

User Manual

Revision 2.000
English

J1939 / Modbus TCP slave - Converter

(Order Code: HD67215-A1, HD67215-B2)

For Website information:

www.adfweb.com?Product=HD67215

For Price information:

www.adfweb.com?Price=HD67215-A1

www.adfweb.com?Price=HD67215-B2

Benefits and Main Features:

- ⊕ Very easy to configure
- ⊕ Triple Electrical isolation
- ⊕ Temperature range: -40°C/+85°C (-40°F/+185°F)

For others Gateways / Bridges:

J1939 to Modbus

See also the following links:

www.adfweb.com?Product=HD67212 (Modbus RTU)

CANopen to Modbus

See also the following links:

www.adfweb.com?Product=HD67001 (Modbus RTU Master)

www.adfweb.com?Product=HD67002 (Modbus RTU Slave)

www.adfweb.com?Product=HD67004 (Modbus TCP Master)

www.adfweb.com?Product=HD67005 (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=HD67014 (Modbus TCP Slave)

www.adfweb.com?Product=HD67015 (Modbus TCP Master)

Do you have your customer protocol? Then go to:

www.adfweb.com?Product=HD67003

Do you need to choose a device? Do you want help?

www.adfweb.com?Cmd=helpme



User Manual

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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.

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.013	17/01/2011	Dp	All	Software changed
1.014	12/02/2013	Nt	All	Added new chapters
1.015	14/03/2013	Dp	All	Software changed
2.000	29/07/2014	Fl	All	New hardware version

WARNING:

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ADFweb.com is not responsible for any error this manual may contain.

TRADEMARKS:

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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, legal and safety regulation are required for each individual application. 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 instruments can represent a potential hazard if they are inappropriately installed and operated by untrained personnel. These instructions refer to residual risks with the following symbol:

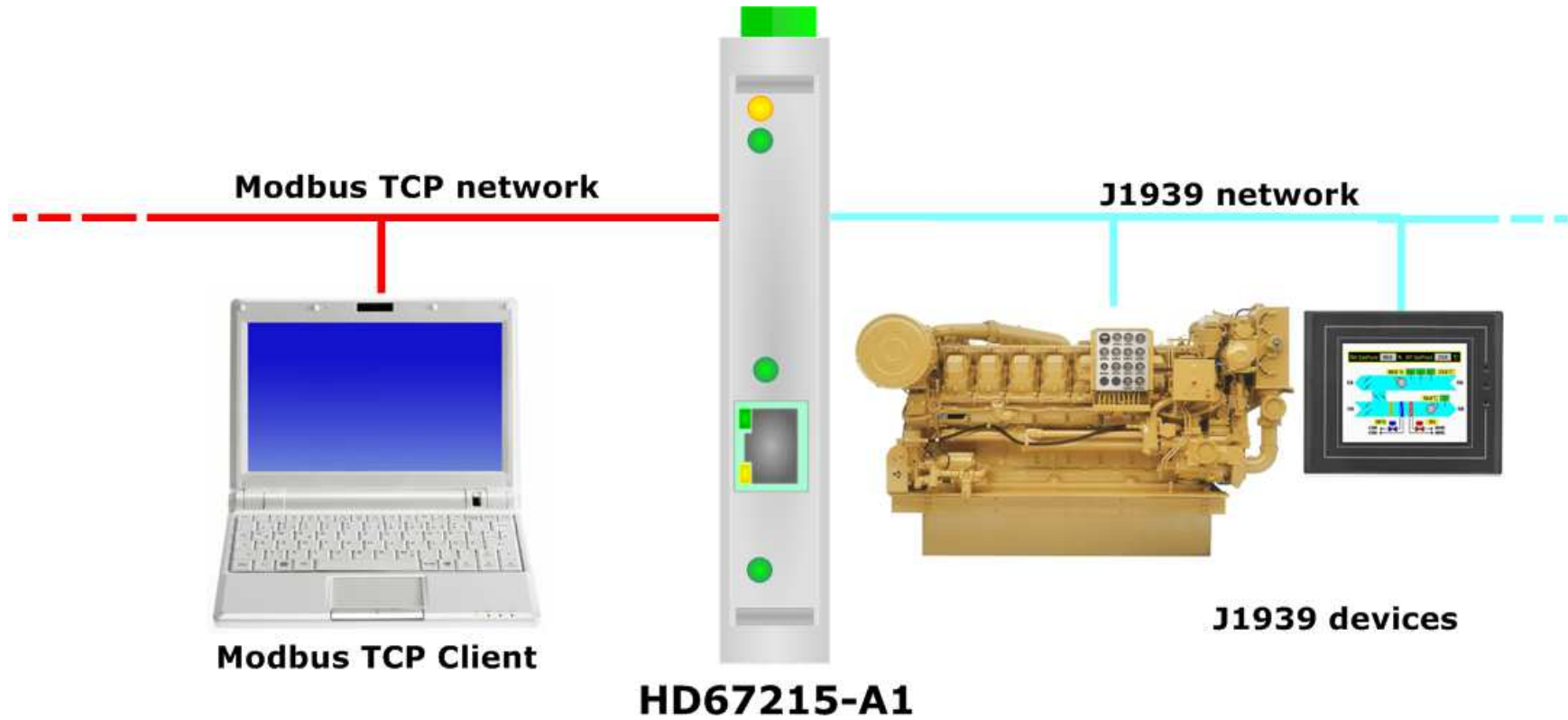


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY

The declaration is made by our company. You can send an email to support@adfweb.com or give us a call if you need it.

