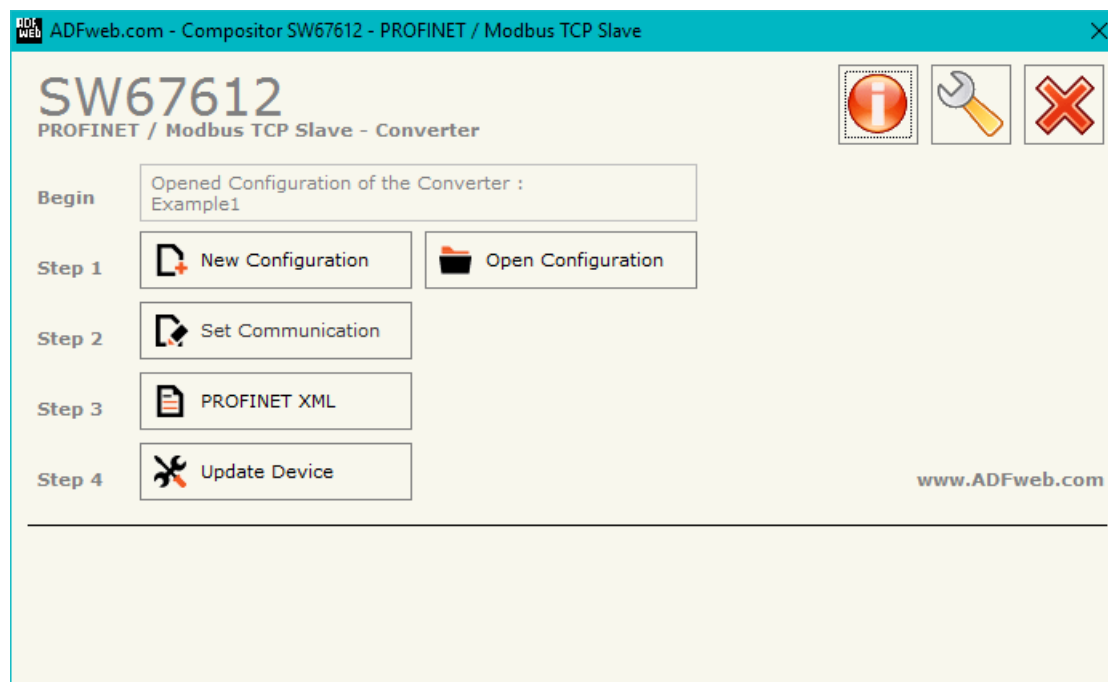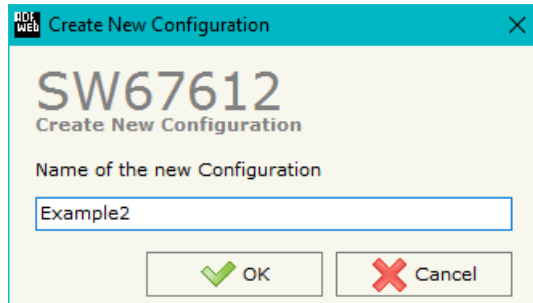
Note:
It is necessary to have installed .Net Framework 4.


Figure 2: Main window for SW67612

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NEW CONFIGURATION / OPEN CONFIGURATION:

The "**New Configuration**" button creates the folder which contains the entire device's configuration.

A device's configuration can also be imported or exported:

➤ To clone the configurations of a Programmable "PROFINET / Modbus TCP Slave - 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 Configuration**".

Industrial Electronic Devices
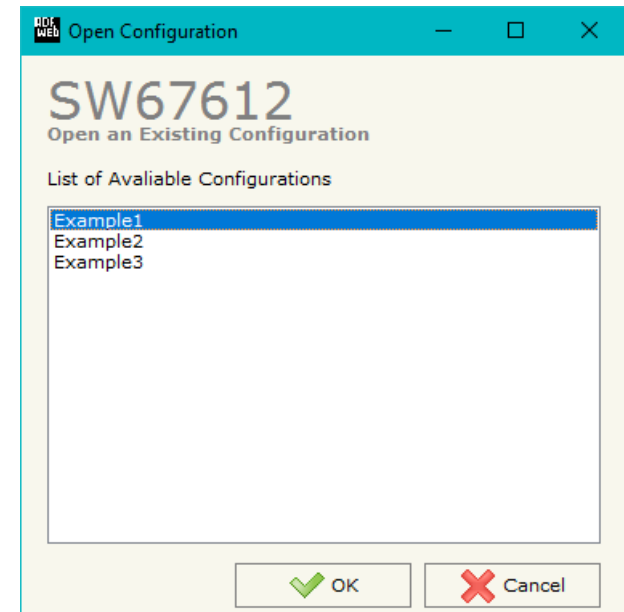
SOFTWARE OPTIONS:

