

User Manual

Revision 1.000
English

OPC UA Server / J1939 - Converter

(Order Code: HD67B40-B2)

for Website information:

<http://www.adfweb.com/?Product=HD67B40>

for Price information:

<http://www.adfweb.com/?Price=HD67B40-B2>

Benefits and Main Features:

- ✦ Triple electrical isolation
- ✦ Power Supply 18...35V DC and 8...24 V AC
- ✦ Temperature range: -40°C/+85°C (-40°F/+185°F)



User Manual

For others OPC UA Server devices, see also the following links:

OPC UA Server from/to ...

| | |
|--|----------------------|
| www.adfweb.com?Product=HD67B26 | (Serial) |
| www.adfweb.com?Product=HD67B27 | (Modbus Master) |
| www.adfweb.com?Product=HD67B28 | (Modbus Slave) |
| www.adfweb.com?Product=HD67B29 | (Modbus TCP Master) |
| www.adfweb.com?Product=HD67B30 | (Modbus TCP Slave) |
| www.adfweb.com?Product=HD67B31 | (Bacnet Master) |
| www.adfweb.com?Product=HD67B32 | (Bacnet Slave) |
| www.adfweb.com?Product=HD67B33 | (CAN) |
| www.adfweb.com?Product=HD67B34 | (CANopen) |
| www.adfweb.com?Product=HD67B35 | (DeviceNet Master) |
| www.adfweb.com?Product=HD67B36 | (DeviceNet Slave) |
| www.adfweb.com?Product=HD67B37 | (DMX) |
| www.adfweb.com?Product=HD67B38 | (EtherNet/IP Master) |
| www.adfweb.com?Product=HD67B39 | (EtherNet/IP Slave) |
| www.adfweb.com?Product=HD67B41 | (KNX) |
| www.adfweb.com?Product=HD67B42 | (MQTT) |
| www.adfweb.com?Product=HD67B43 | (NMEA0183) |
| www.adfweb.com?Product=HD67B44 | (NMEA2000) |
| www.adfweb.com?Product=HD67B45 | (PROFINET Master) |
| www.adfweb.com?Product=HD67B46 | (PROFINET Slave) |
| www.adfweb.com?Product=HD67B47 | (SNMP Manager) |
| www.adfweb.com?Product=HD67B48 | (SNMP Agent) |
| www.adfweb.com?Product=HD67D38 | (LoRaWAN) |
| www.adfweb.com?Product=HD67F48 | (LoRaWAN Gateway) |
| www.adfweb.com?Product=HD67E21 | (EtherCAT Slave) |
| www.adfweb.com?Product=HD67E71 | (EtherCAT 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.

REVISION LIST:

| Revision | Date | Author | Chapter | Description |
|----------|------------|--------|---------|-----------------------|
| 1.000 | 23/01/2024 | Ln | All | First release version |
| | | | | |
| | | | | |

WARNING:

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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:

