User Manual

Revision 1.010
English

Ethernet Client from/to PROFIBUS Slave

(Order Code: HD67576-A1)

for Website information:
 http://www.adfweb.com/?Product=HD67576

for Price information:
 http://www.adfweb.com/?Price=HD67576-A1

Benefits and Main Features:

► Very easy to configure

► Low cost

► Industrial temperature range:
 -40°C / 85°C (-40°F / 185°F)

For others PROFIBUS devices, see also the following links:

PROFIBUS Slave from/to …
www.adfweb.com?Product=HD67045	(… **Serial**)
www.adfweb.com?Product=HD67053	(… **M-Bus Master**)
www.adfweb.com?Product=HD67551	(… **CANopen**)
www.adfweb.com?Product=HD67552	(… **CAN**)
www.adfweb.com?Product=HD67553	(… **J1939**)
www.adfweb.com?Product=HD67554	(… **DeviceNet Slave**)
www.adfweb.com?Product=HD67555	(… **DeviceNet Master**)
www.adfweb.com?Product=HD67561	(… **Modbus Master**)
www.adfweb.com?Product=HD67562	(… **Modbus Slave**)
www.adfweb.com?Product=HD67563	(… **Ethernet Server**)
www.adfweb.com?Product=HD67564	(… **Modbus TCP Client**)
www.adfweb.com?Product=HD67565	(… **Modbus TCP Server**)

PROFIBUS MASTER from/to …
www.adfweb.com?Product=HD67575	(… **Ethernet Server**)

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

INDEX:

UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:
- Updated;
- Related to the product you own.

To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

With this "Document Code" go to web page www.adfweb.com/download/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the updates.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	10/11/2011	Fl	All	First release version
1.010	02/04/2012	Fl	All	Software changed (v1.000)

WARNING:

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

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CONNECTION SCHEME:

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

Led1:
Green
Power

Led2:
Green
Ethernet comm

Led3:
Green
Device State

Led4:
Green
PROFIBUS comm

Connector2:
Ethernet port
(RJ45 Plug)

Led5:
Green
Ethernet Link

Connector3:
PROGIBUS port
(D-SUB9-Female)

