User Manual

Revision 1.001
English

BACnet Slave / EtherNet/IP Master - Converter

(Order Code: HD67689-IP-A1, HD67689-MSTP-A1, HD67689-MSTP-B2)

For Website information:
http://www.adfweb.com/?Product=HD67689

For Price information:
http://www.adfweb.com/?Price=HD67689-IP-A1
http://www.adfweb.com/?Price=HD67689-MSTP-A1
http://www.adfweb.com/?Price=HD67689-MSTP-B2

Benefits and Main Features:

- Triple electrical isolation
- Two Ethernet ports
- Temperature range: -40°C/+85°C (-40°F/+185°F)

For others EtherNet/IP Master devices, see also the following links:

EtherNet/IP Master from/to ...

www.adfweb.com?Product=HD67158	(**SNMP Agent**)
www.adfweb.com?Product=HD67643	(**PROFIBUS Slave**)
www.adfweb.com?Product=HD67645	(**CAN**)
www.adfweb.com?Product=HD67646	(**CANopen**)
www.adfweb.com?Product=HD67647	(**DeviceNet Slave**)
www.adfweb.com?Product=HD67661	(**PROFINET**)
www.adfweb.com?Product=HD67665	(**Modbus TCP Slave**)
www.adfweb.com?Product=HD67667	(**Serial**)
www.adfweb.com?Product=HD67669	(**Modbus Slave**)
www.adfweb.com?Product=HD67689	(**BACnet Slave**)
www.adfweb.com?Product=HD67743	(**IEC 61850 Server**)
www.adfweb.com?Product=HD67806	(**KNX**)
www.adfweb.com?Product=HD67876	(**Ethernet**)
www.adfweb.com?Product=HD67955	(**MQTT**)
www.adfweb.com?Product=HD67B38	(**OPC UA Server**)

Do you have an your customer protocol?
See the following links:
www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?
Ask it to the following link:
www.adfweb.com?Cmd=helpme

User Manual

INDEX:

	Page
INDEX	2
UPDATED DOCUMENTATION	2
REVISION LIST	2
WARNING	2
TRADEMARKS	2
SECURITY ALERT	3
EXAMPLE OF CONNECTION	4
CONNECTION SCHEME	5
CHARACTERISTICS	8
CONFIGURATION	8
POWER SUPPLY	9
FUNCTION MODES	10
LEDS (for HD67689-IP-A1)	11
LEDS (for HD67689-MSTP-xx)	12
ETHERNET	13
RS485 (for BACnet MS/TP)	14
USE OF COMPOSITOR SW67689	15
NEW CONFIGURATION / OPEN CONFIGURATION	16
SOFTWARE OPTIONS	17
SET COMMUNICATION	19
ETHERNET/IP ACCESS	22
SET BACNET ACCESS	24
UPDATE DEVICE	26
MECHANICAL DIMENSIONS	28
ORDERING INFORMATIONS	31
ACCESSORIES	31
DISCLAIMER	32
OTHER REGULATIONS AND STANDARDS	32
WARRANTIES AND TECHNICAL SUPPORT	33
RETURN POLICY	33

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	13/03/2019	Tf	All	First release version
1.001	22/09/2025	Ln	All	New design

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:

