

User Manual

Revision 1.100
English

J1939 / DeviceNet Slave - Converter

(Order Code: HD67137-A1)

for Website information:

www.adfweb.com?Product=HD67137

for Price information:

www.adfweb.com?Price=HD67137-A1

Benefits and Main Features:

- ✦ Very easy to configure
- ✦ Electrical isolation
- ✦ Temperature range: -40°C/85°C (-40°F/185°F)



For others Gateways / Bridges:

J1939 to Modbus

See also the following links:

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

CANopen to Modbus

See also the following links:

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

www.adfweb.com?Product=HD67502 (Modbus RTU Slave)

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

www.adfweb.com?Product=HD67505 (Modbus TCP Slave)

For others Gateways / Bridges:

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

See also the following links:

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

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

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

www.adfweb.com?Product=HD67515 (Modbus TCP Master)

Do you have an your customer protocol?

See the following links:

www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?

Ask it to the following link:

www.adfweb.com?Cmd=helpme



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/ 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	03/12/2008	Fl	All	Software changed
1.002	10/05/2010	Ml Dp	All	Revision
1.003	13/02/2013	Nt	All	Added new chapters
1.100	08/09/2017	Ff	All	New hardware version

WARNING:

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TRADEMARKS:

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SECURITY ALERT:**GENERAL INFORMATION**

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

INTENDED USE

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

QUALIFIED PERSONNEL

The device can be used only by qualified personnel, strictly in accordance with the specifications. Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS

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

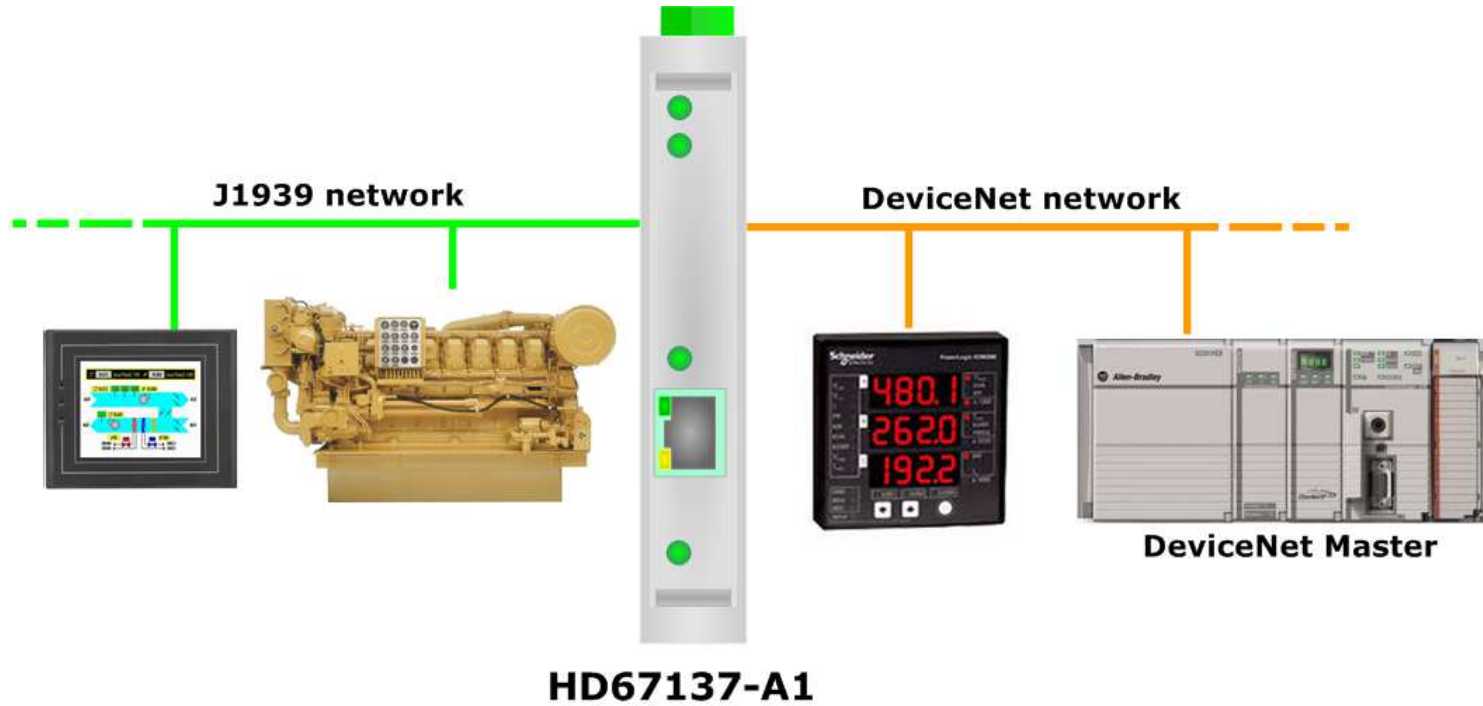


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY

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

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

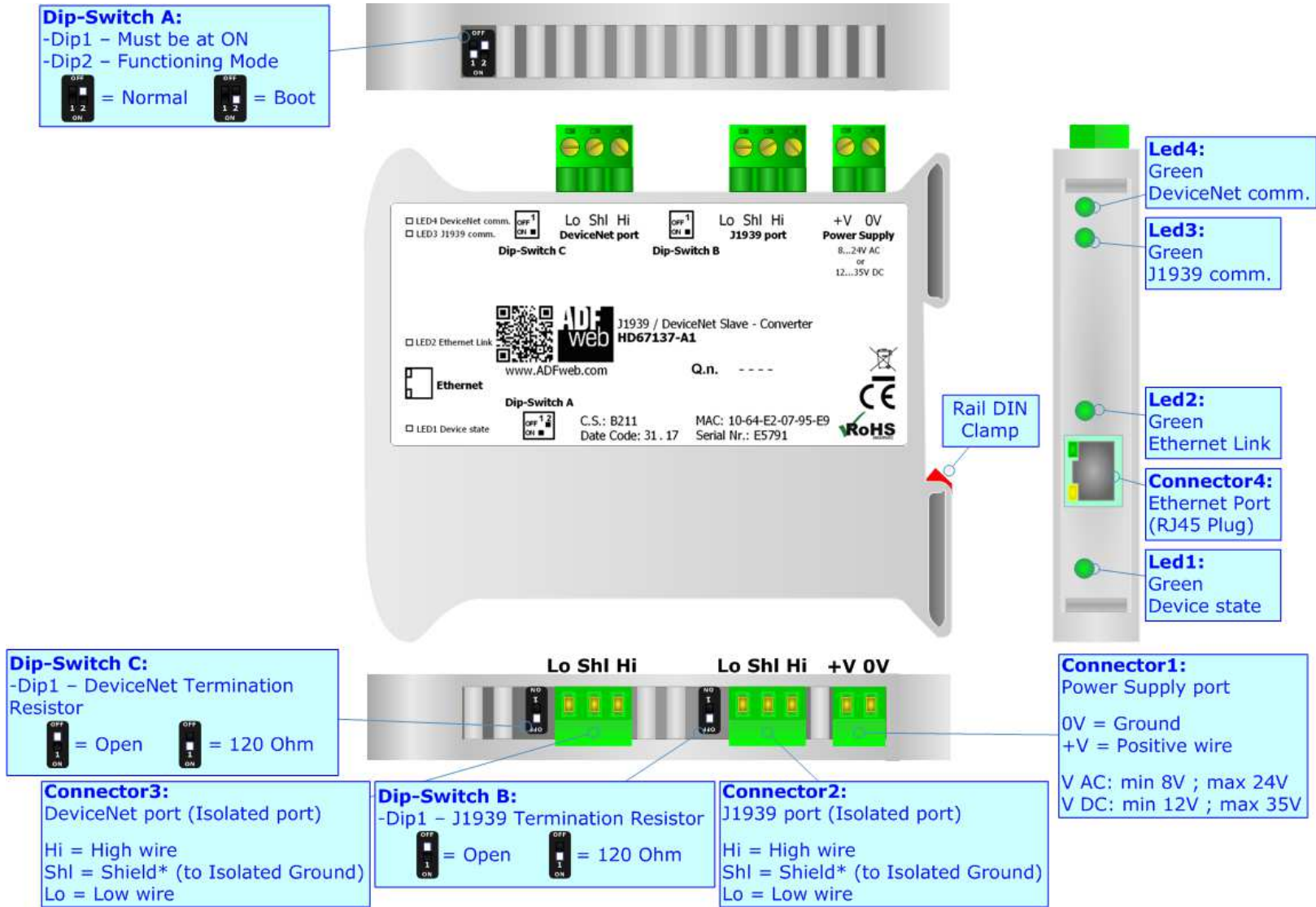


Figure 1: Connection scheme for HD67137-A1

CHARACTERISTICS:

The HD67137-A1 is a J1939 / DeviceNet Slave Converter.

They have the following characteristics:

- Triple isolation between J1939 - Power Supply, J1939 - DeviceNet, DeviceNet - Power Supply;
- Two-directional information between DeviceNet bus and J1939 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 SW67137 software on your PC in order to perform the following:

- Define the parameters of J1939 line;
- Define the parameters of DeviceNet line;
- Define the J1939 messages in reception and in which DeviceNet bytes they will be mapped;
- Define the J1939 messages in transmission and from which DeviceNet bytes they will be taken;
- 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.

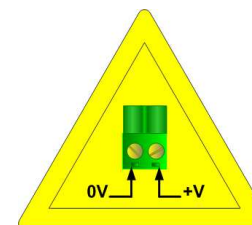
VAC 		VDC 	
Vmin	Vmax	Vmin	Vmax
8V	24V	12V	35V

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67137-A1	3.5

Caution: Do not reverse the polarity power

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



HD67137-A1

FUNCTION MODES:

The device has got two function modes depending on 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 specific functions, see 'LEDS' section.

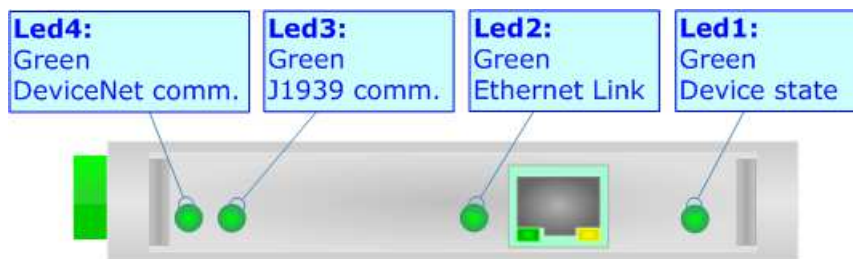
**Warning:**

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

LEDS:

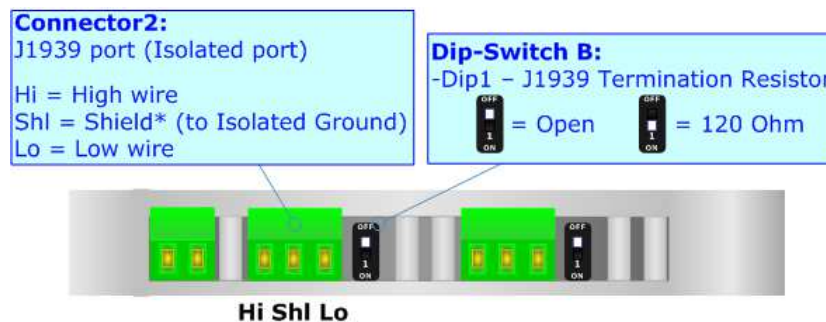
The device has got four LEDs that are used to give information about the functioning status. The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device state	Blinks slowly (~1Hz)	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
2: Ethernet Link	ON: Ethernet cable connected OFF: Ethernet cable disconnected	ON: Ethernet cable connected OFF: Ethernet cable disconnected
3: J1939 communication	Blinks when a J1939 frame is received	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
4: DeviceNet communication	Blinks when DeviceNet communication is running	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress



J1939:

To terminate the J1939 line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch B' is at ON position.



