

# User Manual

Revision 1.000  
English

## NMEA 2000 / EtherNet/IP – Converter

(Order Code: HD67458)

for Website information:

[www.adfweb.com?Product=HD67458](http://www.adfweb.com?Product=HD67458)

for Price information:

[www.adfweb.com?Price=HD67458](http://www.adfweb.com?Price=HD67458)

### 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](http://www.adfweb.com?product=HD67012) (Modbus RTU Slave)
- [www.adfweb.com?product=HD67514](http://www.adfweb.com?product=HD67514) (Modbus TCP Master)
- [www.adfweb.com?product=HD67515](http://www.adfweb.com?product=HD67515) (Modbus TCP Slave)

### CANopen from/to Modbus

See also the following links:

- [www.adfweb.com?product=HD67001](http://www.adfweb.com?product=HD67001) (Modbus RTU Master)
- [www.adfweb.com?product=HD67502](http://www.adfweb.com?product=HD67502) (Modbus RTU Slave)
- [www.adfweb.com?product=HD67504](http://www.adfweb.com?product=HD67504) (Modbus TCP Master)
- [www.adfweb.com?product=HD67505](http://www.adfweb.com?product=HD67505) (Modbus TCP Slave)

Do you have an your customer protocol?

See the following links:

[www.adfweb.com?Product=HD67003](http://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](http://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/](http://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	04/09/2019	Ff	All	First release version

**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:



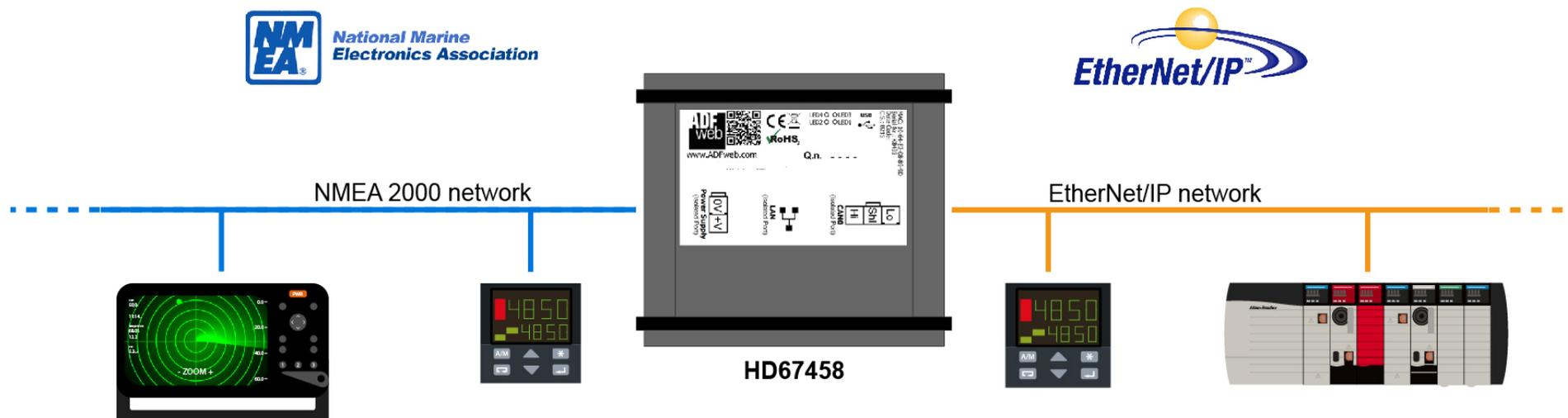
This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

**CE CONFORMITY**

The declaration is made by our company. You can send an email to [support@adfweb.com](mailto:support@adfweb.com) or give us a call if you need it.

**EXAMPLE OF CONNECTION:**

## NMEA 2000 / EtherNet/IP - Converter HD67458



[ADFweb.com](http://ADFweb.com)



+39 0438 309 131



+39 349 440 9592



[support@adfweb.com](mailto:support@adfweb.com)

