

# Fibre Optic I/O-System ELC-4

## Features

- Interference-free fibre optic transmission from point to point (uni- or bidirectional)
- Using SFP modules for flexible adaptation to existing fibre optics
- I/Os with a maximum of 4 digital signals (12 ... 24 V DC)
- Error monitoring (fibre breakage or failure of the transmitter) by dropping the outputs to 0V voltage level and for external monitoring by the integrated relay contact
- Sampling rate 4000 Hz
- Simple installation and commissioning (plug-and-play, no programming necessary)

## Application examples

- Plant engineering and automation technology
- Traffic control technology in road and tunnel construction (e.g. for signalling systems)
- Control and regulation of power generation systems
- Transmission of switching commands for higher-level decoupling protection for power generation systems (photovoltaics, wind power, ...)

## Description

With the I/O-system ELC-4, a maximum of 4 digital signals (e.g. switching, control, clock, synchronous or fault signals) can be transmitted uni- or bidirectionally.

The units can be equipped with various SFP modules as required for different types of fibre optic cables (singlemode or multimode).

Either two transceivers or one transmitter and one receiver are required for each system. The signals are transmitted over optical fibres (FO).

The ELC-4 series therefore guarantees interference-free and fast data transmission in harsh industrial environments and in the field. Due to the absolute potential separation, problems that can occur due to potential displacement, interference voltages, etc. are avoided.

A chain or ring topology can also be realised with the ELC-E4D with optical feed-through or the ELC-SE4 (see examples in the connection plan).

The I/O-system ELC-4 works according to the plug-and-play principle. Neither software nor complex settings are required.

## Function

The acquisition and transmission of the input signals is carried out 1:1 to the remote station.

The ELC-SE4, ELC-E4 or ELC-E4D units also monitor the reception of the valid transmission protocol and contain a relay contact which, in addition to the optical signal by the red LED and the drop of the outputs to 0V voltage level, can be used as a fault signal contact.

In the event of a fault, the normally open contact opens (intrinsically safe even in the event of a power failure). The switching behaviour of the relay contact can further be adjusted by an internal jumper (contact closed in the event of a fault).

The ELC-E4D receiver enables a chain connection of receivers by passing the optical signal, which synchronously outputs the input signals of the transmitter. In this way, synchronisation signals can be sent to all connected receivers (example: flashing signal for traffic control technology).

If, for example, an ELC-SE4 is used as transmitter, the chain could be closed as a ring and it could be monitored at the starting point. In this way, failures (e.g. fibre breakage or failure of a receiver in the chain) can be detected immediately.

### ELC-SE4-F-ME22-SFP



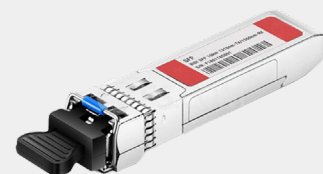
### ELC-SE4 with a module for 2 fibres



### ELC-SE4 with a BiDi module for 1 fibre



### Accessories: various SFP modules



Technical Data	
Transmission	Uni-   bidirectional
Fibre optic connection	LC connector
Optical range	≤ 80 km (depending on SFP module)
Sampling rate	4000 Hz
Signal delay	ca. 1.5 ms (In → Out)
Electrical connections	Pluggable screw terminals
Power supply	10 ... 28 V DC
Power consumption	at 12 V: from ca. 100 mA at 24 V: from ca. 55 mA
Mounting type	Mounting rail TH 35 (EN 60715)
Dimensions (W x H x D)	22.5 x 100 x 127 mm (without SFP module)
Protection class	IP20
Operating temperature	-20 ... +50 °C
Storage temperature	-40 ... +70 °C

**Safety Instructions**



Please be sure to observe the instructions in the connection diagram.

**Installation Notes**



Installation and commissioning may only be carried out by appropriately qualified personnel in accordance with the guidelines and recognised rules of technology!

Technical Data Depending On Device Type				
	ELC-SE4	ELC-S4	ELC-E4	ELC-E4D
Device type	Transceiver	Transmitter	Receiver	Receiver
Input digital	4 x 12 ... 24V DC / 5 mA	4 x 12 ... 24 V DC / 5 mA		
Output digital	4 x 12 ... 24 V DC / 0.2 A total max. 0.8 A		4 x 12 ... 24 V DC / 0.2 A total max. 0.8 A	4 x 12 ... 24 V DC / 0.2 A total max. 0.8 A
Output optical				Fibre optics via SFP module
Optical error monitoring	LED		LED	LED
Error message	Relay contact 60 V / 1 A AC drops out in the event of a fault (factory setting)		Relay contact 60 V / 1 A AC drops out in the event of a fault (factory setting)	Relay contact 60 V / 1 A AC drops out in the event of a fault (factory setting)

**Order Code**

**Device version**

- SE4** Transceiver  
4 digital inputs 12 ... 24 V DC / 5 mA  
4 digital outputs 12 ... 24 V DC / 0.2 A
- S4** Transmitter  
4 digital inputs 12 ... 24 V DC / 5 mA
- E4** Receiver  
4 digital outputs 12 ... 24 V DC / 0.2 A
- E4D** Receiver with optical feed-through  
4 digital outputs 12 ... 24 V DC / 0.2 A

**Enclosure**

**ME22** Module housing made of polyamide for DIN rail (TH 35): 22.5 x 100 x 127 mm

**SFP module**

**SFP** Slot for SFP module

**E L C - S E 4 - F - M E 2 2 - S F P**

**Order Code For SFP Modules**



Further SFP modules with a range of up to 80 km are available on request!

**Fibre optic connector**

**LC** LC-Simplex/-Duplex (socket): depending on the module device version

**Specifications (fibre, range, transmission type, wavelength)**

<b>SM20-TR-1000</b>	Singlemode 9/125 µm   20 km   2 fibres bidirectional   Tx/Rx 1310 nm
<b>SM20-BD1315</b>	Singlemode 9/125 µm   20 km   1 fibre bidirectional   Tx 1310 nm / Rx 1550 nm
<b>SM20-BD1513</b>	Singlemode 9/125 µm   20 km   1 fibre bidirectional   Tx 1550 nm / Rx 1310 nm
<b>SM40-TR-1000</b>	Singlemode 9/125 µm   40 km   2 fibres bidirectional   Tx/Rx 1310 nm
<b>SM40-BD1315</b>	Singlemode 9/125 µm   40 km   1 fibre bidirectional   Tx 1310 nm / Rx 1550 nm
<b>SM40-BD1513</b>	Singlemode 9/125 µm   40 km   1 fibre bidirectional   Tx 1550 nm / Rx 1310 nm
<b>MM2-TR</b>	Multimode 50/125 µm   2 km   2 fibres bidirectional   Tx/Rx 850 nm

S F P - L C - S M 2 0 - T R - 1 0 0 0