

User Manual

Revision 2.000
English

Ethernet / DeviceNet Slave - Converter

(Order Code: HD67043-A1, HD67043-B2)

for Website information:

www.adfweb.com?Product=HD67043

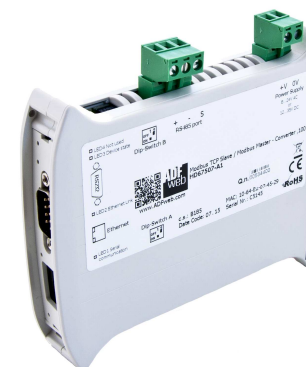
for Price information:

www.adfweb.com?Price=HD67043-A1

www.adfweb.com?Price=HD67043-B2

Benefits and Main Features:

- ⊕ Very easy to configure
- ⊕ 32mm Rail DIN mount
- ⊕ Wide supply input range
- ⊕ Temperature range: -40°C/+85°C (-40°F/+185°F)



For other DeviceNet products see also the following link:

DeviceNet Slave from/to

- www.adfweb.com?Product=HD67681
- www.adfweb.com?Product=HD67721
- www.adfweb.com?Product=HD67235
- www.adfweb.com?Product=HD67134
- www.adfweb.com?Product=HD67136
- www.adfweb.com?Product=HD67598
- www.adfweb.com?Product=HD67137
- www.adfweb.com?Product=HD67809
- www.adfweb.com?Product=HD67058
- www.adfweb.com?Product=HD67141
- www.adfweb.com?Product=HD67138
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- www.adfweb.com?Product=HD67140
- www.adfweb.com?Product=HD67251
- www.adfweb.com?Product=HD67609
- www.adfweb.com?Product=HD67570
- www.adfweb.com?Product=HD67574
- www.adfweb.com?Product=HD67161
- www.adfweb.com?Product=HD67173

- (BACnet Slave)**
- (BACnet Master)**
- (CAN)**
- (CANopen SDO Client)**
- (CANopen SDO Server)**
- (EtherNet/IP)**
- (J1939)**
- (KNX)**
- (M-Bus)**
- (Modbus Master)**
- (Modbus Slave)**
- (Modbus TCP Master)**
- (Modbus TCP Slave)**
- (NMEA 2000)**
- (PROFINET)**
- (PROFIBUS Master)**
- (PROFIBUS Slave)**
- (SNMP Agent)**
- (SNMP Manager)**

Do you have an your customer protocol? See the following link:

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 |
|----------|------------|--------|---------|---------------------------|
| 1.000 | 22/04/2010 | Fl | All | First release version |
| 1.010 | 11/10/2012 | Fl | All | Software changed (v1.000) |
| 1.011 | 26/03/2013 | Nt | All | Added new chapters |
| 2.000 | 01/07/2016 | Ff | All | New hardware 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 are required for each individual application, legal and safety regulation. The same applies also when using accessories.

INTENDED USE

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


QUALIFIED PERSONNEL

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

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

RESIDUAL RISKS

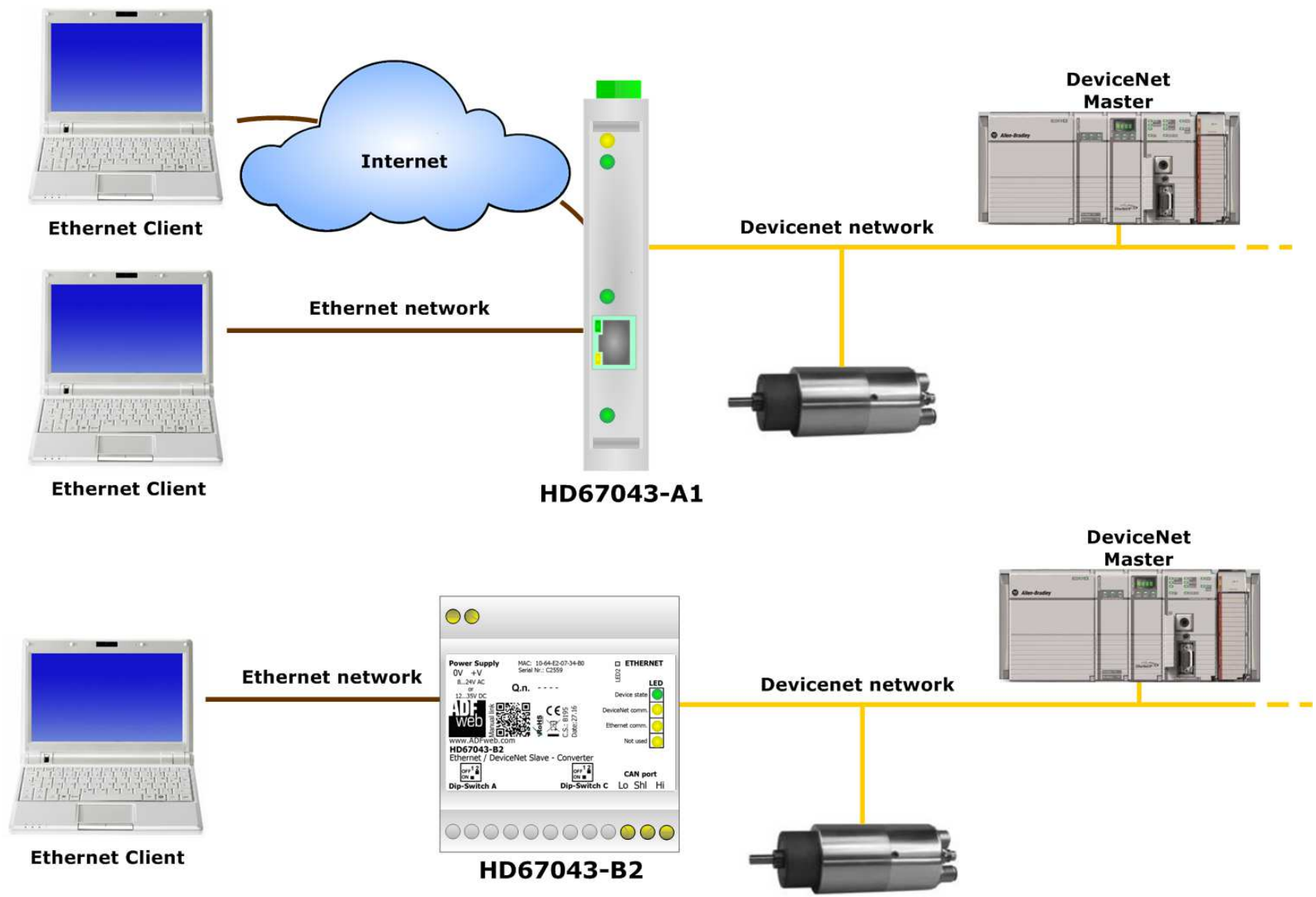
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

