ADFweb

Industrial Electronic Devices

User Manual

Revision 1.002
English

Modbus Slave / Modbus Slave - Converter

(Order Code: HD67147-A1)

for Website information:
www.adfweb.com/?Product=HD67147

for Price information:
www.adfweb.com/?Price=HD67147-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	(... DeviceNet Slave)
www.adfweb.com?Product=HD67506	(... Ethernet)
www.adfweb.com?Product=HD67011	(... CAN)
www.adfweb.com?Product=HD67507	(... Modbus TCP Slave)
www.adfweb.com?Product=HD67561	(... PROFIBUS Slave)

Modbus Slave from/to ...

www.adfweb.com?Product=HD67029	(... M-Bus)
www.adfweb.com?Product=HD67222	(... NMEA 2000)
www.adfweb.com?Product=HD67510	(... Modbus TCP Master)
www.adfweb.com?Product=HD67580	(... PROFIBUS Master)
www.adfweb.com?Product=HD67012	(... CAN)
www.adfweb.com?Product=HD67151	(... DeviceNet Master)
www.adfweb.com?Product=HD67138	(... DeviceNet 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.

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/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	11/02/2013	Dp	All	First release version
1.001	12/02/2012	Dp	All	Revision
1.002	13/02/2013	Nt	All	Added new chapters

WARNING:

ADFweb.com reserves the right to change information in this manual about our product without warning.
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.

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EXAMPLE OF CONNECTION:
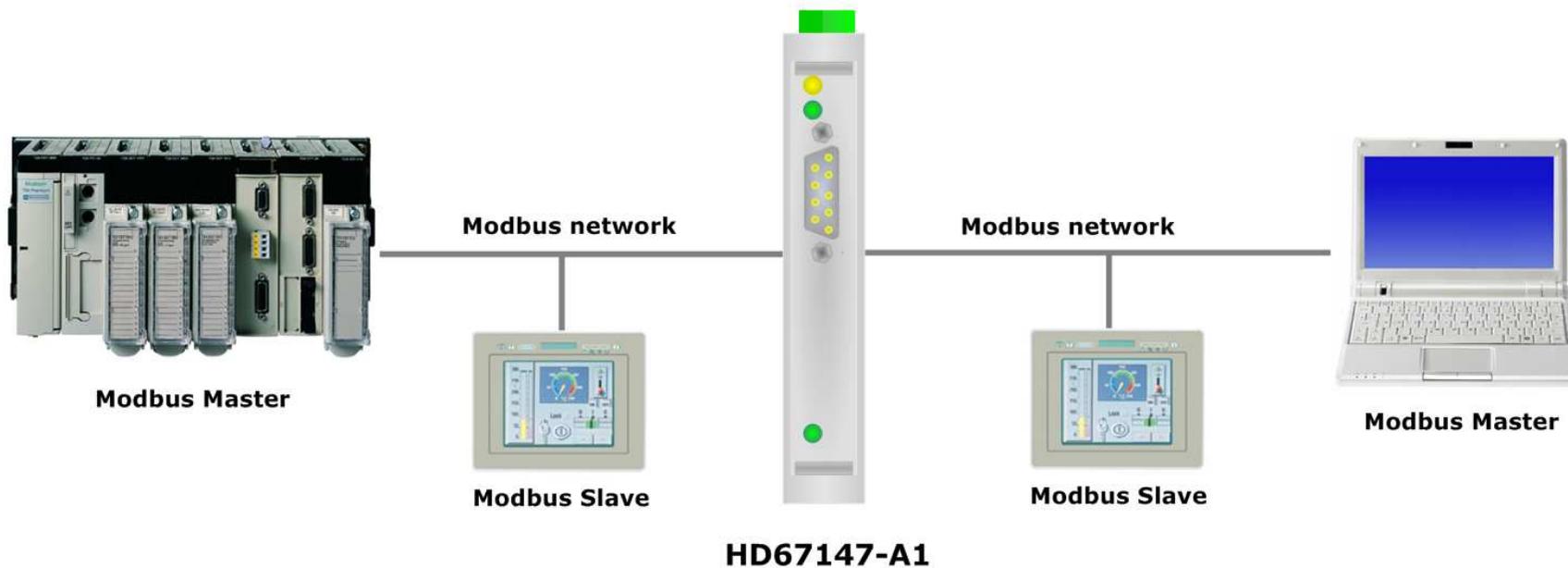
HD67147-A1

