

User Manual

Revision 2.100
English

CAN/ Modbus TCP Master - Converter

(Order Code: HD67514-A1, HD67514-B2)

Benefits and Main Features:

Very easy to configure

32mm Rail DIN mount

Wide supply input range

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



HD67514-A1



HD67514-B2



User Manual

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UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own

To obtain the most recently updated document, note the “document code” that appears at the top right-hand corner of each page of this document.

With this “Document Code” go to web page www.adfweb.com/download/ 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 | 01/09/2008 | Ft | All | First release version |
| 2.000 | 10/11/2011 | Fl | All | Codes changed |
| 2.001 | 14/01/2013 | Nt & Fl | All | Added new chapters |
| 2.100 | 09/05/2016 | Ff | All | New hardware version |

WARNING:

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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 are required for each individual application, legal and safety regulation. 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

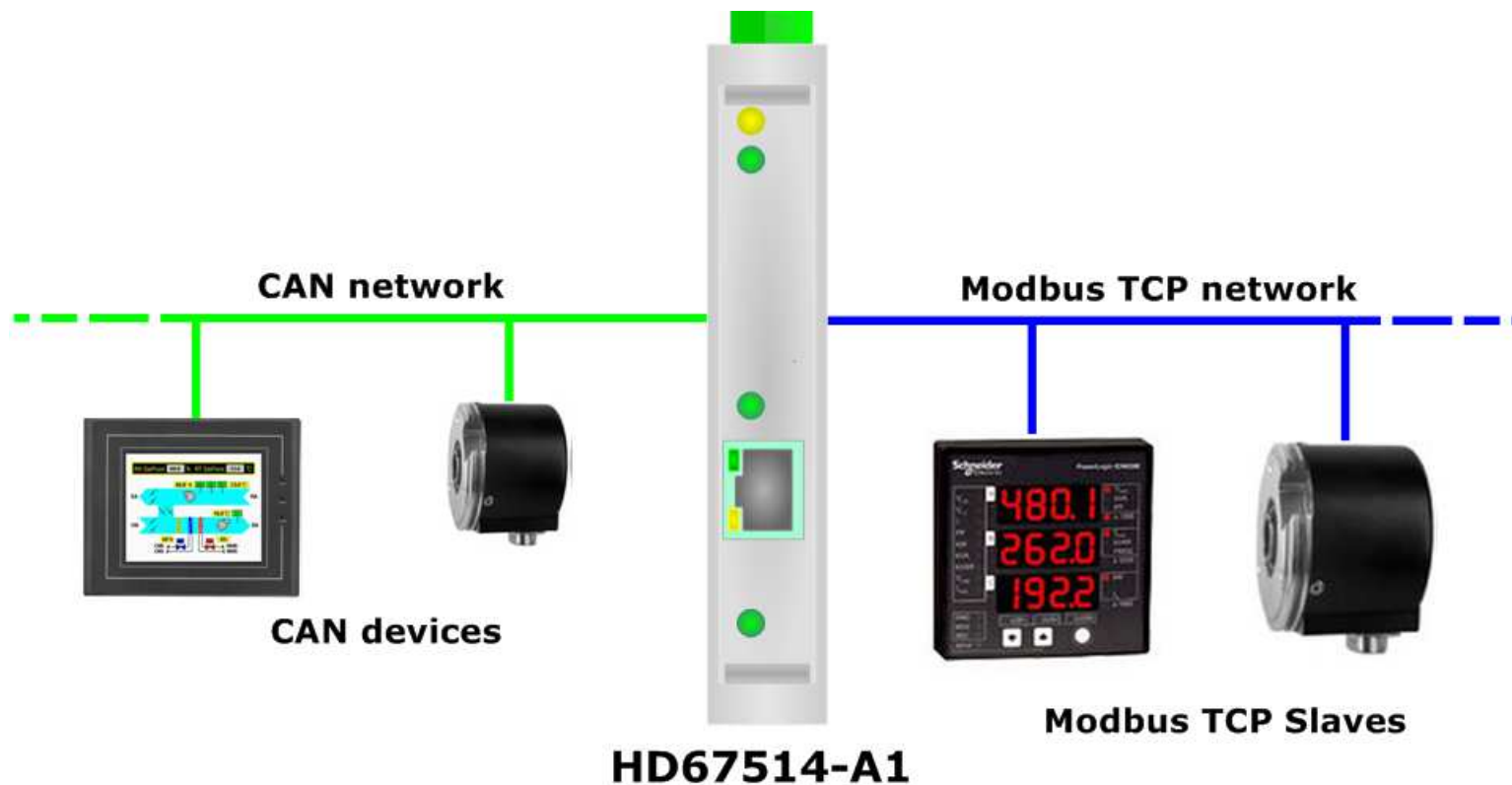
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

