

User Manual

Revision 1.002
English

EtherNet/IP / Serial - Converter

(Order Code: HD67590-232-A1, HD67590-485-A1)

For Website information:

www.adfweb.com?Product=HD67590

For Price information:

www.adfweb.com?Price=HD67590-232-A1

www.adfweb.com?Price=HD67590-485-A1

Benefits and Main Features:

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



Other
Products



For other EtherNet/IP products see also the following link:

Converter EtherNet/IP to

- www.adfweb.com?Product=HD67077
- www.adfweb.com?Product=HD67595
- www.adfweb.com?Product=HD67597
- www.adfweb.com?Product=HD67598
- www.adfweb.com?Product=HD67599
- www.adfweb.com?Product=HD67589
- www.adfweb.com?Product=HD67591
- www.adfweb.com?Product=HD67591
- www.adfweb.com?Product=HD67592
- www.adfweb.com?Product=HD67592

- (M-Bus)**
- (CAN)**
- (DeviceNet Master)**
- (DeviceNet Slave)**
- (J1939)**
- (NMEA 2000)**
- (Modbus Master RS232)**
- (Modbus Master RS485)**
- (Modbus Slave RS232)**
- (Modbus Slave RS485)**

Do you have your customer protocol? Then go to:

www.adfweb.com?Product=HD67003

Do you need to choose a device? Do you want help?

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
Revision	Date	Author	Chapter	Description
1.000	21/06/2012	Fl	All	First release version
1.001	04/04/2013	Nt	All	Added new chapters
1.002	05/08/2014	Ff	All	Revision

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:

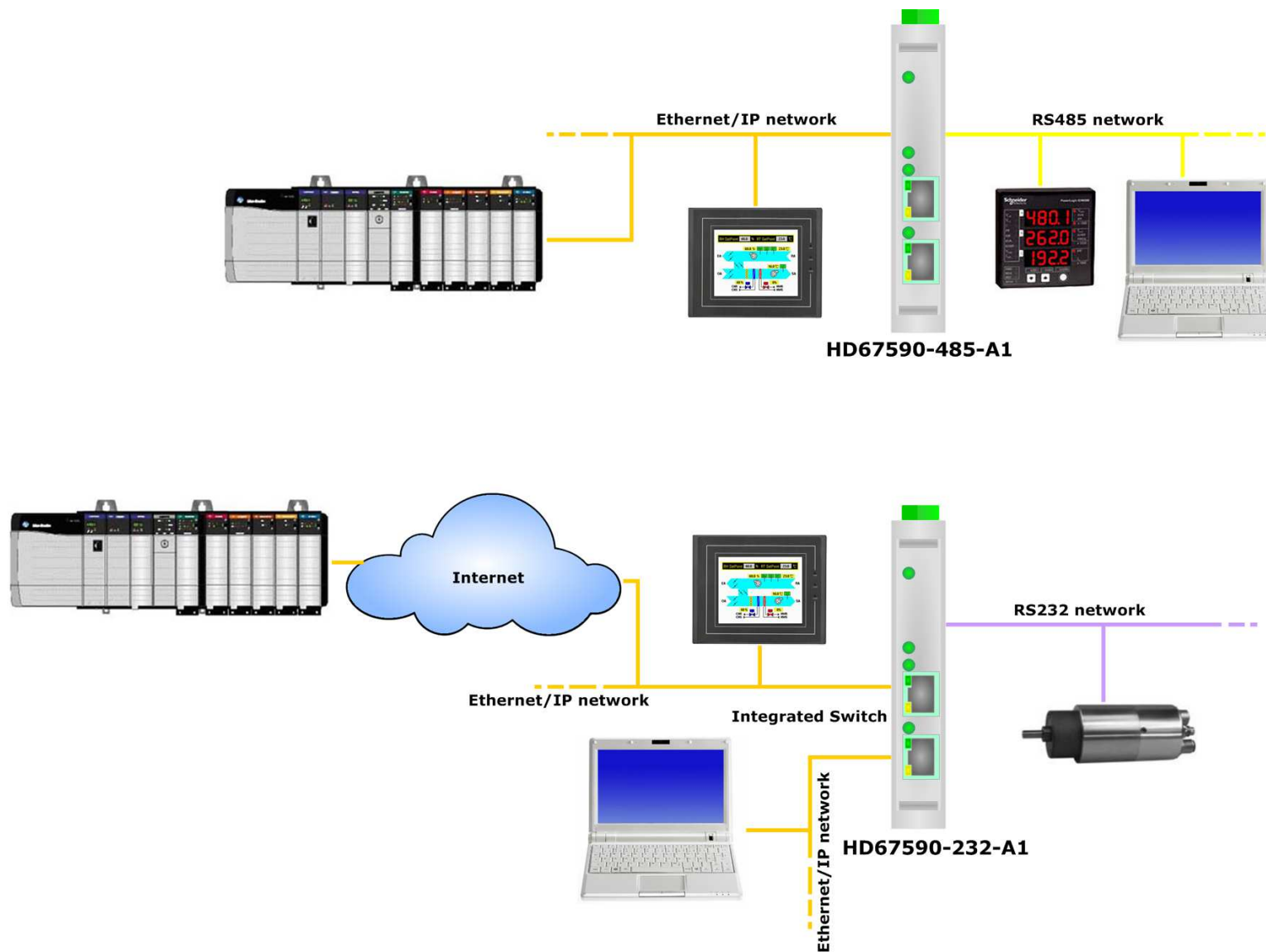


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY

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

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

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

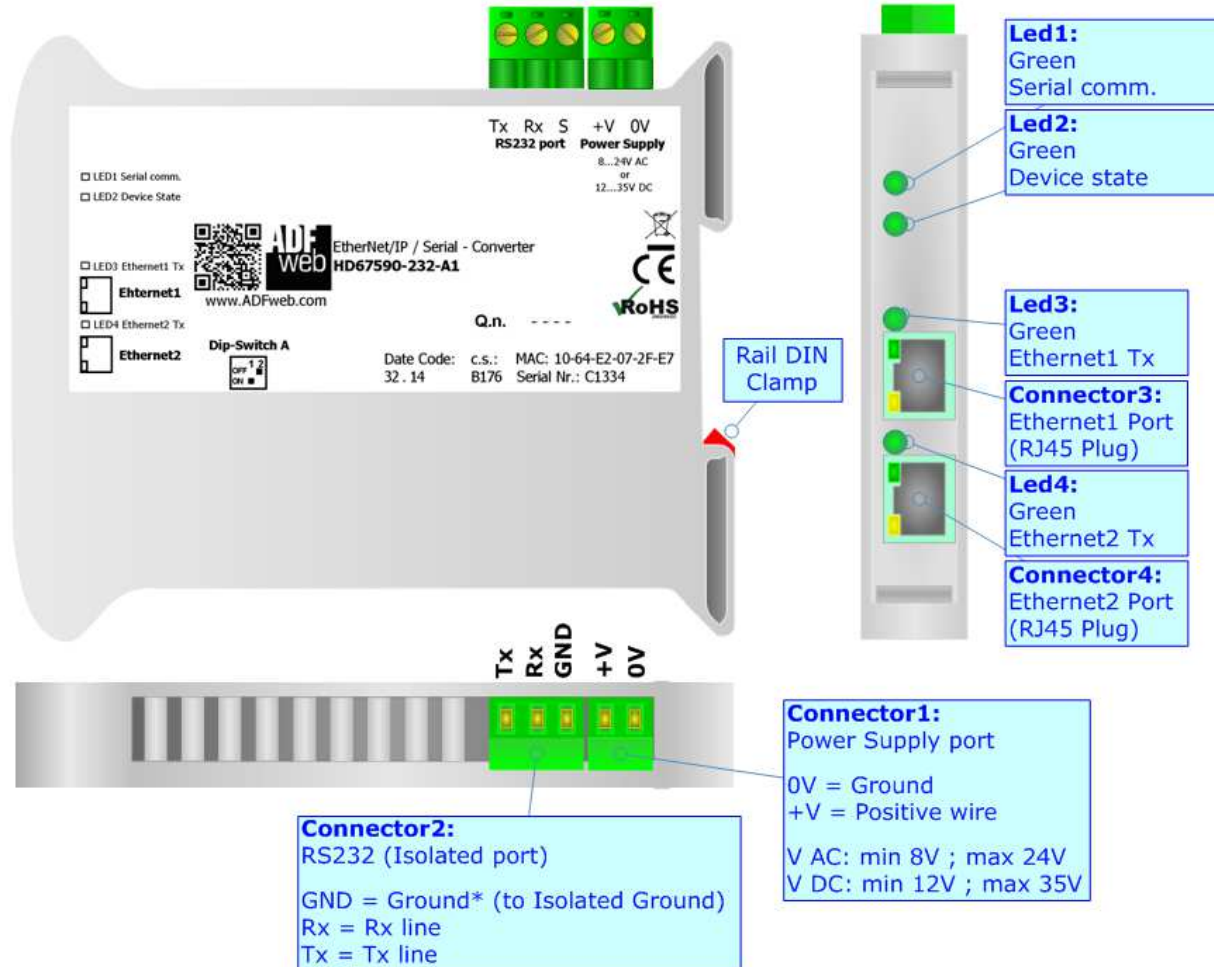


Figure 1a: Connection scheme for HD67590-232-A1

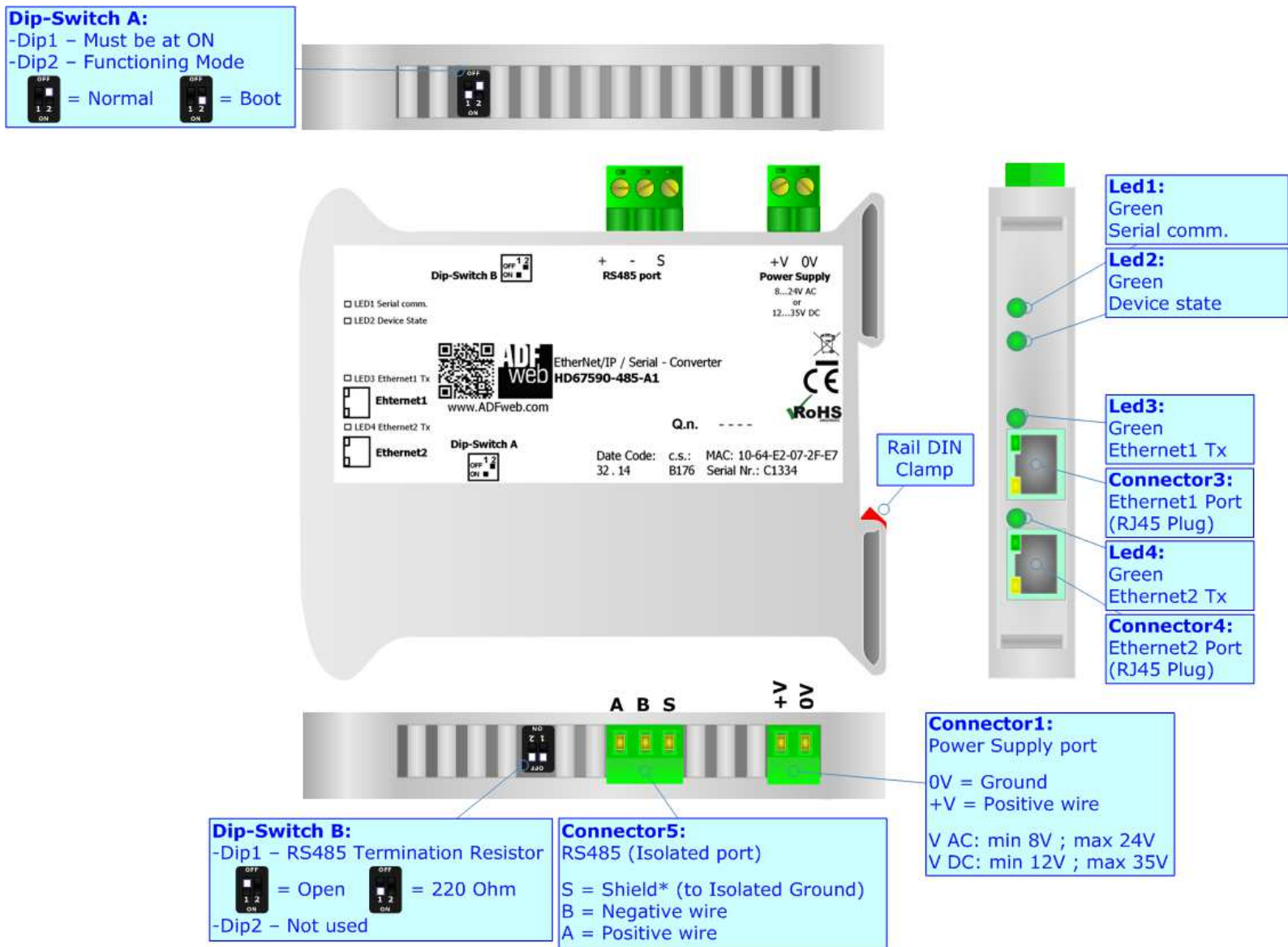


Figure 1b: Connection scheme for HD67590-485-A1

CHARACTERISTICS:

The HD67590-232-A1 and HD67590-485-A1 are a Ethernet/IP / Serial Converter.

It allows the following characteristics:

- Up to 496 bytes in reading and 496 bytes in writing;
- Two-directional information between Serial bus and Ethernet/IP bus;
- Mountable on 35mm Rail DIN;
- Power Supply 8...24V AC or 12...35V DC;
- Temperature range -40°C to 85°C.

The device works in this way: what is written in the RS232 serial goes to Ethernet/IP and if a data is changed at Ethernet/IP, the complete array of data is sent on Serial.



CONFIGURATION:

You need Compositor SW67590 software on your PC in order to perform the following:

- Define the parameter of Ethernet/IP line;
- Define the parameter of Serial line;
- Update the device.

POWER SUPPLY:

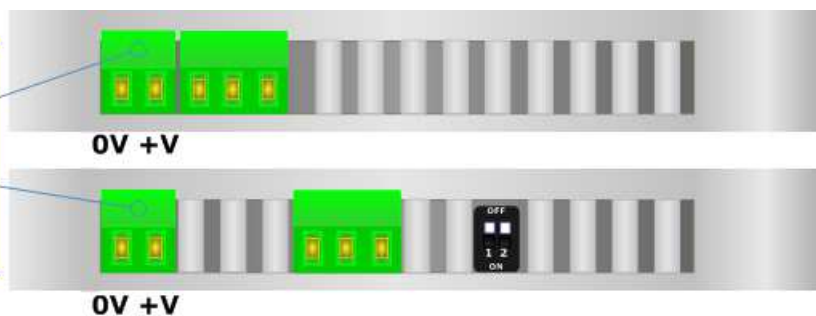
The devices can be powered at 8...24V AC and 12...35V DC. For more details see the two tables below.

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

