![ADFweb logo]

Industrial Electronic Devices

User Manual
Revision 1.002
English

PROFINET / J1939 – Converter
(Order Code: HD67446)

for Website information:
www.adfweb.com?Product=HD67446

for Price information:
www.adfweb.com?Price=HD67446

Benefits and Main Features:

- Very easy to configure
- Isolation between two buses
- Temperature range: -40°C / +105°C (-40°F / +221°F)

User Manual

For other Gateways / Bridges:
CAN from/to Modbus
See also the following links:

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

CANopen from/to Modbus
See also the following links:

www.adfweb.com?product=HD67001	(Modbus RTU Master)
www.adfweb.com?product=HD67502	(Modbus RTU Slave)
www.adfweb.com?product=HD67504	(Modbus TCP Master)
www.adfweb.com?product=HD67505	(Modbus TCP Slave)

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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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
1.000	04/09/2014	Ff	All	First release version
1.001	09/05/2016	Ff	All	New hardware version
1.002	13/03/2017	Ff	All	Revision

WARNING:

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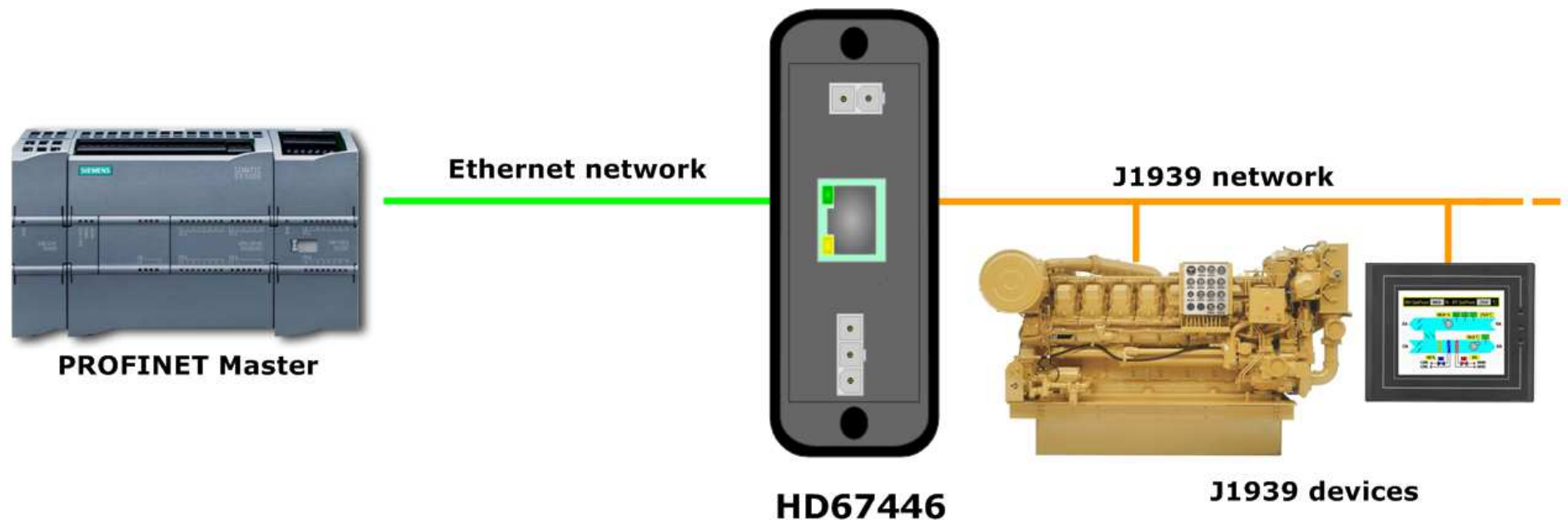
⚠ This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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 Master — Ethernet network — HD67446 — J1939 network — J1939 devices

CONNECTION SCHEME:

Connector3:
J1939 port

Lo →
Shl1 →
Hi →

Hi = High wire
Lo = Low wire
Shl1 = Shield (to Isolated Ground)

Connector2:
Ethernet Port
(RJ45 Plug)

Connector1:
Power Supply port

0V +V

0V = Ground
+V = Positive wire

V AC: min 8V ; max 26V
V DC: min 10V ; max 40V

MAC: 10-64-E2-07-23-97
Serial Nr.: B6812
Date Code:
C.S.: B215

USB

LED4 O OLED3
LED2 O OLED1

Q.n.

www.ADFweb.com
PROFINET / J1939 - Converter
HD67446-E4X-XX

Lo
Shl
Hi

CAN0
(Isolated Port)

LAN
(Isolated Port)

0V +V
Power Supply
(Isolated Port)

Connector4:
USB port

Led 1:
Green
Device State

Led 2:
Green
CAN comm.

Led 3:
Yellow
Boot Mode

Led 4:
Green
Ethernet comm.

Figure 1a: Connection scheme for HD67446-E4x-xx

![ADFweb logo] Industrial Electronic Devices

Connector3:
J1939 port

Lo →
Shl1 →
Hi →

Hi = High wire
Lo = Low wire
Shl1 = Shield (to Isolated Ground)

Connector2:
Ethernet Port

4 →
3 →
2 →
1 →

1 = TX -
2 = TX +
3 = RX +
4 = RX -

Connector1:
Power Supply port

0V →
+V →

0V = Ground
+V = Positive wire

V AC: min 8V ; max 26V
V DC: min 10V ; max 40V

MAC: 10-64-E2-07-23-97
Serial Nr.: B8812
Date Code:20.16
C.S.: 8215

USB

LED4O OLED3
LED2O OLED1

Q.n. - - - - -

www.ADFweb.com
PROFINET / J1939 - Converter
HD67446-E7X-XX

Lo
Shl
Hi
CAN0
(Isolated Port)

RX-
RX+
TX+
TX-
LAN
(Isolated Port)

0V
+V
Power Supply
(Isolated Port)

Connector4:
USB port

Led 1:
Green
Device State

Led 2:
Green
CAN comm.

Led 3:
Yellow
Boot Mode

Led 4:
Green
Ethernet comm.

Figure 1b: Connection scheme for HD67446-E7x-xx

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CHARACTERISTICS:

The "HD67446" series are rugged devices used to interface J1939 devices with a PROFINET Master.

With his particular enclosure, equipped with four fixing lugs, makes available the mounting of the device in any plane surface (horizontal, vertical, oblique).

It is possible to have the device varnished or totally resined and also in both cases with "Mini-Fit®" connectors or "AMP SuperSeal 1.5" connectors. If is resined, the enclosure, like the "AMP SuperSeal 1.5" connectors, is waterproof (IP63).

The device have these characteristics:

- Triple 4kV isolation between Power Supply / Ethernet / CAN;
- Varnished / Resined (optionally);
- Wide power supply input range: 8…26V AC | 10…40V DC;
- Mini-Fit® / AMP SuperSeal 1.5 connectors;
- Metal enclosure with fixing lugs;
- Possibility to use Metal hose clamps for fixing it without using lugs;
- Microprocessor for data control;
- Wide temperature range: -40°C / 105°C (-40°F / 221°F).

CONFIGURATION:

You need Compositor SW67446 software on your PC in order to perform the following:

- Define the parameter of the J1939 bus;
- Define the parameter of the PROFINET bus;
- Define a list of PGNs in reception and transmission;
- Update the Firmware and/or the Project.

Industrial Electronic Devices

POWER SUPPLY:

The devices can be powered between a wide range of tensions. For more details see the two tables below.

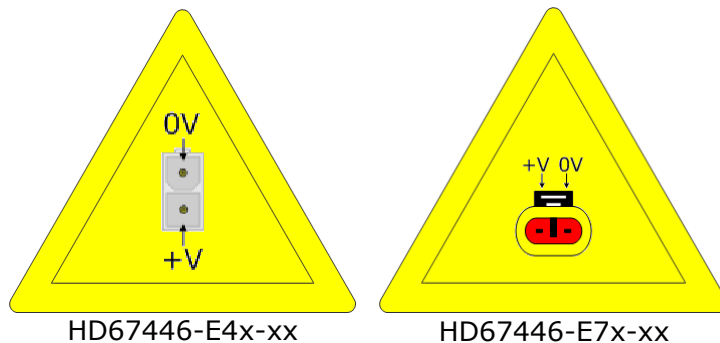|	VAC		VDC	
	Vmin	**Vmax**	**Vmin**	**Vmax**
HD67446-Exx-xx	**8V**	**26V**	**10V**	**40V**

Consumption at 24V DC:

Device	W/VA
HD67446-Exx-xx	4

⚠ **Caution: Not reverse the polarity power**

0V
+V
HD67446-E4x-xx

+V 0V
HD67446-E7x-xx

Note: It is possible to use also negative tensions. In this case the polarity must be inverted.

