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Industrial Electronic Devices

User Manual
Revision 1.101
English

CAN / Ethernet - Converter
(Order Code: HD67644-A1, HD67644-B2, HD67644-WiFi-A1)

For Website information:
www.adfweb.com?Product=HD67644

For Price information:
www.adfweb.com?Price=HD67644-A1
www.adfweb.com?Price=HD67644-B2
www.adfweb.com?Price=HD67644-WiFi-A1

Benefits and Main Features:

⊕ Very easy to configure

⊕ 35mm Rail Din mount

⊕ Wide supply input range

⊕ Temperature range:
    -40°C / 85°C (-40°F / 185°F)

User Manual

For other Gateways / Bridges:
CAN from/to Modbus
See also the following links:

www.adfweb.com?product=HD67012   (Modbus RTU Slave)
www.adfweb.com?product=HD67514   (Modbus TCP Master)
www.adfweb.com?product=HD67515   (Modbus TCP Slave)

CANopen from/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=HD67504   (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
1.000	04/11/2013	Ff	All	First release version
1.100	24/11/2014	Ff	All	New software version
1.101	15/12/2014	Ff	All	Added B2 version

WARNING:

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ADFweb.com is not responsible for any error this manual may contain.

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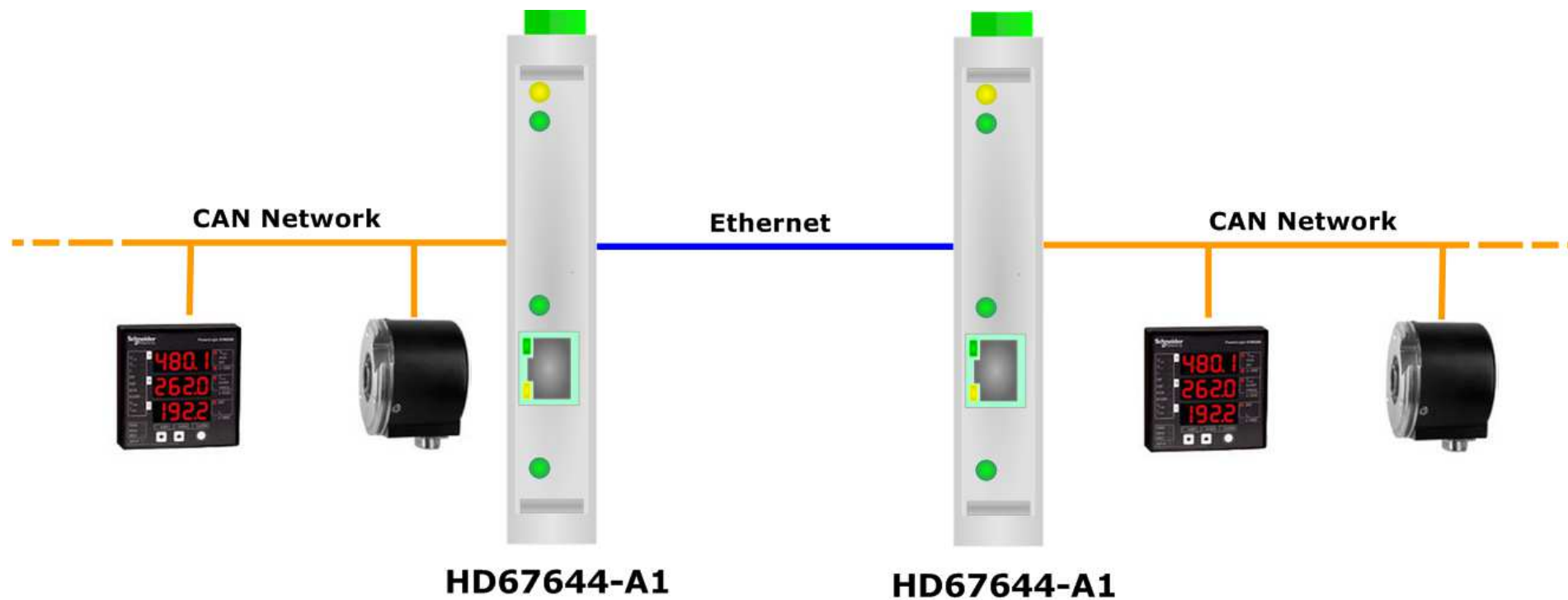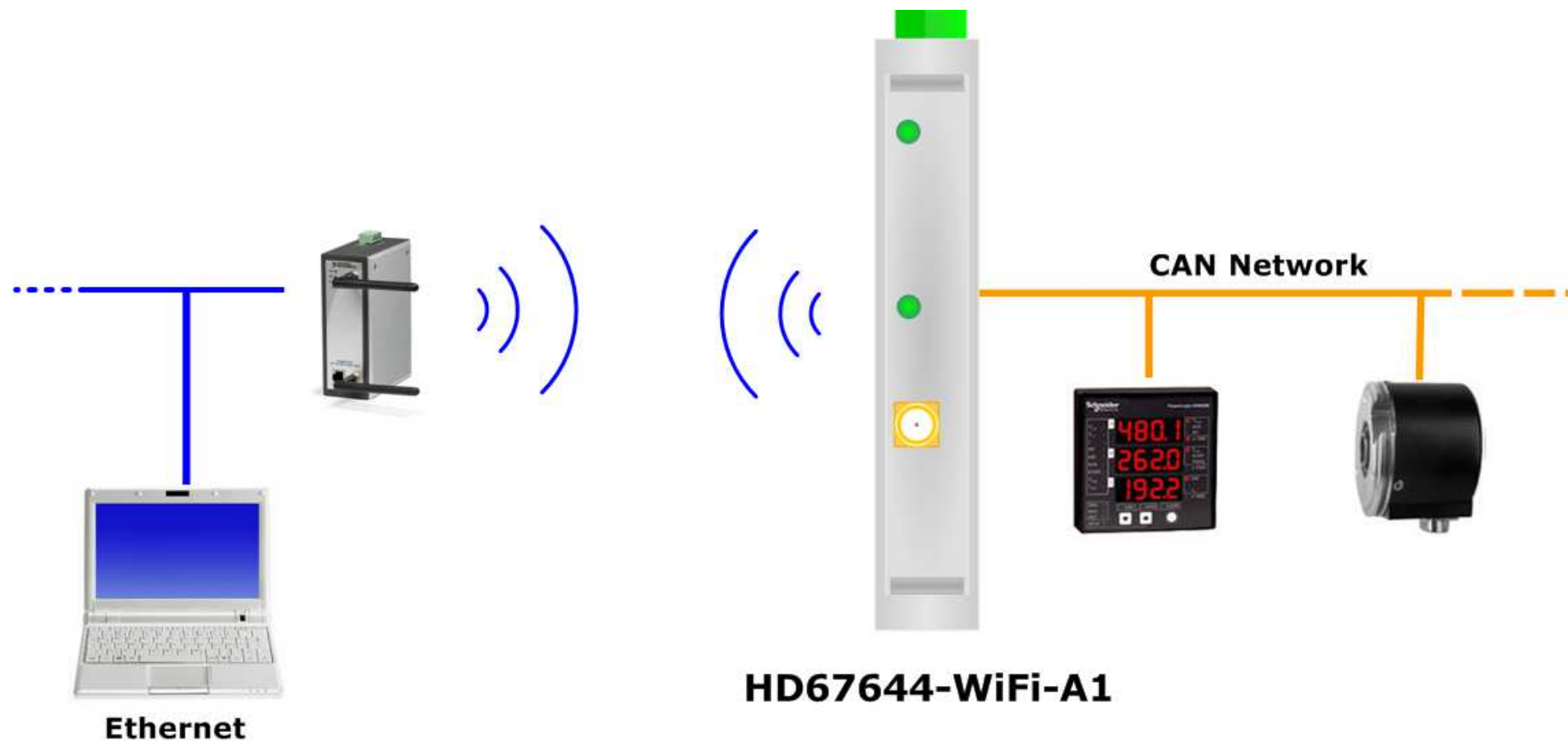
⚠ This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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.

