

User Manual

Revision 1.003
English

J1939 / Modbus TCP Slave – Converter

(Order Code: HD67434)

for Website information:

www.adfweb.com?Product=HD67434

for Price information:

www.adfweb.com?Price=HD67434

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 others Gateways / Bridges:

J1939 to Modbus

See also the following links:

www.adfweb.com?Product=HD67212 (Modbus RTU)

CANopen to Modbus

See also the following links:

www.adfweb.com?Product=HD67001 (Modbus RTU Master)

www.adfweb.com?Product=HD67002 (Modbus RTU Slave)

www.adfweb.com?Product=HD67004 (Modbus TCP Master)

www.adfweb.com?Product=HD67005 (Modbus TCP Slave)

For others Gateways / Bridges:

For **CAN bus 2.0A** and/or **CAN bus 2.0B to Modbus**

See also the following links:

www.adfweb.com?Product=HD67011 (Modbus RTU Slave)

www.adfweb.com?Product=HD67012 (Modbus RTU Master)

www.adfweb.com?Product=HD67014 (Modbus TCP Slave)

www.adfweb.com?Product=HD67015 (Modbus TCP Master)

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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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	11/11/2012	Ff	All	First released version
1.001	16/06/2014	Ff	All	Revision
1.002	09/05/2016	Ff	All	New hardware version
1.003	13/03/2017	Ff	All	Revision

WARNING:

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ADFweb.com is not responsible for any error this manual may contain.

TRADEMARKS:

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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:

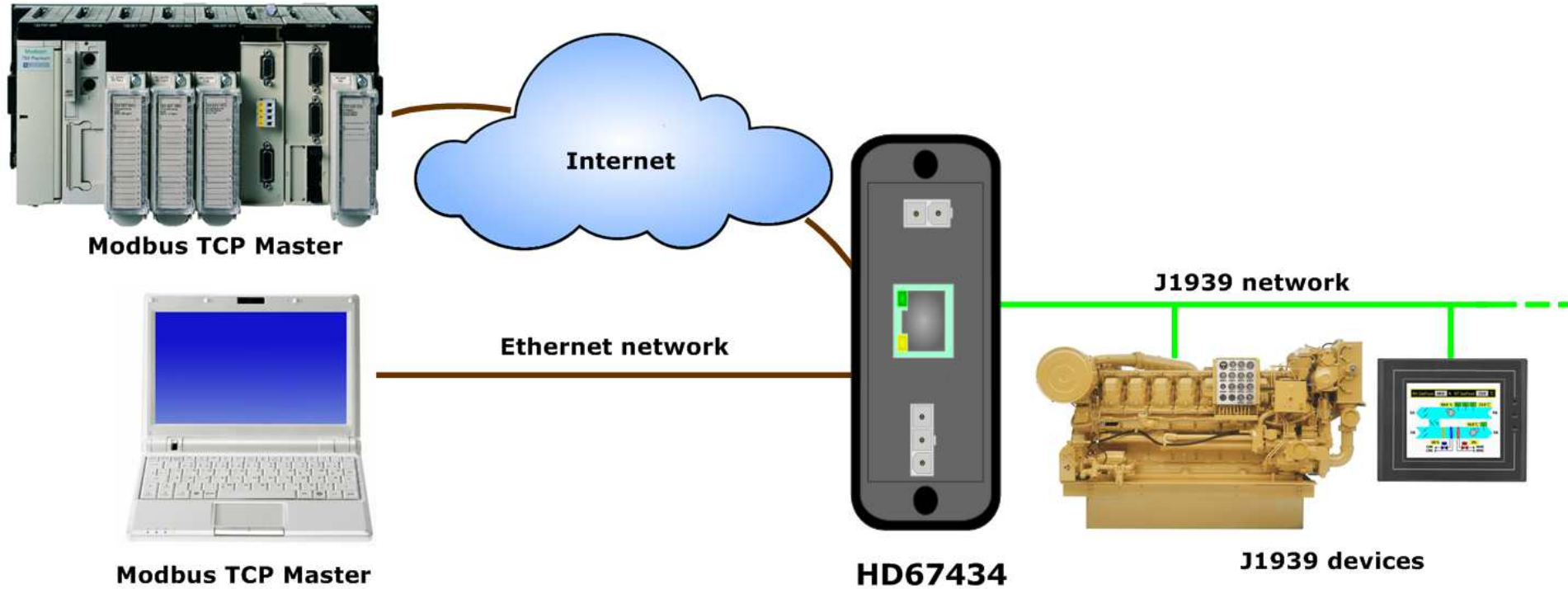


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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.

