![ADFweb logo]
Industrial Electronic Devices

User Manual
Revision 1.000
English

DMX / BACnet slave - Converter
(Order Code: HD67670-IP-B2)

For Website information:
www.adfweb.com?Product=HD67670

For Price information:
www.adfweb.com?Price=HD67670-IP-B2

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 BACnet Slave products see also the following link:

Converter BACnet to

www.adfweb.com?Product=HD67056	(M-Bus Master)
www.adfweb.com?Product=HD67671	(Modbus Master)
www.adfweb.com?Product=HD67672	(Modbus Slave)
www.adfweb.com?Product=HD67673	(Modbus TCP Master)
www.adfweb.com?Product=HD67674	(Modbus TCP Slave)
www.adfweb.com?Product=HD67675	(PROFIBUS Master)
www.adfweb.com?Product=HD67676	(PROFIBUS Slave)
www.adfweb.com?Product=HD67677	(CAN)
www.adfweb.com?Product=HD67678	(CANopen)
www.adfweb.com?Product=HD67679	(PROFINET)
www.adfweb.com?Product=HD67680	(DeviceNet Master)
www.adfweb.com?Product=HD67681	(DeviceNet Slave)
www.adfweb.com?Product=HD67682	(EtherNet/IP)
www.adfweb.com?Product=HD67683	(NMEA 2000)
www.adfweb.com?Product=HD67170	(SNMP Manager)
www.adfweb.com?Product=HD67693	(SNMP Agent)
www.adfweb.com?Product=HD67802	(KNX)

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

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	12/10/2015	Ff	All	First Release

WARNING:

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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.
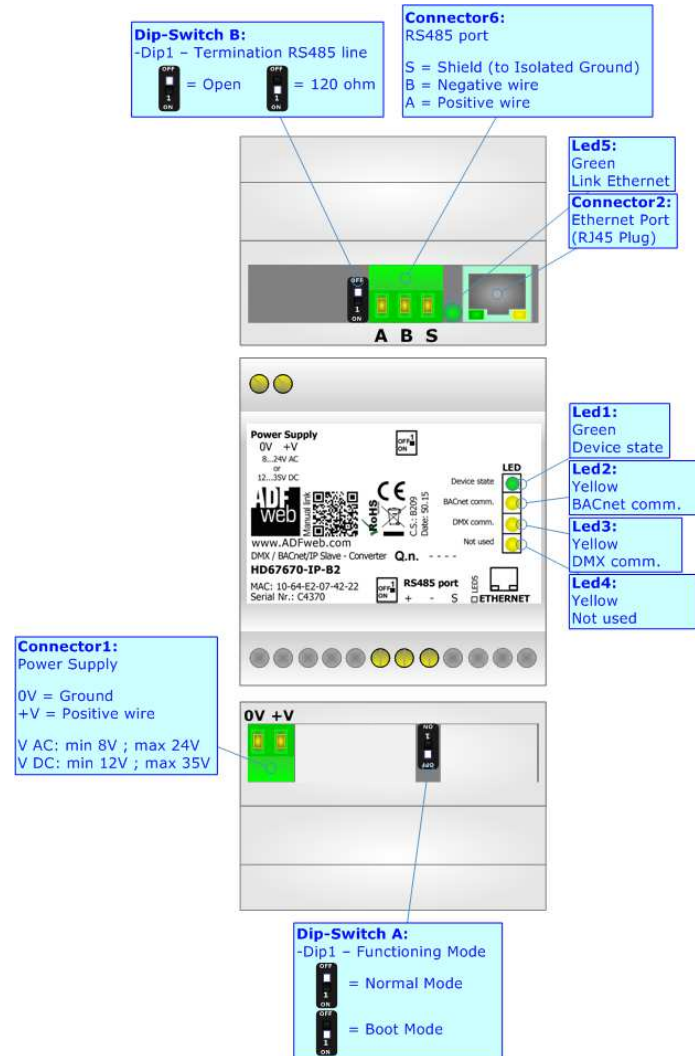
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EXAMPLE OF CONNECTION:

CONNECTION SCHEME:

Figure 1: Connection scheme for HD67670-IP-B2

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CHARACTERISTICS:

The HD67670-IP-B2 is a converter from BACnet slave to DMX and vice-versa.

They allows the following characteristics:

- Up to 2000 BACnet objects (Read+Write);
- Triple isolation between BACnet - Power Supply, BACnet - DMX, Power Supply - DMX.
- Two-directional information between BACnet bus and DMX 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 SW67670 software on your PC in order to perform the following:

- Define the parameter of BACnet line;
- Define the parameter of DMX line;
- Define BACnet objects that contains the data received from DMX;
- Define BACnet objects that contains the data to send to the DMX network;
- Update the device.