Used to connect two Modbus Master, it allows to connect two Modbus Master and exchange data between them.
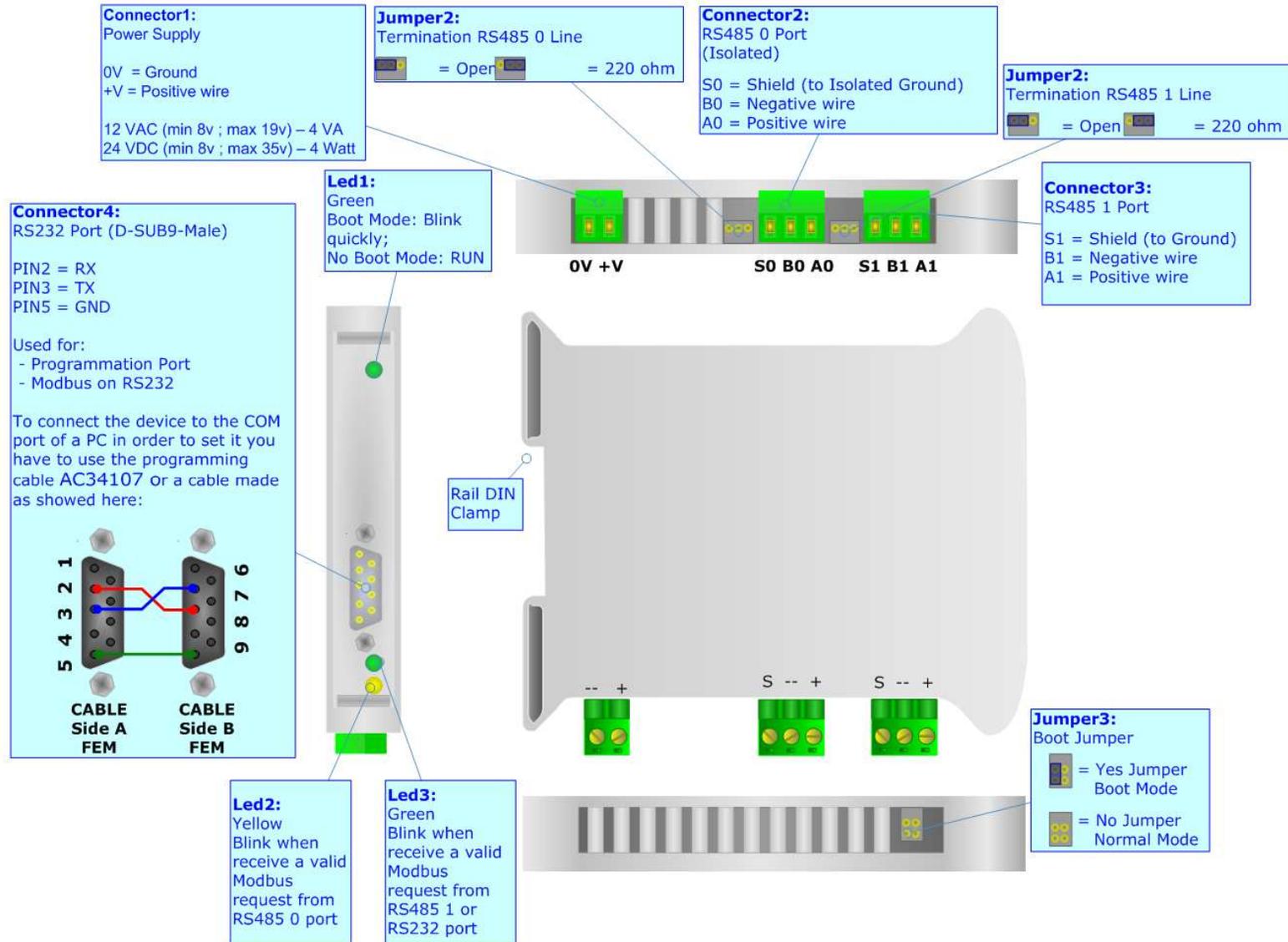
CONNECTION SCHEME:

Connector1:
Power Supply

0V = Ground
+V = Positive wire

12 VAC (min 8v ; max 19v) – 4 VA
24 VDC (min 8v ; max 35v) – 4 Watt

Jumper2:
Termination RS485 0 Line

= Open   = 220 ohm

Connector2:
RS485 0 Port
(Isolated)

S0 = Shield (to Isolated Ground)
B0 = Negative wire
A0 = Positive wire

Jumper2:
Termination RS485 1 Line

= Open   = 220 ohm

Connector4:
RS232 Port (D-SUB9-Male)

PIN2 = RX
PIN3 = TX
PIN5 = GND

Used for:
 - Programmation Port
 - Modbus on RS232

To connect the device to the COM
port of a PC in order to set it you
have to use the programming
cable AC34107 or a cable made
as showed here:

Led1:
Green
Boot Mode: Blink
quickly;
No Boot Mode: RUN

0V +V   S0 B0 A0   S1 B1 A1

Connector3:
RS485 1 Port

S1 = Shield (to Ground)
B1 = Negative wire
A1 = Positive wire

CABLE
Side A
FEM

CABLE
Side B
FEM

Rail DIN
Clamp

-- +   S -- +   S -- +

Jumper3:
Boot Jumper

= Yes Jumper
   Boot Mode

= No Jumper
   Normal Mode

Led2:
Yellow
Blink when
receive a valid
Modbus
request from
RS485 0 port

Led3:
Green
Blink when
receive a valid
Modbus
request from
RS485 1 or
RS232 port

Figure 1: Connection scheme for HD67147-A1

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CHARACTERISTICS:

The configurable "Modbus Slave / Modbus Slave - Converter" allows 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;
➥ Up to 4000 Modbus Register;
➥ Up to 4000 Modbus Staus;

CONFIGURATION:

You need Compositor SW67147 software on your PC in order to perform the following:

➥ Define the parameter of the Modbus (RS485 Port 0);
➥ Define the parameter of the Modbus (RS485 Port 1 or RS232);
➥ Define the Offset of Modbus Register and Status.

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**
HD67147-A1	**8V**	**19V**	**8V**	**35V**

Consumption at 24V DC:

Device	**W/VA**
HD67147-A1	4

⚠️ **Caution: Not reverse the polarity power**
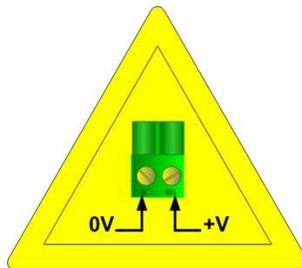
HD67147-A1

Connector1:
Power Supply

0V = Ground
+V = Positive wire

12 VAC (min 8v ; max 19v) – 4 VA
24 VDC (min 8v ; max 35v) – 4 Watt

0V +V

Industrial Electronic Devices
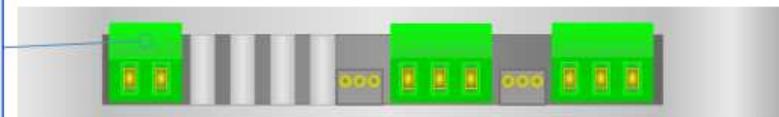
FUNCTION MODES:

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).
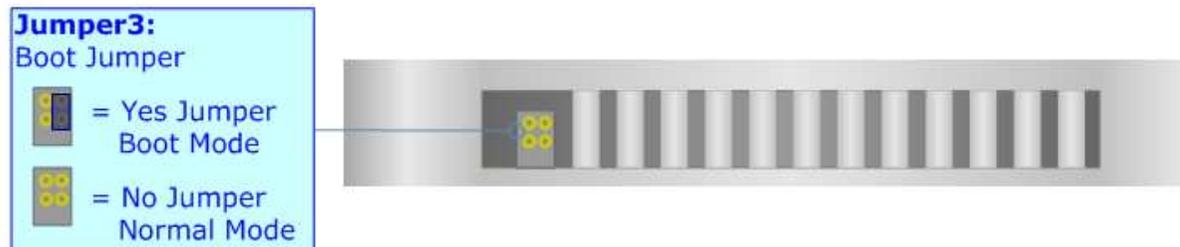
LEDS:

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: Normal/Boot Mode (green)	**Flashing:** Device is in Normal Mode	**Blinks quickly:** Device is in Boot Mode
2: Port 0 (RS485) communication (yellow)	**Flashing:** Device receive a correct Modbus request from the port 0	**Not Used**
3: Port 1 (RS485 or RS232) communication (green)	**Flashing:** Device receive a correct Modbus request from the port 1	**Not Used**
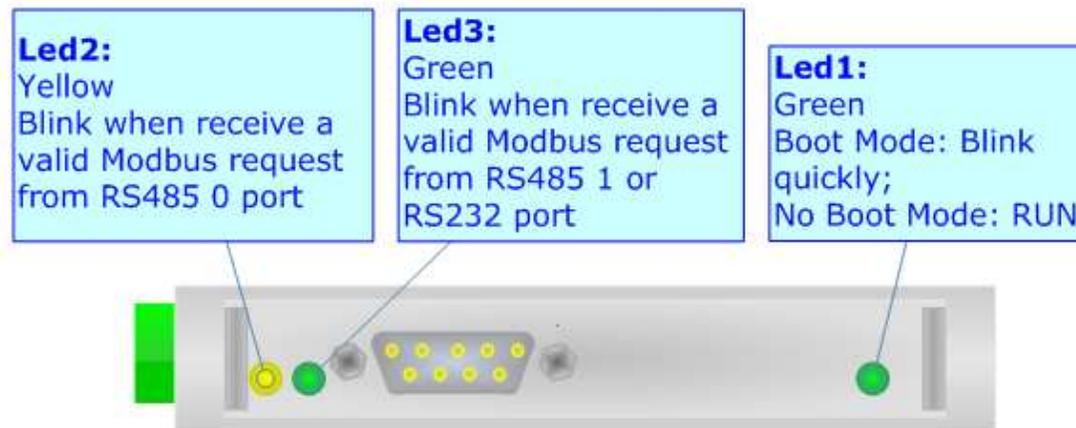
RS485:

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 Port 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.
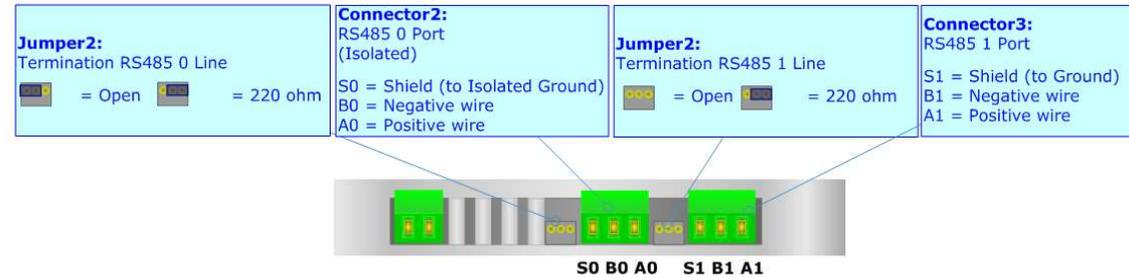
RS232:

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.

