

# User Manual

Revision 2.000  
 English



## Fiber Optic - Bridge CANbus to CANbus For CANbus 2.0A and 2.0B

(Order Code: HD67221FS)

for Website information:

[www.adfweb.com?Product=HD67221FS](http://www.adfweb.com?Product=HD67221FS)

for Price information:

[www.adfweb.com?Price=HD67221FS](http://www.adfweb.com?Price=HD67221FS)

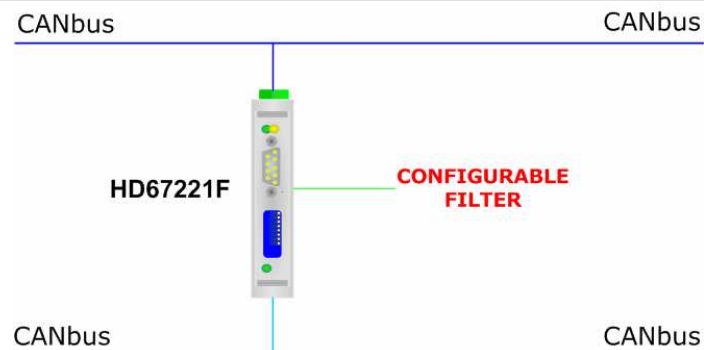
### Benefits and Main Features:

- ▶ 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.

Logical Scheme →

Similar Products →

← Benefit



For others Repeaters:

#### Optic Fibres Repeaters

See also the following links:

- [www.adfweb.com?Product=HD67117F](http://www.adfweb.com?Product=HD67117F) (For CANopen and CAN 2.0A)
- [www.adfweb.com?Product=HD67117FS](http://www.adfweb.com?Product=HD67117FS) (For CANopen and CAN 2.0A)
- [www.adfweb.com?Product=HD67180F](http://www.adfweb.com?Product=HD67180F) (For DeviceNET)
- [www.adfweb.com?Product=HD67180FS](http://www.adfweb.com?Product=HD67180FS) (For DeviceNET)
- [www.adfweb.com?Product=HD67181F](http://www.adfweb.com?Product=HD67181F) (For CAN 2.0B)
- [www.adfweb.com?Product=HD67181FS](http://www.adfweb.com?Product=HD67181FS) (For CAN 2.0B)
- [www.adfweb.com?Product=HD67221FS](http://www.adfweb.com?Product=HD67221FS) (Copper Bridge)

#### CANbus Repeaters

See also the following links:

- [www.adfweb.com?Product=HD67117](http://www.adfweb.com?Product=HD67117) (For CANopen and CAN 2.0A)
- [www.adfweb.com?Product=HD67180](http://www.adfweb.com?Product=HD67180) (For DeviceNET)
- [www.adfweb.com?Product=HD67181](http://www.adfweb.com?Product=HD67181) (For CAN 2.0B)
- [www.adfweb.com?Product=HD67221](http://www.adfweb.com?Product=HD67221) (Copper Bridge)

Do you have an your customer protocol?

See the following links:

[www.adfweb.com?Product=HD67003](http://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](http://www.adfweb.com?Cmd=helpme)

**INDEX:**

	Page
INDEX	2
UPDATED DOCUMENTATION	2
REVISION LIST	2
WARNING	2
TRADEMARKS	2
CHARACTERISTICS	3
COMPOSITOR SW67221	4
COMMUNICATION	6
SET COMMUNICATION	7
CONFIGURATION OF THE cobID	9
UPDATE DEVICE	10
CHARACTERISTICS OF THE CABLES	11
SERIES "FS"	12
SERIES "F"	13
CONNECTION SCHEME	14
MECHANICAL DIMENSIONS	15
ORDER CODE	15
ACCESSORIES	15
WARRANTIES AND TECHNICAL SUPPORT	16
RETURN POLICY	16
PRODUCTS AND RELATED DOCUMENTS	16

**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/](http://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/](http://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

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**CHARACTERISTICS:**

The Configurable CAN Filter CobID Gateway is a mountable electronic device on rail DIN with an autonomous energy supply that allows the following:

- two-directional translation of information between two distinct CAN Buses .
- Electrical isolation between two Buses .
- Filter of CAN frames.
- Temperature range -30°C to 70°C

The Configurable CAN 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 ).

