User Manual

Revision 1.001
English

CAN / PROFIBUS Master – Converter

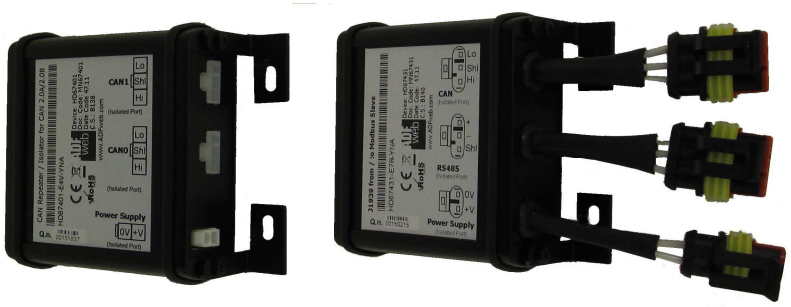
(Order Code: HD67416)

For Website information:
www.adfweb.com?Product=HD67416

For Price information:
www.adfweb.com?Price=HD67416

Benefits and Main Features:

- Very easy to configure
- Wide supply input range
- Triple Isolation
- Temperature range: -40°C / 105°C (-40°F / 221°F)



HD67416

PROFIBUS Slave from/to ...

www.adfweb.com?Product=HD67045 (**... Serial**)
www.adfweb.com?Product=HD67053 (**... M-Bus Master**)
www.adfweb.com?Product=HD67551 (**... CANopen**)
www.adfweb.com?Product=HD67552 (**... CAN**)
www.adfweb.com?Product=HD67553 (**... J1939**)
www.adfweb.com?Product=HD67554 (**... DeviceNet Slave**)
www.adfweb.com?Product=HD67555 (**... DeviceNet Master**)
www.adfweb.com?Product=HD67561 (**... Modbus Master**)
www.adfweb.com?Product=HD67562 (**... Modbus Slave**)
www.adfweb.com?Product=HD67563 (**... Ethernet Server**)
www.adfweb.com?Product=HD67564 (**... Modbus TCP Client**)
www.adfweb.com?Product=HD67565 (**... Modbus TCP Server**)

PROFIBUS Master from/to ...

www.adfweb.com?Product=HD67570 (**... DeviceNet Slave**)
www.adfweb.com?Product=HD67575 (**... Ethernet**)
www.adfweb.com?Product=HD67579 (**... Modbus TCP Slave**)
www.adfweb.com?Product=HD67580 (**... Modbus Slave**)

Do you have an your customer protocol?
See the following links:
www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?
Ask it to the following link:
www.adfweb.com?Cmd=helpme

User Manual

INDEX:

UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own

To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

With this "Document Code" go to web page www.adfweb.com/download/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the updates.

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	17/05/2013	Ff	All	First release version
1.001	18/11/2015	Ff	All	New software interface

WARNING:

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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

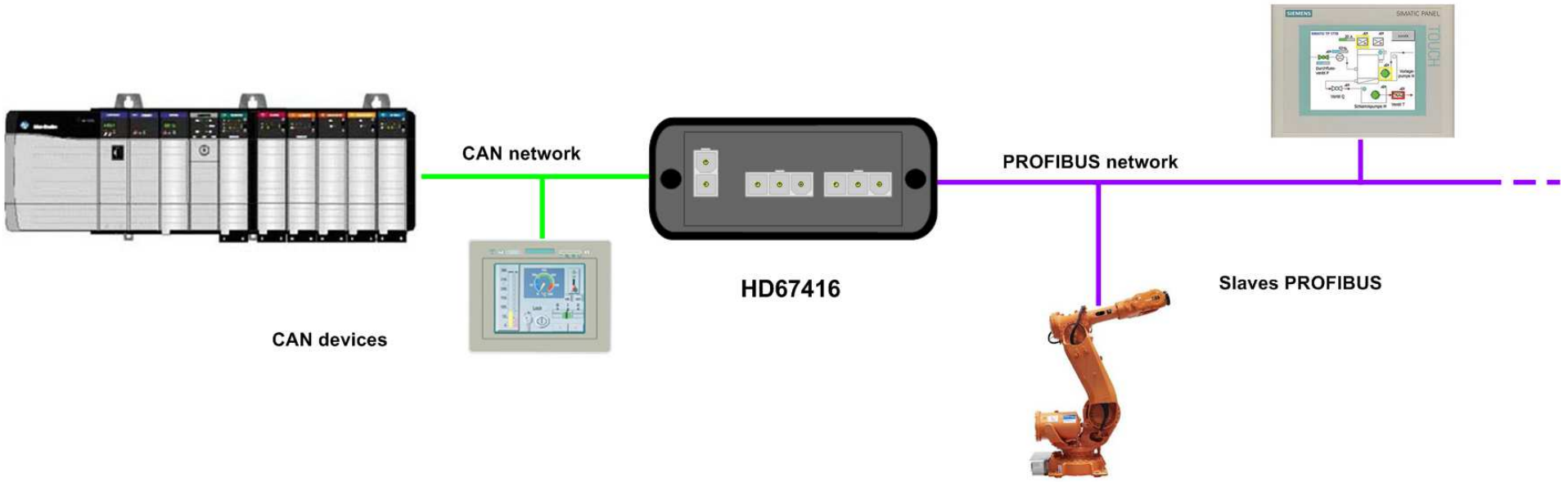
The device is state-of-the-art and is safe. The instruments can represent a potential hazard if they are inappropriately installed and operated by untrained personnel. These instructions refer to residual risks with the following symbol:

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:

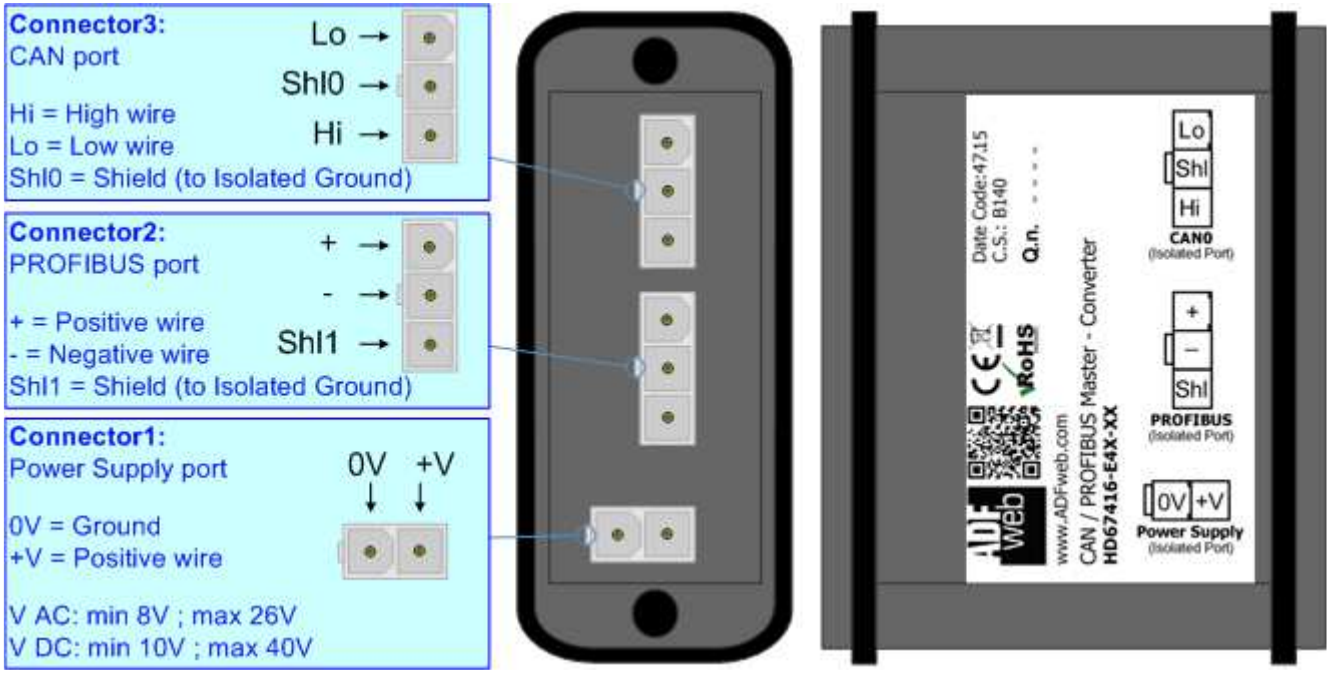


Figure 1a: Connection scheme for HD67416-E4x-xx

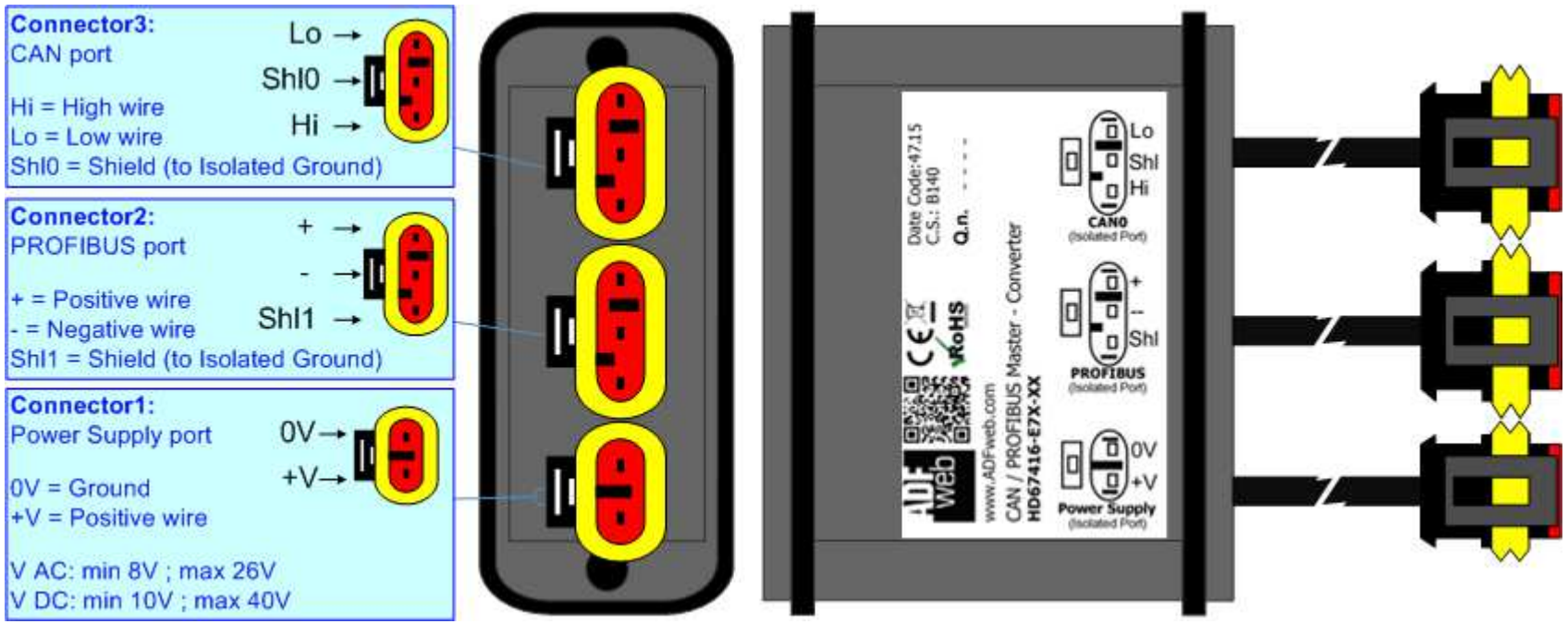


Figure 1b: Connection scheme for HD67416-E7x-xx

CHARACTERISTICS:

The "**HD67416**" series are rugged devices used to interface CAN devices with PROFIBUS 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 (IP67).

