

# User Manual

Revision 2.000  
English

## DeviceNet Slave / CAN - Converter

(Order Code: HD67235-A1, HD67235-A3, HD67235-A4)

For Website information:

[www.adfweb.com?Product=HD67235-A1](http://www.adfweb.com?Product=HD67235-A1)  
[www.adfweb.com?Product=HD67235-A3](http://www.adfweb.com?Product=HD67235-A3)  
[www.adfweb.com?Product=HD67235-A4](http://www.adfweb.com?Product=HD67235-A4)

For Price information:

[www.adfweb.com?Price=HD67235-A1](http://www.adfweb.com?Price=HD67235-A1)  
[www.adfweb.com?Price=HD67235-A3](http://www.adfweb.com?Price=HD67235-A3)  
[www.adfweb.com?Price=HD67235-A4](http://www.adfweb.com?Price=HD67235-A4)

### Benefits and Main Features:

- ✦ Very easy to configure
- ✦ Triple electrical isolation
- ✦ Ethernet programming
- ✦ Temperature range: -40°C/85°C (-40°F/185°F)



User Manual

For others Gateways / Bridges:

### CANopen to DeviceNet

See also the following links:  
[www.adfweb.com?Product=HD67134](http://www.adfweb.com?Product=HD67134)

### CAN bus to Modbus

See also the following links:

<a href="http://www.adfweb.com?Product=HD67011">www.adfweb.com?Product=HD67011</a>	(Modbus RTU Master)
<a href="http://www.adfweb.com?Product=HD67012">www.adfweb.com?Product=HD67012</a>	(Modbus RTU Slave)
<a href="http://www.adfweb.com?Product=HD67014">www.adfweb.com?Product=HD67014</a>	(Modbus TCP Master)
<a href="http://www.adfweb.com?Product=HD67515">www.adfweb.com?Product=HD67515</a>	(Modbus TCP Slave)

### CAN bus to CAN bus

See also the following link:  
[www.adfweb.com?Product=HD67221](http://www.adfweb.com?Product=HD67221)

Do you have an your customer protocol?  
[www.adfweb.com?Product=HD67003](http://www.adfweb.com?Product=HD67003)

Do you need to choose a device? do you want help?  
[www.adfweb.com?Cmd=helpme](http://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/](http://www.adfweb.com/download/) and search for the corresponding code on the page. Click on the proper “Document Code” and download the updates.

**REVISION LIST:**

Revision	Date	Author	Chapter	Description
1.001	23/04/2010	FI	All	Change Fig.1
1.002	16/07/2010	FT	All	Revison
1.003	11/02/2013	Nt	All	Added new chapters
2.000	16/02/2016	FI	All	New hardwre version

**WARNING:**

ADFweb.com reserves the right to change information in this manual about our product without warning. ADFweb.com is not responsible for any error this manual may contain.

**TRADEMARKS:**

All trademarks mentioned in this document belong to their respective owners.

**SECURITY ALERT:****GENERAL INFORMATION**

To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device, legal and safety regulation are required for each individual application. The same applies also when using accessories.

**INTENDED USE**

Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

**QUALIFIED PERSONNEL**

The device can be used only by qualified personnel, strictly in accordance with the specifications.

Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

**RESIDUAL RISKS**

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

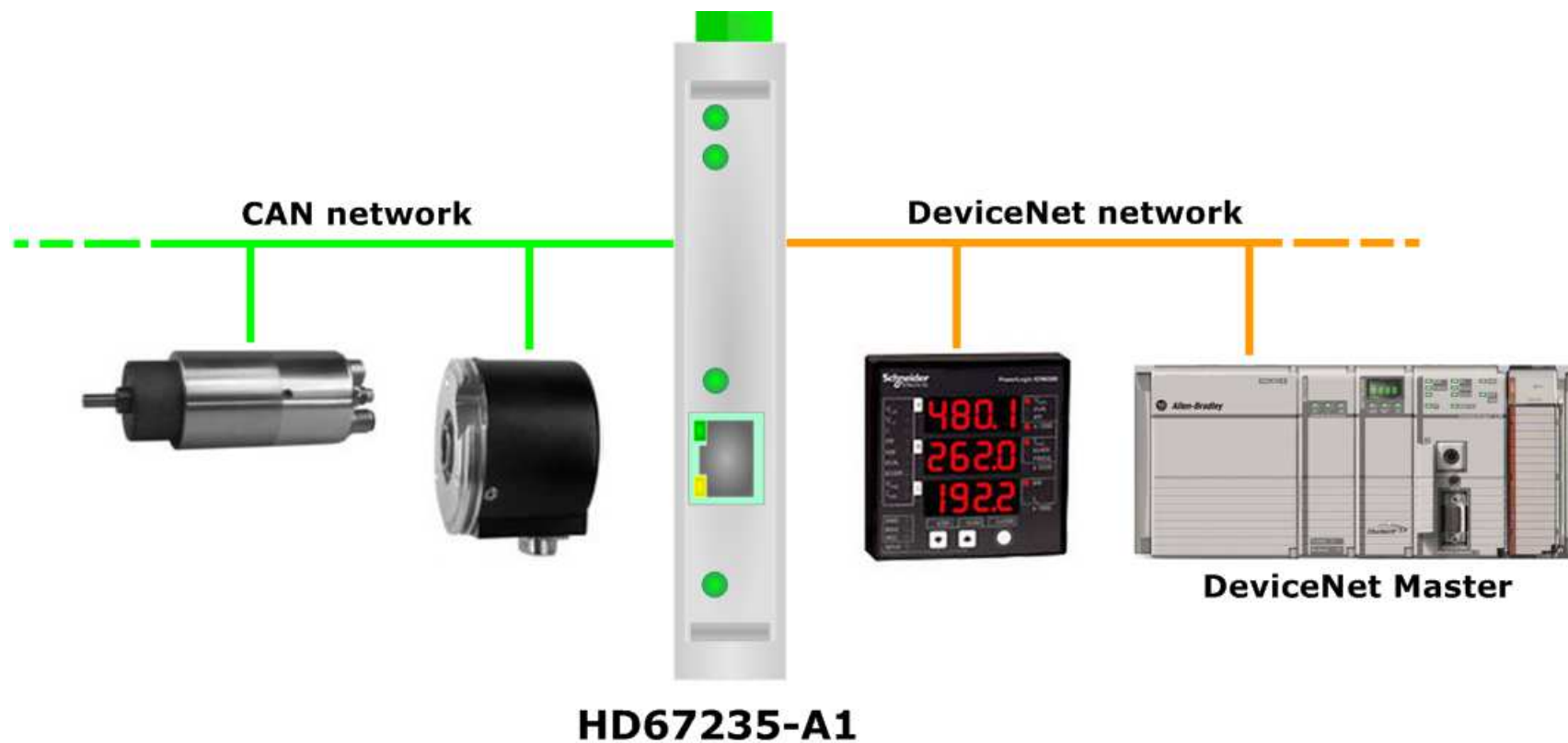


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

**CE CONFORMITY**

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

**EXAMPLE OF CONNECTION:**



**CONNECTION SCHEME:**

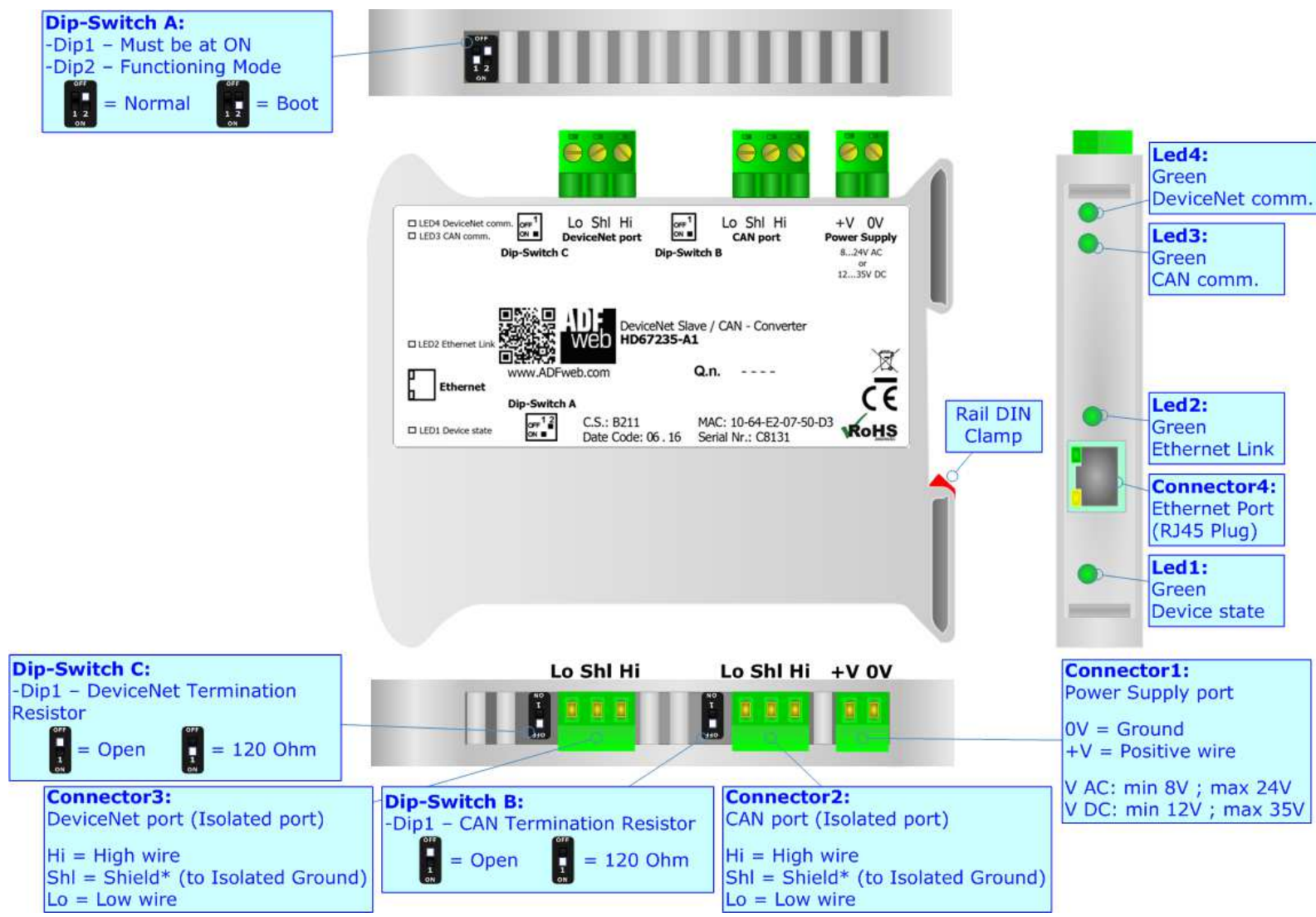