Cable characteristics:

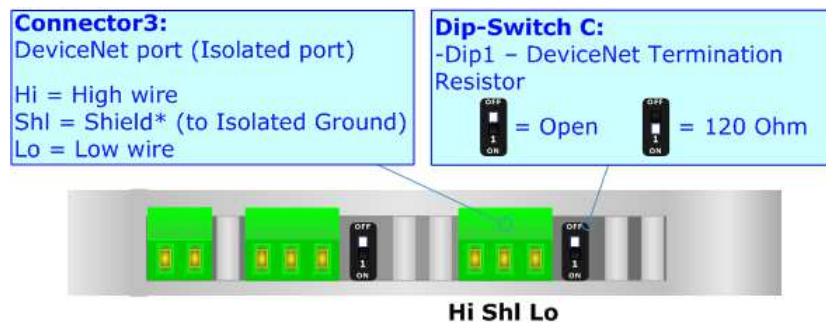
DC parameter:	Impedance	70 Ohm/m
AC parameters:	Impedance	120 Ohm/m
	Delay	5 ns/m
Length	Baud Rate [bps]	Length MAX [m]
	10 K	5000
	20 K	2500
	50 K	1000
	100 K	650
	125 K	500
	250 K	250
	500 K	100
	800 K	50
	1000 K	25

Here some codes of cable:

- ✦ Belden: p/n 3105A - 1x 22WG stranded twisted pairs conductor + foil shield + braid shield.

DEVICENET:

To terminate the DeviceNet line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch C' 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

Here some codes of cable:

- ✦ Belden: p/n 3105A - 1x 22WG stranded twisted pairs conductor + foil shield + braid shield.

ETHERNET:


The Ethernet connection must be made using Connector4 HD67137-A1 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 is recommended the use of a cross cable.



USE OF COMPOSITOR SW67137:

To configure the Converter, use the available software that runs with Windows called SW67137. It is downloadable from 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 SW67137, the window below appears (Fig. 2).

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

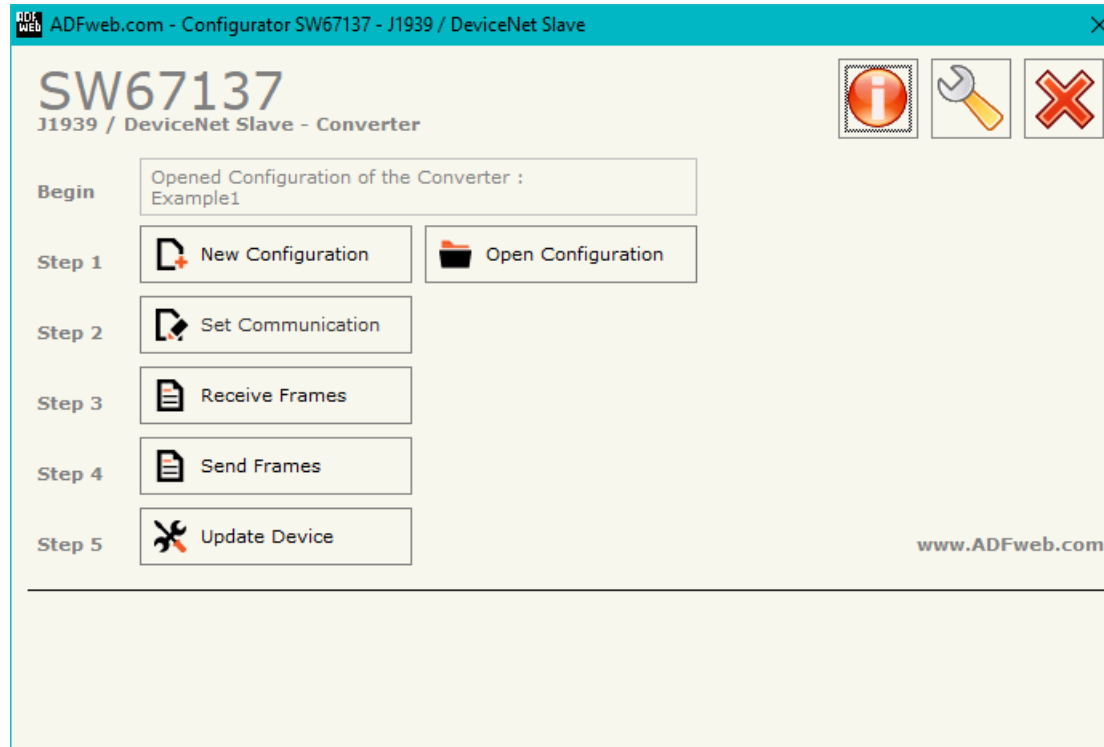
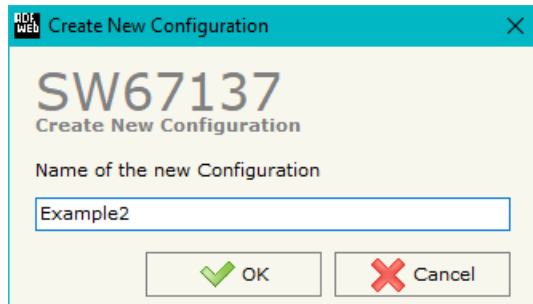


