**ADFweb**

Industrial Electronic Devices

# User Manual
Revision 3.001
English

## CANopen / Modbus TCP Slave - Converter
(Order Code: HD67505-A1 – HD67505-B2)

For Website information:
www.adfweb.com?Product=HD67505

For Price information:
www.adfweb.com?Price=HD67505-A1
www.adfweb.com?Price=HD67505-B2

**Benefits and Main Features:**

⊕ Very easy to configure

⊕ Low cost

⊕ Rail mountable

⊕ Wide supply input range

⊕ Galvanic isolation

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

User Manual

HD67505-A1          HD67505-B2

For other Gateways / Bridges:

**CANopen to Modbus / DeviceNET**

See also the following links:

www.adfweb.com?product=HD67001    (Modbus RTU Master)
www.adfweb.com?product=HD67502    (Modbus RTU Slave)
www.adfweb.com?Product=HD67504    (Modbus TCP Master)
www.adfweb.com?product=HD67134    (DeviceNET)

**CAN bus to Modbus**

See also the following links:

www.adfweb.com?product=HD67011    (Modbus RTU Master)
www.adfweb.com?product=HD67012    (Modbus RTU Slave)
www.adfweb.com?product=HD67514    (Modbus TCP Master)
www.adfweb.com?product=HD67515    (Modbus TCP Slave)

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

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**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 |
|---|---|---|---|---|
| 2.100 | 12/12/2012 | Dp | All | Add NodeGuard |
| 2.101 | 07/02/2013 | Nt | All | Added new chapters |
| 3.000 | 25/07/2014 | Ff | All | New hardware version |
| 3.001 | 05/08/2014 | Ff | All | Revision |

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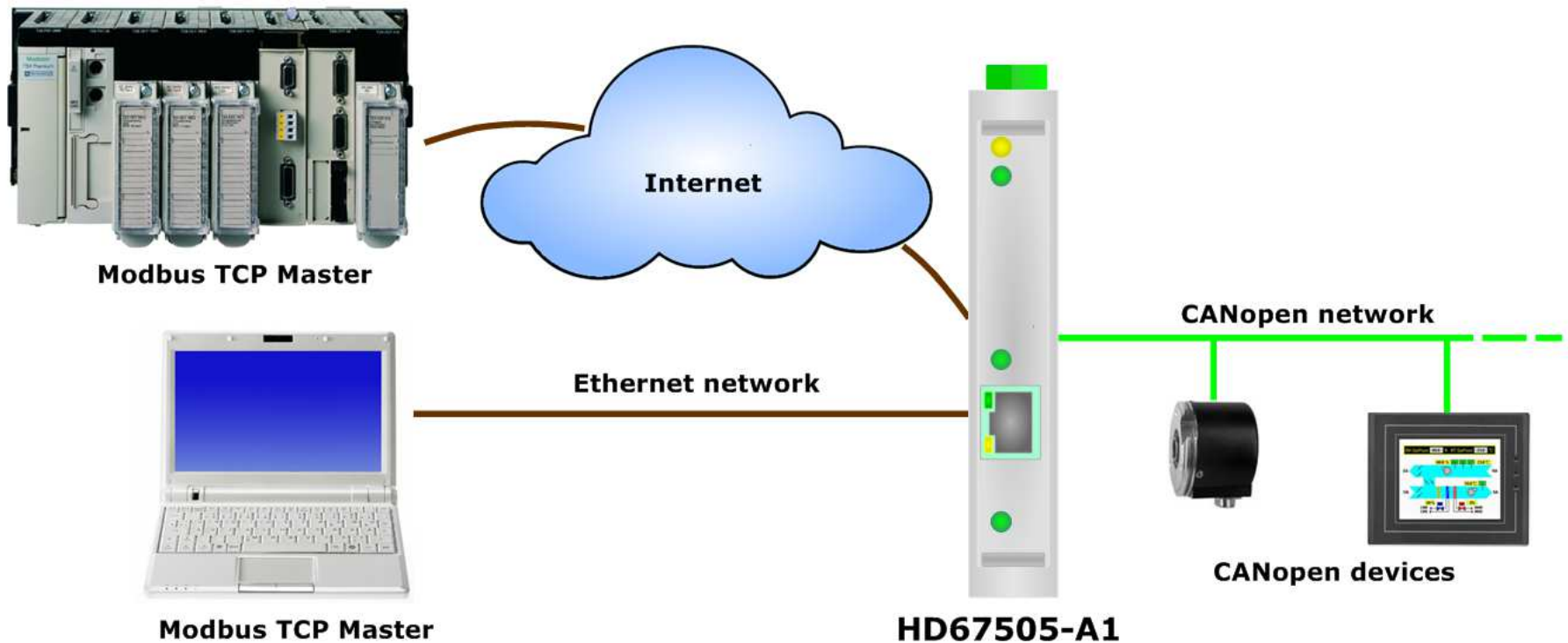
**RESIDUAL RISKS**
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

⚠ 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.

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

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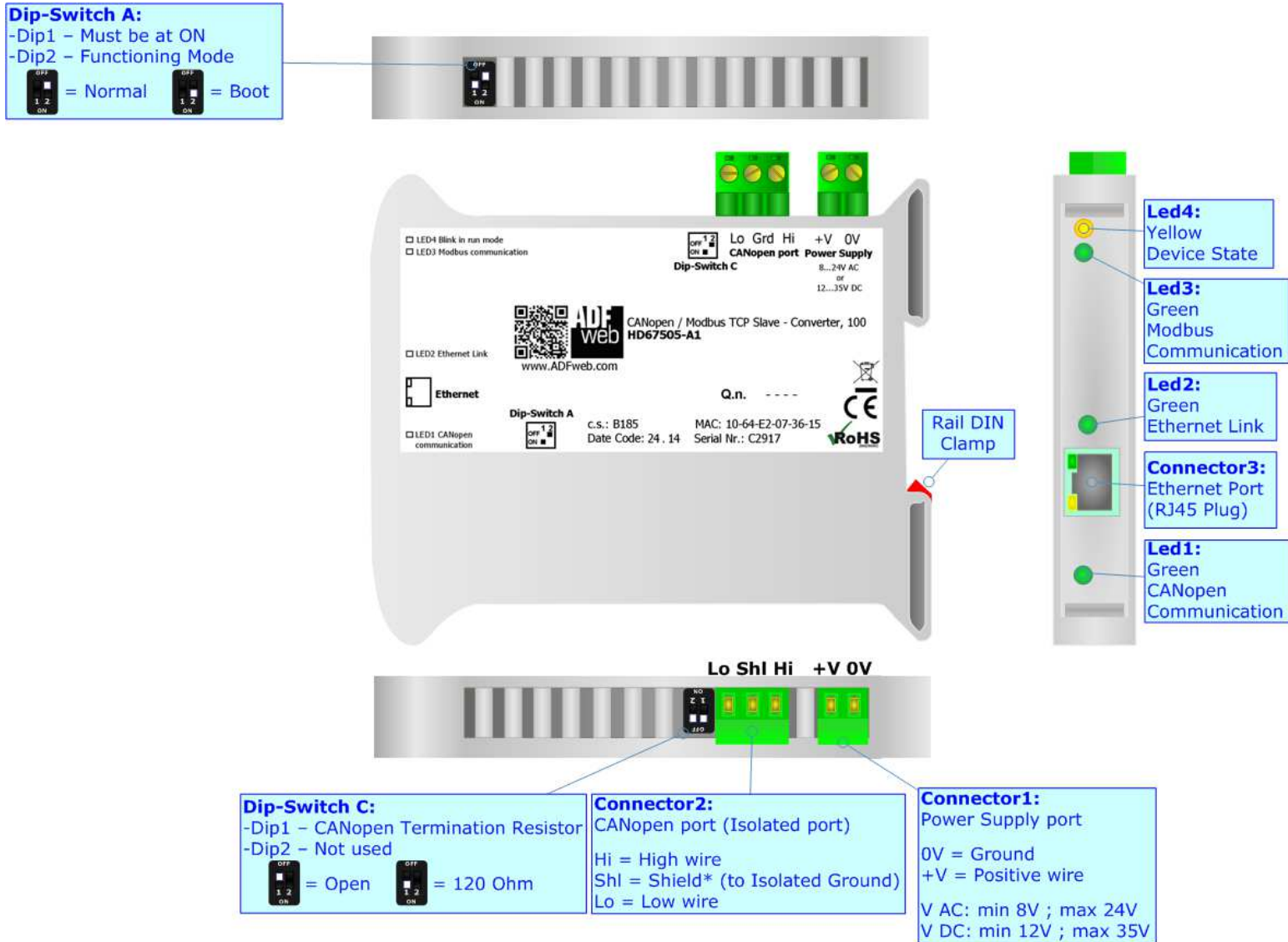
**EXAMPLE OF CONNECTION:**

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**CONNECTION SCHEME:**

**Dip-Switch A:**
-Dip1 – Must be at ON
-Dip2 – Functioning Mode

= Normal    = Boot

☐ LED4 Blink in run mode
☐ LED3 Modbus communication

Lo Grd Hi    +V 0V
CANopen port  Power Supply
Dip-Switch C
8...24V AC
or
12...35V DC

