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User Manual

Revision 1.000 English

OPC UA Client / PROFINET Slave - Converter

(Order Code: HD67B22-B2)

Benefits

- 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



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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	13/03/2019	Tf	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:



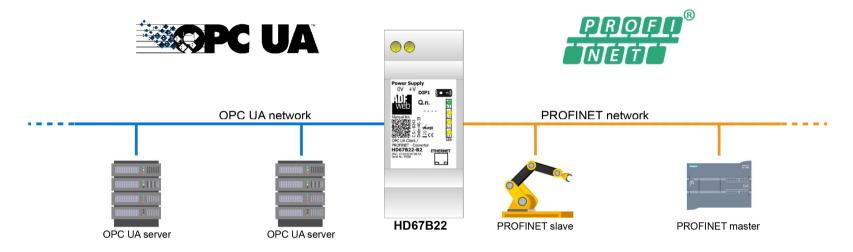
This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

CE CONFORMITY

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

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EXAMPLE OF CONNECTION:



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CONNECTION SCHEME:

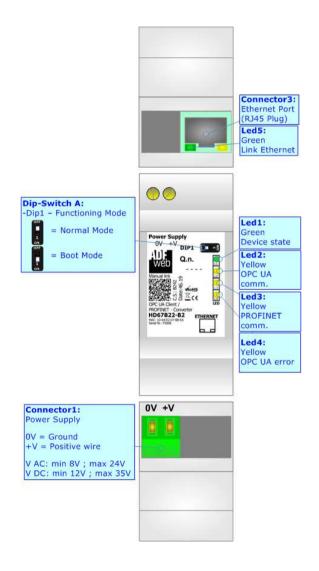


Figure 1: Connection scheme for HD67B22-B2

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CHARACTERISTICS:

The HD67B22-B2 is a OPC UA Client / PROFINET Slave converter.

It allows the following characteristics:

- → Up to 1440 bytes in reading and 1440 bytes in writing;
- → Two-directional information between PROFINET 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 SW67B22 software on your PC in order to perform the following:

- Define the parameter of the OPC UA;
- → Define the parameter of the PROFINET;
- ▶ Define the list of OPC UA servers connected to the converter;
- Update the device.

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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.

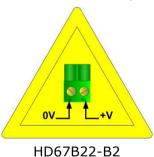
	VAC	\sim	VDC ===			
	Vmin	Vmax	Vmin	Vmax		
HD67B22-B2	8V	24V	12V	35V		

Consumption at 24V DC:

Device	W/VA
HD67B22-B2	4



Caution: Not reverse the polarity power



Connector1:
Power Supply

0V = Ground
+V = Positive wire

V AC: min 8V; max 24V
V DC: min 12V; max 35V

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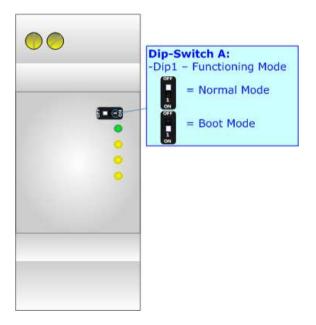
FUNCTION MODES:

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).



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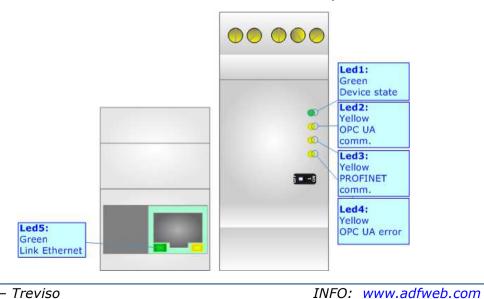
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LEDS:

The device has got six 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. Dovice State (green)	Blinks slowly (a.1 Hz)	Blinks quickly: Boot state				
1: Device State (green)	Blinks slowly (~1Hz)	Blinks very slowly (~0.5Hz): update in progress				
2) ODC IIA somm (vollow)	Flashing: OPC UA response	Blinks quickly: Boot state				
2: OPC UA comm. (yellow)	OFF: No OPC UA response	Blinks very slowly (~0.5Hz): update in progress				
2. DDOFINET comm (vollow)	Flashing: PROFINET communication	Blinks quickly: Boot state				
3: PROFINET comm. (yellow)	OFF: No PROFINET communication	Blinks very slowly (~0.5Hz): update in progress				
4. ODC IIA owner (volley)	ON: At least one OPC UA Server is disconnected	Blinks quickly: Boot state				
4: OPC UA error (yellow)	OFF: all OPC UA Servers are connected	Blinks very slowly (~0.5Hz): update in progress				
F. Link Eth am at (ann an)	ON: Ethernet cable connected	ON: Ethernet cable connected				
5: Link Ethernet (green)	OFF: Ethernet cable disconnected	OFF: Ethernet cable disconnected				

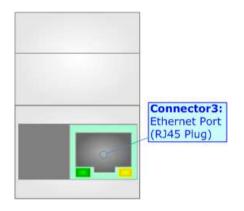


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ETHERNET:

The Ethernet connection must be made using Connector3 of HD67B22-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.



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USE OF COMPOSITOR SW67B22:

To configure the Converter, use the available software that runs with Windows called SW67B22. 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; 32/64bit).

When launching the SW67B22, the window below appears (Fig. 2).



Note:

It is necessary to have installed .Net Framework 4.



Figure 2: Main window for SW67B22

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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 "OPC UA Client / PROFINET 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".

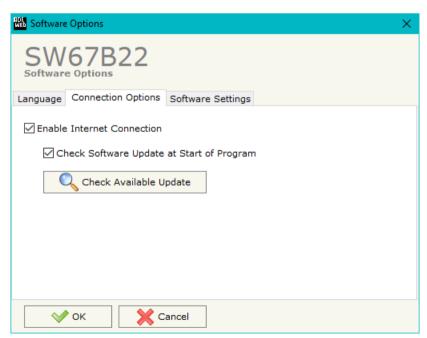


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SOFTWARE OPTIONS:

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 SW67B22 check automatically if there are updatings when it is launched.

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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.

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SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, OPC UA Client and PROFINET.

By Pressing the "**Set Communication**" button from the main window for SW67B22 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The means of the fields for "OPC UA Client" 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 "DNS" the IP Address of the DNS server is defined. This feature can be enabled or disabled pressing the Check Box field.

The means of the fields for "PROFINET" are:

- → In the field "IP Address" the IP address for PROFINET side of the converter is defined;
- In the field "SubNet Mask" the SubNet Mask for PROFINET 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 "Tunneling Port" the port used for transparent UDP communication is defined;
- → In the field "Name of Station" the name of PROFINET side of the converter is defined;
- → In the field "Number Bytes Input" the number of input byte of the slave station is defined;

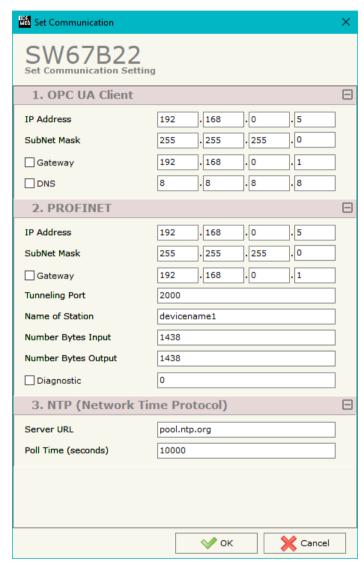


Figure 3: "Set Communication" window



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- ▶ In the field "Number Bytes Output" the number of output byte of the slave station is defined;
- → In the field "Diagnostic" insert the starting byte of the PROFINET array where you will save the diagnostic of OPC UA. It is possible to enable/disable this function using the checkbox.

 For more informations about the diagnostic, see "Diagnostic" section on page 25.

The means of the fields for "NTP (Network Time Protocol)" 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.

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OPC UA ACCESS:

By Pressing the "OPC UA Client Access" button from the main window for SW67B22 (Fig. 2) the window "OPC UA Client Access" appears (Fig. 4).

This section is used to define the list of the OPC UA Servers to read/write with the OPC UA Client.

