![ADFweb logo] **Industrial Electronic Devices**

User Manual

Revision 3.002
English

Optic Fiber – Repeater – Extender bus line

(Order Code: HD67117FS
　　　　　　HD67180FS
　　　　　　HD67181FS
　　　　　　HD67182FS)

HD671xxFS

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:
-40°C / 85°C (-40°F / 185°F)

Similiar Products

Benefits

All Repeaters

See also the following links:

www.adfweb.com?Product=HD67117FS   (For CANopen)
www.adfweb.com?Product=HD67180FS   (For DeviceNet)
www.adfweb.com?Product=HD67181FS   (For CAN 2.0A & 2.0B)
www.adfweb.com?Product=HD67182FS   (For J1939)
www.adfweb.com?Product=HD67221F   (Filtrate CAN)
www.adfweb.com?Product=HD67221FS   (Filtrate CAN)

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   (Filtrate 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

Industrial Electronic Devices

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
1.002	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
3.002	15/02/2013	Nt	All	Added new chapters

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Industrial Electronic Devices

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.

INTRODUCTION:

The "HD67XXXFS" series are CAN Bus devices designed to extend high CAN bus signals onto 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 1Mbs;
- Possible different baud rate setting (into different branches)
- Temperature range -40°C to 85°C;
- Mountable on Rail Din;
- Dimensions 120x23x107 (D x W x H);
- Weight 200g.

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LINKS AND USE:

PRODUCTS	FEATURES	PRODUCT WEB PAGE	PRICE LINK
HD67117FS	**Specific for CanOpen Fixed Fiber Optic boud Rate**	http://www.adfweb.com/?Product=HD67117FS	http://www.adfweb.com/?Price=HD67117FS
HD67180FS	**Specific for DeviceNet Fixed Fiber Optic boud Rate**	http://www.adfweb.com/?Product=HD67180FS	http://www.adfweb.com/?Price=HD67180FS
HD67181FS	**For Generic Can Fixed Fiber Optic boud Rate**	http://www.adfweb.com/?Product=HD67181FS	http://www.adfweb.com/?Price=HD67181FS
HD67182FS	**Specific for J1939 Fixed Fiber Optic boud Rate**	http://www.adfweb.com/?Product=HD67182FS	http://www.adfweb.com/?Price=HD67182FS

