

Let's communicate



**Miniature RS-232 / RS-422 Converter with Galvanic
Isolation of the Interface**



ELO E0CI

Operation manual

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1.0 Introduction

RS-232 interface with asymmetric signals is designed for two terminal equipments connection (DTE). Maximum load capacity can be 2500 pF (about 50m twisted pair). The load impedance is to be 3-7 kiloohm that allows induce disturbing pulses into the cables even from relatively soft supplies. Terminal equipments have to have the same potentials of the neutral, for this reason, RS-232 interface range is limited to 15m distance. RS-422 (V.11) interface signals transmission allows increase communication range to 1200m and transmission interference immunity.

1.1 Use of the converter

The converter increases transmission immunity against electrical disturbance and isolates both interfaces RS-232/RS-422. Insulation strength is 750 V. As for permissible over-voltage the converter can be used in the environments where lightning over-voltage is not necessary to be considered. To lead the cable outside buildings it is necessary to provide additional over-voltage protection on the input points.

The converter allows transmission rate to 115200b/s. This rate is guaranteed when using external supply in other cases it depends on RS-232 interface configuration, DTR and RTS signals polarity and their internal resistance. Maximum real rate decreases due to the line length and/or its impedance growth. Maximum line length is 1200m at rate 9600b/s.

2.0 Operation principles

RS-422 interface is mainly designed for two devices connection. The signal is symmetric, one twisted pair is needed for each signal. The transmission is duplex or simplex.

3.0 Installation

The converter has to be installed with the respect for specifications of both interfaces

3.1 Converter connection to RS-232 Interface

ELO E0CI transmits RxD and TxD signals. Control signals are not transmitted. The converter contains RTS-CTS and DTR-DSR local interconnections.

Signals assignment to the contacts and DTE - DCE interconnection is in the following table:

Signal name	abbrev	DTE connector (DB9M)	E0CI conn. (DB9F)	trans.direction	
				DTE	E0CI
Signal Ground	SG	5	5	--	--
Transmitted Data	TxD	3	3	output	input
Received Data	RxD	2	2	input	output
Request To Send	RTS	7	7	output	input
Clear To Send	CTS	8	8	input	output
Data Set Ready	DSR	6	6	input	output
Data Terminal Ready	DTR	4	4	output	input

!!! CAUTION !!!

Maximum attainable data rate is 115 200 b/s and it is guaranteed if the external power supply is used. In other cases it depends on RS-232 interface configuration, DTR and RTS signals polarity and their internal resistance!

The cable to connect TE to the converter has to transmit at least signals TxD,RxD, GND, and DTR or RTS!DTR or RTS polarity is optional.

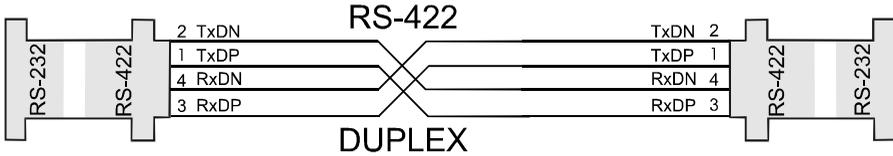
3.2 RS-422 link connection

The connector DB9M (male) is used to the link connection. RS-422 interface connector description is in the following table:

Contact	signal	meaning
1	TxDP(B)	transmitted data – B conductor
2	TxDN(A)	transmitted data – A conductor
3	RxDP(B)	received data - B conductor
4,8	RxDN(A)	received data - A conductor
5	Supply-	for supply negative pole connection Signal ground
6	+5V	contact for possible active terminator connection (Vcc)
9	Supply+	power supply +6V DC

Each pair of RS-422 line should be terminated with the 100-120Ω resistors on both ends placed between A - B conductors (so-called passive terminators). These

terminators suppress undesirable echo and they influence transfer immunity against interference.



3.3 Mode without Power Supply

ELO E0CI converter can work without external power supply on certain conditions. It uses signals energy of RS-232 interface (TxD, RTS and DTR), especially to transmitter supply (TxDP-N signal), which is transferred to RS-422 via isolated DC/DC converter. Energy obtained from RS-232 is in the order of tens mW. RS-422 signal needs energy in the order of hundreds mW.

Therefore:

The converter operation of this mode is available only for short distances (in the order of meters) in the link without terminators and interferences.

3.4 Power Supply Connection

In most applications the converter needs external 6V/200 mA power supply connected via 9 (positive terminal) and 5 (negative terminal) contacts of RS-422 connector. If 5V power supply was necessary to use it can be connected via positive pole to 6 contact. **Caution, polarity reversal protection of the converter is not available in this mode!!**

4.0 Specifications

4.1 Electrical parameters

Interface	RS-232/RS-422
Transmitted signals	TxD and RxD
Control signals	local interconnectors RTS-CTS DTR-DSR
RS-232 connector	DB9F, DCE
Trasmission mode	duplex, simplex
Power supply	external DC supply 6V/200mA or without power supply
Isolation voltage between interfaces	750 V

Permissible overvoltage on the line
under ČSN 33 0420:

the line must not be exposed to the
atmospheric discharge influences

Required link impedance

100Ω

4.2 Other

Range without repeaters

1200m, four-conductors link

Maximum data rate

115 200 b/s

Dimension: width x length x height

34 x 63 x 17 mm

Weight

25 g

Stocking temperature

- 10° to +55° C

Working temperature

+ 0° to +50° C

Humidity

0 – 85% (non-condensing)

5.0 Troubleshooting

Symptom	Action
Converter does not work after installation	Check if the link is connected properly, if 3-4 and 2-1 contacts are not changed. (signal polarity is changed in this case) Check the power supply. Check RS-232 connection
Connection in normal operation quit working	Check the power supply. Check the cable connection

6.0 Ordering information

Supply code is ELO E0CI.

Note