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

CE CONFORMITY

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

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

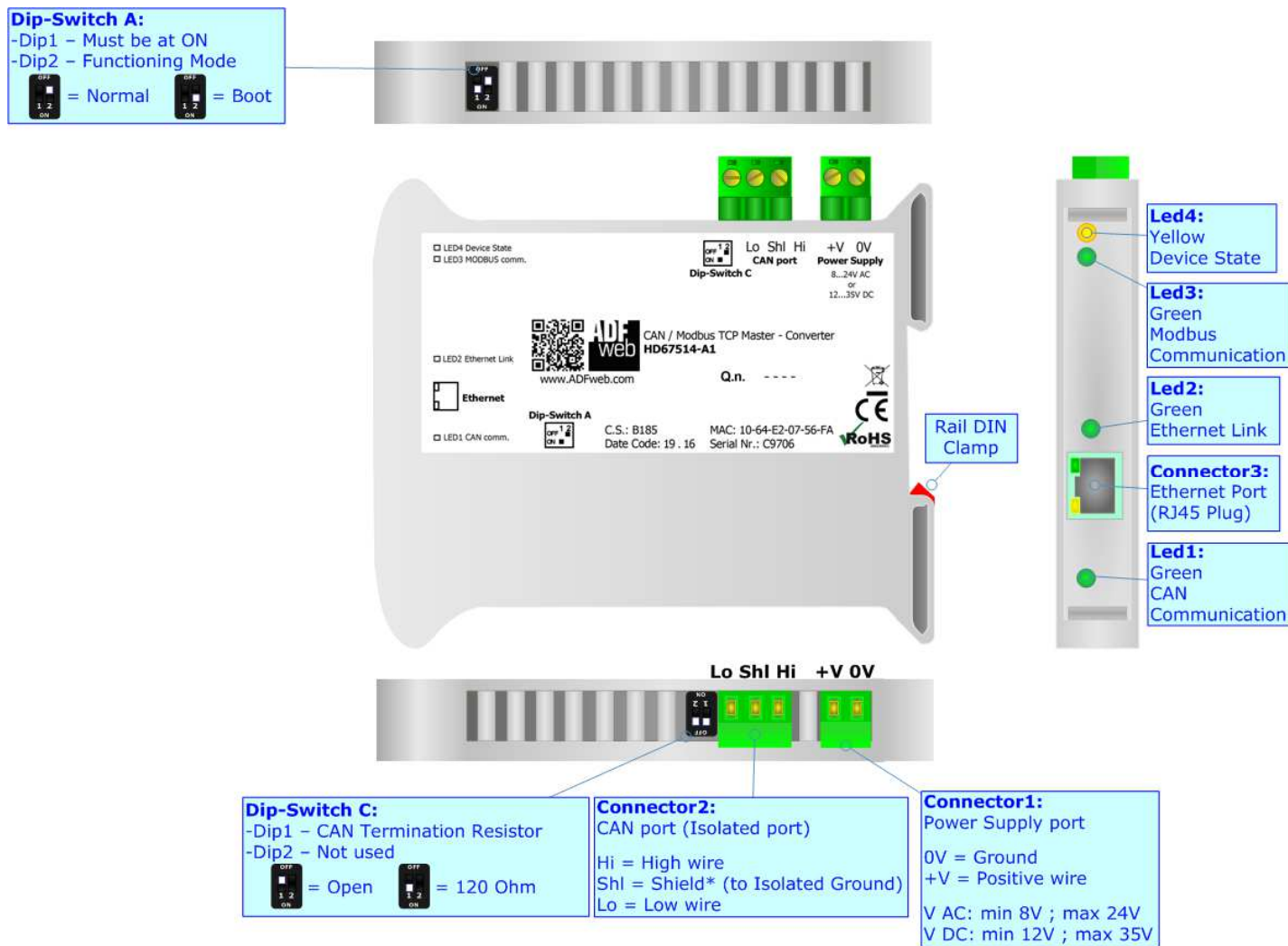


Figure 1a: Connection scheme for HD67514-A1

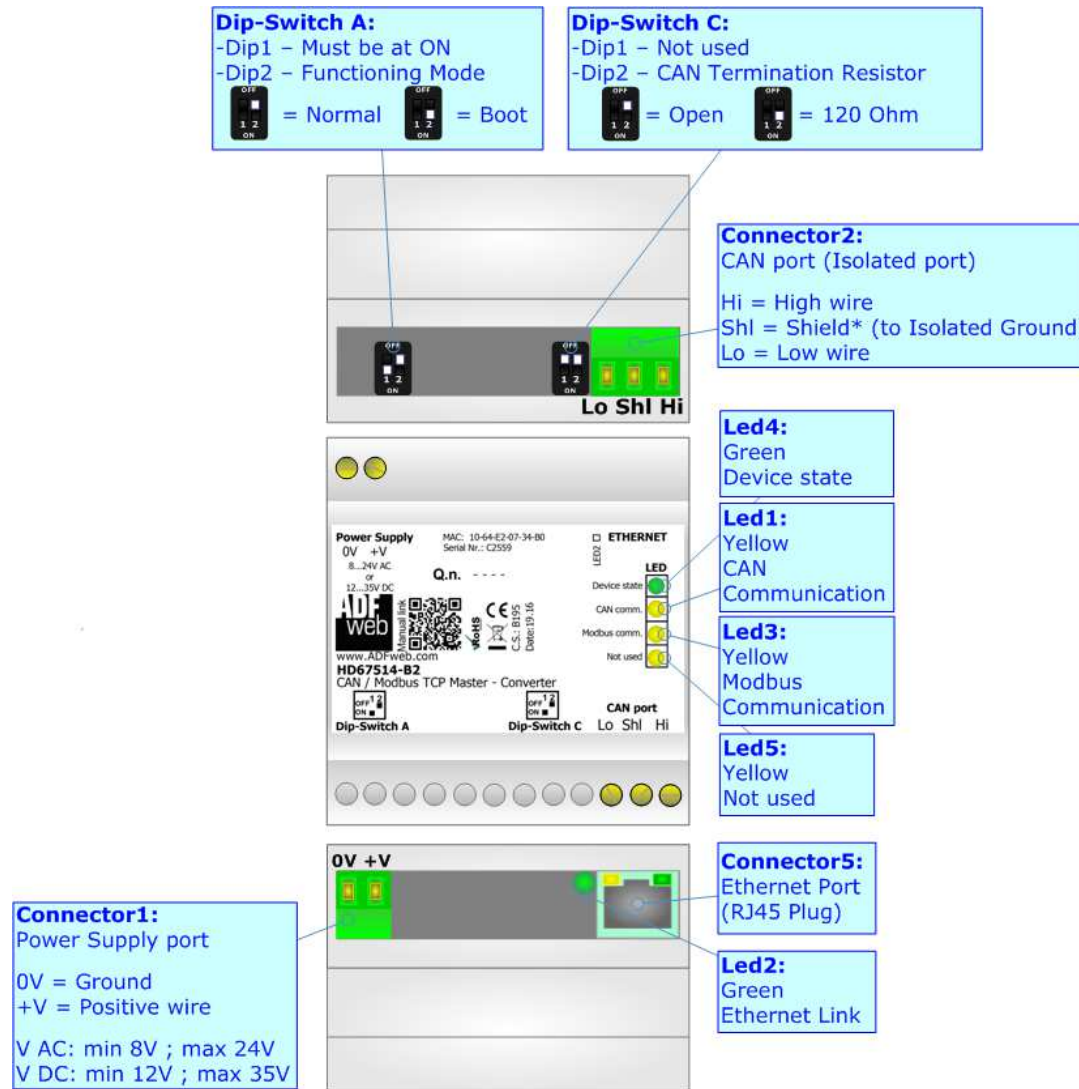


Figure 1b: Connection scheme for HD67514-B2

CHARACTERISTICS:

The "CAN / Modbus TCP Master – Converter" allows the following characteristics:

- two-directional information between networks CAN and Modbus TCP;
- electrical isolation between Ethernet – CAN, Power Supply – Ethernet, Power Supply – CAN;
- Mountable on 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 SW67514 software on your PC in order to perform the following:

- Define the parameter of CAN;
- Define the parameter of Modbus TCP;
- Define CAN frames with which is possible to read Modbus data;
- Define CAN frames with which is possible to write Modbus data.

POWER SUPPLY:

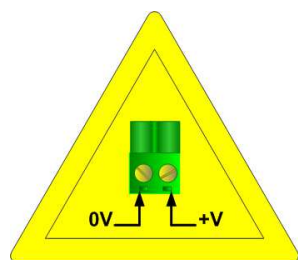
The devices can be powered at 8...24V AC and 12...35V DC. The consumption depends to the code of the device. For more details see the two tables below.

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

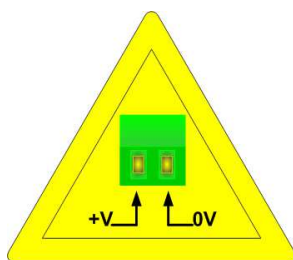
Consumption at 24V DC:

| Device | Consumption [W/VA] |
|------------|--------------------|
| HD67514-A1 | 3.5 |
| HD67514-B2 | 3.5 |