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

CE CONFORMITY

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

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

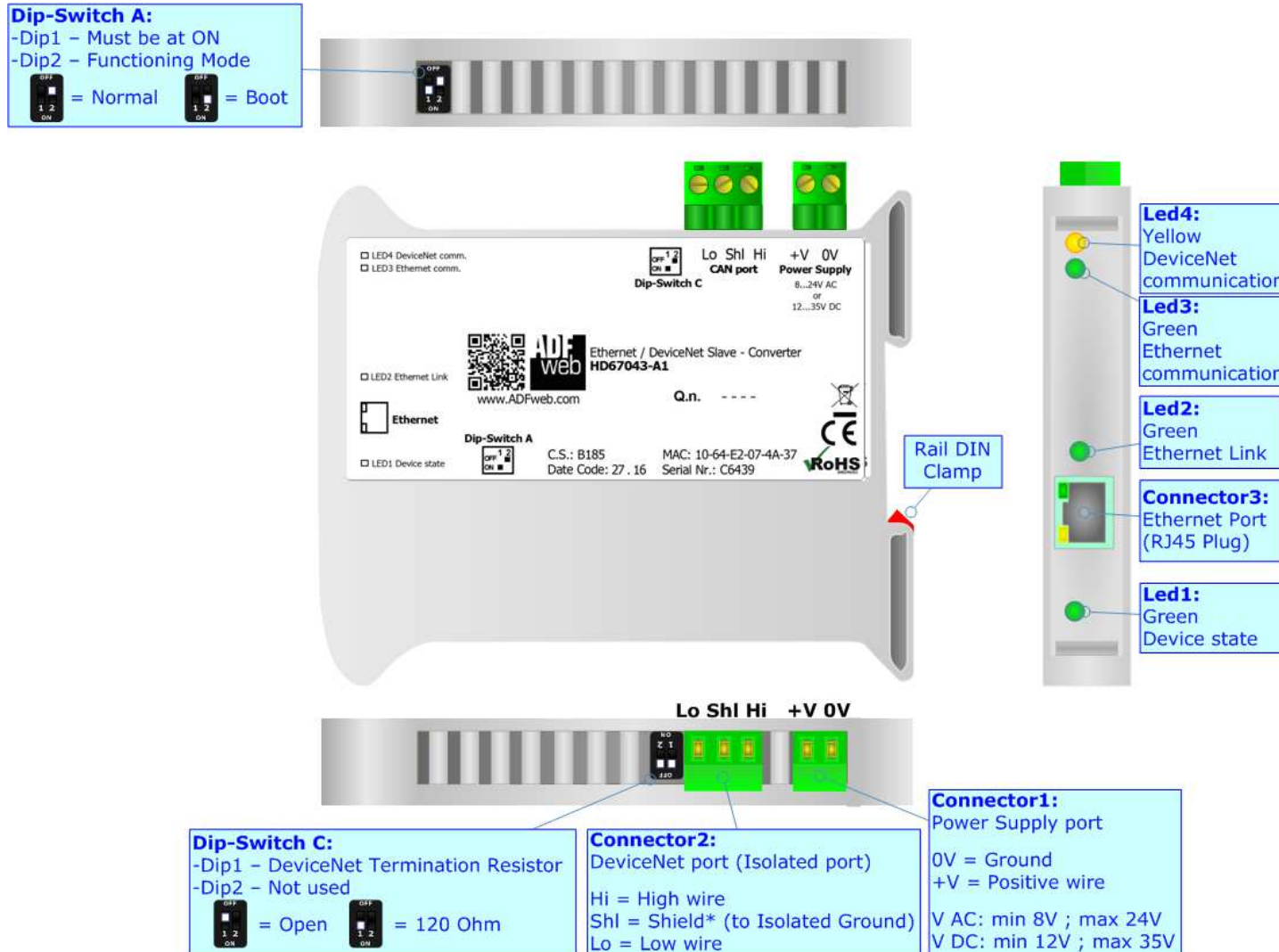


Figure 1a: Connection Scheme for HD67043-A1

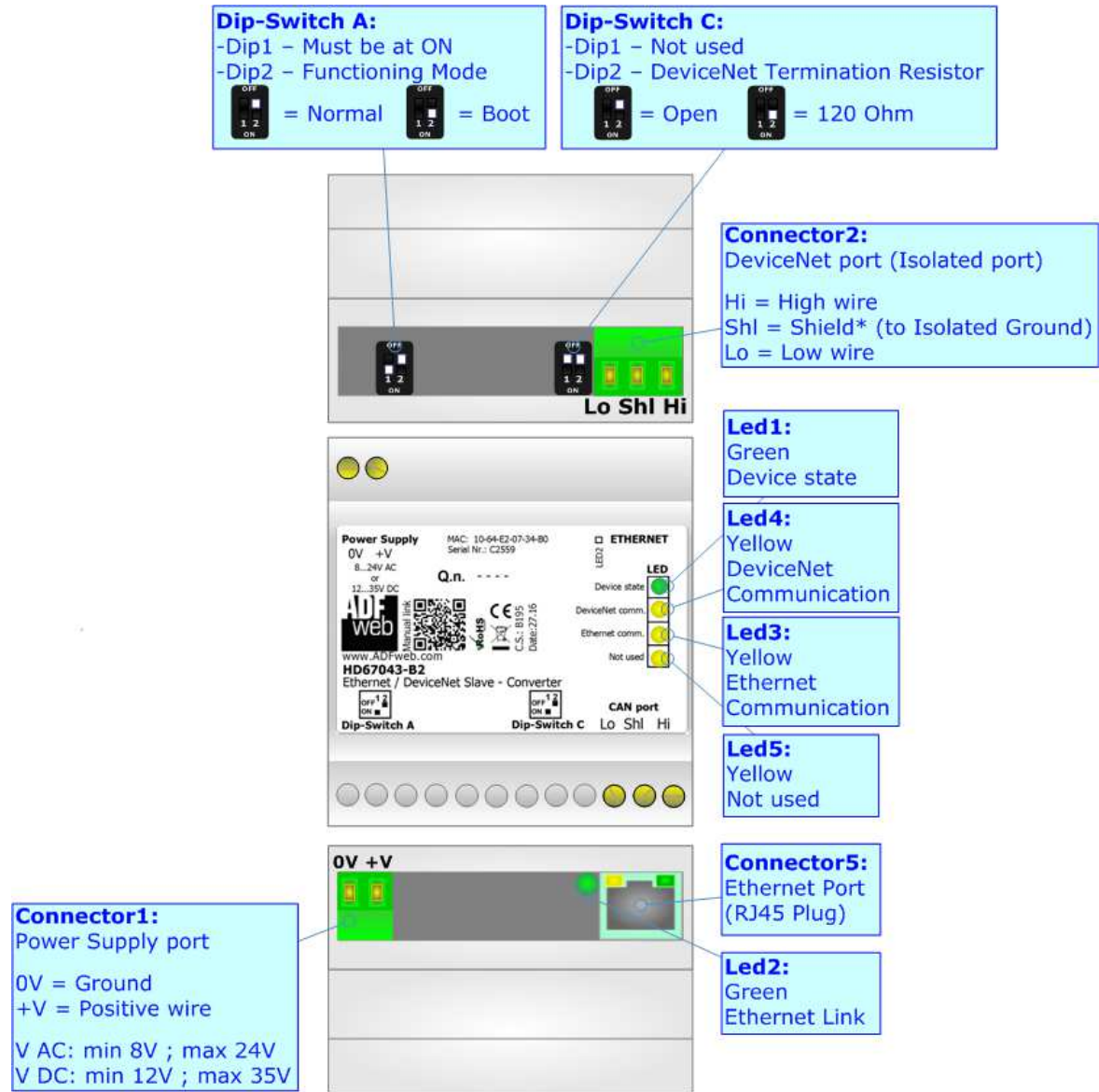


Figure 1b: Connection Scheme for HD67043-B2

CHARACTERISTICS:

The "Ethernet / DeviceNet Slave – Converter" allows the following characteristics:

- Bi-directional information between networks Ethernet and DeviceNet;
- Electrical isolation between two Buses;
- Mountable on 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 SW67043 software on your PC in order to perform the following:

- Define the parameter of Ethernet;
- Define the parameter of DeviceNet;