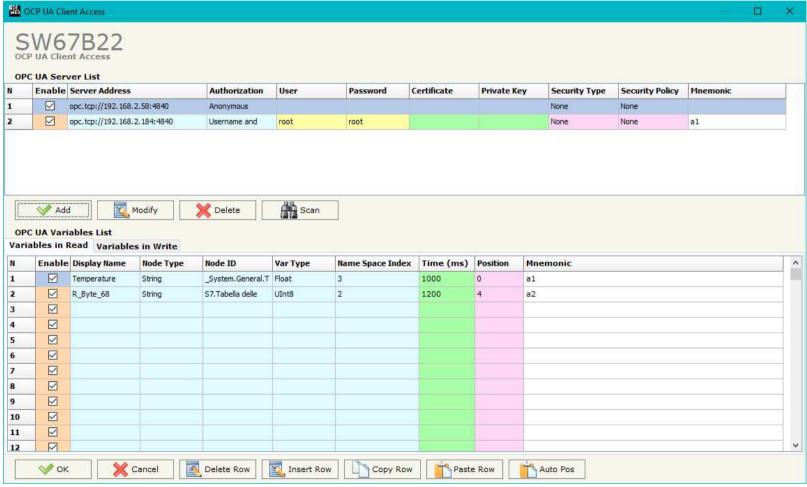


Figure 4: "OPC UA Client Access" window



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By clicking on "Add", it is possible to add a new OPC UA Server inserting its characteristics (Server Address, Authorization, Security Type...). The window "Add OPC UA Server" appears (Fig. 5). By clicking on "Modify", it is possible to change these characteristics for the selected Server. The window "Modify OPC UA Server" appears (Fig. 6).







Figure 6: "Modify OPC UA Server"

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By clicking on "Scan", it is possible to get the list of available variables from the selected Server. The window "Scan Server OPC UA" appears (Fig. 7).

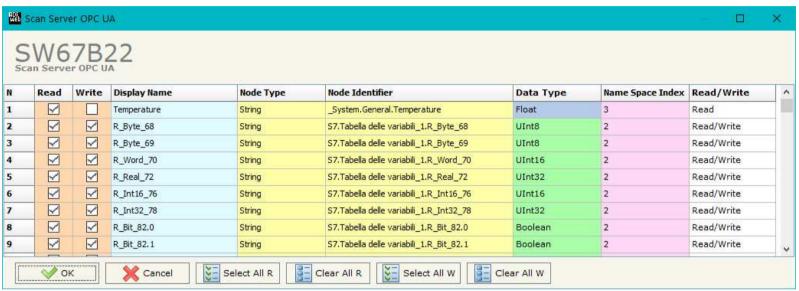


Figure 7: "Scan Server OPC UA" window

The means of the checkboxes inside the table are:

- ▼ If the field "Read" is checked, the variable can be read;
- ▶ If the field "Write" is checked, the variable can be written.

Note

For each variable, it is possible to uncheck these fields and the variable will not be used in read/write.

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After the scan, the selected variables will appear in "Variables in Read" and/or "Variables in Write" sections, in the lower part of the window "OPC UA Client Access" (Fig. 4).

The "Variables in Read" section is used to define the OPC UA variables to read on PROFINET side (Fig. 8).

N	Enable	Display Name	Node Type	Node ID	Var Type	Name Space Index	Time (ms)	Position	Mnemonic	l.
S		Temperature	String	_System.General.T	Float	3	1000	0		
		R_Byte_68	String	S7.Tabella delle	UInt8	2	2000	4		
2		R_Byte_69	String	S7.Tabella delle	UInt8	2	2000	5		
ē.	\checkmark	R_Word_70	String	S7.Tabella delle	UInt16	2	2000	6		
		R_Real_72	String	S7.Tabella delle	UInt32	2	2000	8		
9	$ \mathbf{\nabla} $	R_Int16_76	String	S7.Tabella delle	UInt16	2	2000	12		
Š.		R_Int32_78	String	S7.Tabella delle	UInt32	2	2000	14		
	~	R_Bit_82.0	String	S7.Tabella delle	Boolean	2	2000	18		
,		R_Bit_82.1	String	S7.Tabella delle	Boolean	2	2000	19		
10		R_Bit_82.2	String	S7.Tabella delle	Boolean	2	2000	20		
1		R_Bit_82.3	String	S7.Tabella delle	Boolean	2	2000	21		