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

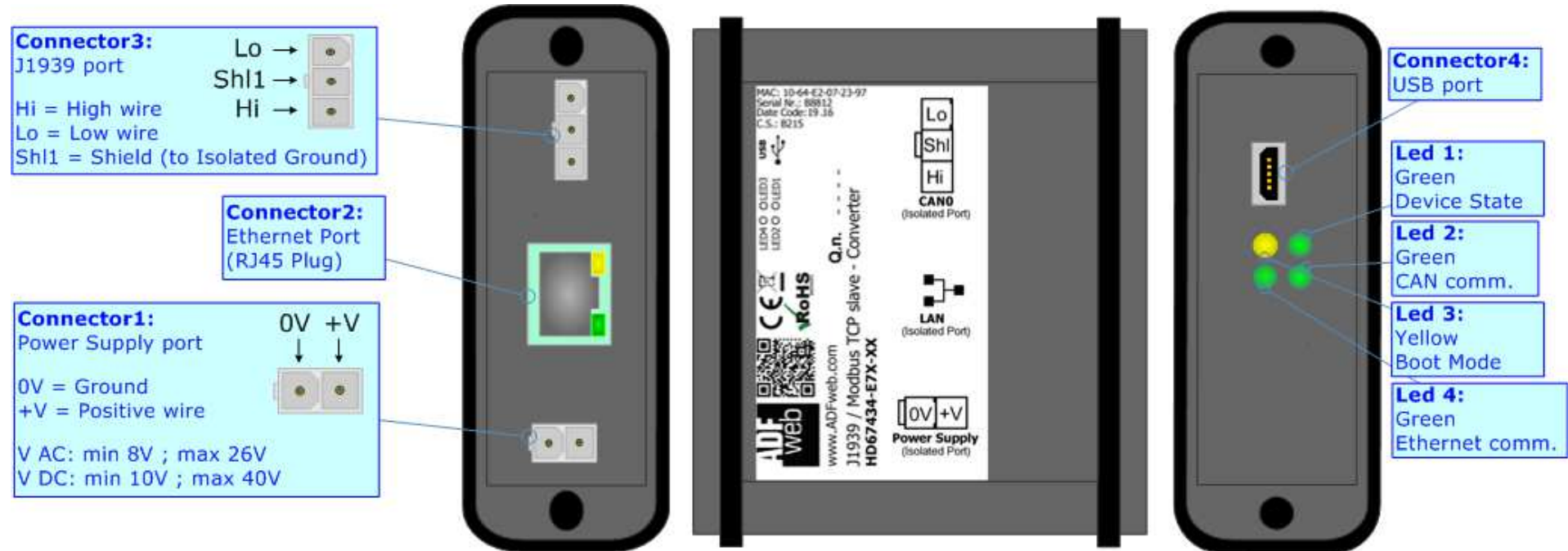


Figure 1a: Connection scheme for HD67434-E4x-xx

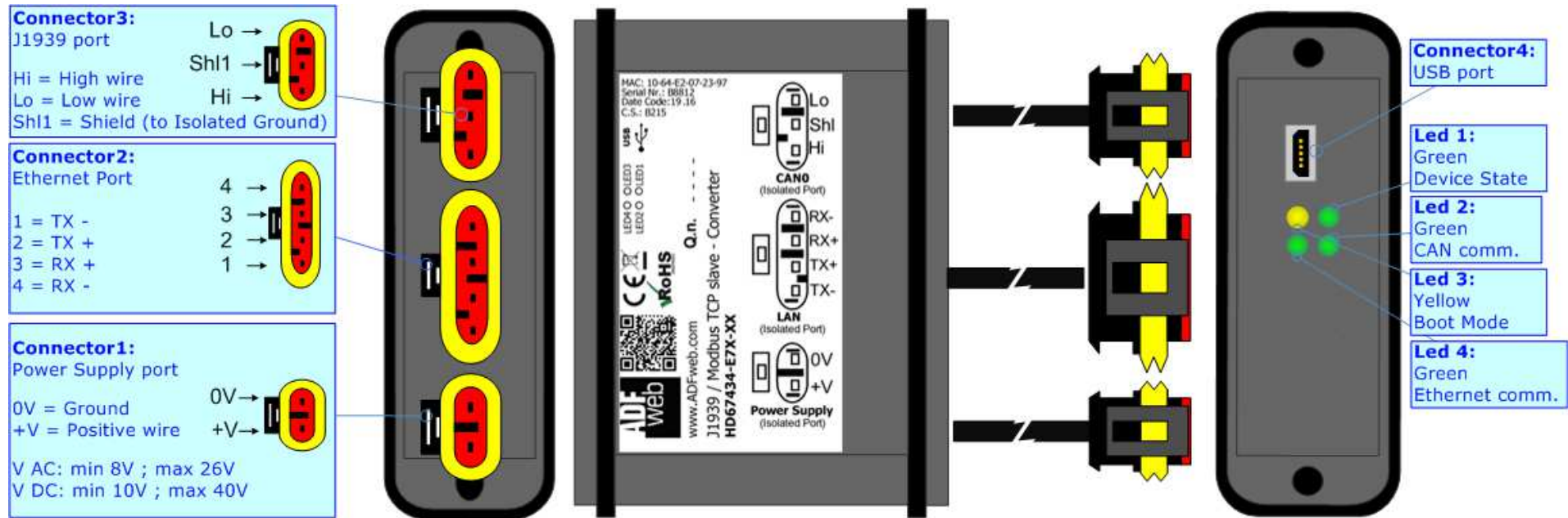


Figure 1b: Connection scheme for HD67434-E7x-xx

CHARACTERISTICS:

The “**HD67434**” series are rugged devices used to interface J1939 devices with a Modbus TCP 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).

All the four series have these characteristics:

- Triple 4kV isolation between Power Supply / Ethernet / J1939;
- 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 SW67434 software on your PC in order to perform the following:

- Define the parameters for the Modbus TCP side;
- Define the parameters for the J1939 side;
- Define which J1939 messages are readable on Modbus TCP side;
- Define which J1939 messages are writeable from Modbus TCP side;
- Update the device.

POWER SUPPLY:

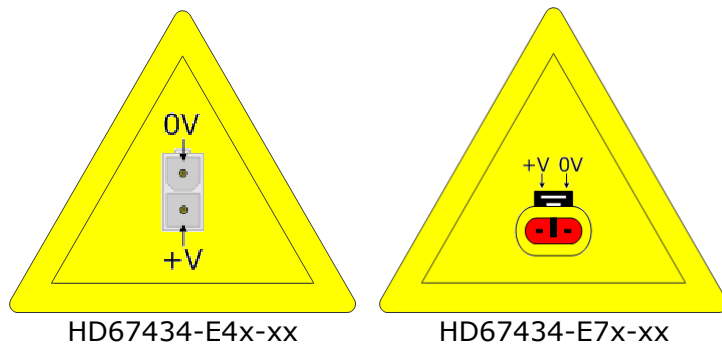
The devices can be powered between a wide range of tensions. For more details see the two tables below.

	VAC		VDC	
	Vmin	Vmax	Vmin	Vmax
HD67434-Exx-xx	8V	26V	10V	40V

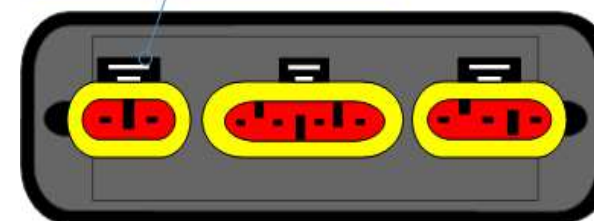
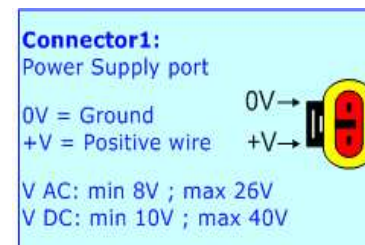
Consumption at 24V DC:

Device	W/VA
HD67434-Exx-xx	4

Caution: Not reverse the polarity power



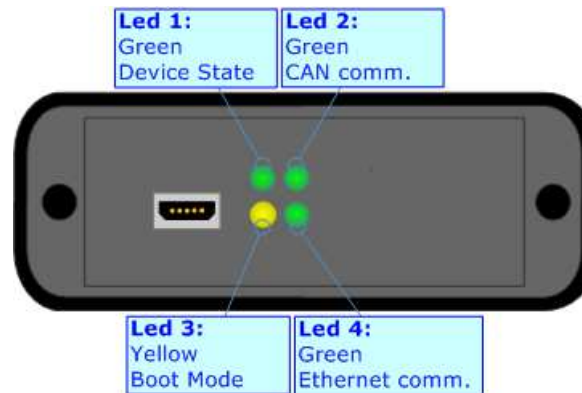
Note: It is possible to use also negative tensions. In this case the polarity must be inverted.



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)	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 (green)	OFF	ON
4: Ethernet communication (yellow)	Blinks when a Modbus TCP request is received	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress



J1939:

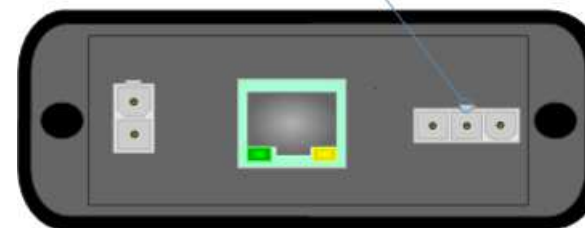
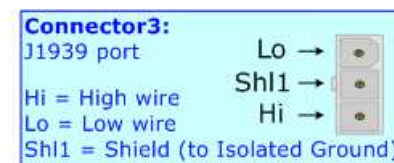
The connection of J1939 in the HD67434-E4x-xx device must be made with a 3way MiniFit Female connector. The pinout of Male Mini-Fit connector of the board is at right side of the page.

