ADFweb

Industrial Electronic Devices

User Manual
Revision 1.000
English

DMX / Modbus TCP Master - Converter

(Order Code: HD67519-B2)

Benefits and Main Features:

⊕ Very easy to configure

⊕ Triple electrical isolation

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

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INDEX:

UPDATED DOCUMENTATION:

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REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	09/08/2016	Nt	All	First Release

WARNING:

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TRADEMARKS:

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SECURITY ALERT:

GENERAL INFORMATION
To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device, legal and safety regulation are required for each individual application. The same applies also when using accessories.

INTENDED USE
Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

QUALIFIED PERSONNEL
The device can be used only by qualified personnel, strictly in accordance with the specifications.
Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS
The device is state-of-the-art and is safe. The instruments can represent a potential hazard if they are inappropriately installed and operated by untrained personnel. These instructions refer to residual risks with the following symbol:
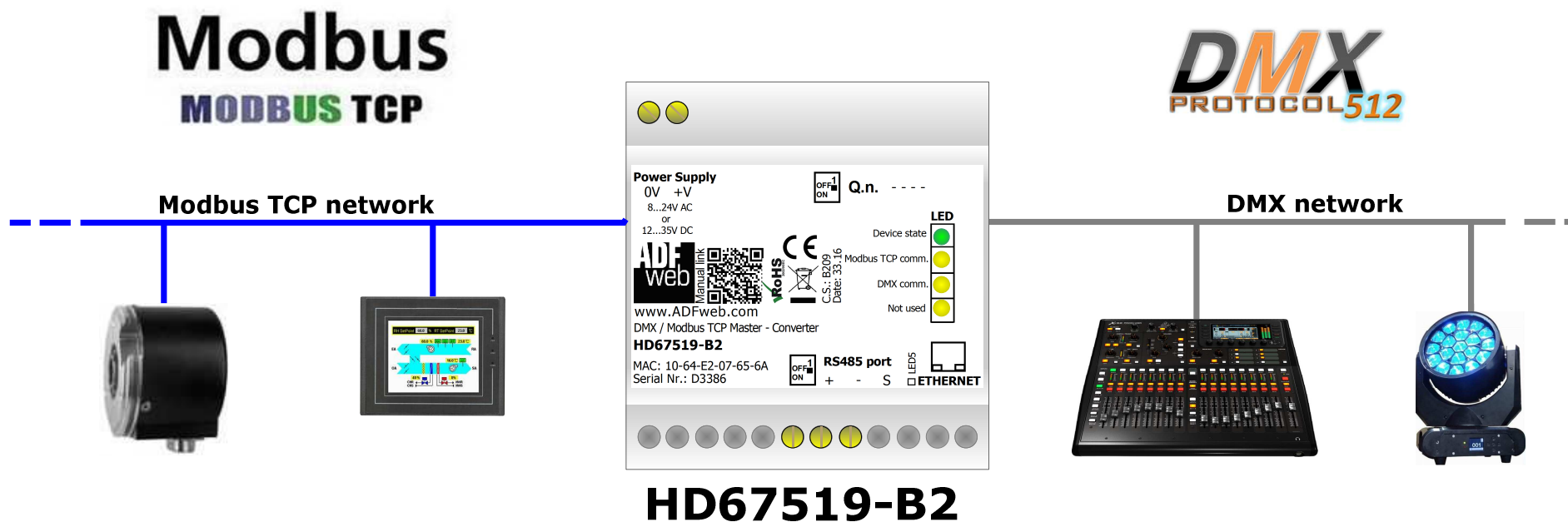
⚠️ This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY
The declaration is made by our company. You can send an email to or give us a call if you need it.