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

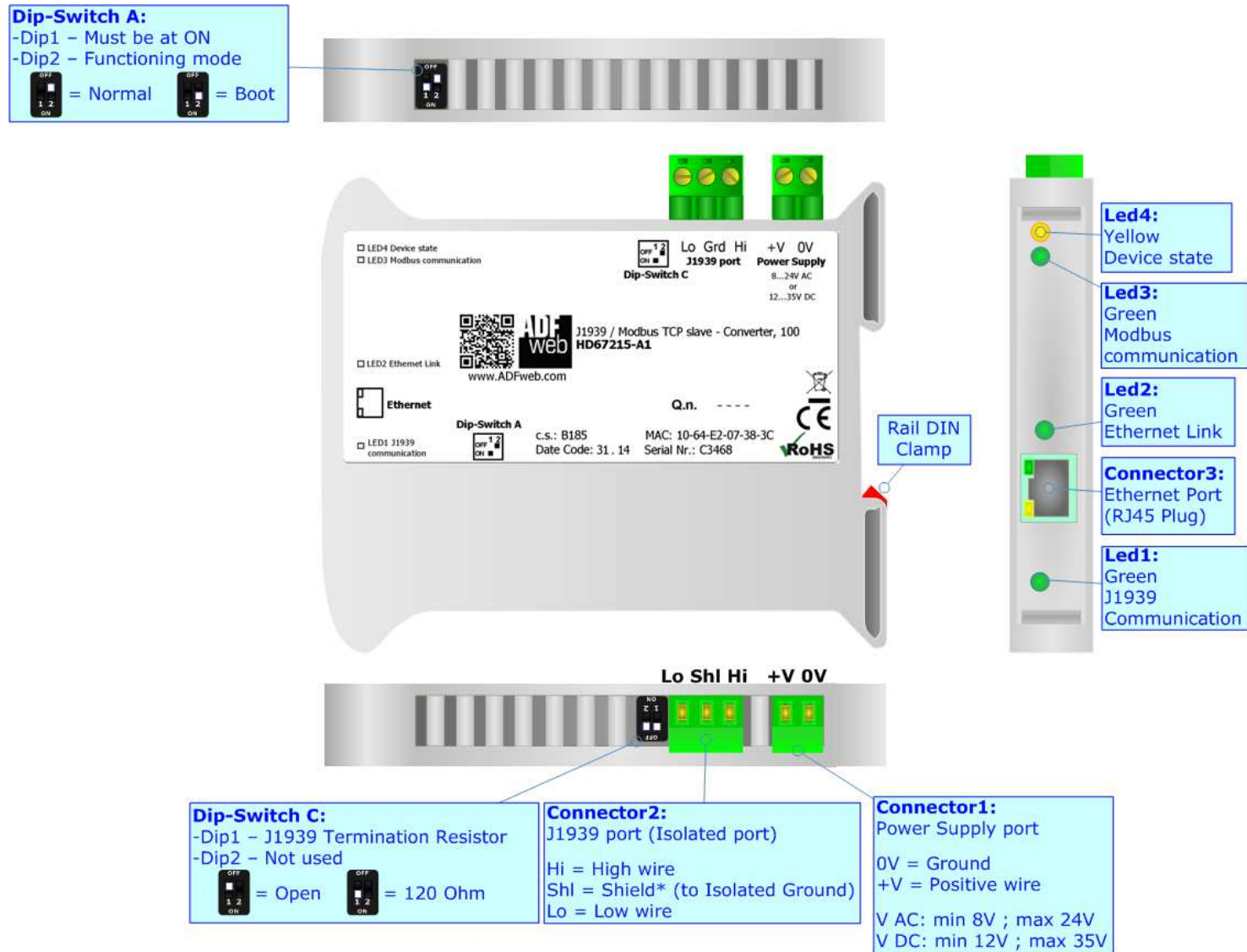


Figure 2: Connection scheme for HD67215-A1

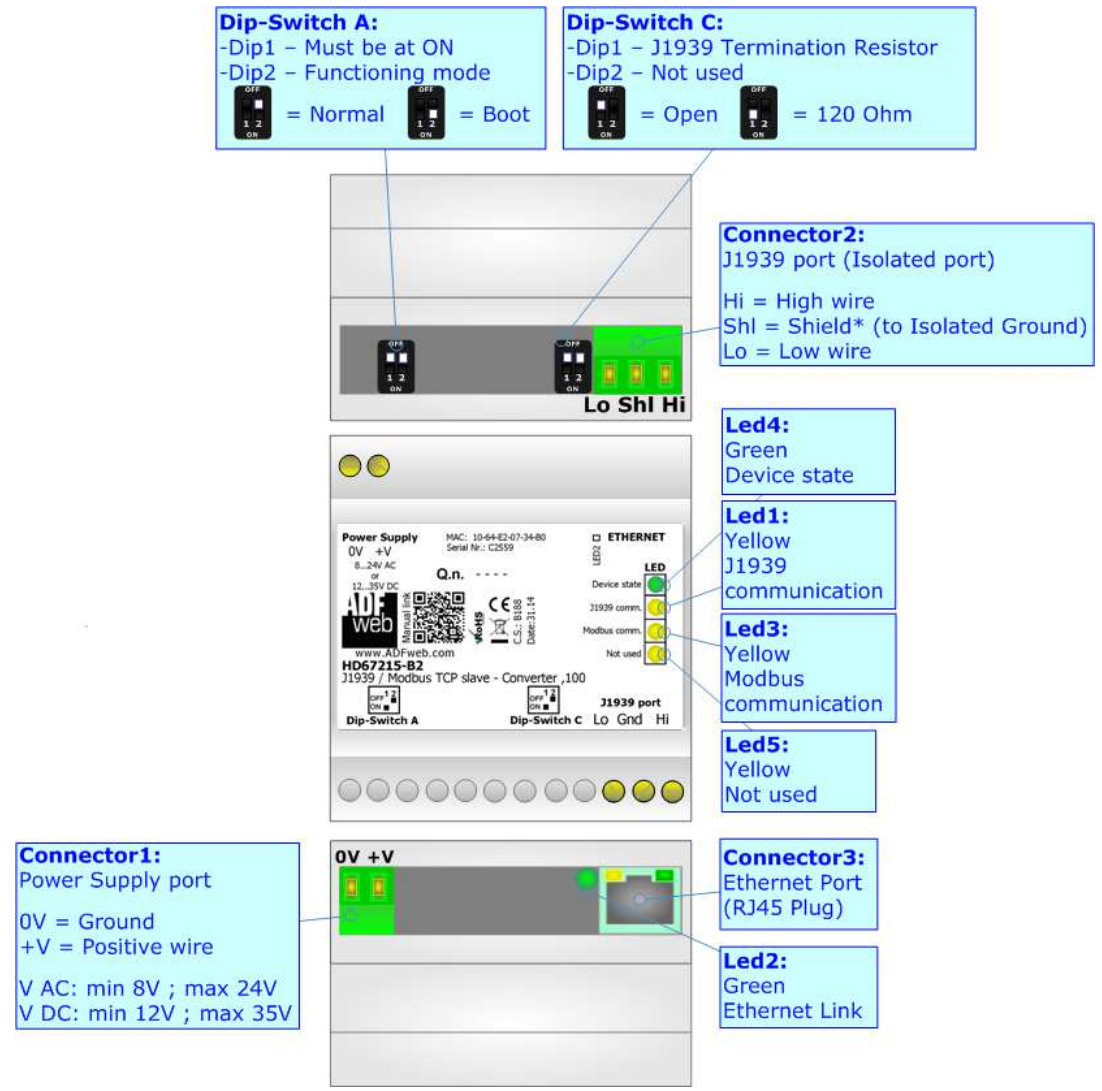


Figure 3: Connection scheme for HD67215-B2

CHARACTERISTICS:

The HD67215-A1 and HD67215-B2 are J1939 / Modbus TCP slave Converters.

They have the following characteristics:

- Triple isolation between J1939 - Power Supply, J1939 - Modbus TCP, Modbus TCP - Power Supply;
- Two-directional information between Modbus TCP bus and J1939 bus;
- Mountable on 35mm Rail DIN;
- Wide power supply input range: 8...24V AC or 12...35V DC;
- Wide temperature range: -40°C / 85°C [-40°F / +185°F].

CONFIGURATION:

You need Compositor SW67215 software on your PC in order to perform the following:

- Define the parameters of J1939 line;
- Define the parameters of Modbus TCP line;
- Define the J1939 frames that contains the data that are readable by a Modbus TCP master;
- Define the J1939 frames that are sent with the data that arrives from a Modbus TCP master;
- Update the device.

POWER SUPPLY:

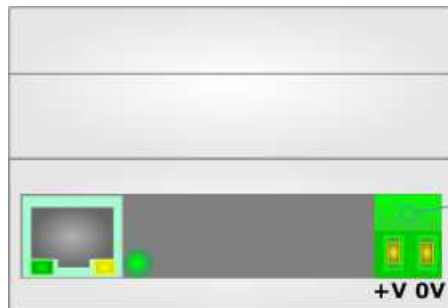
The devices can be powered at 8...24V AC and 12...35V DC. For more details see the two tables below.

VAC		VDC	
Vmin	Vmax	Vmin	Vmax
8V	24V	12V	35V

Consumption at 24V DC:

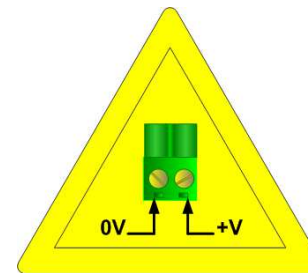
Device	Consumption [W/VA]
HD67215-A1	3.5
HD67215-B2	3.5

Connector1:
 Power Supply port
 0V = Ground
 +V = Positive wire
 V AC: min 8V ; max 24V
 V DC: min 12V ; max 35V

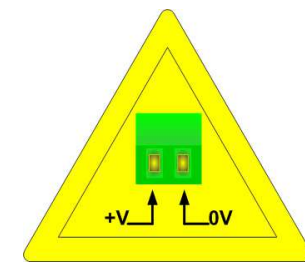


Connector1:
 Power Supply port
 0V = Ground
 +V = Positive wire
 V AC: min 8V ; max 24V
 V DC: min 12V ; max 35V

Caution: Do not reverse the polarity power



HD67215-A1



HD67215-B2

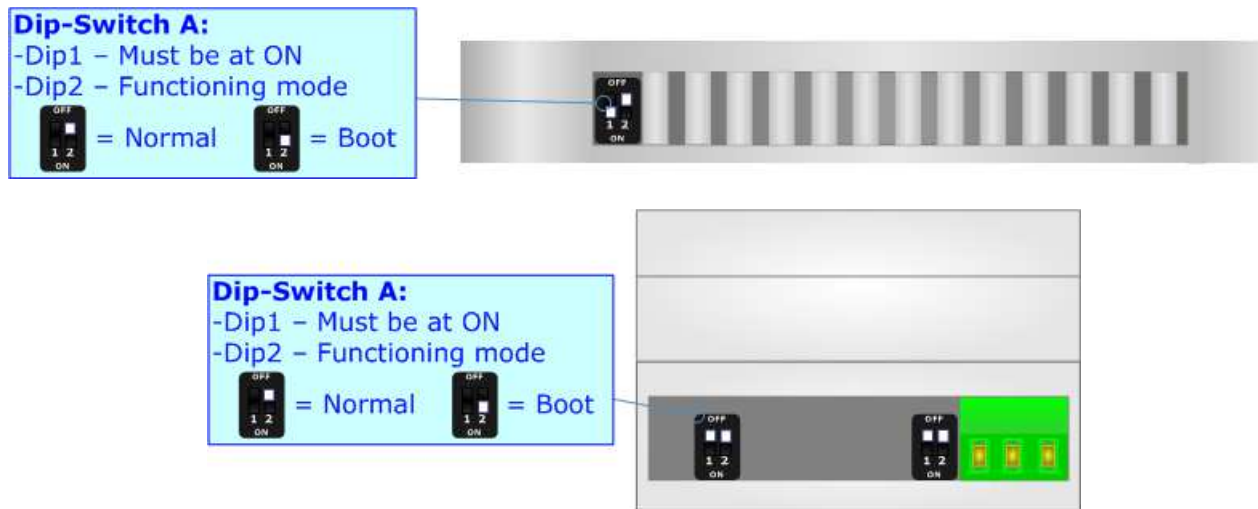
FUNCTION MODES:

The device has got two function modes depending on 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 uploading 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 specific functions, see 'LEDS' section.

