User Manual

Revision 1.000
English

IO-Link / CANopen - Converter

(Order Code: HD67867-A1-2A, HD67867-A1-4A,
HD67867-A1-2B, HD67867-A1-2A-2B)

for Website information:
www.adfweb.com/?Product=HD67867

for Price information:
www.adfweb.com/?Price=HD67867-A1-2A
www.adfweb.com/?Price=HD67867-A1-4A
www.adfweb.com/?Price=HD67867-A1-2B
www.adfweb.com/?Price=HD67867-A1-2A-2B

Benefits and Main Features:

- Triple electrical isolation
- Two Ethernet ports
- Temperature range: -40°C /+85°C (-40°F/+185°F)

User Manual

For others IO-Link devices, see also the following links:

IO-Link from/to ...

www.adfweb.com?Product=HD67860	(**Modbus Master**)
www.adfweb.com?Product=HD67861	(**Modbus Slave**)
www.adfweb.com?Product=HD67862	(**Modbus TCP Master**)
www.adfweb.com?Product=HD67863	(**Modbus TCP Slave**)
www.adfweb.com?Product=HD67864	(**BACnet Master**)
www.adfweb.com?Product=HD67865	(**BACnet Slave**)
www.adfweb.com?Product=HD67866	(**CAN**)
www.adfweb.com?Product=HD67868	(**DeviceNet Master**)
www.adfweb.com?Product=HD67869	(**DeviceNet Slave**)
www.adfweb.com?Product=HD67870	(**EtherNet/IP Master**)
www.adfweb.com?Product=HD67871	(**EtherNet/IP Slave**)
www.adfweb.com?Product=HD67872	(**J1939**)
www.adfweb.com?Product=HD67873	(**MQTT**)
www.adfweb.com?Product=HD67874	(**NMEA0183**)
www.adfweb.com?Product=HD67875	(**NMEA2000**)
www.adfweb.com?Product=HD67876	(**PROFINET Slave**)
www.adfweb.com?Product=HD67877	(**SNMP Manager**)
www.adfweb.com?Product=HD67878	(**SNMP Agent**)

Do you have an your customer protocol?

See the following links:
www.adfweb.com?Product=HD67876

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	13/03/2020	Ff	All	First release version

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SECURITY ALERT:

GENERAL INFORMATION
To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device, legal and safety regulation are required for each individual application. The same applies also when using accessories.

INTENDED USE
Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

QUALIFIED PERSONNEL
The device can be used only by qualified personnel, strictly in accordance with the specifications.
Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS
The device is state-of-the-art and is safe. The instruments can represent a potential hazard if they are inappropriately installed and operated by untrained personnel. These instructions refer to residual risks with the following symbol:
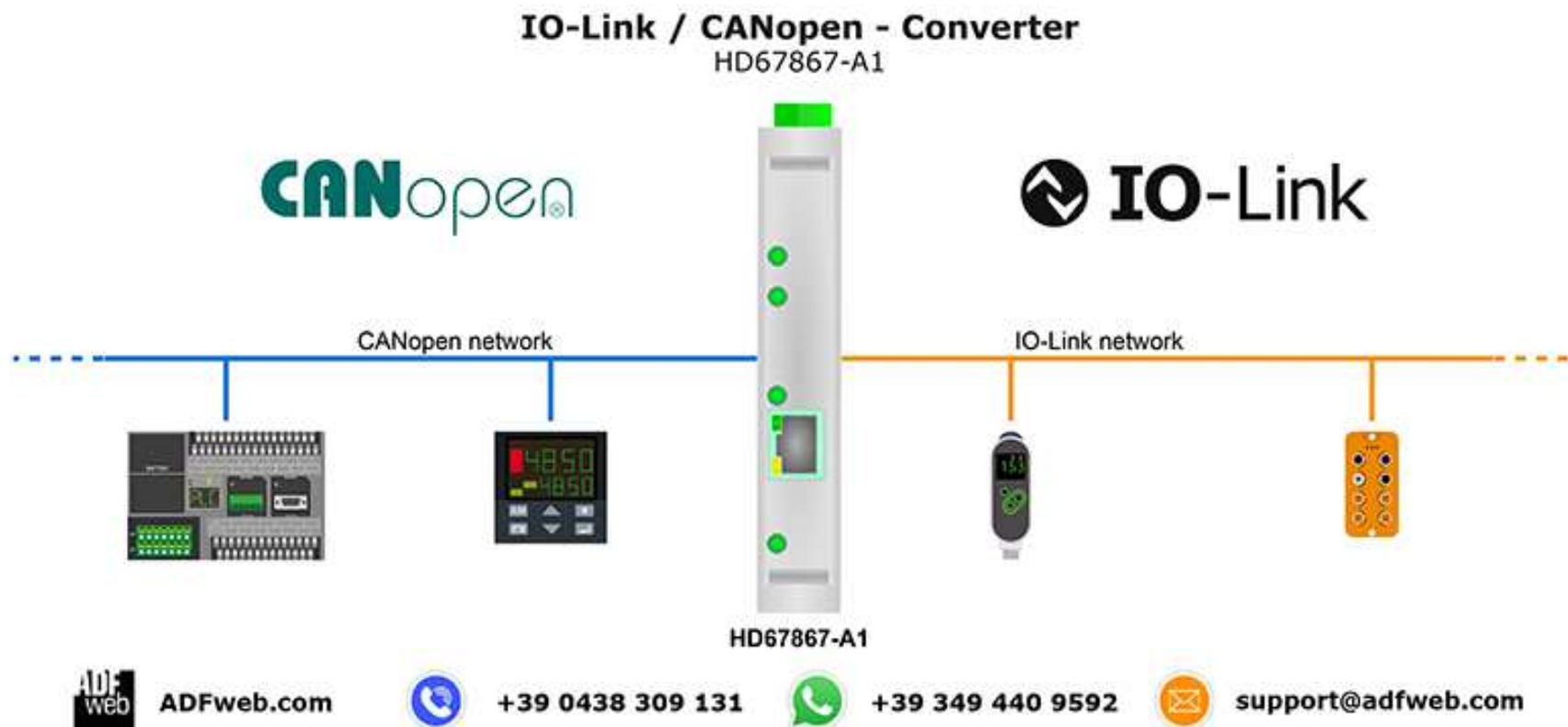
⚠️   This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

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

EXAMPLE OF CONNECTION:

IO-Link / CANopen - Converter
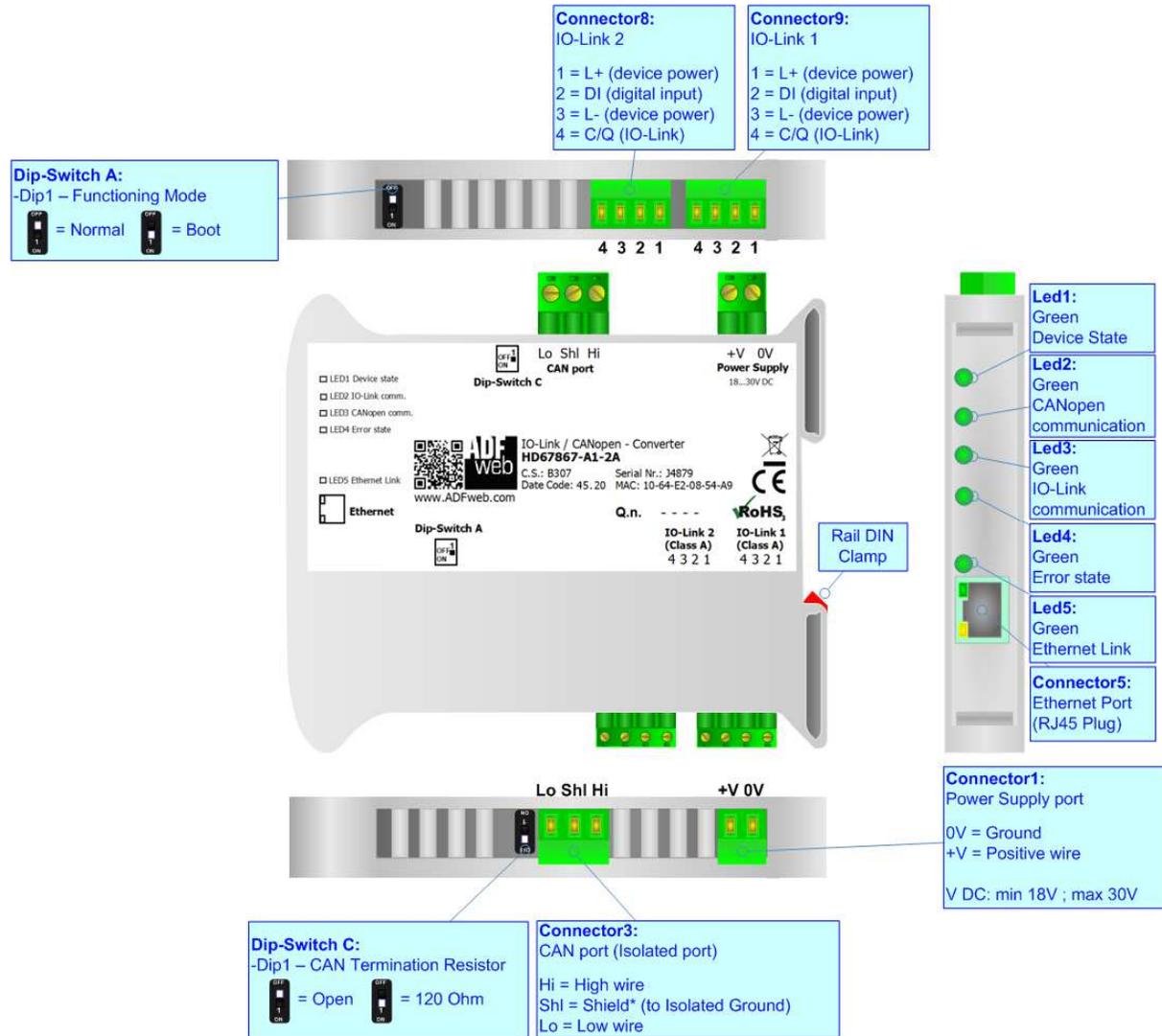HD67867-A1

CANopen network

IO-Link network

HD67867-A1

ADFweb.com   +39 0438 309 131   +39 349 440 9592   support@adfweb.com

Industrial Electronic Devices

CONNECTION SCHEME:

Figure 1a: Connection scheme for HD67867-A1-2A

Connector6:
IO-Link 4

1 = L+ (device power)
2 = DI (digital input)
3 = L- (device power)
4 = C/Q (IO-Link)

Connector7:
IO-Link 3

1 = L+ (device power)
2 = DI (digital input)
3 = L- (device power)
4 = C/Q (IO-Link)

Connector8:
IO-Link 2

1 = L+ (device power)
2 = DI (digital input)
3 = L- (device power)
4 = C/Q (IO-Link)

Connector9:
IO-Link 1

1 = L+ (device power)
2 = DI (digital input)
3 = L- (device power)
4 = C/Q (IO-Link)

Dip-Switch A:
-Dip1 – Functioning Mode

= Normal   = Boot

4 3 2 1   4 3 2 1   4 3 2 1   4 3 2 1

Lo Shl Hi
CAN port
Dip-Switch C

+V   0V
Power Supply
18...30V DC

☐ LED1 Device state
☐ LED2 IO-Link comm.
☐ LED3 CANopen comm.
☐ LED4 Error state

☐ LED5 Ethernet Link

Ethernet

IO-Link / CANopen - Converter
HD67867-A1-4A
C.S.: B307   Serial Nr.: J4879
Date Code: 45.20   MAC: 10-64-E2-08-54-A9

www.ADFweb.com

Q.n.   - - - -

RoHS₃

Dip-Switch A

IO-Link 4   IO-Link 3   IO-Link 2   IO-Link 1
(Class A)   (Class A)   (Class A)   (Class A)
4 3 2 1   4 3 2 1   4 3 2 1   4 3 2 1

Rail DIN
Clamp

Led1:
Green
Device State

Led2:
Green
CANopen
communication

Led3:
Green
IO-Link
communication

Led4:
Green
Error state

Led5:
Green
Ethernet Link

Connector5:
Ethernet Port
(RJ45 Plug)

Lo Shl Hi   +V 0V   +V 0V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V DC: min 18V ; max 30V

Dip-Switch C:
-Dip1 – CAN Termination Resistor

= Open   = 120 Ohm

Connector3:
CAN port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

Figure 1b: Connection scheme for HD67867-A1-4A

Industrial Electronic Devices

Connector8:
IO-Link 2

1 = L+ (device power)
2 = P24 (output power)
3 = L- (device power)
4 = C/Q (IO-Link)
5 = N24 (output power)

Connector9:
IO-Link 1

1 = L+ (device power)
2 = P24 (output power)
3 = L- (device power)
4 = C/Q (IO-Link)
5 = N24 (output power)

Dip-Switch A:
-Dip1 – Functioning Mode

= Normal   = Boot

5 4 3 2 1 5 4 3 2 1

Led1:
Green
Device State

Led2:
Green
CANopen
communication

Led3:
Green
IO-Link
communication

Led4:
Green
Error state

Led5:
Green
Ethernet Link

Connector5:
Ethernet Port
(RJ45 Plug)

Lo Shl Hi   +V 0V   +V 0V
CAN port   Aux Power Supply   Power Supply
Dip-Switch C   24V DC   18...30V DC

□ LED1 Device state
□ LED2 IO-Link comm.
□ LED3 CANopen comm.
□ LED4 Error state
□ LED5 Ethernet Link

Ethernet

IO-Link / CANopen - Converter
HD67867-A1-2B
C.S.: B307   Serial Nr.: J4879
Date Code: 45.20   MAC: 10-64-E2-08-54-A9
www.ADFweb.com

Dip-Switch A

Q.n. - - - -

IO-Link 2   IO-Link 1
(Class B)   (Class B)
5 4 3 2 1   5 4 3 2 1

Rail DIN
Clamp

Lo Shl Hi   +V 0V   +V 0V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V DC: min 18V ; max 30V

Dip-Switch C:
-Dip1 – CAN Termination Resistor

= Open   = 120 Ohm

Connector3:
CAN port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

Connector2:
Aux Power Supply port
(for IO-Link ports Type B)

0V = Ground
+24V DC = Positive wire

Figure 1c: Connection scheme for HD67867-A1-2B

Connector6:
IO-Link 4

1 = L+ (device power)
2 = DI (digital input)
3 = L- (device power)
4 = C/Q (IO-Link)

Connector7:
IO-Link 3

1 = L+ (device power)
2 = DI (digital input)
3 = L- (device power)
4 = C/Q (IO-Link)

Connector8:
IO-Link 2

1 = L+ (device power)
2 = P24 (output power)
3 = L- (device power)
4 = C/Q (IO-Link)
5 = N24 (output power)

Connector9:
IO-Link 1

1 = L+ (device power)
2 = P24 (output power)
3 = L- (device power)
4 = C/Q (IO-Link)
5 = N24 (output power)

Dip-Switch A:
-Dip1 – Functioning Mode

 = Normal   = Boot

Led1:
Green
Device State

Led2:
Green
CANopen
communication

Led3:
Green
IO-Link
communication

Led4:
Green
Error state

Led5:
Green
Ethernet Link

Connector5:
Ethernet Port
(RJ45 Plug)

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V DC: min 18V ; max 30V

Connector2:
Aux Power Supply port
(for IO-Link ports Type B)

0V = Ground
+24V DC = Positive wire

Dip-Switch C:
-Dip1 – CAN Termination Resistor

 = Open   = 120 Ohm

Connector3:
CAN port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

Figure 1d: Connection scheme for HD67867-A1-2A-2B

CHARACTERISTICS:

The HD67867-A1 is a IO-Link / CANopen converter.

It allows the following characteristics:

- Up to 1440 bytes in reading and 1440 bytes in writing;
- Two-directional information between CANopen and IO-Link;
- Mountable on 35mm Rail DIN;
- Wide power supply input range: 18…30V DC;
- Wide temperature range: -40°C / 85°C [-40°F / +185°F].

CONFIGURATION:

You need Compositor SW67867 software on your PC in order to perform the following:

- Define the parameters of IO-Link;
- Define the parameters of CANopen;
- Define IO-Link variables to be read by CANopen devices;
- Define IO-Link variables to be written by CANopen devices;
- Update the device.

POWER SUPPLY:

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

	VDC	
	Vmin	**Vmax**
HD67867-A1-xx	**18V**	**30V**

Consumption at 24V DC:

Device	W/VA
HD67867-A1-xx	4

⚠️ Warning:
   It is necessary to add to this consumption the one required by the IO-Link devices connected to the IO-Link channels.

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

0V ⌐ ⌐ +V
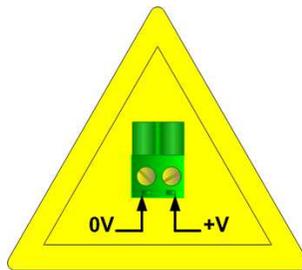
HD67867-A1-xx

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V DC: min 18V ; max 30V

0V +V

Connector1:
Power Supply port

0V = Ground
+V = Positive wire

V DC: min 18V ; max 30V

0V +V

FUNCTION MODES:

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

    ➔ The first, with Dip1 in Off position (factory setting), is used for the normal working of the device.

    ➔ The second, with Dip1 in On position, is used for upload the Project/Firmware.

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

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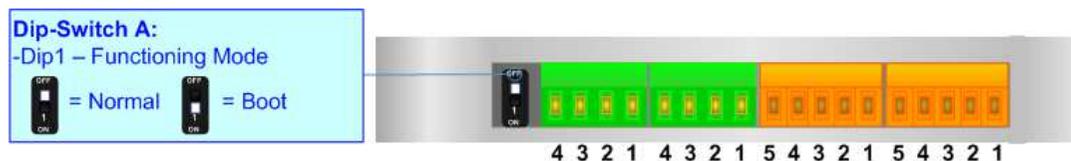
LEDS:

The device has got five LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device State (green)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: CANopen comm. (green)	**Flashing:** CANopen communication **OFF:** No CANopen communication	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: IO-Link comm. (green)	**Flashing:** IO-Link communication **OFF:** No IO-Link communication	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: Error state (green)	**ON:** at least one IO-Link device is not communicating **OFF:** No errors are present	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Ethernet Link (green)	**ON:** Ethernet cable connected **OFF:** Ethernet cable not connected	**ON:** Ethernet cable connected **OFF:** Ethernet cable not connected
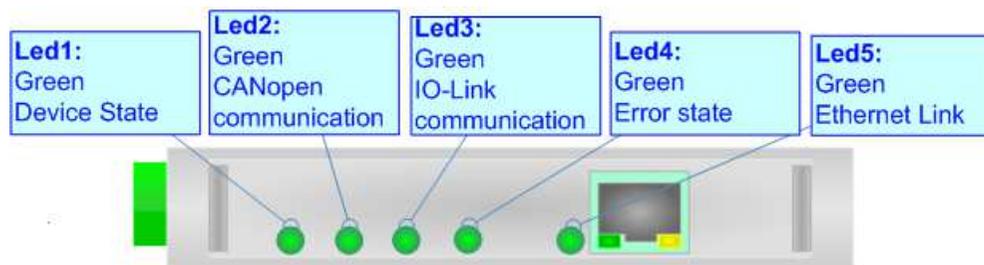
IO-LINK

IO-Link is the first globally standardized IO technology (IEC 61131-9) that communicates from the controller down to the lowest automation level. This universally applicable interface is a fieldbus-neutral point-to-point connection which uses standard unshielded cables. IO-Link sends all the sensor and actuator signals to the controller and in turn carries controller data to the sensor/actuator level with revolutionary consequences.
It is possible to have IO-Link device of two different type: IO-Link Class A and IO-Link Class B. ADFweb.com's converters can manage both of them in relation to the product code selected.

