

# User Manual

Revision 2.100  
English

## CAN - Repeater – Extender bus line

(Order Codes: HD67401-E4V – HD67401-E7R CAN 2.0A & 2.0B  
HD67402-E4V – HD67402-E7R CANopen  
HD67403-E4V – HD67403-E7R DeviceNet  
HD67404-E4V – HD67404-E7R J1939/NMEA2000)

For Website information:

- [www.adfweb.com?Product=HD67401](http://www.adfweb.com?Product=HD67401)
- [www.adfweb.com?Product=HD67402](http://www.adfweb.com?Product=HD67402)
- [www.adfweb.com?Product=HD67403](http://www.adfweb.com?Product=HD67403)
- [www.adfweb.com?Product=HD67404](http://www.adfweb.com?Product=HD67404)

### 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 others Repeaters:

### CAN Repeaters

See also the following links:

- [www.adfweb.com?Product=HD67117](http://www.adfweb.com?Product=HD67117) (For CANopen)
- [www.adfweb.com?Product=HD67180](http://www.adfweb.com?Product=HD67180) (For DeviceNet)
- [www.adfweb.com?Product=HD67181](http://www.adfweb.com?Product=HD67181) (For CAN 2.0A & 2.0B)
- [www.adfweb.com?Product=HD67182](http://www.adfweb.com?Product=HD67182) (For J1939)

### Optic Fibres Repeaters

See also the following links:

- [www.adfweb.com?Product=HD67117F](http://www.adfweb.com?Product=HD67117F) (For CANopen)
- [www.adfweb.com?Product=HD67117FSX](http://www.adfweb.com?Product=HD67117FSX) (For CANopen)
- [www.adfweb.com?Product=HD67180F](http://www.adfweb.com?Product=HD67180F) (For DeviceNet)
- [www.adfweb.com?Product=HD67180FSX](http://www.adfweb.com?Product=HD67180FSX) (For DeviceNet)
- [www.adfweb.com?Product=HD67181F](http://www.adfweb.com?Product=HD67181F) (For CAN 2.0A & 2.0B)
- [www.adfweb.com?Product=HD67181FSX](http://www.adfweb.com?Product=HD67181FSX) (For CAN 2.0A & 2.0B)
- [www.adfweb.com?Product=HD67182F](http://www.adfweb.com?Product=HD67182F) (For J1939)
- [www.adfweb.com?Product=HD67182FSX](http://www.adfweb.com?Product=HD67182FSX) (For J1939)
- [www.adfweb.com?Product=HD67221F](http://www.adfweb.com?Product=HD67221F) (Copper Bridge)
- [www.adfweb.com?Product=HD67221FS](http://www.adfweb.com?Product=HD67221FS) (Copper Bridge)

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
2.000	24/04/2012	Fl	All	New mechanical dimensions
2.001	07/02/2013	Nt	All	Added new chapters
2.002	10/04/2013	Fl	All	Added connectors’ link
2.100	22/03/2017	Ff	All	New Hardware version

**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:



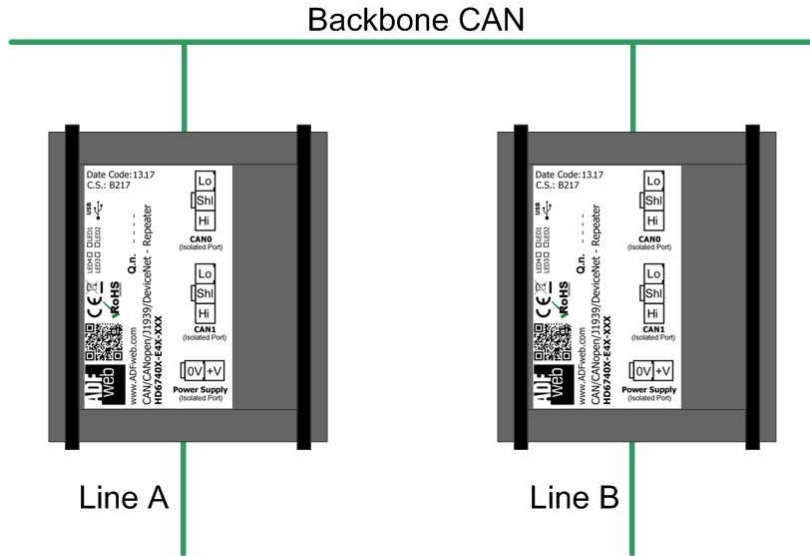
This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

**CE CONFORMITY**

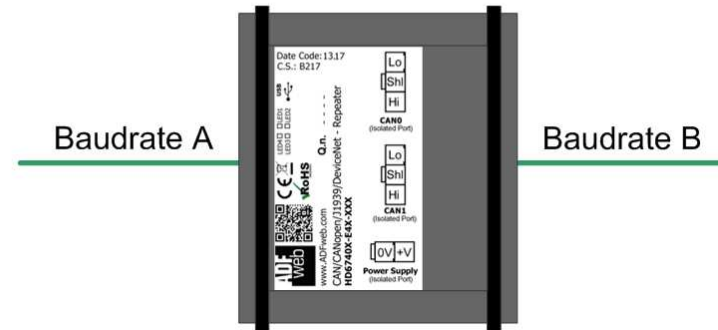
The declaration is made by our company. You can send an email to [support@adfweb.com](mailto:support@adfweb.com) or give us a call if you need it.

