User Manual

Revision 2.102
English

CAN / Modbus Slave - Converter

(Order Code: HD67012)

For Website information:
www.adfweb.com?Product=HD67012

For Price information:
www.adfweb.com?Price=HD67012

Benefits and Main Features:

- Rail mountable
- Wide supply input range
- Galvanic isolation
- Industrial temperature range: -40°C / +85°C (-40°F / +185°F)

For other Gateways / Bridges:

CAN to Modbus

See also the following links:

www.adfweb.com?product=HD67011	(Modbus RTU Master)
www.adfweb.com?product=HD67014	(Modbus TCP Master)
www.adfweb.com?product=HD67515	(Modbus TCP Slave)

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=HD67505	(Modbus TCP 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

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
2.100	19/10/2010	Dp	All	Add function
2.101	04/04/2013	Nt	All	Added new chapters
2.102	25/07/2025	Mdb	All	New design

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 are required for each individual application, legal and safety regulation. 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

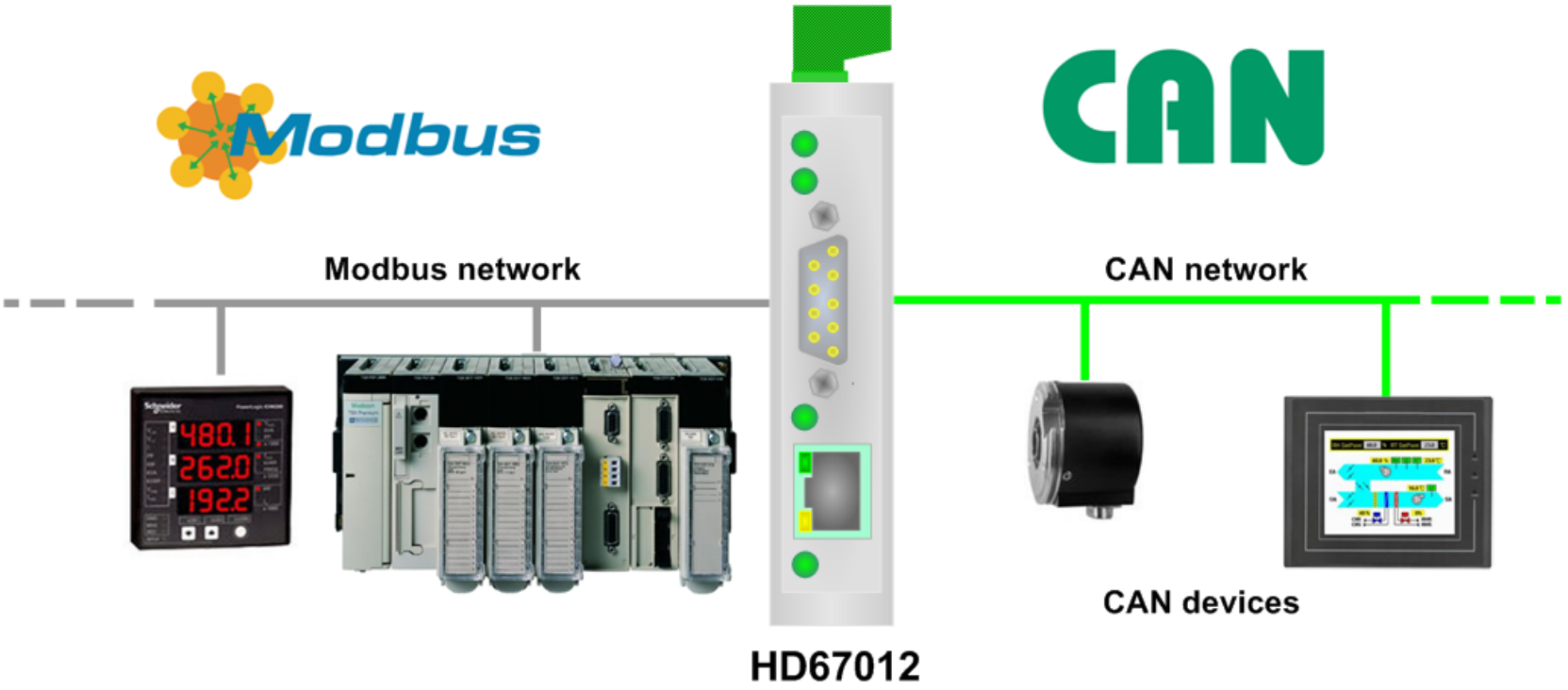
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

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

CE CONFORMITY

The declaration is made by us. You can send an email to support@adfweb.com or give us a call if you need it.

