

User Manual

Revision 1.000
English

PROFINET / Modbus Slave – Converter

(Order Code: HD674-A007)

For Website information:

www.adfweb.com?Product=HD674-A007

For Price information:

www.adfweb.com?Price=HD674-A007

Benefits and Main Features:

- ⊕ Very easy to configure
- ⊕ Wide supply input range
- ⊕ Electrical isolation
- ⊕ Industrial temperature range:
- ⊕ -40°C / 105°C (-40°F / 221°F)



User Manual



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 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:

	Page
INDEX	2
UPDATED DOCUMENTATION	2
REVISION LIST	2
WARNING	2
TRADEMARKS	2
SECURITY ALERT	3
EXAMPLES OF CONNECTION	4
CONNECTION SCHEME	5
CHARACTERISTICS	9
CONFIGURATION	9
POWER SUPPLY	10
LEDS	11
RS232	12
RS485	13
ETHERNET	14
USB	14
USE OF COMPOSITOR SW674-A007	15
NEW PROJECT / OPEN PROJECT	16
SOFTWARE OPTIONS	17
SET COMMUNICATION	18
PROFINET XML	19
UPDATE DEVICE	20
MODBUS MAP	22
PLC CONFIGURATION	24
MECHANICAL DIMENSIONS	27
ORDER CODE	31
ACCESSORIES	32
DISCLAIMER	33
OTHER REGULATIONS AND STANDARDS	33
WARRANTIES AND TECHNICAL SUPPORT	34
RETURN POLICY	34

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	15/06/2017	Ff	All	First released version

WARNING:

ADFweb.com reserves the right to change information in this manual about our product without warning.
ADFweb.com is not responsible for any error this manual may contain.

TRADEMARKS:

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

SECURITY ALERT:**GENERAL INFORMATION**

To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device, 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:

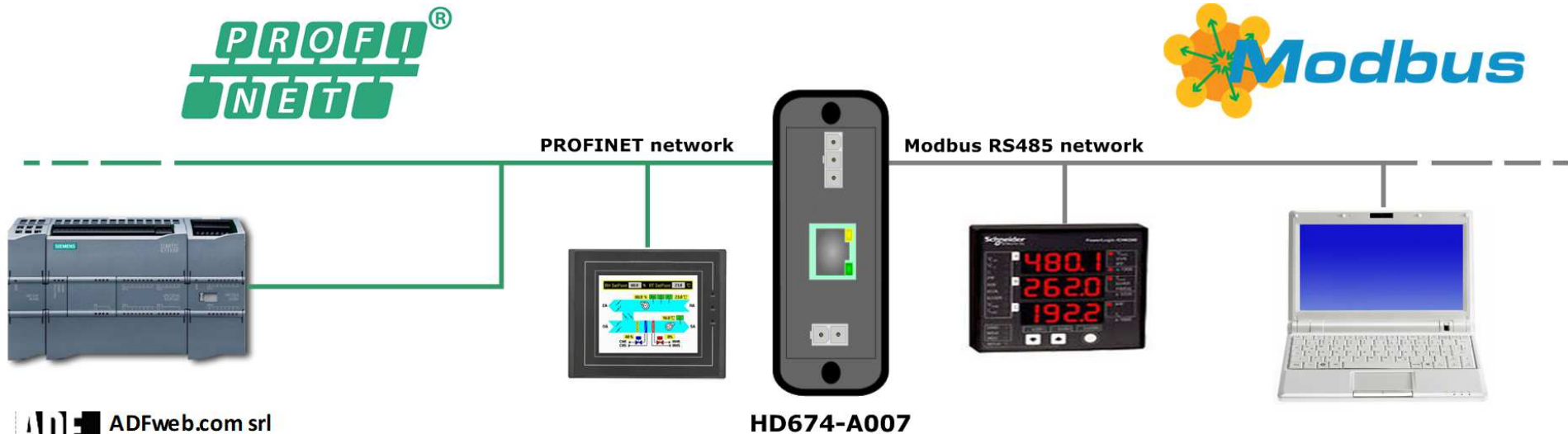


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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.com srl
 tel. +39 - 0438.30.91.31
www.adfweb.com
info@adfweb.com

HD674-A007

CONNECTION SCHEME:

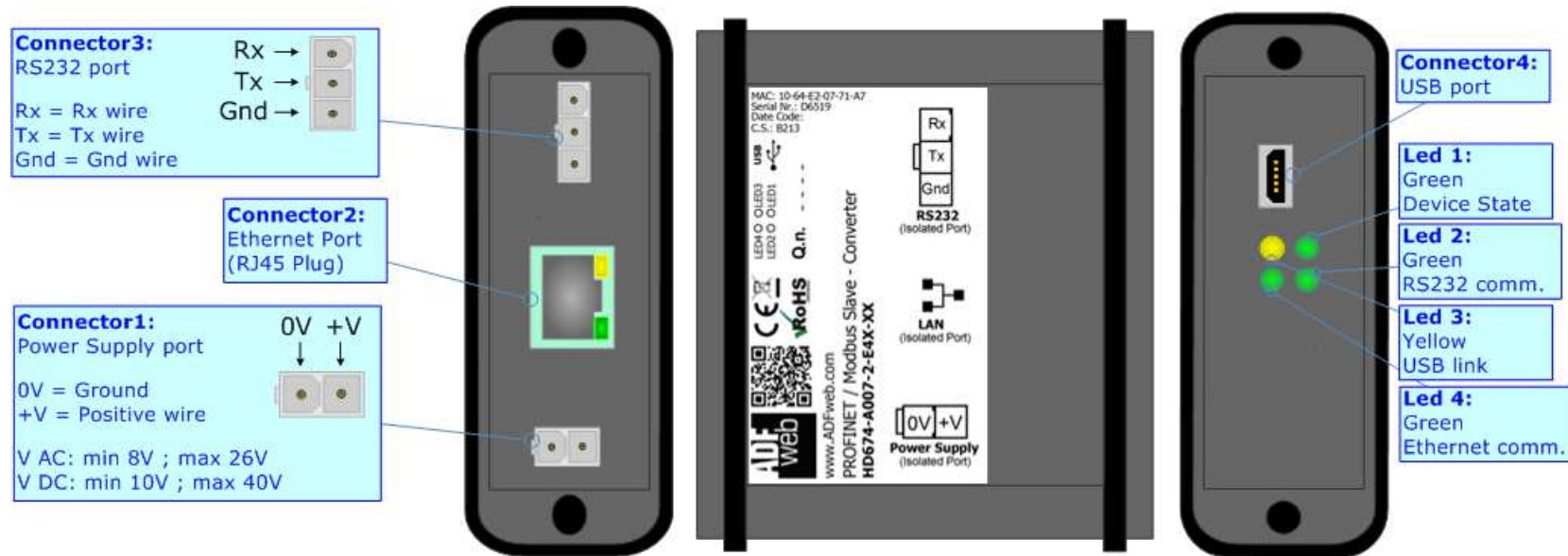


Figure 1a: Connection scheme for HD674-A007-2-E4x-xx

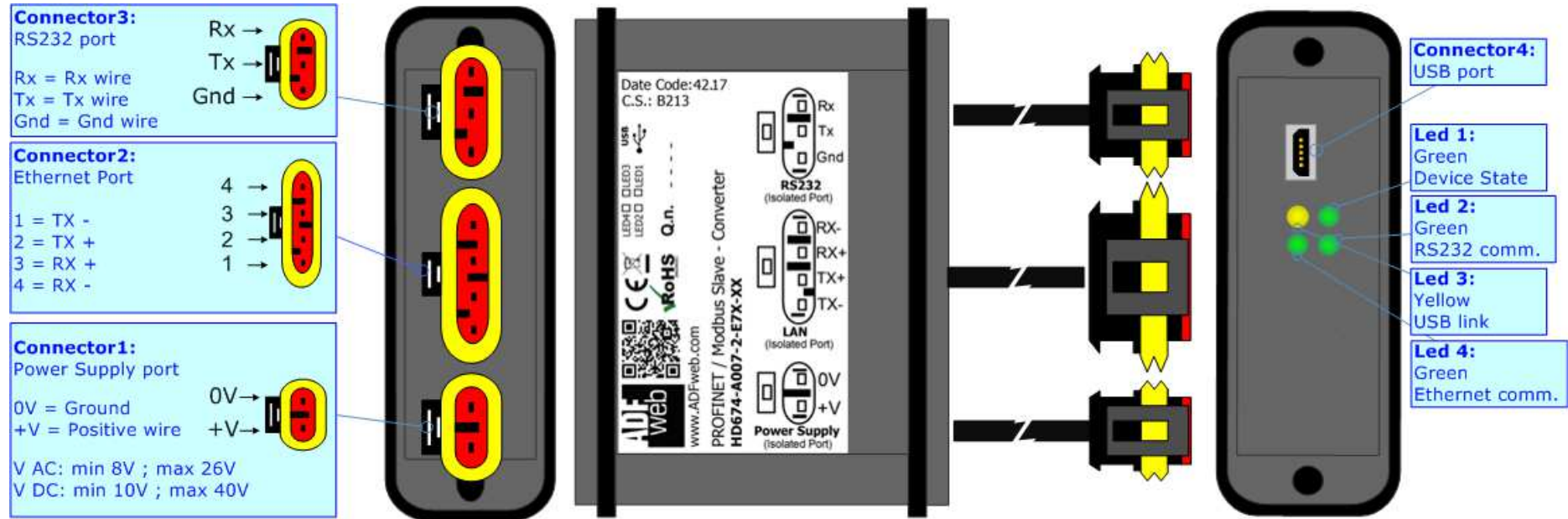


Figure 1b: Connection scheme for HD674-A007-2-E7x-xx

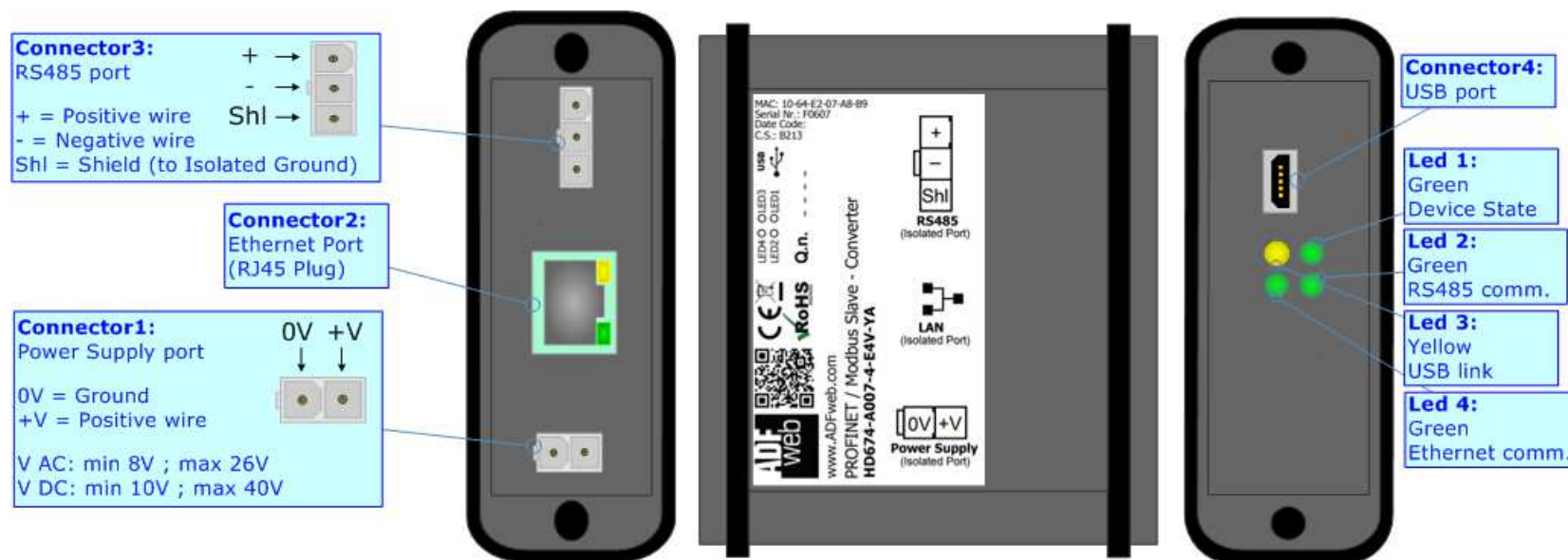


Figure 1c: Connection scheme for HD674-A007-4-E4x-xx

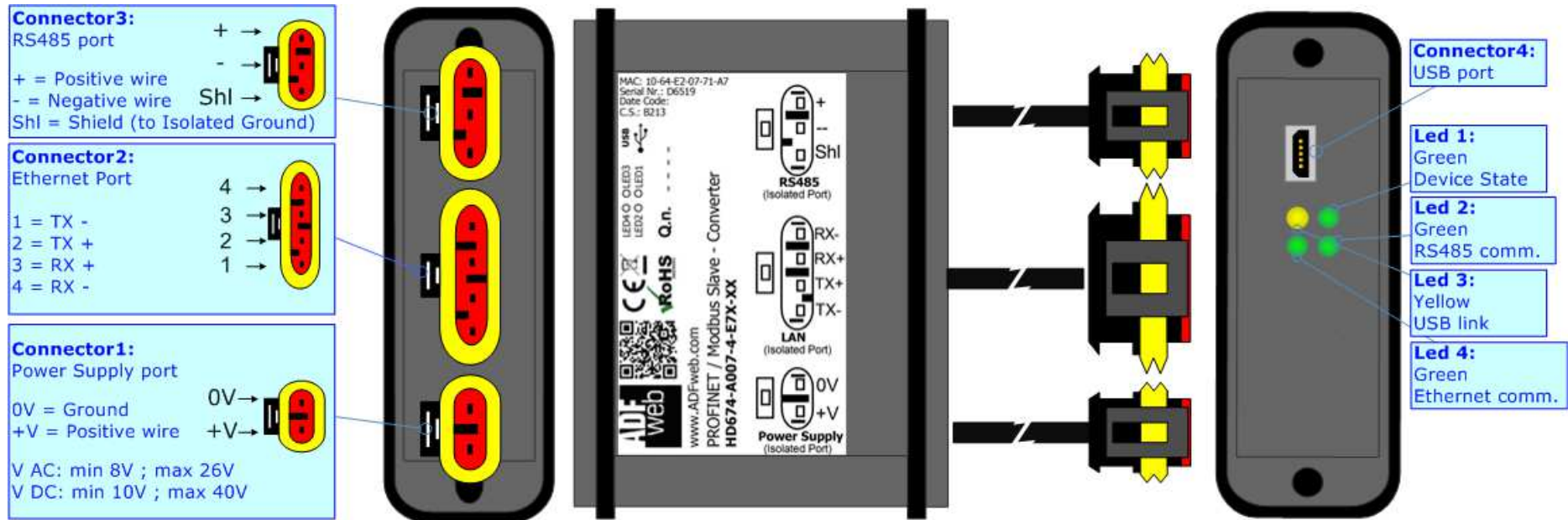


Figure 1d: Connection scheme for HD674-A007-4-E7x-xx

CHARACTERISTICS:

The "**HD674-A007**" series are rugged devices used to interface Modbus Master with PROFINET network.

With its particular enclosure, equipped with four fixing lugs, makes available the mounting of the device in any plane surface (horizontal, vertical, oblique).

It is possible to have the device varnished or totally resined and also in both cases with "Mini-Fit®" connectors or "AMP SuperSeal 1.5" connectors. If is resined, the enclosure, like the "AMP SuperSeal 1.5" connectors, is waterproof.

All the four series have these characteristics:

- Triple 4kV isolation between Power Supply / PROFINET / Modbus;
- Varnished / Resined (optionally);
- Wide power supply input range: 8...26V AC | 10...40V DC;
- Mini-Fit® / AMP SuperSeal 1.5 connectors;
- Metal enclosure with fixing lugs;
- Possibility to use Metal hose clamps for fixing it without using lugs;
- Microprocessor for data control;
- Wide temperature range: -40°C / 105°C (-40°F / 221°F).

CONFIGURATION:

You need Compositor SW674-A007 software on your PC in order to perform the following:

- Define the parameter of PROFINET line;
- Define the parameter of Modbus line;
- Update the device.

POWER SUPPLY:

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

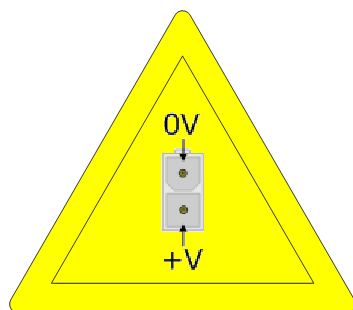
	VAC		VDC	
	Vmin	Vmax	Vmin	Vmax
HD674-A007-x-Exx-xx	8V	26V	10V	40V

Consumption at 24V DC:

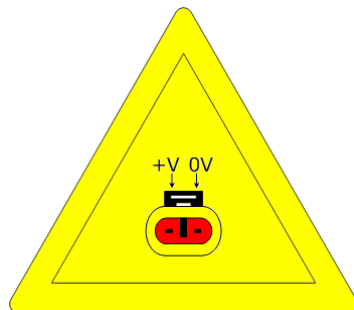
Device	W/VA
HD674-A007-x-Exx-xx	4



Caution: Not reverse the polarity power



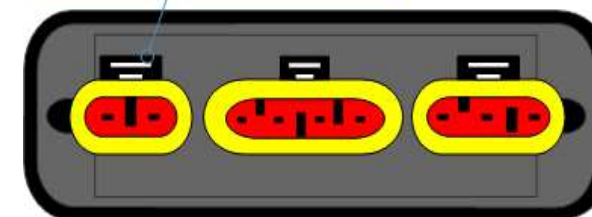
HD674-A007-x-E4x-xx



HD674-A007-x-E7x-xx



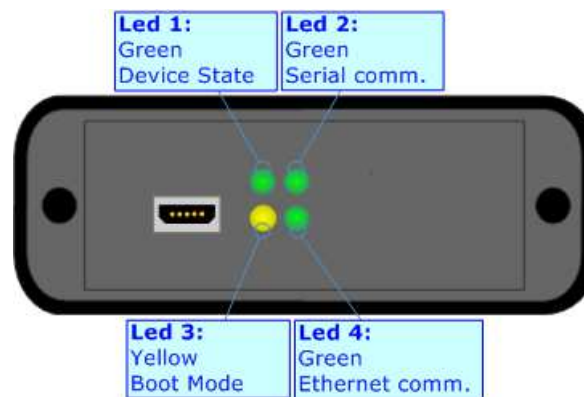
Note: It is possible to use also negative tensions. In this case the polarity must be inverted.