**EXAMPLES OF CONNECTION:**

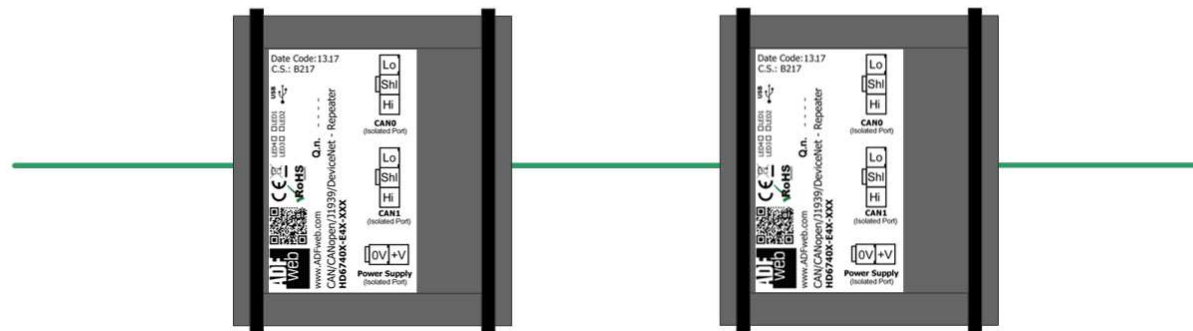
Isolate portions of CAN lines



Different baudrate on CAN lines



Extend CAN line



**CONNECTION SCHEME:**



Figure 1a: Connection scheme for HD6740x-E4x-xxx

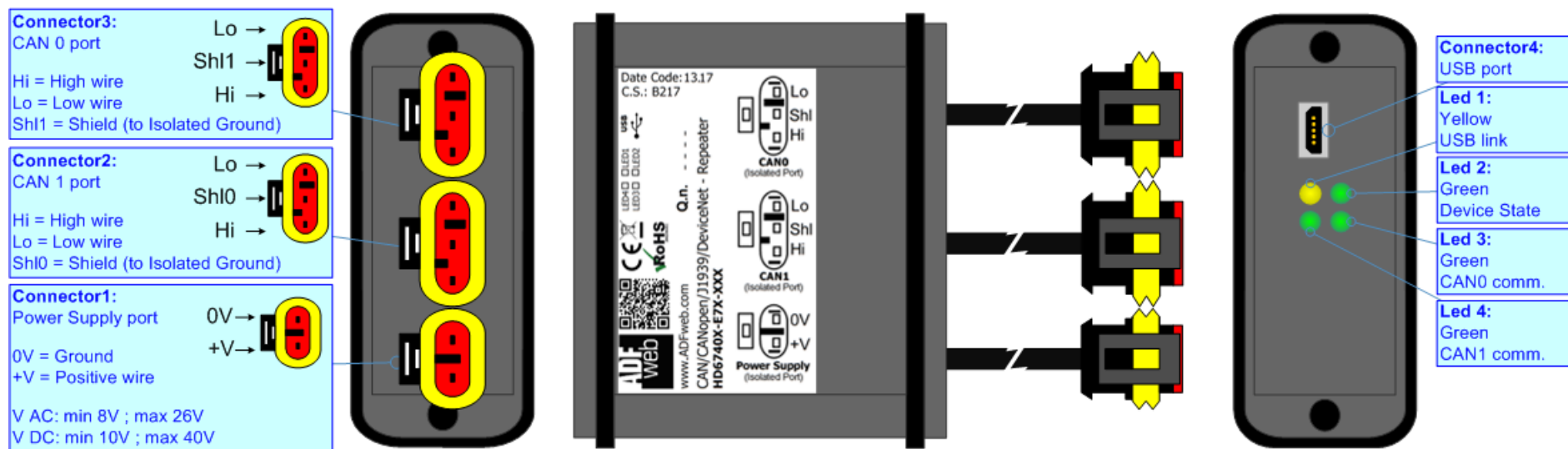


Figure 1b: Connection scheme for HD6740x-E7x-xxx

**CHARACTERISTICS:**

The “**HD67401, HD67402, HD67403, HD67404**” series are rugged devices that can be located on cars, trucks, trains, boats and any other machine that needs to isolate / repeat a portion of CAN bus network (**CAN 2.0A & 2.0B, CANopen, DeviceNet, J1939, NMEA2000**, and generic **ISO11898** standard).

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.

The **HD67401-E4V** and **HD67401-E7R** for generic **CAN 2.0A & 2.0B** network.

The **HD67402-E4V** and **HD67402-E7R** are specific for **CANopen** network.

The **HD67403-E4V** and **HD67403-E7R** are specific for **DeviceNet** network.

The **HD67404-E4V** and **HD67404-E7R** are specific for **J1939/NMEA2000** network.

All the four series have these characteristics:

- Triple 4kV isolation between Power Supply / CAN0 / CAN1;
- 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;
- Programmable baudrate on both CAN sides;
- Wide temperature range: -40°C / 105°C (-40°F / 221°F).

Why uses the products:

- Isolate of a portion of CAN bus network;
- Connect devices with different baudrates in the same network;
- Extend a line segment without lowering the Baudrate.

**POWER SUPPLY:**

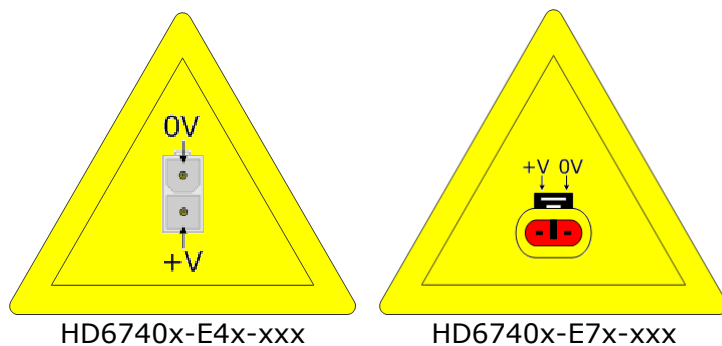
The devices can be powered between a wide range of tensions. For more details see the two tables below.

	VAC		VDC	
	Vmin	Vmax	Vmin	Vmax
<b>HD6740x-Exx-xxx</b>	<b>8V</b>	<b>26V</b>	<b>10V</b>	<b>40V</b>

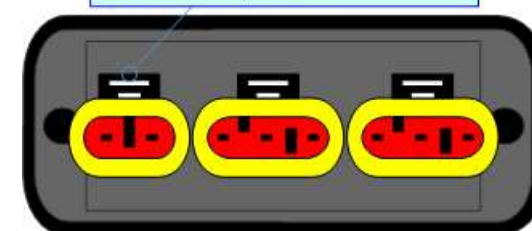
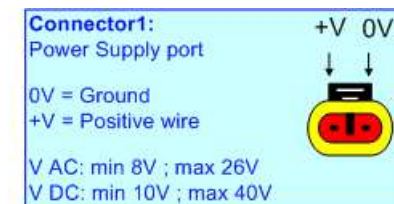
Consumption at 24V DC:

Device	W/VA
HD6740x-Exx-xxx	4

**Caution: Not reverse the polarity power**



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

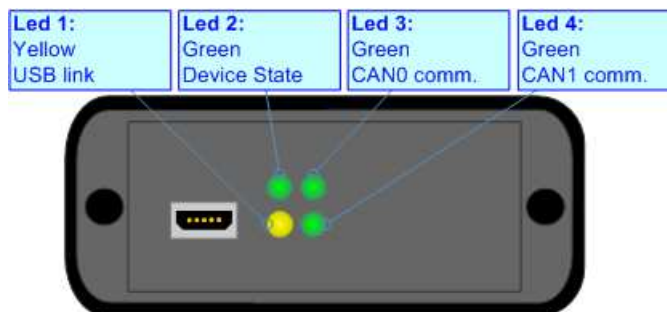




**LEDS:**

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: 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
2: Device state (green)	Blinks slowly (~1Hz)	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
3: CAN0 communication (green)	Blinks when CAN frames are received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
4: CAN1 communication (green)	Blinks when CAN frames are received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress



**CAN:**

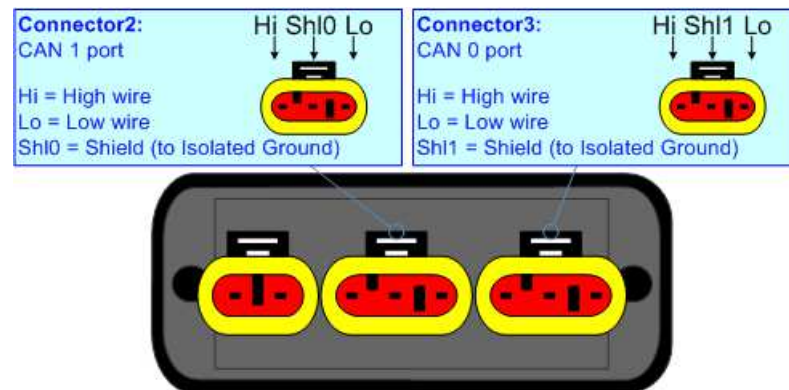
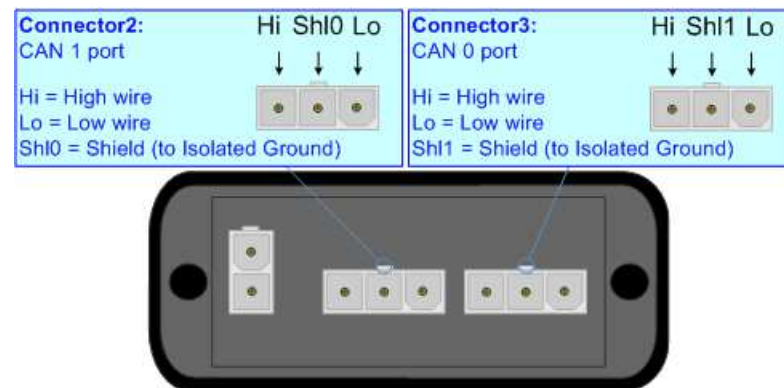
The connection of both CAN (CAN0 and CAN1) in the HD6740x-E4x-xxx device must be made with a 3way MiniFit Female connector. The pinout of Male Mini-Fit connector of the board is at right side of the page.

The connection of both CAN (CAN0 and CAN1) in the HD6740x-E7x-xxx 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 both CAN (CAN0 and CAN1) line, with a 120Ω resistor, in the HD6740x-Exx-xxx is made internally of the device; when the order is performed. If the device have the CAN0 terminated the code is the follow: HD6740x-Exx-Yxx; otherwise is this other: HD6740x-Exx-Nxx. If the device have the CAN1 terminated the code is the follow: HD6740x-Exx-xYx; otherwise is this other: HD6740x-Exx-xNx.

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

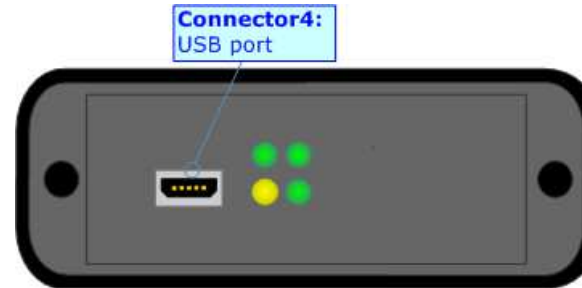


Link for Mini-Fit® connectors: [http://www.molex.com/molex/products/group?key=minifit\\_products&channel=products](http://www.molex.com/molex/products/group?key=minifit_products&channel=products)

Link for SuperSeal 1.5 connectors: <http://www.te.com/catalog/cinf/en/c/10876/956>

**USB:**

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



**USE OF COMPOSITOR SW6740X:**

To configure the Converter, use the available software that runs with Windows called SW6740X. 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 SW6740X, the window below appears (Fig. 2).

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

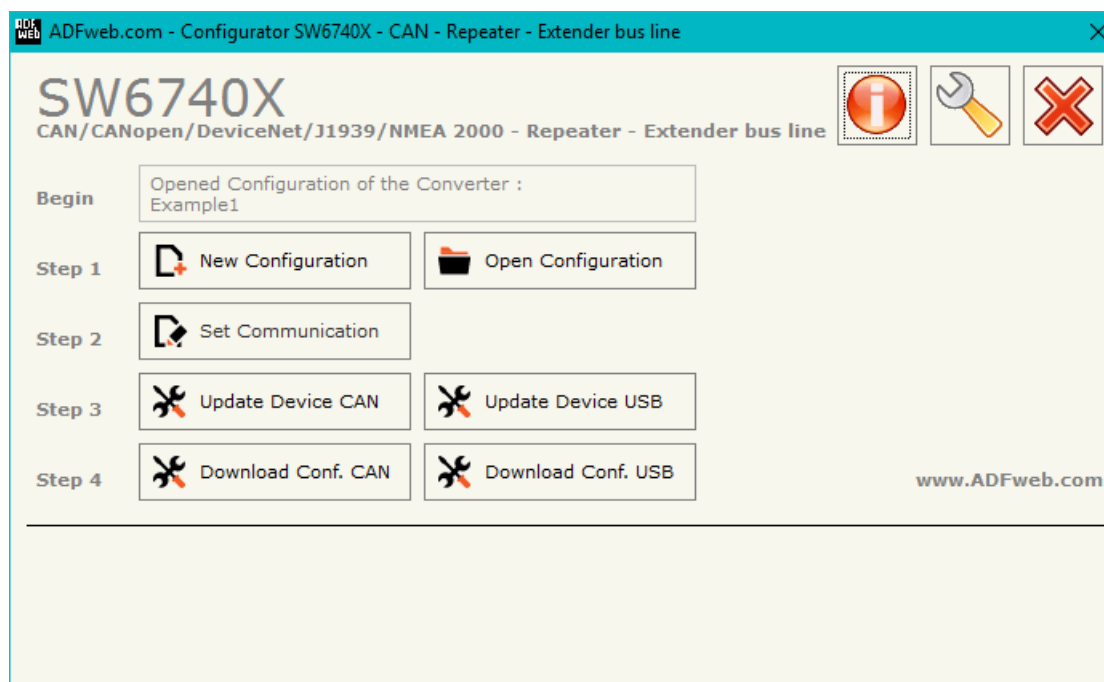
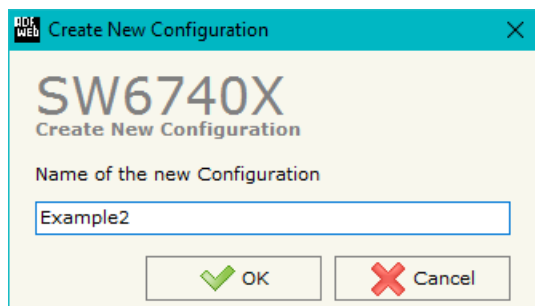


