![ADFweb logo] **Industrial Electronic Devices**

User Manual
Revision 1.001
English

EtherNet/IP / J1939 – Converter
(Order Code: HD67447)

for Website information:
www.adfweb.com?Product=HD67447

for Price information:
www.adfweb.com?Price=HD67447

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	09/05/2016	Ff	All	First release version
1.001	13/03/2017	Ff	All	Revision

WARNING:

ADFweb.com reserves the right to change information in this manual about our product without warning.
ADFweb.com is not responsible for any error this manual may contain.

TRADEMARKS:

All trademarks mentioned in this document belong to their respective owners.

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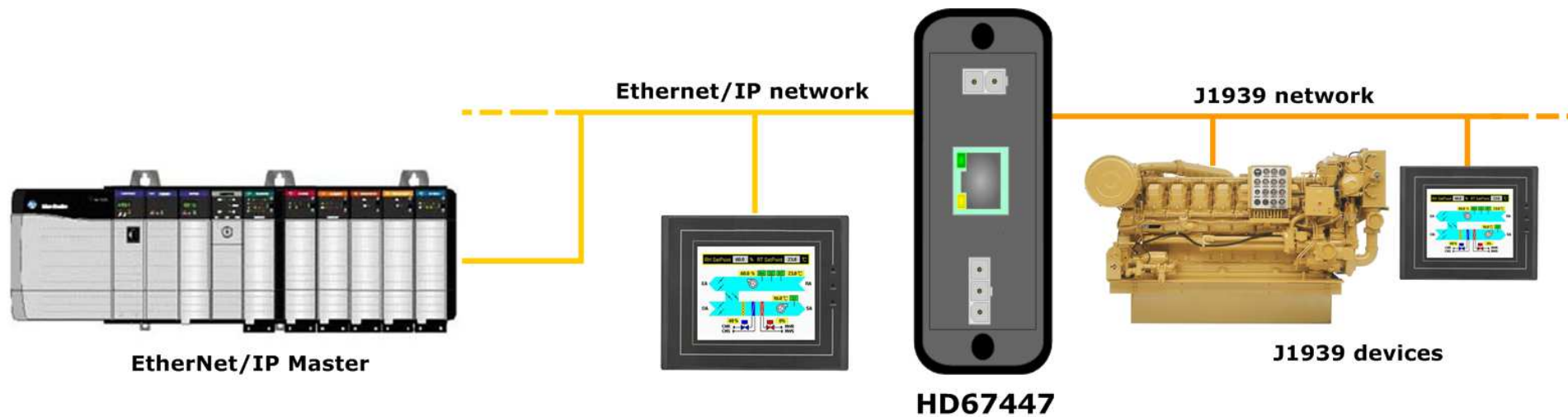
⚠️   This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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.

Industrial Electronic Devices

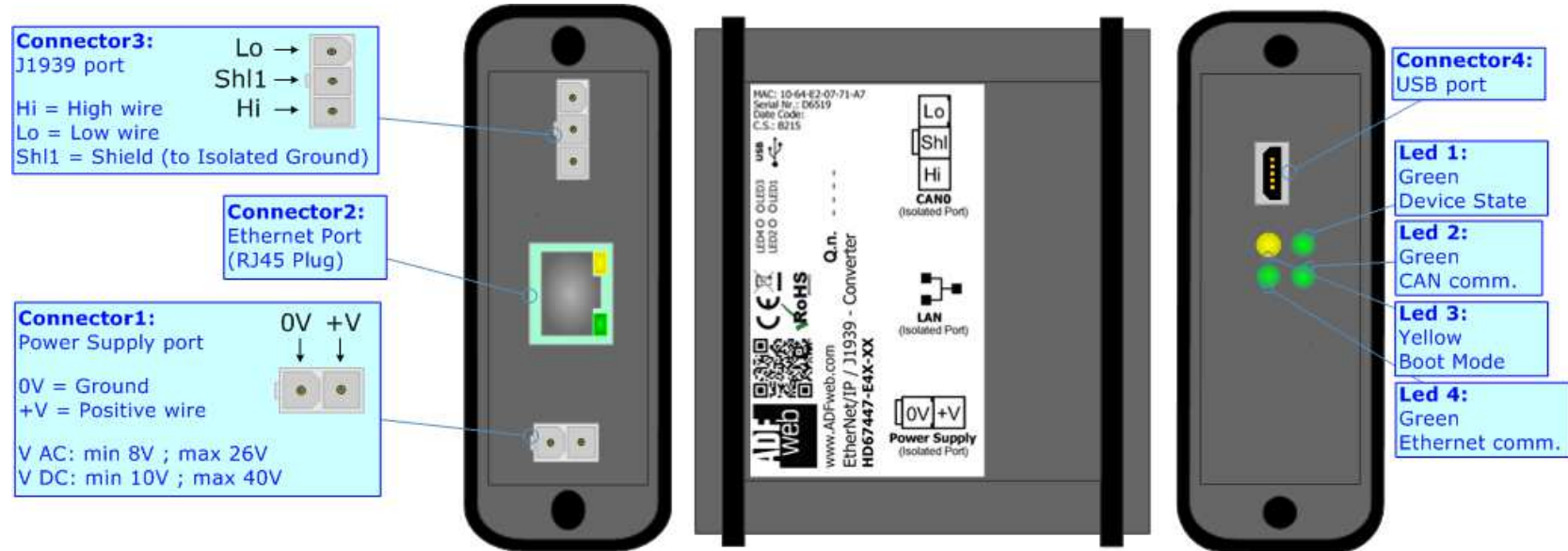**EXAMPLE OF CONNECTION:**

Ethernet/IP network

J1939 network

EtherNet/IP Master

J1939 devices

HD67447

CONNECTION SCHEME:

Figure 1a: Connection scheme for HD67447-E4x-xx

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Connector3:
J1939 port

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

Lo →
Shl1 →
Hi →

Connector2:
Ethernet Port

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

4 →
3 →
2 →
1 →

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

0V→
+V→

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

MAC: 10-64-E2-07-76-A4
Serial Nr.: D7796
Date Code:44.16
C.S.: 8215

USB

LED0 O O LED3
LED2 O O LED1

Q.n. - - - -

www.ADFweb.com
EtherNet/IP / J1939 - Converter
HD67447-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 HD67447-E7x-xx

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CHARACTERISTICS:

The "**HD67447**" series are rugged devices used to interface J1939 devices with a EtherNet/IP 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 SW67447 software on your PC in order to perform the following:

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

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POWER SUPPLY:

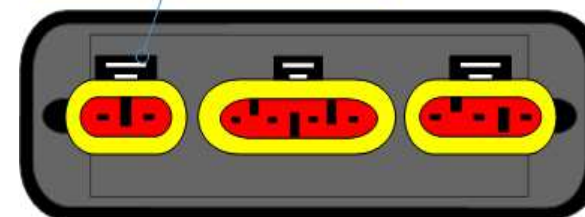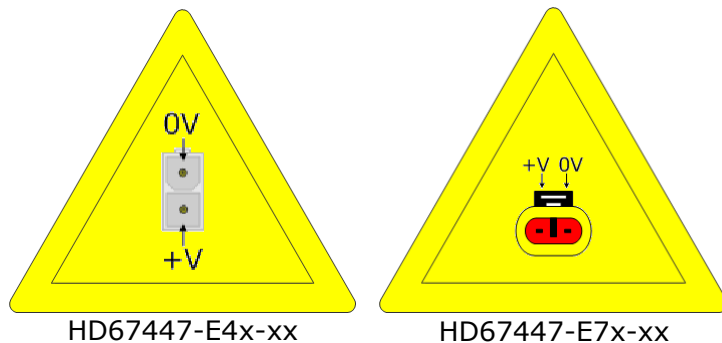The devices can be powered between a wide range of tensions. For more details see the two tables below.

