

User Manual

Revision 1.005
English

J1939 / PROFIBUS Slave - Converter

(Order Code: HD67553)

for Website information:

www.adfweb.com?Product=HD67553

for Price information:

www.adfweb.com?Price=HD67553

Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Low cost
- ▶ PROFIBUS Baudrate up to 12M
- ▶ Wide supply input range
- ▶ Isolation between two buses
- ▶ Industrial temperature range:
-40°C / 85°C (-40°F / 185°F)



HD67553

For others Gateways / Bridges:

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=HD67504 (Modbus TCP Master)

www.adfweb.com?Product=HD67505 (Modbus TCP Slave)

For others Gateways / Bridges:

For **CAN bus 2.0A** and/or **CAN bus 2.0B** to **Modbus**

See also the following links:

www.adfweb.com?Product=HD67011 (Modbus RTU Slave)

www.adfweb.com?Product=HD67012 (Modbus RTU Master)

www.adfweb.com?Product=HD67514 (Modbus TCP Slave)

www.adfweb.com?Product=HD67515 (Modbus TCP Master)

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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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	25/08/2008	FI	All	First release version
1.001	15/12/2008	FI	All	Software changed
1.002	08/07/2009	MI/Dp	All	Revision
1.003	24/06/2010	FT	All	Revision
1.004	14/01/2013	Nt & FI	All	Added new chapters
1.005	08/01/2014	Ff	All	Added “On Request” Mode

WARNING:

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TRADEMARKS:

All trademarks mentioned in this document belong to their respective owners.

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

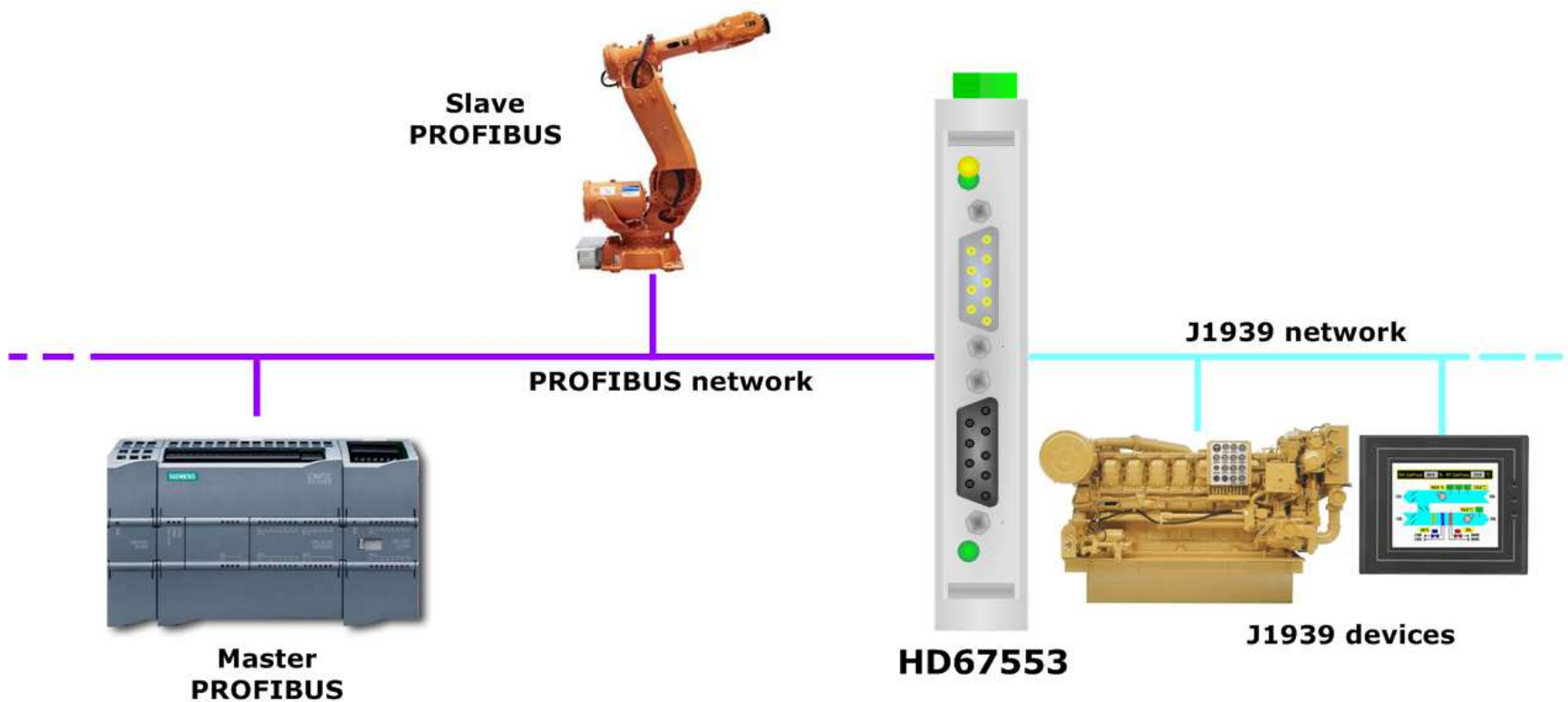
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