To configure the CAN Gateway, use the available software that runs with Windows, called Compositor SW67221. It is downloadable on the site [www.adfweb.com](http://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.

## COMPOSITOR SW67221:

### INTRODUCTION

The device Configurable Gateway CAN , allows a CAN line to communicate with another different CAN line that we simply call 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, so can CAN 1 do to CAN 0. 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.

In order to:

- Define the Baud rate of CAN0 and CAN1
- Define the Type of CAN Network (2.0A or 2.0B)
- Define which CAN frames from CAN0 to CAN1.
- Define which CAN frames from CAN1 to CAN0.
- Update the new configurations of the device.
- Save, duplicate, modify, export the configurations.

The software needed to perform the above on your PC is Compositor SW67221.

When launching it the right 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)

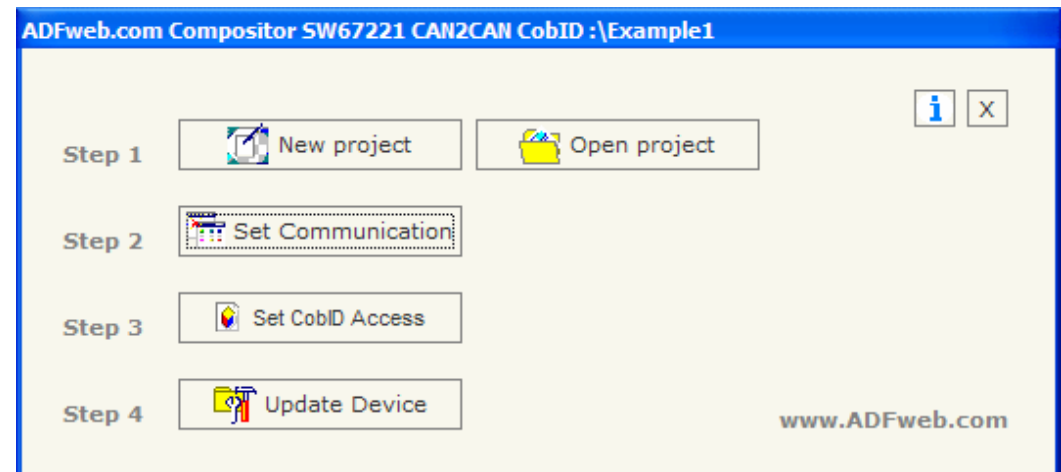


Figure 1: Main window for SW67221

The “New Project” button creates the folder which contains all the project files:

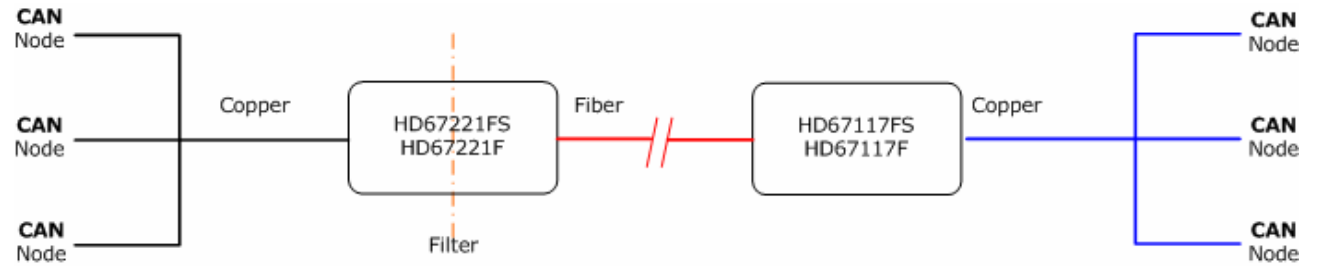
- The project is the complex of files that define a particular configuration of device Configurable CANopen to CANopen. This file can also be imported and exported.
- To clone the configurations of a Configurable CANopen to CANopen Gateway in order to configure another device in the same manner, it is 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.