Connector1:
Power Supply port
0V = Ground
+V = Positive wire
V AC: min 8V ; max 26V
V DC: min 10V ; max 40V

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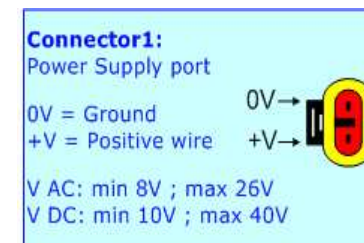
LEDS:

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.

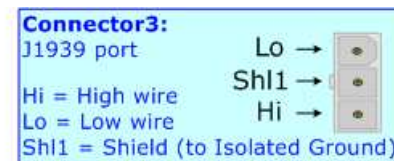| LED	Normal Mode	Boot Mode
1: Device state (green)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: CAN Communication (green)	Blinks when J1939 frames are received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: Boot Mode (yellow)	OFF	ON
4: Ethernet communication (green)	Blinks when the PROFINET communication is working	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
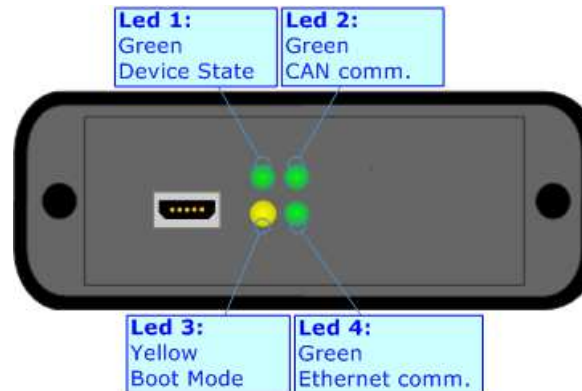
J1939:

The connection of the J1939 in the HD67446-E4x-xx device must be made with a 3way MiniFit Female connector. The pinout of Male MiniFit connector of the board is at right side of the page.

The connection of the J1939 in the HD67446-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.

The termination of J1939 line, with a 120Ω resistor, in the HD67446-Exx-xx is made internally of the device; when the order is performed. If the device have the J1939 terminated the code is the follow: HD67446-Exx-Yx; otherwise is this other: HD67446-Exx-Nx.

Connector3:
J1939 port
Hi = High wire
Lo = Low wire
Shl1 = Shield (to Isolated Ground)
Lo →
Shl1 →
Hi →

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

Connector3:
J1939 port
Hi = High wire
Lo = Low wire
Shl1 = Shield (to Isolated Ground)
Lo →
Shl1 →
Hi →

Industrial Electronic Devices
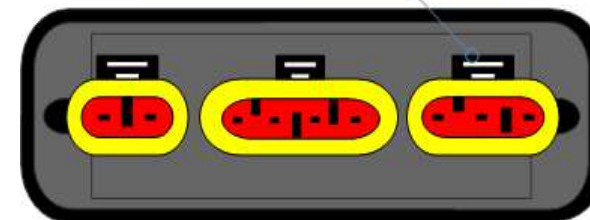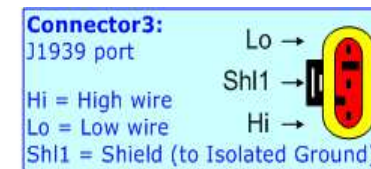
PROFINET:

The connection of PROFINET in the HD67446 device must be made 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.

The connection of PROFINET in the HD67446-E4x-xx device must be made with RJ45 connector.

The connection of the PROFINET in the HD67446-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.
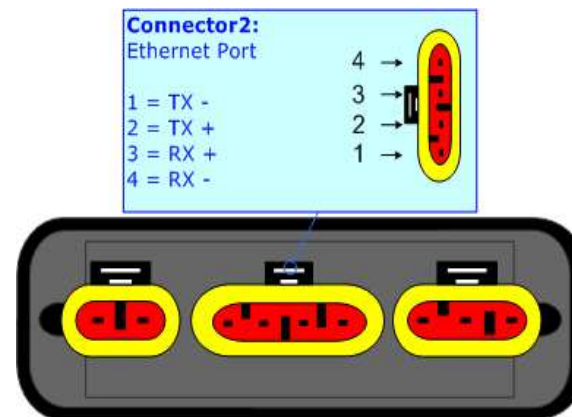
USB:

The USB port is used to start the converter in Boot Mode. It is necessary to use a Micro USB type B cable.

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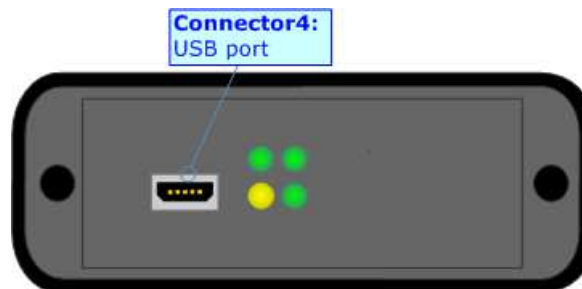
USE OF COMPOSITOR SW67446:

To configure the Converter, use the available software that runs with Windows called SW67446. 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; 32/64bit).

When launching the SW67446, the window below appears (Fig. 2).

Note:
It is necessary to have installed .Net Framework 4.
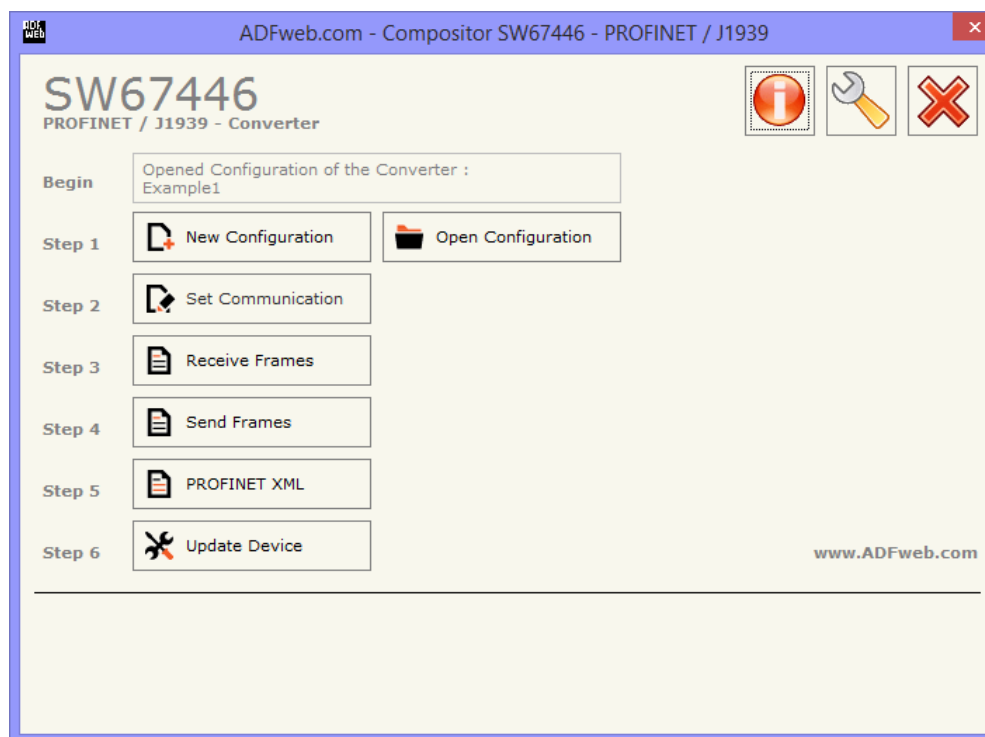
Figure 2: Main window for SW67446

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NEW CONFIGURATION / OPEN CONFIGURATION:

The "**New Configuration**" button creates the folder which contains the entire device's configuration.
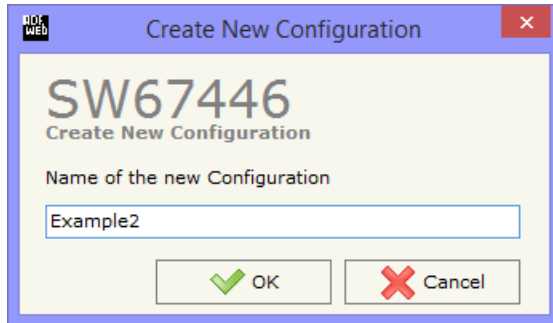
A device's configuration can also be imported or exported:

↳ To clone the configurations of a programmable "PROFINET / J1939 - 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**".