Figure 8: "Variables in Read" section

The means of the fields are:

- ▼ If the field "Enable" is checked, the OPC UA variable is enabled;
- ▶ In the field "Display name" the name of the OPC UA variable is defined;
- ▶ In the field "Node Type " the type of the OPC UA node, which includes the variable, is defined;
- → In the field "Node ID" the name of the OPC UA node, which includes the variable, is defined;
- ▶ In the field "Var Type" the data format of the OPC UA variable is defined;
- ▶ In the field "Name Space Index" the Name Space Index of the node, which includes the variable, is defined;
- ▶ In the field "Time (ms)" the delay in ms between two readings of the variable is defined;
- ▶ In the field "Position" the starting byte of the PROFINET array where saving the value is defined;
- ▶ In the field "Mnemonic" a description of the variable is defined.

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The "Variables in Write" section is used to define the OPC UA variables to write from PROFINET side (Fig. 9).

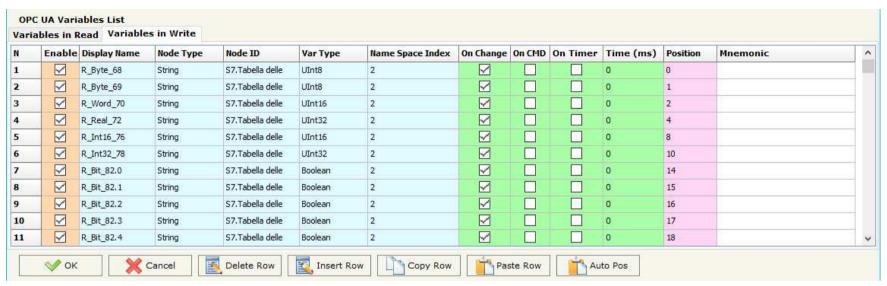


Figure 9: "Variables in Write" section

In "Variables in Write" section (Fig. 8), the means of the fields are:

- ▼ In the field "Display name" the name of the OPC UA variable is defined;
- ▶ In the field "Node Type " the type of the OPC UA node, which includes the variable, is defined;
- ★ In the field "Node ID" the name of the OPC UA node, which includes the variable, is defined;
- ▶ In the field "Var Type" the data format of the OPC UA variable is defined;
- ▶ In the field "Name Space Index" the Name Space Index of the node, which includes the variable, is defined;
- ▶ If the field "On Change" is checked, the OPC UA variable is sent when the data on PROFINET changes the value;

- → In the field "Time (ms)" the delay in ms between two writings of the variable is defined (if "On Timer" is checked);



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- ▶ In the field "Position" the starting byte of the PROFINET array where getting the value is defined;
- ▶ In the field "Mnemonic" a description of the variable is defined.

Note

By clicking on "Auto Pos", the position of the PROFINET arrays where saving/getting the value of variable is automatically calculated.



Note:

A variable can be added manually in "Variables in Read" and/or "Variables in Write" sections without scanning the OPC UA Server.

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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.

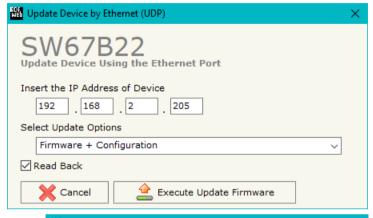
If you don't know the actual IP address of the device you have to use this procedure:

- → 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.



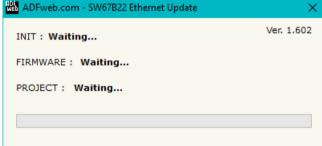


Figure 10: "Update device" windows

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Note:

When you receive the device, for the first time, you also have to update the Firmware in the HD67B22 device.

<u>Warning:</u>

If Fig. 11 appears when you try to do the Update try these points before seeking assistance:

- Check if the serial cable is connected between the PC and the device;
- 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;
- ▼ 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 you have to launch the "Command Prompt" with Administrator Rights;
- → Pay attention at Firewall lock.





