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Industrial Electronic Devices

User Manual

Revision 2.002
English

CAN / Optic Fiber – Repeater – Extender bus line (With filter data configurable)

(Order Code: HD67221F - HD67221FS)

for Website information:
www.adfweb.com?Product=HD67221F

for Price information:
www.adfweb.com?Price=HD67221F

Benefits and Main Features:

► Low Cost

► Naturally Resistant to Surges, Spikes and Electrical Noise

► Multi Modal Optic fibre up to 2000 meters

► MAX baud rate 1Mb

► Allows extension of a line segment (without lowering the Baud Rate)

► Extension of nodes number

► Different baud rate setting

► CAN Protocol independent

HD67221F   HD67221FS

Similiar Products →

← **Benefit**

For others Repeaters:

Optic Fibres Repeaters
See also the following links:
www.adfweb.com?Product=HD67117F   (For CANopen and CAN 2.0A)
www.adfweb.com?Product=HD67117FS   (For CANopen and CAN 2.0A)
www.adfweb.com?Product=HD67180F   (For DeviceNET)
www.adfweb.com?Product=HD67180FS   (For DeviceNET)
www.adfweb.com?Product=HD67181F   (For CAN 2.0B)
www.adfweb.com?Product=HD67181FS   (For CAN 2.0B)
www.adfweb.com?Product=HD67221FS   (Copper Bridge)

CANbus Repeaters
See also the following links:
www.adfweb.com?Product=HD67117   (For CANopen and CAN 2.0A)
www.adfweb.com?Product=HD67180   (For DeviceNET)
www.adfweb.com?Product=HD67181   (For CAN 2.0B)
www.adfweb.com?Product=HD67221   (Copper Bridge)

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.

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
1.000	28/10/2006	Av	All	First release version
1.001	22/06/2007	Av	All	Revision
1.002	26/06/2007	Av	All	Revision
2.000	09/10/2008	Fl	All	New document format
2.001	28/07/2009	MI	All	Revision
2.002	28/05/2010	FTI	All	Revision
2.003	12/02/2013	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 Configurable CAN Filter CobID Gateway is an electronic device mountable on rail DIN with an autonomous energy supply that allows the following characteristics:

➢ Two-directional translation of information between two distinct CAN Buses;
➢ Electrical isolation between two Buses;
➢ Filter of CAN frames;
➢ Temperature range -40°C to 85°C.

The gateway must be used for interfacing two CAN lines. Otherwise, in order to extend the length and electrical isolation of more branches than CANopen line you must use CAN Repeater device (note: view PRODUCTS AND RELATED DOCUMENTS).

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 .