 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.

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

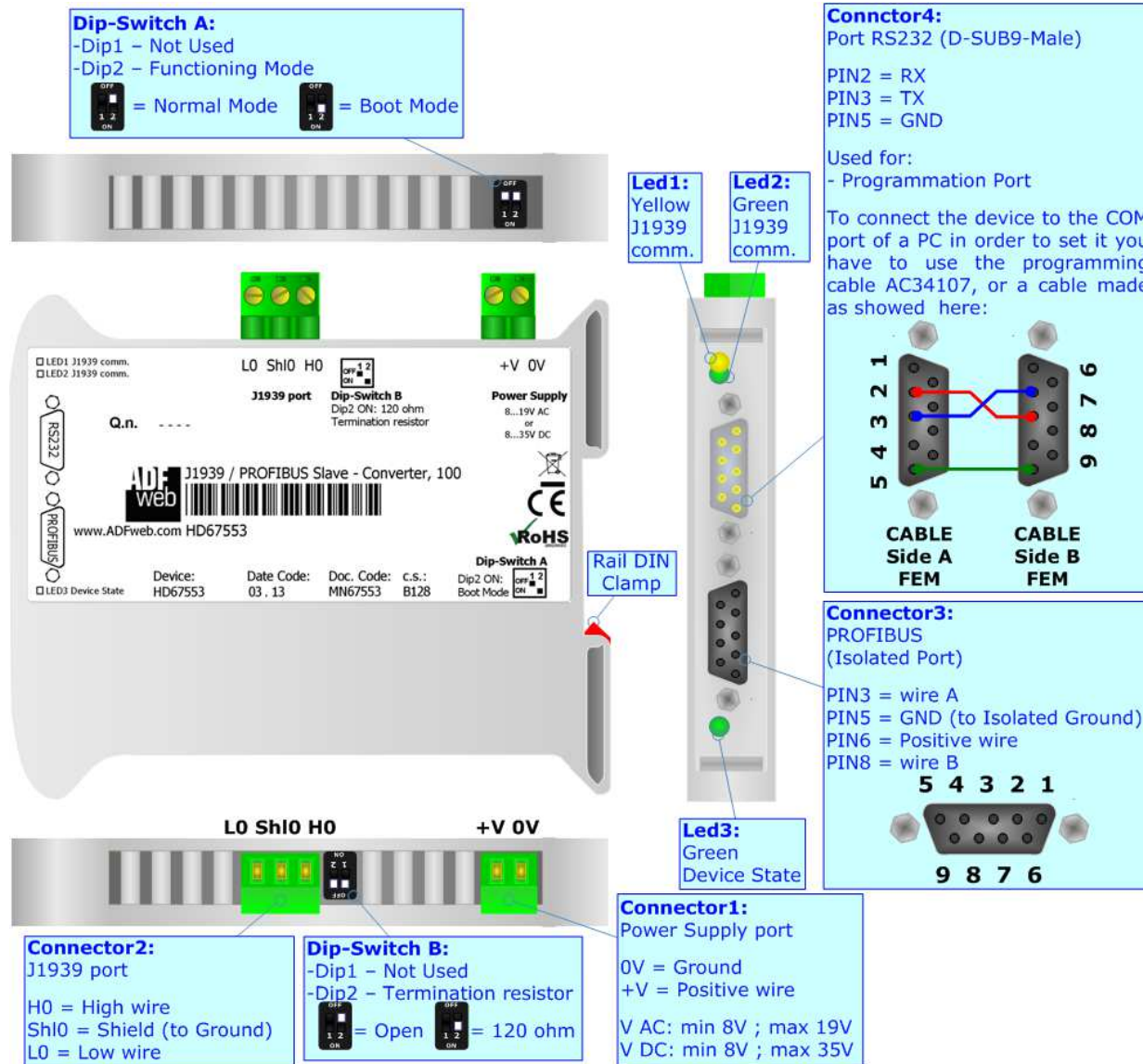


Figure 1: Connection scheme for HD67553

CHARACTERISTICS:

The Configurable J1939 / PROFIBUS Slave - Converter allows the following characteristics:

- Two-directional information between J1939 network and PROFIBUS;
- Electrical isolation between two buses;
- Up to 244 bytes in reading and 244 bytes in writing on PROFIBUS;
- Power Supply 8...19V AC or 12...35V DC;
- Mountable on 35mm Rail DIN;
- Temperature range -40°C to 85°C.



CONFIGURATION:

You need Compositor SW67553 software on your PC in order to perform the following:

- Define the parameter of the J1939;
- Define the parameter of the PROFIBUS;
- Receive J1939 frames;
- Transmit J1939 frames;
- Create a GSD File;
- Update the device.

POWER SUPPLY:

The devices can be powered at 8...19V AC and 8...35V DC. The consumption depends to the code of the device. For more details see the two tables below.

VAC 		VDC 	
Vmin	Vmax	Vmin	Vmax
8V	19V	8V	35V