Industrial Electronic Devices
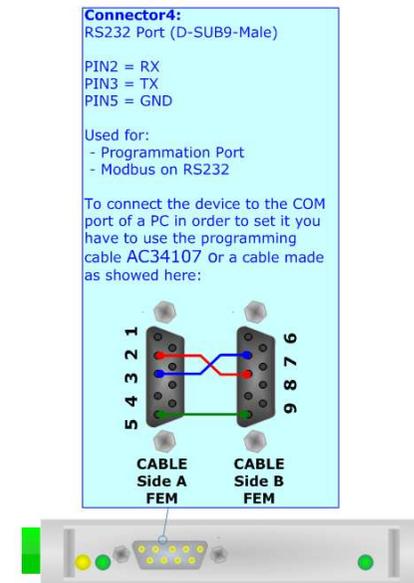
USE OF CONFIGURATOR SW67147:

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

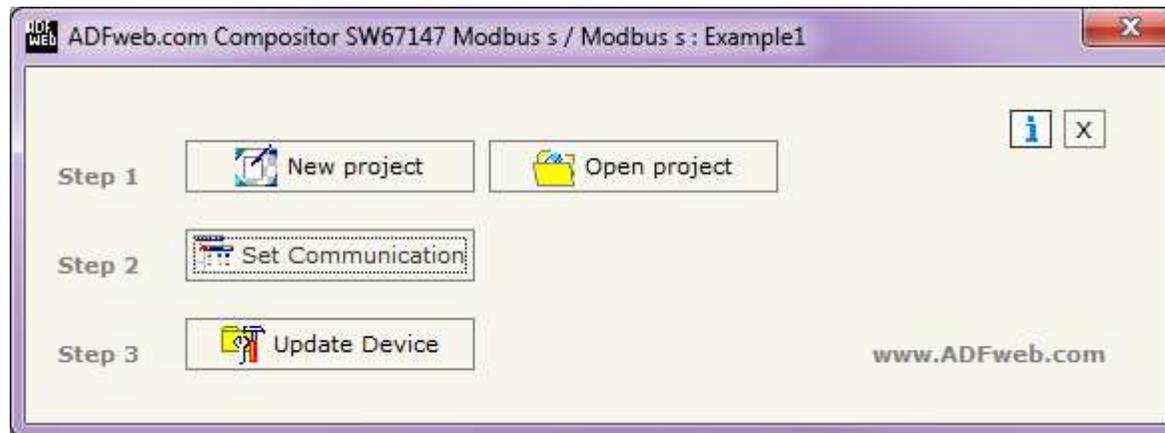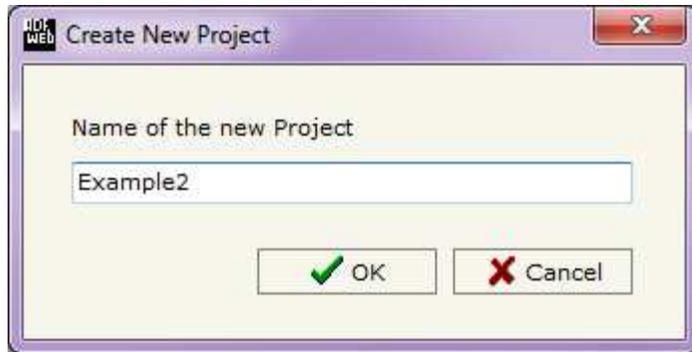When launching the SW67147 this window appears (Fig. 2).
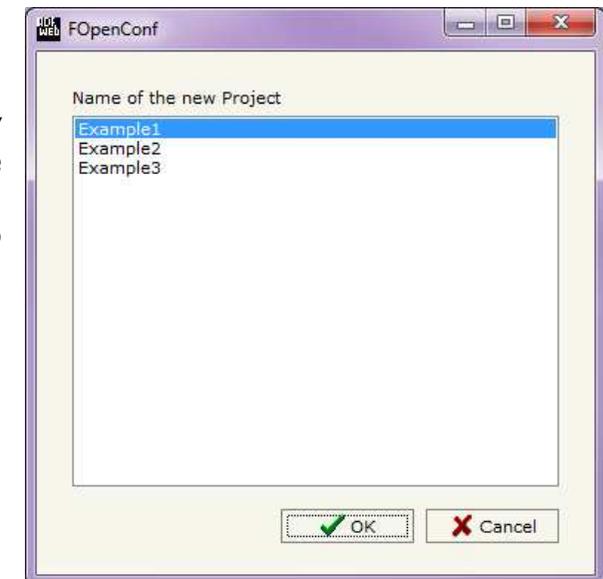

Figure 2: Main window for SW67147

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 "PROFINET / PROFIBUS 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**".

