

# User Manual

Revision 1.101  
English

## CAN / Modbus TCP Master – Converter

(Order Code: HD67414)

For Website information:

[www.adfweb.com?Product=HD67414](http://www.adfweb.com?Product=HD67414)

For Price information:

[www.adfweb.com?Price=HD67414](http://www.adfweb.com?Price=HD67414)

### Benefits and Main Features:

- ✦ Very easy to configure
- ✦ Wide supply input range
- ✦ Electrical isolation
- ✦ Industrial temperature range:
- ✦ -40°C / 105°C (-40°F / 221°F)



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)



User Manual

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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	27/11/2012	Ff	All	First release version
1.100	27/10/2016	Ff	All	New hardware version
1.101	13/03/2017	Ff	All	Revision

**WARNING:**

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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:

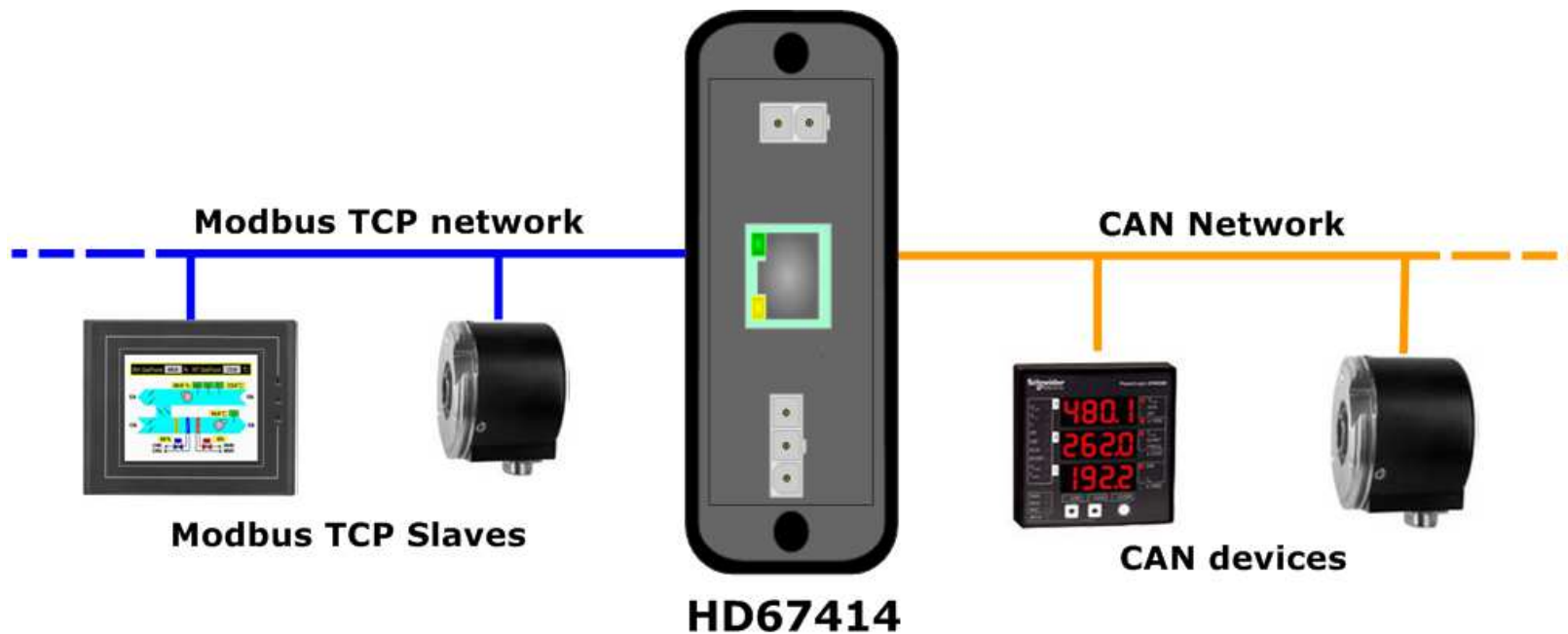


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

**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:**



**CONNECTION SCHEME:**

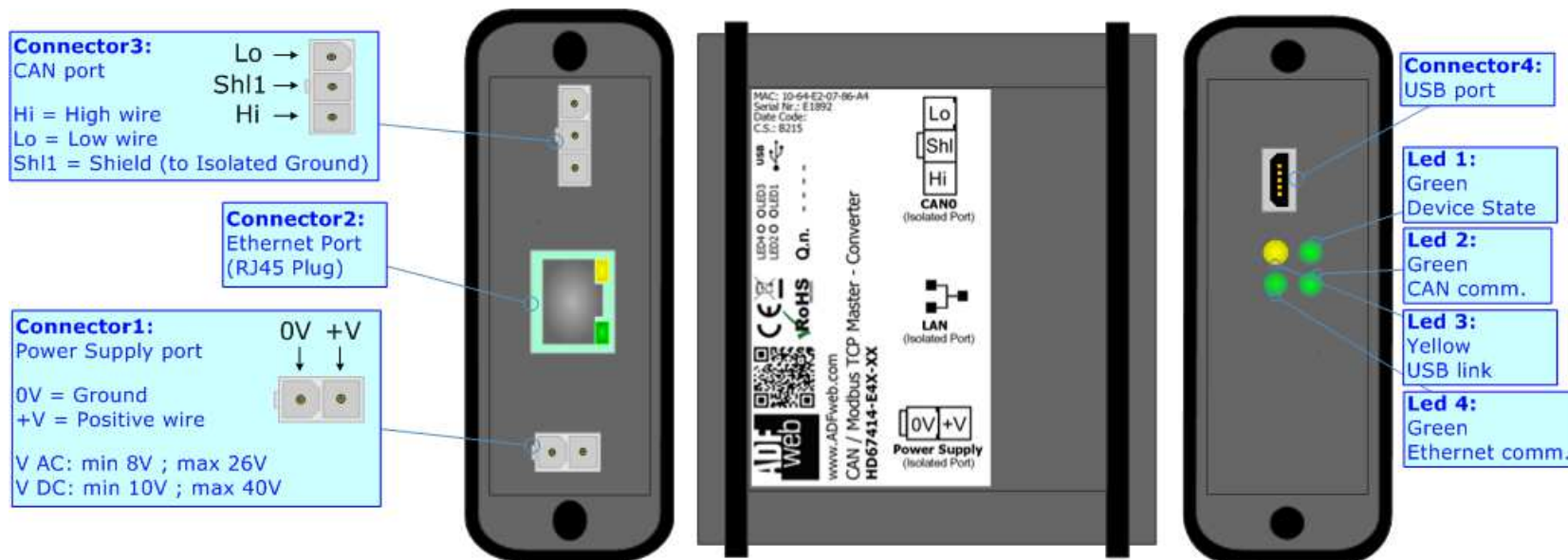


Figure 1a: Connection scheme for HD67414-E4x-xx

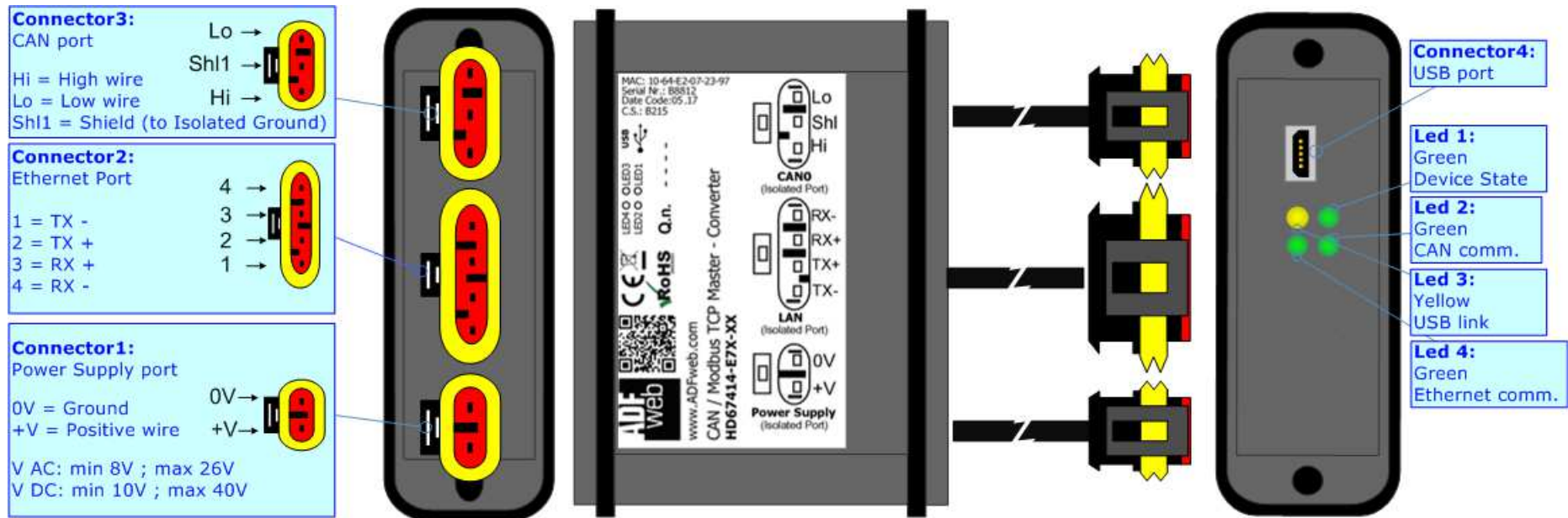


Figure 1b: Connection scheme for HD67414-E7x-xx

**CHARACTERISTICS:**

The "HD67414" series are rugged devices used to interface CAN devices with Modbus TCP Slaves.

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.

All the four series 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 SW67414 software on your PC in order to perform the following:

- Define the CAN frames read from Converter;
- Define the CAN frames write from the Converter;