LEDS:

The device has got four 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: Serial Communication (green)	Blinks when Modbus requests are received	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress
3: USB Link (yellow)	ON: USB cable inserted OFF: USB cable not inserted	ON: USB cable inserted OFF: USB cable not inserted
4: Ethernet communication (green)	Blinks when PROFINET communication is working	Blinks quickly: Boot state Blinks very slowly (~0.5Hz): update in progress



RS232:

The connection of the RS232 in the HD674-A007-2-E4x-xx device must be made with a 3way MiniFit Female connector. The pinout of Male MiniFit connector of the board is at right side of the page.

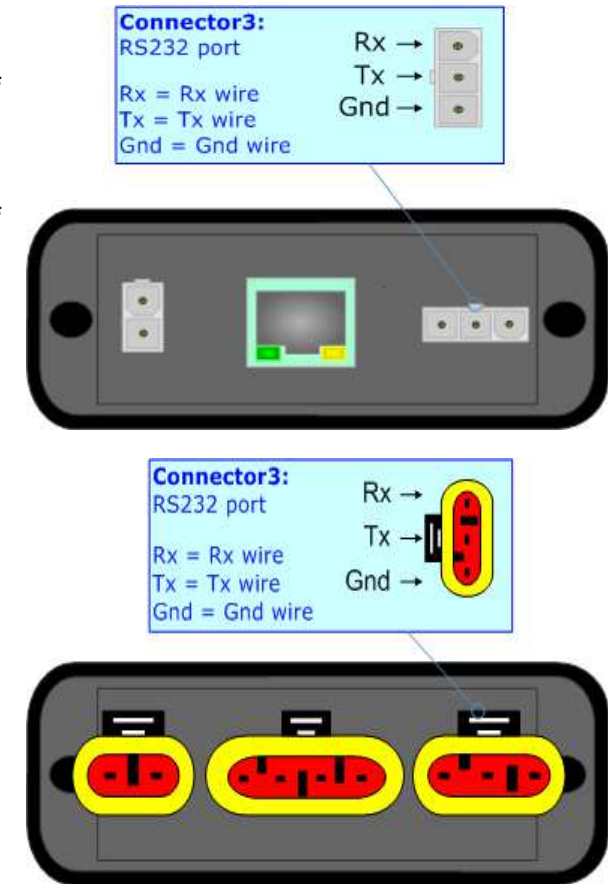
The connection of the RS232 in the HD67-A007-2-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.

The maximum length of the cable should be 15m.

Link for Mini-Fit® connectors:

http://www.molex.com/molex/products/group?key=minifit_products&channel=products

Link for SuperSeal 1.5 connectors: <http://www.te.com/catalog/cinf/en/c/10876/956>



RS485:

The connection of the RS485 in the HD674-A007-4-E4x-xx device must be made with a 3way MiniFit Female connector. The pinout of Male MiniFit connector of the board is at right side of the page.

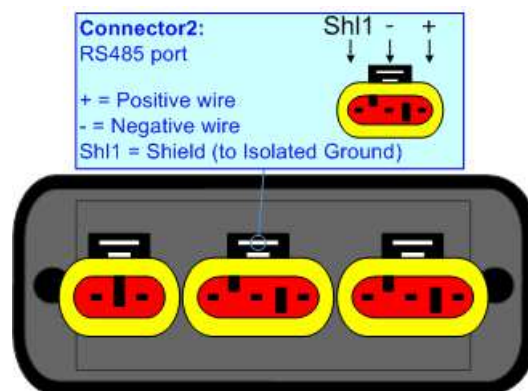
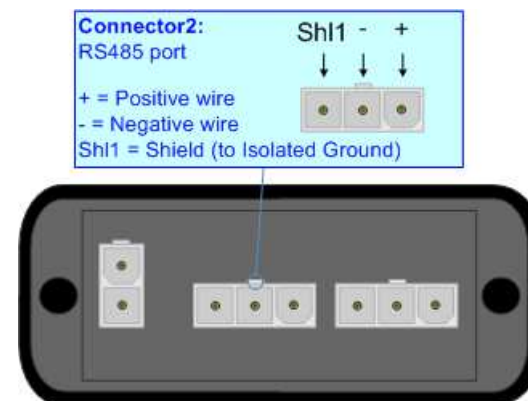
The connection of the RS485 in the HD67-A007-4-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.

The termination of RS485 line, with a 120Ω resistor, in the HD674-A007-4-Exx-xx is made internally of the device; when the order is performed. If the device have the RS485 terminated the code is the follow: HD674-A007-4-Exx-Yx; otherwise is this other: HD674-A007-4-Exx-Nx.

The maximum length of the cable should be 1200m (4000 feet).

Here some codes of cables:

- Belden: p/n 8132 - 2x 28AWG stranded twisted pairs conductor + foil shield + braid shield;
- Belden p/n 82842 - 2x 24AWG stranded twisted pairs conductor + foil shield + braid shield;
- Tasker: p/n C521 - 1x 24AWG twisted pair conductor + foil shield + braid shield;
- Tasker: p/n C522 - 2x 24AWG twisted pairs conductor + foil shield + braid shield.



Link for Mini-Fit® connectors: http://www.molex.com/molex/products/group?key=minifit_products&channel=products

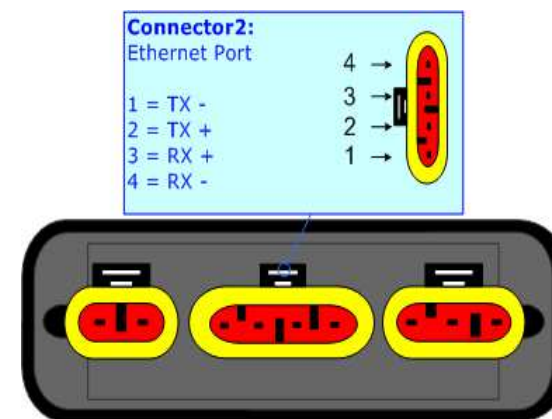
Link for SuperSeal 1.5 connectors: <http://www.te.com/catalog/cinf/en/c/10876/956>

ETHERNET:

The connection of Ethernet in the HD674-A007 device must be made 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.

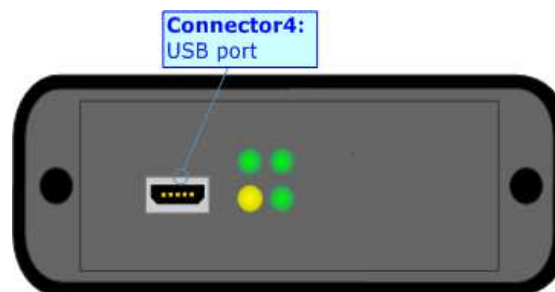
The connection of Ethernet in the HD674-A007-x-E4x-xx device must be made with RJ45 connector.

The connection of the Ethernet in the HD674-A007-x-E7x-xx device must be made with a AMP SuperSeal 1.5 Male connector. The pinout of Female connector of the board is at right side of the page.



USB:

The USB port is used to start the converter in Boot Mode. It is necessary to use a Micro USB type B cable.



USE OF COMPOSITOR SW674-A007:

To configure the Converter, use the available software that runs with Windows called SW674-A007. 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 SW674-A007, the window below appears (Fig. 2).



Note:

It is necessary to have installed .Net Framework 4.