Caution: Not reverse the polarity power

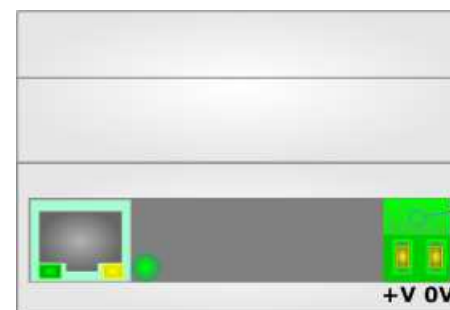


HD67514-A1



HD67514-B2

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

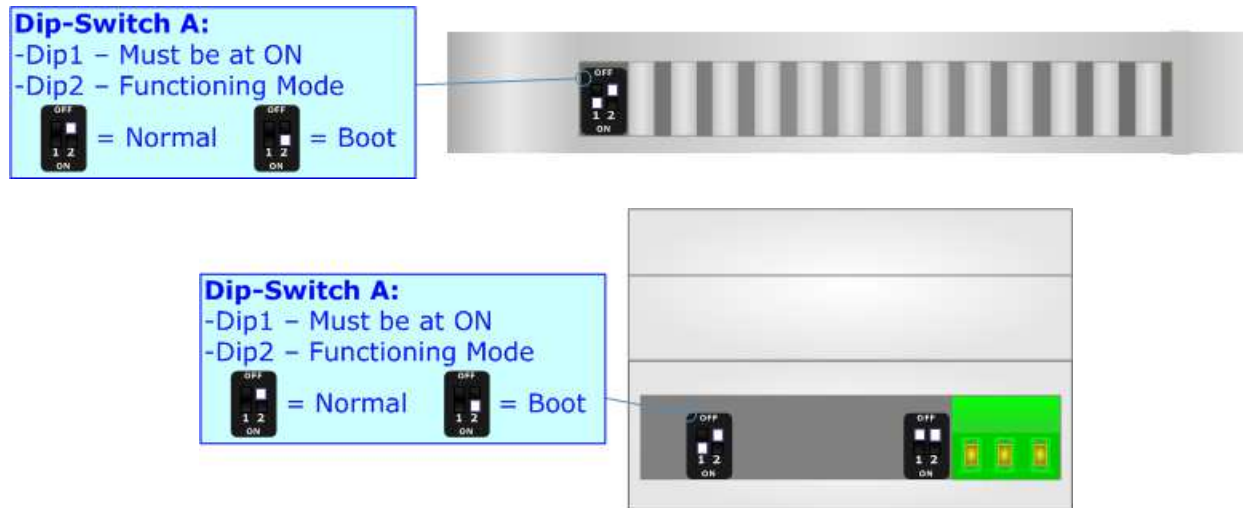
FUNCTION MODES:

The device has got two function modes depending on the position of the 'Dip2 of Dip-Switch A':

- The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip2 of Dip-Switch A' at "ON" position, is used for uploading the Project and/or Firmware.

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

According to the functioning mode, the LEDs will have specific functions, see 'LEDS' section.



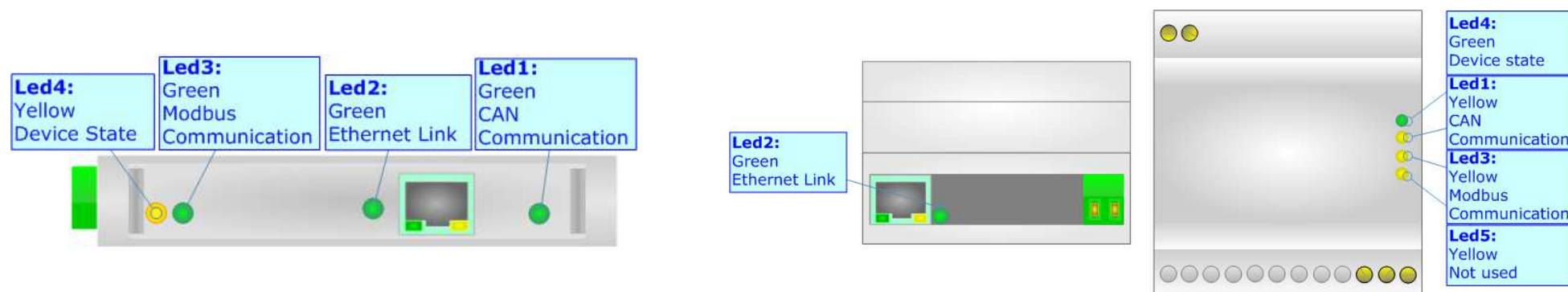
Warning:

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

LEDS:

The devices has got four (five for HD67514-B2) 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: CAN Communication (green) | Blinks when CAN frames are received | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 2: Ethernet Link (green) | ON: Ethernet cable connected OFF: Ethernet cable disconnected | ON: Ethernet cable connected OFF: Ethernet cable disconnected |
| 3: Modbus Communication (green) | Blinks when Modbus TCP frames are received | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 4: Device State (yellow) | Blinks slowly (~1Hz) | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 5: Not used (yellow) (Present only on HD67514-B2) | OFF | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |



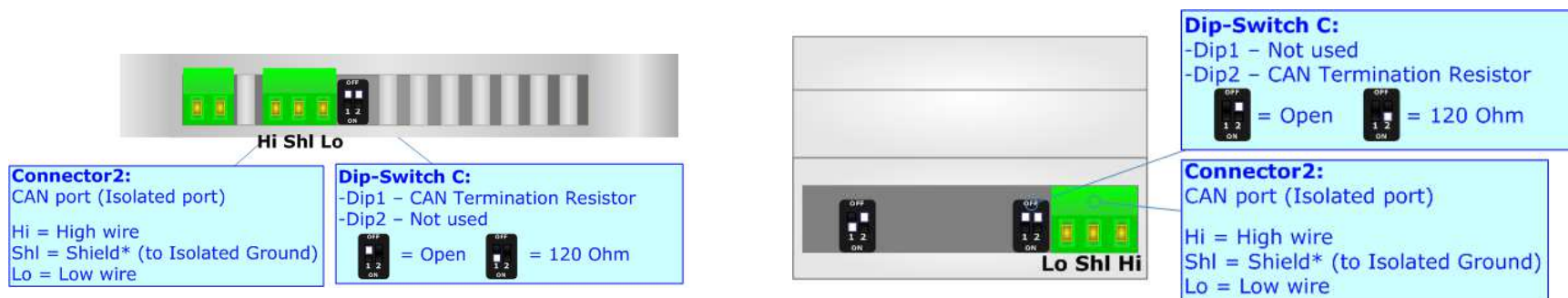
ETHERNET:

The Ethernet connection must be made using Connector5 of HD67514-A1/HD67514-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 a Hub/Switch the use of a straight cable is recommended. To connect the device to a PC/PLC/other the use of a cross cable is recommended.



CAN:

For terminating the CAN line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch C' is at ON position (for HD67514-A1) or that the Dip2 of 'Dip-Switch C' is at ON position (for HD67514-B2).



Cable characteristics:

| | | |
|-----------------------|------------------------|-----------------------|
| DC parameter: | Impedance | 70 Ohm/m |
| AC parameters: | Impedance | 120 Ohm/m |
| | Delay | 5 ns/m |
| Length | Baud Rate [bps] | Length MAX [m] |
| | 10 K | 5000 |
| | 20 K | 2500 |
| | 50 K | 1000 |
| | 100 K | 650 |
| | 125 K | 500 |
| | 250 K | 250 |
| | 500 K | 100 |
| | 800 K | 50 |
| | 1000 K | 25 |

USE OF COMPOSITOR SW67514:

To configure the Converter, use the available software that runs with Windows called SW67514. 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; 32/64bit).

When launching the SW67514, the window below appears (Fig. 2).



Note:

It is necessary to have installed .Net Framework 4.

