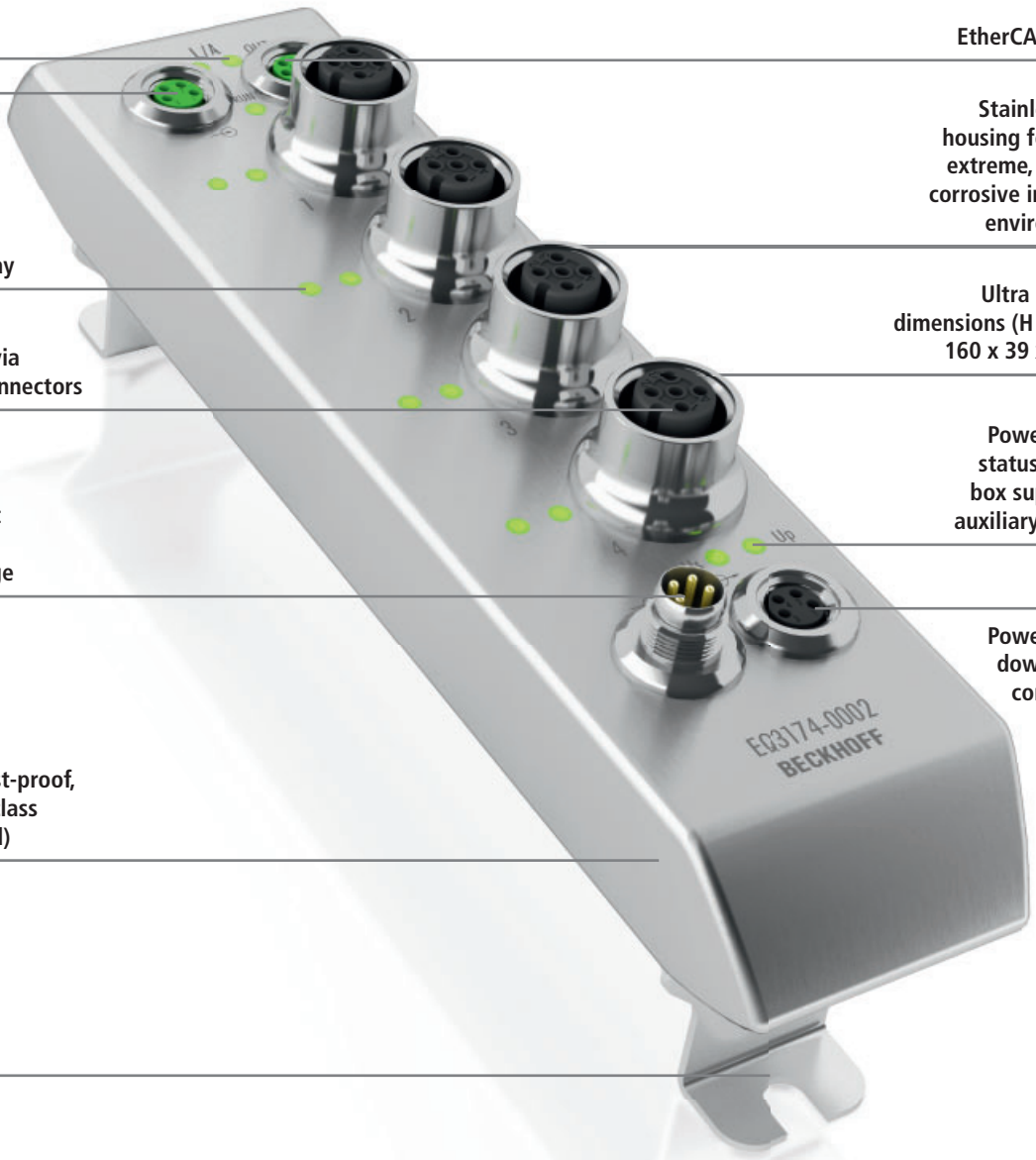
EQxxxx | EtherCAT Box (stainless steel housing)



Signal status

EtherCAT input

Signal status display

Connection of sensors/actuators via M12 screw type connectors

Power supply input
– box supply
– auxiliary voltage

Watertight and dust-proof, due to protection class IP 69K (fully potted)

Fixing lugs for screws M5

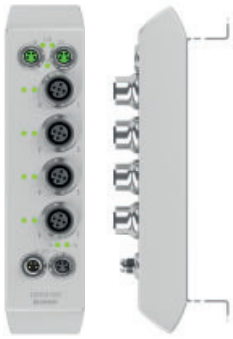
EtherCAT output

Stainless steel housing for use in extreme, harsh or corrosive industrial environments

Ultra compact dimensions (H x W x D) 160 x 39 x 43 mm

Power supply status display: box supply and auxiliary voltage

Power supply downstream connection



4 x M12

8 x M12

The Beckhoff EtherCAT Box system is complemented by modules in stainless steel design. The modules of the EQxxxx series feature "Hygienic Design" throughout. They can be used in extreme, harsh and corrosive industrial environments and are therefore ideal for applications in the food, chemical or pharmaceutical industries, which require protection class IP 69K.