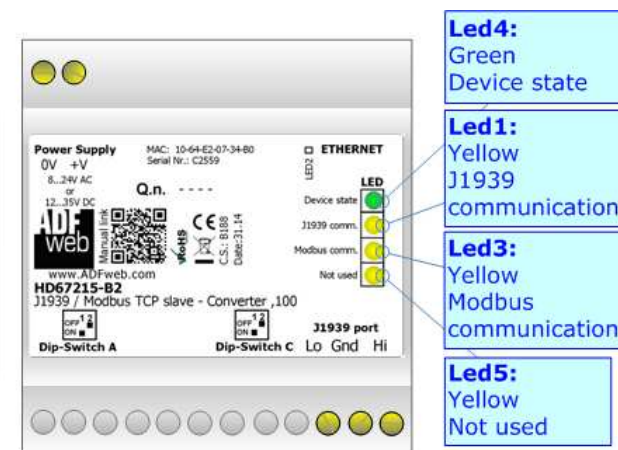
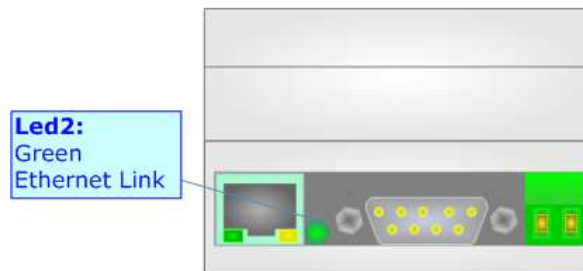
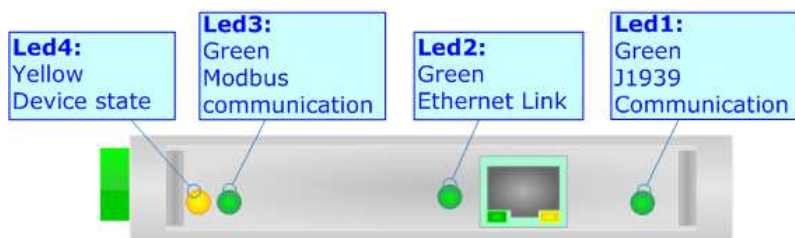


Warning: Dip1 of 'Dip-Switch A' must be at ON position to work even if the Ethernet cable is not inserted.

LEDS:

The device has got four/five LEDs that are used to give information about the functioning status. The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: J1939 communication	Blinks when arrive J1939 frames	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
2: Ethernet Link	ON: Ethernet cable connected OFF: Ethernet cable disconnected	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
3: Modbus communication	Blinks when arrive Modbus TCP requests	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
4: Device state	Blinks slowly (~1Hz)	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
5: Not used (present only on HD67215-B2)	Not used	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress



J1939:

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



Cable characteristics:

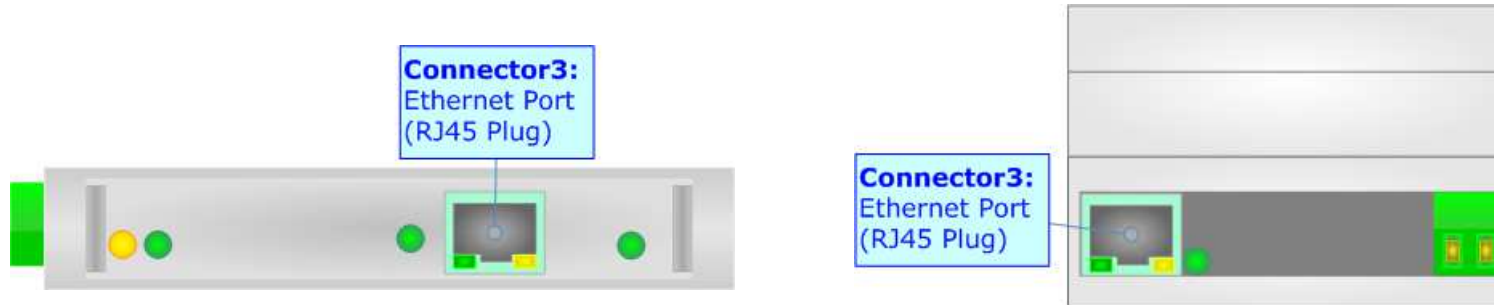
DC parameter:	Impedance	70 Ohm/m
AC parameters:	Impedance	120 Ohm/m
	Delay	5 ns/m
Length	Baud Rate [bps]	Length MAX [m]
	10 K	5000
	20 K	2500
	50 K	1000
	100 K	650
	125 K	500
	250 K	250
	500 K	100
	800 K	50
	1000 K	25

Here some codes of cable:

- Belden: p/n 3105A - 1x 22WG stranded twisted pairs conductor + foil shield + braid shield;

MODBUS TCP:


The MODBUS TCP connection must be made using Connector3 HD67215-A1/B2 with at least a Category 5E cable. The maximum length of the cable should not exceed 100m. The cable has to conform to the T568 norms relative to connections in cat.5 up to 100 Mbps. To connect the device to an Hub/Switch is recommended the use of a straight cable, to connect the device to a PC/PLC/other is recommended the use of a cross cable.



USE OF COMPOSITOR SW67215:

To configure the Converter, use the available software that runs with Windows called SW67215. 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 (XP, Vista, Seven, 8; 32/64bit).

When launching the SW67215, the window below appears (Fig. 2).

 Note:
 It is necessary to have installed .Net Framework 4.

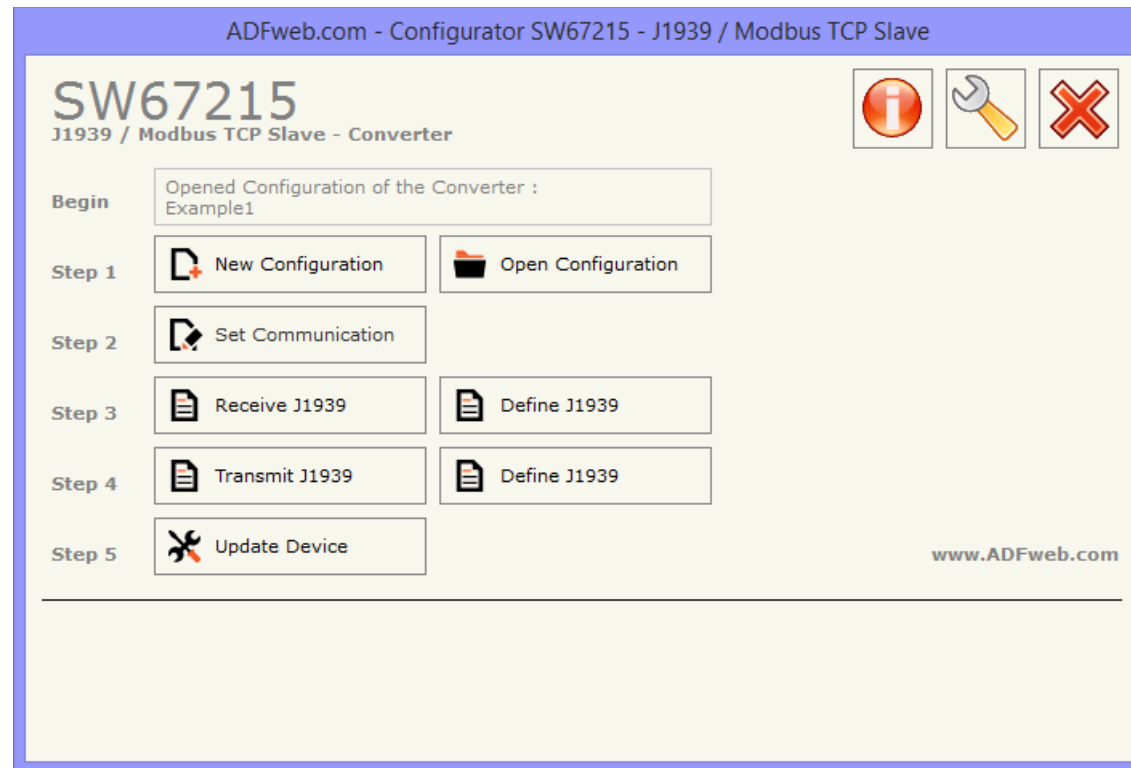
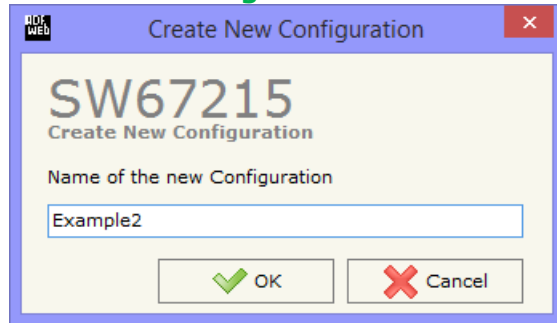