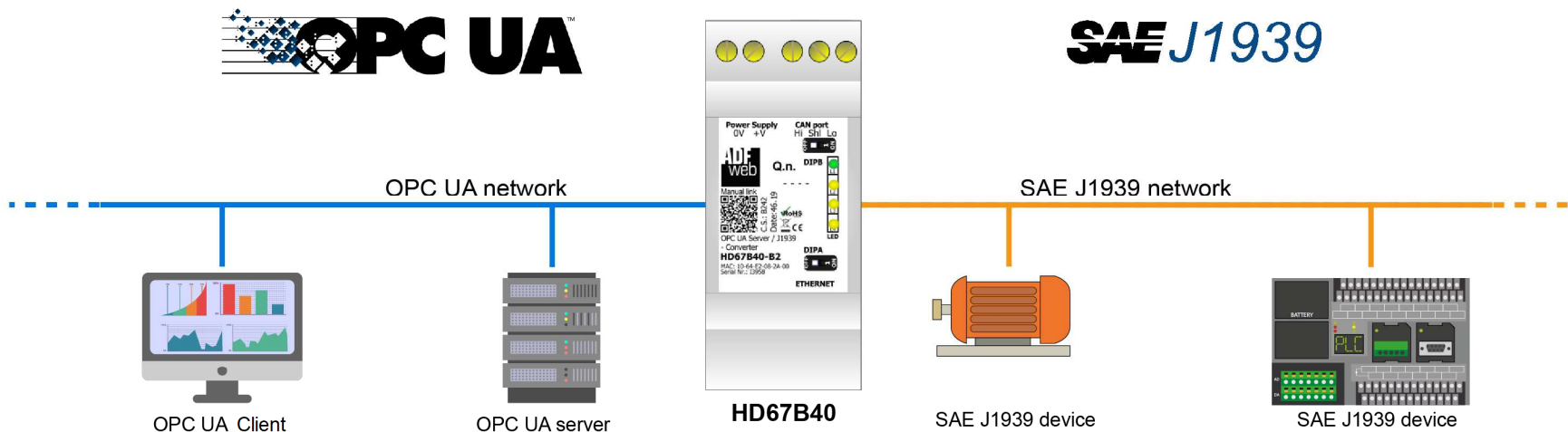


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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:



ADFweb ADFweb.com srl
 Tel. +39 0438 309 131 - Fax +39 0438 492 099
 info@adfweb-com - www.adfweb.com

CONNECTION SCHEME:

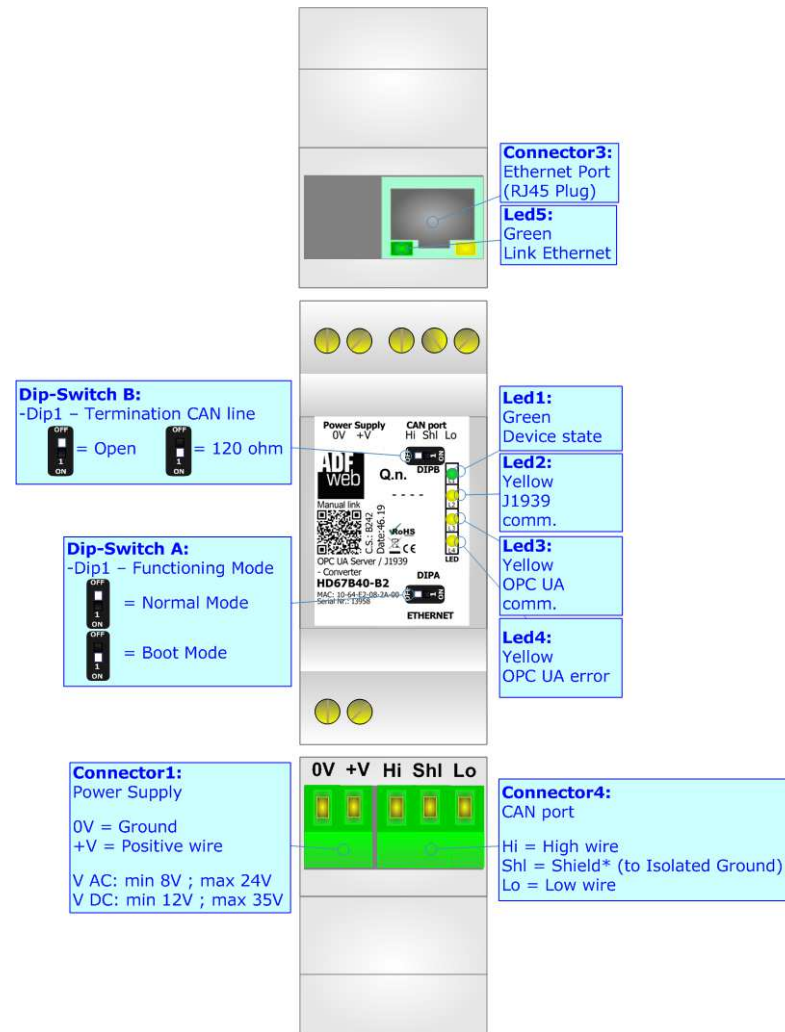


Figure 1: Connection scheme for HD67B40-B2

CHARACTERISTICS:

The HD67B40-B2 is a OPC UA Server / J1939 converter.