The connection of J1939 in the HD67434-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 HD67434-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: HD67434-Exx-Yx; otherwise is this other: HD67434-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

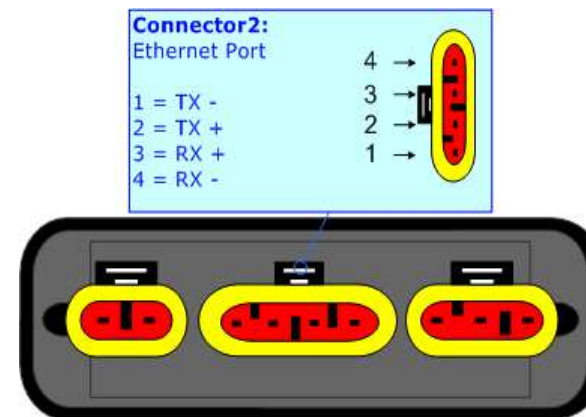


ETHERNET:

The connection of Ethernet in the HD67434 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.

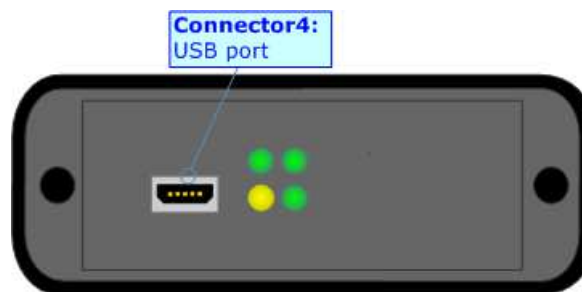
The connection of Ethernet in the HD67434-E4x-xx device must be made with RJ45 connector.

The connection of the Ethernet in the HD67434-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 SW67434:

To configure the Converter, use the available software that runs with Windows called SW67434. 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 SW67434, the window below appears (Fig. 2).



Note:

It is necessary to have installed .Net Framework 4.

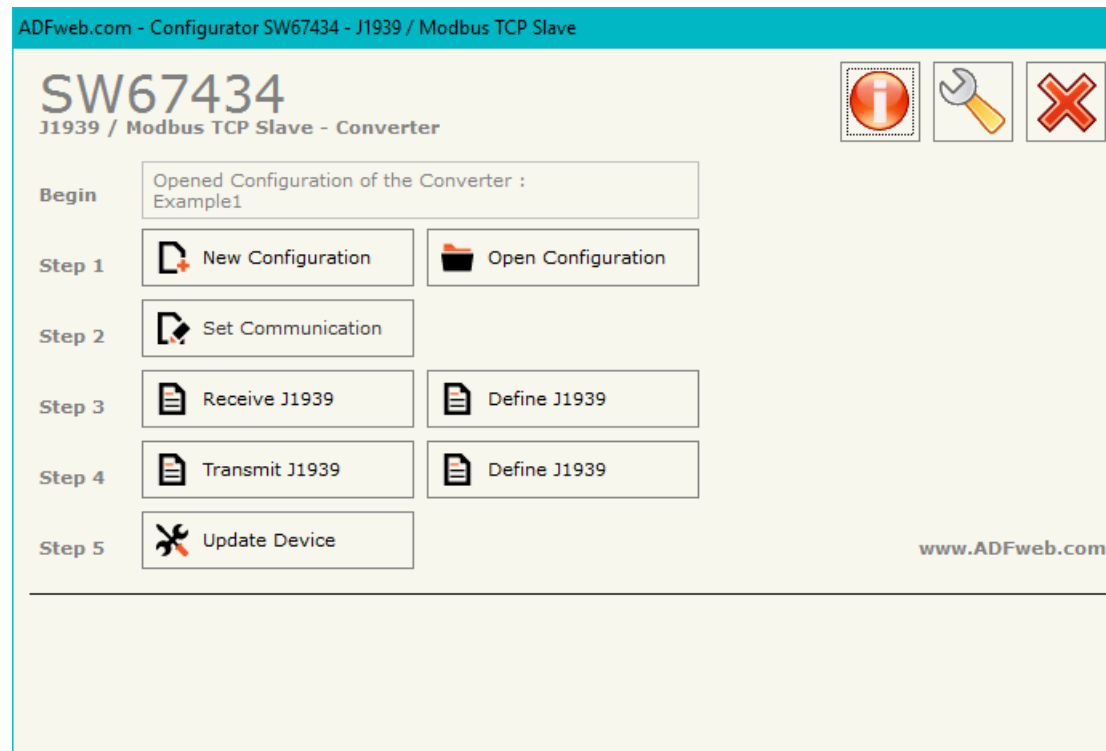
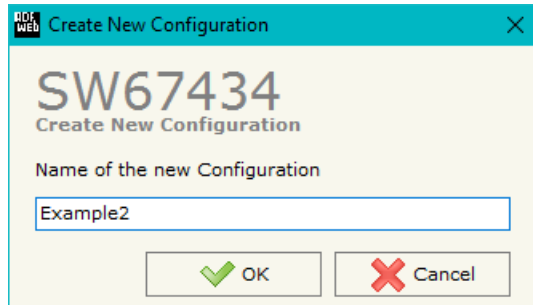


Figure 2: Main window for SW67434

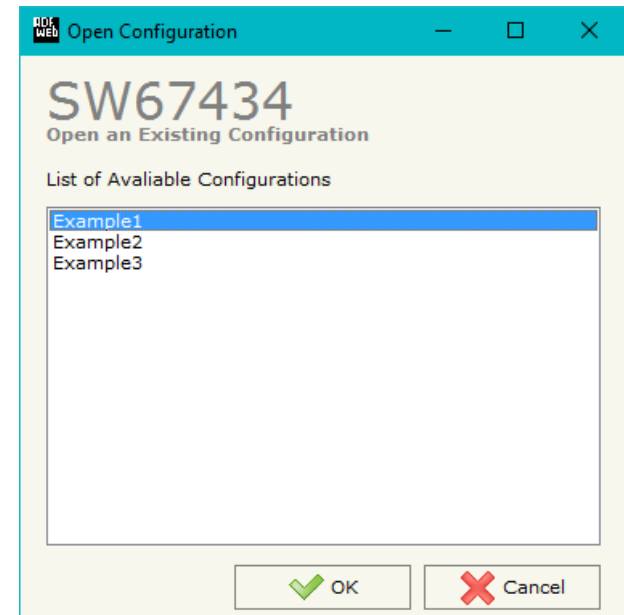
NEW PROJECT / OPEN PROJECT:

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




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

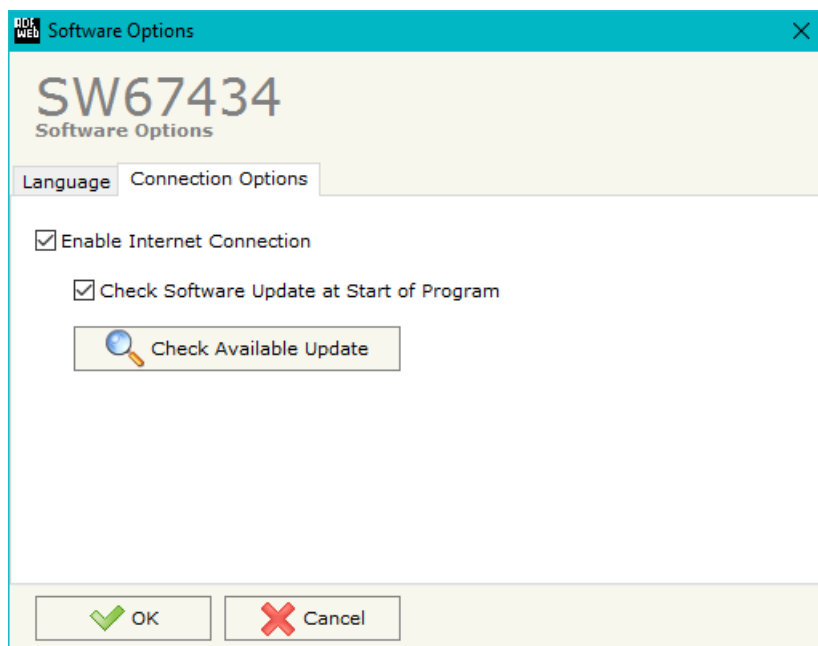
- To clone the configurations of a Programmable “J1939 / Modbus TCP Slave - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button “**Open Configuration**”.



