![ADFweb logo] **ADF web**

Industrial Electronic Devices

User Manual
Revision 1.000
English

CANopen / Ethernet – Converter

(Order Code: HD67423)

For Website information:
www.adfweb.com?Product=HD67423

For Price information:
www.adfweb.com?Price=HD67423

Benefits and Main Features:

⬥ Very easy to configure

⬥ Wide supply input range

⬥ Electrical isolation

⬥ Industrial temperature range:

⬥ -40°C / 105°C (-40°F / 221°F)

User Manual

For other Gateways / Bridges:
CAN from/to Modbus
See also the following links:

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

CANopen from/to Modbus
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=HD67505	(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
1.000	15/06/2017	Ff	All	First released version

WARNING:

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SECURITY ALERT:

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

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

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

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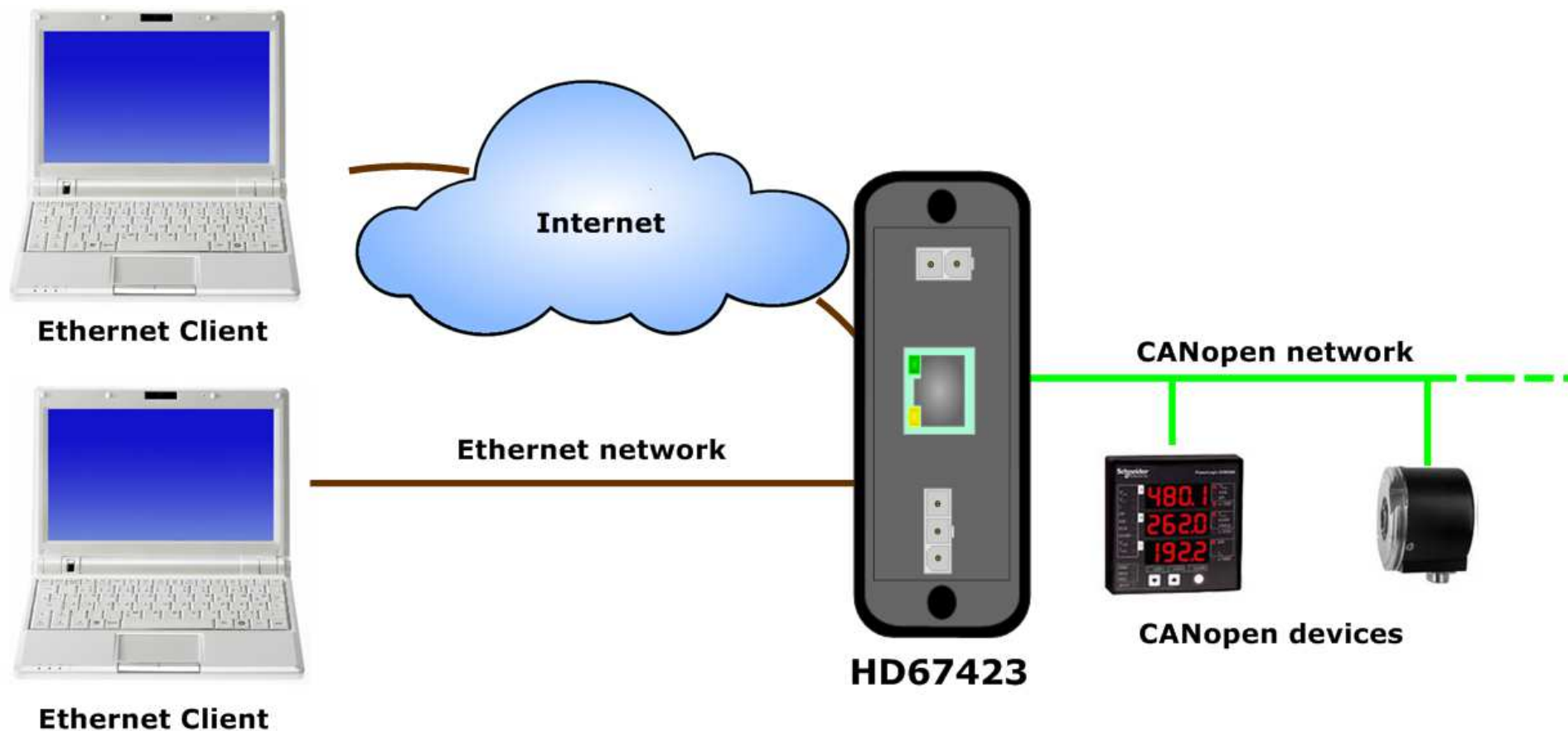
⚠ This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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

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EXAMPLE OF CONNECTION:

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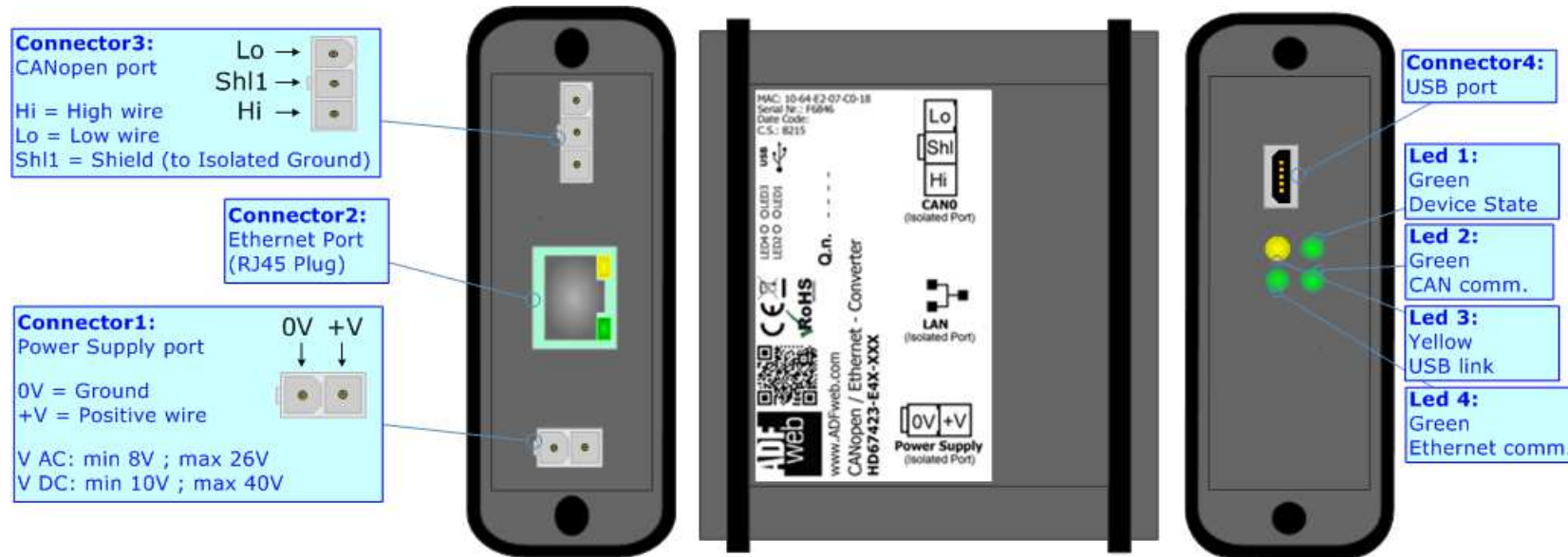
CONNECTION SCHEME:

Figure 1a: Connection scheme for HD67423-E4x-xx

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Connector3:
CANopen port

Hi = High wire
Lo = Low wire
Shl1 = Shield (to Isolated Ground)

Lo →
Shl1 →
Hi →

Connector2:
Ethernet Port

1 = TX -
2 = TX +
3 = RX +
4 = RX -

4 →
3 →
2 →
1 →

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

0V →
+V →

V AC: min 8V ; max 26V
V DC: min 10V ; max 40V

Connector4:
USB port

Led 1:
Green
Device State

Led 2:
Green
CAN comm.

Led 3:
Yellow
USB link

Led 4:
Green
Ethernet comm.

Figure 1b: Connection scheme for HD67423-E7x-xx

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CHARACTERISTICS:

The "**HD67423**" series are rugged devices used to interface CANopen devices with a Ethernet Client.

With his particular enclosure, equipped with four fixing lugs, makes available the mounting of the device in any plane surface (horizontal, vertical, oblique).

It is possible to have the device varnished or totally resined and also in both cases with "Mini-Fit®" connectors or "AMP SuperSeal 1.5" connectors. If is resined, the enclosure, like the "AMP SuperSeal 1.5" connectors, is waterproof.

The device have these characteristics:

- ✦ Triple 4kV isolation between Power Supply / Ethernet / CAN;
- ✦ Varnished / Resined (optionally);
- ✦ Wide power supply input range: 8…26V AC | 10…40V DC;
- ✦ Mini-Fit® / AMP SuperSeal 1.5 connectors;
- ✦ Metal enclosure with fixing lugs;
- ✦ Possibility to use Metal hose clamps for fixing it without using lugs;
- ✦ Microprocessor for data control;
- ✦ Wide temperature range: -40°C / 105°C (-40°F / 221°F).

CONFIGURATION:

You need Compositor SW67423 software on your PC in order to perform the following:

- ✦ Define the parameter of CANopen;
- ✦ Define the parameter of Ethernet;
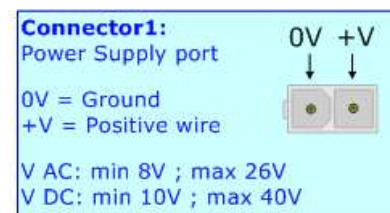- ✦ Define which and how the PDO of CANopen are accessible from Ethernet;
- ✦ Update the device.

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POWER SUPPLY:

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

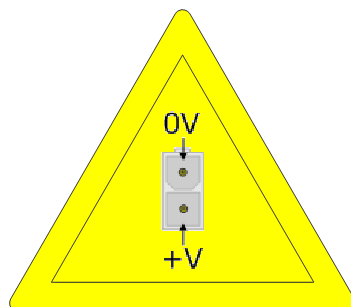|	VAC ∿		VDC ▬▬▬	
	Vmin	**Vmax**	**Vmin**	**Vmax**
HD67423-Exx-xx	**8V**	**26V**	**10V**	**40V**

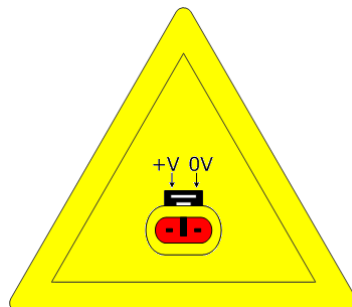Consumption at 24V DC:

Device	W/VA
HD67423-Exx-xx	4

⚠️ **Caution: Not reverse the polarity power**

HD67423-E4x-xx   HD67423-E7x-xx

Connector1:
Power Supply port   0V +V

0V = Ground
+V = Positive wire

V AC: min 8V ; max 26V
V DC: min 10V ; max 40V

Connector1:
Power Supply port

0V = Ground   0V→
+V = Positive wire   +V→

V AC: min 8V ; max 26V
V DC: min 10V ; max 40V

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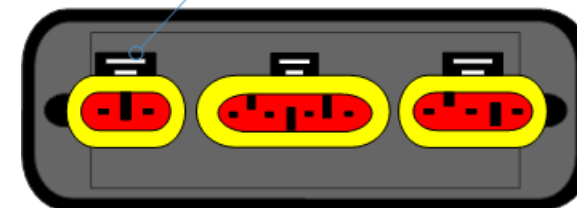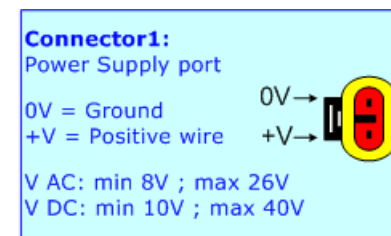
LEDS:

The device has got four 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)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: CAN communication (green)	Blinks when CANopen frames are received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: USB link (yellow)	**ON**: USB cable inserted **OFF**: USB cable not inserted	**ON**: USB cable inserted **OFF**: USB cable not inserted
4: Ethernet communication (green)	Blinks when a Ethernet request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

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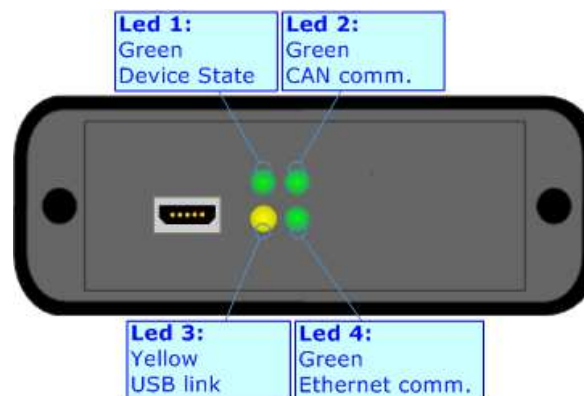
CAN:

The connection of the CANopen in the HD67423-E4x-xx device must be made with a 3way MiniFit Female connector. The pinout of Male MiniFit connector of the board is at right side of the page.

The connection of the CANopen in the HD67423-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.

The termination of CANopen line, with a 120Ω resistor, in the HD67423-Exx-xx is made internally of the device; when the order is performed. If the device have the CANopen terminated the code is the follow: HD67423-Exx-Yx; otherwise is this other: HD67423-Exx-Nx.

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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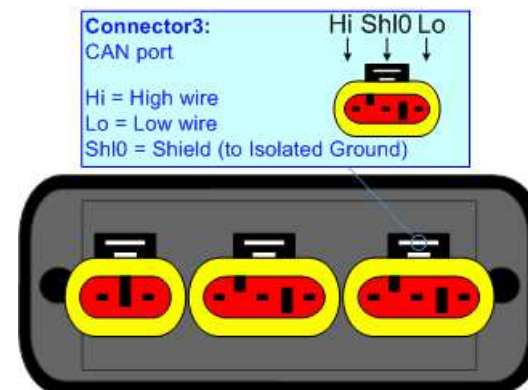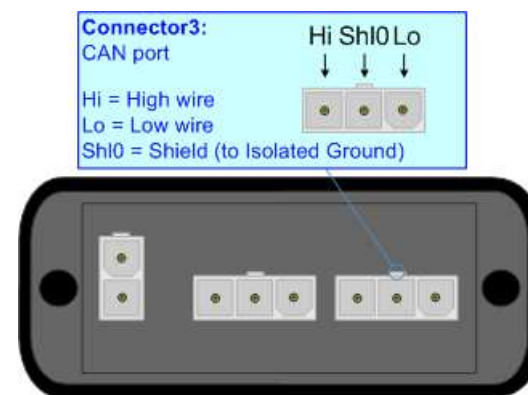
ETHERNET:

The connection of Ethernet in the HD67423 device must be made with at least a Category 5E cable. The maximum length of the cable should not exceed 100m. The cable has to conform to the T568 norms relative to connections in cat.5 up to 100 Mbps. To connect the device to an Hub/Switch is recommended the use of a straight cable, to connect the device to a PC/PLC/other is recommended the use of a cross cable.

The connection of Ethernet in the HD67423-E4x-xx device must be made with RJ45 connector.

The connection of the Ethernet in the HD67423-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.

Connector2:
Ethernet Port

1 = TX -
2 = TX +
3 = RX +
4 = RX -

4 →
3 →
2 →
1 →
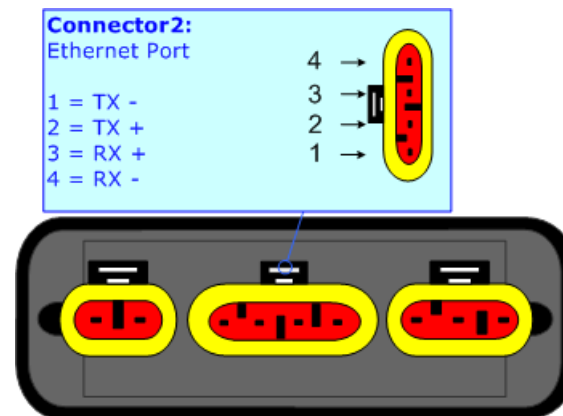
USB:

The USB port is used to start the converter in Boot Mode. It is necessary to use a Micro USB type B cable.

Connector4:
USB port

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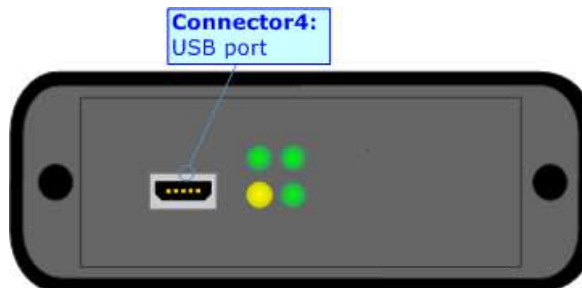
USE OF COMPOSITOR SW67423:

To configure the Converter, use the available software that runs with Windows called SW67423. 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 SW67423, the window below appears (Fig. 2).
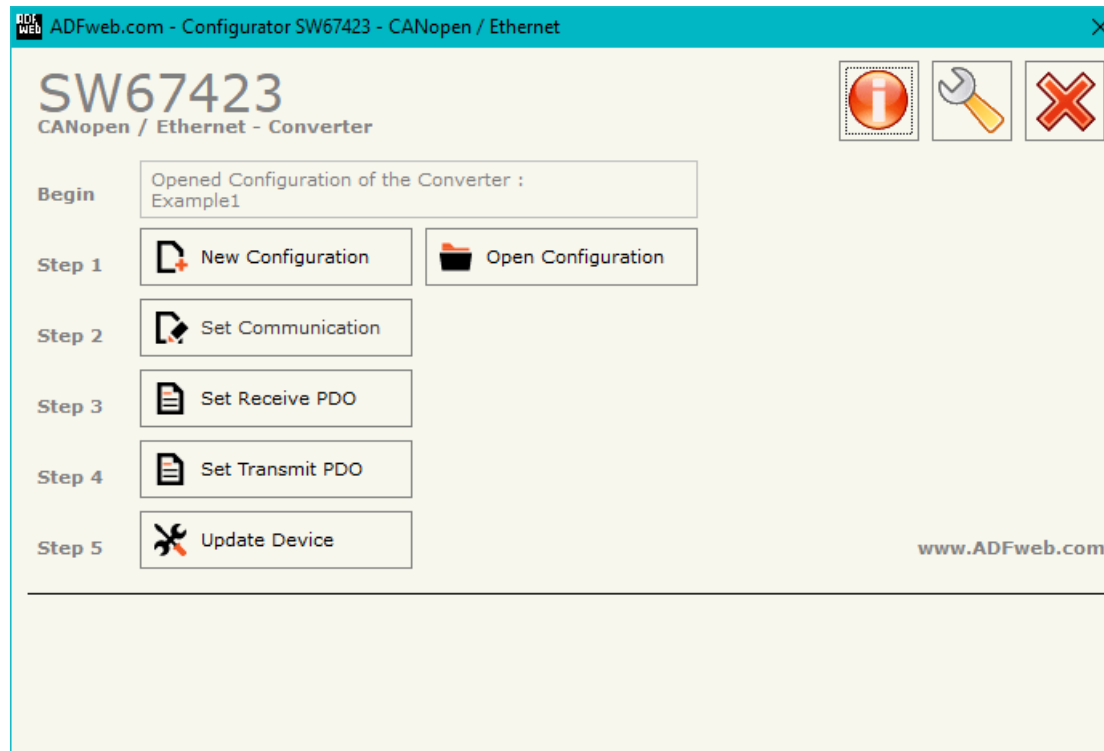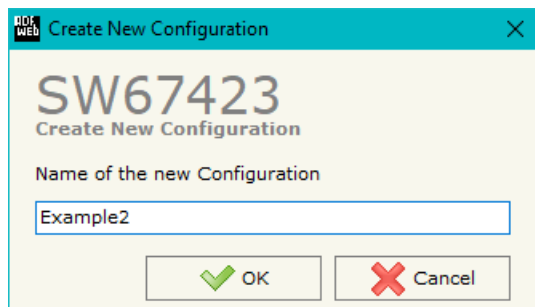
Note:
It is necessary to have installed .Net Framework 4.


Figure 2: Main window for SW67423

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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 / Ethernet - Converter" in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;

➔ To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button "**Open Configuration**".

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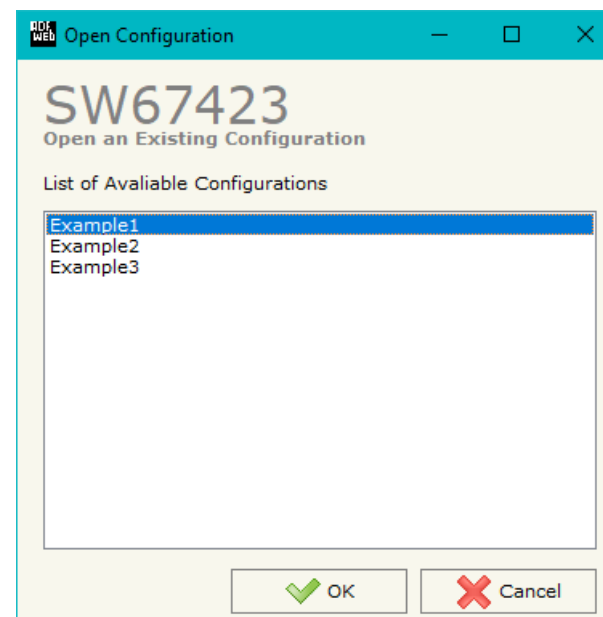
SOFTWARE OPTIONS:

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

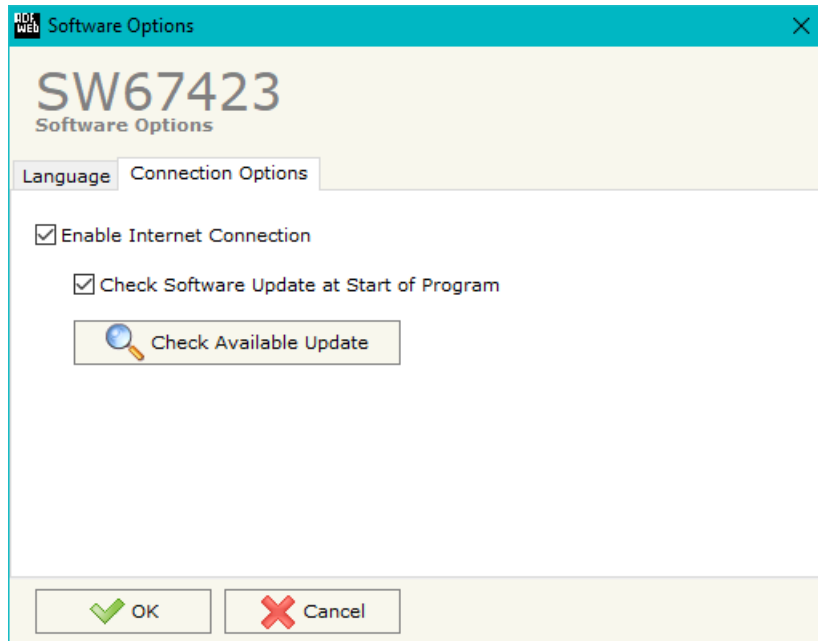In the section "Language" it is possible to change the language of the software.