Figure 1a: Connection scheme for HD67235-A1

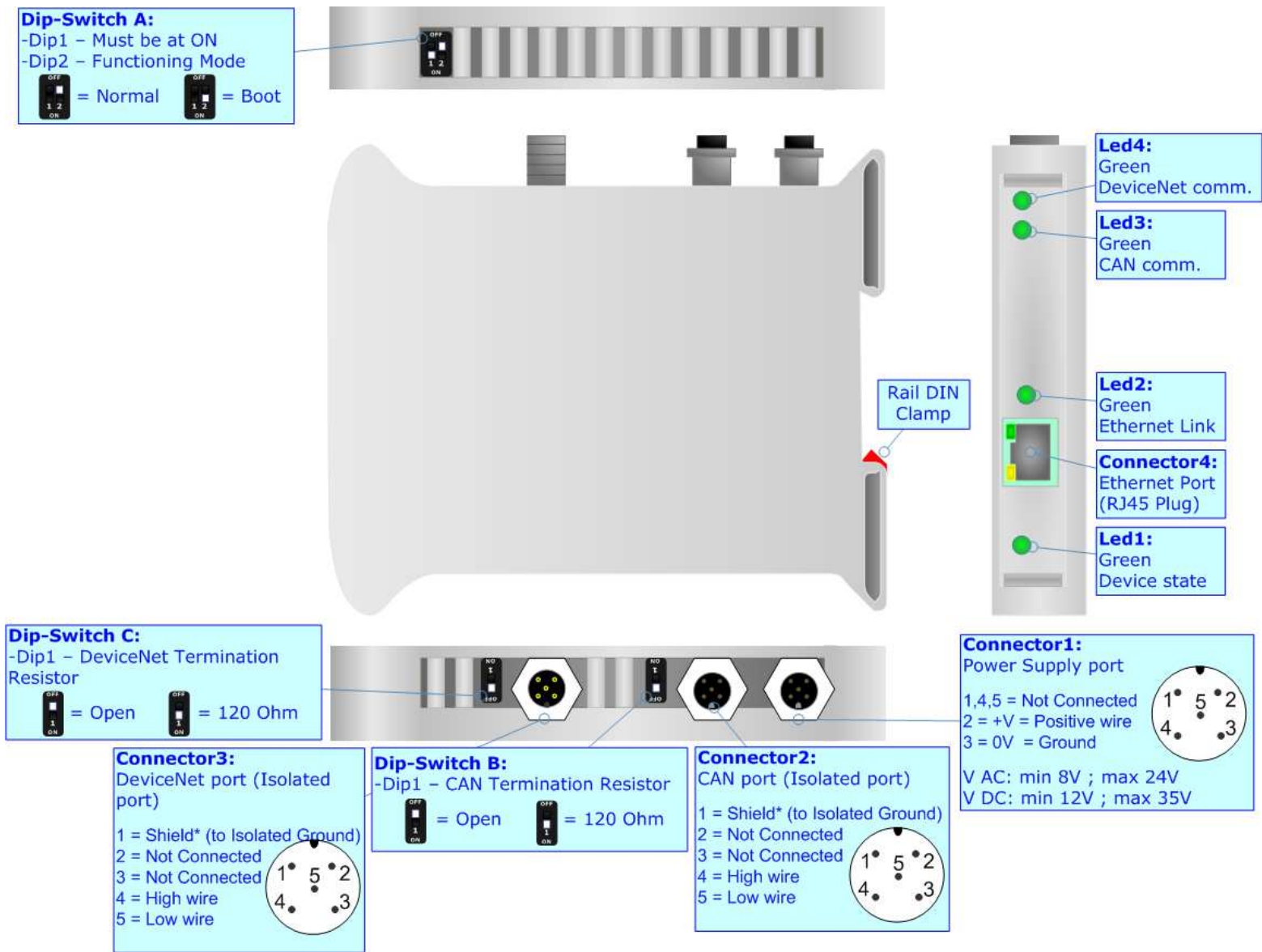


Figure 1b: Connection scheme for HD67235-A3



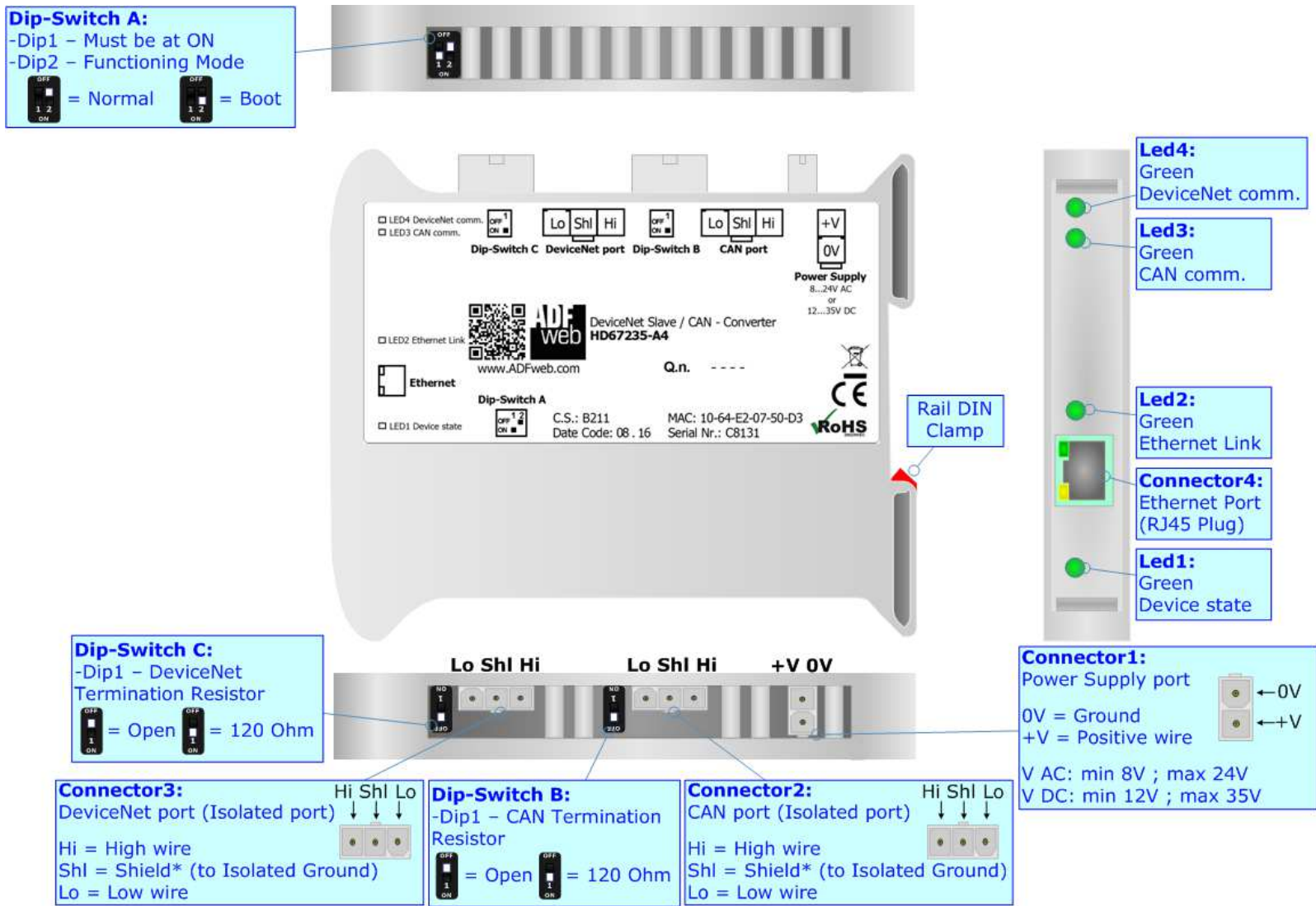


Figure 1c: Connection scheme for HD67235-A4

**CHARACTERISTICS:**

The HD67235-A1, HD67235-A3 and HD67235-A4 are converters from DeviceNet slave to CAN and vice-versa.