- Define the Modbus TCP requests in read;
- Define the Modbus TCP requests in Write;
- Update the device.

**POWER SUPPLY:**

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

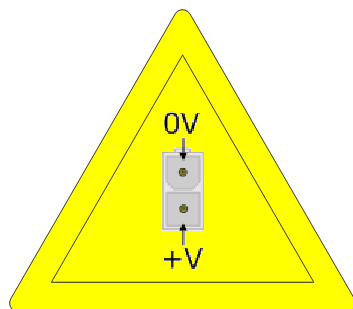
	VAC		VDC	
	Vmin	Vmax	Vmin	Vmax
<b>HD67414-Exx-xx</b>	<b>8V</b>	<b>26V</b>	<b>10V</b>	<b>40V</b>

Consumption at 24V DC:

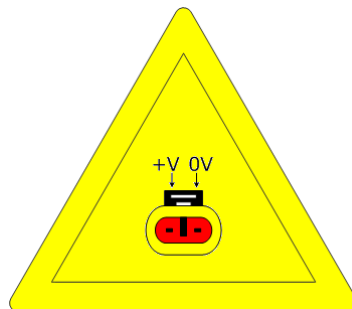
Device	W/VA
HD67414-Exx-xx	4



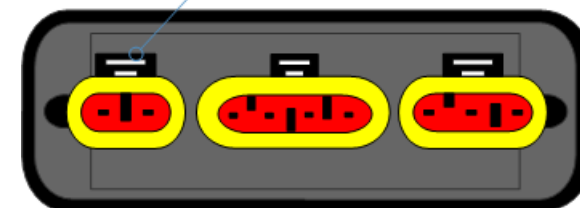
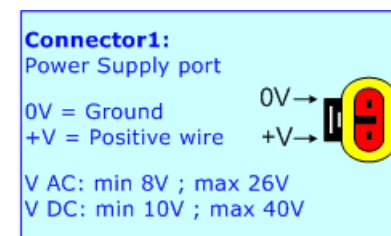
**Caution: Not reverse the polarity power**



HD67414-E4x-xx



HD67414-E7x-xx



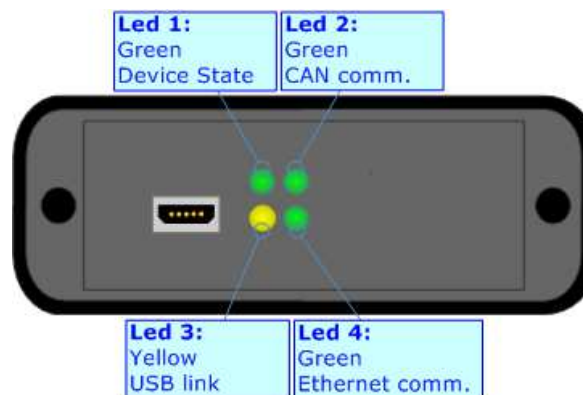
Note: It is possible to use also negative tensions. In this case the polarity must be inverted.



**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 CAN frames are received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
3: USB link (yellow)	<b>ON:</b> USB cable inserted <b>OFF:</b> USB cable not inserted	<b>ON:</b> USB cable inserted <b>OFF:</b> USB cable not inserted
4: Ethernet communication (green)	Blinks when a Modbus TCP response is received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress



**CAN:**

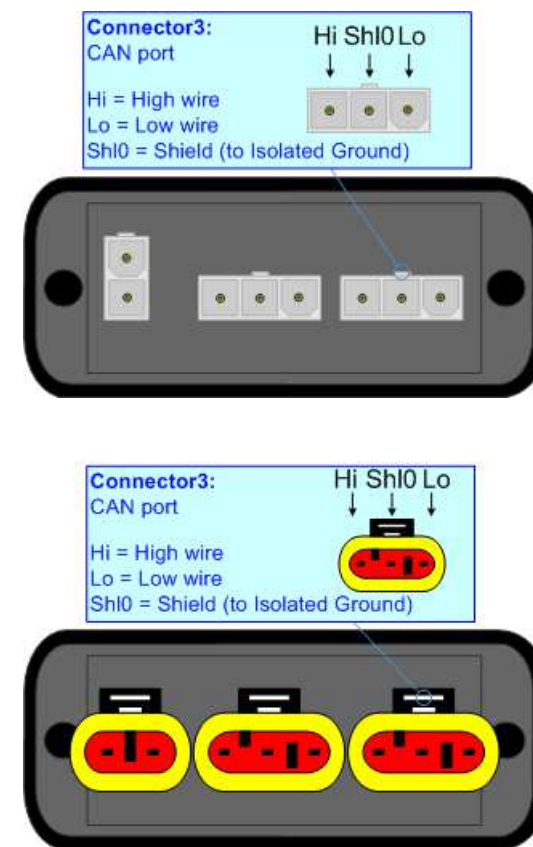
The connection of the CAN in the HD67414-E4x-xx device must be made with a 3way MiniFit Female connector. The pinout of Male MiniFit connector of the board is at right side of the page.

The connection of the CAN in the HD67414-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 CAN line, with a 120Ω resistor, in the HD67414-Exx-xx is made internally of the device; when the order is performed. If the device have the CAN terminated the code is the follow: HD67414-Exx-Yx; otherwise is this other: HD67414-Exx-Nx.