Figure 11: "Error" window



Warning:

In the case of HD67B22 you have to use the software "SW67B22": www.adfweb.com\download\filefold\SW67B22.zip.

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OPC UA DIAGNOSTIC OVER PROFINET:

It is possible to save the OPC UA Diagnostic on PROFINET output array using the field "Diagnostic" of the section "Set Communication". In this case, the status of each OPC UA request defined in the section "Set Access" is saved starting from the byte of the PROFINET array defined in the section "Set Communication".

Each bit will represent the status of a OPC UA request:

- ▶ If for a request the converter receives a wrong response or it doesn't receive any response, the status bit is put to '1'.

Example:

In the section "Set Access" are defined 8 OPC UA reading requests ("Variables in Read" table) and 8 OPC UA writing requests ("Variables in Write" table). The OPC UA reading requests are working and the OPC UA writing request are not working.

The status bits of the OPC UA Diagnostic on PROFINET will be:

	Byte x								Byt	e x+1					
bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

where 'x' is the starting byte of the PROFINET array where the OPC UA diagnostic is saved.

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MECHANICAL DIMENSIONS:

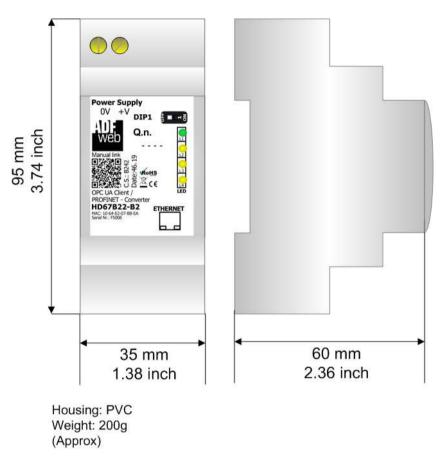
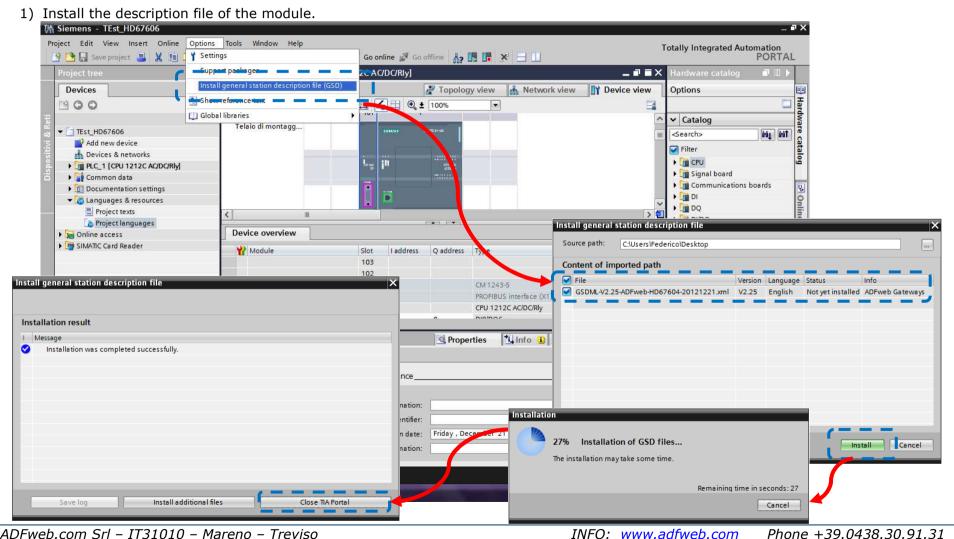


Figure 12: Mechanical dimensions scheme for HD67B22-B2

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PLC CONFIGURATION:

The configuration and commissioning of the PROFINET Converter as described on the following pages was accomplished with the help of the TIA Portal software of Siemens. In case of using a control system from another supplier please attend to the associated documentation. These are the steps to follow:



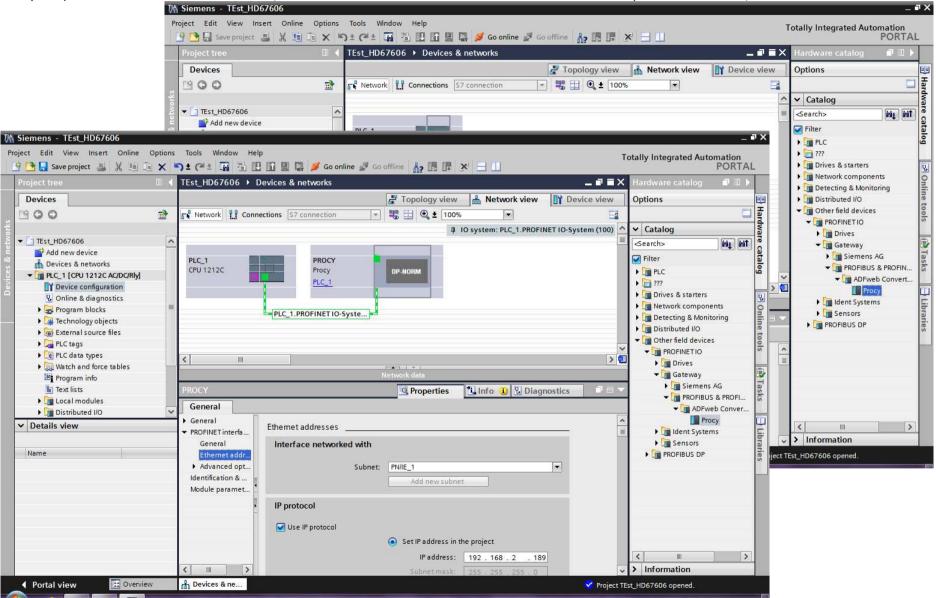


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2) Import the module in the network; connect the device to the PLC network and edit the parameters of IP, station name etc.



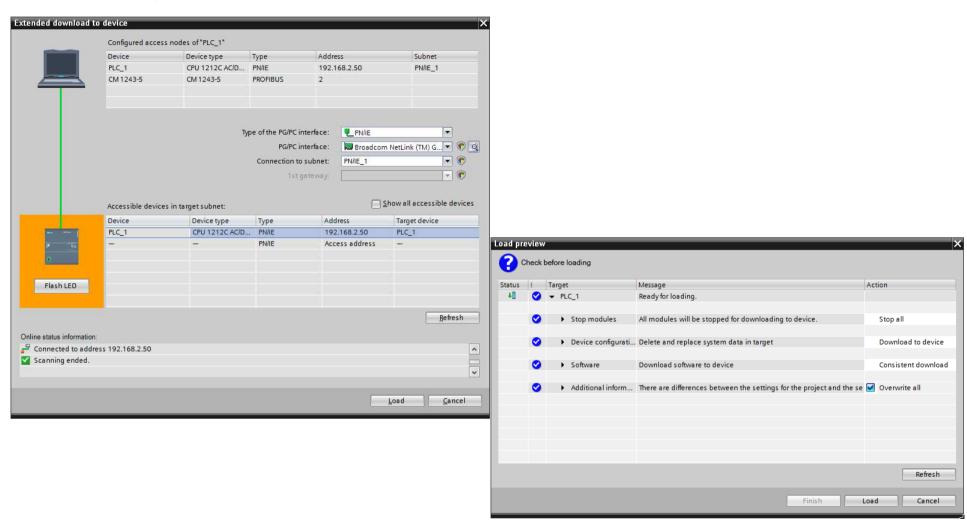


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3) Load the configuration into the PLC.

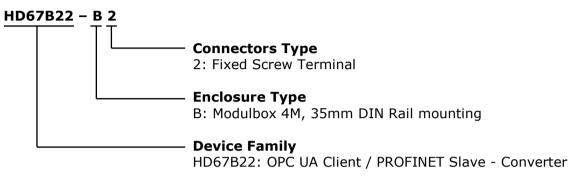


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ORDERING INFORMATIONS:

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



Order Code: **HD67B22-B2** - OPC UA Client / PROFINET Slave - 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

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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 **RoHS** and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

INFO: www.adfweb.com

CE MARKING

The product conforms with the essential requirements of the applicable EC directives.

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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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