Industrial Electronic Devices

User Manual
Revision 1.001
English

PROFINET / NMEA 0183 - Converter
(Order Code: HD67615-A1, HD67615-422-A1)

for Website information:
www.adfweb.com?Product=HD67615

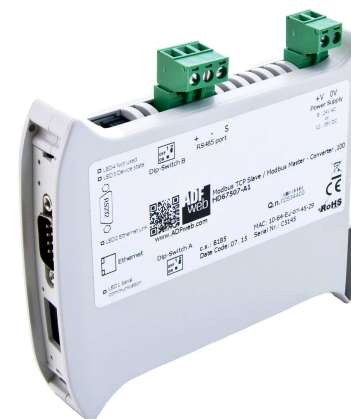for Price information:
www.adfweb.com?Price=HD67615-A1
www.adfweb.com?Price=HD67615-422-A1

Benefits and Main Features:

⊕ Very easy to configure

⊕ 32mm Rail DIN mount

⊕ Wide supply input range

⊕ Temperature range: -40°C/+85°C (-40°F/+185°F)

User Manual

For other Gateways / Bridges:
Serial / Modbus TCP - converter
See also the following links:
www.adfweb.com?product=HD67521   (Modbus TCP Slave)

CAN bus to Modbus
See also the following links:
www.adfweb.com?product=HD67011   (Modbus RTU Master)
www.adfweb.com?product=HD67012   (Modbus RTU Slave)
www.adfweb.com?product=HD67514   (Modbus TCP Master)
www.adfweb.com?product=HD67515   (Modbus TCP 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

Industrial Electronic Devices

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.

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	15/06/2017	Ff	All	First release version
1.001	29/04/2020	Ff	All	Added RS422 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.

Industrial Electronic Devices

SECURITY ALERT:

GENERAL INFORMATION
To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device are required for each individual application, legal and safety regulation. 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 instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

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

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

Industrial Electronic Devices

EXAMPLE OF CONNECTION:

NMEA 0183 network 1

PROFINET network

NMEA 0183 network 2

HD67615-A1
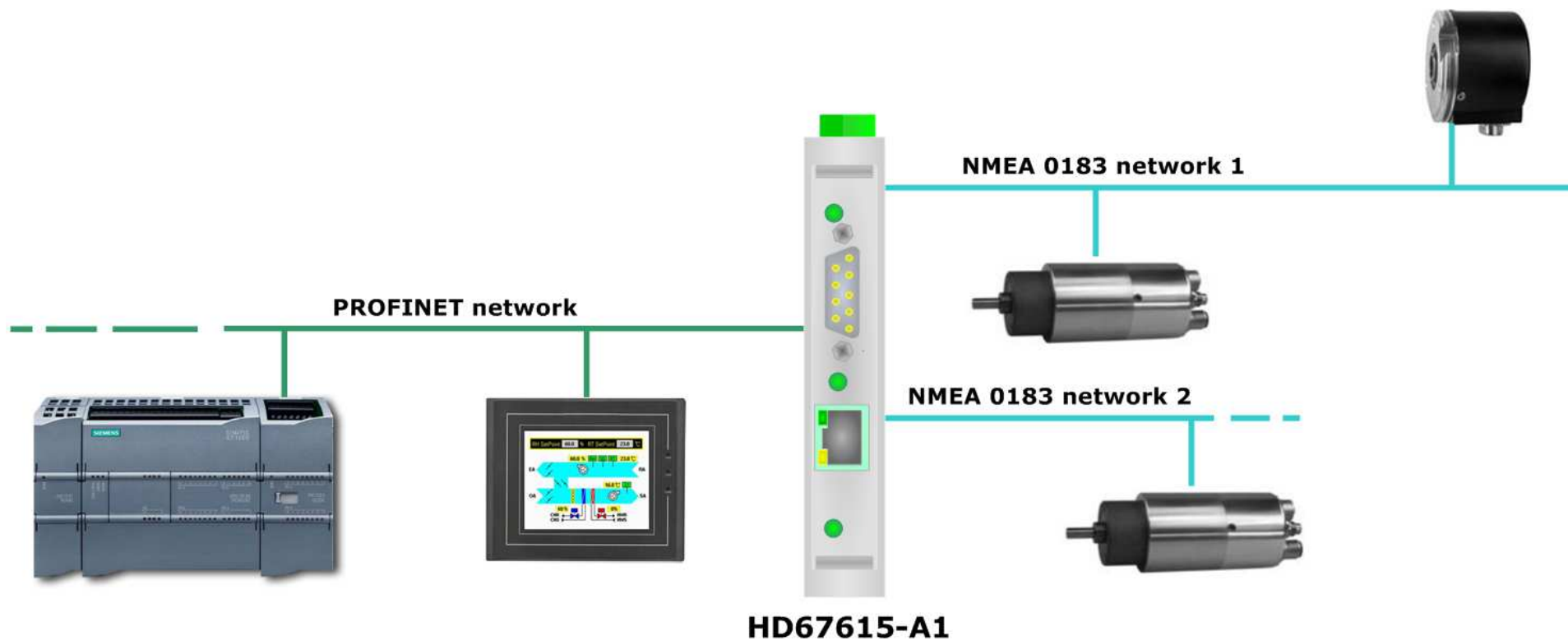
ADFweb.com srl
tel. +39 - 0438.30.91.31
www.adfweb.com
info@adfweb.com

Industrial Electronic Devices

CONNECTION SCHEME:
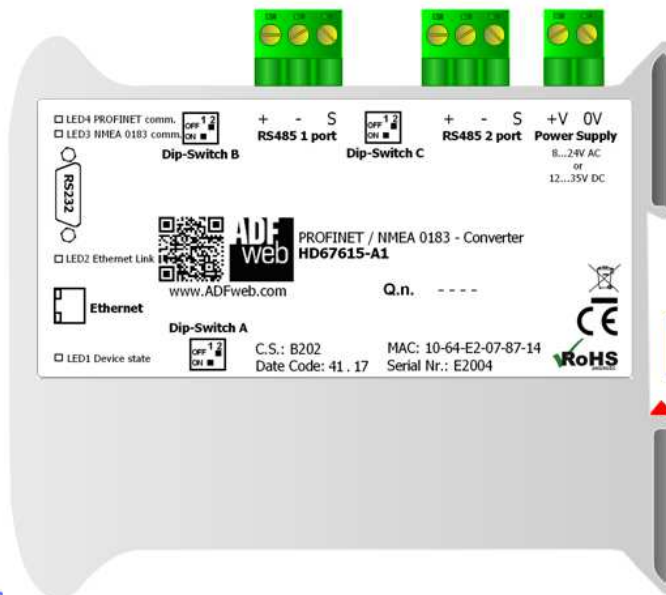

Dip-Switch A:
-Dip1 – Must be at ON
-Dip2 – Functioning Mode

= Normal   = Boot

Connector 4:
RS232 Port (D-SUB9-Male)
(Isolated Port)