Figure 2: Main window for SW67137

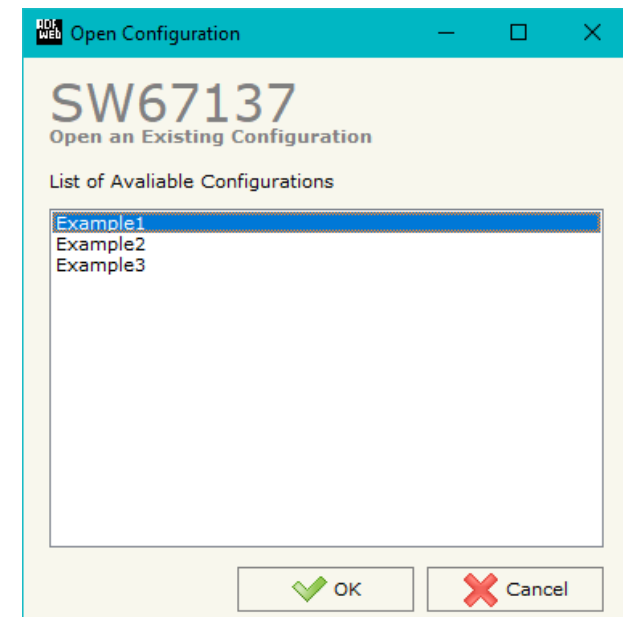
NEW CONFIGURATION / OPEN CONFIGURATION:

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




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

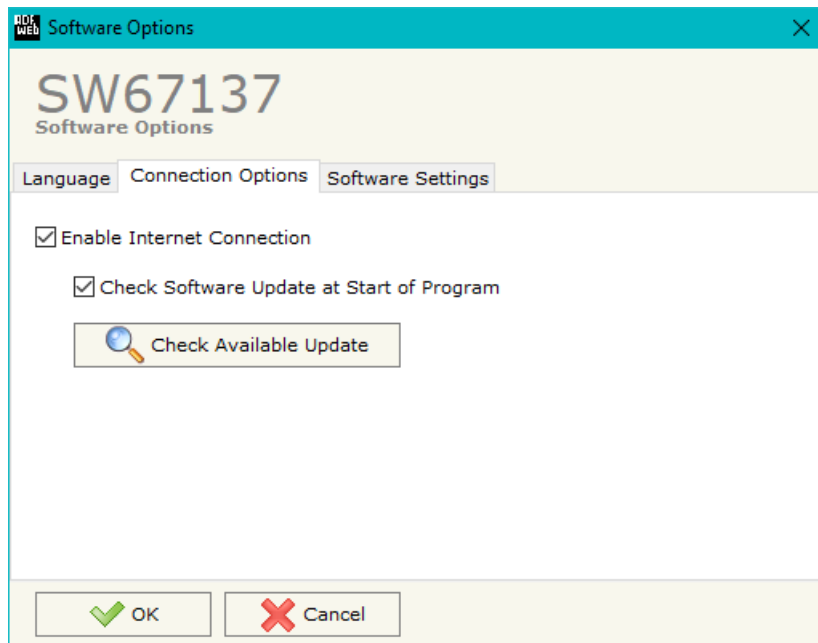
- To clone the configurations of a Programmable “J1939 / DeviceNet Slave - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate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



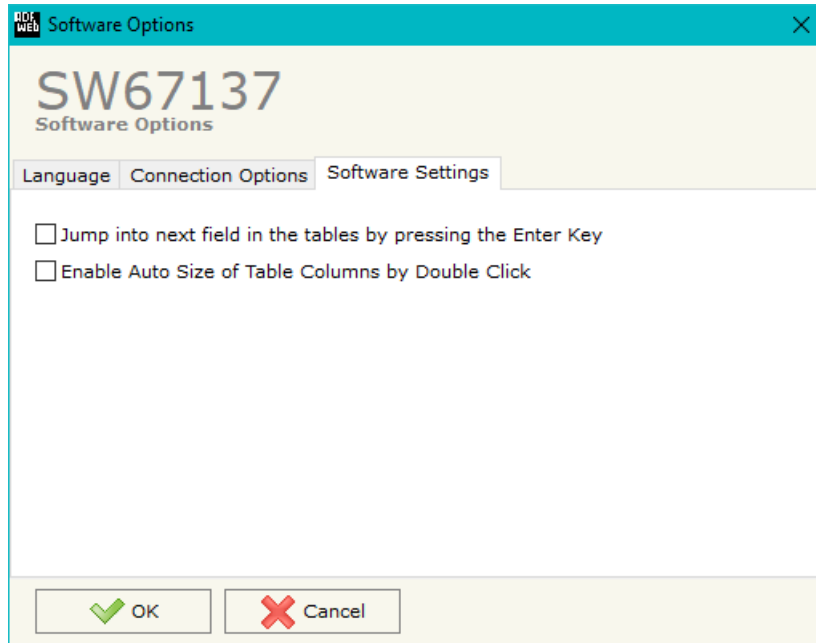
SOFTWARE OPTIONS:

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 SW67137 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 two buses, J1939 and DeviceNet.

By Pressing the "**Set Communication**" button from the main window for SW67137 (Fig. 2) the window "Set Communication" appears (Fig. 3).

In the section "Select Device" it is possible to select the type of converter used:

- Device without Ethernet port;
- Device with Ethernet port.

The means of the fields for "J1939" section are:

- In the field "**Baudrate**" the baudrate for the J1939 line is defined;
- In the field "**TimeOut Data (s)**" a time is defined. When this time is elapsed, the data on DeviceNet side are set to 0xFF;
- If the field "**Enable Peer to Peer**" is checked, the converter accepts any ID that have the PGN inserted in the section "Receive Frames";
- In the field "**Device ID J1939**" the ID for J1939 side of the converter is defined.

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

- In the field "**ID Device**" the DeviceNet ID for the converter is defined;
- In the field "**Baudrate**" the data rate of the DeviceNet is defined.