**CONNECTION SCHEME:**

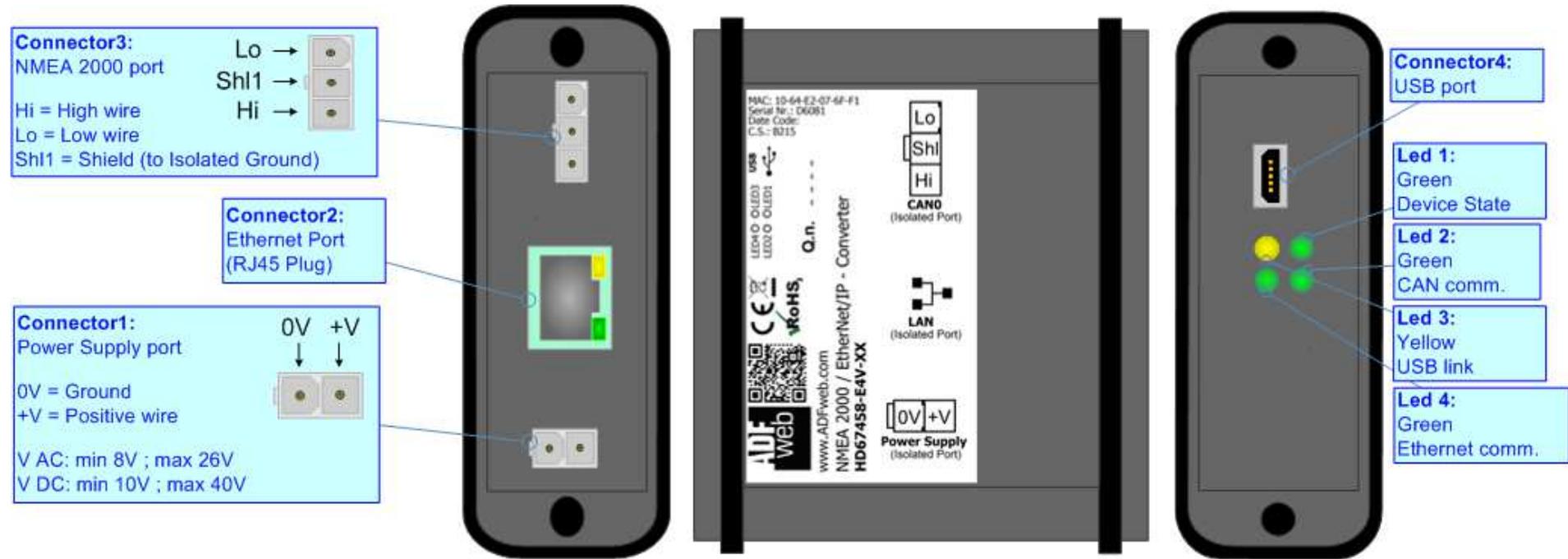


Figure 1a: Connection scheme for HD67458-E4x-xx

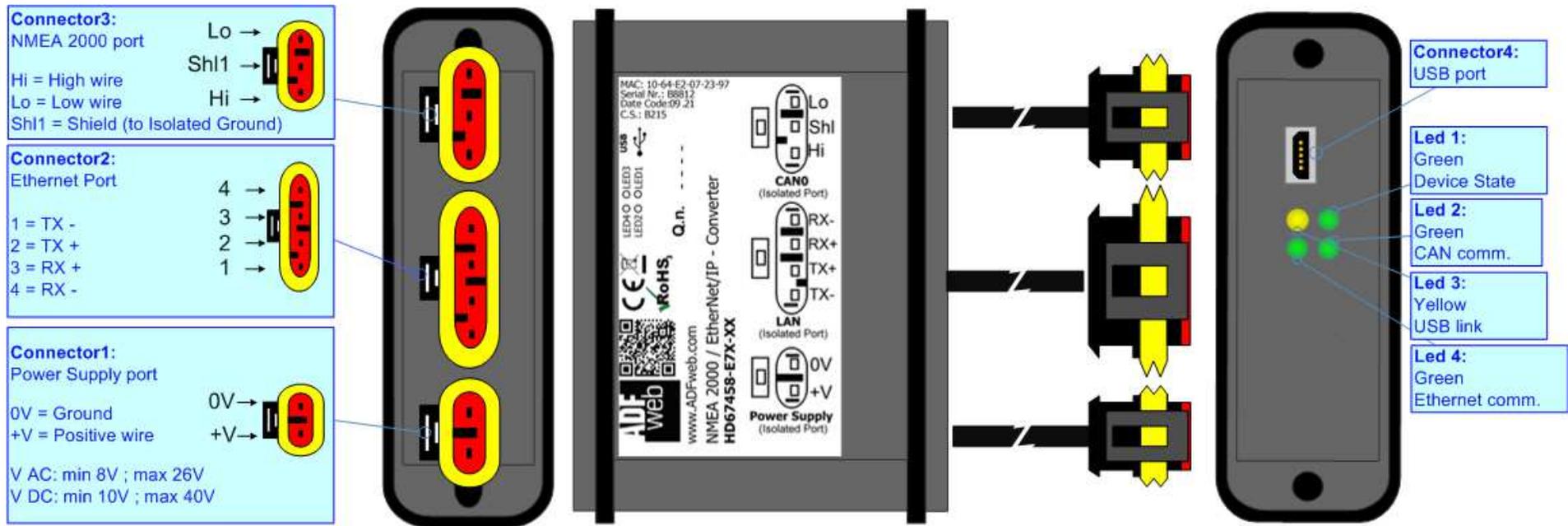


Figure 1b: Connection scheme for HD67458-E7x-xx

**CHARACTERISTICS:**

The “**HD67458**” series are rugged devices used to interface EtherNet/IP Master with a NMEA 2000 network.

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 SW67458 software on your PC in order to perform the following:

- Define the parameter of the EtherNet/IP bus;
- Define the parameter of the NMEA 2000 bus;
- Define the list of NMEA2000 messages in reception and transmission;
- Update the Firmware and/or the Project.

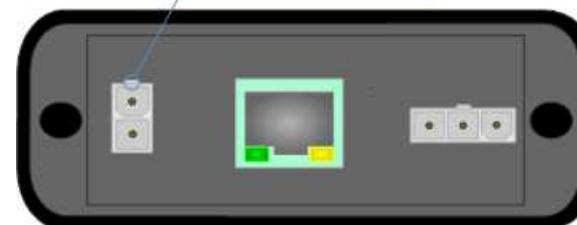
**POWER SUPPLY:**

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

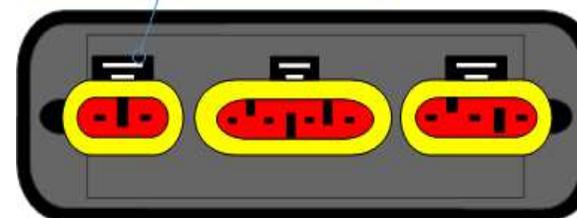
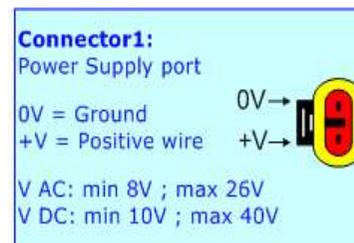
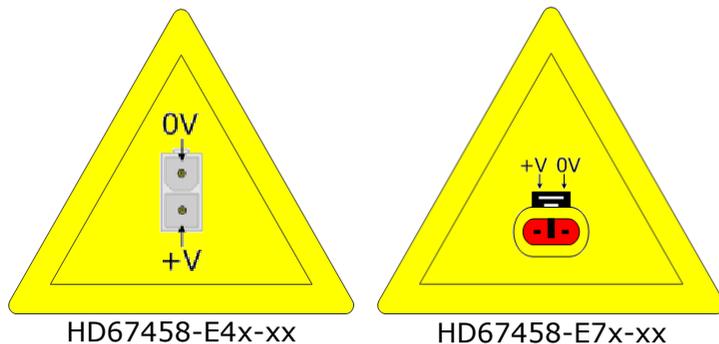
	VAC		VDC	
	Vmin	Vmax	Vmin	Vmax
<b>HD67458-Exx-xx</b>	<b>8V</b>	<b>26V</b>	<b>10V</b>	<b>40V</b>

Consumption at 24V DC:

Device	W/VA
HD67458-Exx-xx	4



**Caution: Not reverse the polarity power**

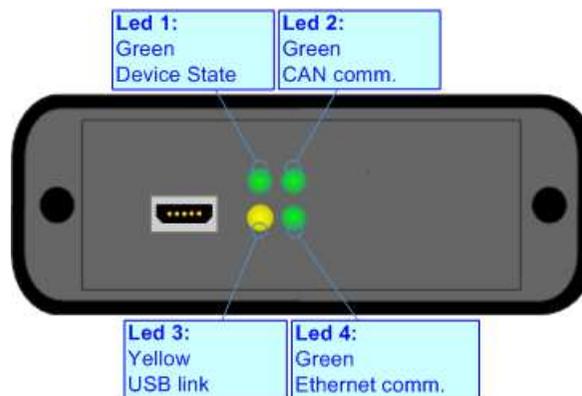


**Note:** It is possible to use also negative tensions. In this case the polarity must be inverted.

**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)	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
2: CAN Communication (green)	Blinks when NMEA 2000 frames are received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
3: USB link (yellow)	OFF	ON
4: Ethernet communication (green)	Blinks when the EtherNet/IP communication is working	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress

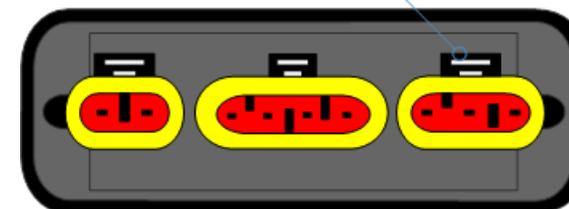
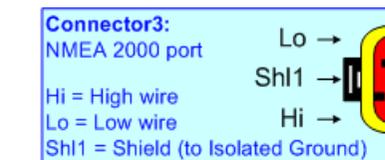
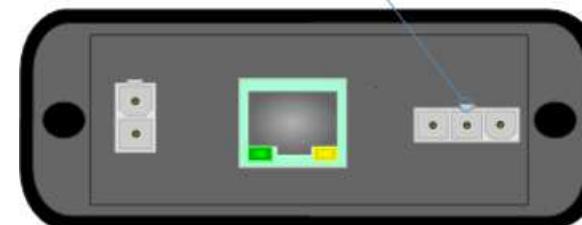
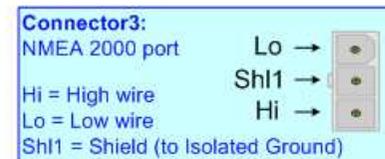


**NMEA 2000:**

The connection of the NMEA 2000 in the HD67458-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 NMEA 2000 in the HD67458-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 NMEA 2000 line, with a 120Ω resistor, in the HD67458-Exx-xx is made internally of the device; when the order is performed. If the device have the EtherNet/IP terminated the code is the follow: HD67458-Exx-Yx; otherwise is this other: HD67458-Exx-Nx.



Cable characteristics:

<b>DC parameter:</b>	Impedance	70 Ohm/m
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<b>AC parameters:</b>	Impedance	120 Ohm/m
	Delay	5 ns/m

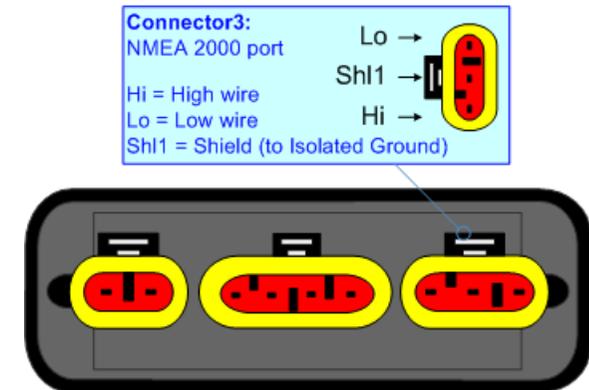
Length	Baud Rate [bps]	Length MAX [m]
	10 K	5000
	20 K	2500
	50 K	1000
	100 K	650
	125 K	500
	250 K	250
	500 K	100
	800 K	50
	1000 K	25

**ETHERNET:**

The connection of EtherNet/IP in the HD67458 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.