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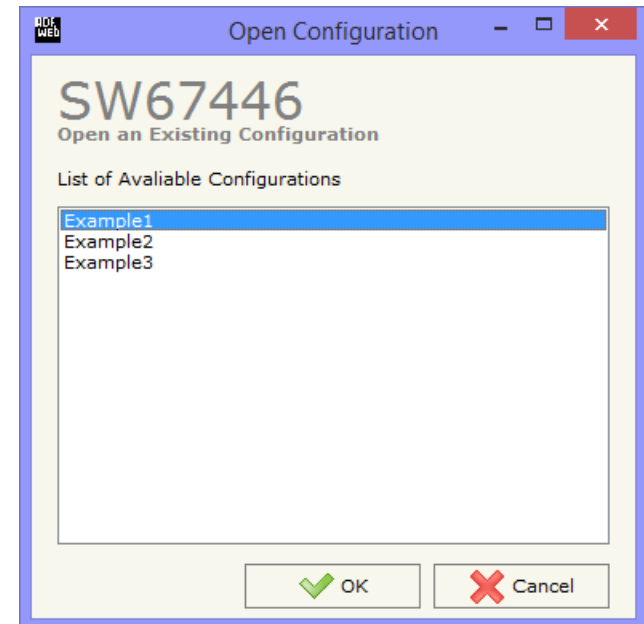
SOFTWARE OPTIONS:

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.
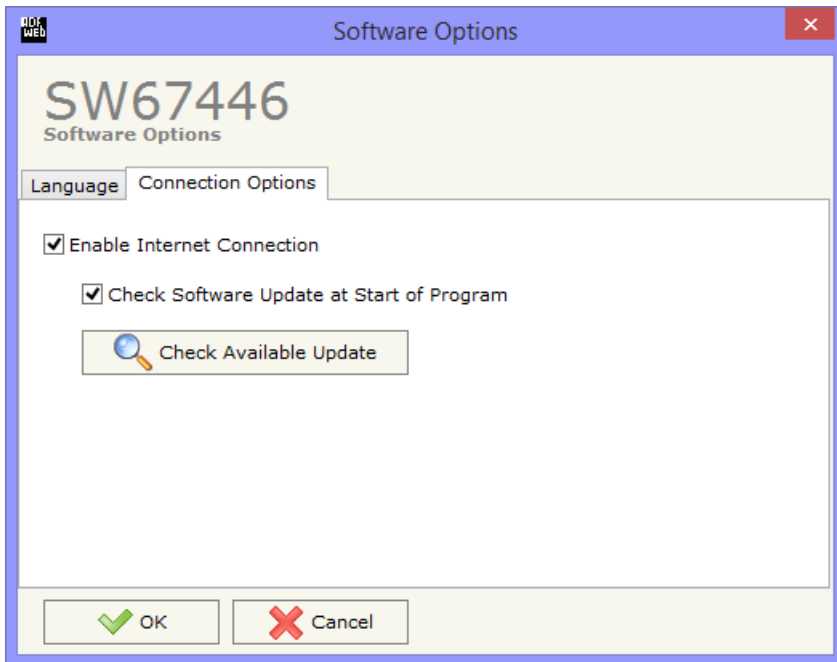
In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67446 checks automatically if there are updatings when it is launched.

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, PROFINET and J1939.

By Pressing the "**Set Communication**" button from the main window for SW67446 (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 J1939.

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.

The means of the fields for the "J1939" section are:

- In the "**Baudrate**" field the J1939 baudrate is defined;
- In the field "**TimeOut Data**" insert a time; when this time is elapsed and the data isn't reliable, in the PROFINET data array you read "0". It is possible to use this function only for the "Receive Frames";
- If the field "**Enable Peer to Peer**" is checked, the gateway accepts all the ID that have the PGN inserted in the "Receive Frames" section.
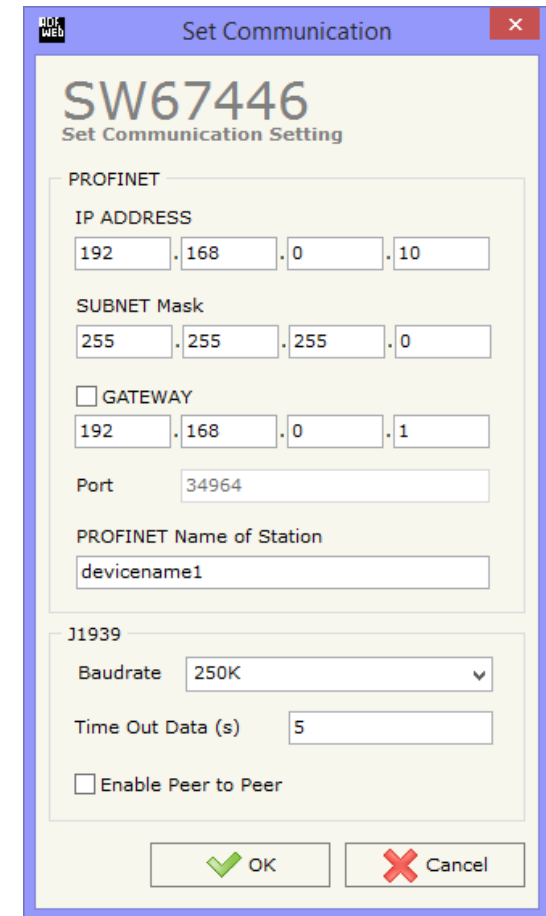

Figure 3: "Set Communication" window

Note:
    The number of Input byte and Output byte of PROFINET is calculated automatically by the Compositor in relation of the J1939 frames defined.

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RECEIVE FRAMES:

By pressing the "**Receive Frames**" button from the main window for SW67446 (Fig. 2) the "Receive J1939 Frames" window appears (Fig. 4). The J1939 frames inserted in this table contains the Output data of PROFINET. These frames are accepted by the gateway.

The data of the columns have the following meanings:

+ In the field "**Data Page**" insert the Data Page, the value is 0 or 1 (usually is 0);
+ In the field "**PGN**" insert the PGN of the data you would like to read from PROFINET to J1939 (it is an identifier);
+ In the field "**Source Address**" insert the address of the device that sends the frame;
+ If the field "**Transport Protocol**" is checked the frame use transport protocol functions;
+ In the field "**Start Byte**" insert the byte which you would start read, this field is enable only when the field Transport Protocol is checked;
+ In the field "**N° Byte**" insert the number of byte you would read, for example your start byte is 20 an N°byte is 10, you can read the byte from 20 to 30;
+ If the field "**Cancel Data**" is checked, the data in the frame will be erased after the expiration of the "**TimeOut Data**" defined in
+ "Set Communication" section;
+ In the field "**Mnemonic**" it is possible to insert a brief description.

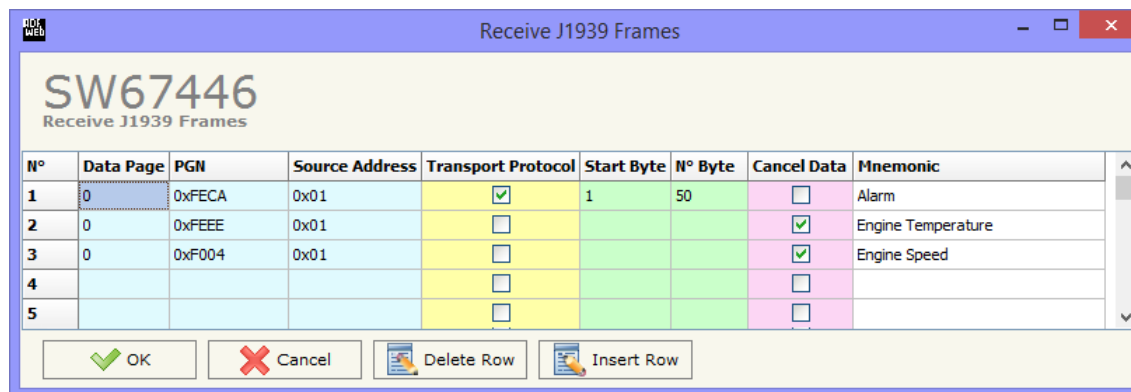| N°	Data Page	PGN	Source Address	Transport Protocol	Start Byte	N° Byte	Cancel Data	Mnemonic
1	0	0xFECA	0x01	☑	1	50	☐	Alarm
2	0	0xFEEE	0x01	☐			☑	Engine Temperature
3	0	0xF004	0x01	☐			☑	Engine Speed
4				☐			☐	
5				☐			☐	

Figure 4: "Receive J1939 Frames" window

Note:
    It is possible to configure a maximum of 62 frames in the "Receive Frames" section.