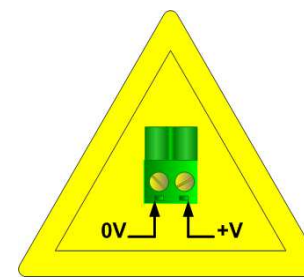
Consumption at 24V DC:

Device	Consumption [W/VA]
HD67590-232-A1	3.5
HD67590-485-A1	3.5

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



HD67590-xxx-A1

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 upload the Project and/or Firmware.

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

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

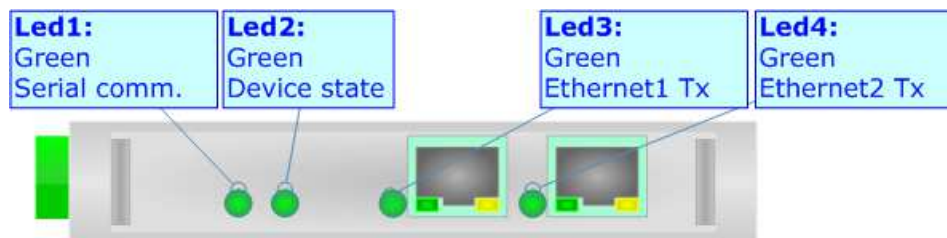
**Warning:**

Dip1 of 'Dip-Switch A' must be at ON position for working even if the Ethernet cable isn't inserted.

LEDS:

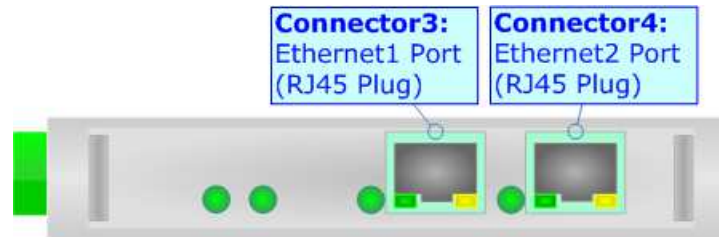
The device has got four LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Serial comm. (green)	Change state when a serial frame is received	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
2: Device State (green)	Blinks slowly (~1Hz)	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
3: Ethernet1 Link (green)	ON: Ethernet cable connected OFF: Ethernet cable disconnected	ON: Ethernet cable connected OFF: Ethernet cable disconnected
4: Ethernet2 Link (green)	ON: Ethernet cable connected OFF: Ethernet cable disconnected	ON: Ethernet cable connected OFF: Ethernet cable disconnected

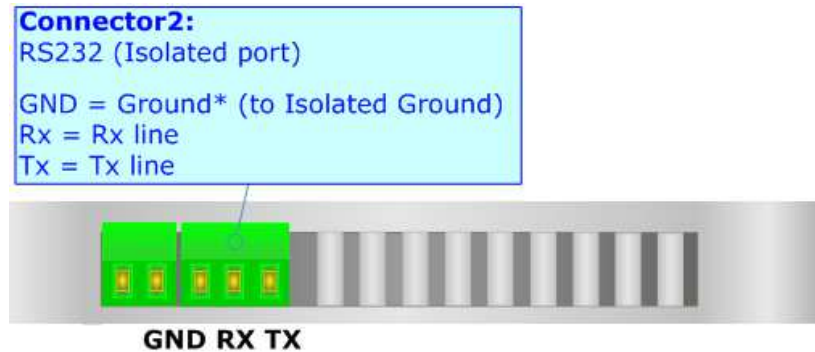


ETHERNET/IP:

The Ethernet/IP connection must be made using Connector3 and/or Connector4 of HD67590-xxx-A1 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.