SOFTWARE OPTIONS:

By pressing the “**Settings**” () button there is the possibility to change the language of the software and check the updates 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 updates of the software compositor in ADFweb.com website. Checking the option “**Check Software Update at Start of Program**”, the SW67434 check automatically if there are updates when it is launched.

SET COMMUNICATION:

This section defines the fundamental communication parameters of two buses, J1939 and Modbus TCP.

By pressing the **"Set communication"** button from the main window for SW67434 (Fig. 2) the window "Set Communication" appears (Fig. 3). It is divided in two sub-section, one for the J1939 (CAN Bus) and the other for the Modbus TCP (Ethernet):

- In the fields **"Baud Rate"**, the velocity of J1939 bus is defined;
- In the field **"Time out Data"** insert a time, when this time is elapsed the data isn't reliable and in the Modbus register you can read "FFFF";
- In the field **"Modbus Reg. TimeOut"** insert a number of register, in this register you can visualize if the data is reliable, if 1 the data is ok, if 0 the data is oldest of the time inserted in the time out data;
- If the field **"Enable Peer to Peer"** is checked the gateway accept any ID that have the PGN inserted in the section "Receive J1939";
- If the field **"Device ID J1939"** insert the device ID for the J1939 converter.
- In the field **"IP ADDRESS"** insert the IP address that you want to give at slave Modbus;
- In the field **"SUBNET Mask"**, insert the SubNet Mask of your Network;
- If the field **"Use Gateway"** is checked in the fields under it is possible to insert the IP address used for going out to the net;
- In the field **"Port"**, insert the number of port that Modbus TCP use.

The screenshot shows the "Set Communication" window for device SW67434. The window is titled "Set Communication" and has a close button (X) in the top right corner. The main title is "SW67434 Set Communication Setting".

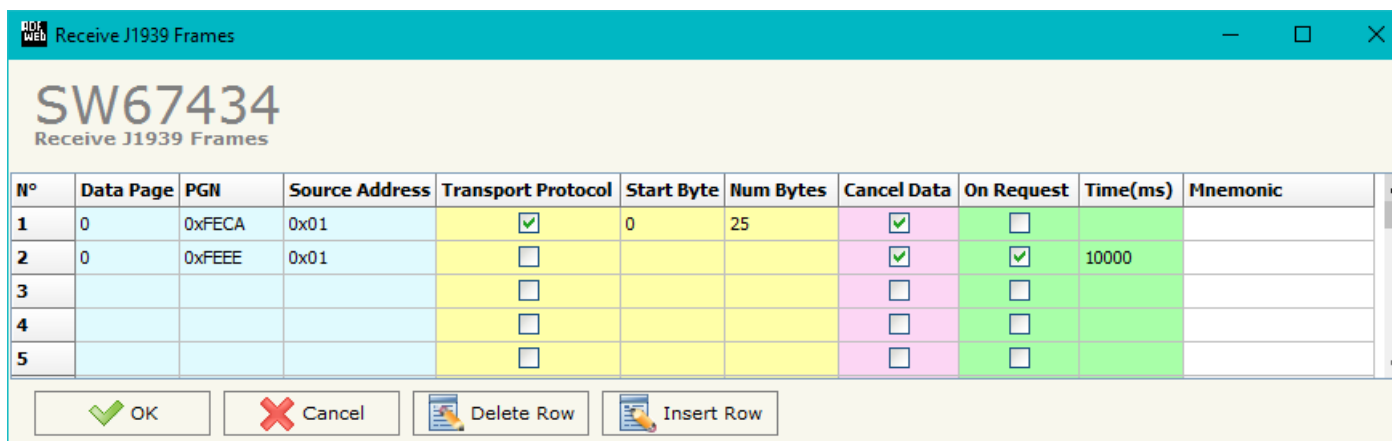
The window is divided into two sections:

- J1939** (CAN Bus):
 - Baudrate: 250K (dropdown menu)
 - TimeOut Data (s): 2 (text input)
 - Modbus Reg. TimeOut: 99 (text input)
 - Enable Peer to Peer
 - Device ID J1939: 1 (text input)
- Modbus TCP Slave** (Ethernet):
 - IP ADDRESS: 192 . 168 . 0 . 10 (four text inputs)
 - SUBNET Mask: 255 . 255 . 255 . 0 (four text inputs)
 - GATEWAY
 - Port: 502 (text input)

At the bottom of the window are two buttons: "OK" (with a green checkmark icon) and "Cancel" (with a red X icon).

Figure 3: "Set Communication" window

RECEIVE J1939:



N°	Data Page	PGN	Source Address	Transport Protocol	Start Byte	Num Bytes	Cancel Data	On Request	Time(ms)	Mnemonic
1	0	0xFECA	0x01	<input checked="" type="checkbox"/>	0	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2	0	0xFEEE	0x01	<input type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	10000	
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"/>		

Figure 4: "Receive J1939" window

By pressing the "Receive J1939" button from the main window for SW67434 (Fig. 2) the window "Receive J1939" appears (Fig. 4).

The means of the fields of the table are:

- 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 to read from modbus to J1939 (in the J1939 protocol the PGN is an identifier);
- In the field "Source Address" insert the address of the device that send the frame.
- If the field "Transport Protocol" is checked the frame can 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 Multi Frame is checked;
- In the field "Num Byte" insert the number of byte you would read, for example your Start Byte is 20 and Num Bytes is 10, you can read the byte from 20 to 30.
- If the field "Cancel Data" is checked and the Modbus Register in the section "Set Communication" is 0 the gateway when the data is oldest of the time inserted in the "TimeOut Data" you visualize "FFFF" in the Modbus registers of this PGN.
- If the field "On Request" is checked the PGN is received when the J1939 Request is sent: this option is used if the PGN can be only sent on request by the J1939 devices.
- In the field "Time(ms)" insert the delay between two J1939 requests.
- In the field "Mnemonic" the description for the frame is defined.

DEFINE RECEIVE J1939

By pressing the "Define J1939" button, near "Receive J1939" from the main window for SW67434 (Fig. 2) the window "Define Receive J1939" appears (Fig. 5):

- In the field "**List of Receive J1939 Frames**" there is the list of frames J1939 that you inserted in Receive J1939 Section
- In the field "**List of Modbus Registers**" there are the Modbus words.
- In the field "**Create/Modify a Modbus Register**" you can define the index of the Modbus register and the bytes of the J1939 PGN that you map in.