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POWER SUPPLY:

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

VAC $\sim$		VDC	
Vmin	Vmax	Vmin	Vmax
8V	24V	12V	35V

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67670-IP-B2	3.5

Connector1:
Power Supply

0V = Ground
+V = Positive wire

V AC: min 8V ; max 24V
V DC: min 12V ; max 35V

Caution: Not reverse the polarity power

HD67670-IP-B2

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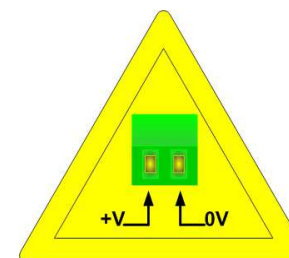
FUNCTION MODES:

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 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.

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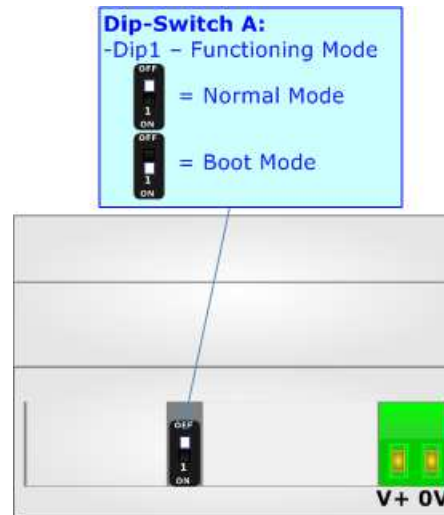
LEDS:

The device has got five 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)	**ON:** Device powered **OFF:** Device not powered
2: BACnet communication (yellow)	Blinks when a BACnet request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: DMX communication (yellow)	Blinks when a DMX frame is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: Not used (yellow)	**OFF**	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Ethernet Link (green)	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected

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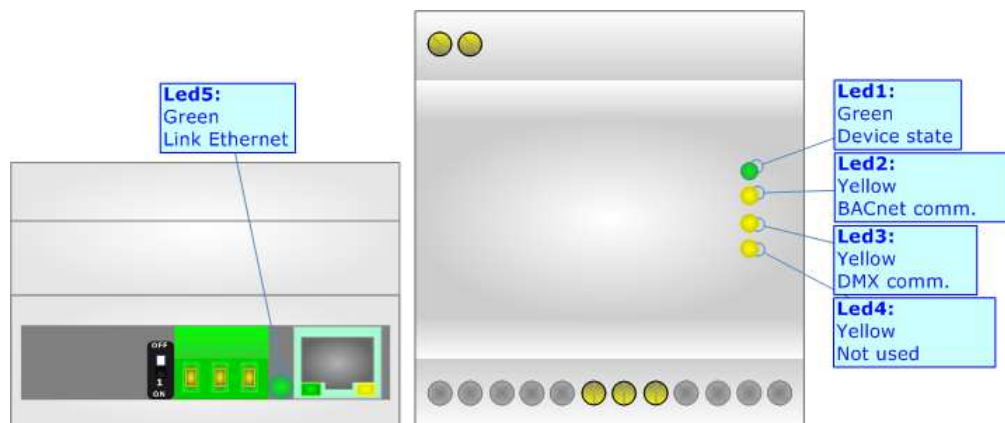
RS485:

For terminate the RS485 line with a 220Ω resistor it is necessary to put ON dip 1, like in figure.
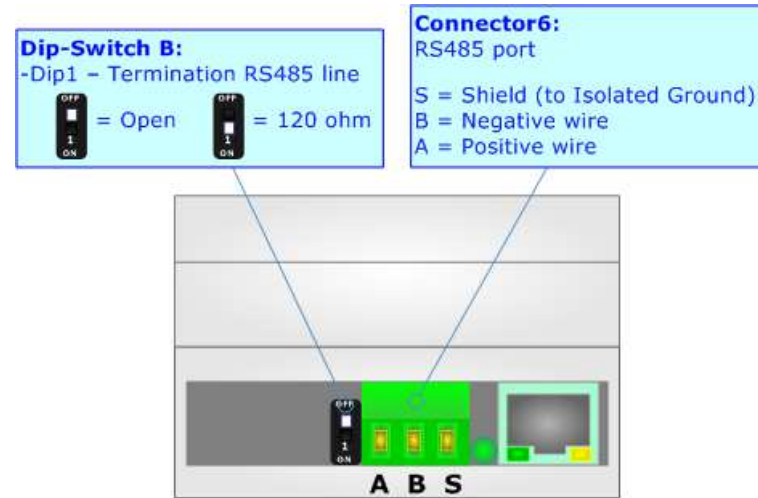
The maximum length of the cable should be 1200m (4000 feet).

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.

ETHERNET:

The Ethernet port is used for BACnet/IP communication and for programming the device.