Figure 2: Main window for SW6740X

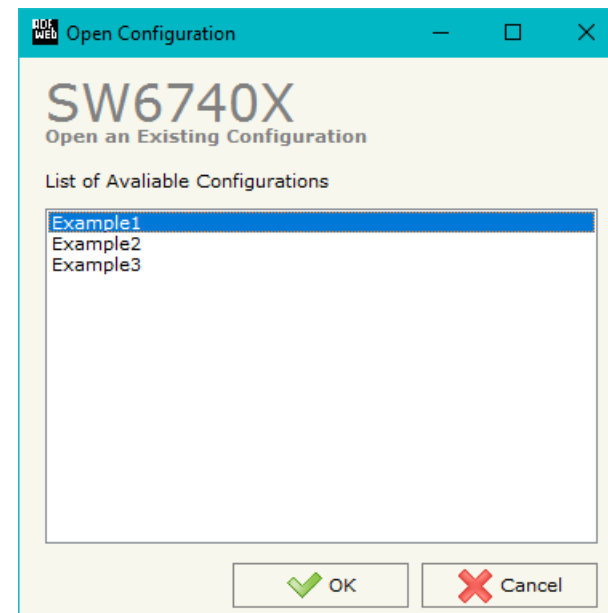
**NEW CONFIGURATION / OPEN CONFIGURATION:**

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




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

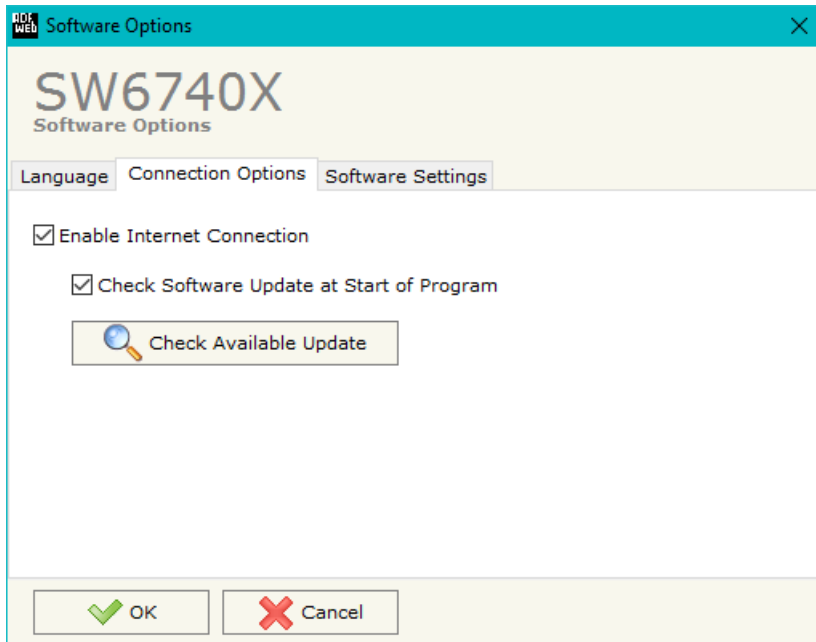
- To clone the configurations of a programmable “CAN – Repeater – Extender bus line” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button “**Open Configuration**”.



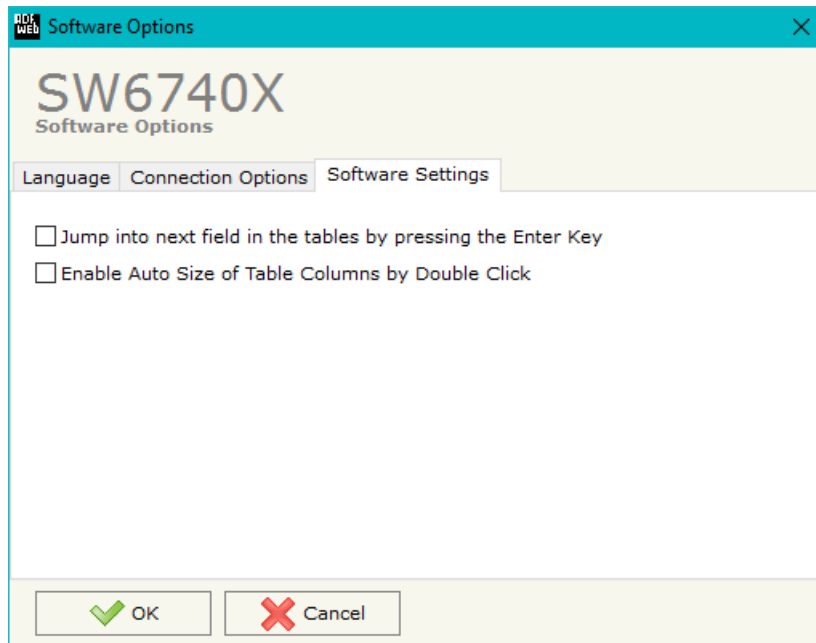
**SOFTWARE OPTIONS:**

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 SW6740X check 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 converter.

By Pressing the "**Set Communication**" button from the main window for SW6740X (Fig. 2) the window "Set Communication" appears (Fig. 3).

The means of the fields for "CANs" are:

- In the field "**Baudrate CAN 0**" the data rate of the CAN0 port is defined;
- In the field "**Baudrate CAN 1**" the data rate of the CAN1 port is defined;
- If the field "**ID Board**" the ID of the converter is defined (fixed to 0x55).

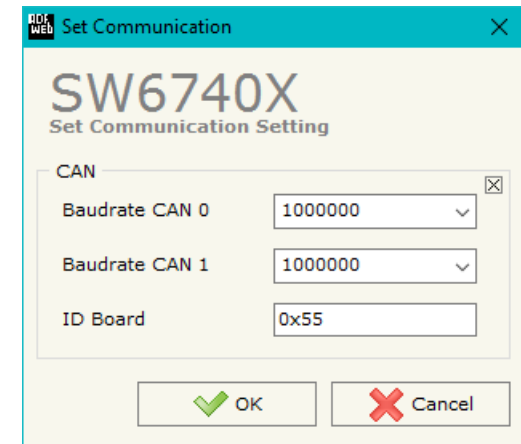


Figure 3: "Set Communication" window



**UPDATE DEVICE CAN (ONLY FOR THE HARDWARE WITHOUT USB PORT):**

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

In order to load the parameters or update the firmware in the Converter, follow these instructions:

- Connect the AC67400 to the PC;
- Connect the CAN port of AC67400 to a CAN port of HD6740X;
- Turn ON the device;
- Select the **“COM port”**;
- Select the **“Baudrate”**;
- 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” turn OFF the device;
- Disconnect the AC67400;
- Turn ON the device.