- Update the device.

POWER SUPPLY:

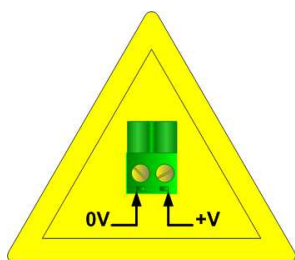
The devices can be powered at 8...24V AC and 12...35V DC. The consumption depends to the code of the device. For more details see the two tables below.

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

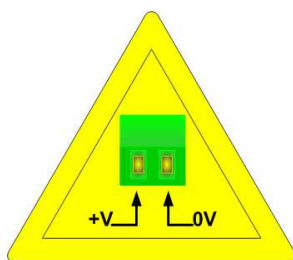
Consumption at 24V DC:

| Device | Consumption [W/VA] |
|------------|--------------------|
| HD67043-A1 | 3.5 |
| HD67043-B2 | 3.5 |

Caution: Not reverse the polarity power

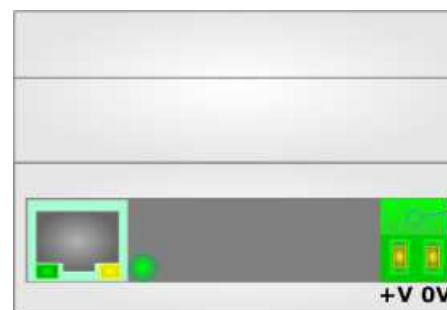


HD67043-A1



HD67043-B2

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

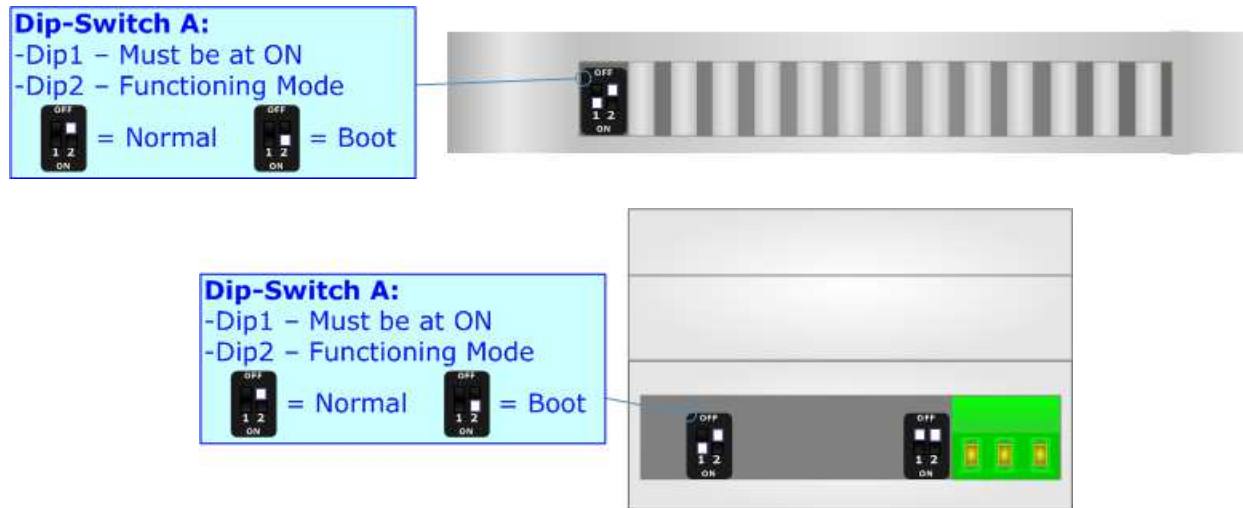
FUNCTION MODES:

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.