The Ethernet connection must be made using Connector2 of HD67670-IP-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 is recommended the use of a cross cable.

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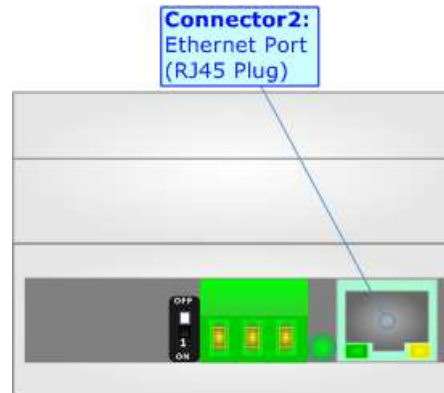
USE OF COMPOSITOR SW67670:

To configure the Converter, use the available software that runs with Windows called SW67670. 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 SW67670, the window below appears (Fig. 2).

Note:
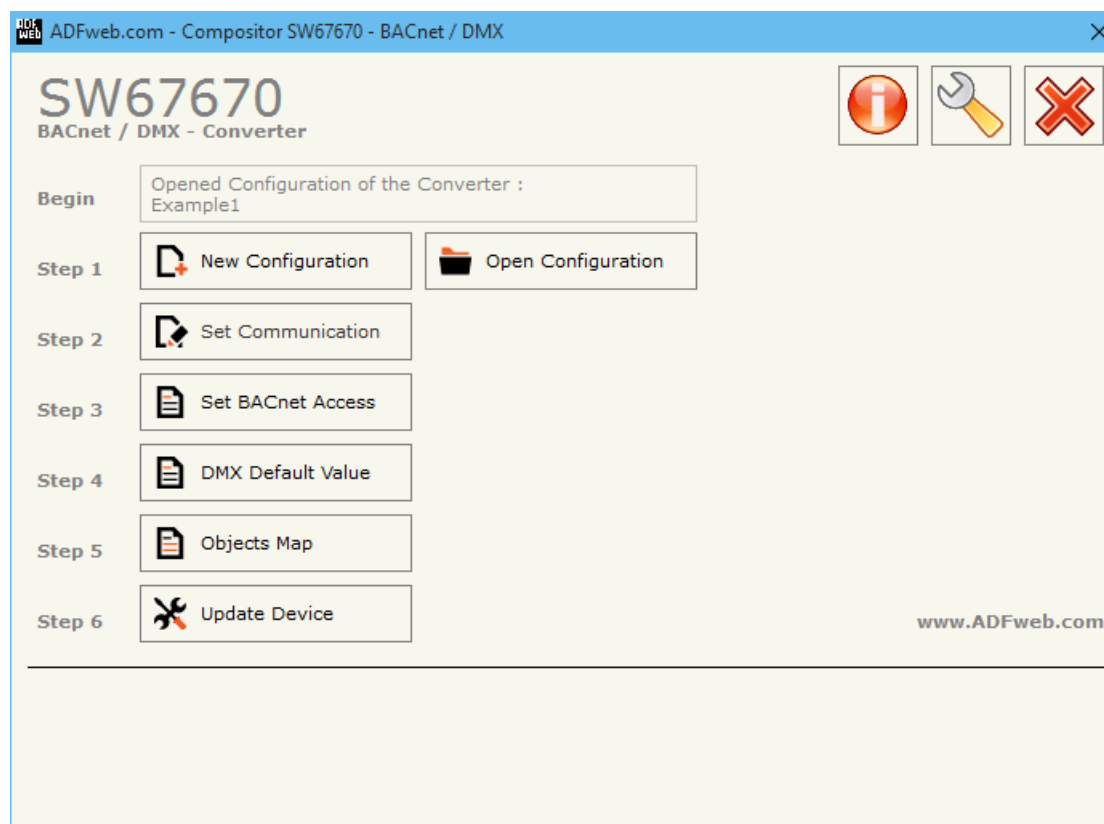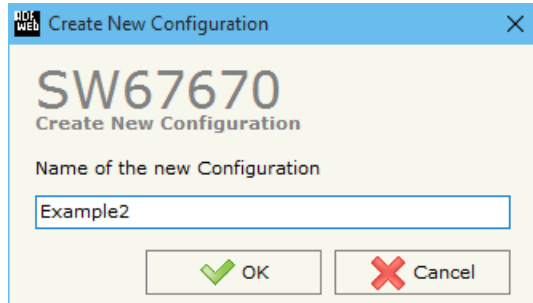   It is necessary to have installed .Net Framework 4.