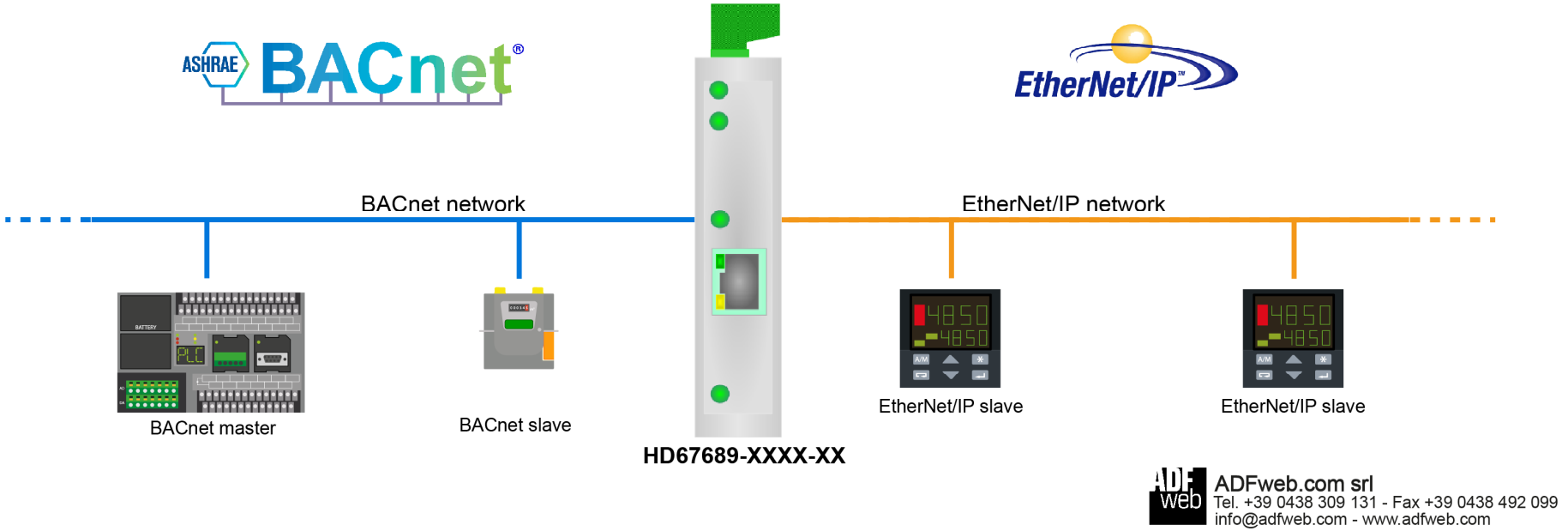


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY

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

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

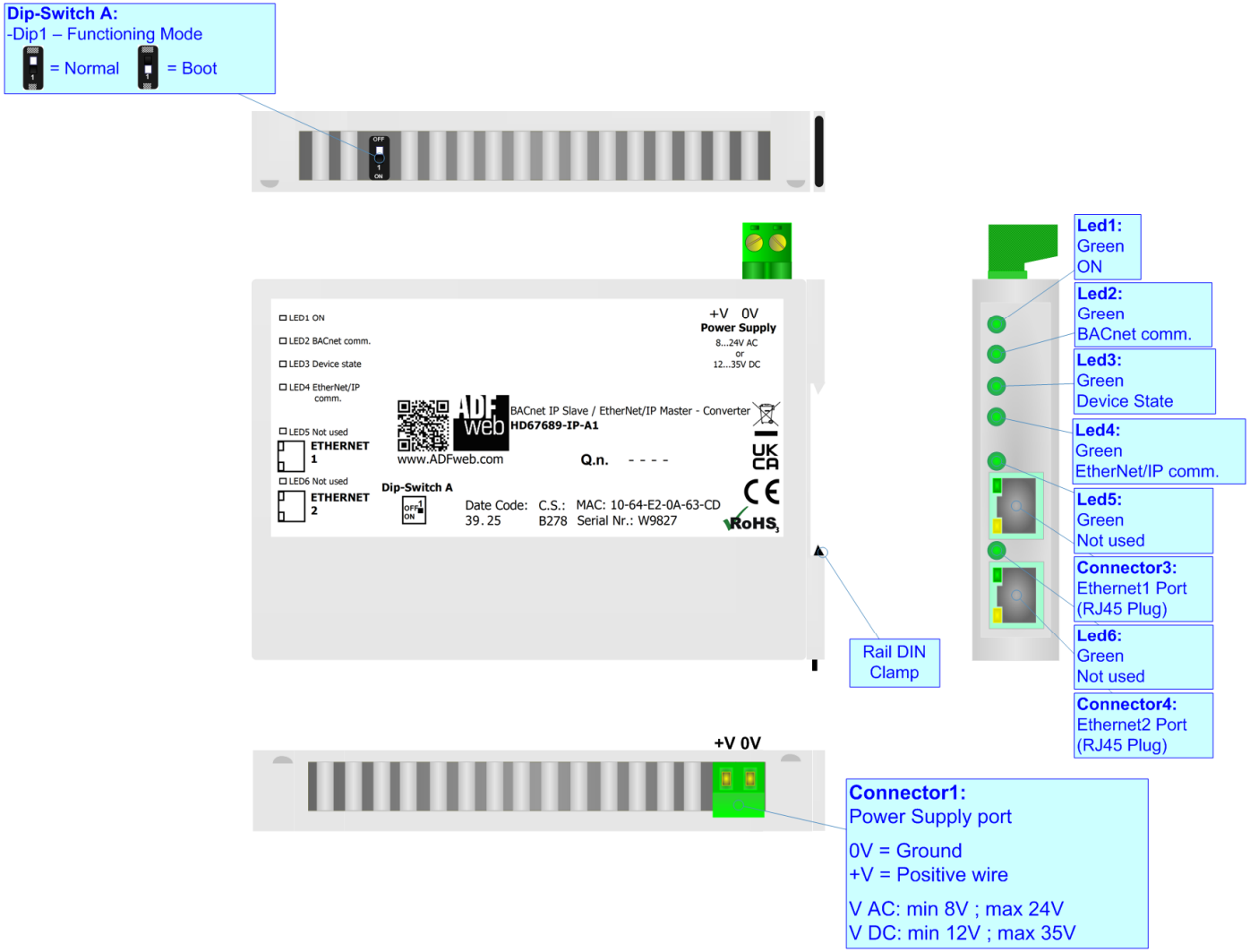


Figure 1a: Connection scheme for HD67689-IP-A1

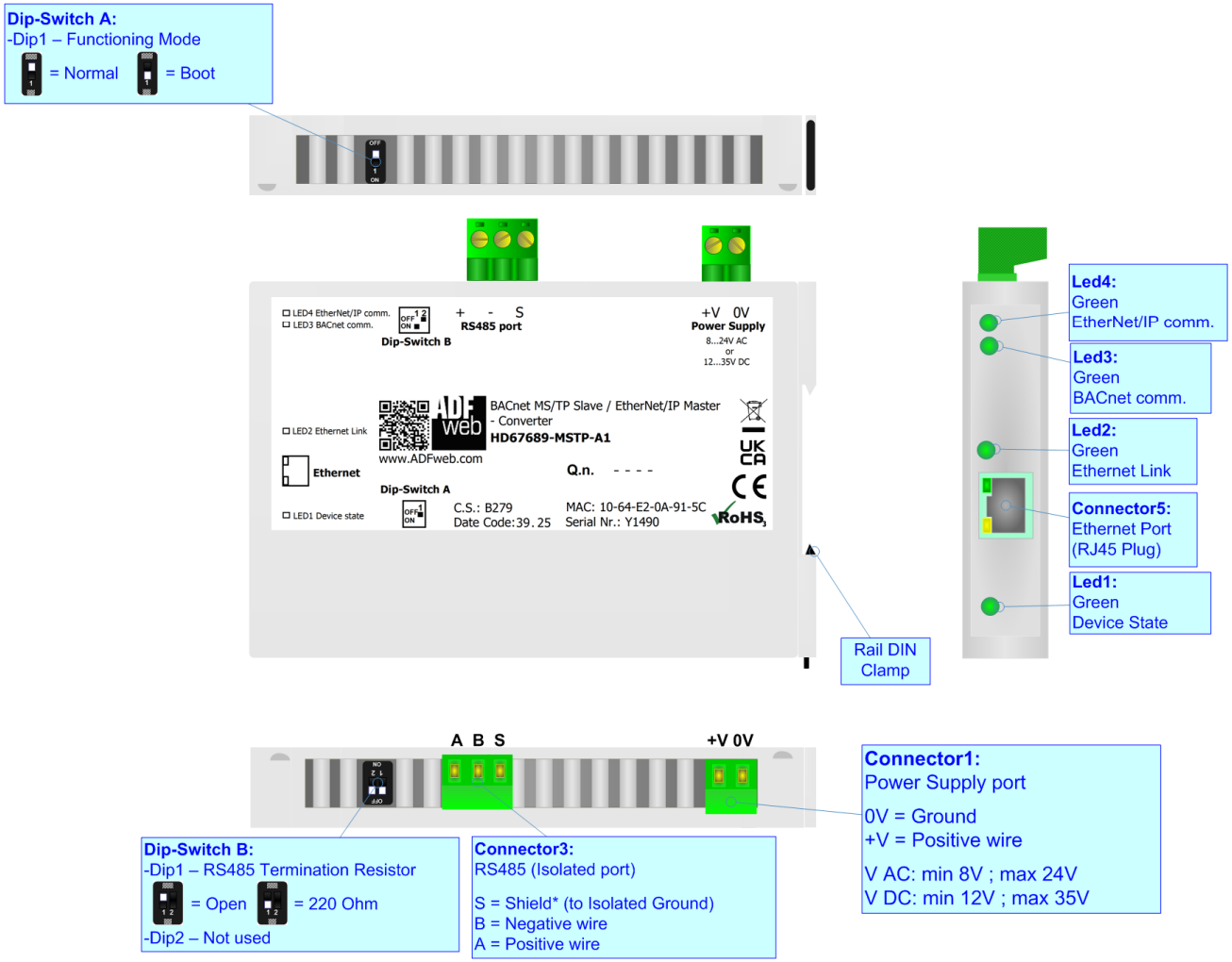


Figure 1b: Connection scheme for HD67689-MSTP-A1

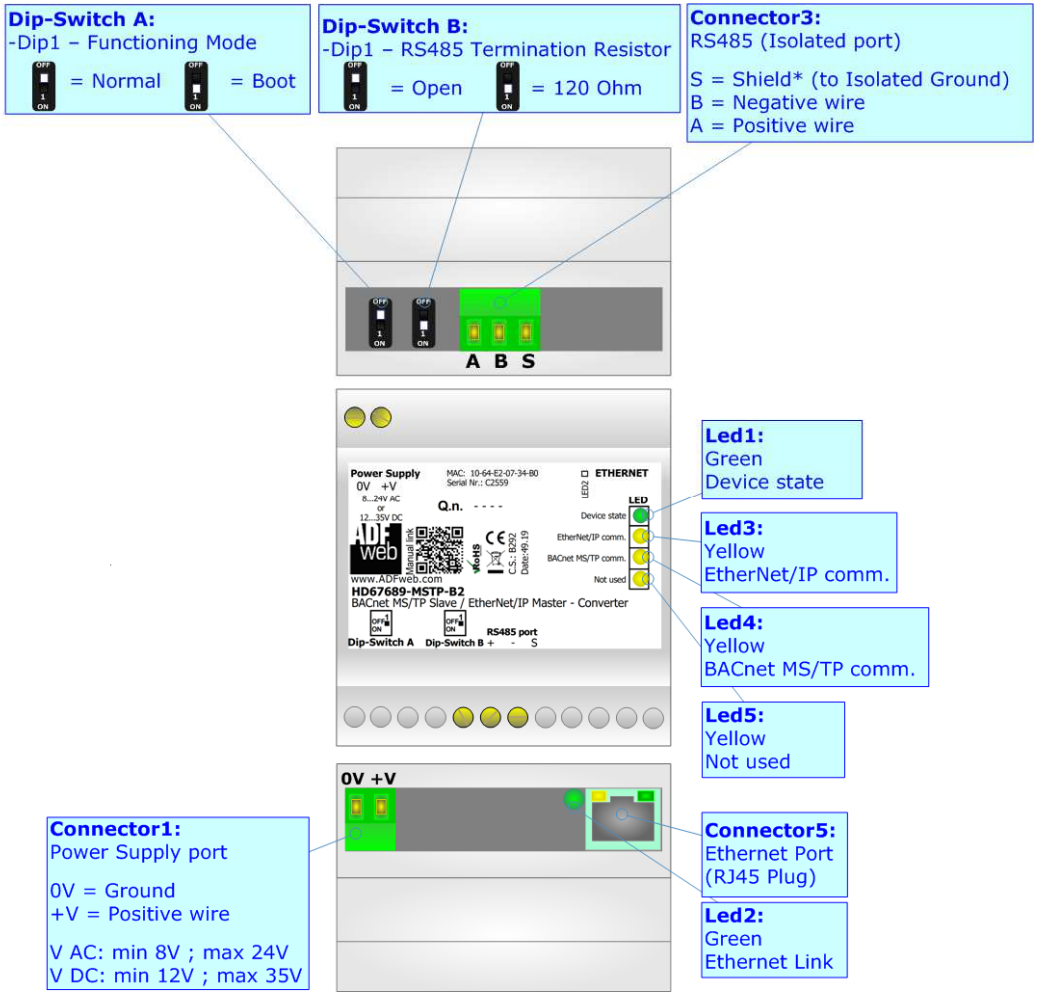


Figure 1c: Connection scheme for HD67689-MSTP-B2

CHARACTERISTICS:

The HD67689-xx is a BACnet Slave / EtherNet/IP Master Converter.

