

# User Manual

Revision 1.010  
English

## Ethernet / DeviceNet master - Converter

(Order Code: HD67154-A1, HD67154-B2)

For Website information:

[www.adfweb.com?Product=HD67154](http://www.adfweb.com?Product=HD67154)

For Price information:

[www.adfweb.com?Price=HD67154-A1](http://www.adfweb.com?Price=HD67154-A1)

[www.adfweb.com?Price=HD67154-B2](http://www.adfweb.com?Price=HD67154-B2)

### Benefits and Main Features:

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



User Manual

For other DeviceNet products see also the following link:

#### DeviceNet Slave from/to

[www.adfweb.com?Product=HD67043](http://www.adfweb.com?Product=HD67043)  
[www.adfweb.com?Product=HD67058](http://www.adfweb.com?Product=HD67058)  
[www.adfweb.com?Product=HD67134](http://www.adfweb.com?Product=HD67134)  
[www.adfweb.com?Product=HD67136](http://www.adfweb.com?Product=HD67136)  
[www.adfweb.com?Product=HD67137](http://www.adfweb.com?Product=HD67137)  
[www.adfweb.com?Product=HD67138](http://www.adfweb.com?Product=HD67138)  
[www.adfweb.com?Product=HD67139](http://www.adfweb.com?Product=HD67139)  
[www.adfweb.com?Product=HD67140](http://www.adfweb.com?Product=HD67140)  
[www.adfweb.com?Product=HD67141](http://www.adfweb.com?Product=HD67141)  
[www.adfweb.com?Product=HD67235](http://www.adfweb.com?Product=HD67235)  
[www.adfweb.com?Product=HD67554](http://www.adfweb.com?Product=HD67554)

**(Ethernet)**  
**(M-Bus)**  
**(CANopen SDO Client)**  
**(CANopen SDO Server)**  
**(J1939)**  
**(Modbus Slave)**  
**(Modbus TCP Client)**  
**(Modbus TCP Server)**  
**(Modbus Master)**  
**(CAN)**  
**(PROFIBUS)**

#### DeviceNet Master from/to

[www.adfweb.com?Product=HD67151](http://www.adfweb.com?Product=HD67151)  
[www.adfweb.com?Product=HD67152](http://www.adfweb.com?Product=HD67152)  
[www.adfweb.com?Product=HD67153](http://www.adfweb.com?Product=HD67153)  
[www.adfweb.com?Product=HD67555](http://www.adfweb.com?Product=HD67555)

**(Modbus Slave)**  
**(Modbus TCP Server)**  
**(CANopen)**  
**(PROFIBUS)**

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

[www.adfweb.com?Product=HD67003](http://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](http://www.adfweb.com?Cmd=helpme)

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**UPDATED DOCUMENTATION:**

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own

To obtain the most recently updated document, note the “document code” that appears at the top right-hand corner of each page of this document.

With this “Document Code” go to web page [www.adfweb.com/download/](http://www.adfweb.com/download/) and search for the corresponding code on the page. Click on the proper “Document Code” and download the updates.

**REVISION LIST:**

Revision	Date	Author	Chapter	Description
1.000	23/04/2010	FI	All	First release version
1.001	04/04/2013	Nt	All	Added new chapters
1.010	04/09/2014	FI	All	Software changed (v1.000)