PIN3 = wire A
PIN5 = GND
PIN8 = wire B

5 4 3 2 1
9 8 7 6

Rail DIN Clamp

Dip-Switch A:
-Dip1 – Not Used
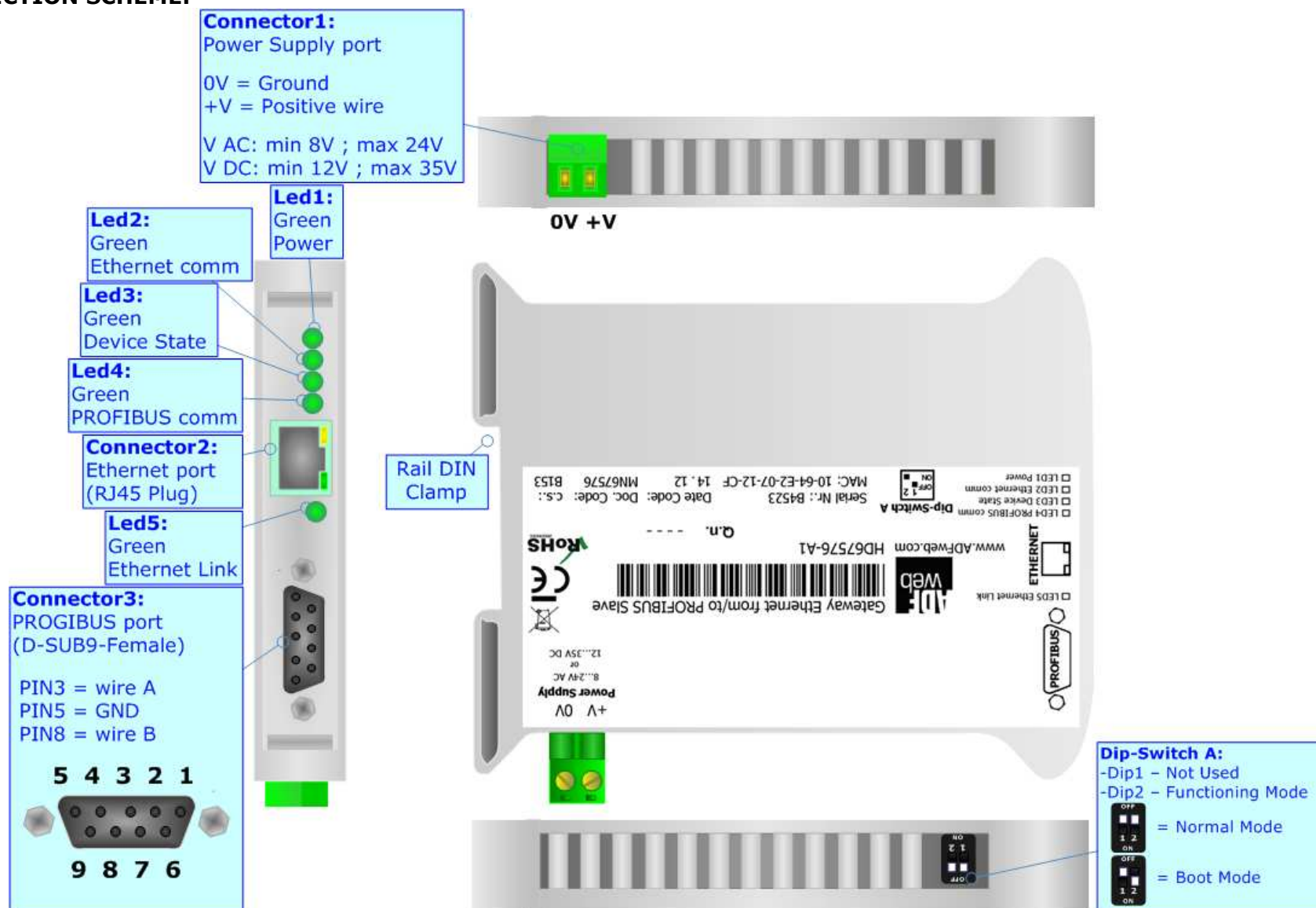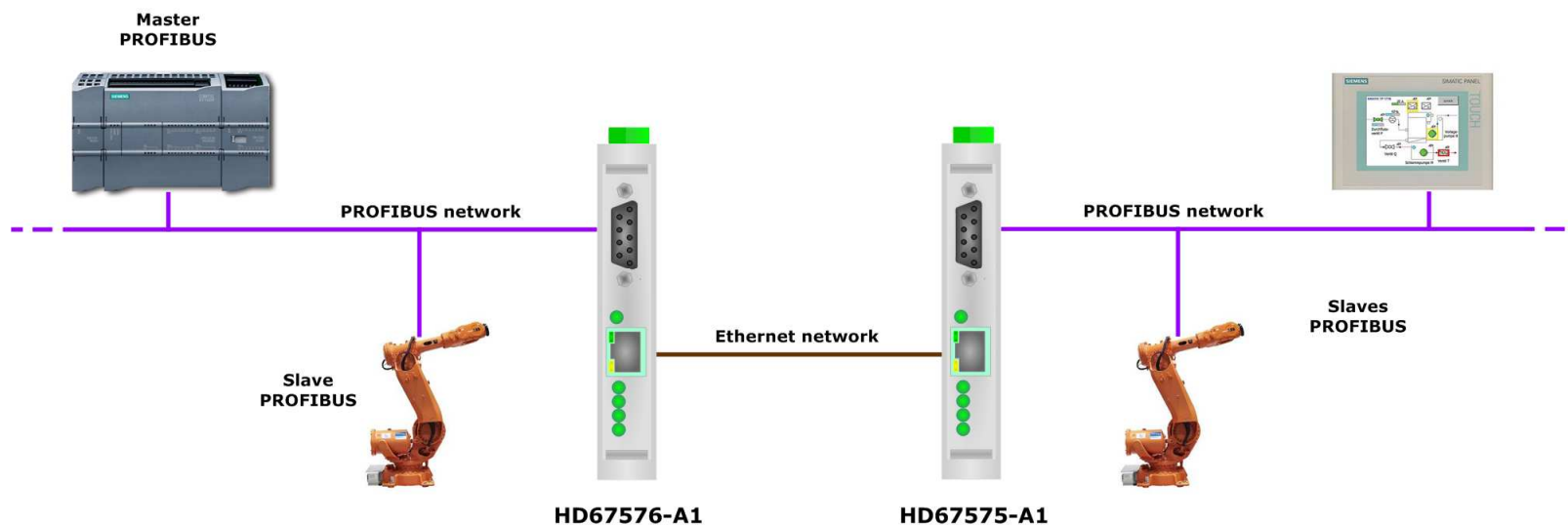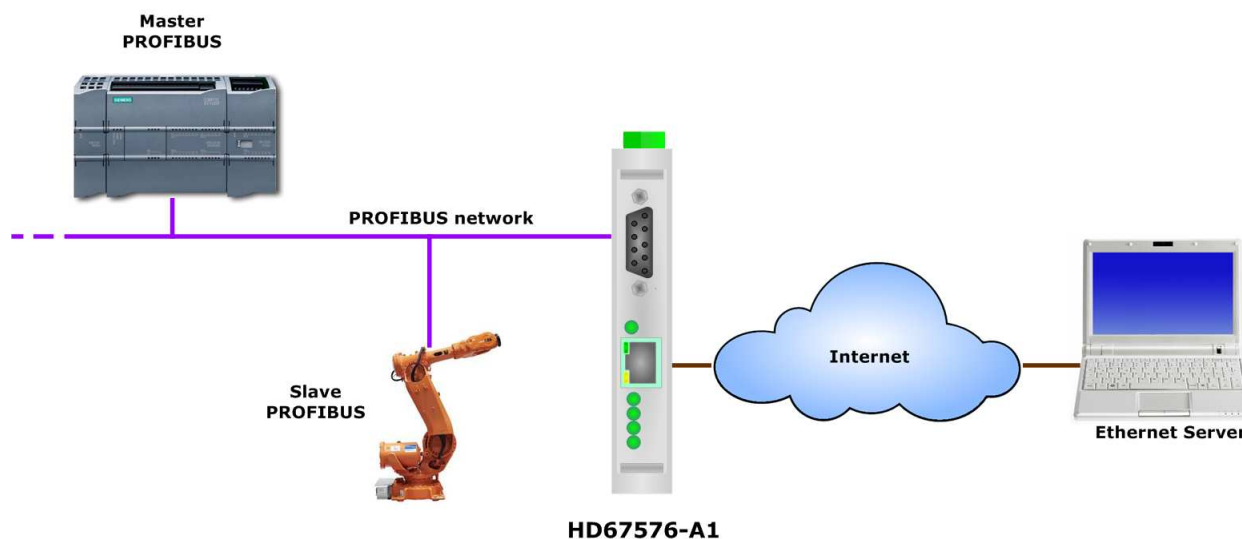-Dip2 – Functioning Mode

