

# User manual

## ADA-7210

### RS-232 to Multidrop Fiber Optic Converter



## Contents

1. GENERAL INFORMATION.....	3
1.1. WARRANTED INFORMATION.....	3
1.2. GENERAL CONDITIONS FOR SAFE USE.....	3
1.3. CE LABEL.....	3
1.4. ENVIRONMENTAL PRESERVATION.....	3
1.5. SERVICE AND MAINTENANCE.....	3
1.6. PACK CONTENTS.....	3
2. PRODUCT INFORMATION.....	3
2.1. PROPERTIES.....	3
2.2. DESCRIPTION.....	4
2.3. ISOLATION.....	5
3. INSTALLATION.....	5
3.1. ASSEMBLING.....	5
3.2. CONNECTION TO RS-232 BUS.....	5
3.3. CONNECTION FIBRE-OPTIC BUS.....	6
3.3.1. WIRING TOPOLOGY FIBER OPTIC BUS.....	6
3.3.2. EXAMPLES OF CONNECTION THE CONVERTER TO FIBER OPTIC BUS.....	7
3.4. POWER SUPPLY CONNECTION.....	8
4. ACTIVATION.....	8
4.1. DESCRIPTION OF SIGNALLING LEDS.....	8
5. RS232 INTERFACE – PIN DESCRIPTION.....	8
6. VERSIONS.....	8
7. SPECIFICATION.....	9

## 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](mailto:support@cel-mar.pl).

### 1.1. WARRANTED INFORMATION

**ADA-7210** 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 or replaced.

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 dis-assembly 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).



#### ATTENTION!!!

**The device is equipped in the laser transmitter.**

**The radiation emitted by the laser transmitter is harmful to the eyes!**

**Under no circumstances should never look to at the uncovered slot, to which it is not connected the fiber optic connector.**

**The manufacturer is not responsible for used not in accordance with the instruction manual.**

**The user manual is an integral part of the device and with it is delivered to users.**

### 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 device.

### 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

ADA-7210 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](mailto:support@cel-mar.pl).

### 1.6. PACK CONTENTS

ADA-7210 converter; user manual; CE declaration.

## 2. PRODUCT INFORMATION

### 2.1. PROPERTIES

- Fibre-Optic to RS-232 conversion,
- Regeneration of Fiber Optic signal – Fiber Optic repeater,
- Fibre-Optic connection via fore fibre connectors type: ST@ \* or SC – transmitter and receiver for an optical wavelength from 792nm to 865 nm or SMA – transmitter and receiver for an optical wavelength from 640nm to 675nm.
- Fibre Optic line: 2 multimode optical fibres eg. type 50/125 µm, 62,5/125 µm, 100/140 µm, 200 µm HCS, 1mm POF,
- Transmission of RX, TX signals,
- Baud rate up to 230,4 Kbps,
- Transparent for all protocols: MODBUS, DNP, PROFIBUS and other,
- Any format of byte, defined by interface specification RS232,
- External power supply 10 - 30 VDC stable min. 3W,

- 1kV= or 3kV= galvanic isolation between RS232 & FO interface and power supply,
- Connection RS232 network and power supply via screw terminal block,
- Connection Fiber Optic network via fibres optic connectors type: ST® \*(850nm), SC(850nm), SMA(650nm),
- Protection against power supply reverse connection,
- DIN 43880 standard - mounting in typical electro-installation unit,
- Rail mounting according to DIN35 / TS35 standard,
- Dimensions of casing contour (W x H x D) 71mm x 90mm x 58mm,

## 2.2. DESCRIPTION

Multidrop fiber optic converter ADA-7210 is a device allows construct of fiber-optic networks, used for connection of devices with RS-232 interface, far removed from each other such as halls, buildings and other objects. Optic signal conversion to RS-232 takes place without interference with the data format. The use of fiber optics provides complete isolation between connected devices and resistance to interference on the transmission bus. The fiber connection is implemented by a line consisting of two fibers. The ADA-7210 can be used for extend fiber optic bus by a distance 2500m because it is also the fiber optic repeater.

The ADA-7210 does not require for work the power supply from the RS-232 port, supports asynchronous transmission RS232 baud rates up to 230.4 Kbps. The converter is equipped with screw terminal for RS-232 connections and power supply. The unit to operate use only the RX and TX signals entered by terminal block. RTS signal is looped inside the converter with CTS and DTR to DSR. If is not needed to loop them, the signals RTS or DTR can not be connected the to the terminal block.