In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67423 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 Ethernet.

By pressing the "**Set Communication**" button from the main window for SW67423 (Fig. 2) the window "Set communication" appears (Fig. 3).

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 data rate of the CANopen line 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.

The means for the fields for "Ethernet" are:

+ In the field "**IP Address**", the IP address of the Ethernet side of the converter is defined;
+ In the field "**SubNet Mask**" the SubNet Mask of the Ethernet side of the converter is defined;
+ In the field "**Gateway**", the default gateway of the network is defined. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net;
+ In the field "**Port**" the port used for Ethernet communication is defined;
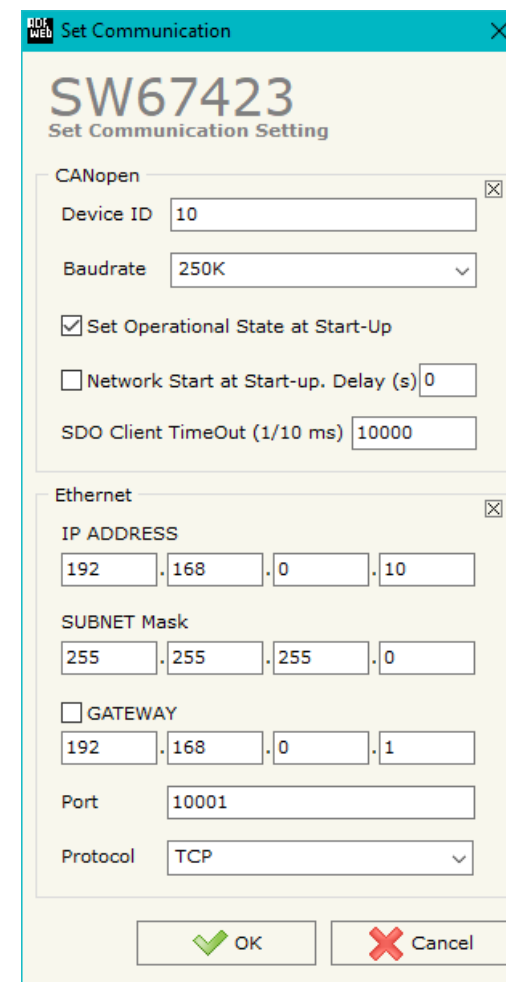+ In the field "**Protocol**" the protocol used is defined (TCP or UDP).

Figure 3: "Set Communication" window

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SET RECEIVE PDO:

By pressing the "**Set Receive PDO**" button from the main window for SW67423 (Fig. 2) the window "Receive PDO Access Definition" appears (Fig. 4). In this section, it is possible to define the PDO frames that the converter will receive from CANopen network.

The window appears like below:

Figure 4: "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, if the PDO is not received, the value of the data on Ethernet side becomes "0";
+ In the field "**Mnemonic**" a description of the PDO is defined.

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TRANSMIT COB:

By pressing the "**Set Transmit PDO**" button from the main window of SW67423 (Fig. 2) the window "Transmit PDO Access Definition" appears (Fig. 5): in this section, it is possible to define the PDO frames that the converter will send to the CANopen network.
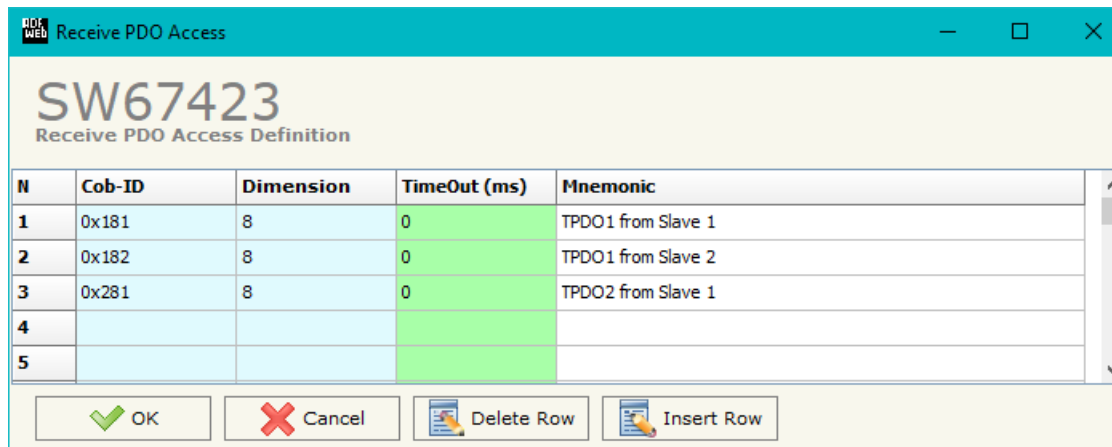
The window appears like below:
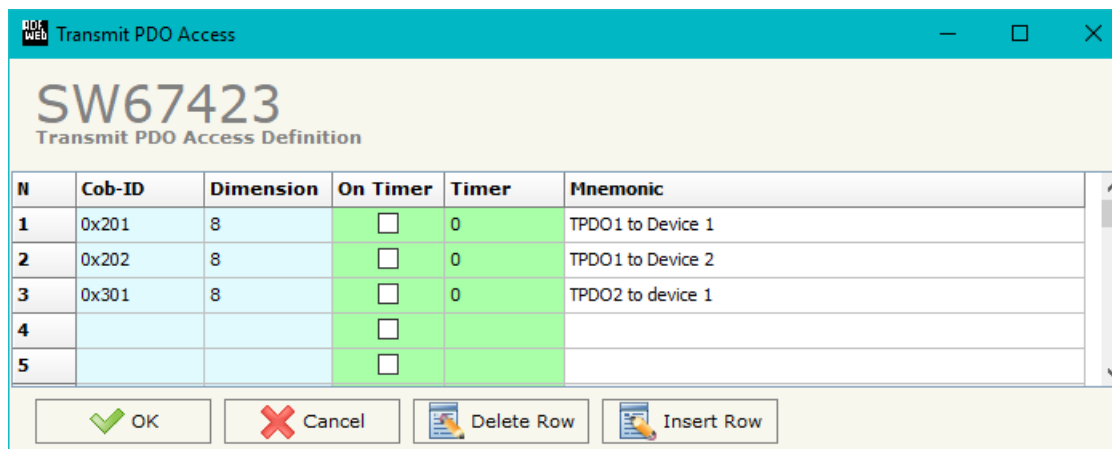
Figure 5: "Transmit PDO Access Definition" window