**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](mailto:support@adfweb.com) or give us a call if you need it.

**CONNECTION SCHEME:**

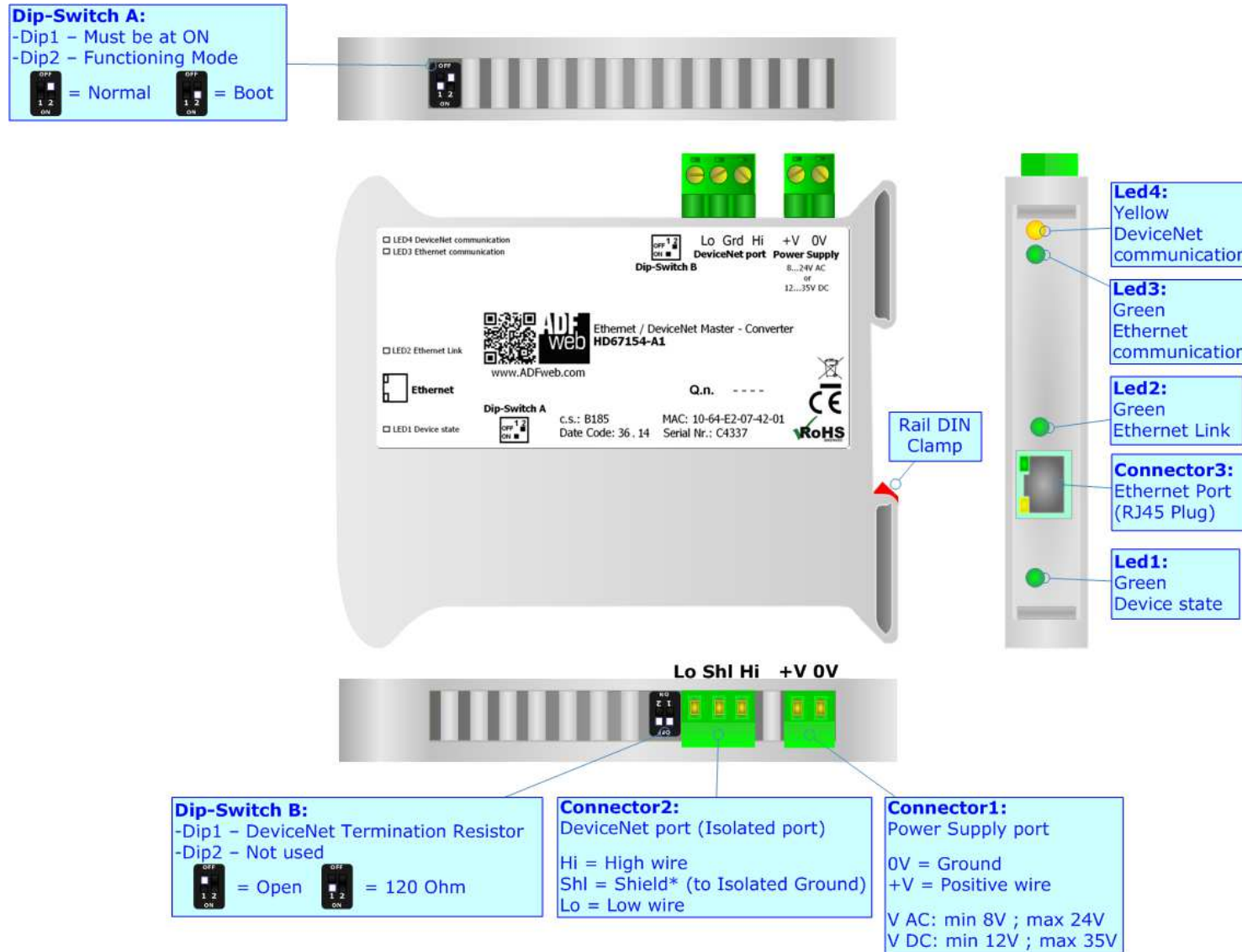


Figure 1a: Connection scheme for HD67154-A1

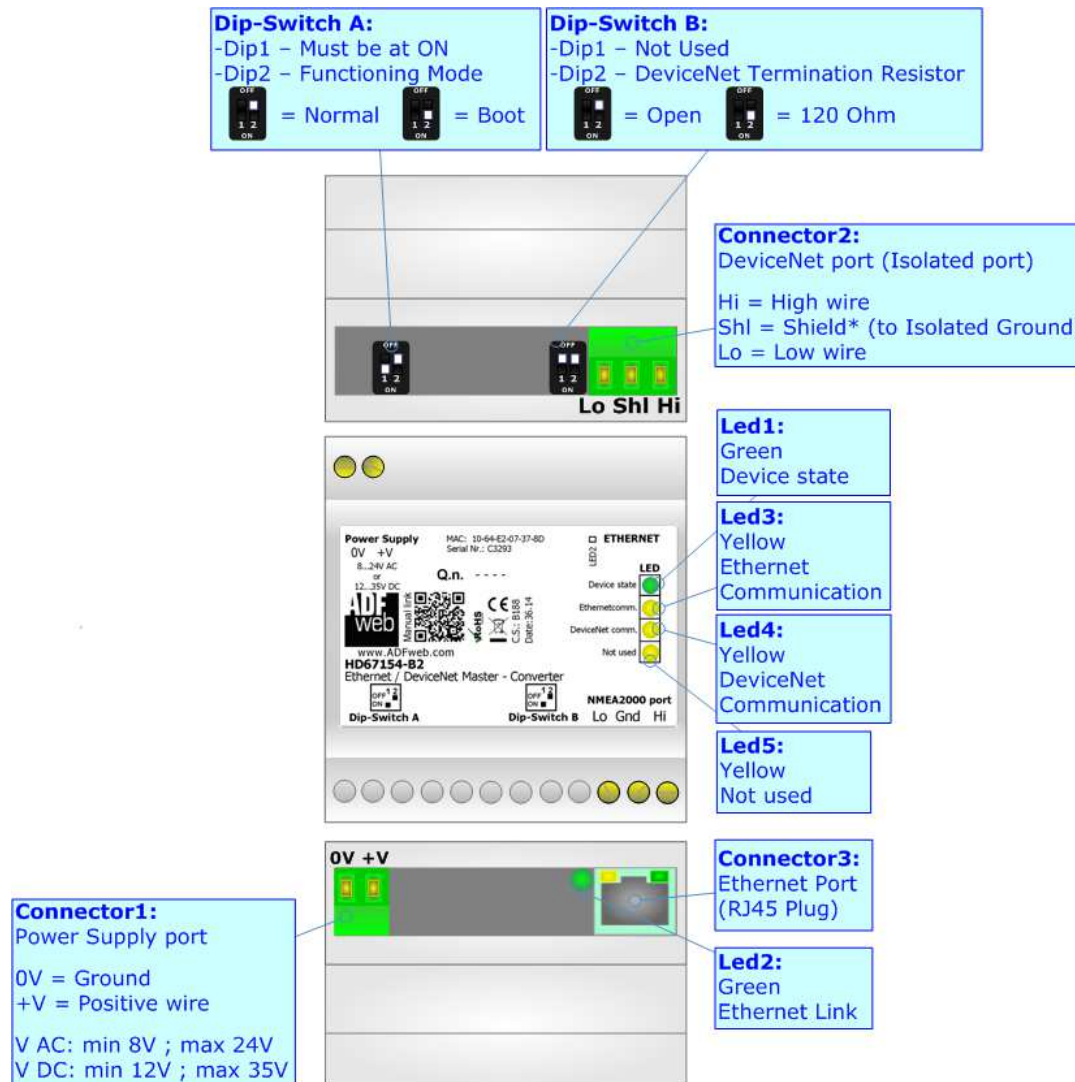


Figure 1b: Connection scheme for HD67154-B2

**CHARACTERISTICS:**

The HD67154-A1 and HD67154-B2 are converters from Ethernet to DeviceNet master and vice-versa.

