User Manual
Revision 1.000
English

M-Bus / BACnet/IP - Converter

(Order Code: HD67694-IP-B2-1-10, HD67694-IP-B2-3-25,
HD67694-IP-B2-15-50, HD67694-IP-B2-30-75, HD67694-IP-B2-50-100)

For Website information:
www.adfweb.com?Product=HD67694

For Price information:
www.adfweb.com?Price=HD67694-IP-B2-1-10
www.adfweb.com?Price=HD67694-IP-B2-3-25
www.adfweb.com?Price=HD67694-IP-B2-15-50
www.adfweb.com?Price=HD67694-IP-B2-30-75
www.adfweb.com?Price=HD67694-IP-B2-50-100

Benefits and Main Features:

⊕   Very easy to configure

⊕   Triple electrical isolation

⊕   Temperature range: -40°C/85°C (-40°F/185°F)

User Manual

For others M-Bus products see also the following link:

Converter M-Bus to
www.adfweb.com?Product=HD67021   **(RS232)**
www.adfweb.com?Product=HD67022   **(RS485)**

Analyzer / Scanner /Sniffer M-Bus
www.adfweb.com?Product=HD67031

Isolator/Repeater M-Bus
www.adfweb.com?Product=HD67032M

Gateway M-Bus / Modbus RTU
www.adfweb.com?Product=HD67029M-232   **(on RS232)**
www.adfweb.com?Product=HD67029M-485   **(on RS485)**

Gateway M-Bus / Modbus TCP
www.adfweb.com?Product=HD67044

Gateway M-Bus / CANopen
www.adfweb.com?Product=HD67051-B2

Gateway M-Bus / PROFIBUS
www.adfweb.com?Product=HD67053M

Gateway M-Bus Concentrator
www.adfweb.com?Product=HD67054M

Gateway M-Bus Slave / Modbus RTU master
www.adfweb.com?Product=HD67059M-232

Do you have an your customer protocol?
www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?
www.adfweb.com?Cmd=helpme

Industrial Electronic Devices

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.

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	16/10/2020	VDB	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:

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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:

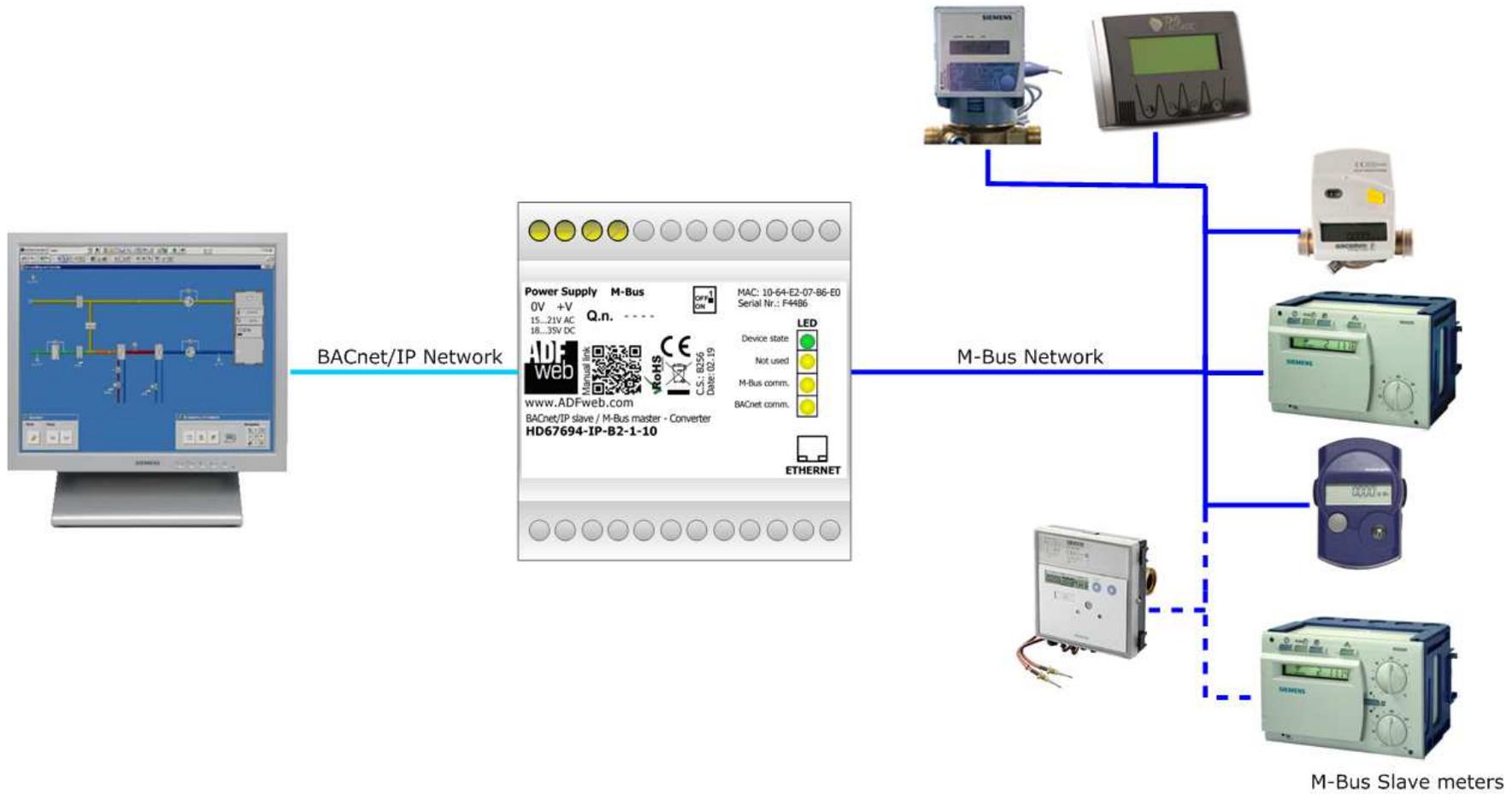⚠️ This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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.