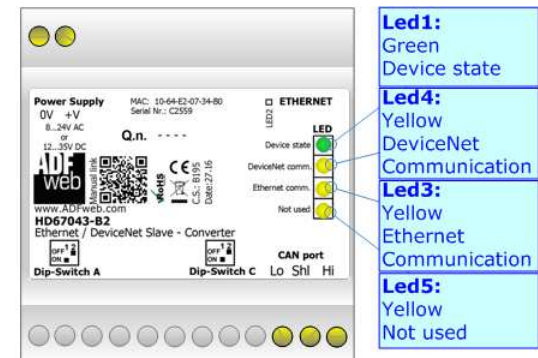
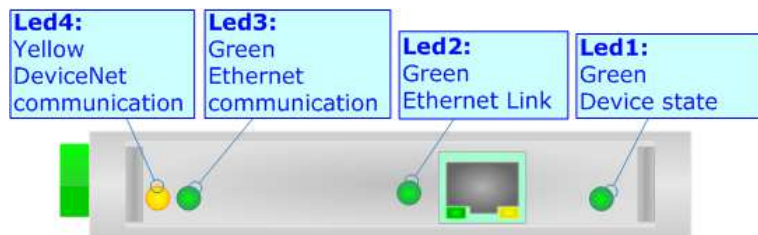
Warning:

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

LEDS:

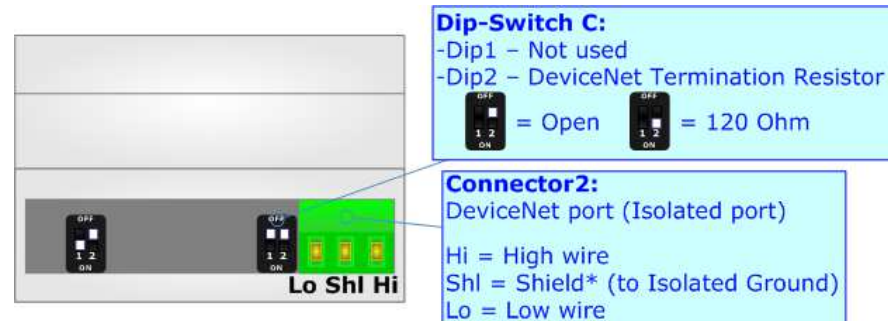
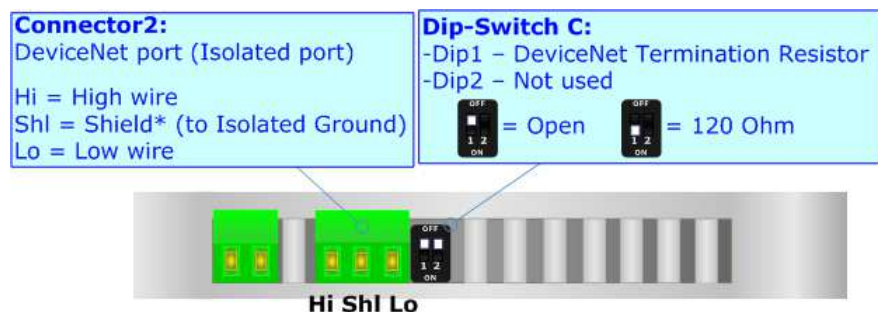
The device has got four (five for HD67043-B2) LEDs that are used to give information of the functioning status. The various meanings of the LEDs are described in the table below.

| LED | Normal Mode | Boot Mode |
|---|--|---|
| 1: Device State (yellow) | Blinks slowly (~1Hz) | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 2: Ethernet Link (green) | ON: Ethernet cable connected OFF: Ethernet cable disconnected | ON: Ethernet cable connected OFF: Ethernet cable disconnected |
| 3: Ethernet communication (green) | Blinks when Ethernet frames are received | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 4: DeviceNet communication (green) | Blinks when DeviceNet requests are received | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 5: Not used (yellow) (Present only on HD67043-B2) | OFF | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |



DEVICENET:

For terminating the DeviceNet line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch C' is at ON position (for HD67043-A1) or that the Dip2 of 'Dip-Switch C' is at ON position (for HD67043-B2).



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] |
| | 125 K | 500 |
| | 250 K | 250 |
| | 500 K | 100 |

ETHERNET:

The Ethernet connection must be made using Connector3/Connector5 of HD67043-A1/HD67043-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.



USE OF COMPOSITOR SW67043:

To configure the Converter, use the available software that runs with Windows called SW67043. It is downloadable on the site www.adfweb.com and its operation is described in this document. (This manual is referenced to the last version of the software present on our web site). The software works with MSWindows (XP, Vista, Seven, 8, 10; 32/64bit).

When launching the SW67043, the window below appears (Fig. 2).



Note:

It is necessary to have installed .Net Framework 4.