PIN2 = RX
PIN3 = TX
PIN5 = GND* (to Isolated Ground)

Used for:
- Programmation Port
- Modbus on RS232

To connect the device to the COM
port of a PC in order to set it
you have to use the programming
cable AC34107 or a cable made as
showed here:

Led4:
Green
PROFINET
communication

Led3:
Green
NMEA 0183
communication

Led2:
Green
Ethernet Link

Connector5:
Ethernet Port
(RJ45 Plug)

Led1:
Green
Device state

Rail DIN Clamp

CABLE Side A FEM   CABLE Side B FEM

Dip-Switch B:
-Dip1 – RS485 Termination Resistor

= Open   = 120 Ohm

-Dip2 – Not used

Connector3:
RS485 1 Port (Isolated port)

S = Shield* (to Isolated Ground)
B = Negative wire
A = Positive wire

Dip-Switch C:
-Dip1 – RS485 Termination Resistor

= Open   = 120 Ohm

-Dip2 – Not used

Connector2:
RS485 2 Port (Isolated port)

S = Shield* (to Isolated Ground)
B = Negative wire
A = Positive wire

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

Figure 1a: Connection scheme for HD67615-A1

Industrial Electronic Devices

Dip-Switch A:
-Dip1 – Must be at ON
-Dip2 – Functioning Mode

= Normal   = Boot

Connector 4:
RS232 Port (D-SUB9-Male)
(Isolated Port)

PIN2 = RX
PIN3 = TX
PIN5 = GND* (to Isolated Ground)

Used for:
 - Programmation Port
 - Modbus on RS232

To connect the device to the COM port of a PC in order to set it
you have to use the programming cable AC34107 or a cable made as showed here:

Led4:
Green
PROFINET
communication

Led3:
Green
NMEA 0183
communication

Led2:
Green
Ethernet Link

Connector5:
Ethernet Port
(RJ45 Plug)

Led1:
Green
Device state

□ LED4 PROFINET comm.
□ LED3 NMEA0183 comm.

R- R+ T+ T- S
RS422 port
Dip-Switch B

+ - S
RS485 port
Dip-Switch C

+V 0V
Power Supply
8...24V AC
or
12...35V DC

PROFINET / NMEA 0183 - Converter
HD67615-422-A1

www.ADFweb.com   Q.n.   - - - -

□ LED2 Ethernet Link

Ethernet

Dip-Switch A

□ LED1 Device state

C.S.: B260   MAC: 10-64-E2-07-87-14
Date Code: 27 . 18   Serial Nr.: E2004

Rail DIN Clamp

CABLE Side A FEM   CABLE Side B FEM
5 4 3 2 1   9 8 7 6

R- R+ T+ T- S   A B S   +V 0V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

Dip-Switch B:
-Dip1 – RS422 Termination Resistor (T)

= Open   = 120 Ohm

-Dip2 – RS422 Termination Resistor (R)

= Open   = 120 Ohm

Connector3:
RS422 (Isolated port)

S = Shield* (to Isolated Ground)
T- = Inverting transmitter
T+ = Noninverting transmitter
R+ = Noninverting receiver
R- = Inverting receiver

Dip-Switch C:
-Dip1 – RS485 Termination Resistor

= Open   = 120 Ohm

-Dip2 – Not used

Connector2:
RS485 2 Port (Isolated port)

S = Shield* (to Isolated Ground)
B = Negative wire
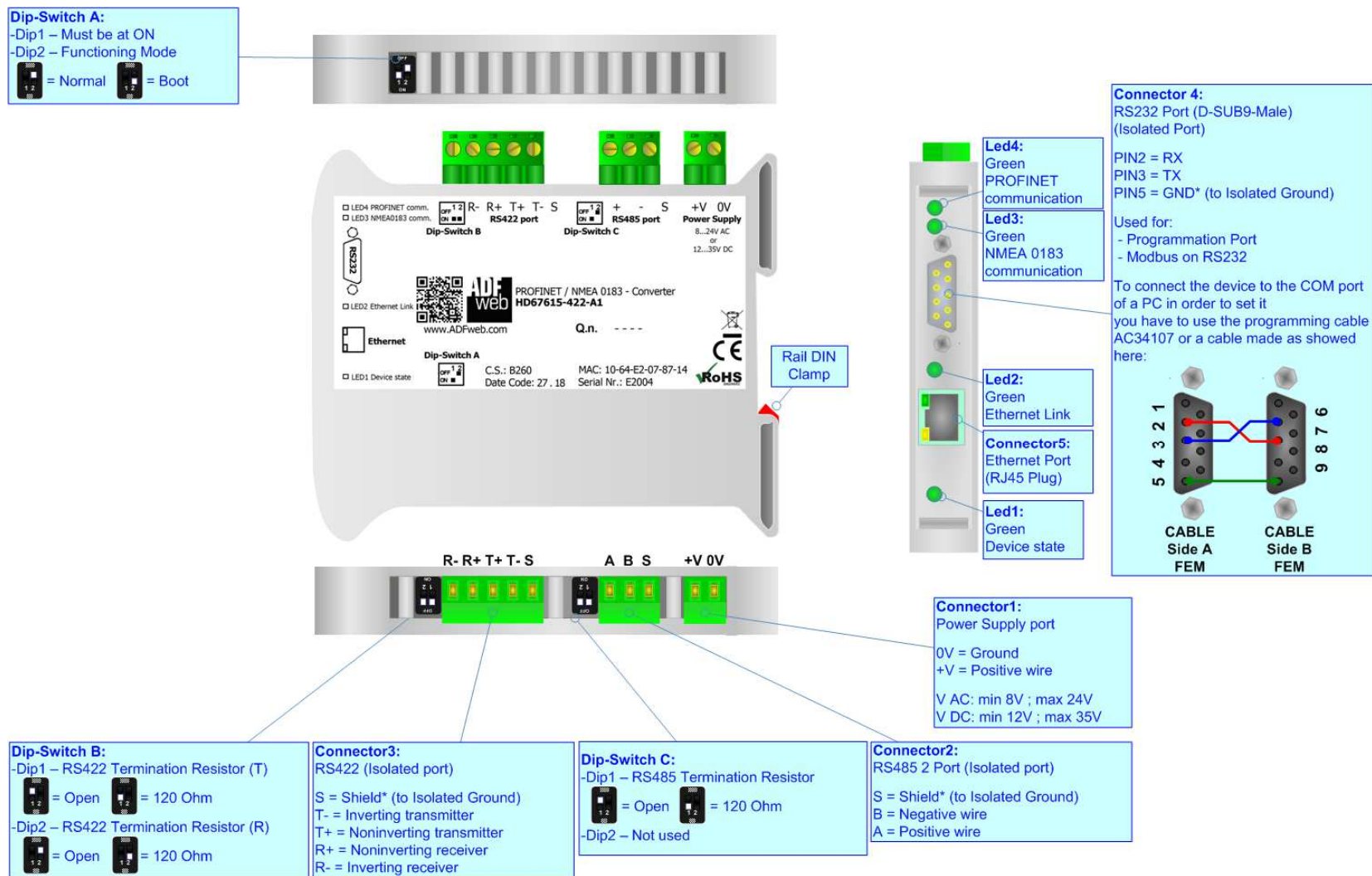A = Positive wire

Figure 1b: Connection scheme for HD67615-422-A1

Industrial Electronic Devices

CHARACTERISTICS:

The "PROFINET / NMEA 0183 – Converter" allows the following characteristics:

- electrical isolation between NMEA 0183 – PROFINET, Power Supply – PROFINET, Power Supply – NMEA 0183;
- Multiple independent NMEA 0183 lines;
- Mountable on 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 SW67615 software on your PC in order to perform the following:

- Define the parameter of NMEA 0183;
- Define the parameter of PROFINET;
- Define the list of NMEA 0183 sentences in reception;
- Update the device.

