2.12   EL9400, EL9410

2.12.1   EL9400, EL9410 - Introduction and Technical Data

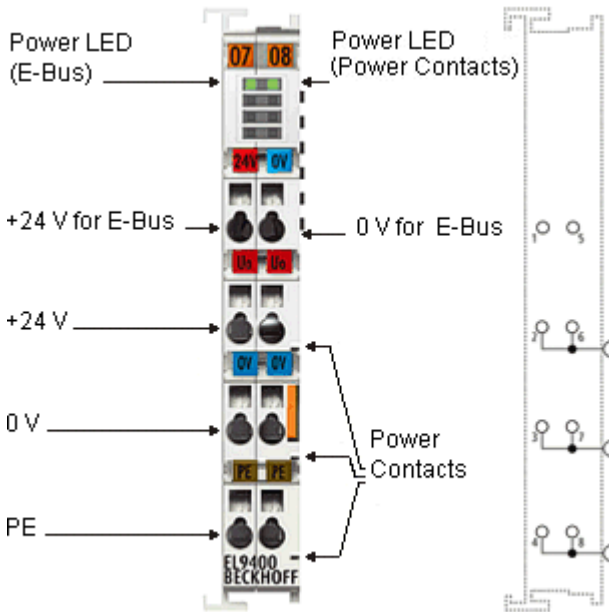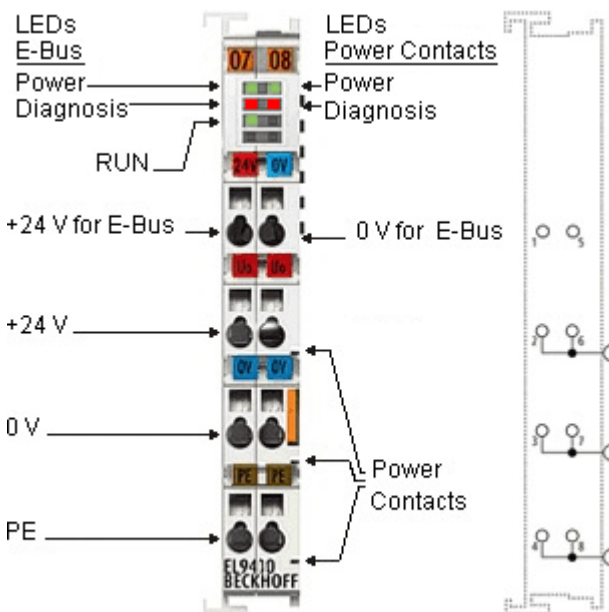**Power supply terminals**

Fig. 36: EL9400

Fig. 37: EL9410

The EL9400 and EL9410 power supply terminals are used to refresh the E-bus.

Data is exchanged between the coupler and the EtherCAT Terminal over the E-bus. Each terminal draws a certain amount of current from the E-bus (see "current consumption E-bus" in the technical data). This current is fed into the E-bus by the relevant coupler's power supply unit. In configurations with many terminals, it is possible to use the EL9400/EL9410 in order to supply an extra 2 A to the E-bus. As opposed to the EL9400, the EL9410 has a diagnostic function which is displayed by LED and on the process image. At the same time the EL9400/EL9410 can establish another potential group by an external 24 V feed-in via the power contacts on the right side.

Technical Data

Technical Data	EL9400	EL9410
Input voltage	24 V_{DC}	
Output current for E-bus supply	2 A	
Power contact voltage	24 V_{DC}	
Power contact current load	max. 10 A	
Current consumption from E-Bus	-	-
Electrical isolation	500 V (E-bus/field potential)	
Diagnosis	no	yes, via LED and in the process image
Electrical connection to mounting rail	no	
PE contact	yes	
Renewed infeed	yes	
Connection facility to additional power contact	1	
Side by side mounting on Bus Terminals with power contact	yes	
Side by side mounting on Bus Terminals without power contact	yes	
Bit width in the process image	-	2 bits (diagnosis)
Configuration	no address or configuration settings	
Weight	approx. 65 g	
Permissible ambient temperature range (during operation)	0°C ... +55°C	
Permissible ambient temperature range (during storage)	-25°C ... +85°C	
Permissible relative humidity	95%, no condensation	
Dimensions (W x H x D)	approx. 15 mm x 100 mm x 70 mm (width aligned: 12 mm)	
Mounting [▶ 93]	on 35 mm mounting rail conforms to EN 60715	
Enhanced mechanical load capacity	yes, see Installation instructions [▶ 98] for enhanced mechanical load capacity	
Vibration / shock resistance	conforms to EN 60068-2-6 / EN 60068-2-27	
EMC resistance burst / ESD	conforms to EN 61000-6-2 / EN 61000-6-4	
Protection class	IP20	
Installation position	variable, see chapter "Mounting of Passive Terminals [▶ 99]"	variable
Approvals / markings*	CE, cULus [▶ 92], UKCA, EAC, ATEX [▶ 86], IECEx [▶ 88]	

*) Real applicable approvals/markings see type plate on the side (product marking).