☐ LED2 Ethernet Link

CANopen / Modbus TCP Slave - Converter, 100
**HD67505-A1**

www.ADFweb.com

Ethernet

Q.n. - - - -

Dip-Switch A

c.s.: B185    MAC: 10-64-E2-07-36-15
Date Code: 24 . 14    Serial Nr.: C2917

☐ LED1 CANopen communication

**√RoHS**

Rail DIN Clamp

**Led4:**
Yellow
Device State

**Led3:**
Green
Modbus
Communication

**Led2:**
Green
Ethernet Link

**Connector3:**
Ethernet Port
(RJ45 Plug)

**Led1:**
Green
CANopen
Communication

Lo Shl Hi    +V 0V

**Dip-Switch C:**
-Dip1 – CANopen Termination Resistor
-Dip2 – Not used

= Open    = 120 Ohm

**Connector2:**
CANopen port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

**Connector1:**
Power Supply port

0V = Ground
+V = Positive wire

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

*Figure 1a: Connection Scheme for HD67505-A1*

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**Dip-Switch A:**
-Dip1 – Must be at ON
-Dip2 – Functioning Mode

= Normal    = Boot

**Dip-Switch C:**
-Dip1 – Not Used
-Dip2 – CANopen Termination Resistor

= Open    = 120 Ohm

**Connector2:**
CANopen port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

Lo Shl Hi

**Led3:**
Green
Device state

**Led1:**
Yellow
CANopen
Communication

**Led4:**
Yellow
Modbus
Communication

**Led5:**
Yellow
Not used

Power Supply    MAC: 10-64-E2-07-37-90    ETHERNET
0V  +V          Serial Nr.: C3296
8...24V AC
or              Q.n.  - - - -
12...35V DC

www.ADFweb.com
HD67505-B2
CANopen / Modbus TCP Slave - Converter,100
Dip-Switch A    Dip-Switch C    CANopen port    Lo  Gnd  Hi

Device state
CAN comm.
ETHERNET comm.
Not used

**Connector1:**
Power Supply port

0V = Ground
+V = Positive wire

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

0V +V

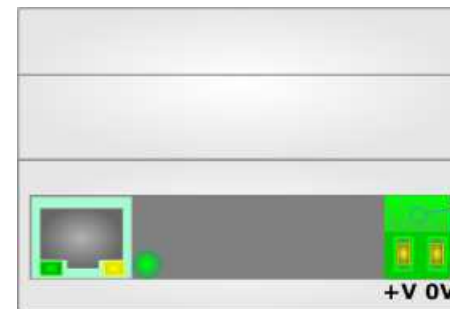**Connector5:**
Ethernet Port
(RJ45 Plug)

**Led2:**
Green
Ethernet Link

*Figure 1b: Connection Scheme for HD67505-B2*

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**CHARACTERISTICS:**

The "CANopen / Modbus TCP Slave – Converter" allows the following characteristics:

- two-directional information between networks CAN and Modbus;
- electrical isolation between two Buses;
- Mountable on Rail DIN;
- Temperature range from -40°C to +85°C.

This device is able to manage a maximum of ten simultaneous connections at Modbus TCP side.

**CONFIGURATION:**

You need Compositor SW67505 software on your PC in order to perform the following:

- Define the parameter of CANopen;
- Define the parameter of Modbus TCP;
- Define that the SDO of the CANopen are accessible from Modbus;
- Define how to update SDO in CANopen from Modbus;
- Define that the EMCY of the CANopen are accessible from Modbus;
- Define how and which EMCY generated in CANopen can be filtered;
- Define which and how the PDO of CANopen are accessible from Modbus;
- Update the new configurations of 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 | | VDC | |
|---|---|---|---|
| **Vmin** | **Vmax** | **Vmin** | **Vmax** |
| **8V** | **24V** | **12V** | **35V** |

Consumption at 24V DC:

| Device | Consumption [W/VA] |
|---|---|
| HD67505-A1 | 3.5 |
| HD67505-B2 | 3.5 |

⚠ **Caution:  Not reverse the polarity power**
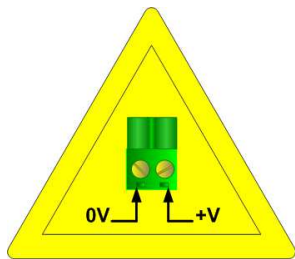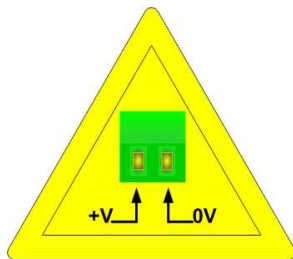
HD67505-A1          HD67505-B2

**Connector1:**
Power Supply port

0V = Ground
+V = Positive wire

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

0V +V

**Connector1:**
Power Supply port

0V = Ground
+V = Positive wire

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

+V 0V

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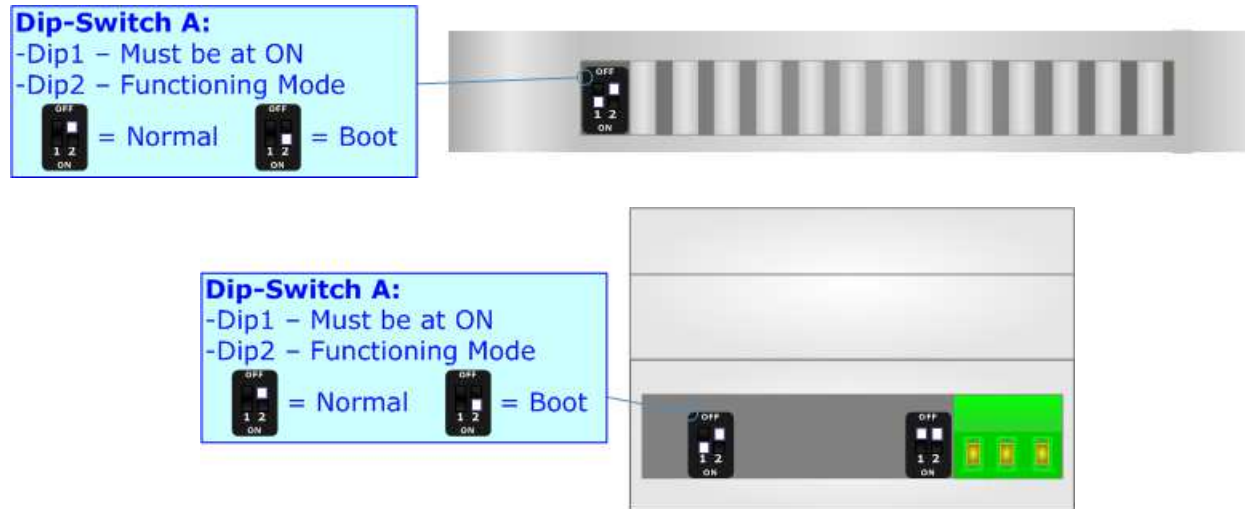
**Warning:**
Dip1 of 'Dip-Switch A' must be at ON position to work even if the Ethernet cable is not inserted.

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**LEDS:**

The devices has got four (five for HD67505-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: CANopen Communication (green) | Blinks when CANopen frames are received | **Blinks quickly:** Boot state<br>**Blinks very slowly (~0.5Hz):** update in progress |
| 2: Ethernet Link (green) | **ON:** Ethernet cable connected<br>**OFF:** Ethernet cable disconnected | **ON:** Ethernet cable connected<br>**OFF:** Ethernet cable disconnected |
| 3: Modbus Communication (green) | Blinks when Modbus TCP frames are received | **Blinks quickly:** Boot state<br>**Blinks very slowly (~0.5Hz):** update in progress |
| 4: Device State (yellow) | Blinks slowly (~1Hz) | **Blinks quickly:** Boot state<br>**Blinks very slowly (~0.5Hz):** update in progress |
| 5: Not used (yellow) (Present only on HD67505-B2) | OFF | **Blinks quickly:** Boot state<br>**Blinks very slowly (~0.5Hz):** update in progress |

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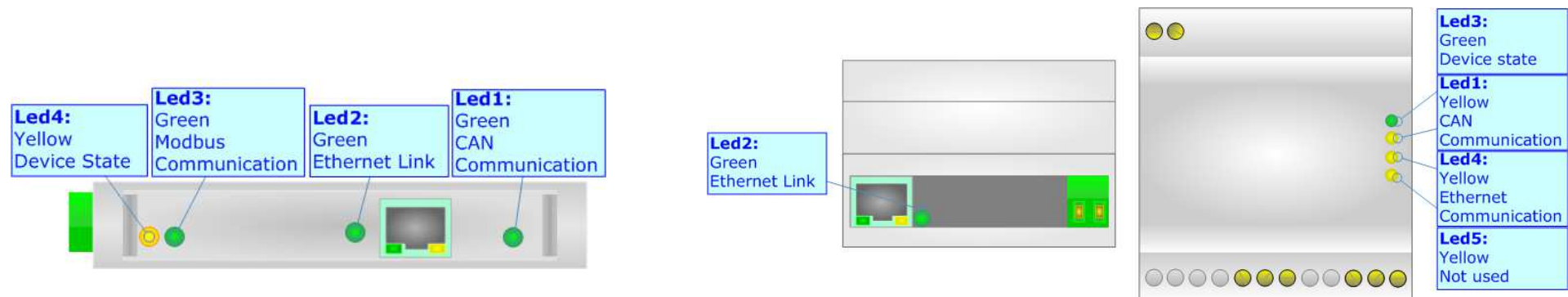
### ETHERNET:

The Ethernet connection must be made using Connector5 of HD67505-A1/HD67505-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.