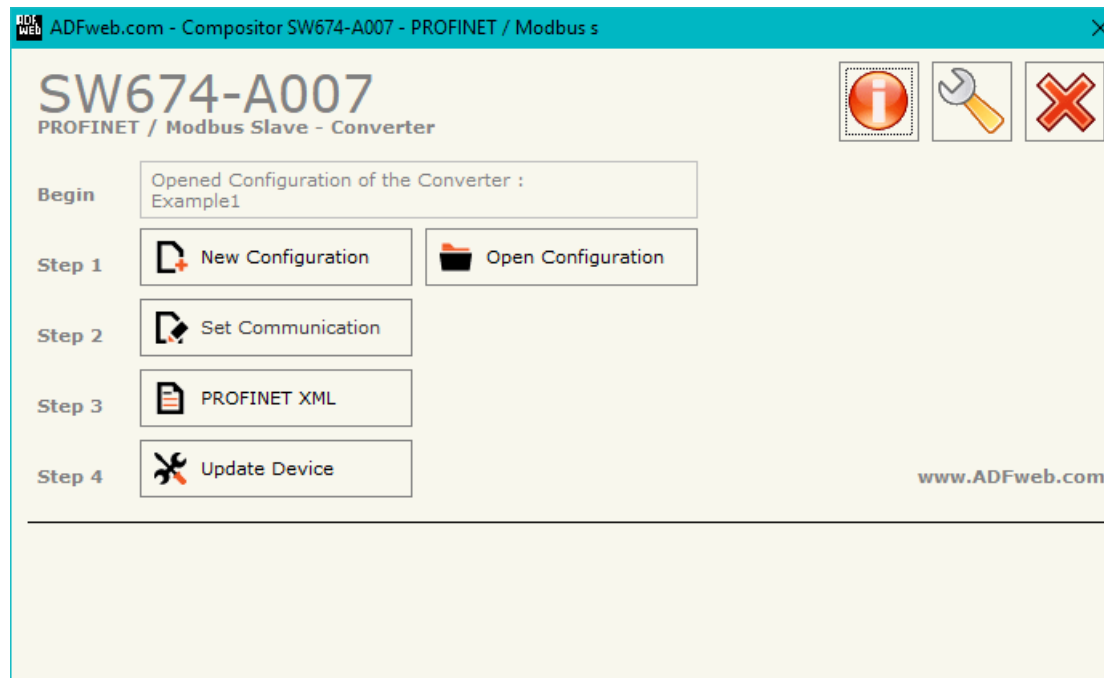
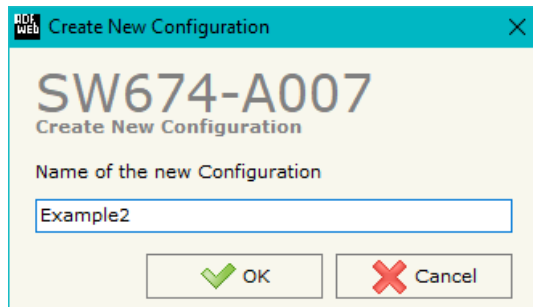


Figure 2: Main window for SW674-A007

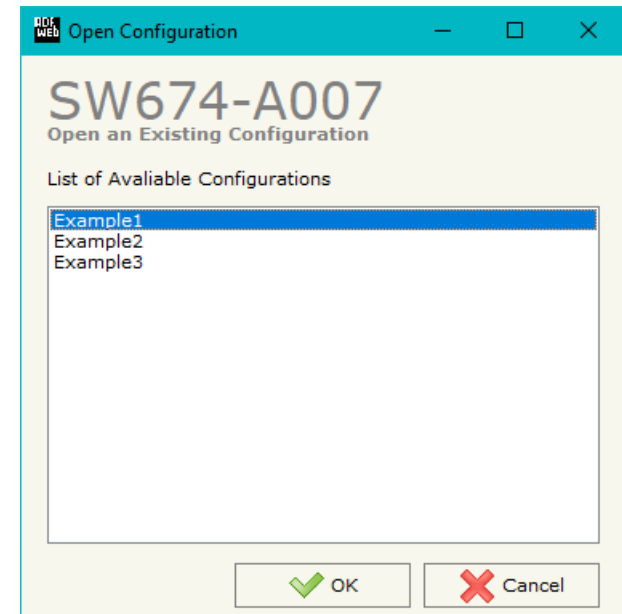
NEW CONFIGURATION / OPEN CONFIGURATION:

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




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

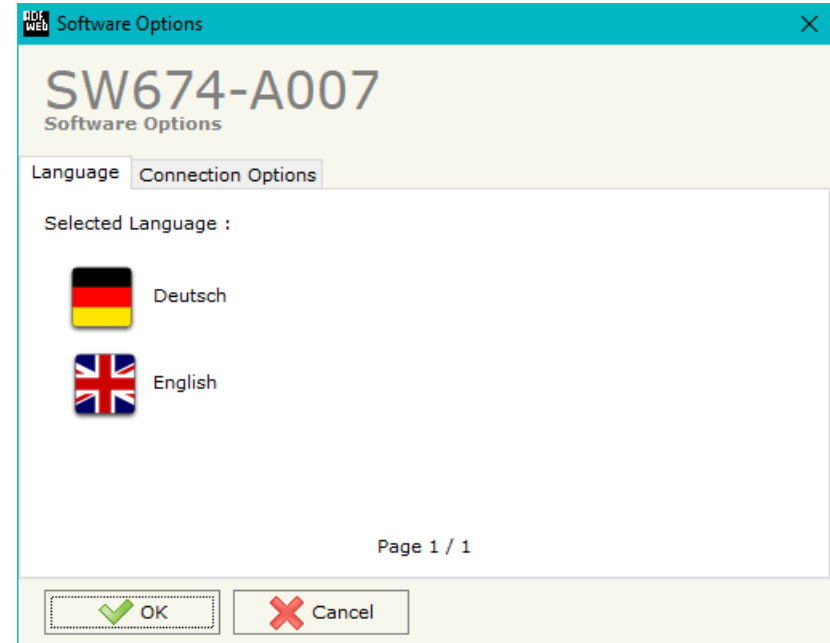
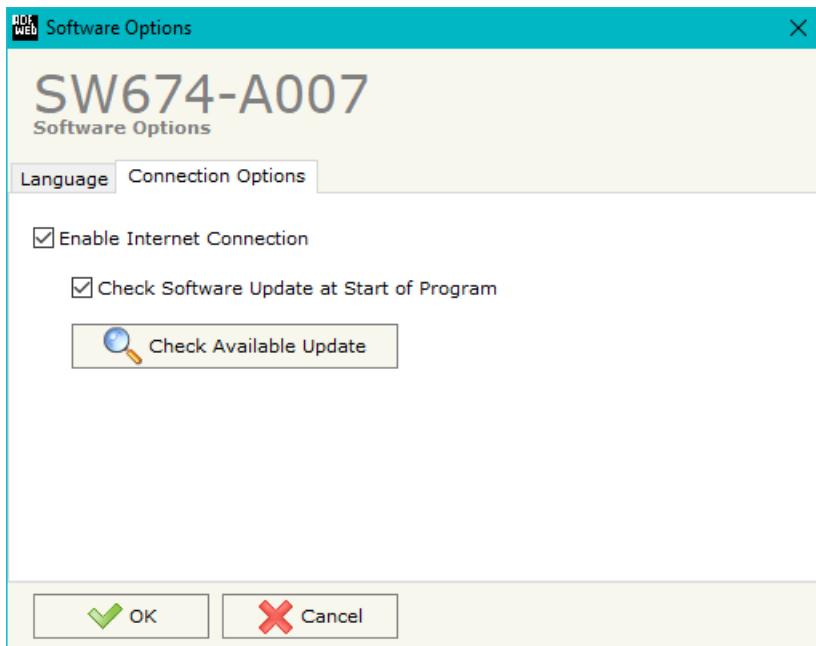
- To clone the configurations of a programmable “PROFINET / Modbus Slave - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate 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 SW674-A007 checks automatically if there are updatings when it is launched.

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, Modbus and PROFINET.

By Pressing the "**Set Communication**" button from the main window of SW674-A007 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The meaning of the fields of "PROFINET" are:

- In the field "**IP ADDRESS**" the IP address of the PROFINET side of the converter is defined;
- In the field "**SUBNET Mask**" the SubNet Mask of the PROFINET side of the converter is defined;
- In the field "**GATEWAY**" the default gateway of the network 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 used for PROFINET communication is defined (fixed to '34964');
- In the field "**PROFINET Name of Station**" the name to the PROFINET side of the converter is defined;
- In the field "**PROFINET -> Gateway**" the number of byte from the PROFINET to the converter is defined (at maximum it is possible to use 1439 byte);
- In the field "**PROFINET <- Gateway**" the number of byte from the converter to the PROFINET is defined (at maximum it is possible to use 1439 byte).

The means of the fields for the "Modbus Master" section are:

- In the field "**Serial**" the serial port to use is defined (RS232 or RS485);
- In the field "**Baudrate**" the baudrate for the serial line is defined;
- In the field "**Parity**" the parity of the serial line is defined;
- In the field "**Device ID**" the ID of Modbus side is defined;
- If the field "**Read with Input Register / Status Function**" is checked, it is possible to read the Input bytes of PROFINET side with Input Registers (Function 04) and write the Output bytes of PROFINET side with Holding Registers (Function 06/16). The Output bytes are readable with Function 03. Otherwise, only Holding Registers will be used and the Output bytes of PROFINET side cannot be read back.

Figure 3: "Set Communication" window

PROFINET XML:

By Pressing the "**PROFINET XML**" button from the main window for SW674-A007 (Fig. 2) it is possible to generate the xml file to be imported into the master PROFINET.