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

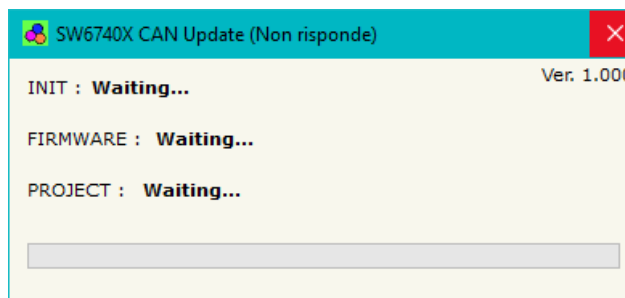
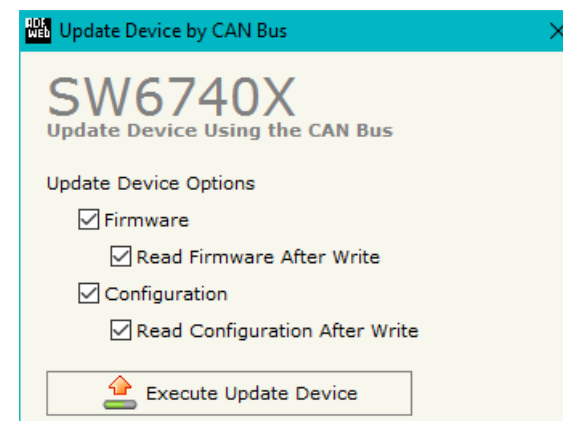
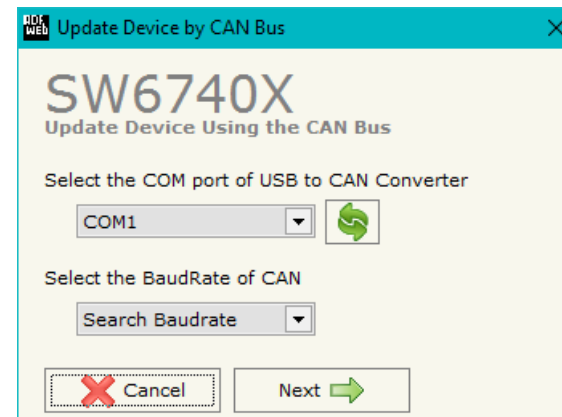


Figure 4: “Update Device” windows

**UPDATE DEVICE USB:**

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

In order to load the parameters or update the firmware in the device, follow these instructions:

- Connect the USB cable from your PC to the Converter;
- Select the **"COM port"**;
- Select which operations you want to do.
- Press the **"Execute update firmware"** button to start the upload;
- When all the operations are "OK", disconnect the USB cable;

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

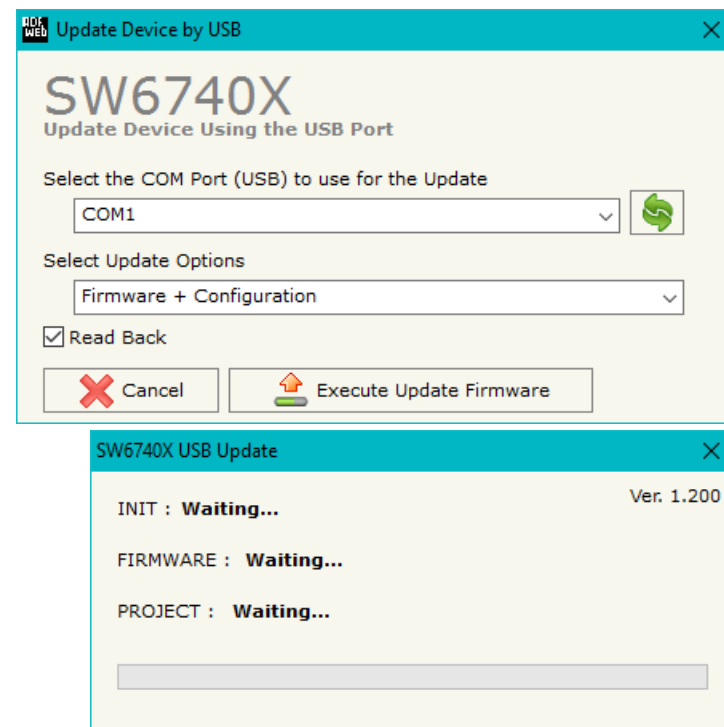





Figure 5: "Update Device" windows

 **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 HD6740X device.

 **Note:**  
When you receive the device, for the first time, you have to update also the Firmware in the HD6740X device.

 **Warning:**  
If the Fig. 6 appears when you try to do the Update, before require assistance, try these points:

- Check if the serial COM port selected is the correct one;
- Check if the AC67400 is connected between the PC and the device;
- Check if the USB cable is connected between the PC and the device;
- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven or Vista or 8 or 10, make sure that you have the administrator privileges;
- Pay attention to Firewall lock.

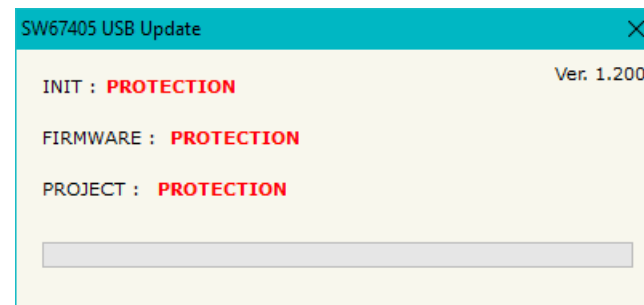


Figure 6: "Protection" window

In the case of HD6740X you have to use the software "SW6740X": [www.adfweb.com/download/filefold/SW6740X.zip](http://www.adfweb.com/download/filefold/SW6740X.zip).

