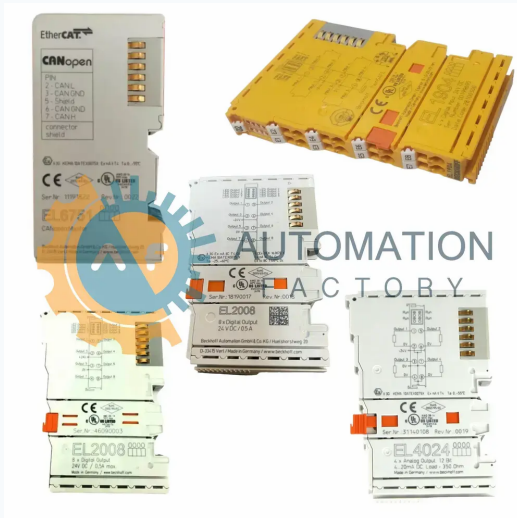




Beckhoff — EL EtherCAT Terminals

EL5002



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The **EL5002** is an encoder interface terminal produced by Beckhoff for the **EL EtherCAT Terminals** series. Designed for machine controllers that use fieldbus I/O, the unit connects serial encoders to the network and transfers position data to the PLC in real time. Its **12 mm**-wide housing conserves cabinet space while supporting synchronized position feedback for motion axes, conveyors, and metrology stations in industrial automation systems.

The terminal provides **2 independent input channels**, allowing one compact unit to receive feedback from a pair of position sensors. Each channel uses the **SSI** protocol, through which a 25-bit or similar serial data frame is clocked out of the connected encoder during every sampling cycle. Physical signaling complies with the differential **RS-422** standard, which improves noise immunity when signals travel through long shielded cables. Clock pulses can operate at up to **1 MHz**, enabling frequent position updates for fast-moving axes. After conversion, the position words are published on the network with deterministic timing, even when many terminals share the same bus segment.

The connected encoder must provide an **absolute data stream**, meaning each frame contains the complete position value and eliminates the need for homing after a power loss. The terminal electronics operate from **24 VDC**, allowing connection to common industrial control power supplies. Support for **distributed clocks** allows the terminal to synchronize its internal timer with the fieldbus master, minimizing jitter between data acquisition and drive commands. This timing capability helps coordinate measurements from separate axes while maintaining a

consistent relationship between sampled positions and control cycles. The terminal can be installed alongside compatible analog, digital, or safety I/O modules without additional gateway hardware.

Specifications

Approvals:	CE, CCC, UL, ATEX, IECEx	Channels:	2	Data direction:	read
Data transfer rate:	max 1 MHz (250 kHz default)	Distributed clocks:	Yes	E-bus current consumption:	typ. 130 mA
Encoder connection:	D+, D-, CI+, CI-	Encoder Interface:	SSI	Encoder operating voltage:	external (e.g. EL91xx)
Encoder Type:	Absolute	Ex marking:	ATEX II 3 G Ex ec IIC T4 Gc; IECEx Ex ec IIC T4 Gc	Fieldbus:	EtherCAT
Max Clock Frequency:	1 MHz	Number of channels:	2	Operating temperature:	-25 to +60 °C
Power supply:	24 V via power contacts	Pulse output signal:	differential (RS-422)	Serial input:	up to 32 bit (24 bit default)
Signal Standard:	RS422	Storage temperature:	-40 to +85 °C	Supply Voltage:	24 VDC
Last Verified:	10/24/2026 7:55 AM				

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