

User manual

ADA-7010

Multimode Fiber Optic to RS-232 Converter



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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-7010 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 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).



ATTENTION!!!

Device equipped with a laser transmitter..

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

Should never look for an uncovered slot, which is not included fiber optic connector.

The manufacturer is not responsible for the use of the unit against the instructions.

User manual is an integral part of the device and along with it is given 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-7010 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-7010 converter; user manual; CE declaration.

2. PRODUCT INFORMATION

2.1. PROPERTIES

- Fiber Optic to RS-232 conversion,
- Fibre Optic connection via two 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 and other,
- Any format of byte defined with the specification of RS232 interface,
- Power supply 10 - 30 VDC stable min. 3W,
- 1kV= or 3kV= galvanic isolation between RS232 and Fiber Optic interface and power supply,

- 5kV= optoisolation between FO and RS232 in the signal channel,
- Connection RS232 network and power supply via screw terminal block,
- Protection against power supply reverse connection,
- Operating temperature: -30°C ÷ +60°C
- DIN 43880 standard - mounting in typical electro-installation unit,
- Rail mounting according to DIN35 / TS35 standard,
- Dimensions (W x D x H) 53mm x 58mm x 90mm.

2.2. DESCRIPTION

Fibre optic ADA-7010 is a device used for connection of devices with RS232 interface without interfering with the data format. Use of fibre-optic provides complete isolation between connected devices and resistance to interference on the transmission bus. The fibre connection is implemented by a line consisting of two fibres - one fiber for the TX signal and one for RX signal. Application of two types these converters, can be use for communication with devices quite distant from each other eg. Computers, controllers etc. ADA-7010 doesn't require power supply from RS232 port, supports asynchronous data transmission with baud rate up to 230,4 kbps and use Rx and Tx siglans. RTS signal is looped with CTS and DTR with DSR, inside in the converter. Other signals are not connected. If the looping is not needed, can be not I RTS or DTS to the terminal block.