Figure 2: Main window for SW67670

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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 "DMX / BACnet slave - 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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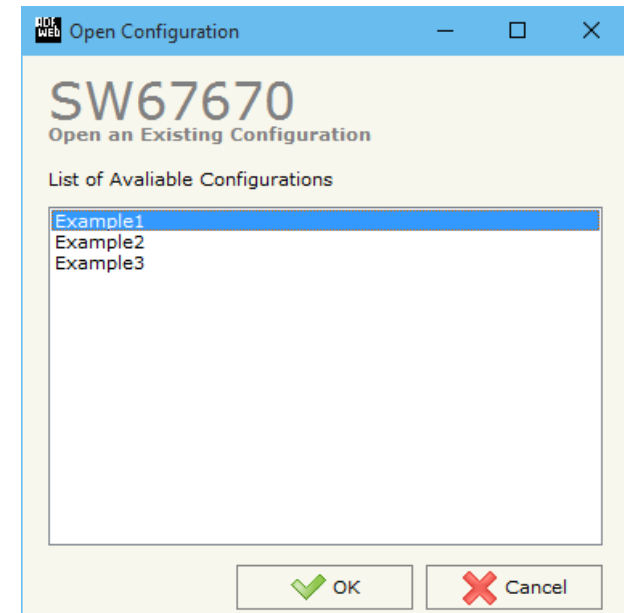
SOFTWARE OPTIONS:

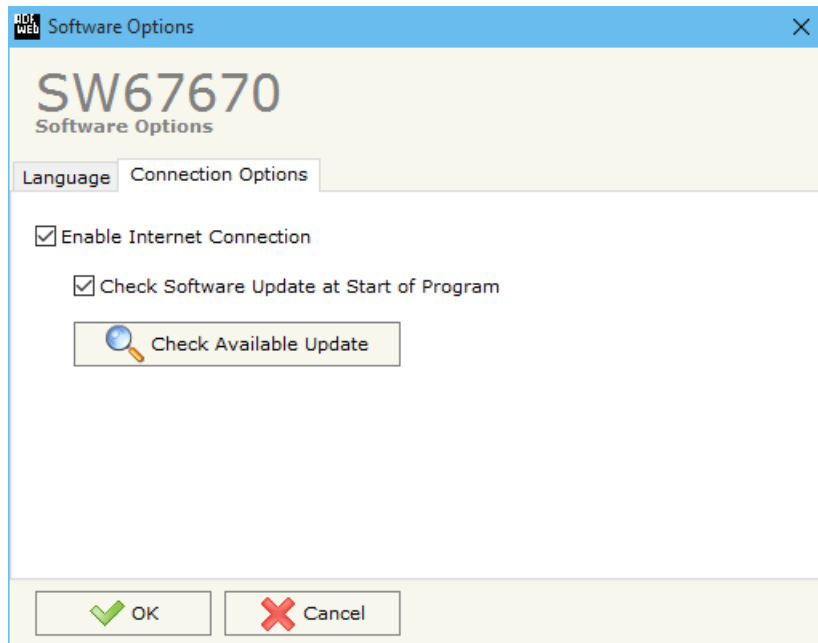By pressing the "**Settings**" (🔧) button there is the possibility to change the language of the software and check the updatings for the compositor.

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 SW67670 check automatically if there are updatings when it is launched.

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SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, BACnet and DMX.

By Pressing the "**Set Communication**" button from the main window for SW67670 (Fig. 2) the window "Set Communication" appears (Fig. 3).
The window is divided in three sections, one for selecting the type of BACnet (in relation to the device bought), one for the BACnet parameters and the other for the DMX parameters.

In the section "BACnet Type" is possible to select the type of BACnet to use from:

- BACnet/IP (it uses Ethernet);
- BACnet MS/TP (it uses RS485);
- BACnet PTP (it uses RS232).

If selected "BACnet/IP" the means of the fields for "BACnet" are:

- In the field "**IP ADDRESS**" insert the IP address that you want to give to the Converter;
- In the field "**SUBNET Mask**" insert the SubNet Mask;
- In the field "**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 BACnet communication is defined. The default port used for BACnet communication is 47808, but is possible to insert any value (except 10000 and 10001);
- In the field "**BACnet Device Name**" it is possible to assign a name to the BACnet node;
- In the field "**Device Identifier**" it is possible to assign a number to the BACnet node (Used for the Device Identifier).

