CEL-MAR®
Zakład Informatyki i Elektroniki

User Manual

ADA-I9110
USB to RS-232 Converter with galvanic isolation

Contents

ADA-I9110

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Zakład Informatyki i Elektroniki

1. GENERAL INFORMATION

Thank you for your purchase of **CEL-MAR Company** product. This product has been completely tested and is covered by a two year warranty on parts and operation from date of sale.

If any questions or problems arise during installation or use of this product, please do not hesitate to contact Technical Support at +48 41 362-12-46 or e-mail support@cel-mar.pl.

1.1. WARRANTED INFORMATION

ADA-I9110 converter is covered by a two year warranty from date of sale. In case of being damaged it will be repair or the damaged component will be replace. The warranty does not cover damage caused from improper use, materials consumption or any unauthorized changes. If the product does not function (is damaged), or not operate in accordance with the instructions, will be repaired.

All warranty and no warranty repairs must be returned with paid transport and insuring to the **CEL-MAR Company.**

CEL-MAR Company under no circumstances won't be responsible for ensuing damage from improper using the product or as a result of random causes: the lightning discharge, the flood, the fire and the like.

CEL-MAR Company is not be held responsible for damages and loss including: loss of profits, loss of data, pecuniary losses ensuing from using or the impossibility of using this product.

In specific cases **CEL-MAR Company** discontinue all warranties and in particular do not follow the user manual and do not accept terms of warranty by the user.

1.2. GENERAL CONDITIONS FOR SAFE USE

The device should be installed in a safe and stable places (eg, electroinstallation cabinet), the powering cable should be arranged so as not to be exposed to trampling, attaching, or pulling out of the circuit.
Do not put device on the wet surface.
Do not connect devices for nondescript powering sources,
Do not damage or crush powering wires.
Do not make connection with wet hands.
Do not adapt, open or make holes in casings of the device!
Do not immerse device in water or no other liquid.
Do not put the fire opened on device sources: candles, an oil lamps and the like.
Complete disable from the supply network is only after disconnecting the power supply circuit voltage.
Do not carry out the assembly or disassembly of the device if it is enabled. This may result to short circuit and damage the device.
The device can not be used for applications that determine human life and health (eg. Medical).

1.3. CE LABEL

The CE symbol on the device CEL-MAR means compatibility with electromagnetic compatibility Electromagnetic Compatibility Directive **EMC 2014/30/WE.**
Declaration of Conformity is delivered with purchased converter.

1.4. ENVIRONMENTAL PRESERVATION

This sign on the device inform about putting expended device with other waste materials. Device should send to the recycling. (In accordance with the act about the Electronic Appliance Expended from day 29 of July 2005)

1.5. SERVICE AND MAINTENANCE

The **ADA-I9110 converter** does not require the servicing and maintenance.
Technical support is available at number +48 41 362-12-46 in 8.00-16.00, from Monday to Friday or e-mail support@cel-mar.pl.

1.6. PACK CONTENTS

ADA-I9110 converter, user manual, CE declaration, CD-R with ADAUSB software.

2. PRODUCT INFORMATION
2.1. PROPERTIES

- Conversion of USB to RS-232 standard,
- Compliant with USB1.1 and USB 2.0 standard,
- Transmitted signals: Rx, Tx, RTS, CTS, DTR, DSR, DCD, RI,
- Baud rate (bps): 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600,
- PROFIBUS baud rate (bps): 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps,19200 bps, **93750**(230400) bps, **187500**(460800) bps, **500000**(921600) bps.
- Transparent for all protocols: MODBUS, DNP, PROFIBUS and other,
- Any format of byte defined with the specification of RS232 interface,
- Automatic data flow control (RTS-TOGGLE function),
- Power supply from the USB port,
- 2,5kV= optoisolation in signal channel between USB and RS-232 interface,
- 1kV= or 3kV= galvanic isolation in power supply channel between USB and RS232,
- RS-232 interface connection via DSUB-9 male connector,
- Connection USB interface via USB-type A connector,
- USB interface, socked B-type,
- Interface casing,

● Casing dimensions (W x D x H) 84mm x 23mmx 59mm.

2.2. DESCRIPTION

ADA-I9110 converts USB to RS-232 without interfering in the format of transmitted data. Converter uses transmission lines as **Rx, Tx, RTS, CTS, DTR, DSR, DCD, RI and GND (ground)** to communicate with RS-232 interface devices and it is automatically detect by the computer system after connecting to USB network (Plug&Play device). This converter doesn't required external power supply (it is powered from USB bus) and it uses asynchronism baud rate up to 921,3 kbps. ADA-I9110 has implemented optoisolation in signal channel between USB and RS-232 and 1kV= or 3kV= galvanic isolation in the power circuit.

Purchasing the converter you will also receive drivers for Windows 98, ME, NT, 2000, XP, Vista, Linux. Installing this software on Operating System it add the additional COM port about the next free number, witch can be used as standard COM port. It is virtual COM port therefore some software use DOS can work improperly but it's considerably faster then standard port – baud rate up to 921,6 kbps.

3. CONFIGURATION

Converter can be configured by using TOG switch (Fig.1) to operate with data flow control of RTS-TOGGLE type or without this control,.

Converter ADA-I9110 can be connected to the converter ADA-1040 (RS232 to RS485/RS422) using the RTS-TOGGLE control type, allowing correct operating on 2-wires RS-485 bus (control operation of the 485 transmitter using the RTS signal from ADA-I9110).

Options TOG Switch are described in the Table bellow.