IO-LINK CLASS A:

IO-Link Class A devices uses 4 pins on connectors and the input power required can be up to 200mA. These devices are normally sensors and actuators that don't require high input power.
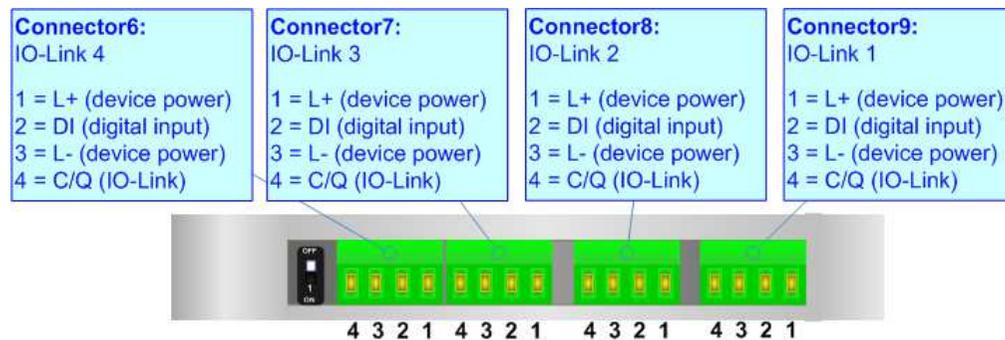
IO-LINK CLASS B:

IO-Link Class B devices uses 5 pins on connectors and they require an additional aux power supply used for the actuation. These devices are normally actuators.

Connector8:
IO-Link 2

1 = L+ (device power)
2 = P24 (output power)
3 = L- (device power)
4 = C/Q (IO-Link)
5 = N24 (output power)

Connector9:
IO-Link 1

1 = L+ (device power)
2 = P24 (output power)
3 = L- (device power)
4 = C/Q (IO-Link)
5 = N24 (output power)

5 4 3 2 1   5 4 3 2 1
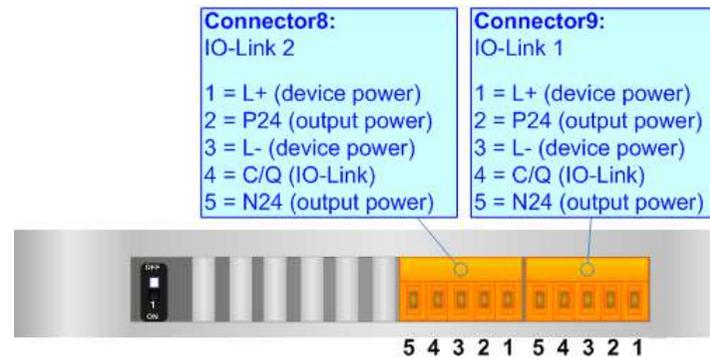
AUX POWER SUPPLY (for IO-Link Class B):

The Aux Power Supply port is used to provide the additional power supply for the IO-Link Class B. The input voltage is fixed to 24 V DC and the current depends on the input power required by the IO-Link devices connected to the IO-Link channels Class B.

Connector2:
Aux Power Supply port
(for IO-Link ports Type B)

0V = Ground
+24V DC = Positive wire

0V +V
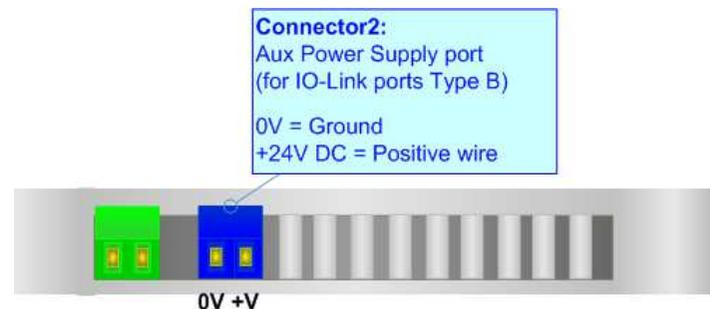
ETHERNET:

The Ethernet connection must be made using Connector5 of HD67867-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.
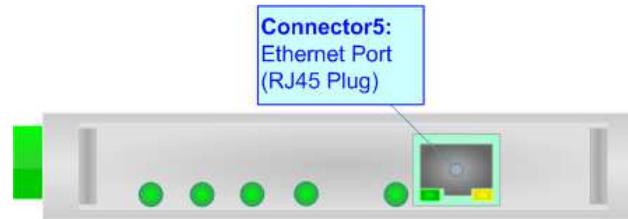
CAN:

For terminate the CAN line with a 120Ω resistor it is necessary that the Dip1 of 'Dip-Switch B' is at ON position.

Connector3:
CAN port (Isolated port)

Hi = High wire
Shl = Shield* (to Isolated Ground)
Lo = Low wire

Dip-Switch C:
-Dip1 – CAN Termination Resistor

= Open   = 120 Ohm

Hi Shl Lo
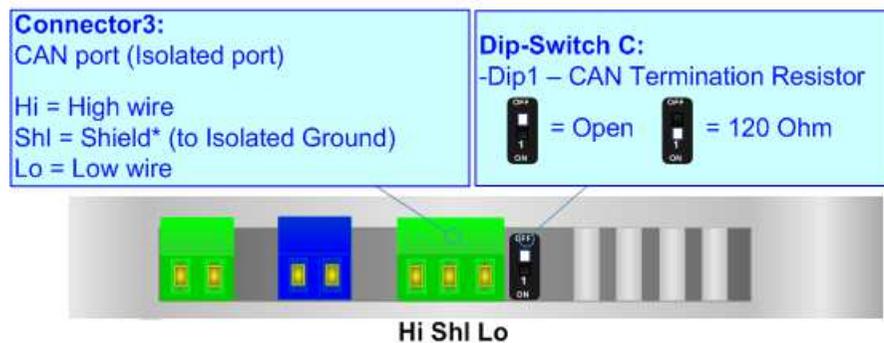
Cable characteristics:

DC parameter:		Impedance	70 Ohm/m

AC parameters:		Impedance	120 Ohm/m
		Delay	5 ns/m

Length		Baud Rate [bps]	Length MAX [m]
		10 K	5000
		20 K	2500
		50 K	1000
		100 K	650
		125 K	500
		250 K	250
		500 K	100
		800 K	50
		1000 K	25

USE OF COMPOSITOR SW67867:

To configure the Converter, use the available software that runs with Windows called SW67867. 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 SW67867, the window below appears (Fig. 2).

Note:
   It is necessary to have installed .Net Framework 4.

Figure 2: Main window for SW67867

NEW CONFIGURATION / OPEN CONFIGURATION:

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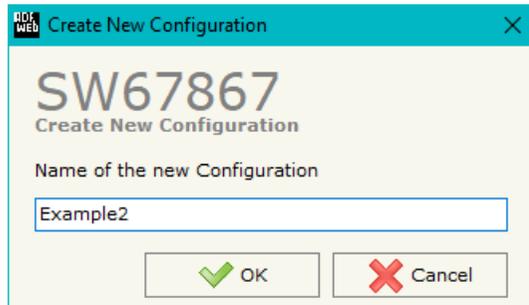
A device's configuration can also be imported or exported:

➜ To clone the configurations of a programmable "IO-Link / CANopen - 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**".
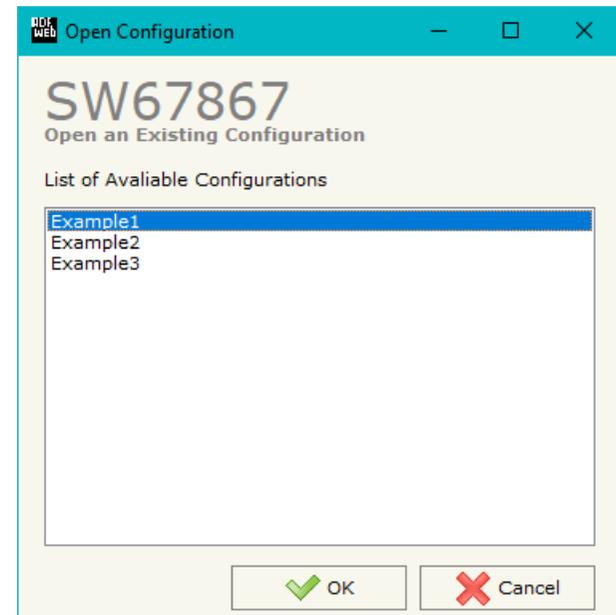
SOFTWARE OPTIONS:

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.
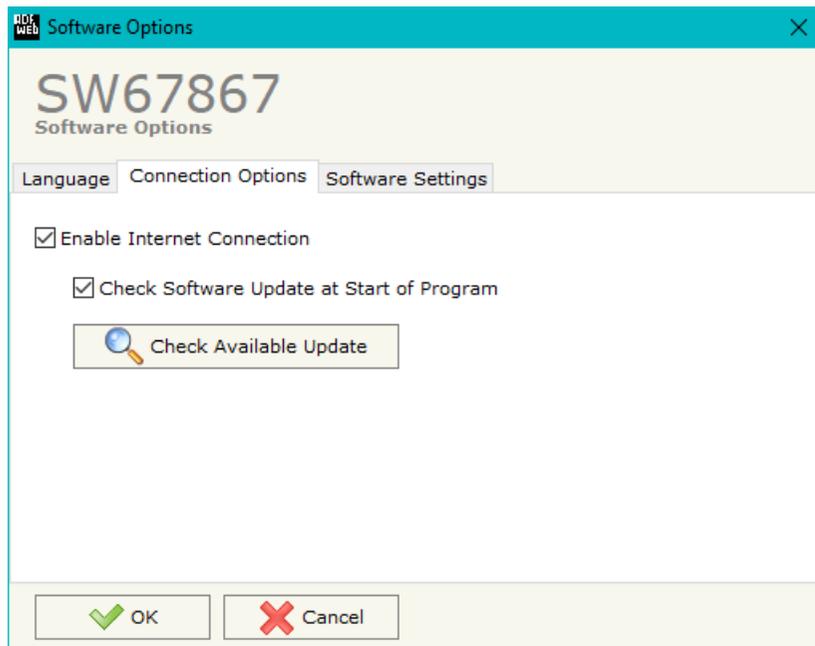
In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website.
Checking the option "**Check Software Update at Start of Program**", the SW67867 check automatically if there are updatings when it is launched.