Cable characteristics:

<b>DC parameter:</b>	Impedance	70 Ohm/m
<b>AC parameters:</b>	Impedance	120 Ohm/m
	Delay	5 ns/m
<b>Length</b>	<b>Baud Rate [bps]</b>	<b>Length MAX [m]</b>
	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

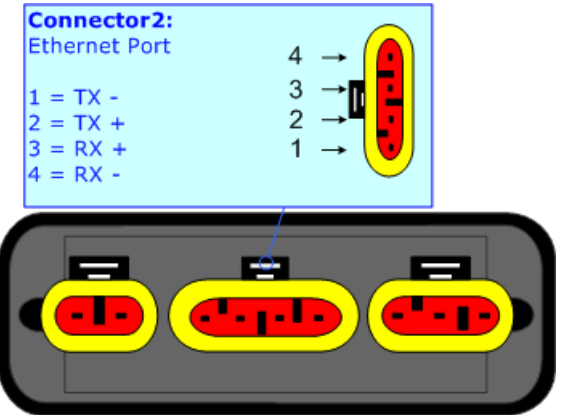


**ETHERNET:**

The connection of Ethernet in the HD67414 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.

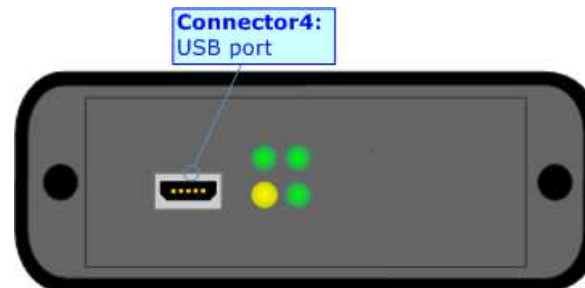
The connection of Ethernet in the HD67414-E4x-xx device must be made with RJ45 connector.

The connection of the Ethernet in the HD67414-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 SW67414:

To configure the Converter, use the available software that runs with Windows called SW67414. 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 SW67414, the window below appears (Fig. 2).



**Note:**

It is necessary to have installed .Net Framework 4.

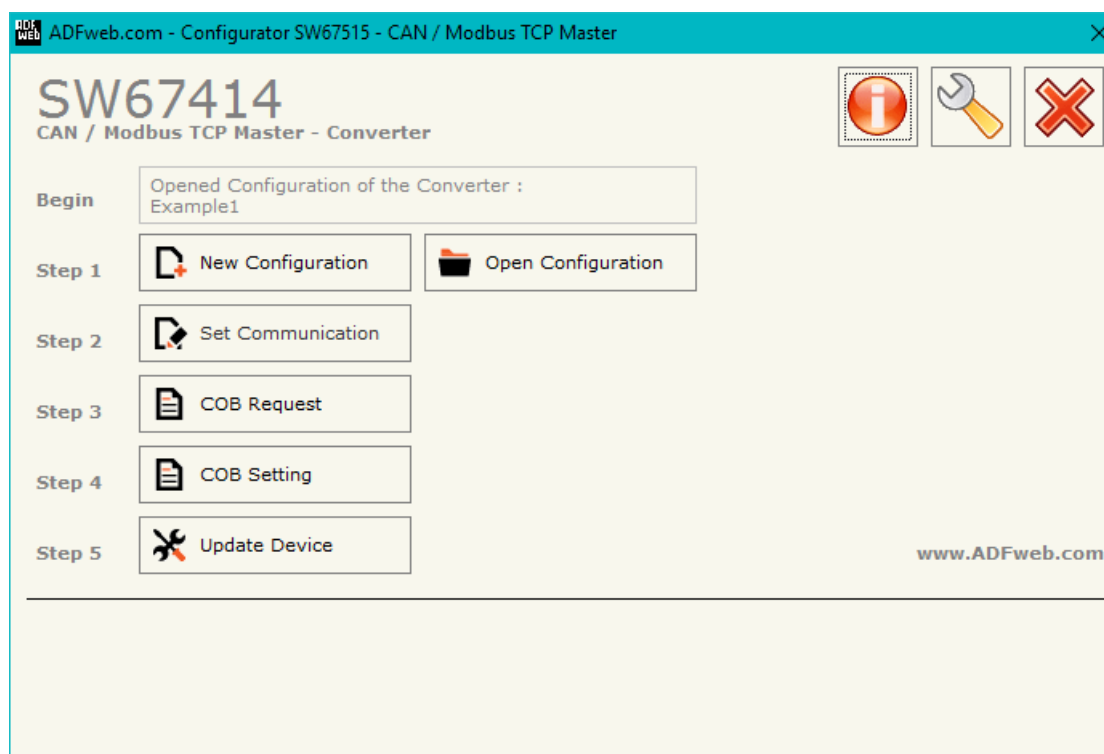
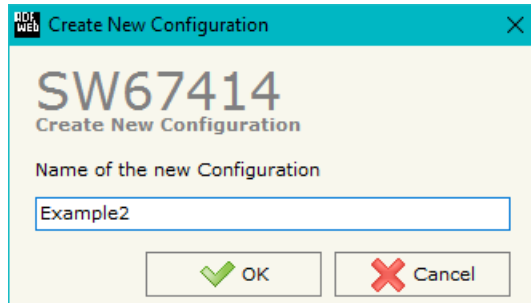


Figure 2: Main window for SW67414

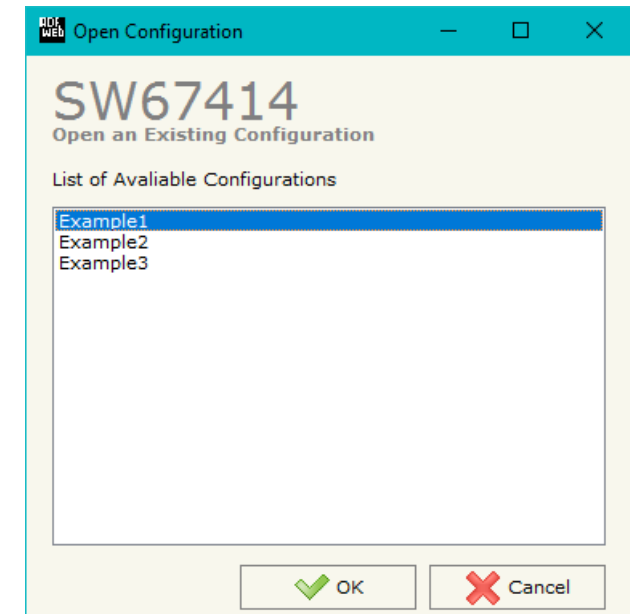
**NEW CONFIGURATION / OPEN CONFIGURATION:**