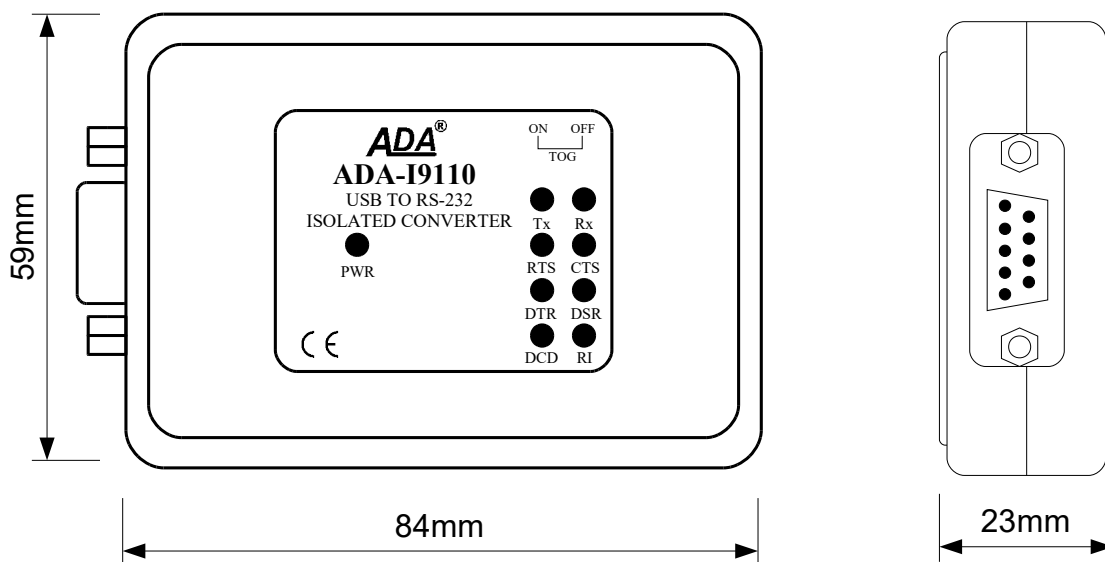| TOG Switch	Description
ON	Operating of RTS line in RTS-TOGGLE mode of RS232 interface of ADA-I9110
OFF	Standard operating of RTS line RS232 interface of ADA-I9110

Fig. 1 ADA-I9110 view

4. INSTALLATION

This chapter will show you correctly connection of the ADA-I9110 to USB and RS-232 interface.

4.1. CONVERTER CONNECTION TO RS-232 INTERFACE OF DEVICE

Connection should be done in use of shielded cable (RS232 extender) ended DB-9M male plug, max. lengths up to 15m.
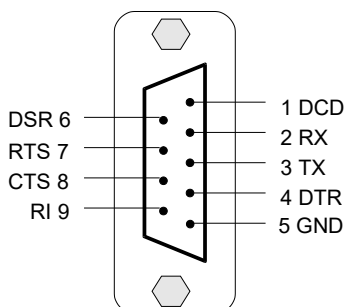

Fig. 2 Signal configuration of RS-232 interface in converter DB-9M (mail) connector
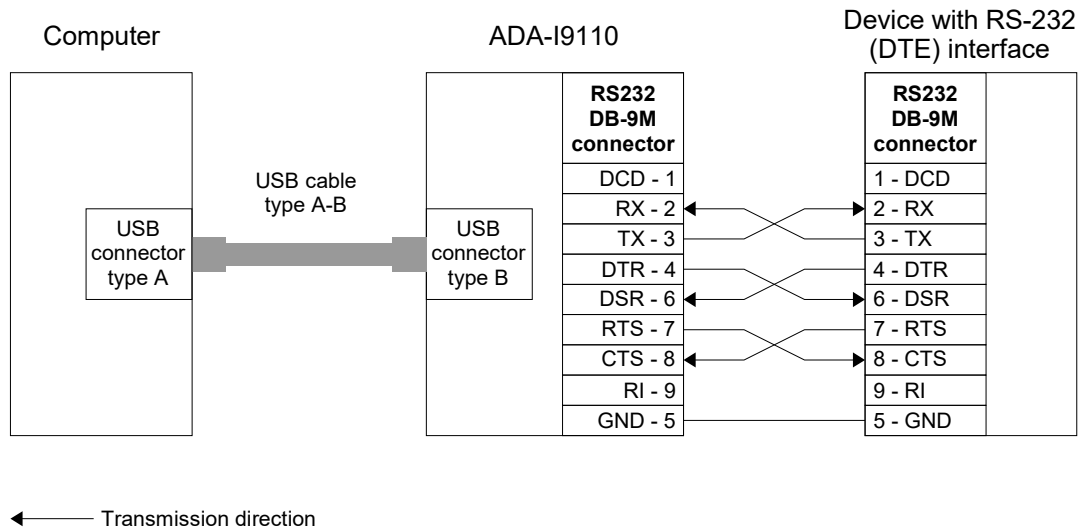
Computer   **ADA-I9110**   **Device with RS-232 (DTE) interface**

RS232 DB-9M connector		RS232 DB-9M connector
DCD - 1		1 - DCD
RX - 2		2 - RX
TX - 3		3 - TX
DTR - 4		4 - DTR
DSR - 6		6 - DSR
RTS - 7		7 - RTS
CTS - 8		8 - CTS
RI - 9		9 - RI
GND - 5		5 - GND

USB cable type A-B

USB connector type A   USB connector type B

◄——— Transmission direction

Fig. 3 Converter connection to DTE type device (e.g. PC) with RS-232 interface

Computer   **ADA-I9110**   **Modem with RS-232 (DCE) interface**

RS232 DB-9M connector		RS232 DB-9M connector
DCD - 1		1 - DCD
RX - 2		2 - RX
TX - 3		3 - TX
DTR - 4		4 - DTR
DSR - 6		6 - DSR
RTS - 7		7 - RTS
CTS - 8		8 - CTS
RI - 9		9 - RI
GND - 5		5 - GND

USB cable type A-B

USB connector type A   USB connector type B
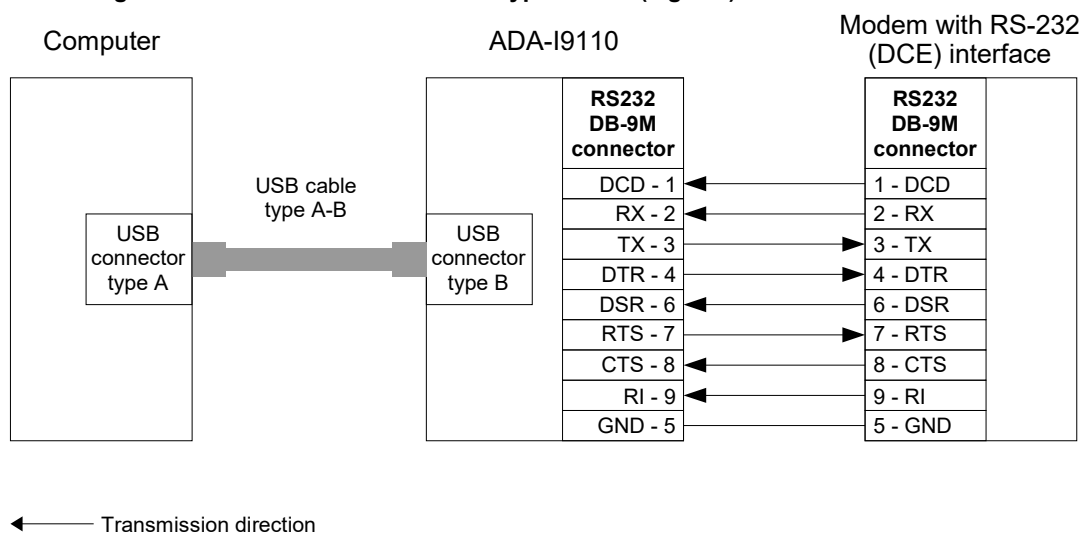
◄——— Transmission direction

Fig. 4 Converter connection to DCE type device (e.g. modem) with RS-232 interface

4.2. CONNECTION TO COMPUTER'S USB INTERFACE

ADA-I9110 converter connection to computer should be done by use USB cable with A type connector.