= Normal Mode

= Boot Mode

Figure 1: Connection scheme for HD67576-A1

EXAMPLES OF CONNECTION:

Used in pair with the HD67575-A1, allows to make a tunneling over Ethernet. In this case you can also connect them to Internet.

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CHARACTERISTICS:

The configurable "Ethernet Client from/to PROFIBUS Slave" gateway allows the following characteristics:

+ UDP protocol at Ethernet side;
+ Mountable on 35mm Rail DIN;
+ Power Supply 8...24V AC or 12...35V DC;
+ Temperature range -40°C to 85°C.

CONFIGURATION:

You need Compositor SW67576 software on your PC in order to perform the following:

+ Define the parameter of the PROFIBUS;
+ Define the parameter of the Ethernet line;
+ Define the PROFIBUS network.

POWER SUPPLY:

The devices can be powered between a wide range of tensions. For more details see the two tables below.
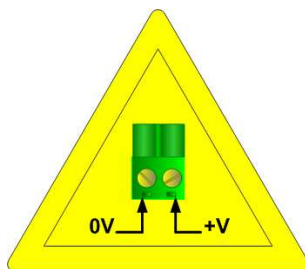
	VAC ～		VDC ▬▬	
	Vmin	**Vmax**	**Vmin**	**Vmax**
HD67576-A1	**8V**	**24V**	**12V**	**35V**

Consumption at 24V DC:

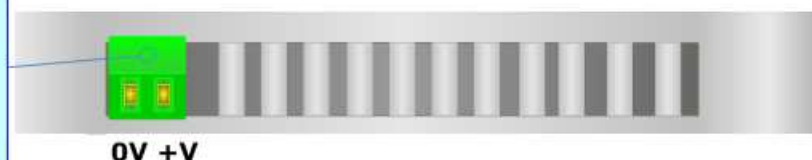| Device	W/VA
HD67576-A1	4

⚠️ **Caution: Not reverse the polarity power**

HD67576-A1

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

0V +V

FUNCTION MODES:

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

- The first, with Dip2 in Off position (factory setting), is used for the normal working of the device.
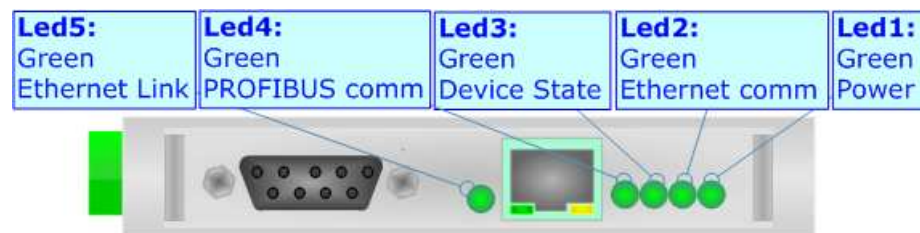- The second, with Dip2 in On position, is used for upload the Project/Firmware.

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: Power (green)	**ON:** Powered **OFF:** Not powered	**ON:** Powered **OFF:** Not powered
2: Ethernet comm (green)	Blinks quickly when receive Ethernet commands	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: Device State (green)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: PROFIBUS comm (green)	Blinks quickly when there is PROFIBUS communication	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Ethernet Link (green)	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected

Led5:
Green
Ethernet Link

Led4:
Green
PROFIBUS comm

Led3:
Green
Device State

Led2:
Green
Ethernet comm

Led1:
Green
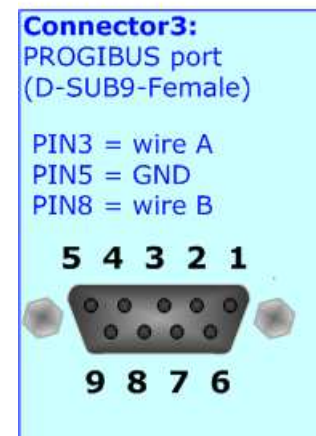Power

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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.

ETHERNET:

The Ethernet connection must be made using Connector3 of HD67576-A1 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 SW67576:

 To configure the Gateway, use the available software that runs with Windows, called SW67576. 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).

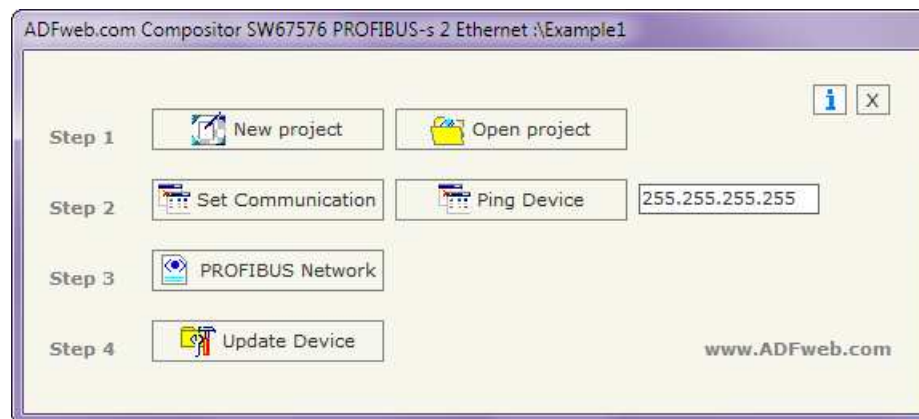When launching the SW67576 the right window appears (Fig. 2).

Figure 2: Main window for SW67576

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 "Ethernet Client from/to PROFIBUS Slave" Gateway 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**".

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SET COMMUNICATION:

This section defines the fundamental communication parameter of two buses, PROFIBUS and Ethernet.

By pressing the "**Set Communication**" button from the main window for SW67576 (Fig. 2) the window "Set Communication" appears (Fig. 3).