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EXAMPLE OF CONNECTION:

Modbus TCP network

DMX network

Power Supply
0V +V
8...24V AC
or
12...35V DC

Q.n. - - - -

LED
Device state
Modbus TCP comm.
DMX comm.
Not used

www.ADFweb.com
DMX / Modbus TCP Master - Converter
HD67519-B2
MAC: 10-64-E2-07-65-6A
Serial Nr.: D3386

RS485 port
+ - S
ETHERNET

C.S.: B209
Date: 33.16

HD67519-B2

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CONNECTION SCHEME:

Dip-Switch B:
-Dip1 – Termination RS485 line

= Open   = 120 ohm

Connector6:
RS485 port

S = Shield (to Isolated Ground)
B = Negative wire
A = Positive wire

Led5:
Green
Link Ethernet

Connector2:
Ethernet Port
(RJ45 Plug)

Led1:
Green
Device state

Led2:
Yellow
Modbus TCP comm.

Led3:
Yellow
DMX comm.

Led4:
Yellow
Not used

Connector1:
Power Supply

0V = Ground
+V = Positive wire

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

Dip-Switch A:
-Dip1 – Functioning Mode

= Normal Mode

= Boot Mode

Figure 1: Connection scheme for HD67519-B2

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CHARACTERISTICS:

The HD67519-B2 is a converter from Modbus TCP Master to DMX and vice versa.

They allows the following characteristics:

- Triple isolation between Modbus TCP - Power Supply, Modbus TCP - DMX, Power Supply - DMX.
- Two-directional information between Modbus TCP 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 SW67519 software on your PC in order to perform the following:

- Define the parameter of Modbus TCP line;
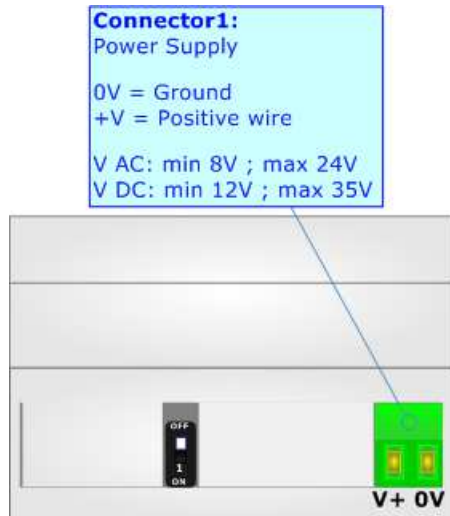- Define the parameter of DMX line;
- Update the device.

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POWER SUPPLY:

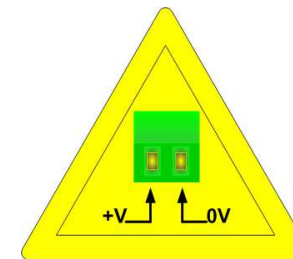The devices can be powered at 8...24V AC and 12...35V DC. For more details see the two tables below.

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

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67519-B2	3.5

Connector1:
Power Supply

0V = Ground
+V = Positive wire

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

V+ 0V

Caution: Not reverse the polarity power

+V   0V

HD67519-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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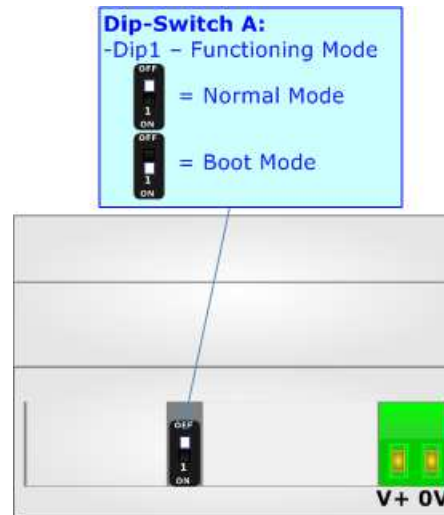
LEDS:

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: Modbus TCP communication (yellow)	Blinks when a Modbus TCP frame 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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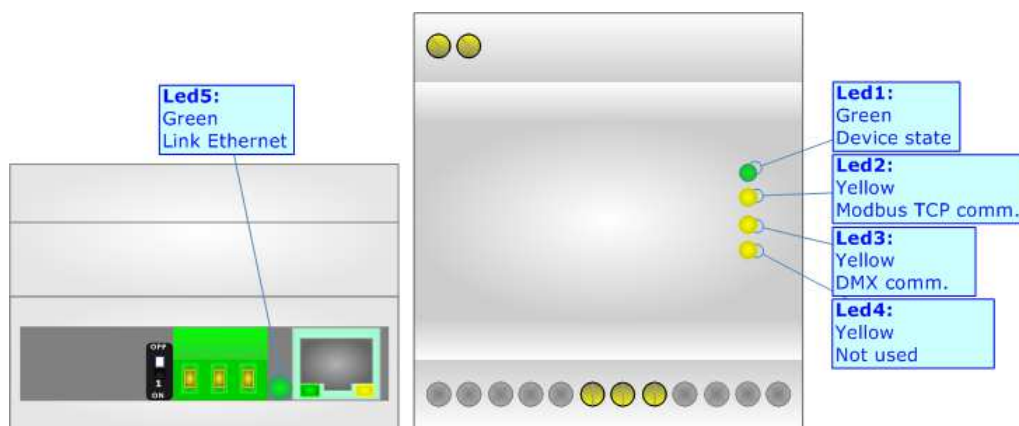
RS485:

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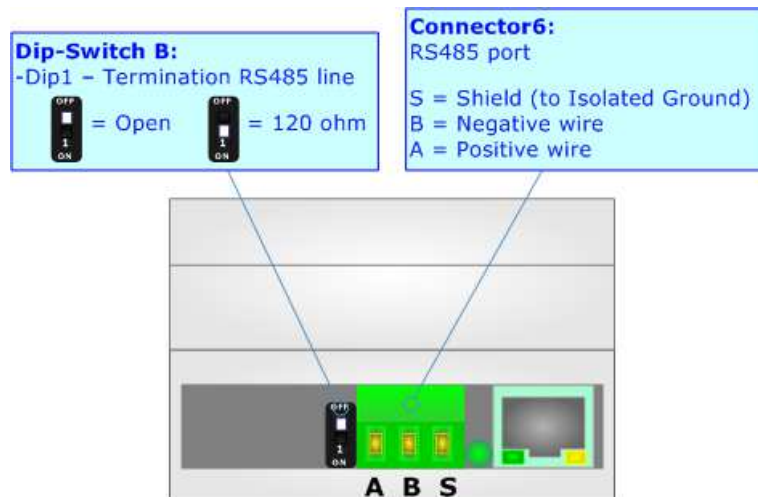
The maximum length of the cable should be 1200m (4000 feet).

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.

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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 HD67519-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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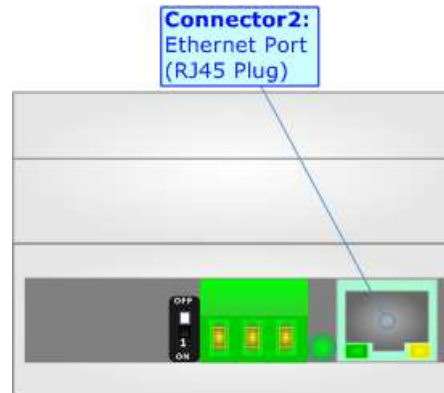
USE OF COMPOSITOR SW67519:

To configure the Converter, use the available software that runs with Windows called SW67519. 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 SW67519, the window below appears (Fig. 2).

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


Figure 2: Main window for SW67519

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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 / 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**".