4.3. POWER SUPPLY

ADA-I9110 converter is fed from USB port of PC. After connection to USB port of computer, green LED PWR should be ON. If doesn't you should check:
–   the computer is running,
–   the connection of converter cable to PC,
–   hibernation mode of PC isn't ON,

5. DRIVERS INSTALLATION IN SYSTEM WINDOWS

Converter ADA-I9110 is purchased with the driver package Installer for Windows systems on CD-ROM.
For installation follow the steps below:
a/ insert the CD-ROM to optical driver of the computer,
b/ the installation wizard will run automatically, if not double click ***ADAUSBDRV.exe***.
c/ following the steps of installation wizard, will be installed the Drivers and Uninstaller for the Windows systems 98, ME, 2000, XP, 2003, Vista, Win7, 2008,
d/ connect the convert to USB port of computer and follow the steps of installation wizard.

5.1. EXAMPLE DRIVER INSTALLATION IN WINDOWS 7 SYSTEM

Together With ADA-I9110 converter is delivered CD-ROM with drivers for the system: Windows 98/ME/2000/XP/Vista/7/2008 for the baud rates:
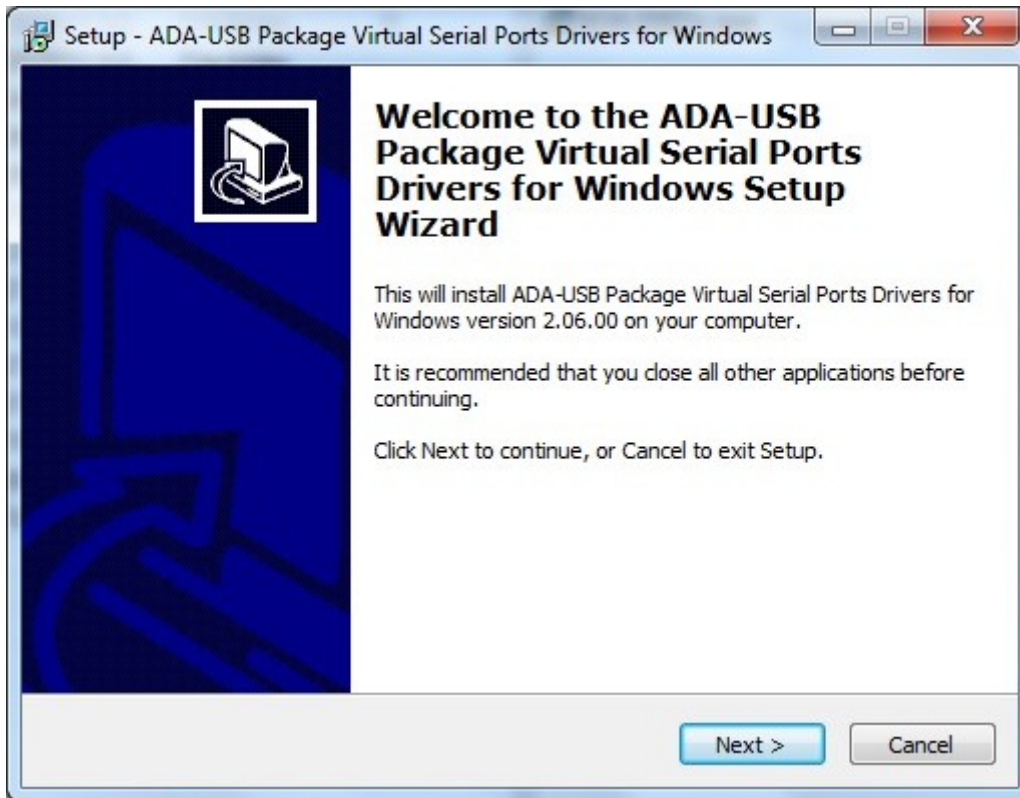**a/ Standard**
b/ Profibus

Driver installation have to be done from the account with Administrator permissions.
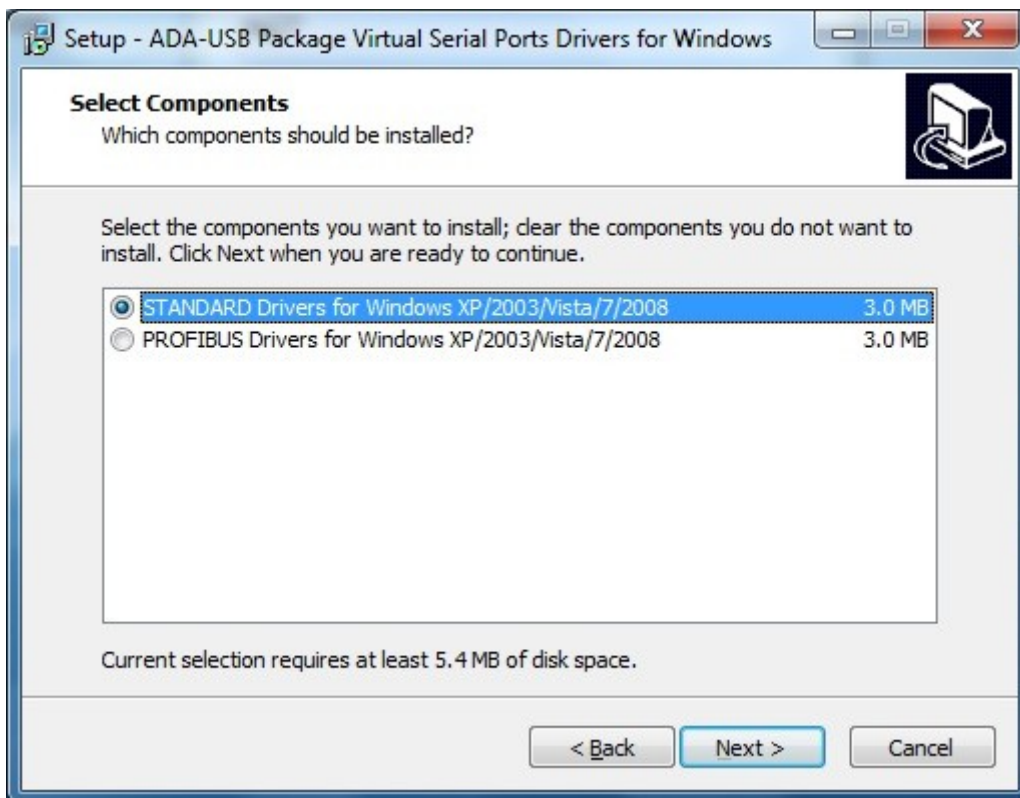For the Drivers installation in Windows 7 system follow the steps bellow:

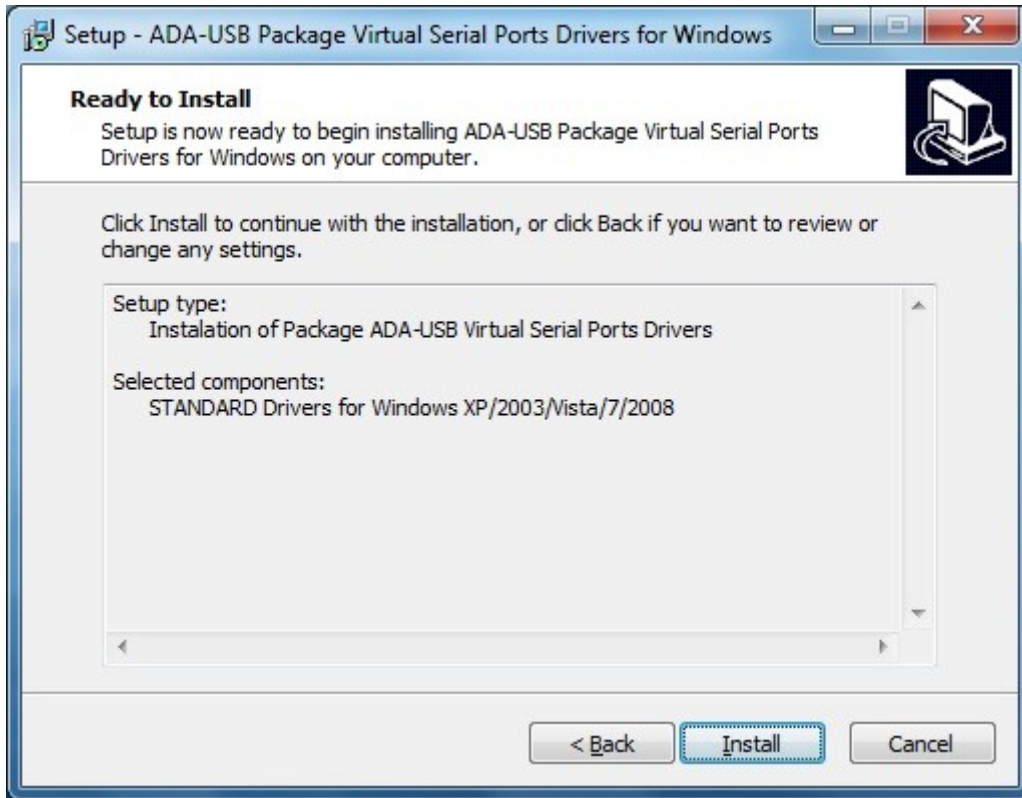a/ insert the CD-ROM to optical driver of computer,

b/ the installation wizard will run automatically, if not double click **ADAUSBDRV.exe** form the CD-ROM.
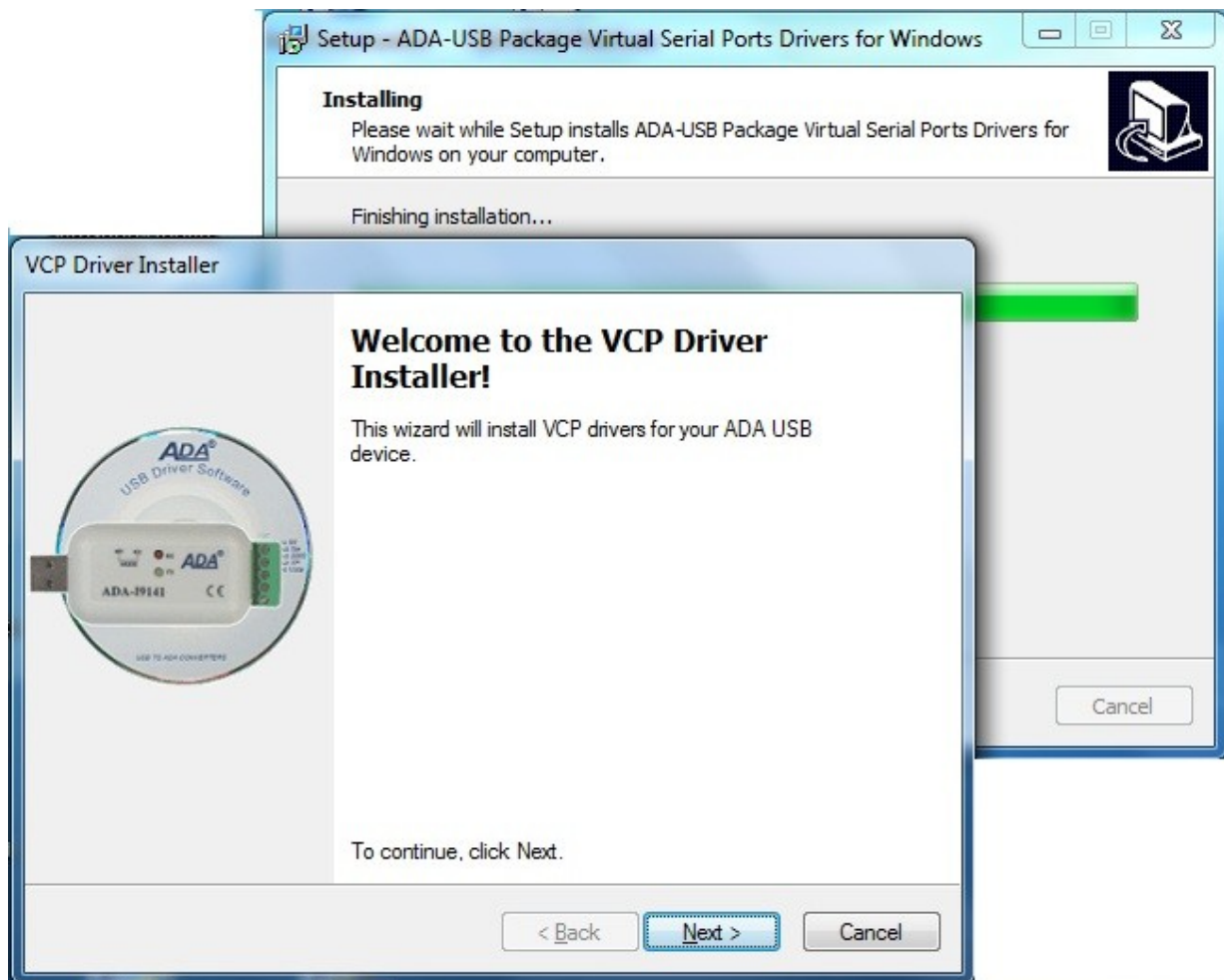After running the installer, the wizard installation window will appear.