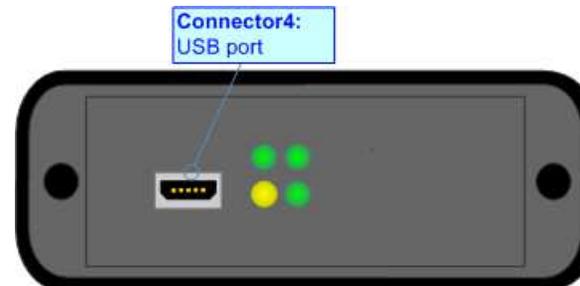
The connection of EtherNet/IP in the HD67458-E4x-xx device must be made with RJ45 connector.

The connection of the EtherNet/IP in the HD67458-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.



**USE OF COMPOSITOR SW67458:**

To configure the Converter, use the available software that runs with Windows called SW67458. It is downloadable on the site [www.adfweb.com](http://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 SW67458, the window below appears (Fig. 2).

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

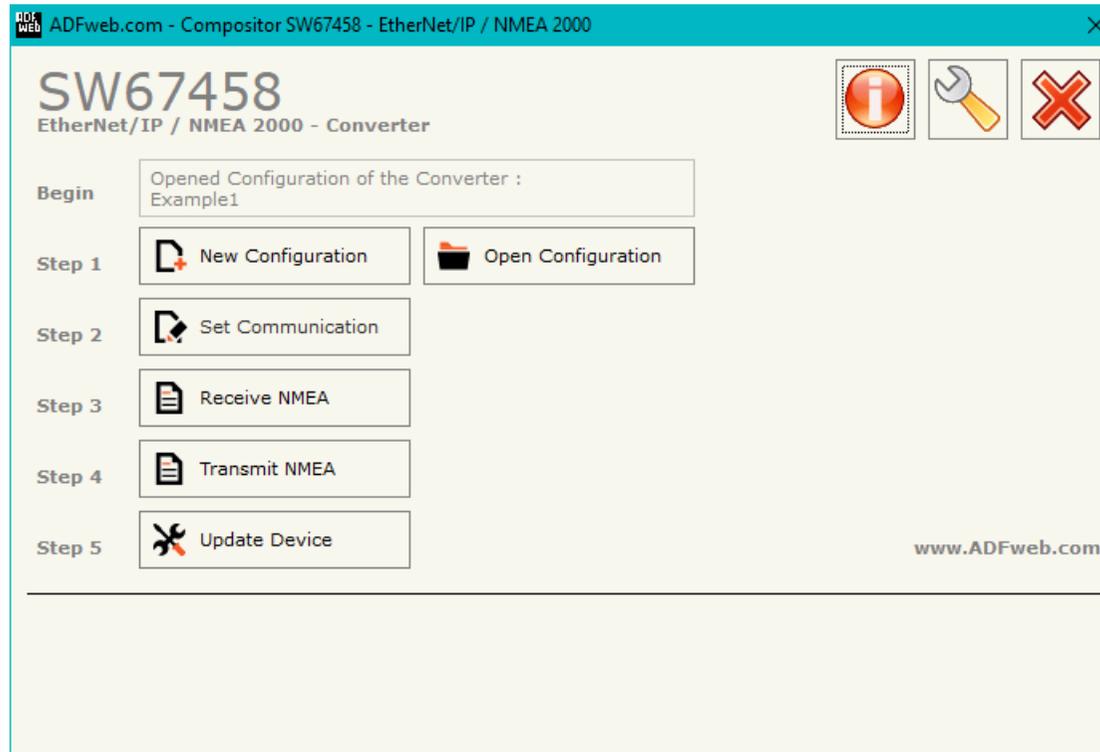
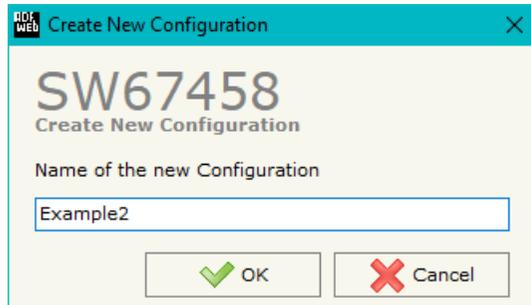


Figure 2: Main window for SW67458

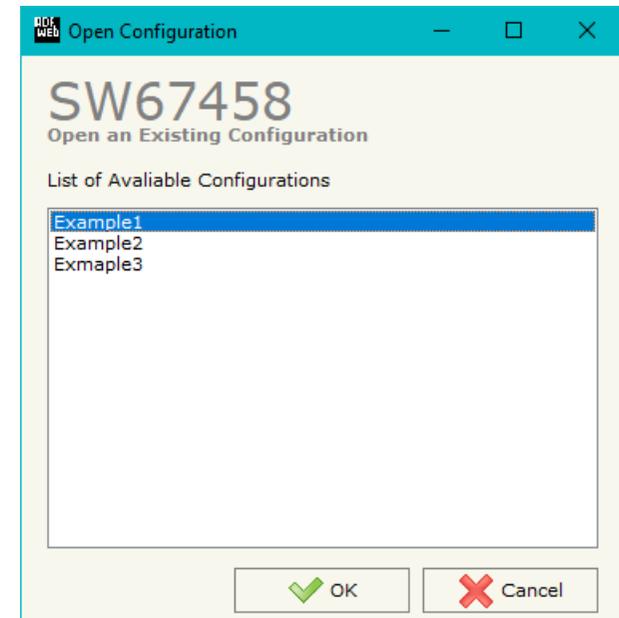
**NEW CONFIGURATION / OPEN CONFIGURATION:**

The “**New Configuration**” button creates the folder which contains the entire device’s configuration.



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

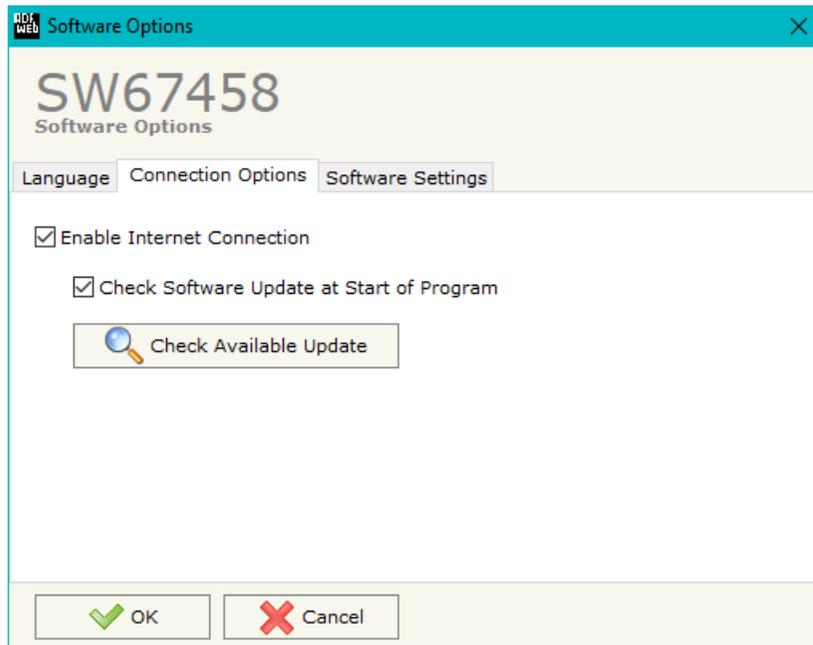
- To clone the configurations of a programmable “NMEA 2000 / EtherNet/IP - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button “**Open Configuration**”.