By pressing the "**Settings**" (🔧) button there is the possibility to change the language of the software and check the updatings for the compositor.
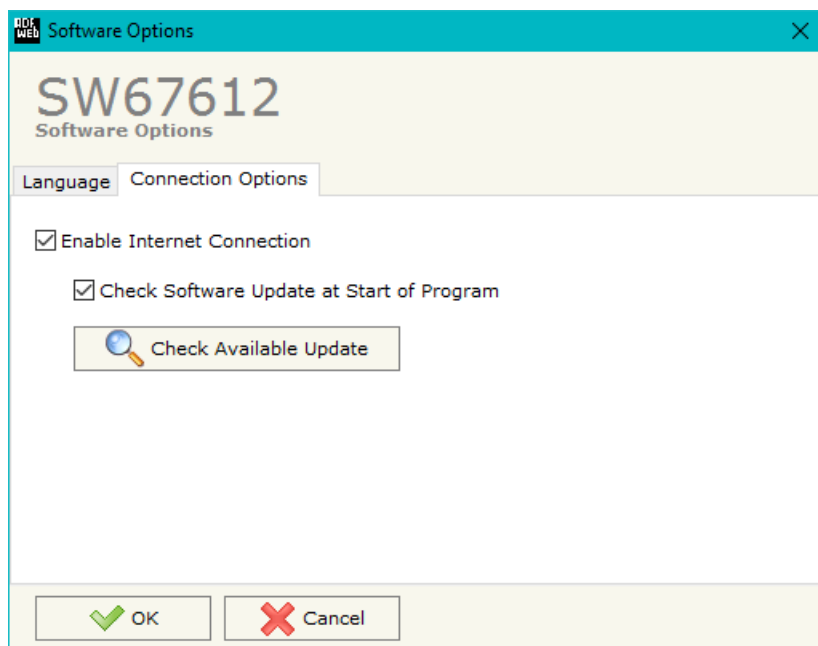
In the section "Language" it is possible to change the language of the software.

In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67612 check automatically if there are updatings when it is launched.

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SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, PROFINET and Modbus TCP.

By Pressing the "**Set Communication**" button from the main window for SW67612 (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 Modbus TCP Slave.

The means of the fields for "PROFINET" are:

- In the field "**IP ADDRESS**" the IP address of PROFINET side of the converter is defined;
- In the field "**SUBNET Mask**" the SubNet Mask of PROFINET side of the converter is defined;
- In the field "**GATEWAY**" the default gateway of the network is defined. 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**" the name to the PROFINET side of the converter is defined;
- In the fields "**PROFINET -> Gateway**" the number of input byte of the slave station is defined;
- In the fields "**PROFINET <- Gateway**" the number of output byte of the slave station is defined.

The means of the fields for the "Modbus TCP Slave" section are:

- In the field "**IP ADDRESS**" the IP address of Modbus TCP side of the converter is defined;
- In the field "**SUBNET Mask**" the SubNet Mask of Modbus TCP side of the converter is defined;
- In the field "**GATEWAY**" the default gateway of the network is defined. 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 Modbus TCP communication is defined;
- If the field "**Read with Input Register / Status Function**" is checked, it is possible to read the Input bytes of PROFINET side with Input Registers (Function 04) and write the Output bytes of PROFINET side with Holding Registers (Function 06/16). The Output bytes are readable with Function 03. Otherwise, only Holding Registers will be used and the Output bytes of PROFINET side cannot be read back.