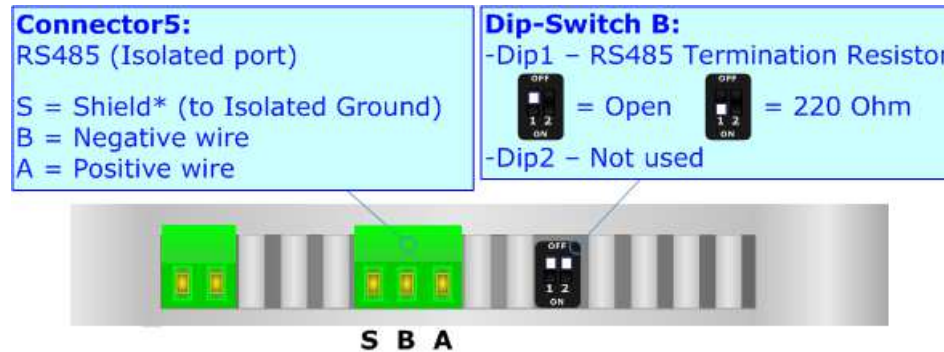


RS232:



RS485:

For terminate the RS485 line with a 220Ω resistor it is necessary to put ON dip 1, like in figure.



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.

USE OF COMPOSITOR SW67590:

To configure the Converter, use the available software that runs with Windows called SW67590. It is downloadable on the site www.adfweb.com and its operation is described in this document. *(This manual is referenced to the last version of the software present on our web site)*. The software works with MSWindows (XP, Vista, Seven, 8; 32/64bit).

When launching the SW67590, the window below appears (Fig. 2).

**Note:**

It is necessary to have installed .Net Framework 4.

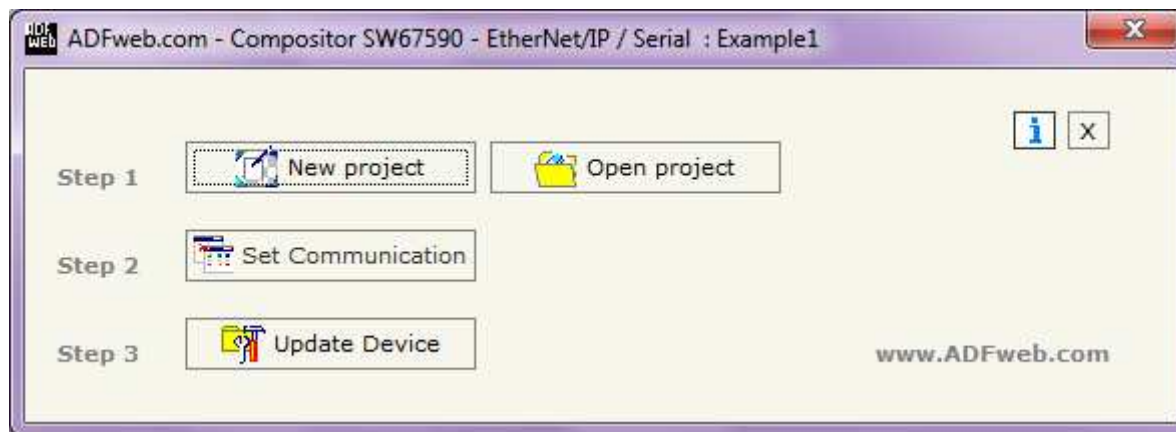
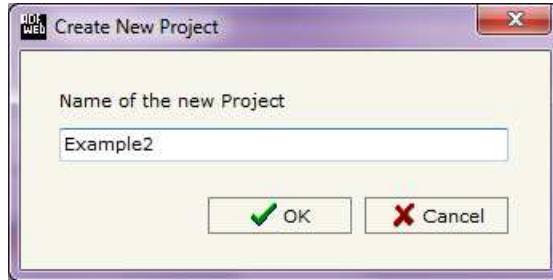


Figure 2: Main window for SW67590

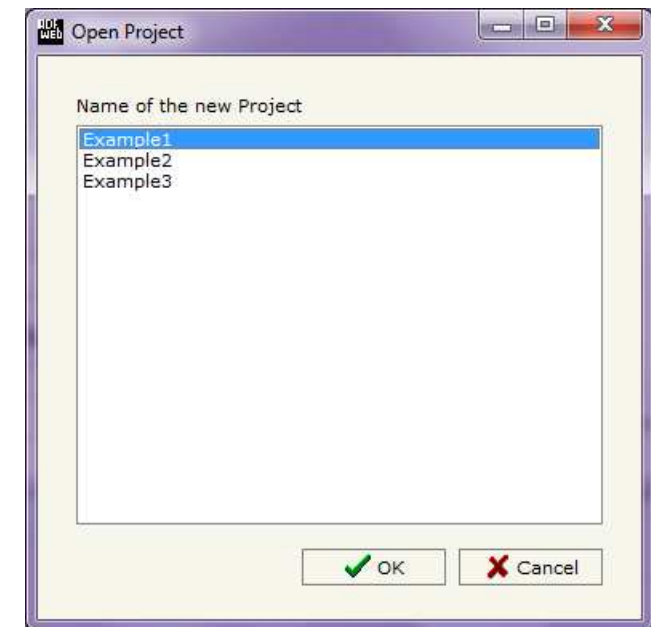
NEW CONFIGURATION / OPEN CONFIGURATION:

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/IP / Serial - 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 define the fundamental communication parameters of two buses, EtherNet/IP and Serial.