Software Options

SW67867
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
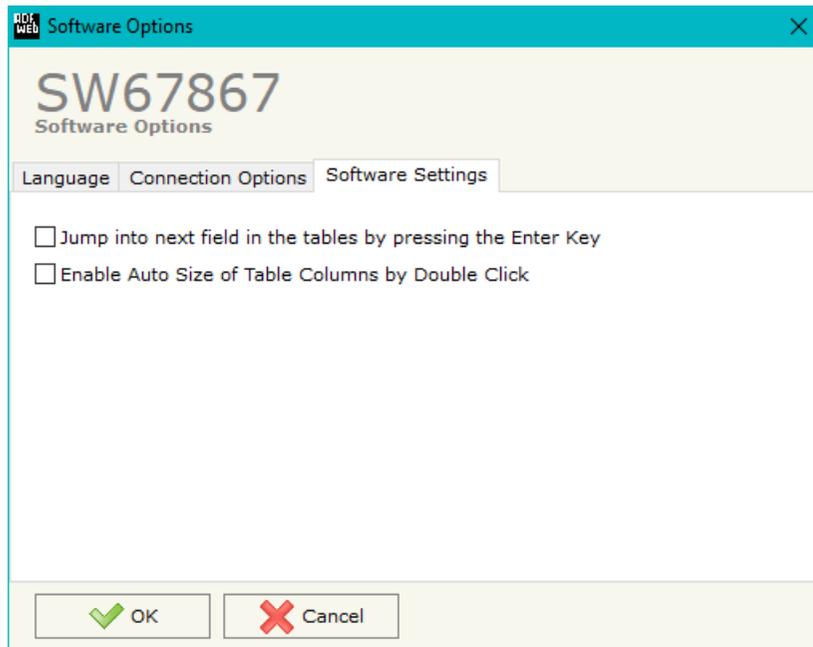
In the section "Software Settings", it is possible to enable/disable some keyboard's commands for an easier navigation inside the tables contained in the different sections of the software.

SET COMMUNICATION:

This section defines the fundamental communication parameters of CANopen.

By Pressing the "**Set Communication**" button from the main window for SW67867 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The means of the fields for "IO-Link" are:

→ In the fields "**Select Device**" the type of IO-Link channels is defined;

The means of the fields for "CANopen" are:

→ In the field "**Device ID**" the ID of the CANopen side is defined;
→ In the field "**Baud Rate**" the data rate of the CANopen line is defined;
→ In the field "**Set Operational State at Start-Up**" the state of the CANopen is defined. I.e. If it is checked the board starts in Operational State, else it starts in Pre-Operational;
→ In the field "**Network Start at Start-Up**" the state of the CANopen network is defined. I.e. If it is checked the board sends a command to set the Operational State of all the devices present in the network, after the time defined in the "Delay" field;
→ In the field "**Delay (s)**" the delay before sending the "Start" command for the CANopen is defined;
→ In the field "**SDO Client TimeOut (1/10 ms)**" the maximum time that the device attends for the answer from the Slave interrogated is defined.

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

→ In the fields "**IP ADDRESS**" the IP address of the converter is defined;
→ In the fields "**SUBNET Mask**" the SubNet Mask of the converter is defined;
→ In the fields "**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.
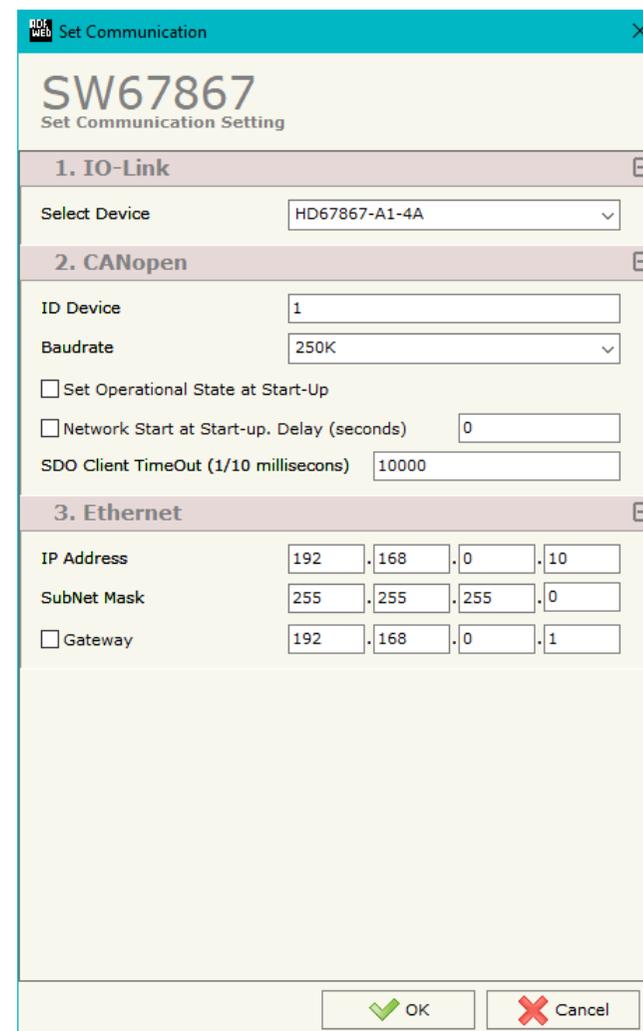

Figure 3: "Set Communication" window

IO-LINK SET ACCESS:

By Pressing the "**IO-Link Set Access**" button from the main window for SW67867 (Fig. 2) the window "IO-Link Set Access" appears (Fig. 4).
This section is used to define the list of IO-Link variables accessible from CANopen side.
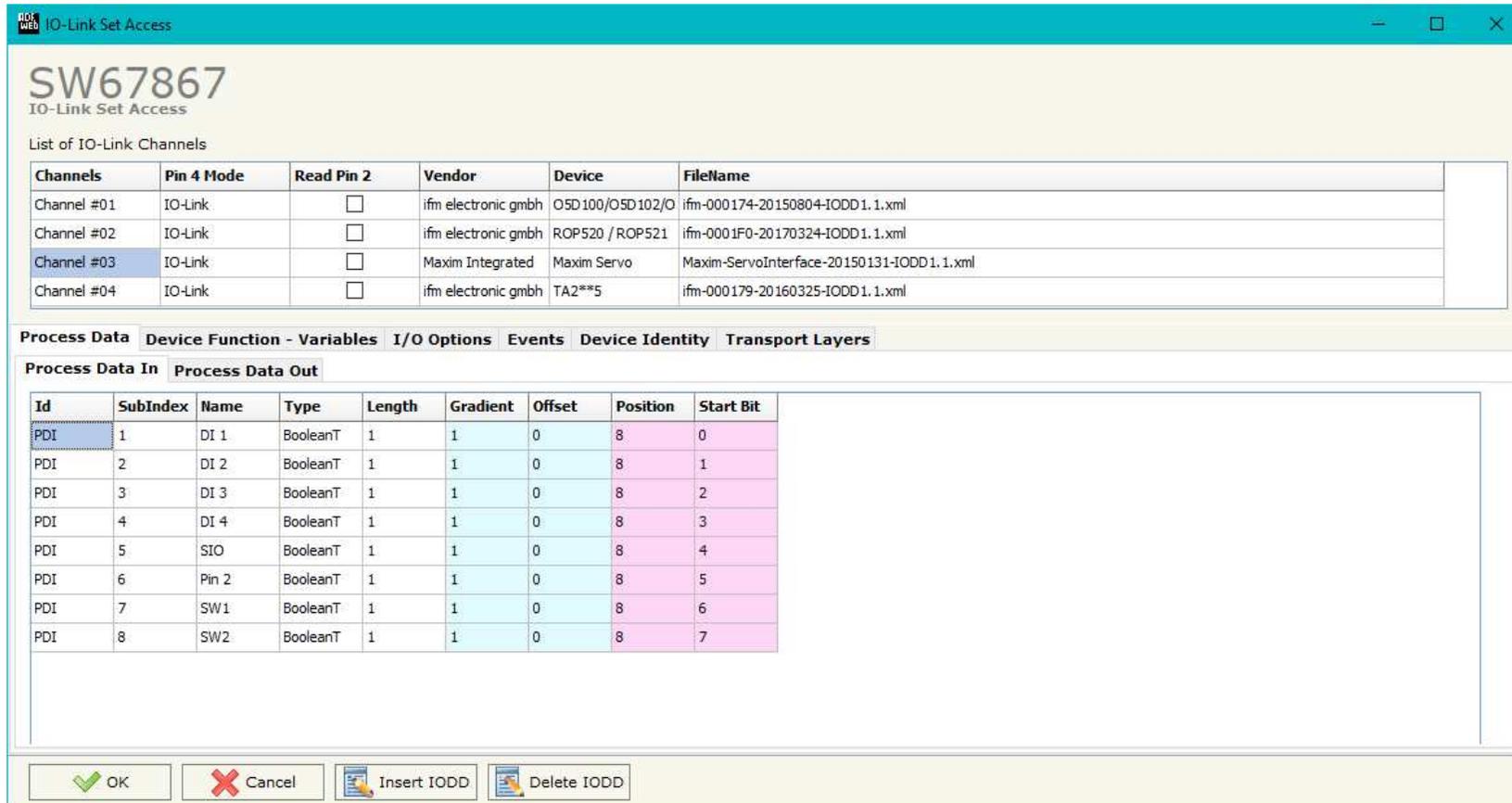

Figure 4: "IO-Link Set Access" window

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Industrial Electronic Devices

In the "List of IO-Link Channel" section it is possible to configure all the IO-Link channels of the converter (Fig. 5).