HD67221F-FS
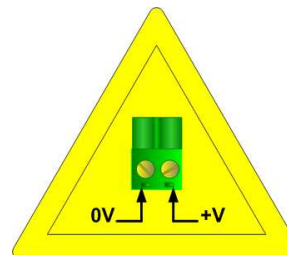
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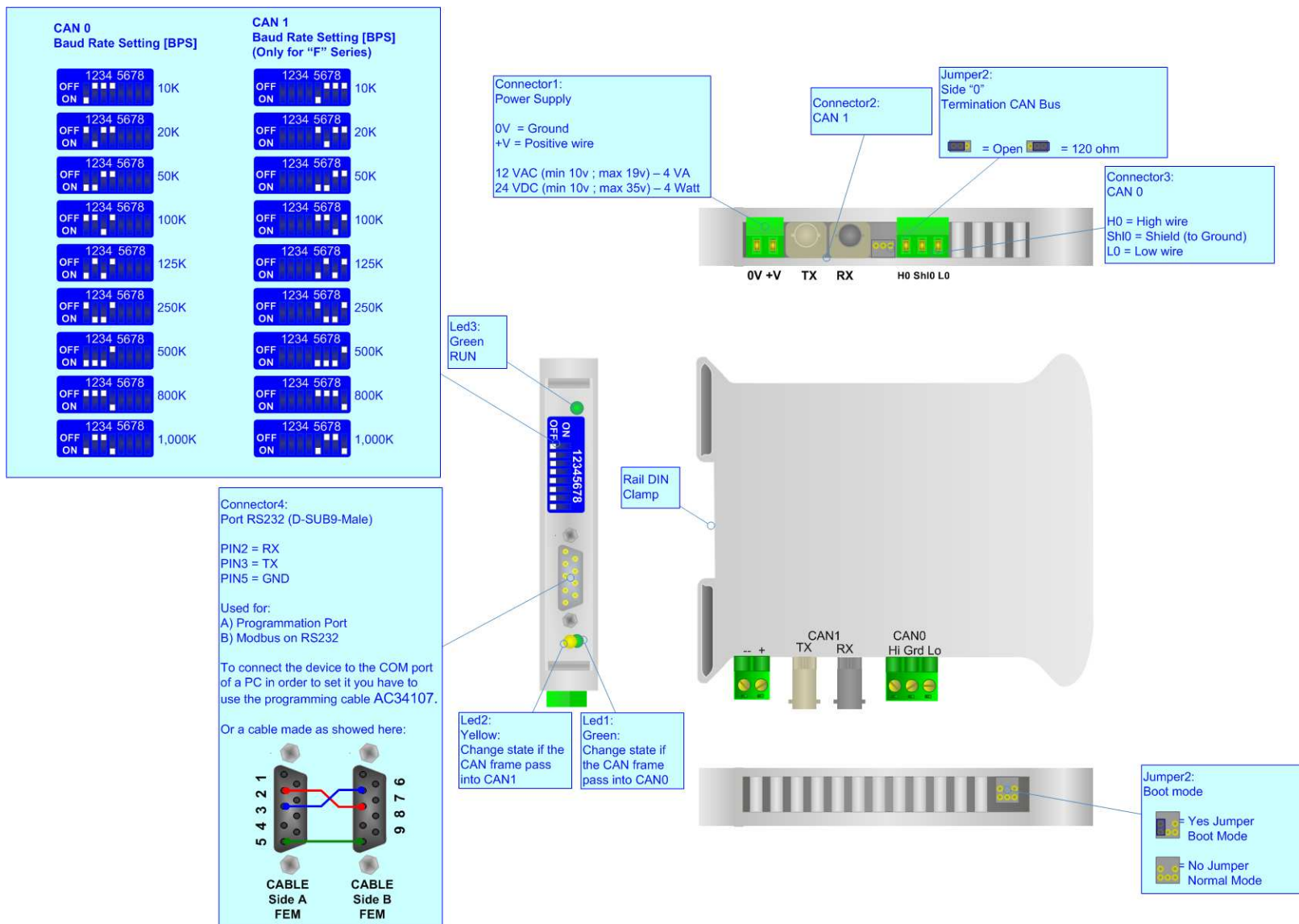
CONNECTION SCHEME:

Figure 1: Connection scheme for HD67221F and HD67221FS

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CONFIGURATION:

To configure the gateway use the available software that runs with Windows, called Compositor SW67221. It is downloadable on the site www.adfweb.com and its operation is described in this document.

The Configurable CAN Gateway can be configured up to a maximum of 2048 CobID for CAN2.0A and up to 2000 CobID for CAN2.0B.

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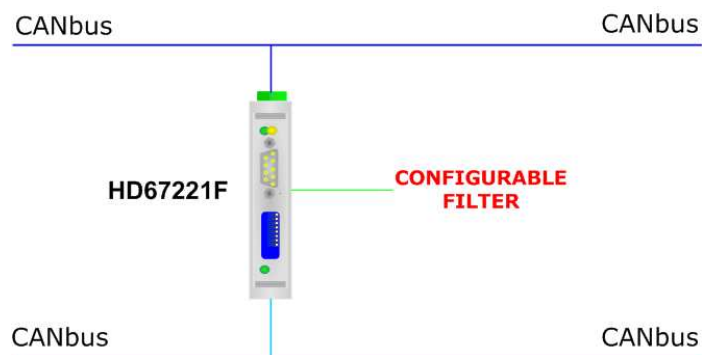
INTRODUCTION:

The gateway allows a CAN line to communicate with a different CAN line. We simply call these "CAN 0" and "CAN 1" in this manual.