Industrial Electronic Devices

POWER SUPPLY:

The devices can be powered at 8…24V AC and 12…35V DC. The consumption depends to the code of the device. For more details see the two tables below.

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

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67615-xxx-A1	3.5

⚠ **Caution: Not reverse the polarity power**
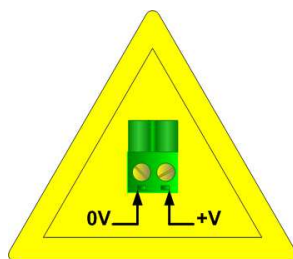
HD67615-A1

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

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

0V +V

Industrial Electronic Devices

FUNCTION MODES:

The device has got two function modes depending on the position of the 'Dip2 of Dip-Switch A':

- The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip2 of Dip-Switch A' at "ON" position, is used for uploading the Project and/or Firmware.

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

According to the functioning mode, the LEDs will have specific functions, see 'LEDS' section.

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

Industrial Electronic Devices

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: Ethernet Link (green)	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected
3: NMEA 0183 communication (green)	Blinks when NMEA 0183 frames are received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: PROFINET communication (green)	Blinks when PROFINET communication is running	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress

Industrial Electronic Devices

RS485:

For terminate the RS485 line with a 120Ω resistor it is necessary to put ON dip 1, like in figure.
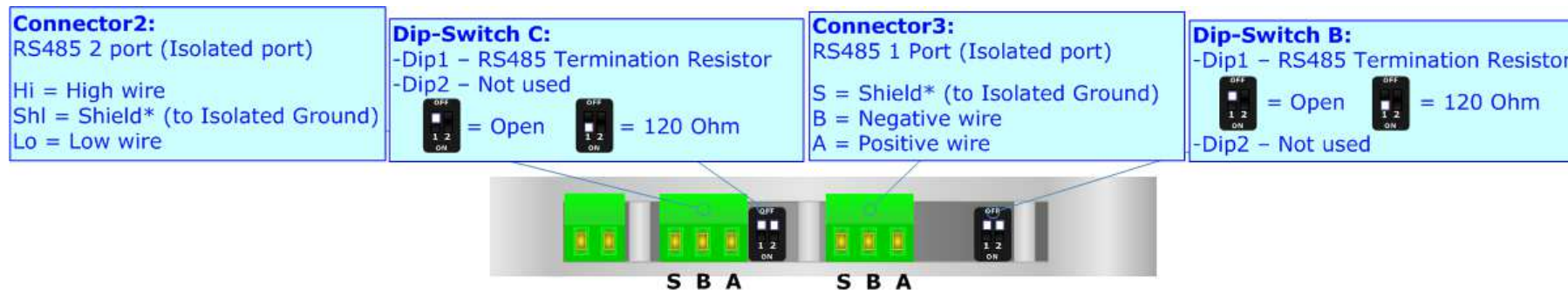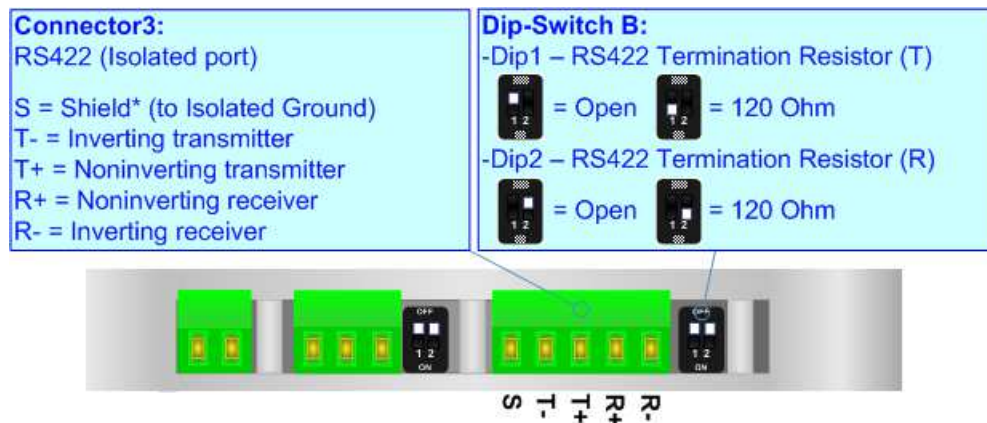

The maximum length of the cable should be 1200m (4000 feet).

Here some codes of cables:

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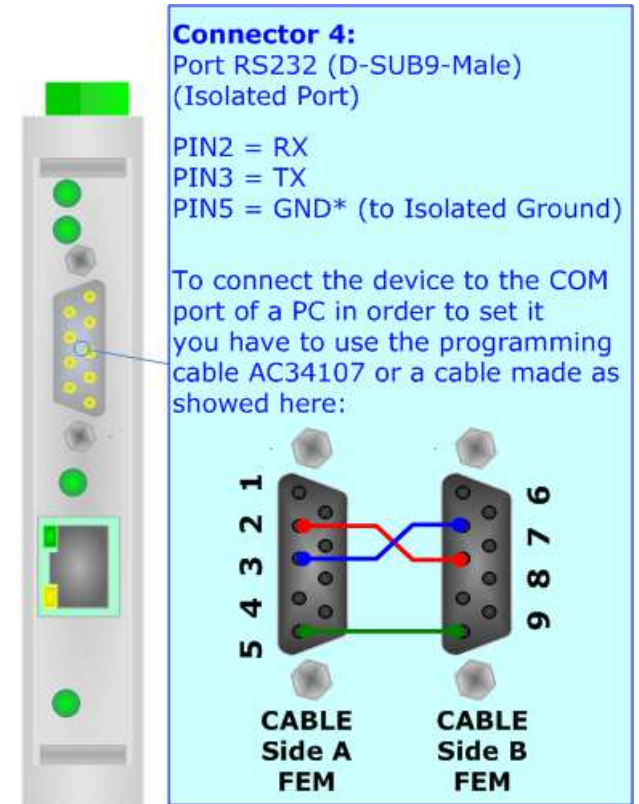- Belden p/n 82842 - 2x 24AWG stranded twisted pairs conductor + foil shield + braid shield;
- Tasker: p/n C521 - 1x 24AWG twisted pair conductor + foil shield + braid shield;
- Tasker: p/n C522 - 2x 24AWG twisted pairs conductor + foil shield + braid shield.

