

# User Manual

Revision 1.001  
English

## Modbus Master / Modbus MultiSlave - Converter

(Order Code: HD67146-A1)

for Website information:

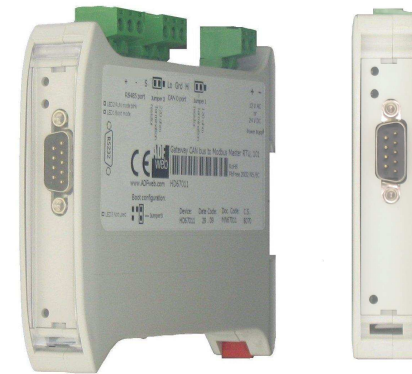
[www.adfweb.com/?Product=HD67146](http://www.adfweb.com/?Product=HD67146)

for Price information:

[www.adfweb.com/?Price=HD67146-A1](http://www.adfweb.com/?Price=HD67146-A1)

### Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Modbus up to 115200bps
- ▶ Industrial temperature range:  
-40°C / +85°C (-40°F / +185°F)



For others Modbus devices, see also the following links:

#### Modbus Master from/to ...

- [www.adfweb.com?Product=HD67141](http://www.adfweb.com?Product=HD67141) (... **DeviceNet Slave**)
- [www.adfweb.com?Product=HD67506](http://www.adfweb.com?Product=HD67506) (... **Ethernet**)
- [www.adfweb.com?Product=HD67011](http://www.adfweb.com?Product=HD67011) (... **CAN**)
- [www.adfweb.com?Product=HD67507](http://www.adfweb.com?Product=HD67507) (... **Modbus TCP Slave**)
- [www.adfweb.com?Product=HD67561](http://www.adfweb.com?Product=HD67561) (... **PROFIBUS Slave**)

#### Modbus Slave from/to ...

- [www.adfweb.com?Product=HD67029](http://www.adfweb.com?Product=HD67029) (... **M-Bus**)
- [www.adfweb.com?Product=HD67222](http://www.adfweb.com?Product=HD67222) (... **NMEA 2000**)
- [www.adfweb.com?Product=HD67510](http://www.adfweb.com?Product=HD67510) (... **Modbus TCP Master**)
- [www.adfweb.com?Product=HD67580](http://www.adfweb.com?Product=HD67580) (... **PROFIBUS Master**)
- [www.adfweb.com?Product=HD67012](http://www.adfweb.com?Product=HD67012) (... **CAN**)
- [www.adfweb.com?Product=HD67151](http://www.adfweb.com?Product=HD67151) (... **DeviceNet Master**)
- [www.adfweb.com?Product=HD67138](http://www.adfweb.com?Product=HD67138) (... **DeviceNet Slave**)

Do you have an your customer protocol?

See the following links:

[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.

To obtain the updated documentation for the product that you own, note the “Document Code” (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site [www.adfweb.com/download/](http://www.adfweb.com/download/)

**REVISION LIST:**

Revision	Date	Author	Chapter	Description
1.000	13/02/2013	Dp	All	First release version
1.001	30/07/2013	Fl	All	Revision