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EXAMPLE OF CONNECTION:

BACnet/IP Network

M-Bus Network

M-Bus Slave meters

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CONNECTION SCHEME:

Connector2:
Ethernet Port
(RJ45 Plug)

Power Supply   M-Bus
0V   +V
15...21V AC   **Q.n.** - - - -
18...35V DC

MAC: 10-64-E2-07-B6-E0
Serial Nr.: F4486

LED
Device state
Not used
M-Bus comm.
BACnet comm.

www.ADFweb.com
BACnet/IP slave / M-Bus master - Converter
HD67694-IP-B2-1-10

ETHERNET

Led1:
Green
Device state

Led2:
Yellow
Not used

Led3:
Yellow
M-Bus comm.

Led4:
Yellow
BACnet comm.

Connector1:
Power Supply

0V = Ground
+V = Positive wire

V AC: min 15V ; max 21V
V DC: min 18V ; max 35V

0V +V

Connector3:
Unpolarized
M-Bus master

Dip-Switch A:
-Dip1 – Functioning Mode

= Normal Mode

= Boot Mode

Figure 1: Connection scheme for HD67694-IP-B2-xx-xxx

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CHARACTERISTICS:

The HD67694-IP-B2 are converters between M-Bus to BACnet/IP and vice-versa.
They allow to read standard M-Bus meters and M-Bus heating controllers like Siemens RVD series, AMARC AVD500 and many others.

They allows the following characteristics:

- Electrical isolation between BACnet/IP and M-Bus;
- Baud Rate and Parity changeable with software;
- Mountable on 35mm Rail DIN;
- Wide power supply input range: 15…21V AC or 18…35V DC;
- Wide temperature range: -40°C / 85°C [-40°F / +185°F].

CONFIGURATION:

You need Compositor SW67694 software on your PC in order to perform the following:

- Define the parameter of BACnet/IP line;
- Define the parameter of M-Bus line;
- Define which M-Bus variables are readable/writeable on BACnet/IP;
- Update the device.

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POWER SUPPLY:

The devices can be powered at 15…21V AC and 18…35V DC. The consumption depends to the code of the device. For more details see the two tables below.

VAC		VDC	
Vmin	**Vmax**	**Vmin**	**Vmax**
15V	**21V**	**18V**	**35V**

Consumption at 24V DC:

Device	No Load [W/VA]	Full Load [W/VA]*
HD67695-B2-1-10		4
HD67695-B2-3-25		5
HD67695-B2-15-50	3.5	8
HD67695-B2-30-75		14
HD67695-B2-50-100		30

* This value is with all the Slave M-Bus devices of the code connected to the line
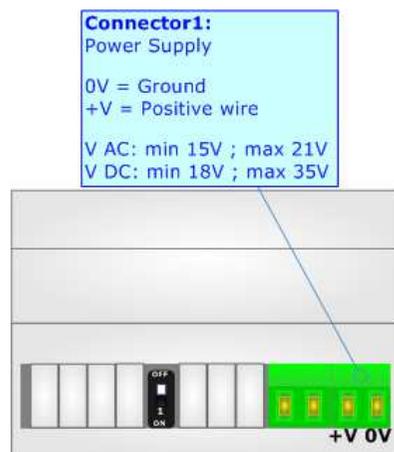
Caution: Not reverse the polarity power

HD67695-B2-xx-xxx

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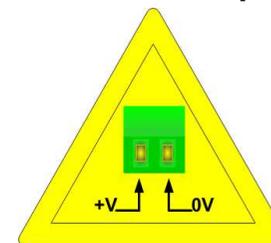
FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Dip1 of Dip-Switch A':

- The first, with 'Dip1 of Dip-Switch A' at "OFF" position, is used for the normal working of the device;
- The second, with 'Dip1 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.