Press [Next]

Select STANDARD Drivers and press [Next]

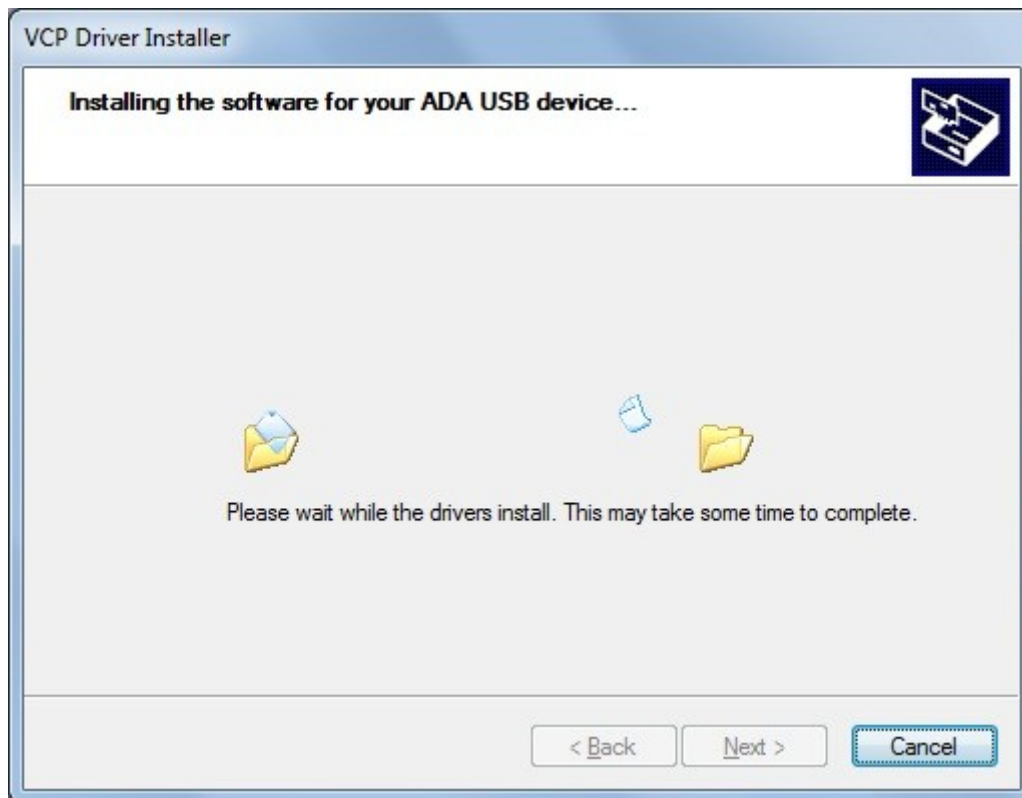Press [Install]