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EXAMPLE OF CONNECTION:

CAN Network   Ethernet   CAN Network

HD67644-A1   HD67644-A1

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CAN Network

HD67644-WiFi-A1

Ethernet

Industrial Electronic Devices
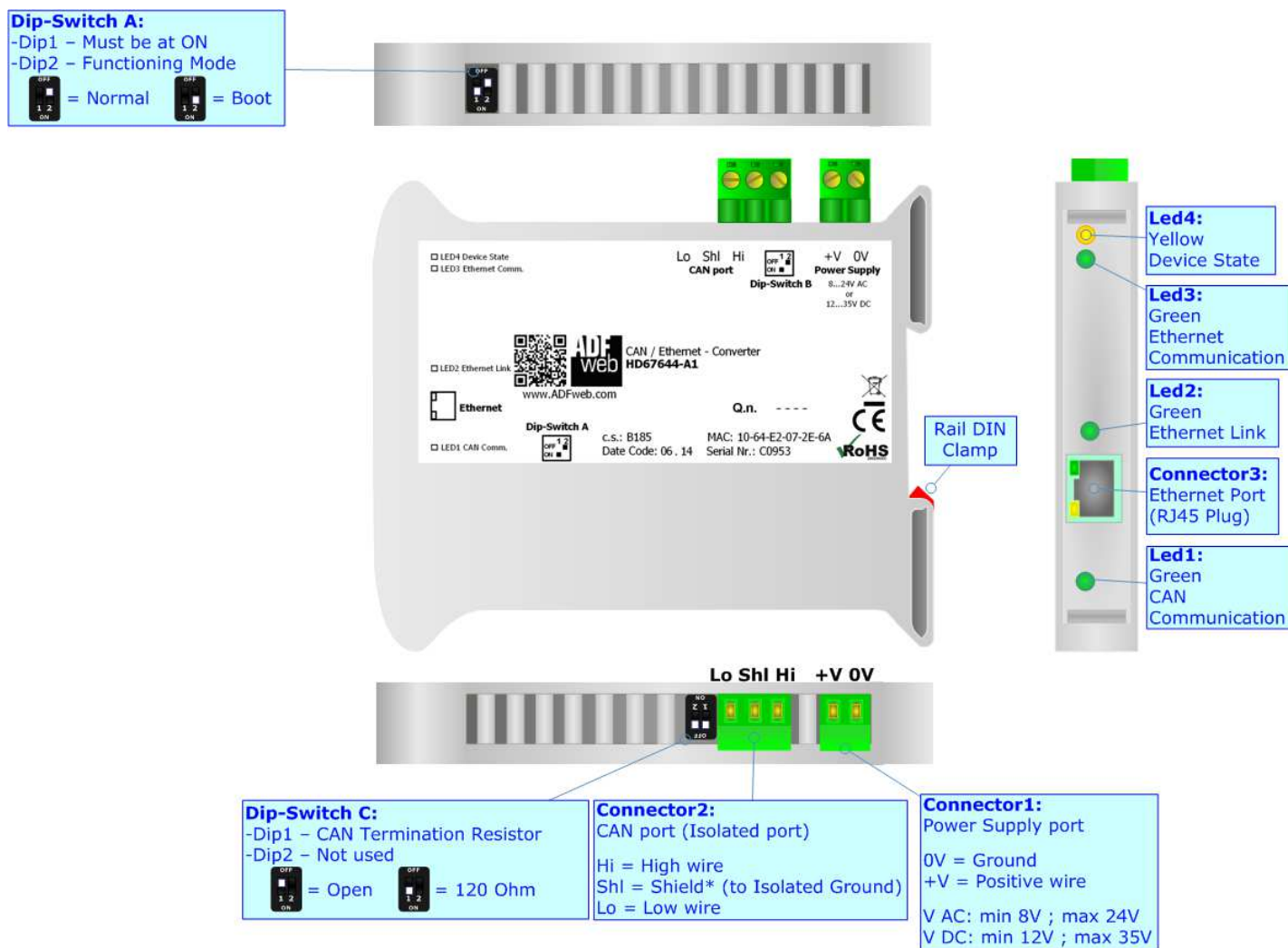
CONNECTION SCHEME:

Figure 1a: Connection scheme for HD67644-A1

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Dip-Switch A:
-Dip1 – Must be at ON
-Dip2 – Functioning Mode

= Normal   = Boot

Dip-Switch C:
-Dip1 – CAN Termination Resistor
-Dip2 – Not used

= Open   = 120 Ohm

Connector2:
CAN port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

Lo Shl Hi

Led3:
Green
Device state

Led1:
Yellow
CAN
Communication

Led4:
Yellow
Ethernet
Communication

Led5:
Yellow
Not used

Power Supply   MAC: 10-64-E2-07-37-90
0V +V   Serial Nr.: C3296
8...24V AC
or   Q.n. - - - -
12...35V DC
                                   ETHERNET
                Device state
                CAN comm.
                ETHERNET comm.
                Not used
www.ADFweb.com
HD67644-B2
CAN / Ethernet - Converter
Dip-Switch A   Dip-Switch C Lo Gnd Hi
                                    CAN port

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

0V +V

Connector5:
Ethernet Port
(RJ45 Plug)

Led2:
Green
Ethernet Link

Figure 1b: Connection scheme for HD67644-B2

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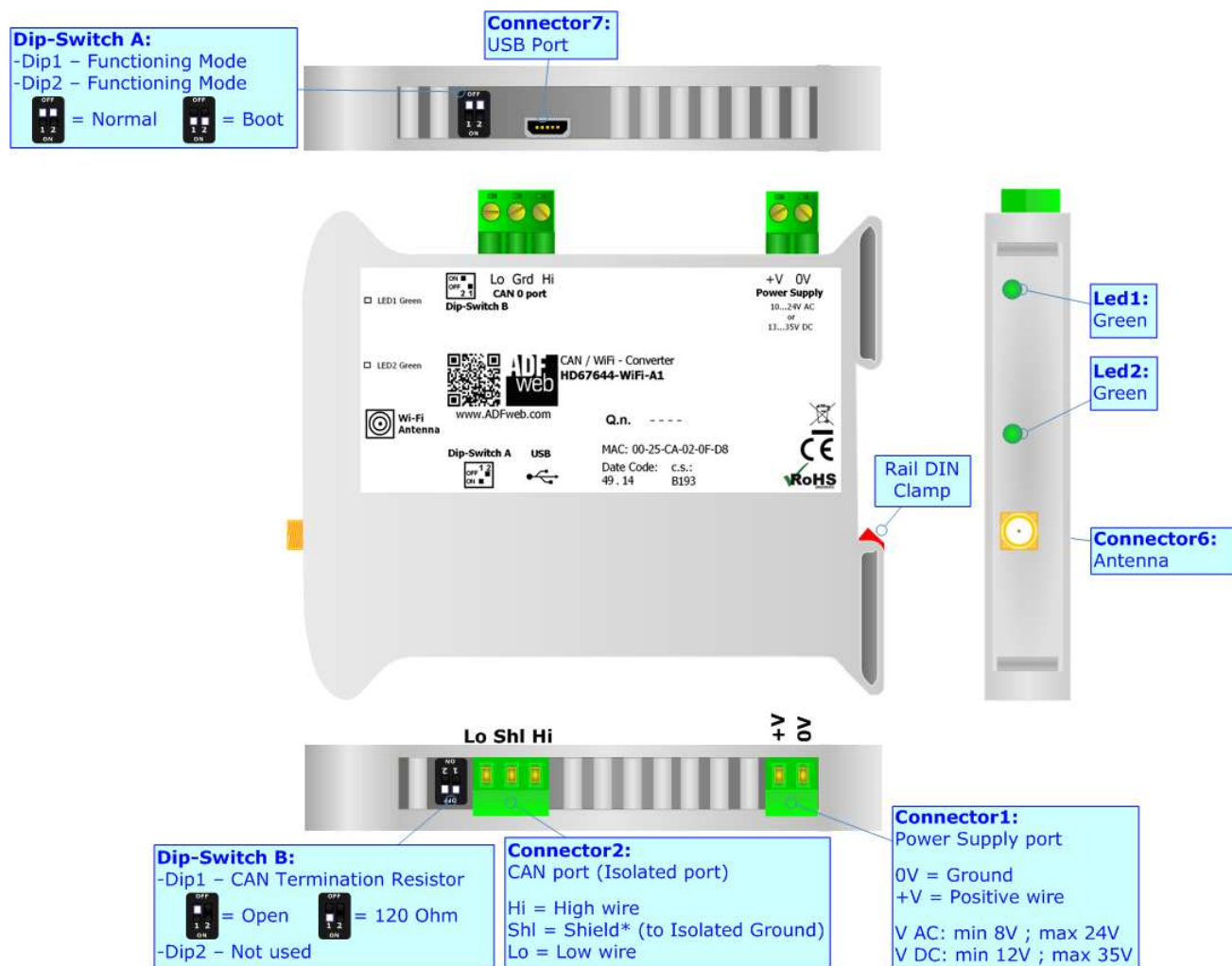
Figure 1c: Connection scheme for HD67644-WiFi-A1

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CHARACTERISTICS:

The "**HD67644-A1/B2**" and the "**HD67644-WiFi-A1**" is a device used to interface CAN devices with Ethernet devices.
This converter can be completely transparent at the CAN frame (so it allows to extend the CAN networks through Ethernet) or can allow the interface between CAN devices and Ethernet devices and vice versa, through a very simple Ethernet protocol. The function can be selected through software compositor.