**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**

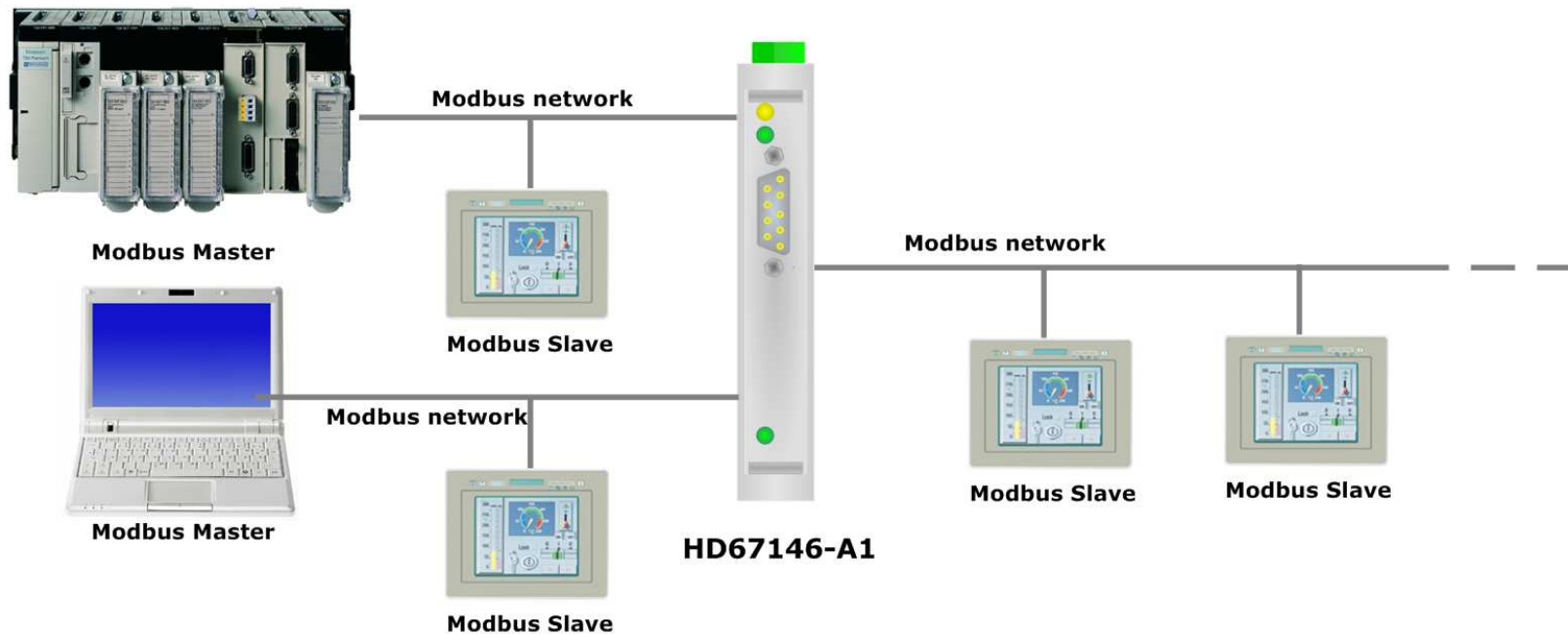
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

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

**EXAMPLE OF CONNECTION:**



Used to communicate with some Modbus slave from two Modbus Master.