All the four series have these characteristics:

- Triple 4kV isolation between Power Supply / PROFIBUS / 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:

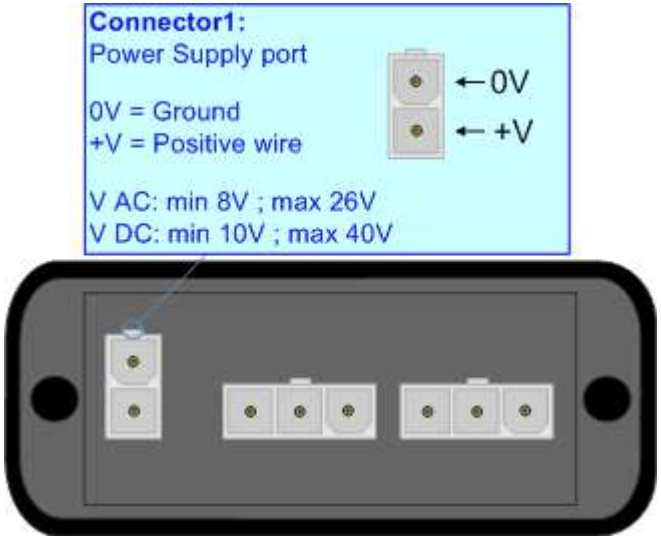
You need Compositor SW67416 software on your PC in order to perform the following:

- Define the parameter of the PROFIBUS;
- Define the parameter of the CAN line;
- Define the PROFIBUS network;
- Define which CAN frames contains PROFIBUS information;
- Define which PROFIBUS data saves on CAN frames.

POWER SUPPLY:

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

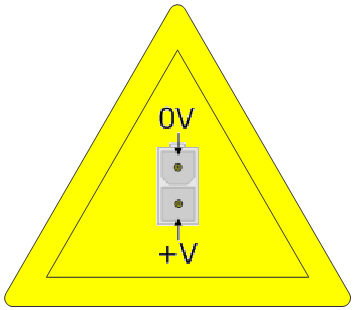
	VAC ~		VDC ⎓	
	Vmin	**Vmax**	**Vmin**	**Vmax**
HD67416-Exx-xx	**8V**	**26V**	**10V**	**40V**



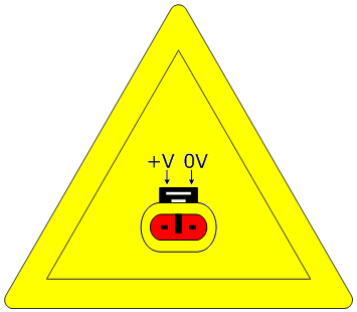
Consumption at 24V DC:

Device	W/VA
HD67416-Exx-xx	4

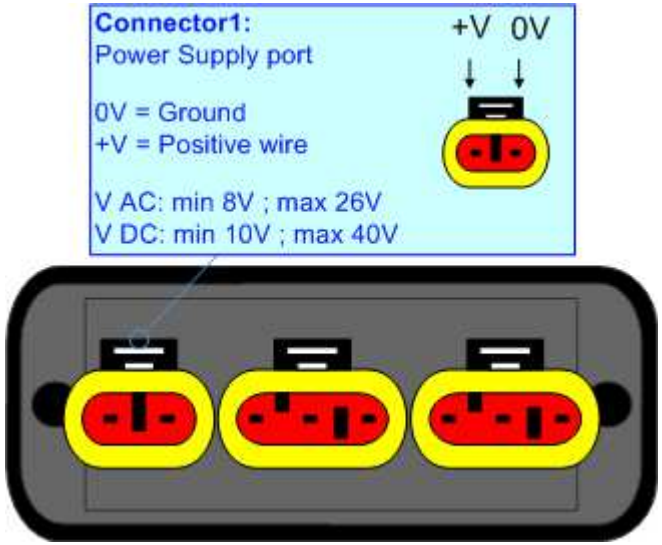
Caution: Not reverse the polarity power



HD67416-E4x-xx



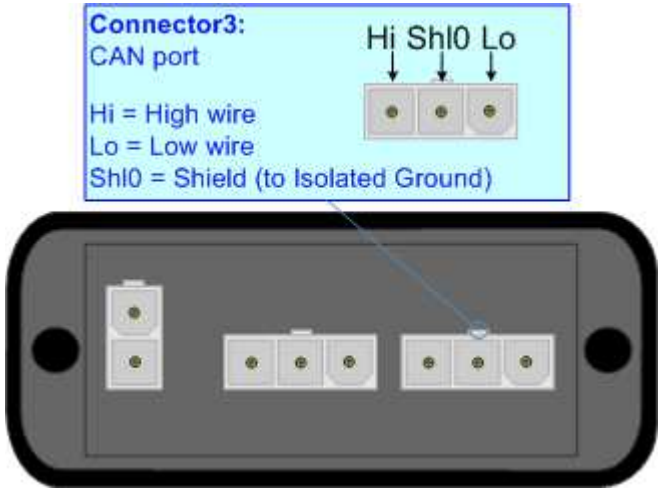
HD67416-E7x-xx



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

CAN:

The connection of CAN in the HD67416-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.



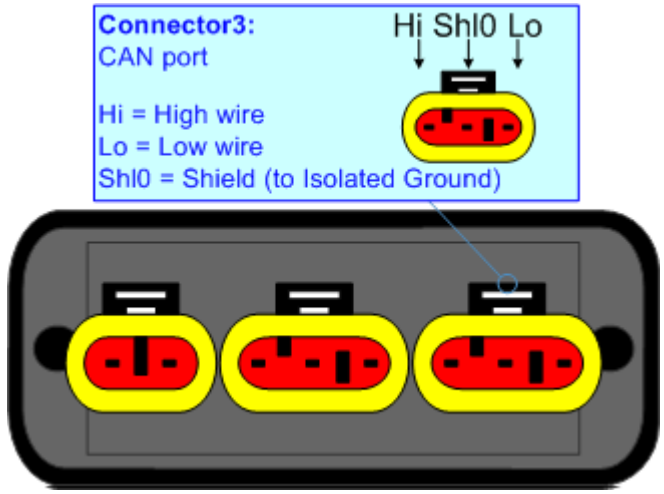
The connection of CAN in the HD67416-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.

The termination of CAN line, with a 120Ω resistor, in the HD67416-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: HD67416-Exx-Yx; otherwise is this other: HD67416-Exx-Nx.

Cable characteristics:

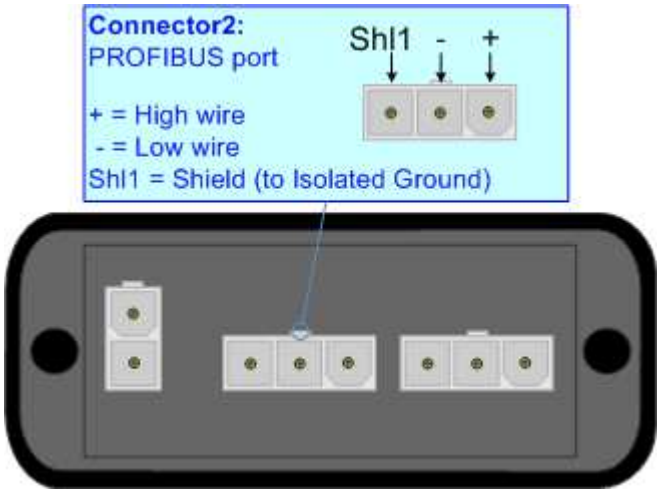
DC parameter:		Impedance	70 Ohm/m
AC parameters:		Impedance	120 Ohm/m
		Delay	5 ns/m

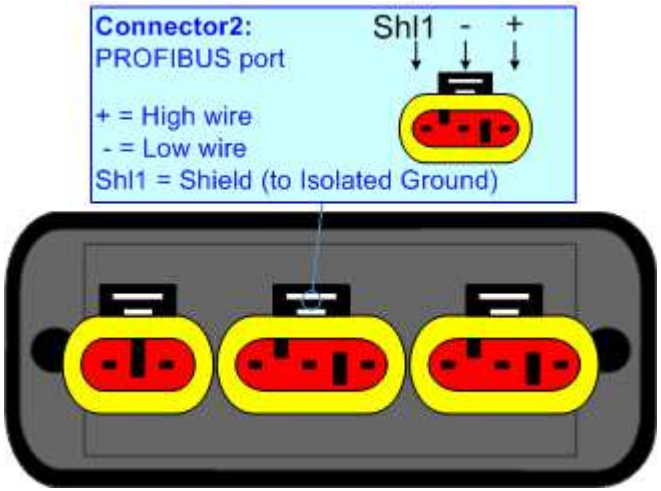
Length		**Baud Rate [bps]**	**Length MAX [m]**
		10 K	5000
		20 K	2500
		50 K	1000
		100 K	650
		125 K	500
		250 K	250
		500 K	100
		800 K	50
		1000 K	25



PROFIBUS:

The PROFIBUS uses 3way MiniFit Maleale connector (HD67416-E4x-xx) or AMP SuperSeal 1.5 Female connector (HD67416-E7x-xx). The pin assignment is defined like in the picture.





USE OF COMPOSITOR SW67416:

To configure the Converter, use the available software that runs with Windows called SW67416. 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 SW67416, the window below appears (Fig. 2).

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

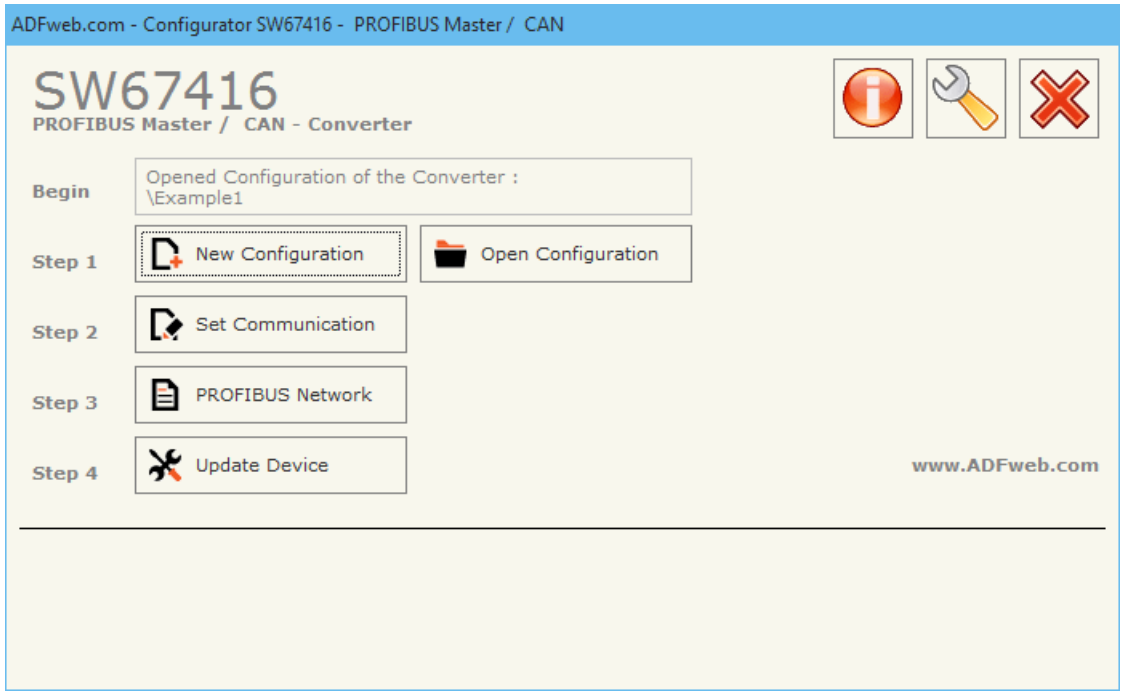
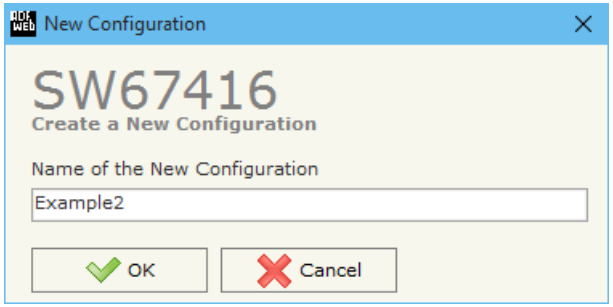


Figure 2: Main window for SW67416

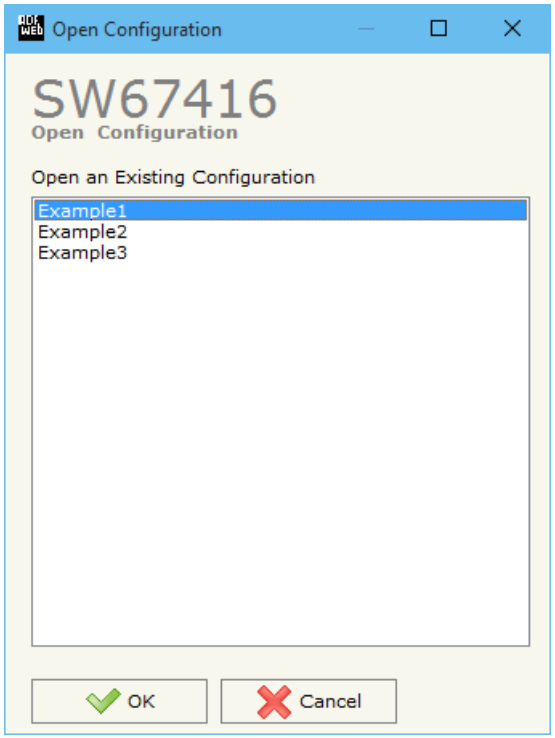
NEW CONFIGURATION / OPEN CONFIGURATION:

The "**New Configuration**" button creates the folder which contains the entire device's configuration.