They have the following characteristics:

- Up to 63 DeviceNet slaves devices;
- Triple isolation between Ethernet - Power Supply, Ethernet - DeviceNet, Power Supply - DeviceNet.
- 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 SW67154 software on your PC in order to perform the following:

- Define the parameter of Ethernet line;
- Define the parameter of DeviceNet line;
- Define the DeviceNet slaves connected to the network;
- Update the device.

**POWER SUPPLY:**

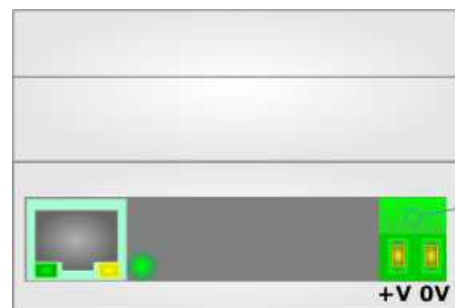
The devices can be powered at 8...24V AC and 12...35V DC. For more details see the two tables below.

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

Consumption at 24V DC:

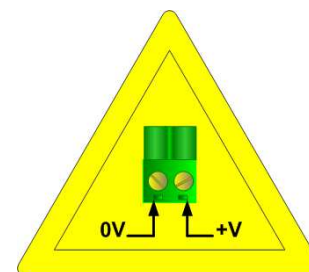
Device	Consumption [W/VA]
HD67154-A1	3.5
HD67154-B2	3.5

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

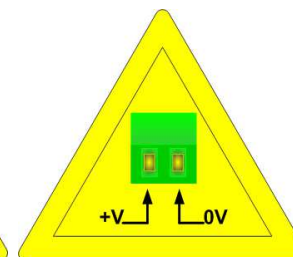


**Connector1:**  
Power Supply port  
0V = Ground  
+V = Positive wire  
V AC: min 8V ; max 24V  
V DC: min 12V ; max 35V

**Caution: Not reverse the polarity power**



HD67154-A1



HD67154-B2

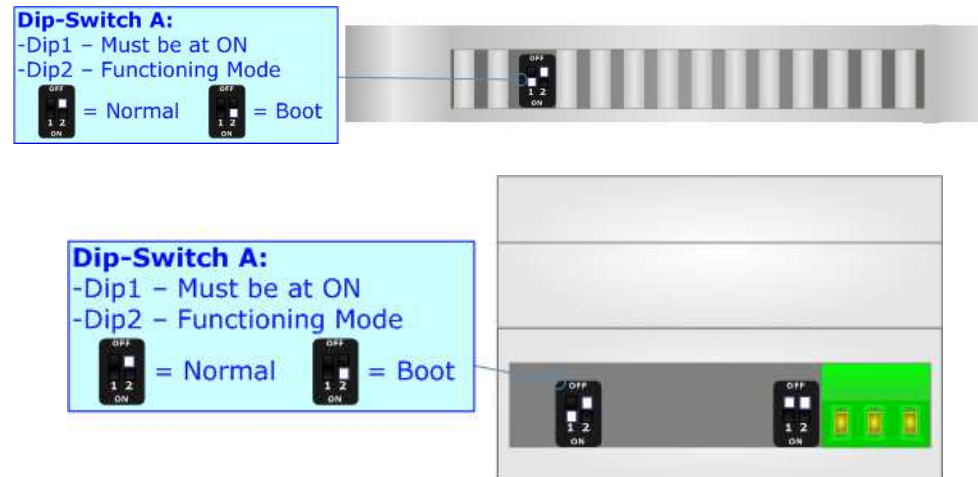
## FUNCTION MODES:

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

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

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

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



**Warning:**

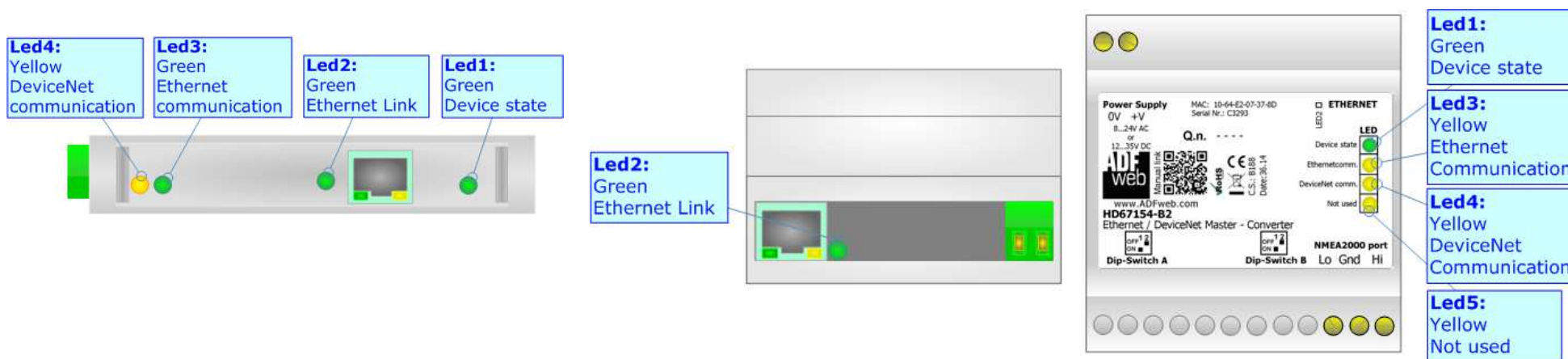
Dip1 of 'Dip-Switch A' must be at ON position to work even if the Ethernet cable is not inserted.