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

The means of the fields for "PROFIBUS" are:

- In the field "**ID Dev.**" The address of the PROFIBUS side is defined;
- In the field "**Baud rate**" the baud rate for the PROFIBUS side is defined;

The means of the fields for "Ethernet" are:

- In the field "**IP ADDRESS**" insert the IP address;
- In the field "**SUBNET Mask**" insert the Subnet mask;
- If the "**GATEWAY**" field is checked it is possible to insert, in the field under, the IP Address for going out to the net;
- In the field "**Port**" insert the number of the port;
- In the field "**COMPANION BOARD IP ADDRESS**" insert the IP address of the Ethernet Server device that communicates with the HD67576;
- In the field "**COMPANION Port**" insert the number of the port of the Ethernet Server device that communicates with the HD67576.

Figure 3: "Set Communication" window

PROFIBUS NETWORK:

By pressing the "**PROFIBUS Network**" button from the main window for SW67576 (Fig. 2) the window "PROFIBUS Network" (Fig. 4) appears.

In this section you can add/modify/remove the GSD files of the PROFIBUS slaves.

When you select the slave, by double click or by the "**Modify Slave PROFIBUS**" button, the window "PROFIBUS Device" (Fig. 5) appears:

- In the section "**ID Slave PROFIBUS**" you must write the PROFIBUS address of your slave.

- In the section "**Available modules**" there are all the modules you can select for this slave, to add a modules you can select it and click on the "**hands**" or with a double click on the module.
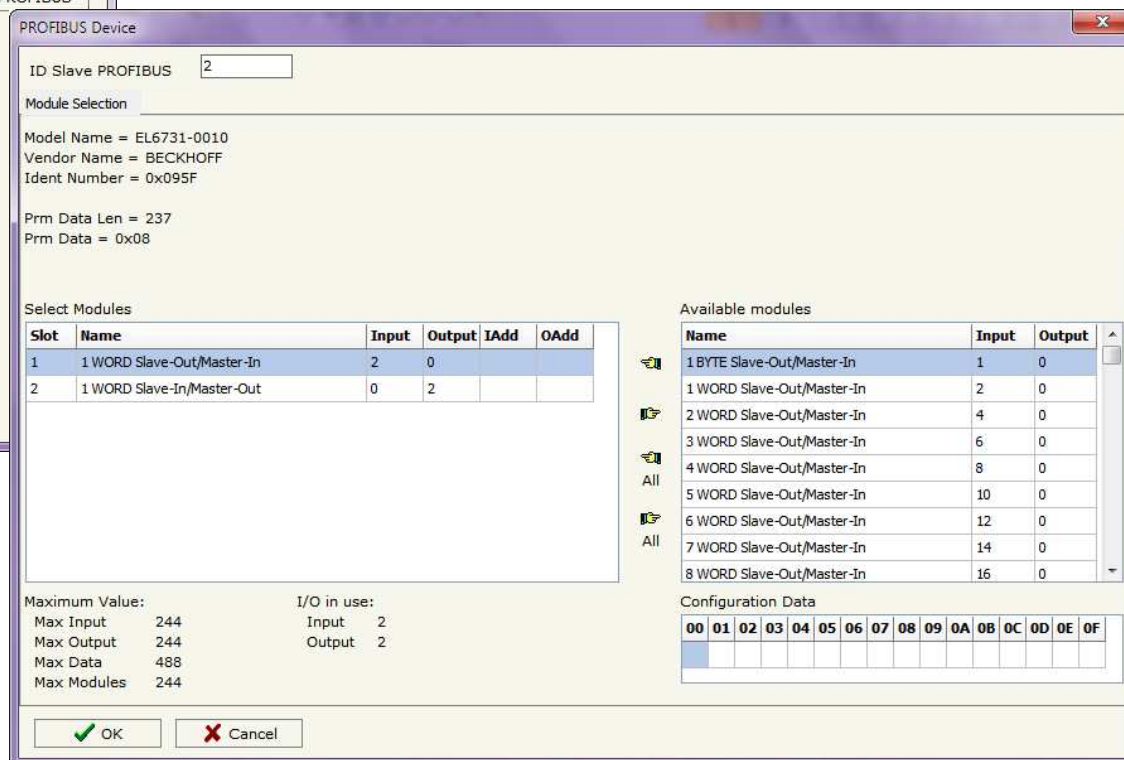
Figure 4: "PROFIBUS Network" window

Figure 5: "PROFIBUS Device" 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 is 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' at ON position;
+ Insert the IP "**192.168.2.205**";
+ Turn on the device;
+ 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" turn off the Device;
+ Put Dip2 of 'Dip-Switch A' at OFF position;
+ Turn on the device.