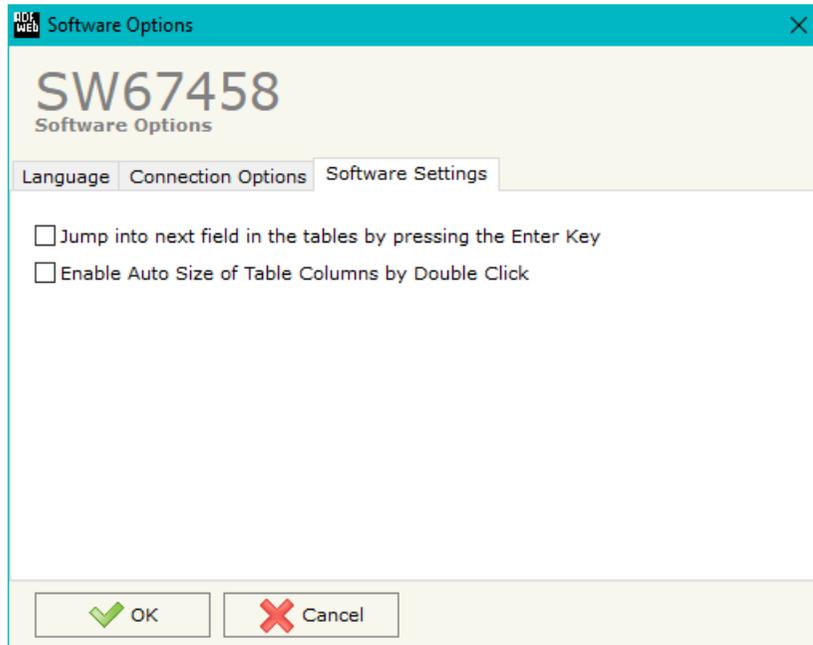
**SOFTWARE OPTIONS:**

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 SW67458 checks automatically if there are updatings when it is launched.



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.

## SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, NMEA 2000 and EtherNet/IP.

By Pressing the "**Set Communication**" button from the main window for SW67458 (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 NMEA 2000.

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

- In the field "**IP ADDRESS**" the IP address of the EtherNet/IP side of the converter is defined;
- In the field "**SUBNET Mask**" the SubNet Mask of the EtherNet/IP 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 EtherNet/IP communication is defined. The port has a fixed value of 34964;
- In the field "**Number Byte Input**" the number of byte from the EtherNet/IP to the converter is defined (at maximum it is possible to use 496 byte);
- In the field "**Number Byte Input**" the number of byte from the converter to the EtherNet/IP is defined (at maximum it is possible to use 496 byte).

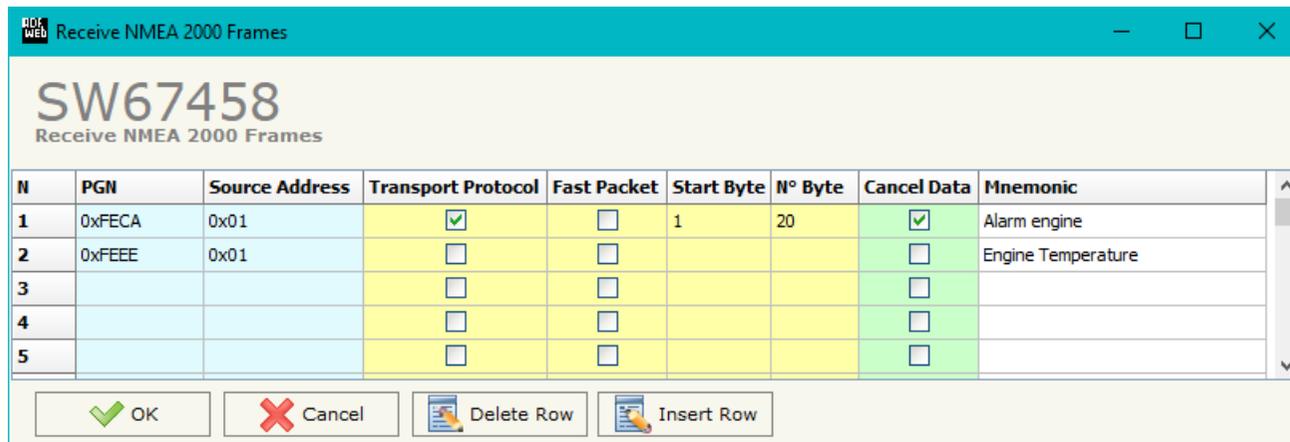
The means of the fields for the "NMEA 2000" section are:

- In the field "**Baud Rate**" the baud rate of the NMEA 2000 is defined;
- In the field "**Time Out Data (s)**" the timeout of the data is defined. If this time is elapsed, the value of the data of the NMEA 2000 frame become "0xFF" (if the "Cancel Data" field is checked in the "Receive NMEA 2000" section);
- 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.

The screenshot shows a software window titled "Set Communication" for device "SW67458". The window is split into two main sections. The top section, "EtherNet/IP", contains several input fields: "IP ADDRESS" (192.168.0.10), "SUBNET Mask" (255.255.255.0), a "GATEWAY" checkbox (unchecked) with a value of 192.168.0.1, "Port" (44818), "Number Byte Input" (496), and "Number Byte Output" (496). The bottom section, "NMEA 2000", contains "Baudrate" (250K) and "Time Out Data (s)" (10). There is also an unchecked "Enable Peer to Peer" checkbox. At the bottom right, there are "OK" and "Cancel" buttons.

Figure 3: "Set Communication" window

## RECEIVE NMEA 2000 FRAMES:



The screenshot shows a window titled "Receive NMEA 2000 Frames" with a header "SW67458" and "Receive NMEA 2000 Frames". Below the header is a table with the following data:

N	PGN	Source Address	Transport Protocol	Fast Packet	Start Byte	N° Byte	Cancel Data	Mnemonic
1	0xFECA	0x01	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	20	<input checked="" type="checkbox"/>	Alarm engine
2	0xFEED	0x01	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	Engine Temperature
3			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	
4			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	
5			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	

At the bottom of the window, there are four buttons: "OK" (with a green checkmark), "Cancel" (with a red X), "Delete Row" (with a trash icon), and "Insert Row" (with a plus icon).

Figure 4: "Receive Frames" window

The means of the fields are:

- ➔ In the field "**PGN**" the PGN of the NMEA 2000 message to receive is defined (in the NMEA 2000 protocol, the PGN is an identifier);
- ➔ 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 can use transport protocol functions;
- ➔ If the field "**Fast Packet**" is checked, the frame will use the Fast Packet functions;
- ➔ In the field "**Start Byte**" the starting byte to save internal memory array is defined;
- ➔ In the field "**N Bytes**" the number of consecutive byte from the starting one is defined. For example, if the Start Byte is '20' and Num Bytes is '10', it is possible to read the byte from 20 to 30;
- ➔ If the field "**Cancel Data**" is checked, when the data is oldest of the time inserted in the "TimeOut Data", the converter sets "0xFF" in the bytes of the internal memory array reserved for the PGN;
- ➔ In the field "**Mnemonic**" the description for the frame is defined.

## TRANSMIT NMEA 2000 FRAMES

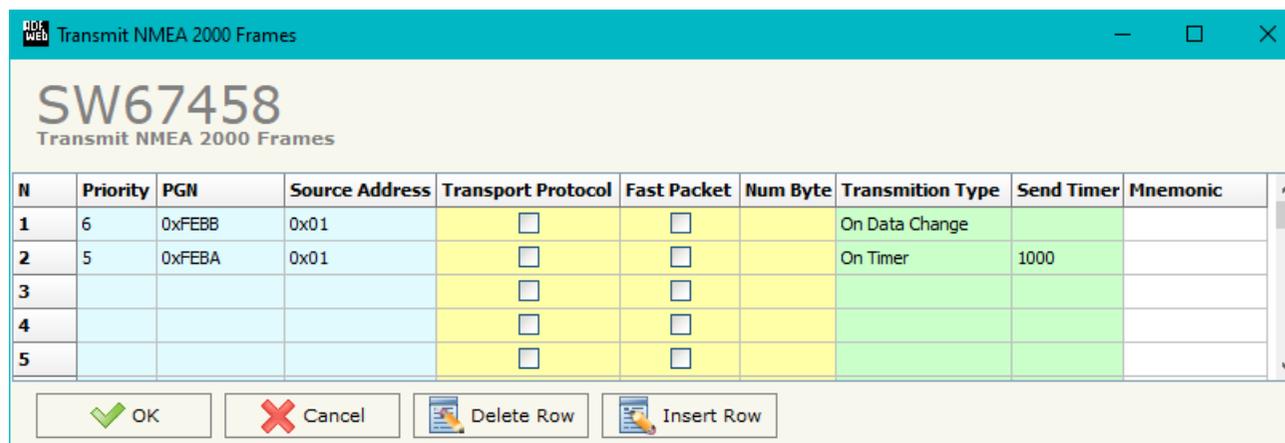


Figure 5: "Send Frames" window

The means of the fields are:

- In the field "**Priority**" the priority of the NMEA 2000 message is defined. In NMEA 2000 protocol, the priority is a number between 0 and 7. '0' is the highest priority and '7' is the lowest;
- In the field "**PGN**" the PGN of the NMEA 2000 message to send is defined (in NMEA 2000 protocol the PGN is an identifier);
- In the field "**Source Address**" the address of the device that sends the frame is defined;
- If the field "**Fast Packet**" is checked, the frame will use the Fast Packet functions;
- In the field "**Num Byte**" the number of bytes of the NMEA 2000 message is defined;
- In the field "**Transmission Type**" the transmission type is defined:
  - On Data Change: NMEA 2000 message is sent only when the data from EtherNet/IP are changed;
  - On Timer: NMEA 2000 message is sent cyclically;
- In the field "**Send Timer**" the delay (in milliseconds) with which sending the NMEA 2000 message is defined (for "On Timer" transmission type);
- In the field "**Mnemonic**" a description for the frame is defined.

### 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.

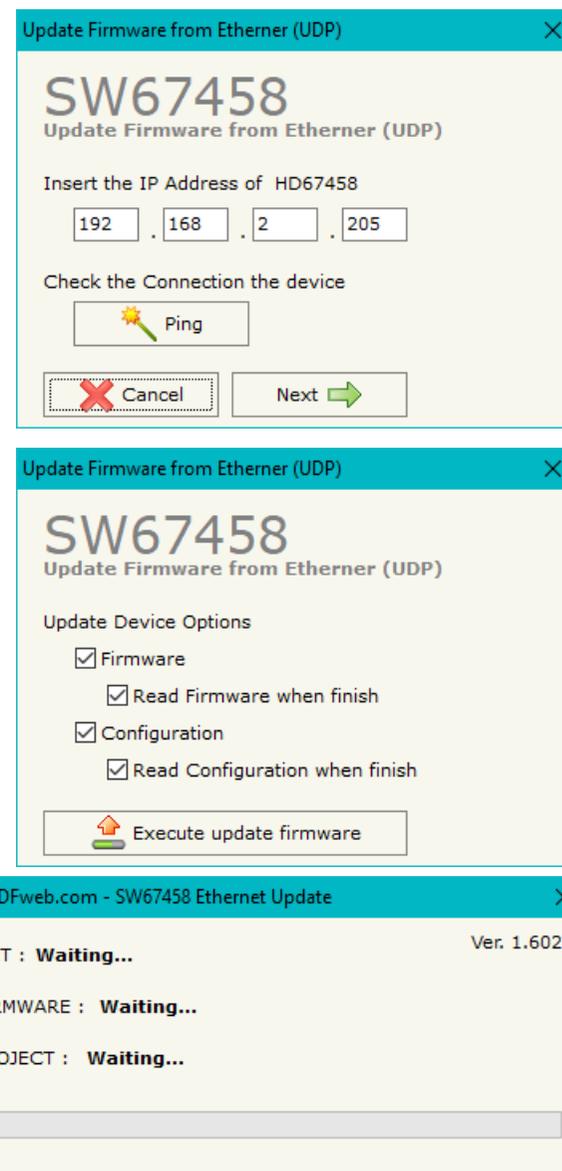


Figure 6: "Update device" windows



**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 HD67458.



**Note:**

When you receive the device, for the first time, you have to update also the Firmware in the HD67458 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.

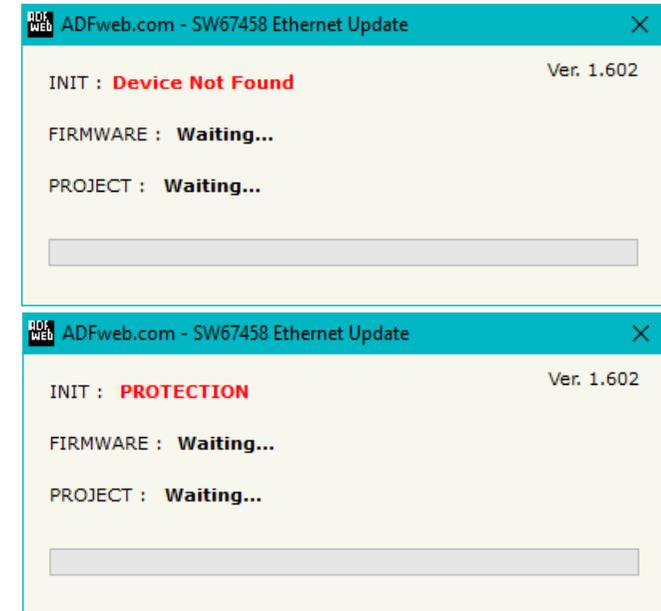


Figure 7: "Protection" error



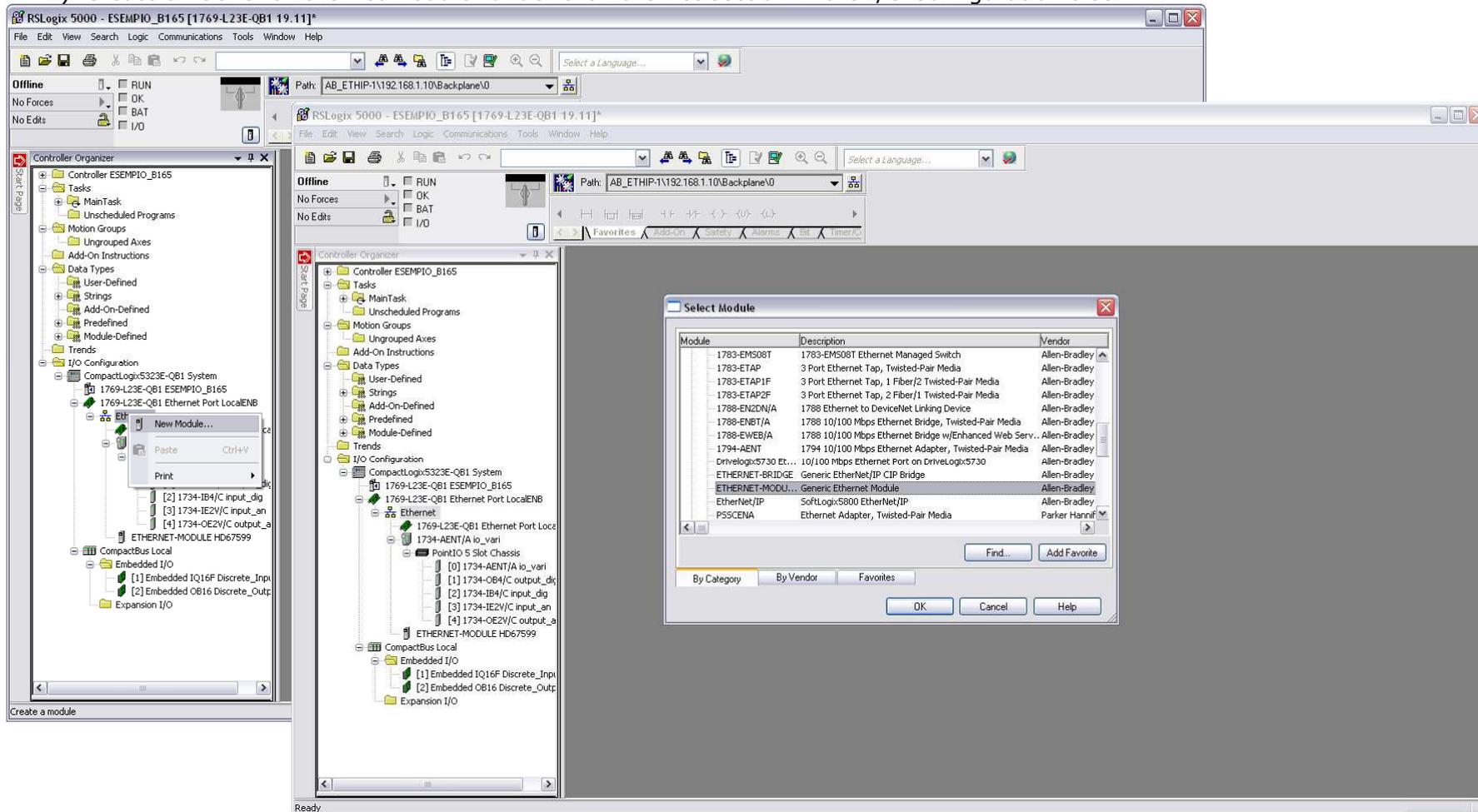
In the case of HD67458 you have to use the software "SW67458": [www.adfweb.com/download/filefold/SW67458.zip](http://www.adfweb.com/download/filefold/SW67458.zip).