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




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

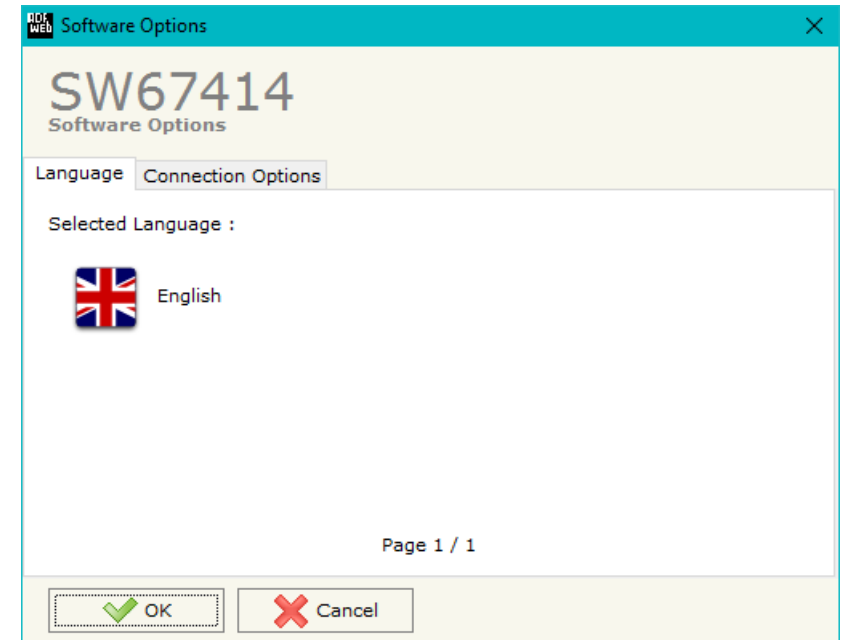
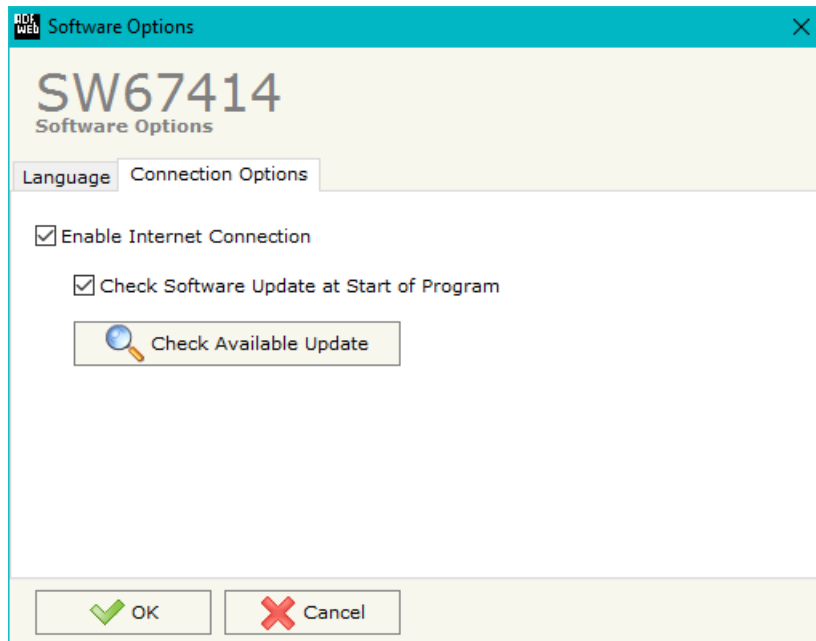
- To clone the configurations of a programmable “CAN / Modbus TCP Master - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate 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 SW67414 check automatically if there are updatings when it is launched.

**SET COMMUNICATION:**

This section defines the fundamental communication parameters of two Buses, CAN and Modbus TCP.

By pressing the "**Set Communication**" button from the main window for SW67414 (Fig. 2) the window "Set communication" appears (Fig. 3).

This window is divided in two sections, one for configure the CAN Network and the other for the Modbus TCP.

The means for the fields for the "CAN" are:

- In the field "**Baud Rate**" the data rate of CAN side is defined.

The means for the fields for "Modbus TCP Master" are:

- In the field "**IP Address**" the IP address for the Modbus TCP side is defined;
- In the field "**SubNet Mask**" the SubNet Mask for the Modbus TCP side is defined;
- In the field "**Gateway**" the default gateway of the net 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 "**TimeOut (ms)**" the timeout for the Modbus TCP communication is defined.

The screenshot shows a software window titled "Set Communication" for device "SW67414". It is divided into two sections. The "CAN" section includes a "Baudrate" dropdown menu currently set to "500K". The "Modbus TCP Master" section includes an "IP ADDRESS" field with four input boxes containing "192", ".168", ".0", and ".111". Below it is a "SUBNET Mask" field with four input boxes containing "255", ".255", ".255", and ".0". There is a "GATEWAY" checkbox which is unchecked, followed by a field with four input boxes containing "192", ".168", ".0", and ".1". At the bottom of the window, there are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon. The "TimeOut (ms)" field is set to "1000".

Figure 3: "Set Communication" window

**COB REQUEST:**

By pressing the “**COB Request**” button from the main window for SW67414 (Fig. 2) the window “Define Modbus TCP Request in Read” appears (Fig. 4). In this section, it is possible to define the CAN frames that the converter will receive from CAN network.

The window appears like below:

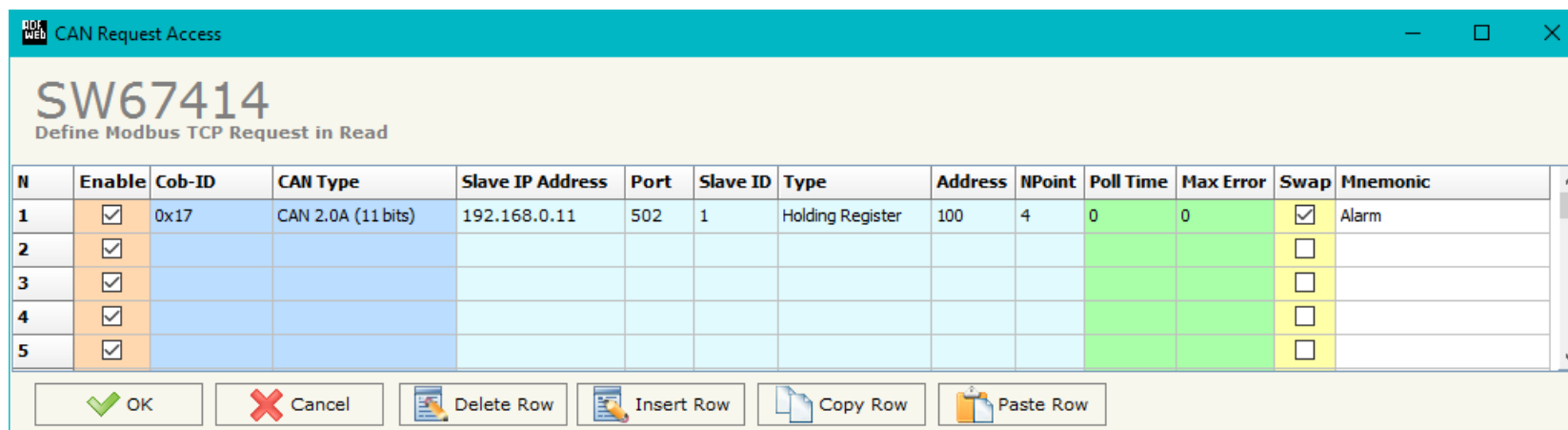


Figure 4: “Define Modbus TCP Request in Read” window

- In the field “**Cob-ID**” the COB-ID of the CAN frame is defined;
- In the field “**Type**” the type of the CAN protocol used for each frame (CAN 2.0A (11 bits) or CAN 2.0B (29 bits)) is defined;
- In the field “**Slave IP Address**” the IP address of the Modbus TCP slave to read is defined;
- In the field “**Port**” the number of the TCP port for the Modbus TCP communication is defined;
- In the field “**Slave ID**” the ID of the Modbus TCP slave to read is defined;
- In the field “**Type**” the type of Modbus register that you would like to read is defined;
- In the field “**Address**” the Modbus register to read is defined;
- In the field “**NPoint**” the number of consecutive Modbus registers to read is defined;
- In the field “**Poll Time**” the delay (in ms) between two Modbus TCP requests is defined;