**LEDS:**

The device has got six 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)	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
2: Ethernet Link	<b>ON:</b> Ethernet cable connected <b>OFF:</b> Ethernet cable not connected	<b>ON:</b> Ethernet cable connected <b>OFF:</b> Ethernet cable not connected
3: Ethernet communication	Change state when receive an Ethernet frame	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
4: DeviceNet communication	<b>ON:</b> At least one slave is not communicating with the master <b>OFF:</b> All slaves defined in the project are in communication with the master	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
5: Not used (only for hardware HD67154-B2)	Off	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress



**DEVICENET:**

For terminating the DeviceNet line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch B' for the HD67154-A1 or Dip2 of 'Dip-Switch B' for the HD67154-B2 is at ON position.

**Connector2:**  
DeviceNet port (Isolated port)  
Hi = High wire  
Shl = Shield\* (to Isolated Ground)  
Lo = Low wire

**Dip-Switch B:**  
-Dip1 – DeviceNet Termination Resistor  
-Dip2 – Not used  
OFF ON = Open OFF ON = 120 Ohm



**Dip-Switch B:**  
-Dip1 – Not used  
-Dip2 – DeviceNet Termination Resistor  
OFF ON = Open OFF ON = 120 Ohm



**Connector2:**  
DeviceNet port (Isolated port)  
Hi = High wire  
Shl = Shield\* (to Isolated Ground)  
Lo = Low wire

Cable characteristics:

<b>DC parameter:</b>	Impedance	70 Ohm/m
<b>AC parameters:</b>	Impedance	120 Ohm/m
	Delay	5 ns/m
<b>Length</b>	<b>Baud Rate [bps]</b>	<b>Length MAX [m]</b>
	125 K	500
	250 K	250
	500 K	100

**ETHERNET:**

The Ethernet connection must be made using Connector3 of HD67154-A1 or HD67154-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 an Hub/Switch is recommended the use of a straight cable, to connect the device to a PC/PLC/other is recommended the use of a cross cable.



### USE OF COMPOSITOR SW67154:

To configure the Converter, use the available software that runs with Windows called SW67154. It is downloadable on the site [www.adfweb.com](http://www.adfweb.com) and its operation is described in this document. *(This manual is referenced to the last version of the software present on our web site).* The software works with MSWindows (XP, Vista, Seven, 8; 32/64bit).

When launching the SW67154, the window below appears (Fig. 2).



**Note:**

It is necessary to have installed .Net Framework 4.

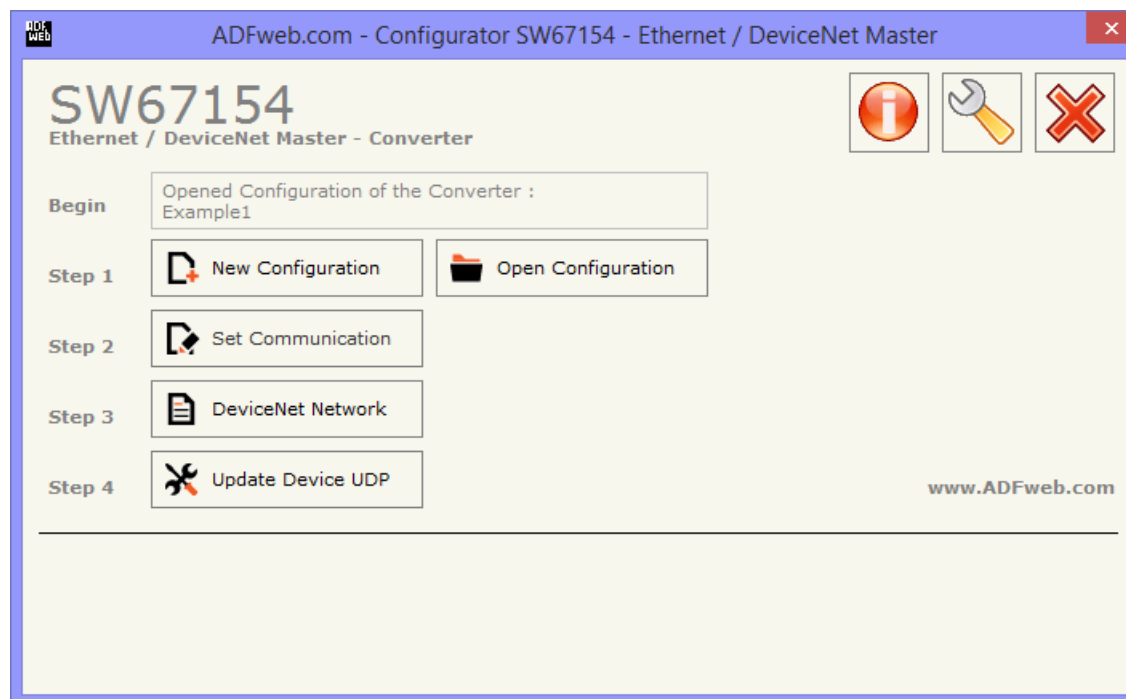
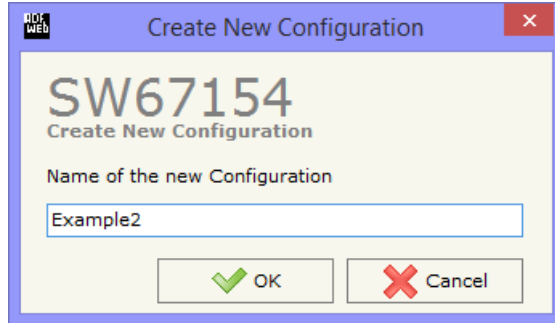