For example:

Click on the frame, insert the valid address in the field "Index of Modbus Register", select the byte position (Byte 1 in High Modbus byte and Byte 3 in Low Modbus byte), click the "Create" button, in the field "List of Modbus Registers" appears the new Modbus register created with the data that it contains.

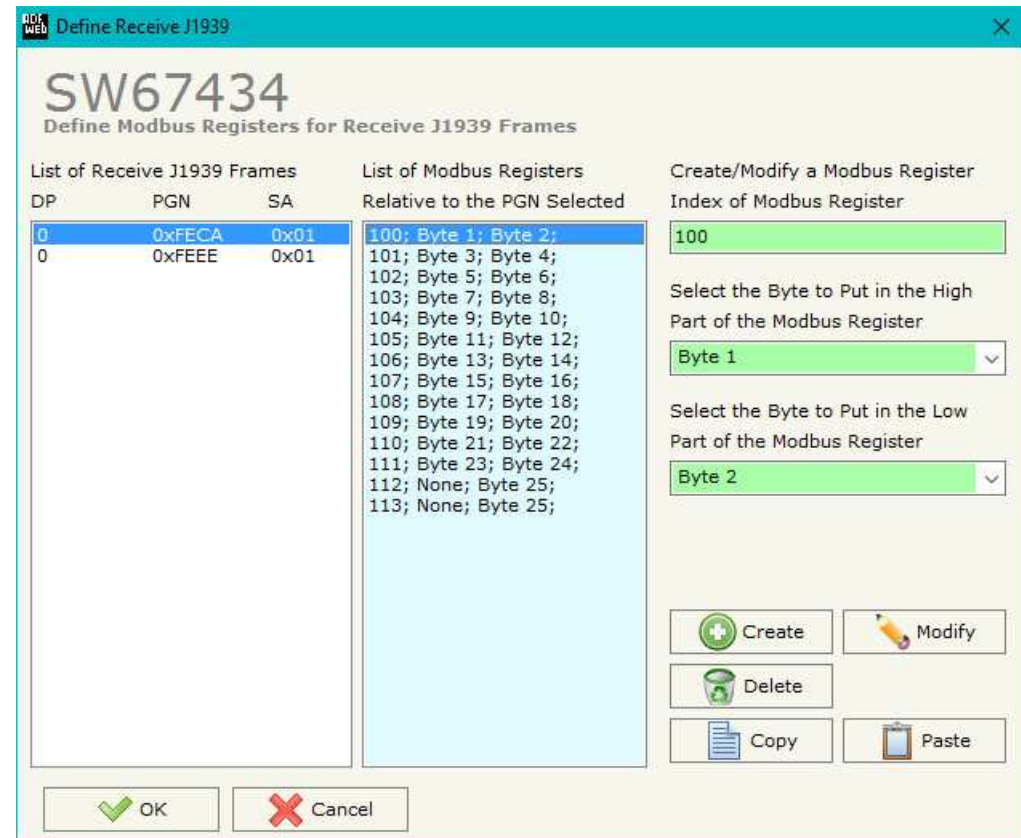


Figure 5: "Define Receive J1939" window

TRANSMIT J1939

N°	Priority	Data Page	PGN	Source Address	On Request	Data Change	On Timer	Time(ms)	Mnemonic
1	6	0	0xFF16	0x10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	
2					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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"/>		

Figure 6: "Transmit J1939 frame" window

By pressing the "**Transmit J1939**" button from the main window of SW67434 the window "Transmit J1939" appears (Fig. 6):

- In the field "**Priority**" insert the priority of the frame, in J1939 protocol 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, in the J1939 protocol is 0 or 1.
- In the field "**PGN**" insert the PGN of the data you would to write from modbus to J1939 (in the J1939 protocol, the PGN is an identifier).
- In the field "**Source address**" you insert the ID of device that send the frame.
- If the field "**On Request**" is checked the PGN is sent when the J1939 Request is received.
- If the field "**Data Change**" is checked the PGN is sent when the data written from Modbus TCP side changes.
- If the field "**On Timer**" is checked the PGN is sent cyclically.
- In the field "**Time(ms)**" insert the cyclic delay.
- In the field "**Mnemonic**" the description for the frame is defined.

DEFINE TRANSMIT J1939

By pressing the “**Define J1939**” button from the main window for SW67434 (Fig. 2) the window “Define Transmit J1939” appears (Fig. 7):

- In the field “**List of Transmit J1939 Frames**” there is the list of frames J1939 that you inserted in Transmit J1939 Section.
- In the field “**List of Modbus Registers**” there are the Modbus words.
- In the field “**Create/Modify a Modbus Register**” you can define the index of the Modbus register and the bytes of the J1939 PGN where you write it.
- With the field “**Send J1939 frame on Modbus Write**” it is possible to decide when to send the J1939 frame. If a Modbus word has written “False” in this field, the J1939 frame is not sent immediately but it is sent when another word have this field “True”.

For example:

Click on the frame, insert the valid address in the field “Index of Modbus Register”, select the byte position (Byte 1 in High Modbus byte and Byte 2 in Low Modbus byte), click the “Create” button, in the field “List of Modbus Registers” appears the new Modbus register created.

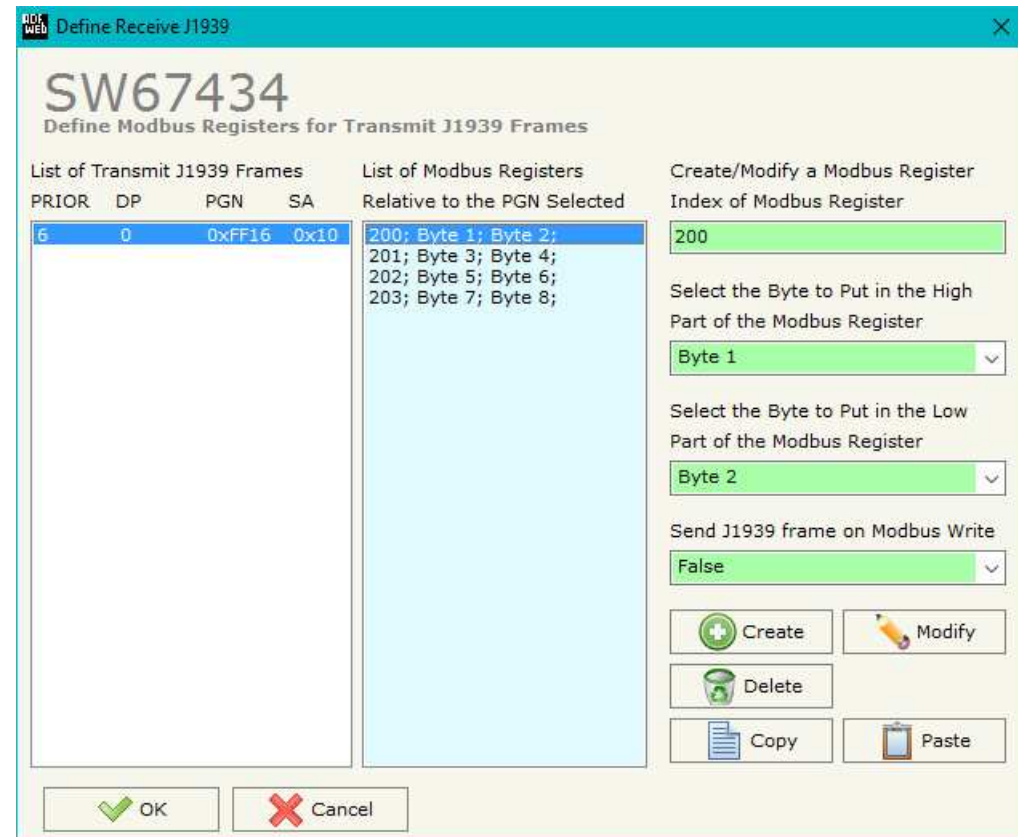


Figure 7: “Define Transmit J1939” window

UPDATE DEVICE:

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

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;

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

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.