They allow the following characteristics:

- Up to 455 bytes in reading and 455 bytes in writing;
- Triple isolation between CAN - Power Supply, CAN - DeviceNet, Power Supply - DeviceNet.
- Two-directional information between BACnet bus and DeviceNet bus;
- 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 SW67235 software on your PC in order to perform the following:

- Define the parameter of CAN line;
- Define the parameter of DeviceNet line;
- Define the CAN frames that the Converter can accept;
- Define the CAN frames that the Converter sends through the CAN line;
- Define the map of CAN byte that must be written in the DeviceNet array;
- Define the map of which DeviceNet bytes must be written in CAN frames;
- 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

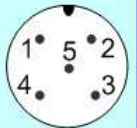
Consumption at 24V DC:

Device	Consumption [W/VA]
HD67671-IP-2-A1	3.5
HD67671-IP-4-A1	3.5
HD67671-MSTP-2-A1	3.5

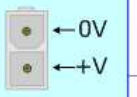
**Connector1:**  
Power Supply port  
0V = Ground  
+V = Positive wire  
V AC: min 8V ; max 24V  
V DC: min 12V ; max 35V



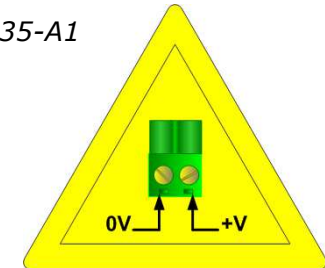
**Connector1:**  
Power Supply port  
1,4,5 = Not Connected  
2 = +V = Positive wire  
3 = 0V = Ground  
V AC: min 8V ; max 24V  
V DC: min 12V ; max 35V



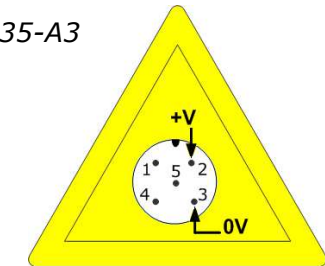
**Connector1:**  
Power Supply port  
0V = Ground  
+V = Positive wire  
V AC: min 8V ; max 24V  
V DC: min 12V ; max 35V



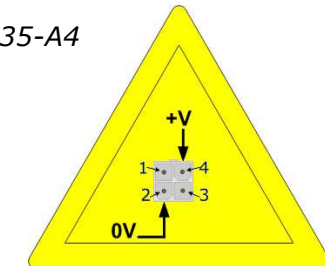
HD67235-A1



HD67235-A3



HD67235-A4



**Caution: Not reverse the polarity power**

**FUNCTION MODES:**

The device has got two functions mode depending of the position of the 'Dip2 of Dip-Switch A':

- The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip2 of Dip-Switch A' at "ON" position, is used for uploading 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.

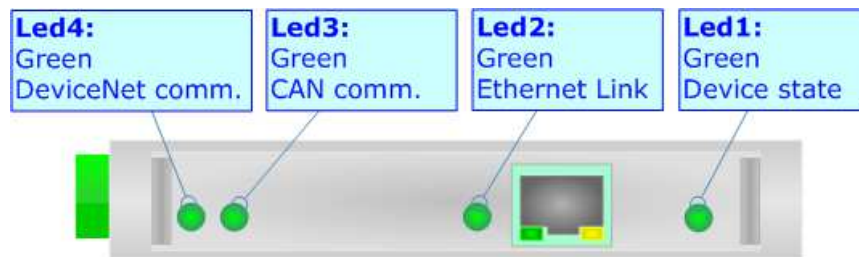
**Warning:**

Dip1 of 'Dip-Switch A' must be at ON position to work even if the Ethernet cable is not inserted.

**LEDS:**

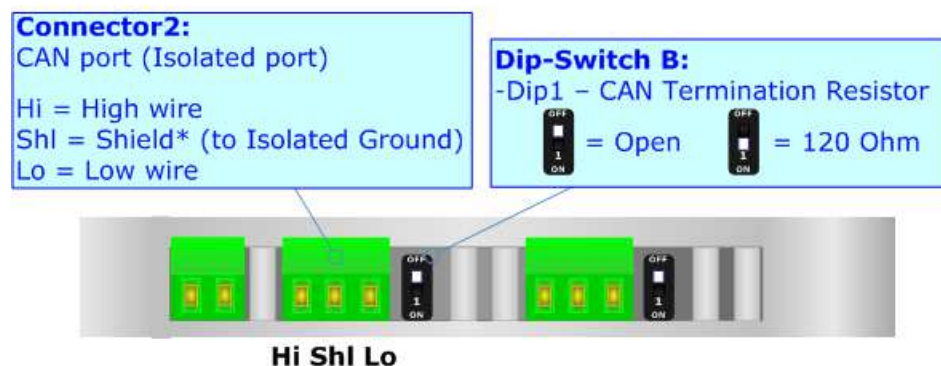
The device has got four LEDs that are used to give information about the functioning status.  
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device state (green)	Blinks slowly (~1Hz)	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
2: Link Ethernet	<b>ON:</b> Ethernet cable connected <b>OFF:</b> Ethernet cable disconnected	<b>ON:</b> Ethernet cable connected <b>OFF:</b> Ethernet cable disconnected
3: CAN comm.	Blinks quickly when receive a CAN frame defined in the Compositor	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
4: DeviceNet comm.	Blinks quickly when is in communication with the DevciceNet master	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress



**CAN:**

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

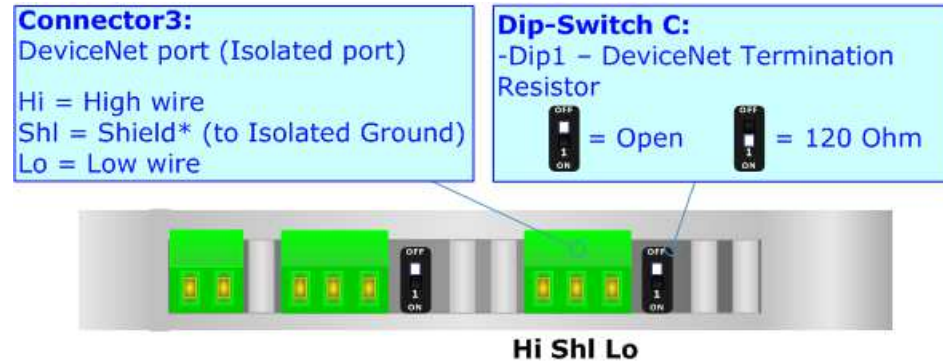


Cable characteristics:

<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

**DEVICENET:**

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



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>
	125 K	500
	250 K	250
	500 K	100

**ETHERNET:**

The Ethernet port is used for programming the device.  
 The Ethernet connection must be made using Connector4 of HD67235 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.



**USE OF COMPOSITOR SW67235:**

To configure the Converter, use the available software that runs with Windows called SW67235. It is downloadable from 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; 32/64bit).

When launching the SW67235, the window below appears (Fig. 2).



**Note:**

It is necessary to have installed .Net Framework 4.