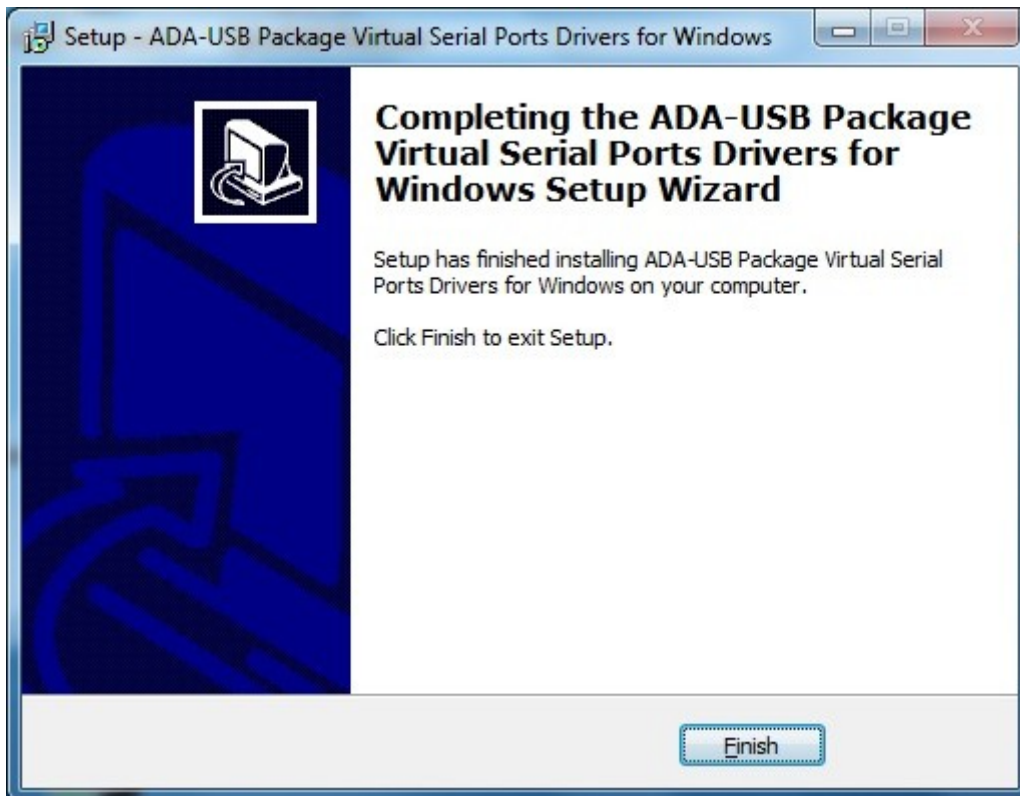Press [Next], will be installed Drivers for USB Bus.
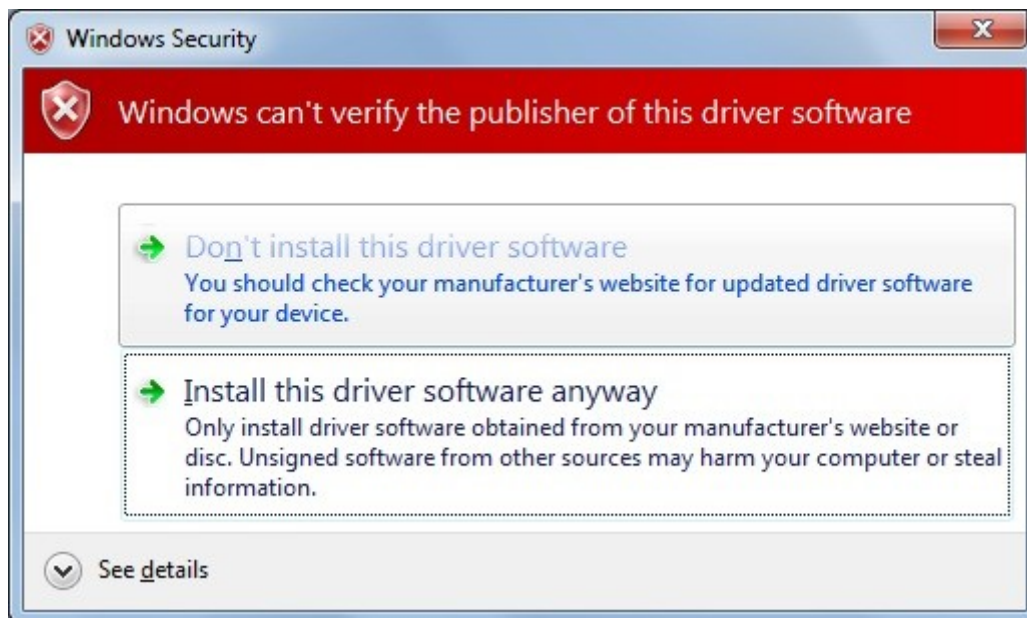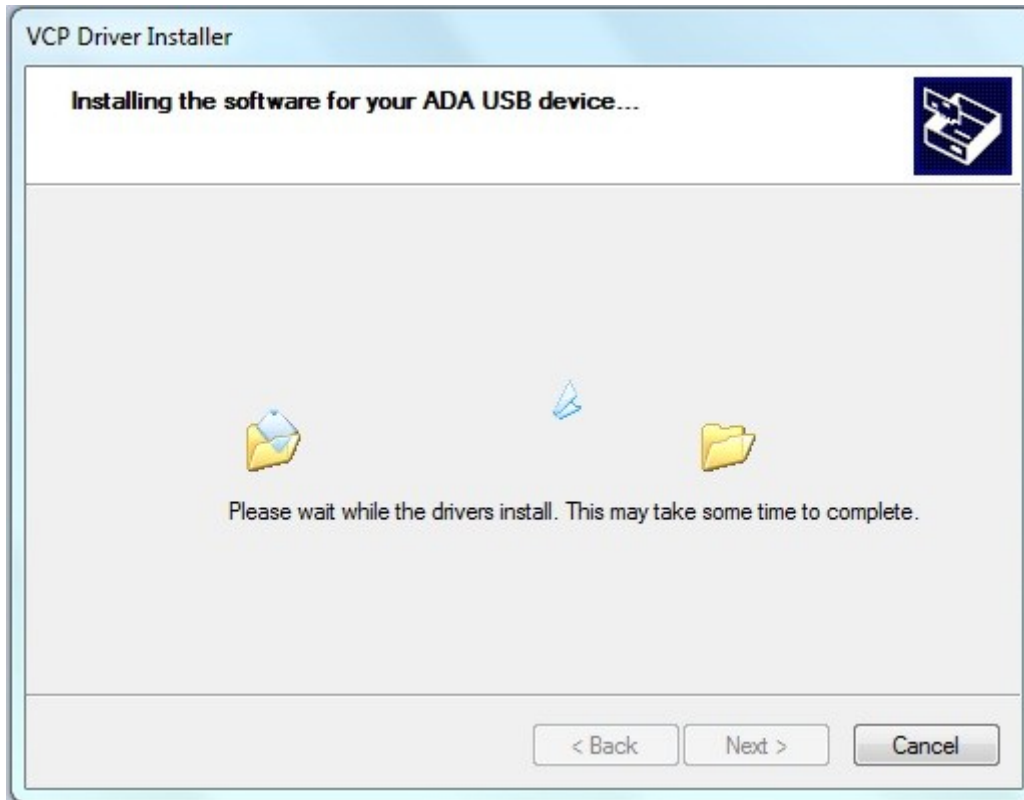
Press [Install this driver software anyway]. Installation of drivers for USB Bus will start.

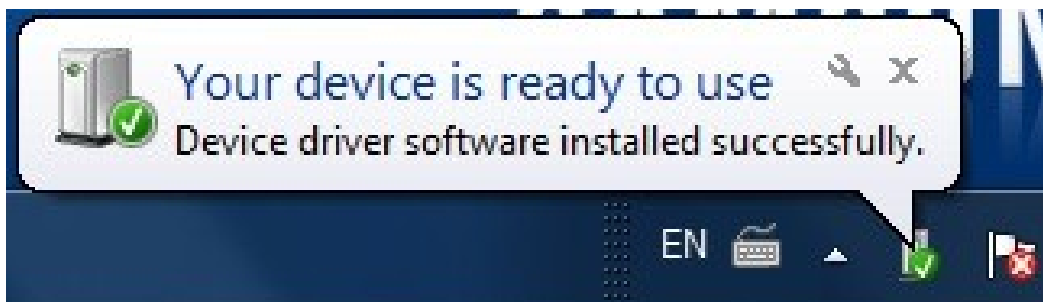Press [Install this driver software anyway]. Installation of drivers for Virtual Port will start.