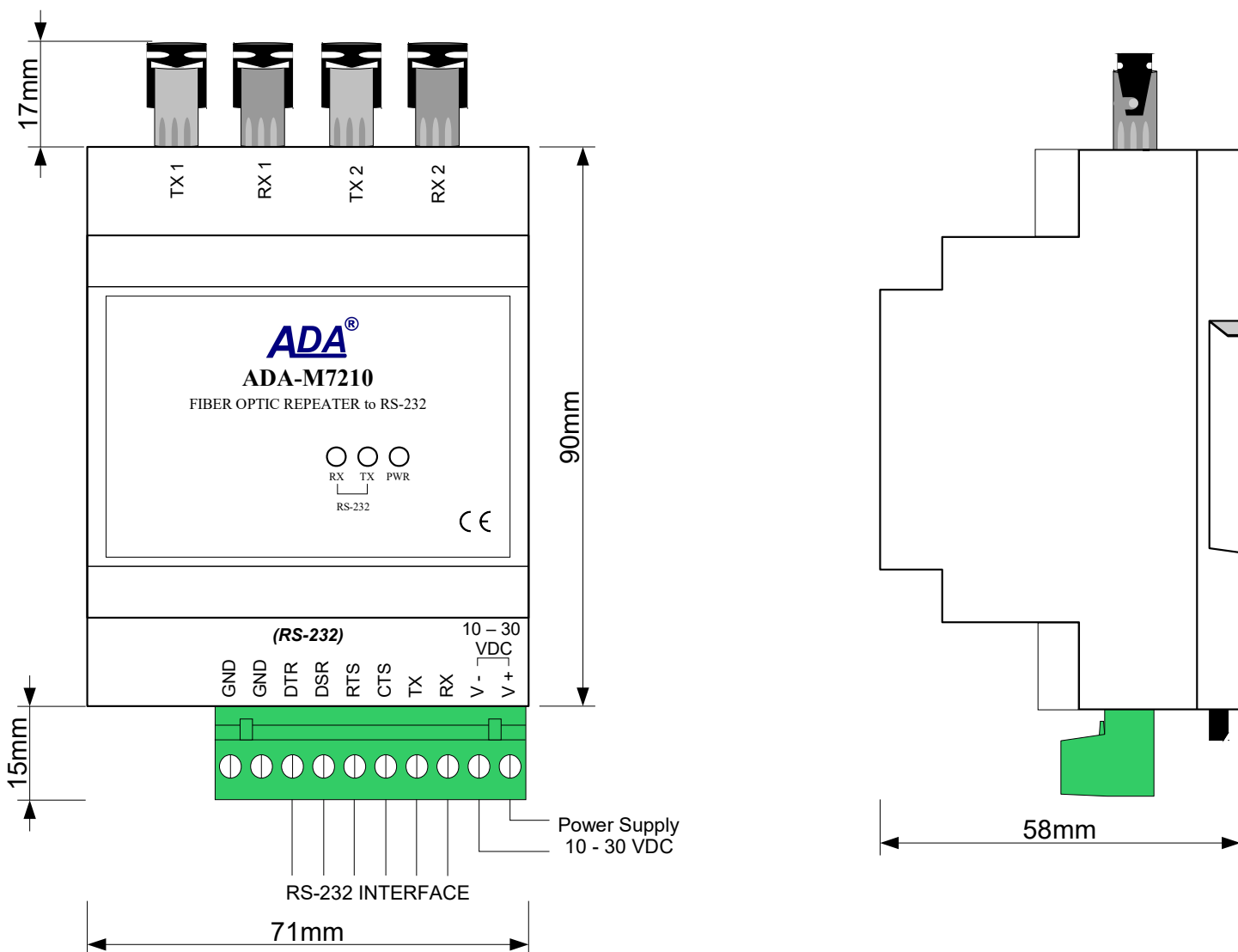


Fig. 1. View of ADA-7210

**2.3. ISOLATION**

Converter ADA-7210 has galvanic isolation between power circuit and communication interfaces (RS232 and Fiber Optic) on level 1kV= or 3kV=, depend on version described in section below.