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

- In the field "**DMX**" it is possible to define if the converter will act as DMX controller ("OUT") or as DMX device ("IN");
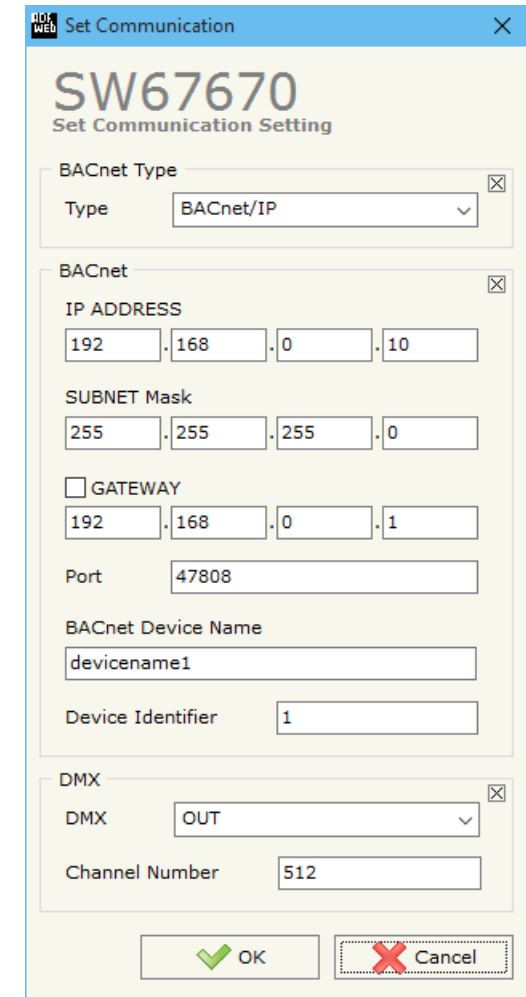- In the field "**Channel Number**" the number of channels of the DMX side is defined (up to 512 channels).

Figure 3: "Set Communication" window
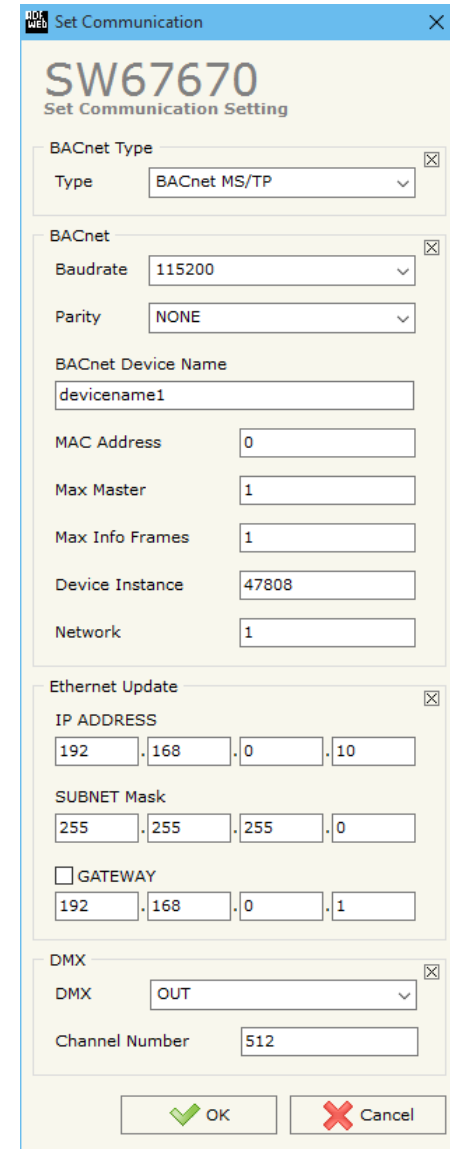
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If selected "BACnet MS/TP" the means of the fields for "BACnet" are:

➤ In the field "**Baudrate**" it is possible to select the baudrate of the BACnet (9600, 19200, 38400, 57600, 76800, 115200);

➤ In the field "**Parity**" it is possible to select the parity of the line (None, Odd, Even);

➤ In the field "**BACnet Device Name**" is possible to insert the name to give to the BACnet node (maximum 17 characters);

➤ In the field "**MAC Address**" it is possible to define the MAC of BACnet node (from 0 to 254);

➤ The field "**Max Masters**" specifies the highest allowable address for master nodes. The value shall be less than or equal to 127;

➤ The field "**Max Info Frames**" specifies the maximum number of information frames the node may send before it must pass the token;

➤ In the field "**Device Istance**" it is possible to assign a number to the BACnet node (Used for the Device Istance);

➤ In the field "**Network**" it is possible to define the number of the MS/TP network.

The means of the fields for the "Ethernet Update" section 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.

These informations are used for programming the Converter.

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SET BACNET ACCESS:

By Pressing the "**Set BACnet Access**" button from the main window for SW67670 (Fig. 2) the window "BACnet Set Access" appears (Fig. 4).

If in the section "Set Communication" the option "DMX IN" is set, the table is called "**BACnet in Read**" and it contains the BACnet objects readable by a BACnet Master; if in the section "Set Communication" the option "DMX OUT" is set, the table is called "**BACnet in Write**" and it contains the BACnet objects writeable by a BACnet Master.