Figure 3: "Set Communication" window

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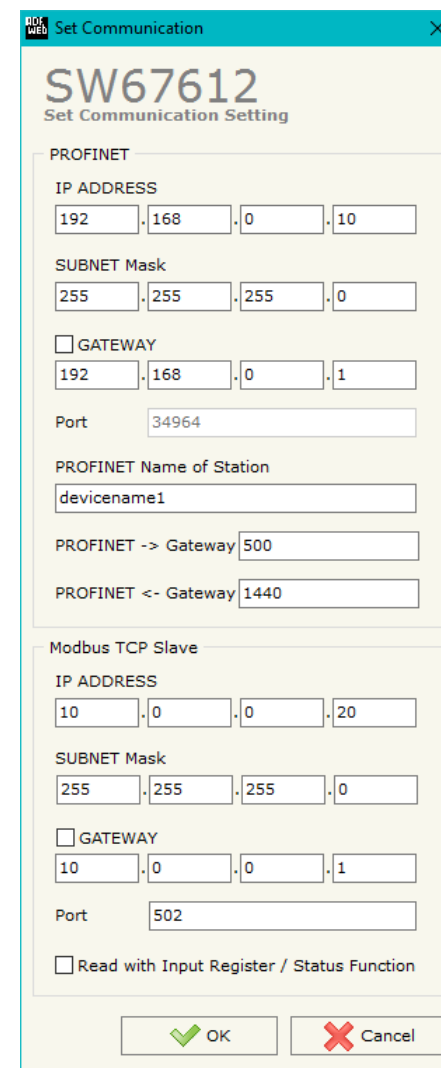
XML FILE:

By Pressing the "**PROFINET XML**" button from the main window for SW67612 (Fig. 2) it is possible to generate the xml file to be imported into the master PROFINET.
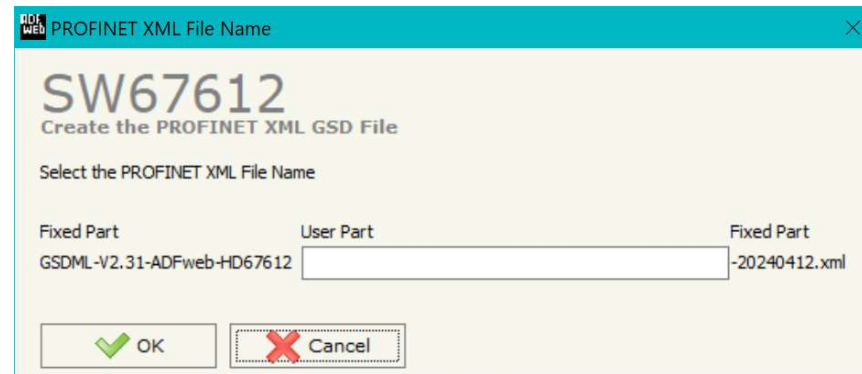

Figure 4: "PROFINET XML File Name" window

UPDATE DEVICE:

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

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

- Turn OFF the Device;
- Put Dip1 of 'Dip-Switch A' in ON position;
- Turn ON the device
- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- 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 Dip1 of 'Dip-Switch A' in OFF position;
- Turn ON the device.

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;
- 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.

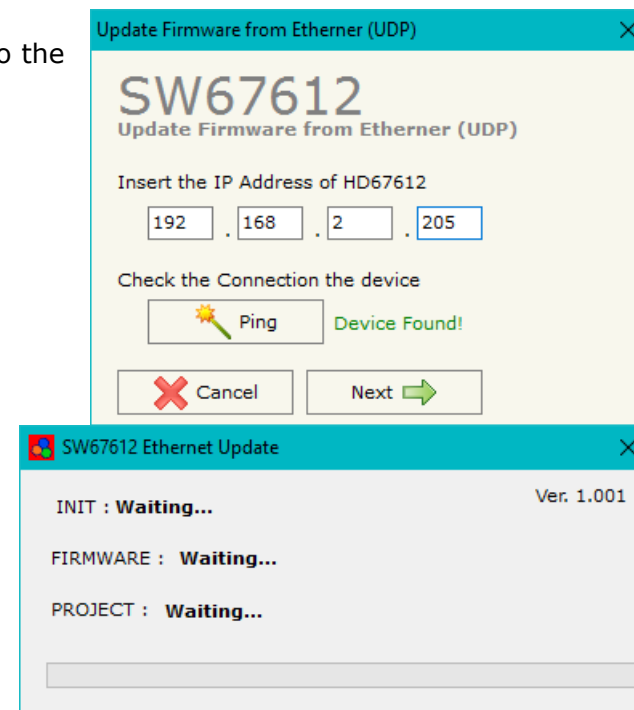At this point the configuration/firmware on the device is correctly updated.

Figure 5: "Update device" windows

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Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67612 device.