	VAC 〜		VDC ===	
	Vmin	**Vmax**	**Vmin**	**Vmax**
HD67447-Exx-xx	**8V**	**26V**	**10V**	**40V**

Consumption at 24V DC:

Device	W/VA
HD67447-Exx-xx	4

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

HD67447-E4x-xx   HD67447-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

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 EtherNet/IP communication is working	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

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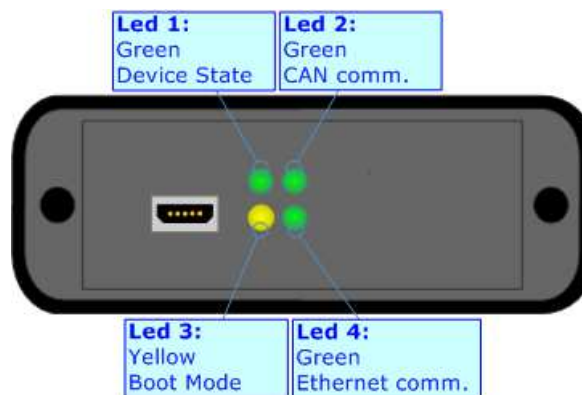
J1939:

The connection of the J1939 in the HD67447-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 HD67447-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 HD67447-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: HD67447-Exx-Yx; otherwise is this other: HD67447-Exx-Nx.

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

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*Industrial Electronic Devices*
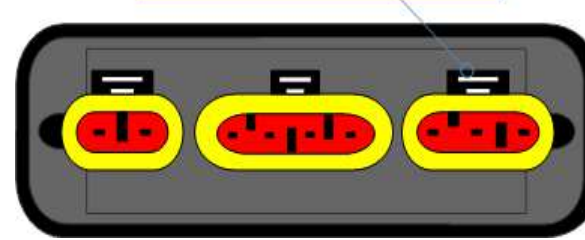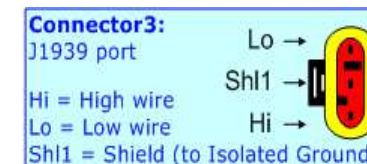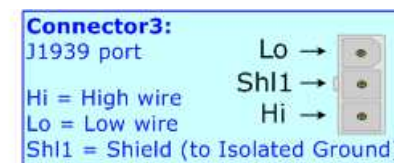
ETHERNET/IP:

The connection of EtherNet/IP in the HD67447 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 EtherNet/IP in the HD67447-E4x-xx device must be made with RJ45 connector.

The connection of the EtherNet/IP in the HD67447-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.
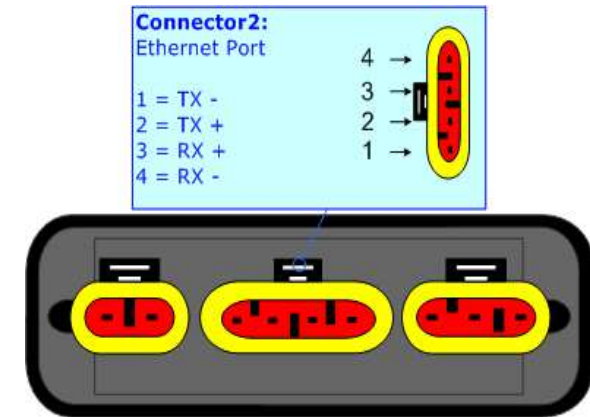
USB:

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

![ADFweb logo] **Industrial Electronic Devices**
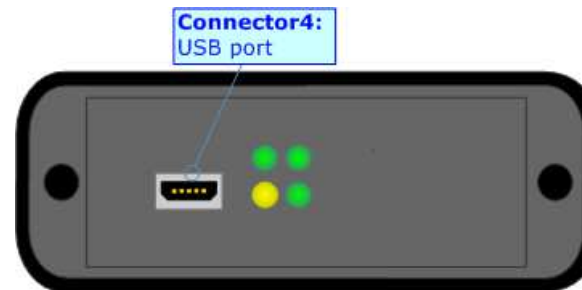
USE OF COMPOSITOR SW67447:

To configure the Converter, use the available software that runs with Windows called SW67447. 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 SW67447, the window below appears (Fig. 2).

Note:
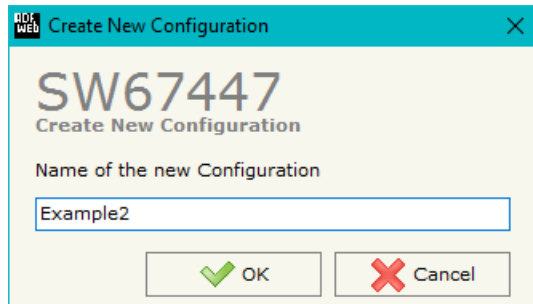   It is necessary to have installed .Net Framework 4.
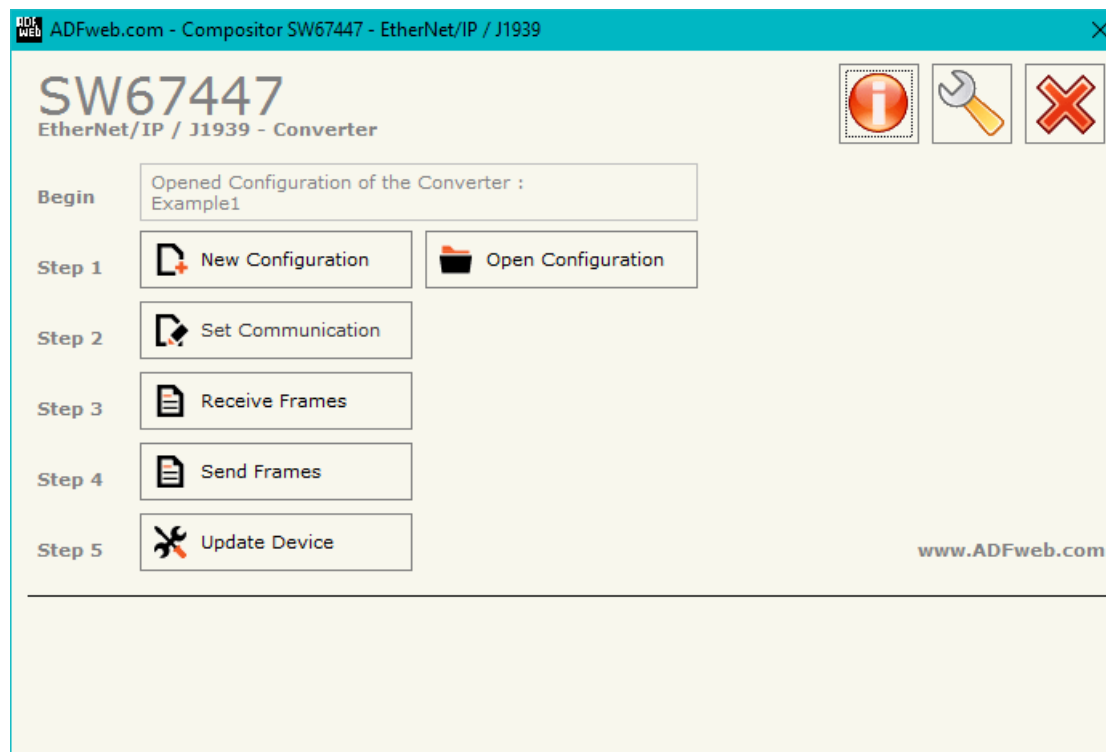
Figure 2: Main window for SW67447