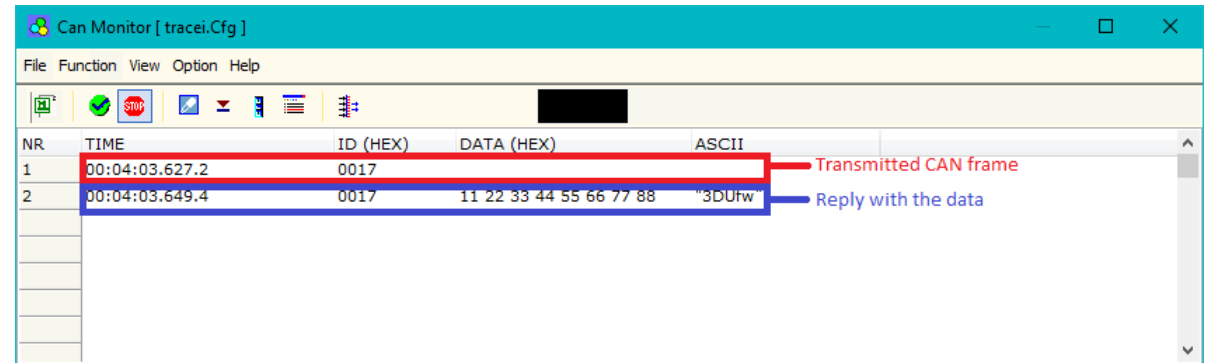


- In the field "**Max Error**" the number of consecutive errors that the Master waits before discarding the row from the cycle of requests is defined;
- If the field "**Swap**" is checked, the bytes written to CAN side will be swapped;
- In the field "**Mnemonic**" a description of the frame is defined.

Example of communication:

If we want to read the Holding Register at address 100 for 4 consecutive registers (Fig. 4), we must send a CAN frame with COB-ID= \$0017 without data (Fig. 5).

As answer we would have a CAN frame with the same COB-ID (\$0017) and 8 bytes of data which are the value of the Modbus registers (Fig. 5).



NR	TIME	ID (HEX)	DATA (HEX)	ASCII
1	00:04:03.627.2	0017		
2	00:04:03.649.4	0017	11 22 33 44 55 66 77 88	"3DUrw

Figure 5: CAN frames for reading request

### COB SETTING:

By pressing the “**COB Setting**” button from the main window for SW67414 (Fig. 2) the window “Define Modbus TCP Request in Write” appears (Fig. 4). In this section, it is possible to define the CAN frames that the converter will receive from CAN network.

The window appears like below:

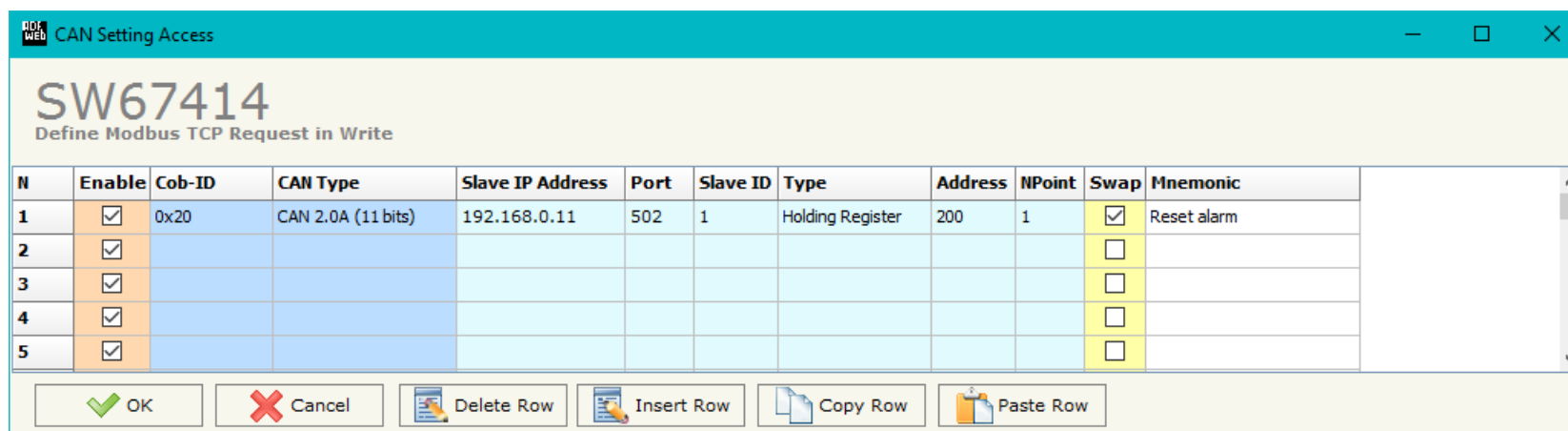


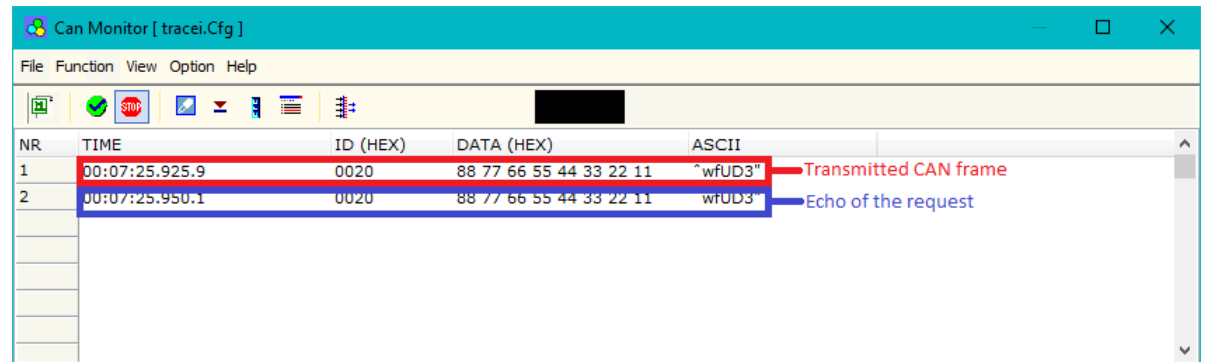
Figure 6: “Define Modbus TCP Request in Write” window

- In the field “**Cob-ID**” the COB-ID of the CAN frame is defined;
- In the field “**Type**” the type of the CAN protocol used for each frame (CAN 2.0A (11 bits) or CAN 2.0B (29 bits)) is defined;
- In the field “**Slave IP Address**” the IP address of the Modbus TCP slave to write is defined;
- In the field “**Port**” the number of the TCP port for the Modbus TCP communication is defined;
- In the field “**Slave ID**” the ID of the Modbus TCP slave to write is defined;
- In the field “**Type**” the type of Modbus register that you would like to write is defined;
- In the field “**Address**” the Modbus register to write is defined;
- In the field “**NPoint**” the number of consecutive Modbus registers to write is defined;
- If the field “**Swap**” is checked, the bytes written from CAN will be swapped;
- In the field “**Mnemonic**” a description of the frame is defined.

For example:

If we want to write the Holding Register (Fig. 6) we must send a CAN frame with COB ID=0020 and 8 bytes of data (Fig. 7); they are the value of the registers Modbus that we want to set.

