

User Manual

Revision 3.001
English

Fiber Optic - Bridge and Repeater

(Order Code: HD67117F – HD67117FSX
HD67180F – HD67180FSX
HD67181F – HD67181FSX
HD67182F – HD67182FSX)

Benefits and Main Features:

- ▶ Designed for serious use
- ▶ Different baud rate of CAN branches
- ▶ Protocol independent, allowing it to work with all the different CAN protocols and frame lengths
- ▶ Industrial temperature range:
-30°C / 70°C (-22°F / 158°F)



HD671xxF



HD671xxFSX

Similar
Products

All Repeaters

See also the following links:

- www.adfweb.com?Product=HD67117F
- www.adfweb.com?Product=HD67117FSX (For CANopen)
- www.adfweb.com?Product=HD67180F (For DeviceNet)
- www.adfweb.com?Product=HD67180FSX (For DeviceNet)
- www.adfweb.com?Product=HD67181F (For CAN 2.0A & 2.0B)
- www.adfweb.com?Product=HD67181FSX (For CAN 2.0A & 2.0B)
- www.adfweb.com?Product=HD67182F (For J1939)
- www.adfweb.com?Product=HD67182FSX (For J1939)

Copper Cables Repeaters

See also the following links:

- www.adfweb.com?Product=HD67117 (For CANopen)
- www.adfweb.com?Product=HD67180 (For DeviceNet)
- www.adfweb.com?Product=HD67181 (For CAN 2.0A & 2.0B)
- www.adfweb.com?Product=HD67182 (For J1939)
- www.adfweb.com?Product=HD67221 (Filter CAN to CAN)

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

Benefits

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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
1.002	26/06/2007	Av	All	Revision
2.000	09/10/2008	Fl	All	New document format
2.001	27/07/2009	Ml	All	Revision
2.002	19/03/2010	Fl	All	Type FSX
3.000	15/06/2010	Ft	All	New document format
3.001	23/08/2011	Fl	All	Revision

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INTRODUCTION:

The "HD67XXXF" and "HD67XXXFSX" series are CAN Bus devices designed to extend high CAN bus signals to Fiber Optic cables, providing RFI and electrical isolation. These CAN bus bridges and repeaters support the CAN-based higher level protocols.

BENEFITS AND CHARACTERISTICS:**Benefits:**

- 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;
- Microprocessor 16bit;
- Rail DIN mounting;
- Removable terminal block;
- Low Cost.

Characteristics:

- Electrical isolation ISO 11898/ISO IEC 11801
- Optical link: UP 2000 metres at 1Mbps;
- Copper link: 5000 m for 10Kbps and 25m for 1Mbps;
- Baud rate from 10k up to 1Mbps;
- Possible different baud rate setting (into different branches)
- Temperature range -30°C to 70°C;
- Mountable on Rail Din;
- Dimensions 120x23x107 (D x W x H);
- Weight 200g.



LINKS AND USE:

PRODUCTS	FEATURES	PRODUCT WEB PAGE	PRICE LINK
HD67117F	Specific for CanOpen Variable Fiber Optic boud Rate	www.adfweb.com?Product=HD67117F	http://www.adfweb.com/?Price=HD67117F
HD67117FSX	Specific for CanOpen Fixed Fiber Optic boud Rate Isolated Can Port	http://www.adfweb.com/?Product=HD67117FSX	http://www.adfweb.com/?Price=HD67117FSX
HD67180F	Specific for DeviceNet Variable Fiber Optic boud Rate	http://www.adfweb.com/?Product=HD67180F	http://www.adfweb.com/?Price=HD67180F
HD67180FSX	Specific for DeviceNet Fixed Fiber Optic boud Rate Isolated Can Port	http://www.adfweb.com/?Product=HD67180FSX	http://www.adfweb.com/?Price=HD67180FSX
HD67181F	For Generic Can Variable Fiber Optic boud Rate	http://www.adfweb.com/?Product=HD67181F	http://www.adfweb.com/?Price=HD67181F
HD67181FSX	For Generic Can Fixed Fiber Optic boud Rate Isolated Can Port	http://www.adfweb.com/?Product=HD67181FSX	http://www.adfweb.com/?Price=HD67181FSX
HD67182F	Specific for J1939 Variable Fiber Optic boud Rate	http://www.adfweb.com/?Product=HD67182F	http://www.adfweb.com/?Price=HD67182F
HD67182FSX	Specific for J1939 Fixed Fiber Optic boud Rate Isolated Can Port	http://www.adfweb.com/?Product=HD67182FSX	http://www.adfweb.com/?Price=HD67182FSX