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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 "EtherNet/IP / 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**".
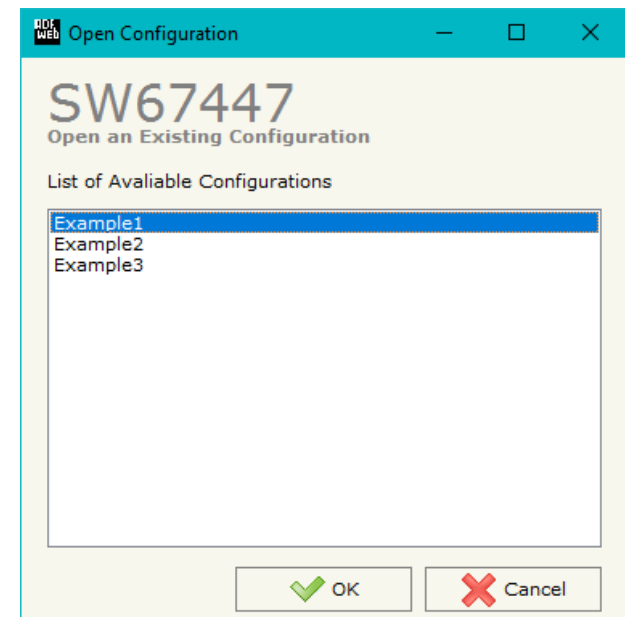
SOFTWARE OPTIONS:

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.
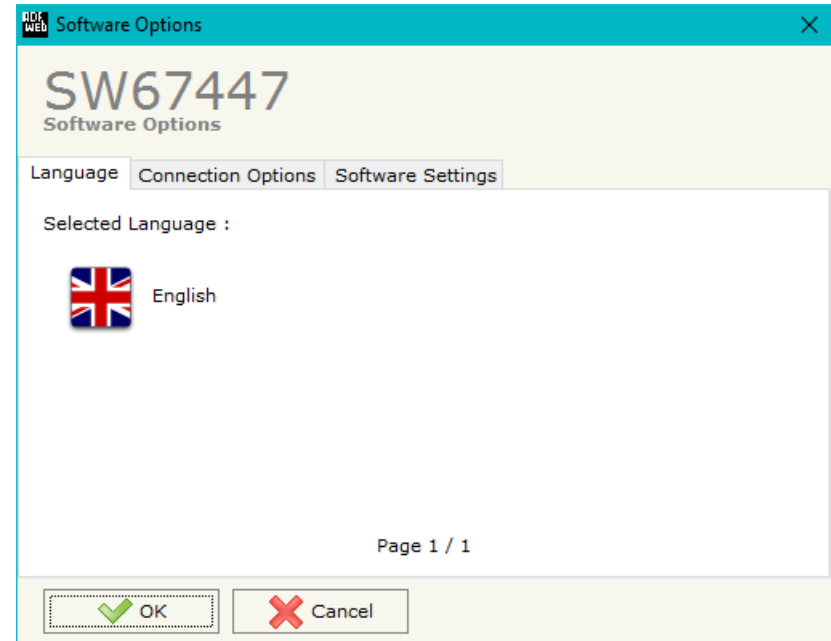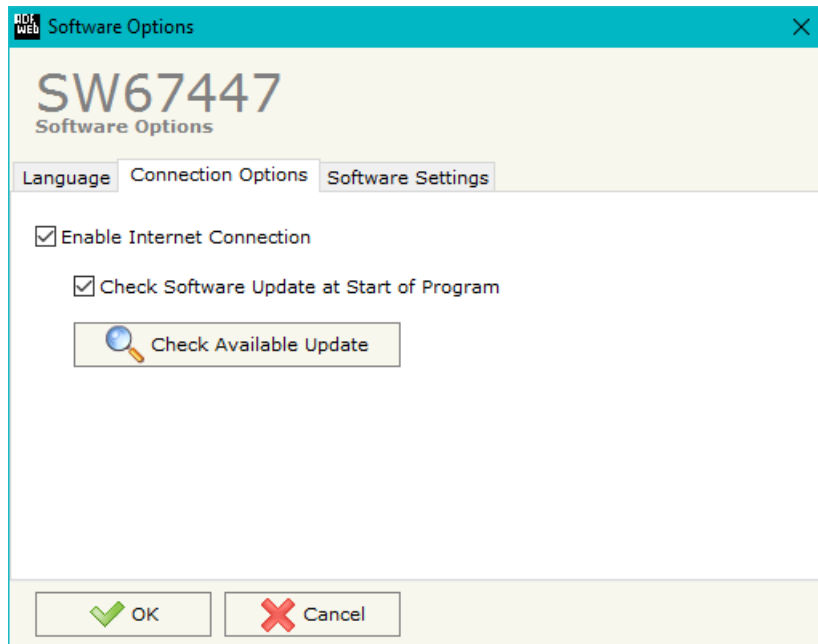
In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67447 checks automatically if there are updatings when it is launched.

Industrial Electronic Devices
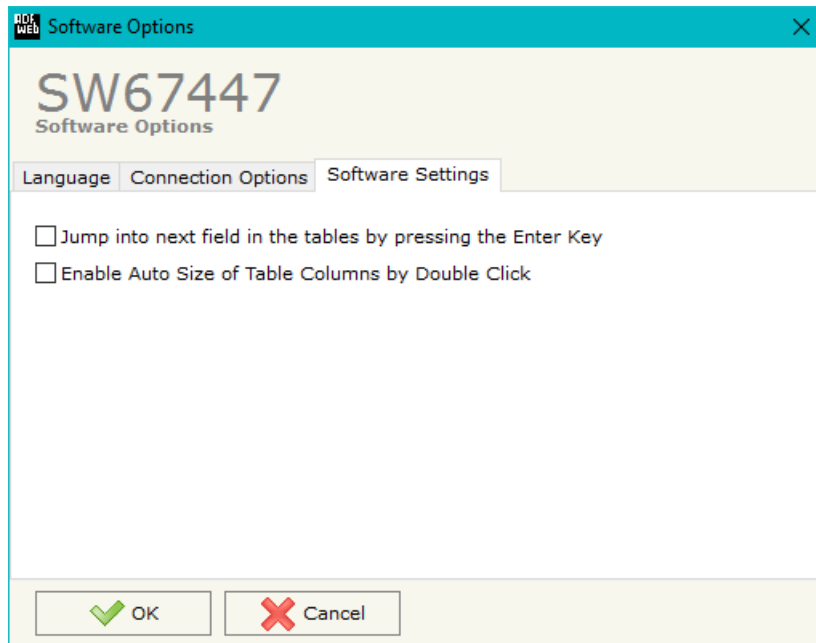
In the section "Software Settings", it is possible to enable/disable some keyboard's commands for an easier navigation inside the tables contained in the different sections of the software.