FUNCTION SCHEME:
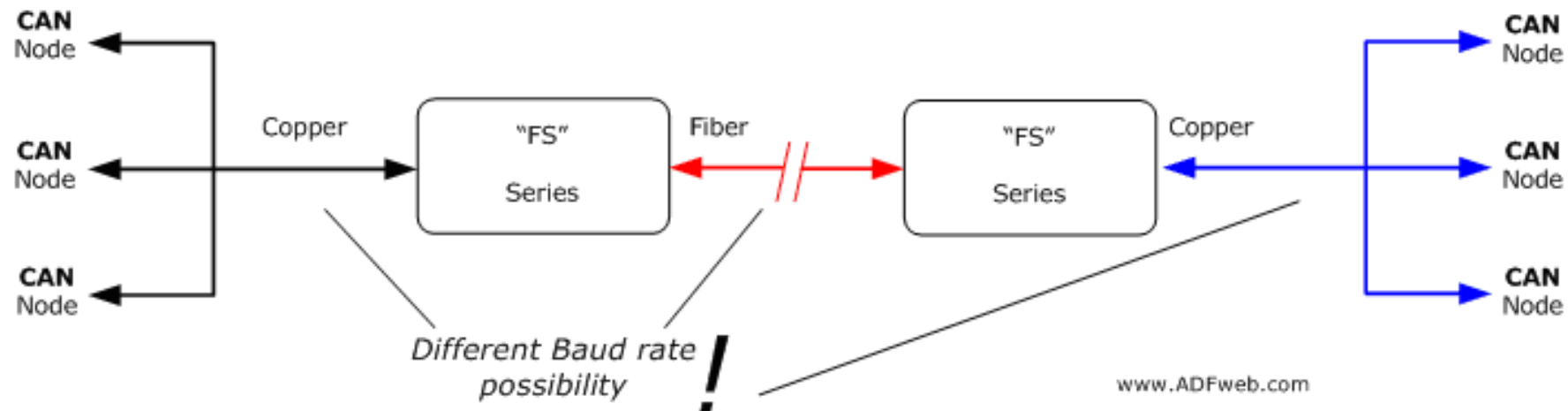

Figure 1: Functional scheme

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"FS" SERIES

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

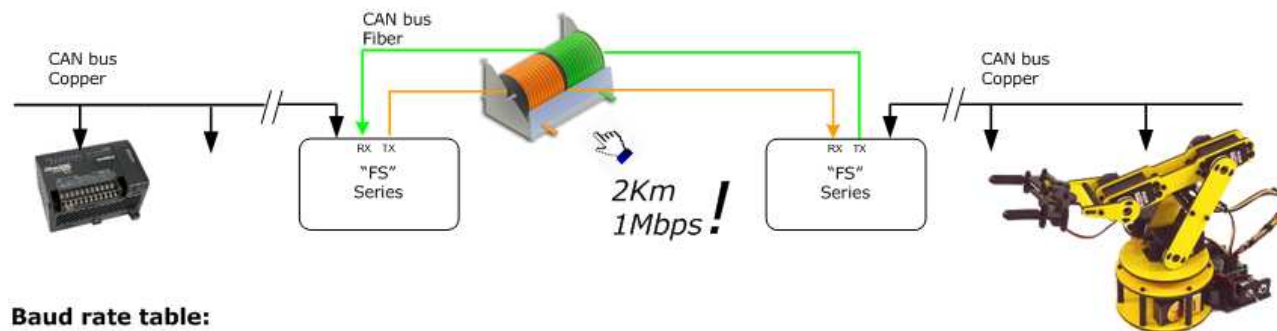**HD67117FS** CANopen to Fiber Optic Repeater;
HD67180FS DeviceNet to Fiber Optic Repeater;
HD67181FS CAN to Fiber Optic Repeater for generic use (Standard and Extended Protocol);
HD67182FS J1939 to Fiber Optic Repeater.

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

www.ADFweb.com

(*) Fiber optic 62.5/125μm

Figure 2: Function scheme and Baud rate table for "FS" series

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SET SWITCH BAUD RATE FOR "FS" 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

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CONNECTION SCHEME:

CAN 0 Baud Rate Setting [bps]
- 10k
- 20k
- 50k
- 62.5k
- 100k
- 125k
- 250k
- 500k
- 800k
- 1000k

Connector1:
Power Supply

0V = Ground
+V = Positive wire

V AC: min 10V ; max 19V
V DC: min 10V ; max 35V

Connector2:
Fiber Optic

Jumper1:
Termination CAN 0 Bus
= Open   = 120 ohm

Connector3:
CAN 0
(Isolated Port)
H0 = High wire
Shl0 = Shield (to Isolated Ground)
L0 = Low wire

0V +V   TX   RX   H0 Shl0 L0

Led3:
Green
Device State

Connector4:
Port RS232 (D-SUB9-Male)

PIN2 = RX
PIN3 = TX
PIN5 = GND

Used for:
- Programmation Port

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:

CABLE Side A FEM
CABLE Side B FEM

Rail DIN Clamp

Power Supply -- +
Fiber Optic TX RX
Optoisolated CAN 0 H0 Shl0 L0

Led1:
Green
CAN
Comunication

Led2:
Green
Fiber Optic
Comunication

Jumper2:
Functioning Mode
= Yes Jumper Boot Mode
= No Jumper Normal Mode

Figure 3: Connection scheme for HD67117/180/181/182FS

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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.

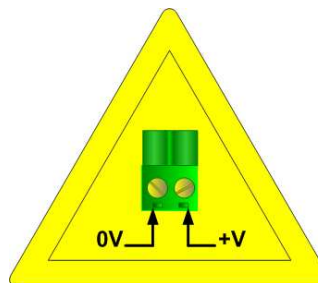|	VAC 〜		VDC ⎓	
	Vmin	**Vmax**	**Vmin**	**Vmax**
Series FS	**10V**	**19V**	**10V**	**35V**

Consumption at 24V DC:

Device	Consumption [W/VA]
Series FS	4

Connector1:
Power Supply

0V = Ground
+V = Positive wire

V AC: min 10V ; max 19V
V DC: min 10V ; max 35V

0V +V
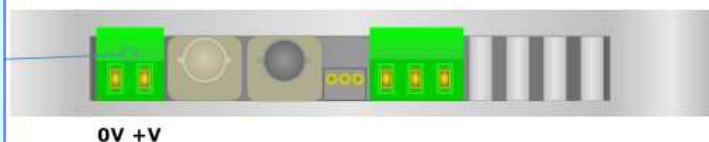
Caution: Not reverse the polarity power

0V _____ _____+V

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FUNCTION MODES:

The FS 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).