Figure 2: Main window for SW67154

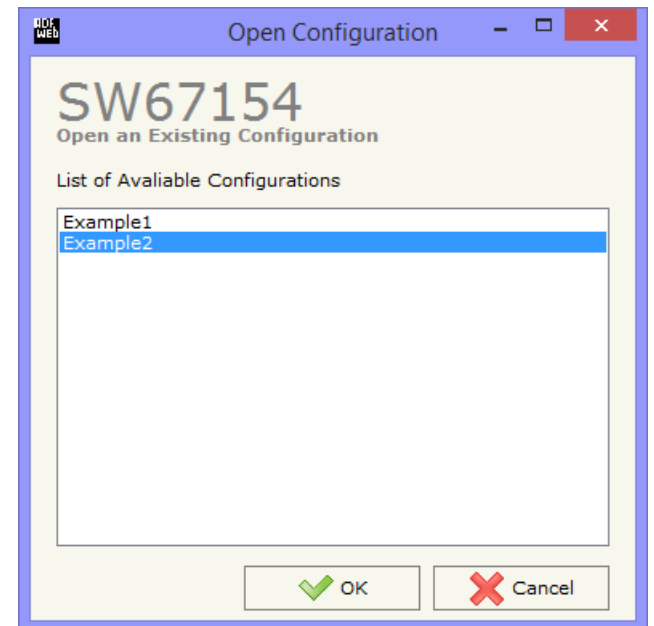
**NEW CONFIGURATION / OPEN CONFIGURATION:**

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




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

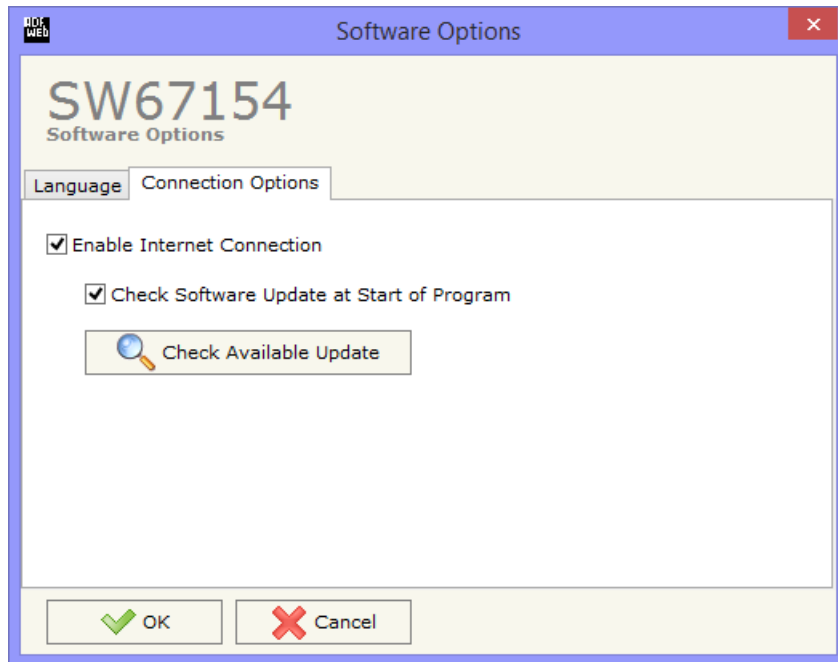
- To clone the configurations of a programmable “Ethernet / DeviecNet Master - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient 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 SW67154 check automatically if there are updatings when it is launched.

**SET COMMUNICATION:**

This section defines the fundamental communication parameters of two buses Ethernet and DeviceNet.

By pressing the **"Set Communication"** button from the main window for SW67154 (Fig. 2), the "Set Communication" window appears (Fig. 3).

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

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

- In the **"ID Device"** Field, the address of the DeviceNet master is defined.
- In the **"Baudrate"** field, the DeviceNet baudrate is defined.

The means of the fields for "Ethernet" are:

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

The screenshot shows a software window titled "Set Communication" for device "SW67154". It is divided into two sections: "DeviceNet Master" and "Ethernet".

- DeviceNet Master:** Contains a text field for "ID Device" with the value "10" and a dropdown menu for "Baudrate" with the value "500K".
- Ethernet:** Contains several fields: "IP ADDRESS" (192.168.0.10), "SUBNET Mask" (255.255.255.0), a checkbox for "GATEWAY" which is unchecked, and a "Port" field with the value "502".

At the bottom of the window are "OK" and "Cancel" buttons.

Figure 3: "Set Communication" window

**DEVICENET NETWORK:**

By pressing the “**DeviceNet Network**” button from the main window for SW67154 (Fig. 2), the window “DeviceNet Network” appears (Fig. 4).

Here it is possible to define the slaves DeviceNet Devices with their ID, number of Input and number of Output bytes.

The data of the columns have the following meanings:

- In the field “**ID Device**” insert the ID of a slave DeviceNet device;
- In the field “**N Byte IN**” insert the number of input byte of the slave DeviceNet;
- In the field “**N Byte OUT**” insert the number of output byte of the slave DeviceNet;
- In the field “**Mnemonic**” is possible to insert a description. It isn't necessary compiling this field, is only a label.