Industrial Electronic Devices

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, EtherNet/IP and J1939.

By Pressing the "**Set Communication**" button from the main window for SW67447 (Fig. 2) the window "Set Communication" appears (Fig. 3).
The window is divided in two sections, one for the EtherNet/IP and the other for the J1939.

The means of the fields for "EtherNet/IP" are:

- In the field "**IP ADDRESS**" the IP address of the converter is defined;
- In the field "**SUBNET Mask**" the SubNet Mask of the converter is defined;
- In the field "**GATEWAY**" the default gateway of the Ethernet network is defined. This feature can be enabled or disabled by pressing the Check Box field. This feature is used for going out of the net;
- In the field "**Port**" the port used for EtherNet/IP communication is defined. The port has a fixed value of 44818;
- In the field "**Number Byte Input**" the number of input byte of the slave station is defined;
- In the field "**Number Byte Output**" the number of output byte of the slave station is defined.

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

- In the field "**Baudrate**" the J1939 baudrate is defined;
- In the field "**TimeOut Data**" a time in ms is defined; when this time is elapsed and the data isn't reliable, in the EtherNet/IP array the data are set to 0xFF. It is possible to use this function only for the "Receive Frames";
- If the field "**Enable Peer to Peer**" is checked, the converter accepts all the ID that have the PGN inserted in the "Receive Frames" section;
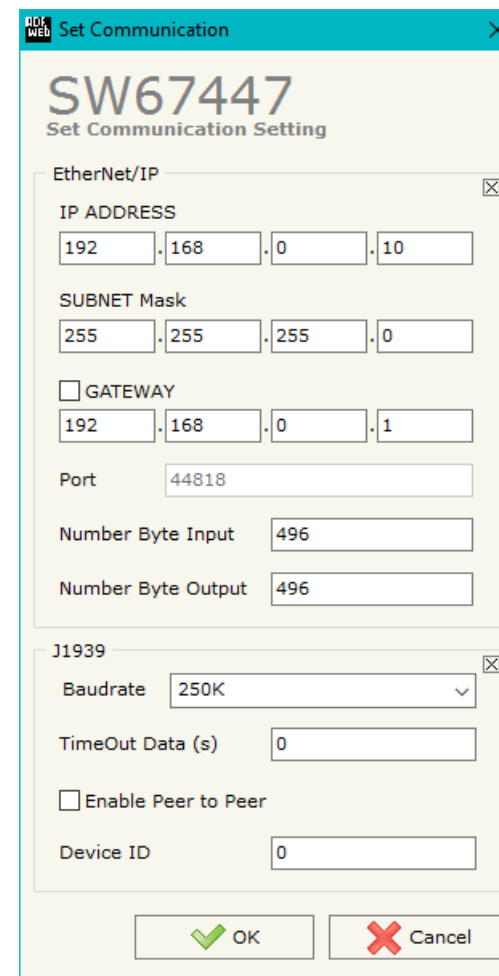- In the field "**Device ID**" the ID of J1939 side of the converter is defined.

Figure 3: "Set Communication" window

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RECEIVE FRAMES:

By pressing the "**Receive Frames**" button from the main window for SW67447 (Fig. 2) the "Receive J1939 Frames" window appears (Fig. 4). The J1939 frames inserted in this table will be linked to the Output data of EtherNet/IP side.

The data of the columns have the following meanings:

- In the field "**Data Page**" the Data Page of the J1939 message is defined. The value can be 0 or 1 (usually it is 0);
- In the field "**PGN**" the PGN of the data to read from EtherNet/IP is defined;
- In the field "**Source Address**" the address of the device that sends the frame is defined;
- If the field "**Transport Protocol**" is checked the frame uses Transport Protocol functions;
- In the field "**Start Byte**" the starting byte to map of EtherNet/IP side is defined. This field is enabled only when the field Transport Protocol is checked;
- In the field "**N° Byte**" the number of bytes to map on EtherNet/IP side is defined. For example, if your start byte is 20 an N°byte is 10, you can read byte 20 to 30 of the PGN. This field is enabled only when the field Transport Protocol is checked;
- 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;
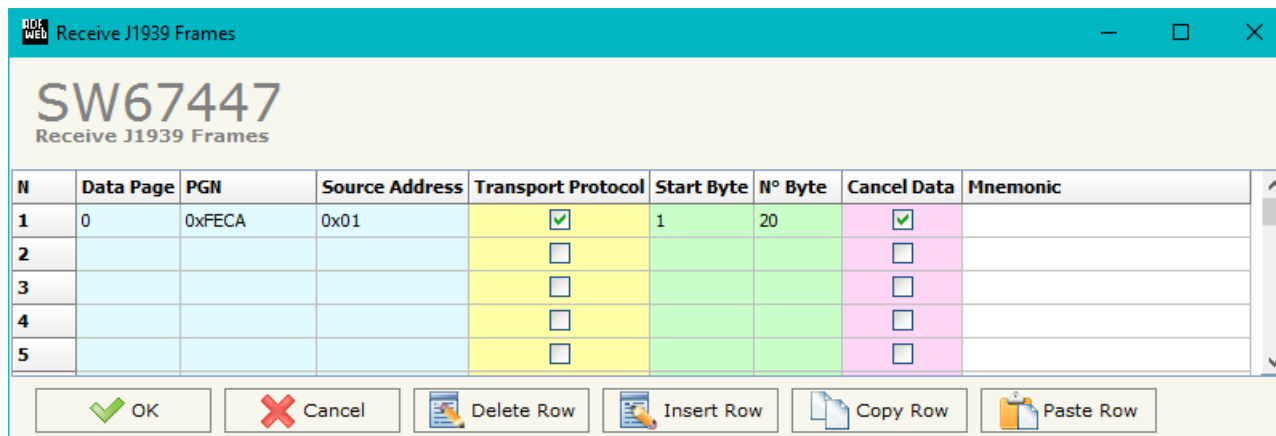- In the field "**Mnemonic**" a brief description is defined.

SW67447
Receive J1939 Frames

N	Data Page	PGN	Source Address	Transport Protocol	Start Byte	N° Byte	Cancel Data	Mnemonic
1	0	0xFECA	0x01	☑	1	20	☑	
2				☐			☐	
3				☐			☐	
4				☐			☐	
5				☐			☐	

| ✔ OK | ✖ Cancel | Delete Row | Insert Row | Copy Row | Paste Row |

Figure 4: "Receive J1939 Frames" window

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SEND FRAMES:

By pressing the "**Send Frames**" button from the main window for SW67447 (Fig. 2) the "Send J1939 frames" window appears (Fig. 5).
The J1939 frames inserted in this table will contain the Input data of EtherNet/IP side.