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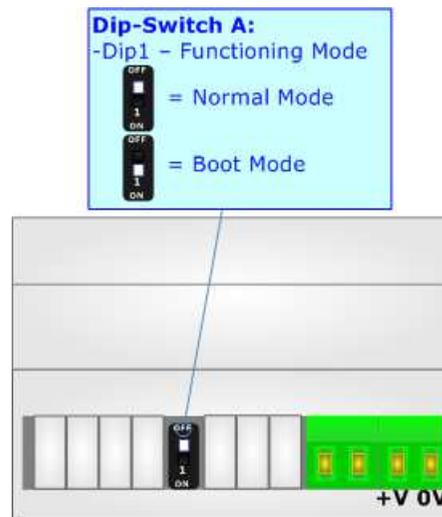
LEDS:

The device has got six 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: Device State (green)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: Not used (yellow)	OFF	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: M-Bus communication (yellow)	Blinks when correct M-Bus frame is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: BACnet communication (yellow)	Blinks when a BACnet request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

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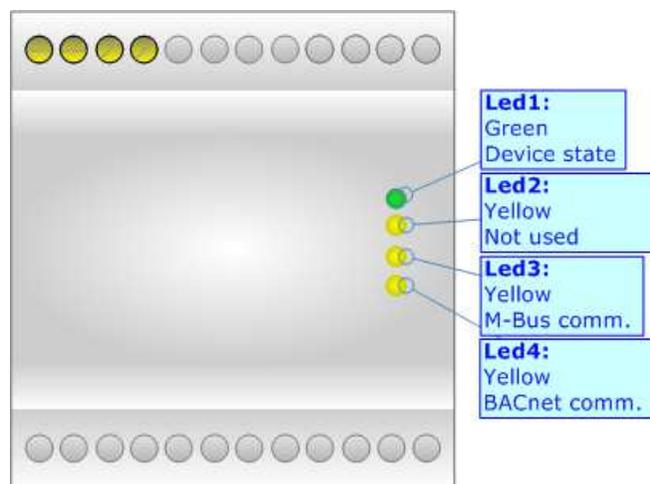
M-BUS:

The M-Bus is a unpolarized bus.

A two wire standard telephone cable (JYStY N*2*0.8 mm) is used as the transmission medium for the M-Bus. The maximum distance between a slave and the repeater is 350m; this length corresponds to a cable resistance of up 29Ω. This distance applies for the standard configuration having Baud rates between 300 and 9600 Baud, and a maximum of 250 slaves. The maximum distance can be increased by limiting the Baud rate and using fewer slaves, but the bus voltage in the space state must at no point in a segment fall below 12V, because of the remote powering of the slaves. In the standard configuration the total cable length should not exceed 1000m, in order to meet the requirement of a maximum cable capacitance of 180nF. *(Taken from M-Bus specifics)*

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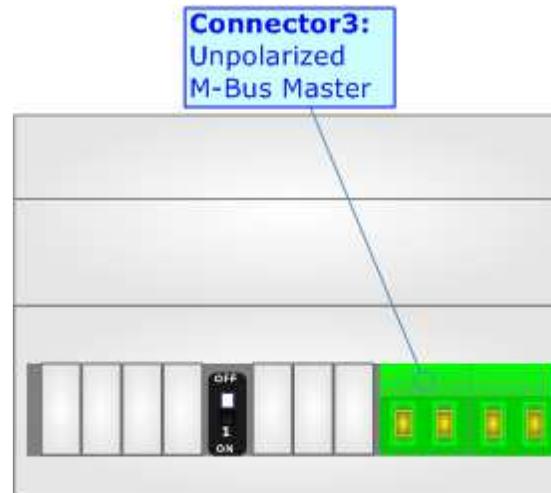
ETHERNET:

The Ethernet port is used for Modbus TCP communication and for programming the device.

The Ethernet connection must be made using Connector2 of HD67694-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.

Industrial Electronic Devices
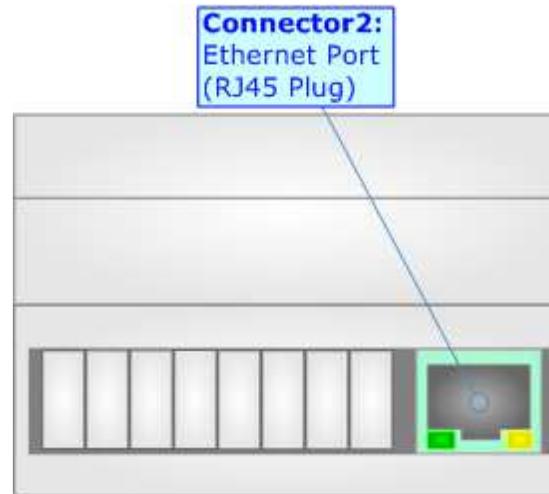
USE OF COMPOSITOR SW67694:

To configure the Converter, use the available software that runs with Windows called SW67694. It is downloadable from 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, 10; 32/64bit).