**Connector3:**
Ethernet Port
(RJ45 Plug)

**Connector5:**
Ethernet Port
(RJ45 Plug)

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**CANopen:**

For terminating the CANopen line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch C' is at ON position (for the HD67505-A1) and that the Dip2 of 'Dip-Switch C' is at ON position (for the HD67505-B2).
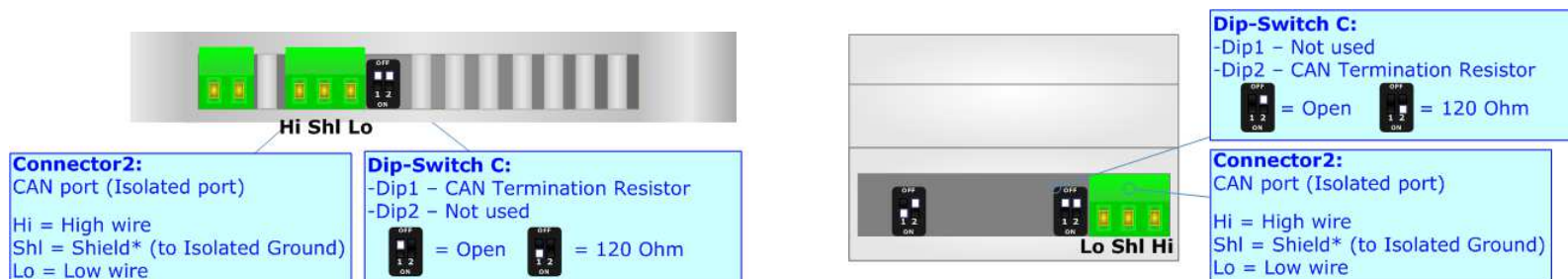


Cable characteristics:

| 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 |

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### USE OF COMPOSITOR SW67505:

To configure the Converter, use the available software that runs with Windows called SW67505. 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; 32/64bit).

When launching the SW67515, the window below appears (Fig. 2).

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



*Figure 2: Main window for SW67505*

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**NEW CONFIGURATION / OPEN CONFIGURATION:**

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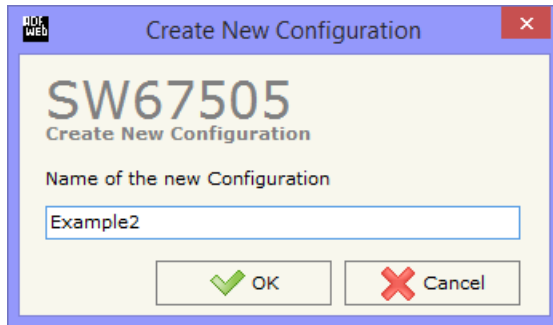
A device's configuration can also be imported or exported:

+ To clone the configurations of a programmable "CANopen / Modbus TCP 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**".
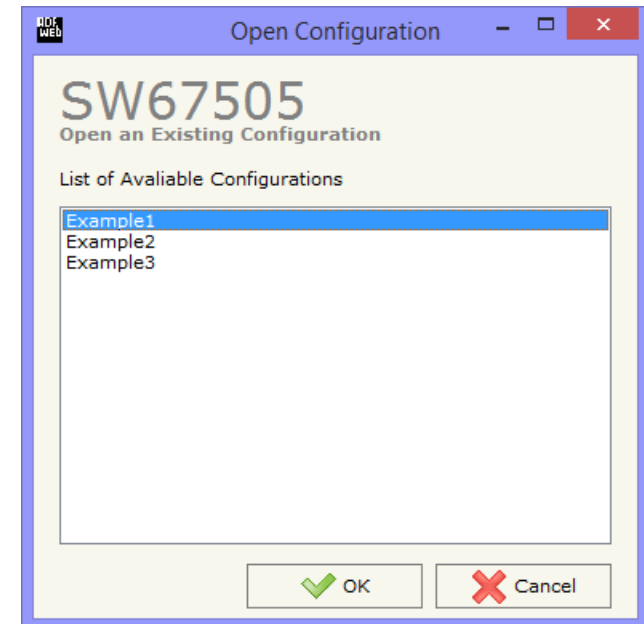
**SOFTWARE OPTIONS:**

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.
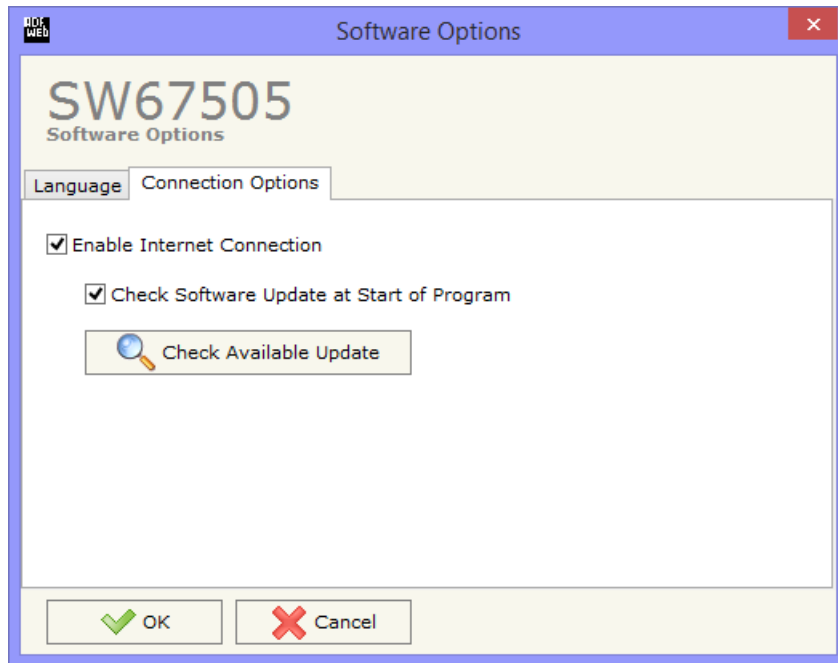




In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67505 check automatically if there are updatings when it is launched.

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**SET COMMUNICATION:**

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

By pressing the "**Set Communication**" button from the main window for SW67505 (Fig. 2) the window "Set communication" appears (Fig. 3).

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

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

- Device till April 2014 (with Jumper);
- Device from May 2014 (with Dip-Switches).

I
The means for the fields for the "CANopen" are:

- In the field "**Device ID**" the ID of the CANopen side is defined;
- In the field "**Baud Rate**" the baudrate of the CAN is defined;
- In the field "**Set Operational State at Start-Up**" the state of the CANopen is defined. I.e. If it is checked the board starts in Operational State, else it starts in Pre-Operational;
- In the field "**Network Start at Start-Up**" the state of the CANopen network is defined. I.e. If it is checked the board sends a command to set the Operational State of all the devices present in the network, after the time defined in the "Delay" field;
- In the field "**Delay (s)**" the delay before sending the "Start" command for the CANopen is defined;
- In the field "**SDO Client TimeOut (1/10 ms)**" the maximum time that the device attends for the answer from the Slave interrogated is defined;
- If the field "**Set CANopen State on Modbus**" is set, it is possible to send the Modbus command (sender word) of Operational/Pre-Operational State to one or all devices in CANopen network.
  The sender word must have:
  - The high byte with the value of 1 for Operational or 2 for Pre-Operational.
  - The low byte must have the address of the device that is commanded to do the action
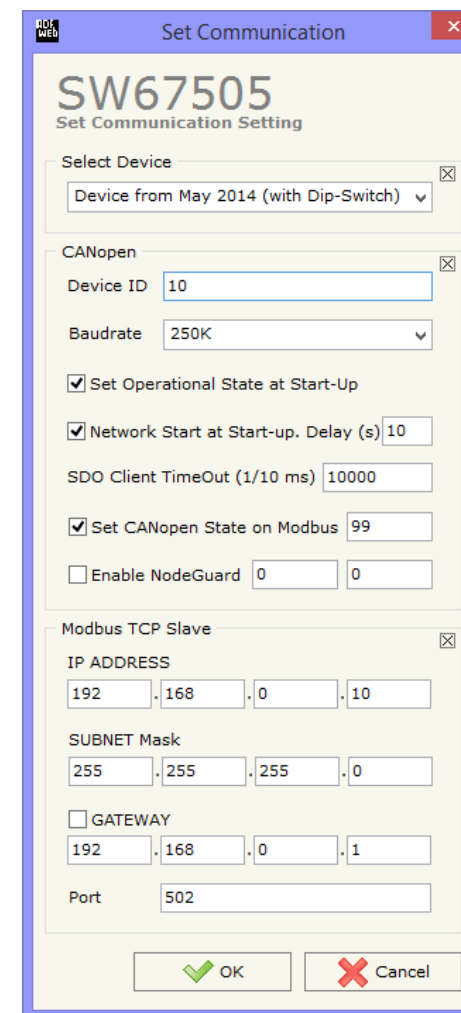
*Figure 3: "Set Communication" window*

(Operational/PreOperational), if you put zero all the devices present in CANopen network take the state setted;

Example if you want to set the state of Operational to the device CANopen with address 3, You must write the word "259" in the field "Add. Word Modbus". Note: 259=0x0103.

- In field "Add. Word Modbus" the address of Modbus register used for this operation is defined.

→ If the field "**Enable NodeGuard**" is set, it is possible to enable the NodeGuard of CANopen Slave. The two fields (Modbus Address) are used to indicate which Modbus registers using to save the state of the CANopen device. Every bit represents a CANopen device, if the device is present, the bit is equal to 1 otherwise 0.

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

→ In the field "**IP Address**", insert the IP address that you want to give to slave Modbus;

→ 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**" insert the number of the port.

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### SET SDO CLIENT:

By pressing the "**Set SDO Client**" button from the main window for SW67505 (Fig. 2) the window "SDO Client Access Definition" appears (Fig. 4).