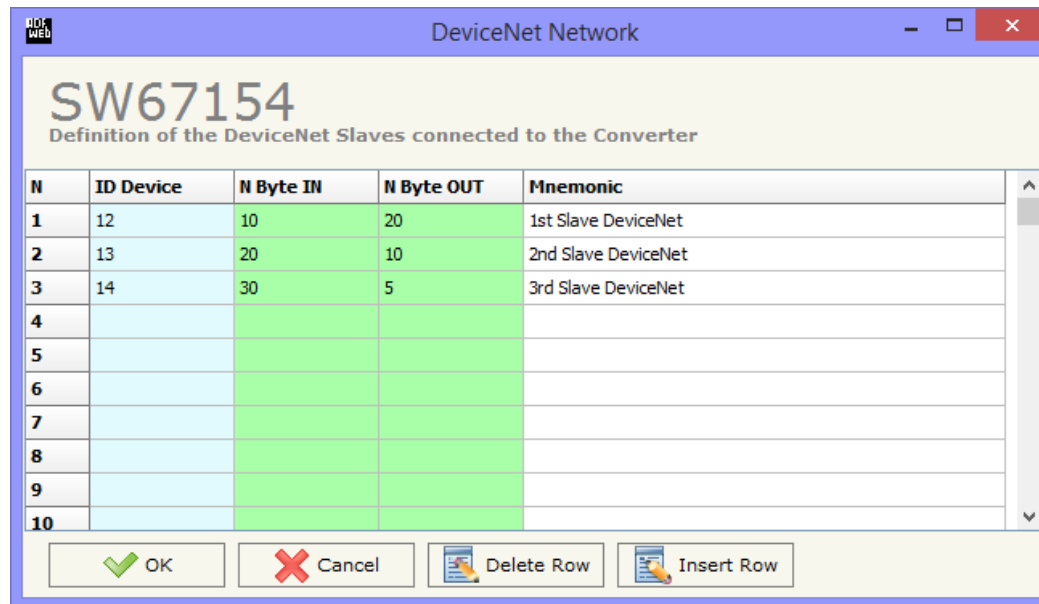


Figure 4: “DeviceNet Network” window

### UPDATE DEVICE:

By pressing the **Update Device UDP** 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' at 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' at OFF position;
- Turn on the device.

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

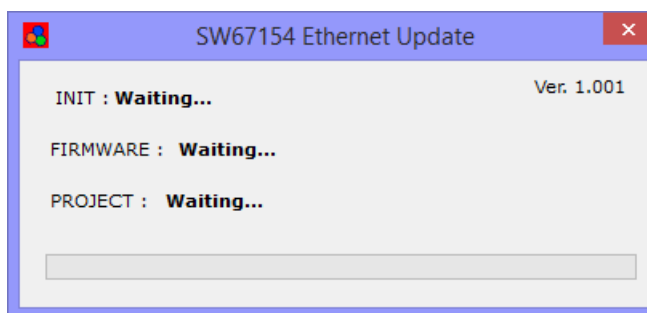
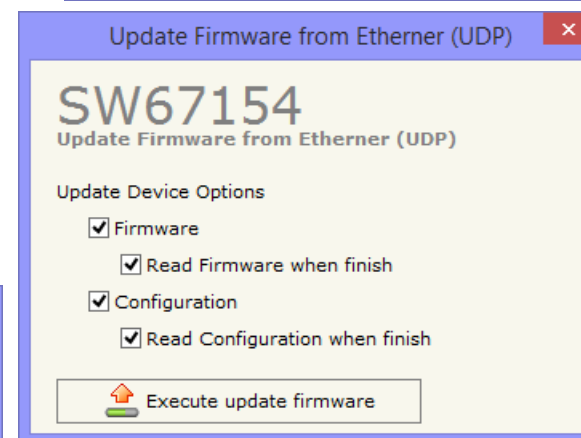
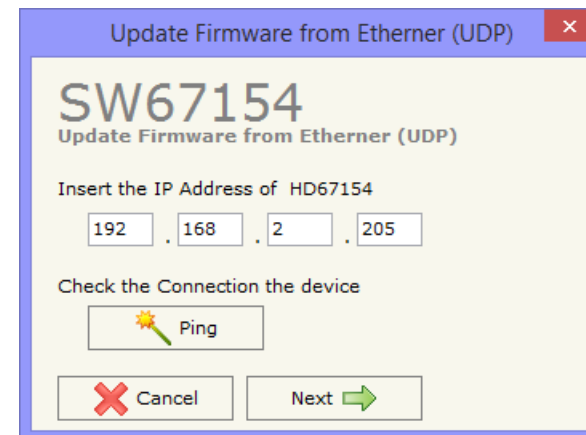


Figure 5: "Update device" windows



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

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

At this point the configuration/firmware on the device is correctly 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 HD67154-A1 or HD67154-B2 device.



**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD67154-A1 or HD67154-B2 device.



**Warning:**

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

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven or Vista or 8, make sure that you have the administrator privileges;
- Take attention at Firewall lock;
- Check the LAN settings.

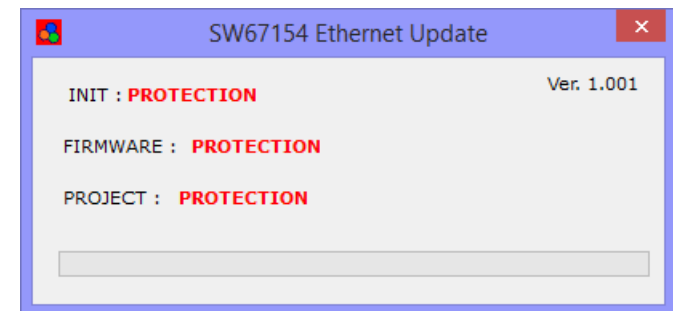


Figure 6: "Protection" window



In the case of HD67154-A1 or HD67154-B2 you have to use the software "SW67154": [www.adfweb.com/download/filefold/SW67154.zip](http://www.adfweb.com/download/filefold/SW67154.zip).