**COMMUNICATION:**

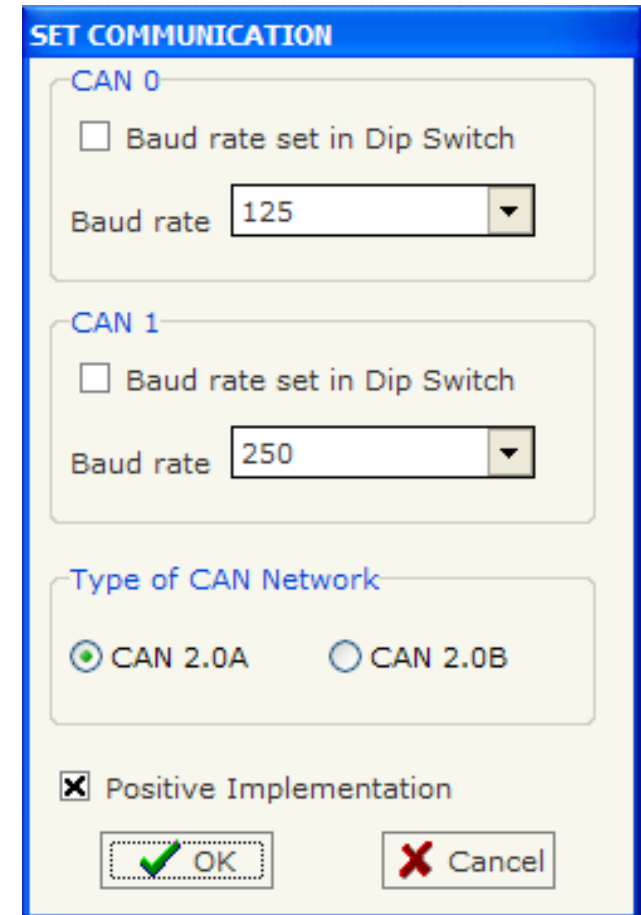
This section defines the fundamental communication parameters of two BUSES where the Configurable CANopen Gateway is inserted.



**Section “Set Communications”:**

By pressing the “Set Communication” button, the previous window appears in which the BUS can be set from both sides.

- In the check box Baud rate set by Dip-Switch, define if Baud rate is set to Dip-Switch or select like parameter in the software. You can select one can to Dip and the other like parameter.
- In the fields Baud Rate, the velocity of the two Buses are defined.
- The parameter Type of CAN Network define if CAN is 2.0A (CobID at 11 Bit) or 2.0B (CobID at 29 Bit)
- The parameter Positive Implementation define if only the CobId write in table (Set CobID Access) are passed to the other CAN bus (Positive Implementation is checked) or if all the CobID write in table are block to the gateway (Positive Implementation isn't checked)



**SET COMMUNICATION**

**CAN 0**

Baud rate set in Dip Switch

Baud rate

**CAN 1**

Baud rate set in Dip Switch

Baud rate

**Type of CAN Network**

CAN 2.0A  CAN 2.0B

Positive Implementation

**Baud rate select by Dip-Switch**

The Baud rate of CAN0 and CAN1 could be defined through the dip-switch present in device. These are the combinations permissible.

**Dip n° 1, 2, 3, 4 CAN1 setting**

**Dip n° 5, 6, 7, 8 CAN0 setting**

Speed CAN1 BPS (Only for "F" Series)	Dip 1	Dip 2	Dip 3	Dip 4
Speed CAN0 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

## CONFIGURATION OF THE CobID

### Section "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 parameter Positive Implementation is set, is possible change the CobID of the frame when pass from one CAN bus to the other. To do it is necessary to insert the new Cob in the column modify COBID.

The Dimension of Data and its value don't change when pass into the gateway.

