

Let's communicate

elo

RS-232 Miniature Converter to Current Loop



ELO E00X

Operation manual

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1.0 Introduction

RS-232 is the interface with asymmetric signals. Maximum load capacity can be 2500pF and equates to c.50m typical twisted-pair cable.

The asymmetric signals are not ideal to eliminate the influence of zero potential differences of terminal equipments (TE and/or DTE). The TE and neutral potentials have to be the same hence the RS-232 interface is intended to the point-to-point connection for 15m distance.

The load impedance is to be 3-7 kilo-ohm that allows disturbing pulses to induce into the cable even from the soft supplies.

1.1 Use of the converter

Current loop interface is resistant to electromagnetic interference **but not to atmospheric electricity influences!**

The current loop enables to span the metallic link of the resistance up to 500 Ohm using the power supply of 12 V.

2.0 Operation principles

E00X converts TxD signal into the transmitting cable pair of the current loop and the signal from the receiving pair into the RxD thus the full duplex connection is carried out. In the idle mode the 20mA current flows through each current loop. The maximum transmission rate is 115 200 bps. Control signals are not transmitted.

3.0 Installation

There are two different problems of installation to discuss: the converter and the TE connection via the RS-232 interface and two modems interconnection.

3.1 RS-232 interface connection

The DB9F (Female) connector is used to the converter connection. The connector is connected as the DCE (to the end device connector, the converter can be connected directly or via the cable 1:1). Signals assignment to the contacts and signals' direction is in the following table:

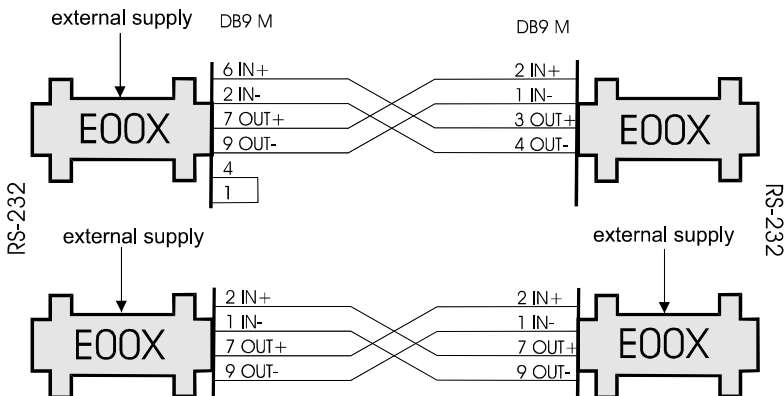
Signal name	abbrev	DB9 Female (DCE)	trans.direction	
			DTE	converter
Signal Ground	SG	5	--	--
Transmitted Data	TxD	3	output	input
Received Data	RxD	2	input	output
Request To Send	RTS	7	output	input
Clear To Send	CTS	8	input	output
Data Set Ready	DSR	6	input	output
Data Terminal Ready	DTR	4	output	input
Data Carrier Detect	DCD	1	input	output

3.2 Two Modems interconnection

For the duplex operation, two current loops - transmitting and receiving - are used to interconnect the converters. To each loop, the twisted pair should be applied to limit the radiation and particularly the disturbance from outside. Each loop connects one transmitter to one receiver and has to contain a power supply. The transmitter or receiver supplies this power most often, it is so-called active transmitter or receiver whereas the passive receiver is a consumer and the passive transmitter is a current switch that supplies the active equivalent.

The converters' operation mode implies the way of their connection. There are three modes selected via the contacts on the DB9M link connector:

- 1) The active transmitter and receiver
- 2) The passive transmitter and receiver
- 3) The active transmitter and passive receiver



3.3 Power Supply Connection

The converter contains two isolated parts that have to be supplied from two supplies isolated from each other. The RS-232 interface circuit is supplied from the TE signals. The TE has to supply at least one of TxD, RTS and DTR signals. The power take-off does not exceed c.3mA.

The current loop circuits need the power supply as described in 3.2 chapter. If the converter operates in the passive transmitter and receiver mode it works with the current supplied via the opposite converter and does not need the external power supply. When in the active receiver or transmitter mode, the power supply to the loops is needed. The supply is connected via the DC connector on the converter case or via 8 (positive) or 4 (negative) contacts on the current loop connector.

The power supply of 12V/100mA is used most often, E0Q4 type. The power supply voltage may be of maximum 24V for one supplied current loop thus up to 50mA.

4.0 Specifications

4.1 Parameters

RS-232 interface	DCE
RS-232 connector	DB9F
Current loop interface	transmitter and receiver active / passive
Current loop connector	DB9M
Loop current in idle mode	20mA
Isolation between interfaces	1 kV
Transmitted signals	TxD and RxD, full duplex are not transmitted, local jumpers
Control signals	RTS-CTS, DTR-DSR-DCD
RS-232 connector	DB9F, DCE
Transmission mode	half-duplex
Power supply	external DC supply 6V/200mA
Maximum range of the link with parameters: 200Ohm, 50nF / 1km	1000m
Maximum data rate	115 200 bps
Minimum data rate	50 bps
Supply	typ. 12 V, max. 24 V / 50 mA
Dimension: Width x Length x Height	34 x 64 x 17 mm
Weight	25 g

Stocking temoerature	- 10° to +55° C
Working temperature	+ 0° to +50° C
Humidity	0 – 85% (non-condensing)

4.2 Other

!!! Caution !!!
The converter use is not allowed in lines exposed to the atmospheric electricity effects.

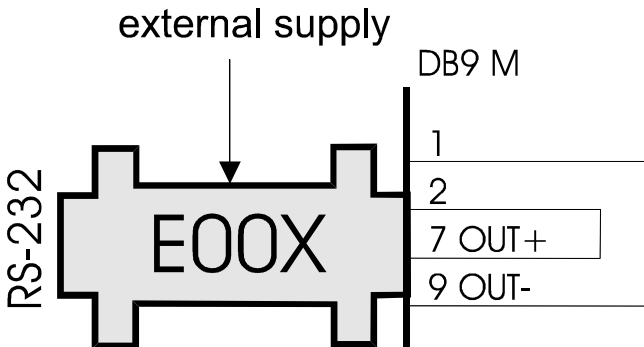
5.0 Testing

If interconnected properly, both diodes light up on each modem. Any simple communication test can be used (terminal emulator, ...).

5.1 Auto-test

You can test either single converter or connected to the terminal equipment with the external supply of 12 – 24 V. The DB9M connector contacts are interconnected via two jumpers: 7-2 and 9-1.

Both diodes must be alight. The transmitted sign has to appear in the receiver (ECHO).



6.0 Troubleshooting

Symptom	Action
Converter does not work after installation	Check if both diodes light. Check the power supply. Check RS-232 connection.
Connection in normal operation quit working	Check the power supply. Check the cable connection. Use auto-test and find out if the converter is OK.

7.0 Ordering Information

Supply code is ELO E00X.

ELOE00XZKE001

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