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 HD67434 device.

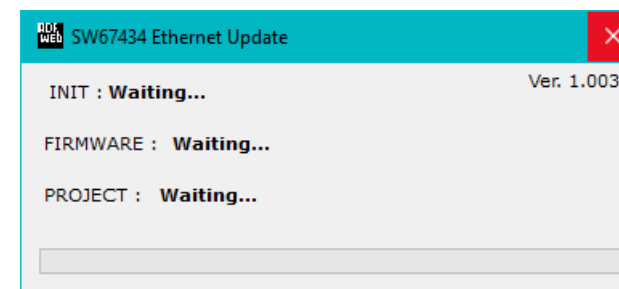
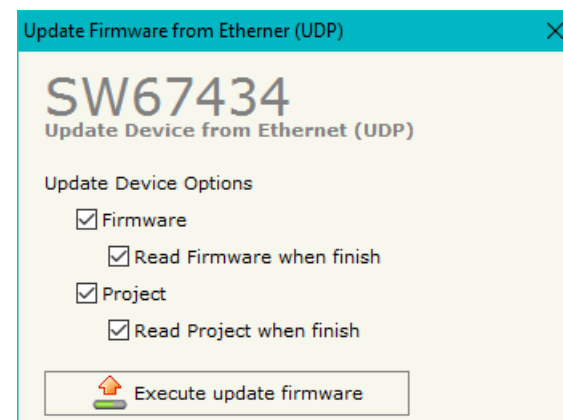
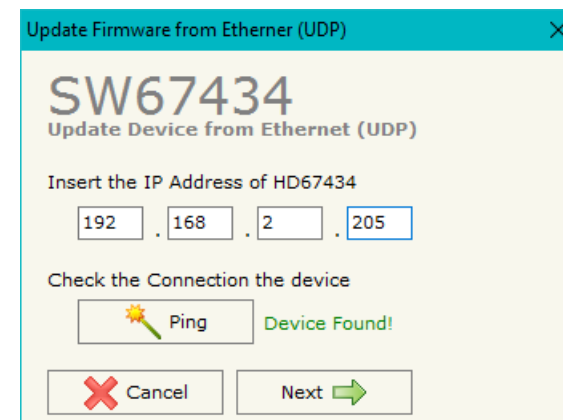


Figure 8: "Update Device" windows