By Pressing the **"Set Communication"** button from the main window for SW67590 (Fig. 2) the window "Set Communication" appears (Fig. 3).

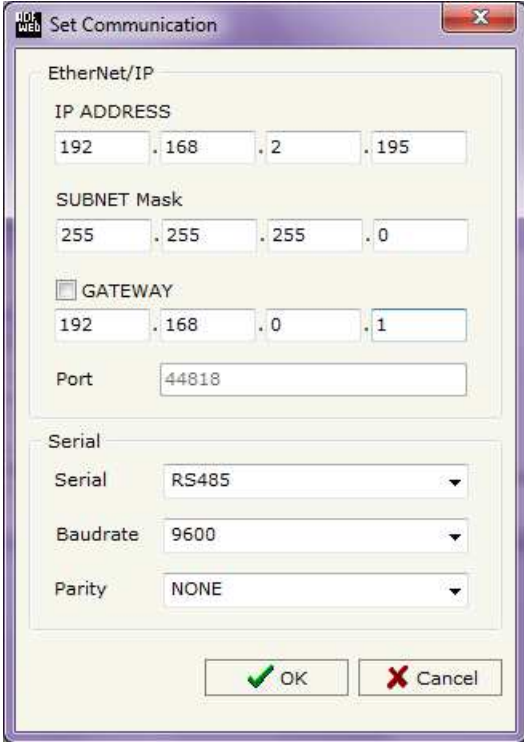
The window is divided in two sections, one for the EtherNet/IP and the other for the Serial.

The means of the fields for "EtherNet/IP" are:

- In the fields **"IP ADDRESS"** insert the IP address that you want to give to the Converter;
- In the fields **"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"**, the port for the EtherNet/IP communication is defined (fixed to '44818').

The means of the fields for the "Serial" section are:

- In the field **"Serial"** the serial to use is defined (RS232 or RS485);
- In the field **"Baudrate"** the baudrate for the serial line is defined;
- In the field **"Parity"** the parity of the serial line is defined.



The screenshot shows a window titled "Set Communication" with a close button (X) in the top right corner. The window is divided into two main sections: "EtherNet/IP" and "Serial".

EtherNet/IP section:

- IP ADDRESS:** Four input fields containing "192", ".168", ".2", ".195".
- SUBNET Mask:** Four input fields containing "255", ".255", ".255", ".0".
- GATEWAY:** A checkbox labeled "GATEWAY" is unchecked. Below it are four input fields containing "192", ".168", ".0", ".1".
- Port:** A single input field containing "44818".

Serial section:

- Serial:** A dropdown menu showing "RS485".
- Baudrate:** A dropdown menu showing "9600".
- Parity:** A dropdown menu showing "NONE".

At the bottom of the window, there are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

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 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.

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

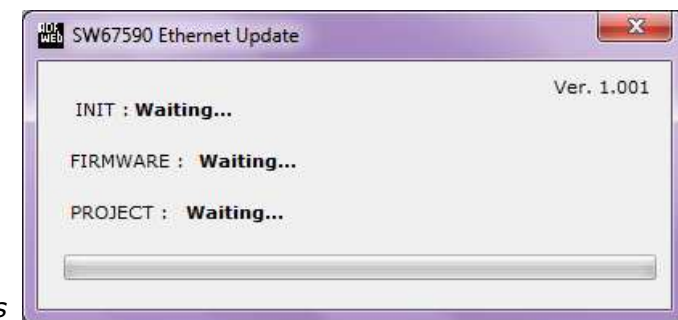
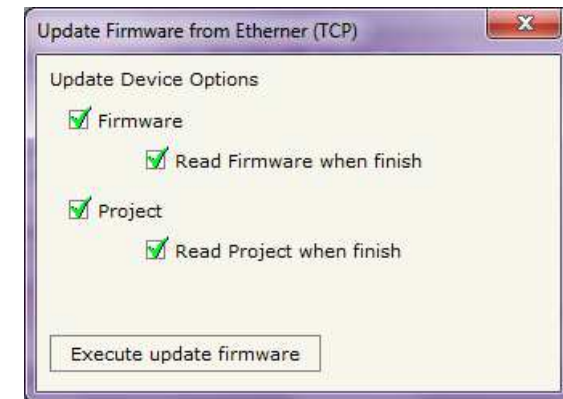
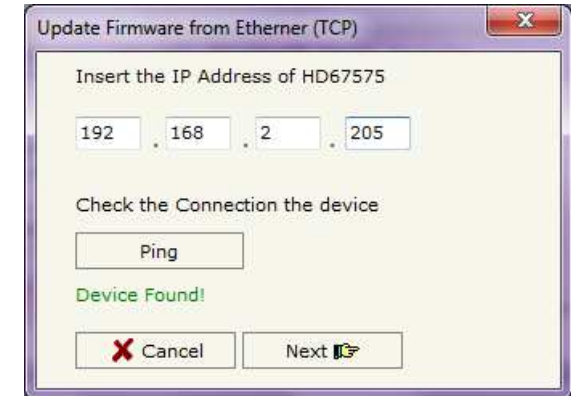


Figure 4: "Update device" windows

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 update.



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 HD67590-232-A1 or HD67590-485-A1 device.



Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67590-232-A1 or HD67590-485-A1 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 update;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use it in the main Operating System;
- If you are using Windows Seven or Vista or 8, make sure that you have the administrator privileges;
- Pay attention to the Firewall lock;
- Check the LAN settings.



Figure 5: "Protection" window



In the case of HD67590-232-A1 or HD67590-485-a1 you have to use the software "SW67590":

www.adfweb.com/download/filefold/SW67590.zip.