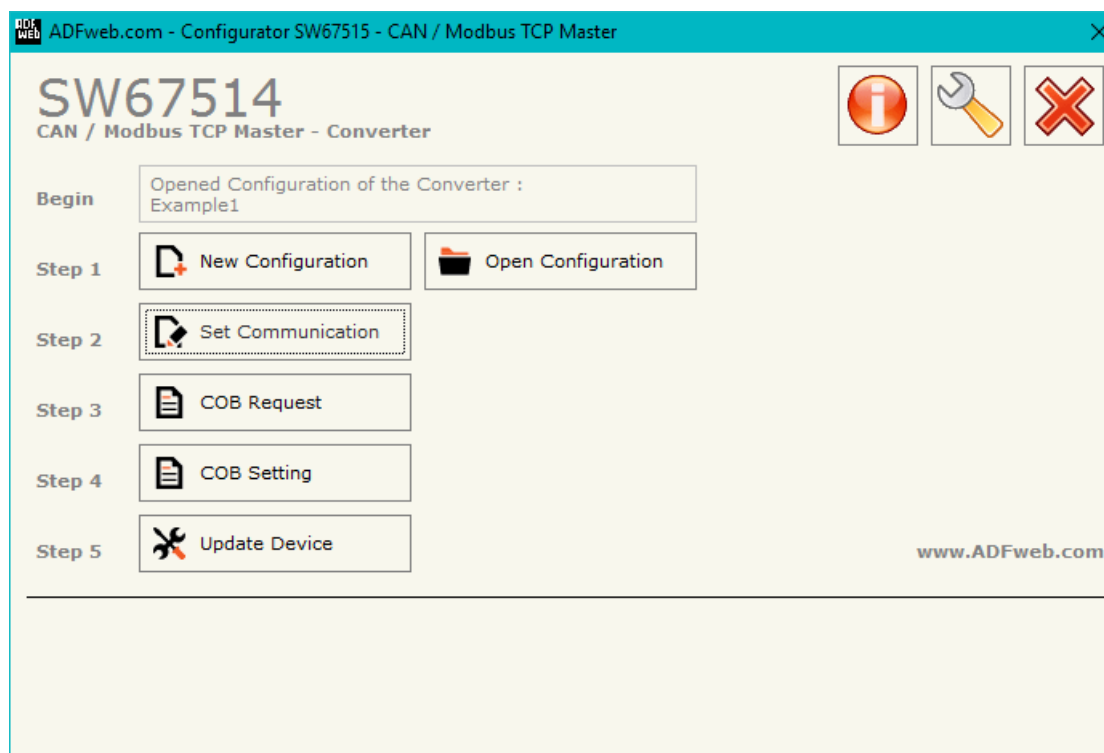
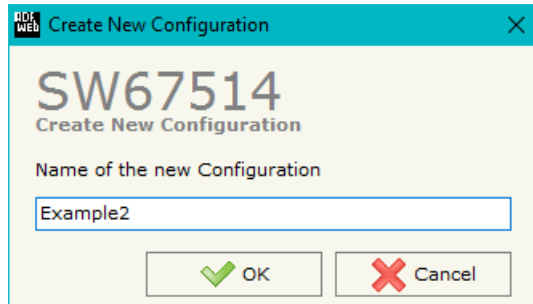


Figure 2: Main window for SW67514

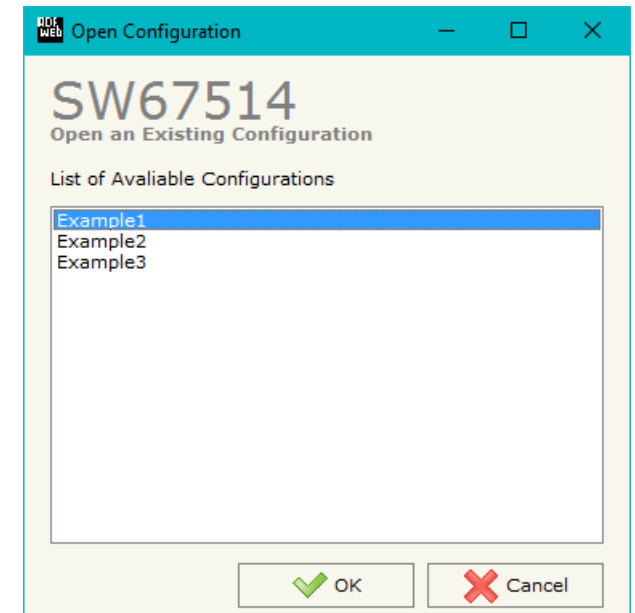
NEW CONFIGURATION / OPEN CONFIGURATION:

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




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

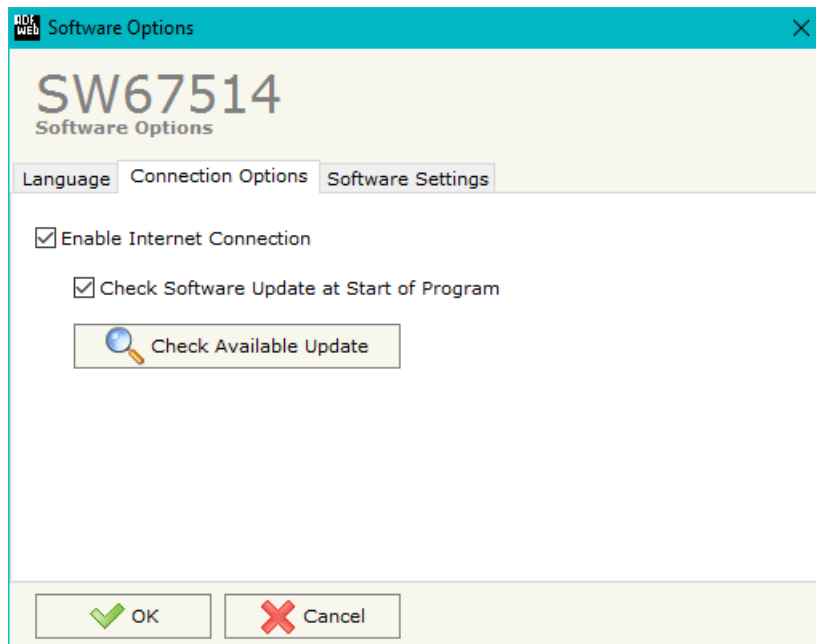
- To clone the configurations of a programmable “CAN / Modbus TCP Master - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button “**Open Configuration**”.



SOFTWARE OPTIONS:

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

In the section “Language” it is possible to change the language of the software.



In the section “Connection Options”, it is possible to check if there are some updatings of the software compositor in ADFweb.com website. Checking the option “**Check Software Update at Start of Program**”, the SW67514 check automatically if there are updatings when it is launched.

SET COMMUNICATION:

This section defines the fundamental communication parameters of two Buses, CAN and Modbus TCP.

By pressing the **"Set Communication"** button from the main window for SW67514 (Fig. 2) the window "Set communication" appears (Fig. 3).

This window is divided in two sections, one for configure the CAN Network and the other for the Modbus TCP.

In the section "Select Device" it is possible to select the type of converter used:

- Hardware with Jumper;
- Hardware with Dip-Switch.

The means for the fields for the "CAN" are:

- In the field **"Baud Rate"** the baudrate of the CAN is defined;
- If the field **"CAN Bus 2.0A (CobID 11 bits)"** is checked, the CAN with a COB-ID of 11Bit is used; otherwise if the field **"CAN Bus 2.0B (CobID 29 bits)"** is checked the CAN with a COB-ID of 29Bit is used (only if "Hardware with Jumper" is set);

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

- In the field **"IP Address"** the IP address for the Modbus TCP side is defined;
- In the field **"SubNet Mask"** the SubNet Mask for the Modbus TCP side is defined;
- In the field **"Port"** the number of the TCP port for the Modbus TCP communication is defined (only if "Hardware with Jumper" is set);
- In the field **"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 **"TimeOut (ms)"** the timeout for the Modbus TCP communication is defined;