The data of the columns have the following meanings:

- In the field "**Priority**" the priority of the frame is defined: 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**" the Data Page of the J1939 message is defined. The value can be 0 or 1 (usually is 0);
- In the field "**PGN**" the PGN of the data to write from EtherNet/IP is defined;
- In the field "**Num Byte**" the dimension of the PGN (number of bytes) is defined. 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 received;
- 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**" the interval used for the "**Send Frame Type** → **On Timer**" is defined. The time is in milliseconds;
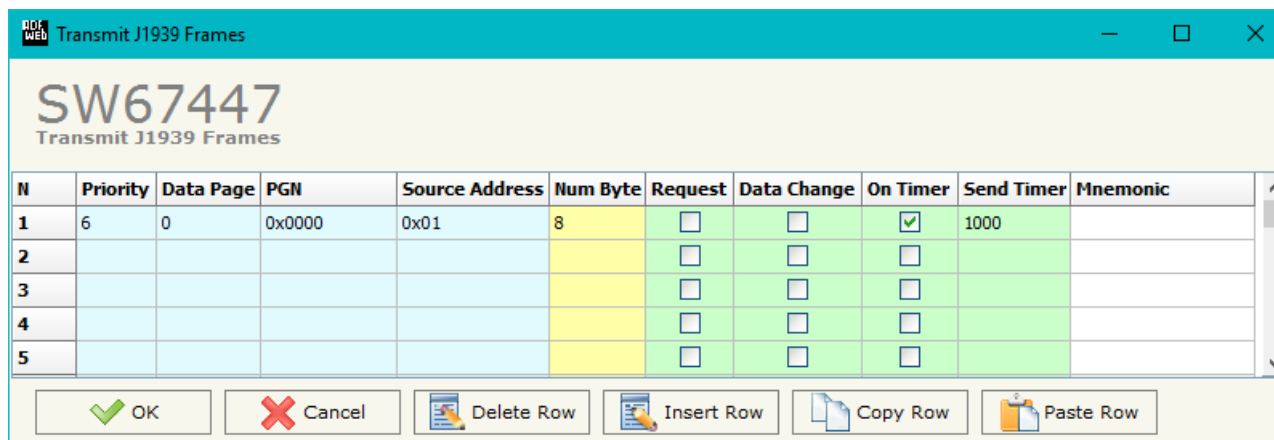- In the field "**Mnemonic**" a brief description is defined.

Figure 5: "Send J1939 Frames" window

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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;
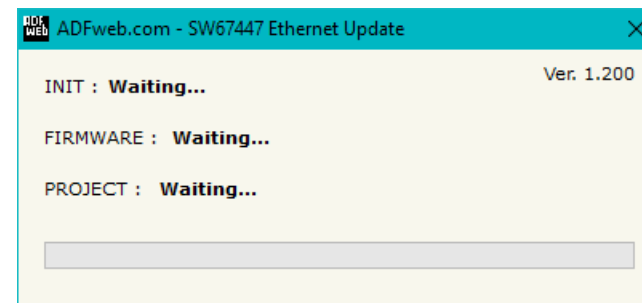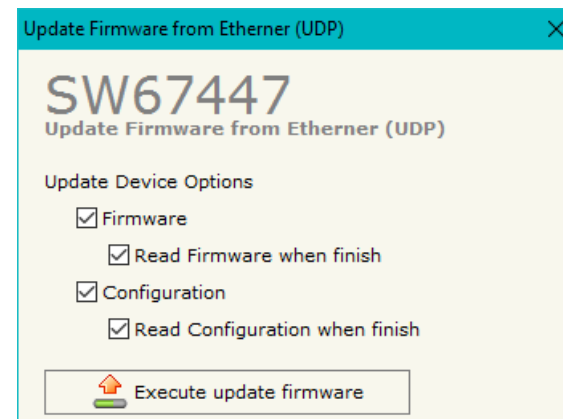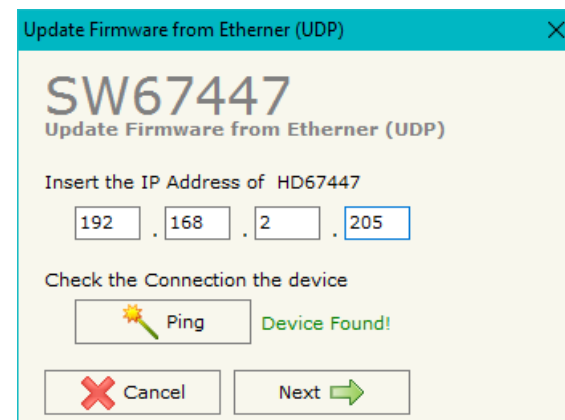- When all the operations are "OK" the device automatically goes at Normal Mode.

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 HD67447.

Note:
When you receive the device, for the first time, you have to update also the Firmware in the HD67447 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 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.

