Industrial Electronic Devices

User Manual

Revision 2.101
English

CAN / Modbus Master - Converter

(Order Code: HD67011)

for Website information:
www.adfweb.com?Product=HD67011
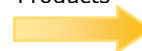
for Price information:
www.adfweb.com?Price=HD67011

Benefits and Main Features:

► Very easy to configure

► Low cost

► Rail mountable

► Wide supply input range

► Galvanic isolation

► Industrial temperature range:
-40°C / 85°C (-40°F / 185°F)

HD67011

Similiar Products

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

www.adfweb.com?product=HD67012	(Modbus RTU Slave)
www.adfweb.com?product=HD67014	(Modbus TCP Master)
www.adfweb.com?product=HD67515	(Modbus TCP Slave)

CANopen 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=HD67004	(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

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

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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.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.002	26/06/2007	Av	All	Revision
2.000	10/06/2007	Av	All	New document format
2.001	08/10/2008	Fl	All	Change figure 1
2.002	24/10/2009	Ml	All	Revision
2.003	27/10/2010	Dp	All	Revision
2.100	14/09/2012	Dp	All	Revision
2.101	04/04/2013	Nt	All	Added new chapters

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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 support@adfweb.com or give us a call if you need it.

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CHARACTERISTICS:

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

➢ two-directional information between networks CAN bus and ModBUS;
➢ electrical isolation between two BUSes;
➢ to read ModBUS word from CAN frame;
➢ to write ModBUS word from CAN frame;
➢ Temperature range -40°C to 85°C.

To configure the Converter use the available software that runs with Windows, called SW67011. It is downloadable on the site www.adfweb.com and its operation is described in this document.
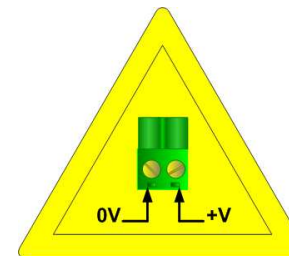
The Converter can be configured up to a maximum 1000 CAN bus frame in reading and 1000 CAN bus frame in writing.

POWER SUPPLY:

Recommended Power Supply	
VDC	VAC
24v	12v

VDC		VAC	
Vmin	Vmax	Vmin	Vmax
10v	35v	10v	19v

Caution: Not reverse the polarity power .

0V   +V

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CONNECTION SCHEME:

Jumper1:
Termination CANopen Line

= Open   = 120 ohm

Connector2:
CAN

H1 = High wire
Shl1 = Shield (to Ground)
L1 = Low wire

Jumper2:
Termination Modbus Line

= Open   = 220 ohm

Connector1:
Power Supply

0V = Ground
+V = Positive wire

12 VAC (min 10v ; max 19v) – 4 VA
24 VDC (min 10v ; max 35v) – 4 Watt

Connector3:
Modbus RTU on RS485
(Isolated)

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

Led3:
Green
Not used

Port RS232 (D-SUB9-Male)

PIN2 = RX
PIN3 = TX
PIN5 = GND

Used for:
A) Programmation Port
B) Modbus on RS232

To connect the device to the COM port
of a PC in order to set it.
You have to use the programming cable
AC34107.

Or a cable made as showed here:

Rail DIN
Clamp

CABLE
Side A
FEM

CABLE
Side B
FEM

Led1:
Yellow
Boot Mode:
Blink quickly;