It allows the following characteristics:

- Two-directional information between BACnet and EtherNet/IP;
- 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 SW67689 software on your PC in order to perform the following:

- Define the parameter of the EtherNet/IP;
- Define the parameter of the BACnet;
- Define the list of EtherNet/IP slaves connected to the converter;
- Define the list of BACnet objects accessible on BACnet side;
- Update the device.

POWER SUPPLY:

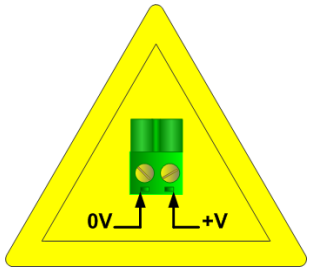
The devices can be powered between a wide range of tensions. For more details see the two tables below.

	VAC ~		VDC ⎓	
	Vmin	Vmax	Vmin	Vmax
HD67689-xx-xx	**8V**	**24V**	**12V**	**35V**

Consumption at 24V DC:

Device	W/VA
HD67689-xxxx-xx	4

Caution: Not reverse the polarity power



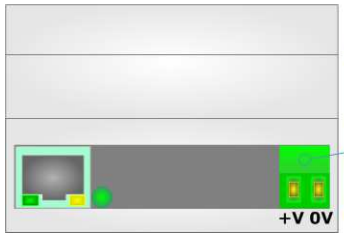
HD67689-xxxx-xx

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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





Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

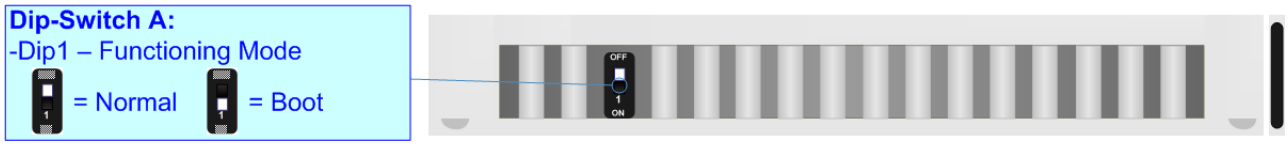
FUNCTION MODES:

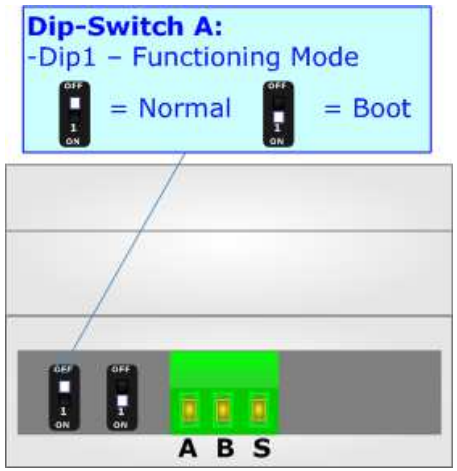
The device has got two functions mode depending of the position of the Dip1 of 'Dip-Switch A':

- The first, with Dip1 in Off position (factory setting), is used for the normal working of the device.
- The second, with Dip1 in On position, is used for upload the Project/Firmware.

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

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

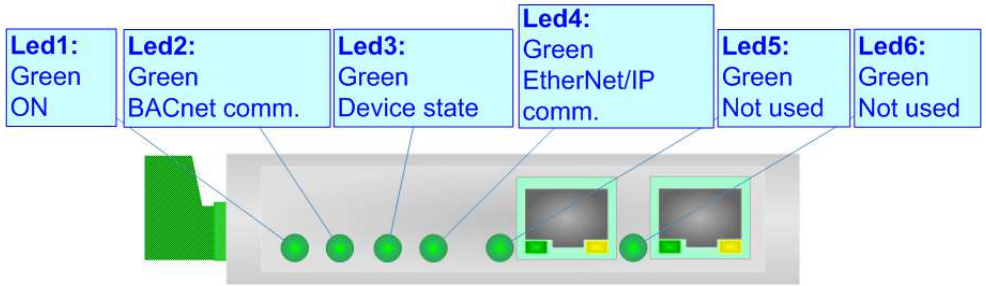




LEDS (for HD67689-IP-A1):

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.

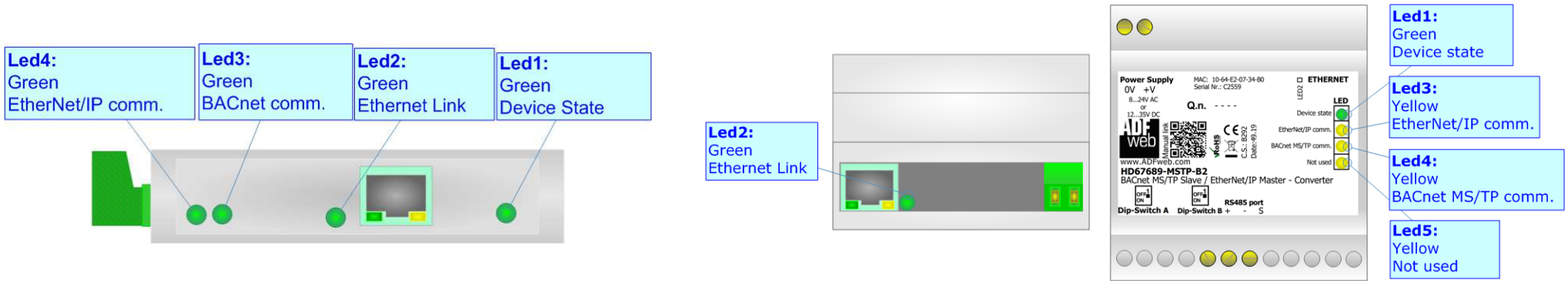
LED	Normal Mode	Boot Mode
1: ON [supply voltage] (green)	**ON:** Device powered **OFF:** Device not powered	**ON:** Device powered **OFF:** Device not powered
2: BACnet comm. (green)	Blinks when a BACnet request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: Device State (green)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: EtherNet/IP Comm. (green)	Blinks when EtherNet/IP communication is running	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Not used (green)	OFF	**OFF**
6: Not used (green)	OFF	**OFF**



LEDS (for HD67689-MSTP-xx):

