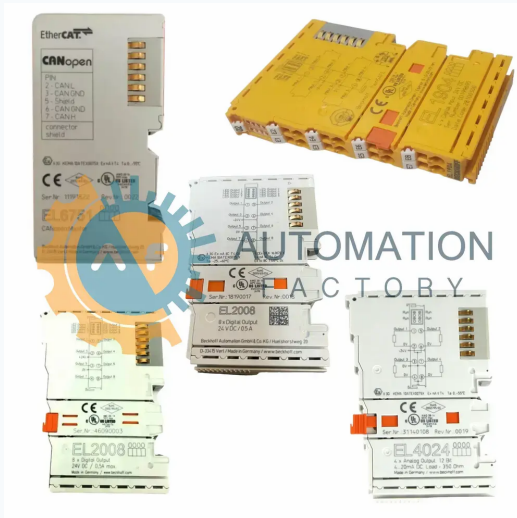




Beckhoff — EL EtherCAT Terminals

EL5151



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The **EL5151** is a single-channel counter terminal produced by Beckhoff within the EL EtherCAT Terminals series. Installed on an EtherCAT I/O string, it captures edge and direction information from encoders or pulse generators so that a PLC can determine position, speed, or event timing in automated machinery. This module fits into distributed control architectures where compact, high-resolution counting and precise timestamping are required close to sensors and actuators.

The terminal's standard counter uses a **32-bit register**, allowing unsigned counts up to 4.29 billion before rollover. A hardware decoder supports **4-fold quadrature evaluation**, so one electrical cycle from an incremental encoder yields four count increments and improves position granularity. For interpolation between full counts, the device offers **8-bit micro-increment resolution**, dividing each encoder period into 256 equal parts. Temporal measurement is precise because the internal period timer resolves events down to **100 ns**. This combination supports smooth velocity estimation in software control loops without requiring additional external timing hardware. The compact counter path uses **16-bit storage** to minimize process data when only small ranges are needed, while its matching **32-bit compact timestamp field** supports millisecond-range timing. For extended synchronization, the distributed-clock domain adds a DC timestamp register with **64-bit capacity**, aligning captured events with network time across multiple axes. The terminal actively participates in EtherCAT cycle synchronization through **Distributed Clocks**, keeping sampling jitter low even when several terminals share the bus. The terminal supports **four selectable PDO transmission formats**, allowing the application to use the format that best fits its

bandwidth and functionality requirements. Separate 32-bit words carry frequency, period, and additional timestamp values, letting the controller retrieve rate or interval data without extra calculations.

Specifications

Compact Counter Width:	16 bit	Compact Timestamp Width:	32 bit	Control Interface:	RS485
Dc Timestamp Width:	64 bit	Distributed Clock Functionality:	Yes	Distributed Clocks:	Yes
Frequency Value Width:	32 bit	Input Frequency (max):	100 kHz	Micro-increment Resolution:	8 bit
Micro-increment Steps:	256	Mounting Type:	DIN Rail	Nominal Voltage:	24 V DC
Operating Temperature:	-10°C to 60°C	Pdo Modes:	4	Period Resolution:	100 ns
Period Value Width:	32 bit	Power Consumption:	50 W	Power Consumption (E Bus):	130 mA
Power Consumption (Power Contacts):	100 mA + load	Quadrature Evaluation:	4-fold	Resolution:	1/256 bit micro increments
Standard Counter Width:	32 bit	Supported Encoder Type:	24 V HTL Encoders	Voltage Range:	220-240 VAC
Voltage Tolerance:	-15 % to +20 %	Last Verified:	10/25/2026 11:17 AM		

Contact Us

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