RS – 232 to Fibre Optic Modems

ELO E240, ELO E241, ELO E242

Operation manual

1.0   Introduction

Fiber Optic (SINGLE MODE and/or MULTI MODE) has been used for signal transmission in automation for communication more and more often.

The main advantage of Fiber Optic is its immunity to electromagnetic interference, slight radiation and high transmission capacity

1.1   Use of the modem

Conversion of metallic media to more expensive fiber optic is mainly suitable:

> 1] in the environment of high interference level,
>
> 2] if the higher isolation is required, (switching stations, transformers),
>
> 3] if the metallic line can not be used because of EMI ,
>
> 4] if the higher transport security and safety is necessary,
>
> 5] if isolation via the optocouplers is not suitable for different reasons

Applying the ELO E240-2 modems family these problems can be solved.

2.0   Operation principles

The principles of ELO E240, E241 and E242 operation are identical. They differ as to the type of optical connector and the optical cable type. So the next parts will describe only ELO E240 and the other models will be meant just if it will be necessary to describe the differences. ELO E240 transfers signal received from RS-232 interface to transmitting fiber of the optic cable and the signal from receiving fiber is transmitted to RS-232.

Besides the signal transfer, the modem activates the ALARM output if the optic path is broken.

The modems are independent from communication protocol and data rate. The data rate can be any from zero to maximmum.

ELO E240 and ELO E241 are designed for multimode optic fibers and ELO E242 for singlemode one. ELO E240 has optical connector ST, ELO E241 and ELO E242 have SC connectors.

3.0   Installation

There are two different problems of installation to discuss: RS-232 link and fiber optic link connection.

3.1   RS-232 Interface Connection

The RS-232 interface connector is DB9 female see the following table:

contact	signal	meaning	direction DCE / DTE
1	alarm	optic line doesn't work	open collector output
2	RxD	received data	from / into the modem
3	TxD	transmitted data	into / from the modem
4	DTR	connected to DSR	
5	GND	signal ground	
6	DSR	connected to DTR	
7	RTS	connected to CTS	
8	CTS	connected to RTS	
9	PWR	power supply input	

The data rate can be from 0 to 230 000 kpbs.

Connecting ELO E240 to DTE (for instance PC) the DIL switches must be set to DCE position. If the ELO E240 is connected to DCE (for instance to modem), he DIL switches must be in DTE position. Both devices connecting cable must be 1:1. If the cable is crossing the signals (null modem) the DIL switches must be set to the same position as the end device is.
The cable length must not exceed 15 m.
Signal ALARM can control an external indicator, for example 24V / 100 mA relay.

3.2   Fibre Link Connection

The fibre optic cable is connected to ELO E240 through the ST connectors, ELO E241 and ELO E242 use SC connectors. To connect the ELO E240, the transmitter of the remote modem must be connected to the receiver of the local ELO E240 and the remote receiver must be connected to the local transmitter (fibres cross). If the LINK indicator lights, the connection is OK.

3.3   Power Connection

The external supply has to have the output voltage of 9-24V and it is connected via DC connector on the back side, or via the contacts 9 (+) and 5(-). The supply take off is c.200 mA. If the supply is on operation the indicator PWR switches on.

4.0   Specification
4.1   Parameters

Transmitted signals		TxD and RxD,
Type of RS-232 connector		DB9 female
Local interconnected		RTS-CTS, DTR-DSR
Transmit mode RS-232		duplex
Fibre optic cable		two fibers
E240, E241		multimode 50/125 µm (62/125µm)
E242		singlemode 9/125 µm
RangeE240, E241		2 km
Range E242		15 km
Optic connectors E240 / E241 / E242		ST / SC / SC type
Maximum/minimum data rate		0 / 230 000 bps
Supply		DC supply 9-24V/260-100 mA
Dimension:	Length	120 mm
	Width	80 mm
	Height	25 mm
Weight		160 g

4.2   Other

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

5.0   Testing

In case of proper installation the PWR and LINK diode is alight. The Tx/Rx indicators must blink during transmission.

6.0   Troubleshooting

Symptom	Action
ELO E24x does not work after installation	Check if the PWR and LINK is alight. Check the power supply. Check the RS-232 link connection.
Connection in normal operation quit working	Check the power supply Check if the cables are OK.. Turn off and on the power supply and detect if the modem starts again.

7.0   Ordering Information

ELO E240   RS-232 / ST multimode,
ELO E241   RS-232 / SC multimode,
ELO E242   RS-232 / SC singlemode.

7.1   Related products

ELO E0Q6   DC supply 12V / 500 mA

Notes

ELO+ sro,Nadrazni 2234, 397 01 PISEK, CZ, www.elo.cz, sales@elo.cz, tel. +420 382 213 695, fax +420 382 213 069