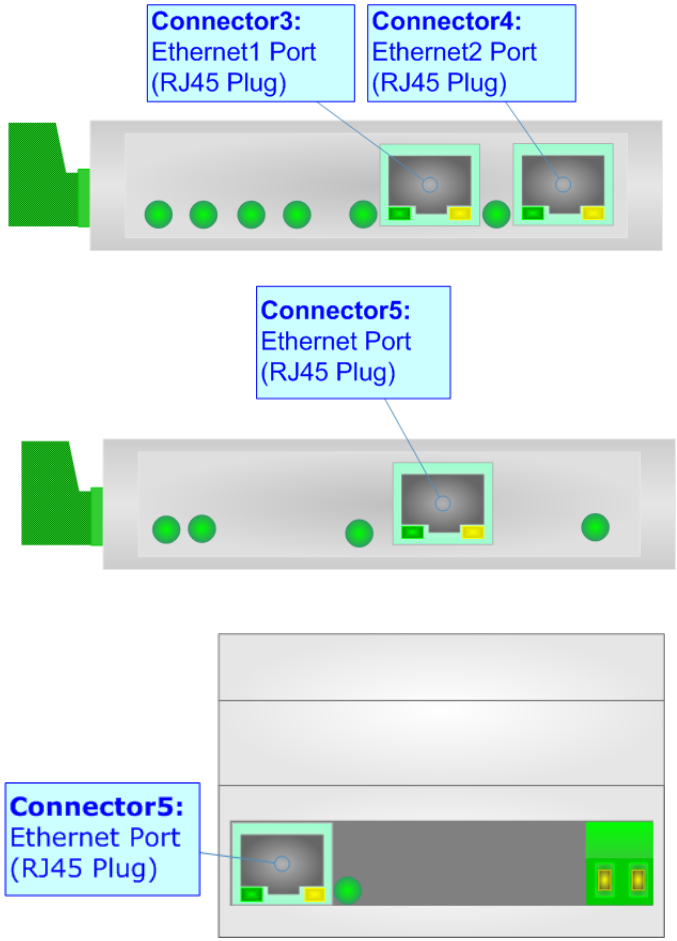
The device has got four (five for the –B2 version) LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device state	Blinks slowly (~1Hz)	**ON:** Device powered **OFF:** Device not powered
2: Ethernet Link	**ON:** Ethernet cable inserted **OFF:** Ethernet cable not inserted	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: BACnet Comm.	Blinks when a BACnet request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: EtherNet/IP Comm.	Blinks when EtherNet/IP communication is running	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Not used (green)	OFF	OFF



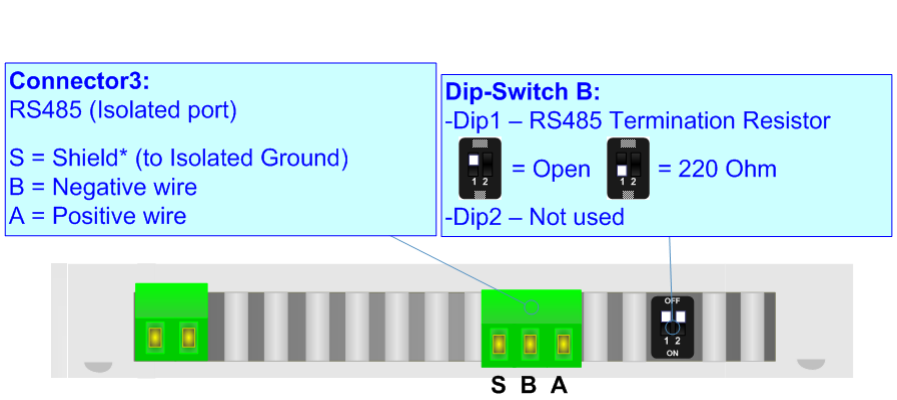
ETHERNET:

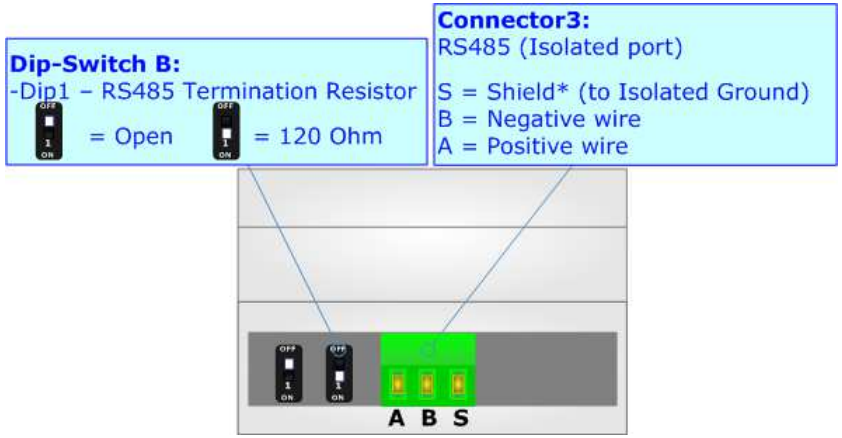
The Ethernet connection must be made using Connector3 or Connector4 or Connector5 of HD67689-xxxx-xx with at least a Category 5E cable. The maximum length of the cable should not exceed 100m. The cable has to conform to the T568 norms relative to connections in cat.5 up to 100 Mbps. To connect the device 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.



RS485 (for BACnet MS/TP):

For terminate the RS485 line with a 120Ω 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 SW67689:

To configure the Converter, use the available software that runs with Windows called SW67689. 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, 10 or 11; 32/64bit).

When launching the SW67689, the window below appears (Fig. 2).

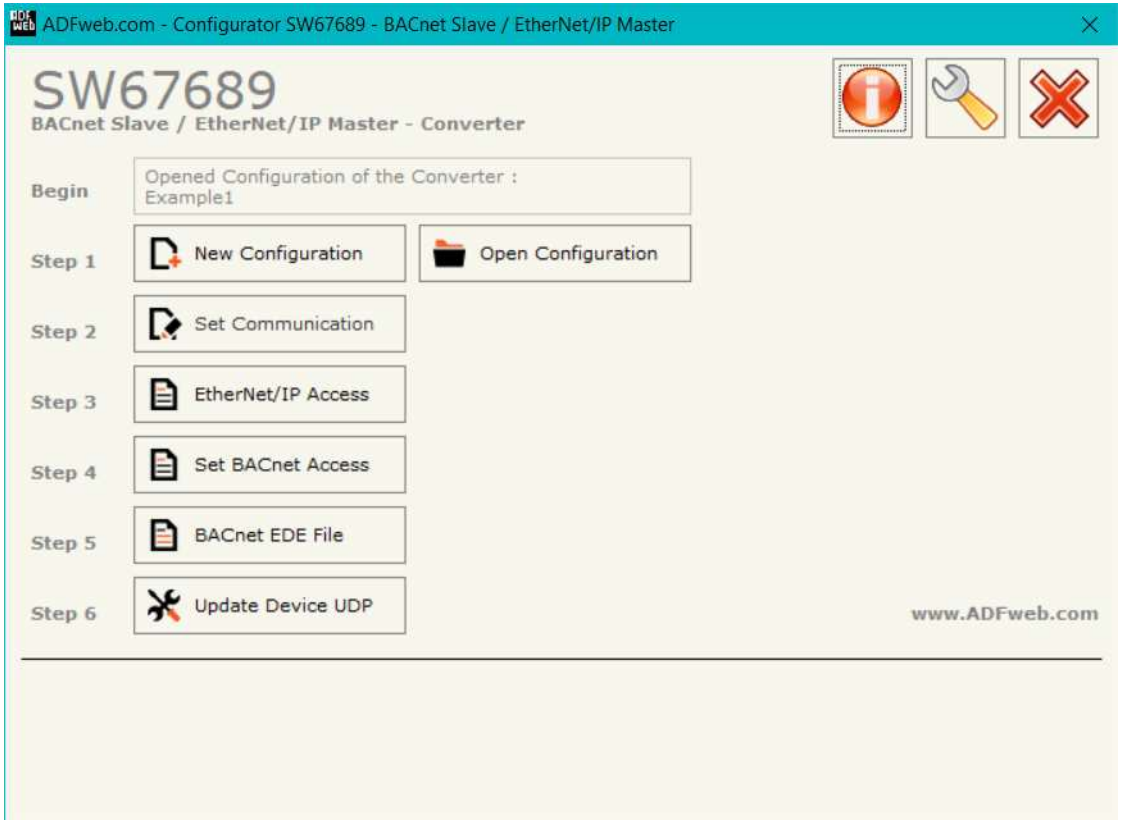


Figure 2: Main window for SW67689

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

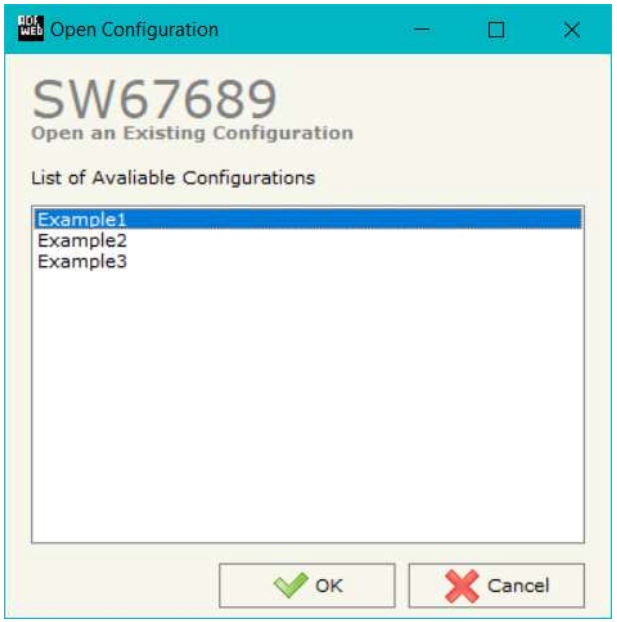
NEW CONFIGURATION / OPEN CONFIGURATION:

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 "BACnet Slave / EtherNet/IP 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**".