Led2:
Green
RUN

Jumper3:
Boot mode

= Yes Jumper
Boot Mode

= No Jumper
Normal Mode

Figure 1: Connection scheme for HD67011

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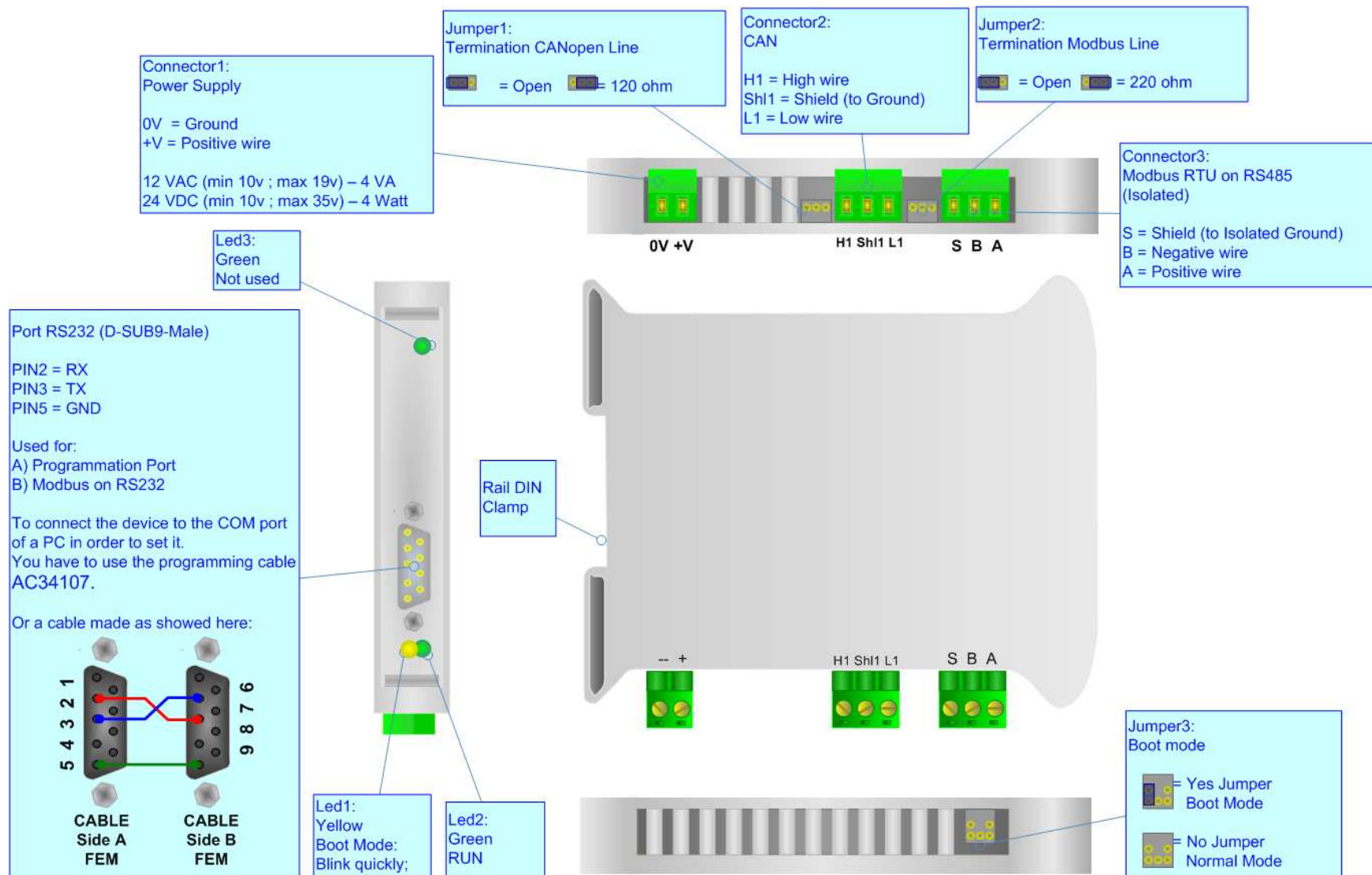
CONFIGURATION:

The "CAN / Modbus Master – Converter" allows a CANbus network to communicate with a Modbus network.

You need Compositor SW67011 software on your PC in order to perform the following:

➢ Define which Modbus Registers are reading from CANbus frame;
➢ Define which Modbus Registers are writing from CANbus frame.

USE OF COMPOSITOR SW67011:

When launching the SW67011 the right window appears
(The SW67011 is downloadable on the site
http://www.adfweb.com/home/download/download.asp
This manual is referenced to the last version of the software present on our web site).
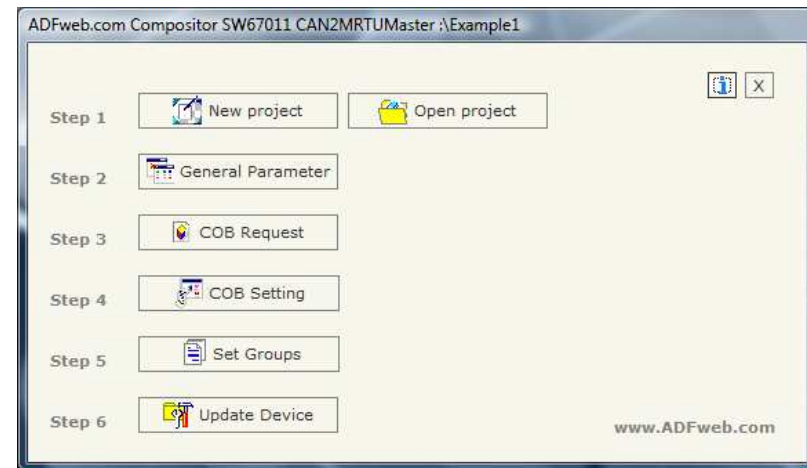
Figure 2: Main window for SW67011

The following explains the function of the buttons:

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NEW PROJECT / OPEN PROJECT:

The "New Project" button creates the folder which contains the entire device configuration.
A device configuration can also be imported and exported:

➢ To clone the configurations of a "CAN / Modbus 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 Project".

When a new project is created or an existent project is open, it will be possible to access the varius configuration sections of the software:

➢ **"General parameter"**
➢ **"COB Request"**
➢ **"COB Setting"**

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GENERAL PARAMETER:

This section defines the fundamental communication parameters of two buses, CAN bus and Modbus.

By pressing the "General Parameter" button from the main window for SW67011 (Fig.2) the window "General Parameter" appears (Fig.3):

 ➢ In the field "Baud Rate", the velocity of the two buses is defined;
 ➢ Select the type of CAN bus (CAN Bus 2.0A or CAN Bus 2.0B);
 ➢ In the field "Select Serial", the port (RS232 or RS485) to use with Modbus is selected;
 ➢ In the field "Parity" the serial parity is defined;
 ➢ "TimeOut" is the maximum time that the device attends for the answer from the Slave interrogated.
 ➢ In the field "Cyclic Delay" insert a time that pass between two Modbus request.
 ➢ Selecting the "Read on request" the request in Modbus network will be do only when arrive a request for the CAN bus, otherwise selecting "Read Cyclic" the request will be do in cyclic way.
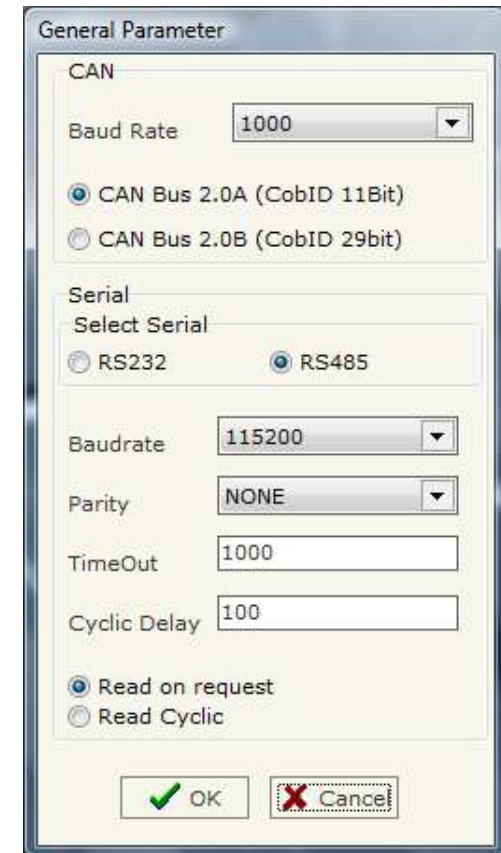

Figure 3: "General Parameter" window

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COB REQUEST:

By pressing the "COB Request" button from the main window for SW67011 (Fig.2) the window "Request" appears (Fig.4).

N°	COB	Address Device	Regiater Address	Type	N° Register	Group	Mnemonic
1	$0011	1	100	Holding Register	4	On Request	1
2	$0014	2	110	Holding Register	2	On Request	4
3							
4							
5							

Figure 4: "Request" window

The COB inserted in this table are the data read from the modbus.