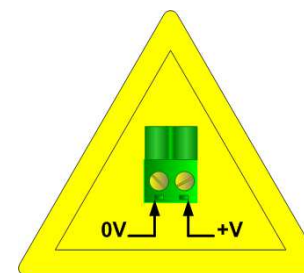
Consumption at 24V DC:

Device	Consumption [W/VA]
HD67553	3.5

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



Caution: Not reverse the polarity power



HD67553

FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Dip2 of Dip-Switch A':

- The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip2 of Dip-Switch A' at "ON" position, is used for upload the Project and/or Firmware.

For the operations to follow for the updating, see 'UPDATE DEVICE' section.

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



LEDS:

The device has got three 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: J1939 comm. (yellow)	Blinks when receive a J1939 frame not defined in the Compositor	Not used
2: J1939 comm. (green)	Blinks when receive a J1939 frame defined in the Compositor	Not used
3: Device State (green)	Blinks slowly (~1Hz)	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress

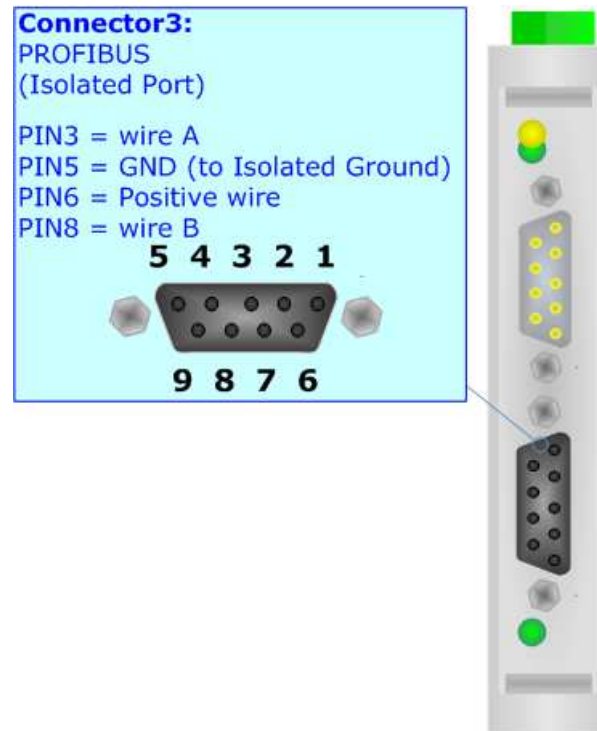


PROFIBUS:

The PROFIBUS uses a 9-pin D-SUB connector. The pin assignment is defined like in the right figure.