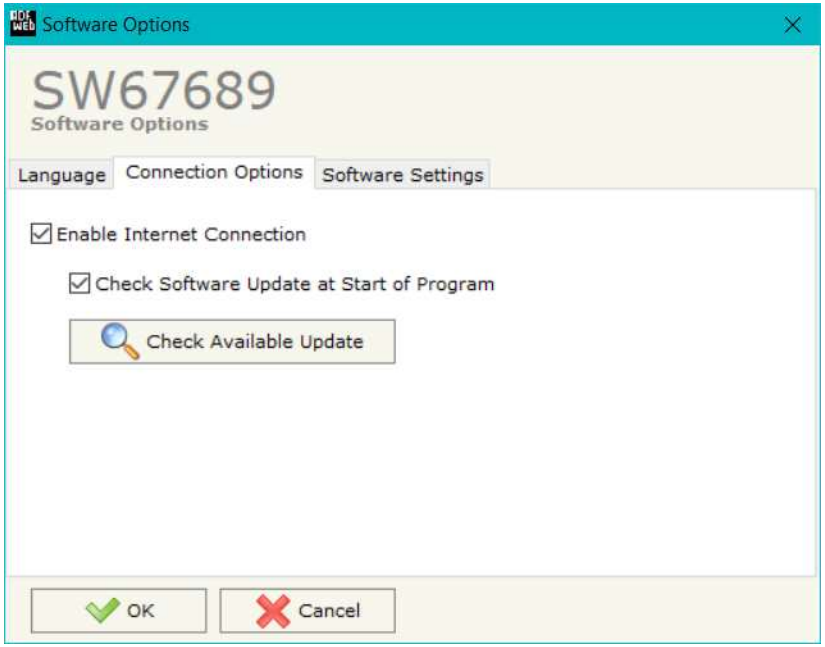


SOFTWARE OPTIONS:

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 SW67689 check automatically if there are updatings when it is launched.



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.

SET COMMUNICATION:

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

By Pressing the "**Set Communication**" button from the main window for SW67689 (Fig. 2) the window "Set Communication" appears (Fig. 3).

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

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

If selected "BACnet/IP" the means of the fields for "BACnet Slave" 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 (except 10000 and 10001);
- In the field "**BACnet Device Name**" the name of BACnet/IP side of the converter is defined;
- In the field "**Device Identifier**" the ID of BACnet/IP side of the converter is defined;
- If the field "**BACnet description up to 32 chars**" is checked, the description for the BACnet Objects can be up to 32 chars long.

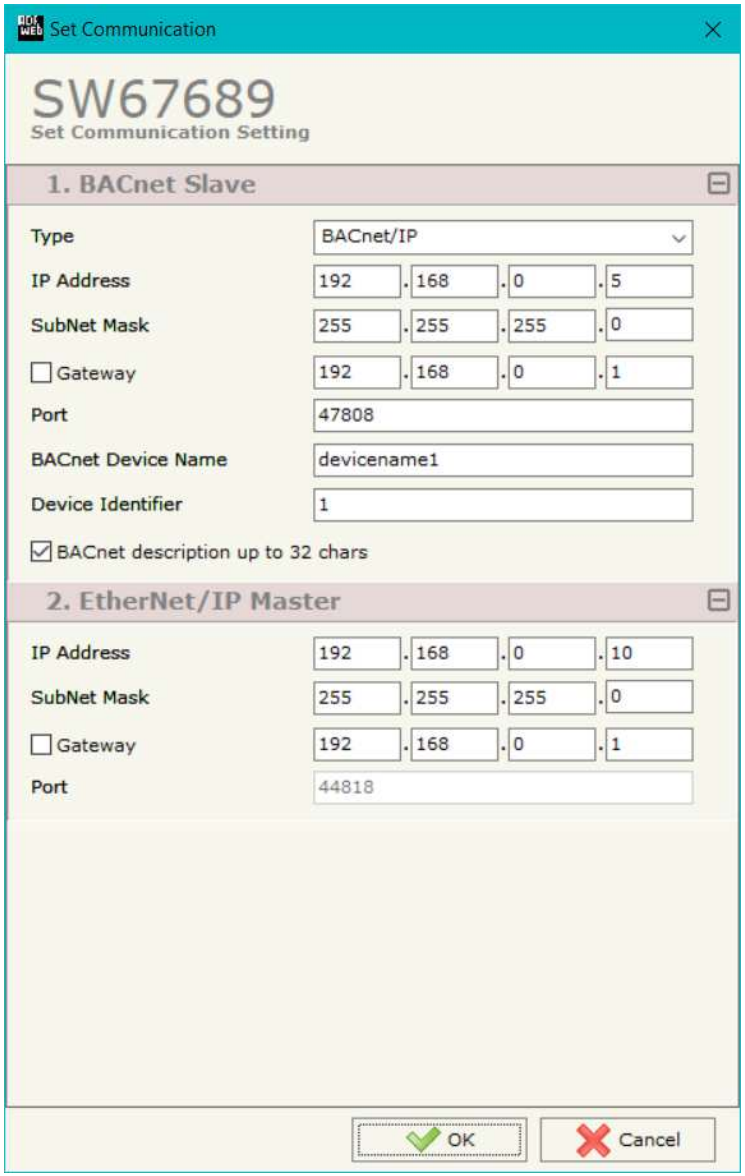


Figure 3a: "Set Communication" window

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

- In the fields "**IP ADDRESS**" the IP address for EtherNet/IP side of the converter is defined;
- In the fields "**SUBNET Mask**" the SubNet Mask for EtherNet/IP side of the converter is defined;
- In the fields "**GATEWAY**" the default gateway of the net 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 EtherNet/IP communication is defined. The port has a fixed value of 44818.

If selected "BACnet MS/TP", the means of the fields for "BACnet Slave" are:

- In the field "**Baudrate**" the data rate of the BACnet line is defined;
- In the field "**Parity**" the parity of the line is defined;
- In the field "**BACnet Device Name**" the name to give to the BACnet node is defined;
- In the field "**MAC Address**" the MAC of BACnet node (from 0 to 254) is defined;
- The field "**Max Master**" 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 Instance**" the of the BACnet MS/TP side of the converter is defined;
- In the field "**Network**" the BACnet MS/TP network number is defined;
- If the field "**BACnet description up to 32 chars**" is checked, the description for the BACnet Objects can be up to 32 chars long.

The means of the fields for the "Ethernet Update" section are:

- In the fields "**IP ADDRESS**" the IP address of the converter is defined;
- In the fields "**SUBNET Mask**" the SubNet Mask 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.

These information are used for programming the Converter.

