

# User Manual

Revision 1.000  
English

## EtherNet/IP / Modbus TCP Master - Converter

(Order Code: HD67664-A1)

For Website information:

[www.adfweb.com?Product=HD67664](http://www.adfweb.com?Product=HD67664)

For Price information:

[www.adfweb.com?Price=HD67664-A1](http://www.adfweb.com?Price=HD67664-A1)

### Benefits and Main Features:

- ✦ Very easy to configure
- ✦ Electrical isolation
- ✦ Two Ethernet ports (for Modbus TCP / EtherNet/IP)
- ✦ Temperature range: -40°C/+85°C (-40°F/+185°F)



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

#### Converter EtherNet/IP to

- [www.adfweb.com?Product=HD67077](http://www.adfweb.com?Product=HD67077)
- [www.adfweb.com?Product=HD67595](http://www.adfweb.com?Product=HD67595)
- [www.adfweb.com?Product=HD67597](http://www.adfweb.com?Product=HD67597)
- [www.adfweb.com?Product=HD67598](http://www.adfweb.com?Product=HD67598)
- [www.adfweb.com?Product=HD67599](http://www.adfweb.com?Product=HD67599)
- [www.adfweb.com?Product=HD67589](http://www.adfweb.com?Product=HD67589)
- [www.adfweb.com?Product=HD67591](http://www.adfweb.com?Product=HD67591)
- [www.adfweb.com?Product=HD67591](http://www.adfweb.com?Product=HD67591)
- [www.adfweb.com?Product=HD67592](http://www.adfweb.com?Product=HD67592)
- [www.adfweb.com?Product=HD67592](http://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](http://www.adfweb.com?Product=HD67003)

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

[www.adfweb.com?Cmd=helpme](http://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/](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	17/06/2014	Ff	All	First Release

**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:**

All trademarks mentioned in this document belong to their respective owners.