List of IO-Link Channels

Channels	Pin 4 Mode	Read Pin 2	Vendor	Device	FileName
Channel #01	IO-Link	☐	ifm electronic gmbh	O5D100/O5D102/O	ifm-000174-20150804-IODD1.1.xml
Channel #02	IO-Link	☐	ifm electronic gmbh	ROP520 / ROP521	ifm-0001F0-20170324-IODD1.1.xml
Channel #03	IO-Link	☐	Maxim Integrated	Maxim Servo	Maxim-ServoInterface-20150131-IODD1.1.xml
Channel #04	IO-Link	☐	ifm electronic gmbh	TA2**5	ifm-000179-20160325-IODD1.1.xml

Figure 5: "List of IO-Link Channel" section

The meanings of the fields are:

- In the field "**Channels**" the index of the IO-Link channel is defined;
- In the field "**Pin 4 Mode**" the mode of the pin 4 of the IO-Link device is defined (if "Io-Link" is selected, a file IODD is needed);
- If the field "**Read Pin 2**" is checked, the pin 2 of the IO-Link device is read;
- In the field "**Vendor**" the vendor of the IO-Link device is defined;
- In the field "**Device**" the name of the IO-Link device is defined;
- In the field "**FileName**" the name of the IODD file inserted is defined;

By clicking on "**Insert IODD**", the window "IO-Link IODD Catalog" appears (Fig. 6). This section is used to select an IO-Link device. By clicking on "**Add IODD**" it is possible to add a new IODD file (the extension must be .xml).
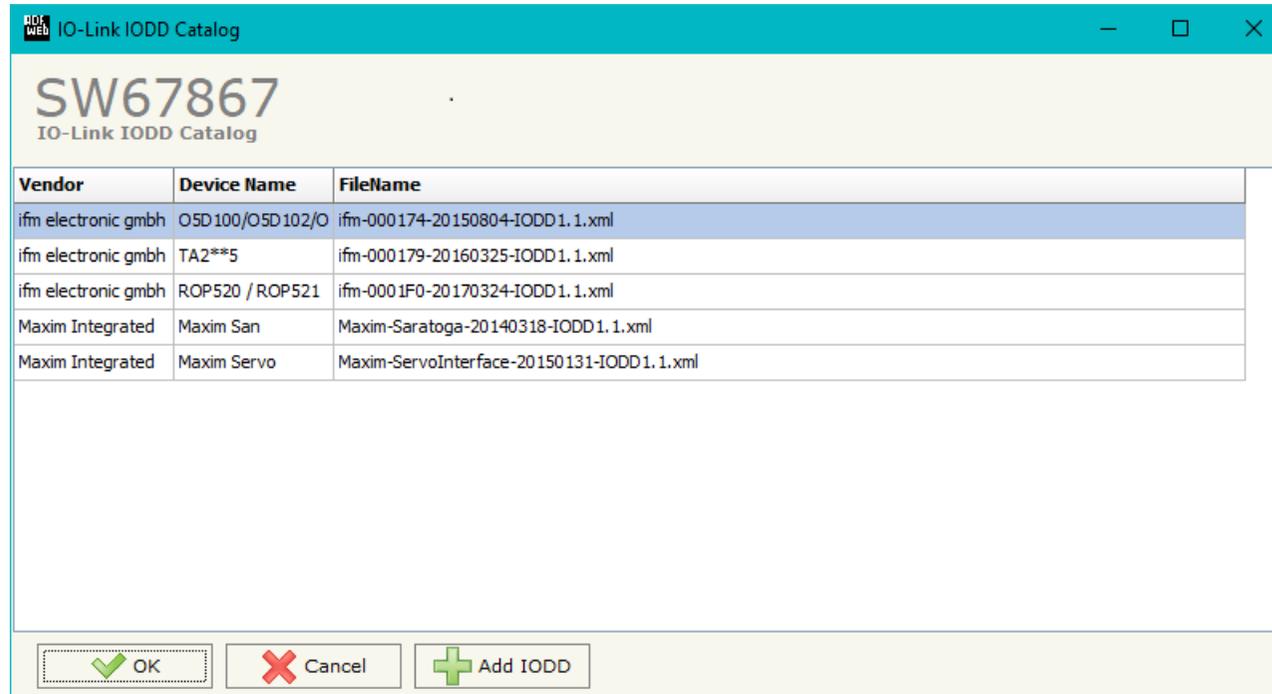
Vendor	Device Name	FileName
ifm electronic gmbh	O5D100/O5D102/O	ifm-000174-20150804-IODD1.1.xml
ifm electronic gmbh	TA2**5	ifm-000179-20160325-IODD1.1.xml
ifm electronic gmbh	ROP520 / ROP521	ifm-0001F0-20170324-IODD1.1.xml
Maxim Integrated	Maxim San	Maxim-Saratoga-20140318-IODD1.1.xml
Maxim Integrated	Maxim Servo	Maxim-ServoInterface-20150131-IODD1.1.xml

OK   Cancel   Add IODD

Figure 6: "IO-Link IODD Catalog" section

The "Process Data" section is used to define the IO-Link process data to link to CANopen side (Fig. 7).

Id	SubIndex	Name	Type	Length	Gradient	Offset	Position	Start Bit
PDO	1	Servo 1	IntegerT	8	1	0	0	0
PDO	2	Servo 2	IntegerT	8	1	0	1	0
PDO	3	Servo 3	IntegerT	8	1	0	2	0
PDO	4	Servo 4	IntegerT	8	1	0	3	0

Figure 7: "Process Data" section

The meanings of the fields are:

- In the field "**Id**" the Id of the IO-Link process data is defined;
- In the field "**SubIndex**" the subindex of the IO-Link process data is defined;
- In the field "**Name**" the name of the IO-Link process data is defined;
- In the field "**Type**" the data format of the IO-Link process data is defined;
- In the field "**Length**" the bit length of the IO-Link process data is defined;
- In the field "**Gradient**" the multiplication factor of the IO-Link process data is defined;
- In the field "**Offset**" the offset of the IO-Link process data is defined;
- In the field "**Position**" the starting byte of the internal memory arrays where mapping/getting the value is defined;
- In the field "**Start Bit**" the starting bit of the byte of the field "Position" is defined.

The "Device Function – Variables" section is used to define the IO-Link parameters to link to CANopen side (Fig. 8).

Figure 8: "Device Function - Variables*" section*

Enable	Index	SubIndex	Id	Name	Type	Access	Length	SindAccSupp	TotBitLen	BitOff	Default	Value	Description
☐	542		V_Operating_Hours	Operating_Hours	UIntegerT	Read Only	16	False	16	0			Operating hours
☐	551		V_uni	uni	UIntegerT	Read Write	8	False	8	0	0		Selection of unit on
☐	552		V_diS	diS	RecordT	Read Write	16	False	16	0			Display settings
☐	552	1	V_diS	Display On / OFF	BooleanT	Read Write	1	False	16	7	false		
☐	552	2	V_diS	Display orientation	BooleanT	Read Write	1	False	16	6	false		
☐	552	3	V_diS	Update rate	UIntegerT	Read Write	6	False	16	0	2		
☐	554		V_coLr	coLr	UIntegerT	Read Write	8	False	8	0	2		Assignment of the
☐	555		V_cFH	cFH	IntegerT	Read Write	16	False	16	0	512		Upper value for
☐	556		V_cFL	cFL	IntegerT	Read Write	16	False	16	0	256		Lower value for
☐	580		V_ou1_rPM	ou1_RPM	UIntegerT	Read Write	8	False	8	0	3		Output
☐	583		V_SP_FH1	SP_FH1	IntegerT	Read Write	16	False	16	0	5000		Switch point 1,
☐	584		V_rP_FL1	rP_FL1	IntegerT	Read Write	16	False	16	0	4000		Reset point 1,

Process Data | Device Function - Variables | I/O Options | Events | Device Identity | Transport Layers

[OK] [Cancel] [Insert IODD] [Delete IODD]

The meanings of the fields are:

  - In the field "**Index**" the Index of the IO-Link parameter is defined;
  - In the field "**SubIndex**" the Subindex of the IO-Link parameter is defined;
  - In the field "**Id**" the Id of the IO-Link parameter is defined;
  - In the field "**Name**" the name of the IO-Link parameter is defined;
  - In the field "**Type**" the data format of the IO-Link parameter is defined;
  - In the field "**Access**" the access type of the IO-Link parameter is defined;
  - In the field "**Length**" the bit length of the IO-Link parameter is defined;
  - In the field "**SindAccSupp**" the value of subindexAccessSupported attribute of the IO-Link parameter is defined;

- In the field "**TotBitLen**" the bit length of the array to which the IO-Link parameter refers is defined;
- In the field "**BitOff**" the bit offset of the IO-Link parameter is defined;
- In the field "**Default**" the default value of the IO-Link parameter is defined;
- In the field "**Value**" the starting value of the IO-Link parameter is defined;
- In the field "**Description**" a description of the IO-Link parameter is defined.

The "I/O Options" section is used to define how linking the data from IO-Link pin 2 and pin 4 to CANopen side (Fig. 9).

Figure 9: "I/O Options" section

The meanings of the fields are:

- In the field "**Name**" the name of the IO-Link pin is defined;
- In the field "**Access**" the access of the IO-Link pin is defined;
- In the field "**Position**" the starting byte of the internal memory arrays where mapping/getting the value is defined;
- In the field "**Start Bit**" the starting bit of the byte of the field "Position" is defined.
- If the field "**Invert**" the value to map/get is inverted;
- In the field "**Mnemonic**" a description of the variable is defined.