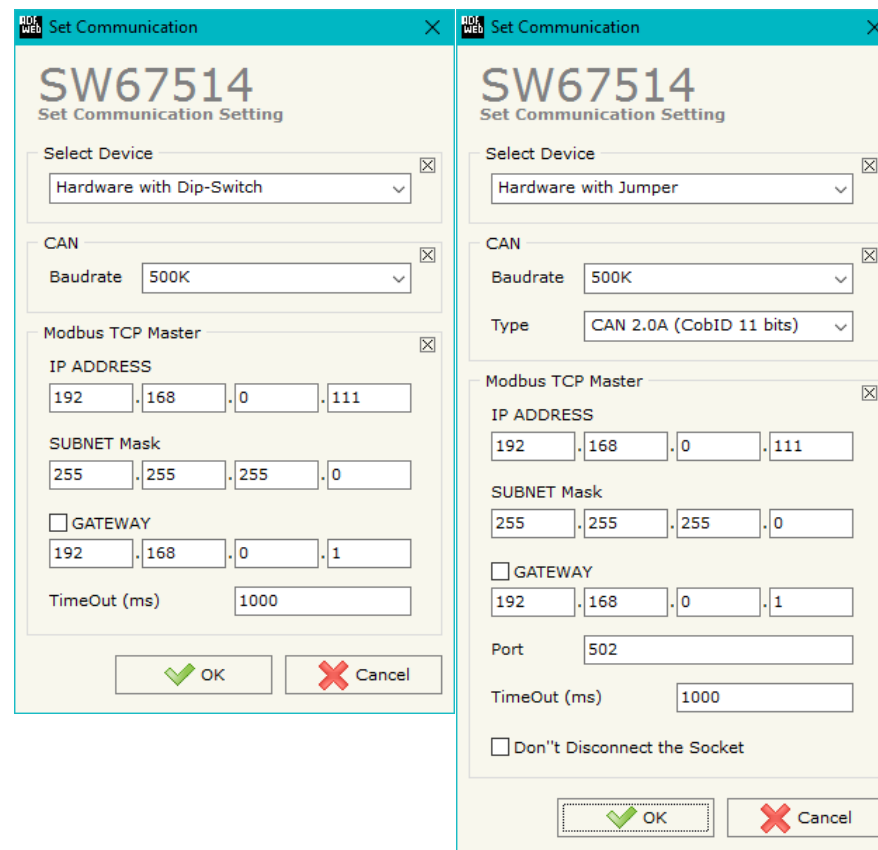


Figure 3: "Set Communication" window

- ➔ If the field "**Don't Disconnect the Socket**" is checked, the converter doesn't close the TCP connection to the slave between the Modbus TCP requests; otherwise, the converter opens-closes the TCP connection between each Modbus TCP request (only if "Hardware with Jumper" is set).

COB REQUEST:

By pressing the “**COB Request**” button from the main window for SW67514 (Fig. 2) the window “Define Modbus TCP Request in Read” appears (Fig. 4). In this section, it is possible to define the CAN frames that the converter will receive from CAN network.

If “Hardware with Jumper” is set in the section “Set Communication”, the window appears like below:

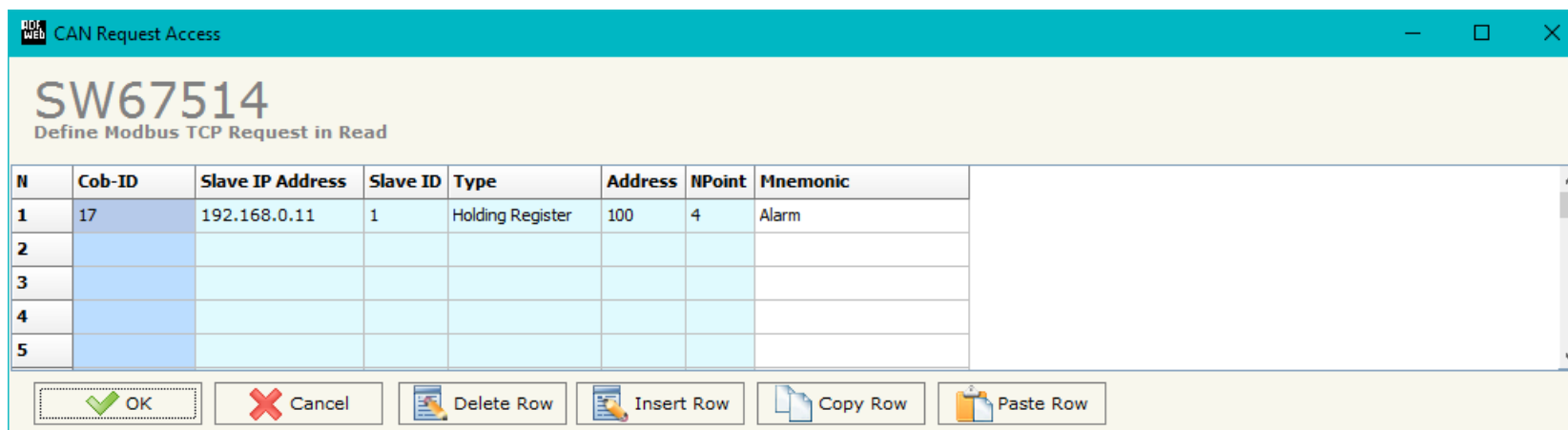


Figure 4a: “Define Modbus TCP Request in Read” window

- ➔ In the field “**Cob-ID**” the COB-ID of the CAN frame is defined;
- ➔ In the field “**Slave IP Address**” the IP address of the Modbus TCP slave to read is defined;
- ➔ In the field “**Slave ID**” the ID of the Modbus TCP slave to read is defined;
- ➔ In the field “**Type**” the type of Modbus register that you would like to read is defined;
- ➔ In the field “**Address**” the Modbus register to read is defined;
- ➔ In the field “**NPoint**” the number of consecutive Modbus registers to read is defined;
- ➔ In the field “**Mnemonic**” a brief description is defined.

If "Hardware with Dip-Switch" is set in the section "Set Communication", the window appears like below:

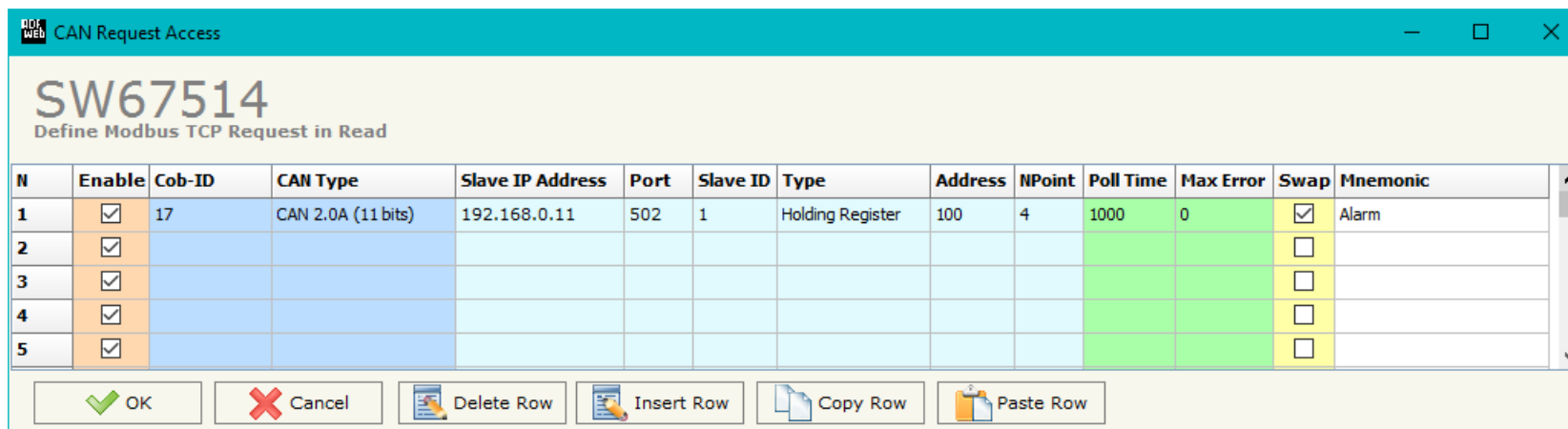


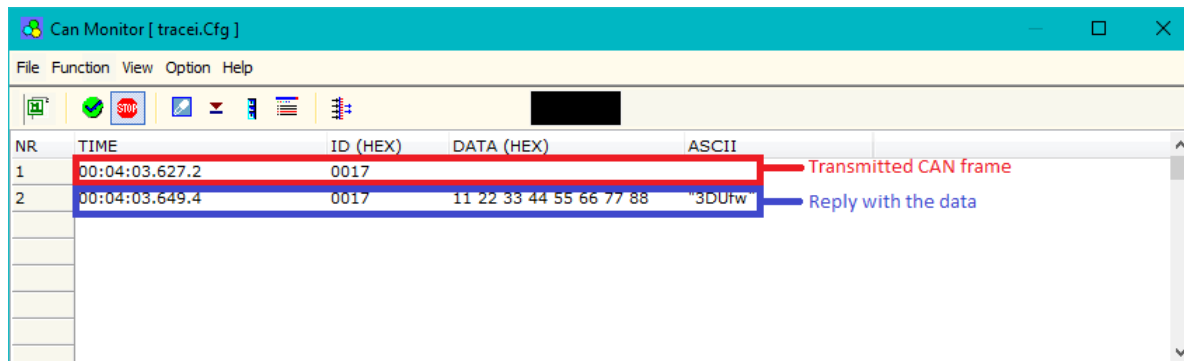
Figure 4b: "Define Modbus TCP Request in Read" window

- In the field "**Cob-ID**" the COB-ID of the CAN frame is defined;
- In the field "**Type**" the type of the CAN protocol used for each frame (CAN 2.0A (11 bits) or CAN 2.0B (29 bits)) is defined;
- In the field "**Slave IP Address**" the IP address of the Modbus TCP slave to read is defined;
- In the field "**Port**" the number of the TCP port for the Modbus TCP communication is defined;
- In the field "**Slave ID**" the ID of the Modbus TCP slave to read is defined;
- In the field "**Type**" the type of Modbus register that you would like to read is defined;
- In the field "**Address**" the Modbus register to read is defined;
- In the field "**NPoint**" the number of consecutive Modbus registers to read is defined;
- In the field "**Poll Time**" the delay between two Modbus TCP requests is defined;
- In the field "**Max Error**" insert the number of consecutive errors that the Master waits before discarding the row from the cycle of requests;
- If the field "**Swap**" is checked, the bytes written to CAN will be swapped;
- In the field "**Mnemonic**" a description of the frame is defined.

Example of communication (Hardware with Jumper):

If we want to read the Holding Register at address 100 for 4 consecutive registers (Fig. 4a), we must send a CAN frame with COB-ID= \$0017 and without data (Fig. 5).

As answer we would have a CAN frame with the same COB-ID (\$0017) and 8 bytes of data which are the value of the Modbus registers (Fig. 5).



| NR | TIME | ID (HEX) | DATA (HEX) | ASCII |
|----|----------------|----------|-------------------------|---------|
| 1 | 00:04:03.627,2 | 0017 | | |
| 2 | 00:04:03.649,4 | 0017 | 11 22 33 44 55 66 77 88 | "3DUfw" |

Figure 5: CAN frames for reading request



Note:

Using the last version of the HD67514-A1/B2 (Hardware with Dip-Switch), it is possible to use this working mode or the converter can polls cyclically and independently the Modbus TCP slaves and sends on CAN side the associated CAN frame at the reception of each Modbus response.

COB SETTING:

By pressing the “**COB Setting**” button from the main window for SW67514 (Fig. 2) the window “Define Modbus TCP Request in Write” appears (Fig. 4). In this section, it is possible to define the CAN frames that the converter will receive from CAN network.

If “Hardware with Jumper” is set in the section “Set Communication”, the window appears like below:

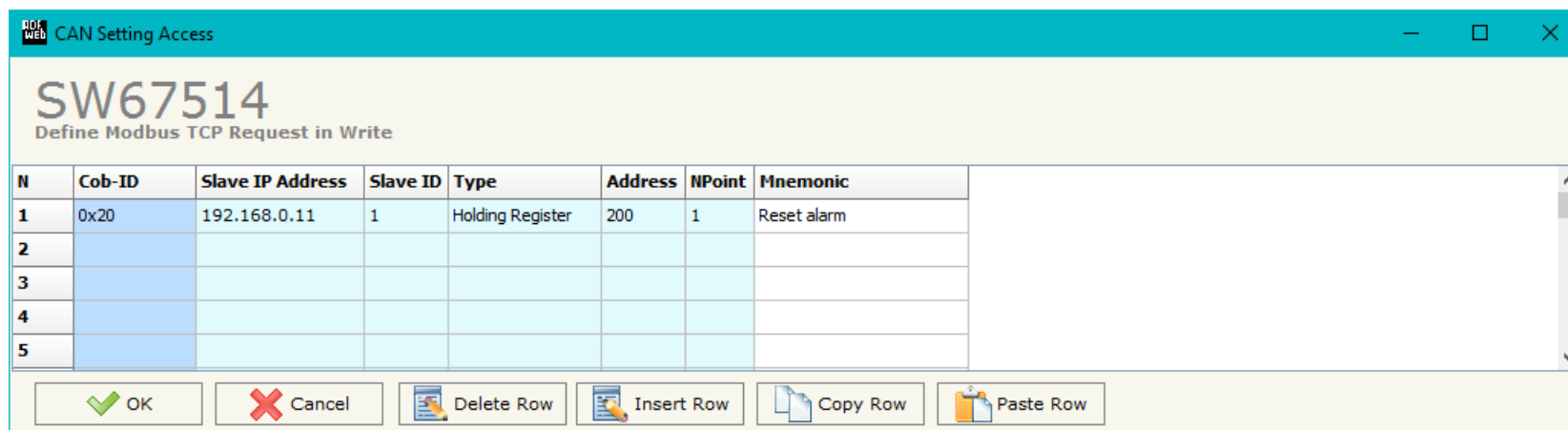
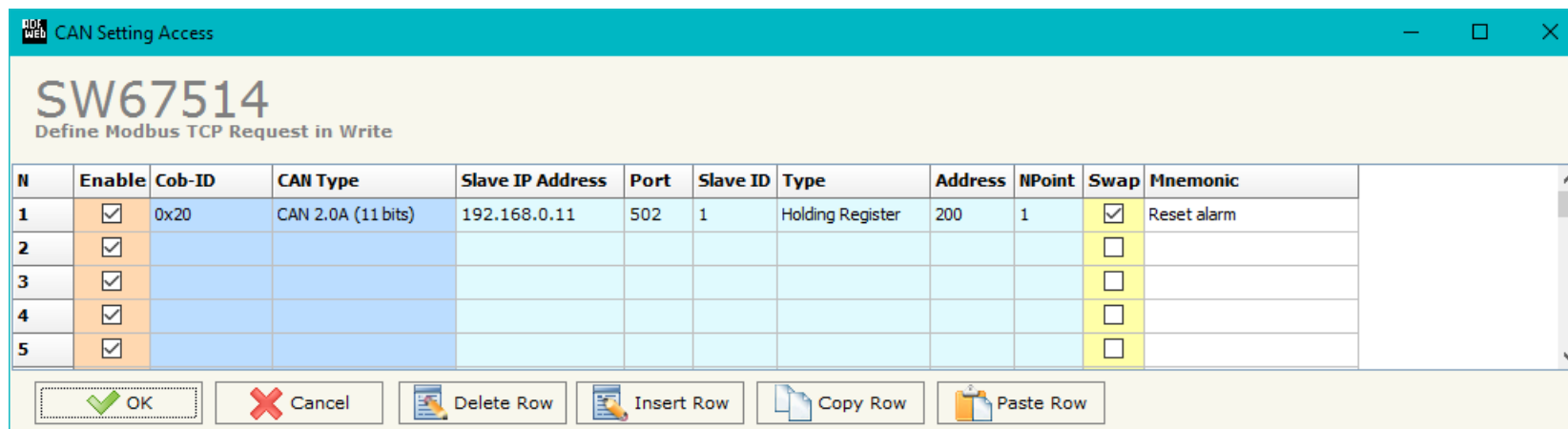


Figure 6a: “Define Modbus TCP Request in Write” window

- In the field “**COB-ID**” insert the COB of the CAN bus frame;
- In the field “**Slave IP Address**” the IP address of the Modbus TCP slave to write is defined;
- In the field “**Slave ID**” the ID of the Modbus TCP slave to write is defined;
- In the field “**Type**” the type of Modbus register that you would like to write is defined;
- In the field “**Address**” the Modbus register to write is defined;
- In the field “**NPoint**” the number of consecutive Modbus registers to write is defined;
- In the field “**Mnemonic**” a brief description is defined.