Here some codes of cables:

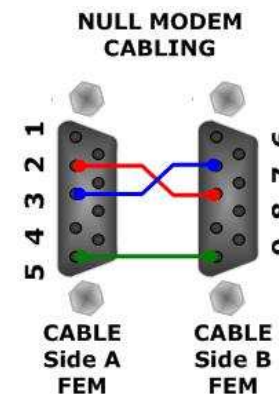
- Belden: p/n 183079A - Continuous Armor DataBus® ISA/SP-50 PROFIBUS Cable;



RS232:

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 RS232C Cable not exceed 15 meters.

The serial port is used for programming the device.



J1939:

For terminate the J1939 line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch B' is at ON position.



Cable characteristics:

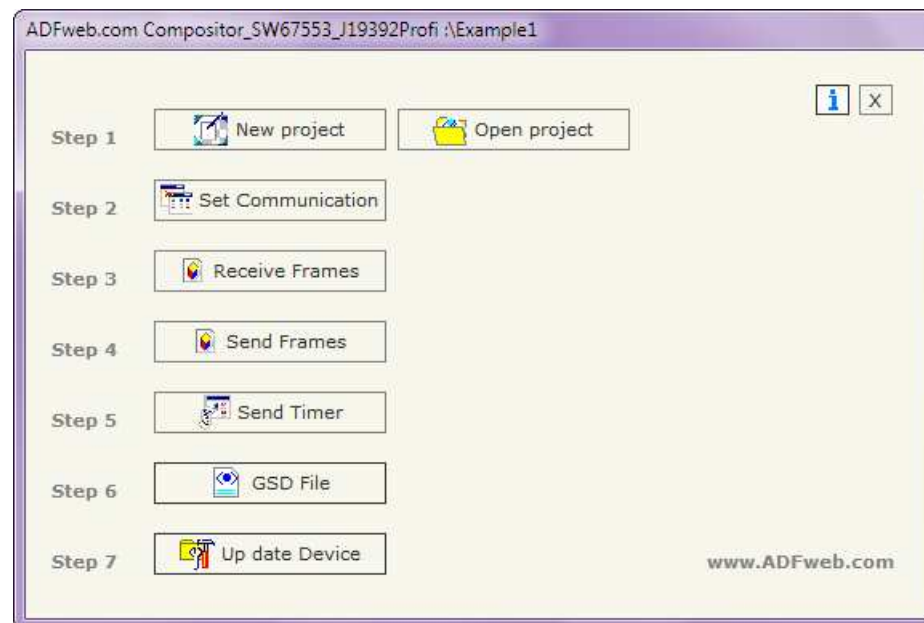
DC parameter:	Impedance	70 Ohm/m
AC parameters:	Impedance	120 Ohm/m
	Delay	5 ns/m
Length	Baud Rate [bps]	Length MAX [m]
	10 K	5000
	20 K	2500
	50 K	1000
	100 K	650
	125 K	500
	250 K	250
	500 K	100
	800 K	50
	1000 K	25

USE OF COMPOSITOR SW67553:

To configure the Converter, use the available software that runs with Windows, called SW67553. It is downloadable on the site www.adfweb.com and its operation is described in this document. (This manual is referenced to the last version of the software present on our web site). The software works with MSWindows (MS 2000, XP, Vista, Seven, 8; 32/64bit).