**ETHERNET PROTOCOL:**

This protocol has got two functions for write and read frames. These routines can use both the UDP protocol and the TCP.

**READ FUNCTION:**

The request include the following byte:

Byte Number	Description
1	Type of Operation (Read = 1)
2	ID of the Slave DeviceNet to Read
3	Starting Address Hi
4	Starting Address Lo
5	Number of Byte to Read Hi
6	Number of Byte to Read Lo

The response includes the following byte:

Byte Number	Description
1	Read Error Byte
2÷n+1	Data Read

n=Number of Byte to Read

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

- 0x00: No error;
- 0x01: Starting Address doesn't exist;
- 0x02: Too many Data to Read;
- 0x03: DeviceNet ID not present in the table "DeviceNet Network";
- 0x04: Wrong length of function;
- 0x05: Function not supported.

If the "Read Error Byte" is 1, 2, 3, 4 or 5 there aren't the data after the first byte (frame has got only one byte).

Example:

Slave DeviceNet: 13 ; DeviceNet OUT: 10 ; DeviceNet OUT Array (0...9): \$46 \$47 \$48 \$49 **\$50 \$51 \$52 \$53 \$54 \$55**

REQ: \$01 \$0D \$00 \$04 \$00 \$06

RES: \$00 **\$50 \$51 \$52 \$53 \$54 \$55**

In blue you can see the requested data. There is an offset so first byte of the DeviceNet array is the 0 and not 1.

**WRITE FUNCTION:**

The request include the following byte:

Byte Number	Description
1	Type of Operation (Write = 2)
2	ID of the Slave DeviceNet to Write
3	Starting Address Hi
4	Starting Address Lo
5	Number of Byte to Write Hi
6	Number of Byte to Write Lo
7÷n+6	Data Write

n=Number of Byte to Write

The response includes the following byte:

Byte Number	Description
1	Write Status Byte

The "Write Status Byte" (Byte 1) can have three values:

- 0x00: No error, operation completed with success;
- 0x01: Starting Address doesn't exist;
- 0x02: Too many Data to Write;
- 0x03: DeviceNet ID not present in the table "DeviceNet Network";
- 0x04: Wrong lenght of function;
- 0x05: Function not supported.

Example:

Slave DeviceNet: 13 ; DeviceNet IN: 20 ;

DeviceNet IN Array (0...19): \$65 \$64 \$63 \$62 \$61 \$60 \$59 \$58 \$57 \$56 \$55 \$54 \$53 \$52 \$51 \$50 \$49 \$48 \$47 \$46

REQ: \$01 \$0E \$00 \$02 \$00 \$05 \$30 \$31 \$32 \$33 \$34

RES: \$00

After that the New DeviceNet IN Array is: \$65 \$64 **\$30 \$31 \$32 \$33 \$34** \$58 \$57 \$56 \$55 \$54 \$53 \$52 \$51 \$50 \$49 \$48 \$47 \$46

In blue you can find the data changed.

**READ DIAGNOSTIC:**

With this command is possible to see if all the nodes defined in the "DeviceNet Network" table are in communication with the Converter  
 The request include the following byte:

Byte Number	Description
1	Type of Operation (Read Diagnostic= 3)

The response includes the following byte:

Byte Number	Description
1	Error Byte
2	Device ID of first slave device in the table
3	State (0= Communication not established; 1= Communiacion established)
...	...
...	...
n-1	Device ID of last slave device in the table
n	State

The "Error Byte" (Byte 1) can have three values:

- 0x00: No error;
- 0x04: Wrong lenght of function;
- 0x05: Function not supported.

If the "Error Byte" is 4 or 5 there aren't the data after the first byte (frame has got only one byte).

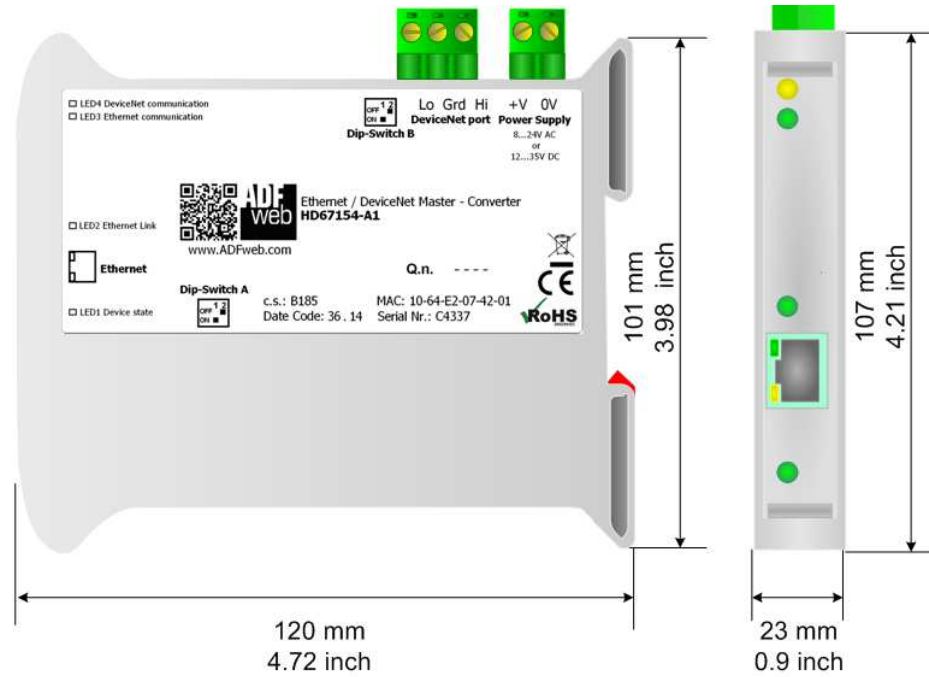
Example:

Slaves defined in the table: 12, 13, 14. Slave 12 and 13 are in communication, slave 14 no.