If the Modbus write command is correctly received, on CAN side an echo of the frame transmitted will be received (Fig. 7).



NR	TIME	ID (HEX)	DATA (HEX)	ASCII
1	00:07:25.925.9	0020	88 77 66 55 44 33 22 11	^wfUD3"
2	00:07:25.950.1	0020	88 77 66 55 44 33 22 11	wfUD3"

Figure 7: CAN Frames for writing request

### UPDATE DEVICE:

By pressing the **“Update Device”** button, it is possible to load the created Configuration into the device; and also the Firmware, if necessary.

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;
- Turn ON the converter;
- Insert the IP **“192.168.2.205”**;
- Press the **“Ping”** button, **“Device Found!”** must appear”;
- 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.

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

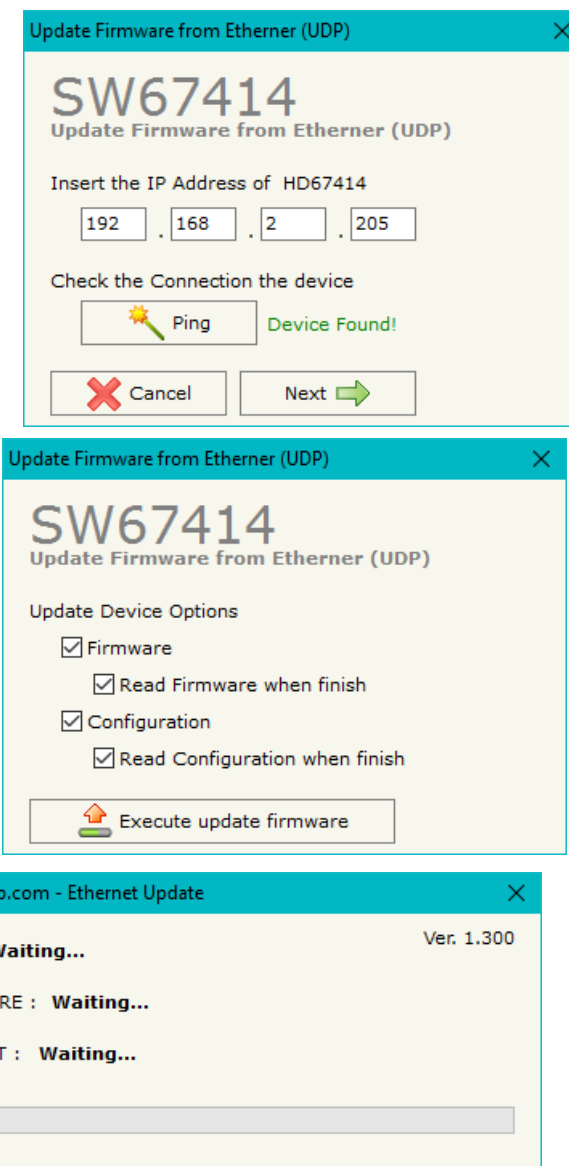


Figure 8: “Update Device” windows



**Note:**

When you install a new version of the software, if it is the first time it is better you do the update of the Firmware in the HD67414 device.



**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD67414 device.



**Warning:**

If Fig. 9 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8 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, 10 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

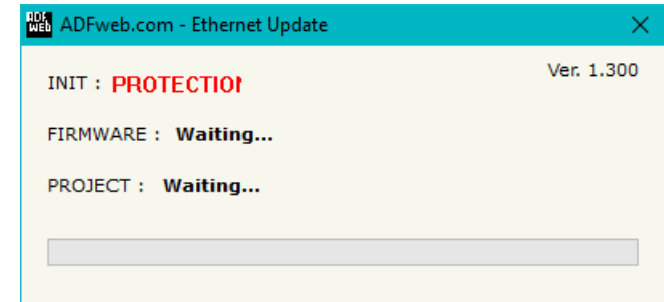
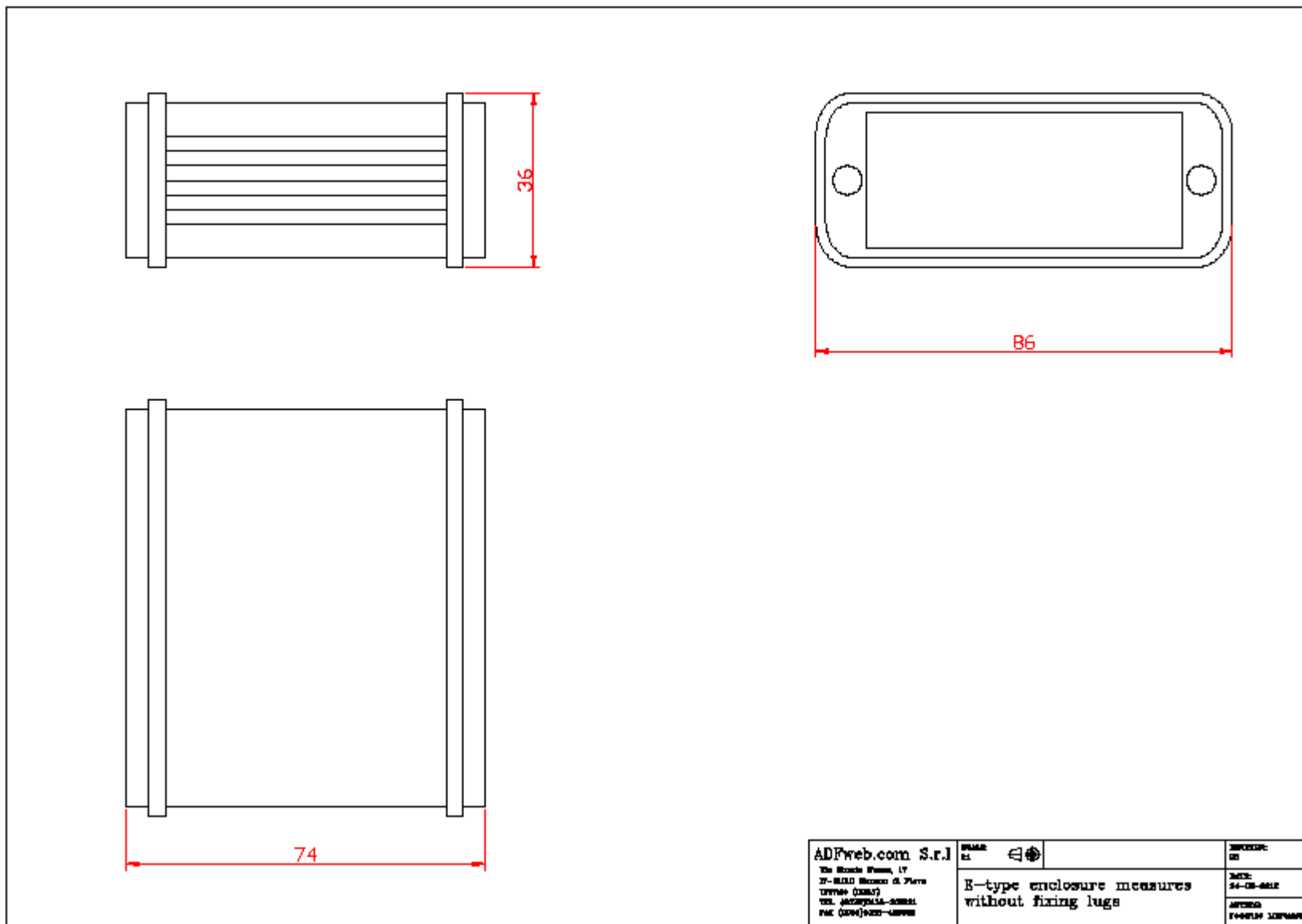
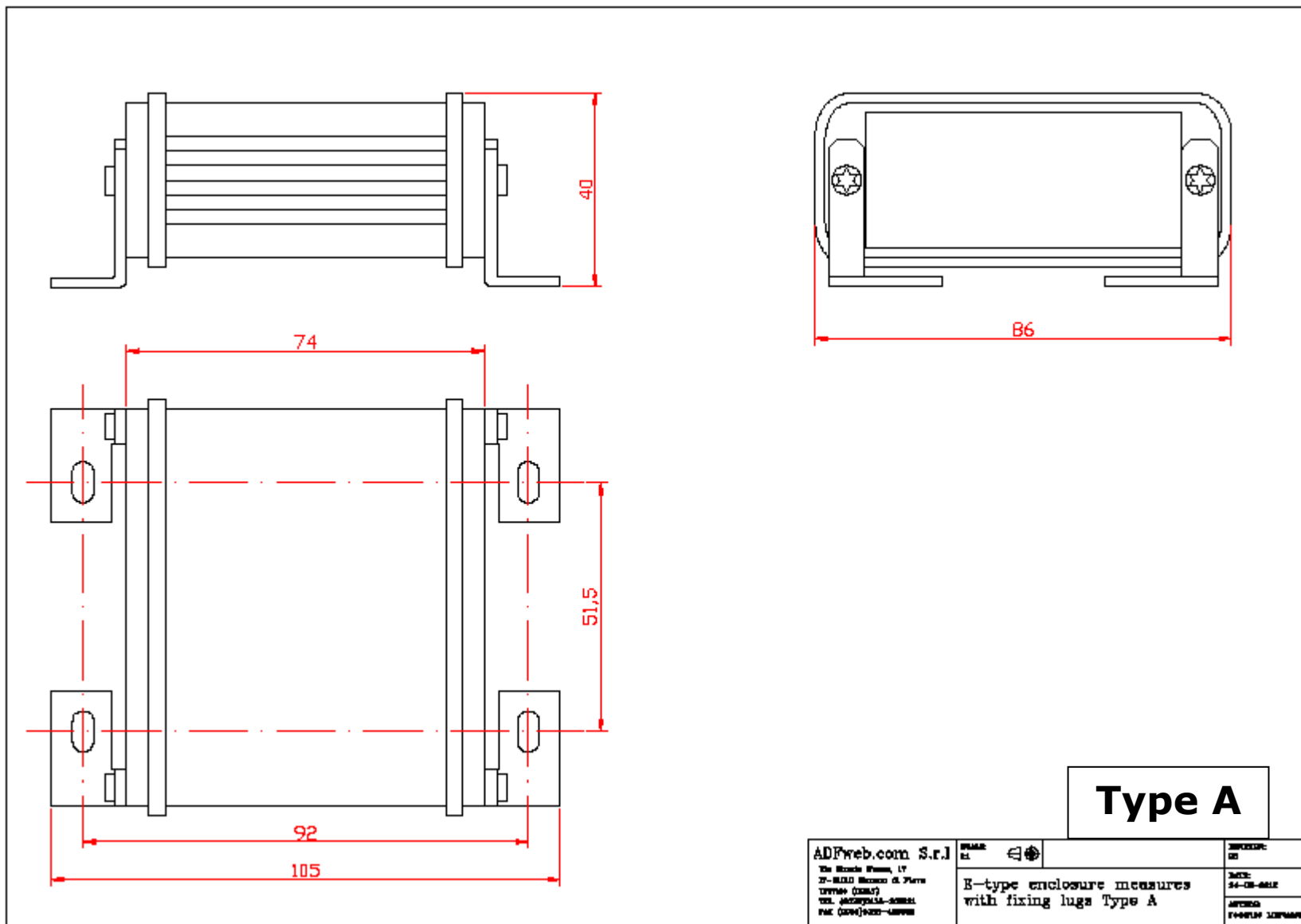