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SEND FRAMES:

By pressing the "**Send Frames**" button from the main window for SW67446 (Fig. 2) the "Send J1939 frames" window appears (Fig. 5).
The J1939 frames inserted in this table contains the Input data of PROFINET. These frames are sent by the gateway.

The data of the columns have the following meanings:

- In the field "**Priority**" insert the priority of the Frame: in J1939 protocol it is a number among 0,1,2,3,4,5,6,7. The number "0" is the highest priority and "7" is the lowest;
- In the field "**Data Page**" insert the data page, the value is 0 or 1 (usually is 0);
- In the field "**PGN**" insert the PGN of the data you would like to write from PROFINET to J1939 (in J1939 protocol the PGN is an identifier);
- In the field "**Source Address**" insert the address of the device that sends the frame;
- In the field "**Num Byte**" insert the dimension of the PGN (number of bytes). If it is bigger than 8, the Transport Protocol will be used;
- If the option "**Request**" is checked, the PGN is transmitted when a J1939 request is sent (On Request);
- If the option "**Data Change**" is checked, the PGN is transmitted when the data of the PGN changes;
- If the option "**On Timer**" is checked, the PGN is transmitted cyclically;
- In the field "**Send Timer**" insert the interval used for the "**Send Frame Type → On Timer**". The time is in milliseconds;
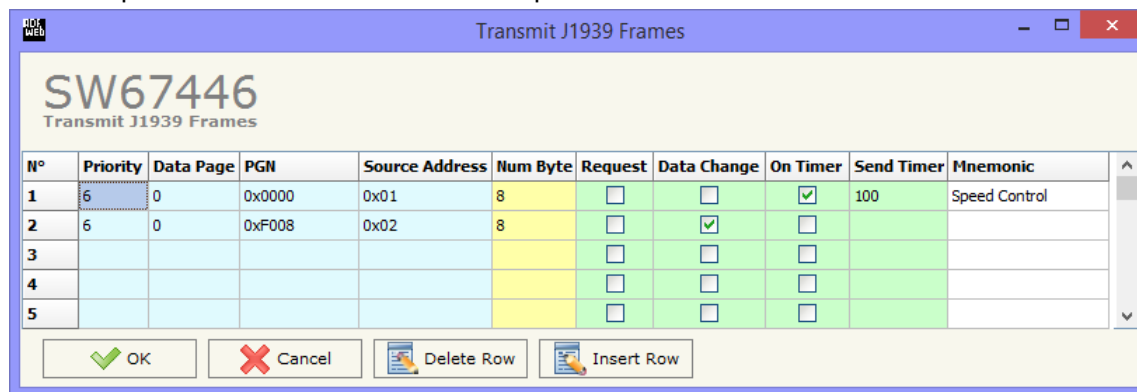- In the field "**Mnemonic**" it is possible to insert a brief description.

N°	Priority	Data Page	PGN	Source Address	Num Byte	Request	Data Change	On Timer	Send Timer	Mnemonic
1	6	0	0x0000	0x01	8	☐	☐	☑	100	Speed Control
2	6	0	0xF008	0x02	8	☐	☑	☐		
3						☐	☐	☐		
4						☐	☐	☐		
5						☐	☐	☐		

Figure 5: "Send J1939 Frames" window

Note:
It is possible to configure a maximum of 62 frames in the "Send Frames" section.

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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:

- Connect the USB cable;
- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- Turn on the device;
- 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 updating is done;
- Remove the USB cable.

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.
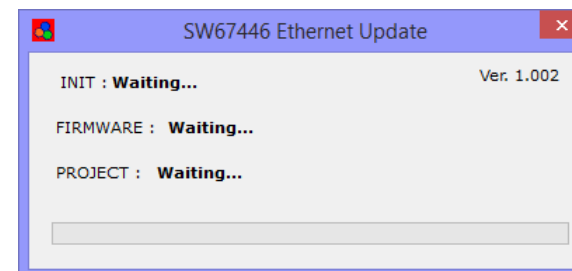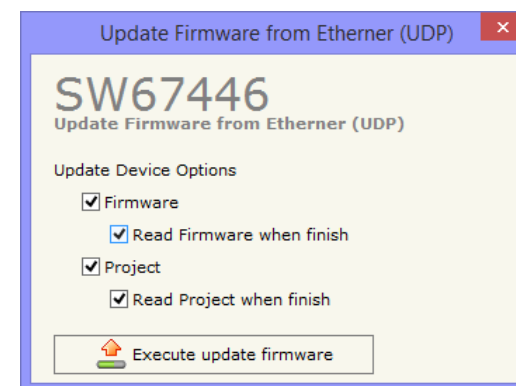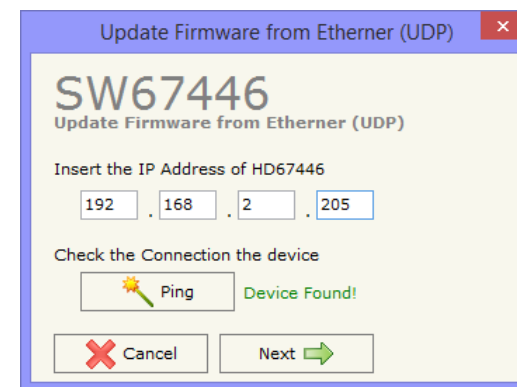
Figure 6: "Update device" windows

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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 HD67446.

Note:
When you receive the device, for the first time, you have to update also the Firmware in the HD67446 device.

Warning:
If the Fig. 7 appears when you try to do the Update before require assistance try these points:

→ Try to repeat the operations for the updating;
→ 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 or 10 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 or 10 you have to launch the "Command Prompt" with Administrator Rights;
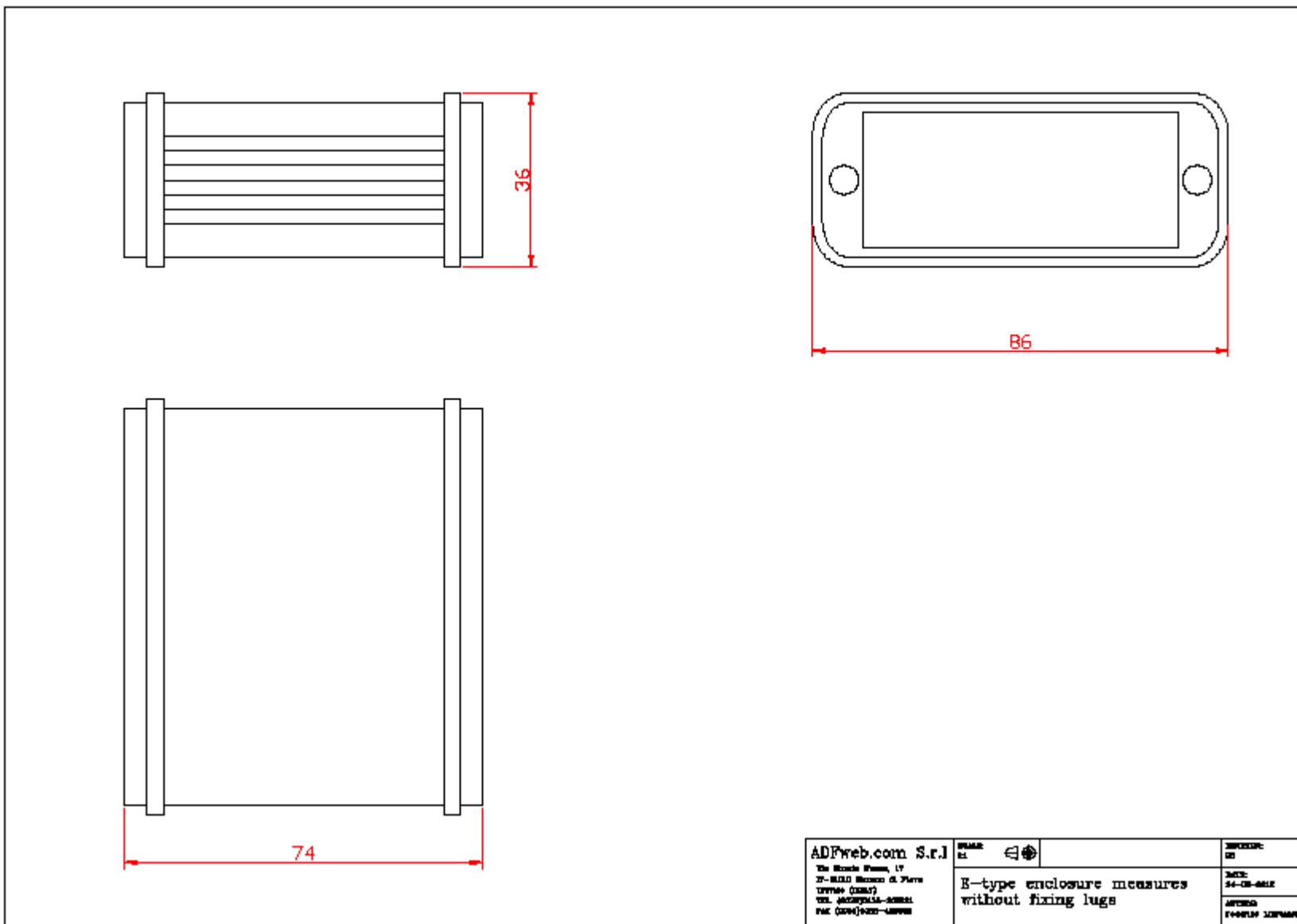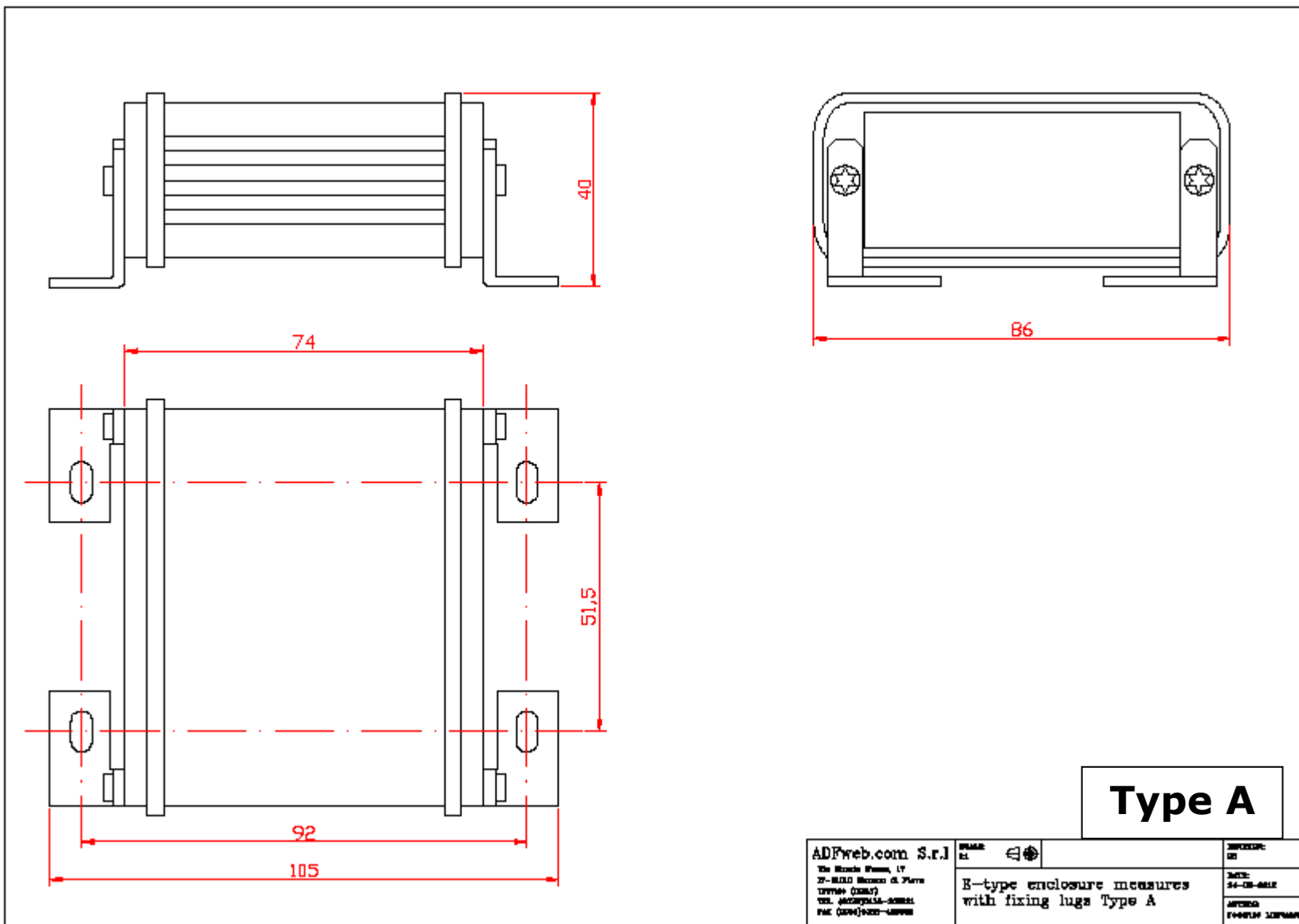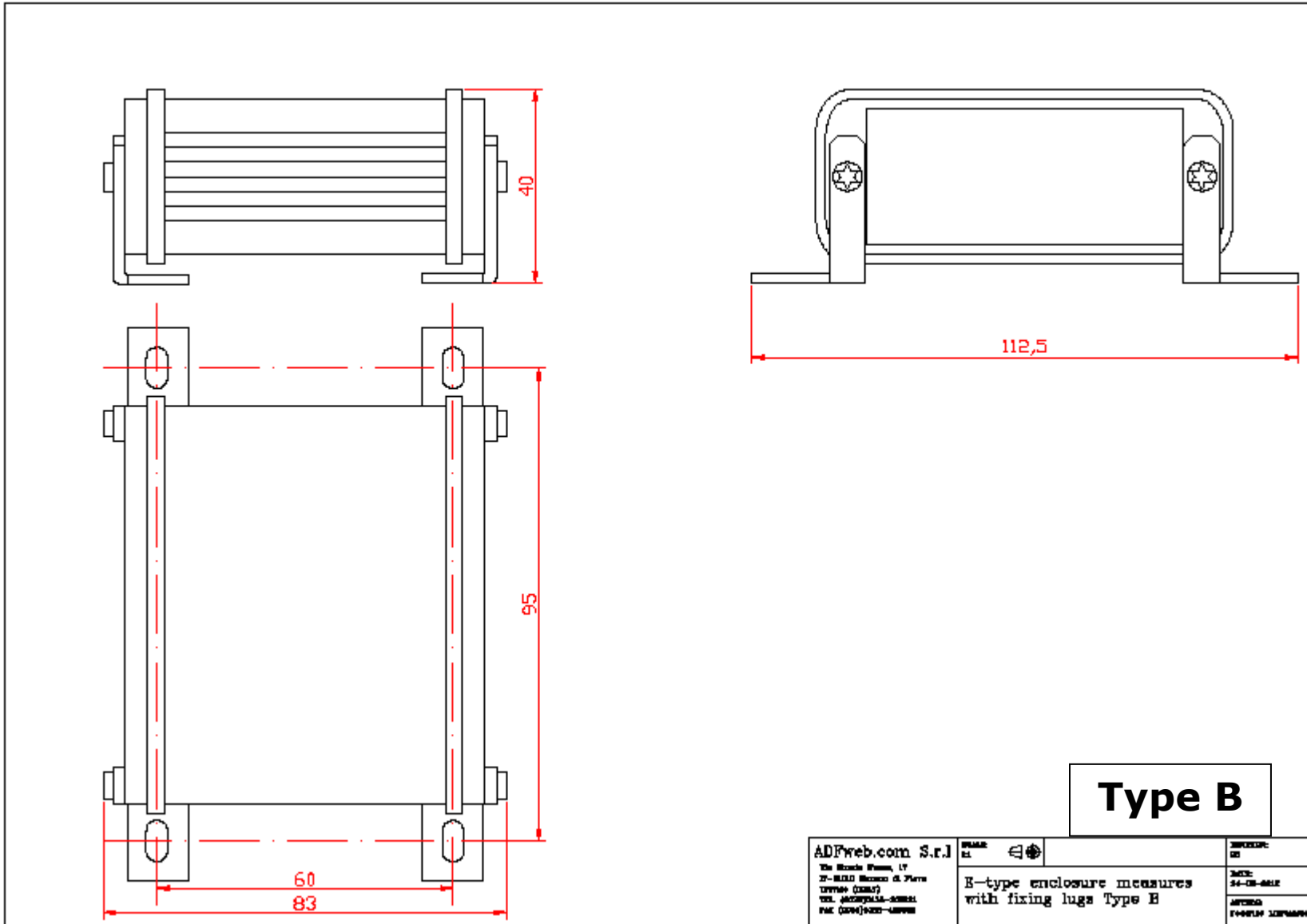→ Pay attention at Firewall lock.
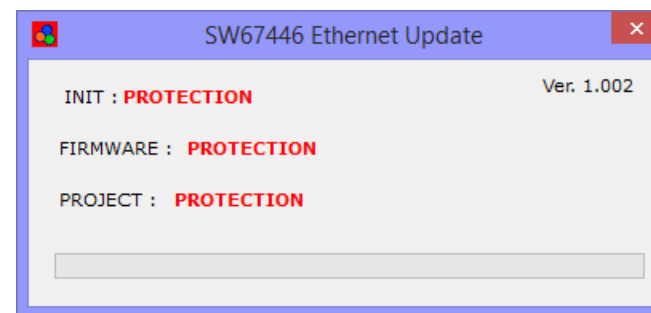
Figure 7: "Protection" error

In the case of HD67446 you have to use the software "SW67446": www.adfweb.com\download\filefold\SW67446.zip.