Industrial Electronic Devices

RS422:

For terminating the RS422 line with a 120Ω resistor it is necessary to put ON dip 1 for T line and/or put ON dip 2 for R line, like in figure.

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

Industrial Electronic Devices

RS232:

The connection from RS232 socket to a serial port must be made with a Null Modem cable (a serial cable where the pins 2 and 3 are crossed).
It is recommended that the RS232 cable not exceed 15 meters.

Connector 4:
Port RS232 (D-SUB9-Male)
(Isolated Port)

PIN2 = RX
PIN3 = TX
PIN5 = GND* (to Isolated Ground)

To connect the device to the COM port of a PC in order to set it you have to use the programming cable AC34107 or a cable made as showed here:

CABLE Side A FEM   CABLE Side B FEM

Industrial Electronic Devices

ETHERNET:

The Ethernet connection must be made using Connector5 of HD67615 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 a Hub/Switch the use of a straight cable is recommended. To connect the device to a PC/PLC/other the use of a cross cable is recommended.

Connector5:
Ethernet Port
(RJ45 Plug)

Industrial Electronic Devices
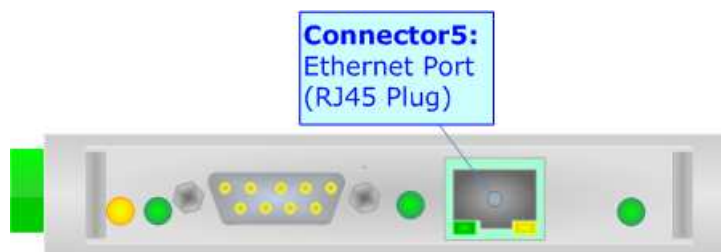
USE OF COMPOSITOR SW67615:

To configure the Converter, use the available software that runs with Windows called SW67615. 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 SW67615, the window below appears (Fig. 2).

Note:
    It is necessary to have installed .Net Framework 4.
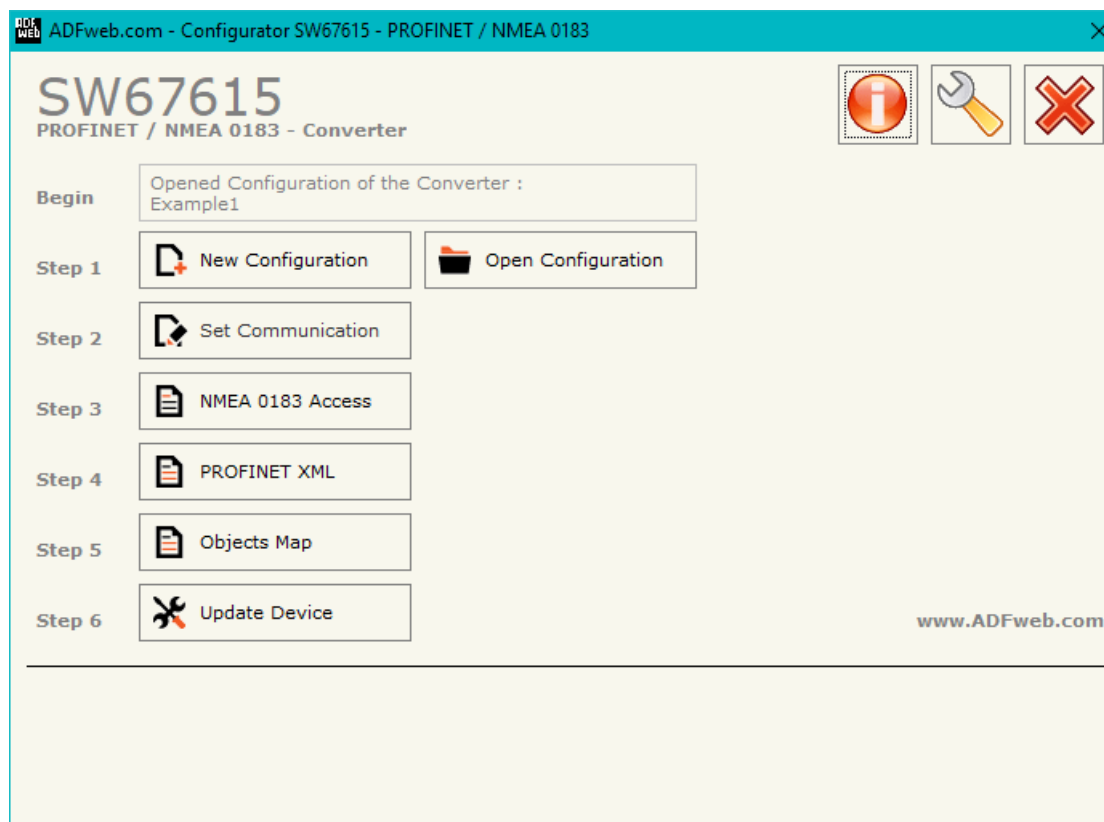
Figure 2: Main window for SW67615

Industrial Electronic Devices

NEW CONFIGURATION / OPEN CONFIGURATION:

The "**New Configuration**" button creates the folder which contains the entire device's configuration.
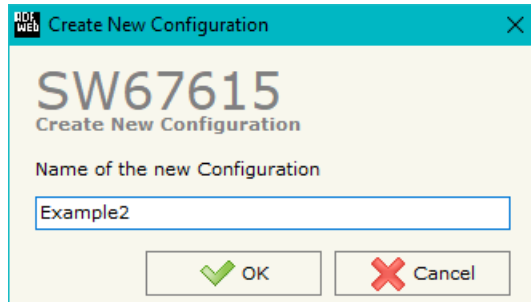
A device's configuration can also be imported or exported:

- To clone the configurations of a programmable "PROFINET / NMEA 0183 - 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**".
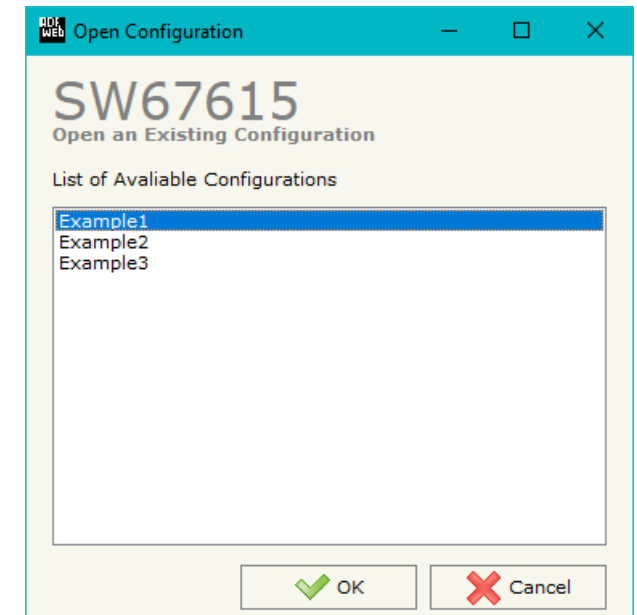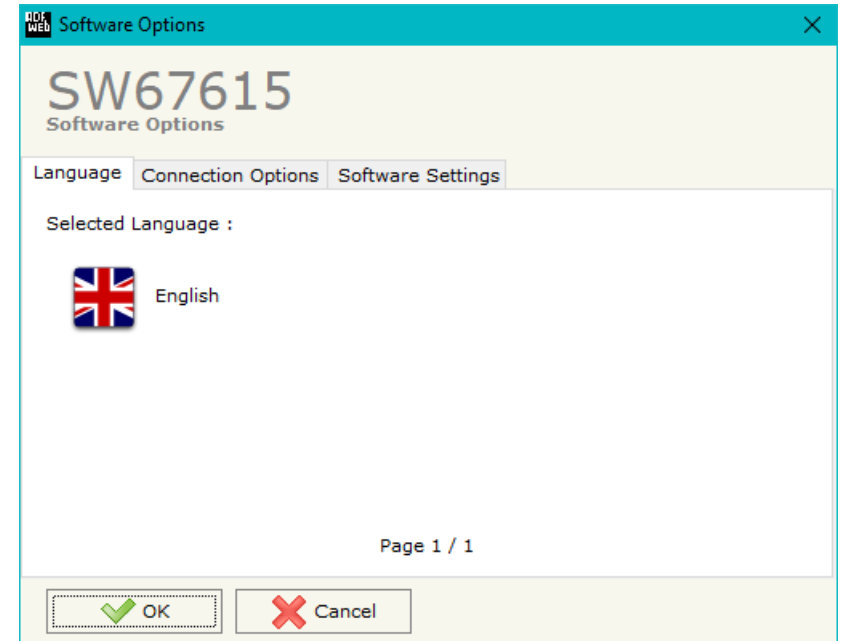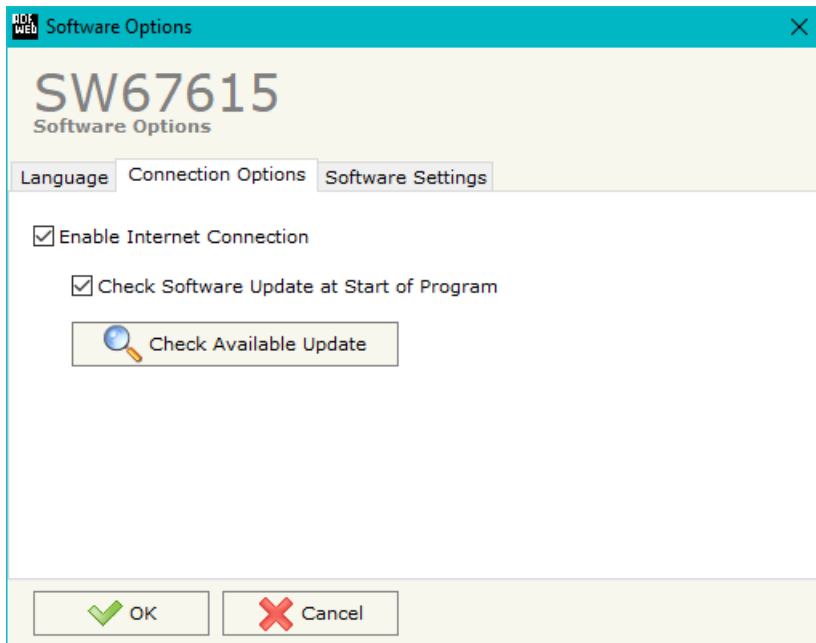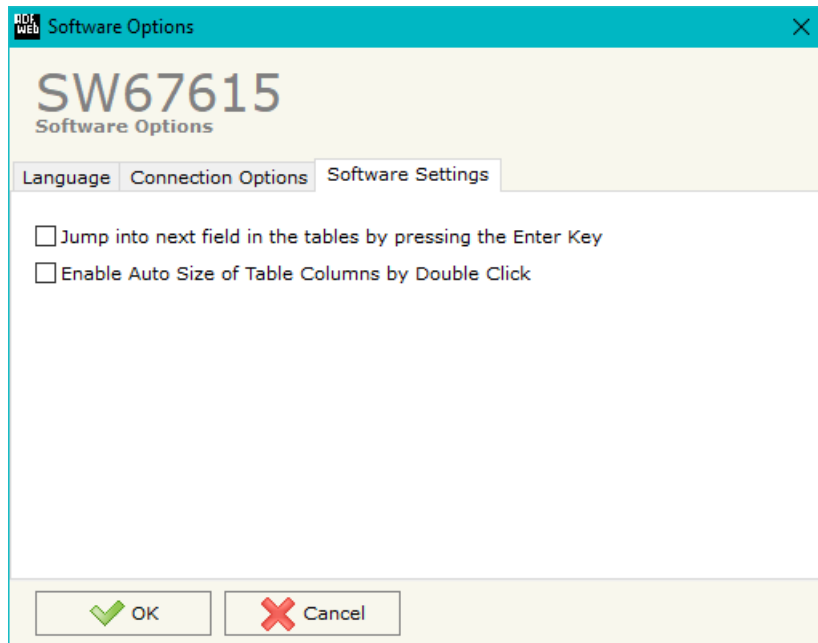
SOFTWARE OPTIONS:

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 SW67615 check automatically if there are updatings when it is launched.

Industrial Electronic Devices

Software Options

SW67615
Software Options

Language | Connection Options | Software Settings

☐ Jump into next field in the tables by pressing the Enter Key

☐ Enable Auto Size of Table Columns by Double Click

OK   Cancel

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.

ADF
web

Industrial Electronic Devices

SET COMMUNICATION:

By Pressing the "**Set Communication**" button from the main window for SW67615 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The window is divided in different sections in order to define the different parameters of the converter:

- PROFINET
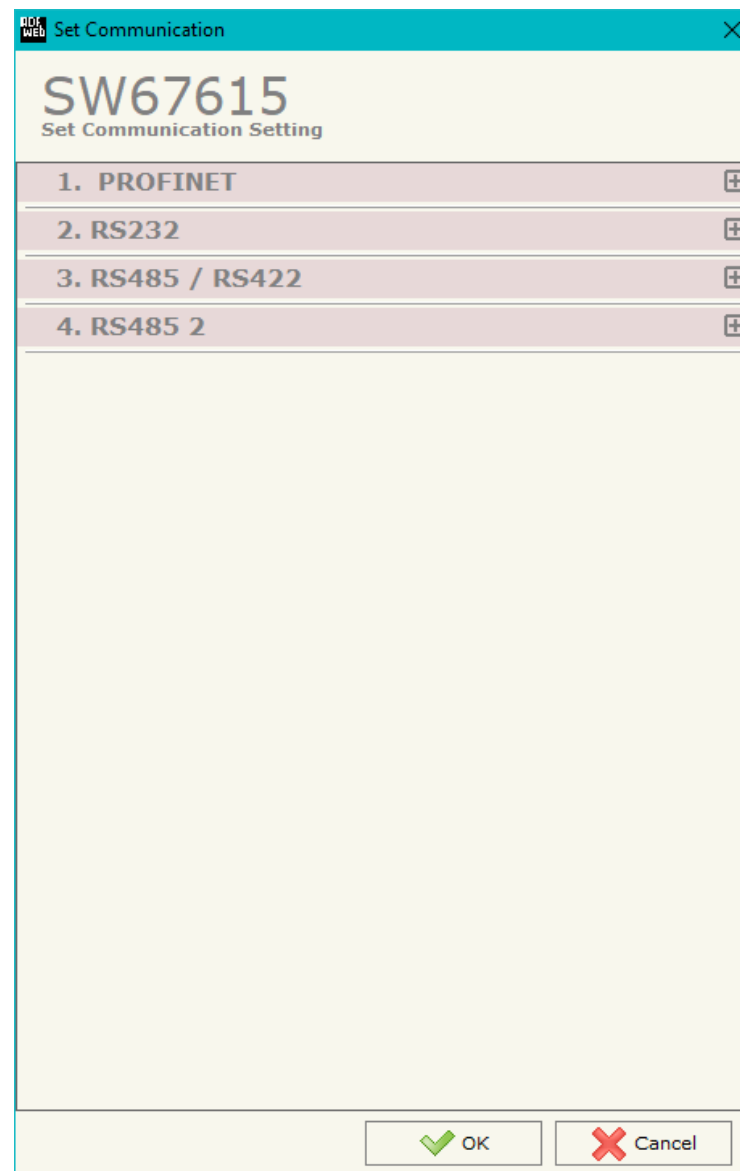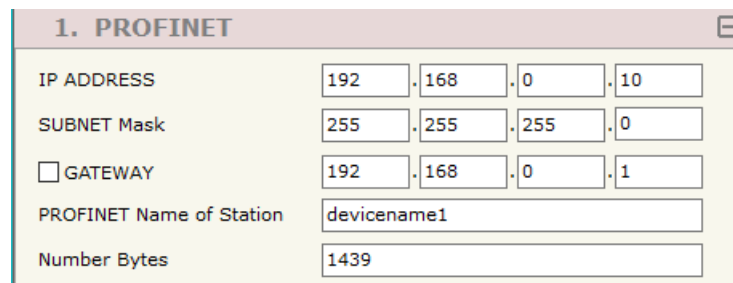- RS232
- RS485 / RS422
- RS485 2

Set Communication

SW67615
Set Communication Setting

1. PROFINET	⊞
2. RS232	⊞
3. RS485 / RS422	⊞
4. RS485 2	⊞

✓ OK   ✗ Cancel

Figure 3a: "Set Communication" window

ADFweb
Industrial Electronic Devices

PROFINET:

This section is used to define the parameters of PROFINET side of the converter. It is possible to define:

  + In the field "**IP Address**" the IP address of the converter is defined;
  + In the field "**SubNet Mask**" the SubNet Mask 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 "**PROFINET Name of Station**" the name for PROFINET side of the converter is defined.
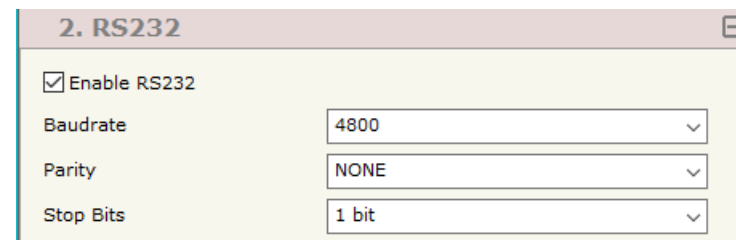 + In the field "**Num Bytes**" the number output bytes of the converter is defined.

Figure 3b: "Set Communication → PROFINET" window

RS232:

This section is used to define the main parameters of RS232 line. The means of the fields are:

  + If the field "**Enable RS232**" is checked, the serial port is enabled;
  + 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 "**Stop Bits**" the number of stop bits of the serial line is defined.
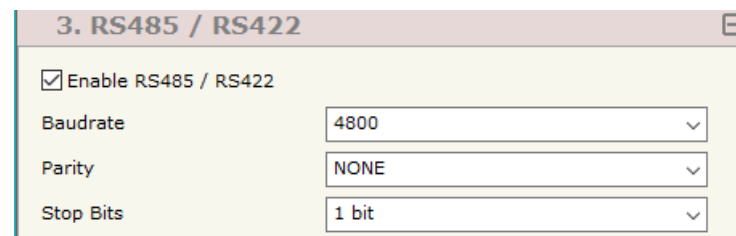
Figure 3c: "Set Communication → RS232" window

RS485 / RS422:

This section is used to define the main parameters of RS485 / RS422 line. The means of the fields are:

  + If the field "**Enable RS485 / RS422**" is checked, the serial port is enabled;
  + 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 "**Stop Bits**" the number of stop bits of the serial line is defined.

Figure 3d: "Set Communication → RS485 / RS422" window

Industrial Electronic Devices

RS485 2:

This section is used to define the main parameters of RS485 2 line. The means of the fields are:

- If the field "**Enable RS485 2**" is checked, the serial port is enabled;
- 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 "**Stop Bits**" the number of stop bits of the serial line is defined.
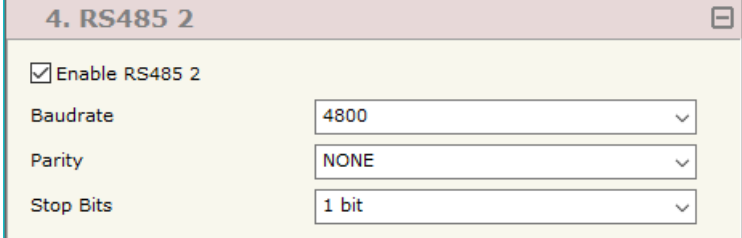

Figure 3e: "Set Communication → RS485 2" window

Industrial Electronic Devices

RECEIVE FRAMES:

By pressing the "**NMEA 0183 Access**" button from the main window for SW67615 (Fig. 2) the "Definition of NMEA 0183 Sentences" window appears (Fig. 4).
The NMEA 0183 sentences inserted in this table contain the output data of PROFINET. These sentences are accepted by the converter.
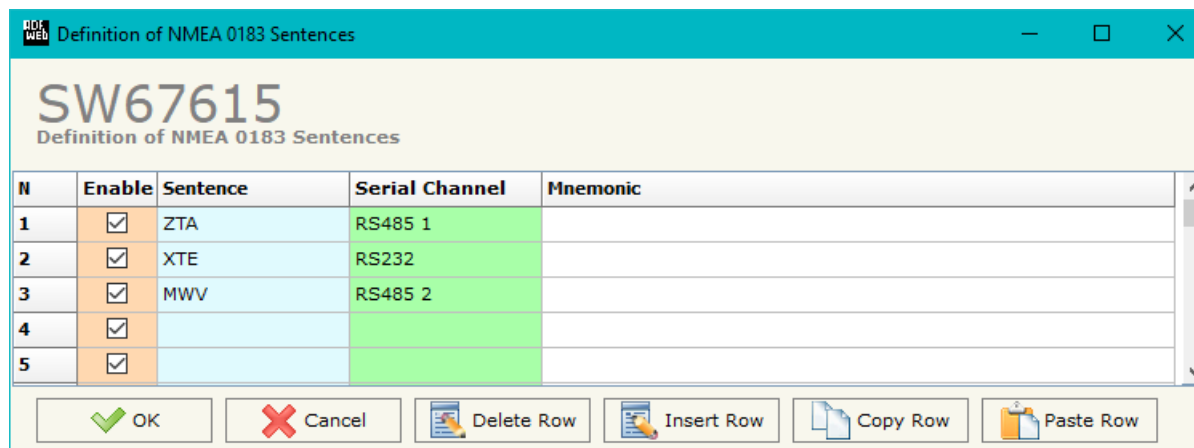

Figure 4: "Definition of NMEA 0183 Sentences" window

The data of the columns have the following meanings:

- If the field "**Enable**" is checked, the NMEA 0183 sentence is enabled;
- In the field "**Sentence**" the NMEA 0183 sentence is defined;
- In the field "**Serial Channel**" the serial port from which the sentence will be received is defined;
- In the field "**Mnemonic**" a brief description is defined.

Industrial Electronic Devices

PROFINET XML:

By Pressing the "**PROFINET XML**" button from the main window for SW67615 (Fig. 2) it is possible to generate the xml file to be imported into the master PROFINET.

Figure 5: "PROFINET XML File Name" window
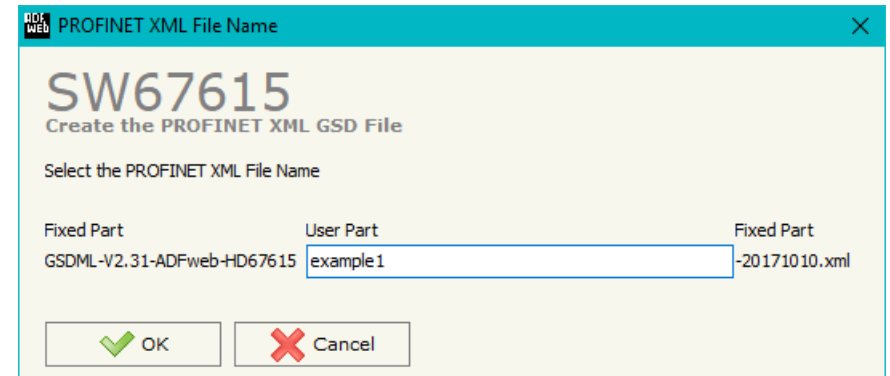
OBJECTS MAP:

By Pressing the "**Objects Map**" button from the main window for SW67615 (Fig. 2) it is possible to generate the a map file where the map of PROFINET side of the conveter is descripted.

UPDATE DEVICE:

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

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

- Turn OFF the Device;
- Put Dip2 of 'Dip-Switch A' in ON position;
- Turn ON the device
- Connect the Ethernet cable;
- Insert the IP "**192.168.2.205**";
- Select which operations you want to do;
- Press the "**Execute update firmware**" button to start the upload;
- When all the operations are "OK" turn OFF the Device;
- Put Dip2 of 'Dip-Switch A' in OFF position;
- Turn ON the device.

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.

Update Device by Ethernet (UDP)

SW67615
Update Device Using the Ethernet Port

Insert the IP Address of Device

| 192 | . | 168 | . | 2 | . | 205 |

Select Update Options

Firmware + Configuration

☑ Read Back

✖ Cancel   ⬆ Execute Update Firmware

ADFweb.com - SW67615 Ethernet Update

Ver. 1.500

INIT : Waiting...

FIRMWARE : Waiting...

PROJECT : Waiting...

Figure 6: "Update Device" windows

Industrial Electronic Devices
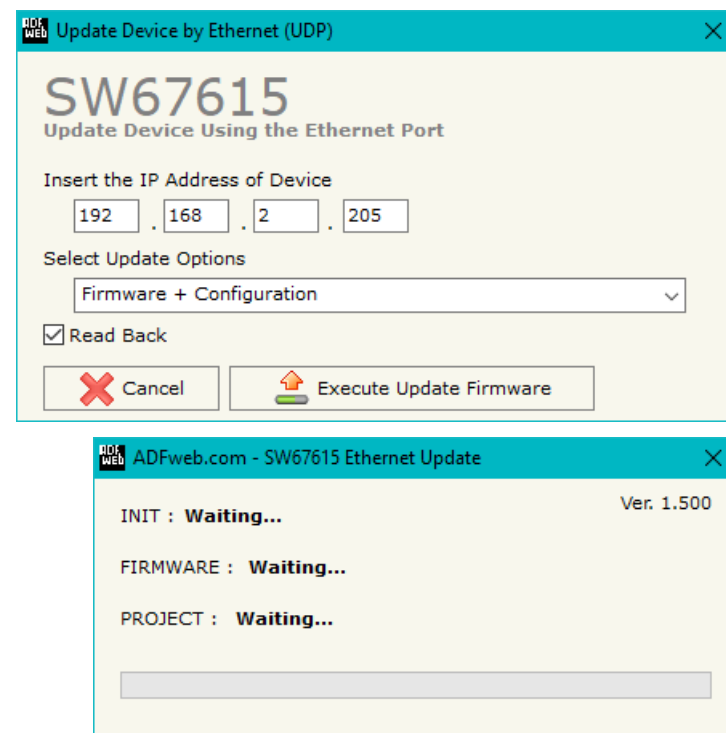
Note:
When you install a new version of the software, if it is the first time it is better you do the update of the Firmware in the HD67615 device.

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67615 device.