Figure 2: Main window for SW67215

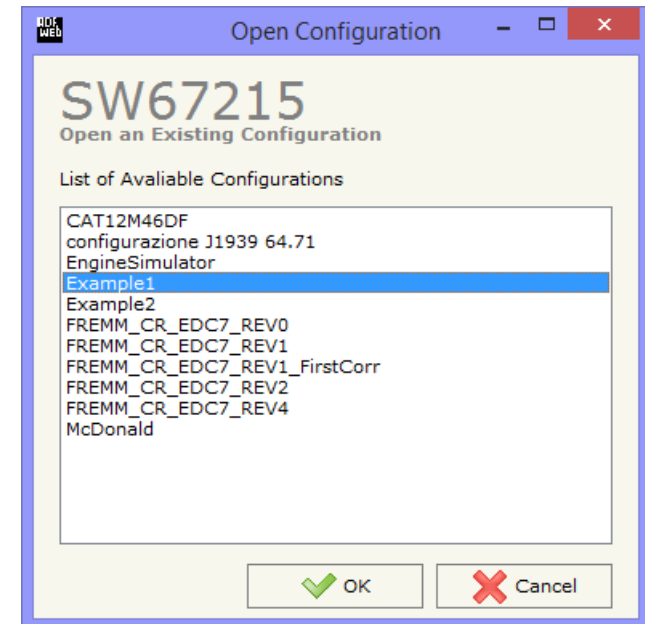
NEW CONFIGURATION / OPEN CONFIGURATION:

The “**New Configuration**” button creates the folder which contains the entire device’s configuration.




A device’s configuration can also be imported or exported:

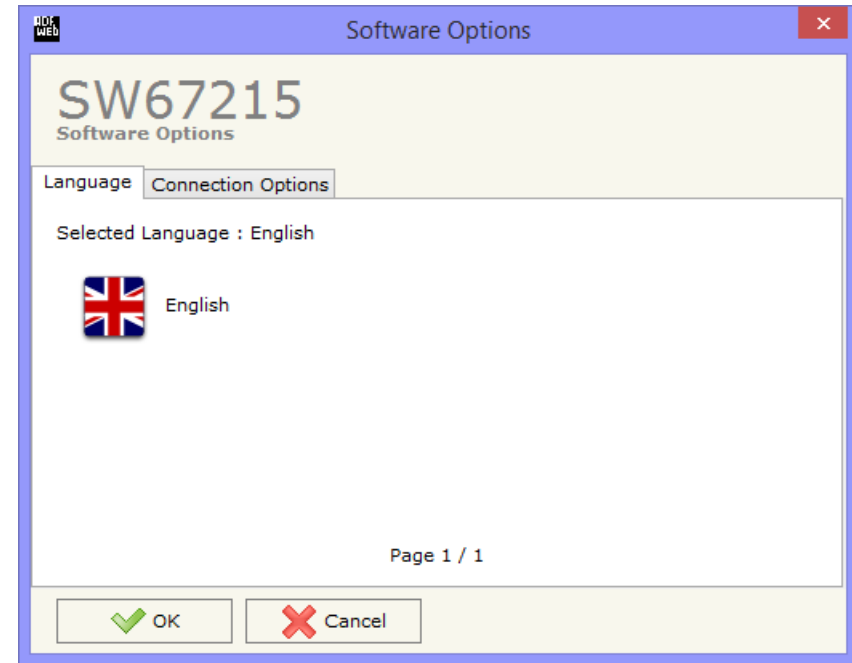
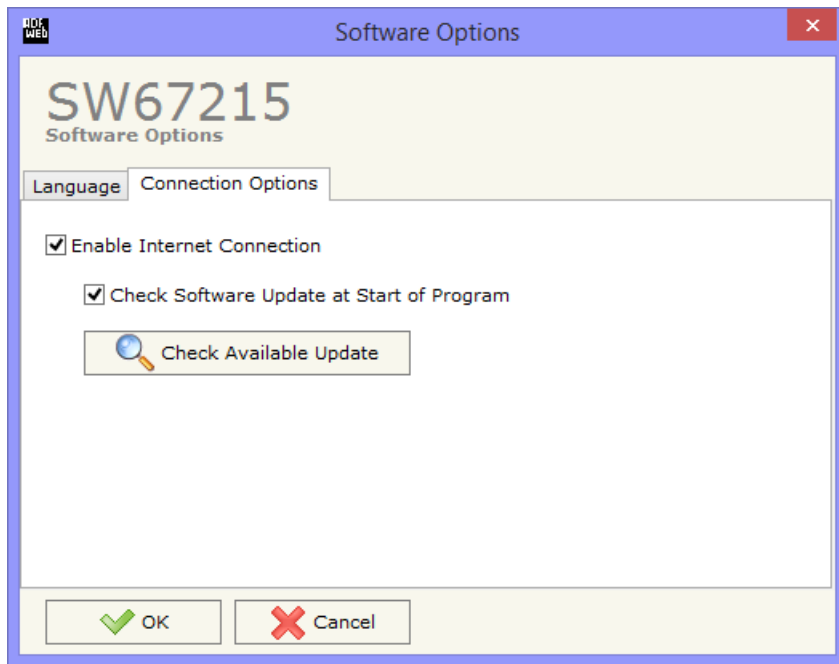
- To clone the configurations of a programmable “J1939 / Modbus TCP slave - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button “**Open Configuration**”.



SOFTWARE OPTIONS:

By pressing the “**Settings**” () button there is the possibility to change the language of the software and check the updatings for the compositor.

In the section “Language” it is possible to change the language of the software.



In the section “Connection Options”, it is possible to check if there are some updatings of the software compositor in ADFweb.com website. Checking the option “**Check Software Update at Start of Program**”, the SW67215 check automatically if there are updatings when it is launched.

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, BACnet and Modbus TCP

By Pressing the **"Set Communication"** button from the main window of SW67714 (Fig. 2) the window "Set Communication" appears (Fig. 3).

In the section "Select Device" is possible to select the type of device in possess:

- Device from May 2014 (with Dip-Switch);
- Device till April 2014 (with Jumper).

If is selected "Device from May 2014 (with Dip-Switch)", the meanings of the fields of "J1939" is:

- In the fields **"Baudrate"**, the velocity of J1939 is defined;
- In the field **"TimeOut Data (s)"** insert a time, when this time is elapsed the data isn't reliable and in the Modbus register you can read "FFFF";
- The field **"Modbus Reg. TimeOut"** insert a number of register, in this register you can visualize if the data is reliable, if 1 the data is ok, if 0 the data is oldest of the time inserted in the "TimeOut Data" field;
- If the field **"Enable Peer to Peer"** is cheked, the converter accept any ID that have the PGN inserted in the section "Receive J1939";
- In the field **"Device ID J1939"** the J1939 address of the converter is defined;
- If the field **"Filter FECA (ms)"** is checked, when the FECA PGN arrives the converter puts the values in Standby. If the time, expressed in milliseconds and written at the right side of "Filter FECA (ms)", is elapsed and there aren't arrived the frames of Transport Protocol the converter put the data of FECA into Modbus Registers. Otherwise if the Transport Protocol arrives before the time is elapsed the gateway put his data into Modbus Registers 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.