Note:
    IO-Link pin 2 can only be read and IO-LINK pin 4 can be defined if "Pin 4 Mode" is set to "DIn" or "DOut" in "List of IO-Link Channel" section.

The "Events" section is used to define the IO-LINK events to map on CANopen side (Fig. 10).

Enable	Code	Name	Type	TimeOut	Position	Start Bit	Menmonic
☑	16928	Device temperature under-run	Warning	2000	3	0	
☑	36016	nEA	Warning	2000	3	1	
☑	36017	fAr	Warning	2000	3	2	
☑	36020	+	Error	2000	3	3	
☑	36021	-	Error	2000	3	4	
☑	36004	ErP	Warning	2000	3	5	
☑	36350	Test Event 1	Warning	2000	3	6	
☑	36351	Test Event 2	Warning	2000	3	7	

Process Data Device Function - Variables I/O Options **Events** Device Identity Transport Layers

✔ OK   ✘ Cancel   Insert IODD   Delete IODD

Figure 10: "Events" section

The meanings of the fields are:

➥ In the field "**Code**" the code of the IO-Link event is defined;
➥ In the field "**Name**" the name of the IO-Link event is defined;
➥ In the field "**Type**" the type of the IO-Link event is defined;
➥ In the field "**TimeOut**" the duration of the IO-Link event after its activation is defined;
➥ In the field "**Position**" the starting byte of the internal memory arrays where mapping/getting the value is defined;
➥ In the field "**Start Bit**" the starting bit of the byte of the field "Position" is defined;
➥ In the field "**Mnemonic**" a description of the variable is defined.

Industrial Electronic Devices

In "Device Identity" section (Fig.11) and "Transport Identity" section (Fig. 12), the main features of the selected IO-Link device are reported. These characteristics are read from the IODD file.

| Process Data | Device Function - Variables | I/O Options | Events | **Device Identity** | Transport Layers |

Vendor ID   310
Vendor Name   ifm electronic gmbh
Device ID   377
Vendor Text   www.ifm.com
Vendor URL   http://www.ifm.com/ifmgb/web/io-link-download.htm
Device Name   TA2**5
Device Family   TA2

Device Variant Collection

Product ID	Name	Description
TA2115	TA2115	Temperature transmitter, -50.0…150 °C, Length
TA2135	TA2135	Temperature transmitter, -50.0…150 °C, Length

✔ OK   ✖ Cancel   Insert IODD   Delete IODD

Figure 11: "Transport Layers" section

| Process Data | Device Function - Variables | I/O Options | Events | Device Identity | **Transport Layers** |

BitRate   COM2
Min Cycle Time   2300
SIO Supported   False
M Sequence Capability   17

✔ OK   ✖ Cancel   Insert IODD   Delete IODD

Figure 12: "Device Identity" section

Industrial Electronic Devices

SET SDO SERVER:

By pressing the "**Set SDO Server**" button from the main window for SW67867 (Fig. 2) the window "Set SDO Server Access" appears (Fig. 13).

This window is made to create the SDO in read or write in the CANopen side, and to indicate which byte are associated to these SDOs.

It is divided in two parts, the "SDO in read" and the "SDO in Write".
The first part is used to read, using the SDO, the data arrived from IO-Link side. The second is used to write, using SDO, the data that will be sent to IO-Link side.

The data of the columns have the following meanings:

➔ In the field "**Index**" the address of the SDO is defined;
➔ In the field "**SubIndex**" the second address of the SDO is defined;
➔ If the field "**N Byte**" the dimension of the SDO is defined (it can be 1, 2 or 4);
➔ In the field "**Address Byte1**" insert the address of the internal arrays where read/write first byte of the SDO;
➔ In the field "**Address Byte2**" insert the address of the internal arrays where read/write second byte of the SDO (only if N Byte is 2 or 4);
➔ In the field "**Address Byte3**" insert the address of the internal arrays where read/write third byte of the SDO (only if N Byte is 4);
➔ In the field "**Address Byte4**" insert the address of the internal arrays where read/write fourth byte of the SDO (only if N Byte is 4);
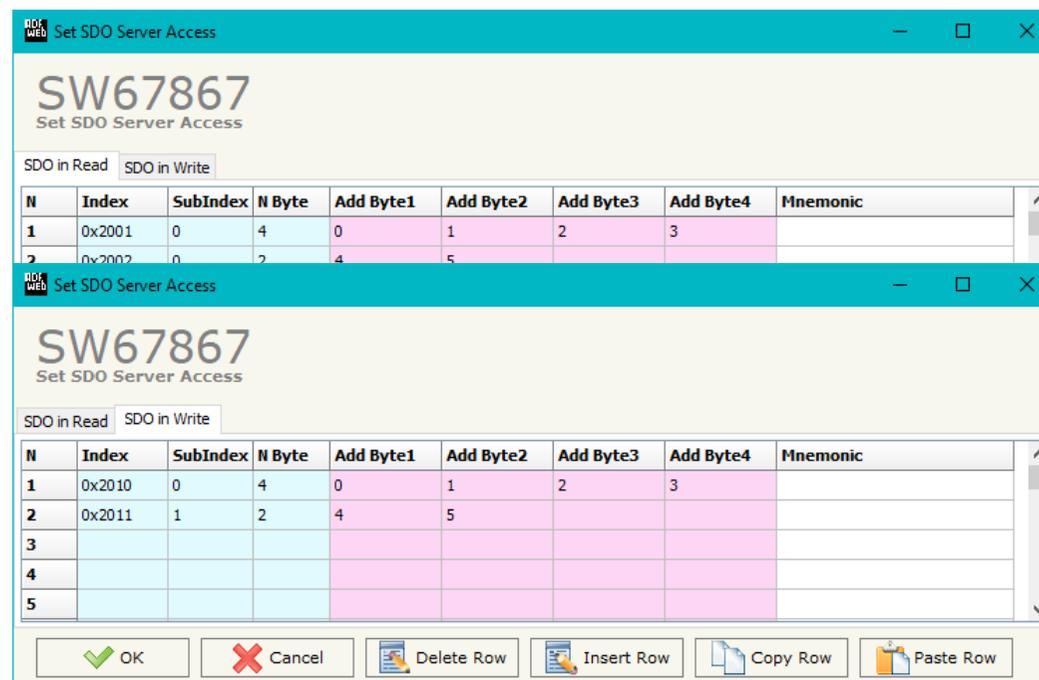➔ In the field "**Mnemonic**" the description for the SDO is defined.

Figure 13: "Set SDO Server Access" window

SET SDO CLIENT:

By pressing the "**Set SDO Client**" button from the main window for SW67867 (Fig. 2) the window "Set SDO Client Access" appears (Fig. 14a and 14b).

With the SDO Client the HD67867 Gateway can read and/or write the data from other devices connected in the network CANopen.

It is divided in two parts, the " SDO Read" and the "SDO Write". The first part is used to read, using the SDO, the data in another device and then put them on IO-Link side. The second part is used to write, using the SDO, the data present on IO-Link side to others CANopen devices.

The data of the columns in the "SDO Read" have the following meanings:

- In the field "**Device ID**" insert the ID of the device to read;
- In the field "**Index**" the address for the SDO is defined;
- In the field "**SubIndex**" the second address for the SDO is defined;
- In the field "**N Byte**" the dimension of the SDO is defined (it can be 1, 2, or 4);
- In the field "**Poll Time**" insert the cyclic time to make this request;
- In the field "**Address Byte1**" the address of the internal array where coping the first byte of the SDO read is defined;

Figure 14a: "Set SDO Client Access – SDO Read" window

- In the field "**Address Byte2**" the address of the internal array where coping the second byte of the SDO read is defined (only if N Byte is 2 or 4);
- In the field "**Address Byte3**" the address of the internal array where coping the third byte of the SDO read is defined (only if N Byte is 4);
- In the field "**Address Byte4**" the address of the internal array where coping the fourth byte of the SDO read is defined (only if N Byte is 4);
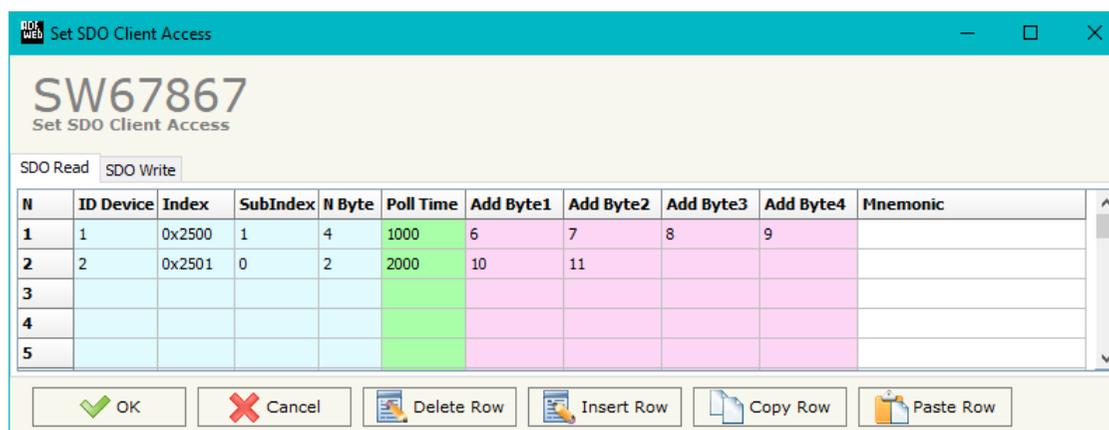- In the field "**Mnemonic**" the description for the SDO is defined.