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

+ In the field "**Data Type**" is possible to select the BACnet object data type;
+ In the field "**Eng. Unit**", with double click the window "*Select the BACnet Engineering Unit*" appears (Fig. 5);
+ In the field "**Position**" is possible to select the position where take/save the data from/to the DMX array;
+ The field "**Start Bit**" is used for the "Binary In" and "Binary Out" BACnet objects;
+ The field "**Length**" is used to define the dimension in bytes of the BACnet Object (the value '1' must be set for Binary Objects).
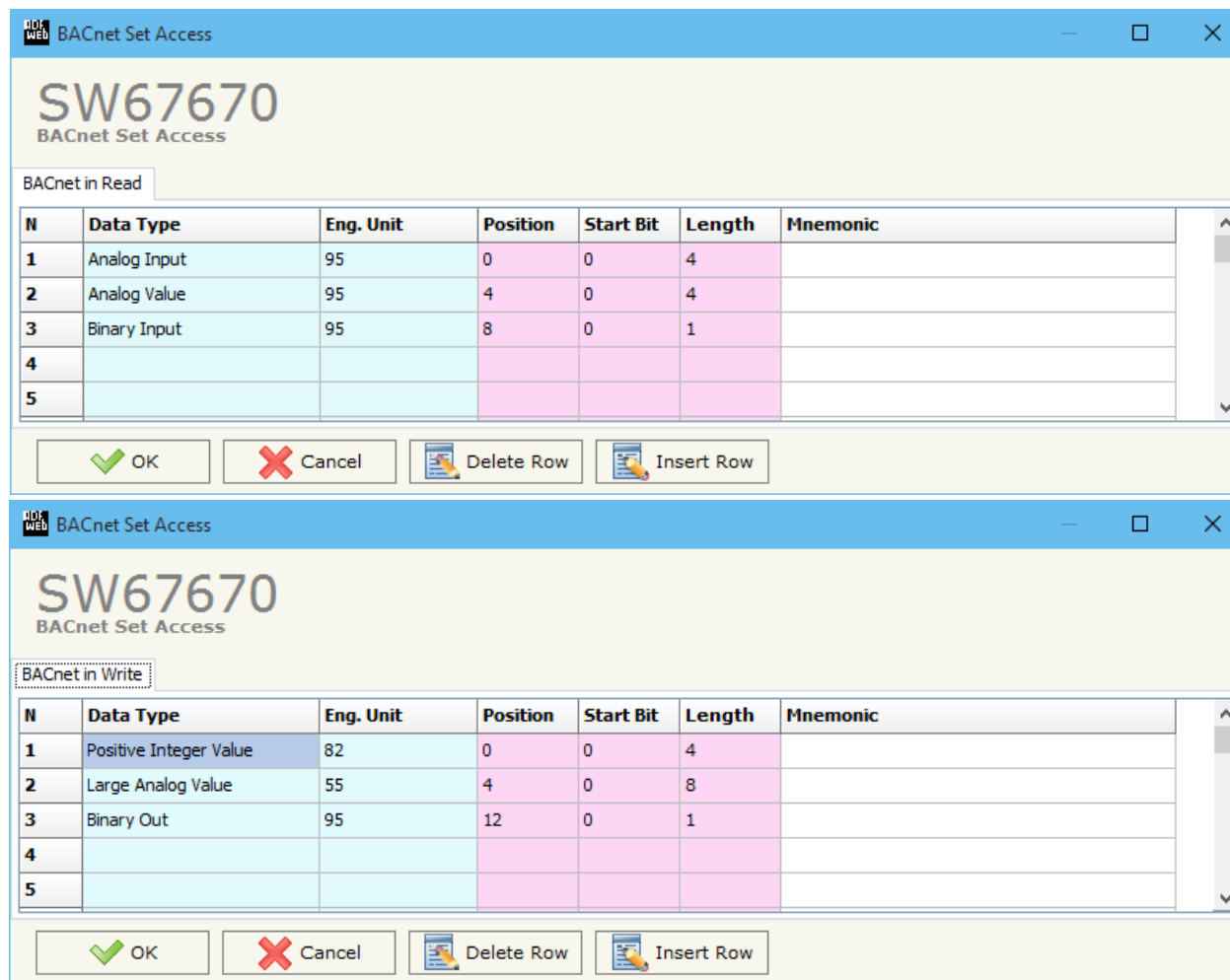

Figure 4: "BACnet Set Access" windows

BACnet Set Access

SW67670
BACnet Set Access

BACnet in Read

N	Data Type	Eng. Unit	Position	Start Bit	Length	Mnemonic
1	Analog Input	95	0	0	4	
2	Analog Value	95	4	0	4	
3	Binary Input	95	8	0	1	
4						
5						

OK   Cancel   Delete Row   Insert Row

BACnet Set Access

SW67670
BACnet Set Access

BACnet in Write

N	Data Type	Eng. Unit	Position	Start Bit	Length	Mnemonic
1	Positive Integer Value	82	0	0	4	
2	Large Analog Value	55	4	0	8	
3	Binary Out	95	12	0	1	
4						
5						

OK   Cancel   Delete Row   Insert Row

Is possible to insert directly the Unit (using its unique number) by compiling the "**Selected BACnet Engineering Unit**" field; or by selecting with the fields "**Select the Type**" and "**Select unit**" the Type/Unit desired. If the second way is used, is necessary to press the "**Select Engineering Unit**" button for confirm the choice.