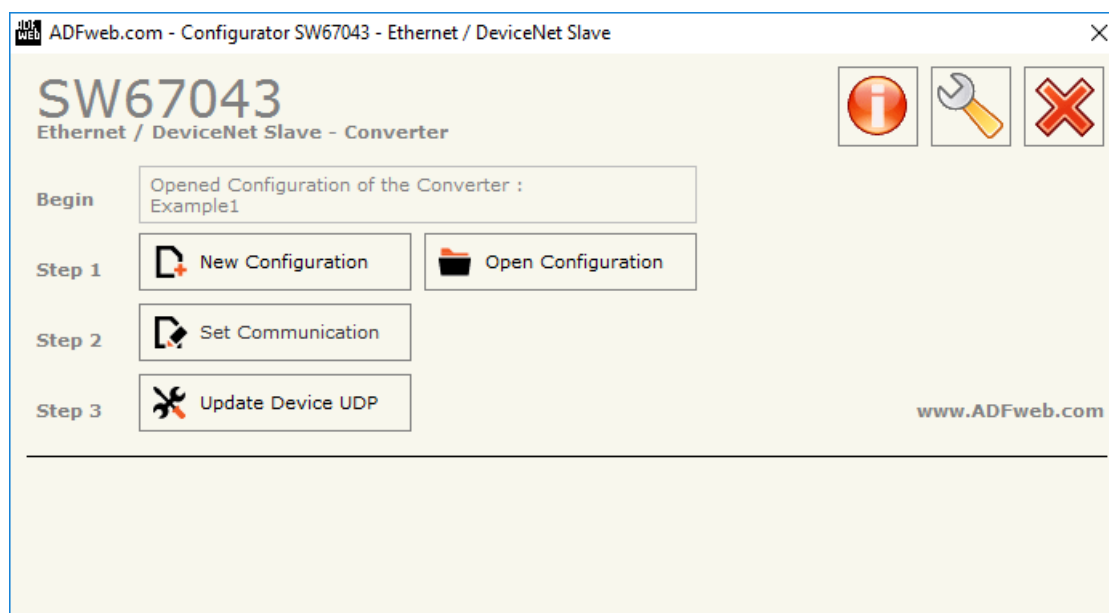
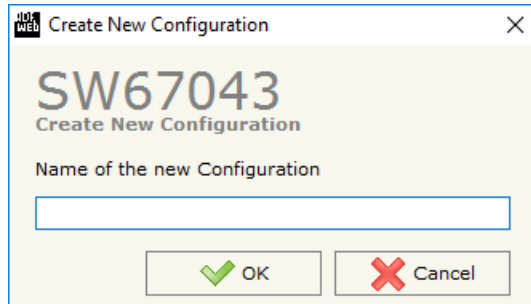


Figure 2: Main window for SW67043

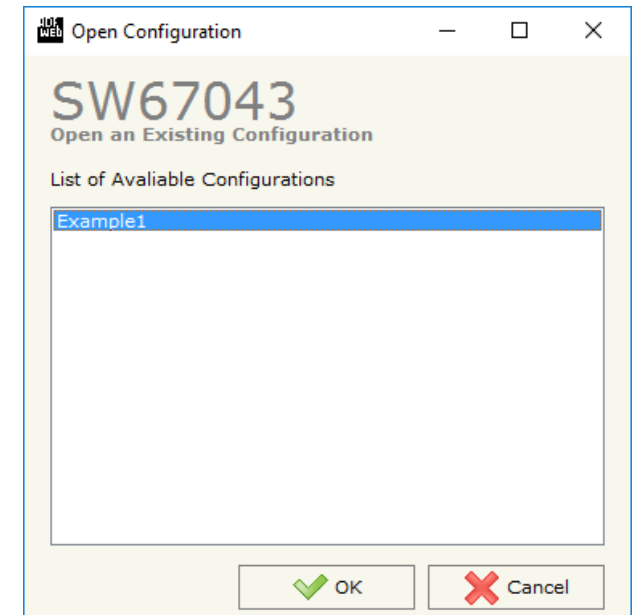
NEW CONFIGURATION / OPEN CONFIGURATION:

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




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

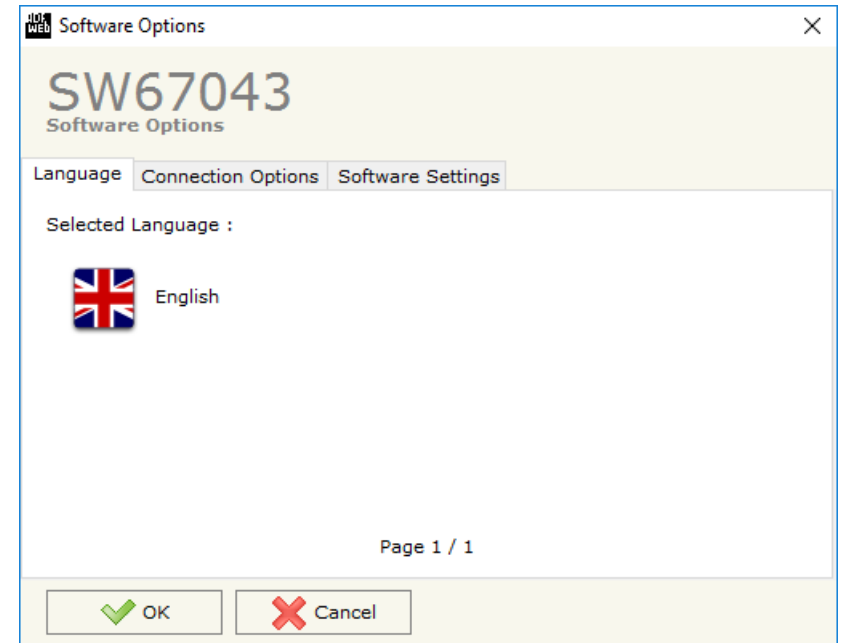
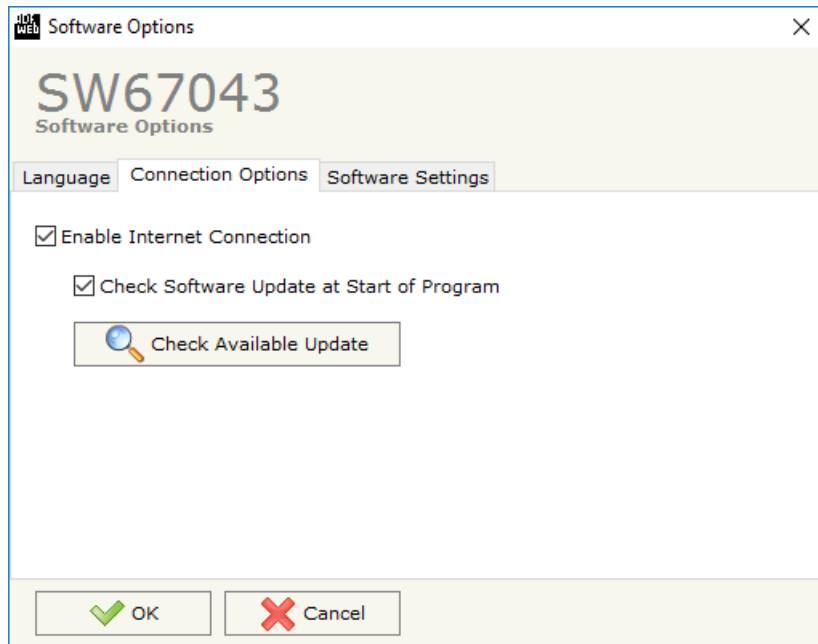
- To clone the configurations of a programmable “Ethernet / DeviceNet Slave - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to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