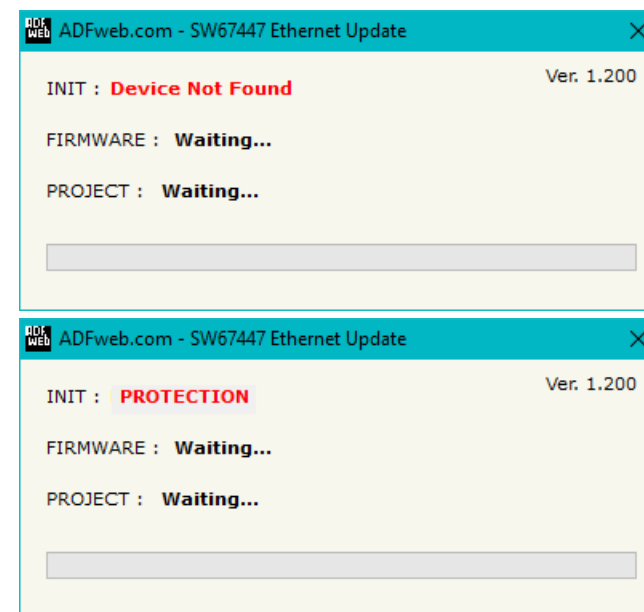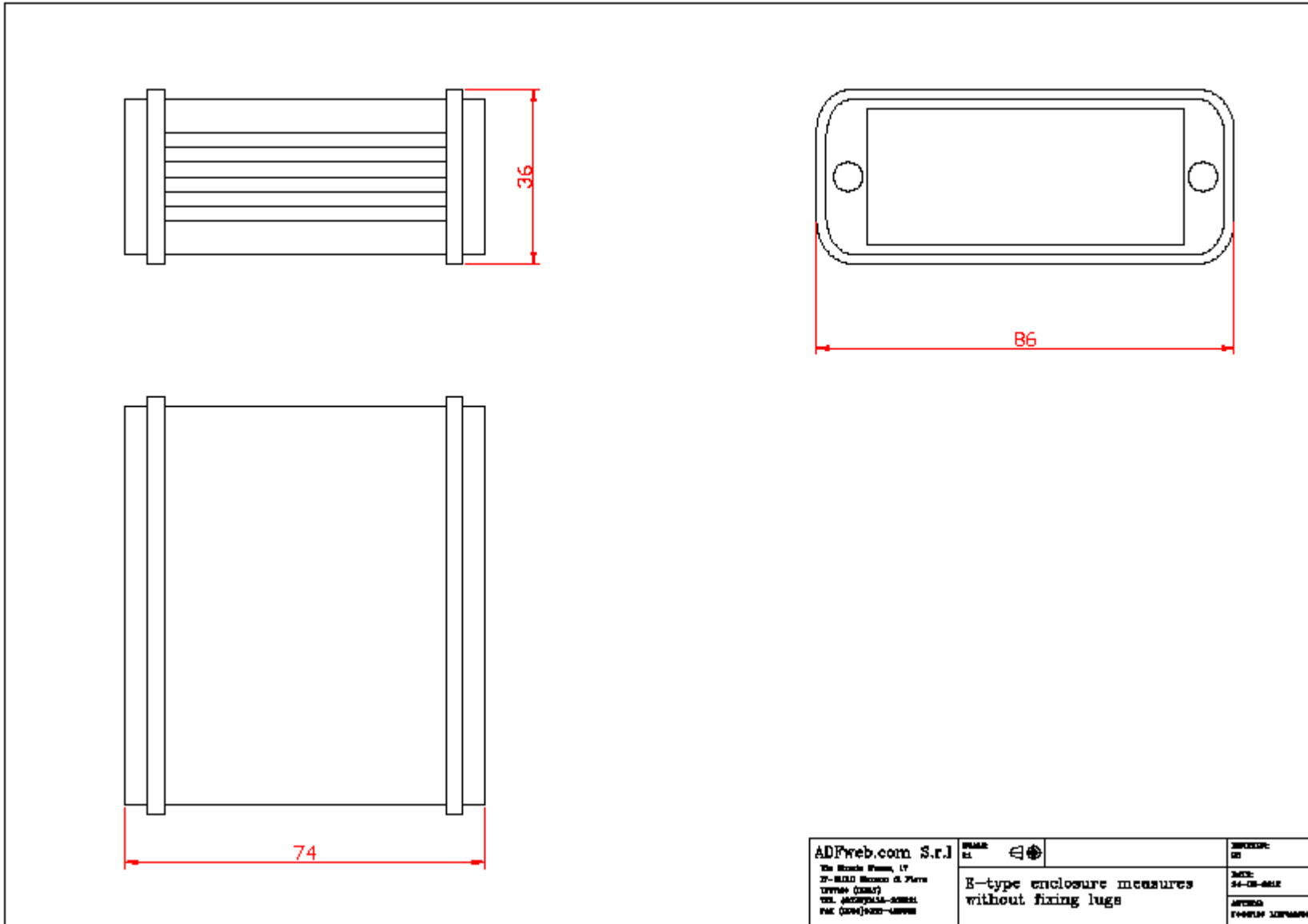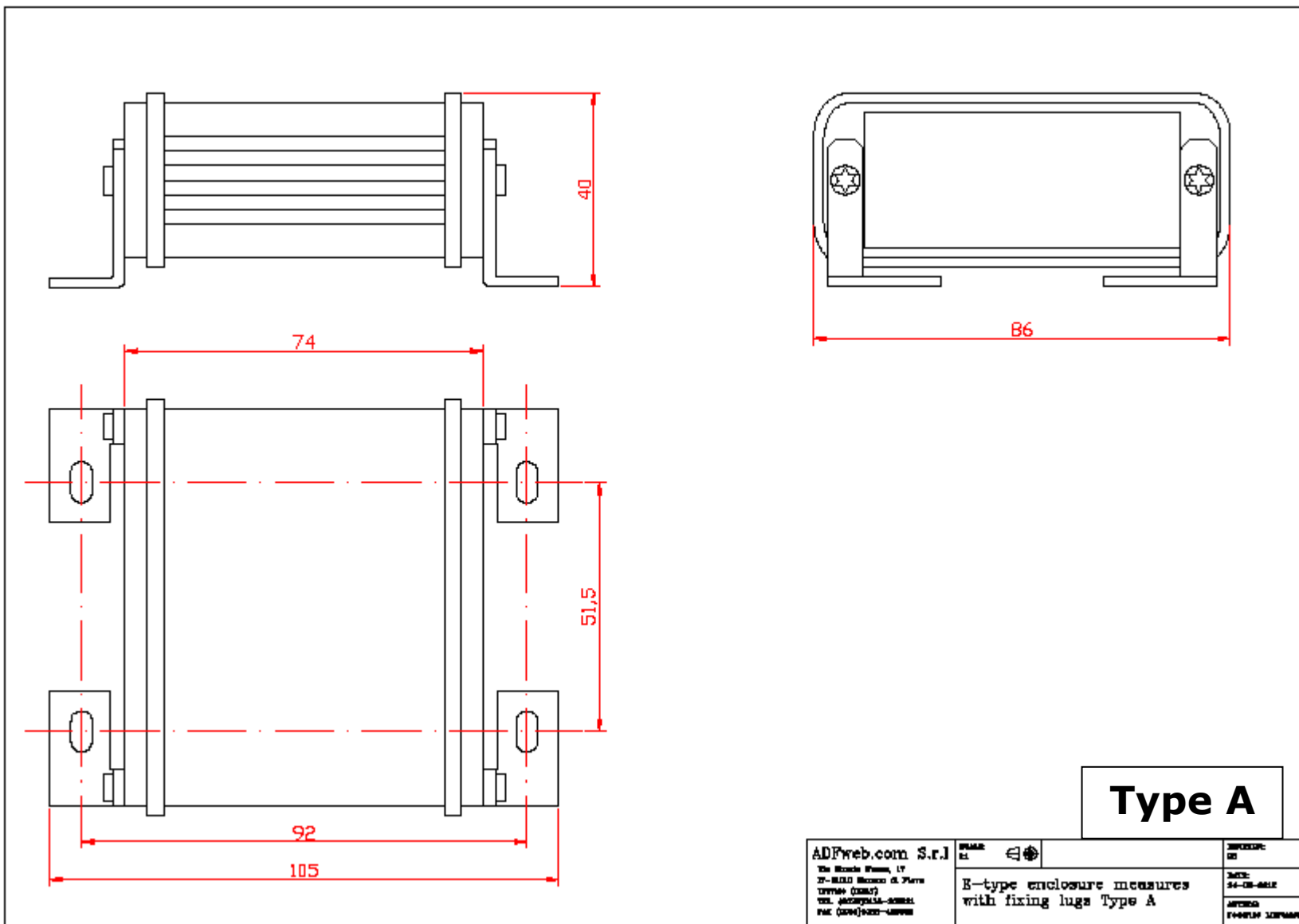In the case of HD67447 you have to use the software "SW67447": www.adfweb.com\download\filefold\SW67447.zip.