FUNCTION SCHEME:

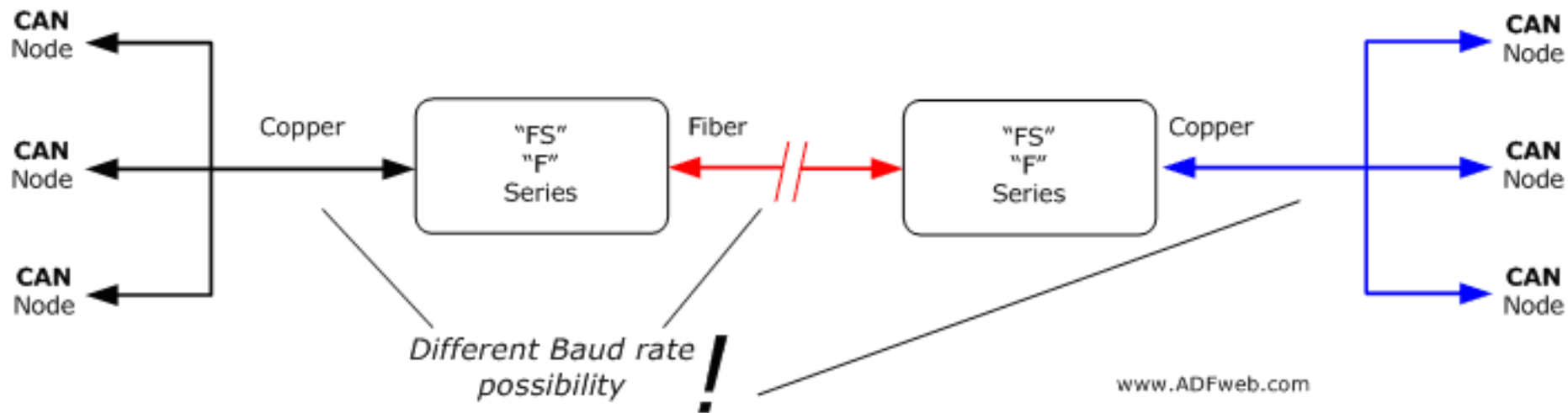


Figure 1: Functional scheme

"F" SERIES

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

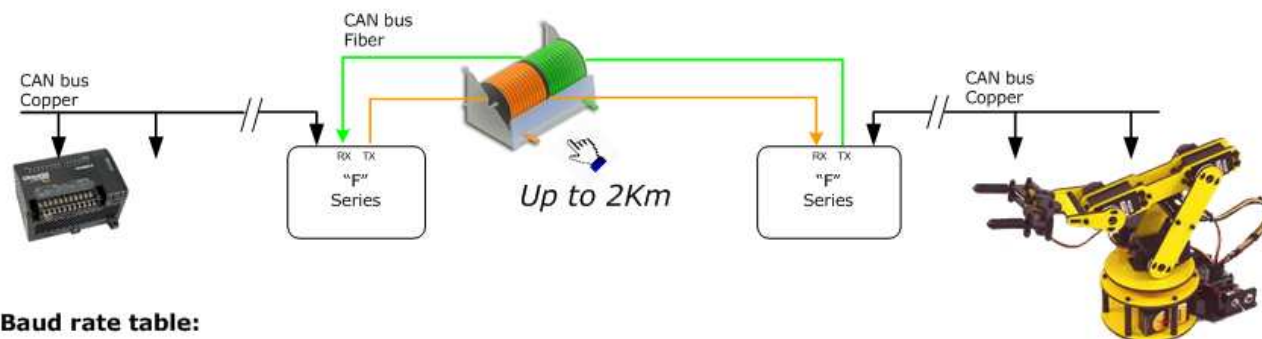
HD67117F CANopen to Fiber Optic Repeater;

HD67180F DeviceNet to Fiber Optic Repeater;

HD67181F CAN to Fiber Optic Repeater for generic use (Standard and Extended Protocol);

HD67182F J1939 to Fiber Optic Repeater.