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

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 Gateway;
+ 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.

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 HD67576-A1 device.

Warning:

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

➜ Try to repeat the operations for the updating;
➜ 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, make sure that you have the administrator privileges;
➜ Take attention at Firewall lock;
➜ Check the LAN settings.

Figure 7: "Protection" window

In the case of HD67576-A1 you have to use the software "SW67576": www.adfweb.com\download\filefold\SW67576.zip.

ETHERNET PROTOCOL:

The communiocation is made through UDP frames.
The frame that the HD67576 sends is composed like follow:

Byte Number	Description	Abbreviation	
1	Address PROFIBUS HD67576 + 0x80	/	
2	Address PROFIBUS Slave simulated	/	
3	Writing state (must be at 0)	/	
4	Slave informations	/	
5	Data length (OUT Slave)	DLR	
6 ÷ (DLR + 5)	Data OUT	/	
DLR + 6	Configuration length (programmed)	CLP	
(DLR + 7) ÷ (DLR + CLP + 6)	Configuration programmed	/	
DLR + CLP + 7	Data length (IN Slave)	DLW	
(DLR + CLP + 8) ÷ (DLR + CLP + DLW + 7)	Data IN	/	
DLR + CLP + DLW + 8	Fixed at 0	/	
DLR + CLP + DLW + 9	Fixed at 0	/	

If the "DLR" and/or "DLW" has got the value 0x00 there are no data to read/write.
The "Data OUT" are the same that the HD67576-A1 receives with the frame sended by the companion.

The frame that the HD67576 expects is composed like the follow:

Byte Number	Description	Abbreviation	
1	Address PROFIBUS + 0x80	/	
2	Address PROFIBUS Slave simulated	/	
3	Writing state (must be at 0)	/	
4	Slave informations	/	
5	Data length (OUT Slave)	DLR	
6 ÷ (DLR + 5)	Data OUT	/	
DLR + 6	Configuration length (programmed)	CLP	
(DLR + 7) ÷ (DLR + CLP + 6)	Configuration programmed	/	
DLR + CLP + 7	Data length (IN Slave)	DLW	
(DLR + CLP + 8) ÷ (DLR + CLP + DLW + 7)	Data IN	/	
DLR + CLP + DLW + 8	Configuration length (of device)	CLD	
(DLR + CLP + DLW + 9) ÷ (DLR + CLP + DLW + CLD + 8)	Configuration of device	/	
DLR + CLP + DLW + CLD + 9	Fixed at 0	/	

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If the "DLR" and/or "DLW" has got the value 0x00 there are no data to read/write.
The "Data IN" are the same that the HD67576-A1 sends.

The "Slave informations" (Byte 4 of all frames) gives informations about the slave interrogated. Every bit has a meaning:
- Bit0: Configuration corresponds;
- Bit1: Parameters OK;
- Bit2: Configuration OK;
- Bit3: Data OK.

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

If all is correct, you have to read 0x0F.

Example of communication between HD67576-A1 connected to a HD67575-A1 through Ethernet and a slave PROFIBUS connected to the HD67575-A1. The Slave has got 7 OUT and 3 IN:

HD67576→HD67575: 8A 14 00 0F 07 00 00 00 00 00 00 00 08 42 06 00 01 82 02 00 02 03 00 00 00 00 00
    Notes: first frame sent by the HD67576-A1. The IN and OUT are at 0.

HD67575→HD67576: 8B 14 00 0F 07 **55** 00 00 00 00 00 00 08 42 06 00 01 82 02 00 02 03 00 00 00 **08** 42 09 00 01 82 04 00 02 00
    Notes: the HD67575-A1 sends a frame where the first OUT of slave is changed from 00h to 55h.