Industrial Electronic Devices
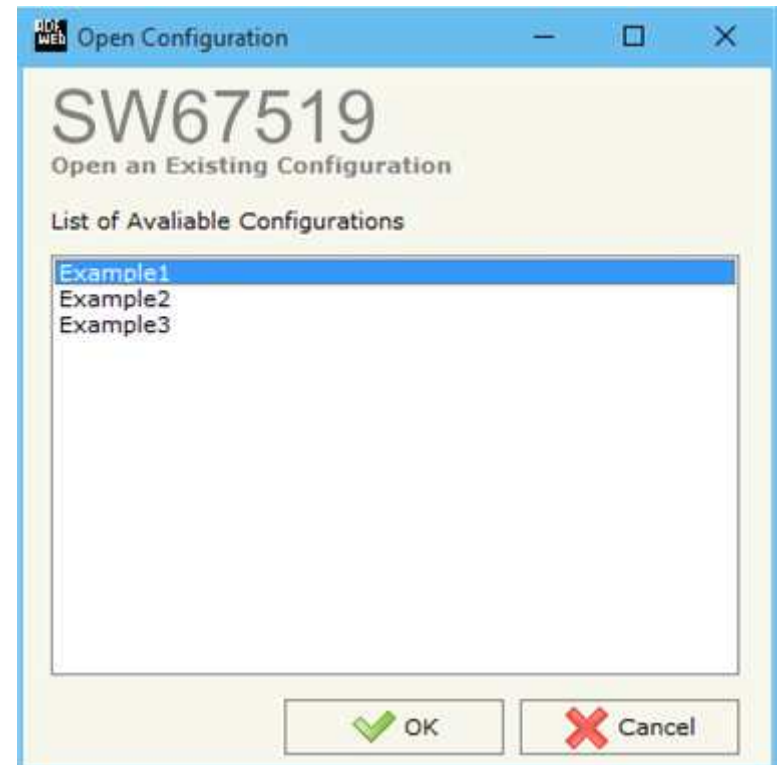
SOFTWARE OPTIONS:

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.
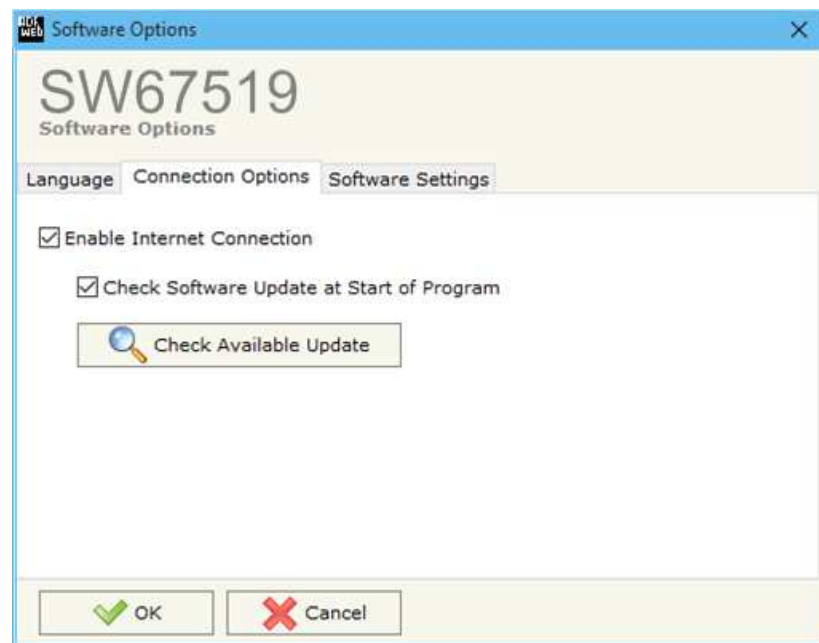
In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67519 check automatically if there are updatings when it is launched.
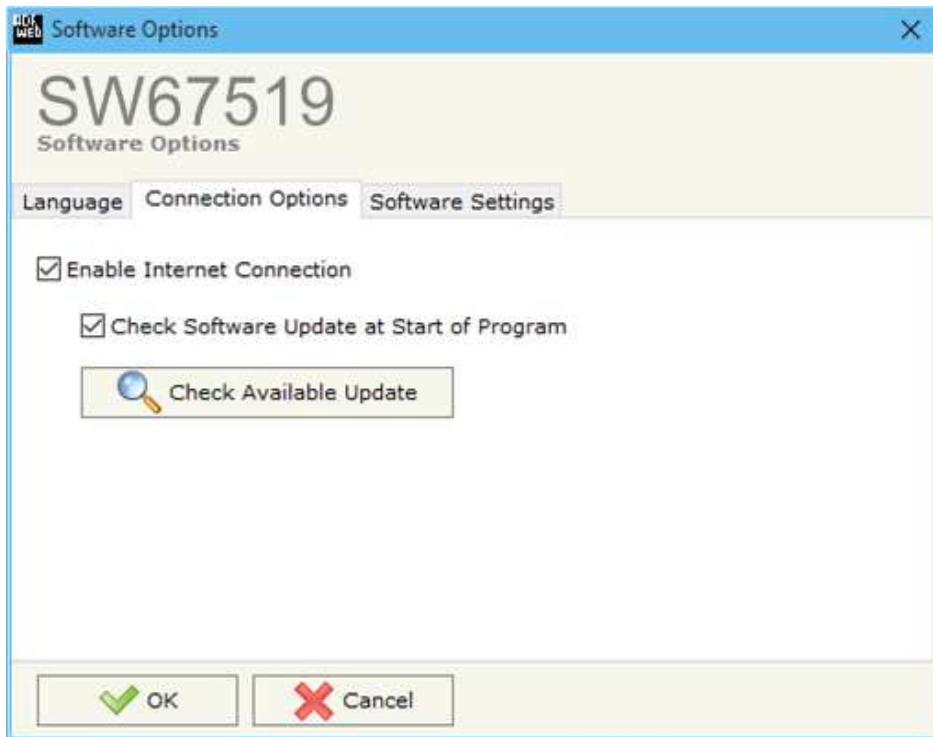
In the section "Software Settings", it is possible to enable/disable some keyboard's commands for an easier navigation inside the tables contained in the different sections of the software.