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

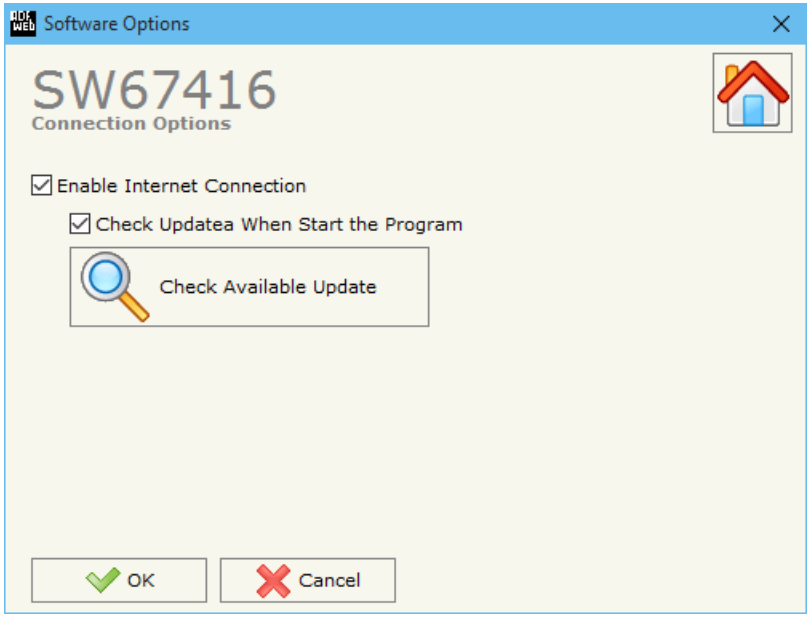
- To clone the configurations of a programmable "CAN / PROFIBUS Master - Converter" in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate 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 SW67416 checks automatically if there are updatings when it is launched.

SET COMMUNICATION:

This section defines the fundamental communication parameter of two buses, PROFIBUS and CAN.

By pressing the "**Set Communication**" button from the main window for SW67416 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The means of the fields for "PROFIBUS" are:

- In the field "**ID Dev.**" the address of the PROFIBUS side is defined;
- In the field "**Baudrate**" the baud rate for the PROFIBUS side is defined.

The means of the fields for "CAN" are:

- In the "**Baudrate**" field the CAN baudrate is defined.

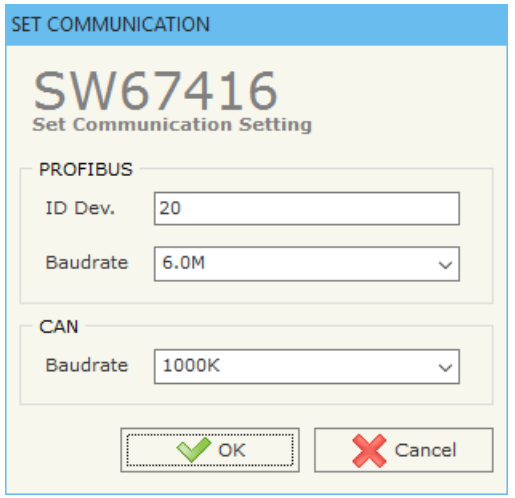


Figure 3: "Set Communication" window

PROFIBUS NETWORK:

By pressing the "**PROFIBUS Network**" button from the main window for SW67416 (Fig. 2) the window "PROFIBUS Network" (Fig. 4) appears.

In this window is possible to:

- Modify the PROFIBUS Master Options ("**Master PROFIBUS Options**");
- Add a PROFIBUS Slave in the Network of the Master ("**Add Slave PROFIBUS**");
- Modify a PROFIBUS Slave in the Network ("**Modify Slave PROFIBUS**");
- Remove a PROFIBUS Slave from the Network ("**Remove Slave PROFIBUS**");
- Select the CAN frames of each PROFIBUS Slave ("**Receive Frames CAN**");
- Select the position of data arrived via CAN in PROFIBUS ("**Info Receive CAN**");
- Select the CAN frames sent from Converter for each PROFIBUS Slave ("**Send Frames CAN**");
- Select data e position of the data PROFIBUS in CAN frames to send ("**Info Send CAN**")

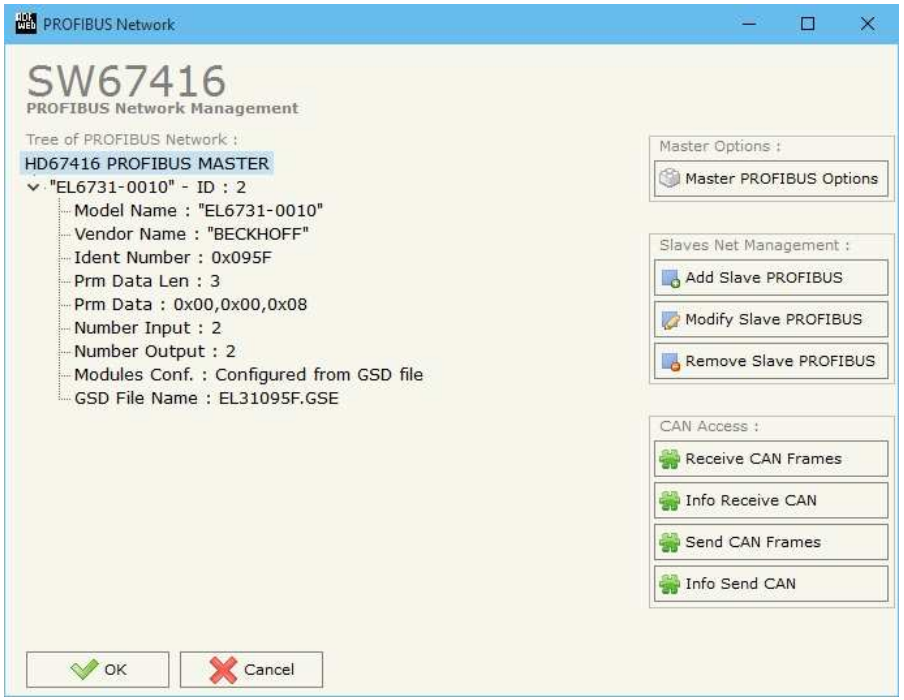


Figure 4: "PROFIBUS Network" window

MASTER PROFIBUS OPTIONS:

By pressin the "**Master PROFIBUS Options**" button from the "PROFIBUS Network" window (Fig. 4) the "**PROFIBUS Master Options**" window appears (Fig. 5).

In this window is possible to set the WatchDog Time for the PROFIBUS Slaves.

Figure 5: "PROFIBUS Master Options" window

Note:
Fact1 and Fact2 could be write in decimal o hexadecimal (with prefix "0x" or "$") and the values must between 1 and 255

Warning:
The WatchDog time must be between 200 and 650250 milliseconds.

PROFIBUS DEVICE:

By pressing the "**Add Slave PROFIBUS**" and "**Modify Slave PROFIBUS**" button (or double click above an existent PROFIBUS Slave) from the "**PROFIBUS Network**" window (Fig. 4) the "**PROFIBUS Device**" window appears (Fig. 6).

In this window is possible to:

- Set the PROFIBUS Slave ID ("**ID Slave PROFIBUS**");
- Select the Modules present in the PROFIBUS Slave from the Available Modules in GSD file ("**Module Selection**");
- Modify the User Parameters (if present) of the PROFIBUS device ("**User Parameters**");
- Modify the Parameters (if present) of the Module Selected ("**Module Parameters**");
- Watch Features and Baudrate supported from the PROFIBUS device ("**Capabilities**");
- Select the Sync, Freeze and Reset of Data Options ("**Options**").

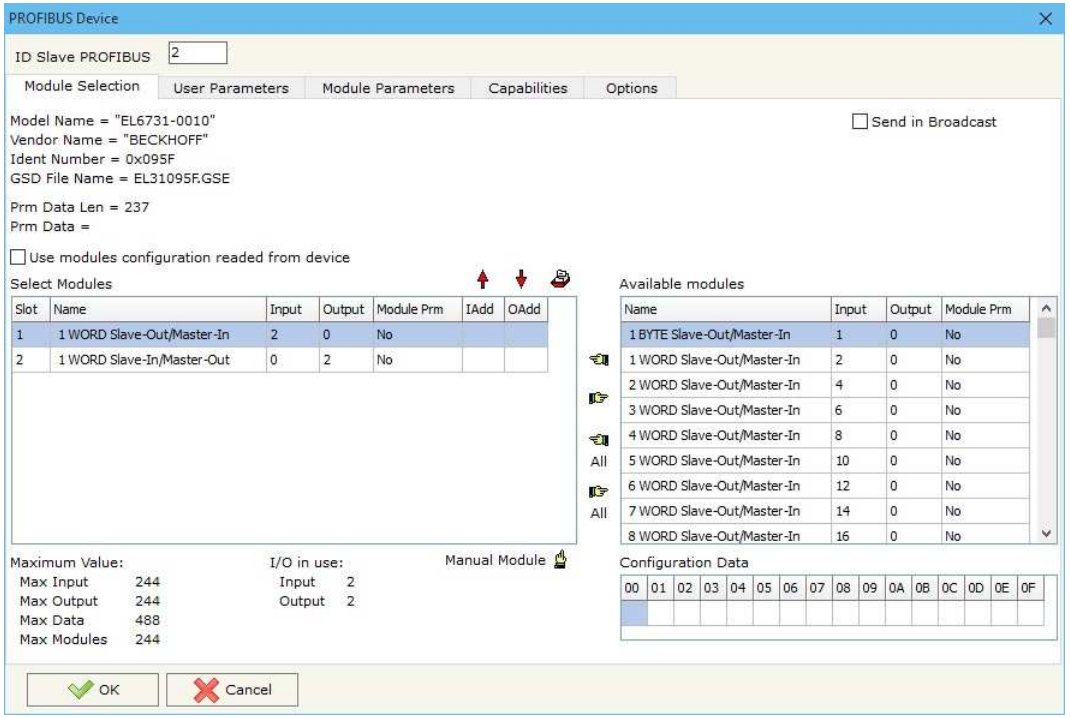


Figure 6: "PROFIBUS Device" window

MODULE SELECTION:

The section "Module Selection" is used to select which Modules are present in the Slave (Fig. 7).