The two networks are symmetrical at a logical level. What "CAN 0" can do to "CAN 1", "CAN 1" can do to "CAN 0" too.
"CAN 0" and "CAN 1" are different only on the level of hardware. One of the two CANopen has the power supply in common with the logic of the device. The other CANopen is isolated, based on the logic of the device.

You need Compositor SW67221 software on your PC in order to perform the following:

- ➢ Define the Baud rate of "CAN 0" and "CAN 1";
- ➢ Define the Type of CAN Network (2.0A or 2.0B);
- ➢ Define which CAN frames pass from "CAN 0" to "CAN 1";
- ➢ Define which CAN frames pass from "CAN 1" to "CAN 0";
- ➢ Update the new configurations of the device;
- ➢ Save, duplicate, modify, export the configurations.

USE OF COMPOSITOR SW67221:

When launching the SW67221 the following window appears.
The SW67004 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).
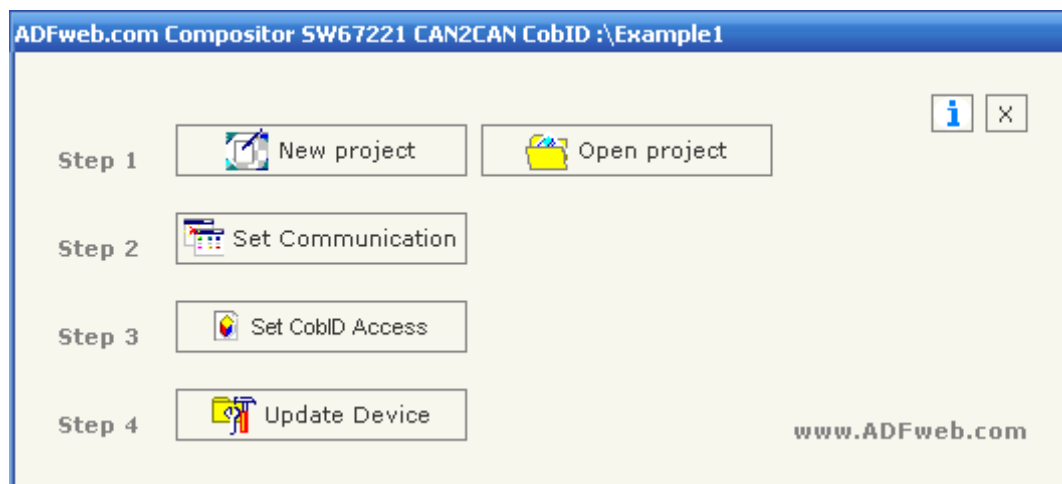

Figure 2: Main window for SW67221

NEW PROJECT / OPEN PROJECT:

The "New Project" button creates the folder which contains all the project files:
The project is the complex of files that define a particular configuration of device Configurable CANopen to CANopen. This file can also be imported or exported:

➢ To clone the configurations of a Configurable CANopen to CANopen Gateway 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 the project is created or open, it is possible to access the various configuration sections of the device:
➢ ***"Set Communication"***;
➢ ***"Set CobID Access"***.

INFO: www.adfweb.com   Phone +39.0438.30.91.31

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FUNCTION SCHEME:

This section defines the fundamental communication parameters of the two BUSes where the Configurable CANopen Gateway is inserted.
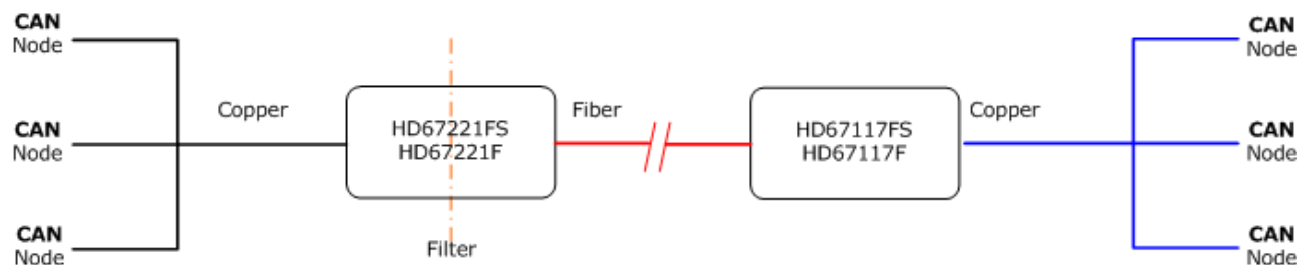