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	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 2: Function scheme and Baud rate table for "F" series

"FSX" SERIES

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

HD67117FSX CANopen to Fiber Optic Repeater;

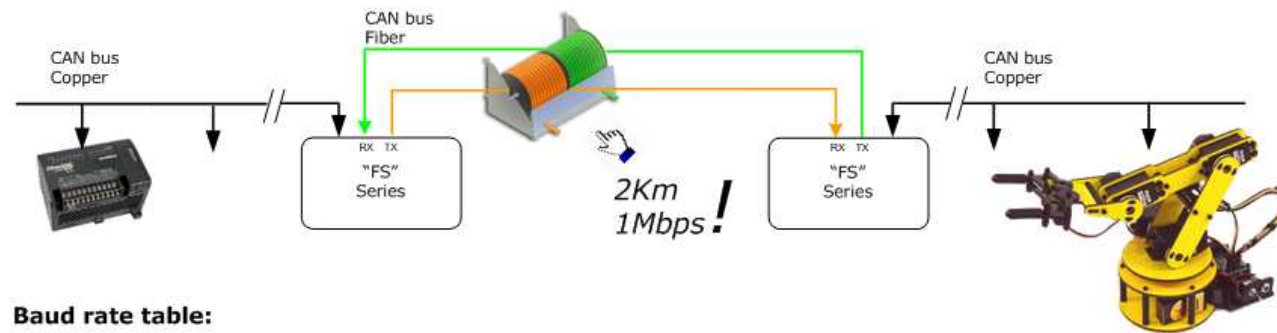
HD67180FSX DeviceNet to Fiber Optic Repeater;

HD67181FSX CAN to Fiber Optic Repeater for generic use (Standard and Extended Protocol);

HD67182FSX J1939 to Fiber Optic Repeater.

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 3: Function scheme and Baud rate table for "FS" and "FSX"

SET SWITCH BAUD RATE FOR "F" SERIES:

The switches for setting the CAN0 baud rate and CAN1 on the front panel of the device:

Dip n° 1, 2, 3, 4 CAN1 setting;

Dip n° 5, 6, 7, 8 CAN0 setting.

Speed CAN1 BPS	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
62.5K	OFF	ON	OFF	ON
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 SWITCH BAUD RATE FOR "FSX" SERIES:

The switches for setting the CAN0 baud rate on the front panel of the device:

Dip n° 5, 6, 7, 8 CAN0 setting.

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
62.5K	OFF	ON	OFF	ON
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

CONNECTION SCHEME:

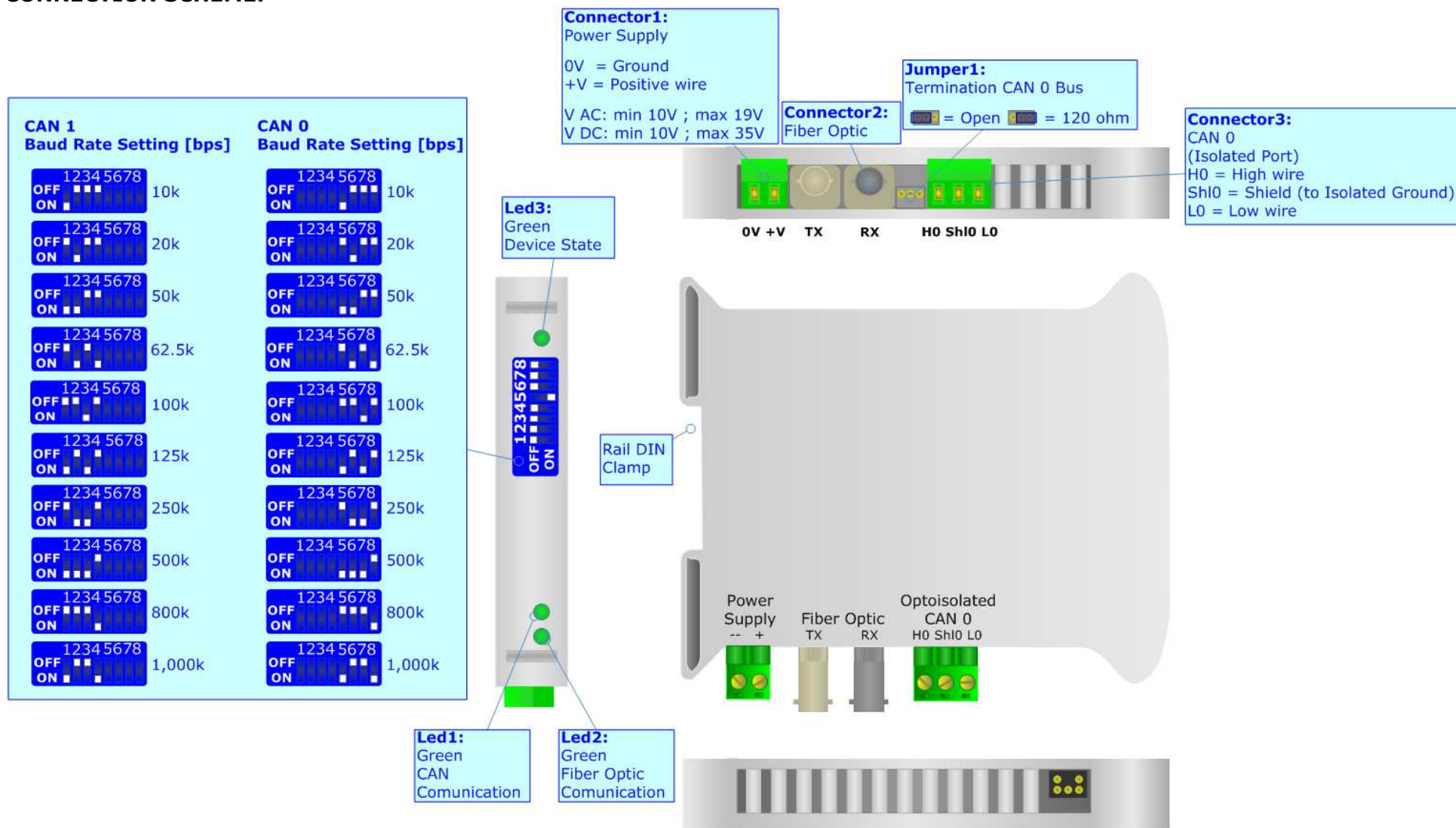


Figure 4: Connection scheme for HD67117/180/181/182F

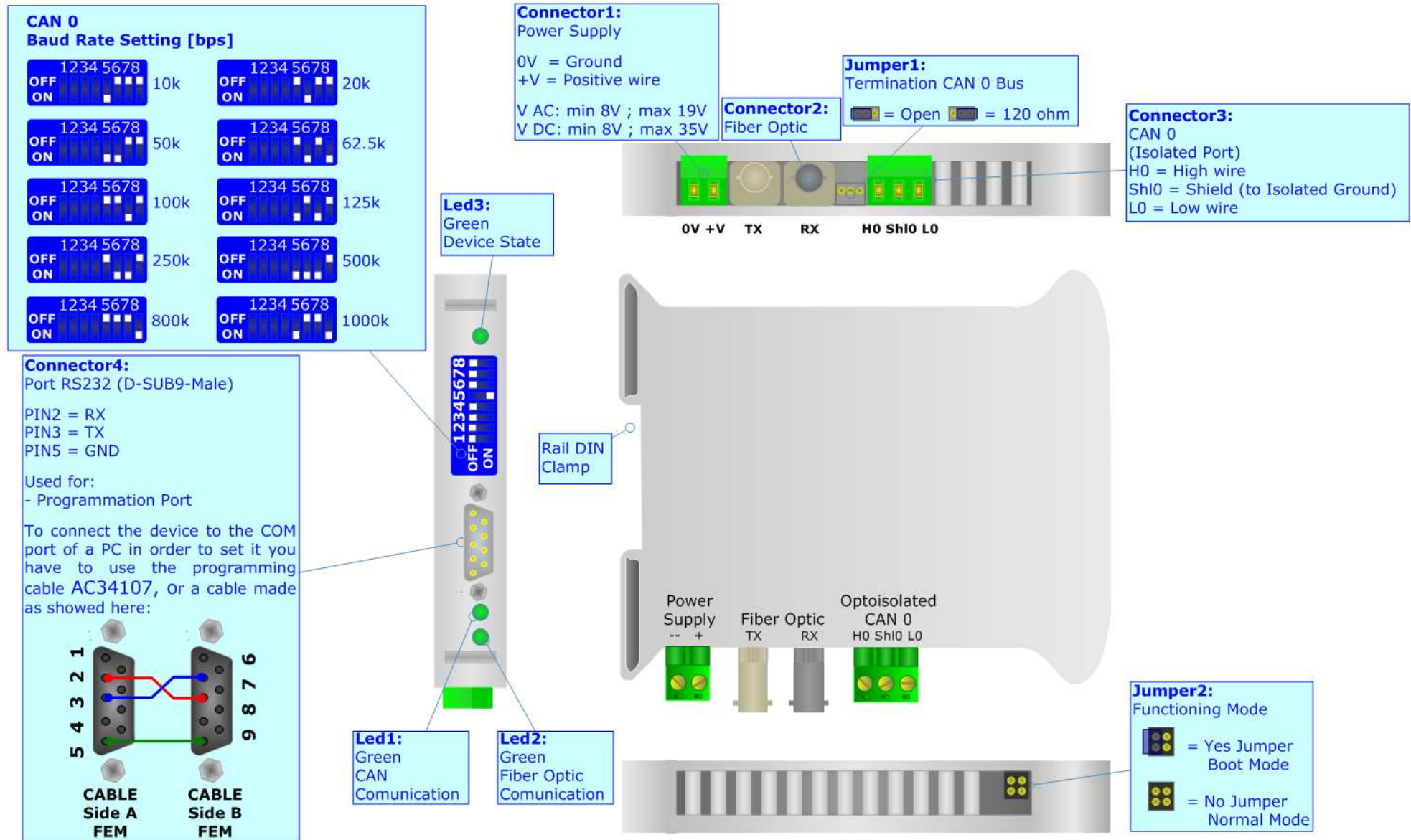


Figure 5: Connection scheme for HD67117/180/181/182FSX

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
Series F	10V	19V	10V	35V
Series FSX	8V	19V	8V	35V

Consumption at 24V DC:

Device	Consumption [W/VA]
Series F	4
Series FSX	

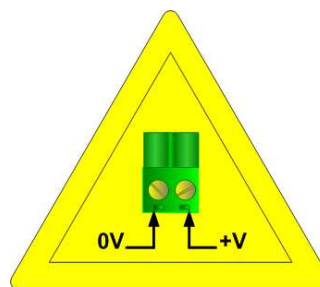
Connector1:
Power Supply
0V = Ground
+V = Positive wire
V AC: min 8V ; max 19V
V DC: min 8V ; max 35V



Connector1:
Power Supply
0V = Ground
+V = Positive wire
V AC: min 10V ; max 19V