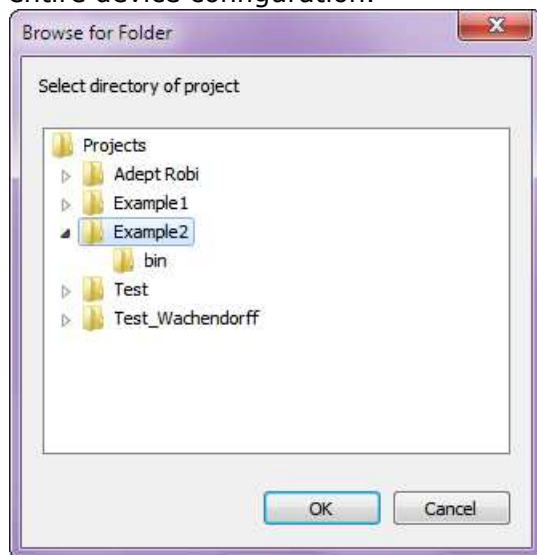
When launching the SW67553 the right window appears (Fig. 2).

Figure 2: Main window for SW67553



NEW PROJECT / OPEN PROJECT:

The “**New Project**” button creates the folder which contains the entire device configuration.



A device configuration can also be imported or exported:

- To clone the configurations of a programmable “J1939 / PROFIBUS Slave – 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**”.

SET COMMUNICATION:

This section defines the fundamental communication parameter of two Buses, J1939 and PROFIBUS.

By Pressing the **"Set Communication"** button from the main window for SW67553 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The window is divided in two sections, one for the J1939 and the other for the PROFIBUS.

The means of the fields for "J1939" are:

- In the field **"Baud Rate"** the velocity of the J1939 bus is defined;
- If the field **"Send Frame on Data Change"** is checked, the frames are sent when the data are changed; otherwise if the field **"Send Frame Every xx ms"** is checked you have to insert a value in the field and then the frames defined in the "Send Frames" table are sent every xx ms; otherwise if the field **"Decide for each Frames"** is checked, is possible to set the timing on the table "Send Timer" and use these;
- In the field **"TimeOut Data"** insert a time; when this time is elapsed and the data isn't reliable, in the register you can read "FFFF". It is possible to use this function only for the "Receive Frames";
- If the field **"Enable Peer to Peer"** is checked, the gateway accepts all the ID that have the PGN inserted in the "Receive Frames" section;
- If the field **"Filter FECA"** is checked when the FECA PGN arrives the gateway puts the values in Standby. If the time, expressed in milliseconds and written at the right side of "Filter FECA", is elapsed and there aren't arrived the frames of Transport Protocol the gateway put the data of FECA into PROFIBUS array. Otherwise if the Transport Protocol arrives before the time is elapsed the gateway put his data into PROFIBUS array discarding the data of FECA. When this field is checked the values aren't updated when the FECA frame arrive but there is an offset of xx ms. You can use this function if there is only one J1939 device in the network.

The means of the fields for "PROFIBUS" are:

- In the field **"ID Dev."** the address for the PROFIBUS side is defined;
- If the field **"Module for every J1939 Frame"** is checked, when you create the "GSD File" every J1939 Frame is inserted in a Module, otherwise if this field is not checked a Module contains up to 64 byte;
- If the field **"Send J1939 Frames with PROFIBUS"** is checked, is possible to send the J1939 frames asynchronously by using PROFIBUS data (see "SEND J1939 FRAMES WITH PROFIBUS" section).

The screenshot shows the "SET COMMUNICATION" dialog box. It is titled "SET COMMUNICATION" and has a purple header. The dialog is divided into two main sections: "J1939" and "PROFIBUS".

J1939 Section:

- Baud rate:** 250K (dropdown menu)
- CAN Type:**
 - CAN 2.0A 11Bit
 - CAN 2.0B 29Bit
- Send Data:**
 - Send Frame on Data Change
 - Send Frame Every 1000 ms
 - Decide For Each Frames
- TimeOut DATA:**
 - TimeOut Data: 5 s
- Peer to Peer:**
 - Enable Peer to Peer
 - Filter FECA 50 ms

PROFIBUS Section:

- ID Dev.:** 10
- Baud rate:** Auto Baudrate (dropdown menu)
- Module for every J1939 Frame
- Send J1939 Frames with PROFIBUS

At the bottom of the dialog, there are two buttons: "OK" (with a green checkmark) and "Cancel" (with a red X).