It allows the following characteristics:

- Up to 1500 bytes in reading and 1500 bytes in writing;
- Two-directional information between J1939 and OPC UA;
- 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 SW67B40 software on your PC in order to perform the following:

- Define the parameter of OPC UA;
- Define the parameter of J1939 line;
- Define the list of OPC UA servers connected to the converter;
- Define the list of J1939 objects accessible on J1939 side;
- Update the device.

POWER SUPPLY:

The devices can be powered between a wide range of tensions. For more details see the two tables below.

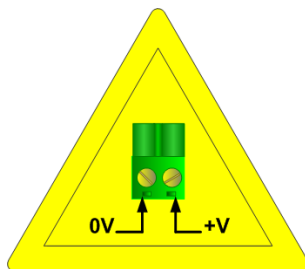
| | VAC | | VDC | |
|-------------------|-----------|------------|------------|------------|
| | Vmin | Vmax | Vmin | Vmax |
| HD67B40-B2 | 8V | 24V | 12V | 35V |

Consumption at 24V DC:

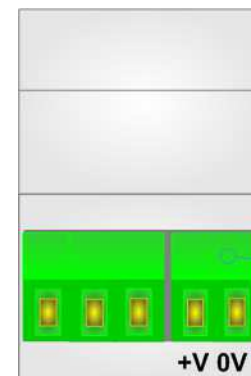
| Device | W/VA |
|------------|------|
| HD67B40-B2 | 4 |



Caution: Not reverse the polarity power



HD67B40-B2



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

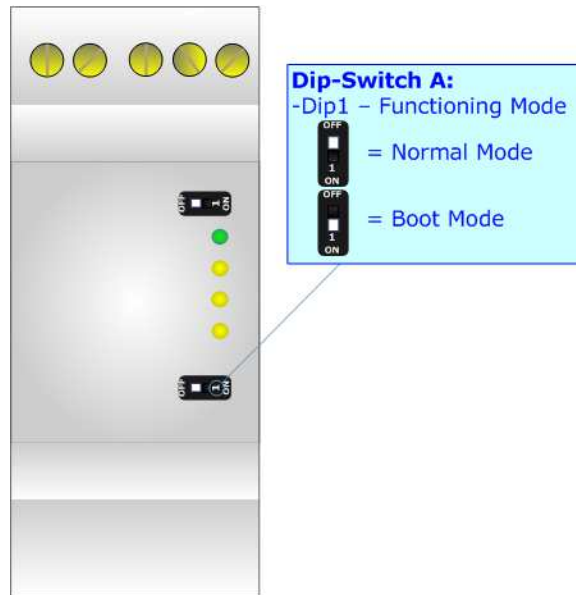
FUNCTION MODES:

The device has got two functions mode depending of the position of the Dip1 of 'Dip-Switch A':

- The first, with Dip1 in Off position (factory setting), is used for the normal working of the device.
- The second, with Dip1 in On position, is used for upload the Project/Firmware.

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

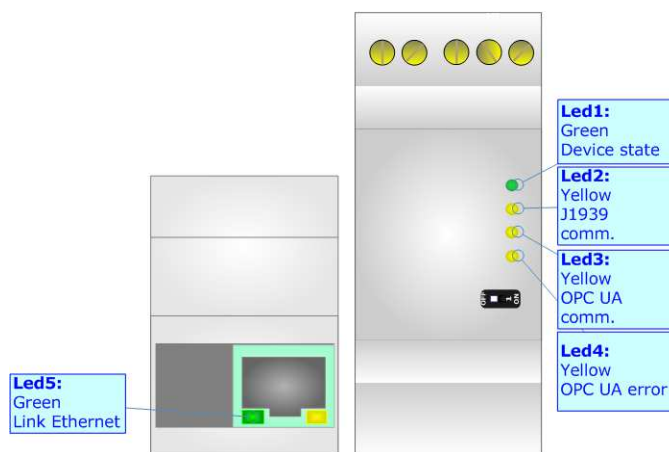
According to the functioning mode, the LEDs will have specifics functions (see 'LEDS' section).