**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:

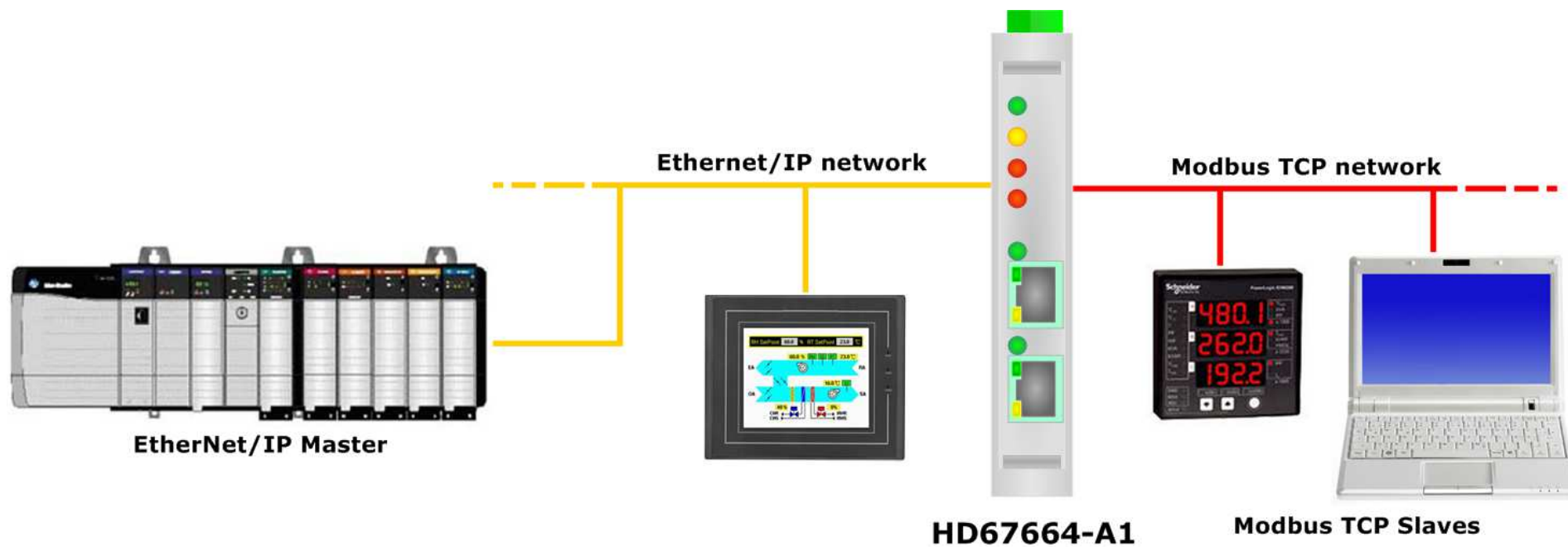


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

**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.

**EXAMPLE OF CONNECTION:**



**CONNECTION SCHEME:**

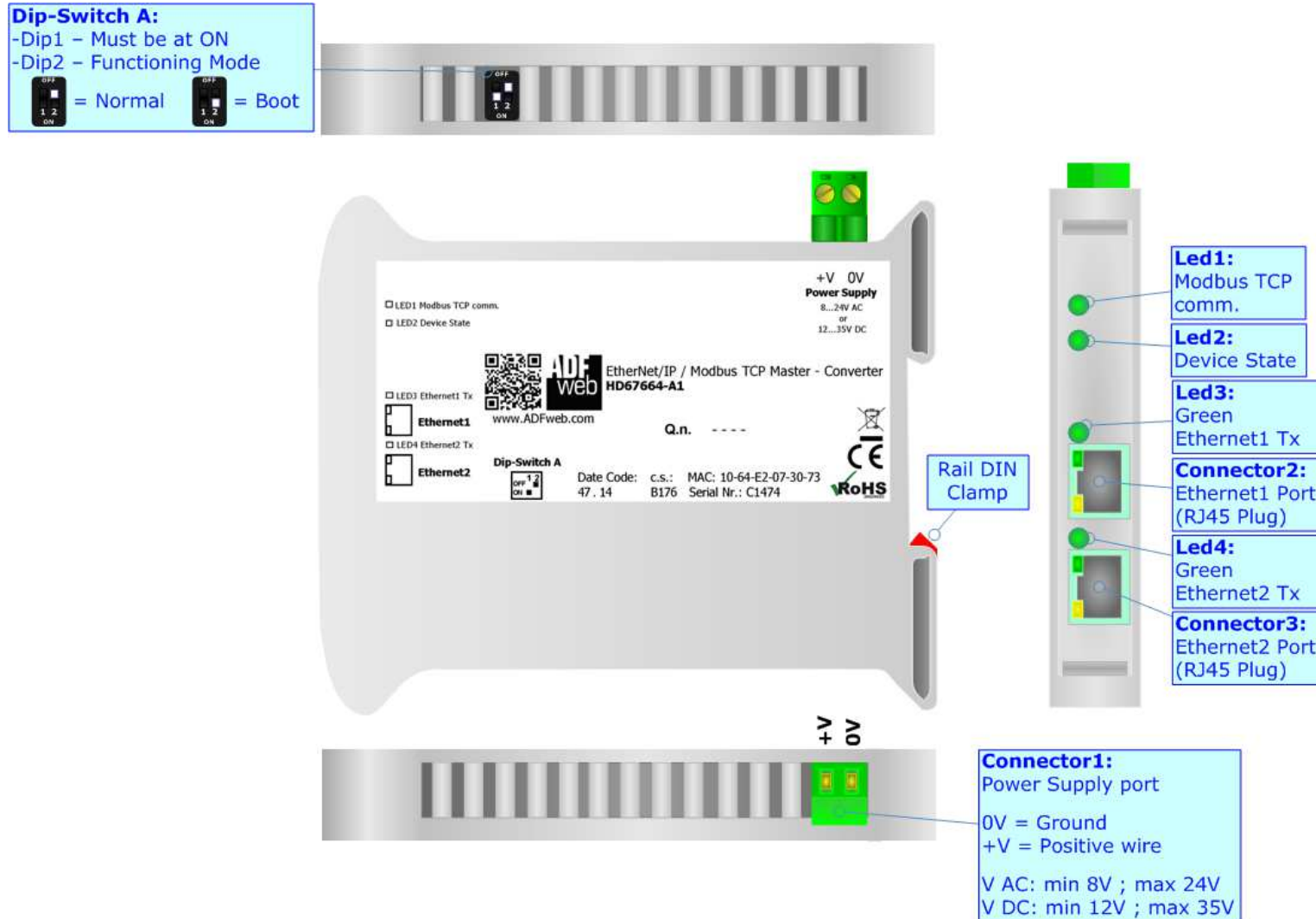


Figure 1: Connection scheme for HD67664-A1

**CHARACTERISTICS:**

The HD67664-A1 is a EtherNet/IP / Modbus TCP Master Converter.

It allows for the following characteristics:

- Up to 500 bytes in reading and 500 bytes in writing;
- Isolation between Modbus/EtherNet/IP - Power Supply;
- Two-directional information between Modbus TCP bus and EtherNet/IP bus;
- 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 SW67664 software on your PC in order to perform the following:

- Define the parameters of EtherNet/IP line;
- Define the parameters of Modbus TCP line;
- Define the data to Read in Modbus TCP and where to map these information in the EtherNet/IP array;
- Define the data to Write in Modbus TCP and where to take the information in the EtherNet/IP array;
- Update the device.

**POWER SUPPLY:**

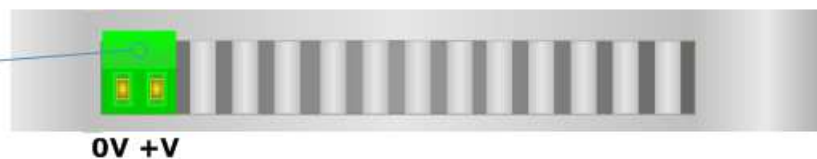
The devices can be powered at 8...24V AC and 12...35V DC. For more details see the two tables below.

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

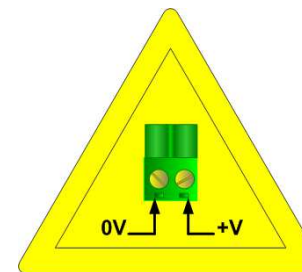
Consumption at 24V DC:

Device	Consumption [W/VA]
HD67664-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: Do not reverse the polarity power**



HD67664-A1

**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:**

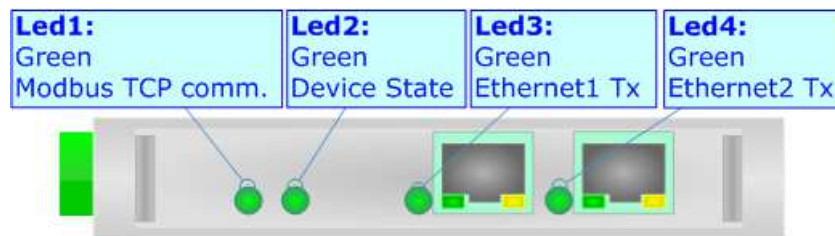
Dip1 of 'Dip-Switch A' must be at ON position to work even if the Ethernet cable is not inserted.