The following objects can be defined in the section "Set SDO Client":

+ Which SDO of the CANopen are accessible from a Modbus TCP;
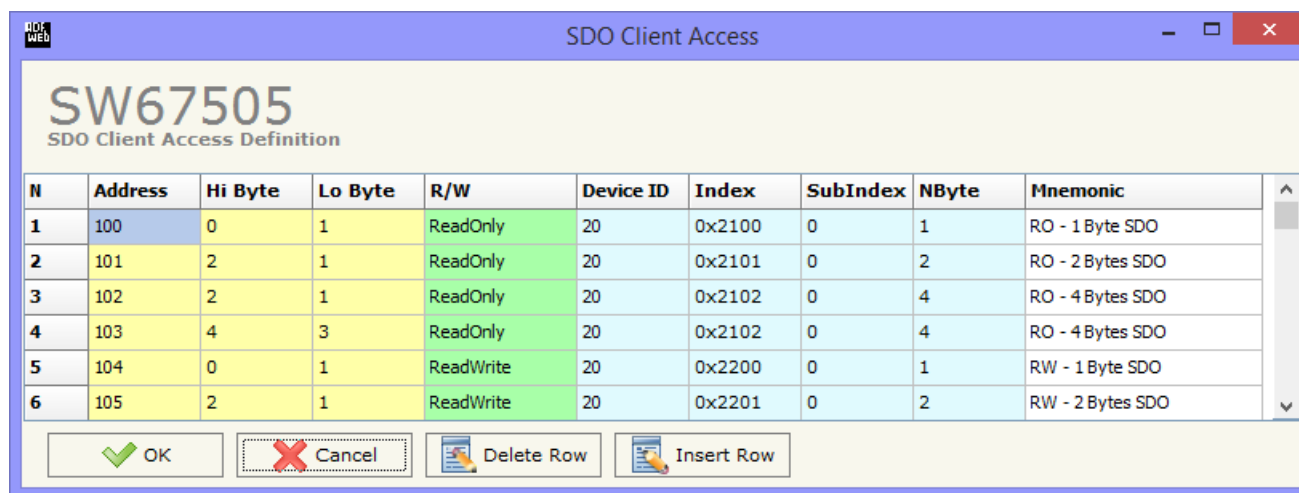+ Which word of the Modbus are accessible from a SDO of the CANopen.

The data of the columns have the following meanings:

+ In the field "**Address**", the Modbus register associated to the SDO is defined;
+ In the field "**Hi Byte**", the correspondence between the Hi byte of the Modbus register and a SDO byte is defined (it can be set with 0, 1, 2, 3, 4);
  - o  1 = First byte of the SDO;
  - o  2 = Second byte of the SDO;
  - o  3 = Third byte of the SDO;
  - o  4 = Fourth byte of the SDO;
  - o  0 = No byte.
+ In the field "**Lo Byte**", the correspondence between the Lo byte of the Modbus register and a SDO byte is defined (it can be set with 0, 1, 2, 3, 4);
  - o  1 = First byte of the SDO;
  - o  2 = Second byte of the SDO;
  - o  3 = Third byte of the SDO;
  - o  4 = Fourth byte of the SDO;
  - o  0 = No byte.
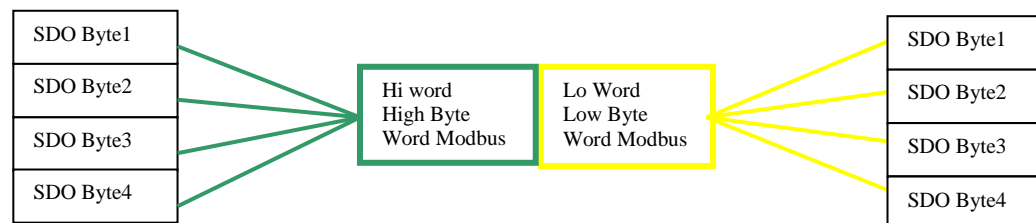+ In the field "**R/W**", the type of SDO is defined (ReadOnly or ReadWrite);



*Figure 4: "SDO Client Access Definition" window*

| N | Address | Hi Byte | Lo Byte | R/W | Device ID | Index | SubIndex | NByte | Mnemonic |
|---|---------|---------|---------|-----|-----------|-------|----------|-------|----------|
| 1 | 100 | 0 | 1 | ReadOnly | 20 | 0x2100 | 0 | 1 | RO - 1 Byte SDO |
| 2 | 101 | 2 | 1 | ReadOnly | 20 | 0x2101 | 0 | 2 | RO - 2 Bytes SDO |
| 3 | 102 | 2 | 1 | ReadOnly | 20 | 0x2102 | 0 | 4 | RO - 4 Bytes SDO |
| 4 | 103 | 4 | 3 | ReadOnly | 20 | 0x2102 | 0 | 4 | RO - 4 Bytes SDO |
| 5 | 104 | 0 | 1 | ReadWrite | 20 | 0x2200 | 0 | 1 | RW - 1 Byte SDO |
| 6 | 105 | 2 | 1 | ReadWrite | 20 | 0x2201 | 0 | 2 | RW - 2 Bytes SDO |



*Figure 5: Scheme of the word configuration*

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- In the field "**Device ID**", the ID of the CANopen device is defined;
- In the field "**Index**", the Index of the SDO is defined;
- In the field "**SubIndex**", the SubIndex of the SDO is defined;
- In the field "**NByte**", the dimension of the SDO is defined;
- In the field "**Mnemonic**", a description is defined.

Example 1:

If you want to write data in the form of SDO in the CANopen from the Modbus network on the device at the address:
- Address 1;
- Index 0x200A;
- SubIndex 1;
- By dimensions 2 bytes.

By the following word Modbus on the Gateway:
- Address 0x1900.

In the above scenario:

The Modbus Master can read (note RW=0):
- to the address Modbus of the Gateway (Note:  the one specified in the "Set Communication");
- to the word Modbus 0x1900 (note: Address 0x1900);
- the first byte of the SDO found in the low byte of the Modbus register (note: Lo Byte=1);
- the second byte of the SDO found in high byte of the Modbus word (note: Hi Byte=2);

The SDO:
- two byte dimension (note: NByte=2);
- belonging to a CANopen device ID 1 (note: Device ID=1);
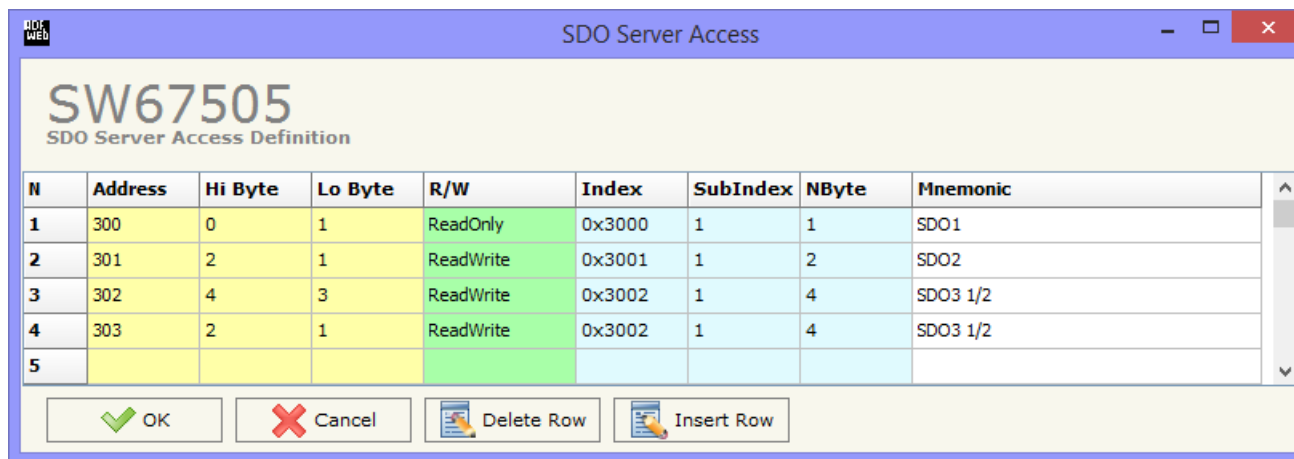- of the following coordinates: Index 0x200A and SubIndex 1.

