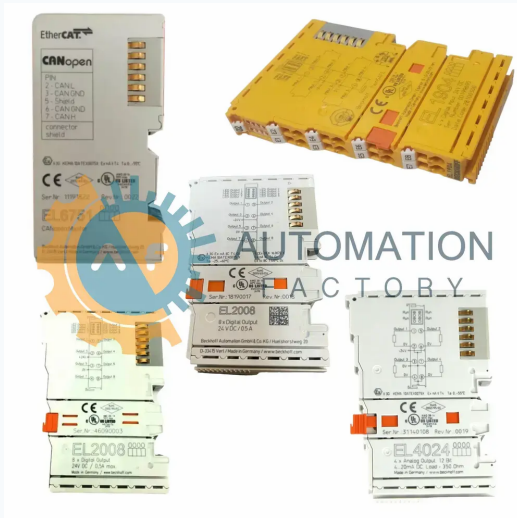




Beckhoff — EL EtherCAT Terminals

EL3001



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The **EL3001** analog input terminal is produced by Beckhoff within the EL EtherCAT Terminals series. Designed for distributed I/O systems, the unit converts a single-ended voltage signal into digital data that the EtherCAT master can process. In industrial automation, it provides modular acquisition of process variables such as pressure or speed, allowing precise control loops to operate over the fieldbus without separate analog wiring.

The terminal digitizes the incoming voltage with a resolution of **12 bits**, providing 4,096 discrete steps across the input range. A conversion time of **0.625 ms** per sample lets the controller refresh analog values during each cycle with minimal delay. An analog low-pass filter with a cutoff frequency of **1 kHz** suppresses higher-frequency noise before digitization so that only process-relevant components reach the analog-to-digital converter. For accurate voltage measurement, the input has an internal impedance greater than **130 k Ω** , minimizing the electrical load placed on sensitive transducers. After acquisition, each reading is mapped to a process image occupying **2 B for status + 2 B for value**, simplifying deterministic data exchange with the PLC task memory.

The housing has an **IP20** rating, making it suitable for enclosed panels where exposure to dust is limited and accidental contact with internal components is prevented. The electronics draw only **130 mA** from the E-bus, leaving more supply capacity available for other connected terminals. The input circuitry withstands common-mode potentials up to **30 V**, providing additional tolerance against wiring faults. It accepts an input range of **$\pm 10 V$** , matching the signals used by many servo drives, position transducers, and signal conditioners. The terminal uses single-ended grounding and supports simultaneous sampling. It operates without distributed clocks and maintains a

measuring error below $\pm 0.3\%$ of full scale. Its single analog channel also keeps process-image addressing straightforward within modular EtherCAT installations.

Specifications

Analog Inputs:	1	Approvals/markings:	CE, CCC, UL, ATEX, IECEx	Bit Width In The Process Image:	Inputs: 4 byte
Conversion Time:	0.625 ms	Current Consumption E-bus:	Typ. 130 mA	Dielectric Strength:	30 V
Distributed Clocks:	No	E-bus Current:	130 mA	Filter Cutoff:	1 kHz
Ground Reference:	Single-Ended	Input Filter Limit Frequency:	1 kHz	Internal Resistance:	>130 k?
Measurement Error/uncertainty:	< $\pm 0.3\%$ (relative to full scale value)	Measuring Error:	< $\pm 0.3\%$ FS	Number Of Inputs:	1 (single-ended)
Operating Temperature:	-25...+60°C	Power Supply:	E-bus	Process Image Width:	2 B status + 2 B value
Protection Rating:	IP20	Resolution:	12 bits	Sampling Type:	Simultaneous
Signal Voltage:	± 10 V	Storage Temperature:	-40...+85°C	Last Verified:	10/23/2026 7:25 PM

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