The means of the fields for "Ethernet" section are (only if "Device with Ethernet" is set):

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

The screenshot shows the "Set Communication" window for SW67137. The window is titled "Set Communication" and "SW67137 Set Communication Setting". It contains several sections: "Select Device" with a dropdown menu set to "Device With Ethernet Port"; "J1939" section with "Baudrate" set to "250K", "TimeOut Data (s)" set to "10", an unchecked "Enable Peer to Peer" checkbox, and "Device ID J1939" set to "0"; "DeviceNet Slave" section with "ID Device" set to "12" and "Baudrate" set to "500K"; and "Ethernet" section with "IP ADDRESS" set to "192.168.0.5", "SUBNET Mask" set to "255.255.255.0", and "GATEWAY" set to "192.168.0.1". At the bottom, there are "OK" and "Cancel" buttons.

Figure 3: "Set Communication" windows

RECEIVE FRAMES:

By pressing the **Receive Frames** button from the main window for SW67137 (Fig. 2) the window "Receive J1939 Frames" appears (Fig. 4). In this section, it is possible to define the J1939 frames that the converter will receive from J1939 network.

If "Device without Ethernet port" is set in the section "Set Communication", the window appears like below:

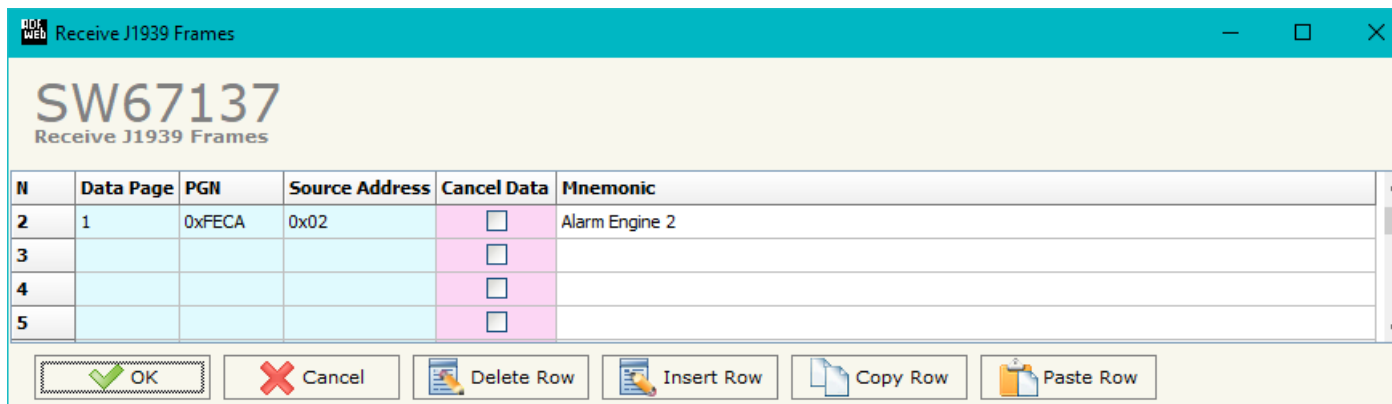
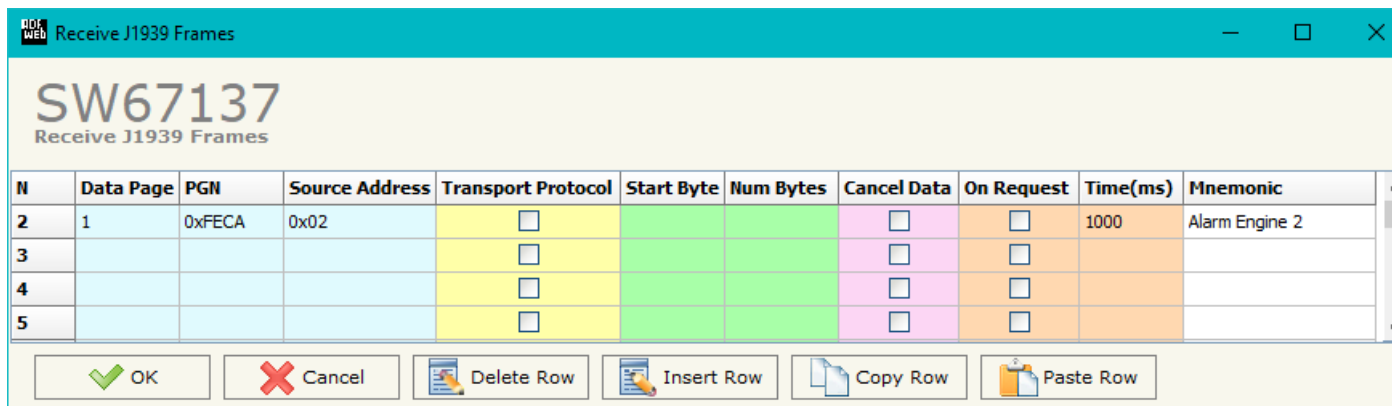


Figure 4a: "Receive J1939 Frames" window

- In the field **Data Page** the data page is defined, the value can be 0 or 1 (usually it is 0);
- In the field **PGN** the PGN of the data to read from J1939 net is defined (in the J1939 protocol the PGN is an identifier);
- In the field **Source Address** the source address of the device that sends the frame is defined;
- If the field **Cancel Data** is checked, when the PGN is not received for the "TimeOut Data (s)" defined, the values of DeviceNet side are set to 0xFF;
- In the field **Mnemonic** a description for the frame is defined.