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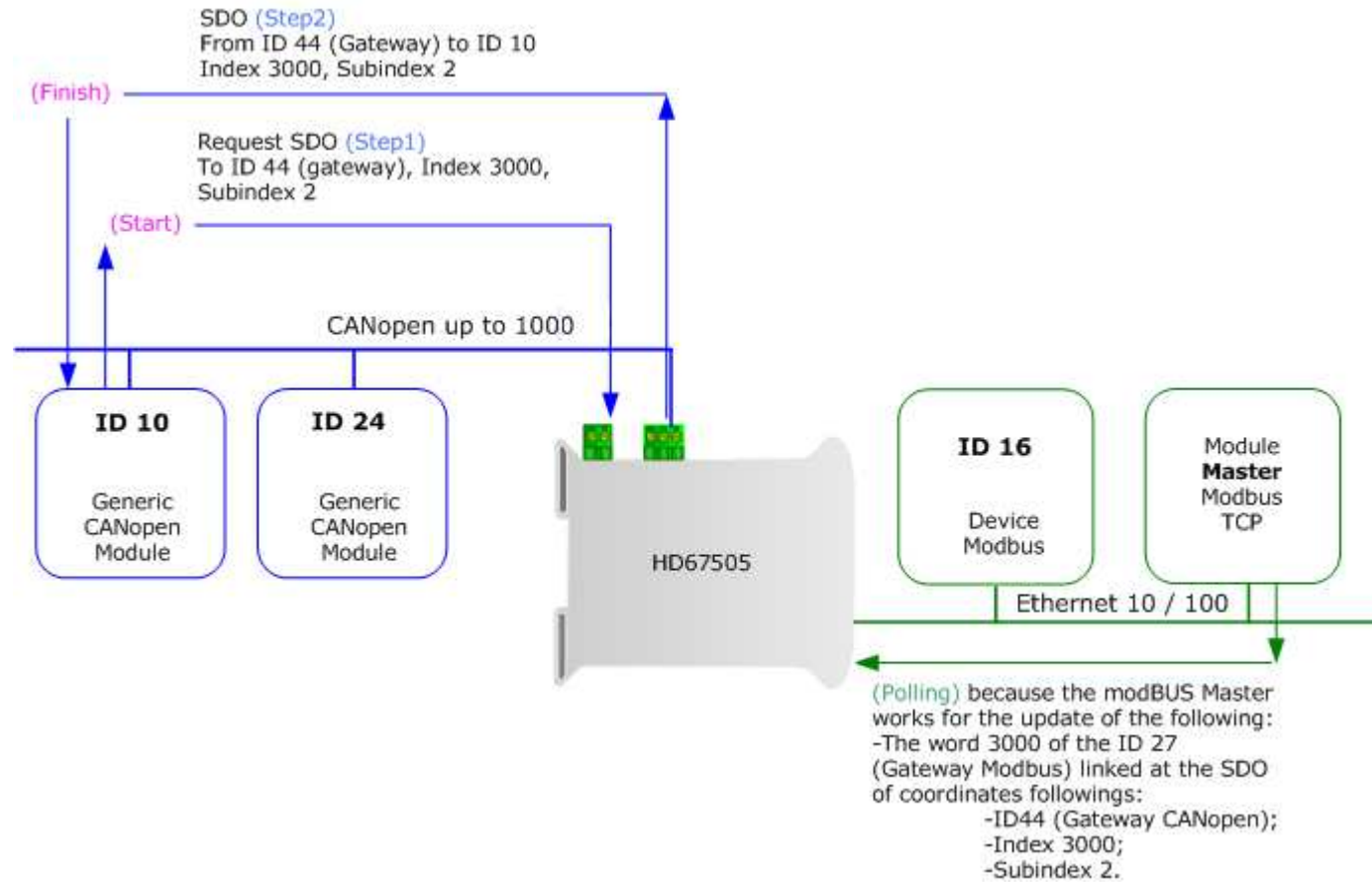


*Figure 6: Chart of SDO request from Modbus side*

**SET SDO SERVER:**

By pressing the "**Set SDO Server**" button from the main window for SW67505 (Fig. 2) the window "SDO Server Access Definition" appears (Fig. 7).

The following objects can be defined in the section "Set SDO Server":

➔ Which SDO object are accessible from the other devices of the CANopen network and the Modbus registers to read/write this informations;

➔ Which Modbus registers are accessible to read/write a SDO object.



| N | Address | Hi Byte | Lo Byte | R/W | Index | SubIndex | NByte | Mnemonic |
|---|---------|---------|---------|-----|-------|----------|-------|----------|
| 1 | 300 | 0 | 1 | ReadOnly | 0x3000 | 1 | 1 | SDO1 |
| 2 | 301 | 2 | 1 | ReadWrite | 0x3001 | 1 | 2 | SDO2 |
| 3 | 302 | 4 | 3 | ReadWrite | 0x3002 | 1 | 4 | SDO3 1/2 |
| 4 | 303 | 2 | 1 | ReadWrite | 0x3002 | 1 | 4 | SDO3 1/2 |
| 5 | | | | | | | | |

*Figure 7: SDO Server Access Definition*

The data of the columns have the following meanings:

➔ In the field "**Address**", the Modbus register associated to the SDO is defined;

➔ In the field "**Hi Byte**", the correspondence between the Hi byte of the Modbus register and a SDO byte is defined (it can be set with 0, 1, 2, 3, 4);
  o 1 = First byte of the SDO;
  o 2 = Second byte of the SDO;
  o 3 = Third byte of the SDO;
  o 4 = Fourth byte of the SDO;
  o 0 = No byte.

➔ In the field "**Lo Byte**",  the correspondence between the Lo byte of the Modbus register and a SDO byte is defined (it can be set with 0, 1, 2, 3, 4);
  o 1 = First byte of the SDO;
  o 2 = Second byte of the SDO;
  o 3 = Third byte of the SDO;
  o 4 = Fourth byte of the SDO;
  o 0 = No byte.

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- In the field "**R/W**", the type of SDO is defined (ReadOnly or ReadWrite);
- In the field "**Index**", the Index of the SDO is defined;
- In the field "**SubIndex**", the SubIndex of the SDO is defined;
- In the field "**NByte**", the dimension of the SDO is defined;
- In the field "**Mnemonic**", a description is defined.

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**SET EMERGENCY:**



*Figure 8: "Emergency Access Definition" window*

By pressing the "**Set Emergency**" button from the Main Window for SW67505 (Fig. 2) the window "Emergency Access Definition" appears (Fig. 8).

- In the field "**Device ID**", the Node ID of your CANopen device that transmit the EMCY is defined;
- In the field "**Error Code**", the value of your error code (the maximum value is 0xFFFF) is defined;
- In the field "**Error Register**", the value of your error register (the maximum value is 0xFF) is defined;
- In the field "**Mnemonic**", a description is defined.

**DEFINE EMERGENCY:**

By pressing the "**Define Emergency**" button from the main window for SW67505 (Fig. 2) the window "Define Modbus Registers for Emergency Frames" appears (Fig. 9):

- In the field "**List of Emergency defined**" there is the list of Emergency that you inserted in "Set Emergency" Section
- In the field "**List of Modbus Registers**" there are the Modbus words.
- In the field "**Create/Modify a Modbus Register**" you can define the index of the Modbus registers and the bytes of the can frame that you map in.

For example:

Click on the frame, insert the valid address in the field "Index of Modbus Register", select the byte position (Byte 1 in High Modbus byte and Byte 3 in Low Modbus byte), click the "Create" button, in the field "List of Modbus Registers" appears the new Modbus register created with the data that it contains.
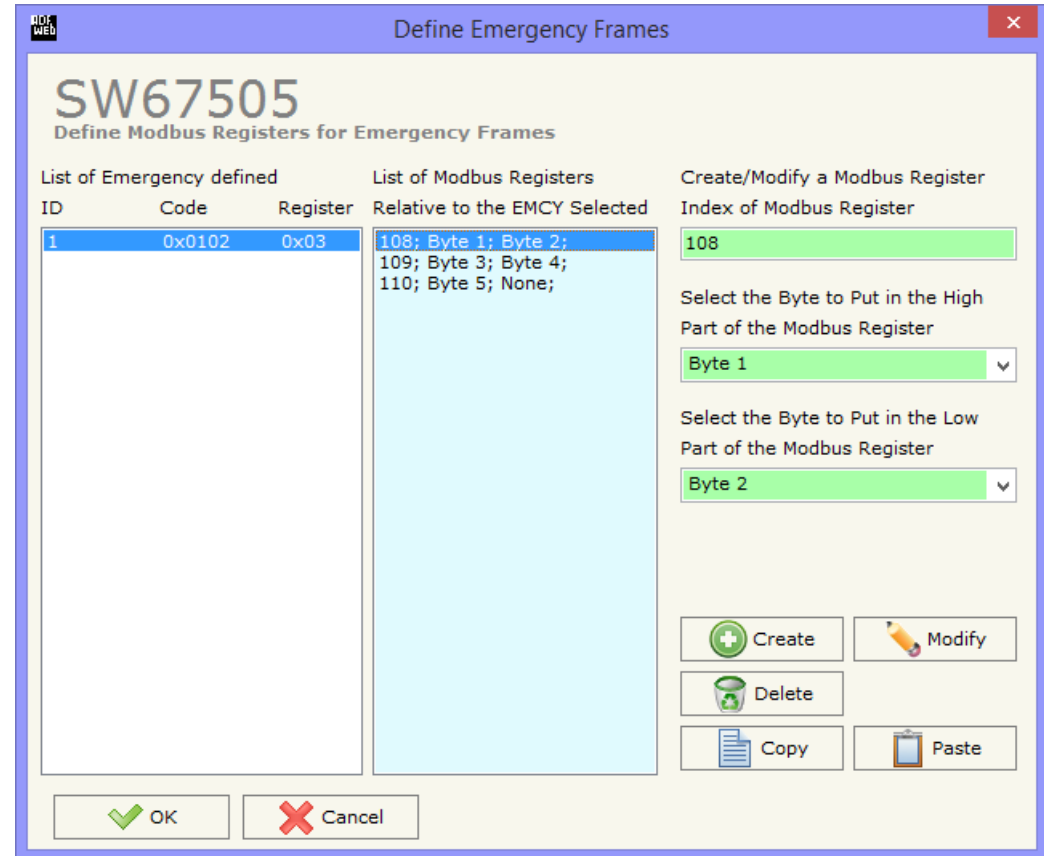


*Figure 9: "Define Modbus Registers for Emergency Frames" window*

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**SET RECEIVE PDO:**

By pressing the "**Receive COB**" button from the main window for SW67505 (Fig. 2) the window "Receive CAN Frames Definition" appears (Fig. 10). In this section, it is possible to define the PDO frames that the converter will receive from CANopen network.