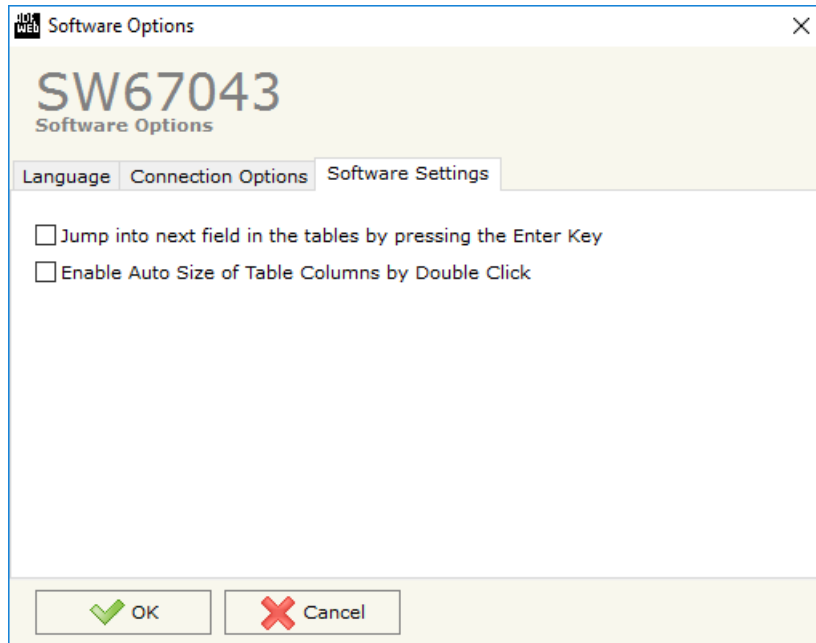
SOFTWARE OPTIONS:

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 SW67043 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 defines the fundamental communication parameter of two buses, Ethernet and DeviceNet.

By pressing the **"Set Communication"** button from the main window for SW67043 (Fig. 3) the window "Set Communication" appears (Fig. 3).

The window is divided in two sections, one for the Ethernet and the other for the DeviceNet Slave.

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

- Old Hardware (with Jumper);
- New Hardware (with Dip-Switch).

The means of the fields for "Ethernet" are:

- 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 field **"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;
- In the field **"Port"** the number of the port for the Ethernet communication is defined;
- In the field **"Protocol"** the Ethernet protocol used for the Ethernet communication (TCP or UDP) is defined.

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

- In the field **"ID Device"** the ID for DeviceNet side of the converter is defined.
- In the field **"Baudrate"** the baudrate for the DeviceNet side 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 c
onverter to the DeviceNet is defined (at maximum it is possible to use 455 byte).

The screenshot shows the 'Set Communication' window for device SW67043. It is divided into two main sections: 'Ethernet' and 'DeviceNet Slave'.
The 'Ethernet' section contains:
- 'Select Device': New Hardware (with Dip-Switch)
- 'IP ADDRESS': 192.168.2.189
- 'SUBNET Mask': 255.255.255.0
- 'GATEWAY': unchecked checkbox, 192.168.0.1
- 'Port': 65
- 'Protocol': TCP
The 'DeviceNet Slave' section contains:
- 'ID Device': 5
- 'Baudrate': 250K
- 'Number Byte IN': 20
- 'Number Byte Out': 30
At the bottom, there are 'OK' and 'Cancel' buttons.

Figure 3: "Set Communication" window

UPDATE DEVICE SER (for 'Hardware with Jumper'):

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 cable from your PC to the Converter;
- Put the converter in Boot Mode;
- 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;
- Put the converter in Run Mode;
- Disconnect the RS232 cable;
- Turn ON the device.

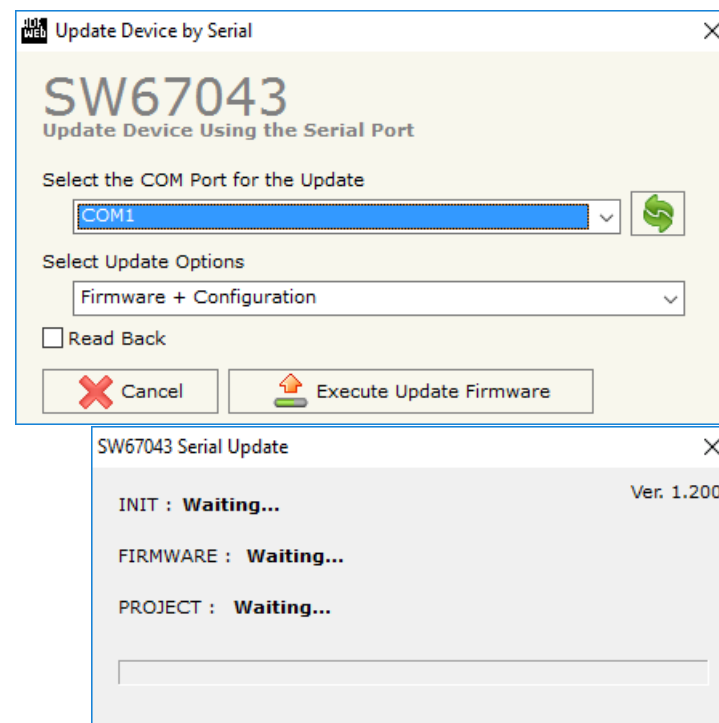


Figure 4: "Update via Serial" windows

UPDATE DEVICE UDP (for 'Hardware with Dip-Switch'):

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"**;
- Press the **"Ping"** button, "Device Found! must appear";
- Press the **"Next"** button;
- Select which operations you want to do;
- Press the **"Execute update firmware"** button to start the upload;
- When all the operations are "OK" turn OFF the Device;
- Put Dip2 of 'Dip-Switch A' in OFF position;
- Turn ON the device.