The data of the columns in the "SDO Write" have the following meanings:

➔ In the field "**Device ID**" insert the ID of the device to write;

➔ In the field "**Index**" the address for the SDO is defined;

➔ In the field "**SubIndex**" the second address for the SDO is defined;

➔ In the field "**N Byte**" the dimension of the SDO is defined (it can be 1, 2, or 4);

➔ In the field "**Poll Time**" insert the cyclic time to make this request;

➔ If the field "**On Change**" is checked, the gateway sends the Write SDO request when the data change the value;

➔ In the field "**Address Byte1**" the address of the internal array where reading the first byte of the SDO write is defined;

➔ In the field "**Address Byte2**" the address of the internal array where reading the second byte of the SDO write is defined (only if N Byte is 2 or 4);

➔ In the field "**Address Byte3**" the address of the internal array where reading the third byte of the SDO write is defined (only if N Byte is 4);

➔ In the field "**Address Byte4**" the address of the internal array where reading the fourth byte of the SDO write is defined (only if N Byte is 4);

➔ In the field "**Mnemonic**" the description for the SDO is defined.
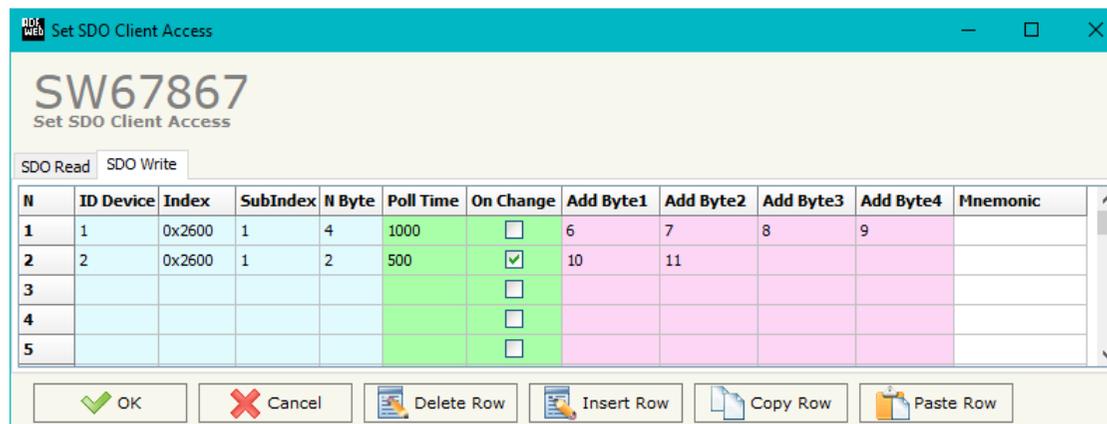
Figure 14b: "Set SDO Client Access – SDO Write" window

SET PDO ACCESS:

By pressing the "**Set PDO Access**" button from the main window for SW67867 (Fig. 2) the window "Set PDO Access" appears (Fig. 15a and 15b).

This window is made to create the Receive and the Transmit PDO in the CANopen side, and to indicate which bytes are associated to these PDO.
It is divided in two parts, the " Receive PDO" and the " Transmit PDO ". The first part is used to receive PDO in the CANopen network and copy the data on IO-Link side. The second part is used to transmit PDO in the CANopen network with the data on IO-Link side.

The data of the columns in the "Receive PDO" have the following meanings:

- In the Field "**Cob-ID**" the address for the PDO is defined;
- In the Field "**Dimension**" the dimension of the PDO is defined (it can be between 1 and 8);
- In the Field "**Add B1**" the first byte where the data will be saved in the internal array is defined;
- In the Field "**Add B2**" the second byte where the data will be saved in the internal array is defined (only if **Dimension** > 1);
- In the Field "**Add B3**" the third byte where the data will be saved in the internal array is defined (only if **Dimension** > 2);

Figure 15a: "Set PDO Access – Receive PDO" window

- In the Field "**Add B4**" the fourth byte where the data will be saved in the internal array is defined (only if **Dimension** > 3);
- In the Field "**Add B5**" the fifth byte where the data will be saved in the internal array is defined (only if **Dimension** > 4);
- In the Field "**Add B6**" the sixth byte where the data will be saved in the internal array is defined (only if **Dimension** > 5);
- In the Field "**Add B7**" the seventh byte where the data will be saved in the internal array is defined (only if **Dimension** > 6);
- In the Field "**Add B8**" the eighth byte where the data will be saved in the internal array is defined (only if **Dimension** > 7);
- The field "**TimeOut**" is used for put at zero the data on IO-Link side if the PDO doesn't arrive with a frequency less than the time expressed in the field. If the value in the field is 0, the function is disabled;
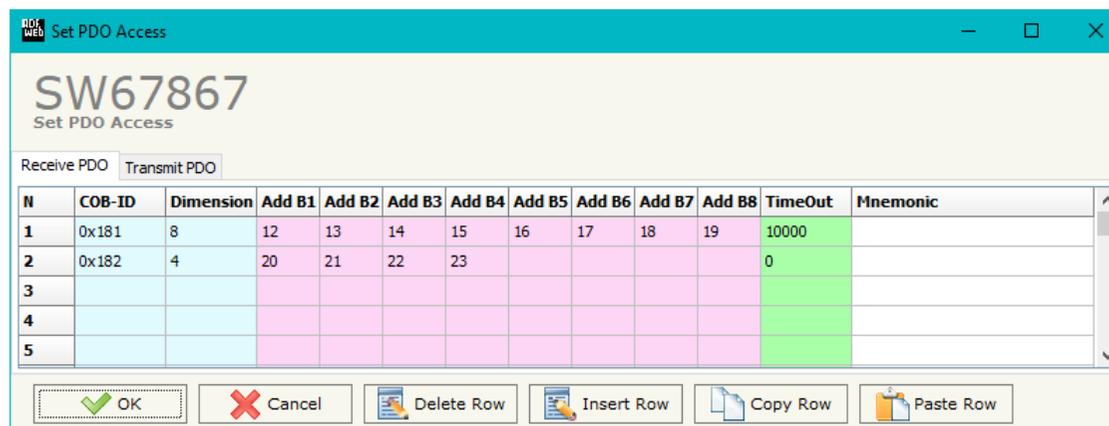- In the field "**Mnemonic**" the description for the PDO is defined.

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The data of the columns in the "Transmit PDO" have the following meanings:

+ In the Field "**Cob-ID**" the address for the PDO is defined;

+ In the Field "**Dimension**" the dimension of the PDO is defined (it can be between 1 and 8);

+ In the Field "**Add B1**" the first byte where the data will be loaded in the internal array is defined;

+ In the Field "**Add B2**" the second byte where the data will be loaded in the internal array is defined (only if **Dimension** > 1);

+ In the Field "**Add B3**" the third byte where the data will be loaded in the internal array is defined (only if **Dimension** > 2);

Figure 15b: "Set PDO Access – Transmit PDO" window

+ In the Field "**Add B4**" the fourth byte where the data will be loaded in the internal array is defined (only if **Dimension** > 3);
+ In the Field "**Add B5**" the fifth byte where the data will be loaded in the internal array is defined (only if **Dimension** > 4);
+ In the Field "**Add B6**" the sixth byte where the data will be loaded in the internal array is defined (only if **Dimension** > 5);
+ In the Field "**Add B7**" the seventh byte where the data will be loaded in the internal array is defined (only if **Dimension** > 6);
+ In the Field "**Add B8**" the eighth byte where the data will be loaded in the internal array is defined (only if **Dimension** > 7);
+ In the Field "**Send Time** " insert the interval used to send the PDO. The time is in milliseconds;
+ If the field "**On Change**" is checked, the gateway send the Transmit PDO when the data change the value;
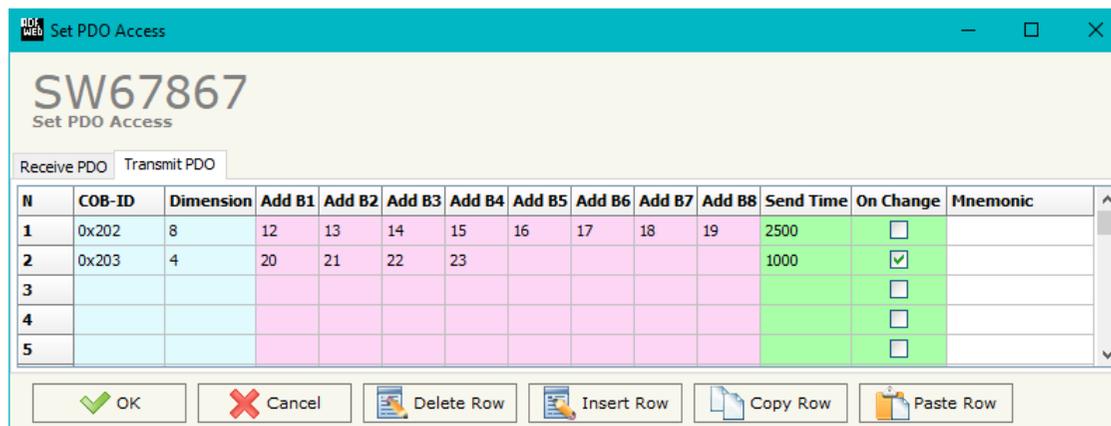+ In the field "**Mnemonic**" the description for the PDO is defined.

EDS FILE:

By Pressing the "**EDS FILE**" button from the main window for SW67867 (Fig. 2) it is possible to generate the EDS file to be imported into the master CANopen.