➢ 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 Timer**" is checked, the PDO is sent cyclically;
➢ In the field "**Timer (ms)**" the cyclic delay is defined;
➢ In the field "**Mnemonic**" the description for the PDO is defined.

Industrial Electronic Devices

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:

- Connect the USB cable;
- Connect the Ethernet cable;
- Turn ON the converter;
- 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", the updating is done;
- Remove the USB cable;

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.

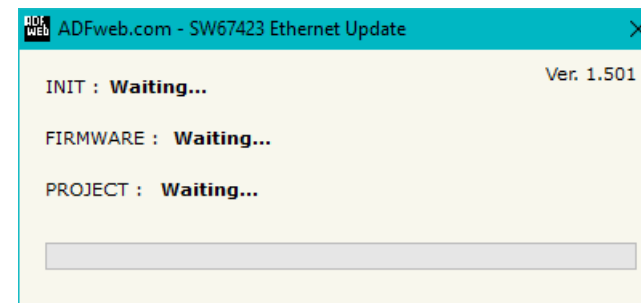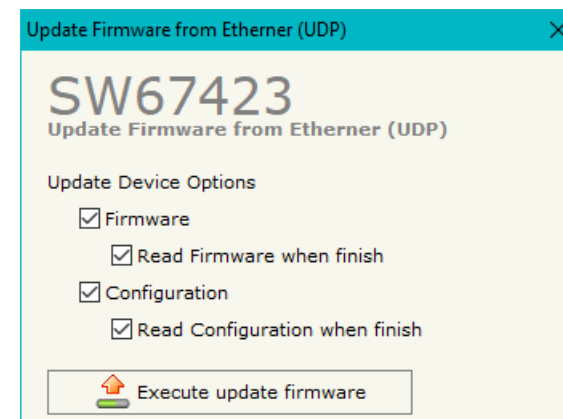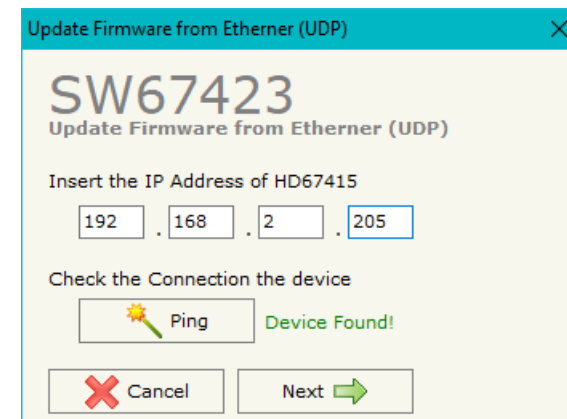At this point the configuration/firmware on the device is correctly updated.

Figure 6: "Update Device" windows

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Note:
When you install a new version of the software, if it is the first time it is better you do the update of the Firmware in the HD67423 device.

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67423 device.

Warning:
If Fig. 7 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8 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.
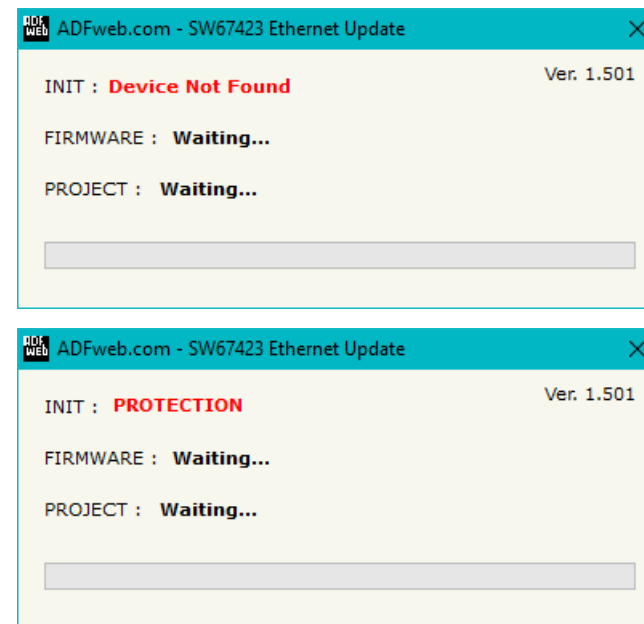
Figure 7: "Error" windows

In the case of HD67423 you have to use the software "SW67423": www.adfweb.com\download\filefold\SW67423.zip.

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ETHERNET PROTOCOL:

For the CANopen it is possible to use two types of data: SDO and PDO. It is possible to have no more than ten PDO, which must be declared in the "SW67423 Compositor" while SDO should not be reported.

Write Frames

PDO

The transmission of PDO is very simple: it has a fixed structure that consist in a maximum of eleven bytes:

Byte Number	Description
1	Write Identifier (0x02)
2	Type of Data (PDO=0x01)
3	Number of frame to send (number of row of "SW67423 compositor")
4÷n+3	Data

n=number of byte defined in the Compositor

The Byte that compose the respons is only one:

Byte Number	Description
1	Ok=0x01 / Error in sending=0x02

Example:

We want to write the frame number one of SW67423 Compositor:
- Type of Data: PDO; Number of frame to send: 1; Data: 0x01020304
So the string of hexadecimal numbers is:
REQ:[02][01][01][01][02][03][04]
RES:[01]

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SDO

The transmission of SDO is very simple: it has a fixed structure that consist in a maximum of eleven bytes.