Warning:
If Fig. 6 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8, 10 or 11 make sure that you have the administrator privileges;
- In case you have to program more than one device, using the "UDP Update", you have to cancel the ARP table every time you connect a new device on Ethernet. For do this you have to launch the "Command Prompt" and write the command "arp -d". Pay attention that with Windows Vista, Seven, 8, 10 or 11 you have to launch the "Command Prompt" with Administrator Rights;
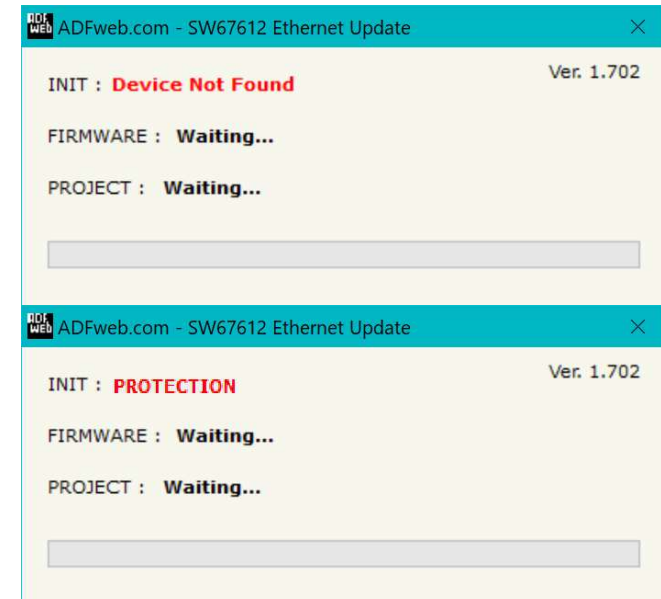- Pay attention at Firewall lock.

Figure 6: "Error" window

Warning:
In the case of HD67612 you have to use the software "SW67612": www.adfweb.com\download\filefold\SW67612.zip.

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MODBUS MAP:

On Modbus side, the map is created automatically. In relation to the configuration defined, it is possible to have two different maps.

Read with Input Register / Status Function not enabled

Data in reading:

Type	Address	Function	Description
Holding Register	0	03	Input Bytes 0-1 of PROFINET side
Holding Register	1	03	Input Bytes 2-3 of PROFINET side
Holding Register	2	03	Input Bytes 4-5 of PROFINET side
.			
.			
Holding Register	719	03	Input Bytes 1438-1439 of PROFINET side

Data in writing:

Type	Address	Function	Description
Holding Register	0	06/16	Output Bytes 0-1 of PROFINET side
Holding Register	1	06/16	Output Bytes 2-3 of PROFINET side
Holding Register	2	06/16	Output Bytes 4-5 of PROFINET side
.			
.			
Holding Register	719	06/16	Output Bytes 1438-1439 of PROFINET side

Note:
    The data can be read/written as single bits too using Coil Status (Function 01 and Functions 05/15).

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Read with Input Register / Status Function enabled

Data in reading:

Type	Address	Function	Description
Input Register	0	04	Input Bytes 0-1 of PROFINET side
Input Register	1	04	Input Bytes 2-3 of PROFINET side
Input Register	2	04	Input Bytes 4-5 of PROFINET side

.
.

Input Register	719	04	Input Bytes 1438-1439 of PROFINET side

Data in writing:

Type	Address	Function	Description
Holding Register	0	R: 03 W: 06/16	Output Bytes 0-1 of PROFINET side
Holding Register	1	R: 03 W: 06/16	Output Bytes 2-3 of PROFINET side
Holding Register	2	R: 03 W: 06/16	Output Bytes 4-5 of PROFINET side

.
.

