

PR152016

25th April 2016

Measurement, Industrial Ethernet

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EtherCAT I/O system: High-precision measurement technology integrated with standard control technology

EL3751 multi-function terminal: High-end measurement technology in the standard I/O system

With the new EL3751 EtherCAT Terminal, Beckhoff presents a new generation of high-precision I/Os for measurement applications. At 10,000 samples per second, a measurement accuracy of ± 0.01 % and 24 bit resolution, the EL3751 provides high-end measurement technology as part of the standard I/O system. Added to this is long-term stability, flexible filter configurations (e.g. band stop), and extensive parameterisation options for the analog input, which supports the measurement functions U, I, R, DMS (strain gauge) and RTD.

Reliable and high-precision acquisition of measurement data offers tremendous potential to optimise machine efficiency and production quality. This can also be achieved for demanding measurement technology tasks with the integrated EL3751 solution from Beckhoff, which combines automation and measurement technology on one universal hardware and software platform. The EL3751 1-channel EtherCAT Terminal for analog measurement technology combines high measurement accuracy – ± 0.01 % of the full scale value for most interfaces, at 25 °C (± 5 °C) – with a high sampling rate of up to 10,000 samples per second and 24 bit resolution (incl. sign). Other important factors include long-term hardware stability through pre-aging, as well as extensive configuration options for the nominal measuring range of the input channel. The XFC technology (eXtreme Fast Control) functions are likewise available in the EL3751.

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Optionally, the measured data can be transmitted to higher-level automation devices with oversampling. The integrated distributed clocks ensure precisely synchronised sampling across the EtherCAT system.

The "Extended Range" feature enables effective measurement even beyond the nominal measuring range, with possible extension up to 107 percent. To suppress aliasing effects, the input channel features two configurable numeric software filters up to 39th order FIR / 6th order IIR. The filters can be preselected or freely defined, so that a band stop or a band pass can be implemented.

The universal and integrated measurement solution

Each EL3751 has a unique serial number and is available with a factory calibration certificate on request. Since the input channel can be parameterised comprehensively, both electrically and on the software side, the measurement terminal can be used universally:

- Voltage measurement (± 5 mV to ± 30 V [incl. ± 10 V], 0...10 V, 0...5 V)
- Current measurement (± 20 mA, 4...20 mA, 0...20 mA, Namur NE43)
- Resistance measurement (0...5 k Ω)
- Electrical resistance R in 2-/3-/4-wire connection
- RTD measurement in 2-/3-/4-wire connection
- Strain gauge/load cell: $\frac{1}{4}$ bridge (350 Ω + 120 Ω), $\frac{1}{2}$ bridge (± 16 mV/V), full bridge (± 32 mV/V)
- Potentiometer (from 1 k Ω)

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The integrated supply and the switchable auxiliary resistors enable direct connection of: a resistor bridge (strain gauge) or a load cell, a fixed ohmic resistor, a PTC or a potentiometer.

Universal use of the EL3751 is supported in large part by its full integration within the standard control system. This significantly reduces engineering effort and costs when integrating high-precision measurement technology, optimises production processes and opens the door to many new applications. Moreover, extremely high-performance software tools are available in the TwinCAT 3 automation suite from Beckhoff, which is integrated in Visual Studio®. The software platform includes valuable tools such as TwinCAT Analytics and Scope for advanced analysis of measurement data. Additionally, integration with MATLAB®/Simulink® enables the optional use of corresponding simulation models in TwinCAT 3.

→ www.beckhoff.com/EL3751

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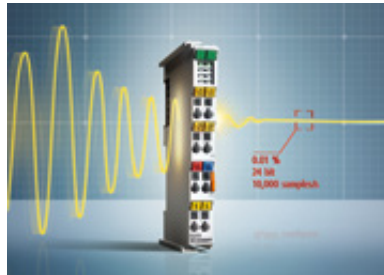
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Press picture:



Picture caption:

The measurement functionality of the EL3751 analog input terminal can be comprehensively parameterised, both electrically and on the software side.

Text and picture:

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