**LEDS:**

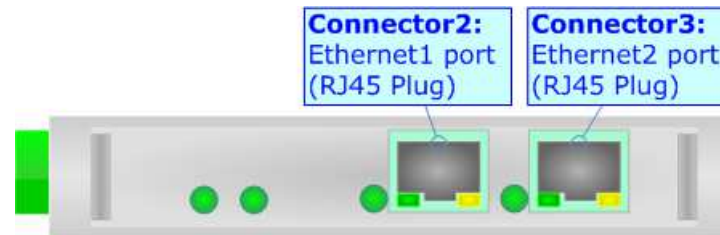
The device has got four LEDs that are used to give information about the functioning status.  
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Modbus TCP comm. (green)	Blinks when receive a correct Modbus TCP response from a slave	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
1: Device State (green)	Blinks slowly (~1Hz)	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
3: Ethernet1 Link (green)	Blinks when transmits a frame in Ethernet	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
4: Ethernet2 Link (green)	Blinks when transmits a frame in Ethernet	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress



**ETHERNET/IP / MODBUS TCP:**

The EtherNet/IP and Modbus TCP connection must be made using Connector3 and/or Connector4 of HD67664-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 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 SW67664:

To configure the Converter, use the available software that runs with Windows called SW67664. 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 SW67664, the window below appears (Fig. 2).



### Note:

It is necessary to have installed .Net Framework 4.

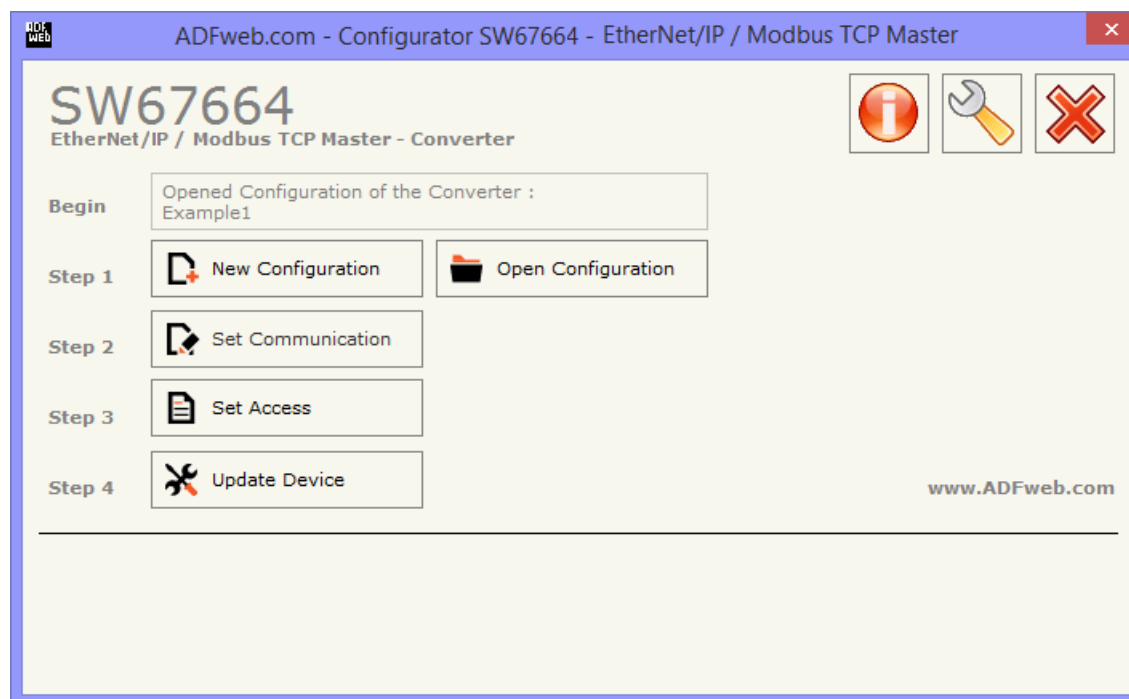
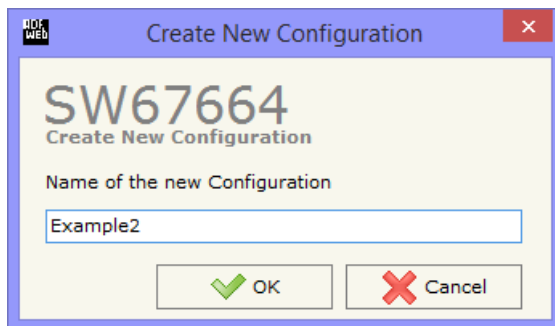


Figure 2: Main window for SW67664

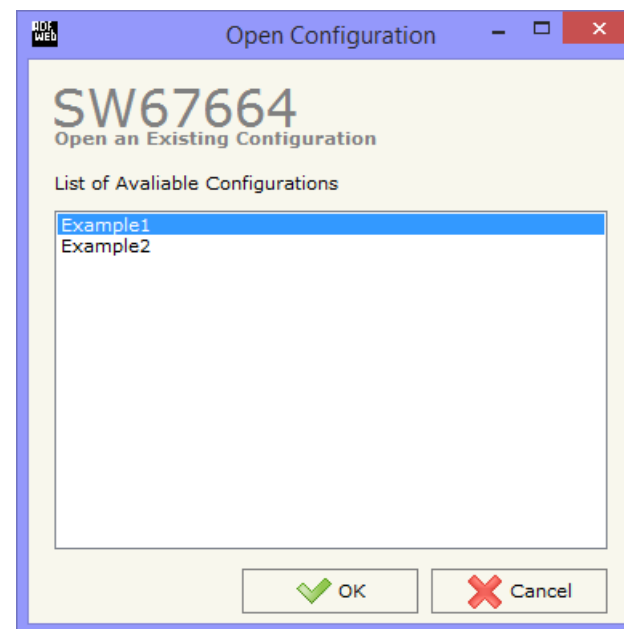
**NEW CONFIGURATION / OPEN CONFIGURATION:**