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

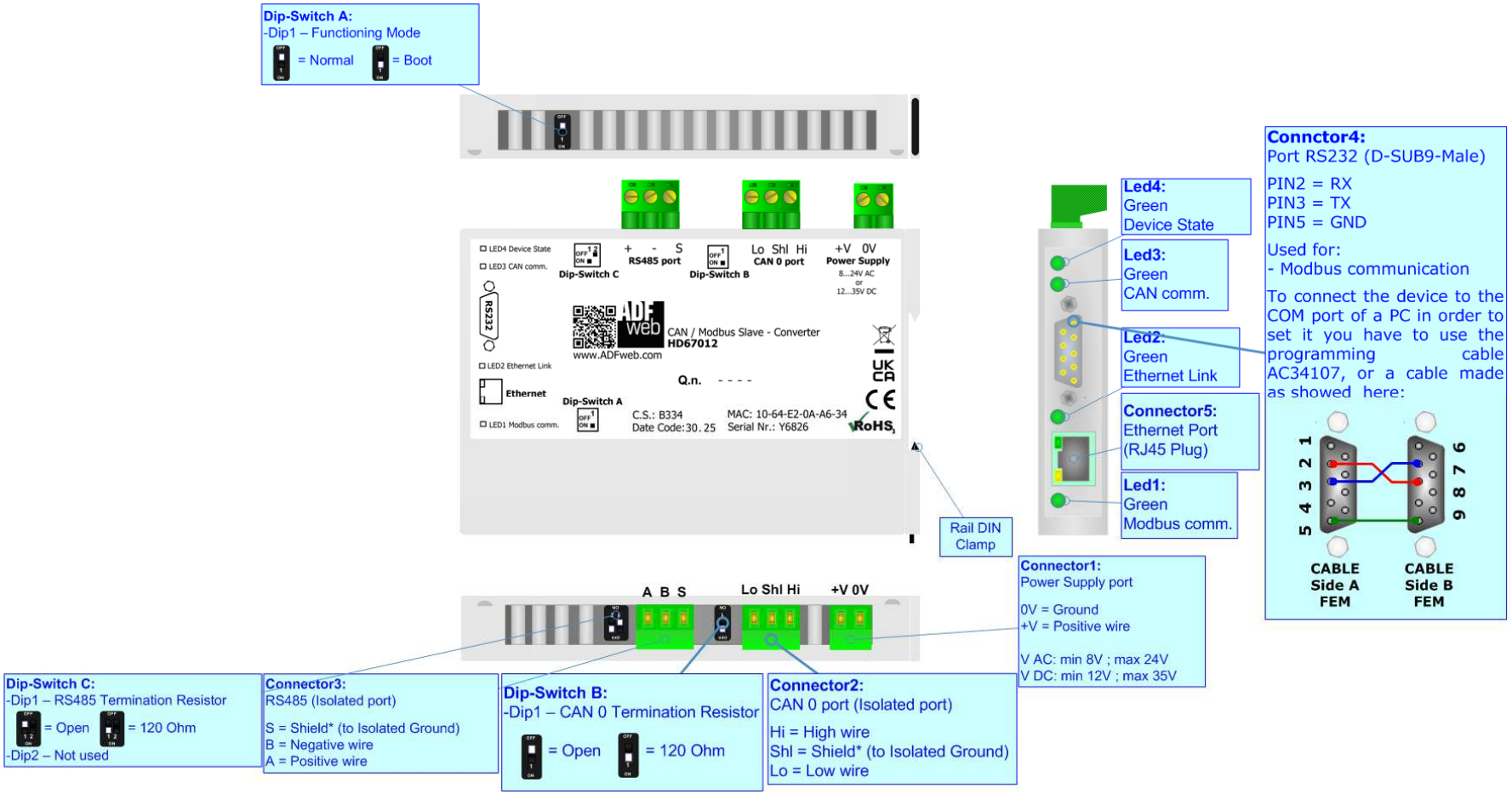


Figure 1: Connection scheme for HD67012

CHARACTERISTICS:

The HD67012 is a CAN / Modbus Slave Converter.

It has the following characteristics:

- Two-directional information between networks CAN and Modbus;
- Electrical isolation between two Buses;
- to read CANbus frame from Modbus word;
- to write CANbus frame from Modbus word;
- Mountable on 35mm Rail DIN;
- Wide power supply input range: 8…24V AC or 12…35V DC;
- Wide temperature range: -40°C / +85°C [-40°F / +185°F].

CONFIGURATION:

You need Compositor SW67012 software on your PC in order to perform the following:

- Define the parameter of CAN;
- Define the parameter of Modbus;
- Define which CAN frames are read by the Modbus;
- Define which CAN frames are write by the Modbus;
- Update the device.

POWER SUPPLY:

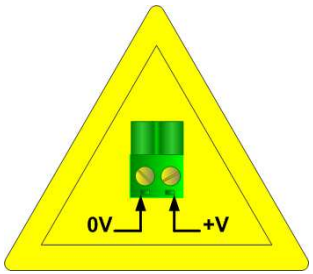
The devices can be powered at 8…24V AC and 12…35V DC. For more details see the two tables below.

VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
8V	**24V**	**12V**	**35V**

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67012	3.5

Caution: Not reverse the polarity power



HD67012

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V AC: min 8V ; max 24V
V DC: min 12V ; max 35V

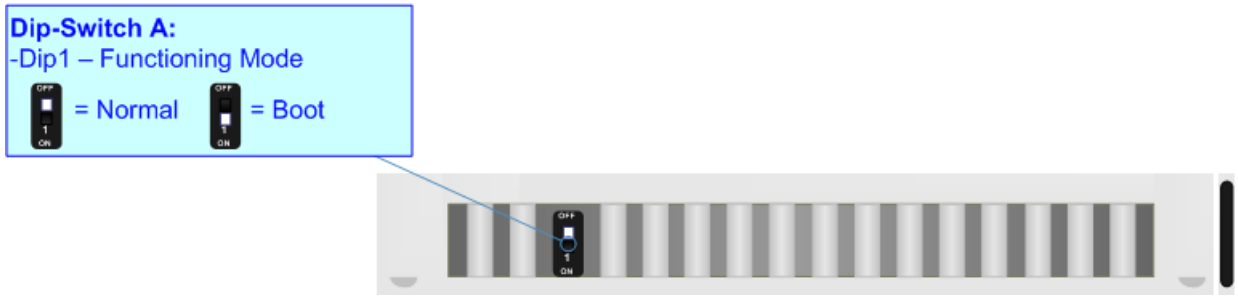
FUNCTION MODES (with Dip-switch):

The device has got two functions mode depending of the position of the 'Dip1 of Dip-Switch A':

- The first, with 'Dip1 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip1 of Dip-Switch A' at "ON" position, is used for upload the Project and/or Firmware.

For the operations to follow for the updating, see 'UPDATE DEVICE' section.