SET COMMUNICATION:

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

By Pressing the "**Set Communication**" button from the main window for SW67519 (Fig. 2) the window "Set Communication" appears (Fig. 3).

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).

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

- In the fields "**IP ADDRESS**" the IP address that you want to give to the Converter is defined;
- In the fields "**SUBNET Mask**" the SubNet Mask is defined;
- In the fields "**GATEWAY**" the default gateway that you want to use 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 "**TimeOut (ms)**" the maximum time that the device attends for the answer from the Slave interrogated is defined;
- In the field "**Communication Idle Time (ms)**" the minimun delay between two polls is defined.
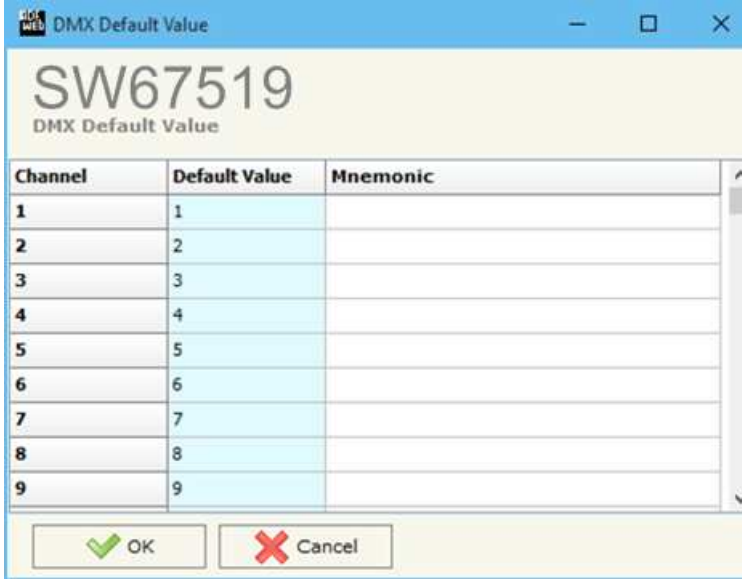

Figure 3: "Set Communication" window

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DMX DEFAULT VALUE:

By pressing the "**DMX Default Value**" button from the main window for SW67519 (Fig. 2) the "DMX Default Value" window appears (Fig. 4).
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 4: "DMX Default Value" window

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SET ACCESS:

By pressing the "**Set Access**" button from the main window for SW67519 (Fig. 2) the window "Set Access" appears.