If "Device till April 2014 (with Jumper)" is set in the section "Set Communication", the window appears like below:
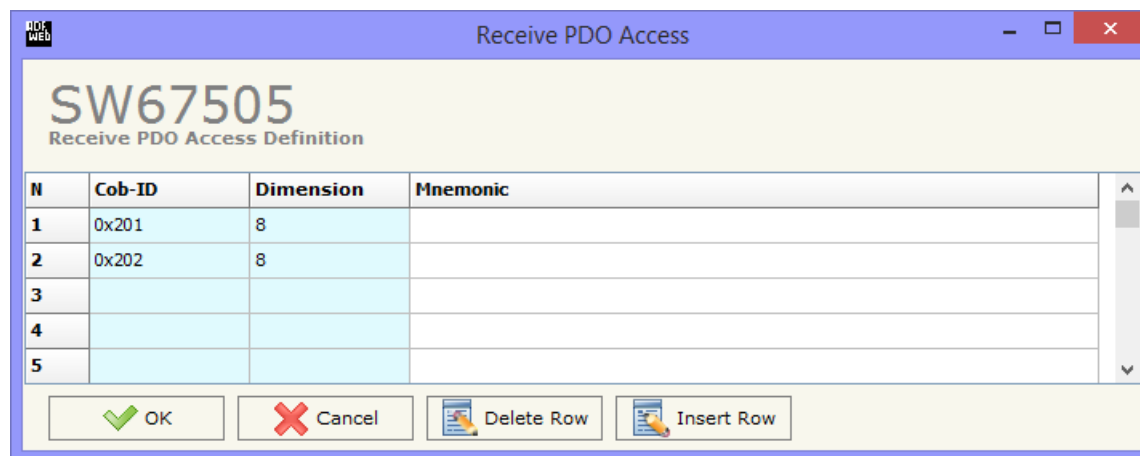


*Figure 10a: "Receive PDO Access Definition" window*

- In the field "**Cob-ID**", the Cob-ID of the PDO is defined;
- In the field "**Dimension**", the number of bytes of the PDO (the maximum dimension is 8 Bytes) is defined;
- In the field "**Mnemonic**", a description of the PDO is defined.

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If "Device from May 2014 (with Dip-Switches)" is set in the section "Set Communication", the window appears like below:



*Figure 10b: "Receive PDO Access Definition" window*

- In the field "**Cob-ID**", the Cob-ID of the PDO is defined;
- In the field "**Dimension**", the number of bytes of the PDO (the maximum dimension is 8 Bytes) is defined;
- If the field "**TimeOut**" the TimeOut is defined; after the TimeOut defined, the value of the data of the PDO become "0";
- In the field "**Mnemonic**" a description of the frame is defined.

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**DEFINE PDO:**

By pressing the "**Define PDO**" button near "Set Receive PDO" from the main window for SW67505 (Fig. 2) the window "Define Modbus Registers for PDO Frames" appears (Fig. 11):

+ In the field "**List of Receive CAN Frames**" there is the list of PDO frames that you inserted in "Set Receive PDO" Section
+ In the field "**List of Modbus Registers**" there are the Modbus words.
+ In the field "**Create/Modify a Modbus Register**" you can define the index of the Modbus register and the bytes of the PDO frame that you map in.

For example:

Click on the frame, insert the valid address in the field "Index of Modbus Register", select the byte position (Byte 1 in High Modbus byte and Byte 3 in Low Modbus byte), click the "Create" button, in the field "List of Modbus Registers" appears the new Modbus register created with the data that it contains.
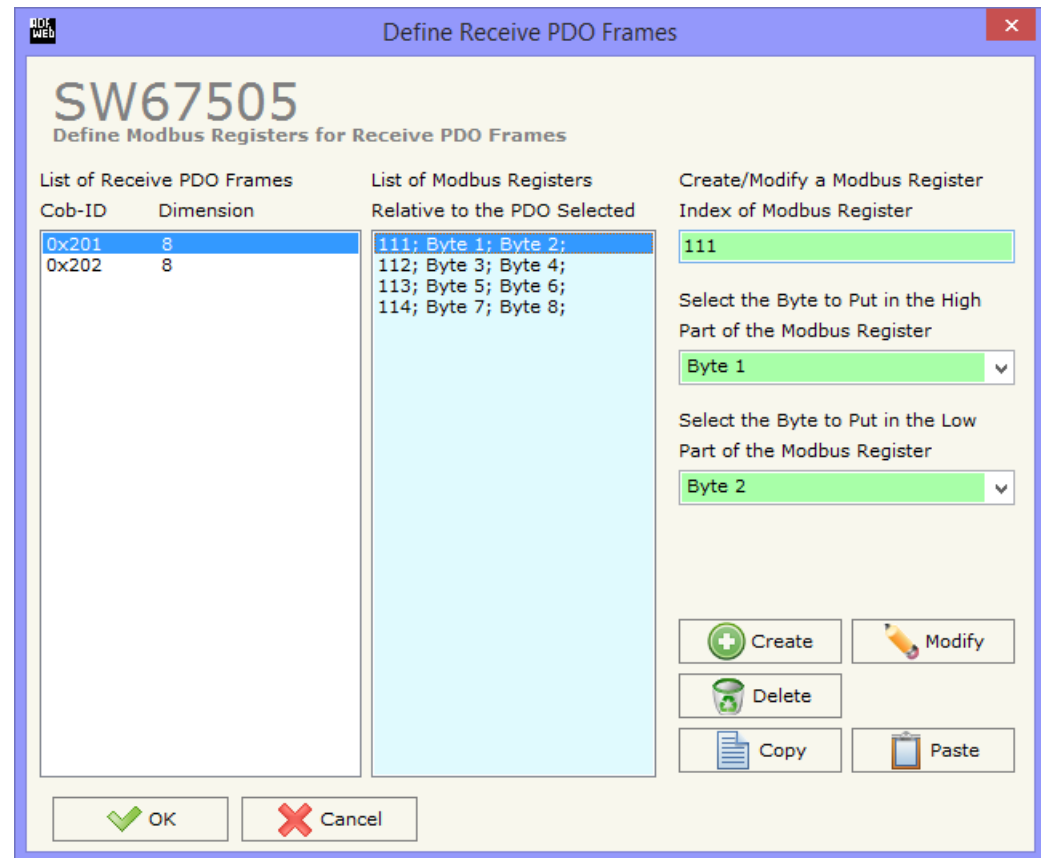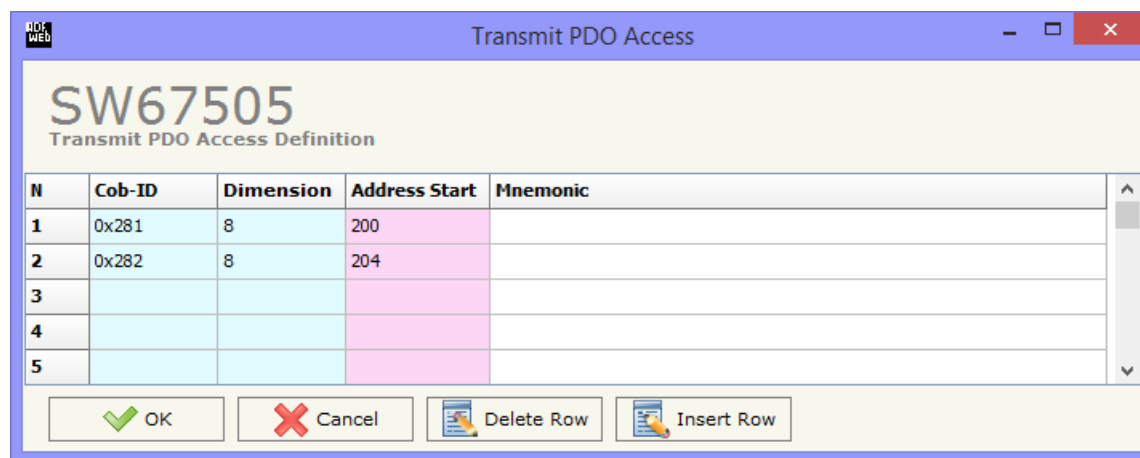


*Figure 11: "Define COB" window*

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**TRANSMIT COB:**

By pressing the "**Set Transmit COB**" button from the main window of SW67505 (Fig. 2) the window "Transmit CAN Frames Definition" appears (Fig. 12): in this section, it is possible to define the PDO frames that the converter will send to the CANopen network.

If "Device till April 2014 (with Jumper)" is set in the section "Set Communication", the window appears like below:



| N | Cob-ID | Dimension | Address Start | Mnemonic |
|---|--------|-----------|---------------|----------|
| 1 | 0x281 | 8 | 200 | |
| 2 | 0x282 | 8 | 204 | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |

*Figure 12a: "Transmit PDO Access Definition" window*

- In the field "**Cob-ID**", the Cob-ID of the PDO is defined;
- In the field "**Dimension**", the number of bytes of the PDO (the maximum dimension is 8 Bytes) is defined;
- In the field "**Address Start**", the starting Modbus register where the PDO will be saved is defined;
- In the field "**Mnemonic**" a description of the frame is defined.