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




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

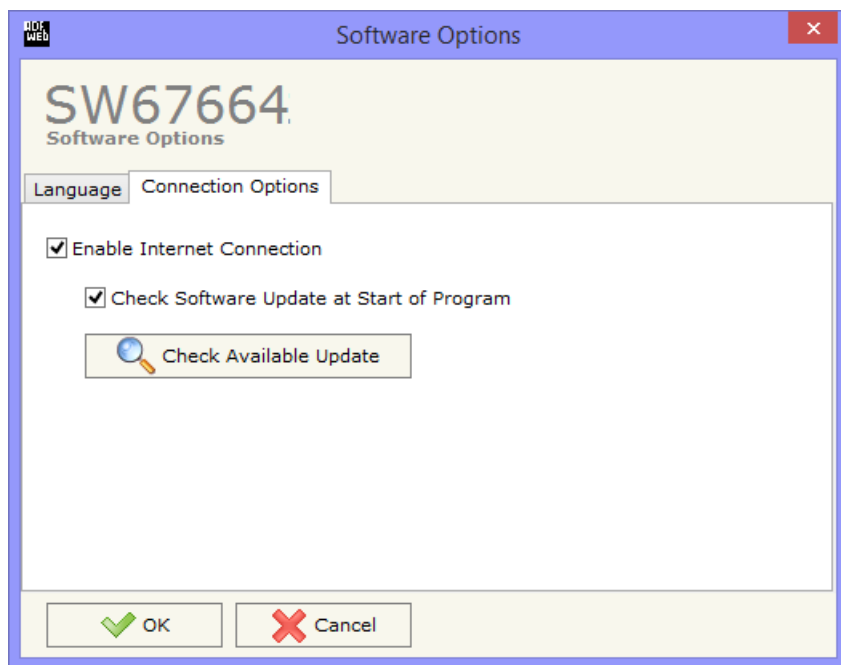
- To clone the configurations of a Programmable “EtherNet/IP / Modbus TCP Master - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient 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 SW67664 check automatically if there are updatings when it is launched.

## SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, EtherNet/IP and Modbus TCP.

By Pressing the **"Set Communication"** button from the main window for SW67664 (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 Modbus TCP Master.

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 (EtherNet/IP side);
- 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 used for EtherNet/IP communication is defined. The port has a fixed value of 44818;
- In the fields **"Number Byte IN"** insert the number of input byte of the slave station;
- In the fields **"Number Byte Out"** insert the number of output byte of the slave station.

The means of the fields for the "Modbus TCP Master" section are:

- In the fields **"IP ADDRESS"** insert the IP address that you want to give to the Converter (Modbus TCP side);
- 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 **"TimeOut (ms)"** define the maximum time that the device attends for the answer from the slave interrogated;
- In the field **"Communication Idle Time (ms)"** the delay between two requests is defined.

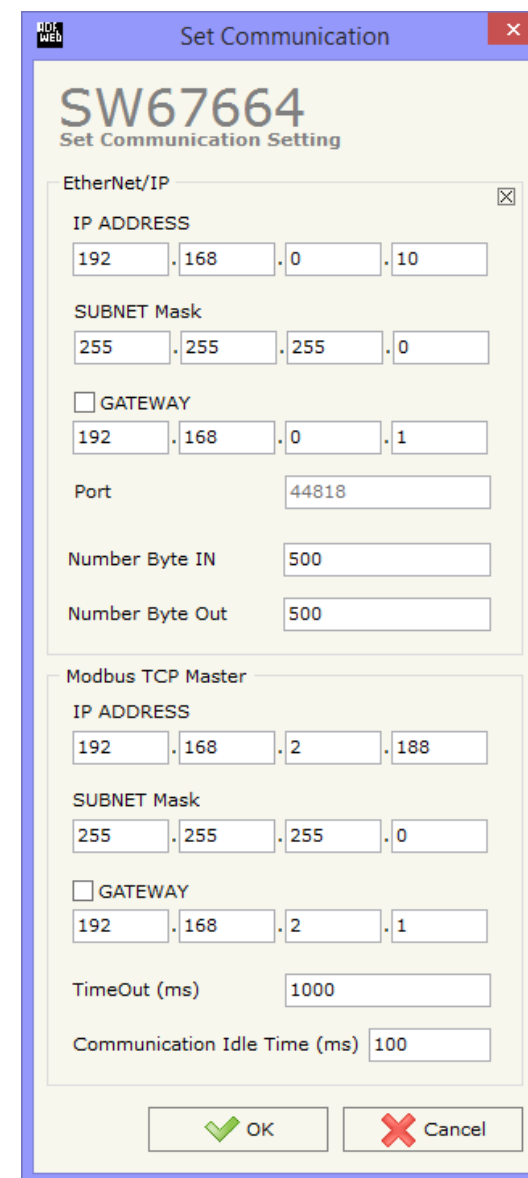


Figure 3: "Set Communication" window

**SET MODBUS ACCESS:**

By Pressing the "Set Modbus Access " button from the main window for SW67664 (Fig. 2) the window "Set Access" appears (Fig. 4).

The window is divided in two parts, the "Modbus Read" that contains the Modbus registers/status readable by the Converter and "Modbus Write" that contains the Modbus registers/status writeable by the Converter.

The meaning of the fields in the window are the follows:

- In the field "Slave IP Address" the address of the Modbus device you have to read/write is defined;
- In the field "Port" the port used for require the Modbus data is defined;
- In the field "Slave ID" is possible to insert the ID the address of the Modbus device you have to read/write;
- In the field "Type" insert the data type of the Register you would like to read/write. You can choose between the following:
  - Coil Status (R/W);
  - Input Status (R);
  - Holding Register (R/W);
  - Input Register (R);
- In the field "Address" the start address of the register/status to read/write is defined;
- In the field "NPoint" insert the number of consecutive registers/status to read/write;