> - In the field "COB" insert the COB of the CANbus frame;
> - In the field "Address Device" insert the address of Modbus device that contains the Modbus data;
> - In the field "Register Address" insert the Modbus word that contains the Modbus data;
> - In the field "Type" insert the data type of Modbus Register you like to read:
>   o   Coil status
>   o   Input status
>   o   Holding register
>   o   Input register
> - In the field "N° Register" insert the number of consecutive registers you configured;
> - In the field "Groups" select or On request or one of ten Groups for the Cyclic request;
> - In the field "Mnemonic" you can insert a brief description.

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For example:

If we want to read 4 Holding Registers at address 100 (Fig. 4) we must send a CAN bus frame with COB ID= $0011 and without data (Fig. 5-1).
As an answer we should have a CAN bus frame with COB ID=$0011 and 8 bytes of data. They are the value of the Modbus registers (Fig. 5-2).

If you are using a CAN Analyzer , you can see the windows on the right:
(for example you can see our CAN Analyzer at the following address:
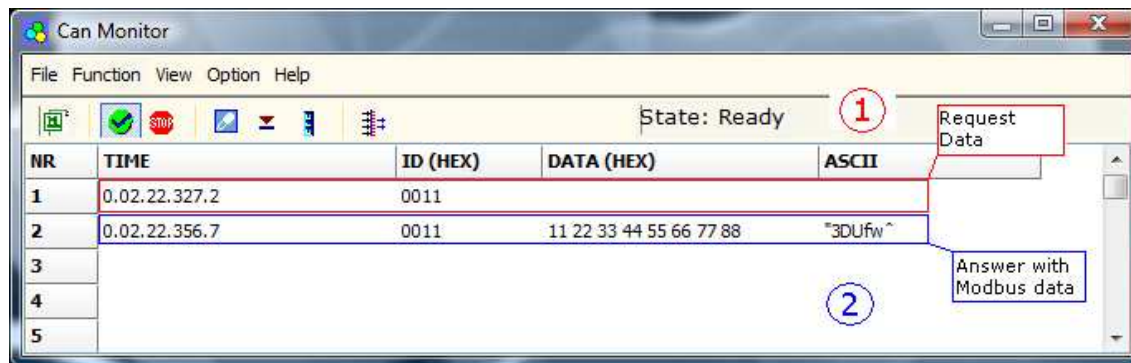http://www.adfweb.com/home/products/CAN_BUS_analyzers.asp)

Figure 5: "Can Monitor" window for visualize the CAN frame for read request 1
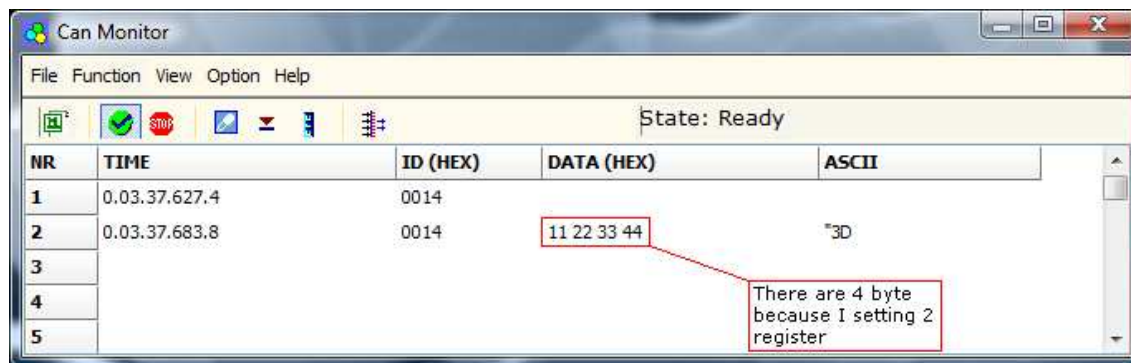
In the second case of the table:

Figure 6: "Can Monitor" window for visualize the CAN frame for read request 2

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COB SETTING:

By pressing the "COB Setting" button from the main window for SW67011 (Fig.2) the window "Request" appears (Fig.7).