| Holding Register	719	R: 03 W: 06/16	Output Bytes 1438-1439 of PROFINET side

Note:
   The data can be read/written as single bits too using Input/Coil Status (Function 02 and Functions 01/05/15).
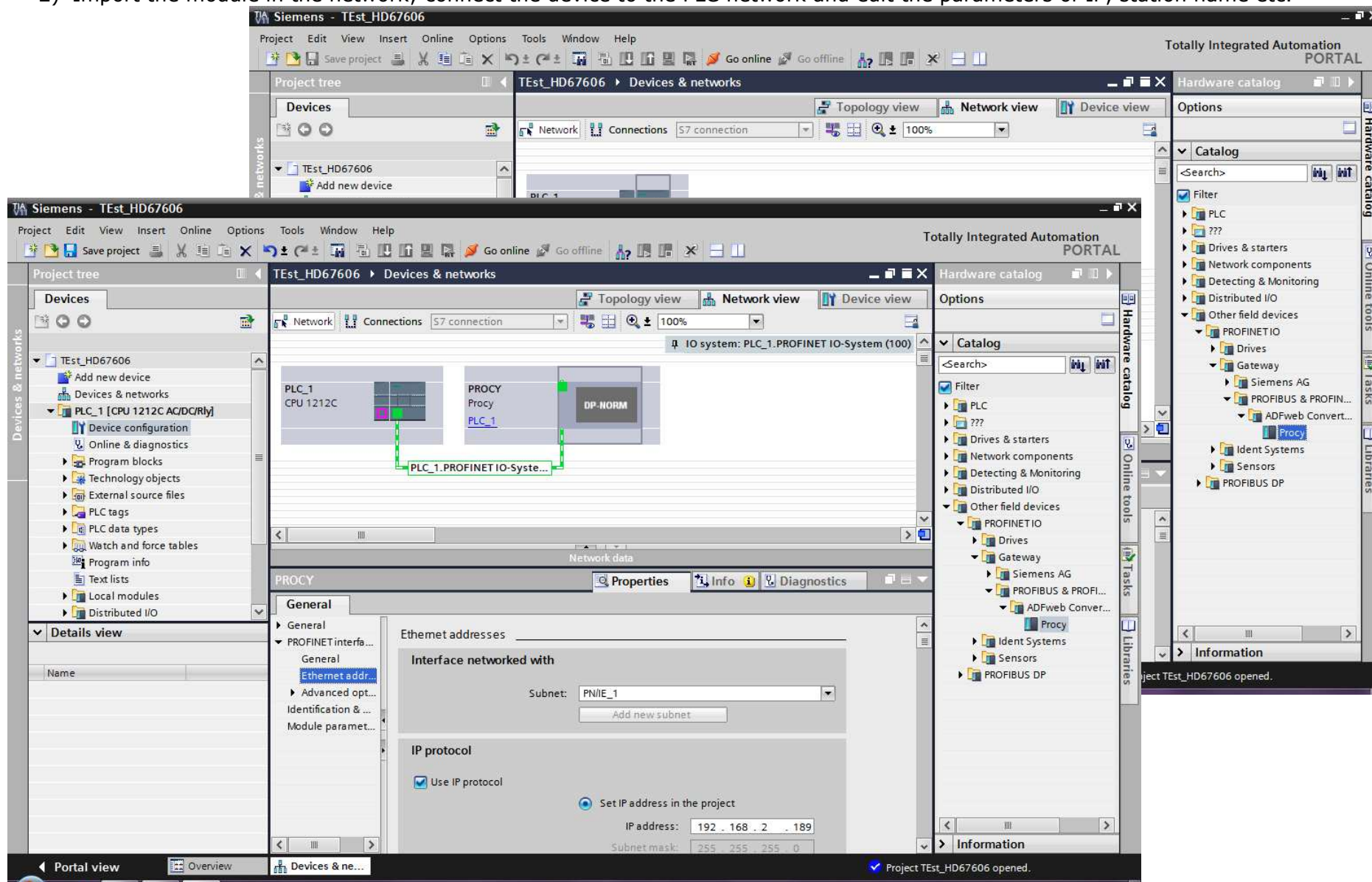
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PLC CONFIGURATION:

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:
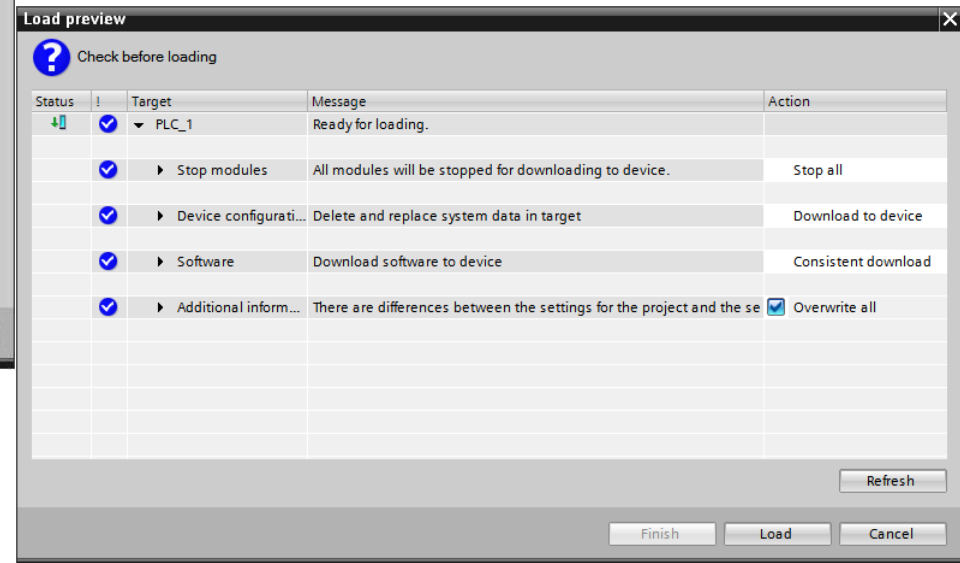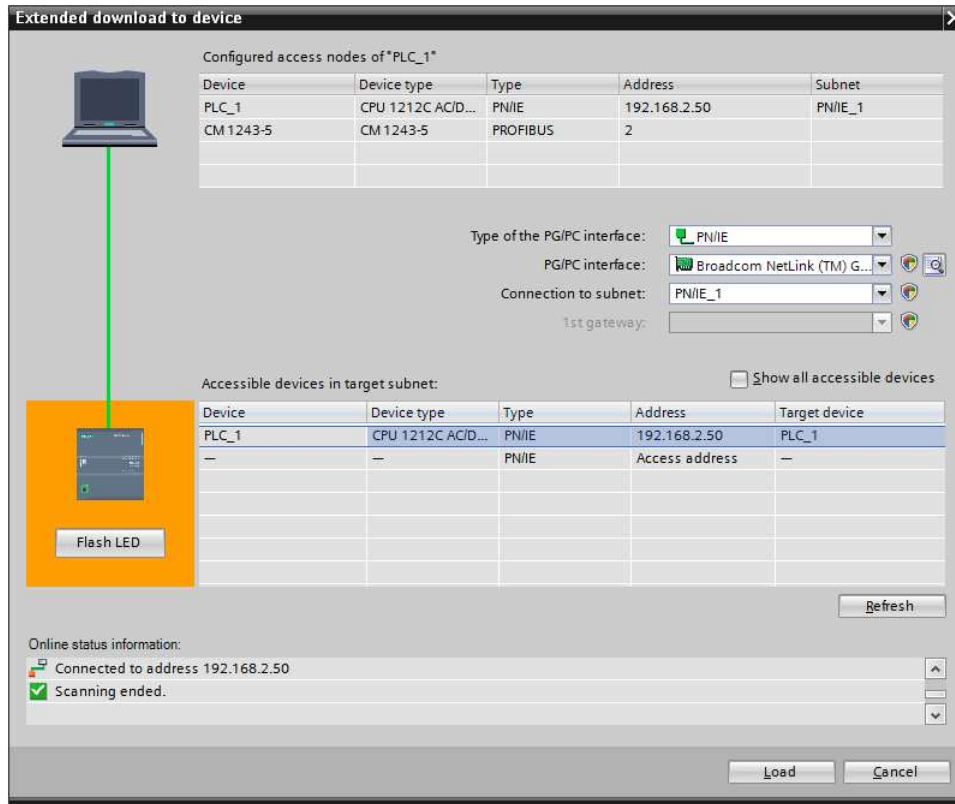
1) Install the description file of the module.