Figure 3: "Set Communication" window

RECEIVE FRAMES:

By pressing the "Receive Frames" button from the main window for SW67553 (Fig. 2) the window "Receive Frames" appears (Fig. 4).

The data of the columns have the following meanings:

- In the field "Data Page" insert the data page, the value is 0 or 1 (usually is 0);
- In the field "PGN" insert the PGN of the data you would like to read from PROFIBUS to J1939 (it is an identifier);
- In the field "Source Address" insert the address of the device that sends the frame;
- If the field "Transport Protocol" is checked the frame use transport protocol functions;
- In the field "StartByte" insert the byte which you would start read, this field is enable only when the field multi frame is checked;
- In the field "N° Byte" insert the number of byte you would read, for example your start byte is 20 an N°byte is 10, you can read the byte from 20 to 30.
- If the field "Cancel Data" is checked, the data in the frame will be erased after the expiration of the "TimeOut Data";
- If the field "On Request" is checked, the PGN is received when the J1939 Request is sent: this option is used if the PGN can be only sent on request by the J1939 devices;
- In the field "Time(ms)" the delay between two J1939 requests is defined;
- In the field "Mnemonic" the description for the frame is defined.

It is possible to configure a maximum of 30 frames in the "Receive Frames" section.

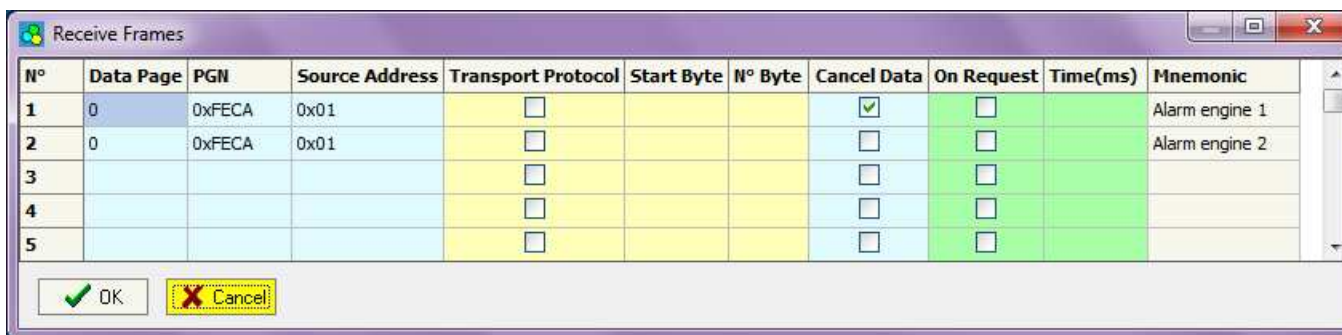


Figure 4: "Receive Frames" window

SEND FRAMES:

By pressing the **Transmit Frames** button from the main window for SW67553 (Fig. 2) the window "Transmit Frames" appears (Fig. 5).

The data of the columns have the following meanings:

- ✦ In the field **Priority** insert the priority of the Frame: in J1939 protocol it is a number among 0,1,2,3,4,5,6,7. The number "0" is the highest priority and "7" is the lowest;
- ✦ In the field **Data Page** insert the data page, the value is 0 or 1 (usually is 0);
- ✦ In the field **PGN** insert the PGN of the data you would like to write from PROFIBUS to J1939 (in J1939 protocol the PGN is an identifier);
- ✦ In the field **Source Address** insert the address of the device that sends the frame;
- ✦ In the field **Transmission Type** select when the frame is sended, or on "Data Change" or "On Timer Tx". If you select the "On Timer Tx" is necessary to compile the table "Send Timer";
- ✦ In the field **Mnemonic** the description for the frame is defined.

It is possible to configure a maximum of 30 frames in the "Send Frames" section.