Example 1:

If i want to pass from CAN0 to CAN1 Network the CobID 0x181 and set it like 0x189 in CAN1 i need to set the follow parameter in table "CAN0 to CAN1":

- Original CobID 0x181
- Modify CobID 0x189

I must write that is represented on the right image (only the first row) (Fig 2):

In the right example:

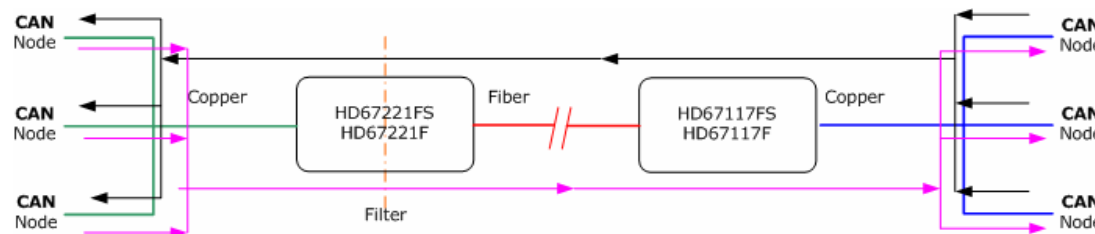
All the Can frames with CobID different from Original CobID Column are forgotten. The Can frames with CobID equal to the Original CobID column are send to CAN1 with the new CobID

The column data has the following meaning:

- "Original CobID" indicate the CobIDs can pass to the other CAN network (if Positive Implementation is not checked then indicate the CobID cannot pass to other CAN Network)
- "Modify CobID" indicate the new CobID of frame when it pass in the other CAN Network (only if Positive Implementation is checked)
- "Description" indicate the description of the Can Frame

N°	Original CobID	Modify CobID	Description
0	0x181	0x189	TPO1
1	0x201	0x209	RPDO1
2	0x281	0x289	TPDO2
3	0x301	0x309	RPDO3
4	0x81	0x89	EMCY1
5	0x00	0x00	Start of Network
6			
7			

Fig 2: Set CobID Access



**UPDATE DEVICE:**

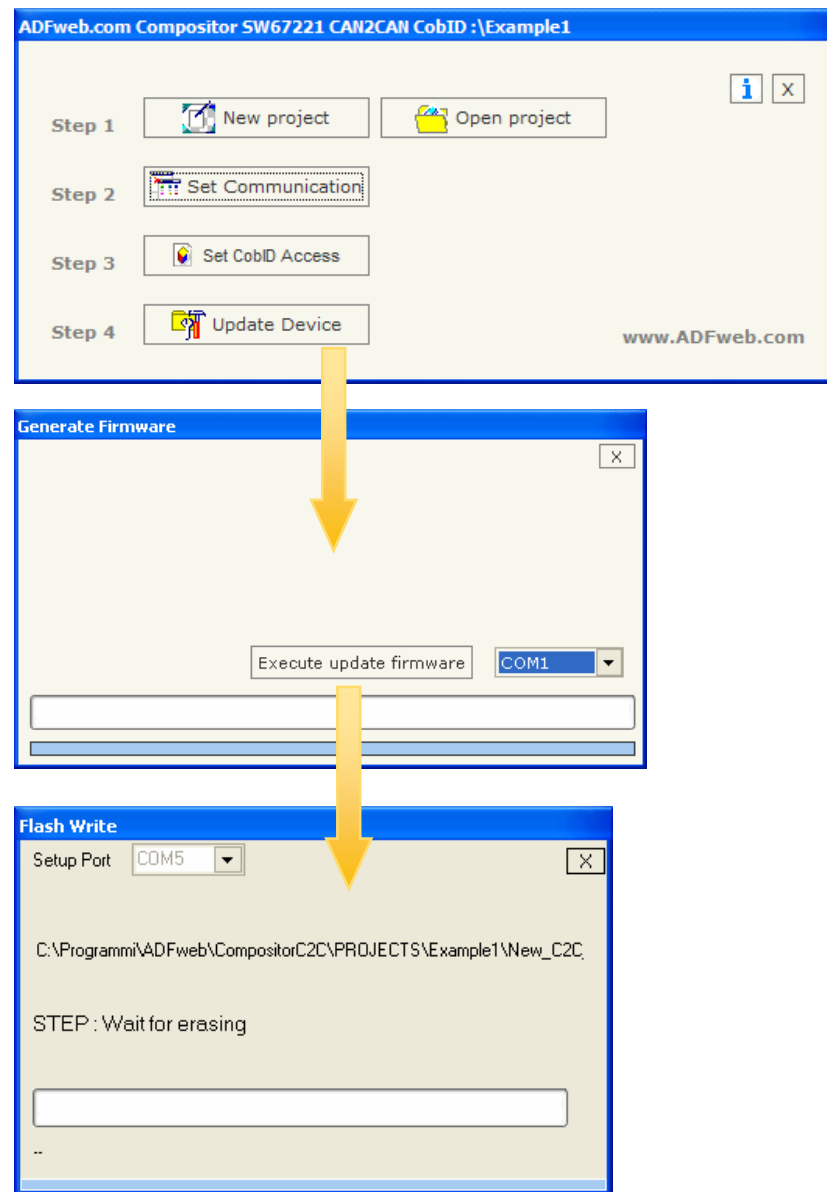
Section "UP Date Device":