Industrial Electronic Devices

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.
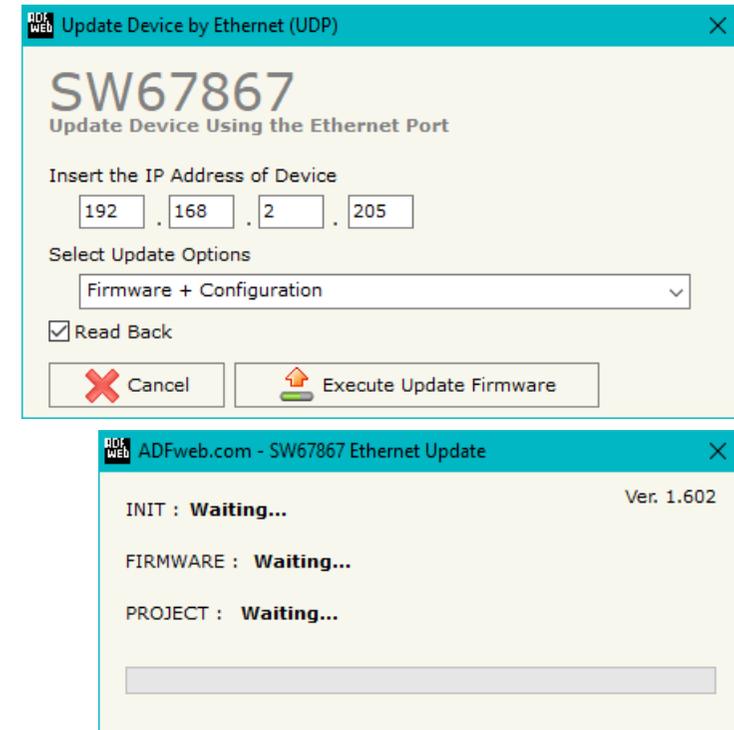

Figure 16: "Update device" windows

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67867 device.

Warning:
If Fig. 17 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;
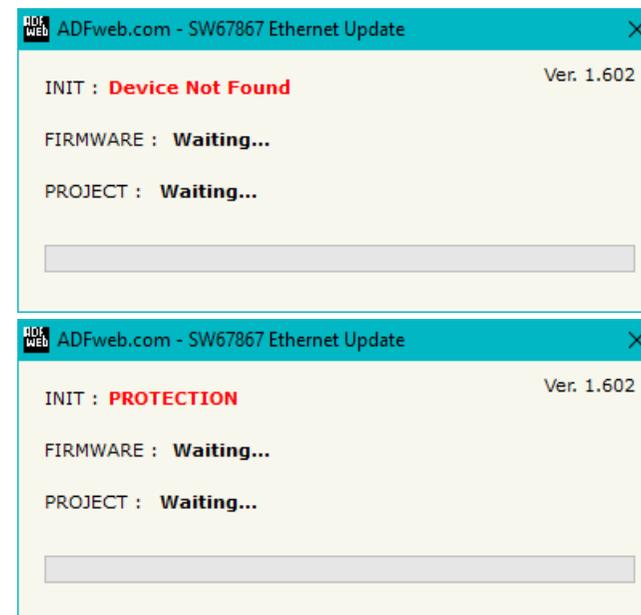- Pay attention at Firewall lock.

ADFweb.com - SW67867 Ethernet Update

INIT : **Device Not Found**   Ver. 1.602

FIRMWARE : **Waiting...**

PROJECT : **Waiting...**

ADFweb.com - SW67867 Ethernet Update

INIT : **PROTECTION**   Ver. 1.602

FIRMWARE : **Waiting...**

PROJECT : **Waiting...**

Figure 17: "Error" window

Warning:
In the case of HD67867 you have to use the software "SW67867": www.adfweb.com\download\filefold\SW67867.zip.
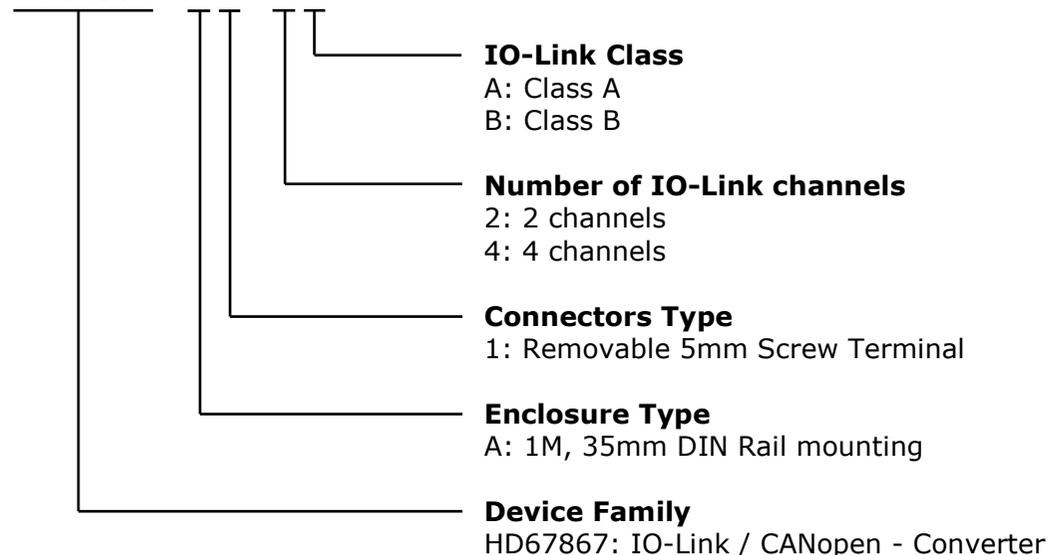
MECHANICAL DIMENSIONS:
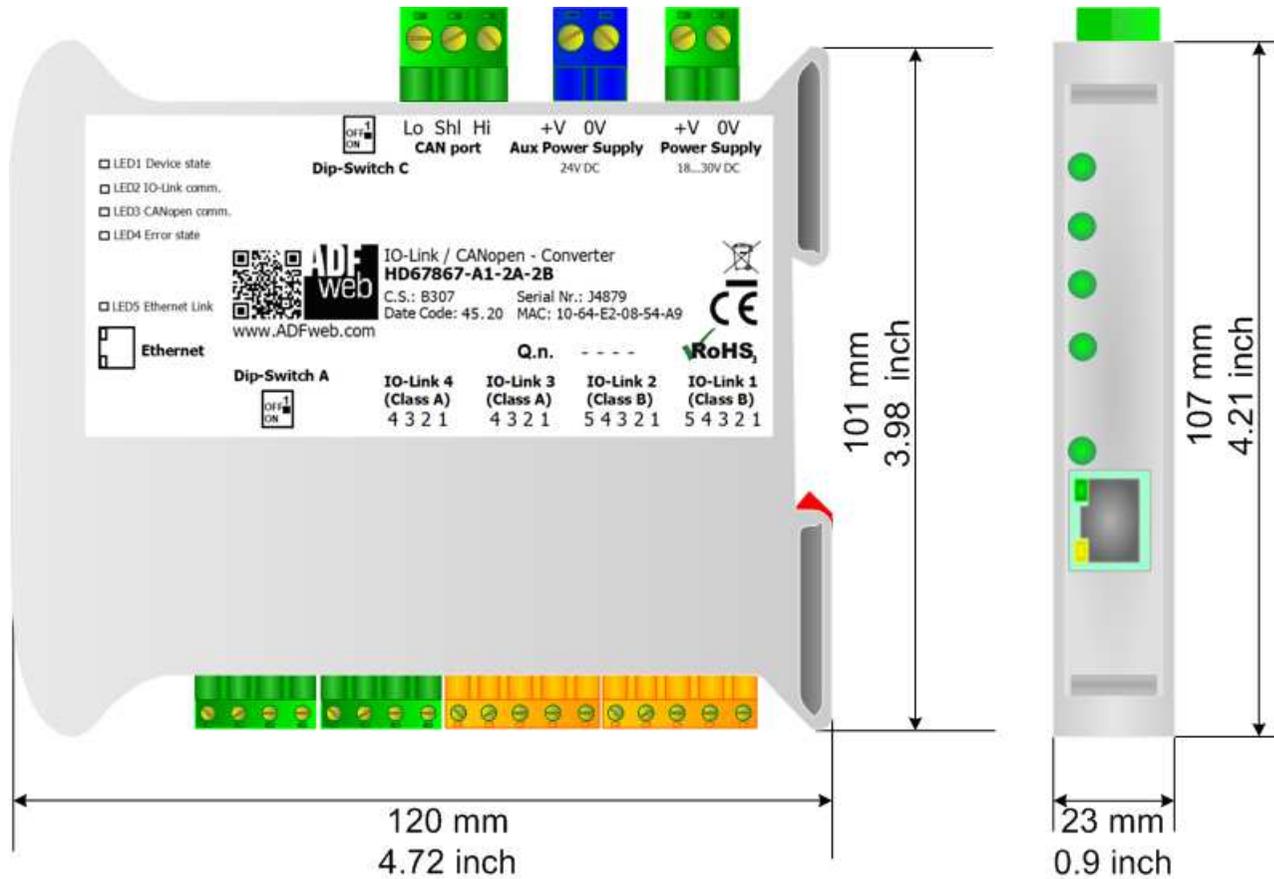
Figure 18: Mechanical dimensions scheme for HD67867-A1-xx

Industrial Electronic Devices

ORDERING INFORMATIONS:

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

HD67867 − A 1 − x x

IO-Link Class
A: Class A
B: Class B

Number of IO-Link channels
2: 2 channels
4: 4 channels

Connectors Type
1: Removable 5mm Screw Terminal

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

Device Family
HD67867: IO-Link / CANopen - Converter

Order Code: **HD67867-A1-2A**   -   IO-Link / CANopen – Converter (IO-Link ports: 2 x Class A)
Order Code: **HD67867-A1-4A**   -   IO-Link / CANopen – Converter (IO-Link ports: 4 x Class A)
Order Code: **HD67867-A1-2B**   -   IO-Link / CANopen – Converter (IO-Link ports: 2 x Class B)
Order Code: **HD67867-A1-2A-2B**   -   IO-Link / CANopen – Converter (IO-Link ports: 2 x Class A and 2 x Class B)

ACCESSORIES:

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

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.

Industrial Electronic Devices

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.