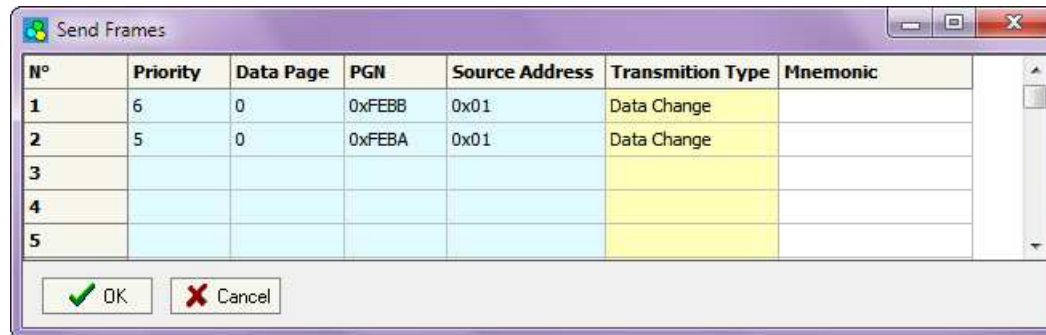


Figure 5: "Transmit Frames" window

GSD FILE:

By pressing the **GSD File** button it is possible to save the GSD file for the PROFIBUS side. With this feature you can save the configuration of the gateway of the PROFIBUS side.



Note:

When you import the .gsd file on your Master PROFIBUS you have to add all the modules that are present inside it.

SEND J1939 FRAMES WITH PROFIBUS:

By checking the field "Send J1939 Frames with PROFIBUS" at "Set Communication" section is possible to send the J1939 frames asynchronously.

In the PROFIBUS array, at the end of the standard J1939 data (8 for each frame) there are other bytes in function of the number of J1939 frames defined in the tables. Each byte can control up to 8 J1939 frames, so if you have defined 14 frames, there are 2 bytes.

Example of PROFIBUS IN array (data that a master PROFIBUS receive)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11	Byte 12	Byte 13	Byte 8	Byte 9	Byte 10	
zz	zz	zz	zz	zz	zz	zz	zz	ss	ss	ss	ss	ss	ss	ss	ss	ss	SO

Example of PROFIBUS OUT array (data that a master PROFIBUS send)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11	Byte 12	Byte 13	Byte 8	Byte 9	Byte 10	
xx	xx	xx	xx	xx	xx	xx	xx	yy	yy	yy	yy	yy	yy	yy	yy	yy	COM

When the Converter starts the SO is at 0. The PROFIBUS master has to write in the COM byte the value '1' if want that the Converter sends the first J1939 frame with the data expressed at 'xx' fields; value '2' if want that the Converter sends the second J1939 frame with the data expressed at 'yy' fields or value '3' if want that the Converter sends the both J1939 frames. After the converter have send the J1939 frame in the network, it puts the SO to the value of COM. After that, for send again J1939 frames the Master PROFIBUS has to put the corresponding bit of the frame that want to send again to '0' at COM byte, wait that the corresponding bit of SO byte becomes '0' and write again the COM bit at '1'.



Note:

If is selected the field "Module for every J1939 Frame" at "Set Communication" the bytes for control this functionality (SO and COM) are on a separate module. In the above scenario, are created 2 modules of 8 bytes and one of 1 byte for the receive and 2 modules of 8 bytes and one of 1 byte for the transmit.

UPDATE DEVICE:

By pressing the **Update Device** button it is possible to load the created Configuration into the device; and also the Firmware, if is necessary.

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 form your PC to the Converter;
- Put Dip2 of Dip-Switch A at "ON" position (see "FUNCTION MODES" section);
- Select the **COM port** and press the **Connect** button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (see "LEDS" section);
- Press the **Next** button;
- Select which operations you want to do.
- Press the **Execute update firmware** button to start the upload;
- When all the operations are "OK" turn off the device;
- Put Dip2 of Dip-Switch A at "OFF" position;
- Disconnect the RS232 cable;
- Turn on the device.

At this point the configuration/firmware on the device is correctly update.