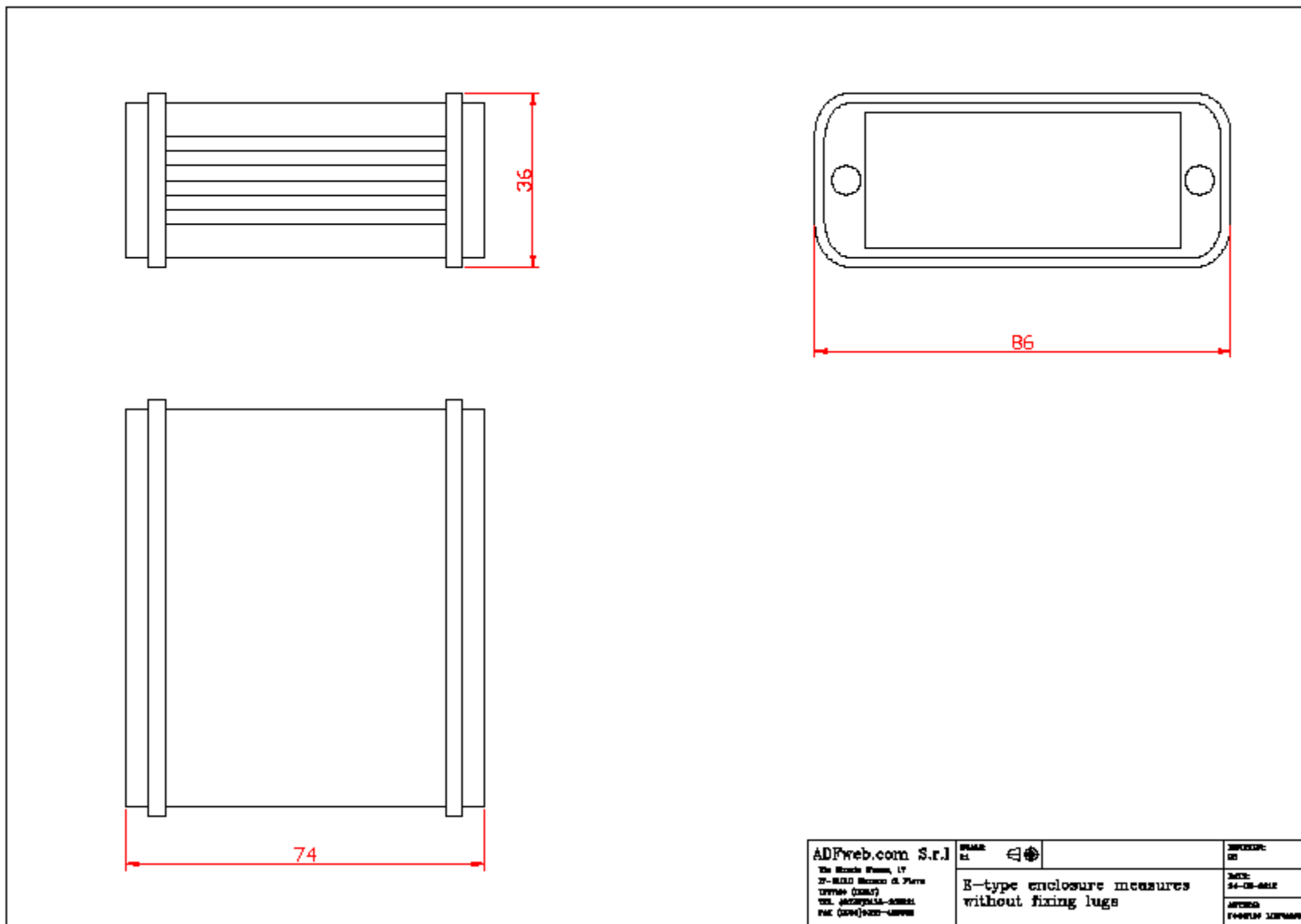
**DOWNLOAD CONF.:**

By pressing the “**Download Conf. CAN**” or “**Download Conf. USB**” button, it is possible to download the Configuration that is inside the device into the opened project.

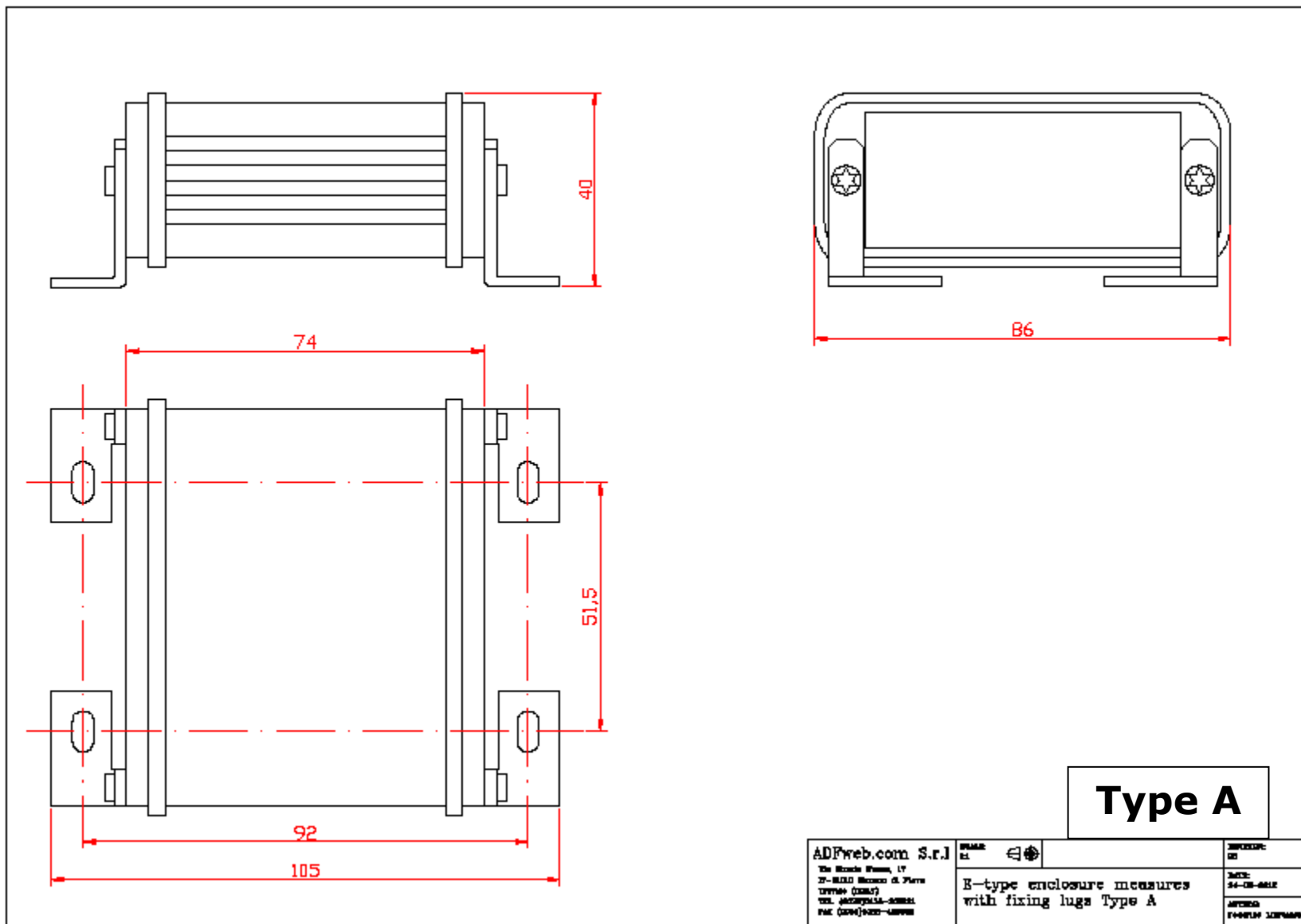
It is possible to download it by CAN (hardware without USB) or by USB (hardware with USB).