HD67576→HD67575: 8A 14 00 0F 07 55 00 00 00 00 00 00 08 42 06 00 01 82 02 00 02 03 **03** 00 00 00 00
    Notes: the HD67576-A1 sends a frame where the first IN is changed from 00h to 03h.

HD67575→HD67576: 8B 14 00 0F 07 55 **A5** 00 00 00 00 00 08 42 06 00 01 82 02 00 02 03 03 00 00 **08** 42 09 00 01 82 04 00 02 00
    Notes: the HD67575-A1 sends a frame where the second OUT of slave is changed from 00h to A5h.

HD67576→HD67575: 8A 14 00 0F 07 55 A5 00 00 00 00 00 08 42 06 00 01 82 02 00 02 03 03 **5A** 00 00 00
    Notes: the HD67576-A1 sends a frame where the second IN is changed from 00h to 5Ah.

HD67575→HD67576: 8B 14 00 0F 07 55 A5 00 00 00 00 00 08 42 06 00 01 82 02 00 02 03 03 5A 00 **08** 42 09 00 01 82 04 00 02 00
    Notes: nothing is changed in the Slave PROFIBUS connected to the HD67575-A1.
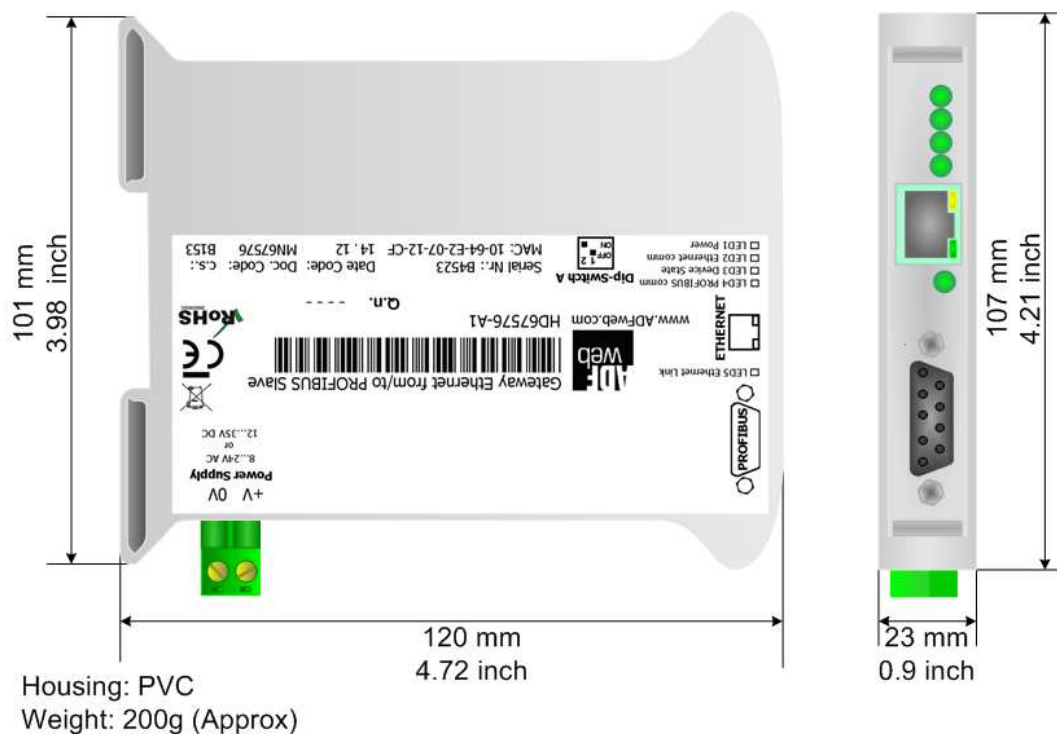
MECHANICAL DIMENSIONS:

Figure 8: Mechanical dimensions scheme

ORDER CODE:

Order Code: **HD67576-A1-**   Gateway – Ethernet UDP Client from/to PROFIBUS Slave

ACCESSORIES:

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

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WARRANTIES AND TECHNICAL SUPPORT:

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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
HD67181	CAN bus Repeater	www.adfweb.com?product=HD67181
HD67316	CAN bus Analyzer	www.adfweb.com?product=HD67316
HD67575	Ethernet Server from/to PROFIBUS Master	www.adfweb.com?product=HD67575