If you know the actual IP address of the device, you have to use this procedure:

- Turn ON the Device with the Ethernet cable inserted;
- Insert the actual IP of the Converter;
- Press the **"Ping"** button, must appear "Device Found!";
- Press the **"Next"** button;
- Select which operations you want to do;
- Press the **"Execute update firmware"** button to start the upload;
- When all the operations are "OK" the device automatically goes at Normal Mode.

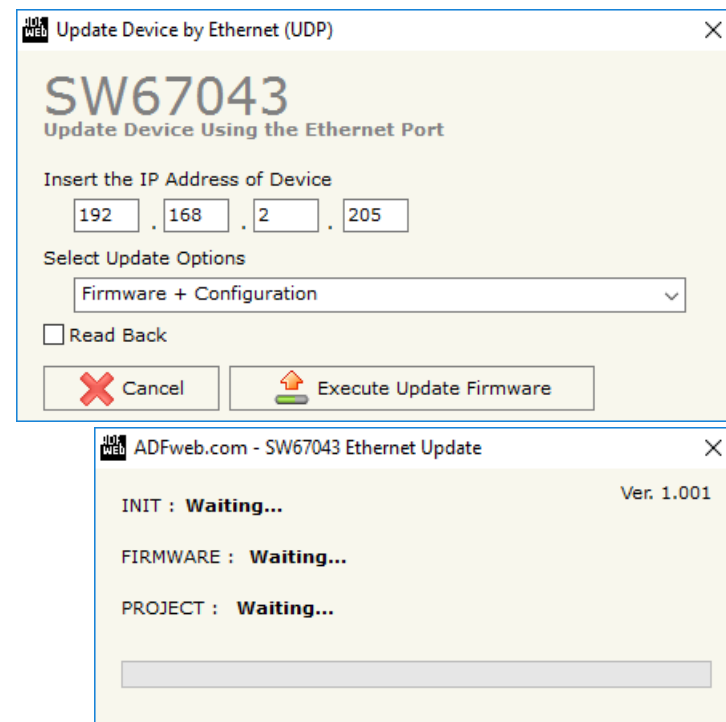


Figure 5: "Update via UDP" windows

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



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 HD67043 device.



Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67043 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;
- If you are using a USB↔RS232 converter try with a native COM port or change the converter;
- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8 and 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 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

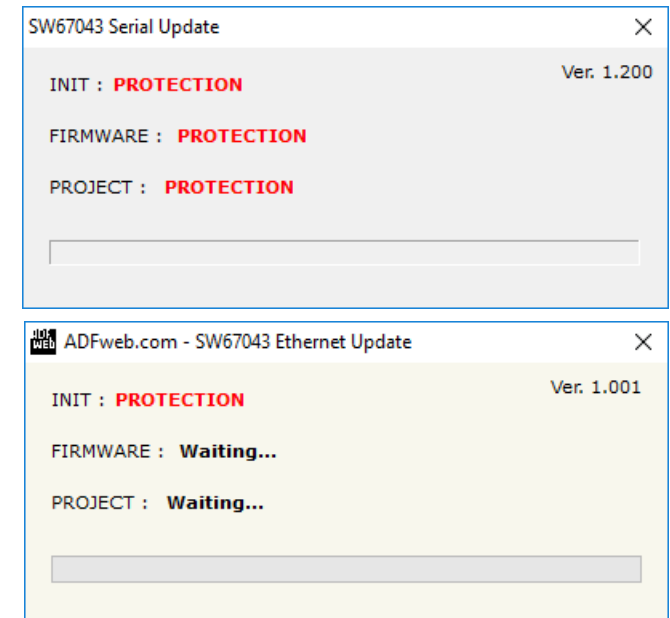


Figure 6: "Protection" window

In the case of HD67043 you have to use the software "SW67043": www.adfweb.com/download/filefold/SW67043.zip.

ETHERNET PROTOCOL:

This protocol has got a single function for write and/or read frames. This routine can use both the UDP protocol and the TCP/IP by setting the parameter wanted with the SW67043 Compositor.

The request include the following byte:

| Byte Number | Description |
|-------------|----------------------------|
| 1 | Starting Address Read Hi |
| 2 | Starting Address Read Lo |
| 3 | Number of Byte to Read Hi |
| 4 | Number of Byte to Read Lo |
| 5 | Starting Address Write Hi |
| 6 | Starting Address Write Lo |
| 7 | Number of Byte to Write Hi |
| 8 | Number of Byte to Write Lo |
| 9÷n+8 | Data Write |

n=Number of Byte to Write

If the "Number of Byte to Write" has got the value 0x0000 there are not data and so the frame has got only eight byte.

The response includes the following byte:

| Byte Number | Description |
|-------------|------------------|
| 1 | Write Error Byte |
| 2 | Read Error Byte |
| 3÷n+2 | Data Read |

n=Number of Byte to Read

The "Write/Read Error Byte" (Byte 1/Byte 2) can have three values:

- 0x00: No error;
- 0x01: Starting Address doesn't exist;
- 0x02: Too many Data to Read/Write.

If you don't want to Read/Write it is necessary to insert the value 0x0000 in the bytes "Starting Address Read/Write" and "Number of Byte to Read/Write".

If there are not Data to read (Starting Address Read = 0x0000, Number of Byte to Read = 0x0000) only the first two bytes are present.