**CONNECTION SCHEME:**

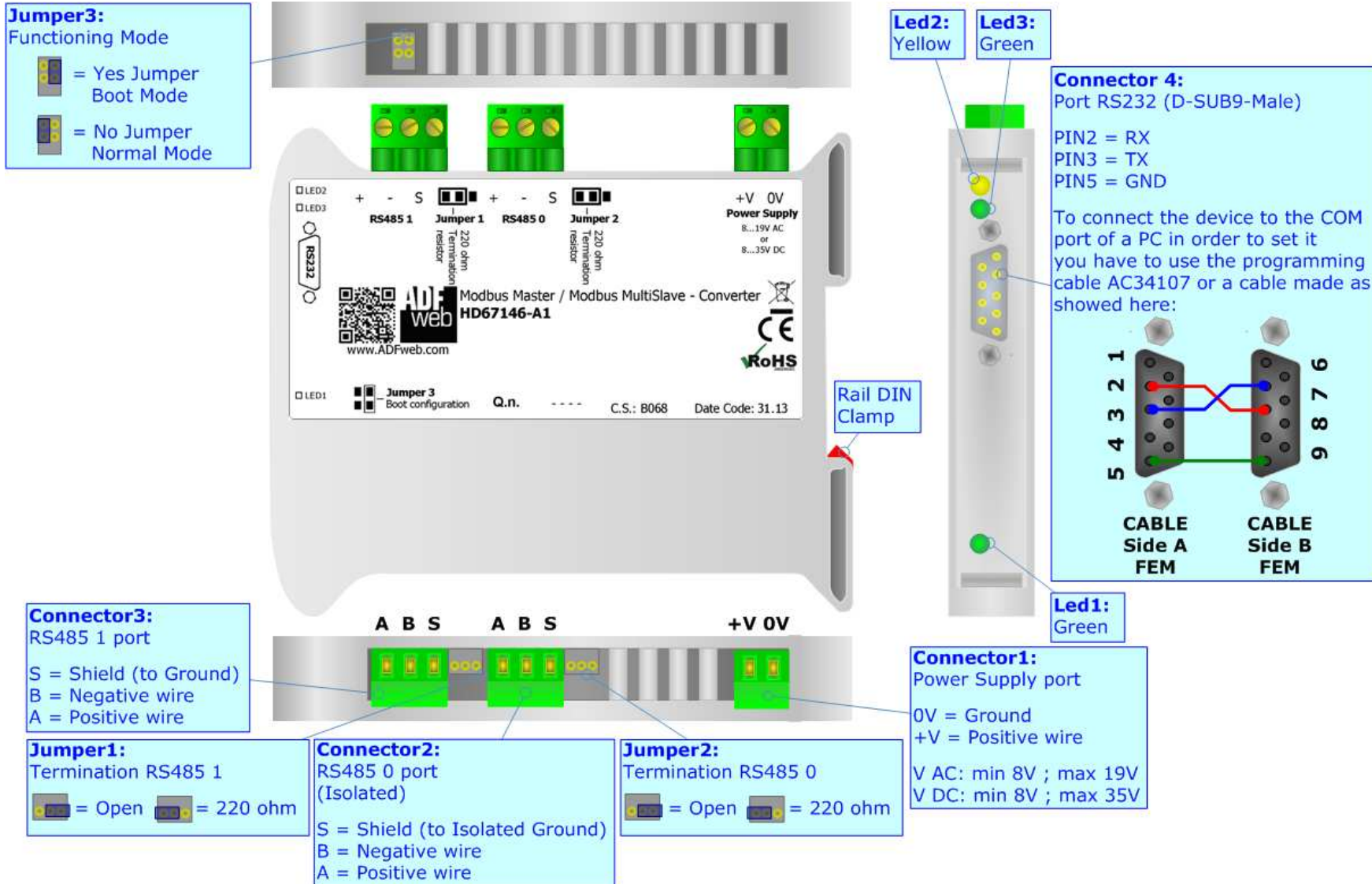


Figure 1: Connection scheme for HD67146-A1

**CHARACTERISTICS:**

The configurable "Modbus Slave / Modbus Slave - Converter" has the following characteristics:

- Galvanic isolation between the two Modbus ports.
- Mountable on 35mm Rail DIN;
- Power Supply 8...19V AC or 8...35V DC;
- Temperature range -40°C to +85°C;
- Accessible Modbus Slave devices from Port 0;
- Accessible Modbus Slave devices from Port 1;

**CONFIGURATION:**

You need Compositor SW67146 software on your PC in order to perform the following:

- Define the parameter of the Modbus Slave (Port 0);
- Define the parameter of the Modbus Slave (Port 1);
- Define the Modbus Slave devices accessible from Port 0;
- Define the Modbus Slave devices accessible from Port 1;
- Define the parameter of the Modbus Master.

**POWER SUPPLY:**

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

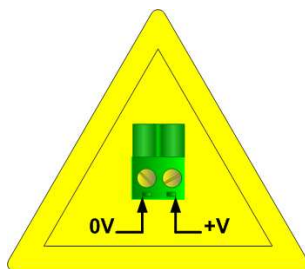
	VAC		VDC	
	Vmin	Vmax	Vmin	Vmax
<b>HD67146-A1</b>	<b>8V</b>	<b>19V</b>	<b>8V</b>	<b>35V</b>

Consumption at 24V DC:

Device	W/VA
HD67146-A1	4

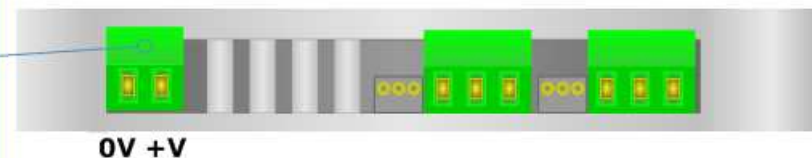


**Caution: Not reverse the polarity power**



HD67146-A1

**Connector1:**  
 Power Supply port  
 0V = Ground  
 +V = Positive wire  
 V AC: min 8V ; max 19V  
 V DC: min 8V ; max 35V