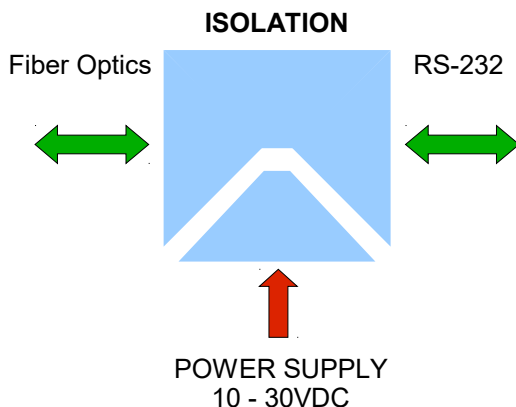


Fig. 2. Isolation structure.

**3. INSTALLATION**

This chapter will show how to connect ADA-7210 to RS232 bus, Fibre-Optic and power supply and how to use it. In the purpose of minimization of disruptions from environment is being recommended to:

- apply multipair type shielded cables, which shield can be connected to the earthing on one end of the cable,
- arrange signal cables in the distance not shorter than 25 cm from powering cables,
- apply cable of adequate cross-section due to voltage drops for converter powering,
- use Interference suppression filters for power supply converters that are installed within a single object.
- not supply converter from power circuit device that generates large impulse interference such as transmitters, contactors,

**3.1. ASSEMBLING**

ADA-7210 converter case is adapted to assembly on TS-35 (DIN35) rail. To install converter should mount device on the rail upper part of the case then press bottom part to hearing characteristic „Click” sound.

**3.2. CONNECTION TO RS-232 BUS**

In the purpose of connection ADA-7210 to device with RS232 port, type DTE (e.g. PC), should be done connection like on the figure below.

