Let's communicate

RS-232 Isolating Repeater

ELO E0M7

Operation manual

ELO+ sro, Za Nadrazim 2609, CZ397 01 PISEK, www.elo.cz, sales@elo.cz, +420 382 213 695

1.0 Introduction 3
1.1 Use of the converter 3
2.0 Operation principles 3
3.0 Installation 3
3.1 RS-232 interface connection 3
3.4 Power supply 4
4.0 Specifications 5
4.1 Parameters 5
4.2 Other 6
5.0 Testing 6
6.0 Troubleshooting 6
7.0 Ordering Information 7

1.0 Introduction

The RS-232 interface (V.24) is a common equipment of the devices in the computer technology and automation. The interface is designed for point-to-point connection at the distance of several meters. While a connecting, both devices have to be switched off. The interface solves neither the problems of neutral potentials differences of both devices nor the static charge influence which can destroy the input circuits during both devices connection.

1.1 Use of the converter

ELO E0M7 is RS-232 repeater with the galvanic isolation of both devices. It can be used to doubling the transmission line (maximum 2 x 15m), to handling the neutral potentials' difference, to interrupt the ground loops or to protect the devices against the static charge influence during both devices connection.

2.0 Operation principles

TxD signal from one connector (DCE) is isolated and emitted to the same contact of the other connector (DTE). In reversed direction the transmitted signal RxD is also isolated. Repeater needs no external supply. It is supplied by output signals TxD (RxD), RTS (CTS) and DTR (DSR) from both terminal devices. Only TxD (RxD) signals are enough for supply of repeater and for its correct operation.

3.0 Installation

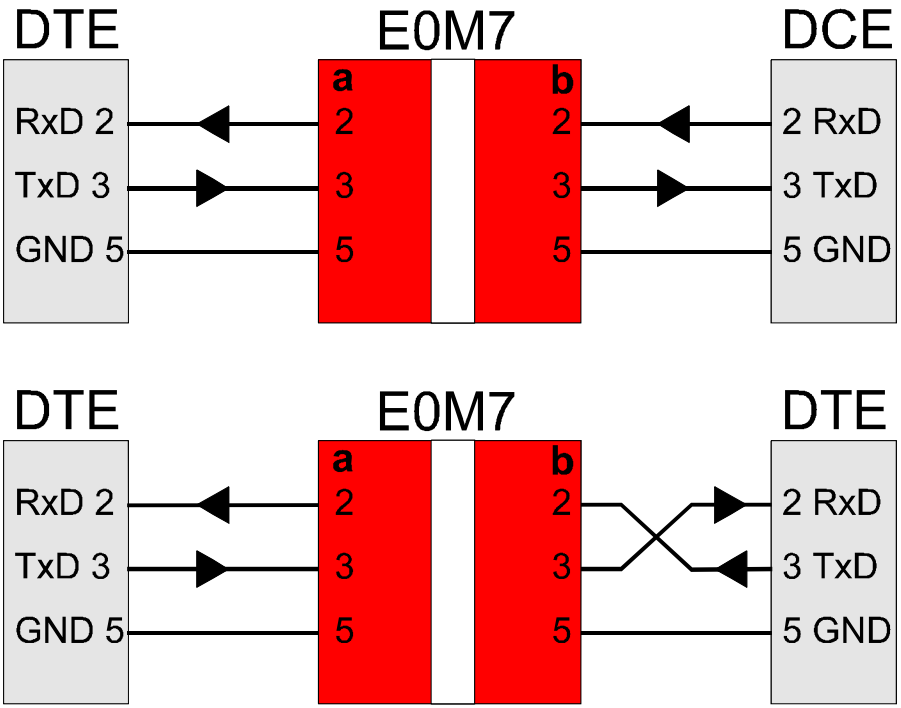
RS-232 interface defines two types of the terminal devices – DTE and DCE. A modem is a typical DCE device, a computer is DTE device. ELO E0M7 repeater has one DCE and the other DTE connector. Repeater can be easily inserted between one device and cable without switching of signals. TxD, RxD and GND are minimum signals for correct operation.