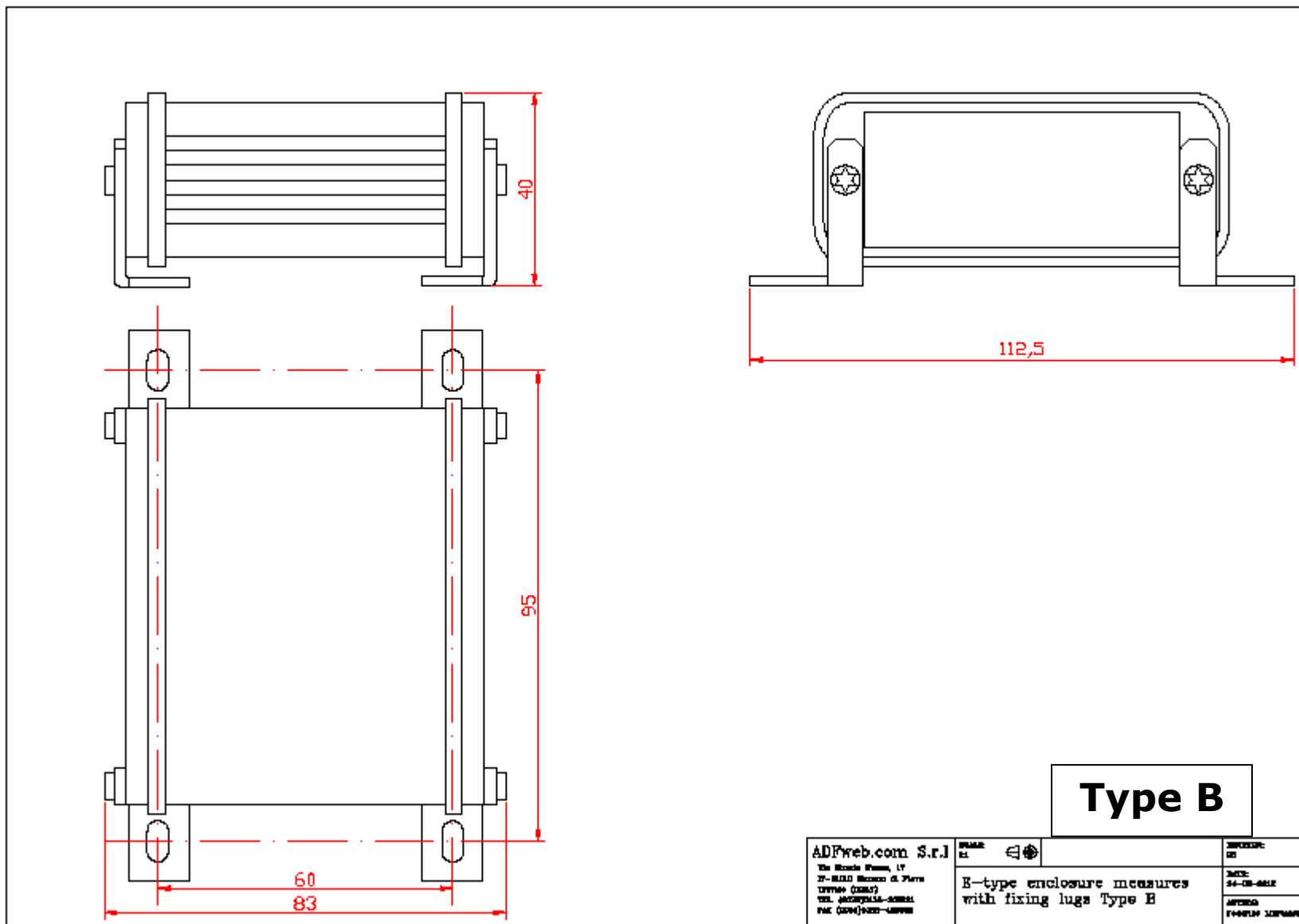
Figure 9: "Protection" window

In the case of HD67414 you have to use the software "SW67414": [www.adfweb.com/download/filefold/SW67414.zip](http://www.adfweb.com/download/filefold/SW67414.zip).