The configurable converter allows the following characteristics:

- TCP/UDP Ethernet protocols changeable with software;
- Two-directional information between Ethernet and CAN bus;
- Electrical isolation between two buses;
- Power supply of 8…19 VAC or 8…35 VDC;
- 35mm Rail DIN mounting;
- Microprocessor for data control;
- Temperature range -40°C to 85°C.

CONFIGURATION:

You need Compositor SW67644 software on your PC in order to perform the following:

- Define the parameter of the CAN bus;
- Define the parameter of the Ethernet;
- Select the working mode (Server Mode or Transparent Mode);
- Define a list of Receive COB (if you use the Server Mode);
- Update the Firmware and/or the Project.

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POWER SUPPLY:

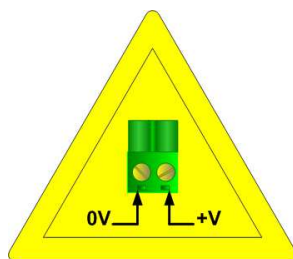The devices can be powered between a wide range of tensions. For more details see the two tables below.

VAC	$\sim$	VDC	$=$
Vmin	**Vmax**	**Vmin**	**Vmax**
8V	**24V**	**12V**	**35V**

Consumption at 24V DC:

Device	**W/VA**
HD67644-A1/B2	4
HD67644-WiFi-A1	4

⚠ **Warning: Not reverse the polarity power**

0V ⌐ ⌐ +V

HD67644-A1
HD67644-B2
HD67644-WiFi-A1

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

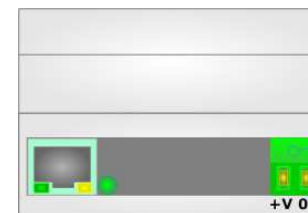V AC: min 8V ; max 24V
V DC: min 12V ; max 35V

0V +V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

+V 0V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

0V +V

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FUNCTION MODES:

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

➔ HD67644-A1:

  o The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
  o The second, with 'Dip2 of Dip-Switch A' at "ON" position, is used for upload the Project and/or Firmware.

➔ HD67644-WiFi-A1:

  o The first, with 'Dip1 and Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
  o The second, with 'Dip 1 and Dip2 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.

Warning:
For the HD67644-A1, Dip1 of 'Dip-Switch A' must be at ON position for working even if the Ethernet cable isn't inserted.

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LEDS (HD67644-A1):

The devices 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: CAN Comm. (green)	Blinks quickly for a short time when CAN frame is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: Ethernet Link (green)	**On:** Ethernet cable connected **Off:** Ethernet cable disconnected	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: Ethernet Comm. (green)	Blinks quickly for a short time when an Ethernet frame is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: Device State (yellow)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

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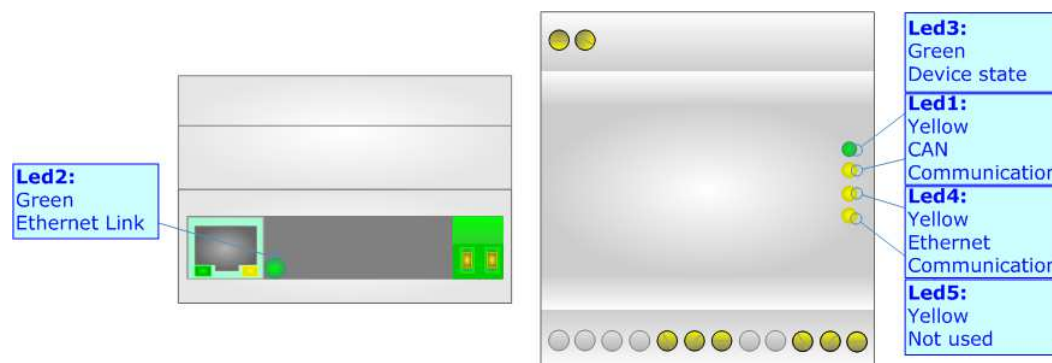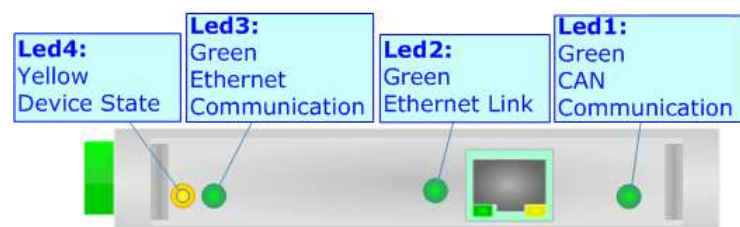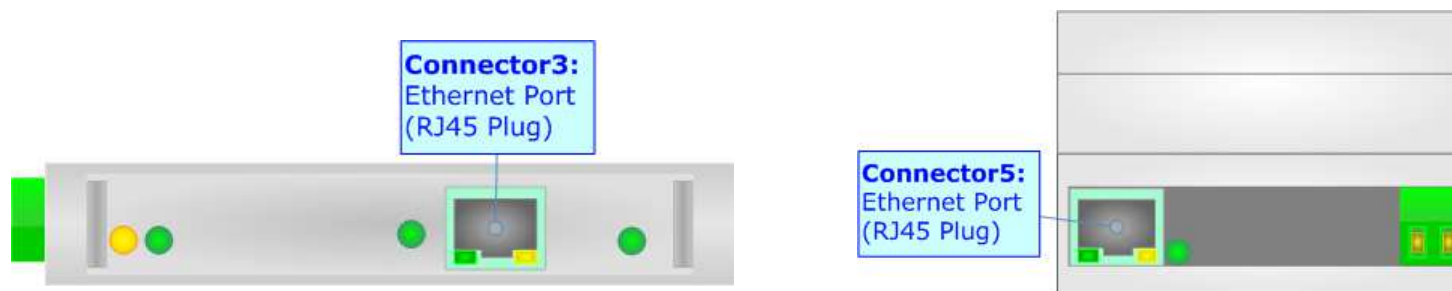
LEDS (HD67644-WiFi-A1):

The devices has got two 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: CAN Comm. (green)	Blinks quickly for a short time when CAN frame is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: Wi-Fi state (green)	**Blinks very slowly (~0.5Hz):** Wi-Fi scanning **Blinks slowly (~1Hz):** Wi-Fi connection **Blinks quickly:** TCP connection opened or UDP message received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

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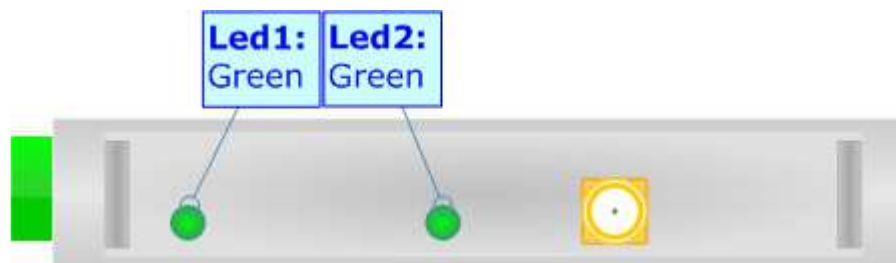
ETHERNET (for HD67644-A1/B2):

The Ethernet connection must be made using Connector5 of HD67644-A1/B2 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 a Hub/Switch the use of a straight cable is recommended. To connect the device to a PC/PLC/other the use of a cross cable is recommended.