This window is divided in two parts, the "Modbus Read" (Fig. 6) and the "Modbus Write " (Fig. 7).
The first part "Modbus Read" is used to read the data from the Modbus TCP slaves, and make them available on DMX network.
The second part "Modbus Write " is used to write the data that arrives from the DMX system into the Modbus TCP slaves.

MODBUS READ

The means of the fields are:

- If the field "**Enable**" is checked, the Modbus Request is enabled;

- In the field "**Slave IP Address**" the IP Address of the Modbus TCP device you have to read is defined;

- In the field "**Port**" the TCP port of the Modbus TCP device you have to read is defined;

- In the field "**Slave ID**" the address of the Modbus device you have to read is defined;

Figure 5: "Set Access --> Modbus Read" window

- In the field "**Type**" insert the data type of the register you would like to read. You can choose between the following:
  - Coil Status;
  - Input Status;
  - Holding Register;
  - Input Register.

- In the field "**Address**" the start address of the register to be read is defined;

- In the field "**NPoint**" insert the number of consecutive registers to be read;

- In the field "**Poll Time**" insert the time to make this request;

- In the field "**Max Error**" is the number of errors continues that the gateway waits before suspending the poll until the next reboot. If is set to zero this function is disabled;

- In the field "**Position**" insert the address of the internal array where placing the information;
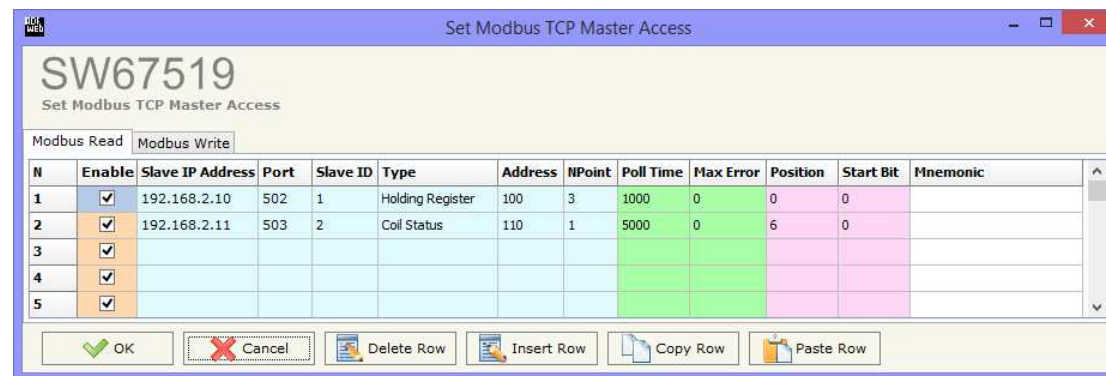
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- In the field "**Start Bit**" insert the start bit of the first byte of the field "Position" where start to insert the data read. Valid only for the "Coil Status" and "Input Status";
- If the field "**Swap**" is checked, the data of the Modbus registers are swapped;
- In the field "**Mnemonic**" the description for the request is defined.

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MODBUS WRITE

The means of the fields are:

+ If the field "**Enable**" is checked, the Modbus Request is enabled;

+ In the field "**Slave IP Address**" the IP Address of the Modbus TCP device you have to write is defined;

+ In the field "**Port**" the TCP port of the Modbus TCP device you have to write is defined;

+ In the field "**Slave ID**" the address of the Modbus device that you have to write is defined;

Figure 6: "Set Access→Modbus Write" window

+ In the field "**Type**" insert the data type of the register you would like to write. You can choose between the following:
    o Coil Status;
    o Holding Register.

+ In the field "**Address**" the start address of the register to be written is defined;

+ In the field "**NPoint**" insert the number of consecutive registers to be written;

+ In the field "**Poll Time**" insert the time to make this request;

+ If the field "**On Change**" is checked, the gateway send the Write request in Modbus when the data change the value.