Byte Number	Description
1	Write Identifier (Write=0x02)
2	Type of Data (SDO=0x02)
3	Address of CANopen device connect to the HD67423
4	Index SDO Hi
5	Index SDO Lo
6	SubIndex SDO
7	Number of byte of frame to send (n)
8÷n+7	Data

The Number of byte of frame to send (Byte 7) can have three values:
- 0x01: Send one byte;
- 0x02: Send two byte;
- 0x04: Send four byte.

The Byte that compose the respons are this:

Byte Number	Description
1	Ok=0x01 / Parameter Error=0x02 / Error in sending=0x03

Example:

We want to write:
- Address of CANopen device: 0x14; Type of Data: SDO; Index: 0x2000; SubIndex: 0x01; Number of byte of frame to send: 2; Data: 0x1122

So the string of hexadecimal numbers is:
REQ:[02][02][14][20][00][01][02][11][22]
RES:[01]

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Read Frames

PDO

The Bytes that compose the request are three:

Byte Number	Description
1	Read Identifier (Read=0x01)
2	Type of Data (PDO=0x01)
3	Number of frame to send (number of row of "SW67423 Compositor")

The Bytes that compose the respons are:

Byte Number	Description
1	Ok=0x01 / Parameter Error=0x02
2÷n+1	Data

n=number of byte declared in the Compositor for the selected frame

Example:

We want to read the first PDO configured in the "SW67423 Compositor". This PDO contains six bytes. So the string of hexadecimal numbers is:
REQ:[01][01][01]
RES:[01][11][22][33][44][55][66]

Industrial Electronic Devices

SDO

The Bytes that compose the request are seven:

Byte Number	Description
1	Read Identifier (Read=0x01)
2	Type of Data (SDO=0x02)
3	Address of CANopen device connect to the HD67423
4	Index SDO Hi
5	Index SDO Lo
6	SubIndex SDO
7	Number of byte of frame to read

The Byte that compose the respons is:

Byte Number	Description
1	Ok=0x01 / Parameter Error=0x02 / Error in sending=0x03
2÷n+1	Data

n=number of byte for the selected frame

Example:

We want to read:
- Address of CANopen device: 0x14; Type of Data: SDO; Index: 0x2000; SubIndex: 0x01; Number of byte: 4.
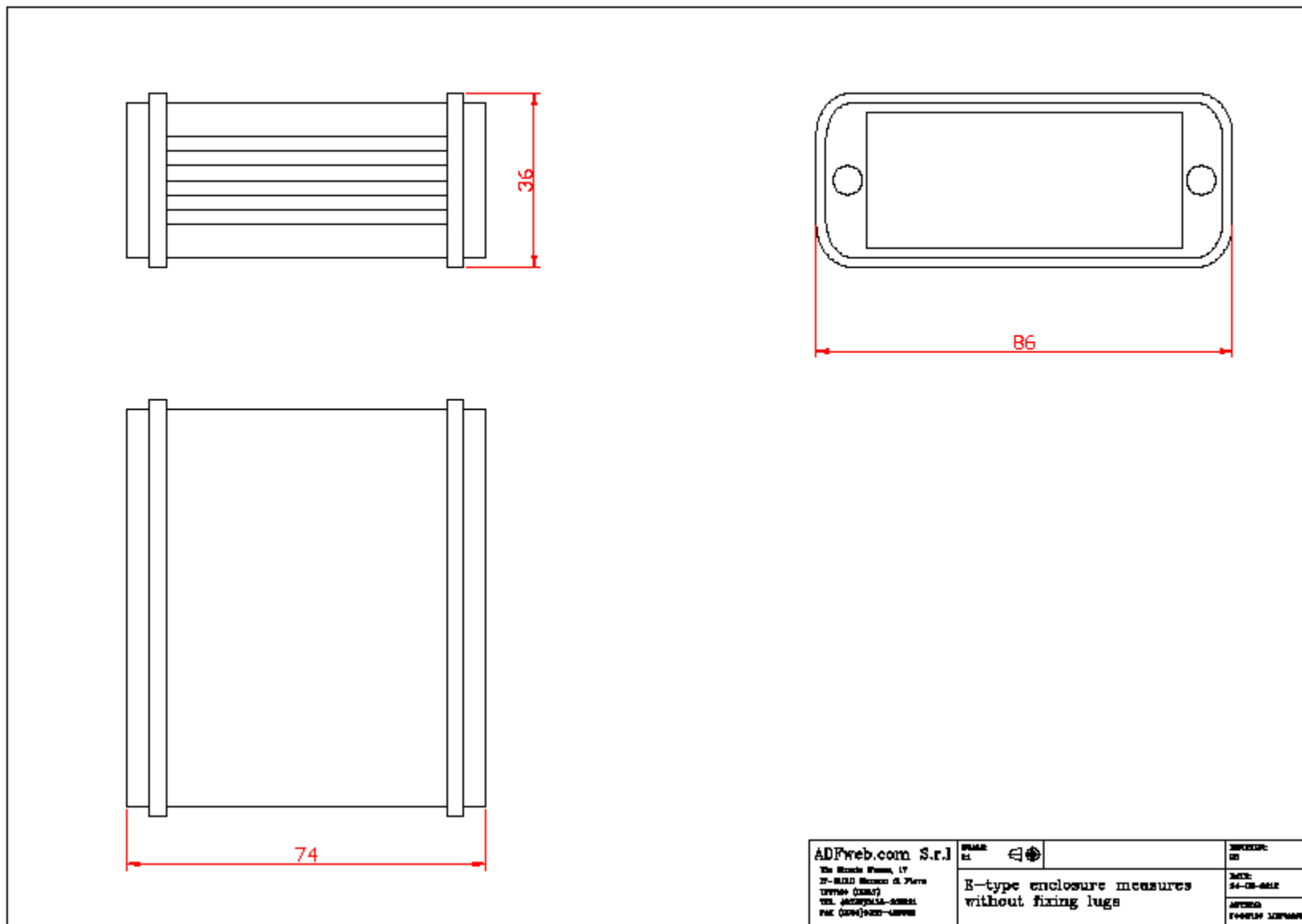
So receive the value 0x1A2B3C4D.
The string of hexadecimal numbers is:
REQ:[01][02][14][20][00][01][04]
RES:[01][1A][2B][3C][4D]