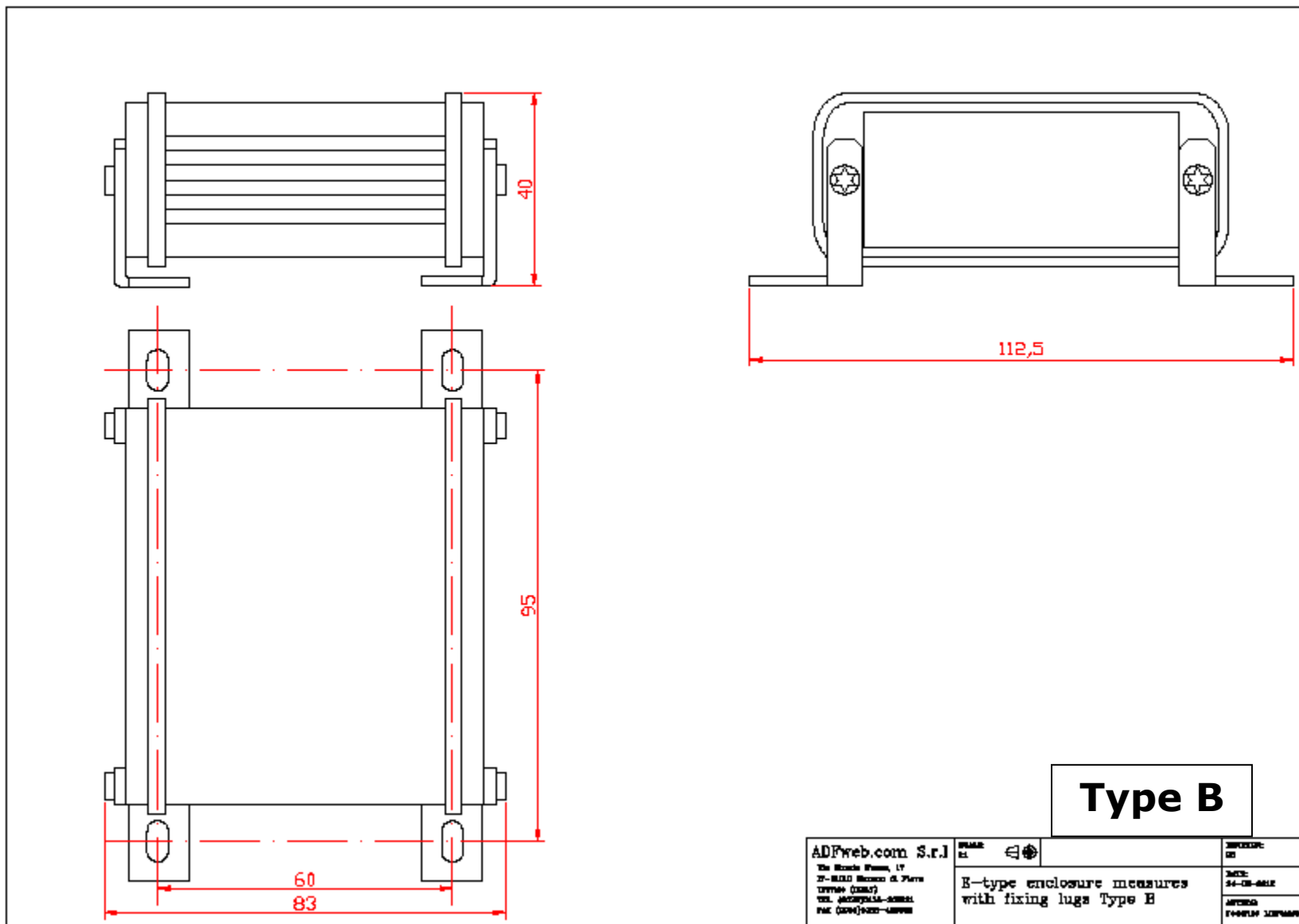
The procedures for the downloading is the same of the ones for the updating.