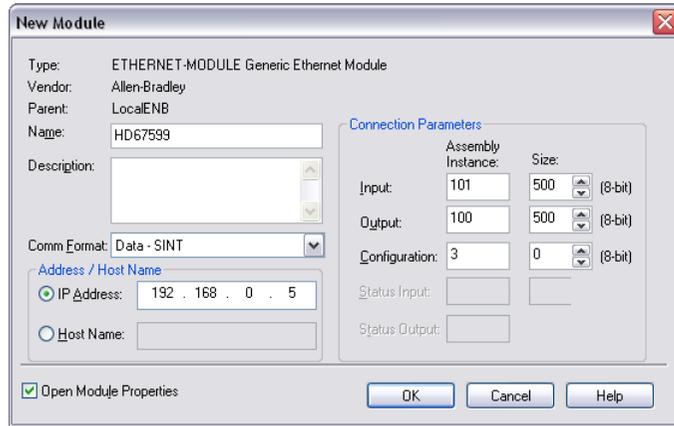
**PLC CONFIGURATION:**

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.





2) Edit the settings of the new Generic Ethernet Module. As shown in the screen shot below, the module was named "HD67458" and the IP-address assigned is 192.168.0.5.

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

The HD67589-A1 can use up to 500 bytes for input assembly instance 101 and 500 bytes for output assembly instance 100.

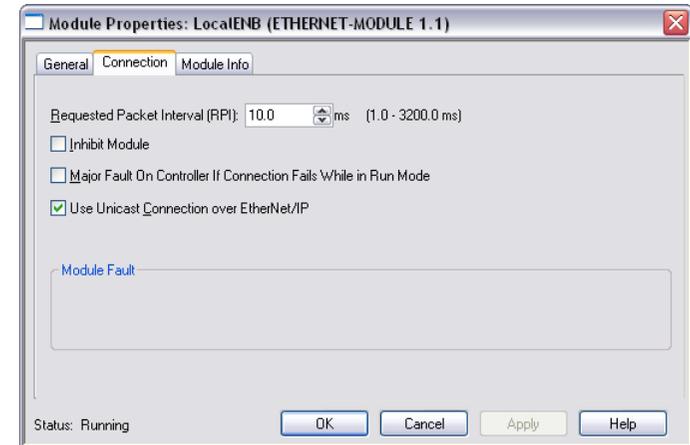
RSLogix 5000 requires a configuration assembly instance. Both modules do not provide a configuration assembly instance. Therefore it is allowed to select an instance of 3 and to set the value to zero.

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.