When launching the SW67694, the window below appears (Fig. 2).

Note:
It is necessary to have installed .Net Framework 4.
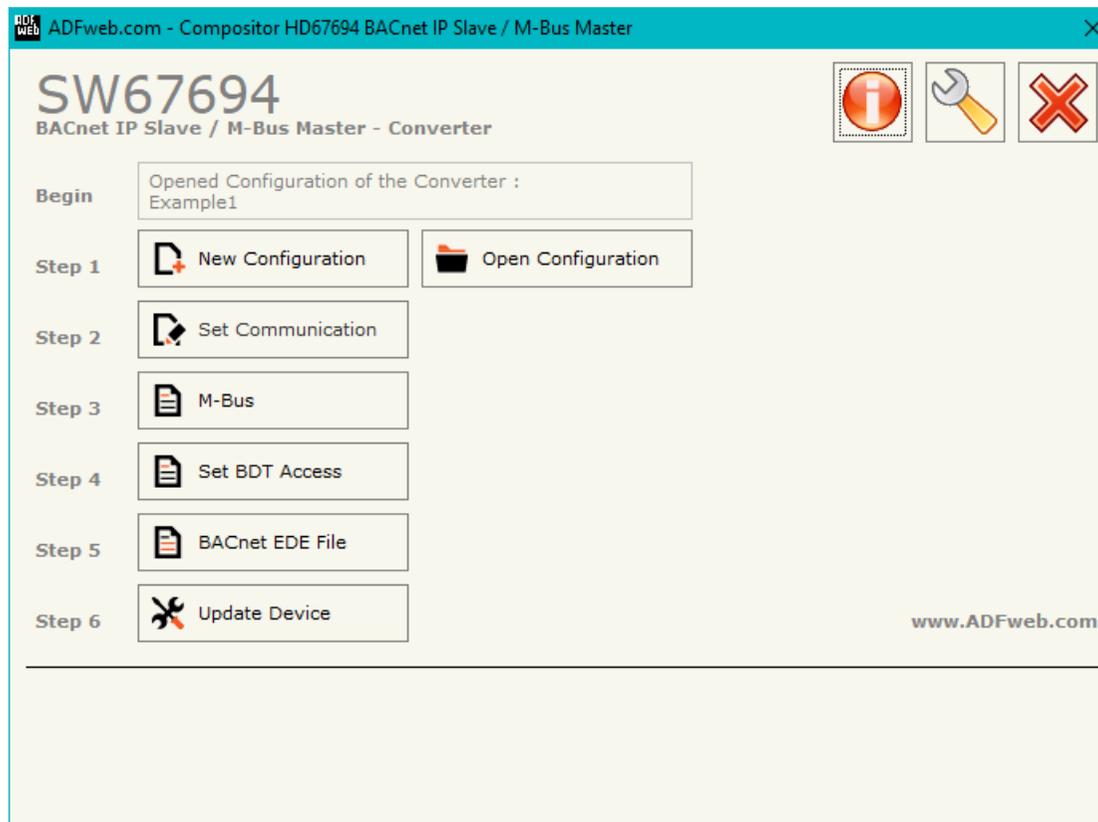
Figure 2: Main window for SW67694

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NEW CONFIGURATION / OPEN CONFIGURATION:

The "**New Configuration**" button creates the folder which contains the entire device's configuration.
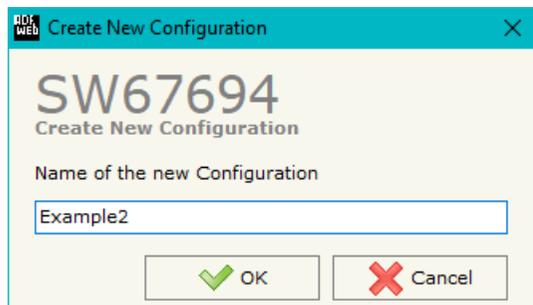
A device's configuration can also be imported or exported:

➔ To clone the configurations of a Programmable "M-Bus / BACnet/IP - 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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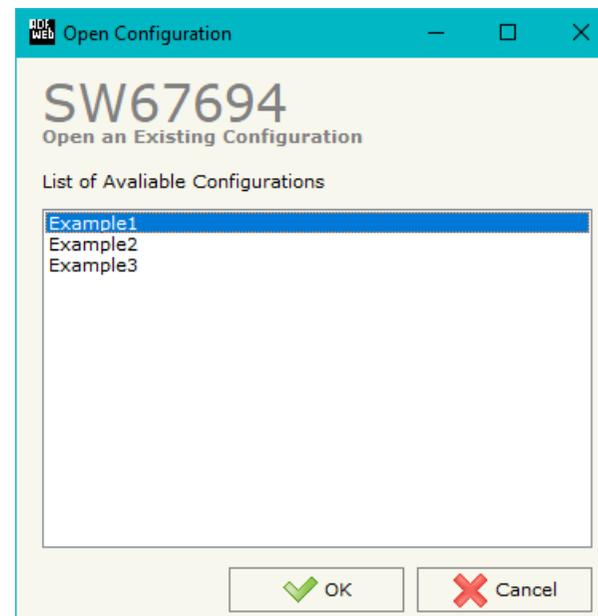
SOFTWARE OPTIONS:

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.
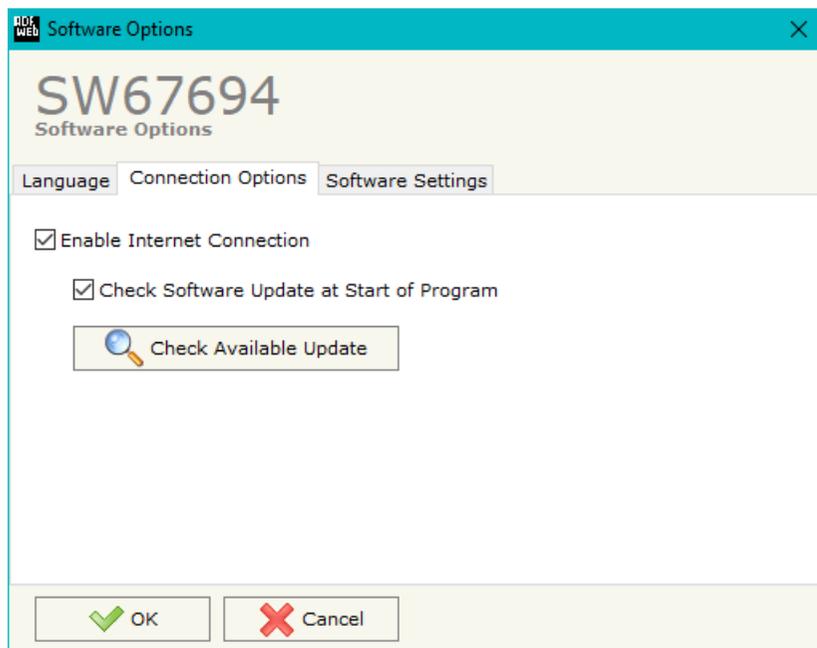
In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67694 check automatically if there are updatings when it is launched.

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Software Options

SW67694
Software Options

| Language | Connection Options | Software Settings |

☐ Jump into next field in the tables by pressing the Enter Key

☐ Enable Auto Size of Table Columns by Double Click

✓ OK   ✗ Cancel

In the section "Software Settings", it is possible to enable/disable some keyboard's commands for an easier navigation inside the tables contained in the different sections of the software.

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SET COMMUNICATION:

This section define the fundamental communication parameters of the three buses, BACnet/IP and M-Bus.

By Pressing the "**Set Communication**" button from the main window for SW67694 (Fig. 2) the window "Set Communication" appears (Fig. 3). The window is divided in two sections.

The means of the fields for "BACnet" are:

- In the fields "**IP ADDRESS**" the IP address of BACnet/IP side of the converter is defined;
- In the fields "**SUBNET Mask**" the SubNet Mask of BACnet/IP side of the converter is defined;
- In the fields "**GATEWAY**" the default gateway of the network is defined. 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 BACnet communication is defined. The default port used for BACnet communication is 47808, but is possible to insert any value;
- In the field "**BACnet Device Name**" the name of BACnet/IP side of the converter is defined;
- In the field "**Device Identifier**" the device instance of BACnet/IP side of the converter is defined;
- If the field "**Enable BBMD**" is checked, the BACnet/IP Broadcast Management Device function is enabled;
- If the field "**Accept FDR**" is checked, the converter accepts the Foreign Device Registration.

The means of the fields for "M-Bus" are (present only if the M-Bus port is "Present"):