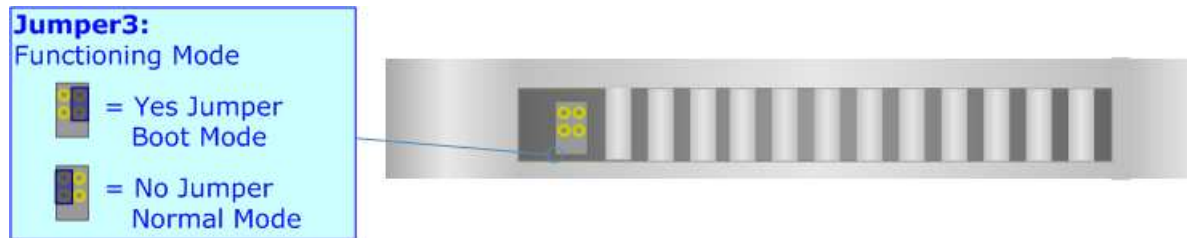
**FUNCTION MODES:**

The device has got two functions mode depending of the position of the Jumper 3 (Boot Jumper):

- The first, without Jumper 3, is used for the normal working of the device.
- The second, with Jumper 3 in position Boot Mode, is used for upload the Project/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).





**LEDS:**

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

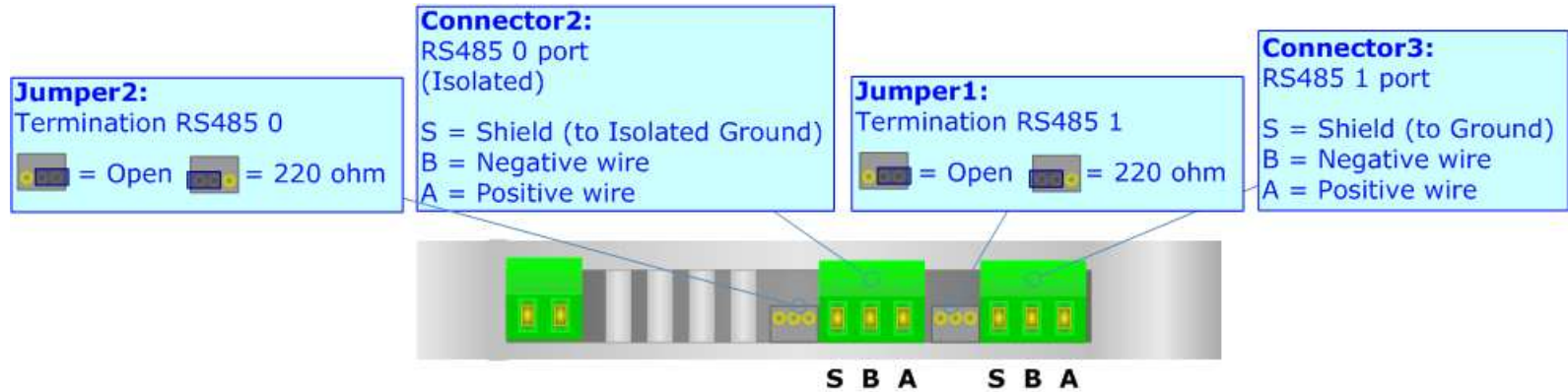
LED	Normal Mode	Boot Mode
1: LED1 (green)	Blinks slowly (~1Hz) Blinks quickly when the device receive a correct Modbus response from the Master port	Blinks quickly
2: LED2 (yellow)	Blinks quickly when the device receive a correct Modbus request from the port 0	Not used
3: LED3 (green)	Blinks quickly when the device receive a correct Modbus request from the port 1	Not used



**RS485:**

For terminate the RS485 line with a 220Ω resistor it is necessary to put the jumper near the terminal block, like in figure.

The RS485 0 is Isolated.