In this section is possible to:

- Check the list of the Modules selected ("Select Modules") (Fig. 7, point (1)) and the list of Modules Available in GSD file ("Available Modules") (Fig. 7, point (7));
- Add a Module from the list of GSD file (Fig. 7, point (6));
- Remove a Module from selected list (Fig. 7, point (5));
- Add all Modules present in the GSD file (Fig. 7, point (4));
- Remove all Modules from selected list (Fig. 7, point (3));
- Insert a Module not present in the GSD file ("**Manual Module**") (Fig. 7 point (2)). For more info see the section "Manual Module" below;
- Enable the read of configuration directly from the PROFIBUS Slave ("**Use module configuration readed from device**") (Fig 7, point (8)). If this option is enable the configuration of the modules is discorded and the device read the correct configuration directly to the PROFIBUS slave.

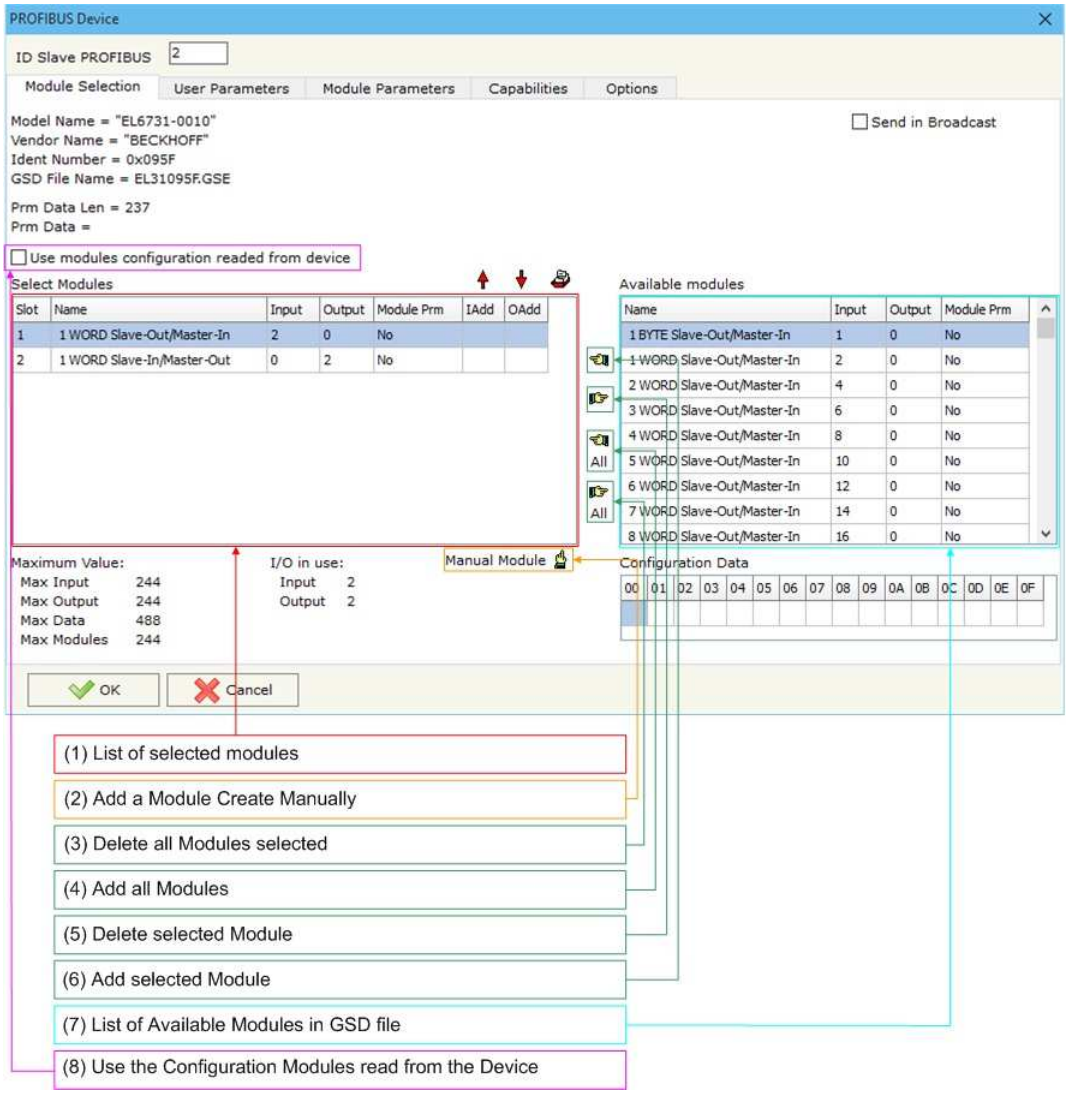


Figure 7: "PROFIBUS Device – Module Selection" window

By pressing the "**Manual Module**" button from the "PROFIBUS Device" window (Fig. 6) the "Add Module Manually" window appears (Fig. 8).

In this window is possible to add a Module manually, i.e. writing the configuration of the module (in hexadecimal).

The means of the fields are:

- In the field "**Description of Module**" a name of the Module is defined;
- In the field "**Insert the Configuration of Module (HEX)**" the configuration of the module is defined. The configuration must be write in hexadecimal mode (without prefix "0x" o "$").

To modify a Module inserted manually, is neccessary to do a double click on the module to change in the "Select Module" list (Fig. 7, point (1)). It is possible to change only the module inserted manually.

Note:
The Values inserted in the table must between 00 and FF.

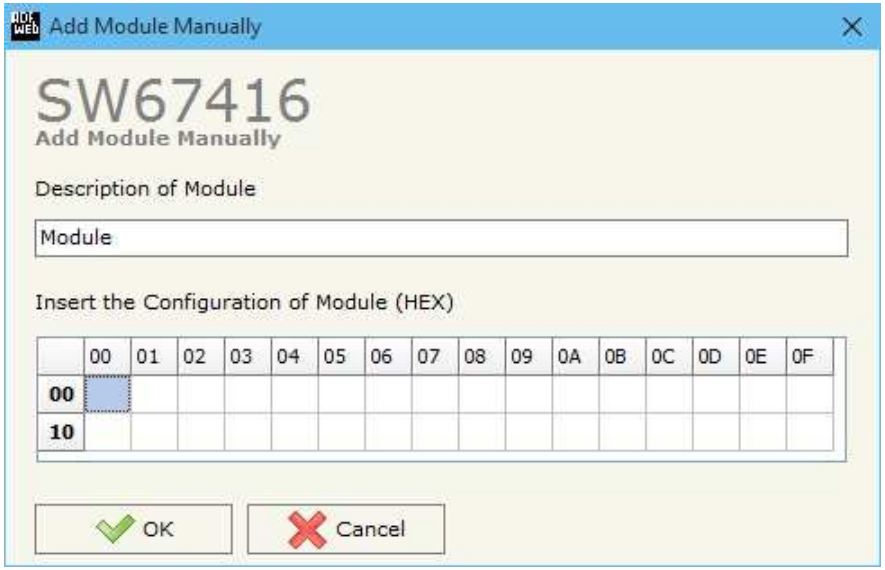


Figure 8: "Add/Modify Module Manually" window

USER PARAMETERS:

The section "User Parameters" is used to modify the parameters of the PROFIBUS slave (Fig. 9).

In this section there are:

- The List of all Parameters available for the PROFIBUS device ("User Parameters") (Fig. 9, point (1));
- The Configuration of all parameters in RAW ("Parameters in RAW (Hex)") (Fig. 9, point(2));
- The "**Use Parameter Inserted Manually**", enable this option is possible to insert manually the parameters of Device and also of the Modules. Using the "**Modify User Parameters Manually**" button is possible to insert/modify the parametrization of the device (and/or modules). For more info see below. (Fig. 9, point(3));
- The admited value for the selected parameter. It is possible to select the value desired and confirm it with the "**Apply**" button. If no value appears in this table, the "Min Value" and "Max Value" are the limit of the parameter. (Fig. 9, point(4));
- The "**Apply**" button is used to confirm the new value of the parameter, the "**Default**" button is used to load the factory value for the parameter. In "**New Value**" edit box it is possible to set the new value. (Fig. 9, point(5)).

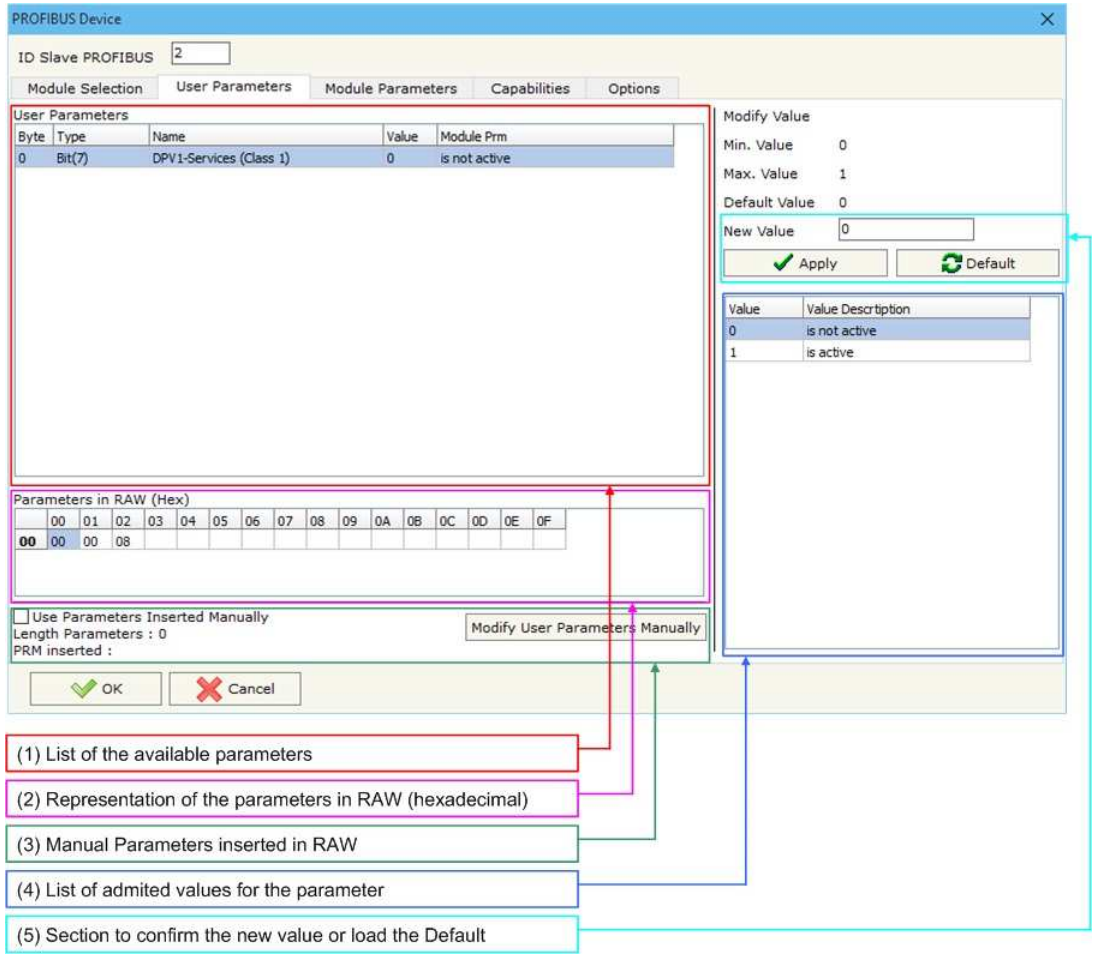


Figure 9: "PROFIBUS Device – User Parameters" window

By pressing the "**Modify User Parameters Manually**" button from the "PROFIBUS Device" window (Fig. 6) the "Add Module Manually" window appears (Fig. 10).

In this window is possible to add/modify the User and/or Modules Parameters manually, i.e. writing the configuration of the parameters (in hexadecimal).