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If "Device from May 2014 (with Dip-Switches)" is set in the section "Set Communication", the window appears like below:
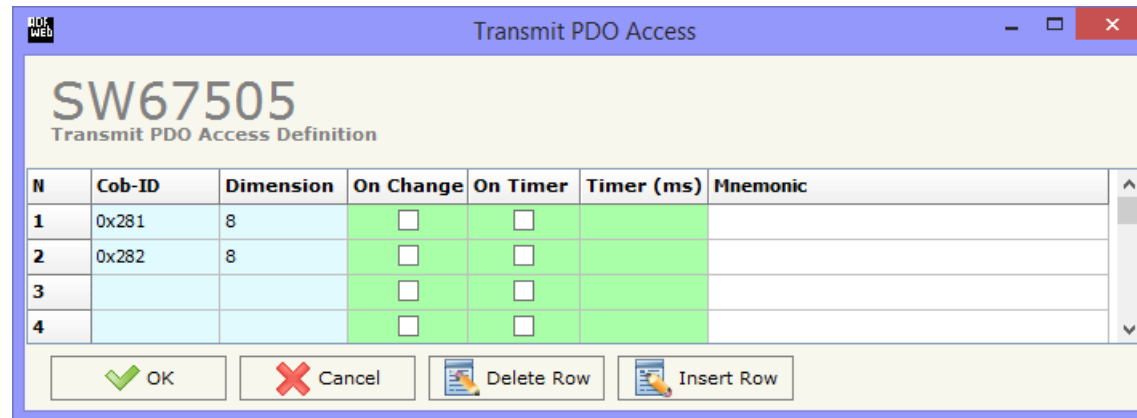


*Figure 12b: "Transmit PDO Access Definition" window*

- In the field "**Cob-ID**", the Cob-ID of the PDO is defined;
- In the field "**Dimension**", the number of bytes of the PDO (the maximum dimension is 8 Bytes) is defined;
- If the field "**On Change**" is checked the CAN frame is sent when the data written from Modbus TCP side changes;
- If the field "**On Timer**" is checked the CAN frame is sent cyclically;
- In the field "**Timer (ms)**" insert the cyclic delay;
- In the field "**Mnemonic**", the description for the frame is defined.

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**DEFINE PDO**

By pressing the "**Define COB**" button near "Set Transmit PDO" from the main window for SW67505 (Fig. 2) (present only if Device till April 2014 (with Jumper)" is set in the section "Set Communication") the window "Define Modbus Registers for Transmit PDO Frames" appears (Fig. 13):

+ In the field "**List of Transmit CAN Frames**" there is the list of PDO that you inserted in "Set Transmit PDO" section.
+ In the field "**List of Modbus Registers**" there are the Modbus words.
+ In the field "**Create/Modify a Modbus Register**" you can define the index of the Modbus register and the bytes of the PDO frame where you write it.
+ With the field "**Send PDO frame on Modbus Write**" it is possible to decide when to send the PDO frame. If a Modbus word has written "False "in this field, the PDO frame is not sent immediately but it is sent when another word that have this field "True" is written.

For example:

Click on the frame, insert the valid address in the field "Index of Modbus Register", select the byte position (Byte 1 in High Modbus byte and Byte 2 in Low Modbus byte), click the "Create" button, in the field "List of Modbus Registers" appears the new Modbus register created.
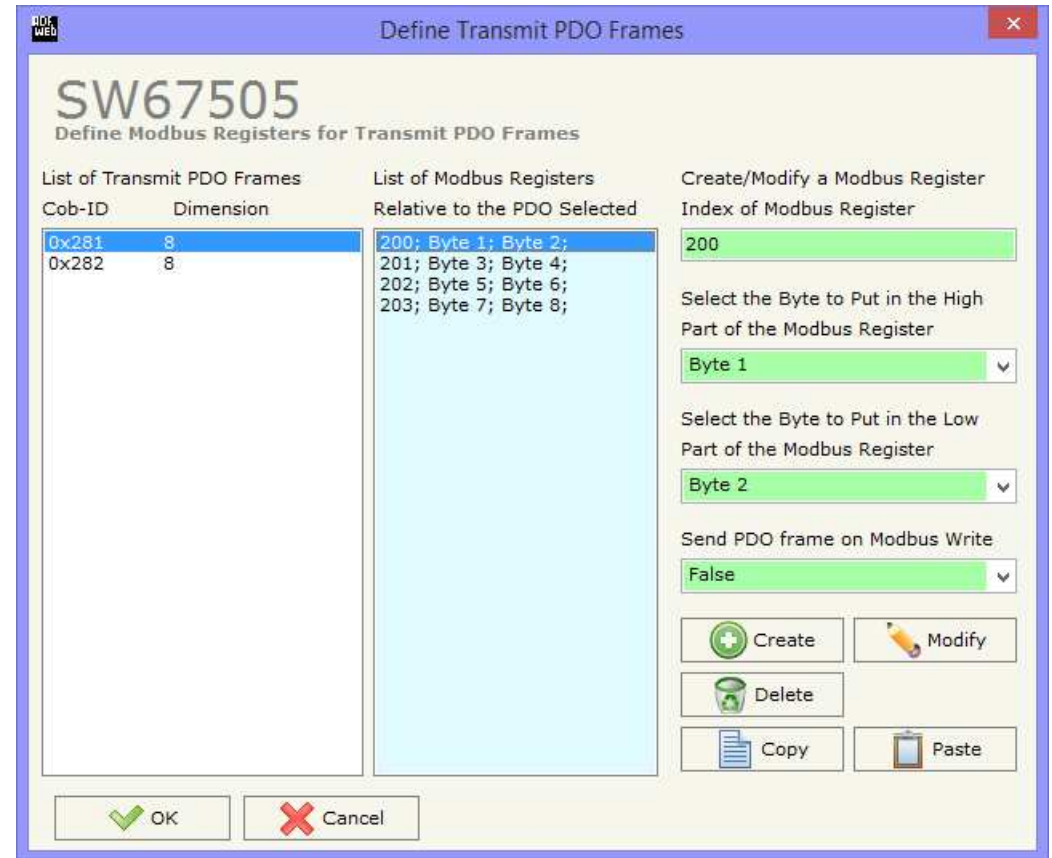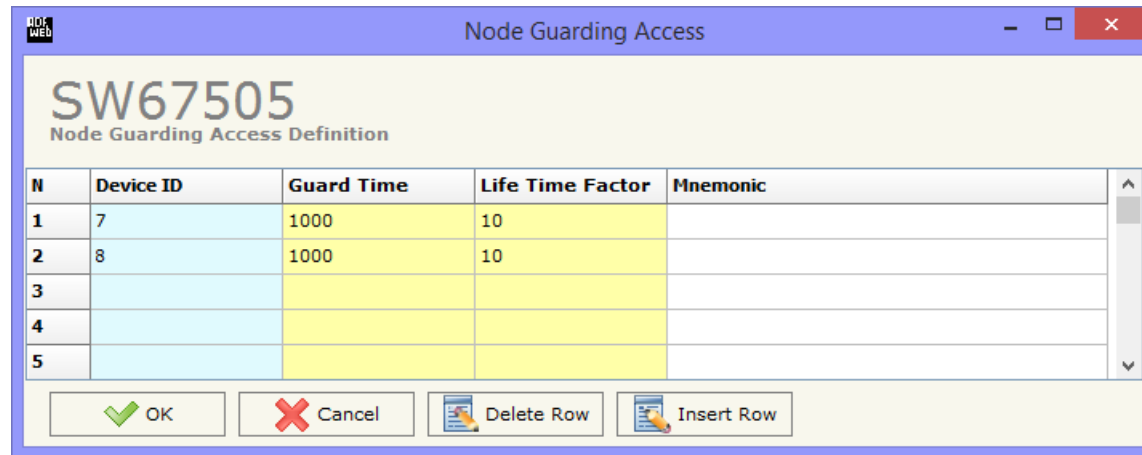


*Figure 13: "Define Modbus Registers for Transmit PDO Frames" window*

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**SET NODE GUARDING**



*Figure 14: "Node Guarding Access Definition" window*

By pressing the "**Set Node Guarding**" button from the Main Window of SW67505 (Fig. 2) the "Node Guarding Access Definition" window appears (Fig. 14).

- In the field "**Device ID**", the address of the device that you want to control is defined. It is possible to insert up to 32 address;
- In the field "**Guard Time**", the Guard Time is defined. This value indicates the delay between two interrogations;
- In the field "**Life Time Factor**", the number of attempts before considering the device absent is defined;
- In the field "**Mnemonic**", a description is defined.

**EDS FILE:**

By Pressing the "**EDS File**" button from the main window for SW67505 (Fig. 2) it is possible to generate the EDS file to be imported into the CANopen Client.

**UPDATE VIA SERIAL (only if "Device till April 2014 (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.

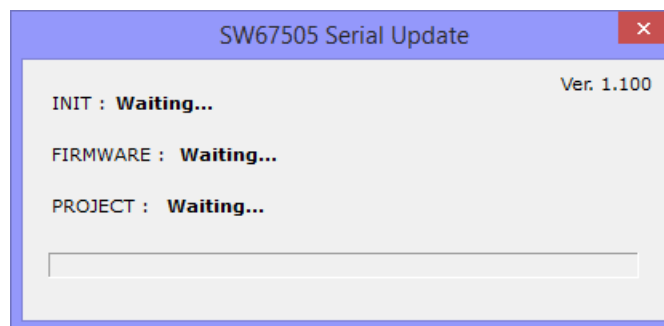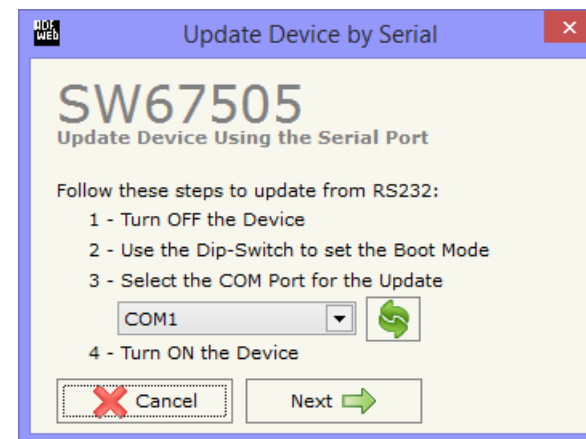At this point the configuration/firmware on the device is correctly updated.

