

*Let's communicate*



## RS-232 to Multimode Optic Fiber Converter



# ELO E14C

## Operation Manual

<b>1.0</b>	<b><i>Introduction</i></b> .....	<b>3</b>
<b>1.1</b>	<b><i>Fiber Optic Modem Application</i></b> .....	<b>3</b>
<b>2.0</b>	<b><i>Principles of Operation</i></b> .....	<b>3</b>
<b>3.0</b>	<b><i>Installation</i></b> .....	<b>4</b>
<b>3.1</b>	<b><i>Fiber Link Connection</i></b> .....	<b>4</b>
<b>3.2</b>	<b><i>RS-232 Interface Connection</i></b> .....	<b>4</b>
<b>3.3</b>	<b><i>Power Connection</i></b> .....	<b>5</b>
<b>4.0</b>	<b><i>Specification</i></b> .....	<b>5</b>
<b>4.1</b>	<b><i>Electrical Parameters</i></b> .....	<b>5</b>
<b>4.2</b>	<b><i>Optical Parameters</i></b> .....	<b>5</b>
<b>4.3</b>	<b><i>Other</i></b> .....	<b>5</b>
<b>5.0</b>	<b><i>Testing</i></b> .....	<b>6</b>
<b>6.0</b>	<b><i>Troubleshooting</i></b> .....	<b>6</b>
<b>7.0</b>	<b><i>Ordering information</i></b> .....	<b>6</b>

## 1.0 Introduction

RS-232 is the interface with asymmetric signals. The maximum load capacitance can be 2500 pF. It corresponds to the 50m of the typical twisted pair cable.

The load impedance can be 3-7 kilohm and it enables to induce the disturbing impulses even from the soft supplies into the cable.

The asymmetric signals can not eliminate the influence of the signal ground's potential drifts.

Therefore the RS-232 interface is destined for the point-to-point connection at 15 m distance. The terminal devices (DTE) must have the same signal grounds potential.

## 1.1 Fiber Optic Modem Application

The fiber optic cable is resistant against the electrical disturbances and against the influences of the atmospheric electricity. It gives the maximum protection of the DTE and the high reliability of communication. The security of communication over optic cable is last but not least advantage.

## 2.0 Principles of Operation

ELO E14C converts TxD signal to transmitting optic cable and the signal from the receiving cable converts to RxD. This way the full duplex connection can be realized. There are not any other signals transmitted over optic fiber.

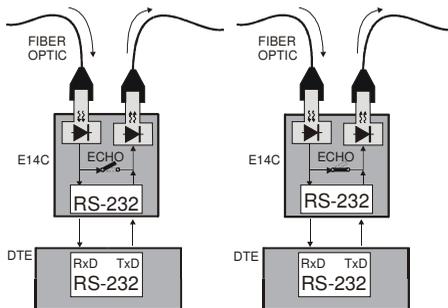
ELO E14C has two switches:

**Switch IDLE** sets a polarity of optic signal. In "LIGHT" position the light in transmitting fiber corresponds to idle state of TxD and the light coming from receiving fiber is been interpreted as idle state of RxD. In "DARK" position of **IDLE** the dark is the idle state in the fibers.

In "LIGHT" mode DTE is getting the information about optic cable's integrity all the time. So this mode is suitable for using in security systems.

**Switch ECHO** in "ECHO=OFF" position is suitable for two-point full duplex lines.

In "ECHO=ON" position data from receiving optic fiber are copied not only to RxD, but to transmitting fiber too. This way data can be delivered to all users of ring optic net. This configuration is equivalent to bus structure on metallic lines. There must be a communication protocol which must synchronize the stream of data packets among wars of the net.



### 3.0 Installation

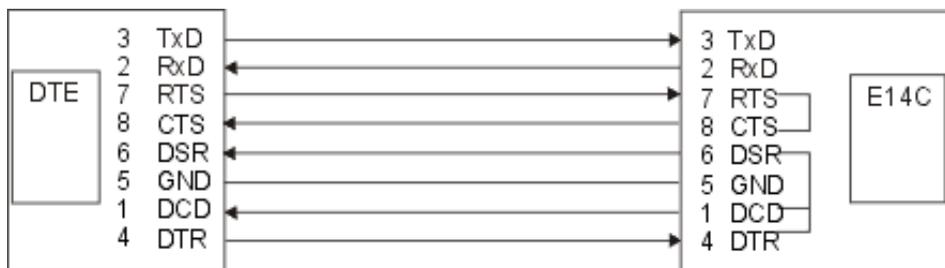
This section describes the proper procedures of installing the ELO E14C.