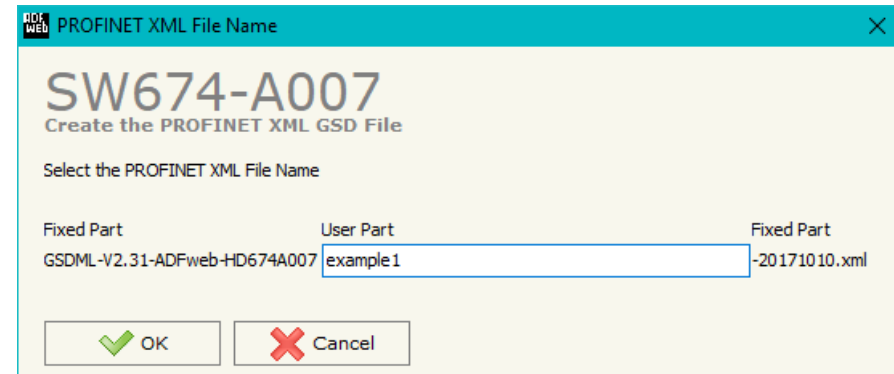


Figure 4: "Create the PROFINET XML GSD File" window

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.

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

- Connect the USB cable;
- Connect the Ethernet cable;
- Turn ON the converter;
- 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", the updating is done;
- Remove the USB cable.

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 updated.

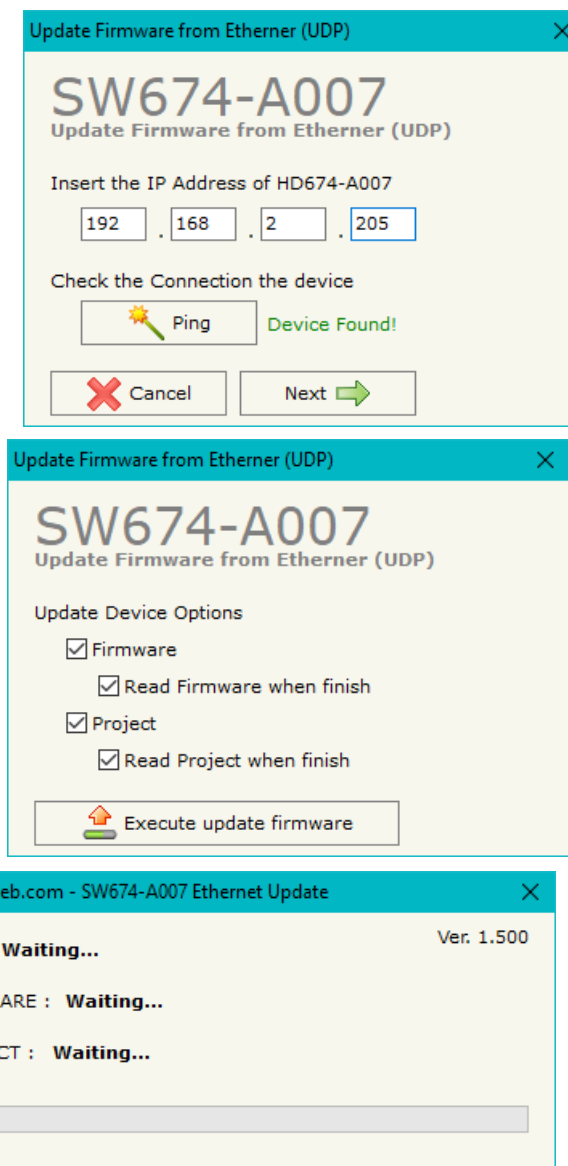


Figure 5: "Update Device" windows

**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 HD674-A007 device.

**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD674-A007 device.

**Warning:**

If Fig. 6 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 or 10 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 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

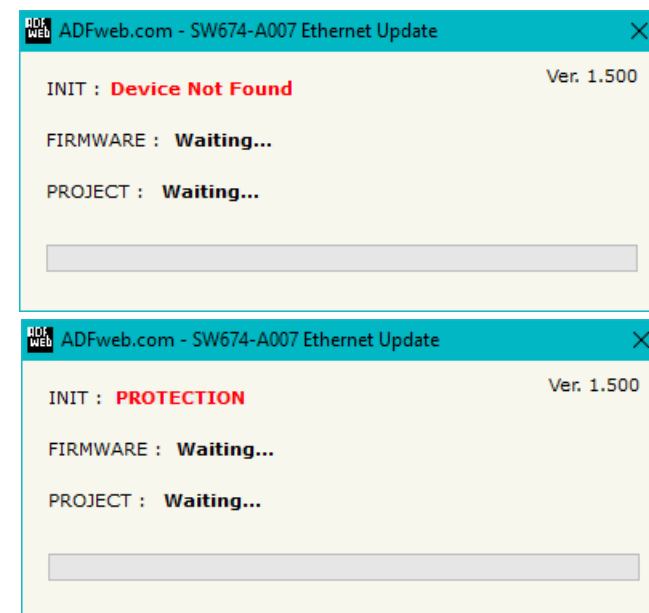


Figure 6: "Protection" window

In the case of HD674-A007 you have to use the software "SW674-A007": www.adfweb.com/download/filefold/SW674-A007.zip.

MODBUS MAP:

On Modbus side, the map is created automatically. In relation to the configuration defined, it is possible to have two different maps.

Read with Input Register / Status Function not enabled

Data in reading:

Type	Address	Function	Description
Holding Register	0	03	Input Bytes 0-1 of PROFINET side
Holding Register	1	03	Input Bytes 2-3 of PROFINET side
Holding Register	2	03	Input Bytes 4-5 of PROFINET side
.	.	.	.
Holding Register	719	03	Input Bytes 1438-1439 of PROFINET side

Data in writing:

Type	Address	Function	Description
Holding Register	0	06/16	Output Bytes 0-1 of PROFINET side
Holding Register	1	06/16	Output Bytes 2-3 of PROFINET side
Holding Register	2	06/16	Output Bytes 4-5 of PROFINET side
.	.	.	.
Holding Register	719	06/16	Output Bytes 1438-1439 of PROFINET side



Note:

The data can be read/written as single bits too using Coil Status (Function 01 and Functions 05/15).

Read with Input Register / Status Function enabled

Data in reading:

Type	Address	Function	Description
Input Register	0	04	Input Bytes 0-1 of PROFINET side
Input Register	1	04	Input Bytes 2-3 of PROFINET side
Input Register	2	04	Input Bytes 4-5 of PROFINET side
.	.	.	.
Input Register	719	04	Input Bytes 1438-1439 of PROFINET side

Data in writing:

Type	Address	Function	Description
Holding Register	0	R: 03 W: 06/16	Output Bytes 0-1 of PROFINET side
Holding Register	1	R: 03 W: 06/16	Output Bytes 2-3 of PROFINET side
Holding Register	2	R: 03 W: 06/16	Output Bytes 4-5 of PROFINET side
.	.	.	.
Holding Register	719	R: 03 W: 06/16	Output Bytes 1438-1439 of PROFINET side



Note:

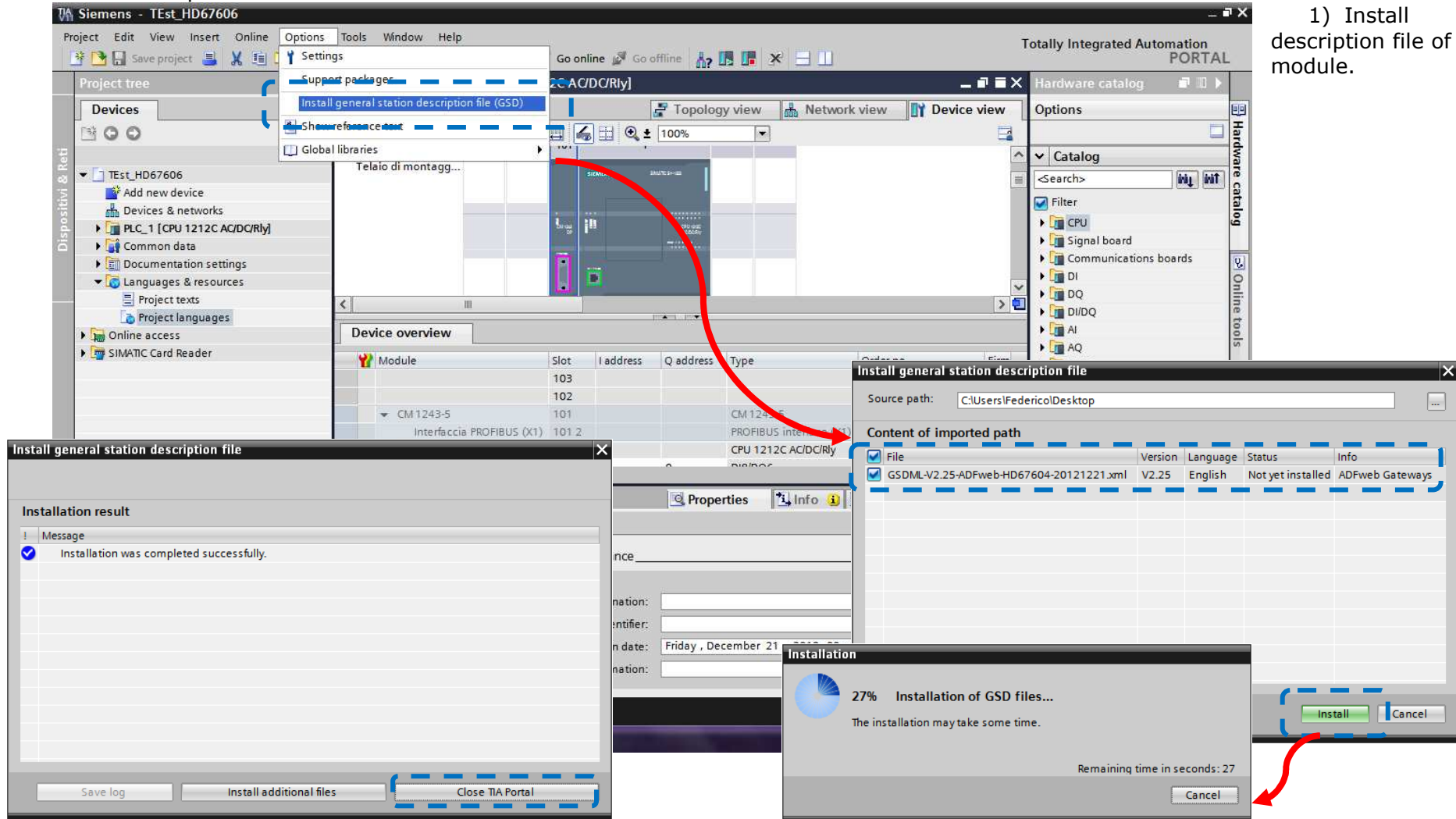
The data can be read/written as single bits too using Input/Coil Status (Function 02 and Functions 01/05/15).