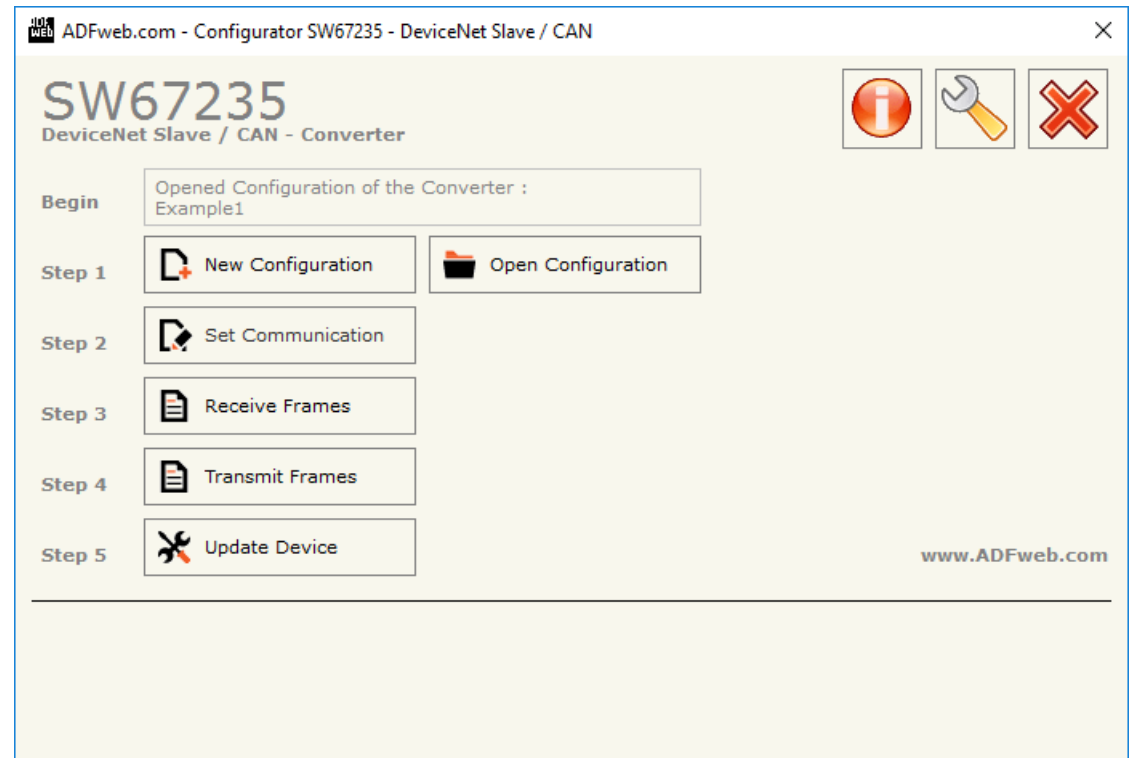
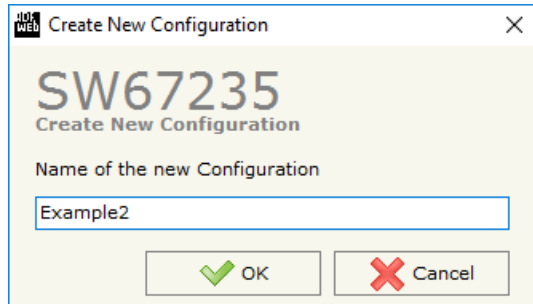


Figure 2: Main window for SW67235

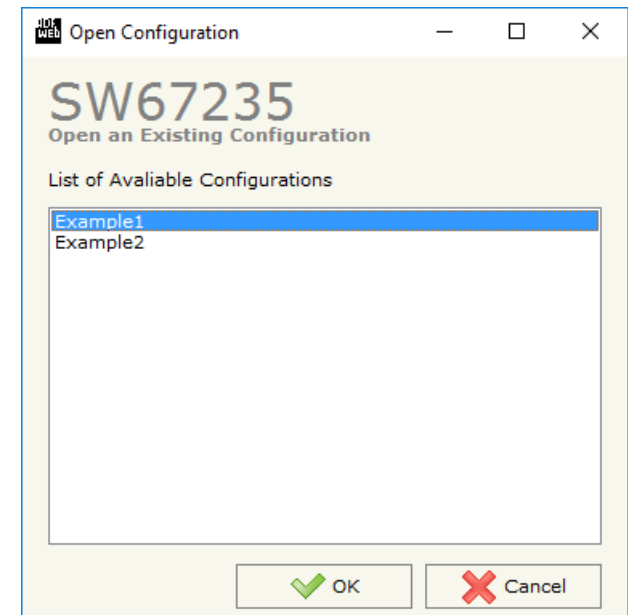
**NEW CONFIGURATION / OPEN CONFIGURATION:**

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 “DeviceNet slave / CAN - 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**”.

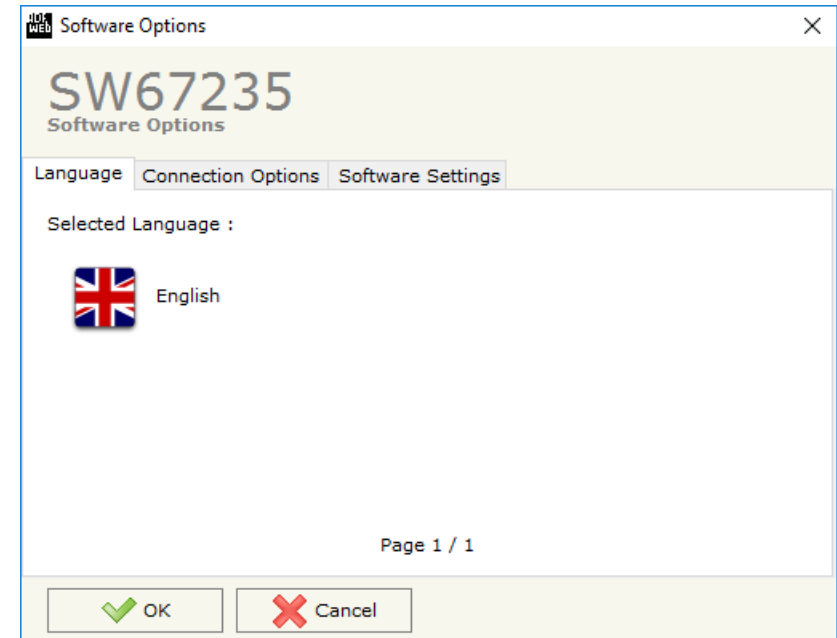
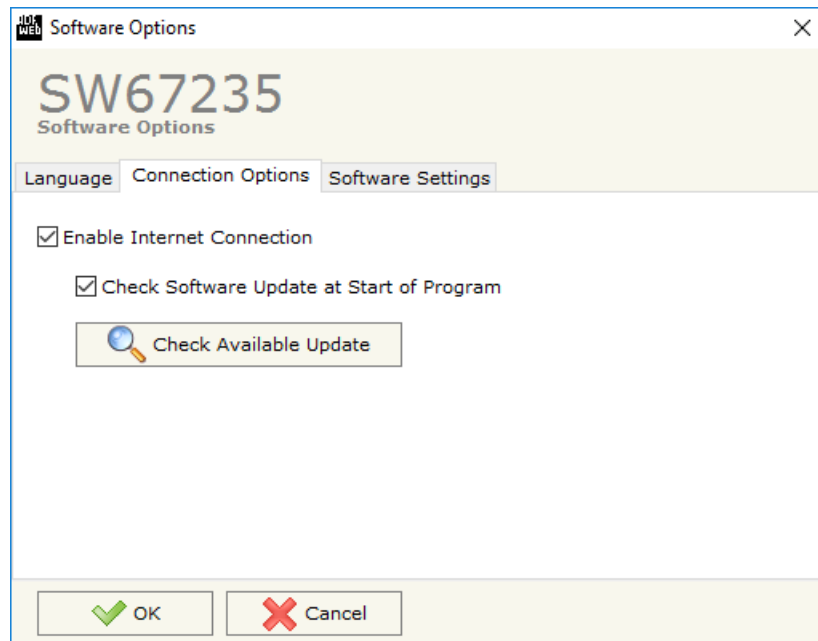