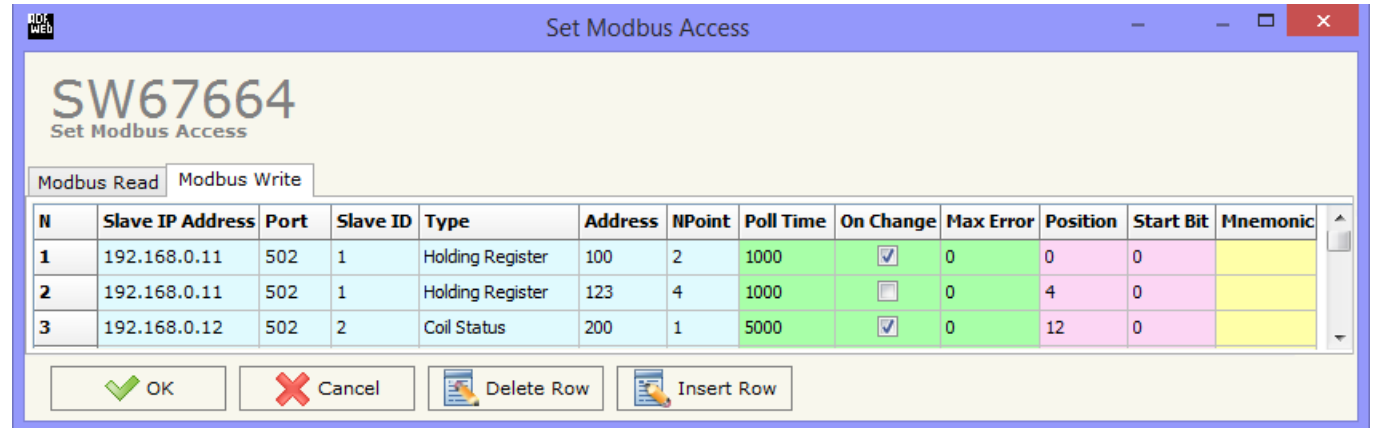
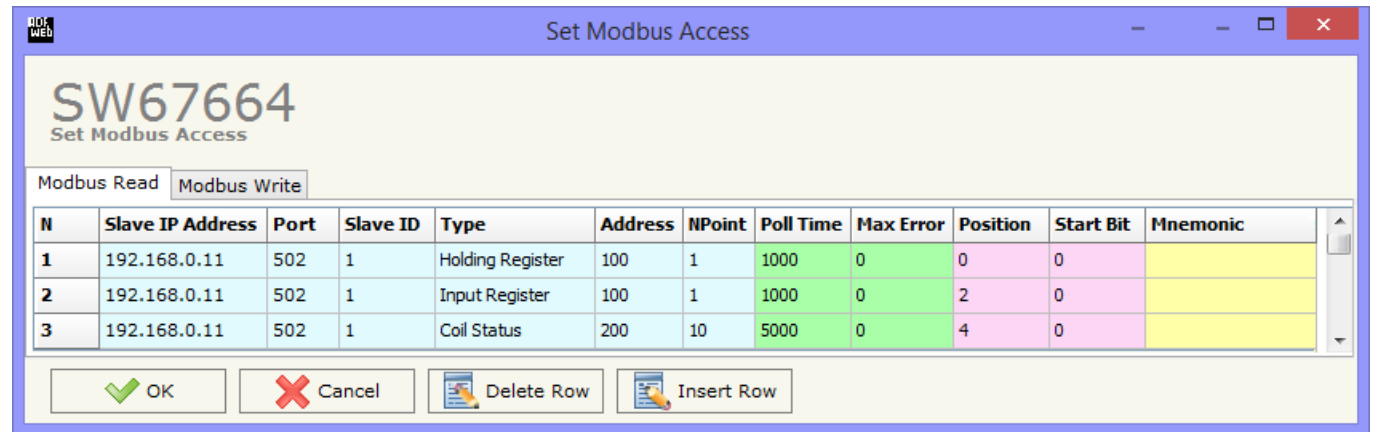


Figure 4: "Set Access" windows

- In the field "**Poll Time**" insert the time (expressed in milliseconds) used for read/write the register/status. If zero, the request isn't made;
- By checking the field "**On Change**" the Modbus write request is made only if EtherNet/IP data are changed; otherwise is sent cyclically, using the "Poll Time". This feature is used only on "Modbus Write" section;
- In the field "**Max Error**" insert the number of consecutive errors that the Master waits before discard the row from the cycle of requests;
- In the field "**Position**" is possible to select the position where take/save the data from EtherNet/IP array;
- The field "**Start Bit**" is used for select from which Bit save the data (to use only when the "Type" is 'Coil Status' or 'Input Status' and the "NPoint" is more than one);
- In the field "**Mnemonic**" is possible to insert a description of the data inserted in the row.

**Note:**

If you want that the Modbus register/status is written only when data are changed, the "Poll Time" of the row must be 0.

**Note:**

If the field "On change" is checked and the "Poll Time" is different from 0, the converter sends the Write request cyclically and also when the data is changed.



**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.

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.

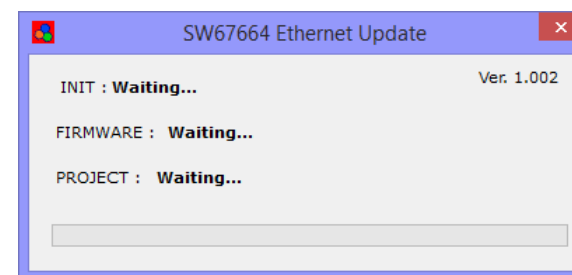
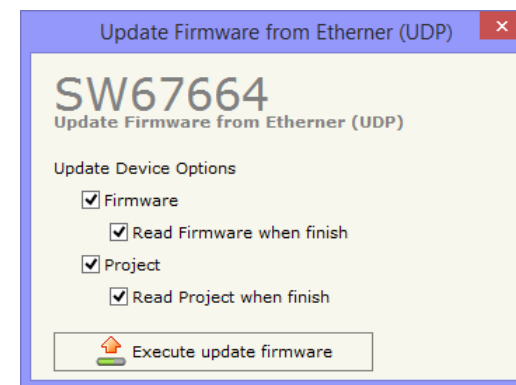
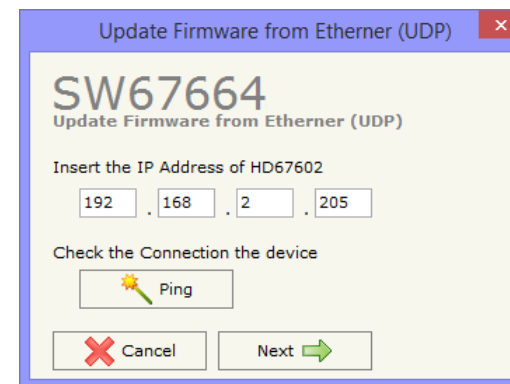


Figure 5: "Update device" windows

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 HD67664 device.