- In the field "**Baudrate**" it is possible to select the data rate of the M-Bus line;
- In the field "**Parity**" it is possible to select the parity of the line;
- If the field "**Cyclic Delay (s)**" it is possible to define the delay with which the converter polls the M-Bus slaves;
- If the field "**Wait Answer (ms)**" is checked, the converter will wait for the response from M-Bus with the timeout defined in the field on the right;
- If the field "**Idle Time (ms)**" is checked, the converter will insert and the idle time defined between the last M-Bus response and the following request.
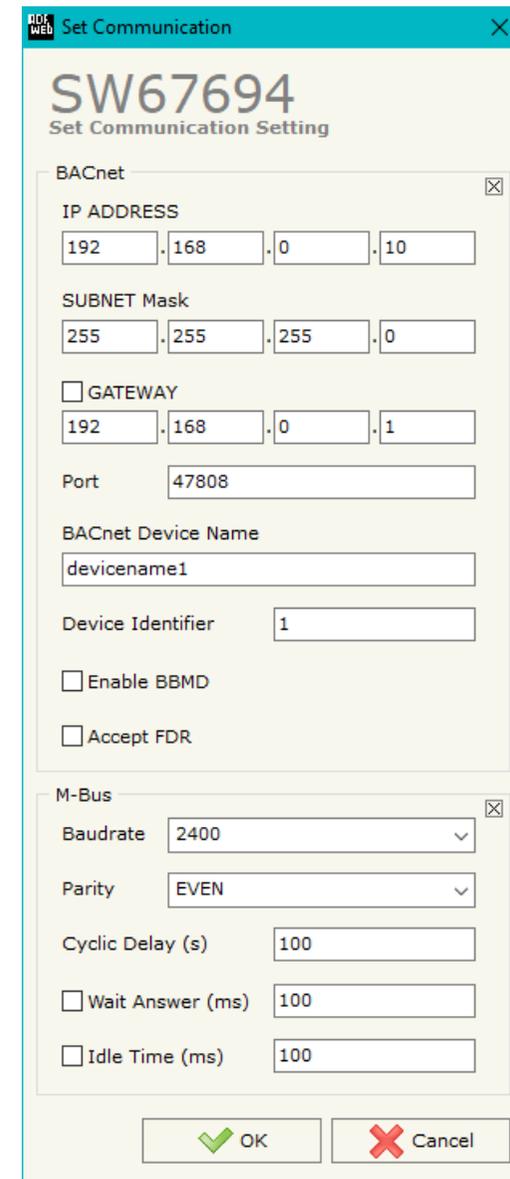
Figure 3: "Set Communication" window

M-BUS

By pressing the "**M-Bus**" button from the main window for SW67694 (Fig. 2) the window "M-Bus" appears (Fig. 4).
In this section, it is possible to select the converter type and the list of nodes/variables of M-Bus side.

The means of the fields are:

- In the field "**Select Converter**" the converter used is defined;

- In the field "**Select Template**" the M-Bus controller connected is defined;

- In the field "**Description**" a description for the node is defined;

- In the field "**M-Bus ID Type**" the type of polling (by Primary or Secondary Address) is defined;

- In the field "**M-Bus ID**" the ID of the M-Bus controller is defined;

- If the field "**Node State**" is checked, the Status of the controller is mapped on Modbus side;

Figure 4: "M-Bus" window

- If the field "**Identification Number**" is checked, the Secondary Address of the M-Bus controller is mapped on Modbus side;

- In the field "**MSB (xx)**" the first part of the description of the M-Bus variable is defined;

- In the field "**SST (yy)**" the second part of the description of the M-Bus variable is defined;

- In the field "**Third Field (zzz)**" the third part of the description of the M-Bus variable is defined.
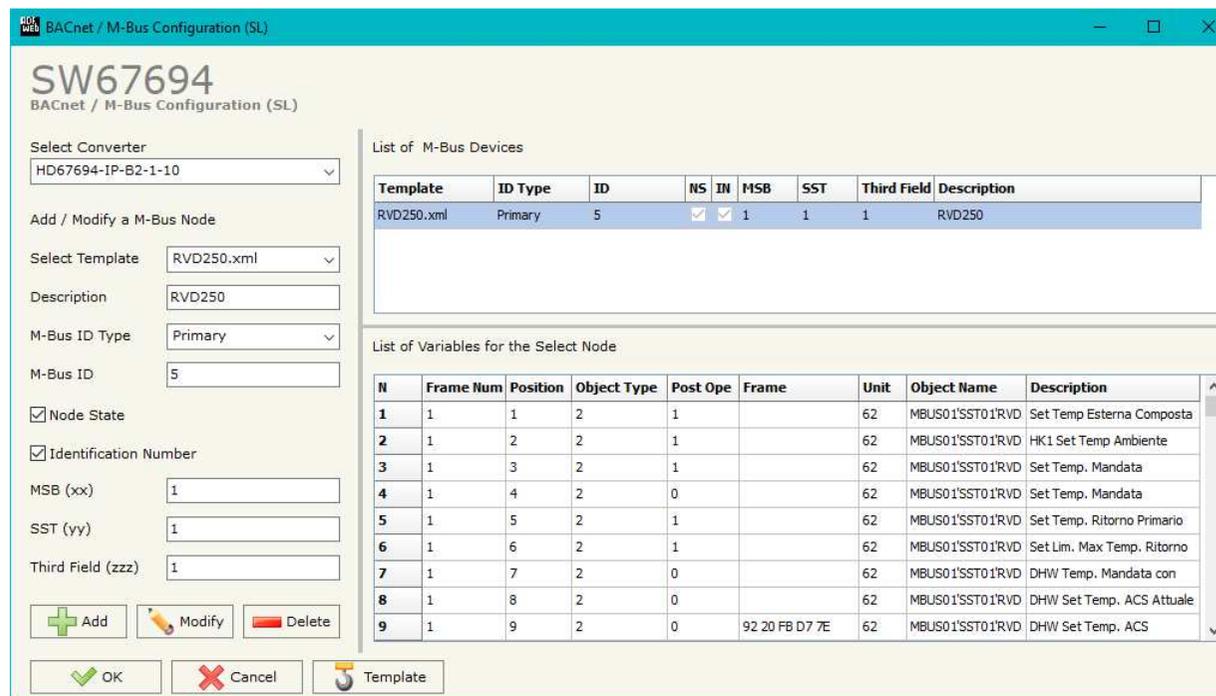
After that, pressing the "**ADD**" button, a new node appears in the "List of M-Bus Devices" table. In order to modify a created node it is necessary to select the desired node, change the wrong items and then press the "**MODIFY**" button.