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 V12-software by Siemens. In the case of using a control system from another supplier, refer to attend to the associated documentation.

These are the steps to follow:

1) Install the description file of the module.



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

The screenshot shows the Siemens TIA Portal interface. The main workspace displays a network diagram with the following components:

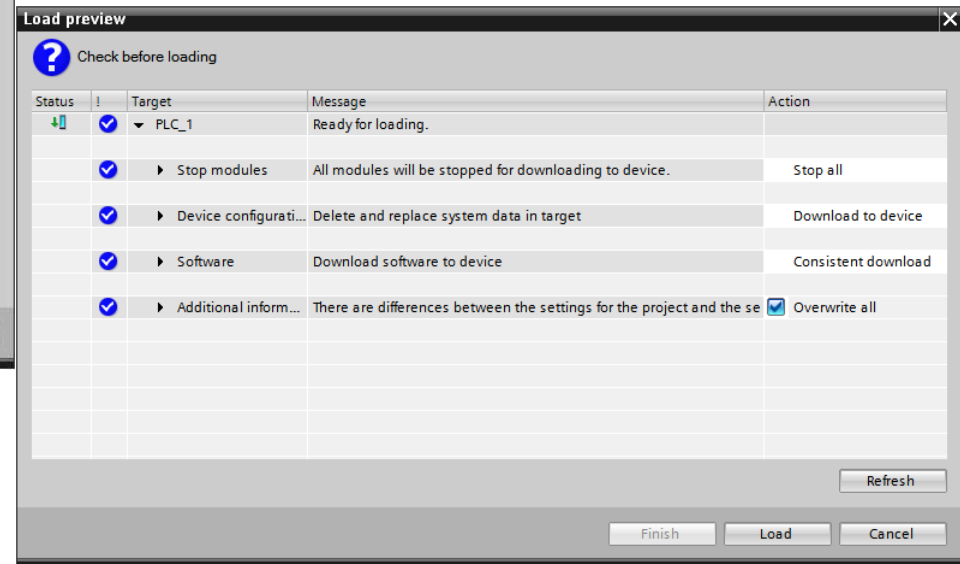
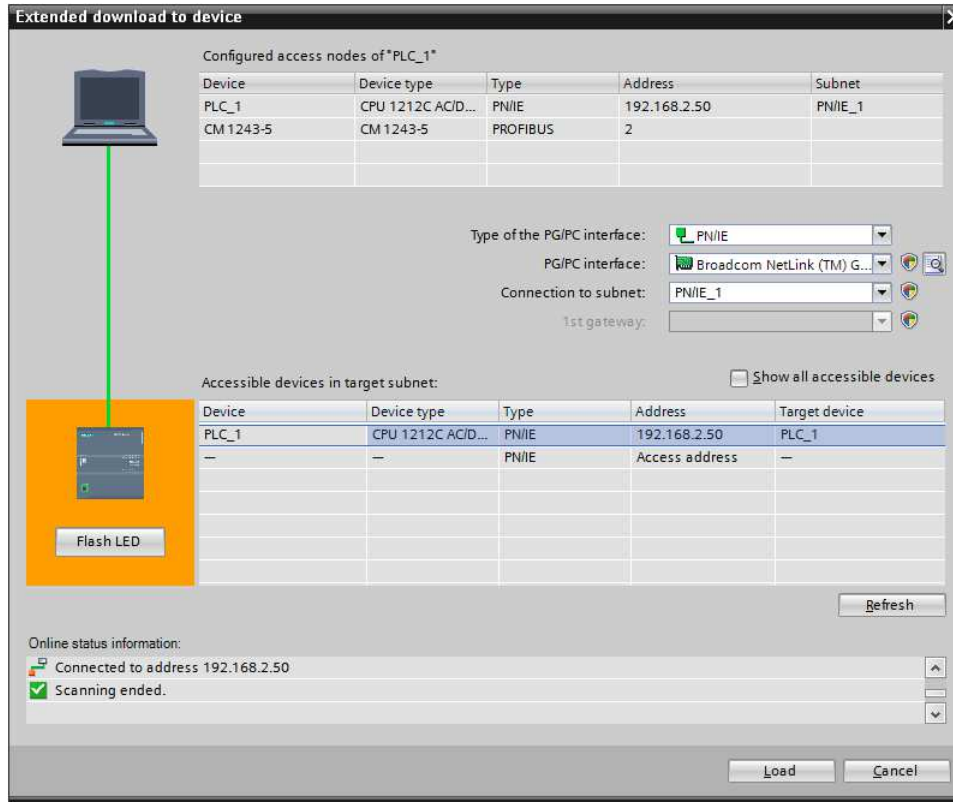
- PLC_1 CPU 1212C
- SERIAL CAN PLC_1
- DP-NORM
- IO system: PLC_1.PROFINET IO-System (100)

Below the diagram is the 'Network overview' table:

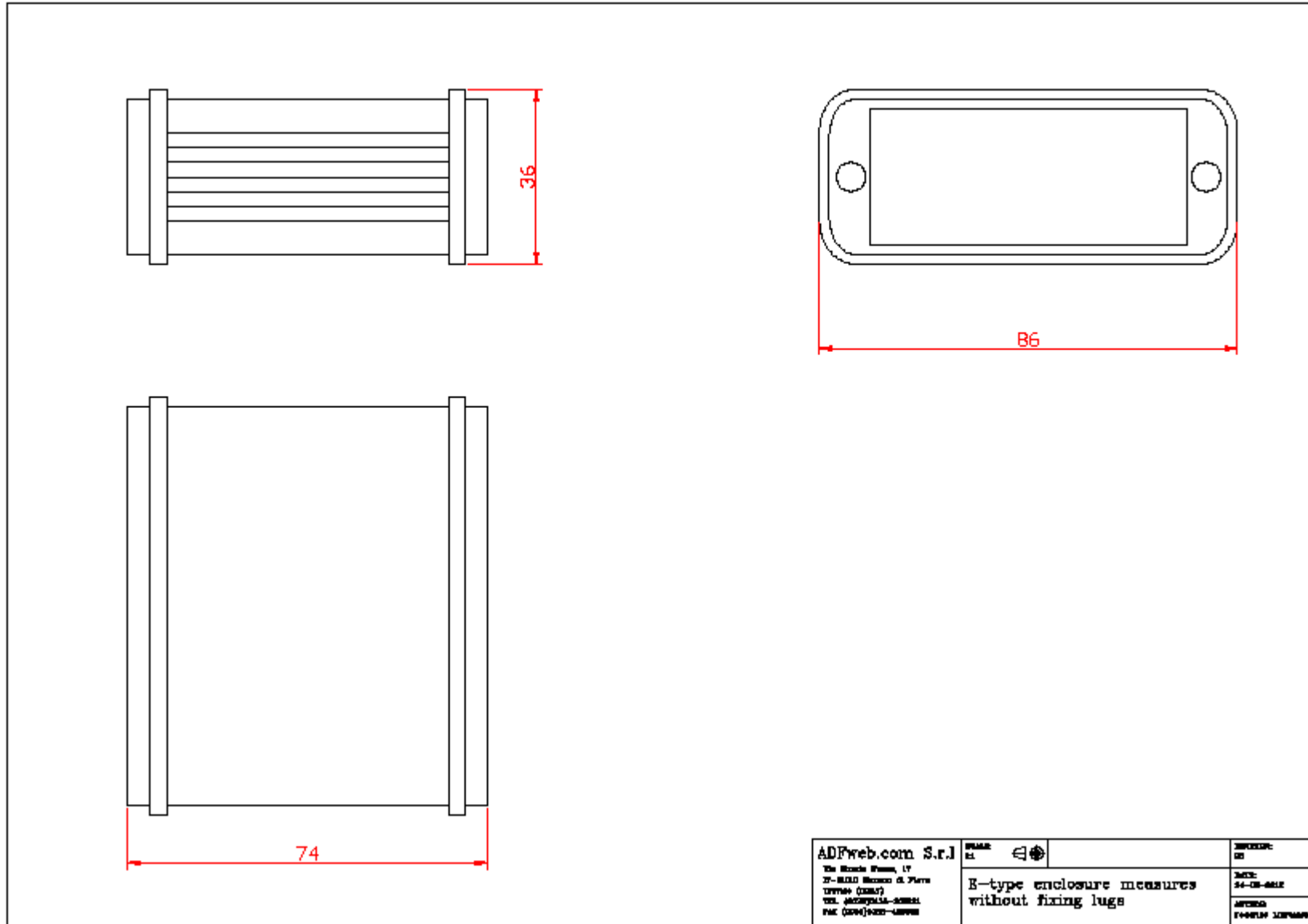
Device	Type	Address in subnet	Subnet	Master system	Comment
SIMATIC 1200 station_1	SIMATIC 1200 station				
PLC_1	CPU 1212C AC/DC/Rly				
GSD device_1	GSD device				
SERIAL	CAN				