**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD67664 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;
- 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 and 8 make sure that you have the administrator privileges;
- In case you have to program more than one device, 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.

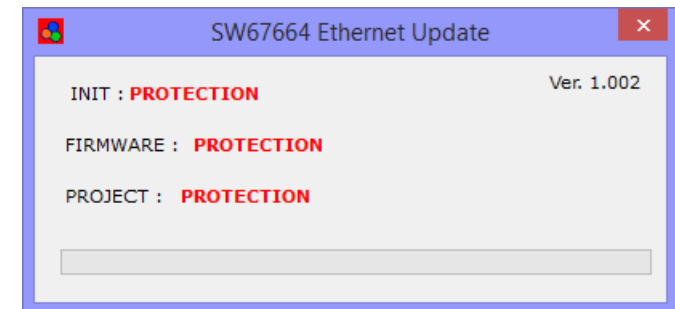
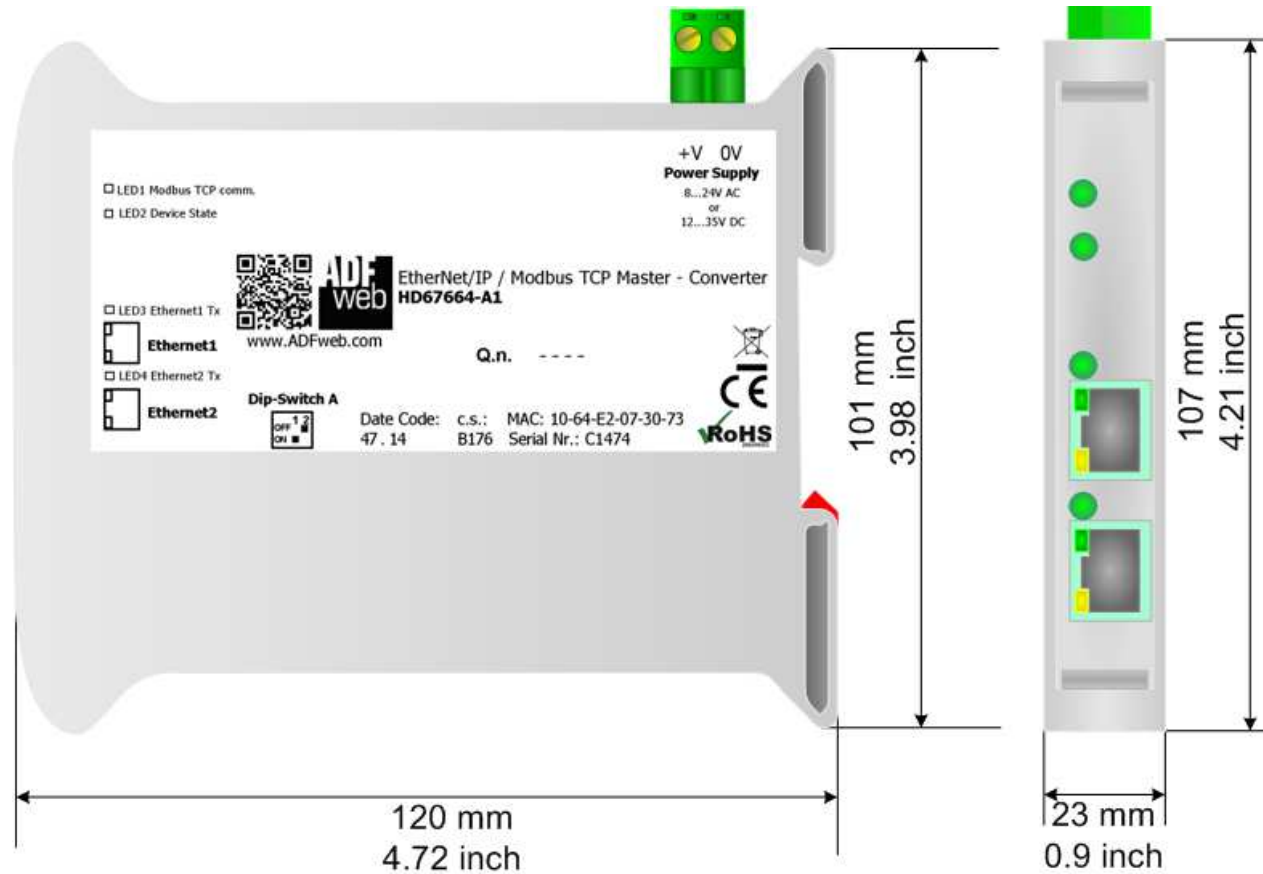


Figure 8: "Protection" window

In the case of HD67664 you have to use the software "SW67664": [www.adfweb.com/download/filefold/SW67664.zip](http://www.adfweb.com/download/filefold/SW67664.zip).