3.1 RS-232 interface connection

The signal assignment to the contacts is shown below:

SIGNAL name	abbrev	connector(a) DCE (DB9F)	Transmission direction	connector(b) DTE (DB9M)
Signal Ground	SG	5	--	5
Transmitted Data	TxD	3	**à**	3
Received Data	RxD	2	**ß**	2
Request To Send	RTS	7	--	7
Clear To Send	CTS	8	--	8
Data Set Ready	DSR	6	--	6
Data Terminal Ready	DTR	4	**à**	4

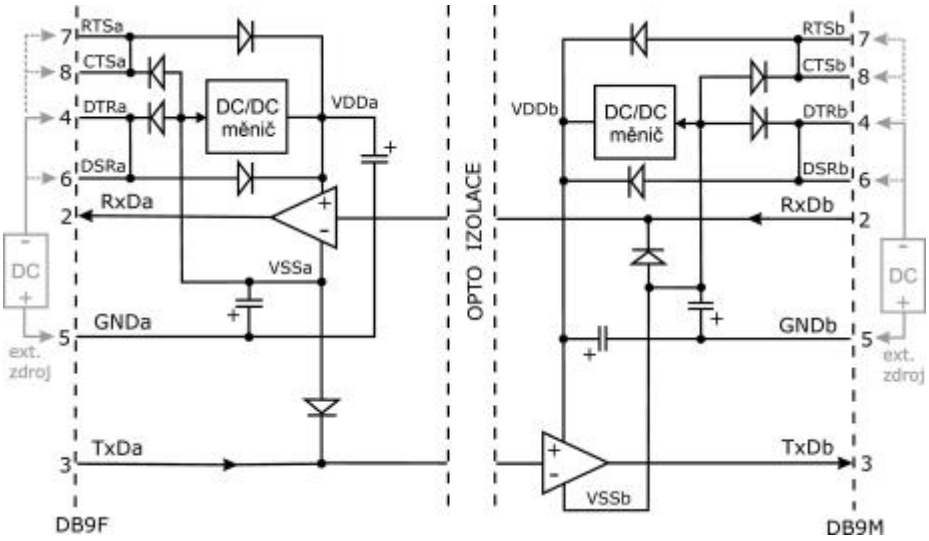
ELO E0M7 has two DB9 connectors. DB9F connector is connected as DCE (referred to as a), DB9M connector as DTE (referred to as b).
ELO E0M7 is connected to the terminal device via the DCE (a) connector directly or via the cable connected 1:1. On the (b) connector there is the DTE interface again which is isolated from the terminal device.
The remote DTE is connected to the (b) connector via the cable of crossed wires.
It is necessary to hold the maximum recommended cable length of 15 m.



3.4 Power supply

ELO E0M7 uses energy of TxD (ev. RTS and DTR) signal for its operation from both terminal devices. It is possible to connect two external power supplies 6 to 9V between pins 5 and 4, 6, 7 or 8 if the stronger power is necessary to reaching longer distance or higher data rate. The positive terminals of the external supplies connect

on pins 5 and the negative terminals on pins 4, 6, 7 or 8. Before it the original signals have to be disconnected. See figure below.



4.0 Specifications

4.1 Parameters

Transmitted signals	TxD and RxD
Control signals	are not transmitted RTS-CTS,DTR-DSR are interconnected
RS-232 interface:	
Type and connection of (a) connector	DB9F, DCE
Type and connection of (b) connector	DB9M, DTE
Transmission mode	duplex
Power supply	works without the power supply
Minimum RS-232 signals DTE (a) device	TxD, RxD, GND
Minimum RS-232 signals DCE (b) device	TxD, RxD, GND
Range	2 x 15m
Maximum data rate	230 400 bps
Isolation voltage between interfaces	1 kV for 1 min
Permissible over-voltage on the line	the line must not be exposed to the

	atmospheric discharge influences
Stocking temperatures	-10° to +55°C
Working temperatures	+0° to +50°C

4.2 Other

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

Repeaters´ connection to the lines exposed to the atmospheric electricity influences is prohibited unless separate line protection is carried out e.g. via very fast lightning suppressor.

5.0 Testing

First two terminal devices are connected straight via cable without the ELO E0M7 and the transmission is tested via the suitable software (e.g. Hyper-terminal). Then the repeater is inserted in. If the cables are right connected the transmission has to be OK.

6.0 Troubleshooting

Symptom	Action
The ELO E0M7 does not work after installation.	Check if it is connected to both devices properly. Check if the signals TxD ev. RTS and DTR are connected.
Connection in normal operation quits working.	Check ELO E0M7 connection to the terminal devices. Use the test as chapter 5.0
Errors in data transmission.	Decrease data rate or shorten the cables. Connect external supplies as chapter 3.4.

7.0 Ordering Information

Supply code is ELO E0M7.

ELO+ sro, Za Nádražím 2609, CZ397 01 PÍSEK, www.elo.cz, sales@elo.cz, +420 382 213 695