If "Hardware with Dip-Switch" is set in the section "Set Communication", the window appears like below:



| N | Enable | Cob-ID | CAN Type | Slave IP Address | Port | Slave ID | Type | Address | NPoint | Swap | Mnemonic |
|---|-------------------------------------|--------|--------------------|------------------|------|----------|------------------|---------|--------|-------------------------------------|-------------|
| 1 | <input checked="" type="checkbox"/> | 0x20 | CAN 2.0A (11 bits) | 192.168.0.11 | 502 | 1 | Holding Register | 200 | 1 | <input checked="" type="checkbox"/> | Reset alarm |
| 2 | <input checked="" type="checkbox"/> | | | | | | | | | <input type="checkbox"/> | |
| 3 | <input checked="" type="checkbox"/> | | | | | | | | | <input type="checkbox"/> | |
| 4 | <input checked="" type="checkbox"/> | | | | | | | | | <input type="checkbox"/> | |
| 5 | <input checked="" type="checkbox"/> | | | | | | | | | <input type="checkbox"/> | |

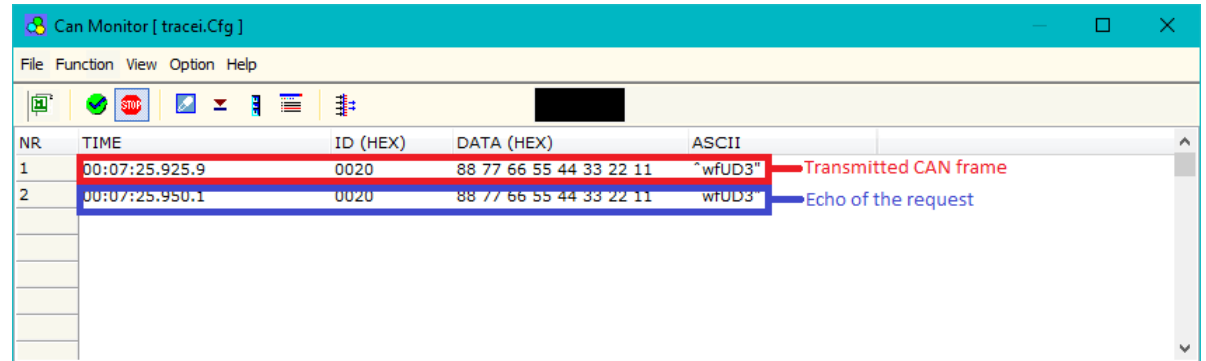
Figure 6b: "Define Modbus TCP Request in Write" window

- In the field "**Cob-ID**" the COB-ID of the CAN frame is defined;
- In the field "**Type**" the type of the CAN protocol used for each frame (CAN 2.0A (11 bits) or CAN 2.0B (29 bits)) is defined;
- In the field "**Slave IP Address**" the IP address of the Modbus TCP slave to write is defined;
- In the field "**Port**" the number of the TCP port for the Modbus TCP communication is defined;
- In the field "**Slave ID**" the ID of the Modbus TCP slave to write is defined;
- In the field "**Type**" the type of Modbus register that you would like to write is defined;
- In the field "**Address**" the Modbus register to write is defined;
- In the field "**NPoint**" the number of consecutive Modbus registers to write is defined;
- If the field "**Swap**" is checked, the bytes written from CAN will be swapped;
- In the field "**Mnemonic**" a description of the frame is defined.

For example:

If we want to write the Holding Register (Fig. 6) we must send a CAN frame with COB ID=0020 and 8 bytes of data (Fig. 7); they are the value of the registers Modbus that we want to set.

If the Modbus write command is correctly received, on CAN side an echo of the frame transmitted will be received (Fig. 7).



| NR | TIME | ID (HEX) | DATA (HEX) | ASCII |
|----|----------------|----------|-------------------------|---------|
| 1 | 00:07:25.925.9 | 0020 | 88 77 66 55 44 33 22 11 | ^wfUD3" |
| 2 | 00:07:25.950.1 | 0020 | 88 77 66 55 44 33 22 11 | wfUD3" |

Figure 7: CAN Frames for writing request

UPDATE VIA SERIAL (only if "Hardware with Jumper" is set):

By pressing the "Update Device" button it is possible to load the created Configuration into the device, and also the Firmware if is necessary, using the RS232 port.

In order to load the parameters or update the firmware in the device, follow these instructions:

- Turn off the Device;
- Connect the RS232 Null Modem cable form your PC to the Converter;
- Put Dip2 of 'Dip-Switch A' in ON position;
- Select the "COM port" and press the "Connect" button;
- Turn on the device;
- Check the "Device state" Led. It must blink quickly (see "LEDS" section);
- Press the "Next" button;
- Select which operations you want to do.
- Press the "Execute update firmware" button to start the upload;
- When all the operations are "OK" turn off the device;
- Put Dip2 of 'Dip-Switch A' in OFF position;
- Disconnect the RS232 cable;
- Turn on the device.

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

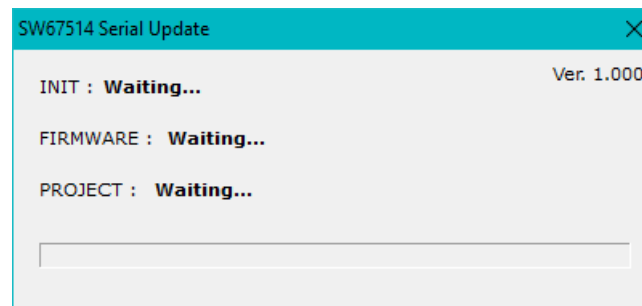
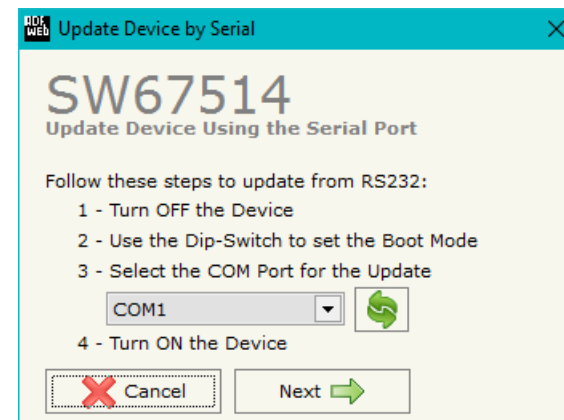


Figure 9a: "Update Device" windows

UPDATE VIA UDP (only if “Hardware with Dip-Switch” is set):

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 Dip2 of ‘Dip-Switch A’ in ON position;
- Turn on the device
- Connect the Ethernet cable;
- Insert the IP “**192.168.2.205**”;
- Press the “**Ping**” button, “Device Found! must appear”;
- Press the “**Next**” button;
- Select which operations you want to do;
- Press the “**Execute update firmware**” button to start the upload;
- When all the operations are “OK” turn off the Device;
- Put Dip2 of ‘Dip-Switch A’ in OFF position;
- Turn on the device.