SERIAL PROTOCOL:



To send/receive EtherNet/IP data from a master device, it is necessary to follow these instructions:

Master EtherNet/IP → HD67590-xxx-A1

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
YY	ZZ	Data...data

In the byte ZZ and the less significant bit of YY the length of data that follow must be written; the most significant bit of YY must be toggled every time a new message must be sent on serial.

Byte 0 (YY)								Byte 1 (ZZ)							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	0	0	0	0	0									

-  Toggle between 0 and 1
-  0...498 (number of bytes to send on serial)
- 0 "0" must be written

Examples:

- Send on serial 4 bytes: 00 04 01 02 03 04
- Send again the same 4 bytes: 80 04 01 02 03 04
- Send 8 bytes: 00 08 05 06 07 08 09 0A 0B 0C

HD67590-xxx-A1 → Master EtherNet/IP

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 7	Byte 6
YY	ZZ	Data...data

In the byte ZZ and the less significant bit of YY the length of data that follow is written; the other bits are used for send a progressive number .

Byte 0 (YY)								Byte 1 (ZZ)							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

- 0...127 (counter incremented after every frame received)
- 0...498 (number of bytes received from serial)

Examples:

- Received on serial 4 bytes: 02 04 01 02 03 04
- Received the same 4 bytes again: 04 04 01 02 03 04
- Received 8 bytes: 06 08 05 06 07 08 09 0A 0B 0C



Note:

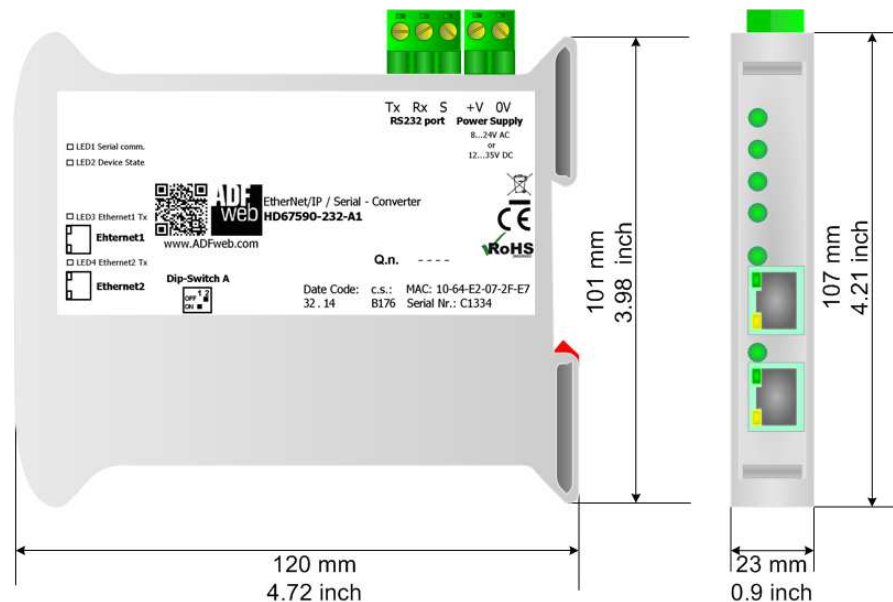
The time for considering the receiving frame finished is when there is a idle time between bytes of 4tbit.



Note:

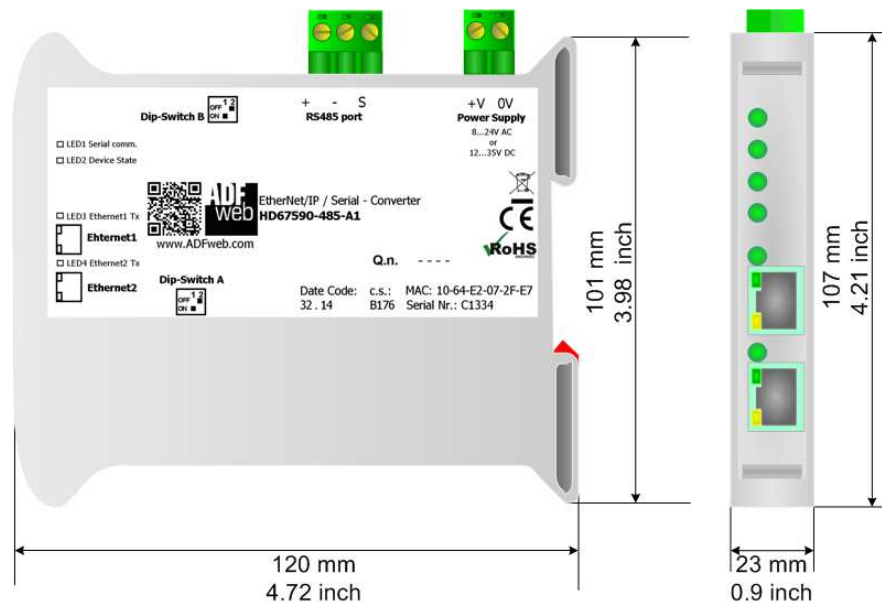
If the Converter receives more than 496 bytes in a single frame, the remaining bytes are deleted and only the firsts 496 are sent to the Master EtherNet/IP.

MECHANICAL DIMENSIONS:



Housing: PVC
Weight: 200g (Approx)

Figure 6a: Mechanical dimensions scheme for HD67590-232-A1



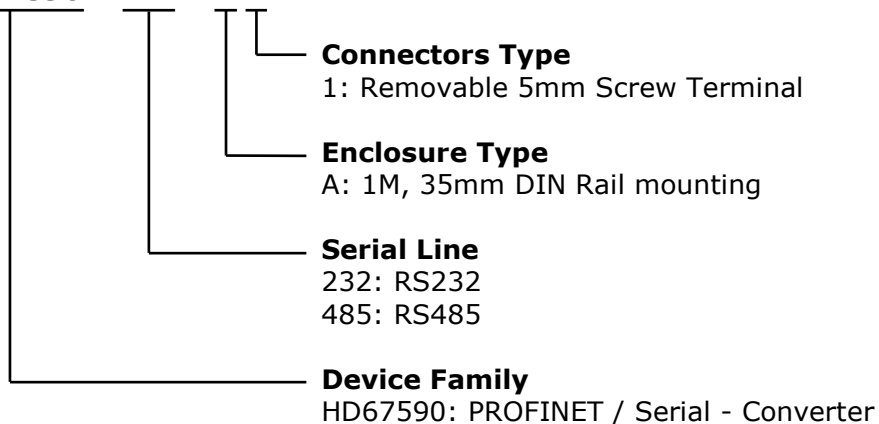
Housing: PVC
Weight: 200g (Approx)