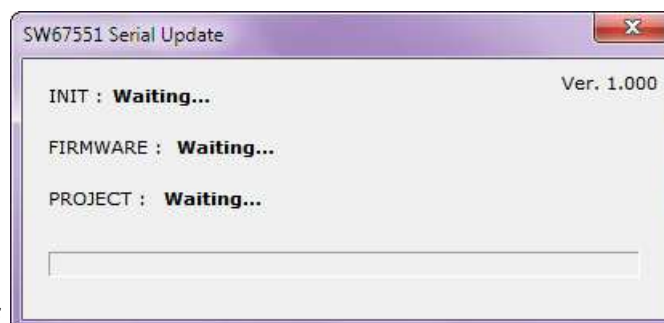
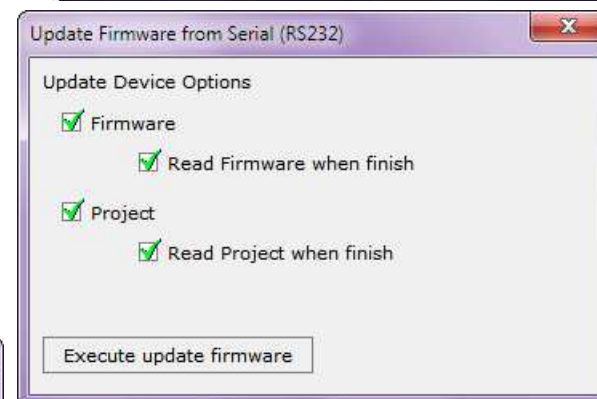





Figure 6: "Update Device" windows

 **Note:**
When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67553 device.

 **Note:**
When you receive the device, for the first time, you have to update also the Firmware in the HD67553 device.

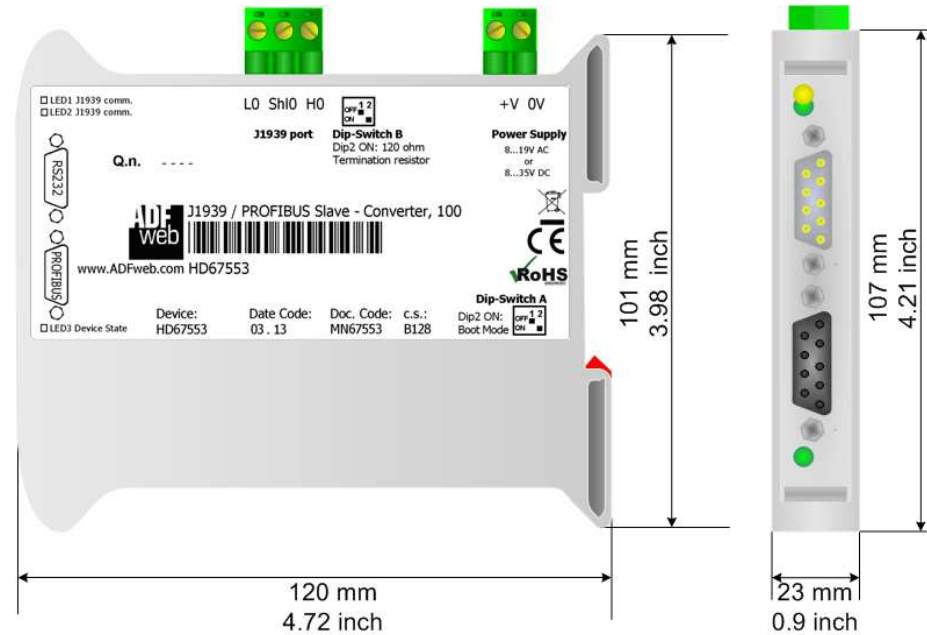
 **Warning:**
If the Fig. 7 appears when you try to do the Update before require assistance try these points:

- 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;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven or Vista or 8, make sure that you have the administrator privileges;
- Take attention at Firewall lock.



Figure 7: "Protection" window

MECHANICAL DIMENSIONS:



Housing: PVC
Weight: 200g (Approx)

Figure 8: Mechanical dimensions scheme

ORDER CODE:

Order Code: **HD67553** - J1939 / PROFIBUS Slave - 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

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
HD67121	Gateway CANopen / Canopen	www.adfweb.com?product=HD67121
HD67502	Gateway CANopen / Modbus - RTU	www.adfweb.com?product=HD67502
HD67505	Gateway CANopen / Modbus - Ethernet TCP	www.adfweb.com?product=HD67505
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