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



N	Data Page	PGN	Source Address	Transport Protocol	Start Byte	Num Bytes	Cancel Data	On Request	Time(ms)	Mnemonic
2	1	0xFECA	0x02	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	1000	Alarm Engine 2
3				<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		
4				<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		
5				<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		

Figure 4b: "Receive J1939 Frames" window

- In the field "**Data Page**" the data page is defined, the value can be 0 or 1 (usually it is 0);
- In the field "**PGN**" the PGN of the data to read from J1939 net is defined (in the J1939 protocol the PGN is an identifier);
- In the field "**Source Address**" the source address of the device that sends the frame is defined;
- If the field "**Transport Protocol**" is checked, the frame uses Transport Protocol functions;
- In the field "**Start Byte**" the starting byte of the PGN to save is defined;
- In the field "**Num Bytes**" the number of bytes starting from the "Start Byte" is defined;
- If the field "**Cancel Data**" is checked, when the PGN is not received for the "TimeOut Data (s)" defined, the values of DeviceNet side are set to 0xFF;
- If the field "**On Request**" is checked, the converter sends the J1939 request for the PGN frame with the "**Time (ms)**" defined. This feature is used for PGNs that must be required;
- In the field "**Mnemonic**" a description for the frame is defined.

SEND FRAMES:

By pressing the **Send Frames** button from the main window of SW67137 the window "Transmit J1939 Frames" appears (Fig. 5): in this section, it is possible to define the J1939 frames that the converter will send to the J1939 network.

If "Device without Ethernet port" is set in the section "Set Communication", the window appears like below:

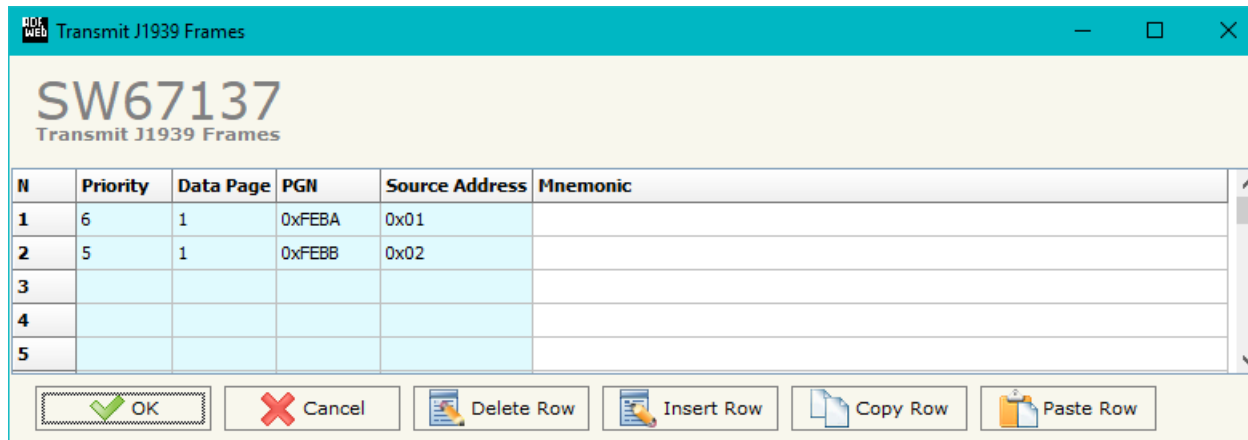


Figure 5a: "Transmit J1939 Frame" window

- In the field **Data Page** the data page of the J1939 message is defined. The value can be 0 or 1 (usually it is 0);
- In the field **PGN** the PGN of the J1939 message to be written from DeviceNet is defined (in J1939 protocol the PGN is an identifier);
- In the field **Source Address** the address of the device that sends the frame is defined;
- In the field **Mnemonic** a description for the frame is defined.

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

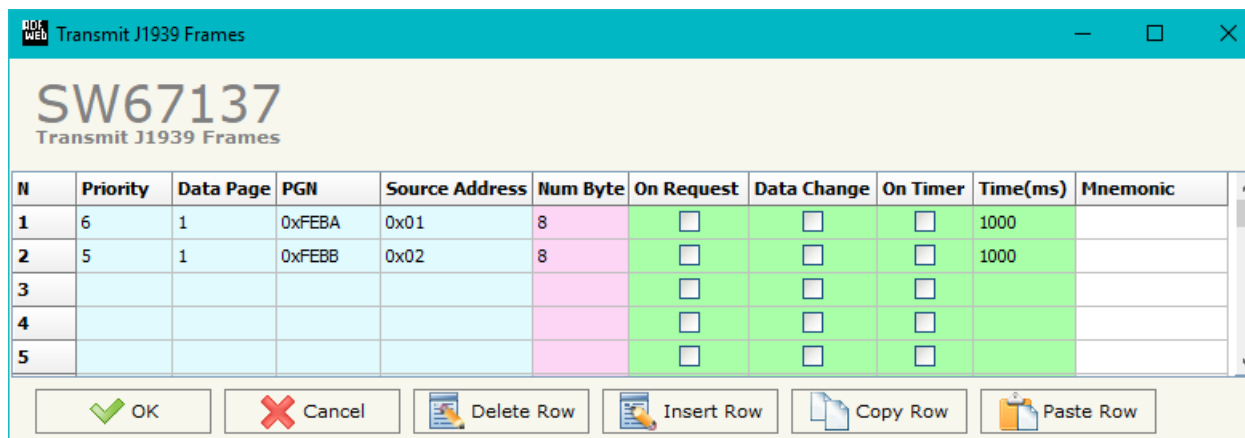


Figure 5b: "Transmit J1939 Frame" window

- In the field "**Priority**" the priority of the J1939 message is defined. In J1939 protocol, the priority is a number between 0 and 7. 0 is the highest priority and 7 is the lowest;
- In the field "**Data Page**" the data page of the J1939 message is defined. The value can be 0 or 1 (usually it is 0);
- In the field "**PGN**" the PGN of the J1939 message to be written from DeviceNet is defined (in J1939 protocol the PGN is an identifier);
- In the field "**Source Address**" the address of the device that sends the frame is defined;
- In the field "**Num Byte**" the length of the J1939 message is defined;
- If the field "**Request**" is checked, the J1939 frame is sent when a request frame arrives from J1939 network;
- If the field "**Data Change**" is checked, the J1939 frame is sent when a byte from DeviceNet side changes value;
- If the field "**On Timer**" is checked, the J1939 frame is sent cyclically;
- In the field "**Send Timer**" the delay (in milliseconds) with which sending the J1939 message is defined;
- In the field "**Mnemonic**" a description for the frame is defined.