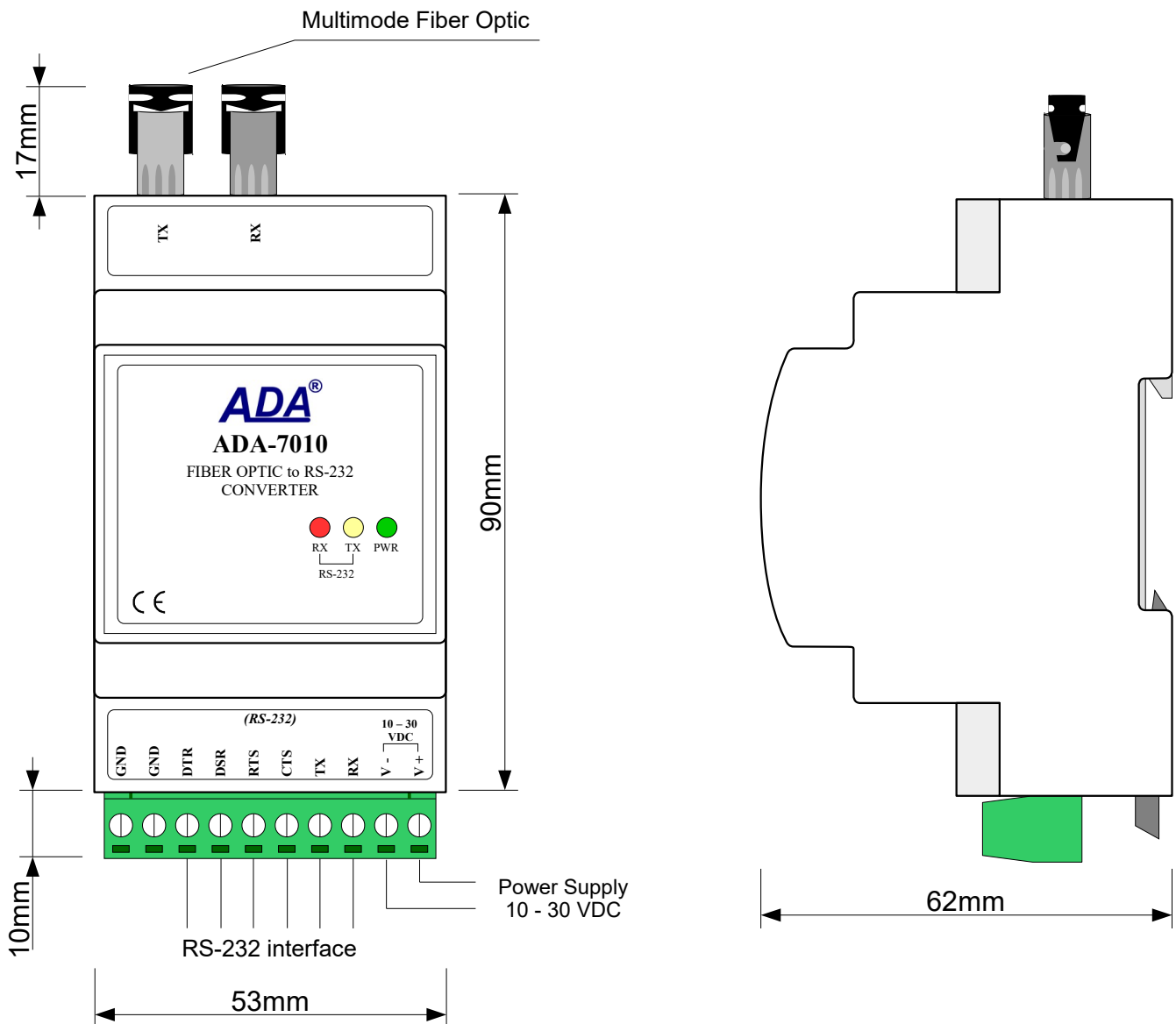


Fig 1. View of ADA-7010 with ST connector

2.3. ISOLATION

Converter ADA-7010 has 3-way galvanic isolation on the levels 1kV= or 3kV=, depend on version described in section *ERSIONS*.

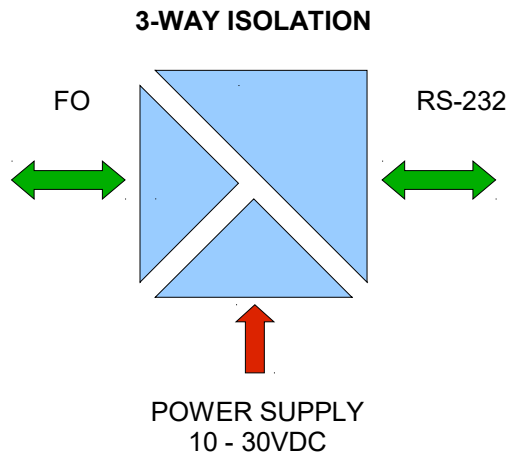


Fig. 2. Isolation structure

3. INSTALLATION

This chapter will show how to connect ADA-7010 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-7010 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 RS232 INTERFACE DEVICE

In purpose of connecting ADA-7010 to device with RS232 port DTE type (eg. computer), connection should be done as follows.