Figure 3: Functional scheme

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SET COMMUNICATION:

This section defines the fundamental communication parameters of two Buses.

By pressing the "Set Communication" button from the main window for SW67221 (Fig. 3) the "SET COMMUNICATION" window appears (Fig. 4).

- ➤ The check boxes "Baud rate set in Dip Switch" define if the baud rate is set by Dip-Switch or selected like a parameter in the software. You can select one CAN by Dip and the other like a parameter;
- ➤ In the fields "Baud rate" the velocity of the two Buses is defined;
- ➤ The parameter "Type of CAN Network" define if the CAN is 2.0A (CobID at 11 Bit) or 2.0B (CobID at 29 Bit);
- ➤ The "Positive Implementation" parameter defines if only the CobID written in the "Set CobID Access" table is passed in the other CAN bus (with "Positive Implementation" checked) or if all the CobID written in the table are blocked to the gateway (with "Positive Implementation" not checked).

Figure 4: "Set Communication" window

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Baud rate selected by Dip-Switch

The baud rate of "CAN 0" and "CAN 1" could be defined through the dip-switch present in device. These are the possible combinations:

Dip n° 1, 2, 3, 4 "CAN 1" setting;
Dip n° 5, 6, 7, 8 "CAN 0" setting.

Speed "CAN 1" BPS (Only for "F" Series)	Dip 1	Dip 2	Dip 3	Dip 4
Speed "CAN 0" BPS	Dip 5	Dip 6	Dip 7	Dip 8
10K	ON	OFF	OFF	OFF
20K	OFF	ON	OFF	OFF
50K	ON	ON	OFF	OFF
100K	OFF	OFF	ON	OFF
125K	ON	OFF	ON	OFF
250K	OFF	ON	ON	OFF
500K	ON	ON	ON	OFF
800K	OFF	OFF	OFF	ON
1000K	ON	OFF	OFF	ON

SET COBID ACCESS:

The following objects can be defined:

  ➢ Which CAN frames of the "CAN 0" pass into "CAN 1";
  ➢ Which CAN frames of the "CAN 1" pass into "CAN 0".

If the "Positive Implementation" parameter is set, it is possible to change the CobID of the frame when it passes from one CAN bus to the other. In order to do this it is necessary to insert the new CobID in the "Modify CobID" column.
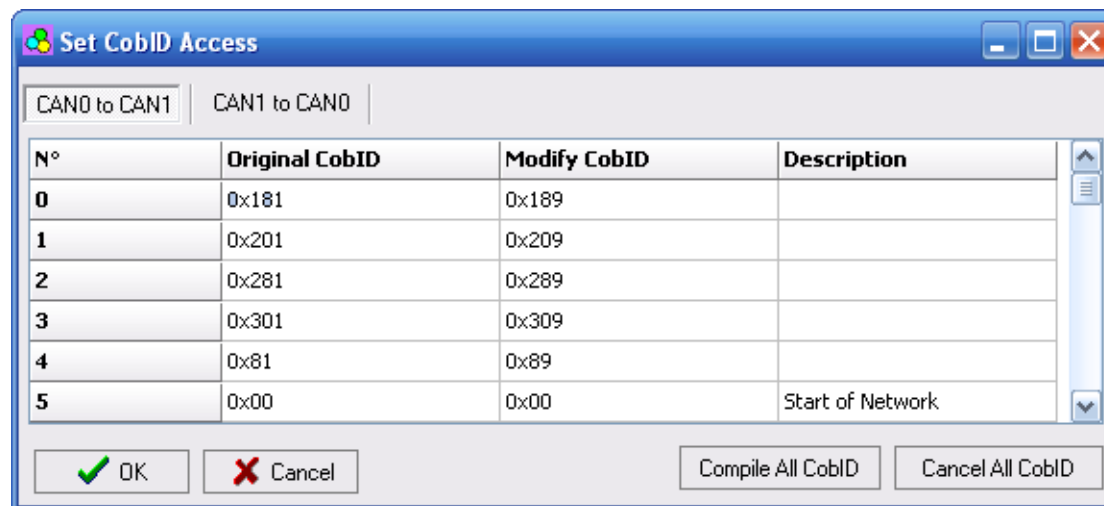The dimension of data and its value do not change when it passes into the gateway.