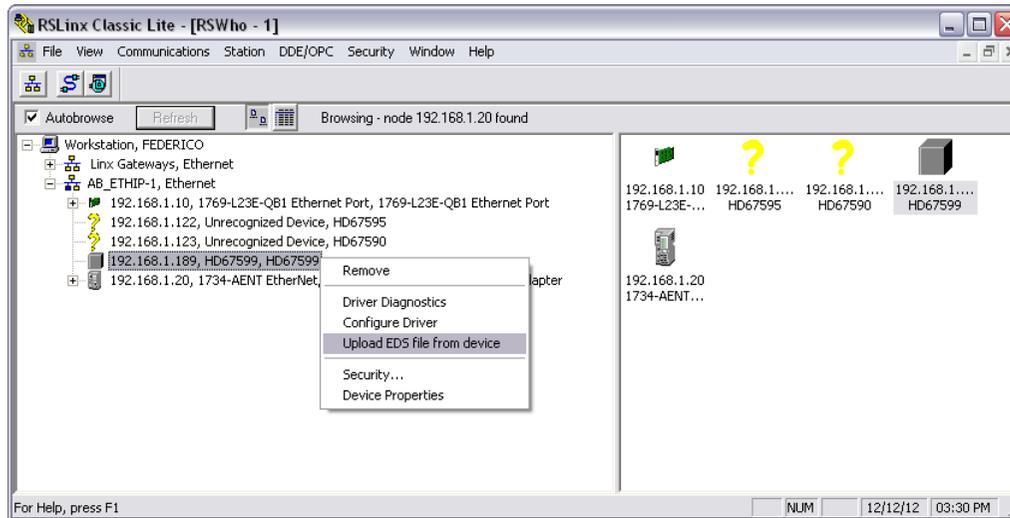
**Warning:**

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

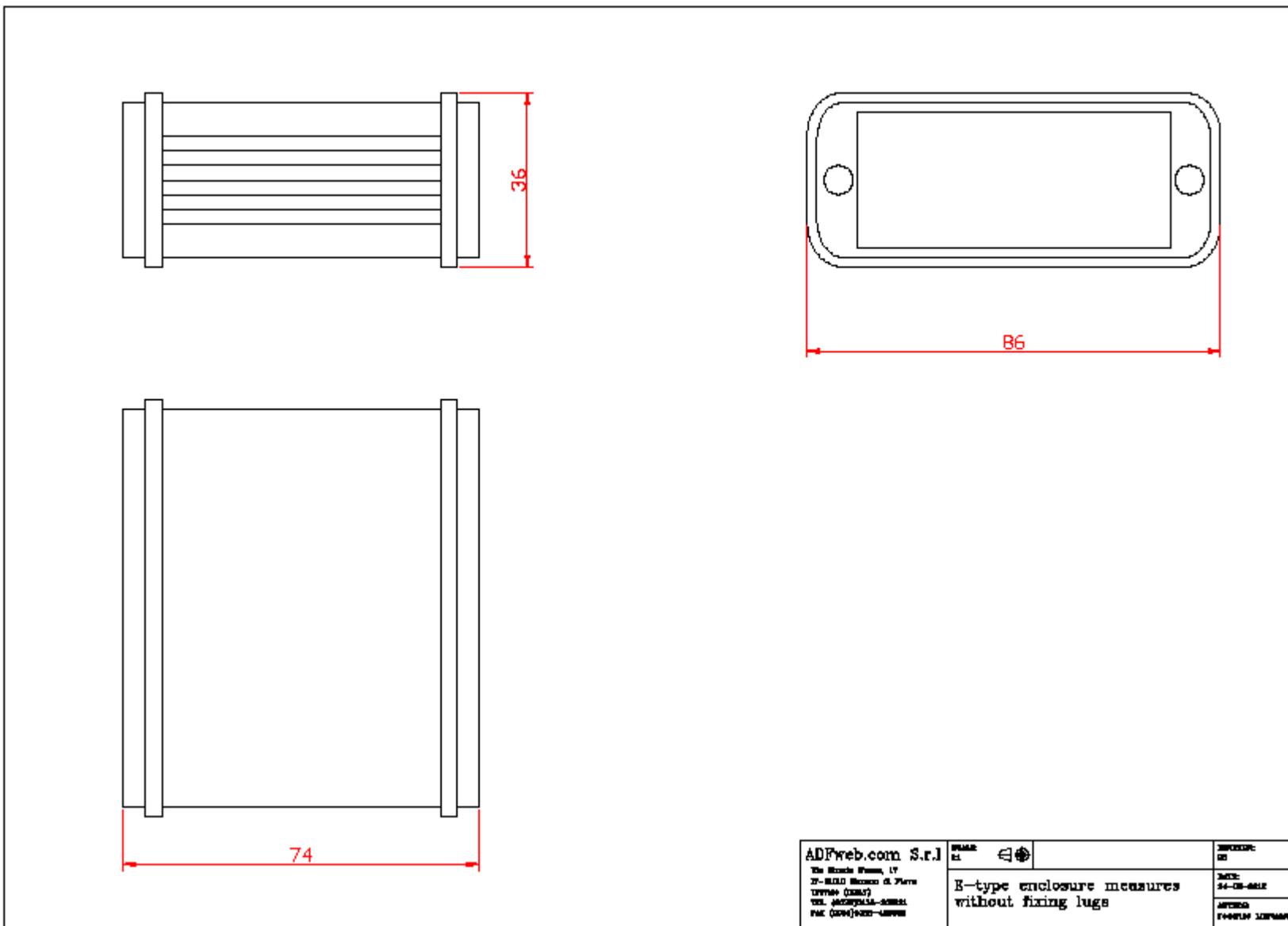


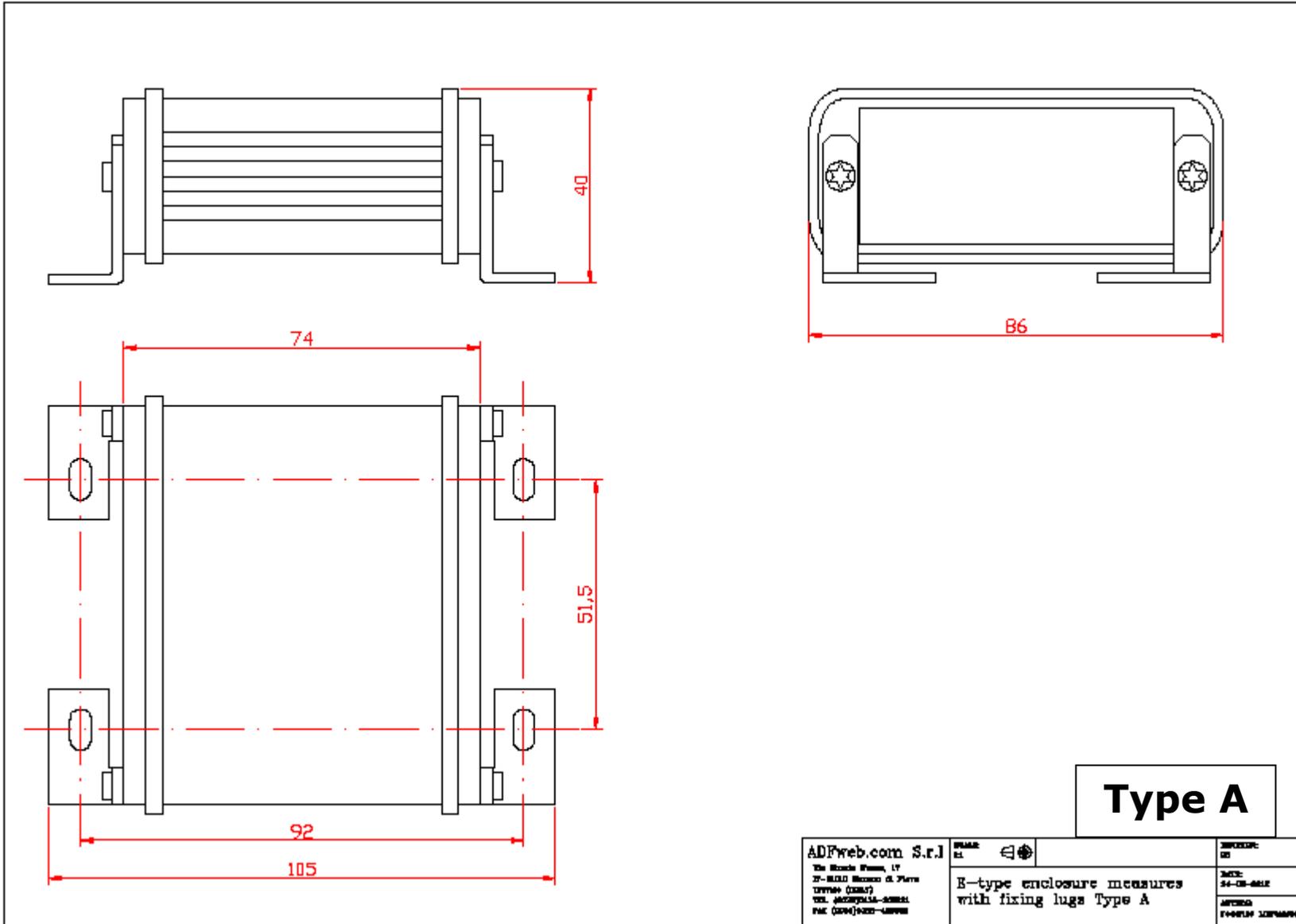


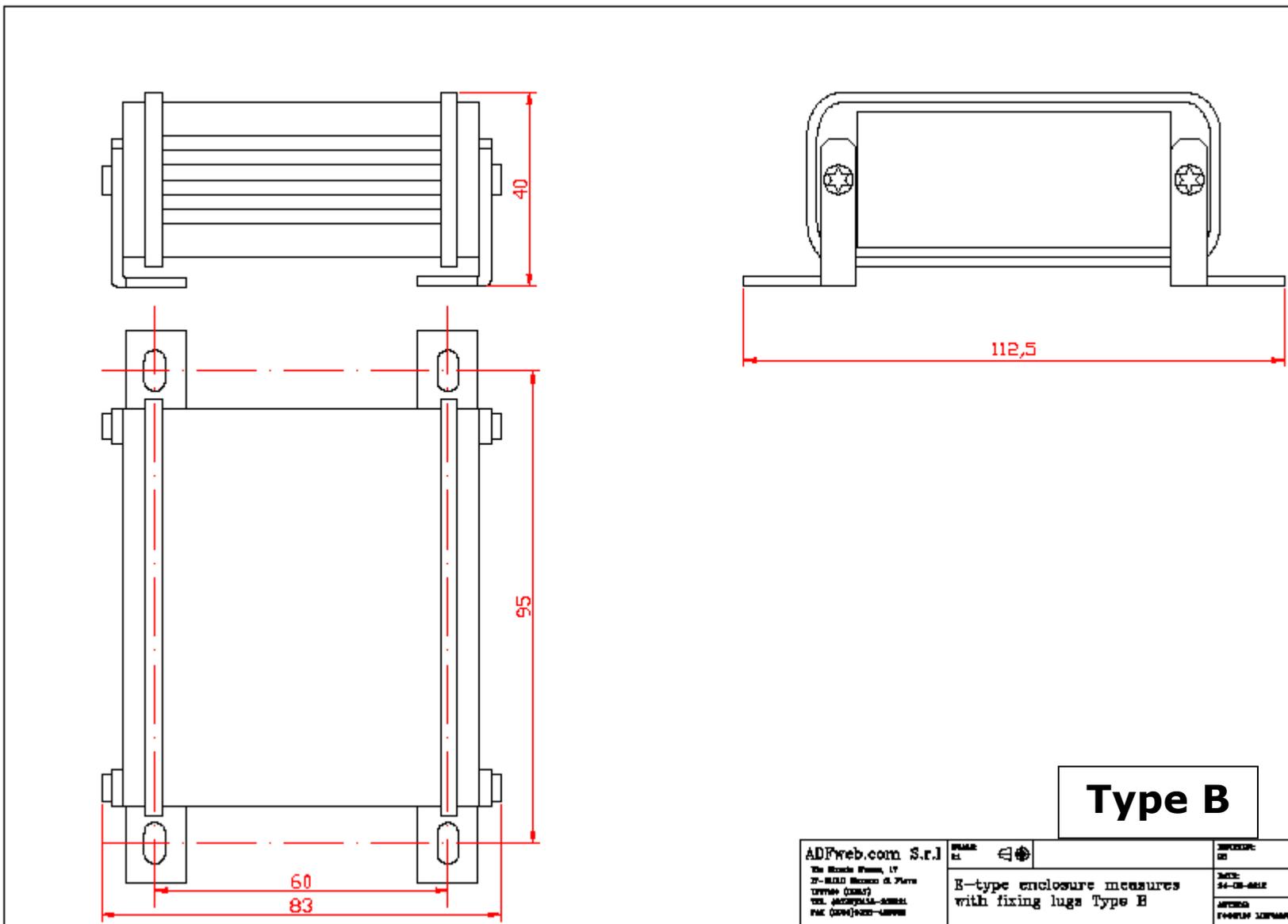
5) With "RSLinks Classic Lite", after have done a network scan (RSWho), and finding the EtherNet/IP device, it is possible to load the EDS file for the device in order to have the "Module Info" compiled.