Press [Finish]

Press [Finish].
The driver for ADA-I9110 have been installed. This can be checked in "Uninstall or change a program".

Now you can connect ADA-I9110 to computer port.

After connection will appear the Tool tip with [Your device is ready to use]. To see the details press the Tooltip, and will appear information window where you can see which COM port was assigned to converter.
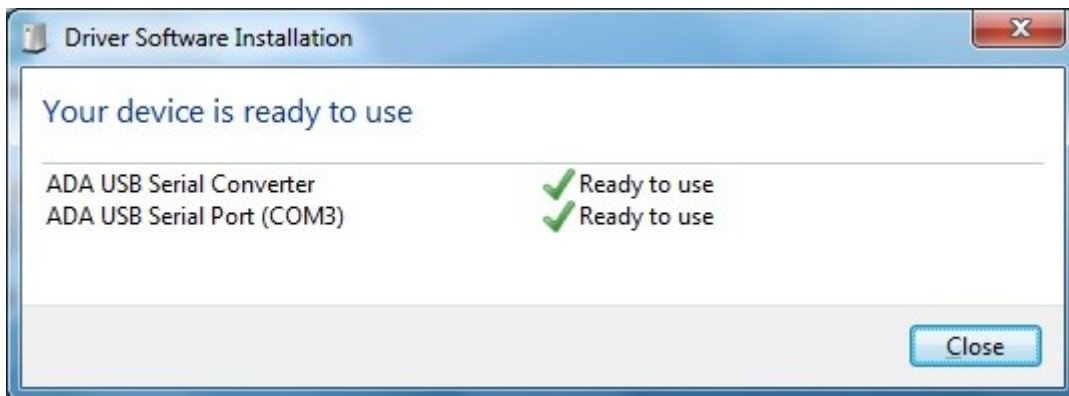
After this installation, RS232 port of ADA-I9110 converter is available in the system as normal COM port. You have to remember about specified baud rate for communication.

If during installation you selected driver for Standard baud rates you would be able to use:
 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, 230400 bps, 460800 bps, 921600 bps.

If during installation you selected driver for Profibus baud rates you would be able to use:
300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, **9600** bps,**19200** bps, **9375 0**bps (if you select 230400bps),
187500 bps (if you select 460800bps), **500000** bps (if you select 921600bps).

6. DRIVER UNINSTALLATION

6.1. DRIVER UNINSTALLATION IN WINDOWS 98/ME SYSTEMS

In this system driver uninstallation have to be done according follow steps:

a/ disconnect converter from computer,
b/ select menu *Start > Setting > Control Panel > Add > Remove Programs,*
c/ select from the list *"ADA USB Serial Converter Driver"* and press **[Change / Remove]**,
e/ reboot the computer.

## 6.2. DRIVER UNINSTALLATION IN WINDOWS 2000/XP/2003/VISTA/7/2008 SYSTEMS

In this system driver uninstallation have to be done according follow steps:

a/ disconnect converter from computer,

b/ login as the **Administrator,**

c/ select menu **Start > Setting > Control Panel > Add > Remove Programs,**

d/ select from the list **Windows Driver Package – CEL-MAR ADA – Virtual USB Serial Port,**

e/ press [Change / Remove], Virtual USB Serial Port driver will be uninstalled,

f/ select from the list **Windows Driver Package – CEL-MAR ADA – USB Serial Converter,**

g/ press [Change / Remove], driver converter of USB Bus will be uninstalled,

h/ after uninstallation reboot the computer.

6.2.1. EXAMPLE DRIVER UNINSTALLATION IN WINDOWS 7 SYSTEMS

Windows 7 system driver uninstallation have to be done according follow steps:

a/ disconnect converter from computer,

b/ login the **Administrator account ,**

c/ select menu **Start > Control Panel > Programs > Uninstall**,

d/ select from **Windows Driver Package – CEL-MAR ADA – Virtual USB Serial Port,**
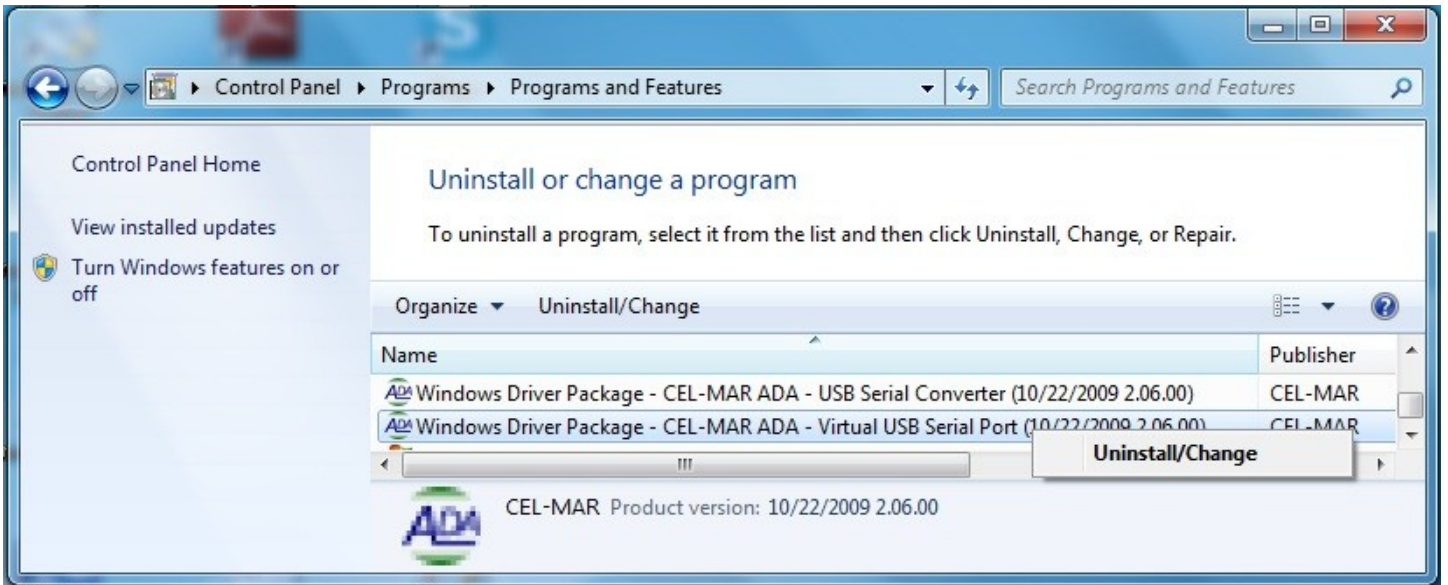
e/ press **[Uninstall/Change]**, Virtual USB Serial Port driver will be uninstalled

f/ select from the list **Windows Driver Package – CEL-MAR ADA – USB Serial Converter**

g/ press **[Uninstall/Change],** driver converter of USB Bus will be uninstalled,

h/ after uninstallation reboot the computer.