Figure 7: "Protection" error

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MECHANICAL DIMENSIONS:

E-type enclosure measures without fixing lugs

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Industrial Electronic Devices

40

74

51,5

92

105

86

Type A

ADFweb.com S.r.l			
Via Strada Nuova, 17		E-type enclosure measures with fixing lugs Type A	
IT-31010 Mareno di Piave			
TREVISO (ITALY)			

![ADFweb logo] Industrial Electronic Devices

Type B

ADFweb.com S.r.l			
Via Strada Nuova, 17 IT-31010 Mareno di Piave TREVISO (ITALY) TEL (0438)30.91.31 FAX (0438)49.20.99	E-type enclosure measures with fixing lugs Type B		

ADFweb

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Type C

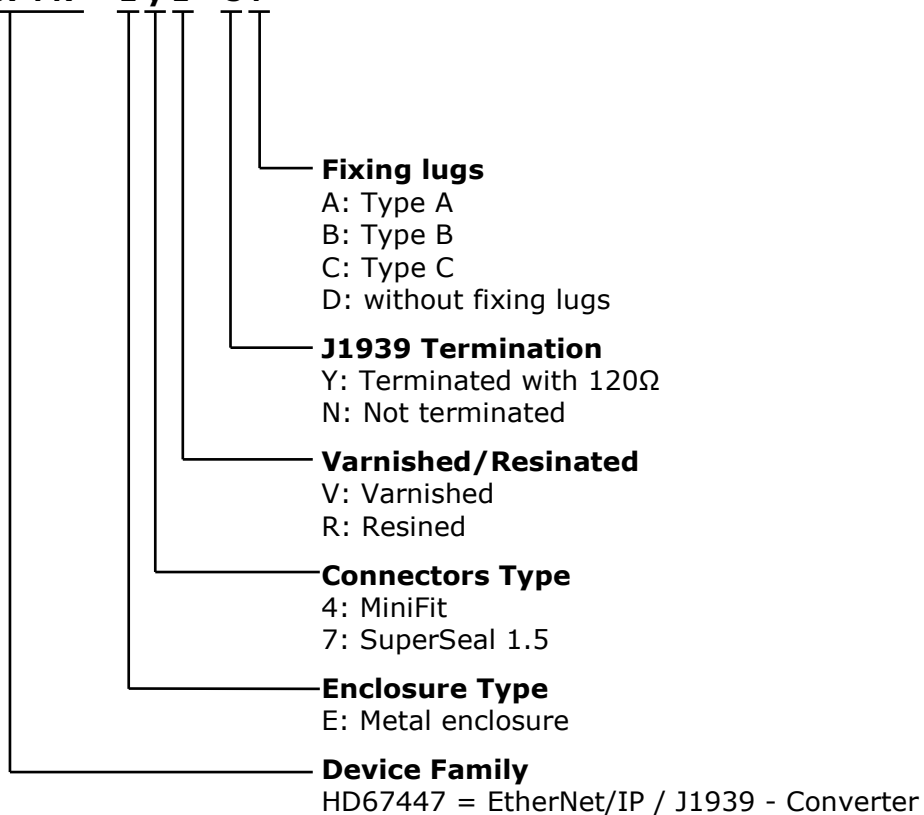|		
ADFweb.com S.r.l		
Via Strada Nuova, 17		
IT-31010 Mareno di Piave	E-type enclosure measures	
TREVISO (ITALY)	with fixing lugs Type C	

Industrial Electronic Devices

ORDERING INFORMATIONS:

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

HD67447 – 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
HD67447 = EtherNet/IP / 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 EtherNet/IP Converter as described on the following pages was accomplished with the help of the "RSLogix 5000" software of Rockwell Automation. In case of using a control system from another supplier please attend to the associated documentation.
These are the steps to follow:

1) Create a "Generic Ethernet Module" under the Ethernet section in the I/O Configuration tree.

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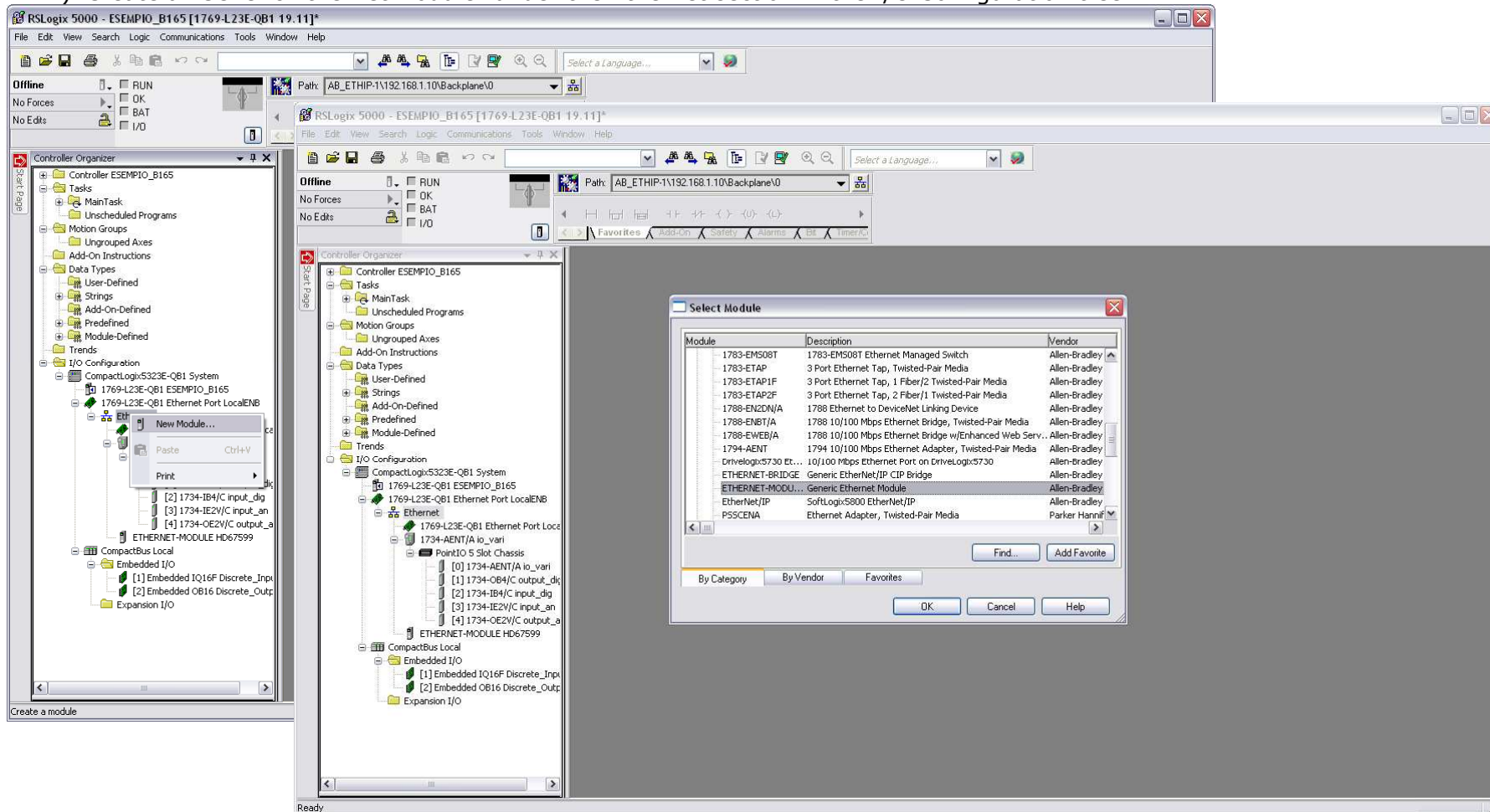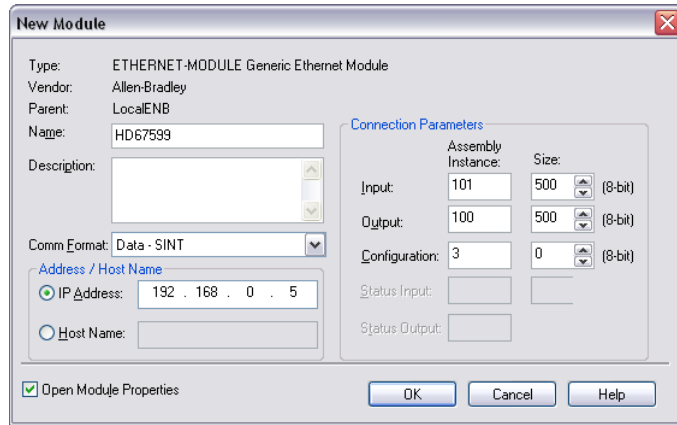
2) Edit the settings of the new Generic Ethernet Module. As shown in the screen shot below, the module was named "HD67447" and the IP-address assigned is 192.168.0.5.