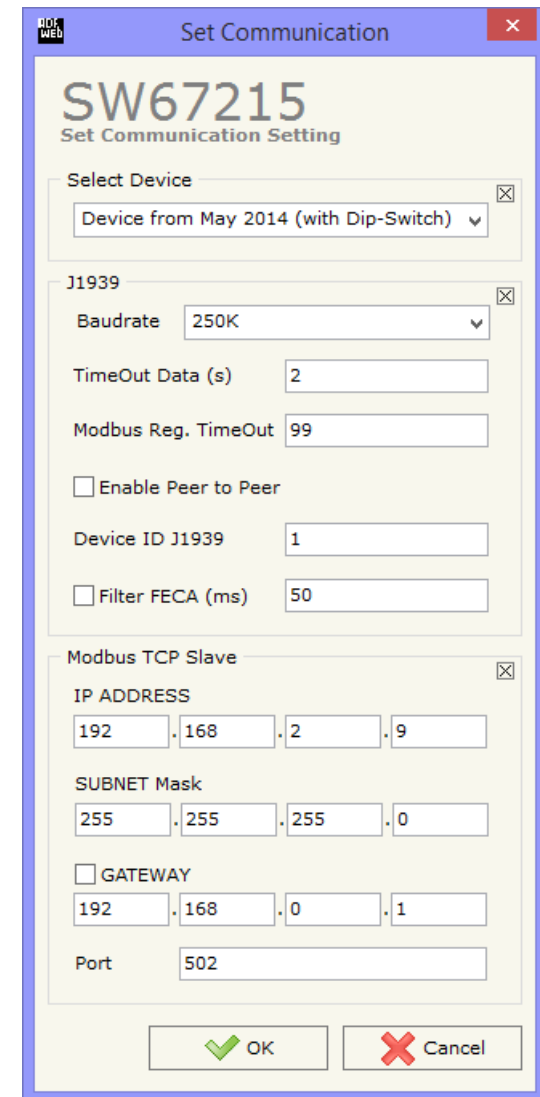


Figure 3: "Set Communication" window

If is selected "Device till April 2014 (with Jumper)", there are two more fields; the meaning of them is:

- If the field "**Enable Remote Request (RTR)**" is checked it is possible to use the "Remote Request". To use this, is necessary to insert in the four fields under, the four Modbus Registers used (see 'ENABLE REMOTE REQUEST (RTR)' section);
- If "**Send Frame Every (ms)**" is checked, the converter sends the J1939 frames defined in "Transmit J1939" section every xx ms. Otherwise a frame is sent in J1939 when a modbus register is written into the gateway.

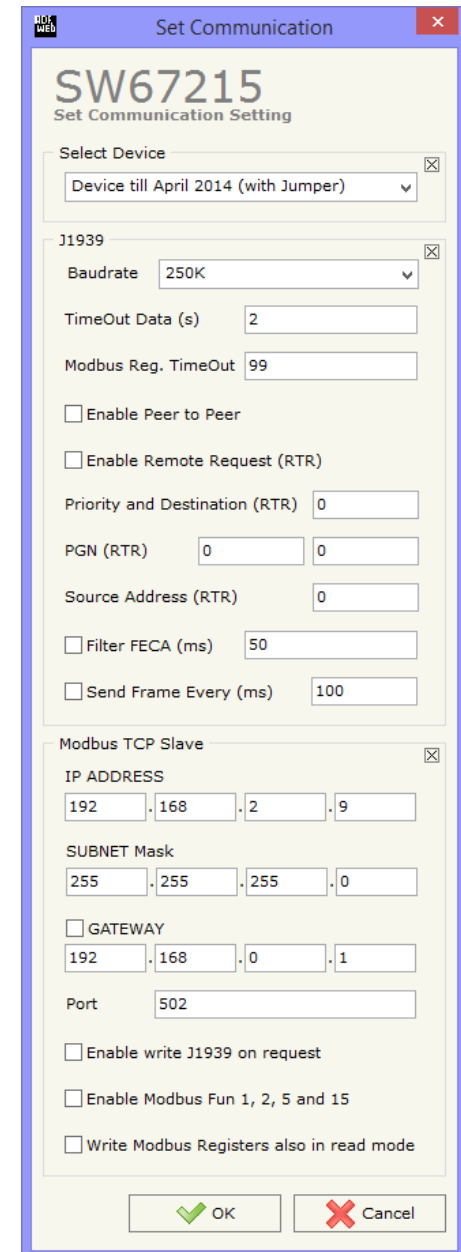
The field "Device ID J1939" is not present with this type of device.

The meaning of the fields of "Modbus TCP Slave" is:

- In the fields "**IP ADDRESS**" insert the IP address that you want to give to the Converter;
- In the fields "**SUBNET Mask**" insert the SubNet Mask;
- In the fields "**GATEWAY**" insert the default gateway that you want to use. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net;
- In the field "**Port**" the port number used for Modbus communication is defined.

If is selected "Device till April 2014 (with Jumper)", there are three other fields, and their meanings is:

- If the field "**Enable write J1939 on request**" is checked, the field "Write J1939 frame" in "Transmit J1939 frame info" is enabled. If this field is not checked, the device send a J1939 frame for every written register. Otherwise it is possible to select when to send the J1939 frame.
- If the field "**Enable Fun 1, 2, 5 and 15**" is checked, the Modbus function for the status are enabled. It is possible to use the status (bit) to read or write the data of J1939. The definition of the register are fixed and start from 1 (or 2 if the Master Modbus has the offset) for the number of byte that you use per 8;
- If the field "**Write Modbus Registers also in read mode**" is checked, is possible to read the registers that are been created into the section "Define Transmit J1939".



RECEIVE J1939:

By pressing the "Receive J1939" button from the main window of SW67215 (Fig. 2) the window "Receive J1939 Frames" appears (Fig. 4).

The meaning of the fields of the table are:

- 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 to read from modbus to J1939. (in the J1939 protocol the PGN is an identifier);
- In the field "Source Address" insert the address of the device that send the frame;
- If the field "Transport Protocol" is checked the frame use Transport Protocol functions;
- In the field "Start Byte" insert the byte which you would start read, this field is enable only when the field Transport Protocol is checked;
- In the field "Num Bytes" insert the number of byte you would read, for example your Start Byte is 20 an Num Bytes is 10, you can read the byte from 20 to 30;
- If the field "On Request" is checked, the converter send the request frame to the related PGN in order to receive the frame with the data;
- In the field "Time (ms)" is possible to insert the interval used to send the frame "On Request";
- If the field "Cancel Data" is checked and the Modbus Register in the section "set communication" is 0 the gateway when the data is oldest of the time inserted in the "time out data" you visualize "FFFF" in the Modbus registers of this PGN;
- In the field "Mnemonic" the description for the frame is defined.

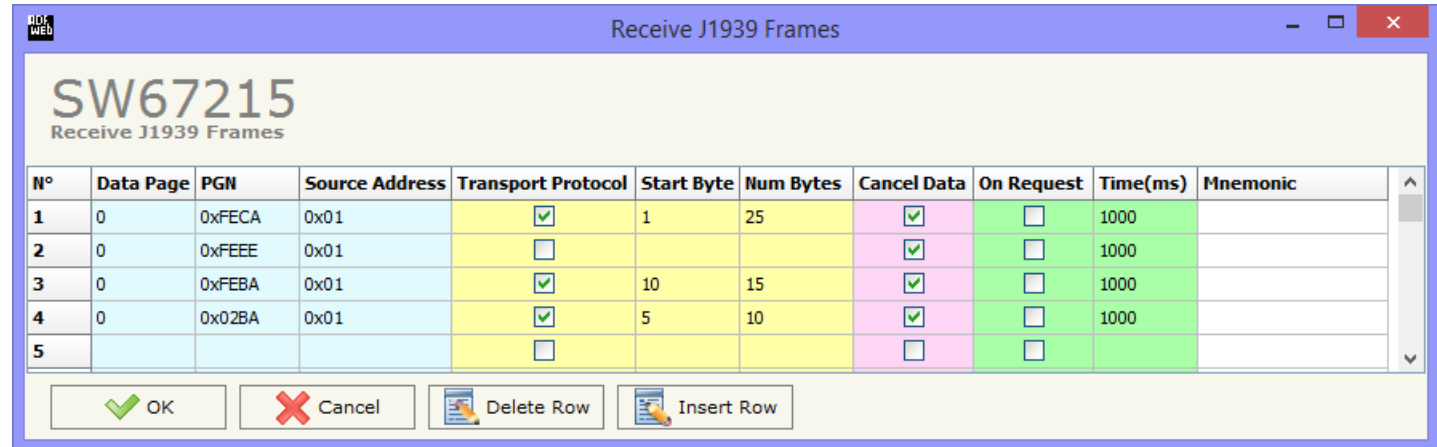


Figure 4: "Receive J1939 Frames" window



Note:

If is selected "Device till April 2014 (with Jumper)", the fields "On Request" and "Time (ms)" are not available.