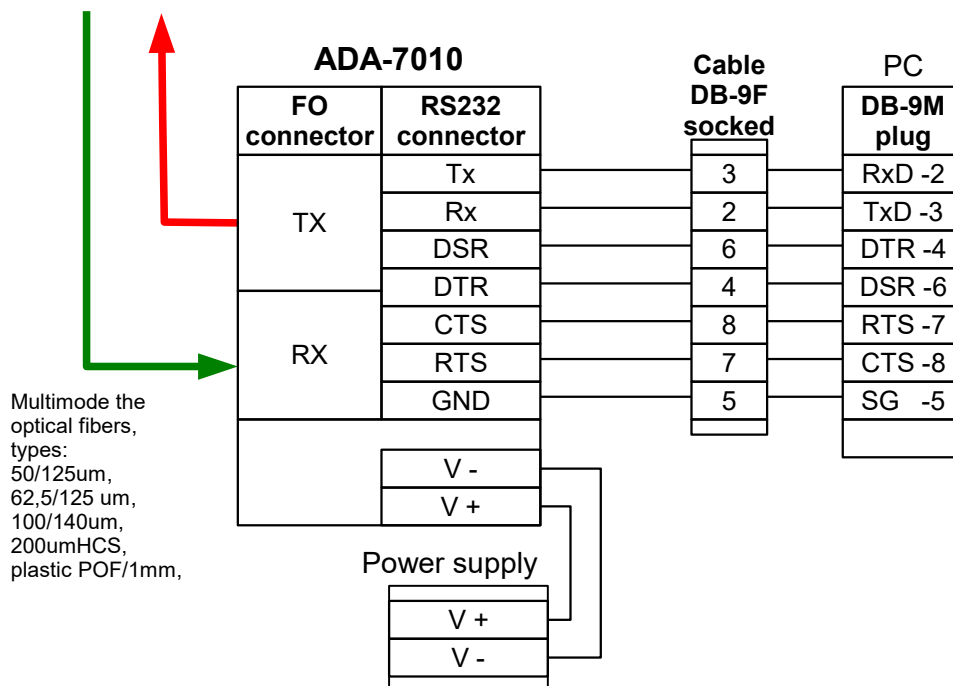


Fig 3. Example connection of ADA-7010 to RS-232 port of PC

3.3. FIBRE-OPTIC CONNECTION

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 a 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

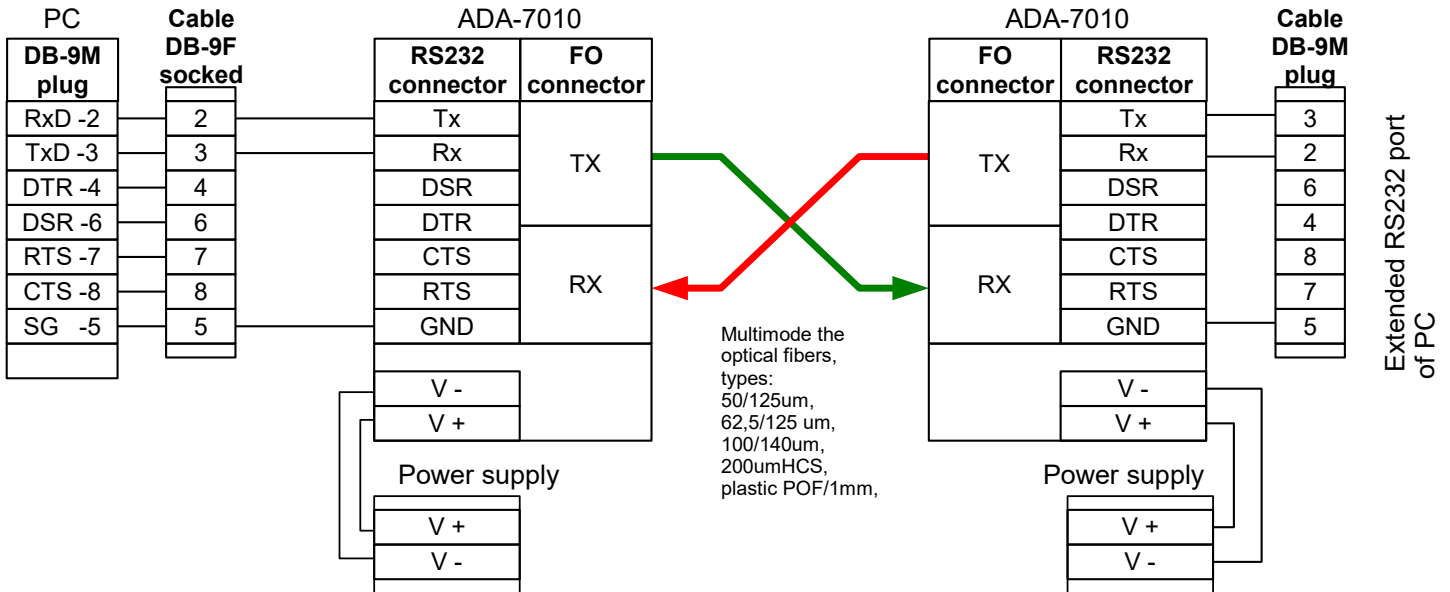


Fig 4. Example connection of PC to device with RS232 interface by the use of ADA-7010



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.

3.4. POWER SUPPLY

The power supply to the ADA-7010 converter should be DC (regulated) from 10 V= to 30V=. Nominal power is typically 2W, e.g. ZS-12/250 or 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-7010 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

Converter can be powered after proper connection according to steps above.