**MECHANICAL DIMENSIONS:**



Housing: PVC  
Weight: 200g (Approx)

Figure 7: Mechanical dimensions scheme for HD67664-A1

**ORDERING INFORMATIONS:**

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

**HD67664 - A 1****Connectors Type**

1: Removable 5mm Screw Terminal

**Enclosure Type**

A: 1M, 35mm DIN Rail mounting

**Device Family**

HD67664: EtherNet/IP / Modbus TCP Master - Converter

Order Code: **HD67664-A1** - EtherNet/IP / Modbus TCP Master - Converter

**ACCESSORIES:**

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

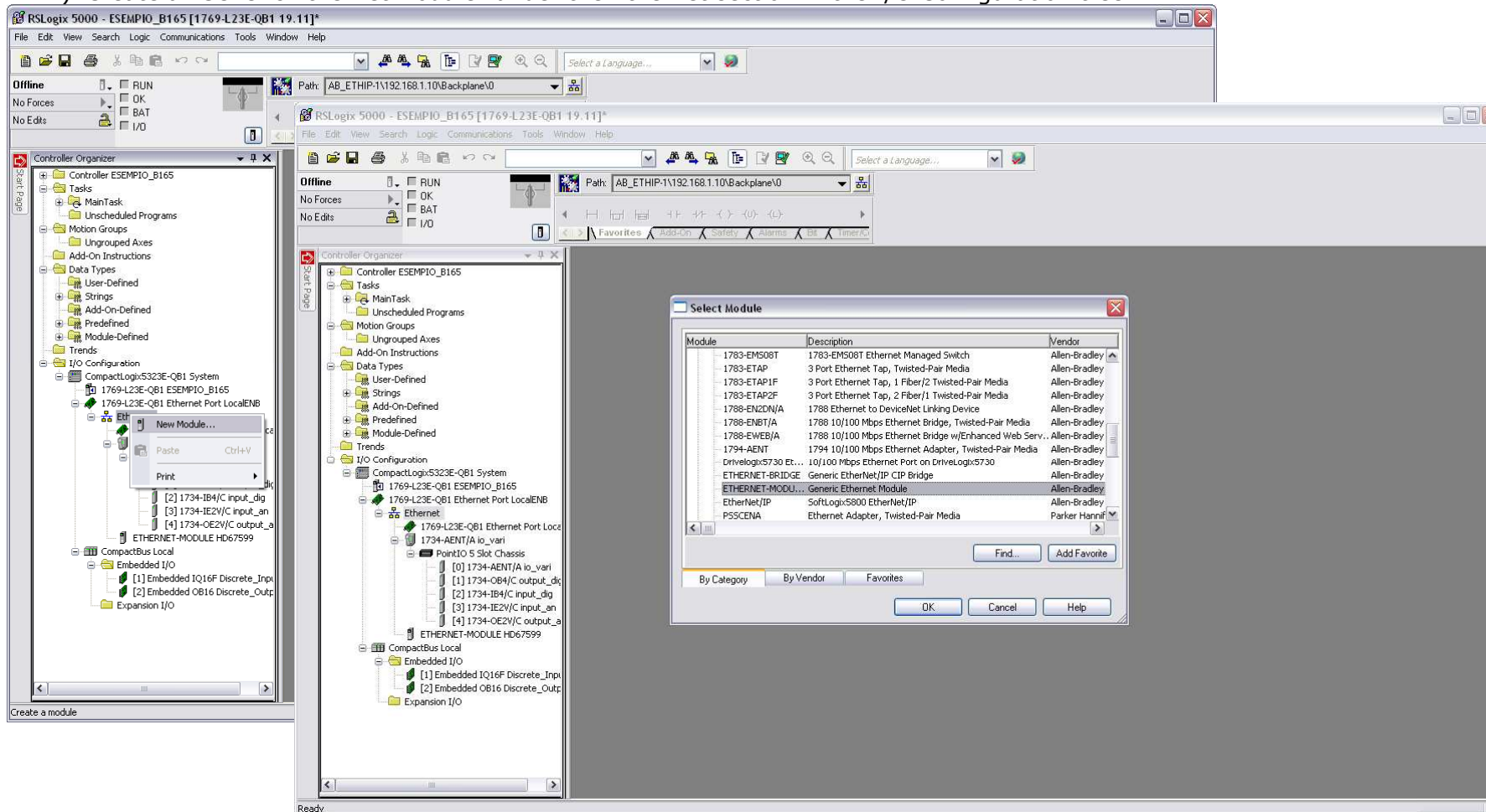
Order Code: **AC34002** - 35mm Rail DIN - Power Supply 110V AC 50/60Hz - 12 V AC

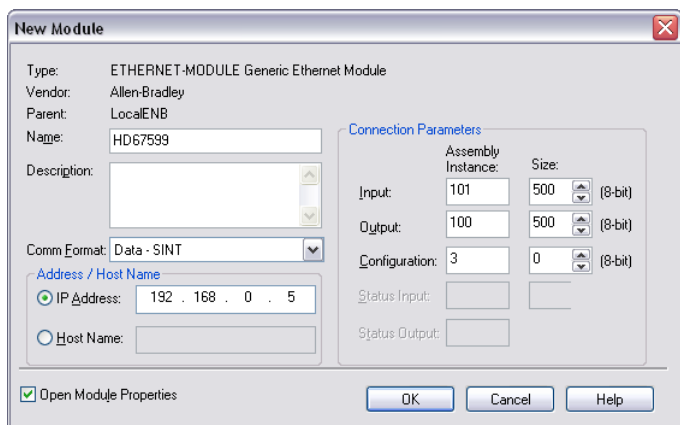
**PLC CONFIGURATION:**

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 "HD67664" and the IP-address assigned is 192.168.0.5.

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

The HD67664-A1 can uses up to 496 bytes for input assembly instance 101 and 496 bytes for output assembly instance 100.