The means of the fields are:

- In the field "**Insert the number of User Parameter**" the number of byte for the parameter have to be inserted;
- In the field "**Insert the Configuration of Module (HEX)**" the configuration of the User and/or Modules Parameters is defined. The configuration must be write in hexadecimal mode (without prefix "0x" o "$").

Note:
The Values inserted in the table must between 00 and FF

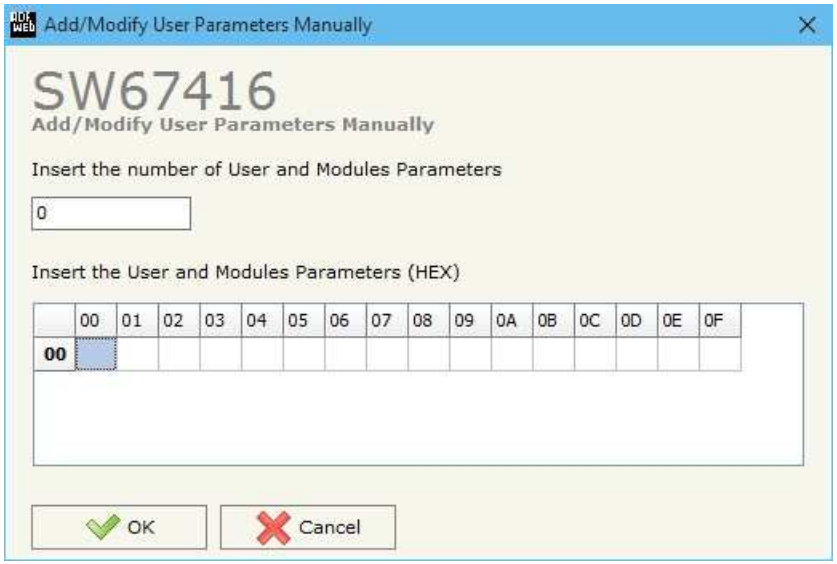


Figure 10: "Add/Modify User Parameters Manually" window

MODULE PARAMETERS:

The section "Module Parameters" is used to modify the parameters of the Modules (Fig. 11).

In this section there are:

- The List of all Module selected in the GSD file ("Available modules") (Fig. 11, point (1));
- The List of all Parameters available for the Module selected ("Parameters of module") (Fig. 11, point (2));
- The Configuration of all parameters in RAW for the Module selected ("Parameters in RAW (Hex)") (Fig. 11, point(3));
- The admited value for the selected parameter. It is possible to select the value desired and confirm it with the "**Apply**" button. If no value appears in this table, the "Min Value" and "Max Value" are the limit of the parameter. (Fig. 11, point(4));
- The "**Apply**" button is used to confirm the new value of the parameter, the "**Default**" button is used to load the factory value for the parameter. In "**New Value**" edit box it is possible to set the new value. (Fig. 11, point(5));

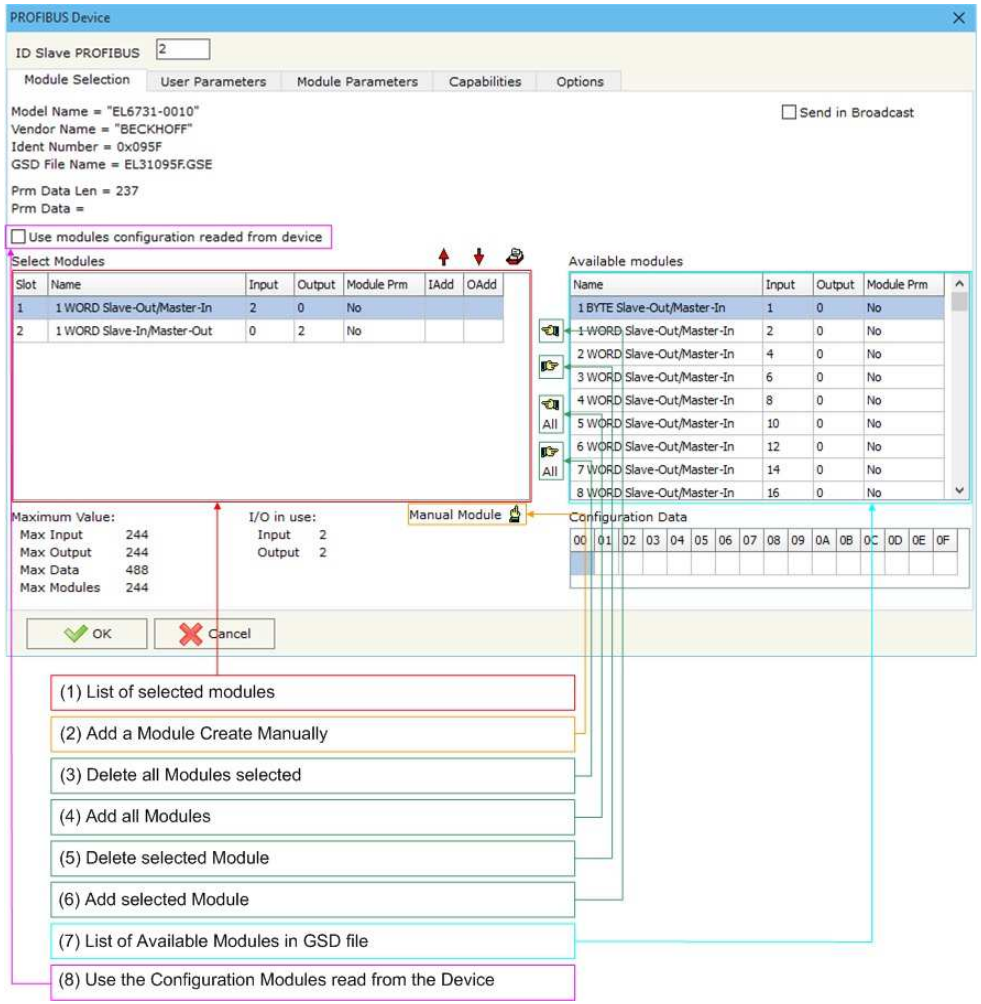


Figure 11: "PROFIBUS Device – Module Parameters" window

CAPABILITIES:

The section "Capabilities" is used only to show which features/baudrates available in the PROFIBUS device. The Green Icon indicate that capability/baudrate is available, the Red Icon indicate no compatibilities with that capability/baudrate (Fig. 12).

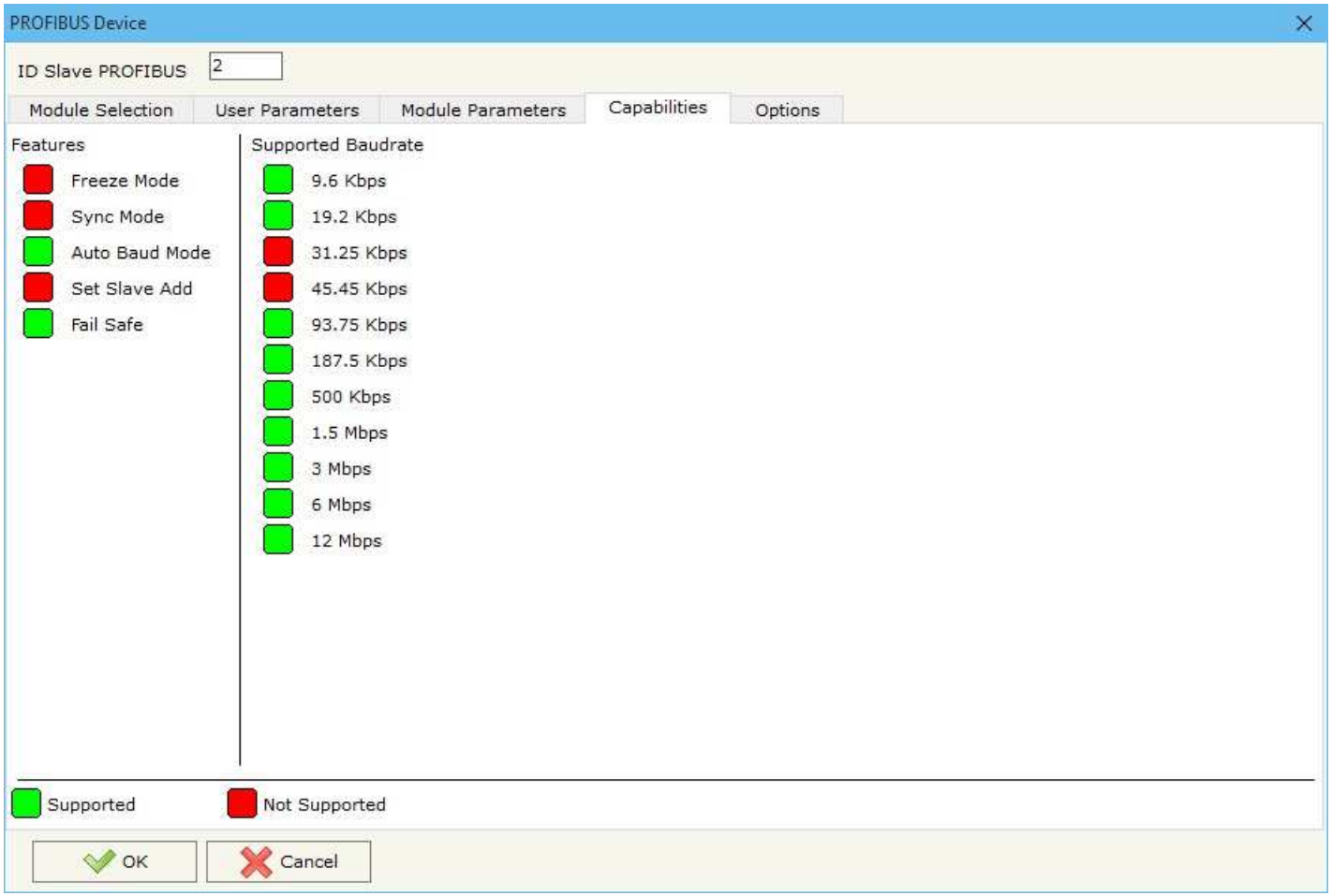


Figure 12: "PROFIBUS Device – Capabilities" window

OPTIONS:

The section "Options" is used to enable some option for each PROFIBUS device (Fig. 13).

The means of the fields are:

- In the field "**Enable Sync**" the PROFIBUS Sync command is enable. This option is enable only if the "Sync Mode" is supported by the device (see Capabilities section to check it);
- In the field "**Enable Freeze**" the PROFIBUS Freeze command is enable. This option is enable only if the "Freeze Mode" is supported by the device (see Capabilities section to check it);
- In the field "**Reset data if PROFIBUS master loses communication from the slave**" is possible to select to cancel the data of the slave if the Master lost the connection with the device.