V DC: min 10V ; max 35V



Caution: Not reverse the polarity power



HD671xxF/FSX

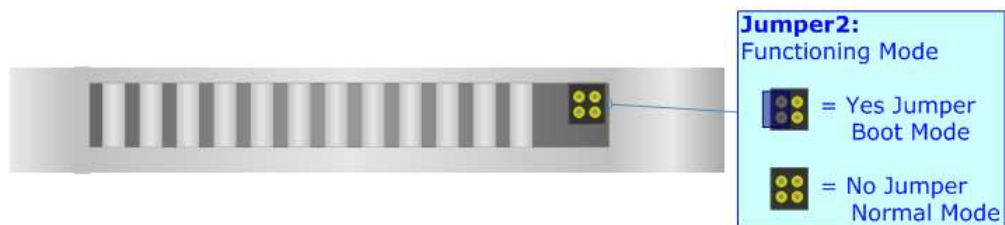
FUNCTION MODES:

The FSX Series has got two functions mode depending of the position of the 'Jumper2':

- The first, without Jumper, is used for the normal working of the device.
- The second, with Jumper, is used for upload the Firmware.

For the operations to follow for the updating (see 'UPDATING FIRMWARE' section).

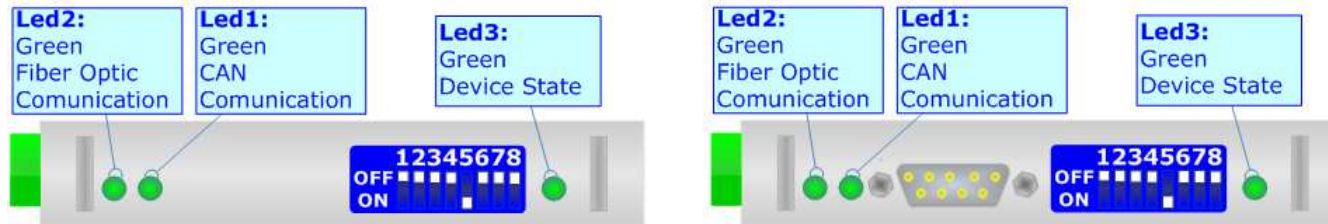
According to the functioning mode, the LEDs will have specifics functions (see 'LEDS' section).



