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## **Isolating Repeater of RS-232 interfaces transmitting data, control, state and clock signals**



# **ELO E0N9**

## **Operation manual**



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## **1.0 Introduction**

RS-232 is the interface with asymmetric signals designed for two terminal equipments connection (DTE). The maximum load capacity may be 2500pF (about 50m of twisted pair). The load impedance is to be 3-7 kilo-ohm that enables disturbing pulses to induce into the cable even from relatively soft supplies. The terminal equipments have to have the same neutral potentials. For this reason, RS-232 interface range is limited to 15m distance.

### **1.1 Use of the converter**

ELO E0N9 is the ELO+ company product which is designed for two devices isolation of RS-232 interface. The signal isolation protects the terminal equipment against the over-voltage being induced into the link.

ELO E0N9 is suitable for the unwanted ground loop interruption or for the terminal equipment protection against the static charge effect while connecting to the other device.

ELO E0N9 isolates two devices of the RS-232 interface and inserts 1 kV isolation barrier between them.

ELO E0N9 may also be used as a repeater and increase the maximum cable length between the terminal equipments for up to 2 x 15m. As for permissible over-voltage, the E0N9 can be used in the environments where lightning over-voltage is not necessary to be considered.

### **2.0 Operation principles**

The synchronous RS-232 interface is designed for two devices communication. The data signals are accompanied by the clock signals. Except of them, some communication protocols also use control and state signals to control data flow and if need be to set up or dissolve connection.

Two data, three clock, two control and three state signals are transmitted via ELO E0N9 whereas inserting 1 kV isolation barrier into all of them.

### **3.0 Installation**

RS-232 interface defines two types of the end device – DTE and DCE. These devices have the different signal assignment to the connector. While installing of ELO E0N9 we have to know which types of devices are to be connected. A modem is a typical DCE device a computer is a DTE device.

### 3.1 RS-232 interface connection

The signal assignment to the contacts is shown below:

SIGNAL name	abbrev	connector(a) (DB25F)	Transm. direction	connector(b) (DB25F)
Signal Ground	SG	7	--	7
Transmitted Data	TxD	2	→	2
Received Data	RxD	3	←	3
Request to Send	RTS	4	→	4
Clear to Send	CTS	5	←	5
Data Set Ready	DSR	6	←	6
Data Terminal Ready	DTR	20	→	20
Data Carrier Detect	DCD	8	←	8
Transmit Clock (from DCE)	TC	15	←	15
Receive Clock (from DCE)	RC	17	←	17
Transmit Clock (from DTE)	TTC	24	→	24

It is necessary to hold the maximum recommended cable length of 15 m.

### 3.2 Power supply

ELO E0N9 needs the external power supply of 6V DC. The power supply take-off is 60mA typically.

## 4.0 Specifications

### 4.1 Electrical parameters

Interface	RS-232/RS-232
Transmitted signals	TxD, RxD, RTS, CTS, DTR DSR, DCD, TC, RC, TTC
RS-232 (a) connector	DB25F
RS-232 (b) connector	DB25F
Transmission mode	half-duplex
Power supply	DC supply 6V/70mA
Isolation voltage between interfaces	1 kV for 1 sec
Permissible over-voltage on the line	the line must not be exposed to the atmospheric discharge influences
Range	2 x 15m

Maximum data rate	115 200 bps
Dimension: Width x Length x Height	57 x 83 x 24 mm
Weight	80 g

**4.2 Other**

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

**CAUTION!!**

Unless otherwise specified on the product, as for permissible over-voltage, it can be used in the environments where lightning over-voltage is not necessary to be considered.

**5.0 Testing**

First two devices are connected via the cable without ELO E0N9 and the transmission is tested via the suitable software. Then the ELO E0N9 is inserted and the transmission is tested again. The transmission has to be faultless when the isolating repeater in correct operation.

**6.0 Troubleshooting**

Symptom	Action
The ELO E0N9 does not work after installation	Check if it is connected to both TE properly, be careful of the wires (not)crossing!
Connection in normal operation quit working	Check the connection to both devices Use the test as with 5.0

**7.0 Ordering Information**

Supply code is ELO E0N9.  
Power supply must be ordered separately.

**Note**

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ELOE0N9ZKE001

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