+ In the field "**Max Error**" is the number of errors continues that the gateway waits before suspending the poll until the next reboot. If is set to zero this function is disabled;

+ In the field "**Position**" insert the address of the internal array where read the information;

+ In the field "**Start Bit**" insert the start bit of the first byte of the field "Position" where start to read the data to write. Valid only for the "Coil Status";

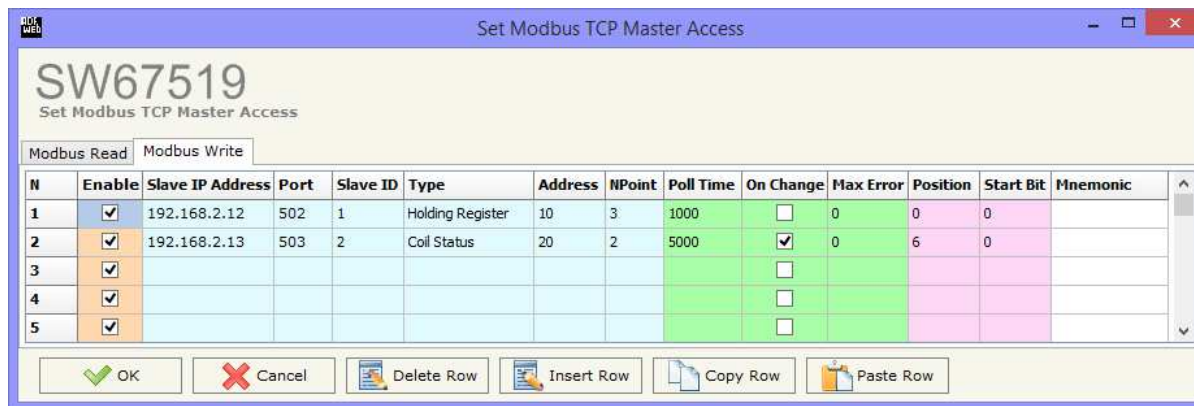+ In the field "**Mnemonic**" the description for the request is defined.

Note:
 If you want that the converter sends the data only "On change" the "Poll Time" must be at 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 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.

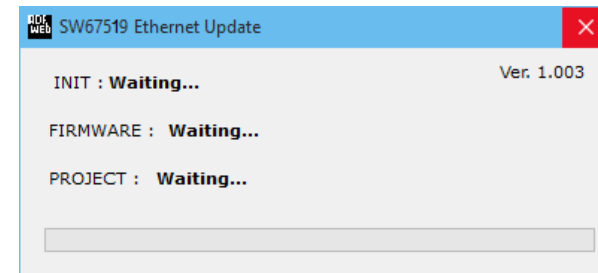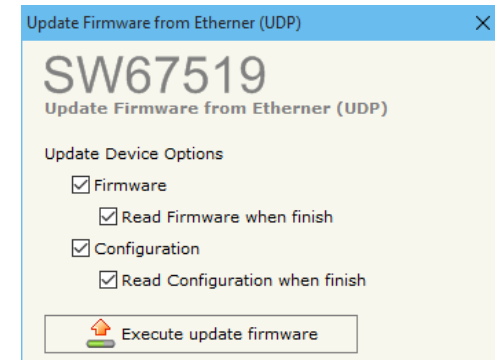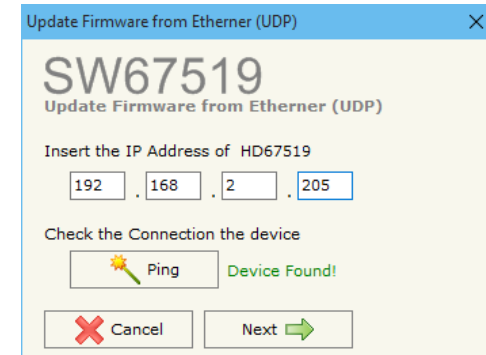At this point the configuration/firmware on the device is correctly updated.