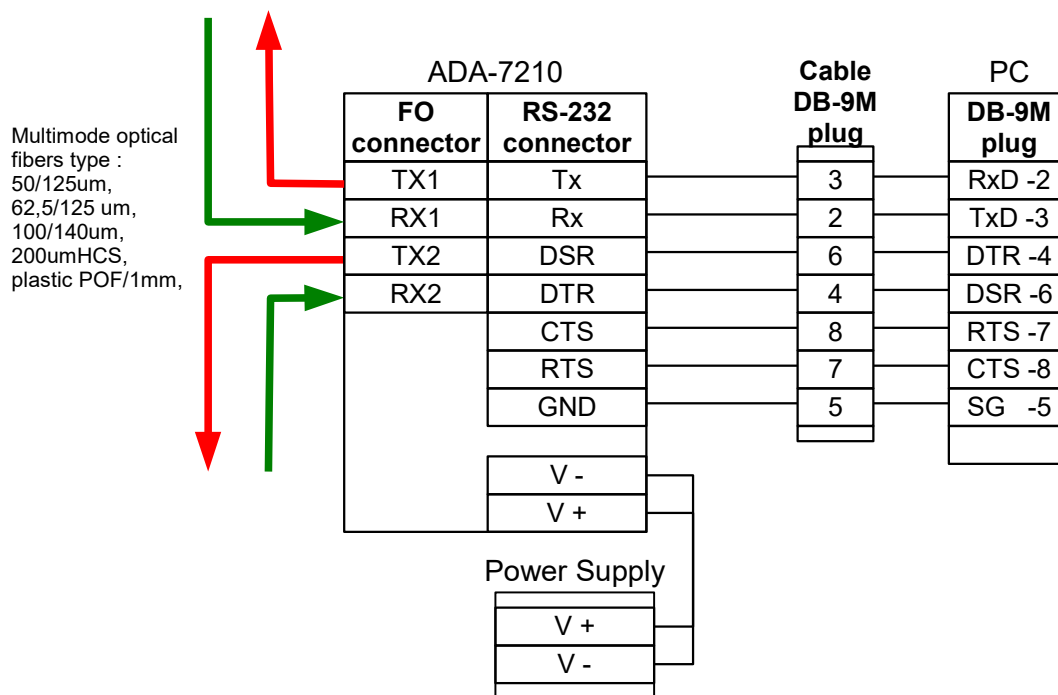



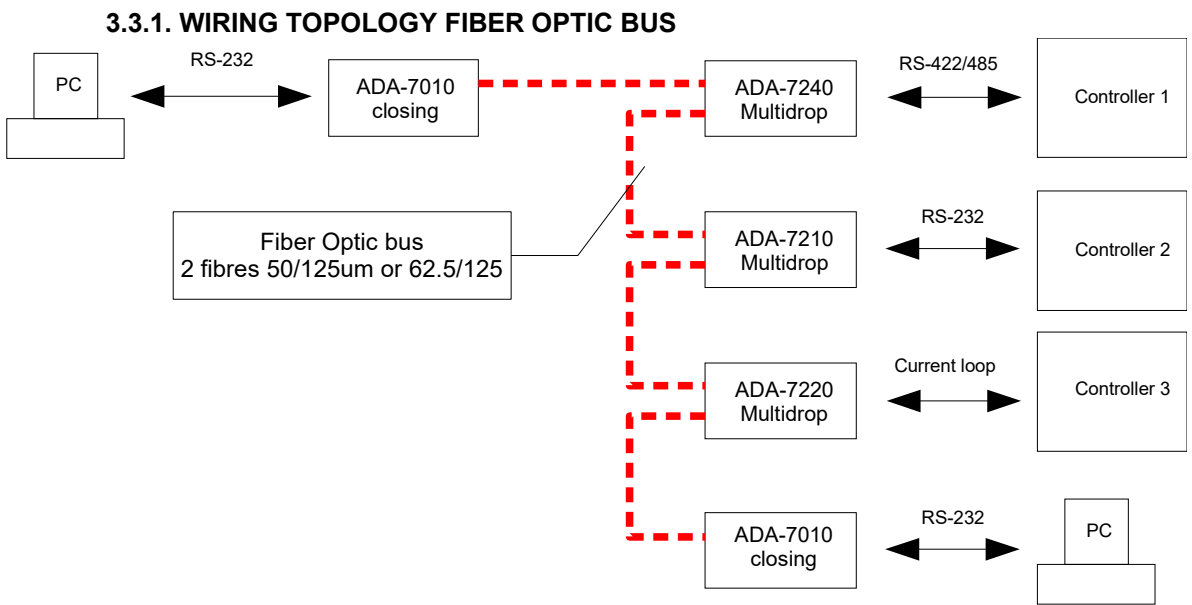
Fig. 3. Example connection of ADA-7210 to RS-232 port of PC

**3.3. CONNECTION FIBRE-OPTIC BUS**

The multimode Fibre-Optic with connectors type: ST®, SC or SMA, connect into their corresponding converter's connectors type: ST®, SC or SMA like on the figure below. Connecting the fiber optic cables should be cautious and careful not to damage them or dirty. If it is necessary to lay the cable at an angle, must be created the appropriate bends.



**ATTENTION!!!**  
 The device is equipped in the laser transmitter.  
 The radiation emitted by the laser transmitter is harmful to the eyes!  
 Under no circumstances should never look to at the uncovered slot, to which it is not connected the fiber optic connector.