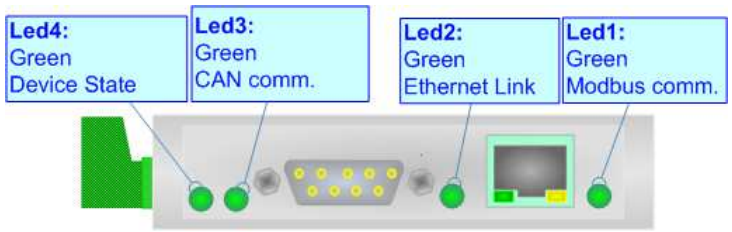
According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.



LED:

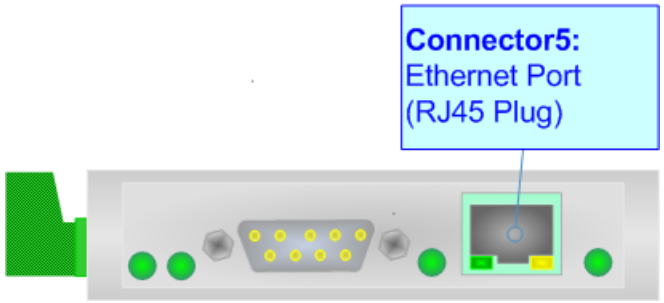
The device has got four LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Modbus comm. (green)	Blinks when a Modbus message is recieved	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: Ethernet Link (green)	**ON:** The Ethernet cable is connected **OFF:** The Ethernet cable is not connected	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: CAN comm. (green)	Blinks when a CAN message is recieved	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: Device State (green)	**ON:** Device powered **OFF:** Device not powered	**ON:** Device powered **OFF:** Device not powered



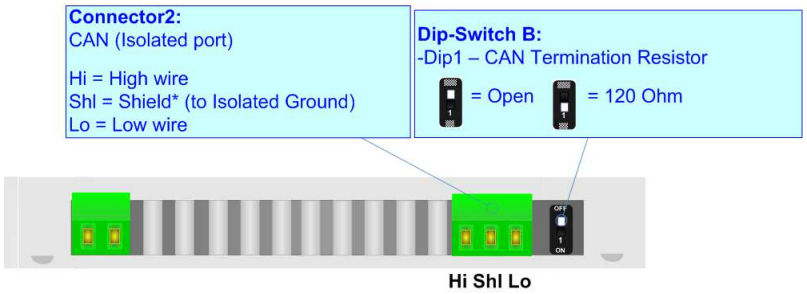
ETHERNET:

The updating of the device must be made using Connector5 of HD67012 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.



CAN:

For terminate the CAN line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch B' is at ON position.



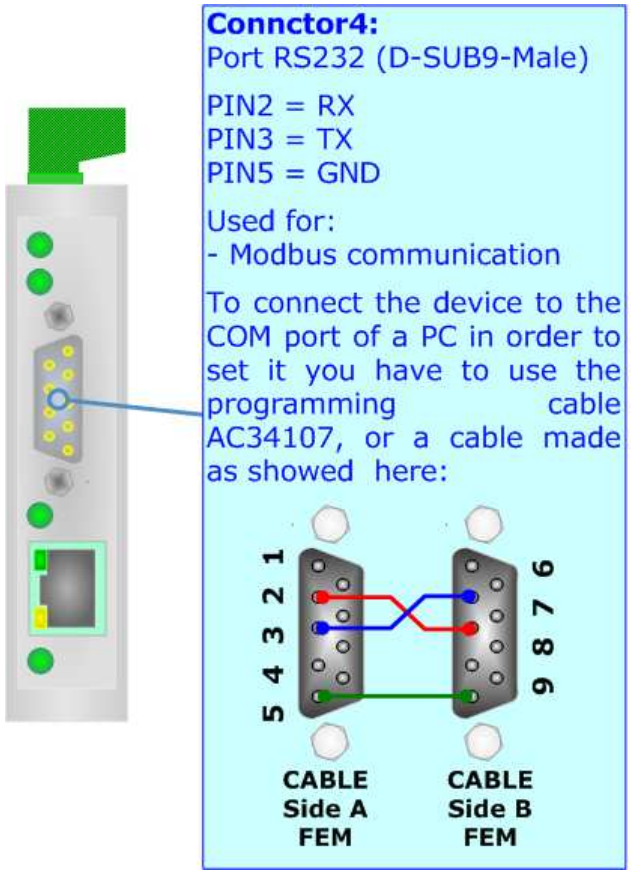
Cable characteristics:

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

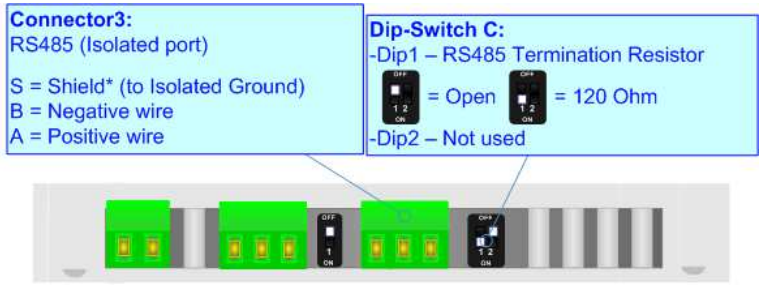
RS232:

The connection from RS232 socket to a serial port (example one from a personal computer), must be made with a Null Modem cable (a serial cable where the pins 2 and 3 are crossed). It is recommended that the RS232 Cable not exceed 15 meters.



RS485:

To terminate the RS485 line with a 120Ω resistor it is necessary to put ON dip 1, like in figure.



The maximum length of the cable should be 1200m (4000 feet).