*Figure 15a: "Update Device" windows*

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**UPDATE VIA UDP (only if "Device from May 2014 (with Dip-Switches)" 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.

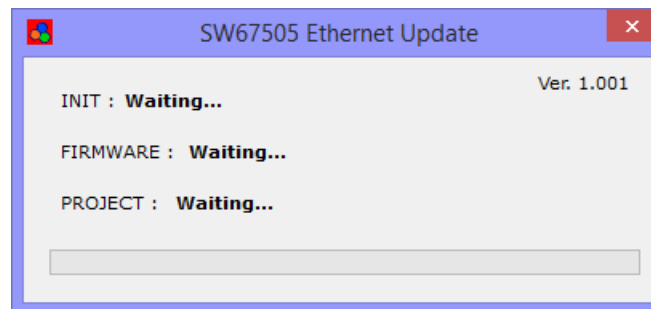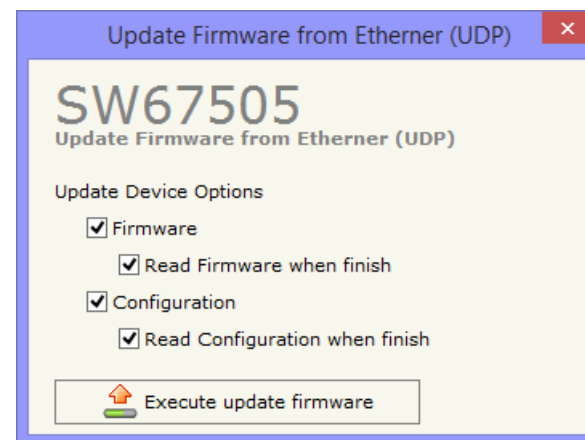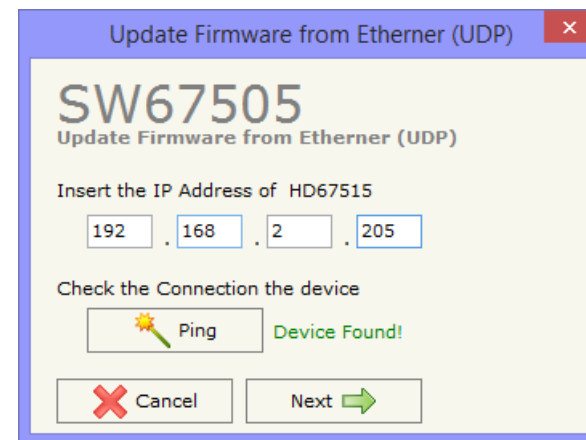At this point the configuration/firmware on the device is correctly updated.

*Figure 15b: "Update device" windows*

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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.

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 HD67505-A1 or HD67505-B2 device.

Note:
  When you receive the device, for the first time, you also have to update the Firmware in the HD67505-A1 or HD67505-B2 device.

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⚠ Warning:
　　If Fig. 67 appears when you try to do the Update try these points before seeking assistance:

- Check if the serial COM port selected is the correct one;
- Check if the serial cable is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a USB←→RS232 converter try with a native COM port or change the converter;
- 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 and 8 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 you have to launch the "Command Prompt" with Administrator Rights;
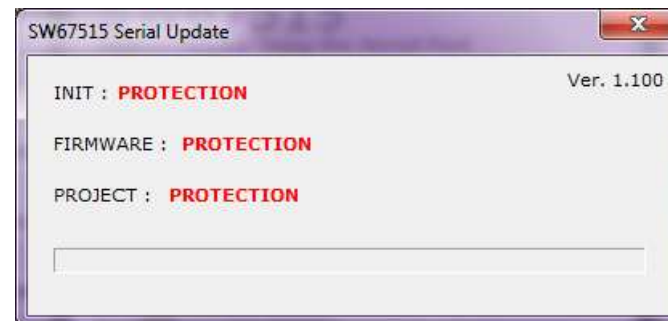- Take attention at Firewall lock.



*Figure 16: "Protection" window*

⚠ Warning:
　　In the case of HD67505-A1 or HD67505-B2 you have to use the software "SW67505":
www.adfweb.com\download\filefold\SW67505.zip.

✎ Note:
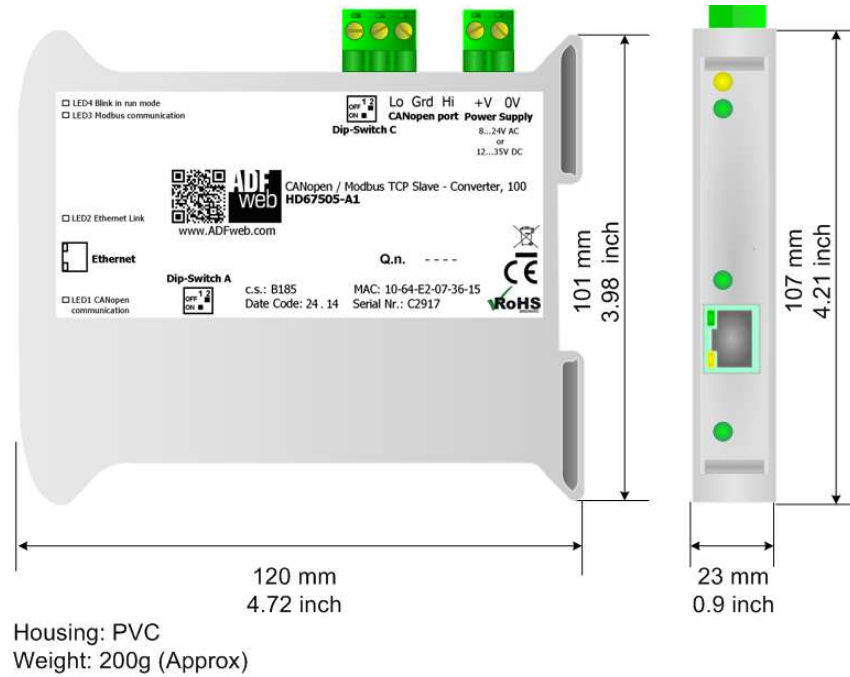　　The minimum version of the configuration software must be the 2.000.

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**MECHANICAL DIMENSIONS:**



*Figure 17a: Mechanical dimensions scheme for HD67505-A1*
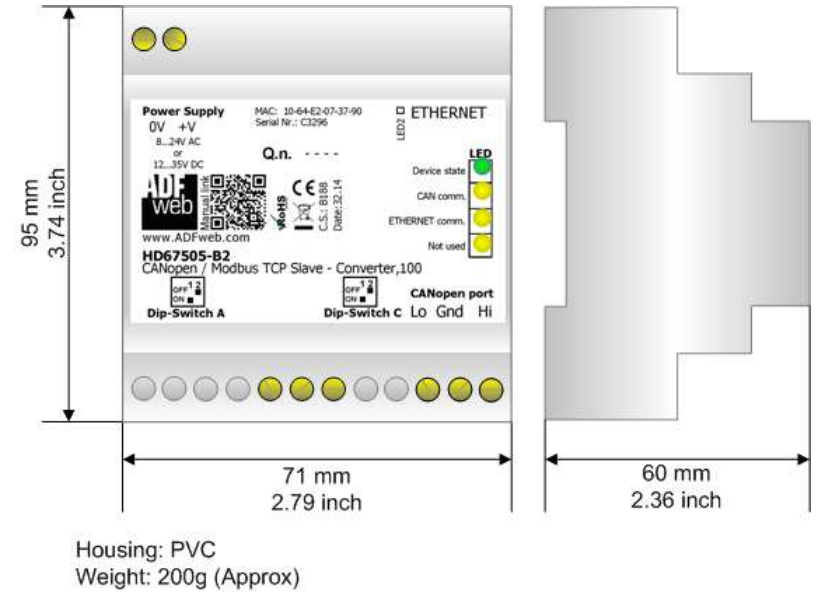


*Figure 17b: Mechanical dimensions scheme for HD67505-B2*

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**ORDERING INFORMATIONS:**

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

**HD67505 - x x**

**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

**Device Family**
HD67515: CANopen / Modbus TCP Slave - Converter
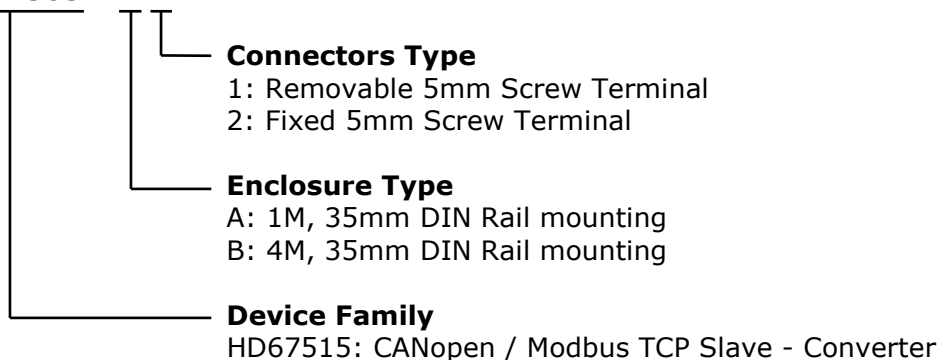
Order Code: **HD67505-A1**     -     CANopen / Modbus TCP Slave - Converter ( Housing type: A, Terminal Blocks Connectors )

Order Code: **HD67505-B2**     -     CANopen / Modbus TCP Slave - Converter ( Housing type: B, Terminal Blocks Connectors )

**ACCESSORIES:**

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

Order Code: **AC34114**     -     Null Modem Cable Fem/Fem D-sub 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

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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.