Wi-Fi (for HD67644-WiFi-A1):

The Wi-Fi connection is done over the Connector6 (Antenna). The Antenna connector is a SMA Female ('Female Outer Shell' and 'Female Receptacle') so the Antenna must have a SMA Male connector.
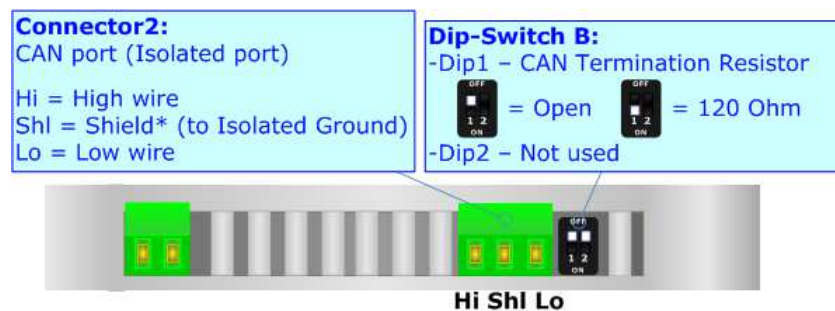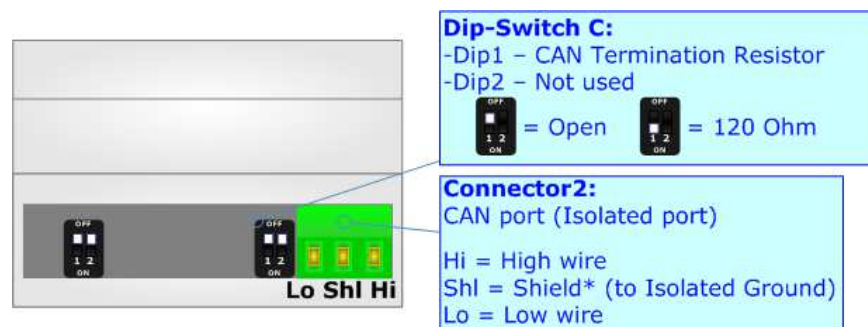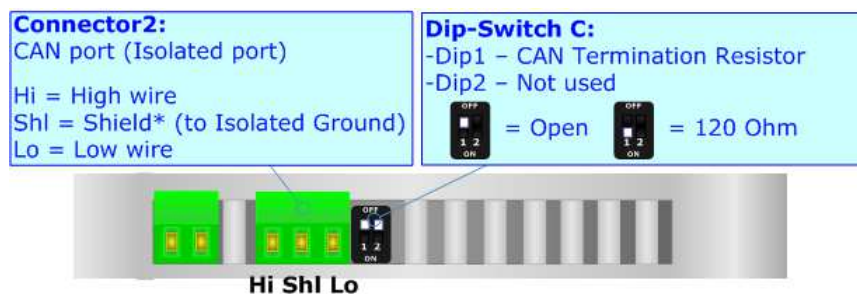The type of Wi-Fi used is the 802.11b/g.
The converter supports different type of security protocol: WEP, WPA, WPA2 and none.

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CAN:

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

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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

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USE OF COMPOSITOR SW67644:

To configure the Converter, use the available software that runs with Windows called SW67644. 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; 32/64bit).

When launching the SW67644, the window below appears (Fig. 2).

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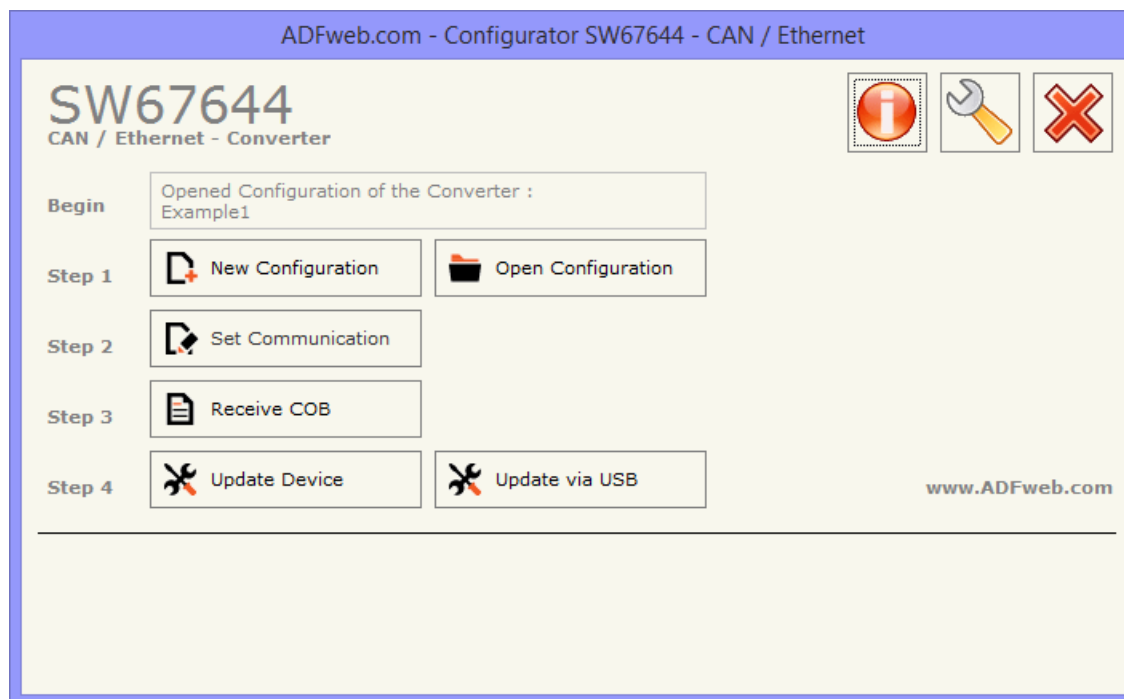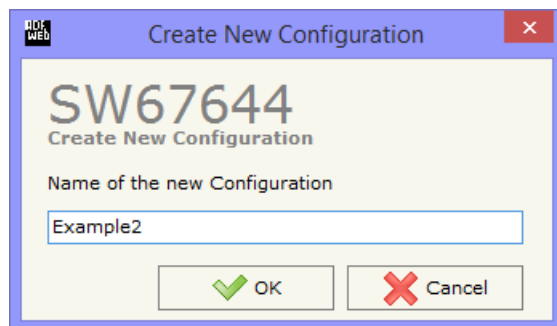   It is necessary to have installed .Net Framework 4.

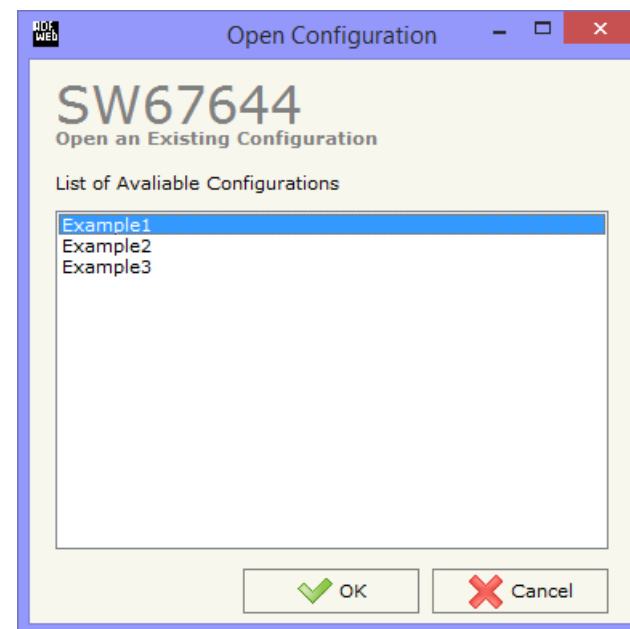

Figure 2: Main window for SW67644

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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 "Ethernet / 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**".

User Manual   **CAN /Ethernet - Converter**

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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.
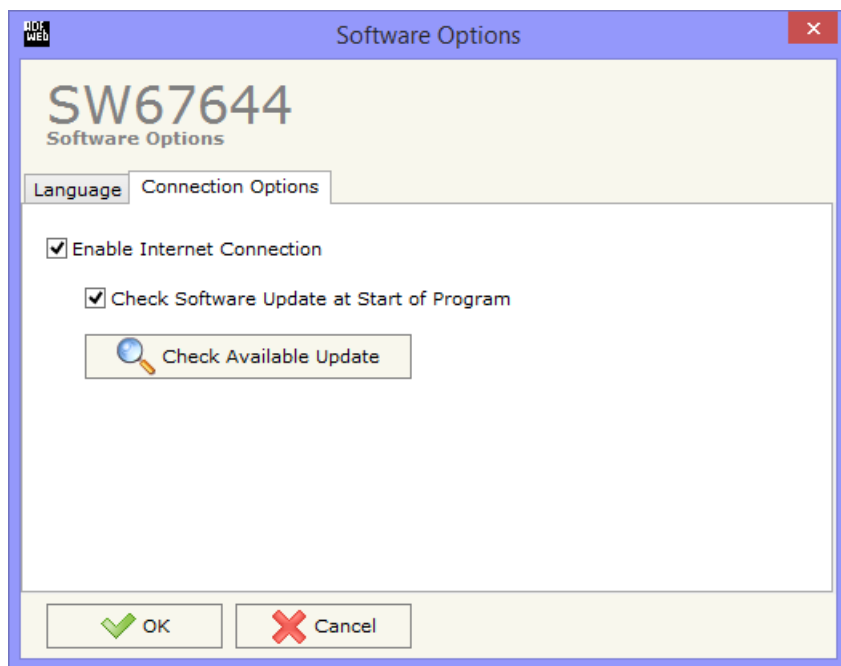
In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67644 check automatically if there are updatings when it is launched.