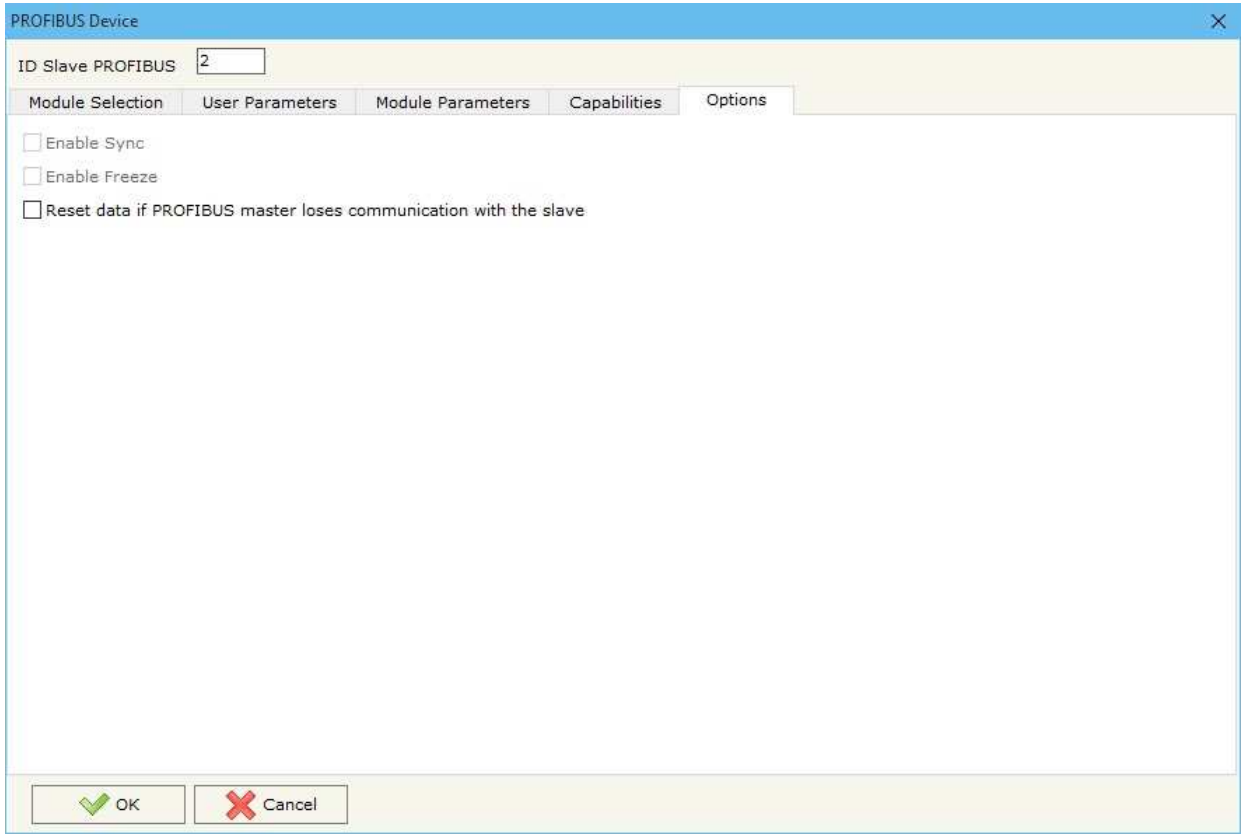


Figure 13: "PROFIBUS Device – Options" window

RECEIVE FRAMES CAN:

By pressing the "**Receive Frames CAN**" button from the "PROFIBUS Network" window (Fig. 4) the "Receive Frames" window appears (Fig. 14).

Note:
The COB inserted in this table contains the Output data of PROFIBUS. These frames are accepted by the gateway.

The data of the columns have the following meanings:

- In the field "**Cob-ID**" insert the COB of the CAN frame;
- In the field "**Type**" you can select the type of CAN frame (2.0A (11Bits) or 2.0B (29Bits));
- In the field "**Dimension**" insert the number of byte of the COB (from 1 to 8);
- In the field "**TimeOut**" insert the number of milliseconds that the HD67416 waits before cancel the data of that Cob-ID if the frame don't arrives every xx ms. If the value is 0, means that you don't want to cancel the data if the frame don't arrives;
- In the field "**Mnemonic**" it is possible to insert a brief description.

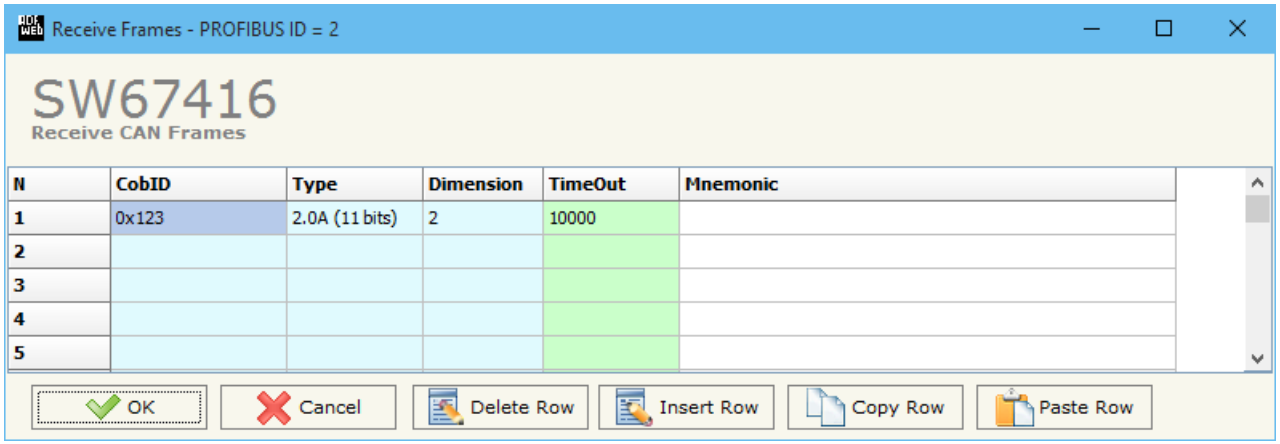


Figure 14: "Receive Frames" window

INFO RECEIVE CAN:

By pressing the "**Info Receive CAN**" button from the "PROFIBUS Network" window (Fig. 4) the "Receive Frames Info" window appears (Fig. 15):

- In the "**COB ID**" field there are the COB ID that you have inserts in the "Receive Frames CAN" section;
- In the "**Bytes**" field select the correspondence of the byte in PROFIBUS that contains the CAN byte information.

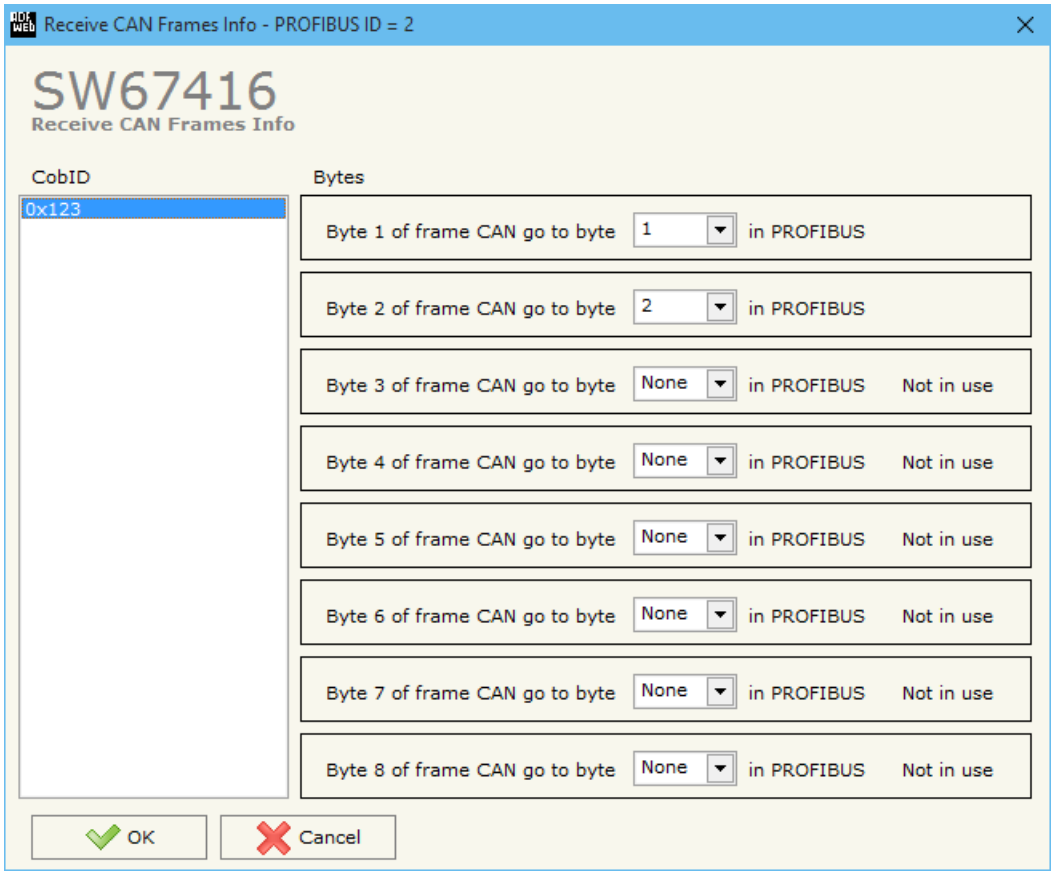


Figure 15: "Receive Frames Info" window

SEND FRAMES CAN:

By pressing the "**Send Frames CAN**" button from the "PROFIBUS Network" window (Fig. 4) the "Send frames" window appears (Fig. 16).

Note:
The COB inserted in this table contains the Input data of PROFIBUS. These frames are sent by the gateway.

The data of the columns have the following meanings:

- In the field "**Cob-ID**" insert the COB of the CAN frame;
- In the field "**Type**" you can select the type of CAN frame (2.0A (11Bits) or 2.0B (29Bits));
- In the field "**Dimension**" insert the number of byte of the COB (from 1 to 8);
- In the field "**Send Frame Type**" you can select when send the frame, or when a data is changed (by selecting 'On Data Change'), or Ciclically (by selecting 'On Timer');
- In the field "**Timer Send**" insert the number of milliseconds used for the "Send Frame Type" → 'On Timer'. Every "Timer Send" milliseconds the frame is sent;
- In the field "**Mnemonic**" it is possible to insert a brief description.

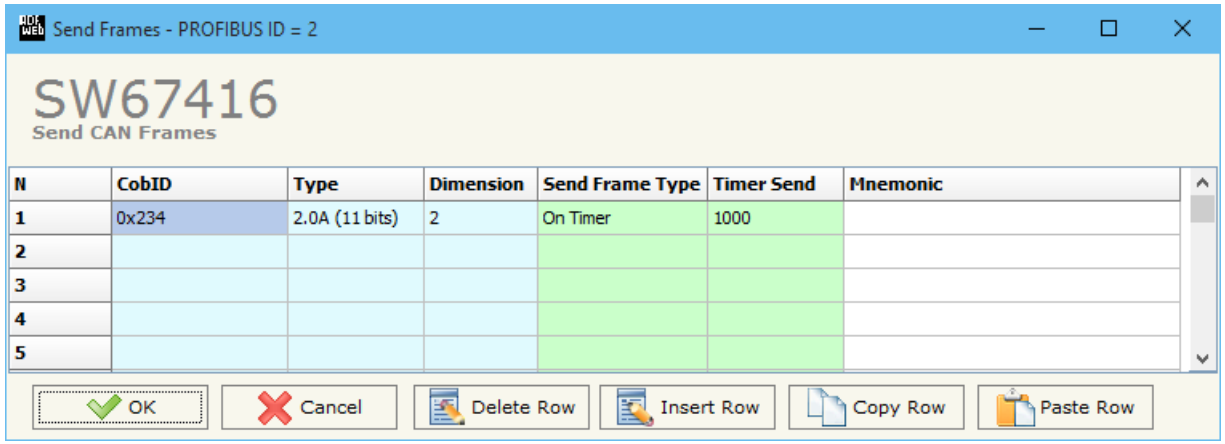


Figure 16: "Send Frames" window

INFO SEND CAN:

By pressing the "**Info Send Frames**" button from the "PROFIBUS Network" window (Fig. 4) the "Send Frames Info" window appears (Fig. 17):

- In the "**COB ID**" field there are the COB ID that you have inserts in the "Send Frames CAN" section;
- In the field "**Bytes**" select the correspondence of the byte of PROFIBUS that you want to put in the byte of CAN frame.