LEDS:

The devices has got three green 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: CAN Comunication	Change State when arrive a CAN message	Off
2: Fiber Optic Comunication	Change state when arrive a Fiber Optic message	Off
3: Device State	Slow flashing	Fast flashing



UPDATING FIRMWARE:

For the Series FSX it is possible to update the Firmware of the device. For doing that, it is necessary to download from this link, www.adfweb.com/download/filefold/SW67SFX.zip, the program, install it and follow these instructions:

- Turn off the Device;
- Connect the Null Modem Cable from your PC to the Gateway;
- Insert the Boot Jumper (For more info see Fig. 5);
- Select the COM port and press the "Init" button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (For more info see Fig. 5);
- Press the "Update Firmware" button;
- Wait than the progress bar is full and appears "Progress: Update Done" and then turn off the device;
- Disconnect the Boot jumper;
- Disconnect the RS232 Cable;
- Turn on the device.

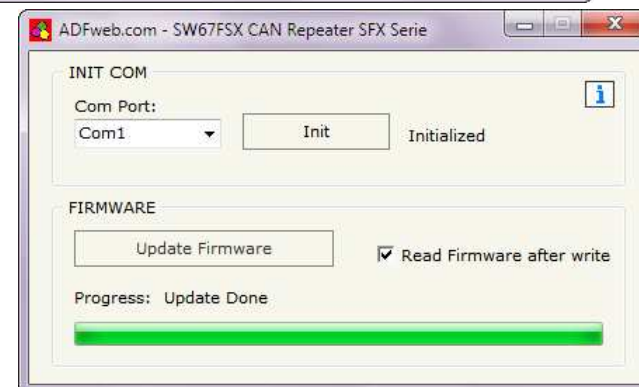
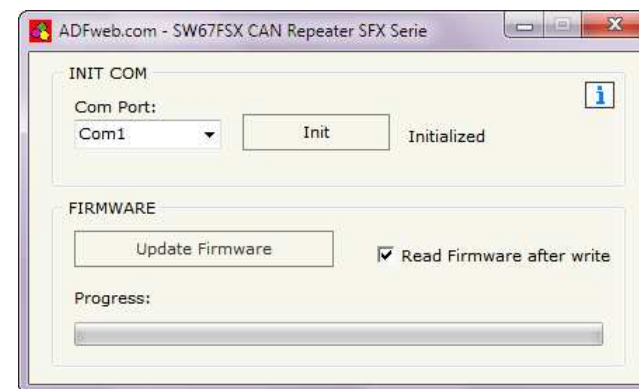
At this point the firmware on the device is correctly updated.



Warning:

If the "Progress: Update Done" doesn't appears when you try to do the Update before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- Try with another PC;
- Try to restart the PC.



CAN BUS CABLE CHARACTERISTICS:

DC parameter:	Impedance	70 ohm/m
AC parameters:	Impedance	120 ohm/m
	Delay	5 ns/m
Fiber optic:	Dimensions	62.5/125µm

MECHANICAL DIMENSIONS:

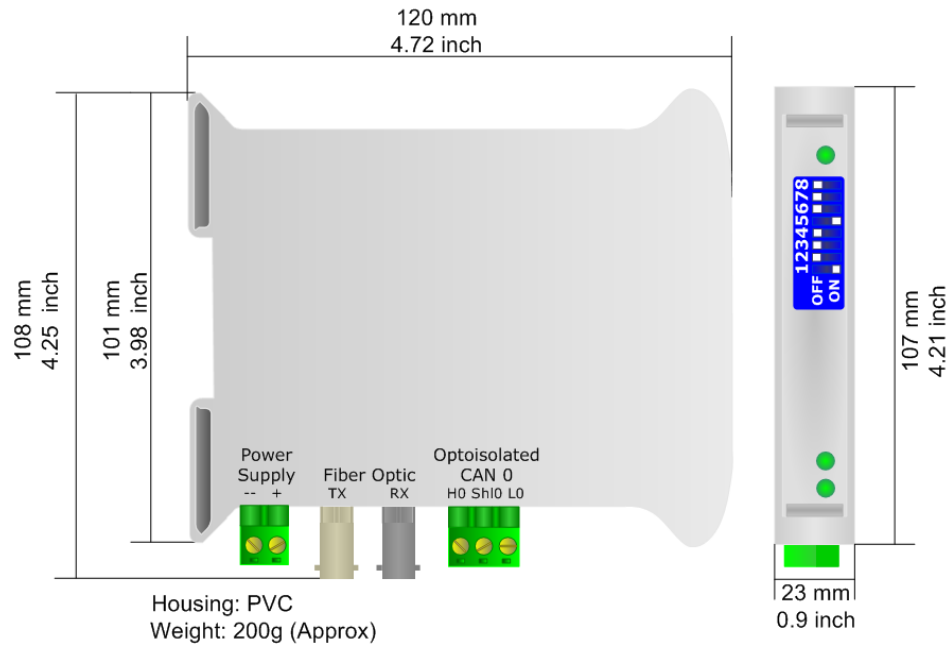


Figure 6: Mechanical Dimensions Scheme for HD67XXXF

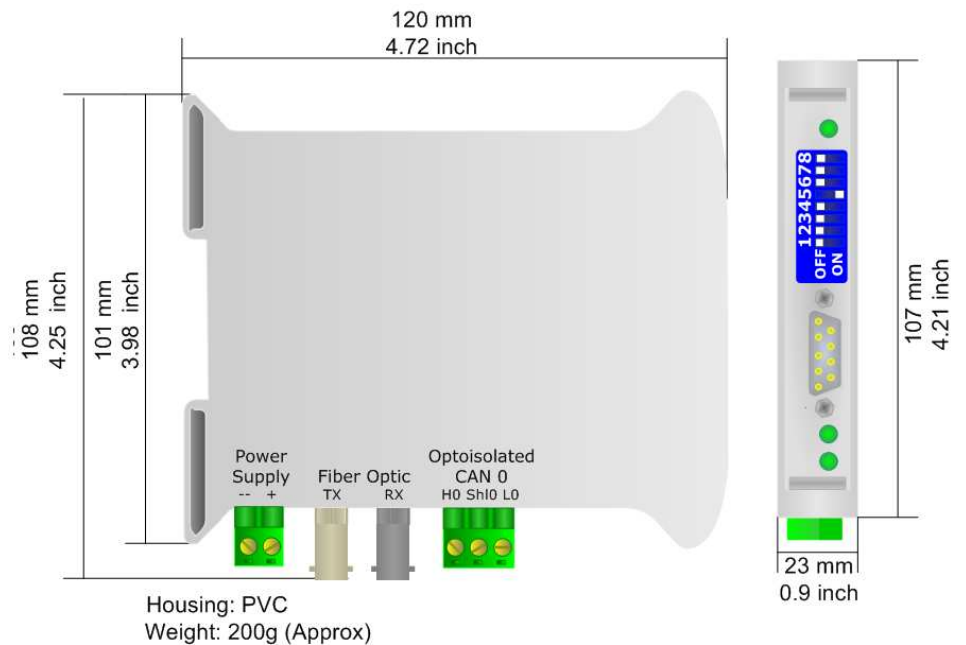


Figure 7: Mechanical Dimensions Scheme for HD67XXXFSX

ORDER CODE: (*)

HD67117F - CANopen to Optic Fibres Repeater
HD67117FSX

HD67180F - DeviceNet to Optic Fibres Repeater
HD67180FSX

HD67181F - CAN to Optic Fibres Repeater for generic use (Standard and Extended Protocol)
HD67181FSX

HD67182F - J1939 to Optic Fibres Repeater
HD67182FSX

(*) Regarding "F" and "FS" series difference, see the above "Baud Rate Table" (Fig. 2 and Fig. 3).

ACCESSORIES:

AC34001 - Power Supply 220/12V AC 50/60Hz

AC34002 - Power Supply 110/12V AC 50/60Hz

AC34021 - Patch Cable Optic Fibres ST/ST 2Mts

AC34022 - Patch Cable Optic Fibres ST/ST 10Mts

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	www.adfweb.com?Product=HD67117
HD67180	DeviceNet Repeater	www.adfweb.com?Product=HD67180
HD67181	CAN Repeater for generic use (Standard and Extended Protocol)	www.adfweb.com?Product=HD67181
HD67182	J1939 Repeater	www.adfweb.com?Product=HD67182
HD67221	Gateway/Bridge Filtrate CAN / CAN	www.adfweb.com?Product=HD67221
HD67316	CAN, CANopen, J1939, DeviceNet, NMEA2000 Analyzer	www.adfweb.com?Product=HD67316