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SET COMMUNICATION:

This section defines the fundamental communication parameters of two Buses, CAN and Ethernet**.**

By pressing the "Set Communication" button from the main window for SW67644 (Fig. 2) the window "Set Communication" appears (Fig. 5-1).

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

- → HD67644-A1/B2 (Ethernet);
- → HD67644-WiFi-A1 (Wi-Fi).

In the section "**Working Mode**" is possible to select Working Mode used:

- ➢ If the "**Transparent Mode**" option is set, the converter will send on Ethernet all the packets received from CAN and vice versa.
- ➢ If the "**Server Mode**" option is set, it is possible to read the data of only some COB-IDs from CAN (defined in the section "Receive COB", see page 22) and write some CAN frames.

Note:
For the Ethernet communication, see "*Ethernet Protocol*" chapter on page 26.

In the section "**CAN**", you can define the parameters for the CAN bus:

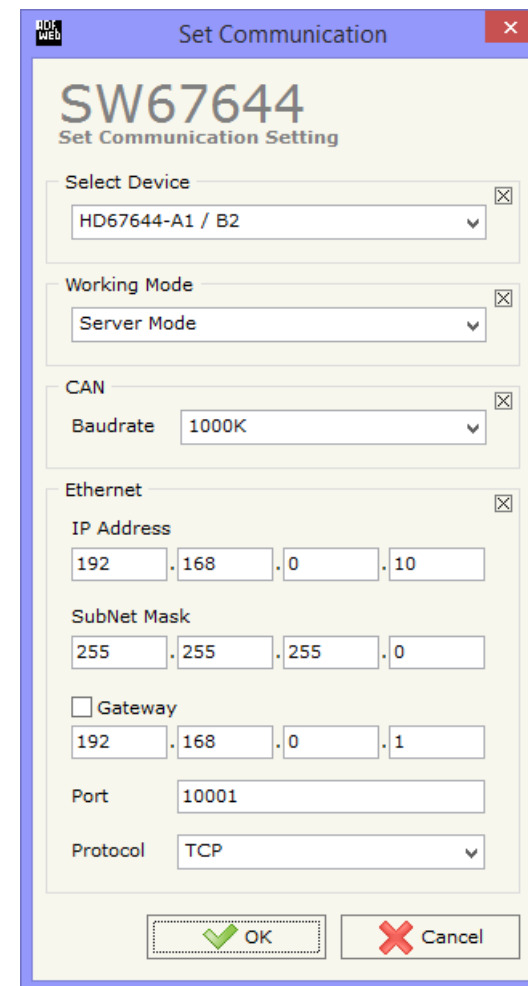- ➢ In the field "**Baudrate**", the data rate of the CAN bus is defined.

Figure   3a: "Set Communication" window

The section "**Ethernet**" changes in relation of the Working Mode selected and of the type of converter used.

When the "Transparent Mode" is selected, the "Ethernet" section is like in the Fig. 3b-3c:

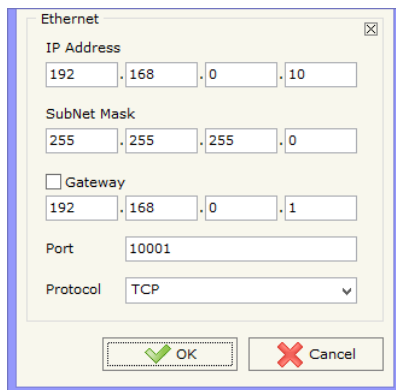*Figure 3b: "Ethernet" section with "Transparent Mode" (Ethernet)*

> ➢ In the field "**IP ADDRESS**" insert the IP address of the Gateway;
> ➢ In the field "**SUBNET Mask**" insert the Subnet Mask;
> ➢ In the field "**GATEWAY**" insert the default Gateway. To enable the Gateway is needed to click on the checkbox;
> ➢ In the field "**IP ADDRESS DESTINATION**" insert the IP address of the device that receives the CAN frames packed in an Ethernet frame;
> ➢ In the field "**Port**" insert the number of port;
> ➢ If the field "**Protocol**", the protocol used on Ethernet side is defined (TCP or UDP)
> ➢ If the field "**Enable Multiframe in Ethernet**" is checked the Gateway can send or receive in a single Ethernet frame more CAN frames. A single Ethernet frame can contain up to twenty CAN frames or the CAN frames that arrive within 5 ms after the first. Otherwise a single CAN frame is put in an Ethernet frame and sent.
> ➢ If the field "**Type**", it is defined if the gateway works like client TCP and/or server TCP (only if TCP option is checked);
> ➢ If the "**UDP Broadcast**" field is checked the gateway send the UDP packet in broadcast on the network (only if UDP option is selected);

Only if selected "HD67644-WiFi-A1" some additional fields are present:

Figure 3c: "Ethernet" section with "Transparent Mode" (Wi-Fi)

> ➢ In the field "**SSID**" insert the name of the Wi-Fi network;
> ➢ In the field "**Password**" insert the password used to connect to the Wi-Fi network;
> ➢ In the field "**Type**", the type of security protocol used by the Wi-Fi network.

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When the "Server Mode" is selected, the "Ethernet" section is like in the Fig. 3d-3e:

➤ In the field "**IP ADDRESS**" insert the IP address;
➤ In the field "**SUBNET Mask**" insert the SubNet Mask;
➤ In the field "**Port**" insert the number of the port;
➤ If the field "**Protocol**" it is defined the Ethernet protocol used on Ethernet side (TCP or UDP).

Figure 3d: "Ethernet" section with "Server Mode" (Ethernet)

Only if selected "HD67644-WiFi-A1" some additional fields are present:

➤ In the field "**SSID**" insert the name of the Wi-Fi network;
➤ In the field "**Password**" insert the password used to connect to the Wi-Fi network;
➤ In the field "**Type**", the type of security protocol used by the Wi-Fi network.

Figure 3e: "Ethernet" section with "Transparent Mode" (Wi-Fi)

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RECEIVE COB:

If the "Server Mode" is selected, by pressing the "**Receive COB**" button from the main window for SW67644 (Fig. 2) the window "Receive CAN Frame" appears (Fig. 4).
If the "Transparent Mode" is selected, this button is disabled.

The means of the fields are:

➢ In the field "**Cob-ID**", the Cob_ID of the CAN Bus frame is defined;

➢ In the field "**Cob-ID Type**", the CAN Protocol of the frame (CAN2.0A or CAN 2.0B) is defined;

➢ In the field "**Mnemonic**", a brief description is defined.

N°	Cob-ID	Cob-ID Type	Mnemonic
1	0x201	2.0A (11 bits)	1st CAN frame with protocol 2.0A
2	0x400001	2.0B (29 bits)	2nd CAN frame with protocol 2.0B
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

OK   Cancel   Delete Row

Figure 4: "Receive CAN Frame" window

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UPDATE DEVICE VIA UDP:

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

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

- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- Turn on the device;
- 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" configuration/firmware on the device is correctly updated.

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" configuration/firmware on the device is correctly updated.

Note:
The UDP updating for the HD67644-WiFi-A1 is possible only if you have already programmed the correct parameters for the Wi-Fi network over USB.
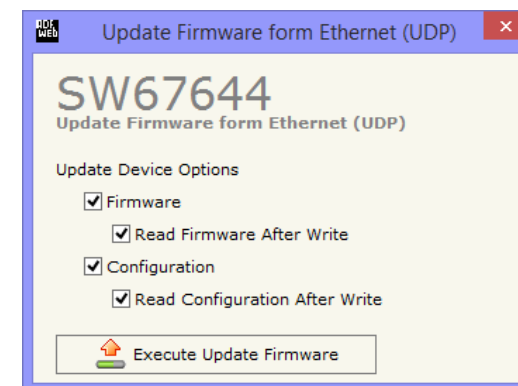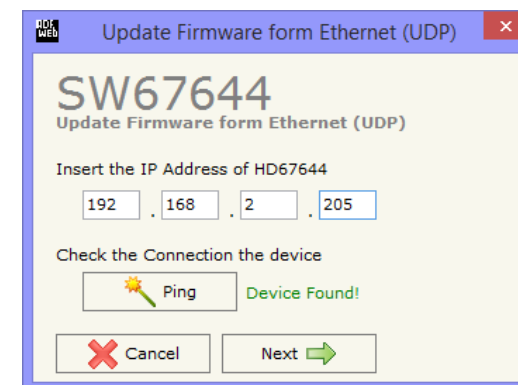

Figure 5: "Update device" windows

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UPDATE DEVICE VIA USB (only for HD67644-WiFi-A1):