⚠ Warning:
If Fig. 7 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 and 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 you have to launch the "Command Prompt" with Administrator Rights;
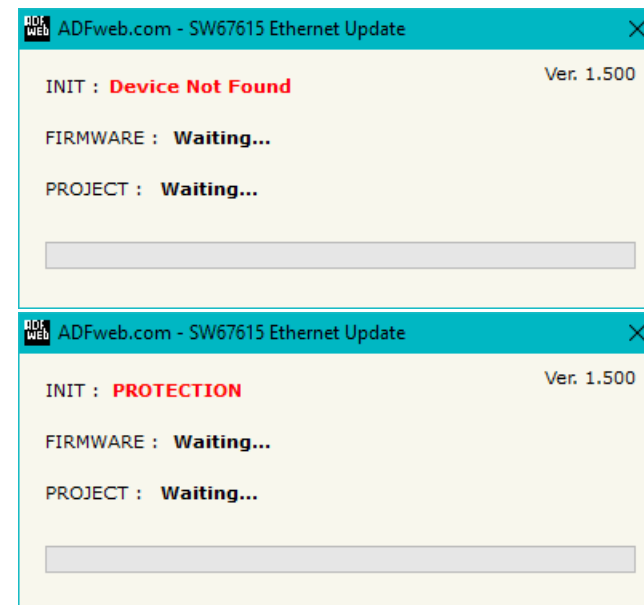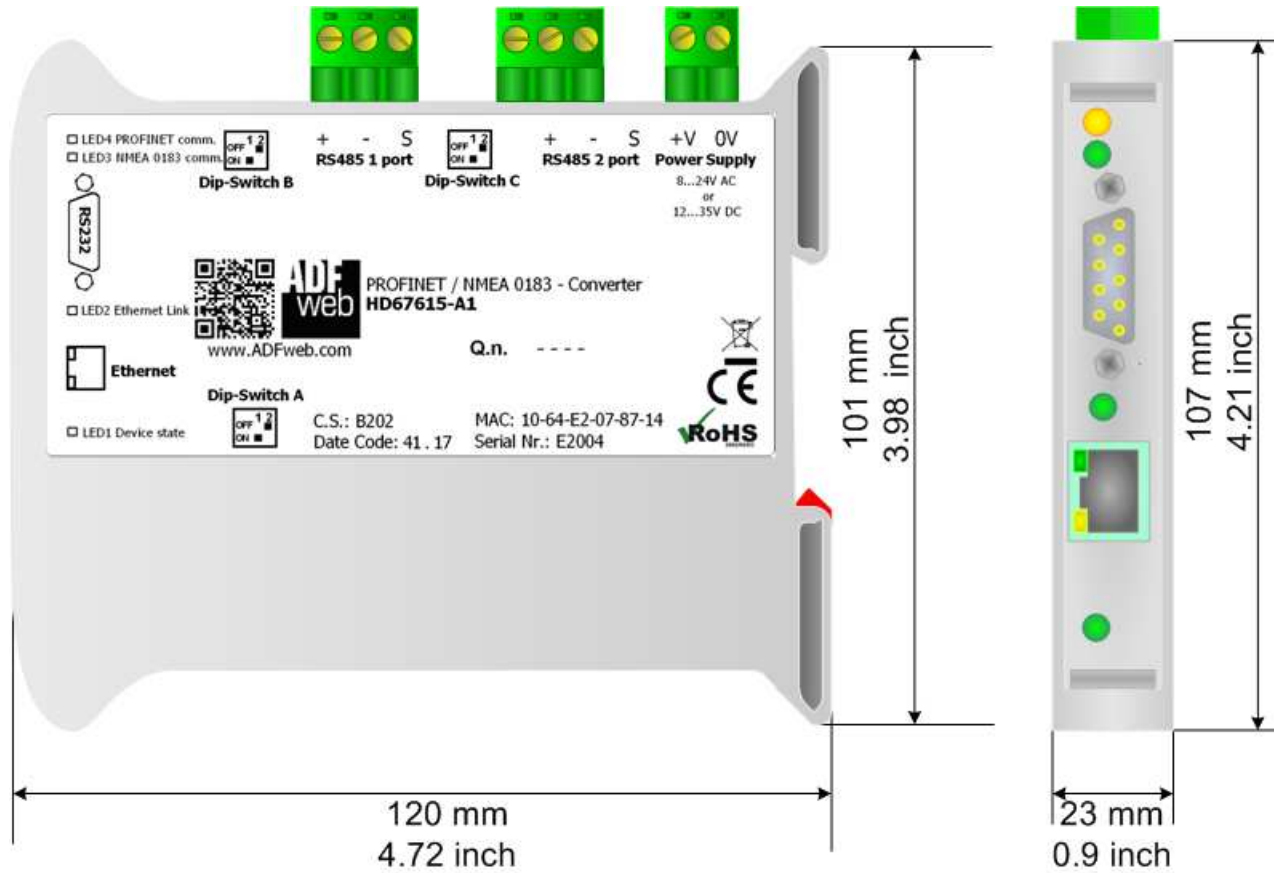- Pay attention at Firewall lock.

Figure 7: "Error" windows

In the case of HD67615 you have to use the software "SW67615": www.adfweb.com\download\filefold\SW67615.zip.

Industrial Electronic Devices

MECHANICAL DIMENSIONS:

Housing: PVC
Weight: 200g (Approx)

Figure 8: Mechanical dimensions scheme for HD67615-xxx-A1

ADF web

Industrial Electronic Devices

ORDERING INFORMATIONS:

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

HD67615 - xxx - A 1

    Connectors Type
    1: Removable 5mm Screw Terminal

    Enclosure Type
    A: 1M, 35mm DIN Rail mounting

    Serial Ports
    None: 1 x RS232, 2 x RS485
    RS422: 1 x RS232, 1 x RS485, 1 x RS422

    Device Family
    HD67615: PROFINET / NMEA 0183 - Converter
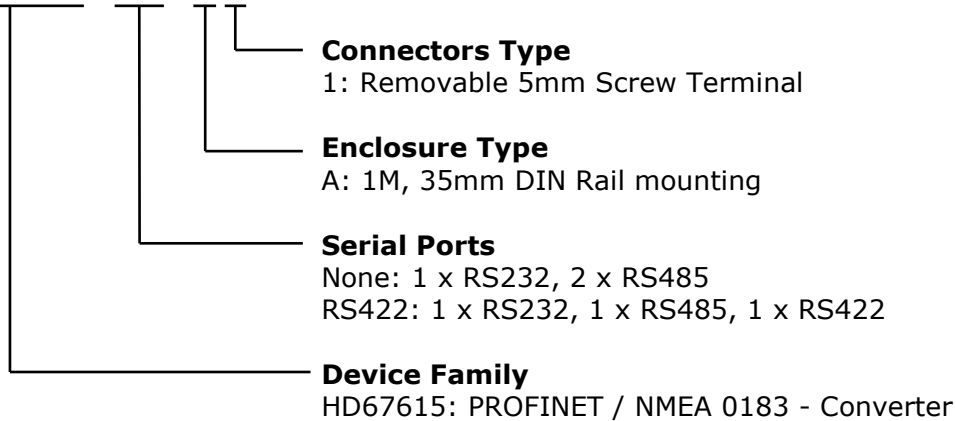
Order Code: **HD67615-A1**   **-**   PROFINET / NMEA 0183 – Converter (1 x RS232, 2 x RS485)

Order Code: **HD67615-422-A1** **-**   PROFINET / NMEA 0183 – Converter (1 x RS232, 1 x RS485, 1 x RS422)

ACCESSORIES:

Order Code: **AC34107**   **-**   Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m

Order Code: **AC34114**   -   Null Modem Cable Fem/Fem DSub 9 Pin 5 m

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

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

ADF web — Industrial Electronic Devices

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