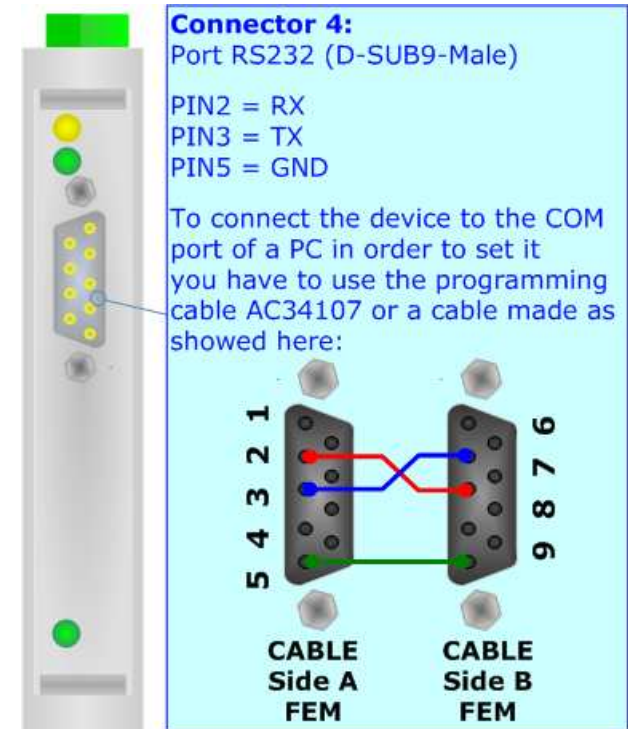
The maximum length of the cable should be 1200m (4000 feet).

Here some codes of cables:

- Belden: p/n 8132 - 2x 28AWG stranded twisted pairs conductor + foil shield + braid shield;
- Belden p/n 82842 - 2x 24AWG stranded twisted pairs conductor + foil shield + braid shield;
- Tasker: p/n C521 - 1x 24AWG twisted pair conductor + foil shield + braid shield;
- Tasker: p/n C522 - 2x 24AWG twisted pairs conductor + foil shield + braid shield.

**RS232:**

The connection from RS232 socket to a serial port (example one from a personal computer) must be made with a Null Modem cable (a serial cable where the pins 2 and 3 are crossed). It is recommended that the RS232 cable not exceed 15 meters.



### USE OF CONFIGURATOR SW67146:

To configure the Converter, use the available software that runs with Windows, called SW67147. 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 (MS 2000, XP, Vista, Seven, 8; 32/64bit).

When launching the SW67146 this window appears (Fig. 2).

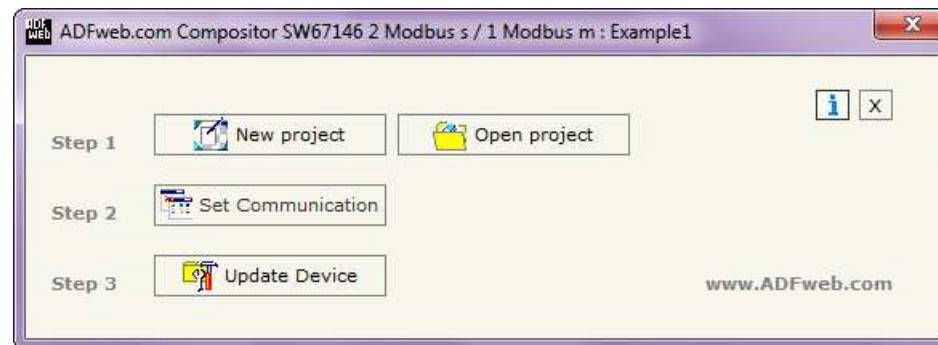
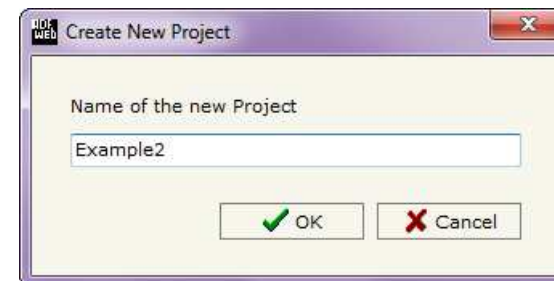
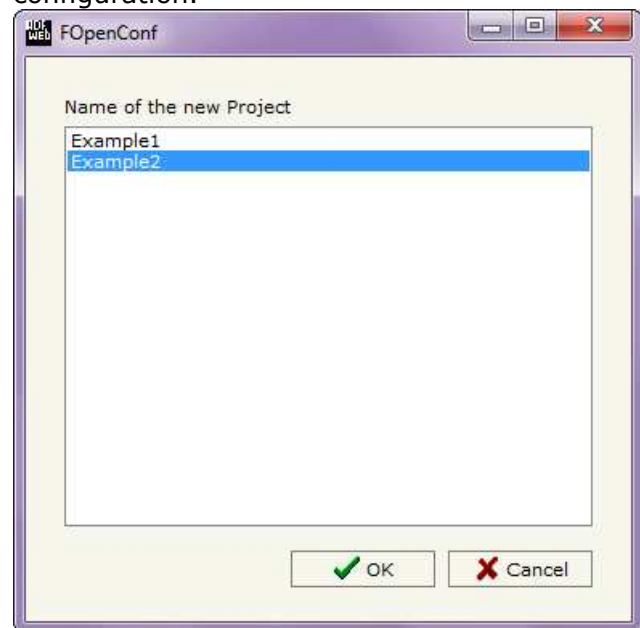