DEFINE RECEIVE J1939

By pressing the "Define J1939" button, near "Receive J1939" from the main window of SW67215 (Fig. 2) the window "Define Receive J1939" appears (Fig. 5).

The meaning of the fields of the table are:

- In the field "List of Receive J1939 Frames" there is the list of frames J1939 who you inserted in "Receive J1939" Section;
- In the field "List of Modbus Registers" there is the list of Modbus registers you have defined for the selected J1939 frame;
- In the field "Index of Modbus Register" insert a value for the Modbus register;
- In the field "Select the Byte to put in the High Part of Modbus Register" insert which byte of the J1939 frame you want to save in the high part of Modbus register;
- In the field "Select the Byte to put in the Low Part of Modbus Register" insert which byte of the J1939 frame you want to save in the low part of Modbus register.

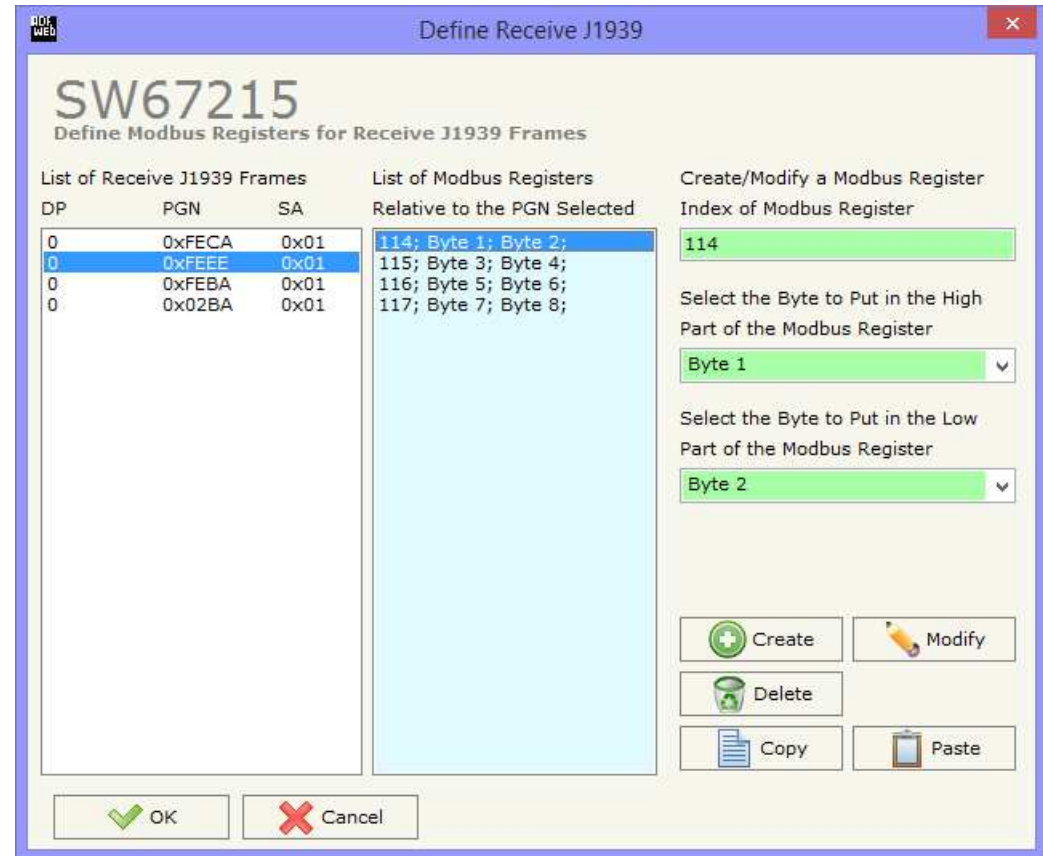


Figure 5: "Define Receive J1939" window

For example:

Select one of the J1939 frames you have defined, insert a valid address in the field "Index of Modbus Register", select the byte position (Byte 1 in high MODBUS byte and Byte 2 in low MODBUS byte), press the "Create" button. In the field "List of Modbus Registers" appears the modbus register you have defined.

Note: With some Modbus master there is the necessity to insert an offset of +1 from what is defined in the Compositor and what you request. i.e. if in the Compositor you have defined register 114 you have to require the 115.

TRANSMIT J1939

By pressing the **Transmit J1939** button from the main window of SW67215 (Fig. 2) the window "Transmit J1939 Frames" appears (Fig. 6).

The meaning of the fields of the table are:

- In the field **Priority** insert the priority of the frame, in J1939 protocol 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, in the J1939 protocol is 0 or 1;
- In the field **PGN** insert the PGN of the data you would to write from modbus to J1939. (in the J1939 protocol the PGN is an identifier);
- In the field **Source Address** you insert the ID of device that send the frame;
- If the field **On Request** is checked, the frame is sent when the converter receives the "On Request" command;
- If the field **Data Change** is checked, the frame is sent when the data changes;
- If the field **On Timer** is checked, the frame is send cyclically;
- In the field **Time (ms)** insert the interval used to send the frame with the option "On Timer";
- In the field **Mnemonic** the description for the frame is defined.

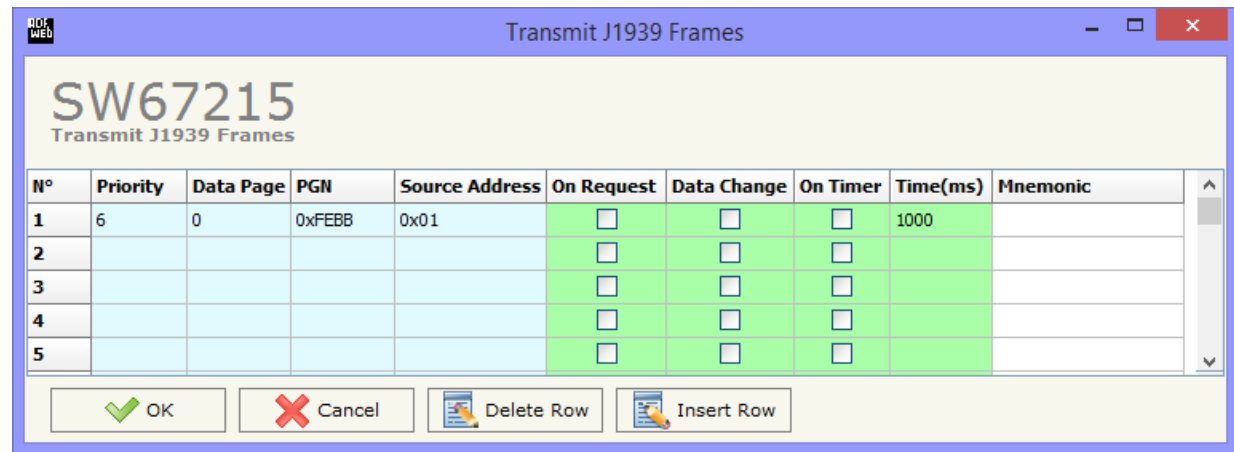



Figure 6: "Transmit J1939 Frames" window

 **Note:** If is selected "Device till April 2014 (with Jumper)", the fields "On Request", "Data Change", "On Timer" and "Time (ms)" are not available.

DEFINE TRANSMIT J1939

By pressing the **Define J1939** button, near "Transmit J1939" from the main window of SW67215 (Fig. 2) the window "Define Transmit J1939" appears (Fig. 7).

The meaning of the fields of the table are:

- In the field **"List of Receive J1939 Frames"** there is the list of frames J1939 who you inserted in "Transmit J1939" Section;
- In the field **"List of Modbus Registers"** there is the list of Modbus registers you have defined for the selected J1939 frame;
- In the field **"Index of Modbus Register"** insert a value for the Modbus register;
- In the field **"Select the Byte to put in the High Part of Modbus Register"** select which byte of the J1939 frame you want to save in the high part of Modbus register;
- In the field **"Select the Byte to put in the Low Part of Modbus Register"** select which byte of the J1939 frame you want to save in the low part of Modbus register;
- In the field **"Send J1939 frame on Modbus Write"** is possible to decide if the J1939 frame is sent when the related Modbus register is written by the Modbus master.