Here some codes of cables:

- Belden: p/n 8132 - 2x 28AWG stranded twisted pairs conductor + foil shield + braid shield;
- Belden p/n 82842 - 2x 24AWG stranded twisted pairs conductor + foil shield + braid shield;
- Tasker: p/n C521 - 1x 24AWG twisted pair conductor + foil shield + braid shield;
- Tasker: p/n C522 - 2x 24AWG twisted pairs conductor + foil shield + braid shield.

USE OF COMPOSITOR SW67012:

To configure the Converter, use the available software that runs with Windows called SW67012. 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 or 11; 32/64bit).

When launching the SW67012, the window below appears (Fig. 2).

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

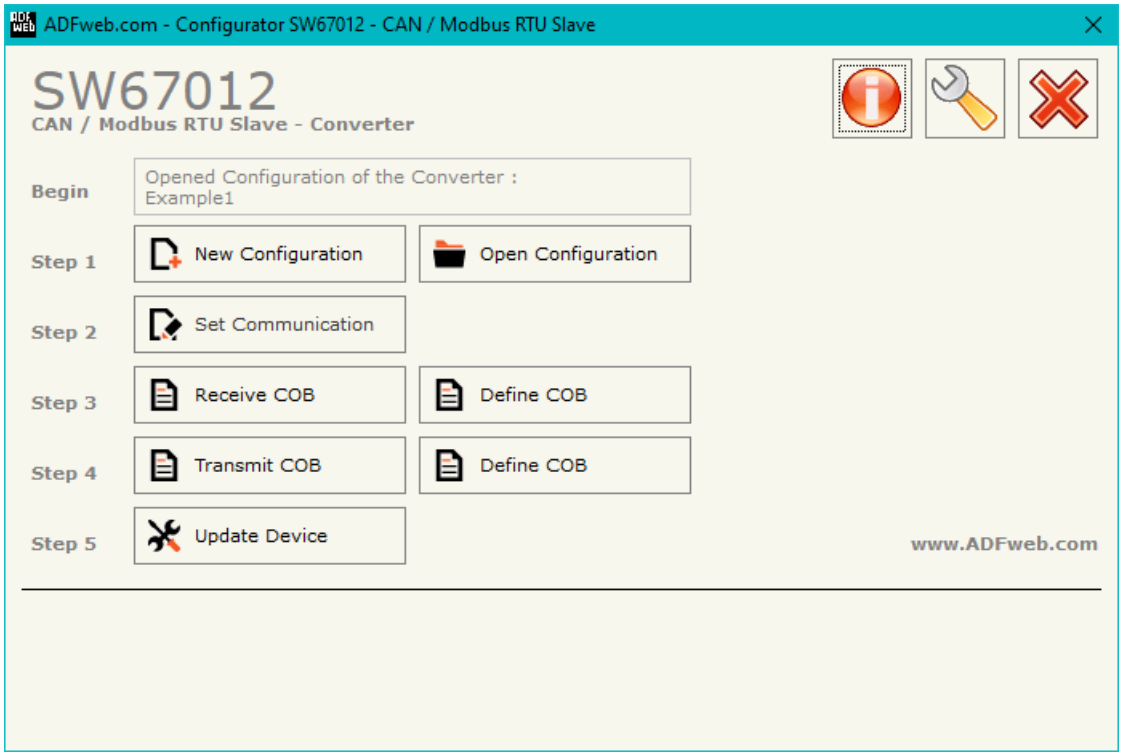
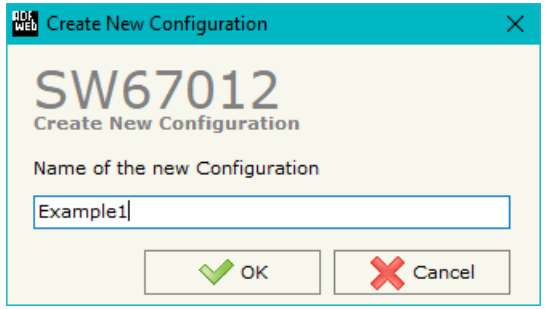


Figure 2: Main window for SW67012

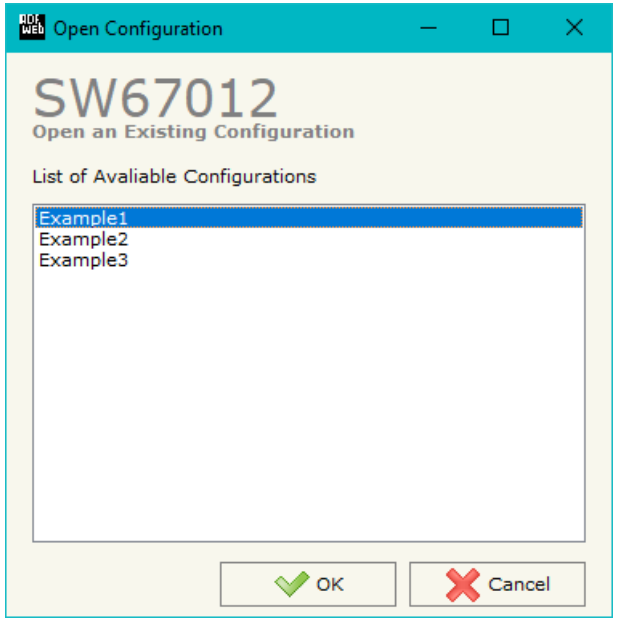
NEW CONFIGURATION / OPEN CONFIGURATION:

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



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

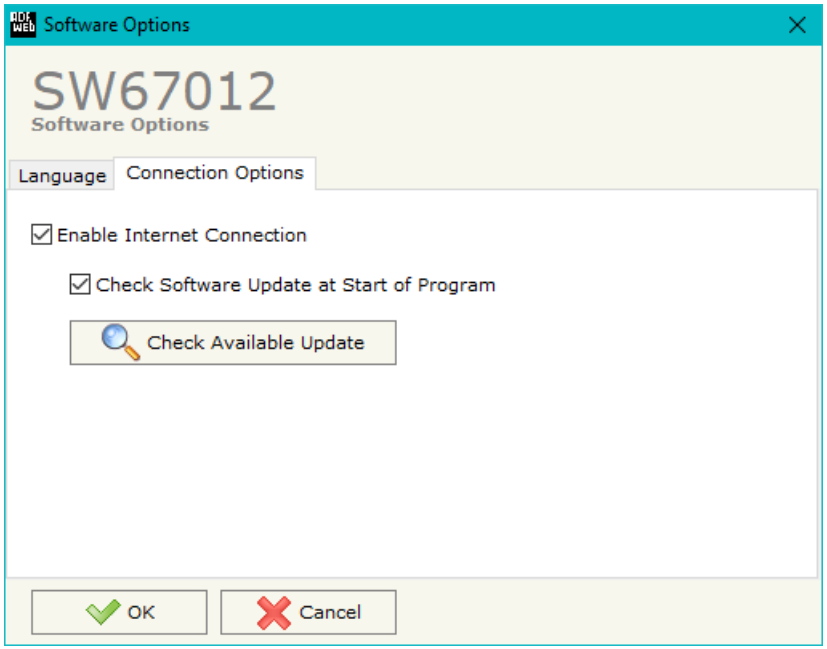
- To clone the configurations of a Programmable "CAN / Modbus Slave - Converter" in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate 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 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 SW67012 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.

By pressing the "**Set Communication**" button from the main window for SW67012 (Fig. 2) the window "Set communication" appears (Fig. 3):

In the section "Select Device" is possible to select the type of device in possess:

- Device With Ethernet Port (with Dip-Switch);
- Device Without Ethernet Port (with Jumper).

The meaning of the fields of "CAN" are:

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

The meaning of the fields of "Modbus Slave" are:

- In the field "**Serial**" the serial port used for the Modbus communication is defined;
- In the field "**Baudrate**" the data rate of the Modbus line is defined;
- In the field "**Parity**" the parity of the Modbus line is defined;
- In the field "**ID Device**" the address of the Modbus is defined.

The means of the fields of "Ethernet" are:

- In the fields "**IP Address**" the IP address of the converter is defined;
- In the fields "**SubNet Mask**" the SubNet Mask of the converter is defined;
- In the fields "**Gateway**" the default gateway of the network is defined. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net.

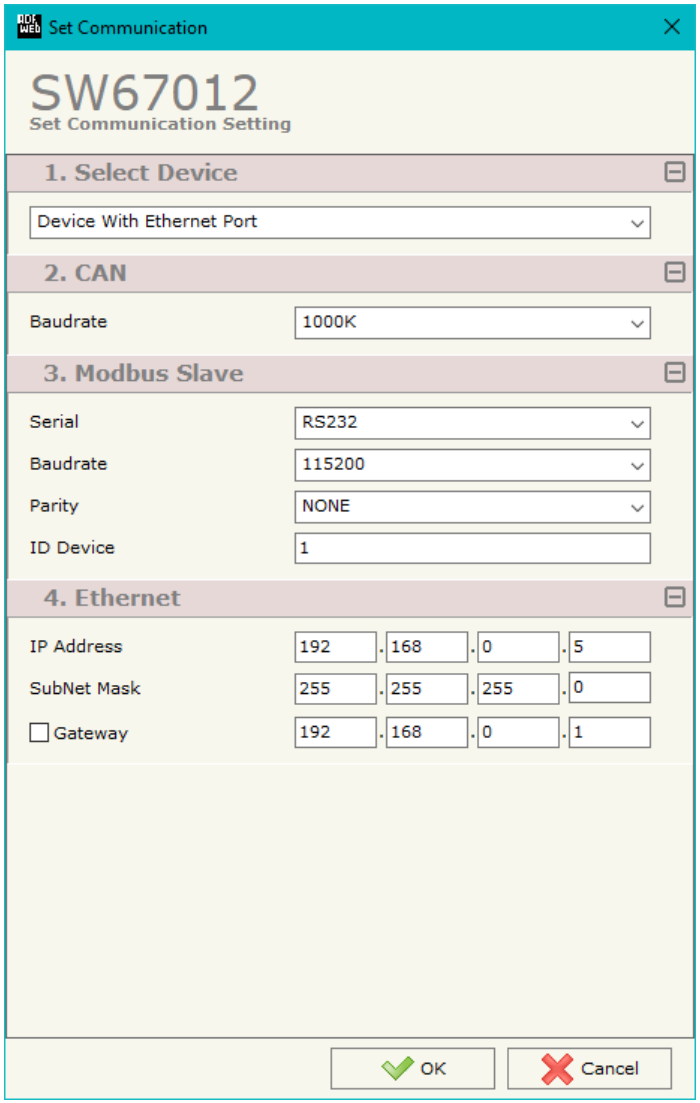


Figure 3: "Set communication" window

RECEIVE COB:

By pressing the "**Receive COB**" button from the main window for SW67012 (Fig. 2) the window "Receive CAN Frames Definition" appears (Fig. 4). In this section, it is possible to define the CAN frames that the converter will receive from CAN network.