Figure 2: Main window for SW67146

### NEW PROJECT / OPEN PROJECT:

The "New Configuration" button creates the folder which contains the entire device configuration.



A device configuration can also be imported or exported:

- To clone the configurations of a programmable "Modbus Master / Modbus MultiSlave - 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".

## SET COMMUNICATION:

This section defines the fundamental communication parameter of three ports Modbus.

By pressing the **"Set Communication"** button from the main window for SW67146 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The window is divided in three sections: "RS485 0 / RS232 Slave", "RS485 1 Slave" and "RS485 0 / RS232 - Master".

The means of the fields for "RS485 0 / RS232 Slave" are:

- In the field **"Baudrate"** the baud rate for the Modbus is defined;
- In the field **"Parity"** the parity of the Modbus is defined;
- In the field **"Accessible Devices List"** the IDs of the Modbus Slaves accessible from the master connected to the Port 0 is defined;

The means of the fields for "RS485 1 Slave" are:

- In the field **"Baudrate"** the baud rate for the Modbus is defined;
- In the field **"Parity"** the parity of the Modbus is defined;
- In the field **"Accessible Devices List"** the IDs of the Modbus Slaves accessible from the master connected to the Port 1 is defined;

The means of the fields for "RS485 0 / RS232 - Master" are:

- In the field **"Serial"** is possible to select the serial used for the Master Modbus between **"RS232"** and **"RS485"**.
- In the field **"Baudrate"** the baud rate for the Modbus Master is defined;
- In the field **"Parity"** the parity of the Modbus Master is defined;
- In the field **"TimeOut"** there is the maximum time that the device attends for the answer from the Slave interrogated.