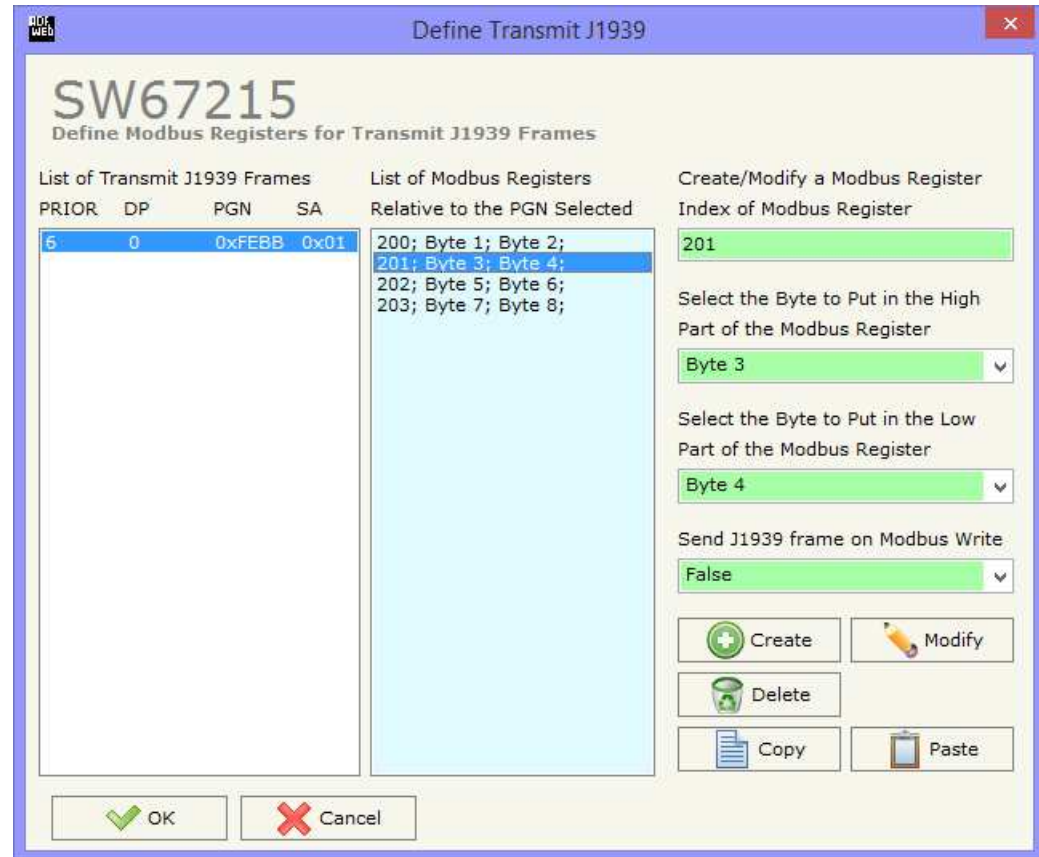


Figure 7: "Define Transmit J1939" window

For example:

Select one of the J1939 frames you have defined, insert a valid address in the field "Index of Modbus Register", select the byte position (Byte 1 in high MODBUS byte and Byte 2 in low MODBUS byte), press the **Create** button. In the field "List of Modbus Registers" appears the modbus register you have defined.

ENABLE REMOTE REQUEST (RTR)

If the field "**Enable Remote Request (RTR)**" that is present in the section "Set Communication" is checked, you need to define the Modbus registers that are used to compose the Remote Request.

In the "Priority and Destination (RTR)" register you have to indicate the Priority of the request in the high byte of the register (usually this value is equal to 6) and the Address of the Destination Device in the low byte of register.

In the first (left) "PGN (RTR)" register you have to indicate the first two byte of the PGN while in the second (right) "PGN (RTR)" register you have to indicate, in the high byte of register, the third byte of the PGN.

In the "Source Address (RTR)" register you have to indicate the Source Address of the request in the high part of the register.

Only when you write the "Souce Address" register, the request will be send to the J1939 network.

For example if you want to request the PGN 0x00FEE5 at device with address 5 you have to write:

1st reg = 0x0605

2nd reg = 0xE5FE

3rd reg = 0x0000

4th reg = 0x0100

UPDATE DEVICE:

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

If you don't know the actual IP address of the device you have to use this procedure:

- Turn off the Device;
- Put Dip2 of 'Dip-Switch A' in ON position;
- Turn on the device
- Connect the Ethernet cable;
- Insert the IP **“192.168.2.205”**;
- Press the **“Ping”** button, “Device Found! must appear”;
- 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' in OFF position;
- Turn on the device.

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

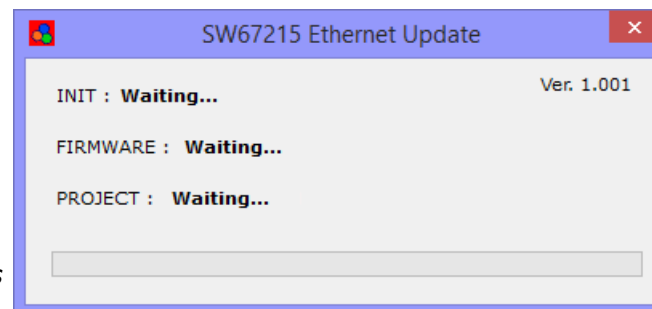
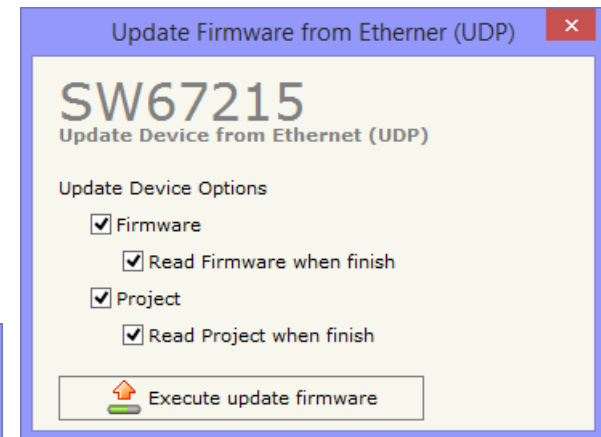
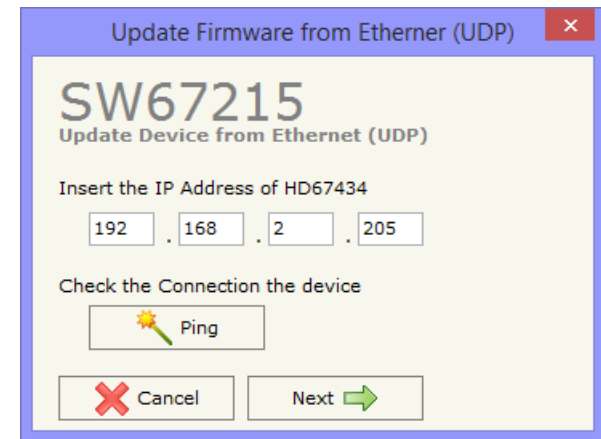


Figure 8: “Update Device” windows

If you know the actual IP address of the device, you have to use this procedure:

- Turn on the Device with the Ethernet cable inserted;
- Insert the actual IP of the Converter;
- Press the "**Ping**" button, must appear "Device Found!";
- 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" the device automatically goes at Normal Mode.

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



Note:

When you install a new version of the software, if it is the first time it is better you do the update of the Firmware in the HD67215-A1 or HD67215-B2 device.



Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67215-A1 or HD67215-B2 device.



Warning:

If Fig. 9 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the update;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use it in the main Operating System;
- If you are using Windows Seven or Vista or 8, make sure that you have the administrator privileges;
- Pay attention to the Firewall lock;
- Check the LAN settings.

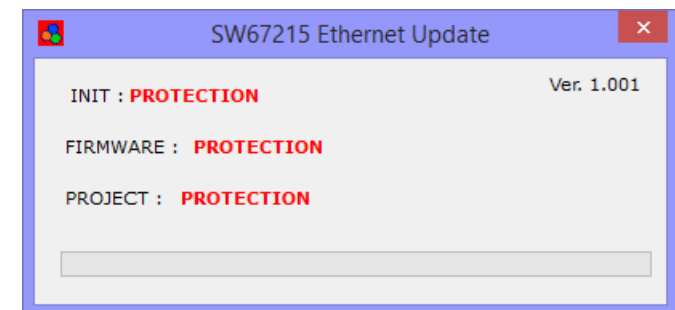


Figure 9: "Protection" window



In the case of HD67215-A1 or HD67215-B2 you have to use the software "SW67215":
www.adfweb.com/download/filefold/SW67215.zip.

UPDATE DEVICE (ONLY FOR OLD HW WITH JUMPER):

By pressing the **“Update Device”** button it is possible to load the created configuration into the device, and also the Firmware if is necessary. This by using the RS232 port.



Note:

With this type of update is possible to update only the hardware with jumpers (old version no longer sold).