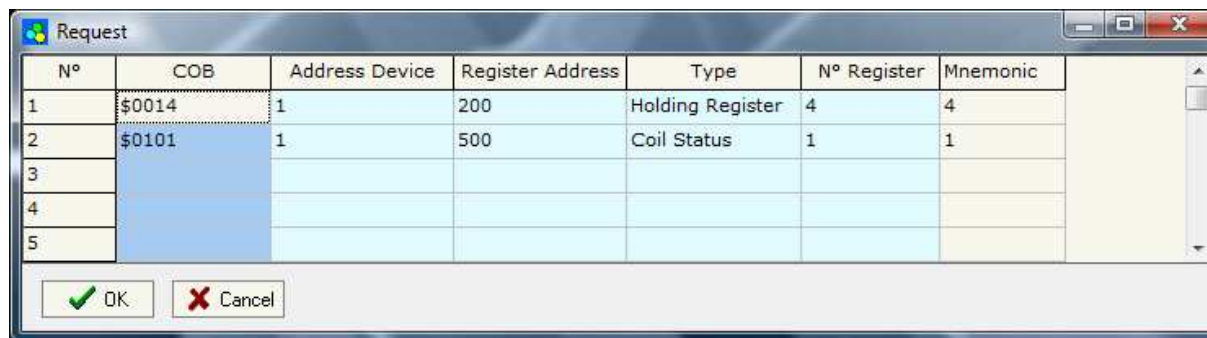| N°	COB	Address Device	Register Address	Type	N° Register	Mnemonic
1	$0014	1	200	Holding Register	4	4
2	$0101	1	500	Coil Status	1	1
3						
4						
5						

✔ OK   ✘ Cancel

Figure 7: "Setting" window

The COB inserted in this table are the data write from the modbus.

> ➢ In the field "COB" insert the COB of the CANbus frame;
> ➢ In the field "Address Device" insert the address of Modbus device that contains the Modbus data;
> ➢ In the field "Register Address" insert the Modbus word that contains the Modbus data;
> ➢ In the field "Type" insert the data type of Modbus Register you like to read:
>   o Coil status
>   o Holding register
> ➢ In the field "N° Register" insert the number of consecutive registers you configured;
> ➢ In the field "Mnemonic" you can insert a brief description.

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For example:

If we want to write the 4 Holding Register at address 200 (Fig. 7) we must send a CANbus frame with COB ID=$0014 and 8 byte of data (Fig. 8-1); they are the values of the registers Modbus that they want to set.

If the Modbus write command is correctly received, into CAN bus you found the echo of the frame transmitted (Fig. 8-2).

If you are using a CAN Analyzer, you can see the windows on the right.
(for example you can see our CAN Analyzer
at the following address:
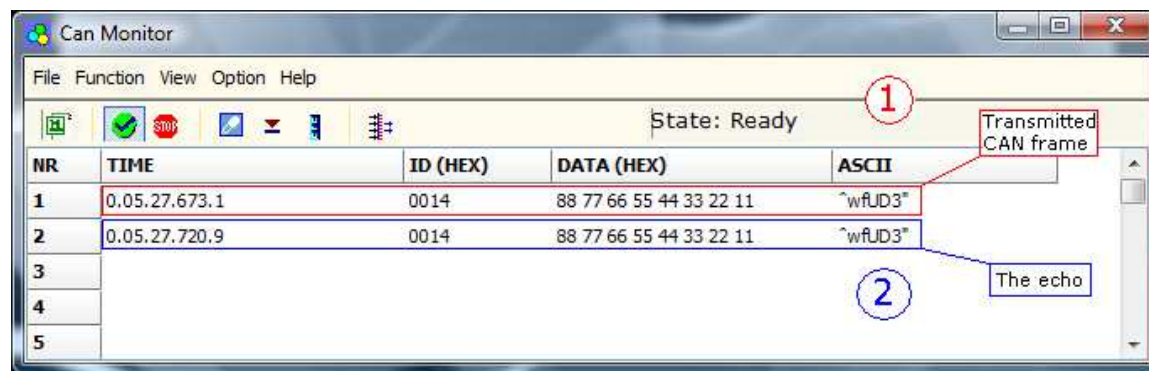http://www.adfweb.com/home/products/CAN_BUS_analyzers.asp)

Figure 8: "Can Monitor" window for visualize the CAN frame for write request

SET GROUPS:

By pressing the "Set Groups" button from the main window for SW67011 (Fig.2) the window "Groups Setting" appears (Fig.9).

The Groups are used for the Cyclic Read and define the time between two Modbus read. There are 10 Groups that the4 user can use in the COB Request record.