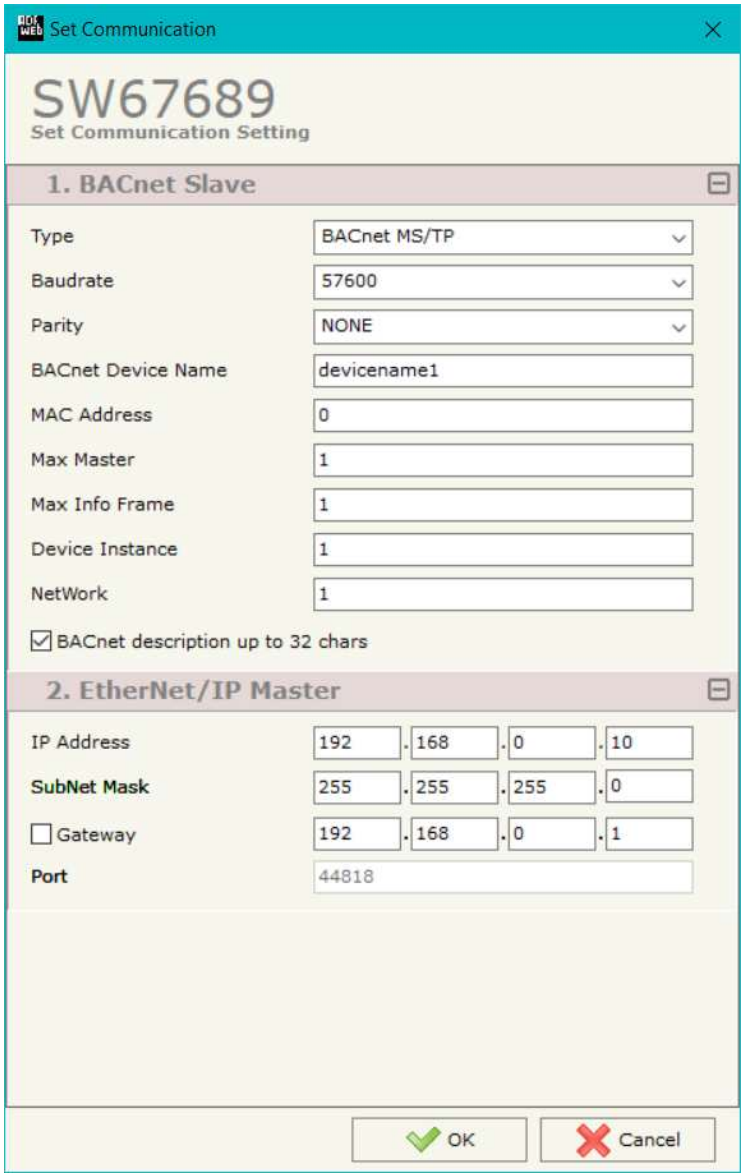
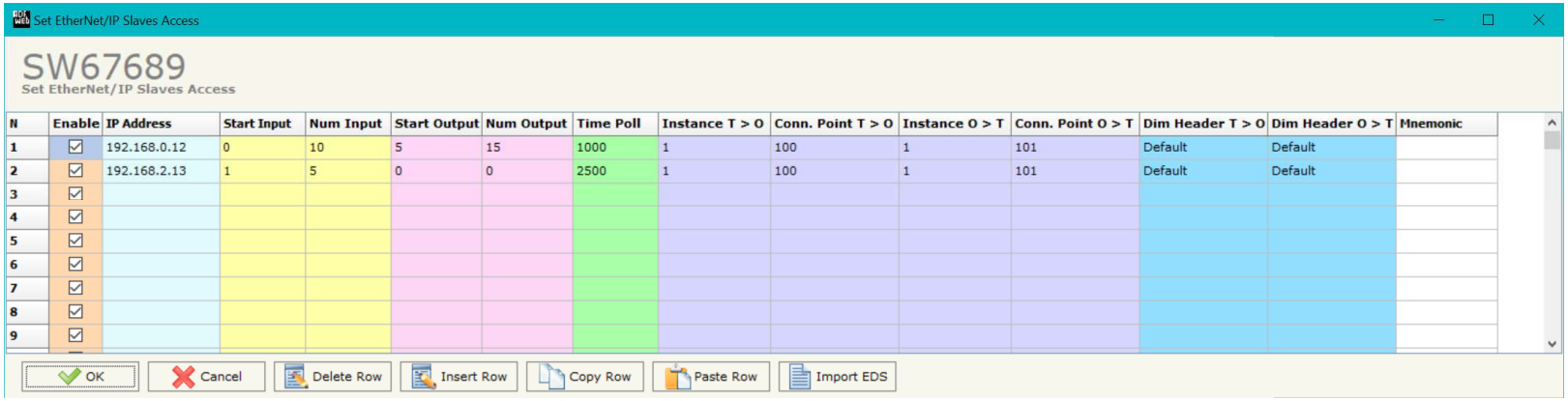


Figure 3b: "Set Communication" window

ETHERNET/IP ACCESS:

By Pressing the "**EtherNet/IP Access**" button from the main window for SW67689 (Fig. 2) the window "Set EtherNet/IP Slaves Access" appears (Fig. 4).
This section is used to define the list of the EtherNet/IP slaves to read/write with the BACnet Master.



N	Enable	IP Address	Start Input	Num Input	Start Output	Num Output	Time Poll	Instance T > O	Conn. Point T > O	Instance O > T	Conn. Point O > T	Dim Header T > O	Dim Header O > T	Mnemonic
1	☑	192.168.0.12	0	10	5	15	1000	1	100	1	101	Default	Default	
2	☑	192.168.2.13	1	5	0	0	2500	1	100	1	101	Default	Default	
3	☑													
4	☑													
5	☑													
6	☑													
7	☑													
8	☑													
9	☑													

Figure 4: "Set EtherNet/IP Slaves Access" window

The means of the fields are:

- If the field "**Enable**" is checked, the polling to the EtherNet/IP slave is enabled;
- In the field "**IP Address**" the IP Address of the EtherNet/IP slave is defined;
- In the field "**Start Input**" the starting Input byte of the EtherNet/IP slave to map on BACnet side is defined;
- In the field "**Num Input**" the number of consecutive Input byte to map on BACnet side is defined;
- In the field "**Start Output**" the starting Output byte of the EtherNet/IP slave to write from BACnet side is defined;
- In the field "**Num Output**" the number of consecutive Output byte to write from BACnet side is defined;
- In the field "**Time Poll**" the polling time in ms is defined;
- In the field "**Instance T > O**" the instance of the assembly for the Target to Originator data direction is defined;
- In the field "**Conn. Point T > O**" the connection point of the assembly for the Target to Originator data direction is defined;
- In the field "**Instance O > T**" the instance of the assembly for the Originator to Target data direction is defined;
- In the field "**Conn. Point O > T**" the connection point of the assembly for the Originator to Target data direction is defined;
- In the field "**Dim Header T > O**" the dimension of the header for the Target to Originator data direction is defined;

- In the field "**Dim Header O > T**" the dimension of the header for the Originator to Target data direction is defined;
- In the field "**Mnemonic**" a brief description is defined.

SET BACNET ACCESS:

By Pressing the "**Set BACnet Access**" button from the main window for SW67689 (Fig. 2) the window "BACnet Set Access" appears (Fig. 5).

The window is divided in two parts, the "**BACnet in Read**" that contains the BACnet objects readable by a BACnet Master (they contains the data read from the EtherNet/IP slaves); and "**BACnet in Write**" that contains the BACnet objects writeable by a BACnet Master (they contains the data to write to the EtherNet/IP slaves).

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

- In the field "**Data Type**" it 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. 6);
- In the field "**Position**" it is possible to select the position (byte) where taking/saving the data from/to the internal arrays of the converter;
- The field "**Start Bit**" is used for the "Binary" BACnet objects and it allows to select which bit of the selected Position using;
- The field "**Length**" is used to define the dimension in bytes of the BACnet Object. For "Binary" Objects, this field must be set to '1'.