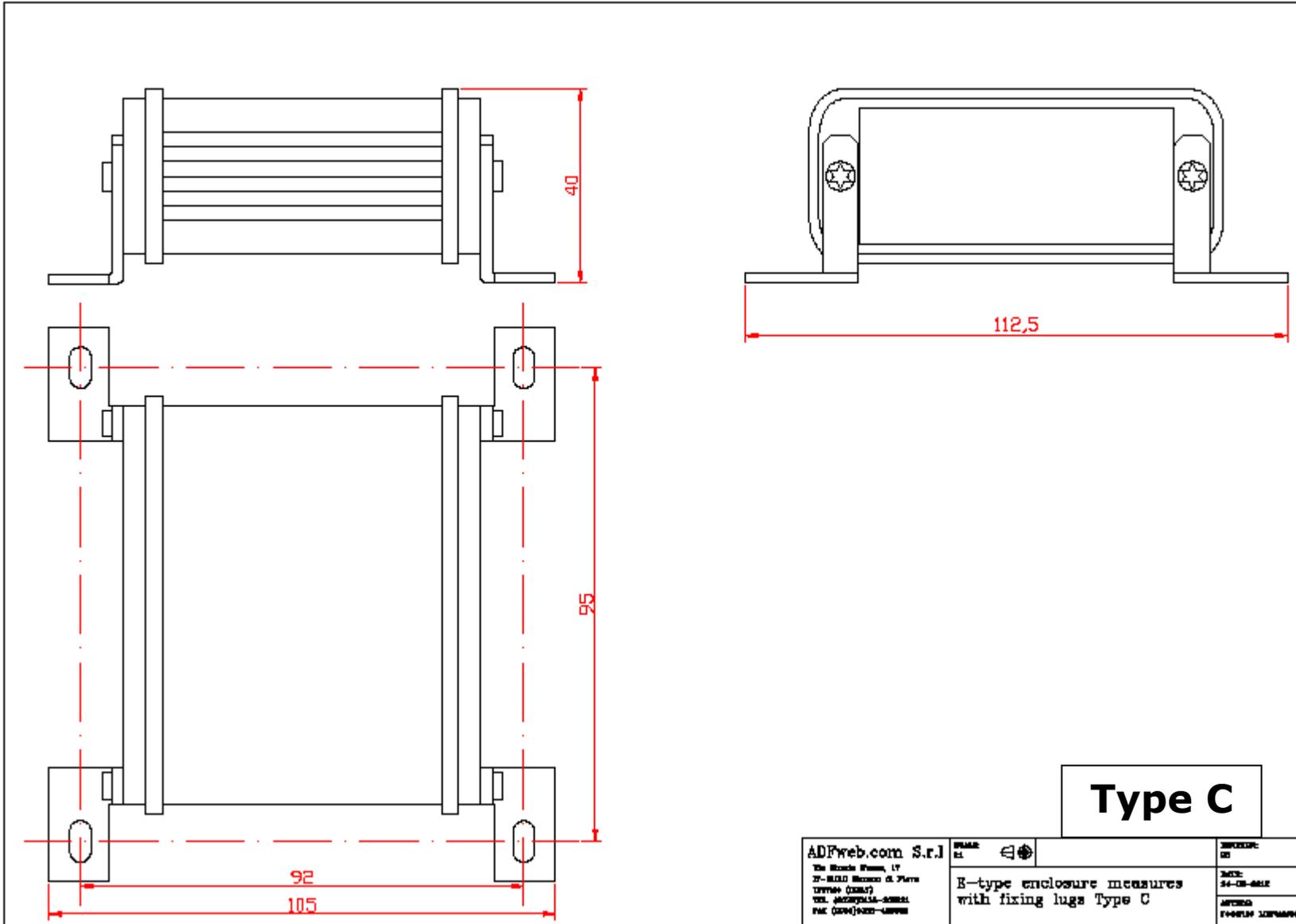


**MECHANICAL DIMENSIONS:**





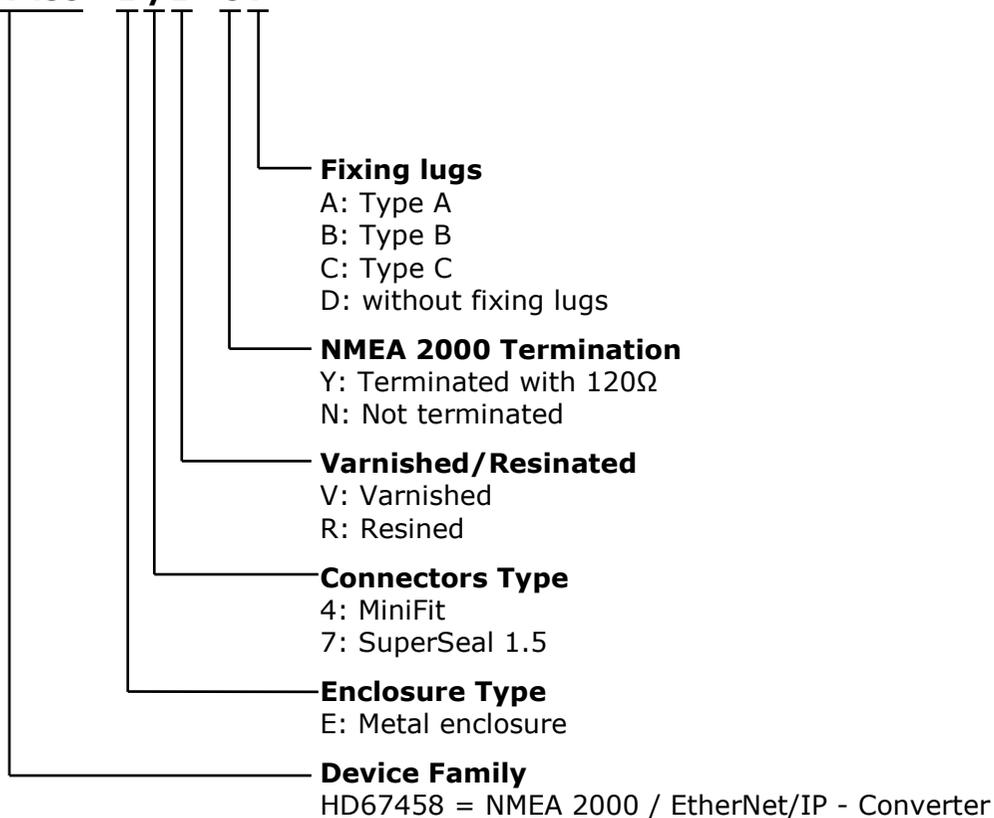




**ORDERING INFORMATIONS:**

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

**HD67458 - E y z - s f**



**ACCESSORIES:**

- Order Code: **AC34011** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V DC
- Order Code: **AC34012** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 24 V DC
- Order Code: **AC67410** - Accessory Automotive Devices - Support for rail DIN

**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.

### **WARRANTIES AND TECHNICAL SUPPORT:**

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at [www.adfweb.com](http://www.adfweb.com). Otherwise contact us at the address [support@adfweb.com](mailto: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](http://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.



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