In order to load the parameters after they are set, you must click the button "create file binary" on the principal window. When the processing is complete, click on "Generate Firmware".

On the "Generate firmware window", select the original firmware of the device "open firmware". Click on "Execute Modify File SX".

At this point, the update occurs like our other products (see documentation on flash write). Boot the Gateway with the provided jumper.

Select the serial port which performs the update. Click on "Execute Update Firmware". Wait for the running bar to finish. Remove the jumper and reboot the Gateway.



**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 at Ethernet socket must be with a Ethernet Cable with a RJ45 Plug

The connection at RS485 socket must be done with 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:

<b>DC parameter:</b>	Impedance	70 Ohm/m
<b>AC parameters:</b>	Impedance	120 Ohm/m
	delay	5 ns/m
<b>Length</b>	<b>Baud Rate [bps]</b>	<b>Length MAX [m]</b>
	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

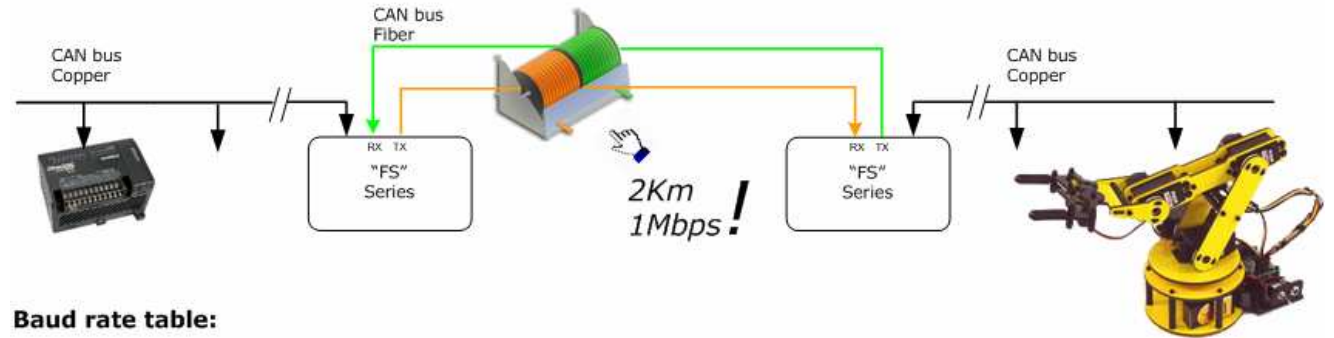
**“FS” SERIES**

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

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

HD67221FS 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 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