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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	Fast flashing
2: Fiber Optic Comunication	Change state when arrive a Fiber Optic message	Off
3: Device State	Slow flashing	Off

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UPDATING FIRMWARE:

For the Series FS it is possible to update the Firmware of the device. For doing that, it is necessary to download from these links:
-   www.adfweb.com/download/filefold/US67117FS.zip for HD67117FS;
-   www.adfweb.com/download/filefold/US67180FS.zip for HD67180FS;
-   www.adfweb.com/download/filefold/US67181FS.zip for HD67181FS;
-   www.adfweb.com/download/filefold/US67182FS.zip for HD67182FS,
the program, extract it, launch the "FlashWrite.exe" and follow these instructions:

+ Turn off the Device;
+ Connect the Null Modem Cable form your PC to the Gateway;
+ Insert the Boot Jumper (For more info see Fig. 3);
+ Select the COM port and press the "**File Open**" button;
+ Select the file;
+ Turn on the device;
+ Check the BOOT Led. It must blink quickly (For more info see Fig. 3);
+ Press the "**Download**" button;
+ Wait than the progress bar is full and appears "Done" popup; and then turn off the device;
+ Disconnect the Boot jumper;
+ Disconnect the RS232 Cable;
+ Turn on the device.
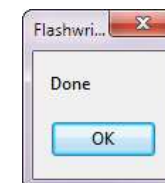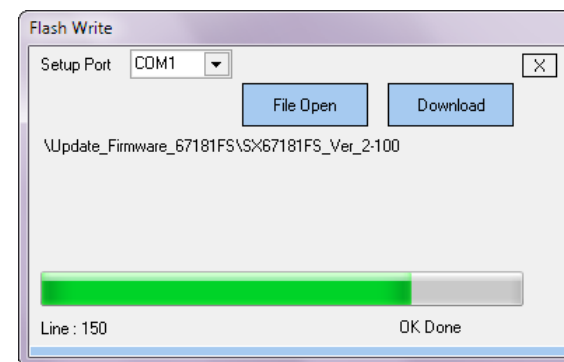
At this point the firmware on the device is correctly updated.

⚠️ Warning:
    If the "Done" popup 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:
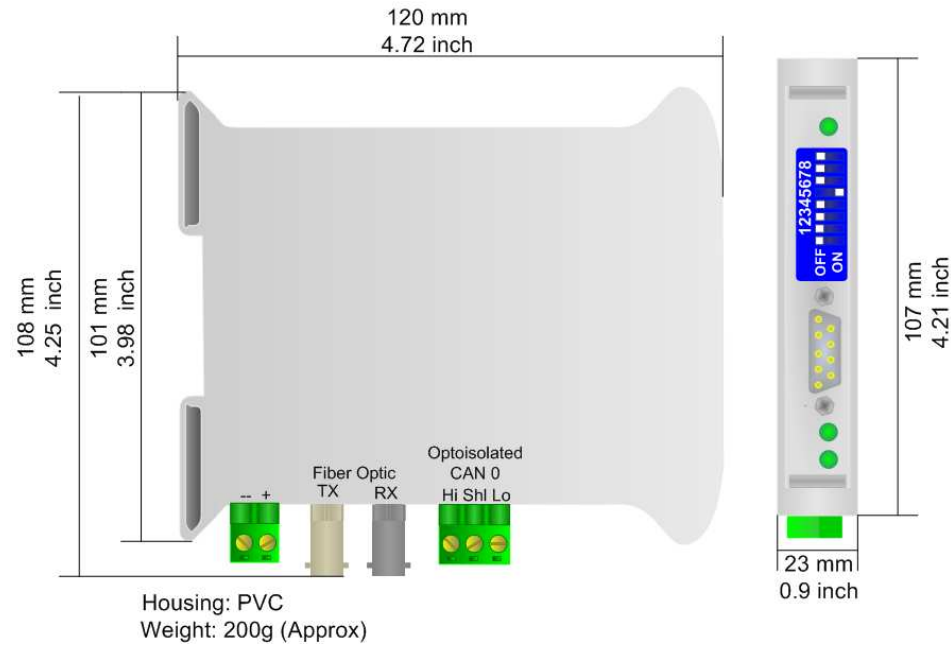
Figure 4: Mechanical Dimensions Scheme for HD67XXXFS

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ORDER CODE:

HD67117FS   **-**   CANopen / Optic Fiber - Repeater – Extender bus line

HD67180FS   **-**   DeviceNet / Optic Fiber - Repeater – Extender bus line

HD67181FS   **-**   CAN / Optic Fiber - Repeater – Extender bus line

HD67182FS   **-**   J1939 and NMEA 2000 / Optic Fiber - Repeater – Extender bus line

ACCESSORIES:

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

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

AC34021   -   Patch Cable Optic Fibres ST/ST 2Mts

AC34022   -   Patch Cable Optic Fibres ST/ST 10Mts

DISCLAIMER

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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.

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