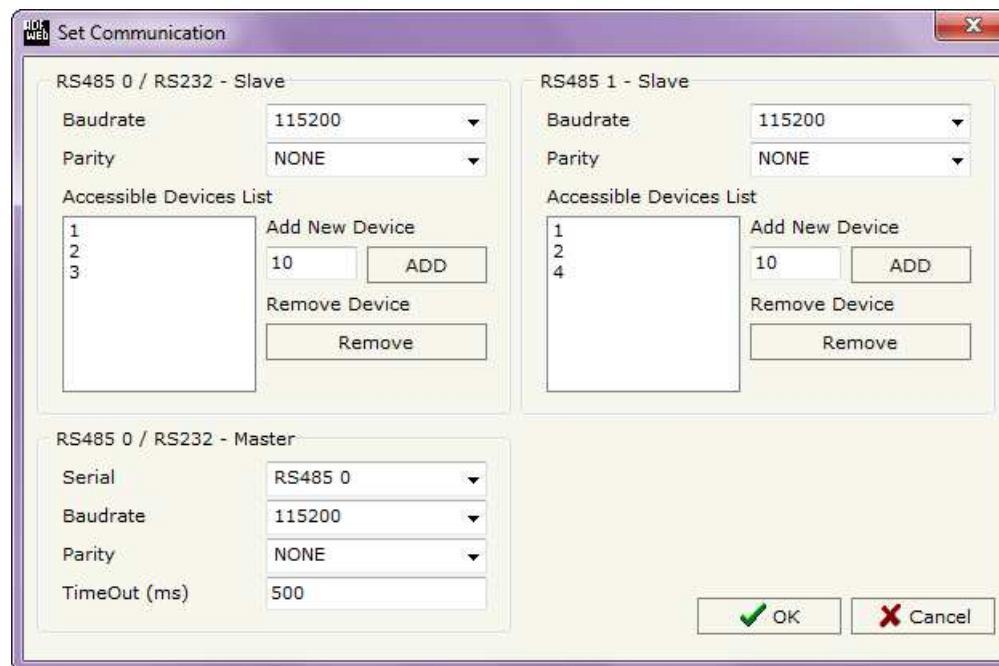


Figure 3: "Set Communication" window

**UPDATE DEVICE:**

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

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

- Turn off the Device;
- Connect the RS232 Null Modem Cable form your PC to the Gateway;
- Insert the Jumper 3 (Boot Jumper) (see "FUNCTION MODES" section);
- Select the **"COM port"** and press the **"Connect"** button;
- Turn on the device;
- Check the BOOT 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;
- Disconnect the Jumper 3 (Boot jumper);
- Disconnect the USB or RS232 Cable;
- Turn on the device.

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

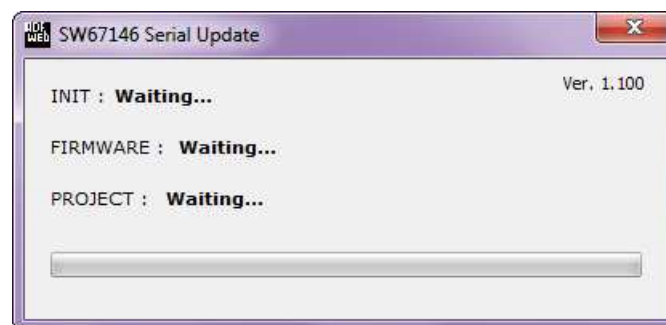


Figure 4: "Update Device" windows

**Note:**

When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67146-A1.

**Note:**

When you receive the device, for the first time, you have to update also the Firmware in the HD67146-A1 devices.

**Warning:**

If the Fig. 5 appears when you try to do the Update before require assistance try these points:

- 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 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, make sure that you have the administrator privileges;
- Take attention at Firewall lock.