UPDATE VIA SERIAL (only if "Device without Ethernet port" is set):

By pressing the **"Update Device"** button it is possible to load the created Configuration into the device, and also the Firmware if is necessary, using the RS232 port.

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

- Turn OFF the Device;
- Connect the RS232 Null Modem cable form your PC to the Converter;
- Put Jumper1 in Boot position;
- Select the **"COM port"** and press the **"Connect"** button;
- Turn ON the device;
- Check the "Device state" Led. It must blink quickly;
- 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;
- Remove Jumper1 from Boot position;
- Disconnect the RS232 cable;
- Turn ON the device.

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

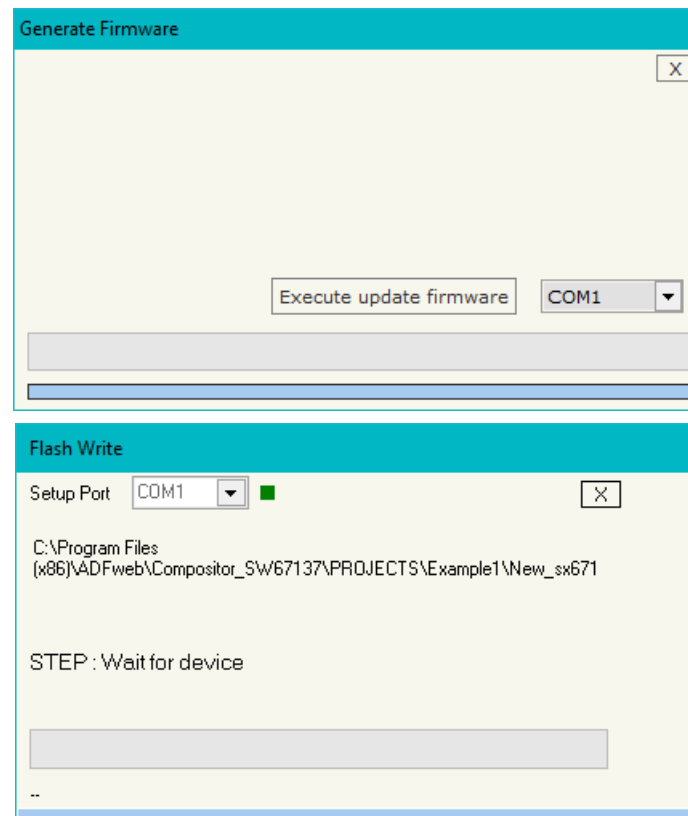


Figure 6a: "Update Device" windows

UPDATE VIA ETHERNET (only if "Device with Ethernet port" is set):

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 Dip2 of 'Dip-Switch A' in ON position;
- Turn ON the device;
- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- 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 Dip2 of 'Dip-Switch A' at 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;
- 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.

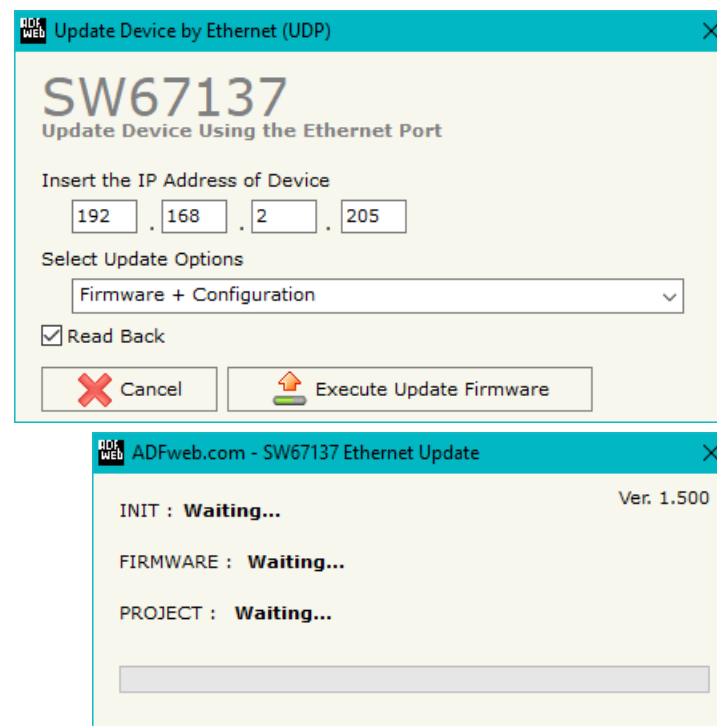


Figure 6b: "Update device" windows



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 HD67137 device.



Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67137 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;
- Check the LAN settings;
- Check the Wi-Fi settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8 or 10 make sure that you have the administrator privileges;
- In case you have to program more than one device, using the "UDP Update", you have to cancel the ARP table every time you connect a new device on Ethernet. For do this you have to launch the "Command Prompt" and write the command "arp -d". Pay attention that with Windows Vista, Seven, 8, 10 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