#### 3.1 Fiber Link Connection

Multimode cable with optic fibers 50/125, or 62.5/125  $\mu\text{m}$  can be connected by ST connectors. There are two optic route configurations for which ELO E14C can be used to – **point - to-point connection** and **ring bus**.

If the **point - to -point connection** has been realized, local adapter's TRANSMIT connector must be connected to RECEIVE connector of remote one and RECEIVE connector of local adapter to TRANSMIT connector of remote adapter.

It is not necessary to use a pair of ELO E14C to build a point-to-point connection. ELO E14C can be combined for instance with ELO E171 (respectively ELO E210). This way can be realized not only optic extension of RS-232, but also the conversion from RS-232 to RS-485 (resp. virtual COM though USB port). ECHO must be in the state "OFF". Installing the **optical ring bus**, the previous neighbour's transmitting fiber must be connected to local RECEIVE connector and local TRANSMIT connector to the next neighbour's receiving connector. If the DTE we are connecting through ELO E14C to the optic net will be working in SLAVE mode, switch ECHO must be in the state "ON". If the DTE's mode has to be a MASTER, switch ECHO must be in the state "OFF".



#### 3.2 RS-232 Interface Connection

RS-232 connector of ELO E14C is DB9F (female) and it is connected as DCE. So ELO E14C can be connected to DTE directly or using a short cable 1:1. The connection between DTE and ELO E14C including the bonds in ELO E14C are described in picture above.

There are only three RS-232 signals which are necessary for the correct function: TxD, RxD and GND. The other output RS-232 control signals are connected with

input status ones and they aren't transmitted.

### 3.3 Power Connection

The external DC supply with voltage rating 12 – 24V is necessary. It must be connected to the clamps + and -. The minimum voltage is 9 V, maximum 30 V. The consumption is c. 20-30 mA if the voltage is 12V. Indicator READY lights when supply is connected.

## 4.0 Specification

### 4.1 Electrical Parameters

Interface	RS-232
Transmitted signals	TxD and RxD
Control signals	local loops RTS-CTS DTR-DSR-DCD
RS-232 connector	DB9F, DCE
Communication mode	ECHO OFF - full duplex ECHO ON – half duplex
Maximum data rate	115 200 bps

### 4.2 Optical Parameters

Wave length	820 nm,
Fiber optic cable	50/125 or 62.5/125, multimode fiber
Connectors	ST
Maximum range	up for c.3 km

### 4.3 Other

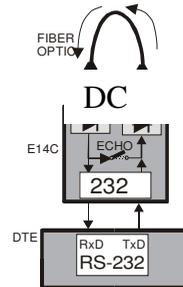
Supply	12-24V (min 9, max 30 V)
Consumption Dark / Light	max. 30 / 50 mA,
Dimension: Width	55 mm
Length	80 mm
Height	24 mm
Weight	90 g
Stocking temperature	- 10 <sup>0</sup> to +55 °C
Working temperature	+ 0 <sup>0</sup> to +50 °C
Humidity	0 – 85% (non-condensing)

### 5.0 Testing

Autotest is the way to assure about the serviceability of the converter. Both optical connectors must be interconnected. Transmitted data must be equal to data received data.

Any simple communication program can be used (terminal emulator, e.g. Hyperterminal).

LED diodes are blinking during data transfer. The luminous intensity depends on data rate and size of packets.



### 6.0 Troubleshooting

Symptom	Action
After the installation converter does not work.	Check if the fiber cables and RS-232 cable are connected properly. Check if READY lights (supply OK). Check the state of IDLE switch. Check the state of ECHO switch.
The normally working connection quit working braced.	Check if READY lights (supply OK). Check if the cables are connected properly.

### 7.0 Ordering information

Ordering product code is ELO E14C. The power supply must be specified in the order separately.

## Note

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