> ➢ In the field "Cyclic Time" the time between two Modbus request is defined;
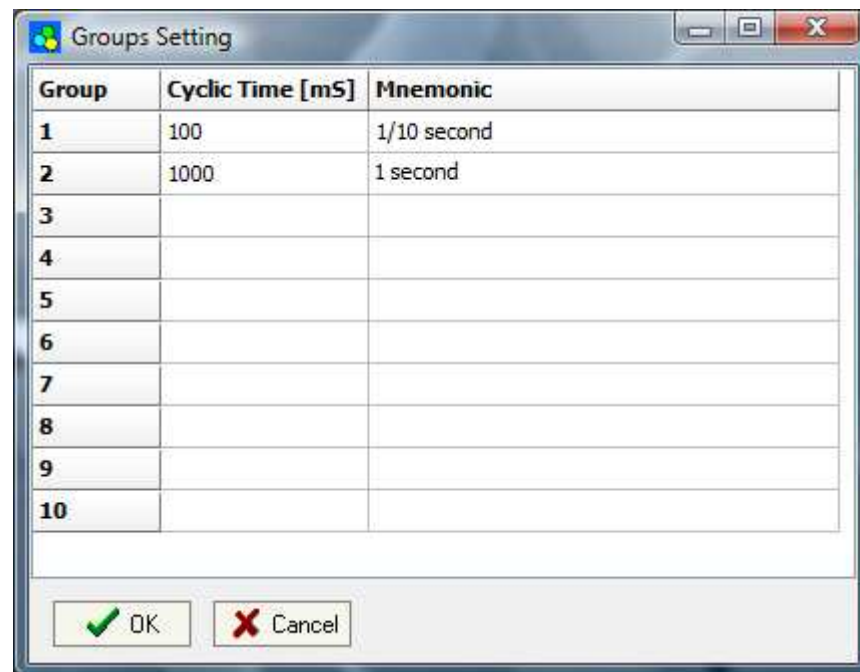> ➢ In the field "Mnemonic" you can insert a brief description.

Group	Cyclic Time [mS]	Mnemonic
1	100	1/10 second
2	1000	1 second
3		
4		
5		
6		
7		
8		
9		
10		

Figure 9: "Groups" Window

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UPDATE DEVICE:

Section "UP date Device".

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

- Turn off the device;
- Connect the Null Modem Cable from your PC to the Converter;
- Insert the Boot Jumper (See the Fig. 1 for more info);
- Turn on the Device;
- Check the Boot Led. It must blink quickly (See the Fig. 1 for more info)
- Select COM port and press "Execute update firmware" to start the upload;
- When all the operation are "OK" turn off the Device;
- Disconnect the Boot Jumper;
- Disconnect the RS232 cable;
- Turn on the device.

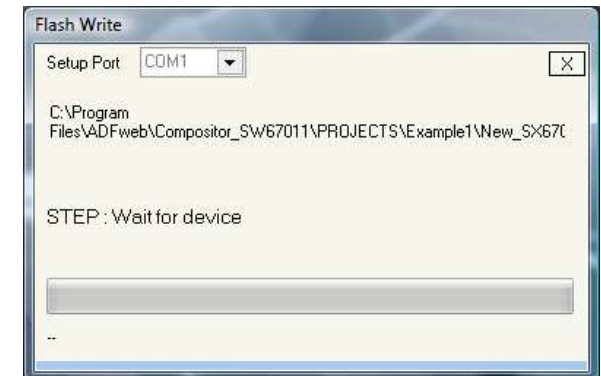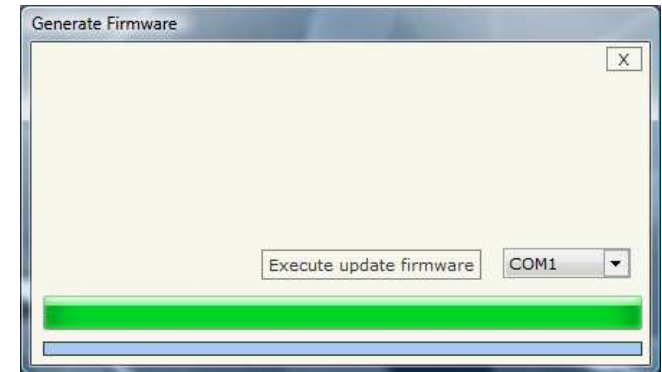At this point the configuration/firmware on the Device is correctly updated.
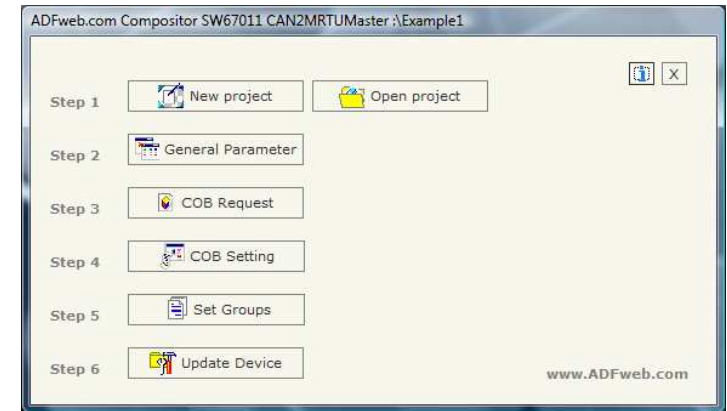
Figure 10: Update device procedure