Table of errors:

In the case with this feature (N Byte IN=0x0F, N Byte OUT=0x14)

| Starting Address Read | Number of Byte to Read | Read Error Byte |
|-----------------------|------------------------|-----------------|
| 0x0007 | 0x0005 | 0x00 |
| 0x0000 | 0x0005 | 0x01 |
| 0x0003 | 0x0013 | 0x02 |
| 0x0005 | 0x0000 | 0x02 |
| 0x0015 | 0x0003 | 0x02 |

| Starting Address Write | Number of Byte to Write | Write Error Byte |
|------------------------|-------------------------|------------------|
| 0x0006 | 0x0004 | 0x00 |
| 0x0000 | 0x0006 | 0x01 |
| 0x0002 | 0x0011 | 0x02 |
| 0x0004 | 0x0000 | 0x02 |
| 0x0010 | 0x0002 | 0x02 |

Examples:

- 1) We want to write ten bytes from Starting Address 1 and read ten bytes from Starting Address 15. So the string of hexadecimal numbers is:
 REQ: [00][0F][00][0A][00][01][00][0A][10][11][12][13][14][15][16][17][18][19]
 RES: [00][00][20][21][22][23][24][25][26][27][28][29]
- 2) We want to read five bytes from Starting Address 7. So the string of hexadecimal numbers is:
 REQ: [00][07][00][05][00][00][00][00]
 RES: [00][00][28][29][2A][2B][2C]
- 3) We want to write four bytes from Starting Address 9. So the string of hexadecimal numbers is:
 REQ: [00][00][00][00][00][09][00][04][30][31][32][33]
 RES: [00][00]

MECHANICAL DIMENSIONS:

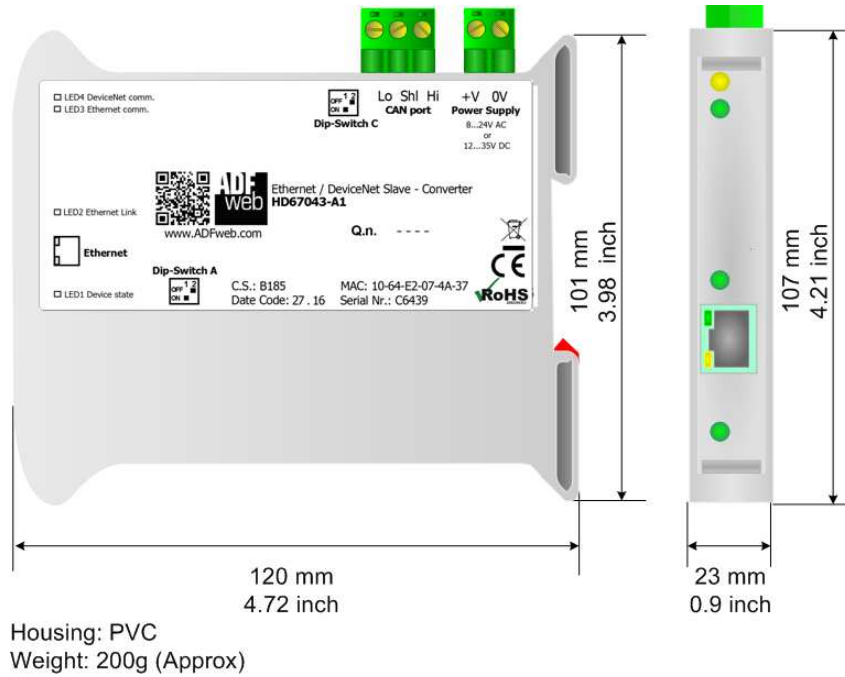


Figure 7a: Mechanical dimensions scheme for HD67043-A1

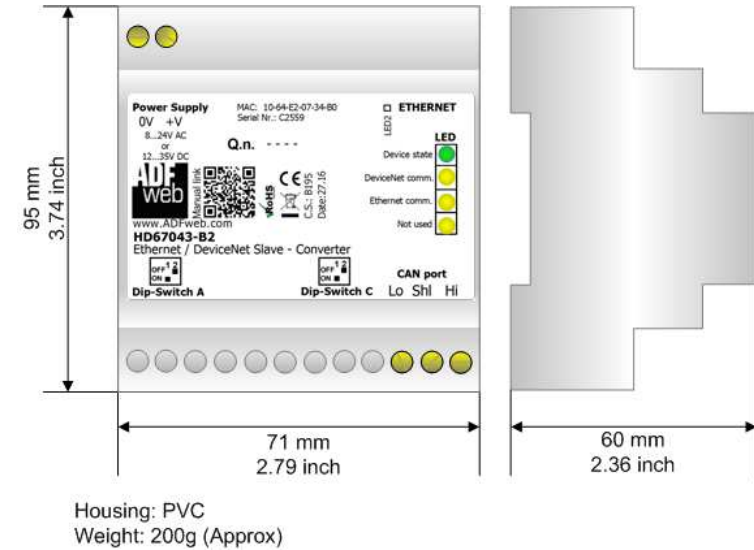
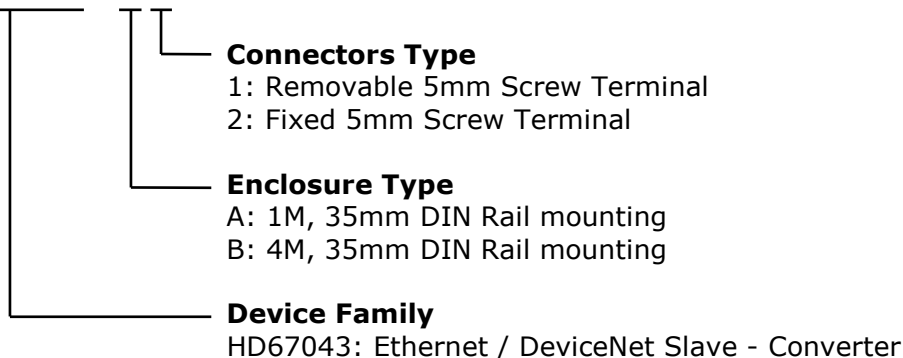


Figure 7b: Mechanical dimensions scheme for HD67043-B2

ORDERING INFORMATIONS:

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

HD67043 - x x



Order Code: **HD67043-A1** - Ethernet / DeviceNet Slave – Converter (Housing type: A, Terminal Blocks Connectors)

Order Code: **HD67043-B2** - Ethernet / DeviceNet Slave - Converter (Housing type: B, Terminal Blocks Connectors)

ACCESSORIES:

Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m

Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m

Order Code: **AC34001** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V AC

Order Code: **AC34002** - Rail DIN - Power Supply 110V AC 50/60Hz – 12 V AC

DISCLAIMER:

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. 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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