LEDS:

The device has got five 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: Device State (green) | Blinks slowly (~1Hz) | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 2: J1939 comm. (yellow) | Flashing: J1939 communication OFF: No J1939 communication | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 3: OPC UA comm. (yellow) | Flashing: OPC UA response OFF: No OPC UA response | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 4: OPC UA error (yellow) | ON: At least one OPC UA Server is disconnected OFF: all OPC UA Servers are connected | Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress |
| 5: Link Ethernet (green) | ON: Ethernet cable connected OFF: Ethernet cable disconnected | ON: Ethernet cable connected OFF: Ethernet cable disconnected |



J1939:

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

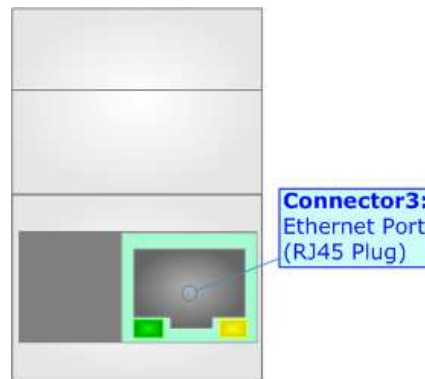


Cable characteristics:

| | | |
|-----------------------|------------------------|-----------------------|
| 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 |

ETHERNET:

The Ethernet connection must be made using Connector3 of HD67B40-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 SW67B40:

To configure the Converter, use the available software that runs with Windows called SW67B40. 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, 10 or 11; 32/64bit).

When launching the SW67B40, the window below appears (Fig. 2).



Note:

It is necessary to have installed .Net Framework 4.



Figure 2: Main window for SW67B40

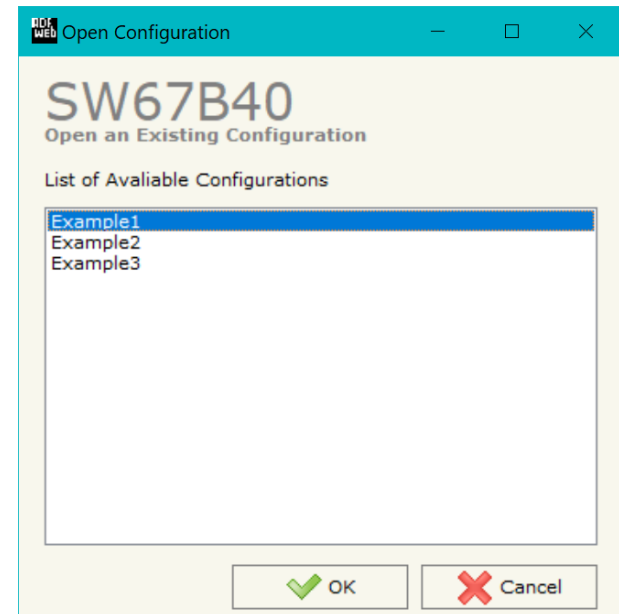
NEW CONFIGURATION / OPEN CONFIGURATION:

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




device’s configuration can also be imported or exported:

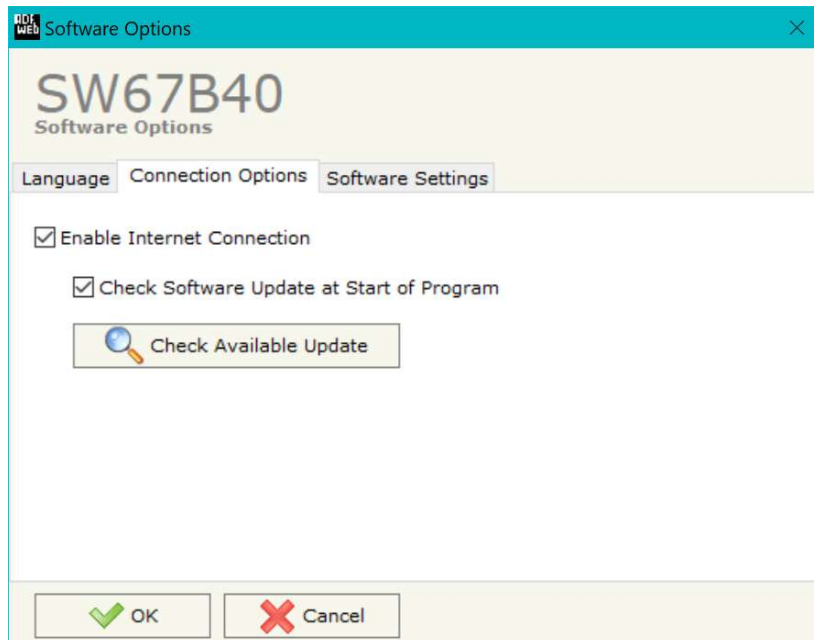
- To clone the configurations of a programmable “OPC UA Server / J1939 - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate 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 SW67B40 check automatically if there are updatings when it is launched.