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CHARACTERISTICS OF THE CABLES:

The connection from RS232 socket to a serial port (example one from a personal computer) must be made with a Null Modem cable (a serial cable where the pins 2 and 3 are crossed).
It is recommended that the RS232 Cable not exceed 15 meters.

Can bus 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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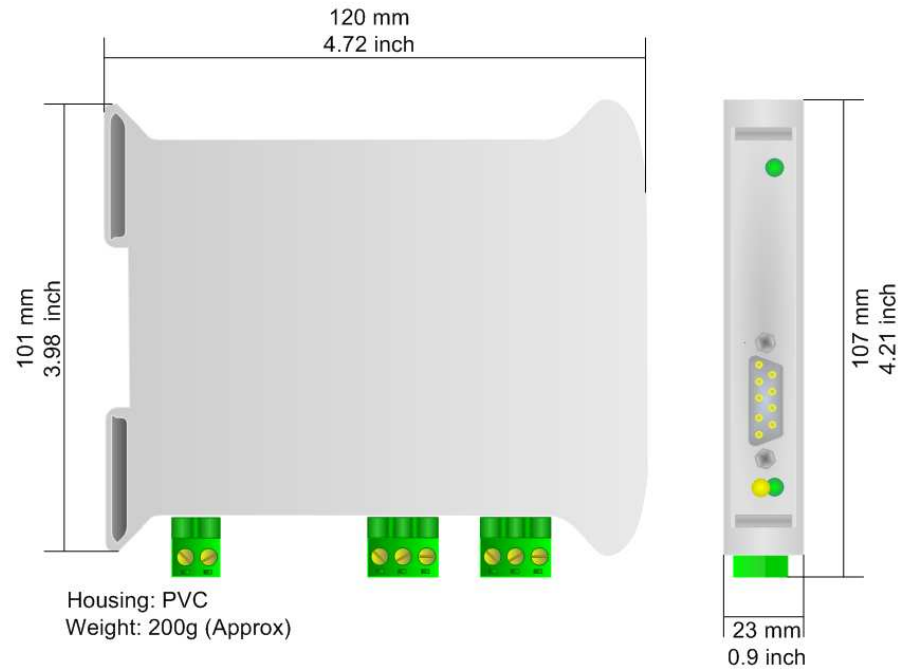
MECHANICAL DIMENSIONS:

Figure 11: Mechanical dimensions scheme

ORDER CODE:

Order Code: **HD67011**   **-**   CAN / Modbus Master – Converter

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

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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 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:
1) 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.
2) 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.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67117	CANopen - Repeater - Extender bus line	www.adfweb.com?Product=HD67117
HD67316	CAN Analyzer Hardware and Software	www.adfweb.com?Product=HD67316
HD67012	CAN / Modbus Slave - Converter	www.adfweb.com?Product=HD67012
HD67514	CAN / Modbus TCP Master - Converter	www.adfweb.com?Product=HD67014
HD67515	CAN / Modbus TCP Slave - Converter	www.adfweb.com?Product=HD67515