If "Device With Ethernet Port" is set in the section "Set Communication", the window appears like below:

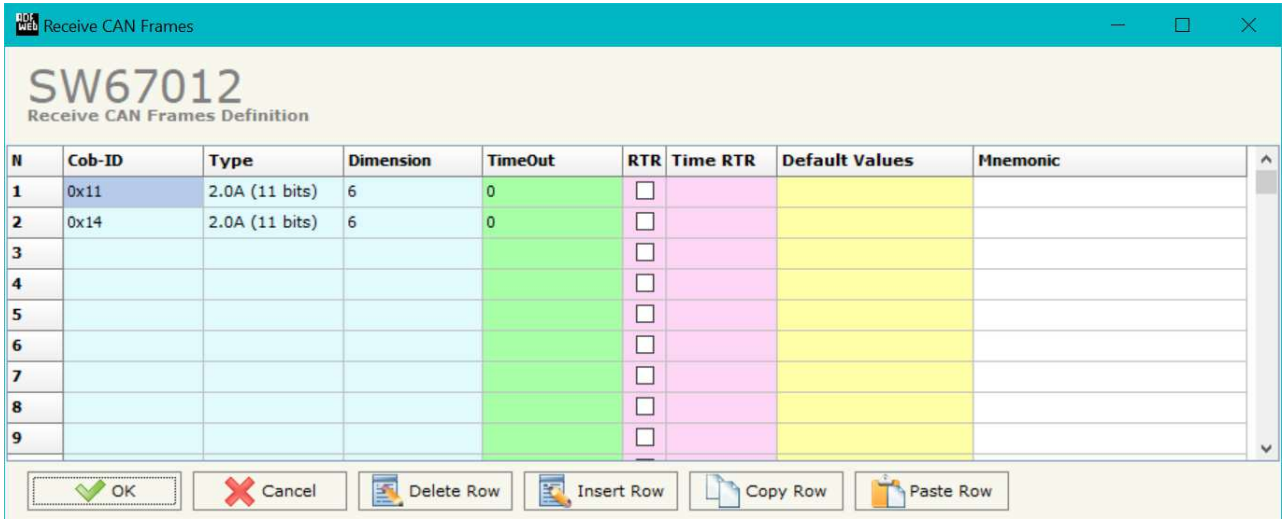


Figure 4: "Receive CAN Frame" window

- In the field "**Cob-ID**" insert the Cob-ID of the CAN frame;
- In the field "**Type**" insert the type of the CAN protocol used for each frame (CAN 2.0A (11 bits) or CAN 2.0B (29 bits));
- In the field "**Dimension**" insert the number of bytes of the CAN frame (the maximum dimension is 8 Bytes);
- If the field "**TimeOut**" insert the Timeout; after the Timeout defined, the value of the data of the CAN frame become "0";
- If the field "**RTR**" is checked, the RTR bit for the selected frame is enabled;
- In the field "**Time RTR**" it is possible to define a cyclical time to send to Remote Transmit Request (RTR);
- In the field "**Default Values**" it is possible to define the default values when the converter starts;
- In the field "**Mnemonic**" a description of the frame is defined.

DEFINE COB:

By pressing the "**Define COB**" button near "Receive COB" from the main window for SW67012 (Fig. 2) the window "Define Modbus Registers for Receive CAN Frames" appears (Fig. 5):

- In the field "**List of Receive CAN Frames**" there is the list of CAN frames that you inserted in "Receive COB" 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 can frame 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.

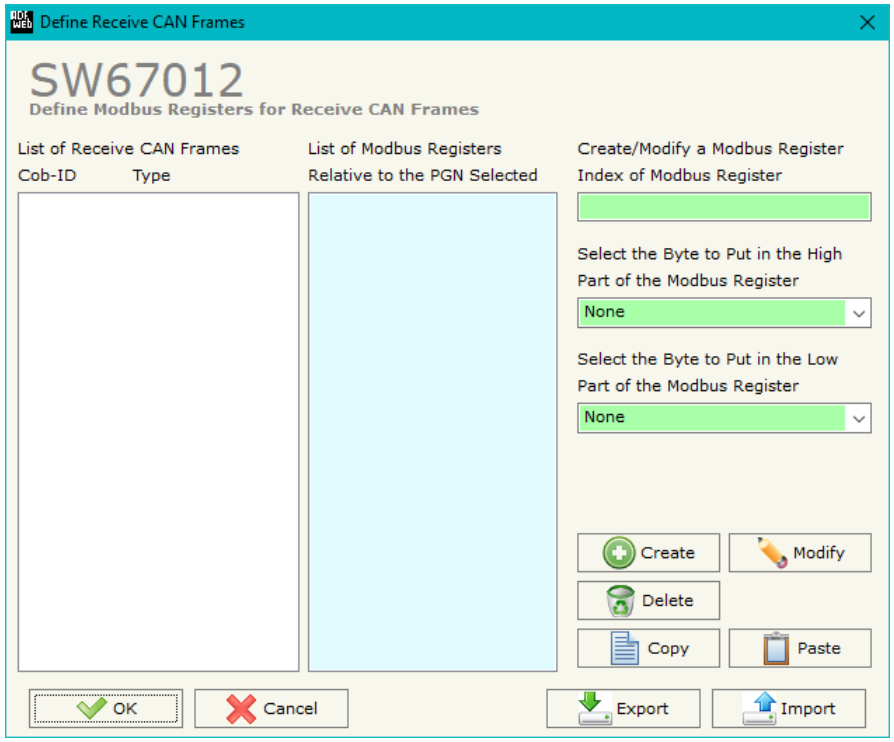


Figure 5: "Receive CAN Frame Info" window

TRANSMIT COB:

By pressing the "**Transmit COB**" button from the main window of SW67012 the window "Transmit CAN Frames Definition" appears (Fig. 6): in this section, it is possible to define the CAN frames that the converter will send to the CAN network.