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MECHANICAL DIMENSIONS:

ADFweb.com S.r.l

E-type enclosure measures
without fixing lugs

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Type A

E-type enclosure measures with fixing lugs Type A

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40

112,5

95

60

83

Type B

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Via Simade Premo, 17
IT-31010 Mareno di Piave
TREVISO (ITALY)
TEL. +39(0)0438-30.91.31
FAX (0434)+390-489766

E-type enclosure measures
with fixing lugs Type B

40

112,5

95

92

105

Type C

ADFweb.com S.r.l

E-type enclosure measures
with fixing lugs Type C

Industrial Electronic Devices
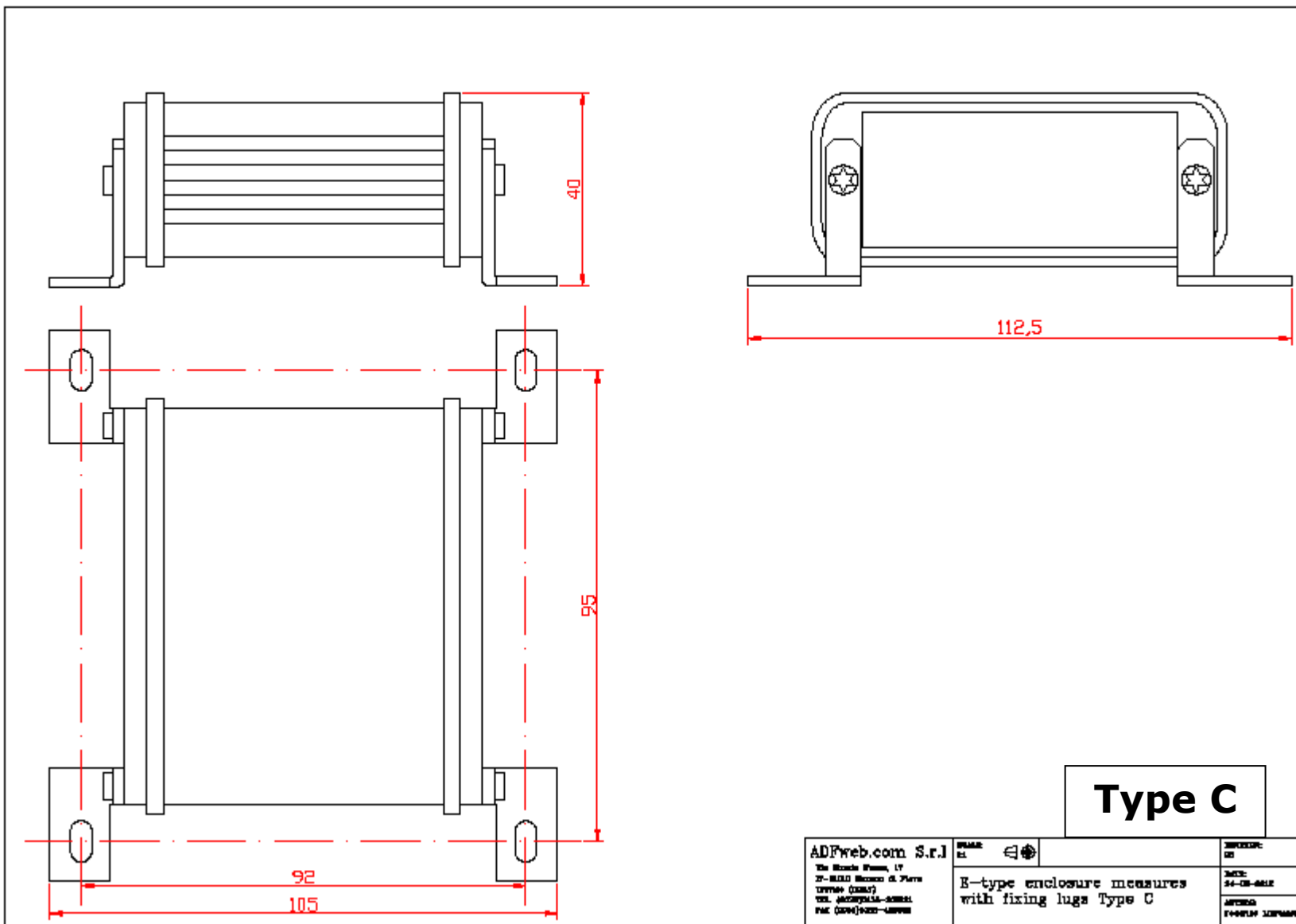
ORDERING INFORMATIONS:

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

HD67446 – E y z – s f

Fixing lugs
A: Type A
B: Type B
C: Type C
D: without fixing lugs

J1939 Termination
Y: Terminated with 120Ω
N: Not terminated

Varnished/Resinated
V: Varnished
R: Resined

Connectors Type
4: MiniFit
7: SuperSeal 1.5

Enclosure Type
E: Metal enclosure

Device Family
HD67446 = PROFINET / J1939 - Converter
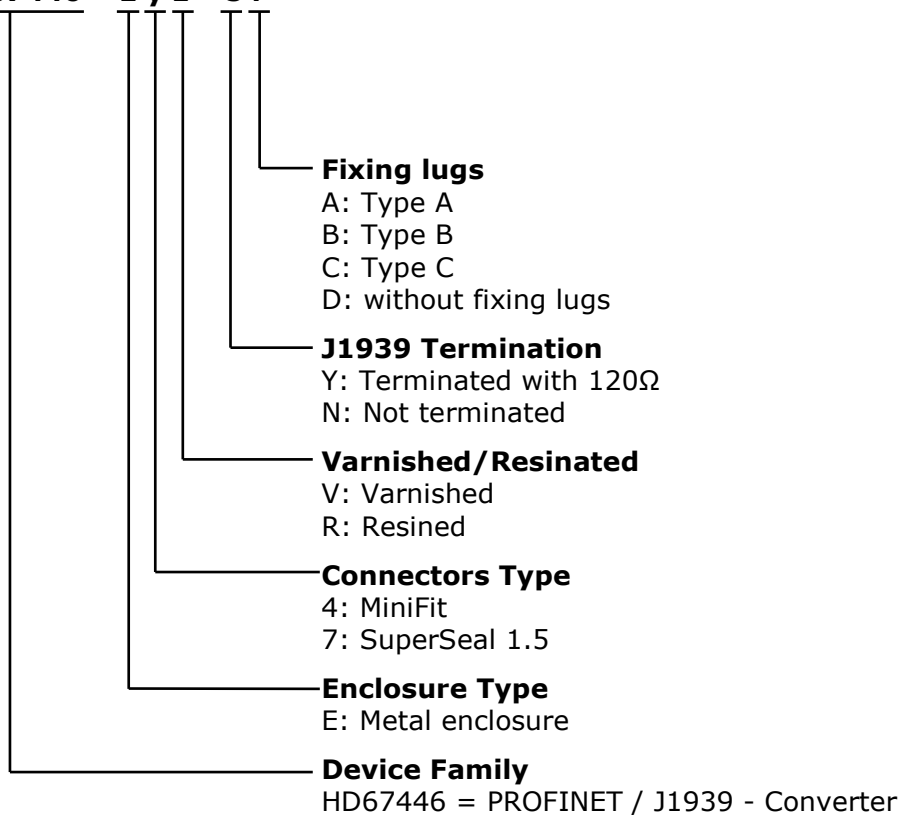
ACCESSORIES:

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

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

Order Code: **AC67410** -   Accessory Automotive Devices - Support for rail DIN

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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 by Siemens. In the case of using a control system from another supplier, refer to attend to the associated documentation.
These are the steps to follow:

1) Install the description file of the module.