In the section "Software Settings", it is possible to enable/disable some keyboard's commands for an easier navigation inside the tables contained in the different sections of the software.

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, OPC UA Server and J1939.

By Pressing the **"Set Communication"** button from the main window for SW67B40 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The means of the fields for "Ethernet Connection" are:

- In the field **"Device Name (Hostname)"** the Hostname to assign to the converter is defined;
- If the field **"Obtain an IP Address Automatically (DHCP for Cable Connection)"** is checked, DHCP for LAN connection is enabled;
- If the field **"Obtain an IP Address Automatically (DHCP for Wi-Fi Connection)"** is checked, DHCP for Wi-Fi connection is enabled;
- If the field **"Enable DNS"** is checked, DNS protocol is enabled;
- In the field **"Primary DNS"** the IP Address of the primary DNS server is defined;
- In the field **"Secondary DNS"** the IP Address of the secondary DNS server is defined.

The means of the fields for "OPC UA Server" are:

- In the field **"IP Address"** the IP address for OPC UA side of the converter is defined;
- In the field **"SubNet Mask"** the SubNet Mask for OPC UA side of the converter is defined;
- In the field **"Gateway"** the default gateway of the net is defined. 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 of OPC UA Server is defined.

The screenshot shows the 'Set Communication' window for device SW67B40. The window is titled 'Set Communication' and has a close button in the top right corner. The device name 'SW67B40' is displayed at the top. The window is divided into four sections:

- 1. Ethernet Connection:** Contains fields for 'Device Name (Hostname)', 'Obtain an IP Address Automatically (DHCP for Cable Connection)', 'Obtain an IP Address Automatically (DHCP for Wi-Fi Connection)', 'Enable DNS', 'Primary DNS', and 'Secondary DNS'.
- 2. OPC UA Server:** Contains fields for 'IP Address', 'SubNet Mask', 'Gateway', and 'Port'.
- 3. J1939:** Contains fields for 'Baudrate', 'TimeOut Data (s)', 'Enable Peer to Peer', and 'ID Device J1939'.
- 4. NTP (Network Time Protocol):** Contains fields for 'Server URL' and 'Poll Time (seconds)'.

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

Figure 3: "Set Communication" window

The means of the fields for the "J1939" section are:

- In the "**Baudrate**" field the J1939 baudrate is defined;
- In the field "**TimeOut Data**" insert a time; when this time is elapsed and the data isn't reliable, in the OPC UA data array you read "0". 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;
- In the "**ID Device J1939**" field the source address of the converter is defined.

The means of the fields for the "NTP" section are:

- In the field "**Server URL**" the URL or the IP Address of the NTP Server is defined;
- In the field "**Poll Time (seconds)**" the polling time for the time synchronization is defined.

OPC UA ACCESS:

By Pressing the “**OPC UA Client Access**” button from the main window for SW67B40 (Fig. 2) the window “OPC UA Server Access” appears (Fig. 4).

This section is used to define the list of OPC UA variables to read/write.