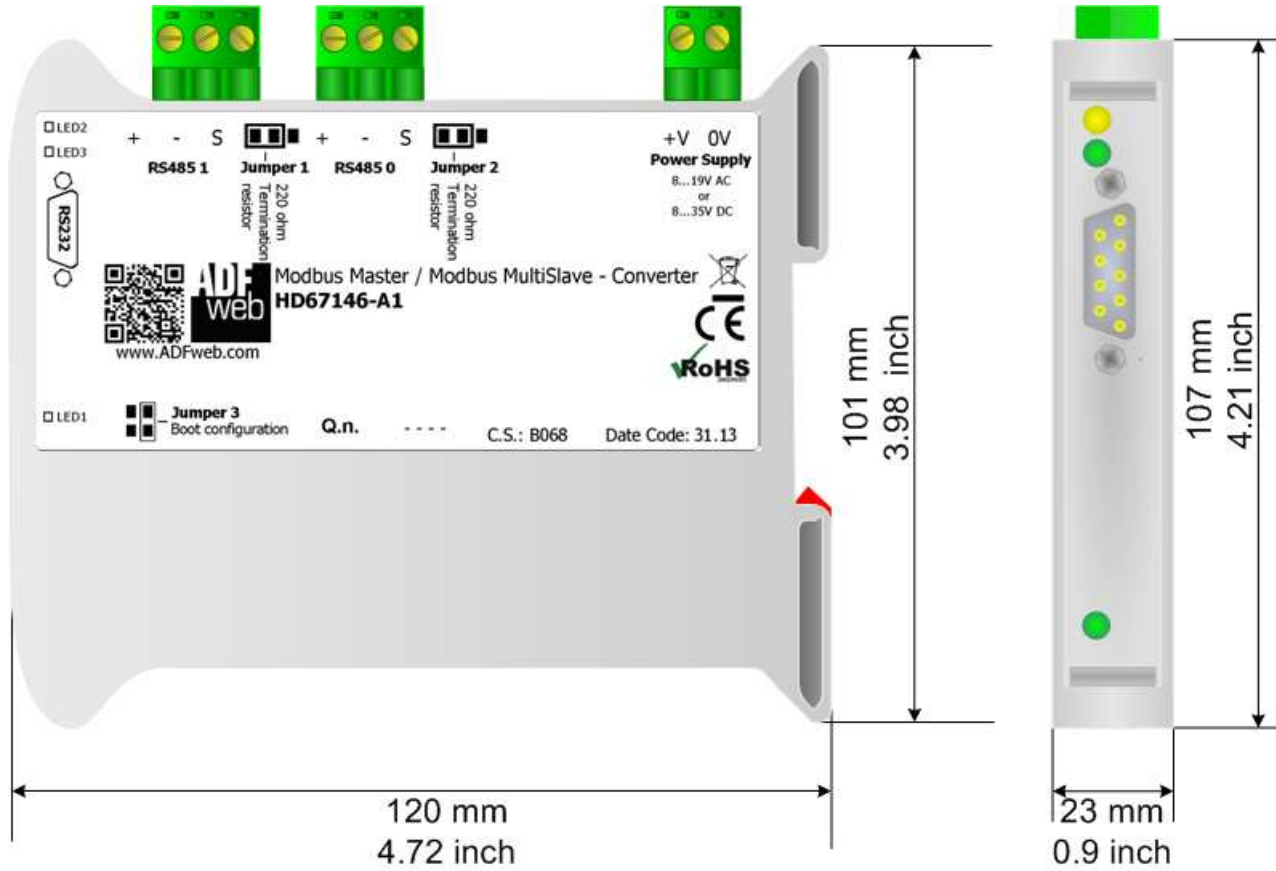


Figure 5: "Protection" window



In the case of HD67146-A1 you have to use the software "SW67146": [www.adfweb.com/download/filefold/SW67146.zip](http://www.adfweb.com/download/filefold/SW67146.zip).

**MECHANICAL DIMENSIONS:**



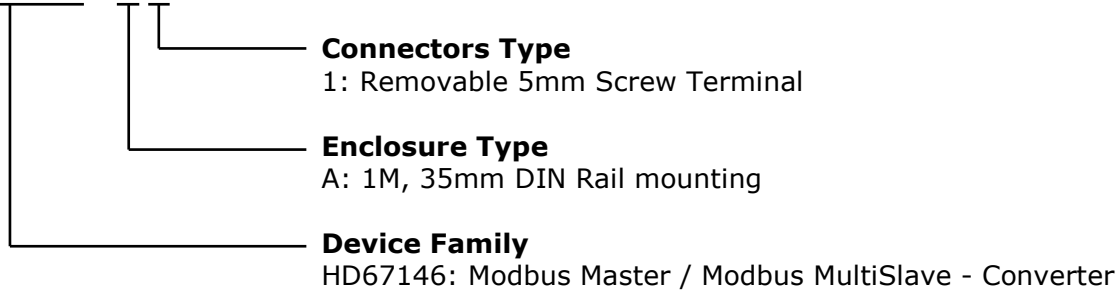
Housing: PVC  
Weight: 200g (Approx)

Figure 6: Mechanical dimensions scheme for HD67146-A1

**ORDERING INFORMATIONS:**

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

**HD67146 - A 1**



Order Code: **HD670146-A1** - Modbus Master / Modbus MultiSlave - Converter

**ACCESSORIES:**

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

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



## DISCLAIMER

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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 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.