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.

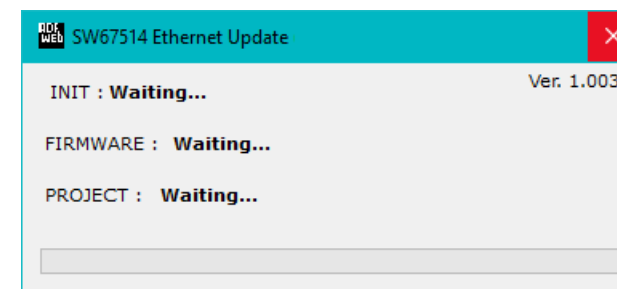
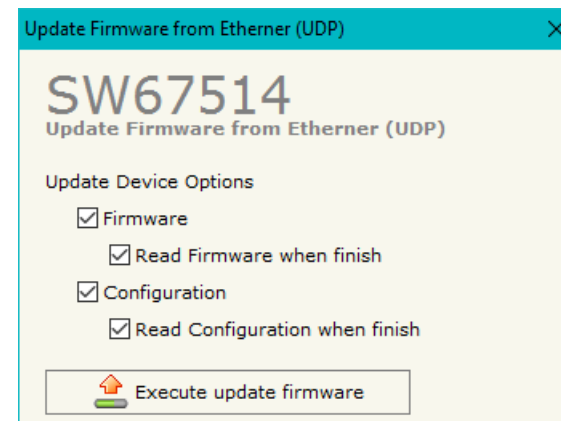
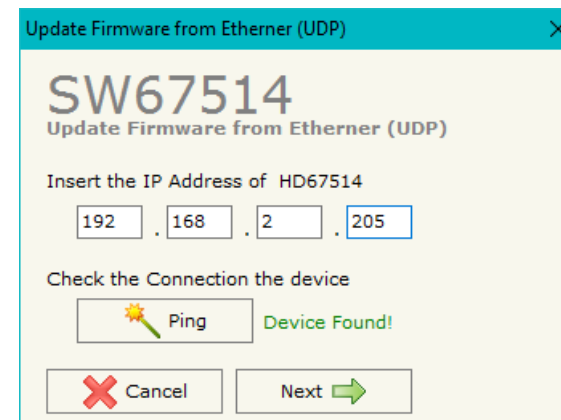


Figure 9b: “Update device” windows



Note:

When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67514.



Note:

When you receive the device, for the first time, you have to update also the Firmware in the HD67514 device.



Warning:

If the Fig. 10 appears when you try to do the Update before require assistance try these points:

- 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 or 10 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

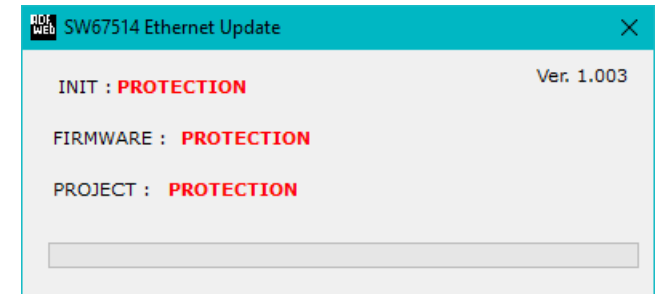


Figure 10: "Protection" error



In the case of HD67514 you have to use the software "SW67514": www.adfweb.com/download/filefold/SW67514.zip.

MECHANICAL DIMENSIONS:

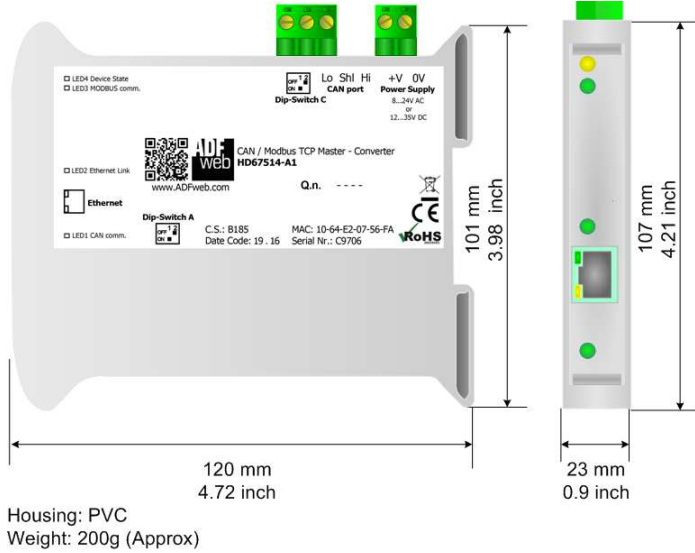


Figure 11a: Mechanical dimensions scheme HD67514-A1

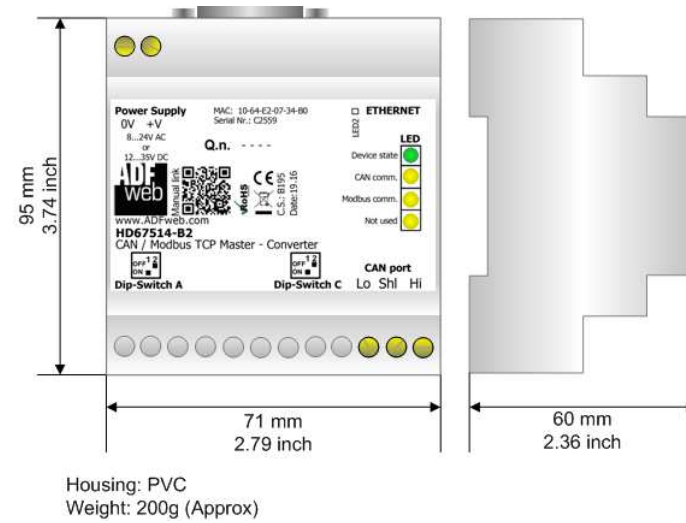
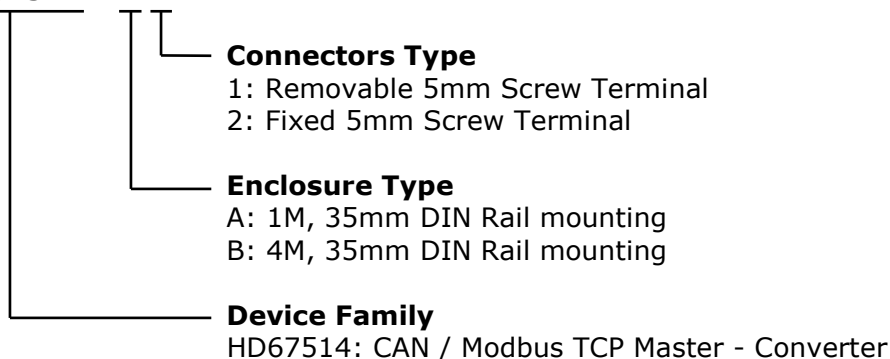


Figure 11b: Mechanical dimensions scheme HD67514-B2

ORDERING INFORMATIONS:

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

HD67514 - x x



Order Code: **HD67514-A1** - CAN / Modbus TCP Master – Converter (Housing type: A, Terminal Blocks Connectors)

Order Code: **HD67514-B2** - CAN / Modbus TCP Master - Converter (Housing type: B, Terminal Blocks Connectors)

ACCESSORIES:

Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m

Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m

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

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

DISCLAIMER:

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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.

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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