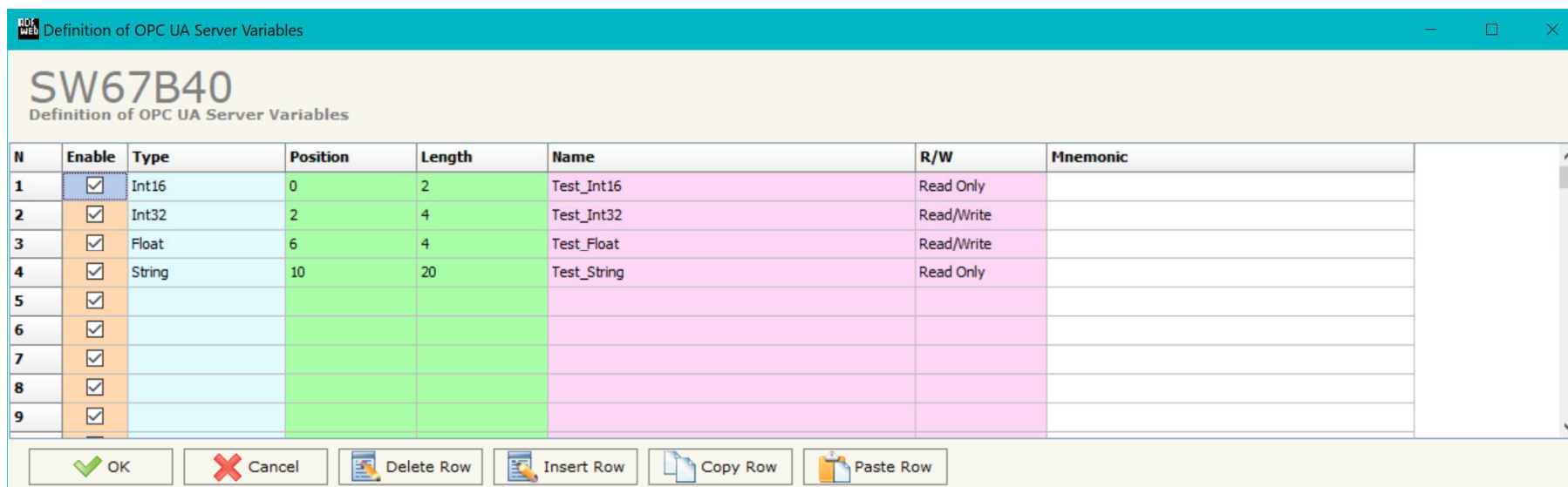


Figure 4: “OPC UA Server Access” window

The means of the checkboxes inside the table are:

- In the field “**Type**” the data format of the OPC UA variable is defined;
- In the field “**Position**” the starting byte of the internal memory arrays where getting the value is defined;
- In the field “**Length**” the byte length of the OPC UA variable is defined;
- In the field “**Name**” the name of the OPC UA variable is defined;
- In the field “**R/W**” the access type of the OPC UA variable is defined;
- In the field “**Mnemonic**” a description of the OPC UA variable is defined.

RECEIVE FRAMES:

By pressing the "Receive Frames" button from the main window for SW67B40 (Fig. 2) the "Receive J1939 Frames" window appears (Fig. 4).

The J1939 frames inserted in this table contains the Output data of OPC UA. These frames are accepted by the gateway.

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 OPC UA 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 "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 "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" defined in "Set Communication" section;
- If the field "On Request" is checked, the converter sends the J1939 request for the selected PGN with the cyclical time defined into "Time (ms)" field;
- In the field "Mnemonic" it is possible to insert a brief description.

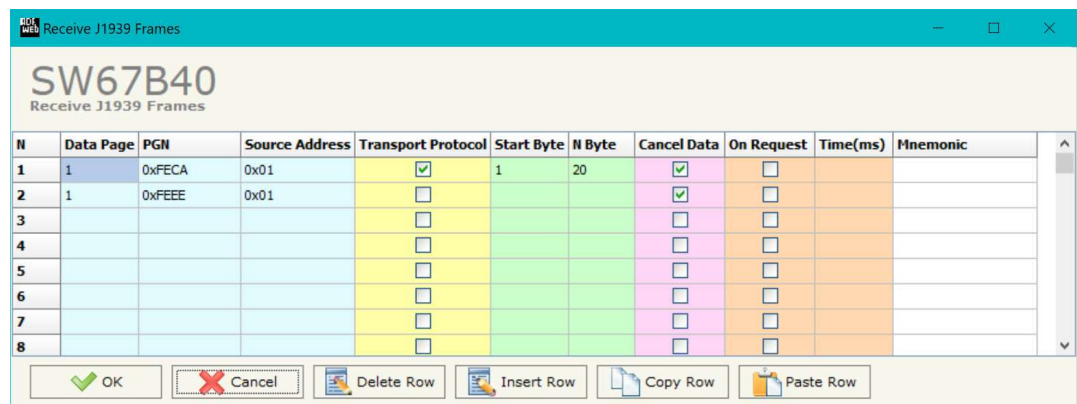


Figure 5: "Receive J1939 Frames" window

SEND FRAMES:

By pressing the **"Send Frames"** button from the main window for SW67B40 (Fig. 2) the "Send J1939 frames" window appears (Fig. 6).