If "Device With Ethernet Port" is set in the section "Set Communication", the window appears like below:

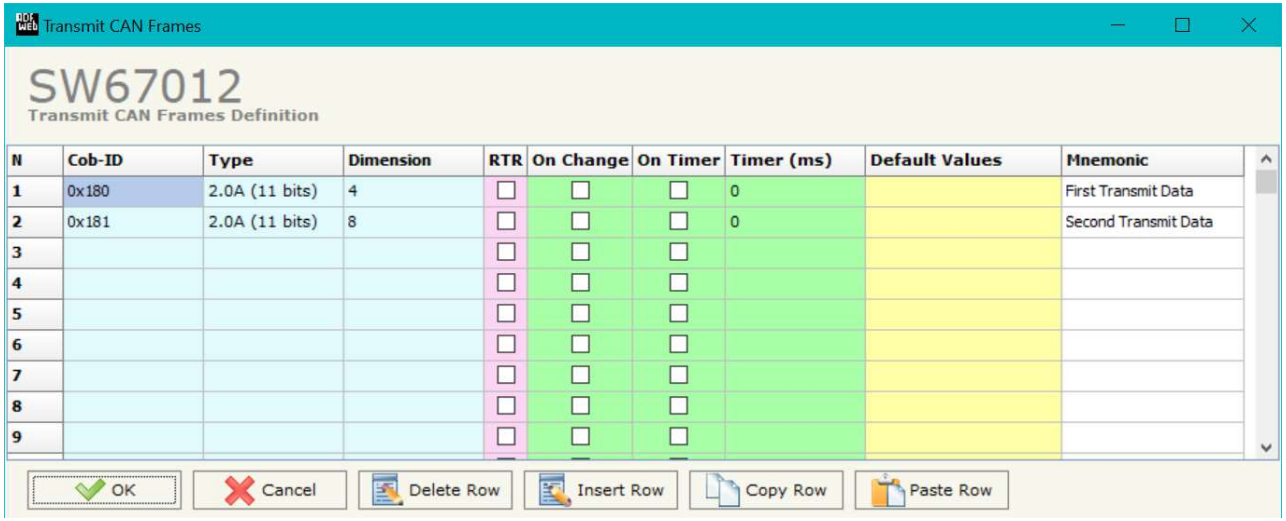


Figure 6: "Transmit CAN Frame" window

- In the field "**Cob-ID**" insert the Cob-ID of the CAN frame you would to write from Modbus to CAN;
- In the field "**Type**" insert the type of the CAN protocol used for each frame (CAN 2.0A (11 bits) or CAN 2.0B (29 bits));
- In the field "**Dimension**" insert the number of bytes of the CAN frame (the maximum dimension is 8 Bytes);
- If the field "**RTR**" is checked, the RTR bit is enabled ('1'); if it is not checked, it is disabled ('0');
- If the field "**On Change**" is checked the CAN frame is sent when the data written from Modbus side changes;
- If the field "**On Timer**" is checked the CAN frame is sent cyclically;
- In the field "**Timer (ms)**" insert the cyclic delay;
- In the field "**Default Values**" it is possible to define the default values when the converter starts;
- In the field "**Mnemonic**" the description for the frame is defined.

DEFINE COB:

By pressing the "**Define COB**" button near "Transmit COB" from the main window for SW67012 (Fig. 2) the window "Define Modbus Registers for Transmit CAN Frames" appears (Fig. 7):

- In the field "**List of Transmit CAN Frames**" there is the list of CAN frames that you inserted in "Transmit COB" 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 CAN frame where you write it;
- With the field "**Send CAN frame on Modbus Write**" it is possible to decide when to send the CAN frame. If a Modbus word has written "False "in this field, the CAN frame is not sent immediately but it is sent when another word that have this field "True" is written.

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.

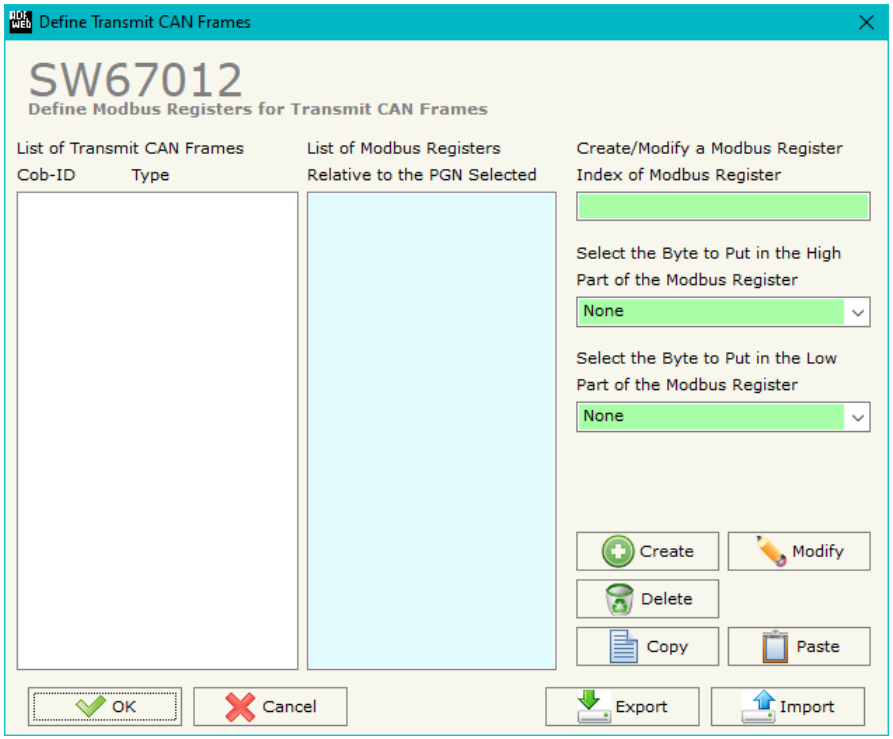


Figure 7: "Transmit CAN Frame Info" window

UPDATE DEVICE:

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

If you don't know the actual IP address of the device you have to use this procedure:

- Turn off the Device;
- Put Dip1 of 'Dip-Switch A' in ON position;
- Turn on the device
- Connect the Ethernet cable;
- 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" turn off the Device;
- Put Dip1 of 'Dip-Switch A' in OFF position;
- Turn on the device.