Figure 5: "Set CobID Access" window

The data of the columns have the following meaning:
  ➢ In the field "Original CobID" insert the CobID that can pass in the other CAN network (if Positive Implementation is not checked then the indicated CobID cannot pass to other CAN Network);
  ➢ In the field "Modify CobID" insert the new CobID of the frame that passes in the other CAN network (only if "Positive Implementation" is checked);
  ➢ In the field "Description" you can insert the description of the Can Frame.

Example 1:
If I want to pass the CobID 0x181 from "CAN 0" to "CAN 1" Network and set it like 0x189 in "CAN 1", I need to set the follow parameter in table "CAN 0 to CAN1":
  ➢ Original CobID 0x181;
  ➢ Modify CobID 0x189.

In the right example (Fig. 6):
All the Can frames with CobID different from the "Original CobID" column are forgotten. The Can frames with CobID equal to the "Original CobID" column are sent to "CAN 1" with the new CobID.
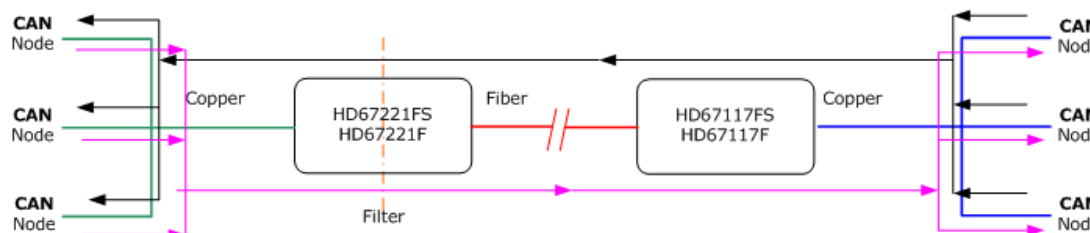
Figure 6: Chart of CobID request from CAN bus sides

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UPDATE DEVICE:

Section "Update Device":
Insert the boot jumper (see figure 2).
In order to load the parameters after they are set, set the COM port you used for update, then you must click the button "Execute update firmware" on the principal window.
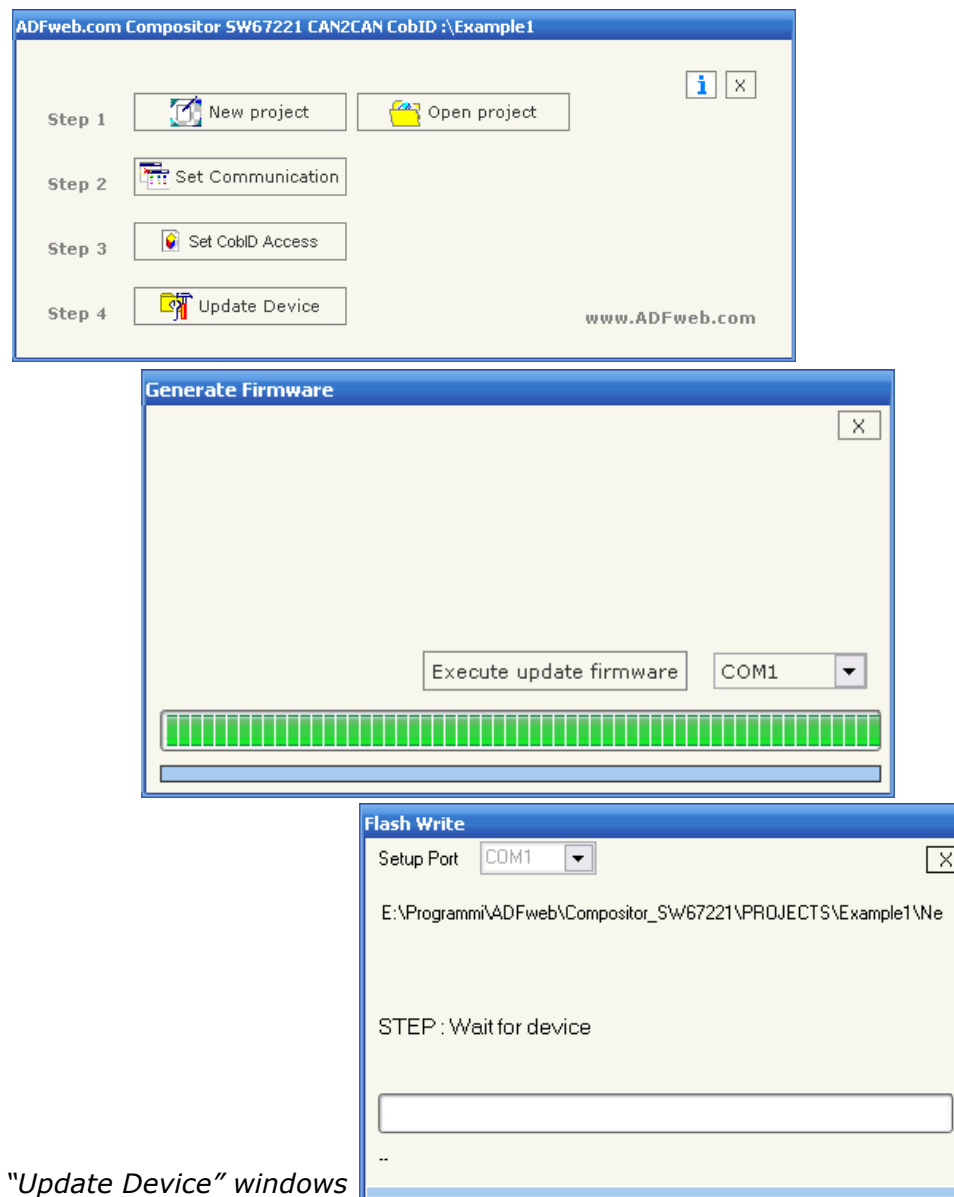
Figure 7: "Update Device" windows

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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.

The connection with the Ethernet socket must be with a Ethernet Cable with a RJ45 Plug.

The connection with the RS485 socket must be done with a twisted and shielded cable.
The terminal resistor must be inserted when the HD67102 is at the end of the line, using the Terminator jumper.

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

"F" SERIES:

Bridges and repeaters for CANbus, CANopen, DeviceNET, J1939, CAN2.0A, CAN2.0B:

HD67221F CANbus to fiber optic – Data bridge repeaters

Function scheme:

Baud rate table:

Copper Side:

Baud rate [bps]	Lenght 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

Fiber Oprtic Side:

Baud rate [bps]	Lenght max [m]
10 K	2000
20 K	2000
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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(*) Link distance is limited by signaling rate as specified by the CAN bus specification to bus arbitration.