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

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

- Turn off the Device;
- Connect the USB cable fromm your PC to the Converter;
- Put Dip1 and Dip2 of 'Dip-Switch A' in ON position;
- Select the "**COM port**" and press the "**Connect**" button;
- Turn on the device;
- Check the "Device state" Led. It must blink quickly (see "LEDS" section);
- 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 and Dip2 of 'Dip-Switch A' in OFF position;
- Disconnect the USB cable;
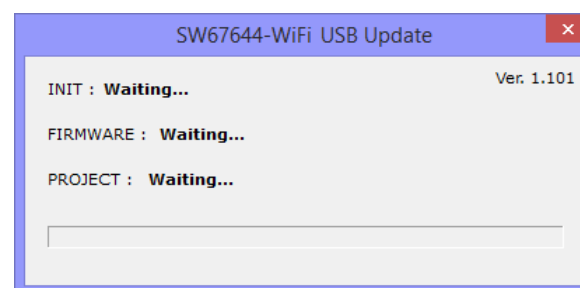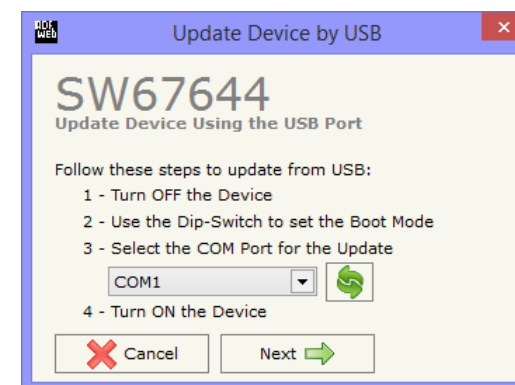- Turn on the device.

Figure 6: "Update device" windows

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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 HD67644 device.

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67644 device.

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

→ Check if the serial COM port selected is the correct one;
→ Check if the serial cable is connected between the PC and the device;
→ Try to repeat the operations for the updating;
→ 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 and 8 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 you have to launch the "Command Prompt" with Administrator Rights;
→ Pay attention at Firewall lock.
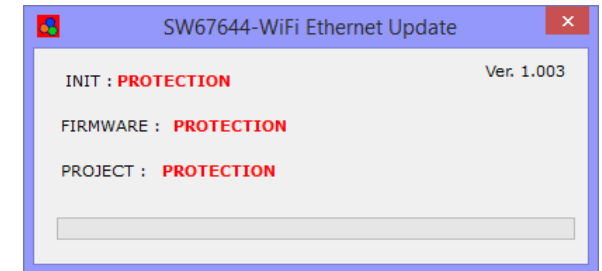
Figure 7: "Protection" window

In the case of HD67644 you have to use the software "SW67644": www.adfweb.com\download\filefold\SW67644.zip.

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ETHERNET PROTOCOL WITH TRANSPARENT MODE

ETHERNET FRAME TO BE SENT TO OUR GATEWAY WITH "ENABLE MULTIFRAME IN ETHERNET" DISABLED

The Bytes that compose the frame are these:

Byte Number	Description
1 ÷ 4	Cob_ID
5 ÷ 12	Data (Byte 5 is the higher, byte 12 is the lower)
13	Number of Byte to send (0x00÷0x08)

To choose the type of CAN (2.0A or 2.0B) of the frame that the converter will send, it is necessary to put the most significant bit of the byte 1 to:
- 0: CAN 2.0A;
- 1: CAN 2.0B.

If the "Number of Byte to send" has got a value less than 0x08 the byte of Data unused must be put with value 0x00.

Example:
We want to write in CAN network a frame with the following characteristics: CAN Type=2.0B; Cob_ID=0x01FECA02; Data=0x0123456789AB0000; Number of Byte to send=6.

So the string of hexadecimal numbers to be send to our Gateway is: [81][FE][CA][02][01][23][45][67][89][AB][00][00][06]

ETHERNET FRAME TO BE SENT TO OUR GATEWAY WITH "ENABLE MULTIFRAME IN ETHERNET" ENABLED

The Bytes that compose the frame are these:

Byte Number	Description
1	Number of CAN frames in Ethernet frame
2 ÷ 5	Cob_ID
6 ÷13	Data (Byte 6 is the higher, byte 13 is the lower)
14	Number of Byte to send (0x00÷0x08)

If the "Enable Multiframe in Ethernet" field is checked the first byte of the frame contain the numbers of CAN frames to be sent in CAN network. If this byte is bigger than one, the bytes 2÷14 are repeated for every CAN frame. If the "Number of Byte to send" has got a value less than 0x08 the byte of Data unused must be put with value 0x00. A single Ethernet frame can contain up to 20 CAN frames or the frames that arrived within 5 ms after the first.
To choose the type of CAN (2.0A or 2.0B) of the frame that the converter will send, it is necessary to put the most significant bit of the byte 2 to:
- 0: CAN 2.0A;
- 1: CAN 2.0B.

Example:

We want to write in CAN network two frames with the following characteristics:
    CAN Type=2.0B; Frame 1: Cob_ID=0x01FECA02; Data=0x0123456789ABCDEF; Number of Byte to send=8;
    CAN Type=2.0B; Frame 2: Cob_ID=0x01FEBA04; Data=0x0102030405060000; Number of Byte to send=6.

So the string of hexadecimal numbers to be send to our Gateway is:
[02][81][FE][CA][02][01][23][45][67][89][AB][CD][EF][08][01][FE][BA][04][01][02][03][04][05][06][00][00][06]

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ETHERNET FRAME THAT CONTAIN CAN FRAMES ARRIVED IN THE GATEWAY WITH "ENABLE MULTIFRAME IN ETHERNET" DISABLED

The Bytes that compose the frame are these:

Byte Number	Description
1÷4	Cob_ID
5÷12	Data (Byte 5 is the higher, byte 12 is the lower)
13	Number of Data Byte (0x00÷0x08)

To define the type of CAN (2.0A or 2.0B) of the frame that the converter has received, it is necessary to read the most significant bit of the byte 1:
- 0: CAN 2.0A;
- 1: CAN 2.0B.

If the "Number of Data Byte" has got a value less than 0x08 the byte of Data unused have the value 0x00.

Example:
The Gateway receives a CAN frame with the following characteristics: CAN Type=2.0B; Cob_ID=0x01FECA02; Data=0x0123456789AB; Number of Data Byte=6.

So the string of hexadecimal numbers that we send in Ethernet is: [81][FE][CA][02][01][23][45][67][89][AB][00][00][06]

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ETHERNET FRAME THAT CONTAIN CAN FRAMES ARRIVED IN THE GATEWAY WITH "ENABLE MULTIFRAME IN ETHERNET" ENABLED

The Bytes that compose the frame are these:

Byte Number	Description
1	Number of CAN frames in Ethernet frame
2÷5	Cob_ID
6÷13	Data (Byte 6 is the higher, byte 13 is the lower)
14	Number of Data Byte (0x00÷0x08)

If the "Enable Multiframe in Ethernet" field is checked the first byte of the frame contain the numbers of CAN frames to be sent in CAN network. If this byte is bigger than one, the bytes 2÷14 are repeated for every CAN frame. If the "Number of Data Byte" has got a value less than 0x08 the byte of Data unused has the value 0x00. A single Ethernet frame can contain up to 20 CAN frames or the frames that arrived within 5 ms after the first.
To define the type of CAN (2.0A or 2.0B) of the frame that the converter has received, it is necessary to read the most significant bit of the COB-ID's bytes:
- 0: CAN 2.0A;
- 1: CAN 2.0B.

Example:

The Gateway receives two CAN frames with the following characteristics:
    Frame 1: CAN Type=2.0B; Cob_ID=0x01FECA02; Data=0x0123456789ABCDEF; Number of Byte to send=8;
    Frame 2: CAN Type=2.0B; Cob_ID=0x01FEBA04; Data=0x010203040506; Number of Byte to send=6.

So the string of hexadecimal numbers that we send in Ethernet is:
[02][81][FE][CA][02][01][23][45][67][89][AB][CD][EF][08][01][FE][BA][04][01][02][03][04][05][06][00][00][06]

REMOTE TRANSMIT REQUEST (RTR) FRAME

It is possible to send or receive Remote Frames. For doing that it is necessary to use the fifth bit of the field "Number of Byte to send" if you want to send a CAN frame to the network from Ethernet, and also in the Ethernet frame sent by the gateway when a CAN frame arrives the field "Number of Data Byte" contain in the fifth bit the in formation of the Remote Frame.

If this bit is at 1 means that the frame is a Remote Frame, otherwise, if is at 0, means that is a normal frame.