6.3. EMERGENCY DRIVER UNINSTALLATION

If there are problems with correct operation of drivers or converter and or on computer was installed driver other devices this type, you can use special software form delivered CD-ROM to clean the system form files and entries in the system registry.. This can be done after uninstallation descried in point 6.1 and 6.2.

6.3.1. EMERGENCY DRIVER UNINSTALLATION IN WINDOWS 98/ME/2000

Emergency driver uninstallation in Windows 98/ME/2000 system have to be done according follow steps:

a/ disconnect converter from computer,

b/ from CD-ROM delivered with converter, copy to hard disk the folder *Windows\Win-98ME_1.09.06\FTClean* for Windows 98/ME or *Windows\Win-2000\FTClean* for Windows 2000,

c/ from FTClean folder run the application *FTClean.exe* and follow the Tooltip,

d/ after finishing, reboot the computer.

6.3.2. EMERGENCY DRIVER UNINSTALLATION IN WINDOWS XP/2003/Vista/7/2008

Emergency driver uninstallation in Windows XP/2003/Vista/7/2008 system have to be done according follow steps:

a/ disconnect converter from computer,

b/ login the *Administrator account,*

c/ from CD-ROM delivered with converter, copy to hard disk the folder *Windows\Win-XP-2003-Vista-7-2008_2.06\ CDMUninstaller*,

d/ from CDMUninstaller folder run the application *uninstall.bat*,

e/ after finishing, reboot the computer.

7. USING

After property connection according to section above you can start using the converter. During the data transmission LEDs should blink and they indicate appropriately:

LED	Description
PWR – green	Power ON
Tx – yellow	Transmitted Data form the ADA-I9110 via RS-232 port to the RS-232 Device.
Rx – red	Received Data from the RS-232 Device connected to RS232 converter port.
RTS – yellow	RTS (Request To Send) line condition of RS232 converter port.
CTS – red	CTS (Clear To Send) line condition of RS232 converter port.
DTR – yellow	DTR (Data Terminal Ready) line condition of RS232 converter port.
DSR – red	DSR (Data Set Ready) line condition of RS232 converter port.
DCD – red	DCD (Data Carrier Detect) line condition of RS232 converter port.

LED ON - status signal equal 1 logical
LED OFF - status signal equal 0 logical

7.1. BAUD RATE SELECTION FOR PROFIBUS COM PORT

For setting correct Profibus baud rate (after installation "Virtual Port" driver for Profibus) in application using virtual port COM follow table below.

Set baud rate [bps]	Actual baud rate [bps] Profibus
230400	937500
460800	187500
921600	500000

7.2. SELECTION OF COM PORT GREATER THEN COM9

If virtual port COM of converter will install in Windows OS as COM10 or greater then in application using this port you should type COM port address as: \\.\COM10.

8. VERSIONS

ADA-I9110 - ☐

Galvanic isolation:

1kV=	**1**
3kV=	**2**

Order example:
Product symbol : **ADA-I9110-2**

2 – galvanic isolation 1kV=.

9. RS232 INTERFACE – PIN DESCRIPTION OF D-SUB9-MALE SOCKET

Pin DB-9 connector	SIGNAL	DESCRIPTION	ADA-I9110
1	DCD	Data Carrier Detect	Receiver
2	Rx	Transmitted Data	Receiver
3	Tx	Received Data	Transmitter
4	DTR	Data Terminal Ready	Transmitter
5	GND	Signal ground	GND
6	DSR	Data Set Ready	Receiver
7	RTS	Request To Send	Transmitter
8	CTS	Clear To Send	Receiver
9	RI	Ring Indicator	Receiver

10. SPECIFICATION

TECHNICAL DATA		
Transmission Parameters		
Interface	**USB**	**RS-232**
Connector	USB connector type B	DSUB-9M (mail)
Line length	up to 5m	up to15 m
Maximum number of connected devices	1	1
Transmission line	Standard USB extension cable A-A	Cable DB9F/DB9M multi-core 9x0,34 shielded (op to 15m) or twisted cable 9-pairs UTP 9x2x0,5 (24AWG) shield inside large interferences (STP 9x2x0,5 (24AWG)).
Standards	USB1.1, USB2.0	EIA-232, CCITT V.11
Maximum baud rate	up to 921,6 kbps (Standard) / up to 1500 kbps (Profibus)	
Transmission type	Asynchronism half duplex or full duplex,	
Optical Signalization	• PWD – green LED power supply, • RX – red LED received data, • TX – yellow LED transmitted data, • additional signals: RTS, CTS, DTR, DSR, DCD, RI	
Electrical Parameters		
Power requirements	from USB of Computer	
Power Cable	USB cable	
Power	< 0,5 W	
Protection from reverse power polarization	Not applicable	
Galvanic Isolation	1kV= or 3kV= between RS232 and USB interfaces	
Optoisolation	2,5 kV= in signal channel between RS232 and USB interfaces	
Electromagnetic compatibility	Resistance to disruptions according to the standard PN-EN 55024. Emission of disruptions according to the standard PN-EN 55022.	
Safety requiring	According to the PN-EN60950 norm.	
Environment	Commercial and light industrial.	
Environmental Parameters		
Operating temperature	0 ÷ 50°C	
Humidity	5 ÷ 95% - non-condensing	
Storage temperature	-40 ÷ 70°C	
Casing		
Dimensions (W x D x H)	84 mm x 23 mm x 59 mm.	
Material	Polistyren	
Degree of casing protection	IP20	
Weight	0,05 kg	
Implementation of Standard	Not applicable	
Location during work	Free	
Mounting method	Not applicable	

Dear Customer,

Thank you for purchasing **CEL-MAR Company** product.
We hope that this user manual helped connect and start up the **ADA-I9110 converter.** We also wish to inform you that we are a manufacturer of the widest selections of data communications products in the world such as: data transmission converters with interface RS232, RS485, RS422, USB, Ethernet, Wi-Fi, Current Loop, Fibre-Optic Converters and other.

Please contact us to tell how you like our products and how we can satisfy you present and future expectation.

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