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SET BDT ACCESS

By pressing the "**Set BDT Access**" button from the main window for SW67694 (Fig. 2) the window "Broadcast Distribution Table Access" appears (Fig. 5).
In this section, it is possible to route the broadcast messages to the specific IP Addresses.
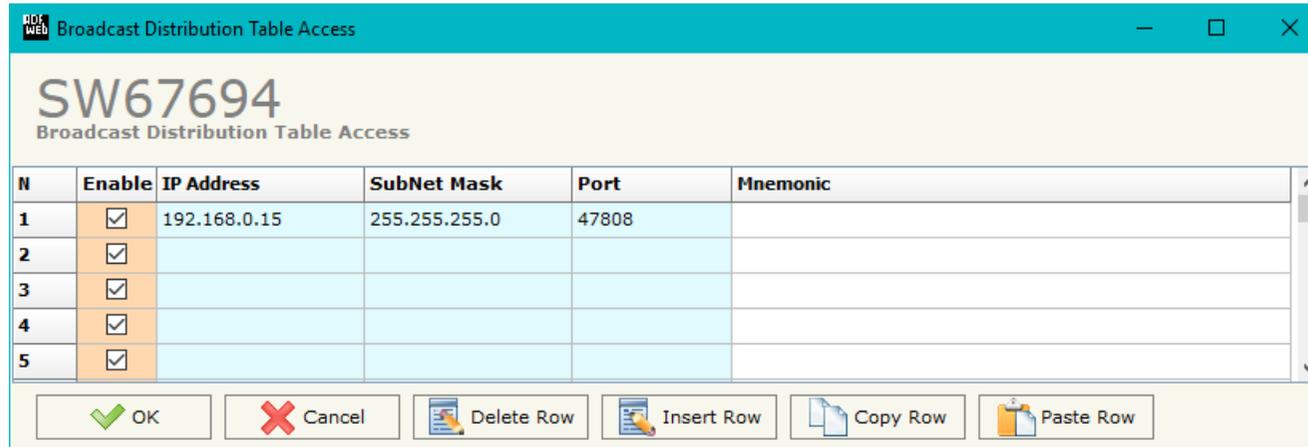
Figure 5: "Broadcast Distribution Table Access" window

The means of the fields are:

- If the field "**Enable**" is checked, the rule is enabled;
- In the field "**IP Address**" the IP Address of the device to which addressing the broadcast messages is defined;
- In the field "**SubNet Mask**" the SubNet Mask of the device to which addressing the broadcast messages is defined;
- In the field "**SubNet Mask**" the UDP port for the communication is defined;
- In the field "**Mnemonic**" a brief description is defined.

BACNET EDE FILE:

By pressing the "**BACnet EDE File**" button it is possible to save the EDE file for the BACnet Master.

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. This by using the Ethernet port.

If you don't know the actual IP address of the device you have to use this procedure:

- Turn OFF the Device;
- Put Dip1 of 'Dip-Switch A' in ON position;
- Turn ON the device
- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- 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 Dip1 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;
- 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.

Figure 6: "Update device" windows

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Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67694 device.