Ex markings

Standard	Marking
ATEX	II 3 G Ex nA IIC T4 Gc
IECEx	Ex nA IIC T4 Gc

Connection EL9400, EL9410

Terminal point		Description
Indication	No.	
+24 V for E-Bus	1	Supply input + 24 V for the E-Bus
+24 V	2	Supply input + 24 V (connected internally with terminal 6 and positive power contact)
0 V	3	0 V for supply input (connected internally with terminal 7 and negative power contact)
PE	4	PE (connected internally with terminal 8)
0 V for E-Bus	5	0 V for supply input E-Bus
+24 V	6	Supply input + 24 V (connected internally with terminal 2 and positive power contact)
0 V	7	0 V for supply input (connected internally with terminal 3 and negative power contact)
PE	8	PE (connected internally with terminal 4)

BECKHOFF

LEDs

LED	Color	Meaning	
Power LED (E-Bus)	green	off	No input voltage at supply input for the E-Bus
		on	24 V_{DC} at supply input for the E-Bus
Power LED (Power Contacts)	green	off	No input voltage at supply input
		on	24 V_{DC} at supply input
Diagnosis LED** Us	red	off	No error
		on	Undervoltage: Us less than 17 V
Diagnosis LED** Up	red	off	No error
		on	Undervoltage: Up less than 17 V
RUN	green	This LED indicates the terminal's operating state:	
		off	State of the EtherCAT State Machine: **INIT** = Initialization of the terminal
		flashing (2 Hz)	State of the EtherCAT State Machine: **PREOP** = Setting for mailbox communication and variant standard settings
		flashing (1 Hz)	State of the EtherCAT State Machine: **SAFEOP** = Channel checking of the Sync Manager and the Distributed Clocks. Outputs stay in safe operation mode.
		on	State of the EtherCAT State Machine: **OP** = Normal operation mode, mailbox- and process data communication possible
		flashing (10 Hz)	State of the EtherCAT State Machine: **BOOTSTRAP** = Function for e. g. firmware updates of the terminal

** only EL9410

Process data (only EL9410)

The EL 9410 has a bit width of 2 bits (diagnosis bits for the power contacts voltage [Up] and for the E-Bus voltage [Us], 'Undervoltage') and is displayed in the TwinCAT tree as follows:
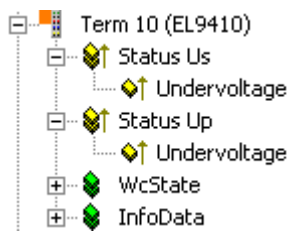

Fig. 38: EL9410 in the TwinCAT tree

If the Up or Us voltage is below 17 V, the corresponding diagnosis bit 'Undervoltage' has TRUE (1) status.

2.13 EL9540, EL9540-0010, EL9550, EL9550-0010, EL9550-0012

2.13.1 EL9540, EL9540-0010, EL9550, EL9550-0010, EL9550-0012 - Introduction and Technical Data

Surge filter terminals

The surge filter terminals protect the EtherCAT Terminals from conducted Surge voltages, as they can be caused on the supply lines by high-energy, dynamic disturbance variables, e. g. switching overvoltages with inductive loads or overvoltage with indirect lightning strikes.

The EL9540, EL9550 and EL9550-0012 EtherCAT Terminals enable the terminal station to be protected against damage in particularly harsh environments, such as in the on- and offshore area.

The EL9540-0010 is particularly suitable for the protection of analog terminals, the EL9550-0010 for digital terminals, and can be used, for example, in shipbuilding.

The EL954x have a filter for the 24 V DC field supply and the EL955x have a filter for the 24 V DC field and system supply.

For the EL9550-0012 variant, the current load for both the field supply and the system supply is 10 A each. For the EL9550-0010, the total field and system supply is 10 A. The higher system supply is advantageous for the supply of Embedded PCs, which have a higher current consumption.