Figure 5: "Select the BACnet Engineering Unit" window

DMX DEFAULT VALUE:

By pressing the "**DMX Default Value**" button from the main window for SW67670 (Fig. 2) the "DMX Default Value" window appears (Fig. 6).
In this section it is possible to define the default value for each channel of the DMX array when the converter is turned ON.
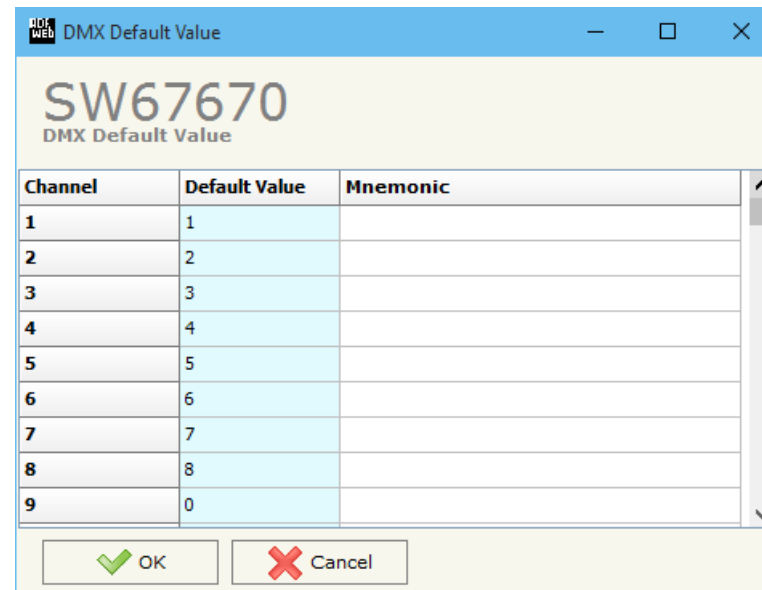

Figure 6: "DMX Default Value" window

OBJECTS MAP:

By Pressing the "**Objects Map**" button from the main window for SW67670 (Fig. 2) is possible to create a .csv document with the map of BACnet Objects.

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 Dip1 of 'Dip-Switch A' at 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 Dip1 of 'Dip-Switch A' at OFF position;
- Turn on the device.

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

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.

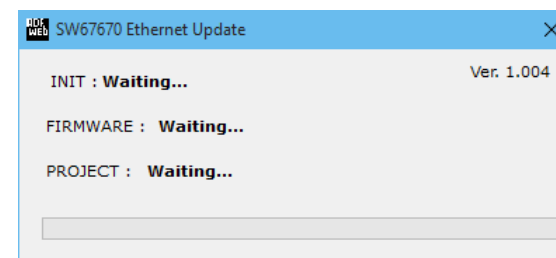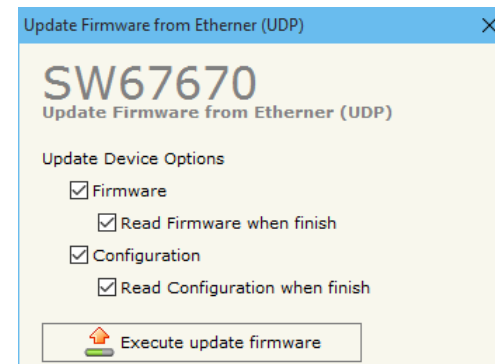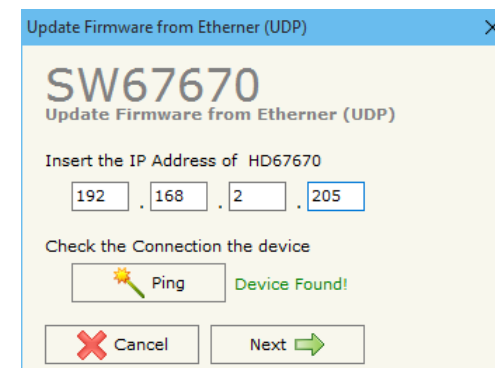At this point the configuration/firmware on the device is correctly updated.

Figure 7: "Update device" windows

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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 HD67670 device.

Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67670 device.