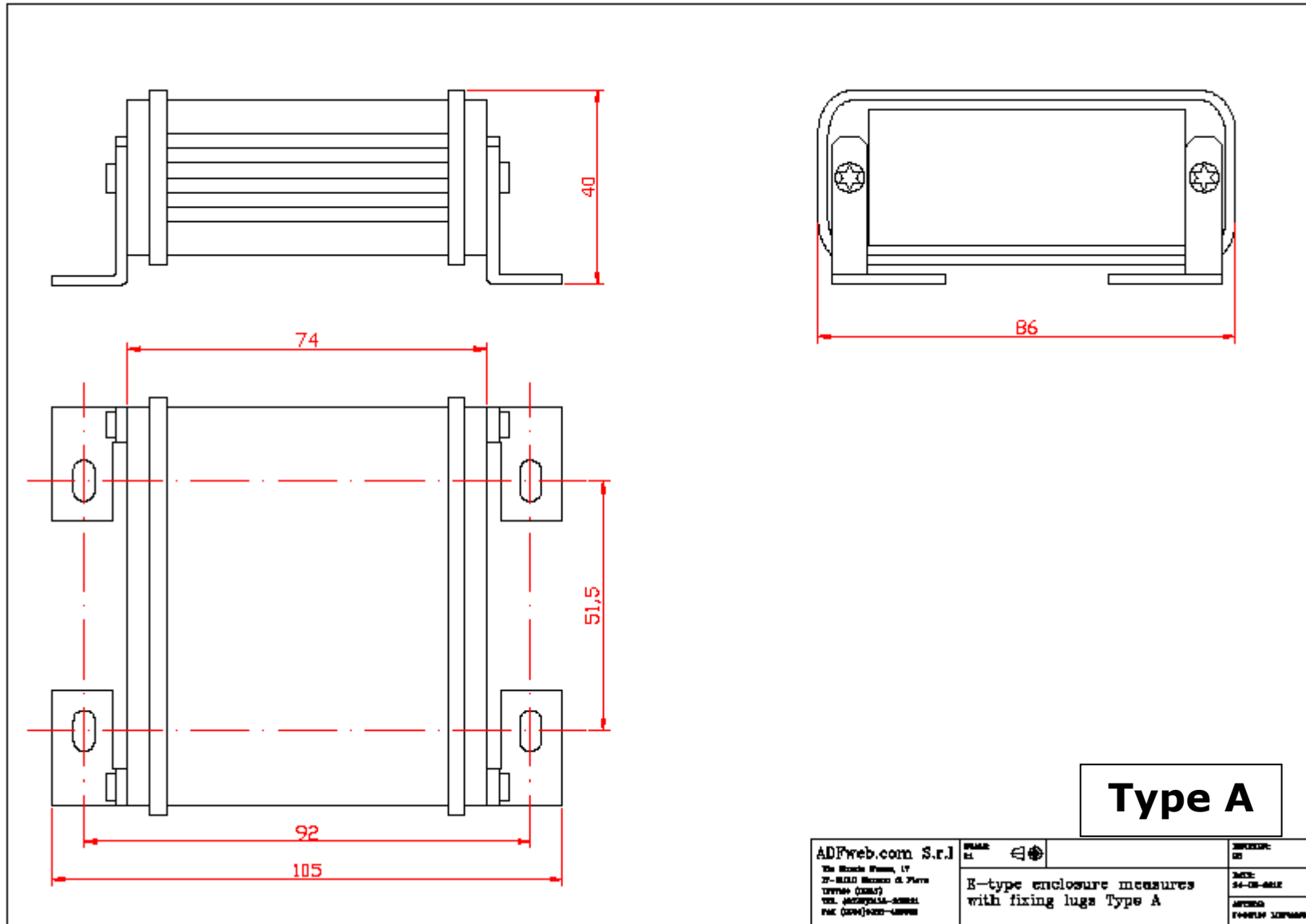
The 'Properties' dialog for 'IE1' is open, showing the 'General' tab. The 'Use IP protocol' checkbox is checked. The 'Set IP address in the project' radio button is selected. The IP address is 192.168.2.139 and the Subnet mask is 255.255.255.0.

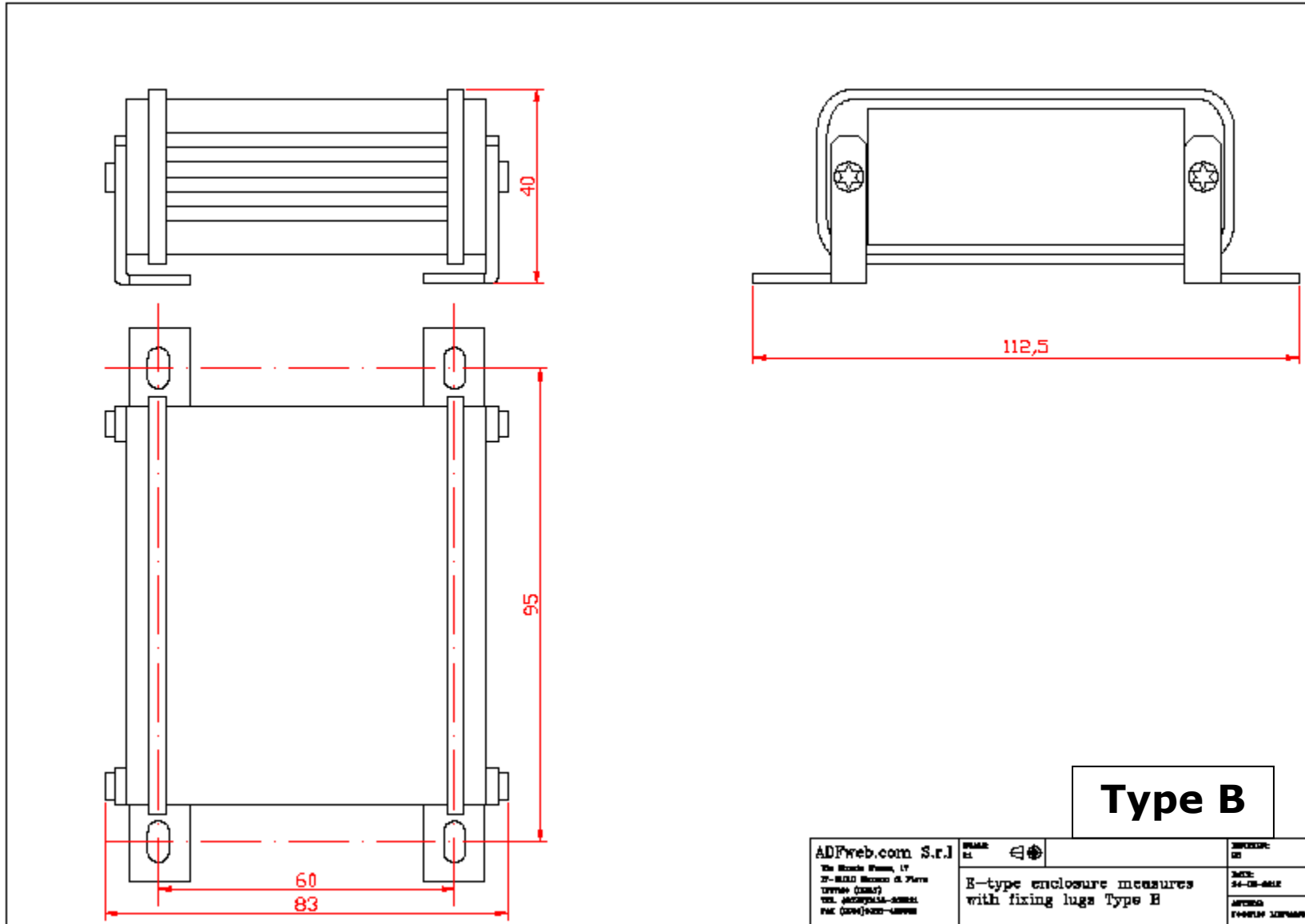
3) Load the configuration into the PLC.