![ADFweb logo] **Industrial Electronic Devices**
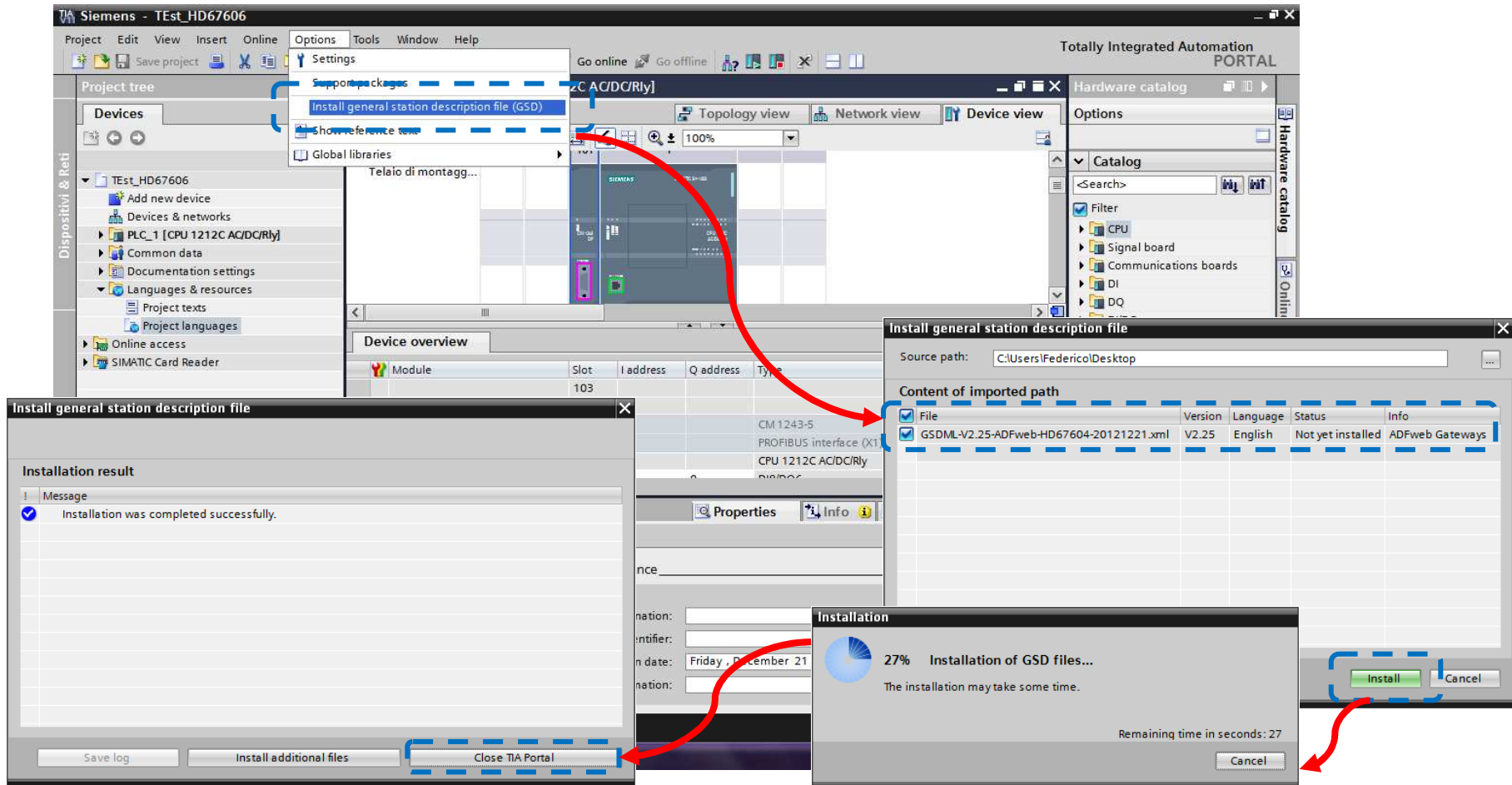
2) Press the "**Devices and networks**" button *(1)*, from the right drop-down menu, under "Other field devices→PROFINET IO→Gateway→ADFWEB.com→HD67446" double click on "MBmaster" module *(2)*.

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

![ADFweb logo]

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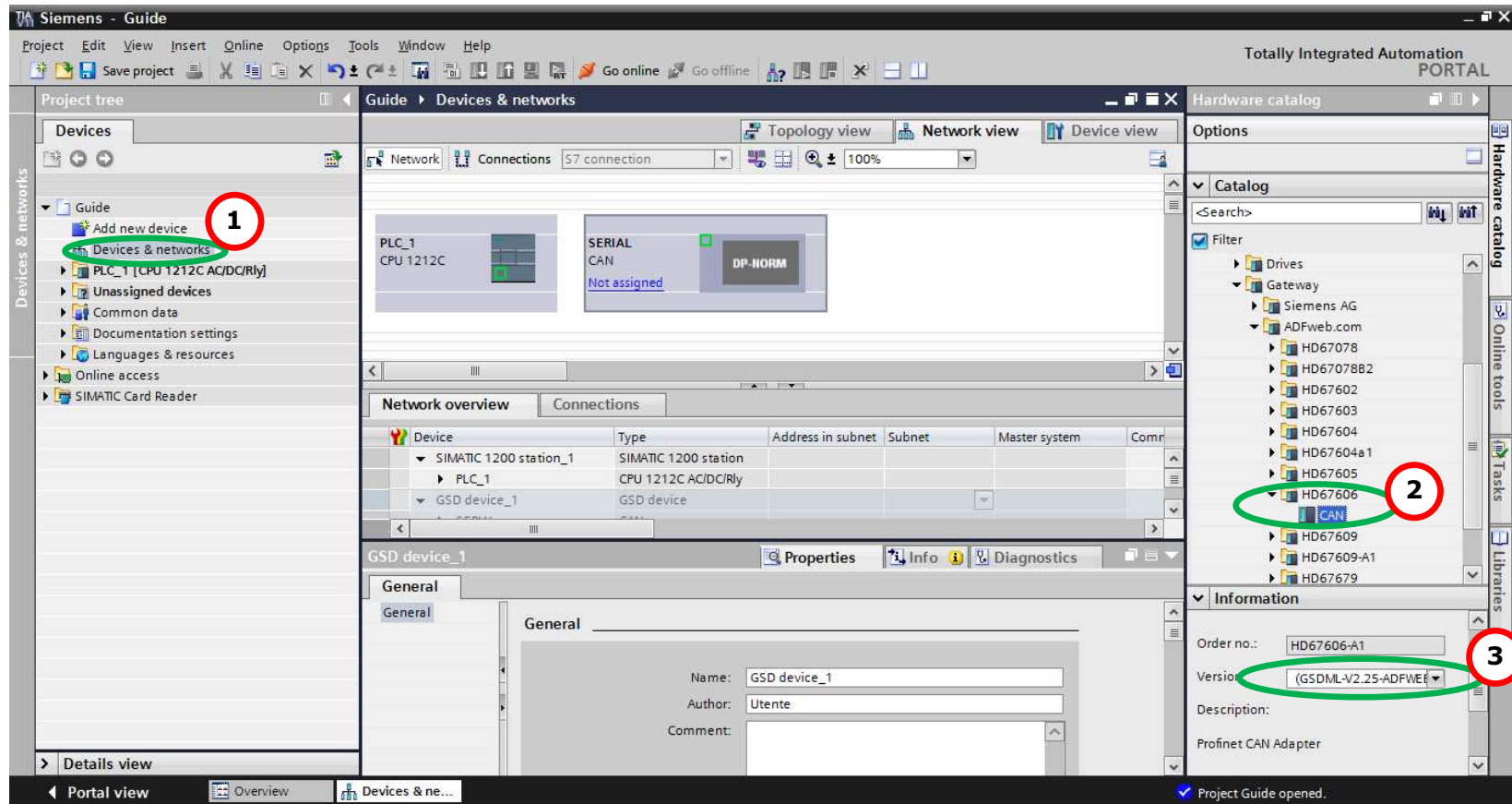
3) Connect the PLC to the HD67446 module by drawing the Ethernet wire between the two Ethernet ports. Then assign the IP Address **(1)** defined in the Compositor_SW67446 to the HD67446. Then double click the "Module" **(2)**.