**Fig. 4. Examples of fiber optic bus connection.**

3.3.2. EXAMPLES OF CONNECTION THE CONVERTER TO FIBER OPTIC BUS

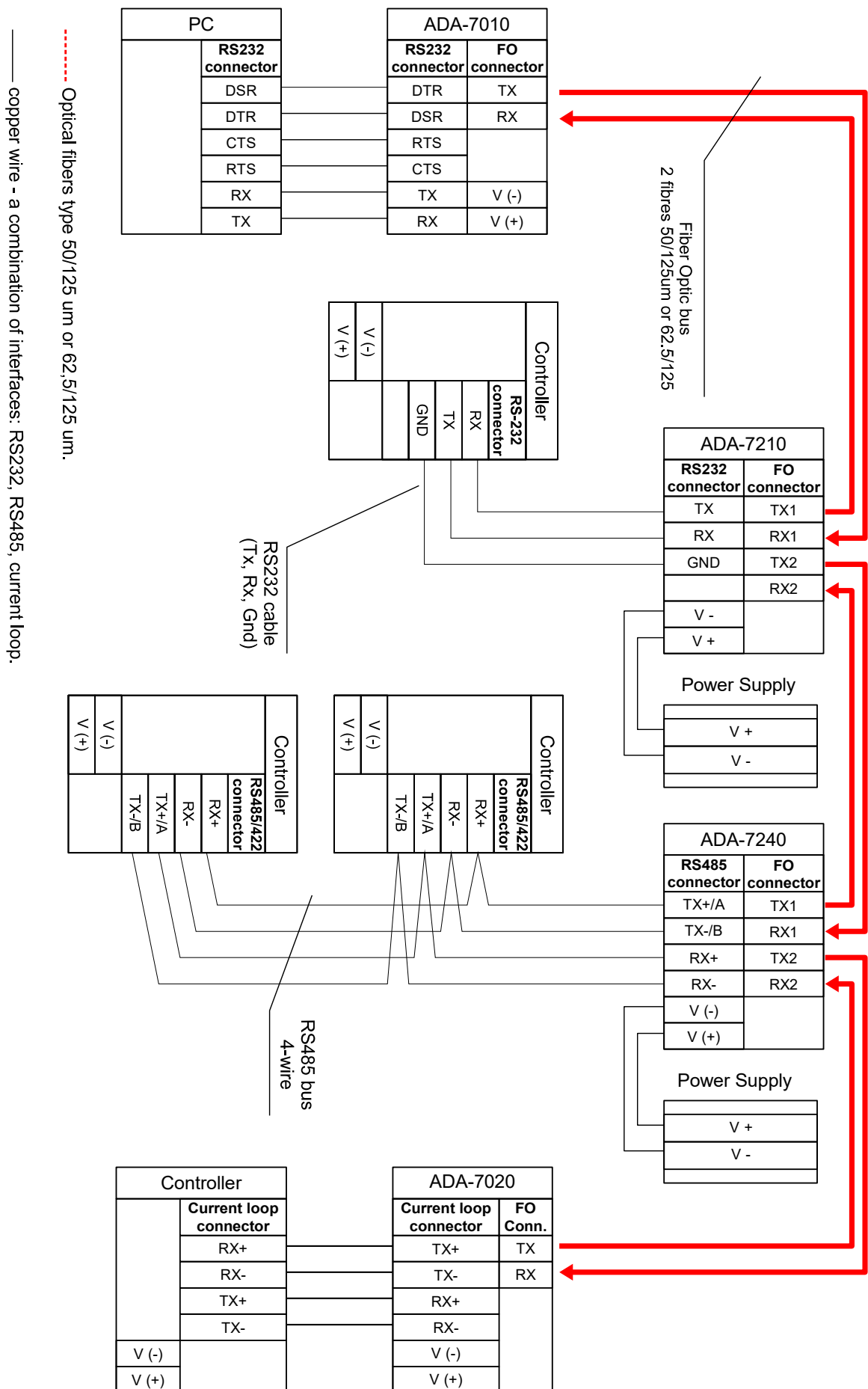


Fig. 5. Example connection of ADA-7210 to fiber optic bus

### 3.4. POWER SUPPLY CONNECTION

The power supply to the ADA-7210 converter should be DC (regulated) from 10 V= to 30V=. Nominal power is typically 3W, e.g. HDR-15-24. Power cable from DC power supplies to device must not be longer than 3m. Observe the polarity, connect positive (+) of DC power supplies to V+ and negative (-) end to V- screw terminal block. ADA-7210 has the protection from opposite connection power supply. If after power, on the front panel is not lit green LED PWR, check the power connection (polarity).

### 4. ACTIVATION

The converter can be power on after properly connection according to section above. If after connection power supply on front panel will not light green led PWR, check correctness of power supply connecting (polarization). When data is present the LEDs Tx and Rx should blink.

#### 4.1. DESCRIPTION OF SIGNALLING LEDS

LED	Description
PWR	Signalling of Power Supply
RX	Signalling of data receiving through ADA-7210 from RS232 port
TX	Signalling of data transmitting from ADA-7210 through RS232 port

**ATTENTION!**

**AT BAUD RATE ABOVE 38.4 Kbps THE LED'S TX, RX WILL LIGHT WEAKLY DURING DATA TRANSMISSION**

### 5. RS232 INTERFACE – PIN DESCRIPTION

Pin	Signal	Description	ADA-7210
Tx	(TD)	Data transmission from ADA-7210	Transmitter
Rx	(RD)	Data receiving via ADA-7210	Receiver
RTS	(RTS)	Request to Send Data from ADA-7210	Looped with CTS
CTS	(CTS)	Clear to Send Data to ADA-7210	Looped with RTS
DSR	(DSR)	Readiness of receiving via ADA-7210	Looped with DTR
DTR	(DTR)	Readiness of data receiving/ transmission from ADA-7210	Looped with DSR
GND	(SG)	Signal ground	GND

### 6. VERSIONS

	ADA-7210 -	-	-
<b>Galvanic isolation:</b>			
1kV=	2		
3kV=	3		
<b>Terminal &amp; Terminal Cover:</b>			
Cover without inlets, screw terminal block	1		
Cover with inlets, screw terminal block	2		
Cover without inlets, plug-in screw terminal block	3		
<b>Fibre connectors:</b>			
ST – type 850nm	1		
SC – type 850nm	2		
SMA – type 650nm	3		