If connection was made properly green LED PWR on front panel of converter should light, if not check polarization of power connection. During proper data transmission through converter the LEDs Tx and Rx should blink.

LED	Description
PWR	Signalling of Power Supply
RX	Signalling of data receiving through ADA-7010 on RS-232 port
TX	Signalling of data transmitting from ADA-7010 converter through RS-232

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-7010
Tx	(TD)	Data transmission via ADA-7010	Transmitter
Rx	(RD)	Data receiving via ADA-7010	Receiver
RTS	(RTS)	Request to Send Data from ADA-7010	Looped with CTS
CTS	(CTS)	Clear to Send Data to ADA-7010	Looped with RTS
DSR	(DSR)	Readiness of receiving via ADA-7010	Looped with DTR
DTR	(DTR)	Readiness of data receiving/ transmission from ADA-7010	Looped with DSR
GND	(SG)	Signal ground	GND

6. VERSIONS

ADA-7010 - - - -

Electronics version:	
Basic	1
Special	x
Galvanic isolation:	
1kV=	2
3kV=	3
Terminal & Terminal Cover:	
Cover without inlets, screw terminal block	1
Cover with inlets, screw terminal block	2
Cover without inlets, plug-in screw terminal block	3
Fiber connectors:	
ST -type 850nm fiber connector	1
SC -type 850nm fiber connector	2
SMA -type 650nm fiber connector	3

Order example:
Product Symbol: **ADA-7010-1-2-3-1**
1 – Basic electronics version,
2 – galvanic isolation 1kV=,
3 – cover without inlets, plug-in screw terminal block,
1 – ST-type 850nm fiber connectors,

7. SPECIFICATION

TECHNICAL DATA		
Transition Parameters		
Interface	Fiber optic	RS-232
Connector	ST® * type - transmitter and receiver for an optical wavelength from 792nm to 865nm, SC type - transmitter and receiver for an optical wavelength from 792nm to 865nm, SMA type - transmitter and receiver for an optical wavelength from 640nm to 675nm.	Screw terminal block - max. Ø 2,5mm ²
Max. Line length	- up to 2000m for fibre type 50/125 µm, optical power budget Tx/Rx 9,6[dB], - up to 2500m for fibre type 62,5/125 µm, optical power budget Tx/Rx 15[dB], - up to 2000m for fibre type 100/140 µm, optical power budget Tx/Rx 15[dB], - up to 1500m for fibre type 200 µm HCS, optical power budget Tx/Rx 20[dB], - up to 20m for fibre type POF/1mm	Up to 15 m
Max. number of connected device	1	1
Transmission line	Two multimode fibers optic: - ST-850 connectors, fiber type 50/125 mm, 62,5/125 mm, 100/140mm, 200mm HCS. - SC-850 connectors, fiber type 50/125 mm, 62,5/125 mm, 100/140mm, 200mm HCS. - SMA-650 connectors, fiber type plastic POF/1mm.	Multi-wire cable 9x0,34 in shield
Max. baud rate	230,4 kbps	
Transmission type	Asynchronous full duplex, half duplex.	
Standards	EIA-232, CCITT V.24.	
Optical Signalization	<ul style="list-style-type: none"> • PWD – green LED power supply, • RX - red LED data receiving on RS232, • TX - yellow LED data transmission via RS232. 	
Electrical Parameters		

Power requirements	10 - 24 – 30 V DC
Power cable	Recommended length of power cable < 3m
Power	< 3W
Protection from reverse power polarization	YES
Galvanic isolation	1kV or 3kV between power circuit and signal line RS-232 and FO
Optoisolation	5kV – between signal lines FO and RS-232
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	-30 ÷ 60°C
Humidity	5 ÷ 95% - non-condensing
Storage temperature	-40 ÷ +70 °C
Casing	
Dimensions	53mm x 90mm x 62 mm,
Material	ABS/PC
Degree of casing protection	IP40
Degree of terminal protection	IP20
Weight	0,10 kg
According to standard	DIN EN50022, DIN EN43880
Location during work	Free
Mounting method	On the rail compliant with DIN35 / TS35 standard.

* ST is a trademark of AT&T company.

Dear Customer,

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

We hope that this user manual helped connect and start up the **ADA-7010 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.

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