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SET COMMUNICATION:

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

By pressing the "**Set Communication**" button from the main window for SW67147 (Fig. 2) the window "SET COMMUNICATION" appears (Fig. 3).

The window is divided in three sections, Port 0, Port 1 and Options.

The means of the fields for "Port 0 (RS485)" are:

➤ In the field "**Baudrate**" the baud rate for the Modbus (Port 0) is defined;
➤ In the field "**Parity**" the parity of the Modbus (Port 0) is defined;
➤ In the field "**Device ID**" the address of the Modbus (Port 0) is defined;

The means of the fields for "Port 1 (RS232/RS485)" are:

➤ In the field "**Serial**" the serial to use for the Modbus is defined (RS232 or RS485);
➤ In the field "**Baudrate**" the baud rate for the Modbus (Port 1) is defined;
➤ In the field "**Parity**" the parity of the Modbus (Port 1) is defined;
➤ In the field "**Device ID**" the address of the Modbus (Port 1) is defined;

The means of the fields for "Options" are:

➤ In the fields "**Offset Registers**" insert the Offset of Modbus registers to use with Modbus;
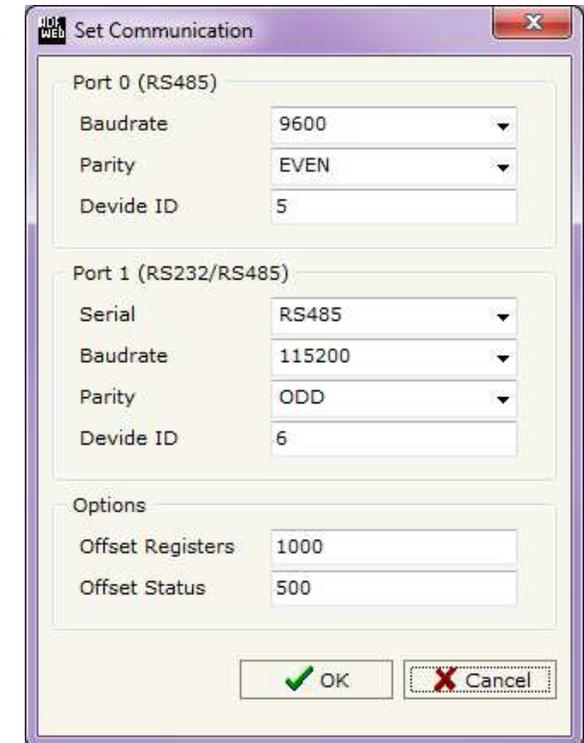➤ In the fields "**Offset Status**" insert the Offset of Modbus status to use with Modbus;