Order example:

Product symbol: **ADA-7210-2-3-1**

**2** - galvanic isolation 1kV=,

**3** – cover without inlets, plug-in screw terminal block,

**1** – ST-type 850nm fibre connectors,



7. SPECIFICATION

**TECHNICAL DATA**

**Transmission Parameters**

Interface	Fibre-Optic	RS-232
<b>Connector</b>	<b>ST</b> <sup>®</sup> * type - transmitter and receiver for an optical wavelength from 792nm to 865nm, <b>SC</b> type - transmitter and receiver for an optical wavelength from 792nm to 865nm, <b>SMA</b> type - transmitter and receiver for an optical wavelength from 640nm to 675nm.	Screw terminal, wire max. Ø 2,5mm <sup>2</sup> .
<b>Line length</b>	up to 2000m for fibre type 50/125 µm, up to 2500m for fibre type 62,5/125 µm up to 2000m for fibre type 100/140 µm up to 20m for fibre type POF/1mm	Up to 15m
<b>Max. number of connected device</b>	free	1
<b>Transmission line</b>	Two multimode fibres: - connectors ST-850, fibres type 50/125 µm, 62,5/125 µm, 100/140µm, 200µm HCS. - connectors SC-850 fibres type 50/125 µm, 62,5/125 µm, 100/140µm, 200µm HCS. - connectors SMA-650 plastic fibres type POF/1mm.	DB9F/DB9M multi-wires cable 9x0,34 shield or 9-pair twisted cable eg UTP cat. 5e, shield inside large interferences eg STP cat. 5e.
<b>Max. baud rate</b>	230,4 kbps	
<b>Transmission type</b>	Asynchronism full duplex, half duplex.	
<b>Standards</b>	EIA-485/422, CCITT V.11	
<b>Optical signalisation</b>	<ul style="list-style-type: none"> <li>• PWR – green LED power supply,</li> <li>• RX - red LED data receiving from RS-232,</li> <li>• TX - yellow LED data transmission through RS-232 interface.</li> </ul>	
<b>Electrical Parameters</b>		
<b>Power requirements</b>	10 - 24 – 30 V DC	
<b>Power Cable</b>	Recommended length of power cable – up to 3m.	
<b>Power</b>	<3W	
<b>Protection from reverse power polarization</b>	YES	
<b>Galvanic Isolation</b>	1kV DC or 3kV DC.	
<b>Electromagnetic compatibility</b>	Resistance to disruptions according to the standard PN-EN 55024. Emission of disruptions according to the standard PN-EN 55022.	
<b>Safety requiring</b>	According to the PN-EN60950 norm.	
<b>Environment</b>	Commercial and light industrial.	
<b>Environmental Parameters</b>		
<b>Optoisolation</b>	-30°C ÷ 60°C	
<b>Humidity</b>	5 ÷ 95% - non-condensing	
<b>Storage temperature</b>	-40 ÷ 70 °C	
<b>Casing</b>		
<b>Dimensions</b>	71 x 90 x 58 mm	
<b>Material</b>	PC/ABS	
<b>Degree of casing protection</b>	IP40	
<b>Degree of terminal protection</b>	IP20	
<b>Weight</b>	0,10 kg	
<b>According to standard</b>	DIN EN50022, DIN EN43880	
<b>Location during work</b>	Free	
<b>Mounting method</b>	On the rail compliant with DIN35 / TS35 standard.	

\* ST is a trademark of AT&T.





**Dear Customer,**

Thank you for purchasing **CEL-MAR Company** products.

We hope that this user manual helped connect and start up **ADA-7210 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, Current Loop, Fibre-Optic Converters and Ethernet or Wi-Fi.

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

**CEL-MAR sp.j.**

Zakład Informatyki i Elektroniki  
Scięgiennego 219C str.  
25-116 Kielce, POLAND

Tel.....: +48 41 362-12-46  
Tel/fax.....: +48 41 361-07-70  
Web.....: <http://www.cel-mar.pl/en>  
Office.....: [office@cel-mar.pl](mailto:office@cel-mar.pl)  
Sales department.....: [sales@cel-mar.pl](mailto:sales@cel-mar.pl)  
Technical information .....: [support@cel-mar.pl](mailto:support@cel-mar.pl)