Figure 7: "Update device" windows

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 HD67519 device.

Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67519 device.

Warning:

If Fig. 6 appears when you try to do the Update try these points before seeking assistance:

Figure 8: "Protection" window

- 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 HD67519 you have to use the software "SW67519": www.adfweb.com\download\filefold\SW67519.zip.

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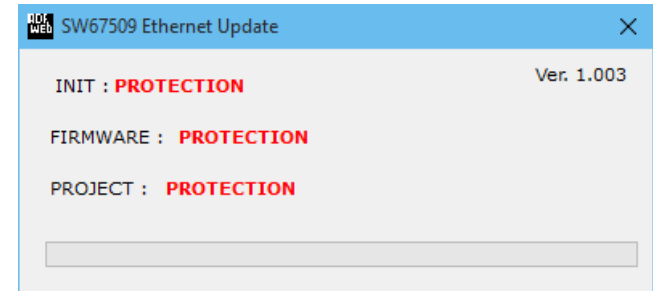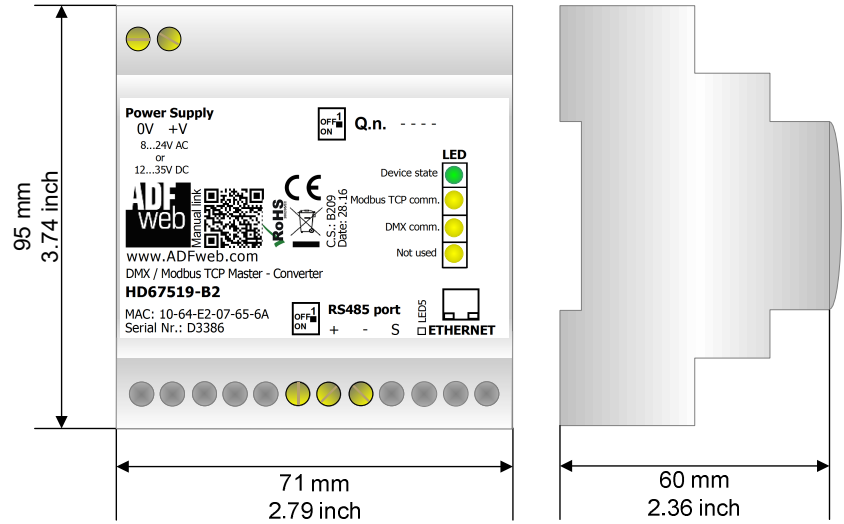## MECHANICAL DIMENSIONS:

Housing: PVC
Weight: 200g (Approx)

Figure 9: Mechanical dimensions scheme for HD67519-B2

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ORDERING INFORMATIONS:

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

HD67519 – B 2

Connectors Type
2: Fixed 5mm Screw Terminal

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

Device Family
HD67519: DMX / Modbus TCP Master - Converter
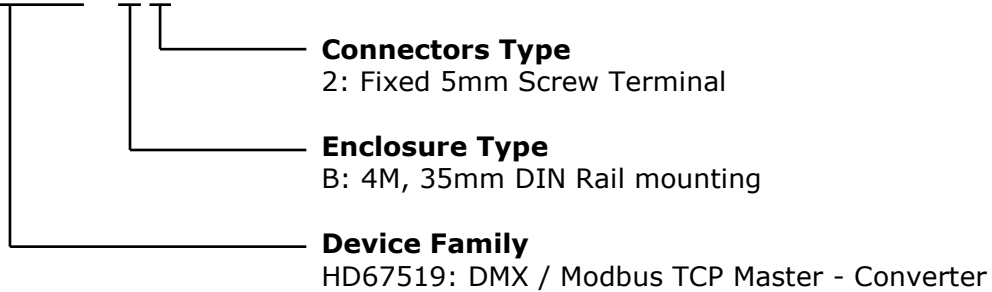
Order Code: **HD67519-B2**   -   DMX / Modbus TCP Master – Converter

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

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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.

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