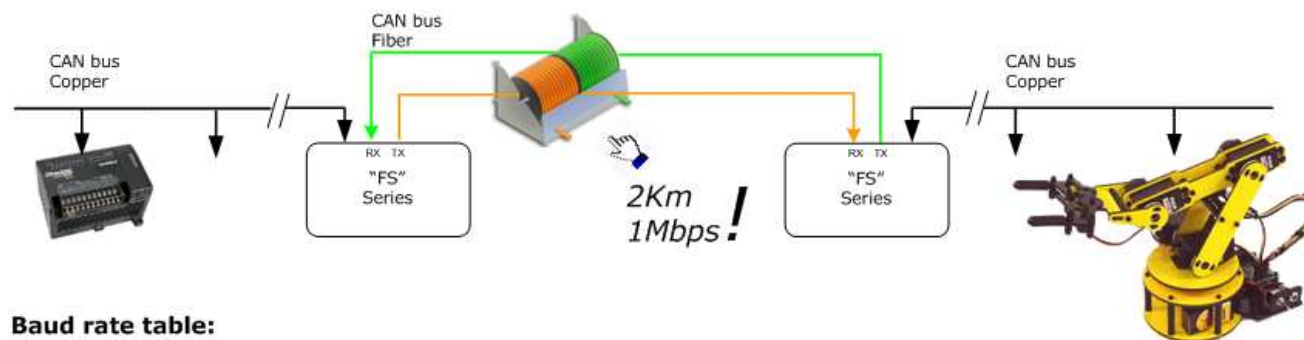*Figure 8: Function scheme and Baud rate table for "F"*

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"FS" SERIES:

Bridges and repeaters for CANbus, CANopen, DeviceNET, J1939, CAN2.0A, CAN2.0B:

HD67221FS CANbus to fiber optic – Data bridge repeaters

These series of device use the large bandwidth of optics fibres for extend the CAN bus link.

Function scheme:

Baud rate table:

Copper Side:

Baud rate [bps]	Lenght 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

Fiber Optic Side: (*)

Baud rate [bps]	Lenght max [m]
10 K	2000
20 K	2000
50 K	2000
100 K	2000
125 K	2000
250 K	2000
500 K	2000
800 K	2000
1000 K	2000

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(*) Fiber optic 62.5/125µm

Figure 9: Function scheme and Baud rate table for "FS"

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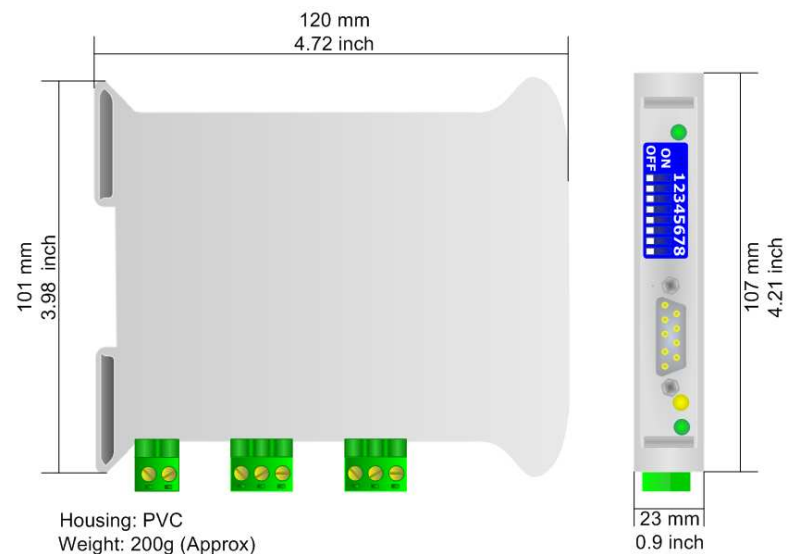
MECHANICAL DIMENSIONS:

Figure 10: Mechanical dimensions scheme for HD67221F and HD67221FS

ORDER CODE:

HD67221F   -   CAN / Optic Fiber – Repeater – Extender bus line (With filter data configurable)
HD67221FS

(*) Regarding "F" and "FS" series difference, see the above "Baud Rate Table"

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
HD67121	Gateway CANopen / Canopen	www.adfweb.com?Product=HD67121
HD67001	Gateway CANopen / Modbus – RTU Master	www.adfweb.com?Product=HD67001
HD67505	Gateway CANopen / Modbus – Ethernet TCP	www.adfweb.com?Product=HD67004
HD67134	Gateway CANopen / DeviceNet	www.adfweb.com?Product=HD67134
HD67117	CAN bus Repeater	www.adfweb.com?Product=HD67117
HD67216	CAN bus Analyzer	www.adfweb.com?Product=HD67216