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MECHANICAL DIMENSIONS:

E-type enclosure measures without fixing lugs

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40

74

51,5

92

105

B6

Type A

ADFweb.com S.r.l

E-type enclosure measures
with fixing lugs Type A

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Type B

ADFweb.com S.r.l	SCALE: 1:1			REVISION: 03
Via Strada Favero, 17 IT-31010 Mareno di Piave TVPV60 (ITALY) TEL. (0039)0438-30931 FAX (0039)0438-492099		E-type enclosure measures with fixing lugs Type B		DATE: 24-08-2012
				AUTHOR: Pozzobon Alessandro

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40

112,5

95

92

105

Type C

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E-type enclosure measures
with fixing lugs Type C

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ORDERING INFORMATIONS:

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

HD67423 – E y z – s f

Fixing lugs
A: Type A
B: Type B
C: Type C
D: without fixing lugs

CANopen Termination
Y: Terminated with 120Ω
N: Not terminated

Varnished/Resinated
V: Varnished
R: Resined

Connectors Type
4: MiniFit
7: SuperSeal 1.5

Enclosure Type
E: Metal enclosure

Device Family
HD67423 = CANopen / Ethernet - Converter

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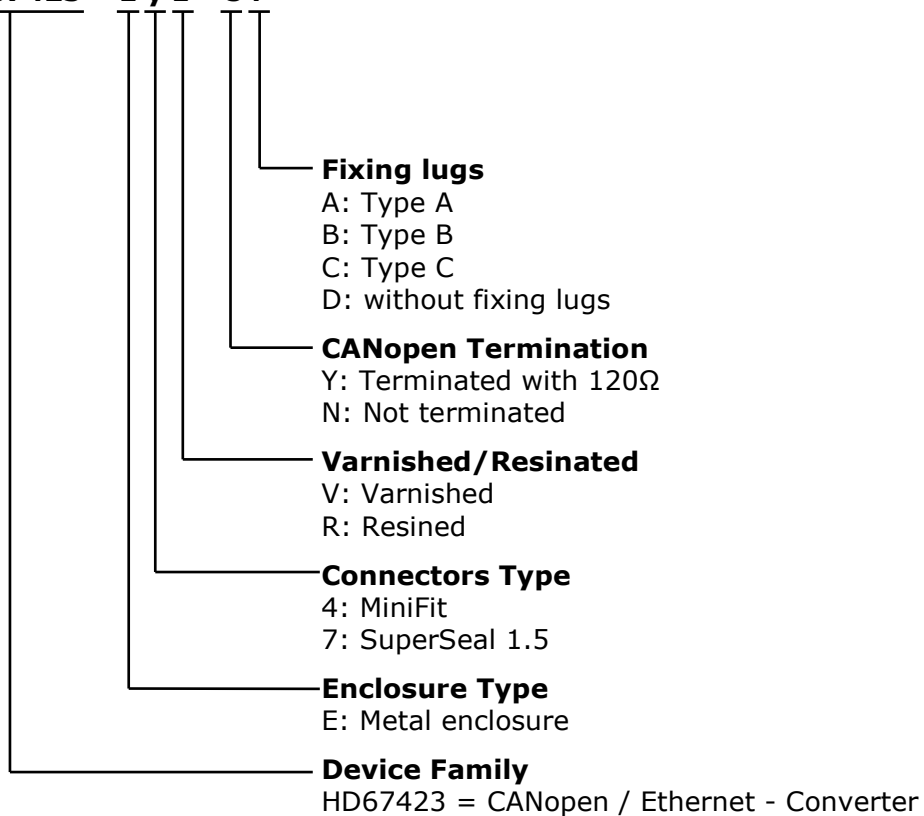
ACCESSORIES:

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

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

Order Code: **AC67402**   -   Cable Super Seal 1.5 MALE 2-pole - 1.0 Meter

Order Code: **AC67402-3** -   Cable Super Seal 1.5 MALE 2-pole - 3.0 Meters

Order Code: **AC67403**   -   Cable Super Seal 1.5 MALE 3-pole - 1.0 Meter

Order Code: **AC67403-3** -   Cable Super Seal 1.5 MALE 3-pole - 3.0 Meters

Order Code: **AC67404**   -   Cable Super Seal 1.5 MALE 4-pole - 1.0 Meter

Order Code: **AC67404-3** -   Cable Super Seal 1.5 MALE 4-pole - 3.0 Meters

Order Code: **AC67410**   -   Accessory Automotive Devices - Support for rail DIN

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DISCLAIMER:

All technical content within this document can be modified without notice. The content of the document is a under continual renewal.
For losses due to fire, earthquake, third party access or other accidents, or intentional or accidental abuse, misuse, or use under abnormal conditions repairs are charged to the user. ADFweb.com S.r.l. will not be liable for accidental loss of use or inability to use this product, such as loss of business income. ADFweb.com S.r.l. shall not be liable for consequences of improper use.

OTHER REGULATIONS AND STANDARDS:

WEEE INFORMATION

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

This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and impact of human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

CE MARKING

The product conforms with the essential requirements of the applicable EC directives.

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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.