**SOFTWARE OPTIONS:**

By pressing the “**Settings**” () button there is the possibility to change the language of the software and check the updatings for the compositor.

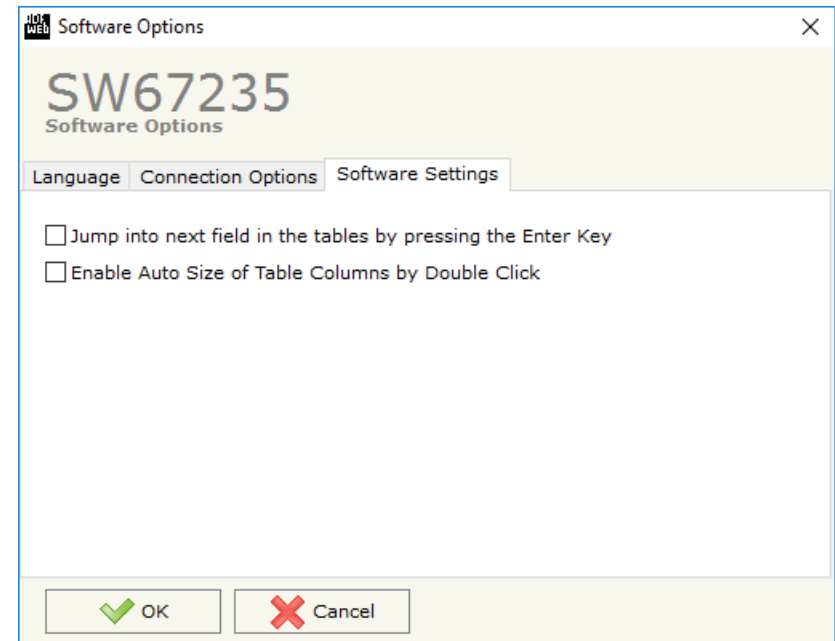
In the section “Language” it is possible to change the language of the software.



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 SW67235 check automatically if there are updatings when it is launched.

In the section "Software Settings" it is possible to enable or disable some additional functions:

- ➔ By checking the field "**Jump into next field in the tables by pressing the Enter Key**" is possible to jump to the next cell with the Enter button;
- ➔ By checking the field "**Enable Auto Size of Table Columns by Double Click**" is possible to re-size the columns in the tables with a double click.



## SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, DeviceNet and CAN.

By Pressing the **"Set Communication"** button from the main window for SW67235 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The window is divided in four sections, one for selecting the type of hardware, one for the CAN parameters, one for DeviceNet parameters and the last for Ethernet.

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

- Device till 2015 (without Ethernet Port);
- Device from 2016 (with Ethernet Port).

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

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

The means of the fields for the "DeviceNet" section are:

- In the field **"ID Device"** insert the Address you want to assing to the Converter.
- In the field **"Baudrate"** the DeviceNet baud rate is defined;
- In the field **"Number Byte IN"** the number of byte from the DeviceNet to the Converter is defined (at maximum it is possible to use 455 byte);
- In the field **"Number Byte OUT"** the number of byte from the Converter to the DeviceNet is defined (at maximum it is possible to use 455 byte).

The means of the fields for "Ethernet" are:

- In the fields **"IP ADDRESS"** insert the IP address that you want to give to the Converter;
- In the fields **"SUBNET Mask"** insert the SubNet Mask;
- In the fields **"GATEWAY"** insert the default gateway that you want to use. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net.

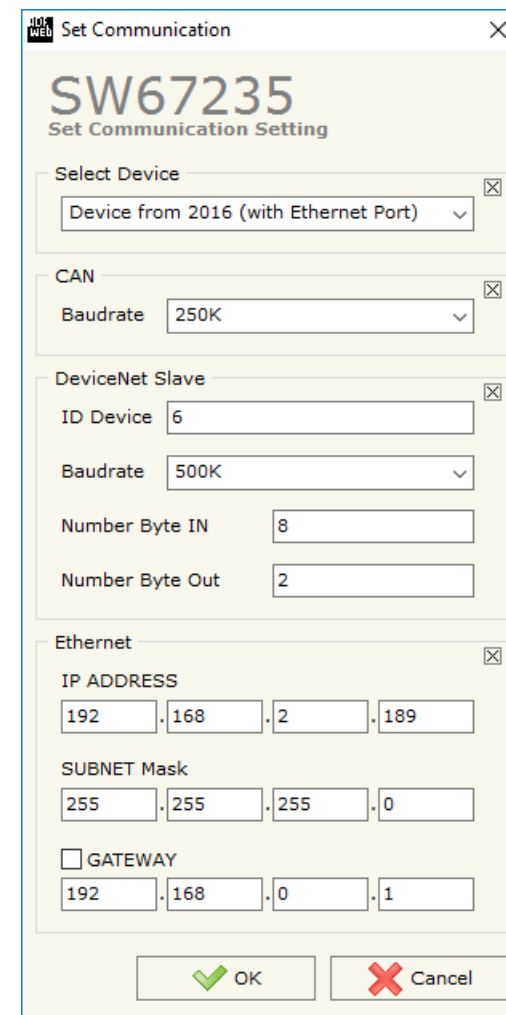


Figure 3: "Set Communication" window

**RECEIVE FRAMES:**

By pressing the "Receive Frames" button from the main window for SW67235 (Fig. 2) the "Receive Frames" window appears (Fig. 4).