Warning:
If Fig. 7 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, 8 or 10 make sure that you have the administrator privileges;
- In case you have to program more than one device, using the "UDP Update", 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, 10 you have to launch the "Command Prompt" with Administrator Rights;
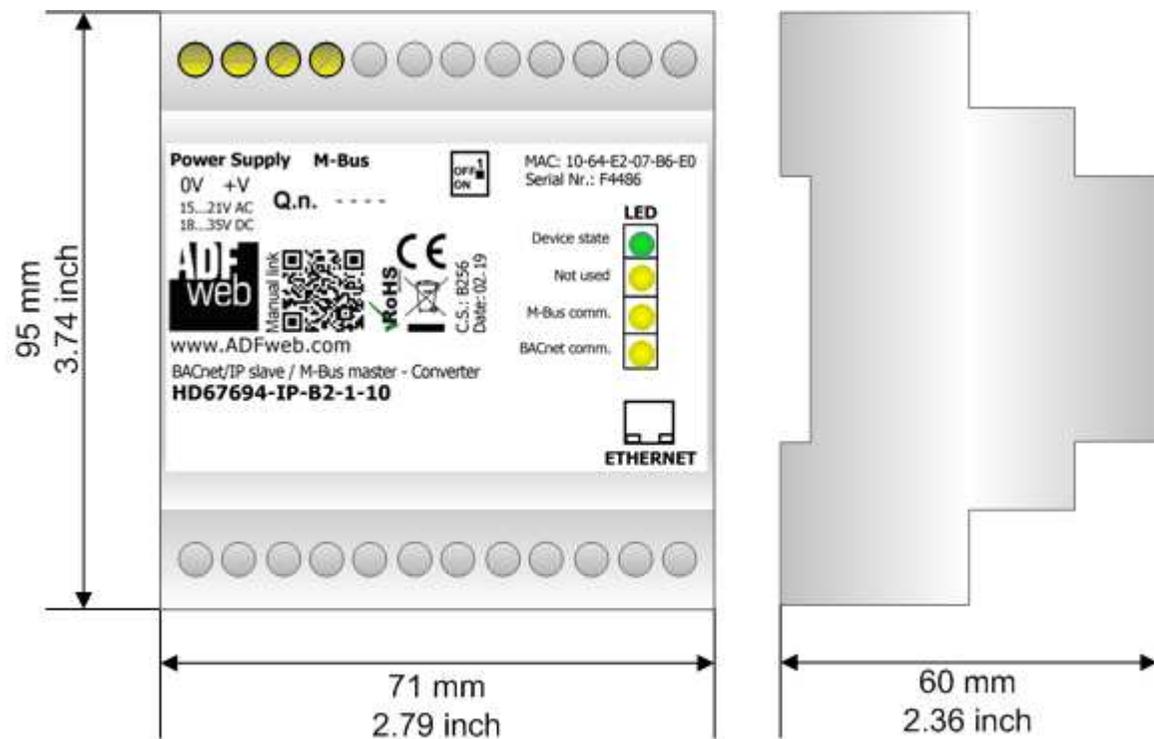- Pay attention at Firewall lock.

Figure 7: "Error" window

Warning:
In the case of HD67694 you have to use the software "SW67694": www.adfweb.com\download\filefold\SW67694.zip.

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MECHANICAL DIMENSIONS:

Housing: PVC
Weight: 200g (Approx)

Figure 8: Mechanical dimensions scheme for HD67694-B2-xx-xxx

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ORDERING INFORMATIONS:

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

HD67694 – B 2 – xx - xxx

Number of standard M-Bus meters connectable to the M-Bus port
10: Up to 10 standard M-Bus slaves
25: Up to 25 standard M-Bus slaves
50: Up to 50 standard M-Bus slaves
75: Up to 75 standard M-Bus slaves
100: Up to 100 standard M-Bus slaves

Number of M-Bus heating controllers connectable to the M-Bus port
1: Up to 1 heating controller
3: Up to 3 heating controllers
15: Up to 15 heating controllers
30: Up to 30 heating controllers
50: Up to 50 heating controllers

Connectors Type
2: Fixed 5mm Screw Terminal

Enclosure Type
B: 4M, 35mm DIN Rail mounting

Device Family
HD67694: M-Bus / BACnet/IP - Converter

Industrial Electronic Devices

Order Code: **HD67694-B2-1-10**   **-**   M-Bus / BACnet/IP – Converter (1 heating controller + up to 10 M-Bus slaves)
Order Code: **HD67694-B2-3-25**   **-**   M-Bus / BACnet/IP – Converter (3 heating controllers + up to 25 M-Bus slaves)
Order Code: **HD67694-B2-15-50**   **-**   M-Bus / BACnet/IP – Converter (15 heating controllers + up to 50 M-Bus slaves)
Order Code: **HD67694-B2-30-75**   **-**   M-Bus / BACnet/IP – Converter (30 heating controllers + up to 75 M-Bus slaves)
Order Code: **HD67694-B2-50-100**   **-**   M-Bus / BACnet/IP – Converter (50 heating controllers + up to 100 M-Bus slaves)

ACCESSORIES:

Order Code: **APW020**   -   Power Supply for M-Bus Master device that supports up to 20 Slaves
Order Code: **APW040**   -   Power Supply for M-Bus Master device that supports up to 40 Slaves
Order Code: **APW080**   -   Power Supply for M-Bus Master device that supports up to 80 Slaves
Order Code: **APW0160**   -   Power Supply for M-Bus Master device that supports up to 160 Slaves
Order Code: **APW0250**   -   Power Supply for M-Bus Master device that supports up to 250 Slaves

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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.

Industrial Electronic Devices

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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