Figure 6b: Mechanical dimensions scheme for HD67590-485-A1

ORDERING INFORMATIONS:

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

HD67590 - xxx - A 1



Order Code: **HD67590-232-A1** - EtherNet/IP / Serial - Converter (RS232 serial)

Order Code: **HD67590-485-A1** - EtherNet/IP / Serial - Converter (RS485 serial)

ACCESSORIES:

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

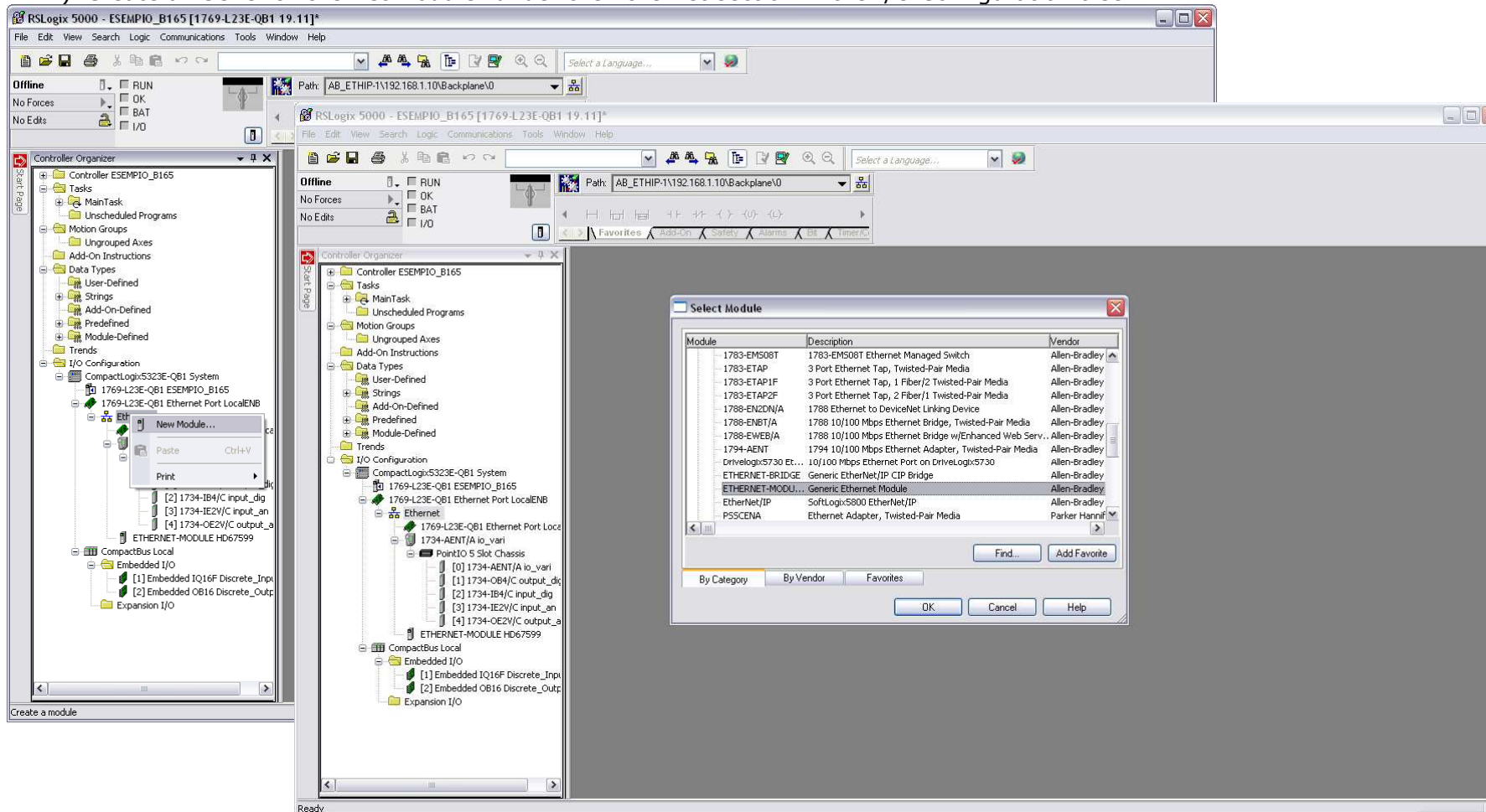
Order Code: **AC34002** - 35mm Rail DIN - Power Supply 110V AC 50/60Hz – 12 V AC

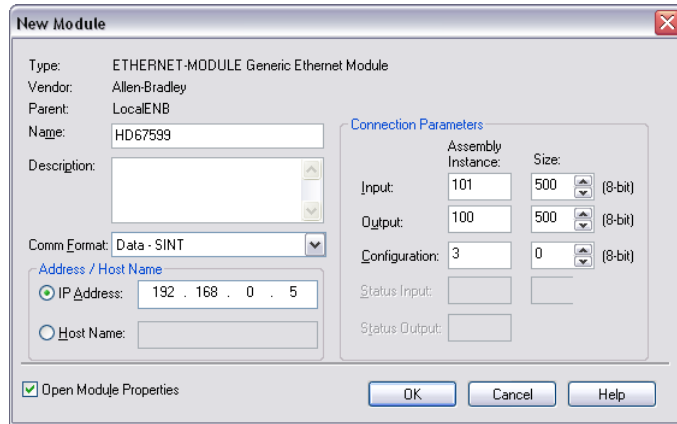
PLC CONFIGURATION:

The configuration and commissioning of the EtherNet/IP Converter as described on the following pages was accomplished with the help of the "RSLogix 5000" software of Rockwell Automation. In case of using a control system from another supplier please attend to the associated documentation.