Figure 3: "Set Communication" window

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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.
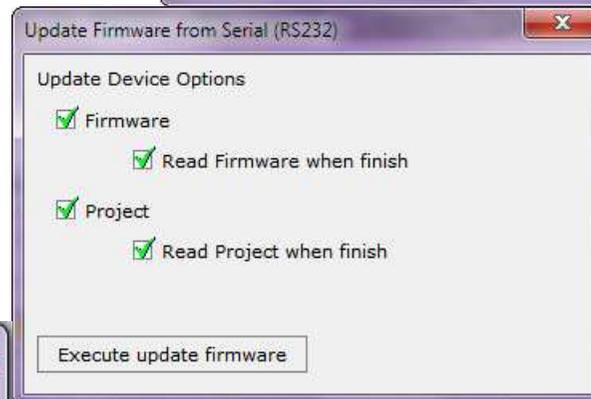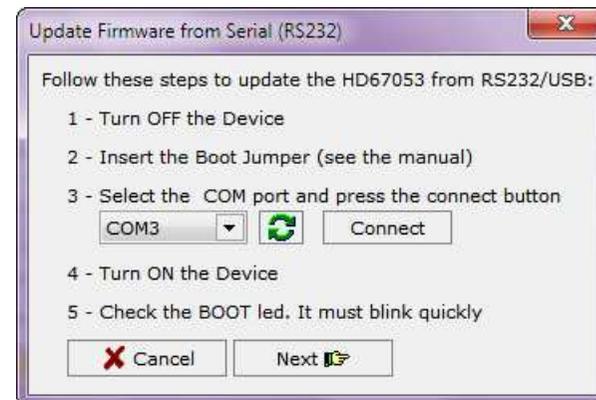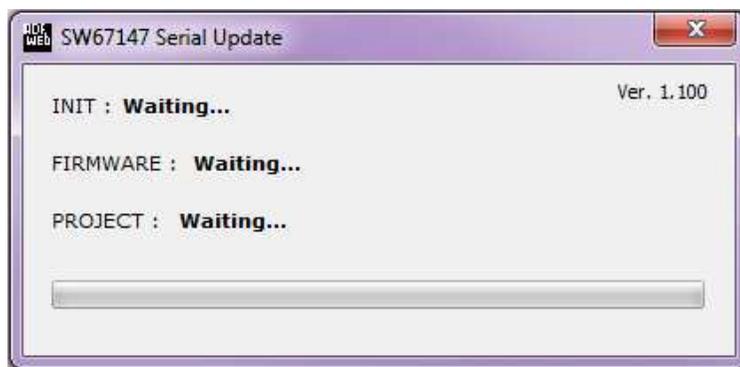
Figure 5: "Update Device" windows

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 HD67147-A1.

Note:
   When you receive the device, for the first time, you have to update also the Firmware in the HD67147-A1 devices.

Warning:
   If the Fig. 6 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 6: "Protection" window