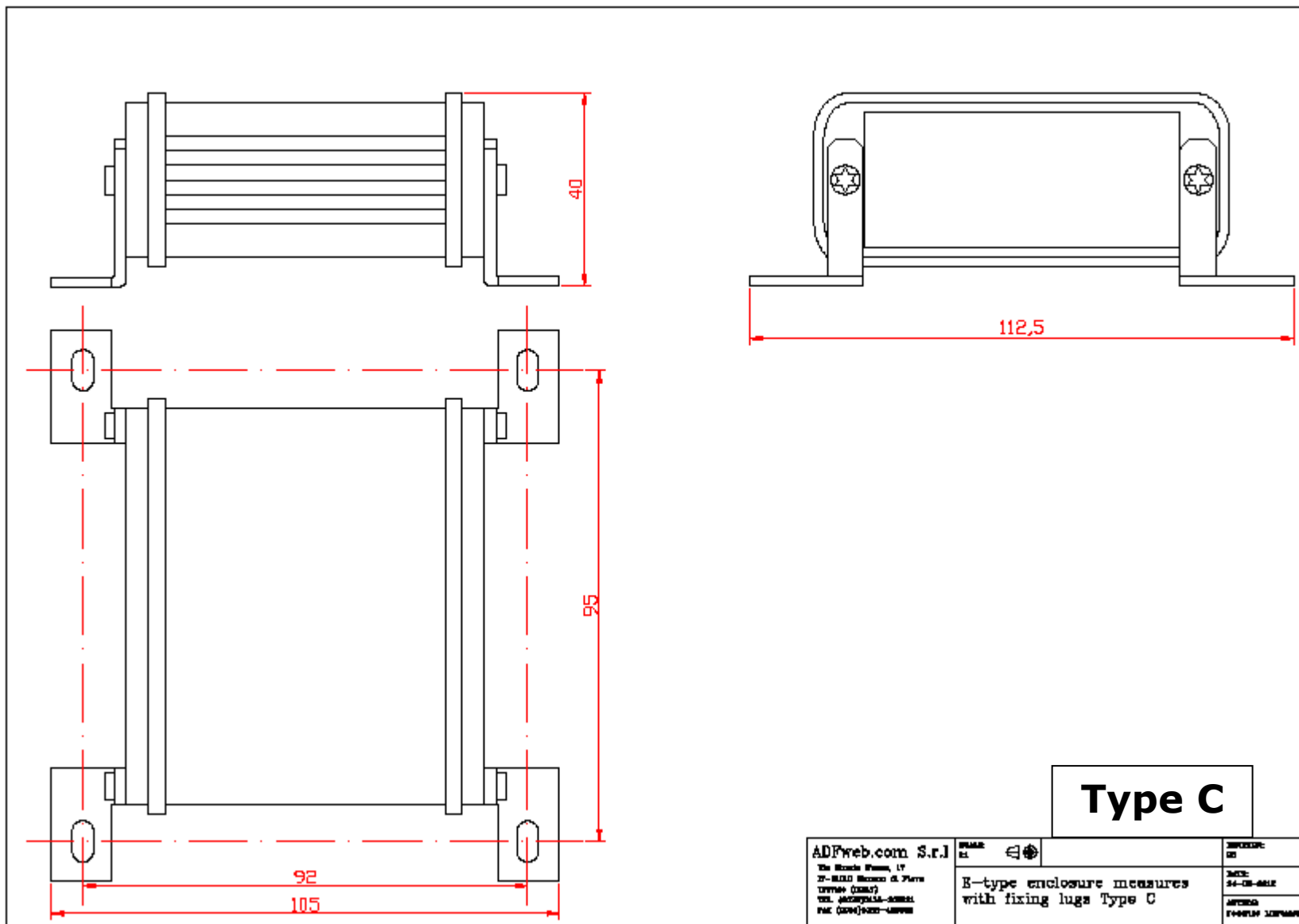
**MECHANICAL DIMENSIONS:**







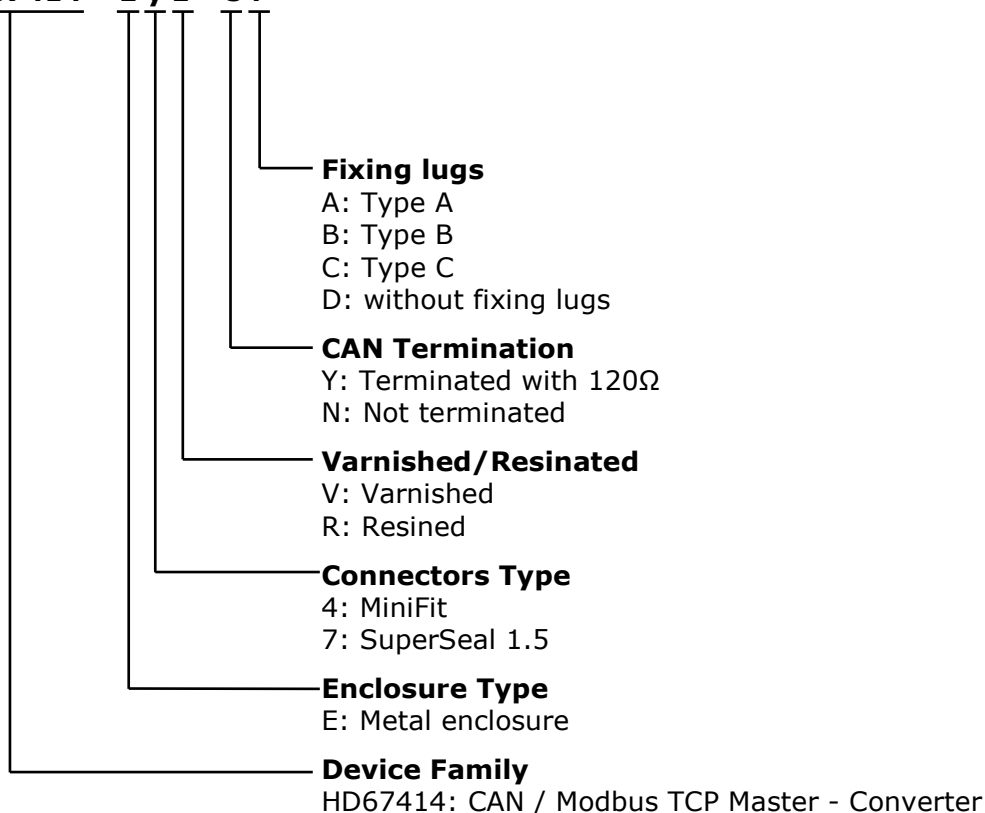




**ORDERING INFORMATIONS:**

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

**HD67414 - E y z - s f**



**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

**DISCLAIMER:**

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**OTHER REGULATIONS AND STANDARDS:****WEEE INFORMATION**

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).

— This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and impact of human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

**RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE**

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

**CE MARKING**

The product conforms with the essential requirements of the applicable EC directives.

**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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