The COB inserted in this table contains the Output data of DeviceNet. These frames are accepted by the Converter.

The data of the columns have the following meanings:

- In the field "CobID" insert the COB of the CAN frame;
- In the field "Type" is possible to select which type of CAN packet use for this Cob-ID; or 2.0A (11 bits) or 2.0B (29 bits);
- In the field "Dimension" insert the number of byte of the COB (from 1 to 8);
- The field "TimeOut" is used for put at zero the data into DeviceNet if the CAN frame don't arrives with a frequency less than the time expressed in the field. If the value in the field is 0, means that you don't want to use this feature, and so the value is never deleted;
- In the fields "Byte1", "Byte2", "Byte3", "Byte4", "Byte5", "Byte6", "Byte7", "Byte8" is possible to select which byte save into DeviecNet Output array;
- In the field "Mnemonic" it is possible to insert a brief description.

N	Enable	CobID	Type	Dimension	TimeOut	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Mnemonic
1	<input checked="" type="checkbox"/>	0x250	2.0A (11 bits)	8	1000	0	1	None	None	None	None	None	None	Temperature
2	<input checked="" type="checkbox"/>													
3	<input checked="" type="checkbox"/>													
4	<input checked="" type="checkbox"/>													
5	<input checked="" type="checkbox"/>													

Figure 4: "Receive Frames" window

For Example:

Byte 1 of frame CAN 0x250 go to byte 0 in DeviceNET: the first byte of CAN frame is 0x11, in the byte 0 of DeviceNET I can read 0x11.

**SEND FRAMES:**

By pressing the "Send Frames" button from the main window for SW67235 (Fig. 2) the "Send frames" window appears (Fig. 5).

The COB inserted in this table contains the Input data of DeviceNet. These frames are sent by the Converter.

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**" is possible to select which type of CAN packet use for this Cob-ID; or 2.0A (11 bits) or 2.0B (29 bits);
- In the field "**Dimension**" insert the number of byte of the COB (from 1 to 8);
- If the field "**On Change**" is checked, the CAN frame is sent when one of the data is changed;
- If the field "**On Timer**" is checked, the CAN frame is sent cyclically;
- In the field "**Timer**" insert the interval used for the "On Timer". The time is in milliseconds;
- In the fields "**Byte1**", "**Byte2**", "**Byte3**", "**Byte4**", "**Byte5**", "**Byte6**", "**Byte7**", "**Byte8**" is possible to select which byte of DeviceNet Input array use to compose the CAN frame;
- In the field "**Mnemonic**" it is possible to insert a brief description.

N	Enable	CobID	Type	Dimension	OnChange	OnTimer	Time	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Mnemonic
1	<input checked="" type="checkbox"/>	0x350	2.0A (11 bits)	8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	0	1	2	3	4	5	6	7	Set Temperautre
2	<input checked="" type="checkbox"/>	0x355	2.0A (11 bits)	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500	0	1	2	3	4	5	6	7	Set Umidity
3	<input checked="" type="checkbox"/>	0x360	2.0A (11 bits)	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3000	0	1	2	3	4	5	6	7	
4	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>										
5	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>										

Figure 5: "Send Frames" window

For Example:

Byte 1 of frame CAN is byte 0 in DeviceNet: the byte 0 of DeviceNet is 0x22, the first byte of CAN frame with COB=0x350 will be 0x22.

**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"**;
- Select update options (Firmware + Configuration);
- 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' at OFF position;
- Turn on the device.

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

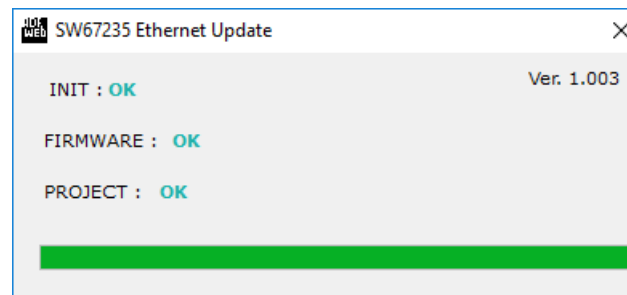
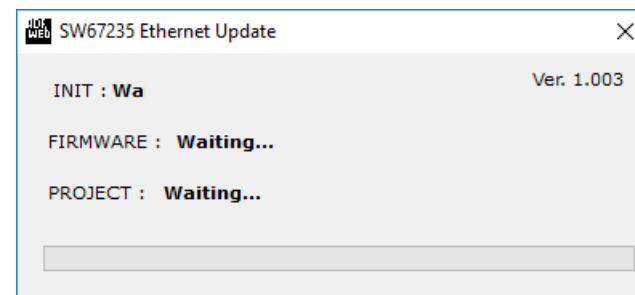
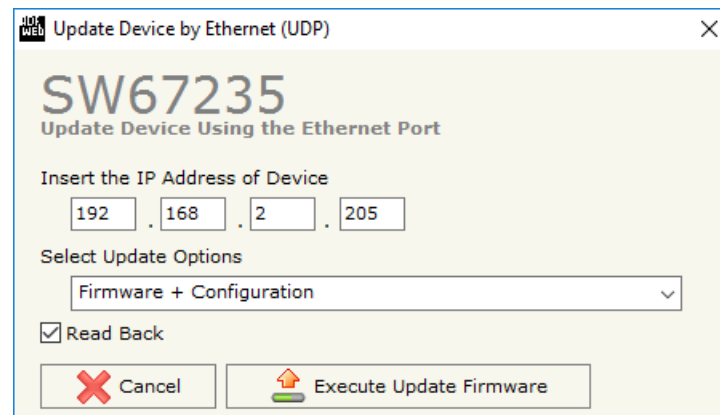


Figure 6: "Update device" windows

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;
- Select update options (Firmware + Configuration);
- 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.



**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 HD67235-A1 device.



**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD67235-A1 device.



**Warning:**

If Fig. 7 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;
- 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, 10, make sure that you have the administrator rights;
- Take attention at Firewall lock;
- Check the LAN settings.