⚠ In the case of HD67147-A1 you have to use the software "SW67147": www.adfweb.com\download\filefold\SW67147.zip.
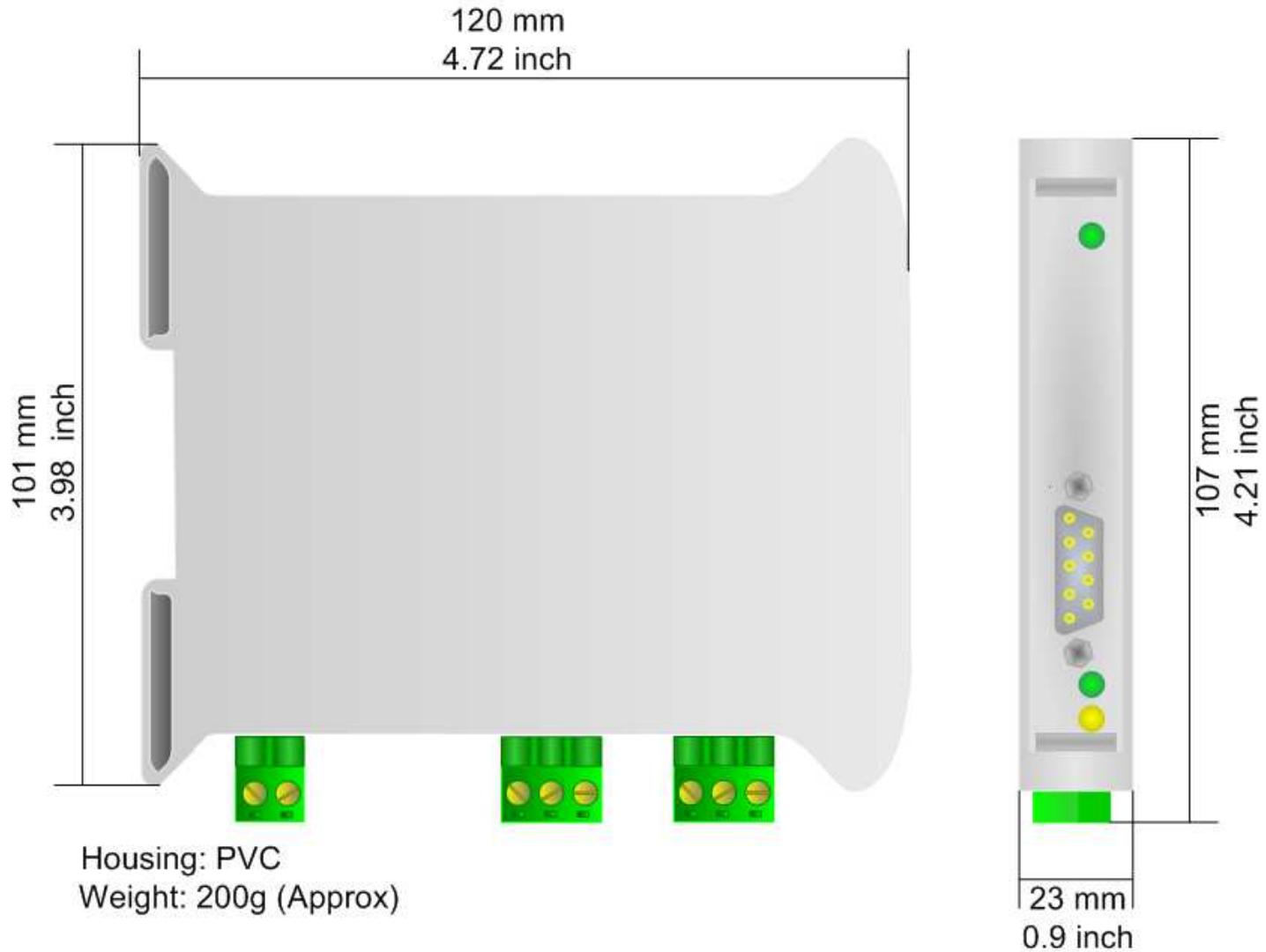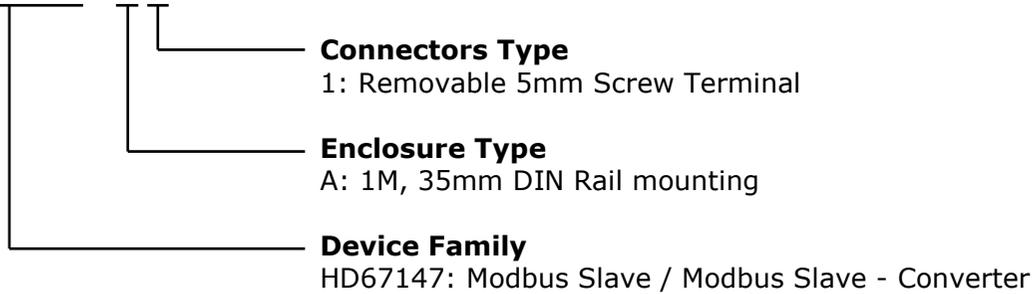
MECHANICAL DIMENSIONS:

120 mm
4.72 inch

101 mm
3.98 inch

107 mm
4.21 inch

Housing: PVC
Weight: 200g (Approx)

23 mm
0.9 inch

Figure 16: Mechanical dimensions scheme for HD67147-A1

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ORDERING INFORMATIONS:

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

HD67147 – A 1

Connectors Type
1: Removable 5mm Screw Terminal

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

Device Family
HD67147: Modbus Slave / Modbus Slave - Converter

Order Code: **HD670147-A1**   **-**   Modbus Slave / Modbus Slave - 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

All technical content within this document can be modified without notice. The content of the document content is a recurring audit.
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 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.

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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.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67181	CAN bus Repeater	www.adfweb.com?product=HD67181
HD67316	CAN bus Analyzer	www.adfweb.com?product=HD67316