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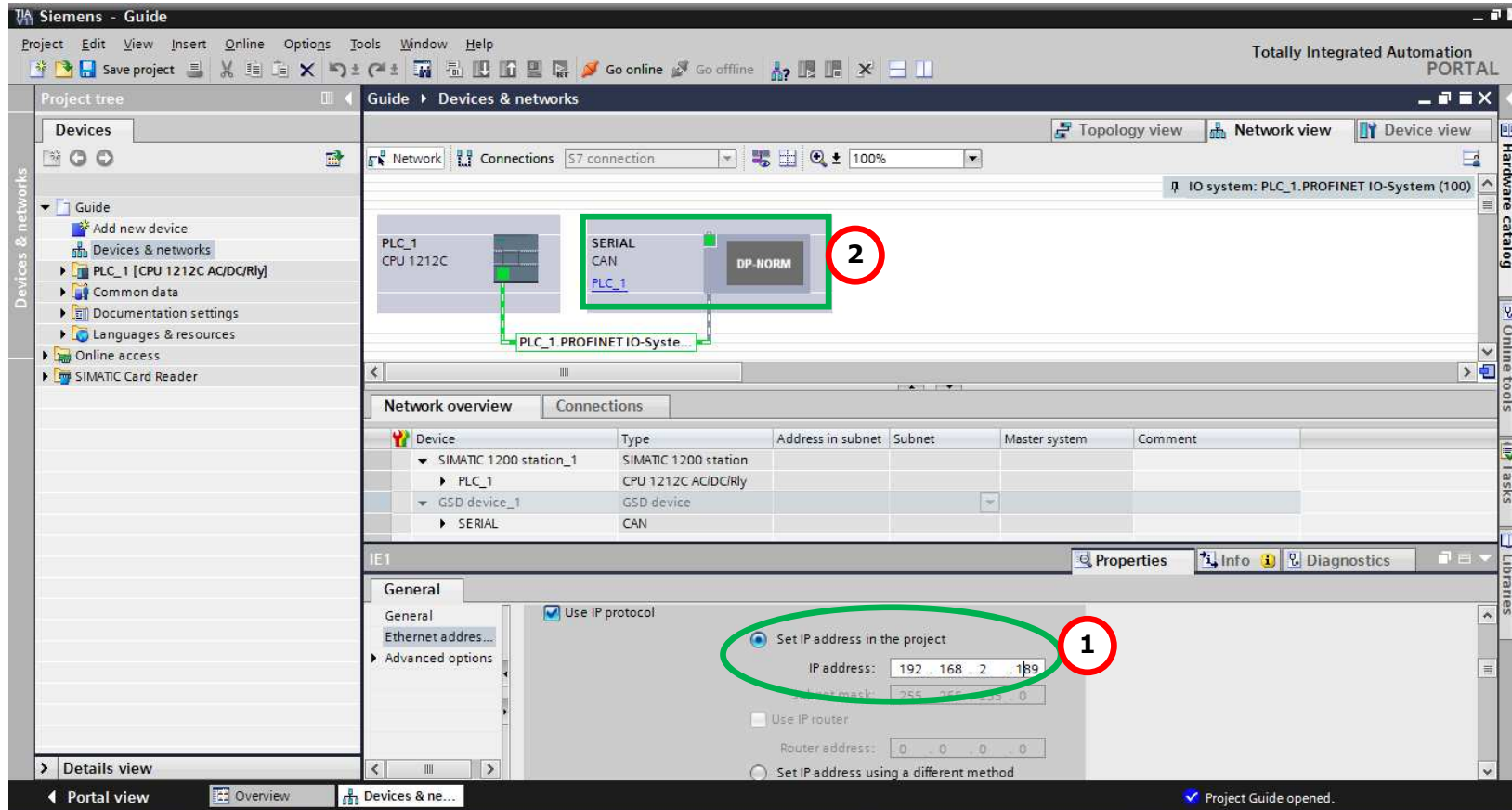
4) Then doubleclivk on the "DNSLAVE" label **(1)** and in the field name change it accordingly to the name defined in the Compositor_SW67446 **(2)**. Then add the main module "Module" and the sub-modules of "Digital Input" and "Digital Output" by double click on the three items in this order "Module" **(3)**, "Submodule 1" **(4)**, "Submodule 2" **(5)**.
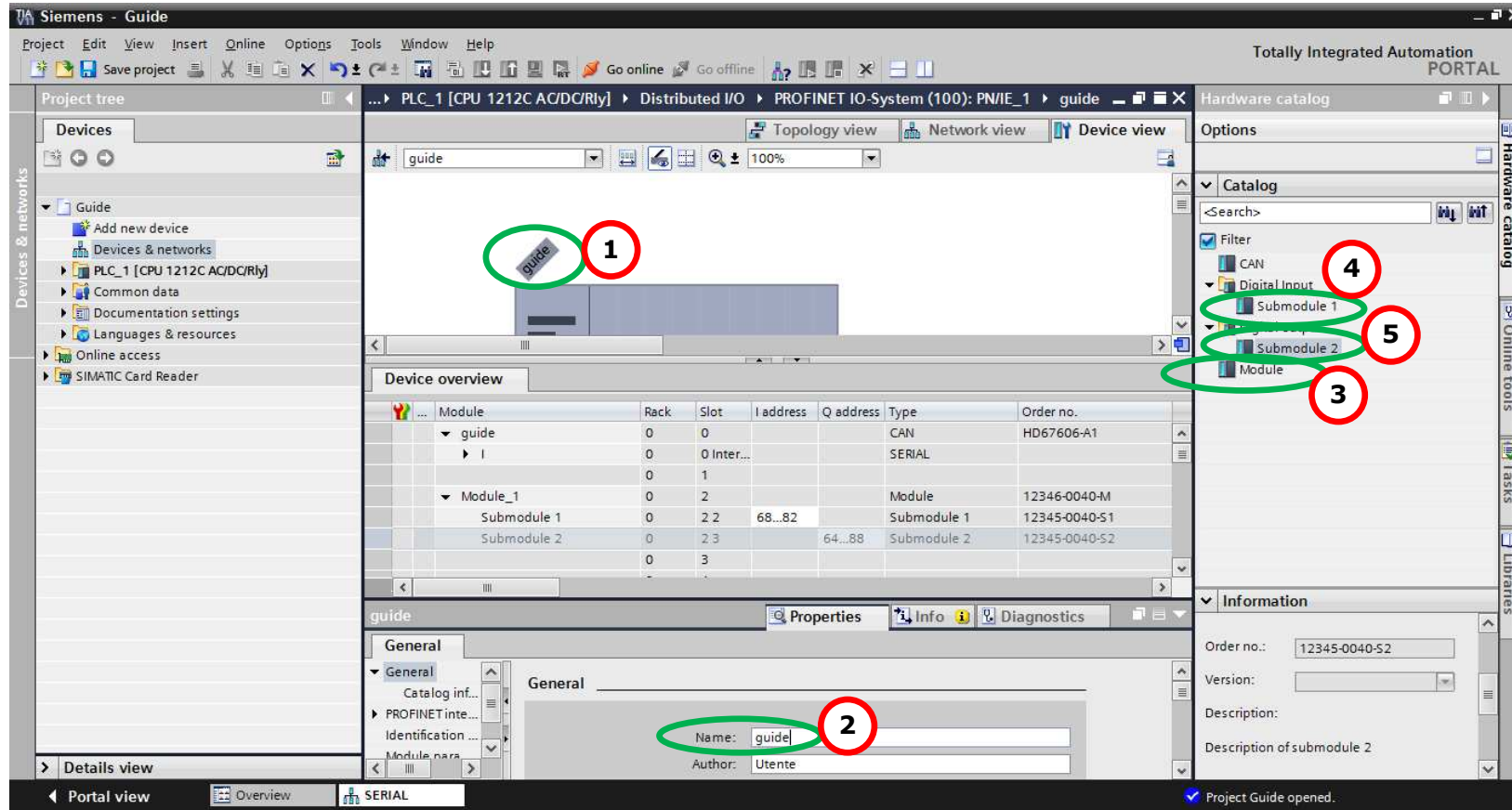
5) Load the configuration into the PLC.

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DISCLAIMER:

All technical content within this document can be modified without notice. The content of the document is a under continual renewal.
For losses due to fire, earthquake, third party access or other accidents, or intentional or accidental abuse, misuse, or use under abnormal conditions repairs are charged to the user. ADFweb.com S.r.l. will not be liable for accidental loss of use or inability to use this product, such as loss of business income. ADFweb.com S.r.l. shall not be liable for consequences of improper use.

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.