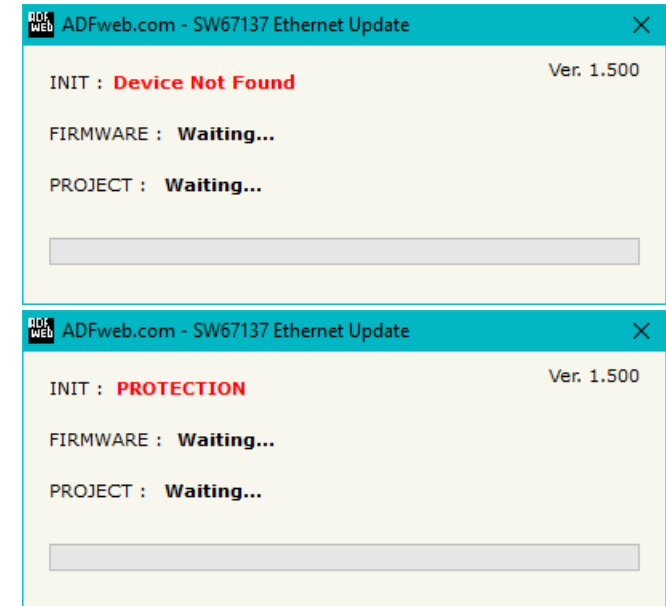
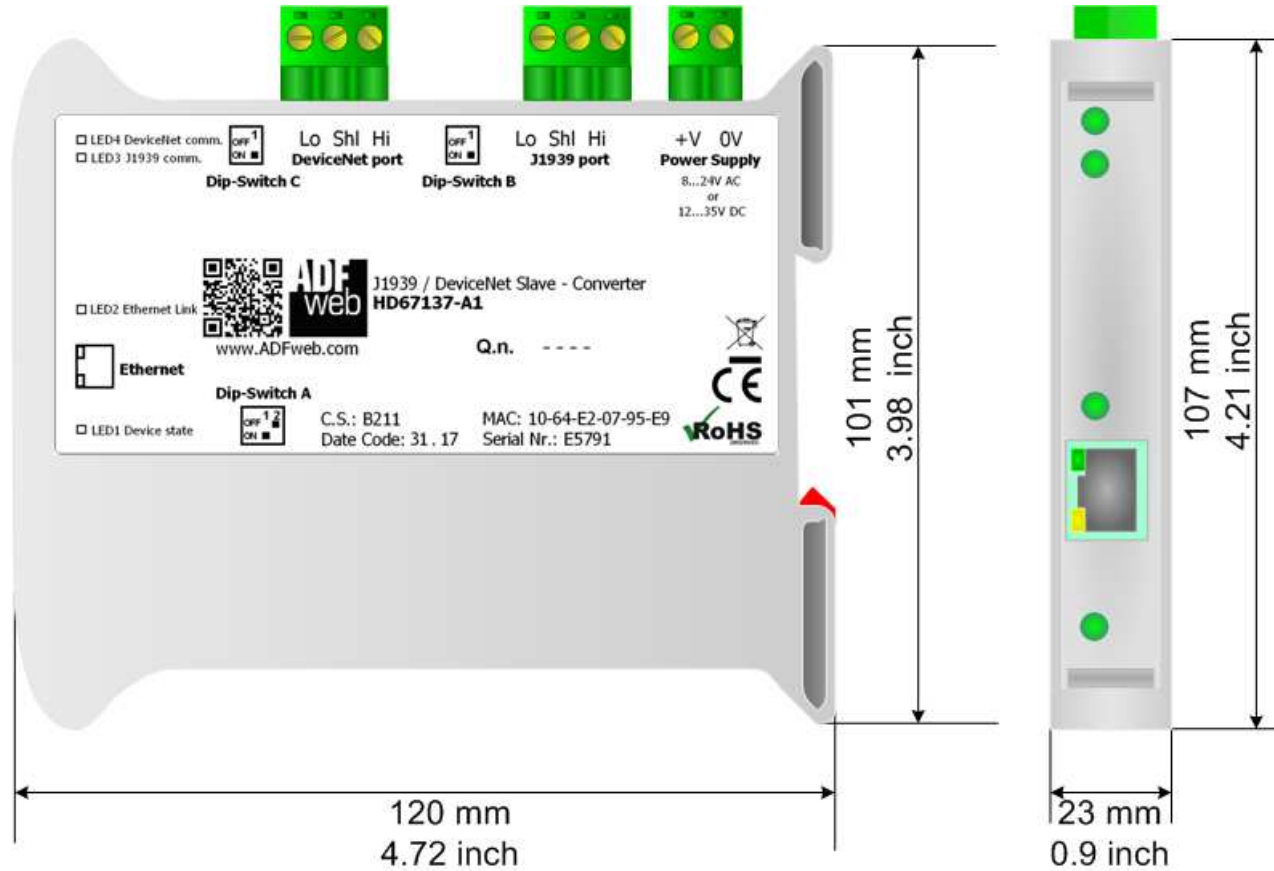


Figure 7: Error windows



In the case of HD67137 you have to use the software "SW67137": www.adfweb.com/download/filefold/SW67137.zip.

MECHANICAL DIMENSIONS:



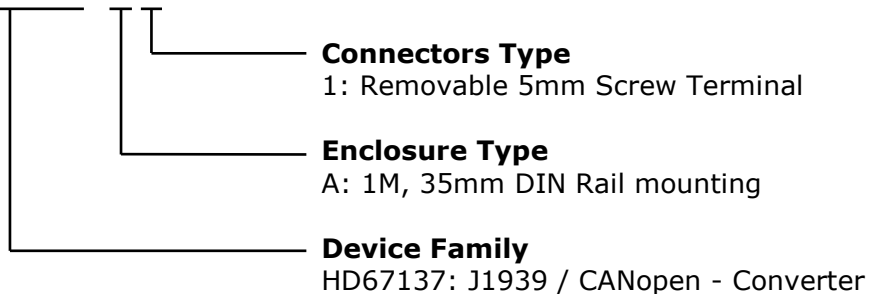
Housing: PVC
Weight: 200g (Approx)

Figure 8: Mechanical dimensions scheme for HD67137-A1

ORDERING INFORMATIONS:

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

HD67137 - x x



Order Code: **HD67137-A1** - J1939 / CANopen - Converter

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

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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. 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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