In order to load the parameters or update the firmware in the device, follow these instructions:

- Turn off the Device;
- Connect the RS232 Null Modem cable form your PC to the Converter;
- Insert the Jumper like in the label of the converter;
- Select the **“COM port”** and press the **“Connect”** button;
- Turn on the device;
- Check the **“Device state”** 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;
- Remove the Jumper;
- Disconnect the RS232 cable;
- Turn on the device.

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

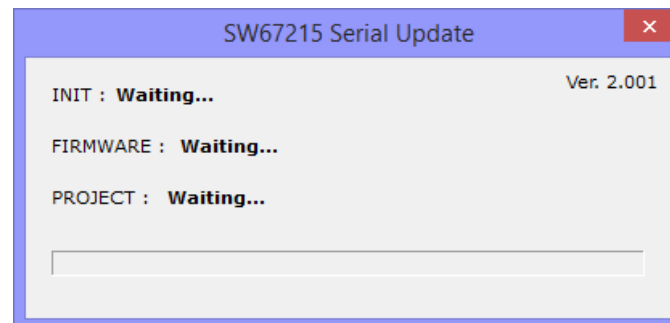
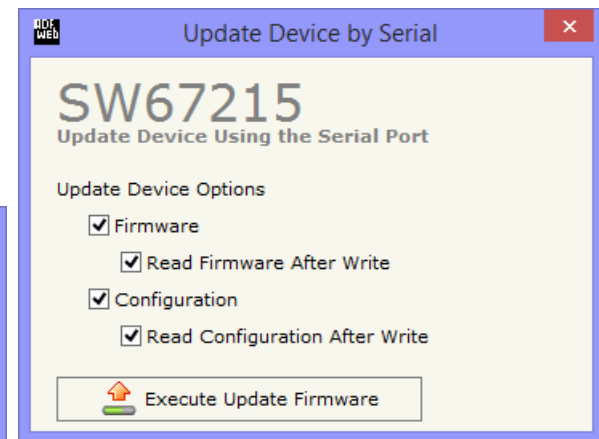
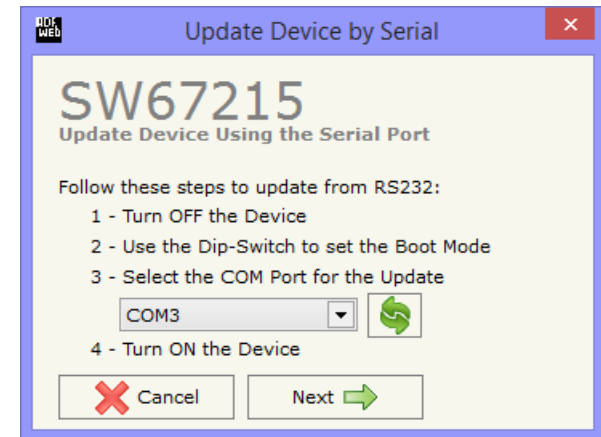
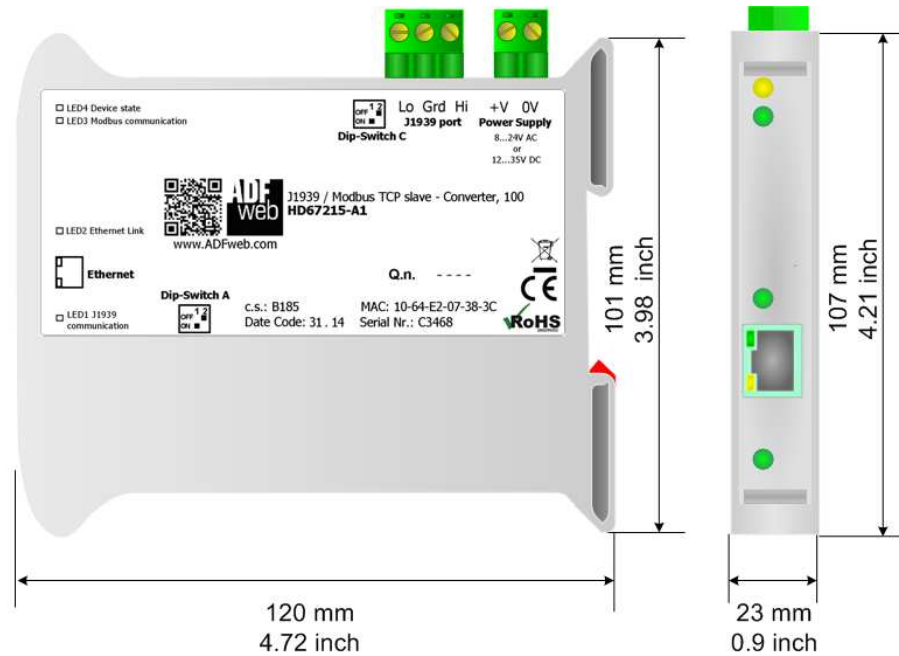


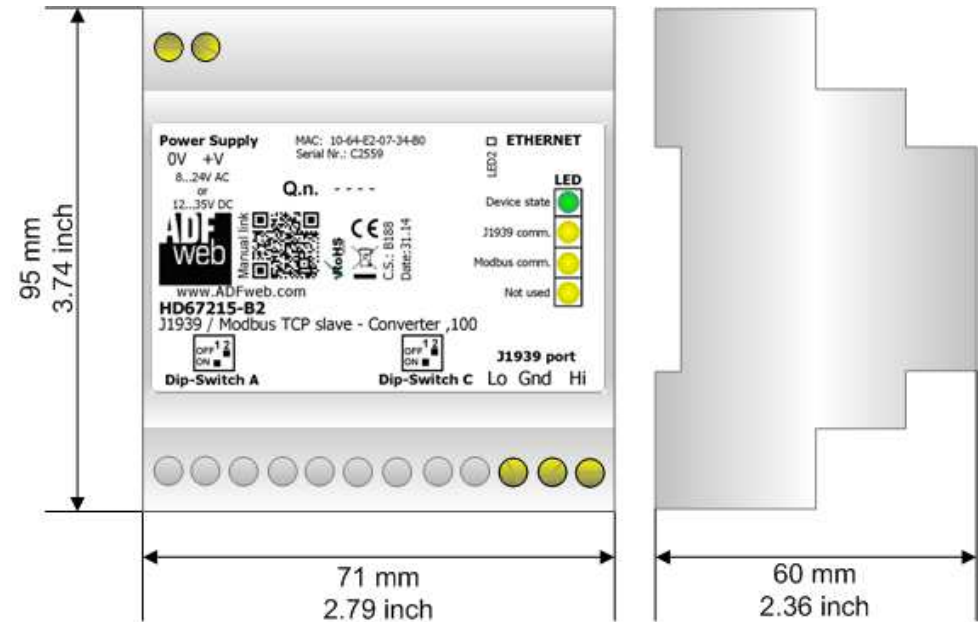
Figure 10: “Update Device by Serial” windows

MECHANICAL DIMENSIONS:



Housing: PVC
 Weight: 200g (Approx)

Figure 11: Mechanical dimensions scheme for HD67215-A1



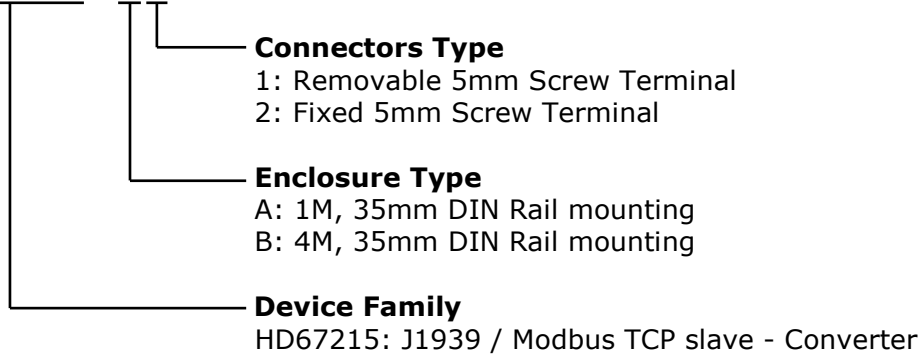
Housing: PVC
 Weight: 200g (Approx)

Figure 12: Mechanical dimensions scheme for HD67215-B2

ORDERING INFORMATIONS:

The ordering part number is formed by a valid combination of the following:

HD67215 - x x



- Order Code: **HD67215-A1** - J1939 / Modbus TCP slave - Converter
- Order Code: **HD67215-B2** - J1939 / Modbus TCP slave - Converter

ACCESSORIES:

- Order Code: **AC34001** - 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V AC
- Order Code: **AC34002** - 35mm 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 impact of 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:

- 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.
- 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.



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