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 update.

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 HD67012 device.

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67012 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 and 8, 10 or 11 make sure that you have the administrator privileges;
- In case you have to program more than one device, 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 or 11 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

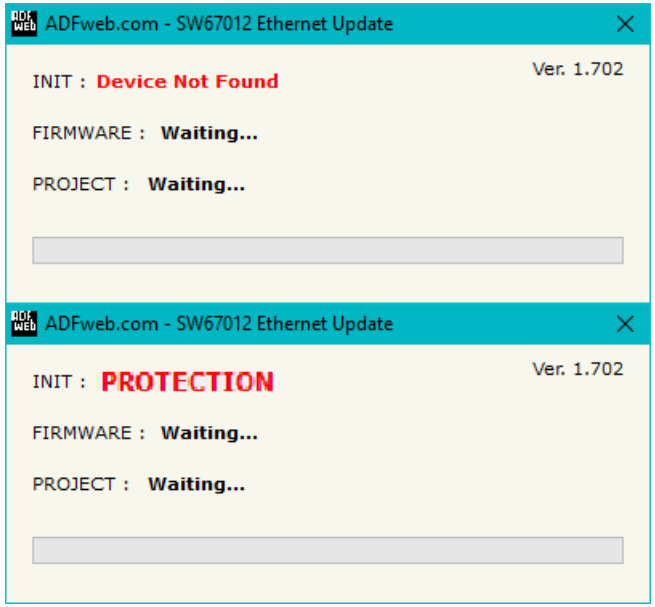


Figure 9: "Protection" window

In the case of HD67012 you have to use the software "SW67012": www.adfweb.com\download\filefold\SW67012.zip.

MECHANICAL DIMENSIONS:

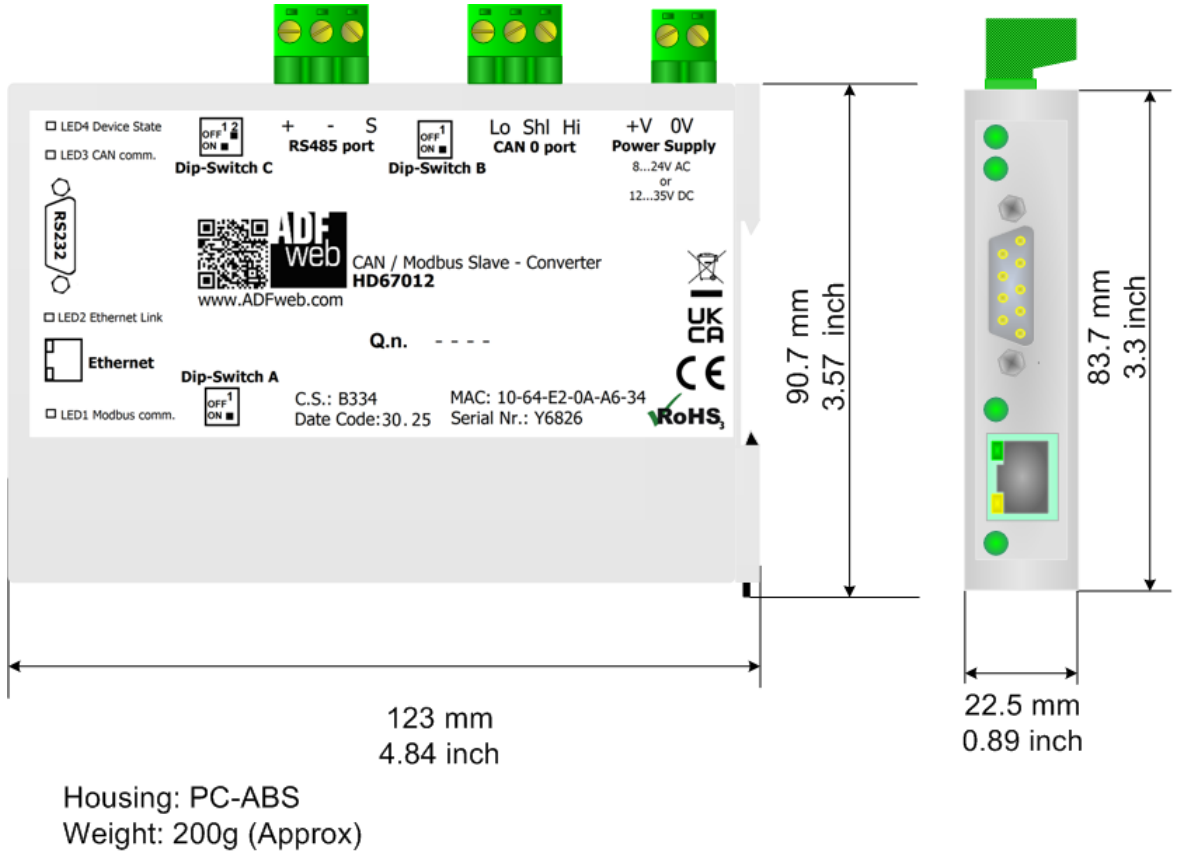


Figure 10: Mechanical dimensions scheme for HD67012

ORDER CODE:

Order Code: **HD67012** - CAN / Modbus Slave - Converter

ACCESSORIES:

Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m
Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m
Order Code: **AC34011** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V DC
Order Code: **AC34012** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 24 V DC

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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 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:

1) 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.
2) 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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