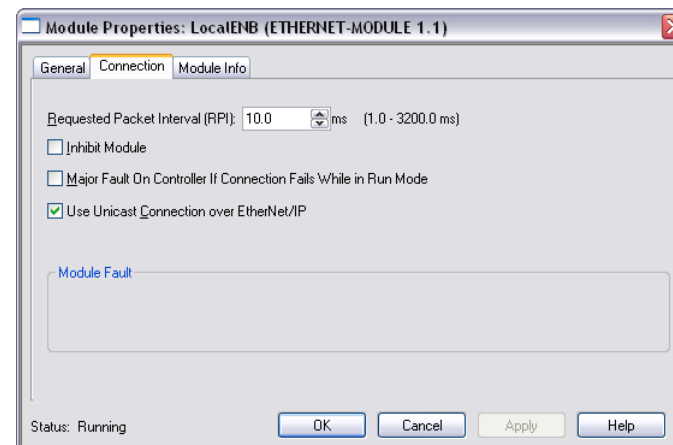
RSLogix 5000 requires a configuration assembly instance. Both modules do not provide a configuration assembly instance. Therefore it is allowed to select an instance of 3 and to set the value to zero.

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:**

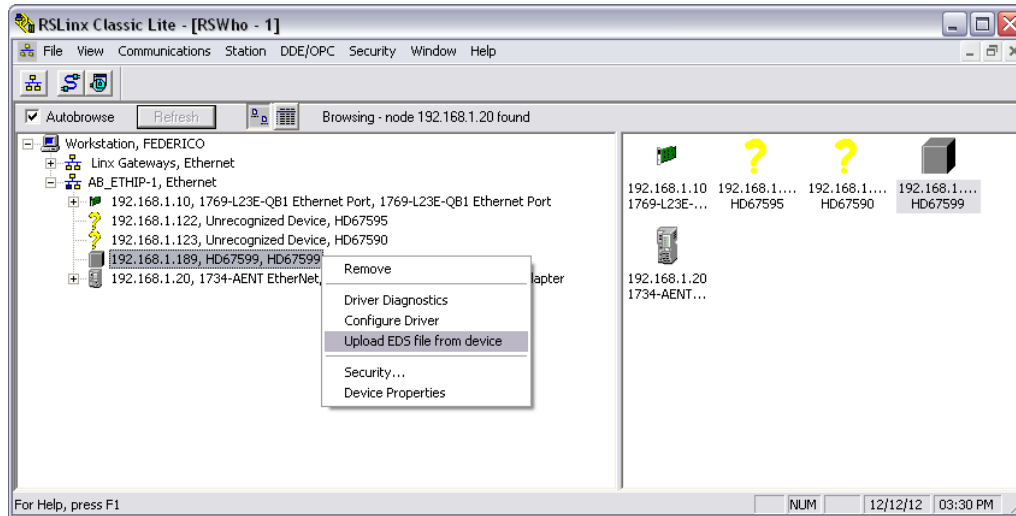
The field "Use Unicast Connection over EtherNet/IP" must be checked.



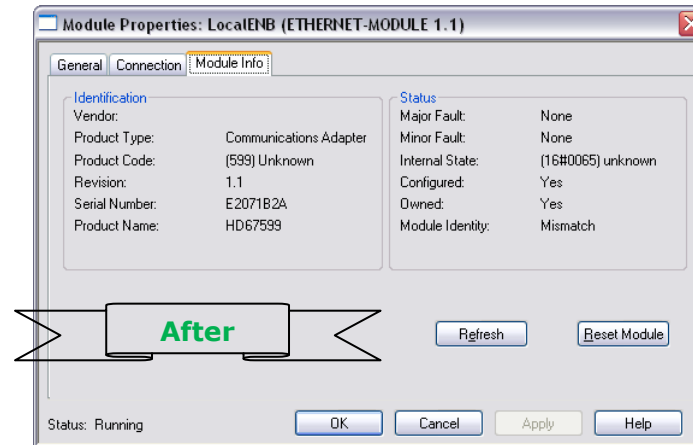
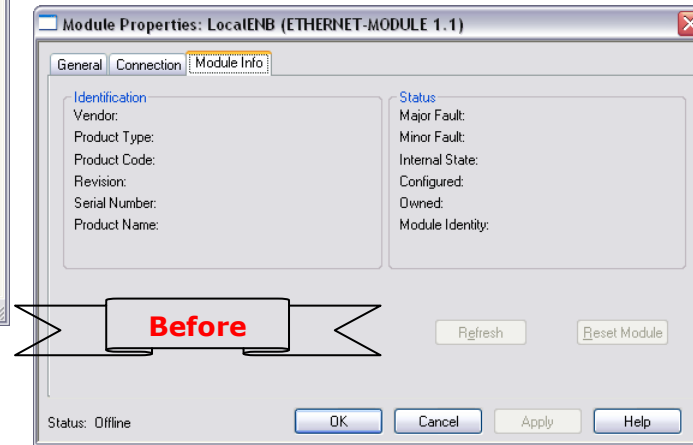
4) After the configuration is completed, the controller tags are created.

The screenshot displays the RSLogix 5000 software interface. The main window shows the Controller Organizer on the left, listing various components like Controller Fault Handler, Tasks, and I/O Configuration. The central pane shows a table of Controller Tags for the ESEMPIO\_B165 controller. The table columns include Name, Value, Force Mask, Style, Data Type, Description, and Constant. The tags listed are HD67591 through HD67599, with values ranging from 0 to {...} and data types of SINT or SINT[500].

Name	Value	Force Mask	Style	Data Type	Description	Constant
- HD67591	{...}	{...}	{...}	Decimal	SINT[500]	
+ HD67592	0			Decimal	SINT	
+ HD67593	0			Decimal	SINT	
+ HD67594	0			Decimal	SINT	
+ HD67595	0			Decimal	SINT	
+ HD67596	0			Decimal	SINT	
+ HD67597	0			Decimal	SINT	
+ HD67598	0			Decimal	SINT	
+ HD67599	0			Decimal	SINT	



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](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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