REQ: \$03

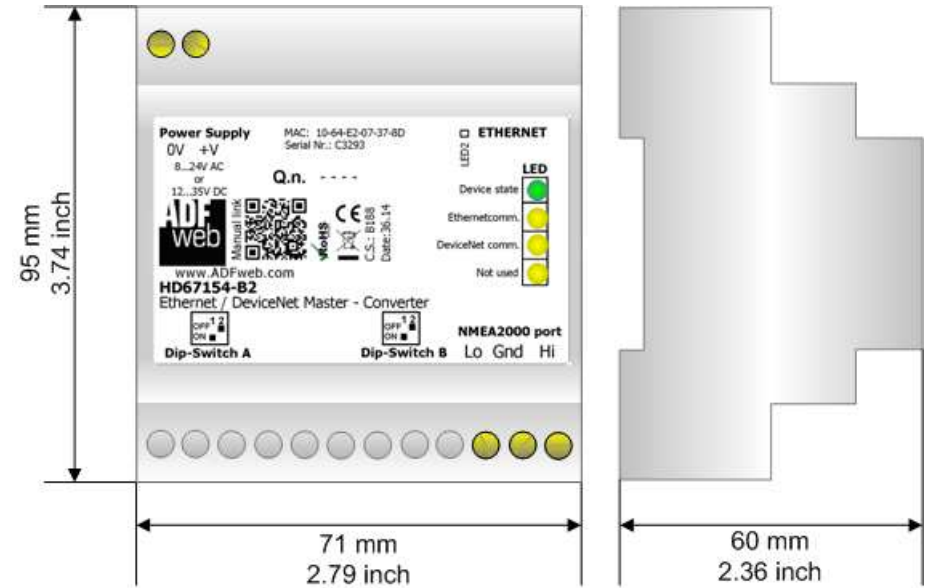
RES: \$00 \$0C \$00 \$0D \$00 \$0E \$01

**MECHANICAL DIMENSIONS:**



Housing: PVC  
Weight: 200g (Approx)

Figure 7: Mechanical dimensions scheme for HD67154-A1

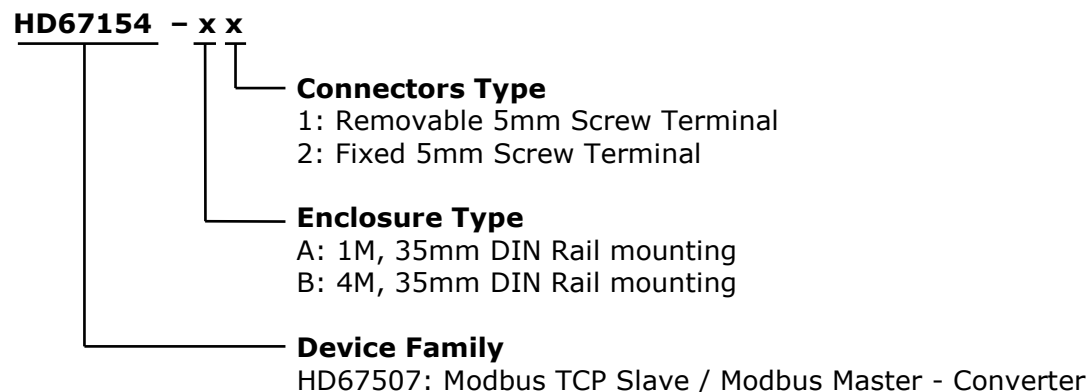


Housing: PVC  
Weight: 200g (Approx)

Figure 8: Mechanical dimensions scheme for HD67154-B2

### ORDERING INFORMATIONS:

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



Order Code: **HD67154-A1** - Ethernet / DeviceNet Master - Converter ( Housing type: A, Terminal Blocks Connectors )

Order Code: **HD67154-B2** - Ethernet / DeviceNet Master - Converter ( Housing type: B, Terminal Blocks Connectors )

### ACCESSORIES:

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

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

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All technical content within this document can be modified without notice. The content of the document is under continual renewal. For losses due to fire, earthquake, third party access or other accidents, or intentional or accidental abuse, misuse, or use under abnormal conditions repairs are charged to the user. ADFweb.com S.r.l. will not be liable for accidental loss of use or inability to use this product, such as loss of business income. ADFweb.com S.r.l. shall not be liable for consequences of improper use.

**OTHER REGULATIONS AND STANDARDS:****WEEE INFORMATION**

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).

— This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and impact of human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

**RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE**

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

**CE MARKING**

The product conforms with the essential requirements of the applicable EC directives.

**WARRANTIES AND TECHNICAL SUPPORT:**

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at [www.adfweb.com](http://www.adfweb.com). Otherwise contact us at the address [support@adfweb.com](mailto:support@adfweb.com)

**RETURN POLICY:**

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

- Obtain a Product Return Number (PRN) from our internet support at [www.adfweb.com](http://www.adfweb.com). Together with the request, you need to provide detailed information about the problem.
- Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.



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