Warning:

If Fig. 8 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the updating;
- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- Check the Wi-Fi 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;
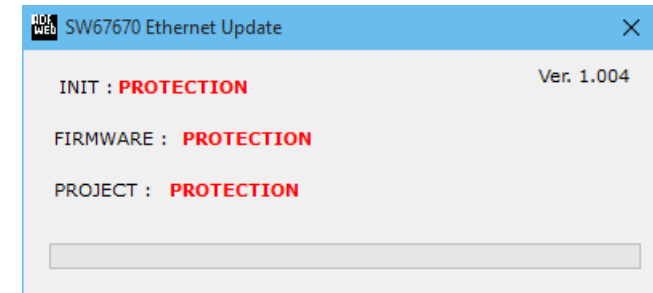- Pay attention at Firewall lock.

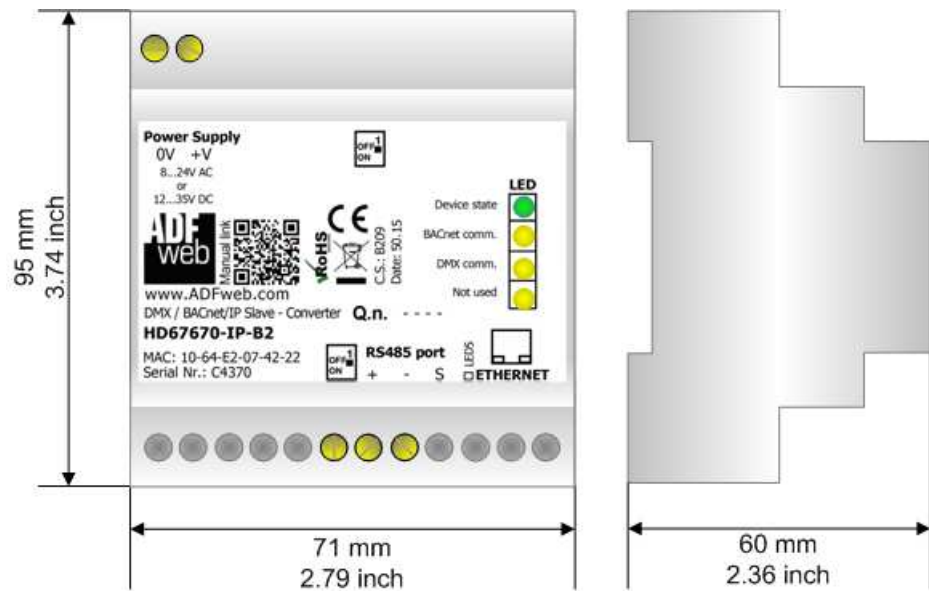In the case of HD67670 you have to use the software "SW67670": www.adfweb.com\download\filefold\SW67670.zip.

Figure 8: "Protection" window

SW67670 Ethernet Update

INIT : **PROTECTION**   Ver. 1.004

FIRMWARE : **PROTECTION**

PROJECT : **PROTECTION**

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MECHANICAL DIMENSIONS:

Housing: PVC
Weight: 200g (Approx)

Figure 9: Mechanical dimensions scheme for HD67670-IP-A1

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ORDERING INFORMATIONS:

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

HD67670 - IP – B 2

Connectors Type
2: Fixed 5mm Screw Terminal

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

BACnet type:
IP: BACnet/IP
MSTP: BACnet MS/TP

Device Family
HD67670: DMX / BACnet slave - Converter
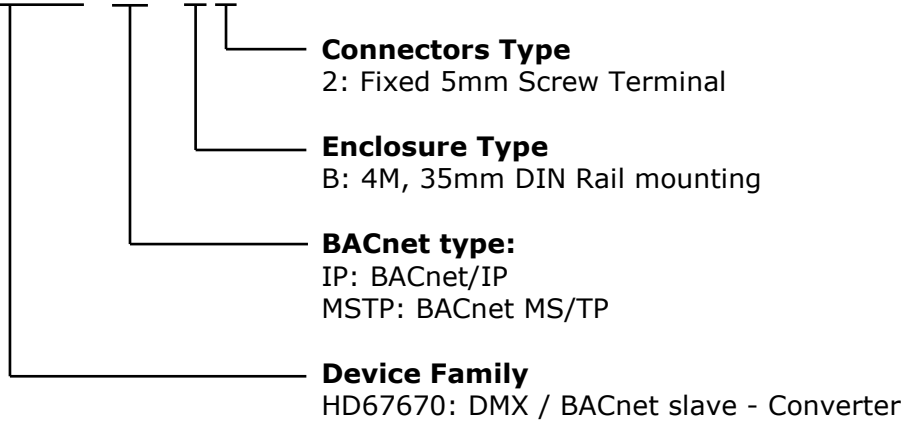
Order Code: **HD67670-IP-B2**   -   DMX / BACnet/IP slave – Converter

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

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OTHER REGULATIONS AND STANDARDS:

WEEE INFORMATION

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).

This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and 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.

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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.