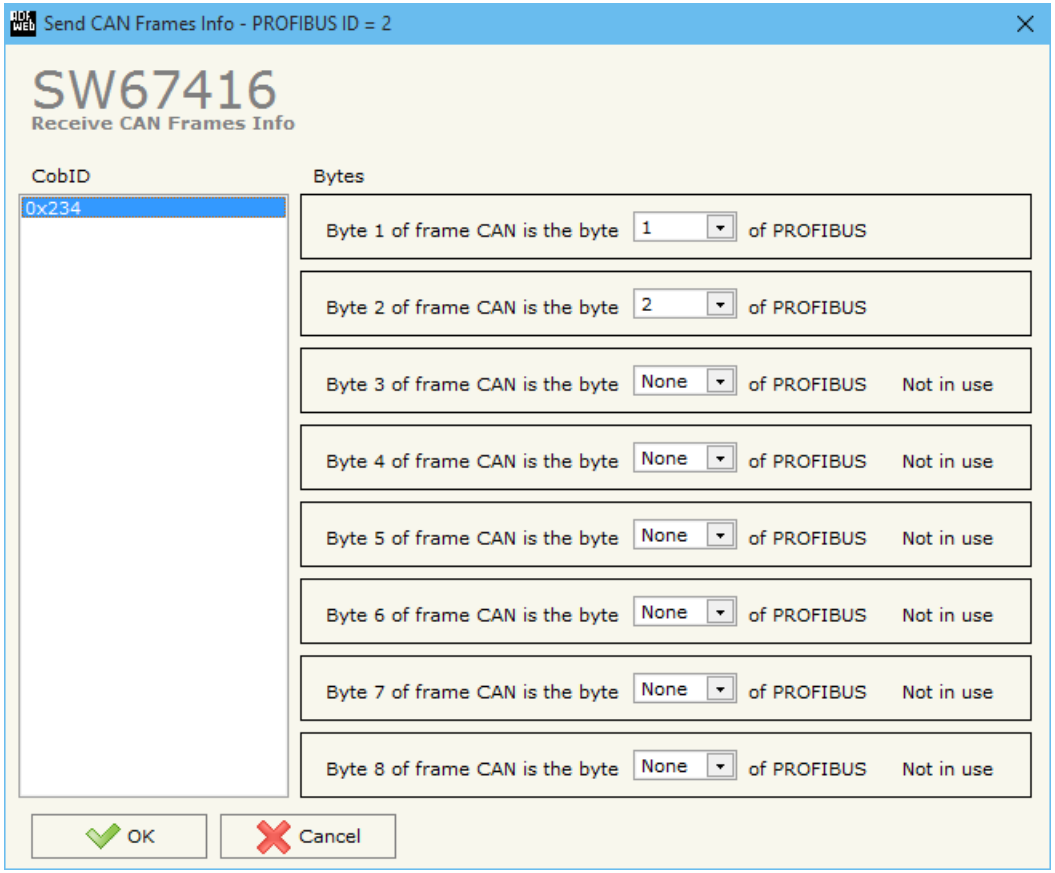


Figure 17: "Send Frames Info" window

UPDATE DEVICE:

By pressing the "**Update Device**" button it is possible to load the created Configuration into the device; and also the Firmware, if 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 CAN port of HD67416;
- Feed the HD67416;
- Turn on the device;
- Select the "**COM port**" and press the "***Connect***" button;
- 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.

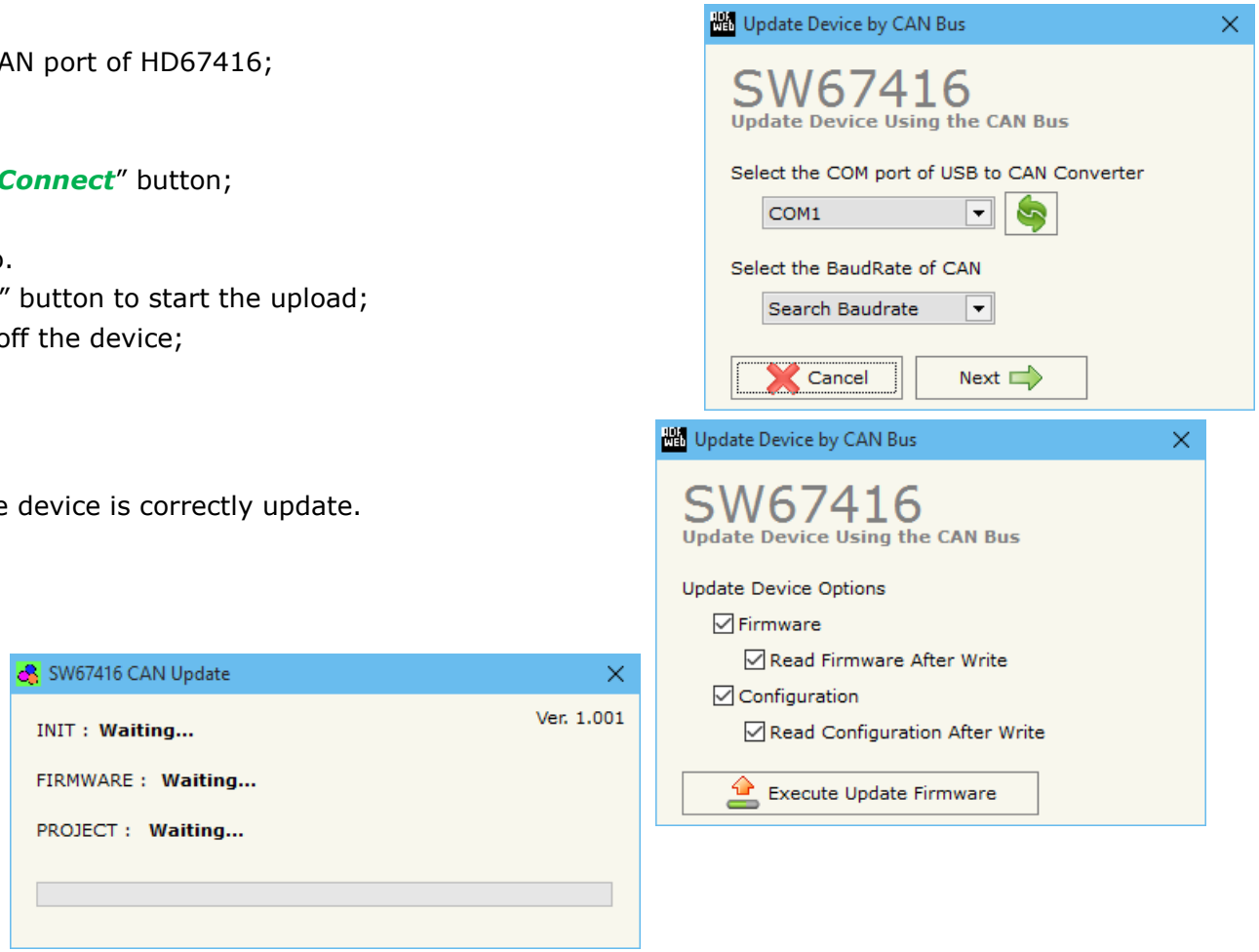


Figure 18: "Update Device" windows

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 HD67416 device.

Note:
When you receive the device, for the first time, you have to update also the Firmware in the HD67416 device.

Warning:
If the Fig. 19 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;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- 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 at Firewall lock.

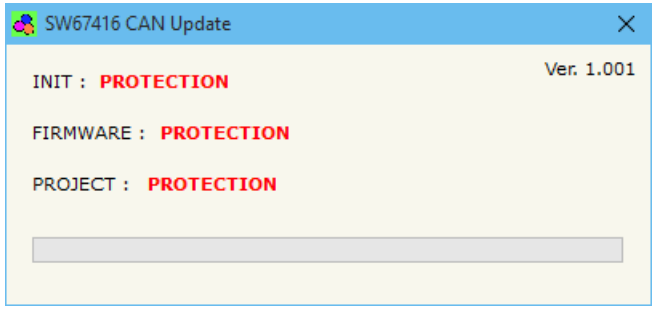
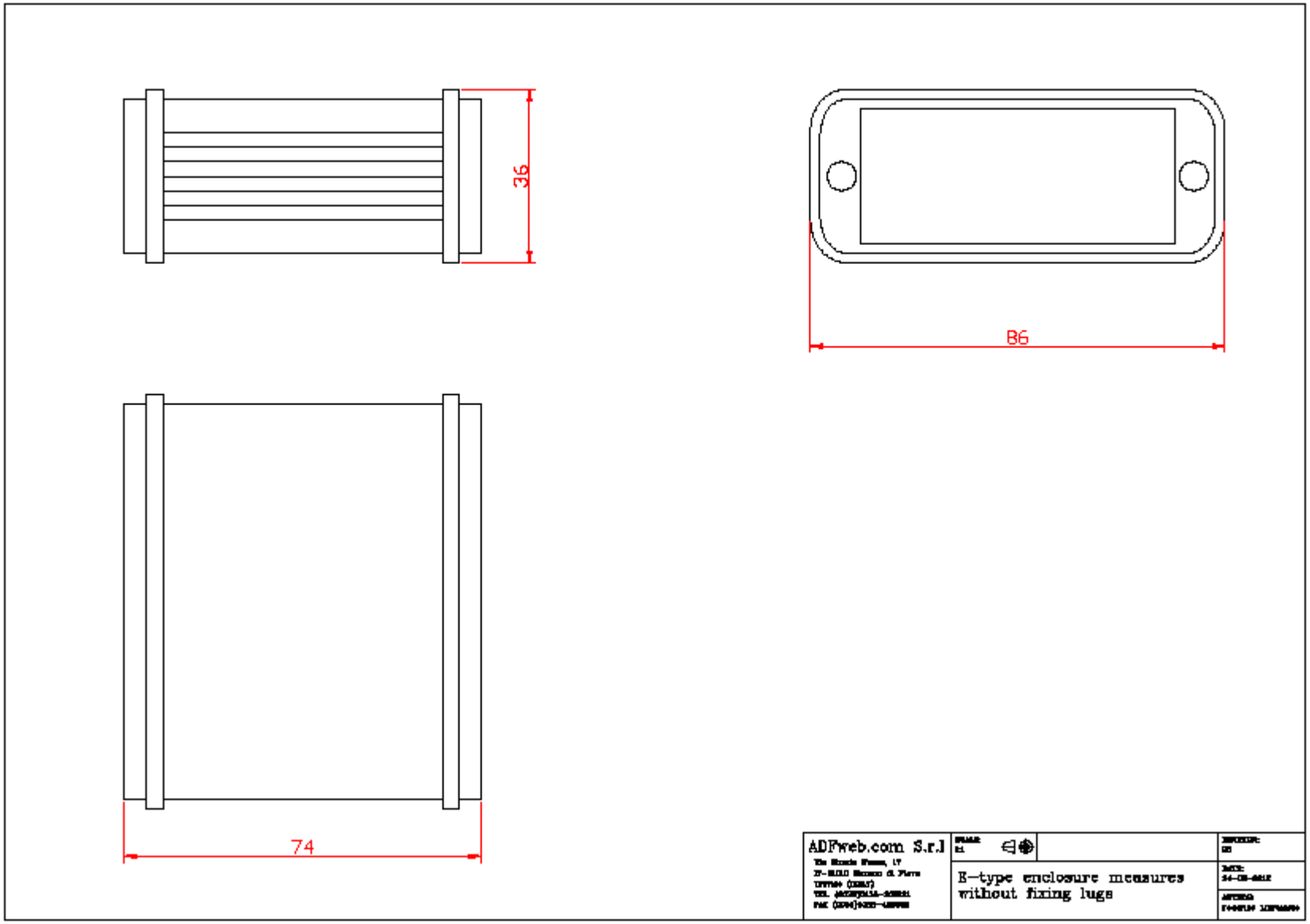
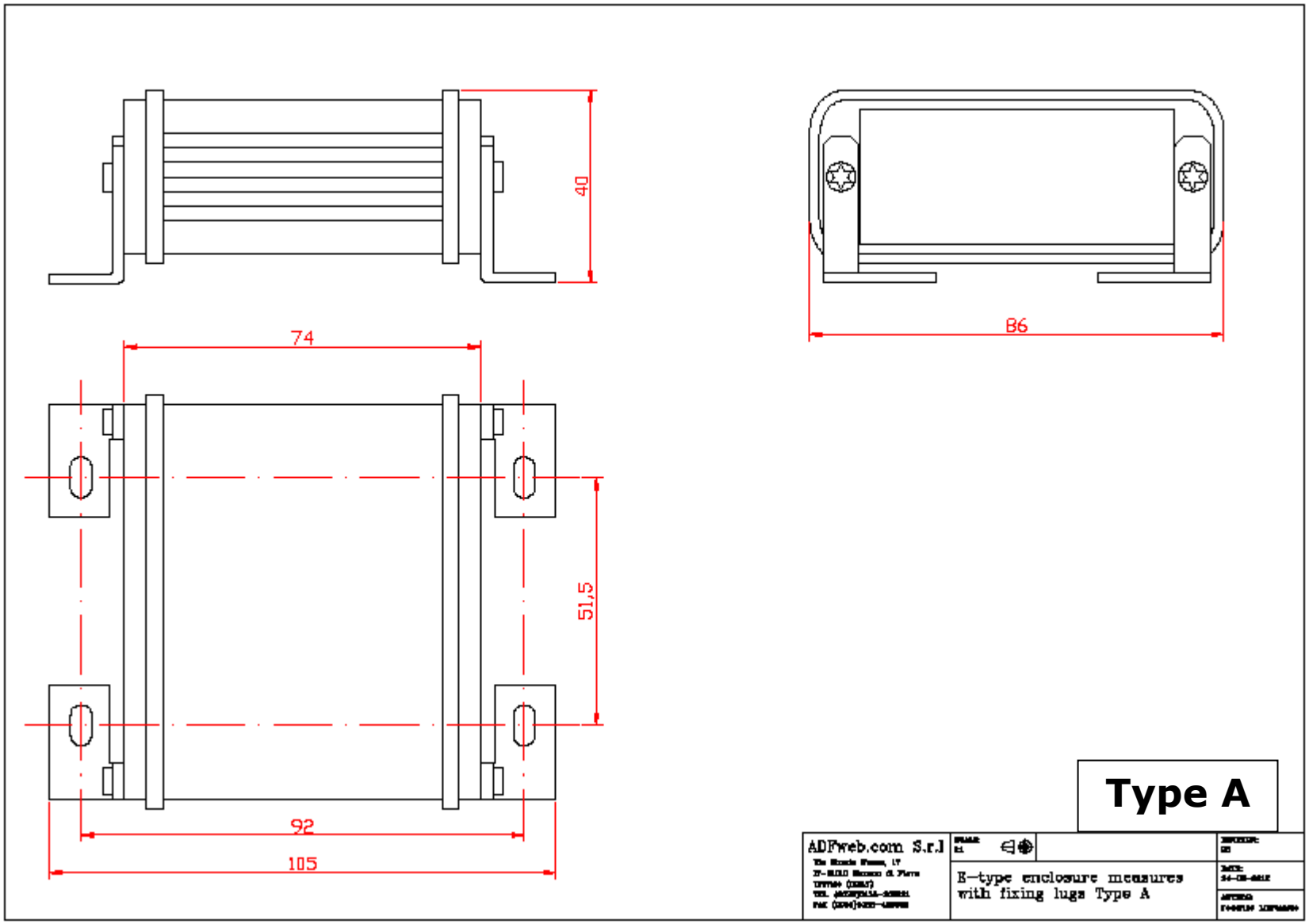