**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD67434 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 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.

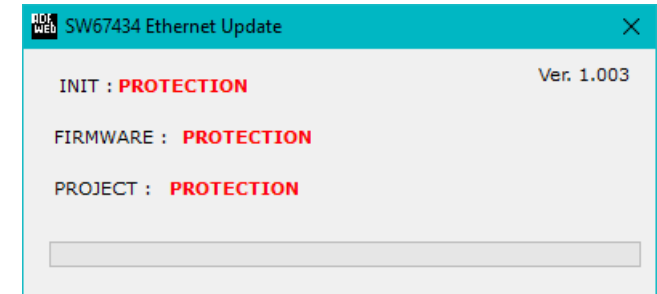
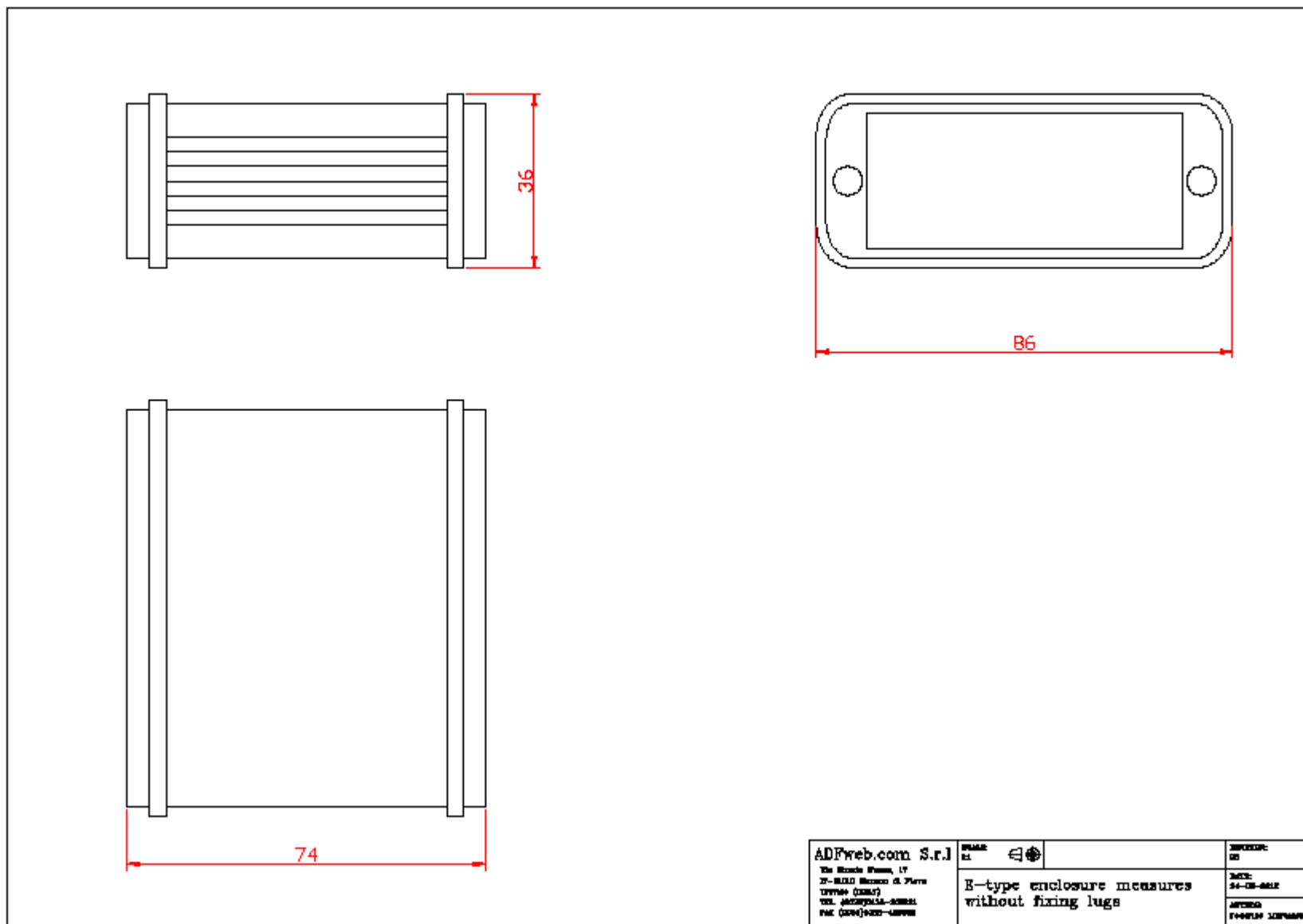
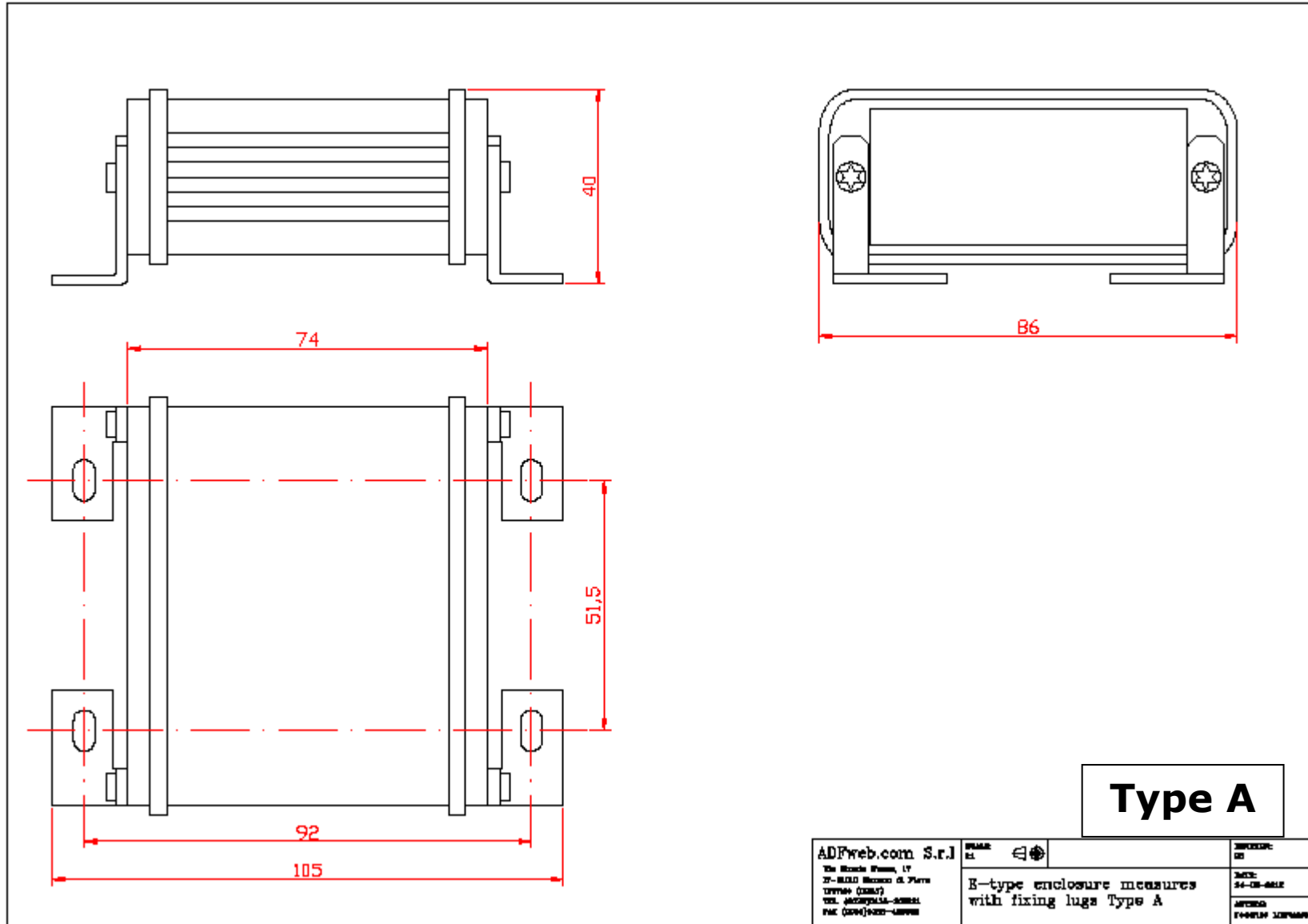