To define the type of CAN (2.0A or 2.0B), it is necessary to read the most significant bit of the COB-ID's bytes. If this bit is 0, it means that it is CAN 2.0A, if this bit is 1, it is CAN 2.0B.

Examples:

1) We want to write in CAN network a frame with the following characteristics: CAN Type=2.0A; Cob_ID=0x201; RTR bit active.
   So the string of hexadecimal numbers to be send to our Gateway is: [00][00][02][01][00][00][00][00][00][00][00][00][10]

2) The Gateway receives a two CAN frames with the following characteristics:
   Frame 1: CAN Type=2.0B; Cob_ID=0x01FECA02; Data=0x0123456789ABCDEF; Number of Byte to send=8;
   Frame 2: CAN Type=2.0B; Cob_ID=0x01FEBA04; RTR bit active.

   So the string of hexadecimal numbers that we send in Ethernet is:
   [02][81][FE][CA][02][01][23][45][67][89][AB][CD][EF][08][81][FE][BA][04][00][00][00][00][00][00][00][00][10]

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ETHERNET PROTOCOL WITH SERVER MODE

This protocol is able to read and write frames in the CAN net.

Write Frames

The transmission is very simple; it requires only what are the packets to send. In a single request it is possible to write at maximum 19 frames in the CAN net. The Bytes that composed the request are these:

Byte Number	Description
1	Write Identifier (0x02)
2	Number of frames to send
3÷6	Cob_ID
7	Number of Byte to send (0x01÷0x08)
8÷15	Data (Byte 8 is the higher, byte 15 is the lower)

A single frame is composed by 13 bytes (byte 3 to byte 15). If the "Number of frame to send" (Byte Number 2) has got a value greater than zero, the next frame is composed from byte 3 to byte 15 and so for all the frames.
If the "Number of Byte to send" has got a value less than 0x08 the byte of Data unused must be put with value 0x00.
To choose the type of CAN (2.0A or 2.0B) of the frame that the converter will send, it is necessary to put the most significant bit of the byte 3 to:
 • 0: CAN 2.0A;
 • 1: CAN 2.0B.

The response is composed only by one byte. It can have two values:
 • 0x00: No Errors;
 • 0x01: Parameter Error.

Example:

We want to write three frames with the following characteristics:
        Frame 1: CAN Type=2.0A; Cob_ID=0x0000018A; Number of Byte to send=8; Data=0x0102030405060708;
        Frame 2: CAN Type=2.0B; Cob_ID=0x000413CB; Number of Byte to send=6; Data=0x1122334455660000;
        Frame 3: CAN Type=2.0A; Cob_ID=0x00000001; Number of Byte to send=8; Data=0x123456789A9B9C9D.

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So the string of hexadecimal numbers is:
REQ:[02][03][00][00][01][8A][08][01][02][03][04][05][06][07][08][80][04][13][CB][06][11][22][33][44][55][66][00][00][00][00][00][01][08][12][34][56][78][9A][9B][9C][9D]
RES:[00]

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Read Frames

For reading Data it is necessary to have a map in the RAM memory that contains the Data that passing in the bus. This map is implemented in the "Compositor SW67644" but it has some standard addresses given by the software. It is possible to see this map in Fig. 6.

The Bytes that composed the request are these:

Byte Number	Description
1	Read Identifier (0x01)
2	Starting Address Hi
3	Starting Address Lo
4	Number of Byte to read Hi
5	Number of Byte to read Lo

The Bytes that composed the respons are these:

Byte Number	Description
1	Error
2÷n+1	Data

n=Number of Byte

The Error Byte (Byte 1) can have three values:
- 0x00: No error;
- 0x01: Starting Address doesn't exist;
- 0x02: Too many Data to read.

Example:
1- We want to read the data of the first COB-ID defined in Fig. 6.. So the string of hexadecimal numbers is:
   REQ:[01][00][00][00][06]
   RES:[00][01][02][03][04][05][06]

2- We want to read the data of the second COB-ID defined in Fig. 6.. So the string of hexadecimal numbers is:
   REQ:[01][00][01][00][08]
   RES:[00][11][22][33][44][55][66][77][88]

3- We want to read the data of the first and second COB-ID defined in Fig. 6. together. So the string of hexadecimal numbers is:
   REQ:[01][00][00][00][0E]
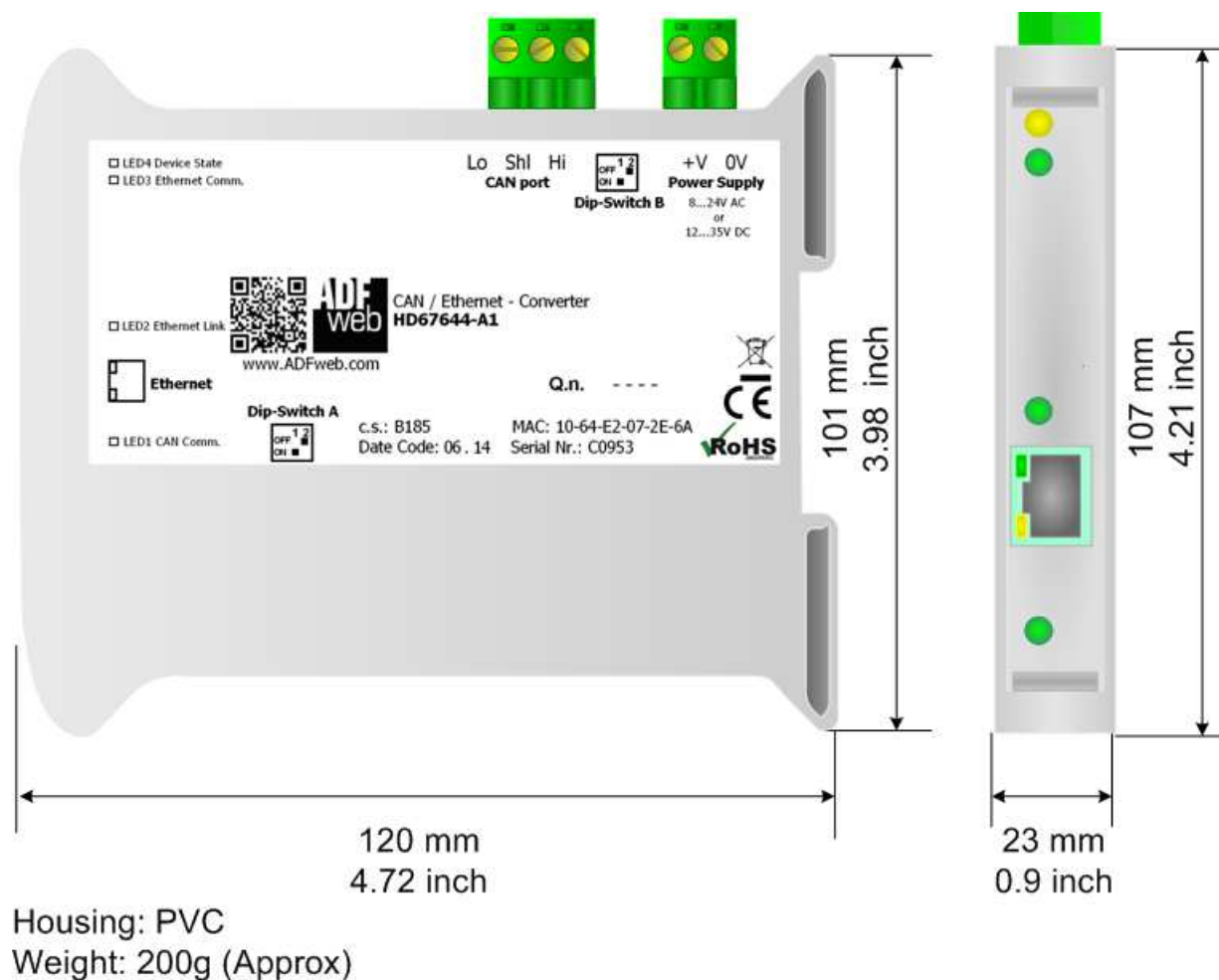   RES:[00][01][02][03][04][05][06][11][22][33][44][55][66][77][88]

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MECHANICAL DIMENSIONS:

Figure 8a: Mechanical dimensions scheme for HD67644-A1

![ADFweb logo]