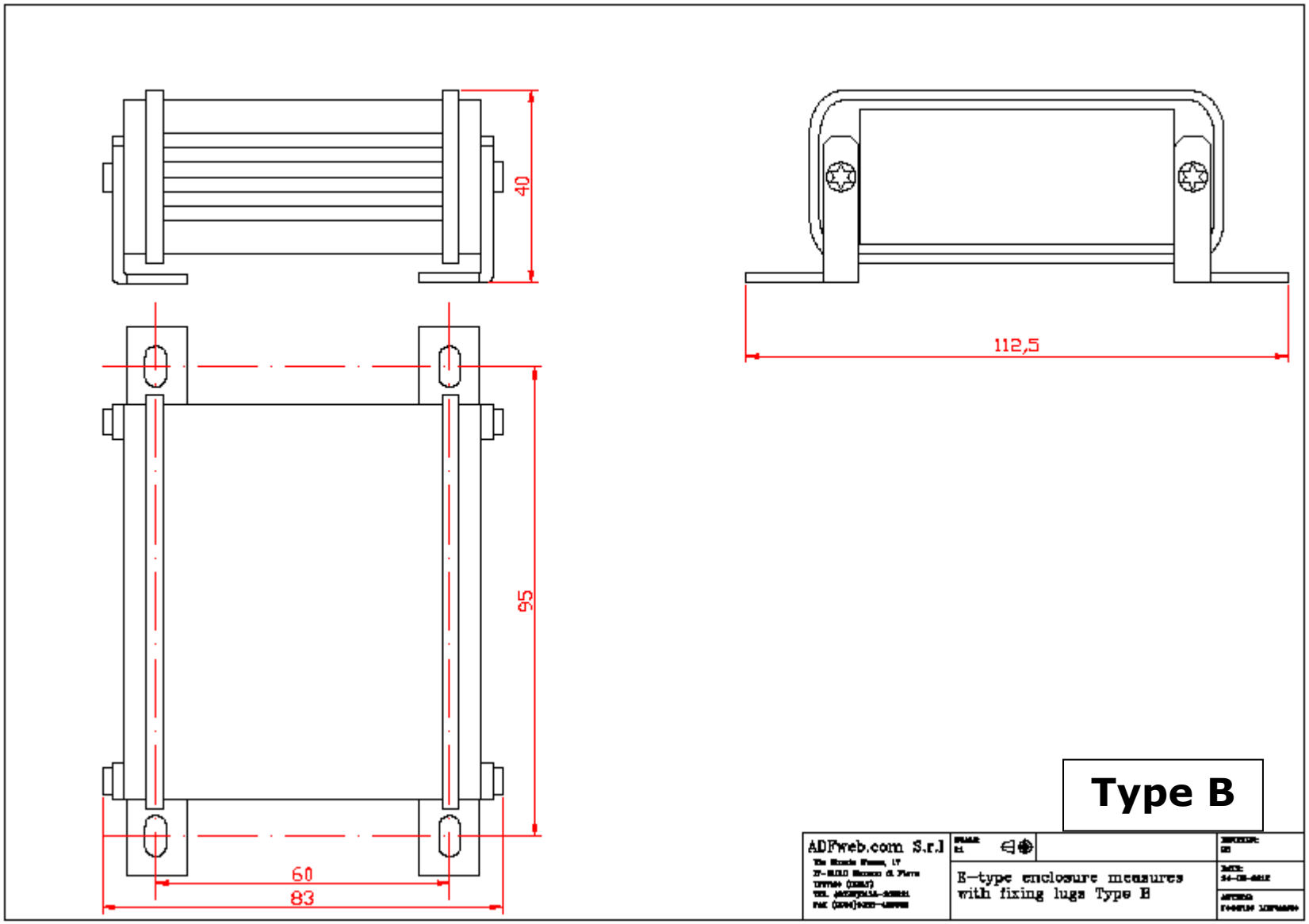
Figure 19: "Protection" window

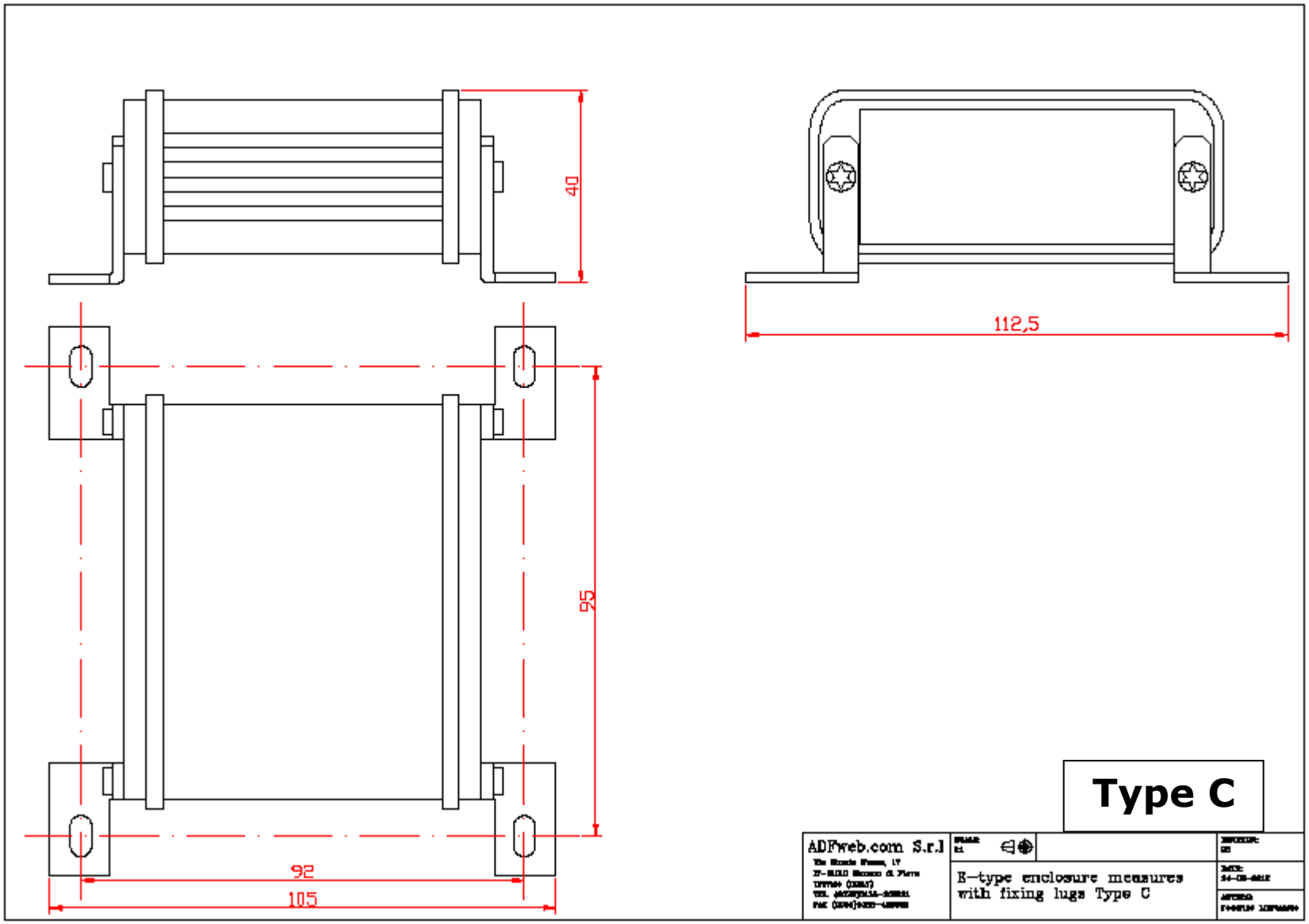
Note:
In the case of HD67416 you have to use the software "SW67416": www.adfweb.com\download\filefold\SW67416.zip.

MECHANICAL DIMENSIONS:




40
74
86
51,5
92
105
Type A
ADFweb.com S.r.l
E-type enclosure measures
with fixing lugs Type A


40
112,5
95
60
83
Type B
ADFweb.com S.r.l
E-type enclosure measures
with fixing lugs Type B


40
112,5
95
92
105
Type C
ADFweb.com S.r.l
E-type enclosure measures
with fixing lugs Type C

ORDERING INFORMATIONS:

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

HD67416 – E y z – s f

Fixing lugs
A: Type 1
B: Type 2
C: Type 3

CAN Termination
Y: Terminated with 120Ω
N: Not terminated

Varnished/Resinated
V: Varnished
R: Resined

Connectors Type
4: MiniFit
7: SuperSeal 1.5

Enclosure Type
E: Metal enclosure

Device Family
HD67416 = CAN / PROFIBUS Master - Converter

ACCESSORIES:

Order Code:	**AC67400**	-	CAN interface to configure devices
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

DISCLAIMER:

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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.

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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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