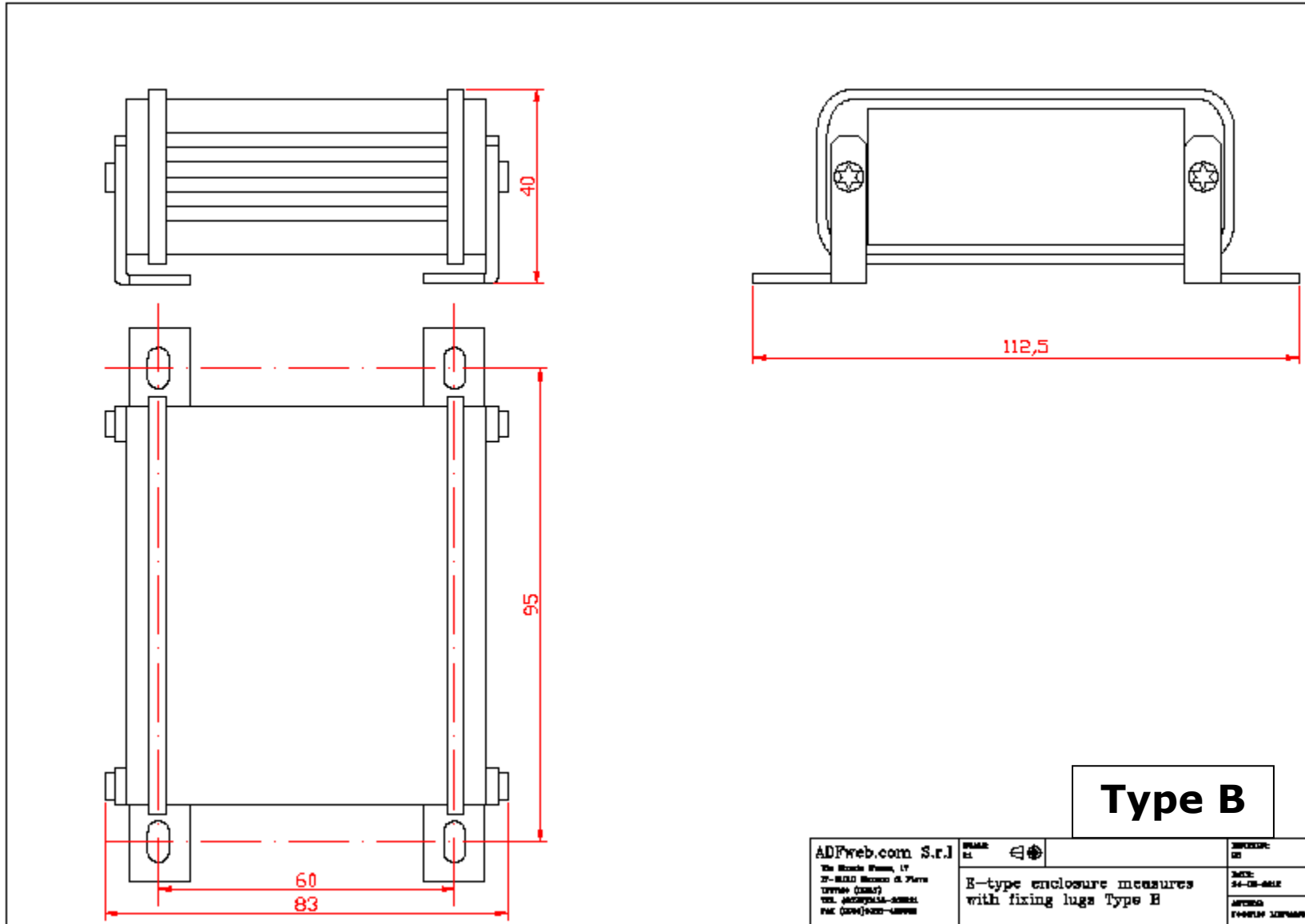
Figure 9: "Protection" window

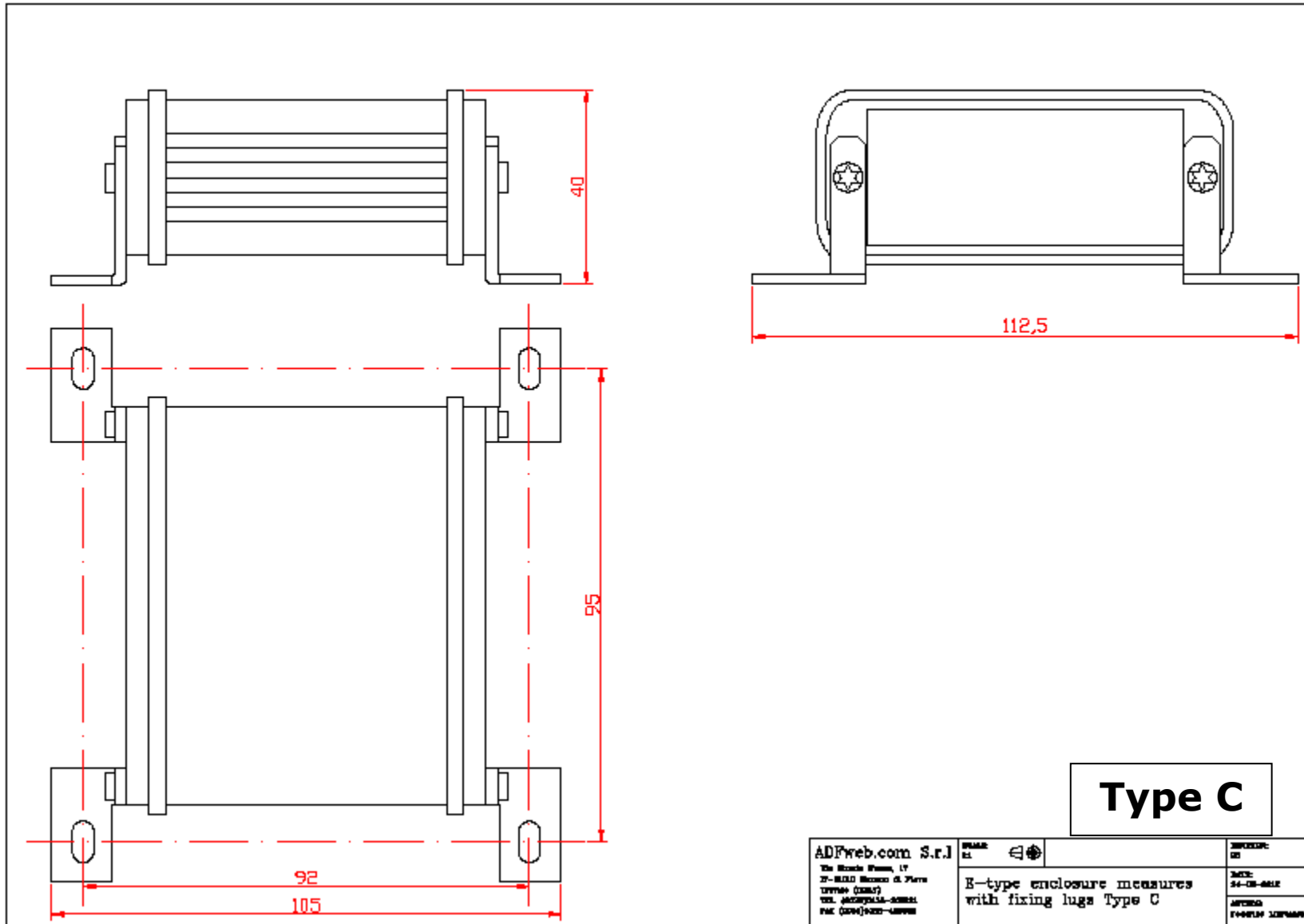
In the case of HD67434 you have to use the software "SW67434": www.adfweb.com/download/filefold/SW67434.zip.

MECHANICAL DIMENSIONS:





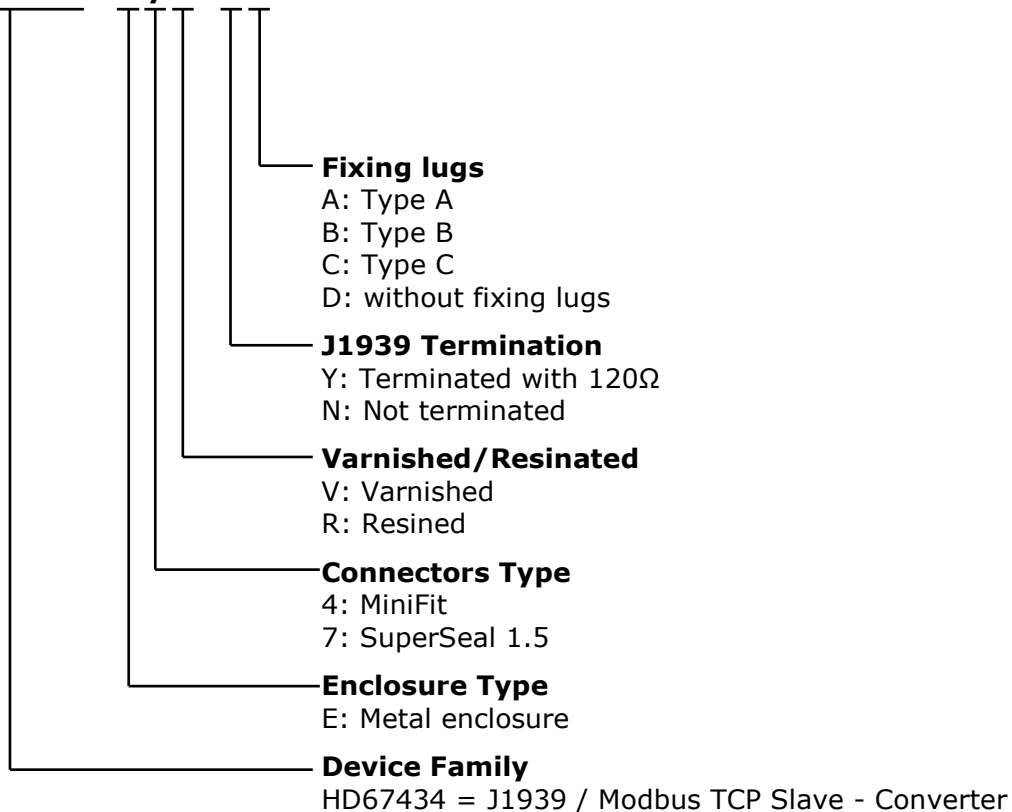




ORDERING INFORMATIONS:

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

HD67434 - 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:

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. 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.



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