The J1939 frames inserted in this table contains the Input data of OPC UA. These frames are sent by the gateway.

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 PROFINET 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 **"N Byte"** the number of byte of the frame is defined, this field is enable only when the field Transport Protocol is checked;
- If the field **"Request"** is checked, the J1939 message is sent when a J1939 request is received;
- If the field **"Data Change"** is checked, the J1939 frame is sent when the data from OPC UA change;
- If the field **"On Timer"** is checked, the J1939 message is sent cyclically with the delay defined in the field **"Send Timer"**;
- In the field **"Mnemonic"** it is possible to insert a brief description.

| N | Priority | Data Page | PGN | Source Address | N Bytes | Request | Data Change | On Timer | Send Timer | Mnemonic |
|---|----------|-----------|--------|----------------|---------|-------------------------------------|-------------------------------------|-------------------------------------|------------|----------|
| 1 | 6 | 0 | 0xFE01 | 0x01 | 8 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1000 | |
| 2 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 3 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 4 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 5 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 6 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 7 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |

Figure 6: "Send J1939 Frames" window

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. This by using the Ethernet port.

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

- Turn OFF the Device;
- Put Dip1 of 'Dip-Switch A' in ON position;
- Turn ON the device
- Connect the Ethernet cable;
- Insert the IP **"192.168.2.205"**;
- 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 Dip1 of 'Dip-Switch A' in OFF position;
- Turn ON the device.

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;
- 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 updated.

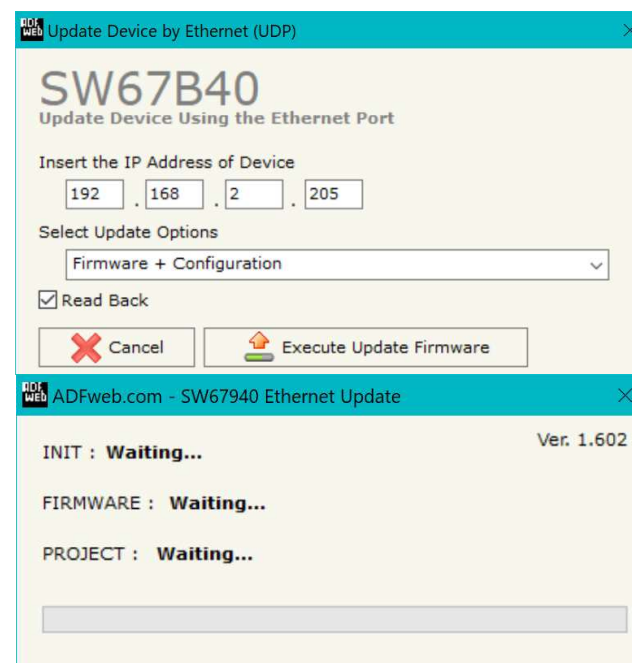


Figure 7: "Update device" windows



Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67B40 device.



Warning:

If Fig. 8 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8, 10 or 11 make sure that you have the administrator privileges;
- In case you have to program more than one device, using the "UDP Update", you have to cancel the ARP table every time you connect a new device on Ethernet. For do this you have to launch the "Command Prompt" and write the command "arp - d". Pay attention that with Windows Vista, Seven, 8, 10 or 11 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