www.ADFweb.com

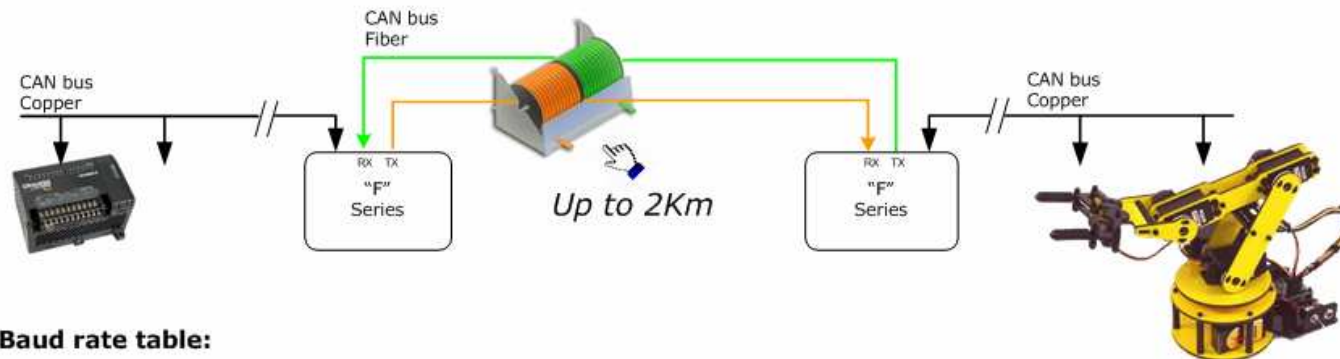
(\*) Fiber optic 62.5/125µm

**“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

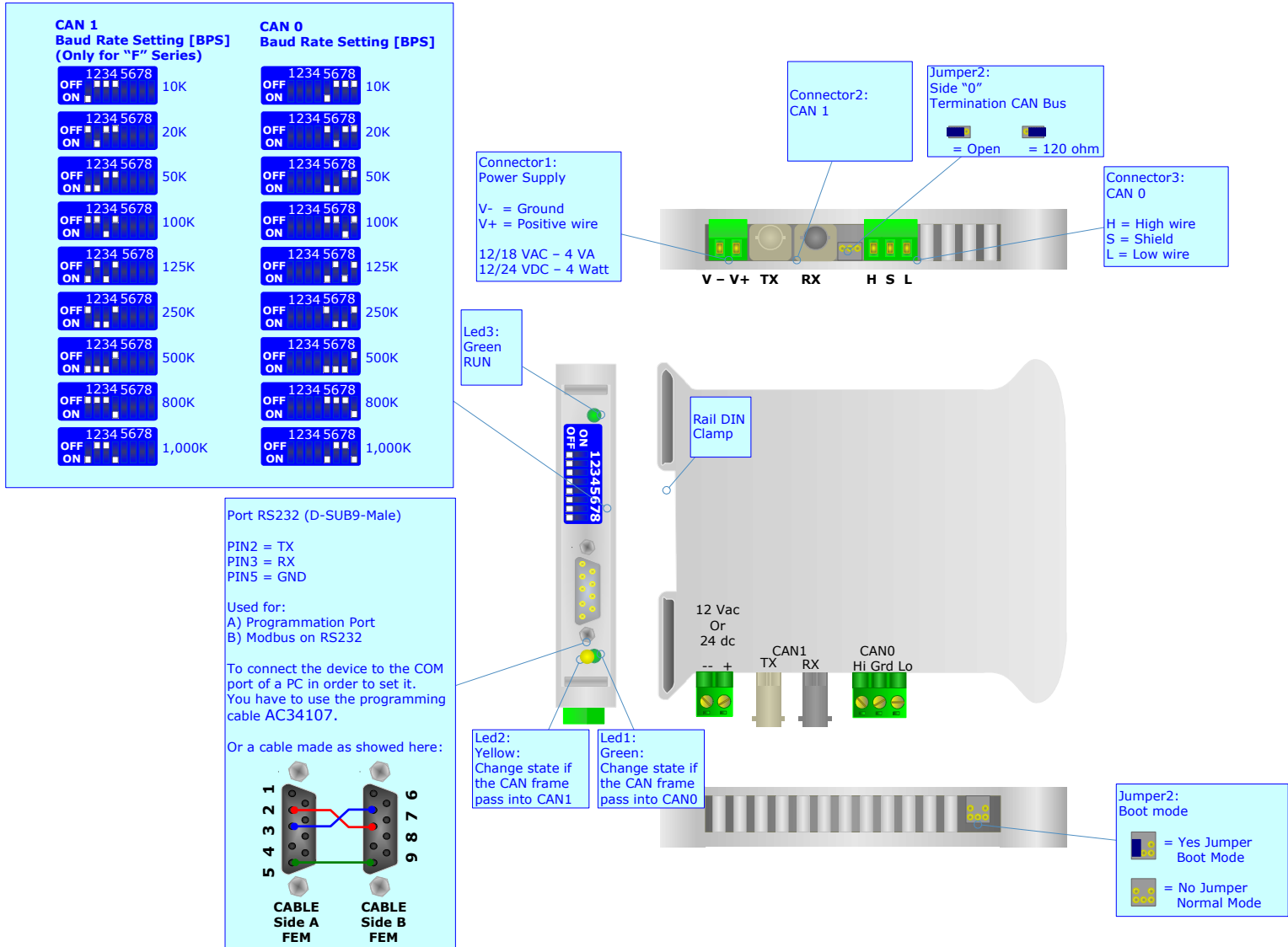
Fiber Oprtic Side:

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 (*)

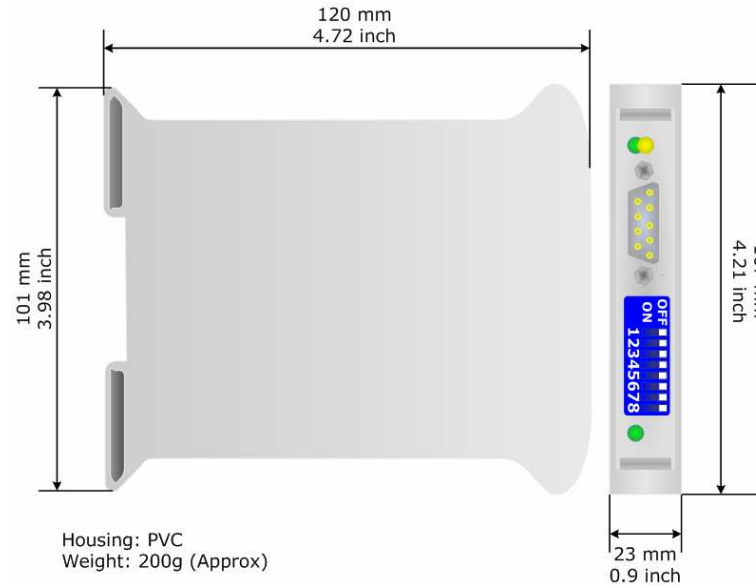
www.ADFweb.com

(\*) Link distance is limited by signaling rate as specified by the CAN bus specification to bus arbltration.

**CONNECTION SCHEME:**



**MECHANICAL DIMENSIONS:**



**ORDER CODE:**

**HD67221F** - Data bridge repeaters  
**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

**WARRANTIES AND TECHNICAL SUPPORT:**

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at [www.adfweb.com](http://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](http://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	<a href="http://www.adfweb.com?Product=HD67121">www.adfweb.com?Product=HD67121</a>
HD67001	Gateway CANopen / Modbus – RTU Master	<a href="http://www.adfweb.com?Product=HD67001">www.adfweb.com?Product=HD67001</a>
HD67004 HD67005	Gateway CANopen / Modbus – Ethernet TCP	<a href="http://www.adfweb.com?Product=HD67004">www.adfweb.com?Product=HD67004</a>
HD67134	Gateway CANopen / DeviceNet	<a href="http://www.adfweb.com?Product=HD67134">www.adfweb.com?Product=HD67134</a>
HD67117	CAN bus Repeater	<a href="http://www.adfweb.com?Product=HD67117">www.adfweb.com?Product=HD67117</a>
HD67216	CAN bus Analyzer	<a href="http://www.adfweb.com?Product=HD67216">www.adfweb.com?Product=HD67216</a>