In the case of HD67606-A1 you have to use the software "SW67606": [www.adfweb.com/download/filefold/SW67235.zip](http://www.adfweb.com/download/filefold/SW67235.zip).

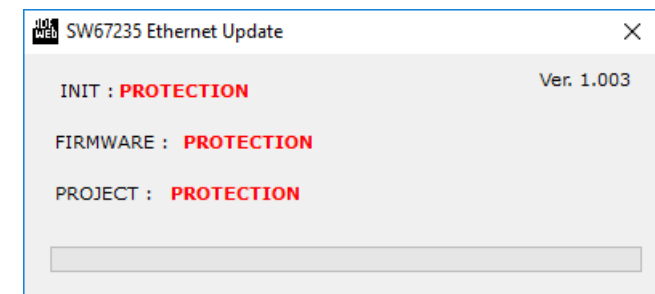
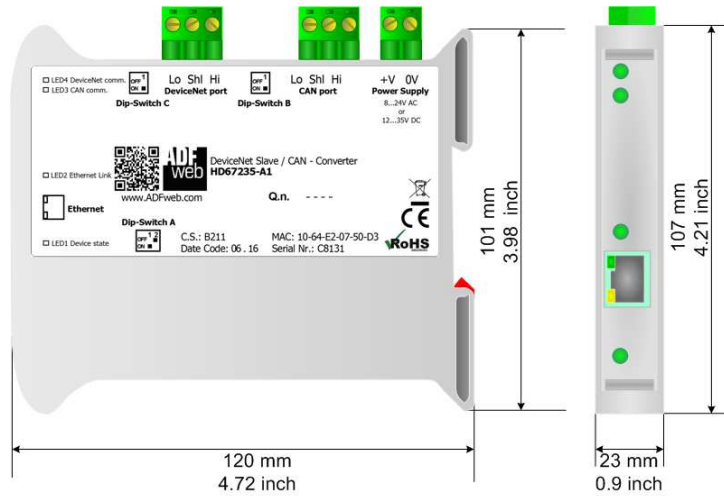


Figure 7: "Protection" window

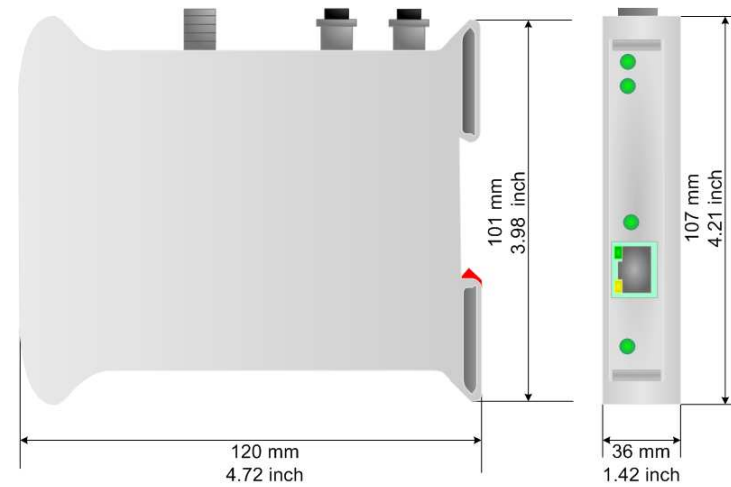


**MECHANICAL DIMENSIONS:**



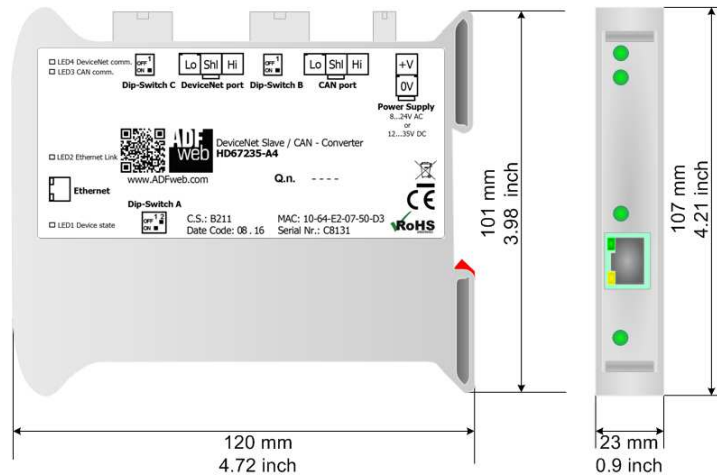
Housing: PVC  
Weight: 200g (Approx)

Figure 8a: Mechanical dimensions scheme for HD67235-A1



Housing: PVC  
Weight: 200g (Approx)

Figure 8b: Mechanical dimensions scheme for HD67235-A3



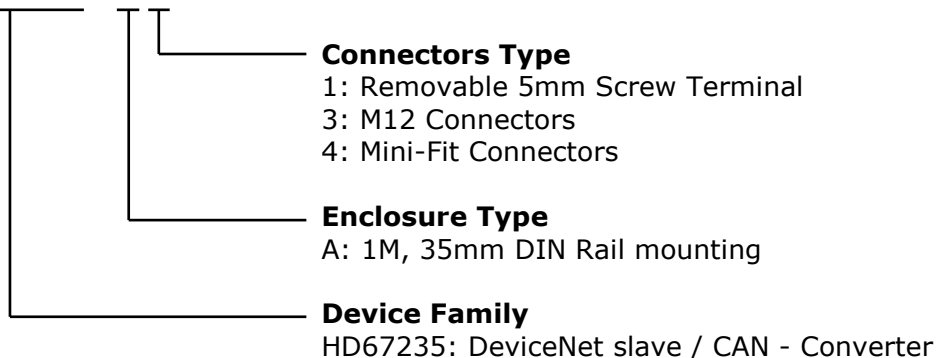
Housing: PVC  
Weight: 200g (Approx)

Figure 8c: Mechanical dimensions scheme for HD67235-A4

**ORDERING INFORMATIONS:**

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

**HD67235 - A 1**



- Order Code: **HD67235-A1** - DeviceNet slave / CAN - Converter (Removable screw terminal connectors)
- Order Code: **HD67235-A3** - DeviceNet slave / CAN - Converter (M12 connectors)
- Order Code: **HD67235-A4** - DeviceNet slave / CAN - Converter (Mini-Fit connectors)

**ACCESSORIES:**

- Order Code: **AC34001** - 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz - 12 V AC
- Order Code: **AC34002** - 35mm Rail DIN - Power Supply 110V AC 50/60Hz - 12 V AC

**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](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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