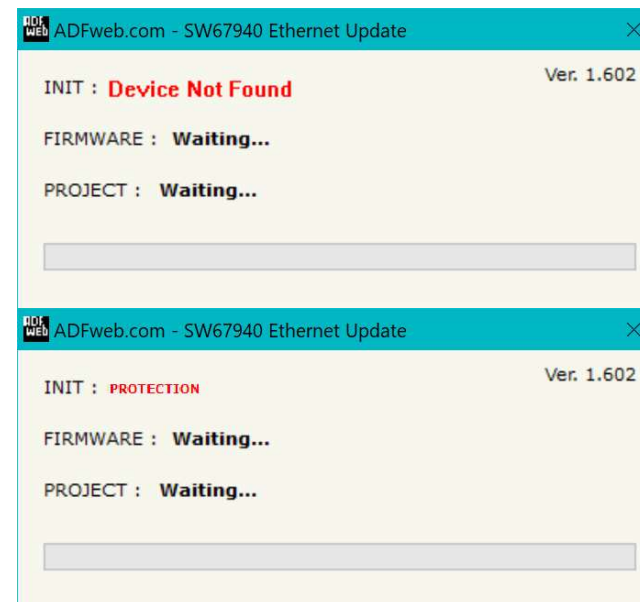


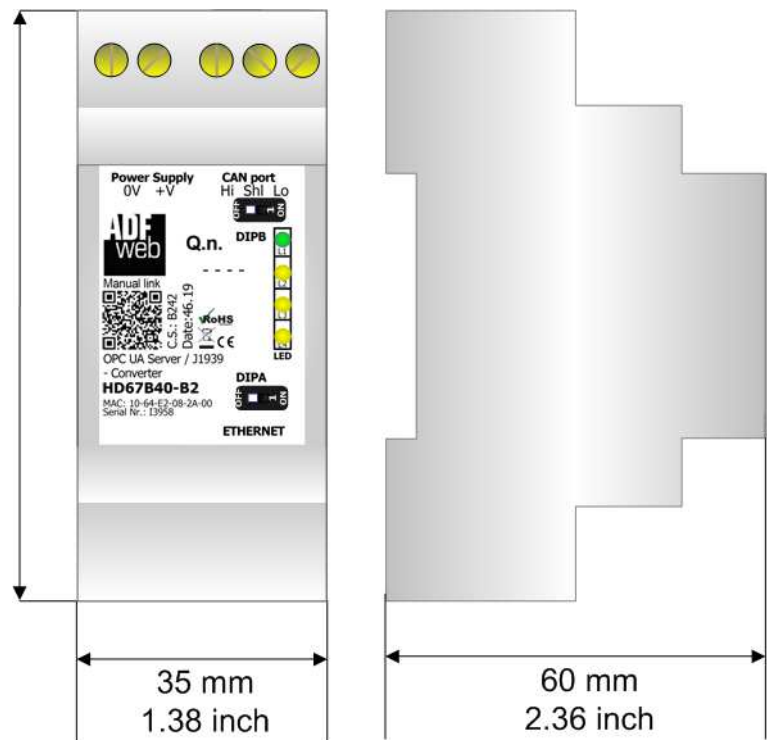
Figure 8: "Error" window



Warning:

In the case of HD67B40 you have to use the software "SW67B40": www.adfweb.com/download/filefold/SW67B40.zip.

MECHANICAL DIMENSIONS:



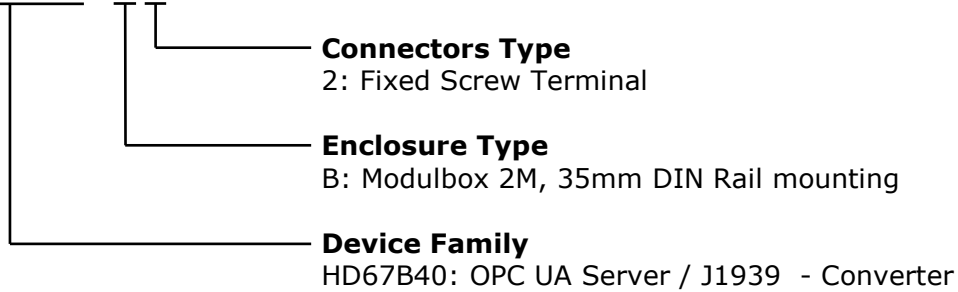
Housing: PVC
 Weight: 200g
 (Approx)

Figure 9: Mechanical dimensions scheme for HD67B40-B2

ORDERING INFORMATIONS:

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

HD67B40 - B 2



Order Code: **HD67B40 -B2** - OPC UA Server / J1939 - Converter

ACCESSORIES:

Order Code: **AC34011** - 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V DC

Order Code: **AC34012** - 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 24 V DC

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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