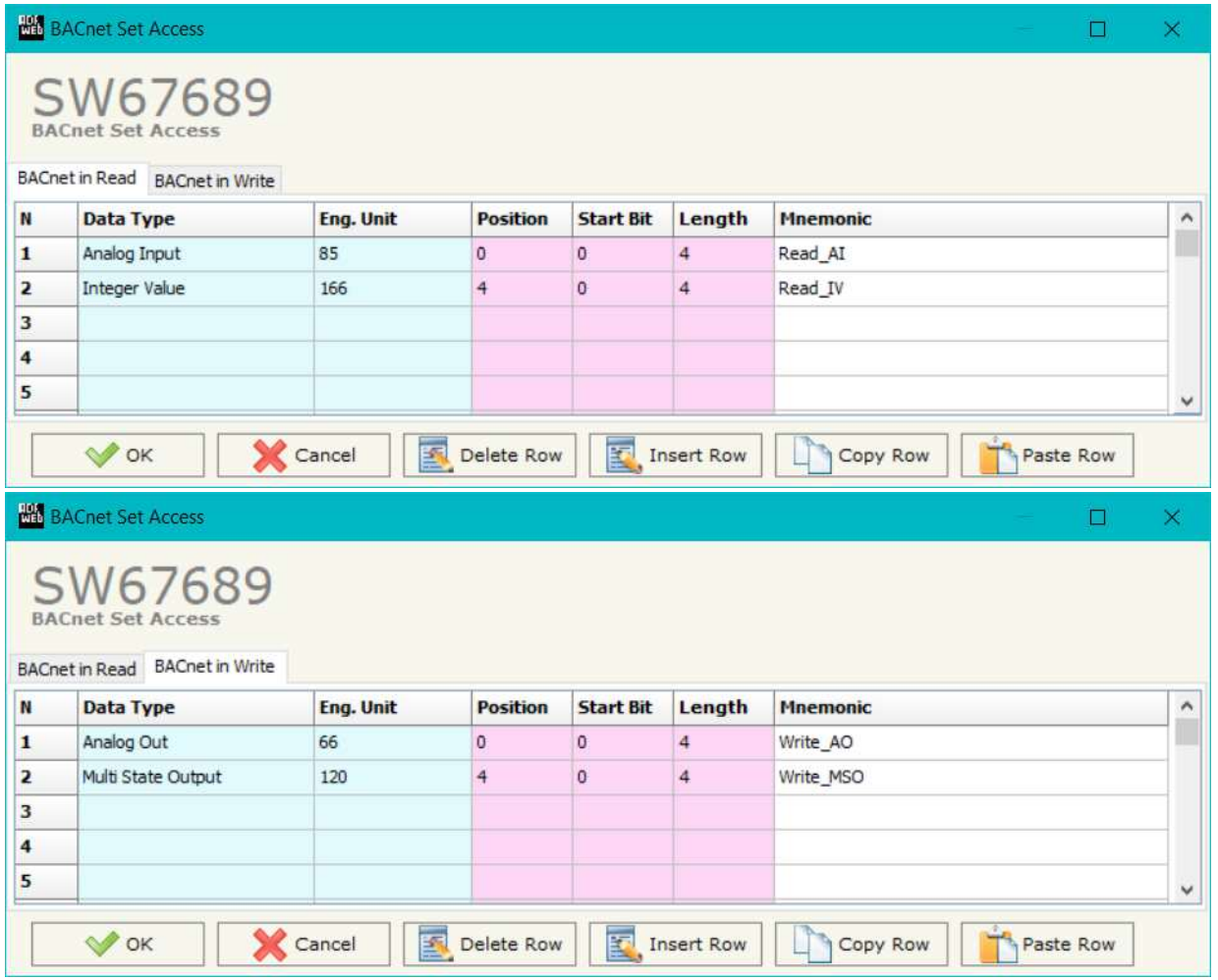


Figure 5: "BACnet Set Access" window

It 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.

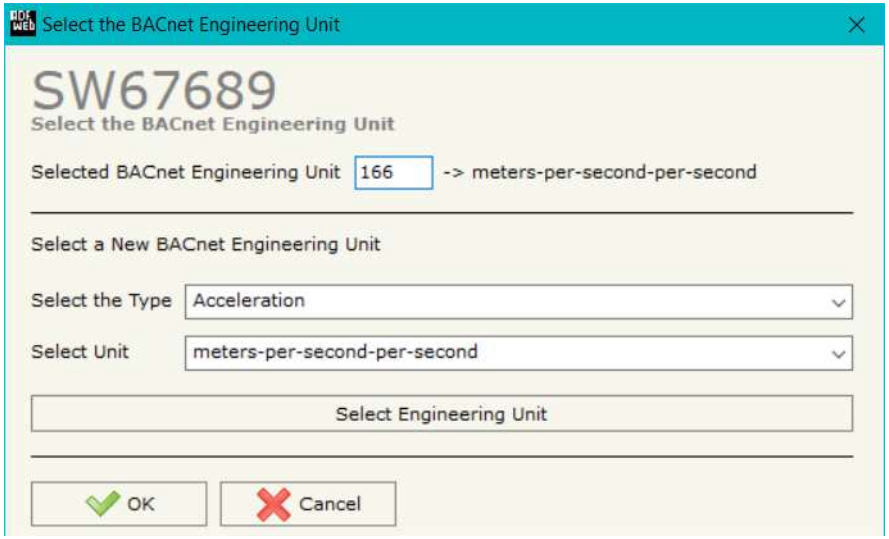


Figure 6: "Select the BACnet Engineering Unit" window

BACNET EDE FILE:

By Pressing the "**BACnet EDE File**" button from the main window for SW67689 (Fig. 2) is possible to create the .csv document (EDE file) 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. This by using the Ethernet port.



Figure 7: "Update device" windows

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.

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67689 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 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, 10 or 11 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 or 11 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.



Figure 8: "Error" window

Warning:
In the case of HD67689 you have to use the software "SW67689": www.adfweb.com\download\filefold\SW67689.zip.

MECHANICAL DIMENSIONS:

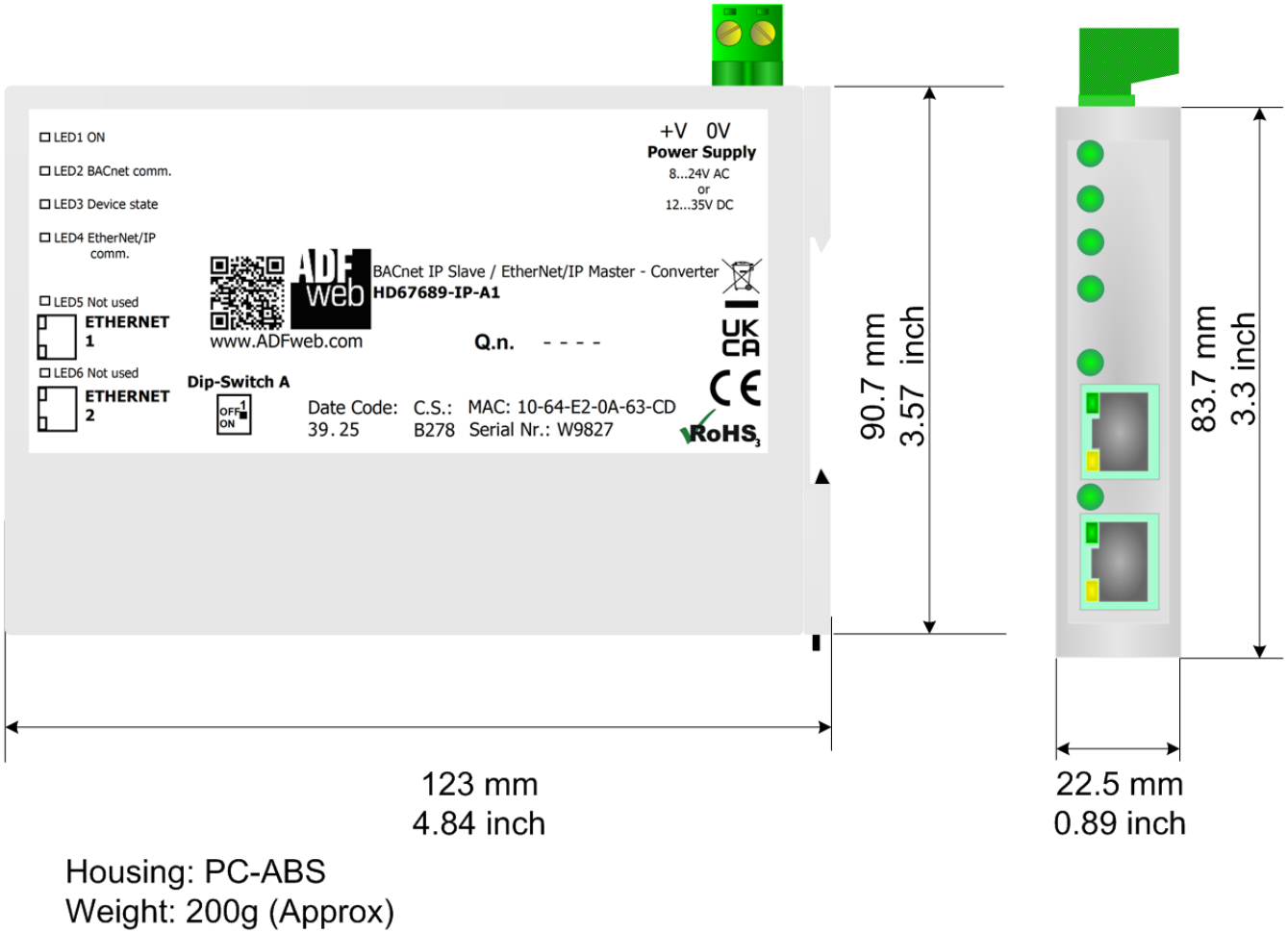


Figure 9a: Mechanical dimensions scheme for HD67689-IP-A1

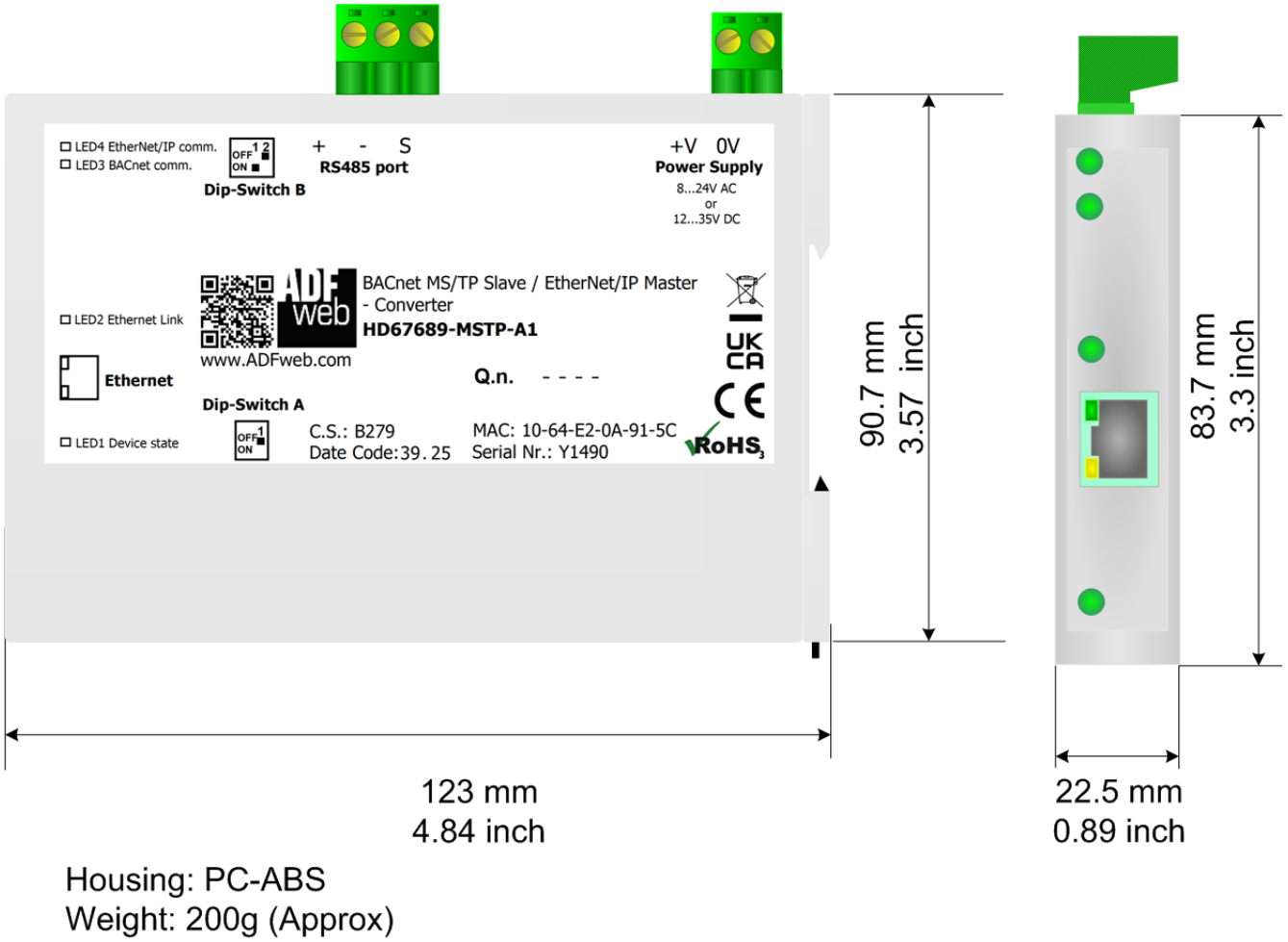
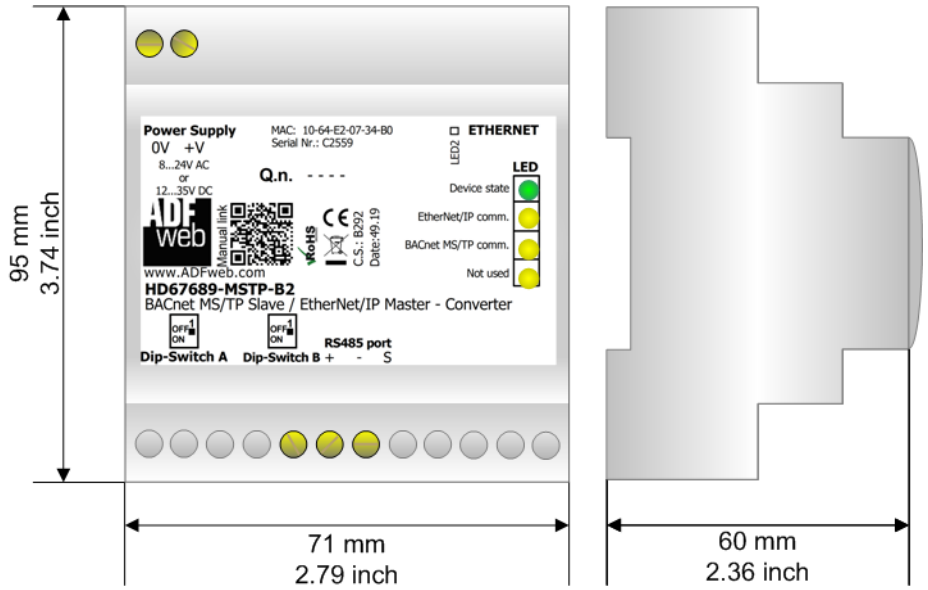


Figure 9b: Mechanical dimensions scheme for HD67689-MSTP-A1



Housing: PVC
Weight: 200g (Approx)

Figure 9c: Mechanical dimensions scheme for HD67689-MSTP-B2

ORDERING INFORMATIONS:

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

HD67689 - xx - A 1

Connectors Type
1: Removable 5mm Screw Terminal
2: Fixed 5mm Screw Terminal

Enclosure Type
A: 1M, 35mm DIN Rail mounting
B: 4M, 35mm DIN Rail mounting

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

Device Family
HD67689: BACnet Slave / EtherNet/IP Master - Converter

Order Code:	**HD67689-IP-A1**	**-**	BACnet/IP Slave / EtherNet/IP Master – Converter
Order Code:	**HD67689-MSTP-A1**	**-**	BACnet MS/TP Slave / EtherNet/IP Master – Converter
Order Code:	**HD67689-MSTP-B2**	**-**	BACnet MS/TP Slave / EtherNet/IP Master – Converter

ACCESSORIES:

Order Code:	**AC34011**	**-**	Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V DC
Order Code:	**AC34012**	**-**	Rail DIN - Power Supply 220/240V AC 50/60Hz – 24 V DC

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.

ADFweb.com S.r.l.
Via Strada Nuova, 17
IT-31010 Mareno di Piave
TREVISO (Italy)
Phone +39.0438.30.91.31
Fax +39.0438.49.20.99
www.adfweb.com