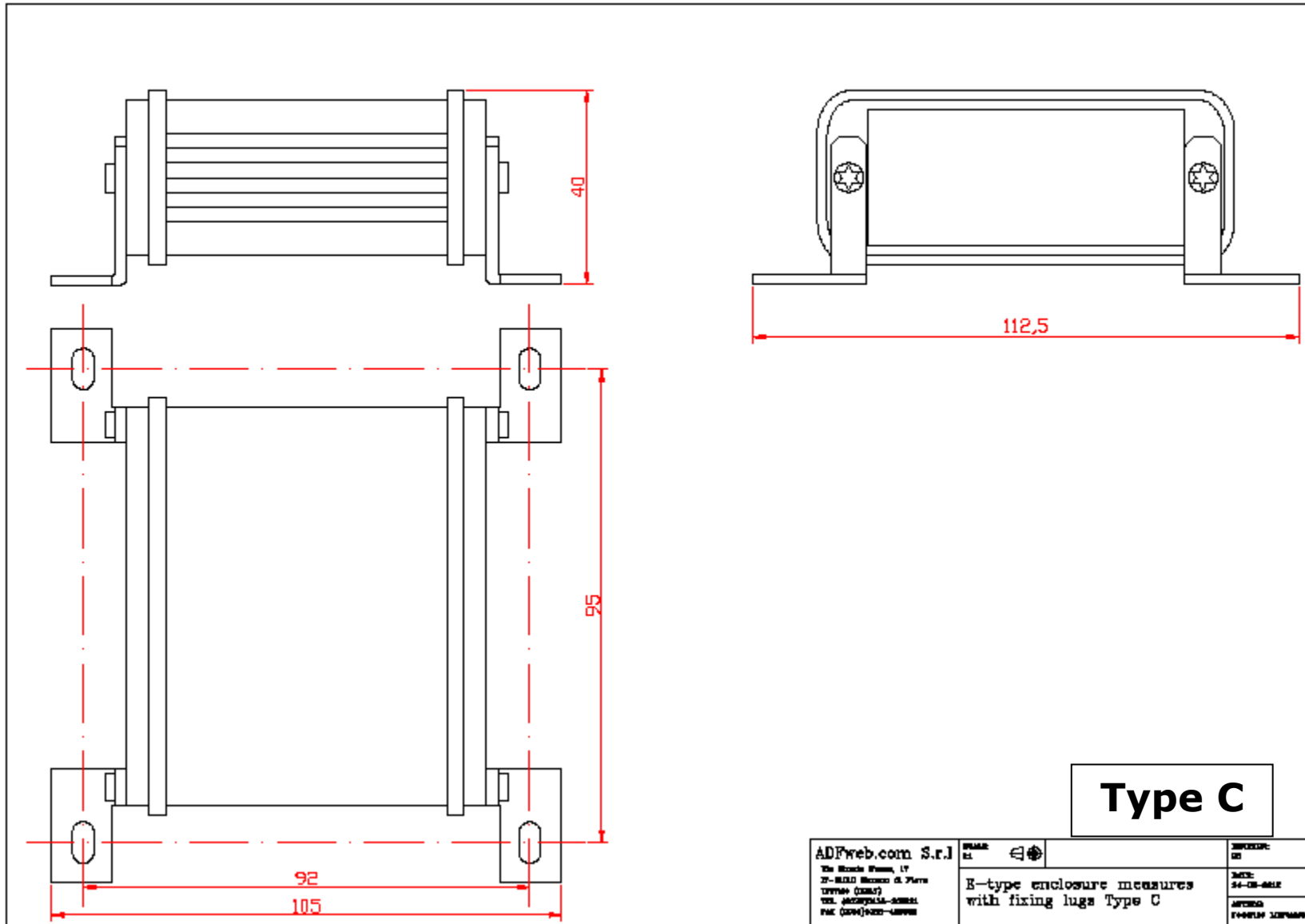


MECHANICAL DIMENSIONS:





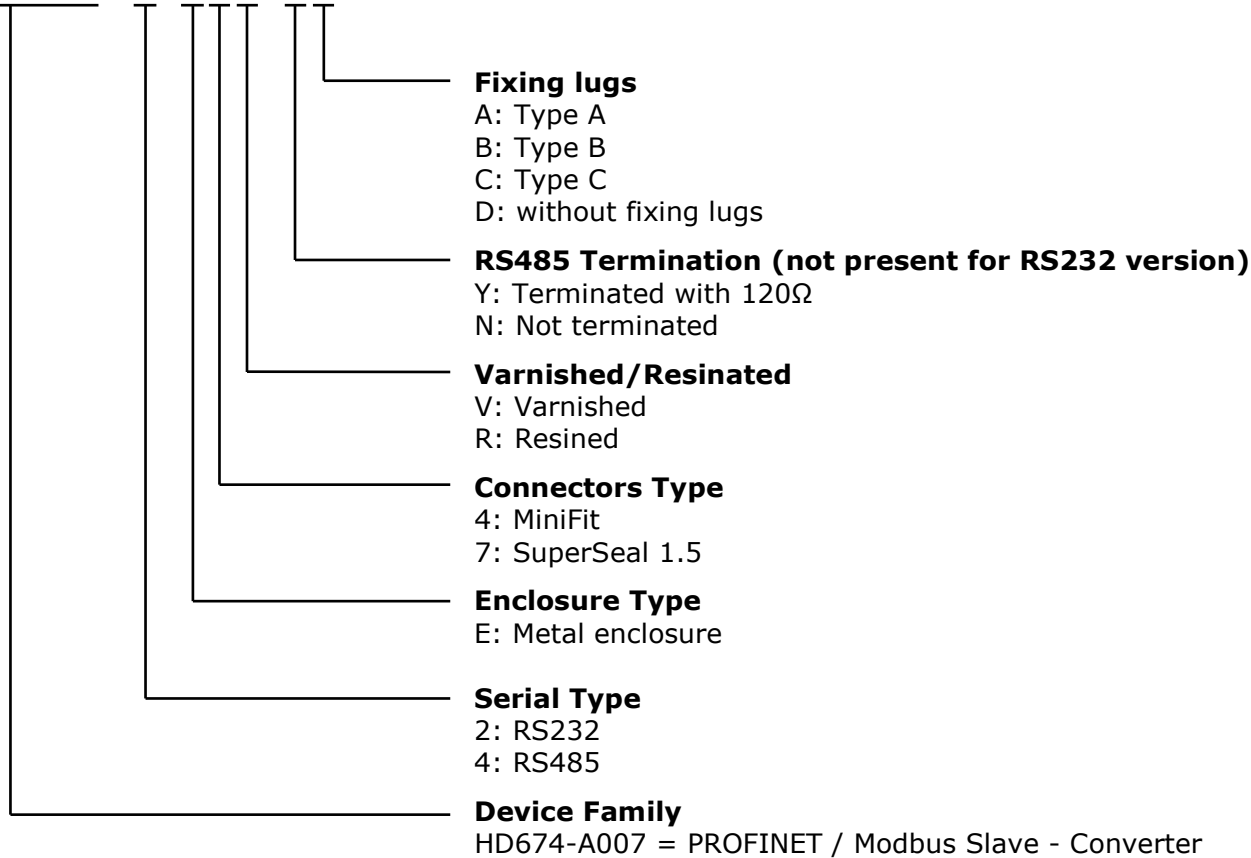




ORDERING INFORMATIONS:

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

HD674-A007 - x - E y z - s f



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
- Order Code: **AC67402** - Cable Super Seal 1.5 MALE 2-pole - 1.0 Meter
- Order Code: **AC67402-3** - Cable Super Seal 1.5 MALE 2-pole - 3.0 Meters
- Order Code: **AC67403** - Cable Super Seal 1.5 MALE 3-pole - 1.0 Meter
- Order Code: **AC67403-3** - Cable Super Seal 1.5 MALE 3-pole - 3.0 Meters
- Order Code: **AC67404** - Cable Super Seal 1.5 MALE 4-pole - 1.0 Meter
- Order Code: **AC67404-3** - Cable Super Seal 1.5 MALE 4-pole - 3.0 Meters
- Order Code: **AC67410** - Accessory Automotive Devices - Support for rail DIN

DISCLAIMER:

All technical content within this document can be modified without notice. The content of the document is a under continual renewal. For losses due to fire, earthquake, third party access or other accidents, or intentional or accidental abuse, misuse, or use under abnormal conditions repairs are charged to the user. ADFweb.com S.r.l. will not be liable for accidental loss of use or inability to use this product, such as loss of business income. ADFweb.com S.r.l. shall not be liable for consequences of improper use.

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.



ADFweb.com S.r.l.
Via Strada Nuova, 17
IT-31010 Mareno di Piave
TREVISO (Italy)
Phone +39.0438.30.91.31
Fax +39.0438.49.20.99
www.adfweb.com