These are the steps to follow:

- 1) Create a "Generic Ethernet Module" under the Ethernet section in the I/O Configuration tree.





2) Edit the settings of the new Generic Ethernet Module. As shown in the screen shot below, the module was named "HD67590" and the IP-address assigned is 192.168.0.5.

For the Comm Format "Data - SINT" shall be selected as the data type.

The HD67590-xxx-A1 can uses up to 496 bytes for input assembly instance 101 and 496 bytes for output assembly instance 100.

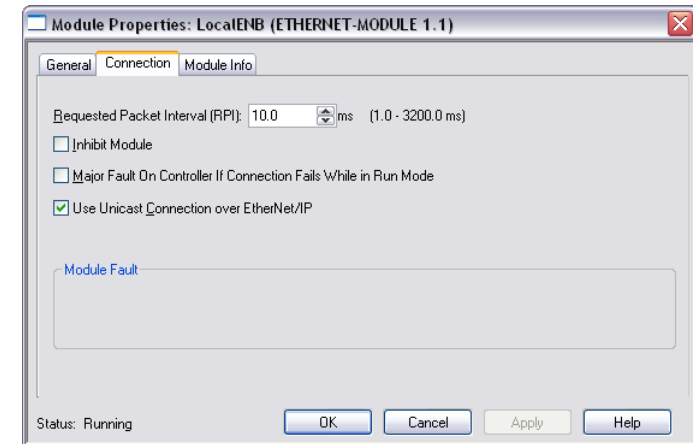
RSLogix 5000 requires a configuration assembly instance. Both modules do not provide a configuration assembly instance. Therefore it is allowed to select an instance of 3 and to set the value to zero.

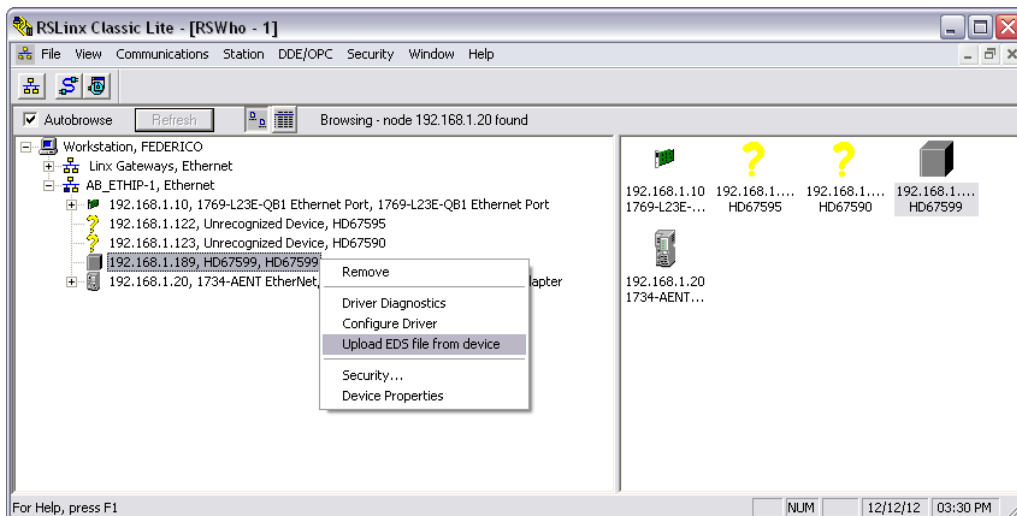
3) The setting of 10msec for the "Requested Packet Interval (RPI)" is adequate but it is possible to change this value as required. A lower value of 2ms shall not be selected.



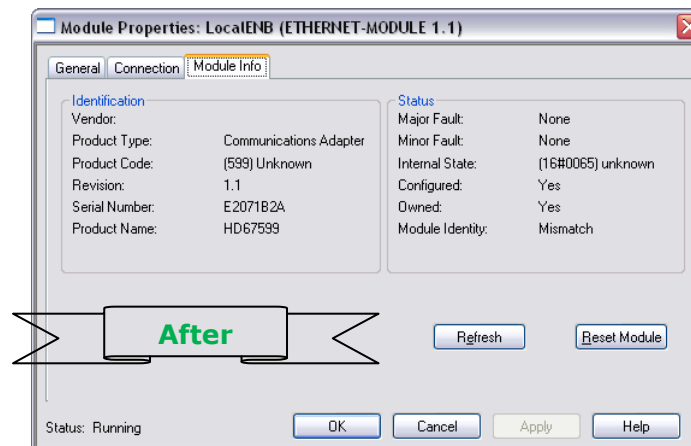
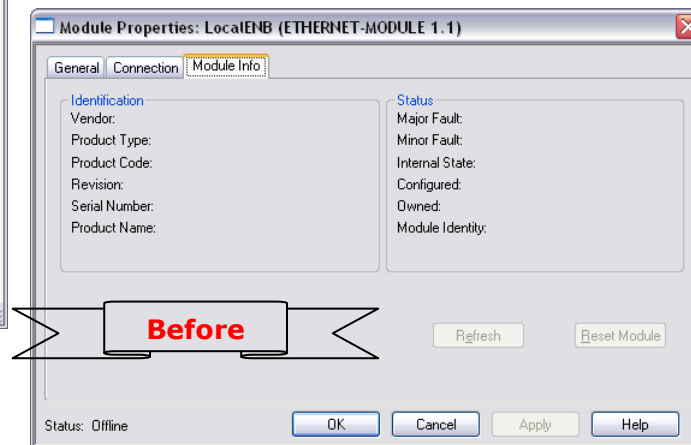
Warning:

The field "Use Unicast Connection over EtherNet/IP" must be checked.





5) With "RSLinks Classic Lite", after have done a network scan (RSWho), and finding the EtherNet/IP device, it is possible to load the EDS file for the device in order to have the "Module Info" compiled.



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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