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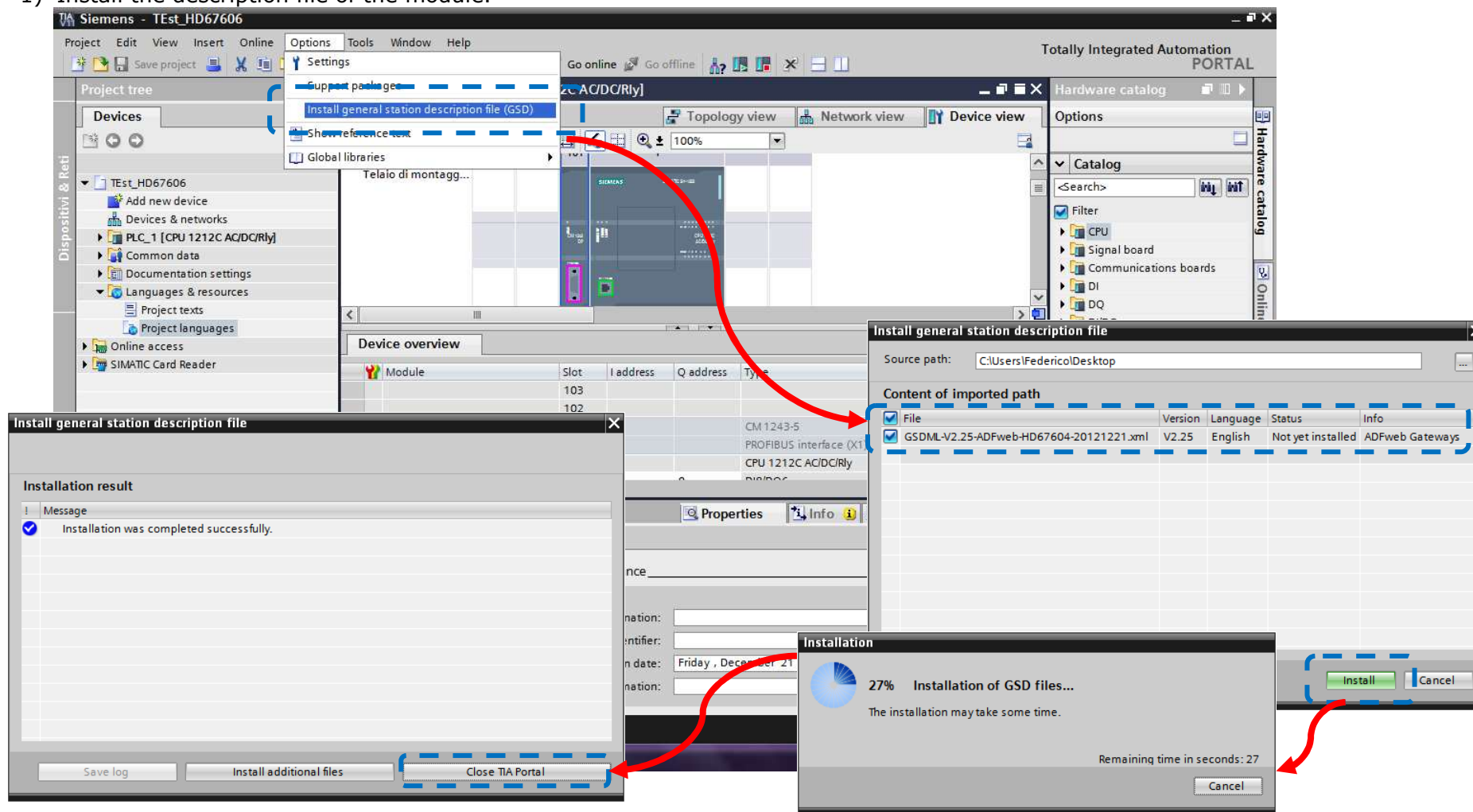
2) Import the module in the network; connect the device to the PLC network and edit the parameters of IP, station name etc.

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3) Load the configuration into the PLC.

MECHANICAL DIMENSIONS:

90.7 mm
3.57 inch

83.7 mm
3.3 inch

123 mm
4.84 inch

22.5 mm
0.89 inch

Housing: PC-ABS
Weight: 200g (Approx)
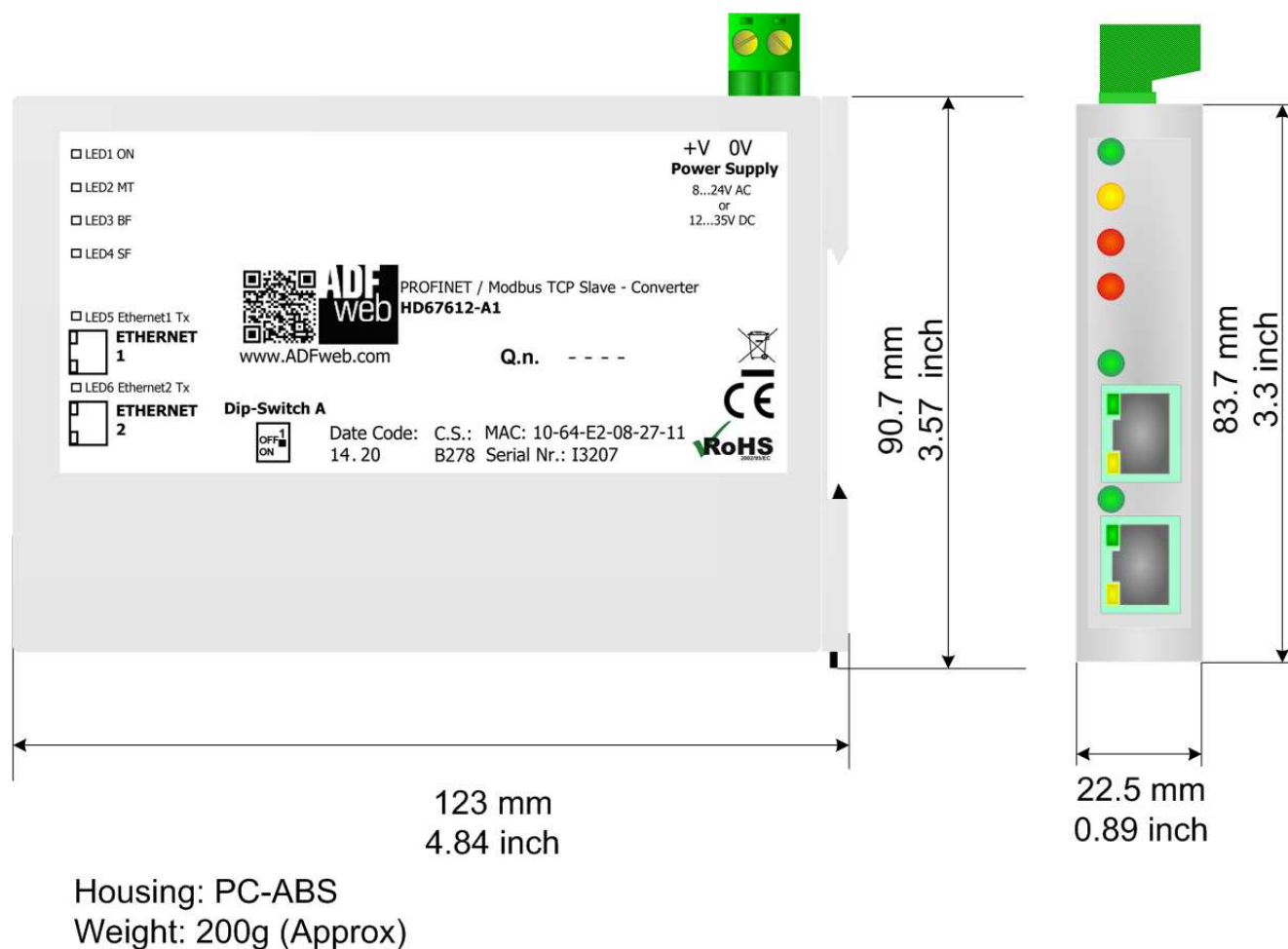
Figure 7: Mechanical dimensions scheme for HD67612-A1

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ORDERING INFORMATIONS:

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

HD67612 – A 1

Connectors Type
1: Removable 5mm Screw Terminal

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

Device Family
HD67612: PROFINET / Modbus TCP Slave - Converter
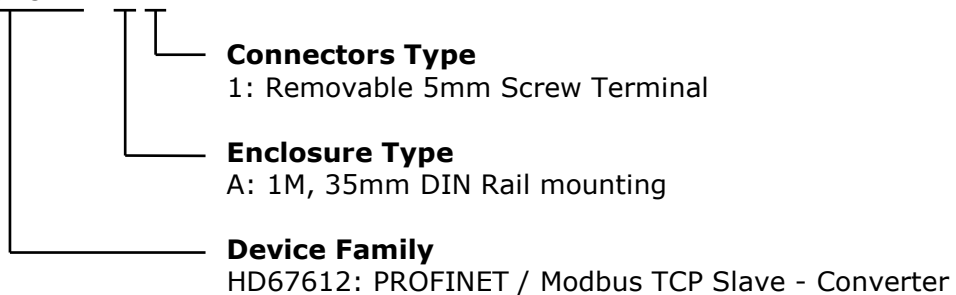
Order Code: **HD67612-A1**   -   PROFINET / Modbus TCP Slave - Converter

ACCESSORIES:

Order Code: **AC34011**   -   35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V DC

Order Code: **AC34012**   -   35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 24 V DC

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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 impact of 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.

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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:

- 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.
- 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.