For the Comm Format "Data – SINT" shall be selected as the data type.

The HD67447 can uses up to 500 bytes for input assembly instance 101 and 500 bytes for output assembly instance 100.
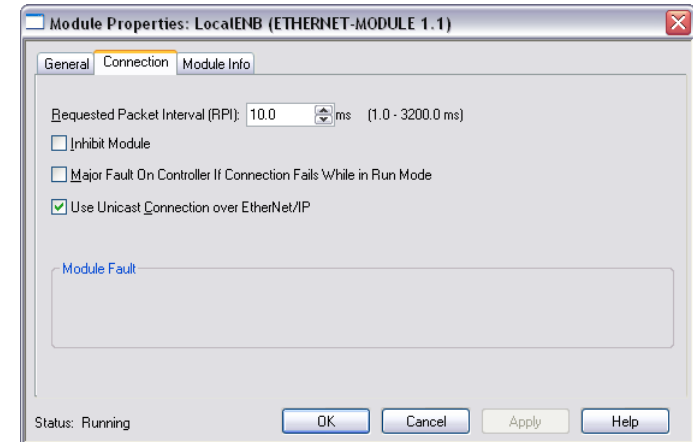
RSLogix 5000 requires a configuration assembly instance. Both modules do not provide a configuration assembly instance. Therefore it is allowed to select an instance of 3 and to set the value to zero.
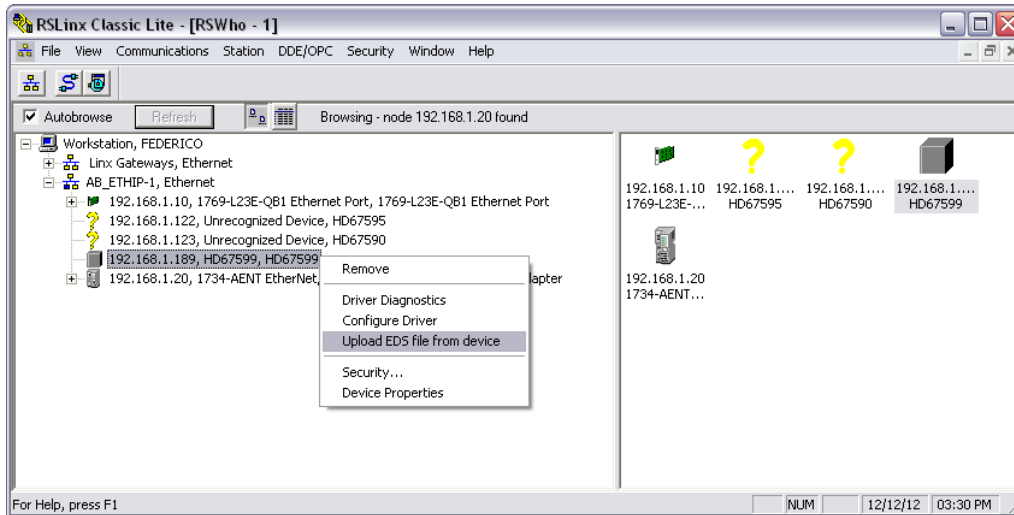
3) The setting of 10msec for the "Requested Packet Interval (RPI)" is adequate but it is possible to change this value as required. A lower value of 2ms shall not be selected.

⚠ Warning:
    The field "Use Unicast Connection over EtherNet/IP" must be checked.

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4) After the configuration is completed, the controller tags are created.

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5) With "RSLinks Classic Lite", after have done a network scan (RSWho), and finding the EtherNet/IP device, it is possible to load the EDS file for the device in order to have the "Module Info" compiled.

Industrial Electronic Devices
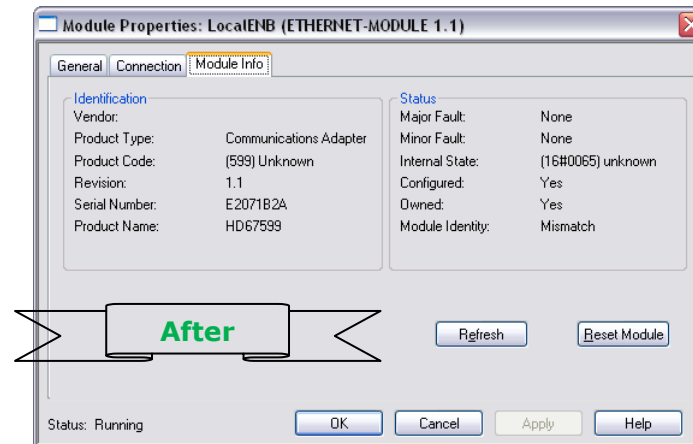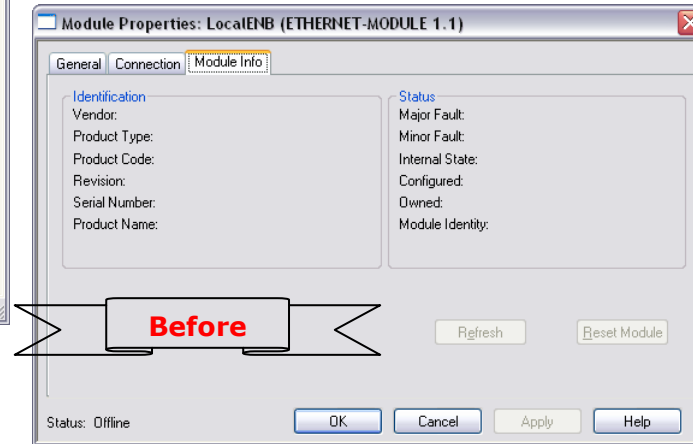
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This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product 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.

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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).

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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.