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Housing: PVC
Weight: 200g (Approx)
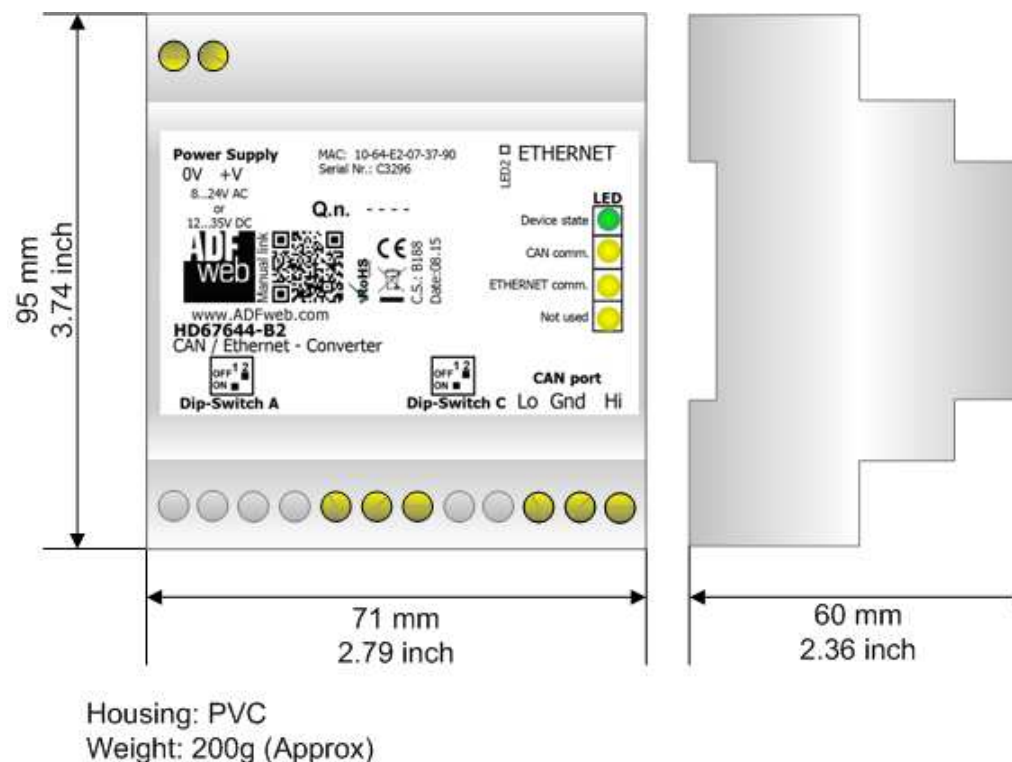
Figure 8b: Mechanical dimensions scheme for HD67644-B2

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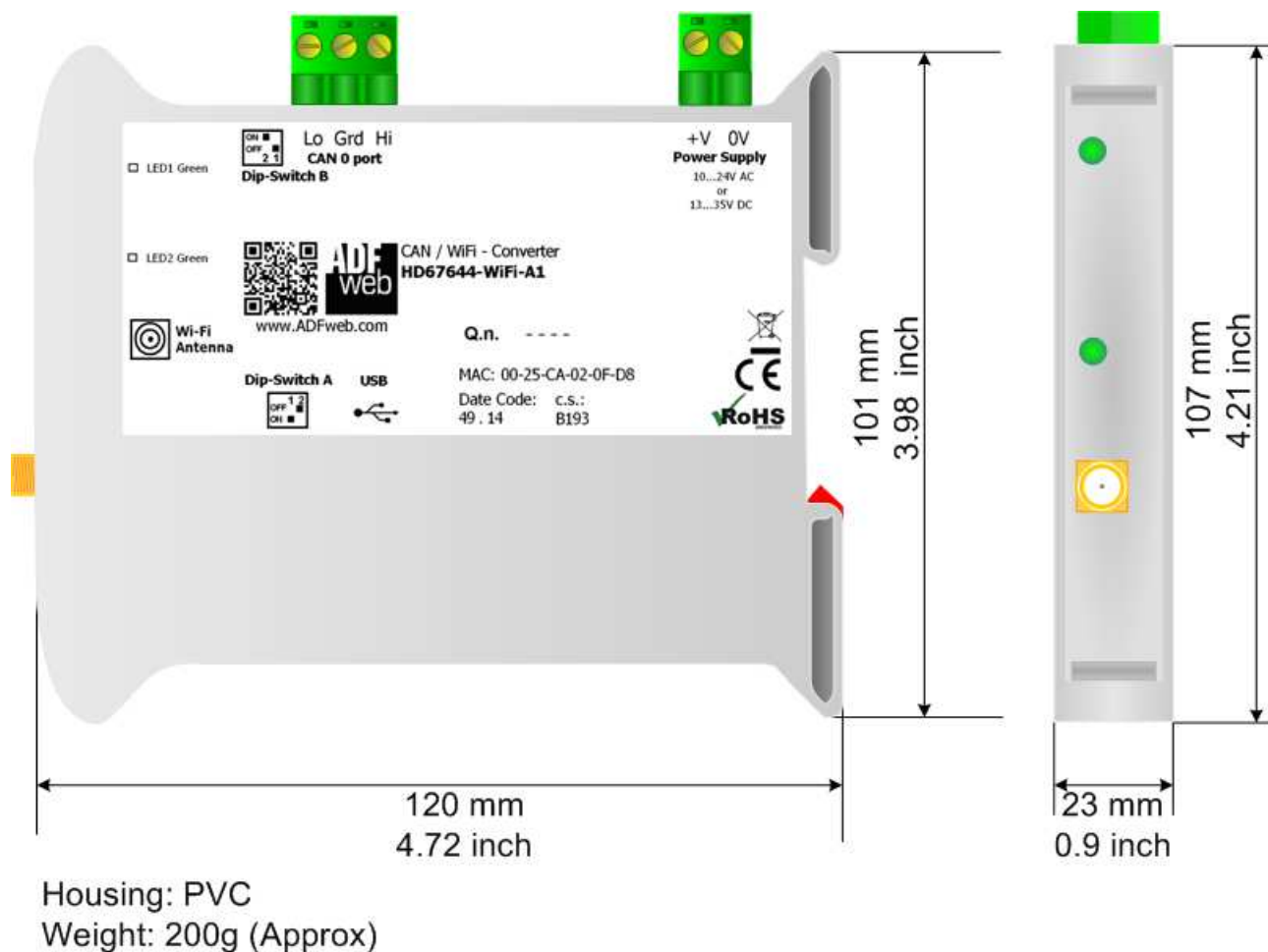
Figure 8c: Mechanical dimensions scheme for HD67644-WiFi-A1

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ORDERING INFORMATIONS:

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

HD67644 - xxxx – xx

Connectors Type
1: Removable 5mm Screw Terminal
2: Fixed 5mm Screw Terminal

Enclosure Type
A: 1M, 35mm DIN Rail mounting
B: 4M, 35mm DIN Rail mounting

Ethernet communication type:
None: Ethernet
WiFi: Wi-Fi

Device Family
HD67644: Ethernet / CAN - Converter
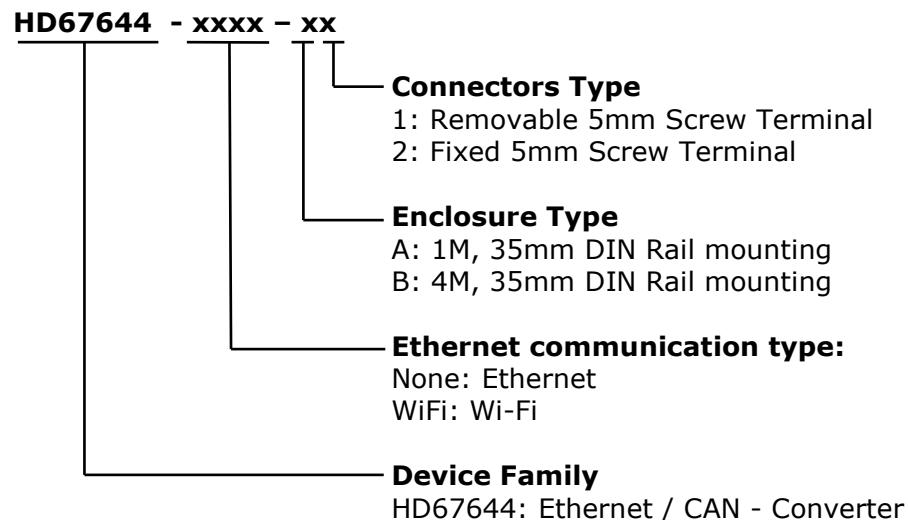
Order Code: **HD67644-A1**   -   Ethernet / CAN - Converter (Housing type: A, Terminal Blocks Connectors)

Order Code: **HD67644-B2**   -   Ethernet / CAN - Converter (Housing type: B, Terminal Blocks Connectors)

Order Code: **HD67644-WiFi-A1** -   Ethernet / CAN - Converter (Housing type: A, Terminal Blocks 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

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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.