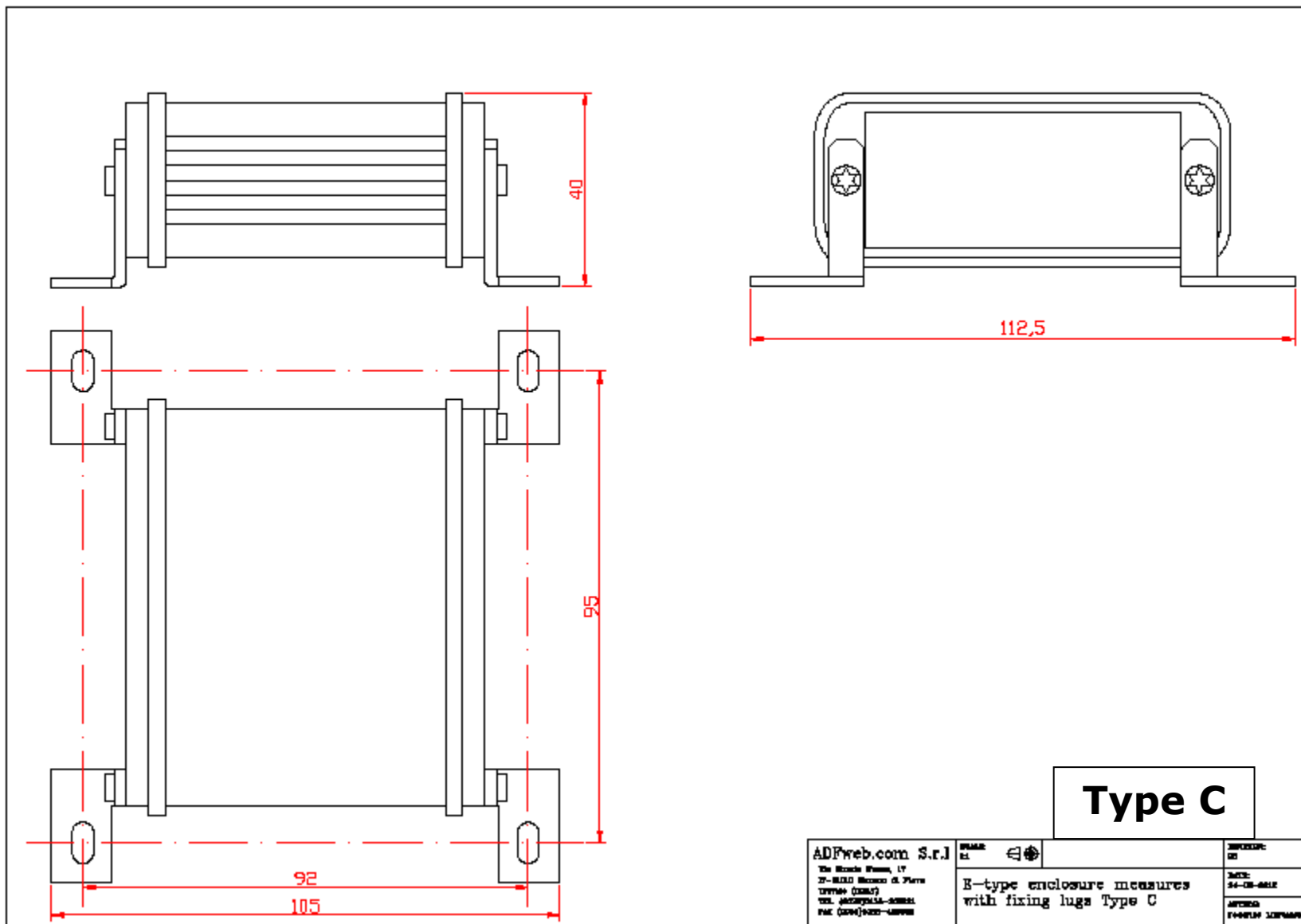
**MECHANICAL DIMENSIONS:**



<p>ADFweb.com S.r.l. Via Sileto 10000, 11 31-04030 Marenco di Piave TREVISO (TV) 31040 TEL. 0423/30111-30112 FAX 0423/30113-30114</p>	<p>IPRAME E1</p>	<p>E-type enclosure measures without fixing lugs</p>	<p>DESCRIZIONE E1 MATERIALE 34-08-0812 AUTORE FABBRICAZIONE</p>
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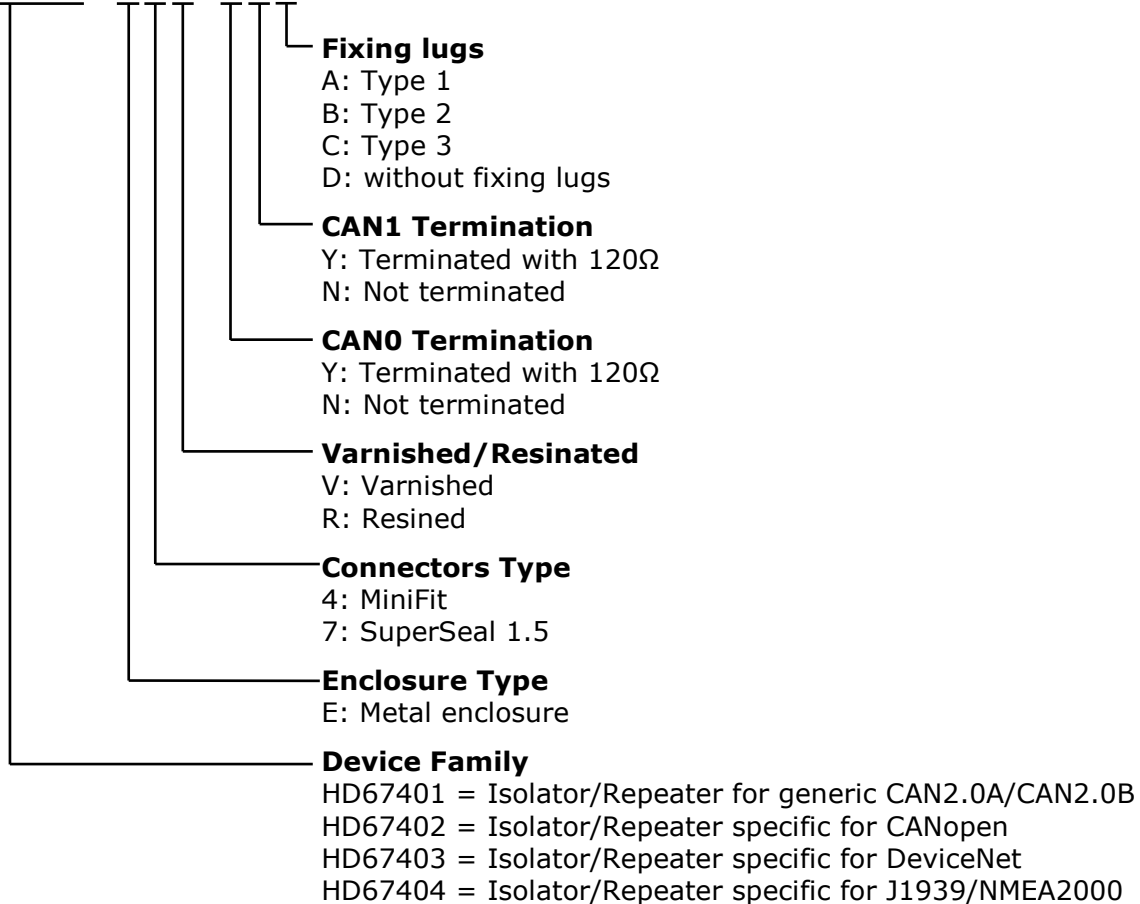




**ORDERING INFORMATIONS:**

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

**HD6740X – E y z – s d 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: **AC67402** - Cable Super Seal 1.5 MALE 2-pole - 1.0 Meter
- Order Code: **AC67402-3** - Cable Super Seal 1.5 MALE 2-pole - 3.0 Meters
- Order Code: **AC67403** - Cable Super Seal 1.5 MALE 3-pole - 1.0 Meter
- Order Code: **AC67403-3** - Cable Super Seal 1.5 MALE 3-pole - 3.0 Meters
- Order Code: **AC67410** - Accessory Automotive Devices - Support for rail DIN

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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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