The stainless steel EtherCAT Box modules cover the typical range of requirements of I/O signals: digital inputs with a filter of 3.0 ms, digital outputs with 0.5 A output current, and combi modules with freely selectable digital inputs or outputs. In addition, analog input modules for current/voltage measurement are available. Temperature measurement modules for resistance sensors or thermocouples complement the product range. The signals are connected via M12 connectors.

The modules of the EQxxxx series have an EtherCAT interface. The power supply and transfer takes place via M8 connectors or sockets.

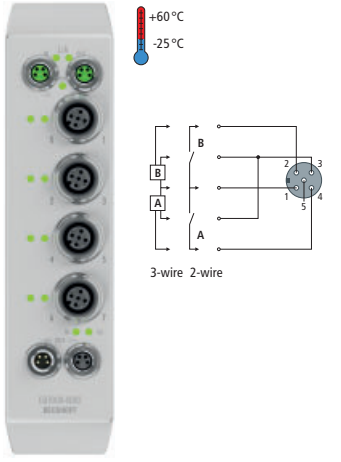
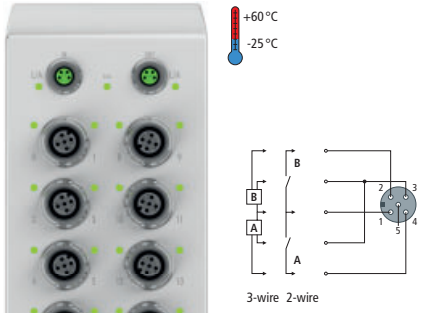
The EtherCAT Box modules in stainless steel are qualified for the extended temperature range of -25…+60 °C (storage temperature -40…+85 °C). This way, the IP 69K modules can also be used in extreme climates.

EQxxxx-00yz

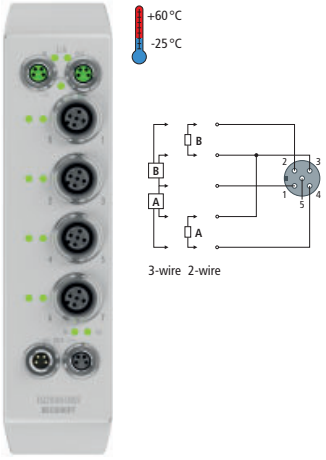
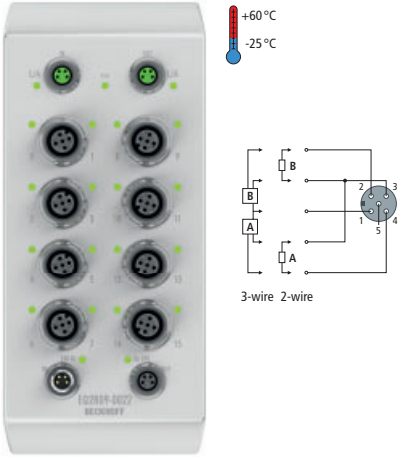
- 2 = connector M12, screw type, 5-pin
- 0 = width: 39 mm
- 2 = width: 72 mm
- Signals see page 500

▶ **www.beckhoff.com/EQxxxx**

Digital input | 24 V DC, positive switching

	8-channel digital input, 24 V DC, M12, type 1/3	16-channel digital input, 24 V DC, M12, type 1/3
Technical data	**EQ1008-0002**	**EQ1809-0022**
Connection technology	M12, screw type	M12, screw type
Specification	EN 61131-2, type 1/3	EN 61131-2, type 1/3
Input filter	3.0 ms	3.0 ms
Number of inputs	8	16
		
	The EQ1008 EtherCAT Box with digital inputs acquires the binary control signals from the process level and transmits them, in an electrically isolated form, to the controller. The signals are connected via M12 screw type connectors. The sensors are supplied from the box supply voltage U_S. The auxiliary voltage U_P is not used in the input module, but may be connected in order to be relayed downstream.	The EQ1809 EtherCAT Box with digital inputs acquires the binary control signals from the process level and transmits them, in an electrically isolated form, to the controller. The signals are connected via M12 screw type connectors. The sensors are supplied from the box supply voltage U_S. The auxiliary voltage U_P is not used in the input module, but may be connected in order to be relayed downstream.
Nominal voltage	24 V DC (-15 %/+20 %)	24 V DC (-15 %/+20 %)
Protocol	EtherCAT	EtherCAT
Bus interface	2 x M8 socket, shielded, screw type	2 x M8 socket, shielded, screw type
Distributed clocks	–	–
Sensor supply	from load supply voltage, max. 0.5 A total, short-circuit-proof	from load supply voltage, max. 0.5 A total, short-circuit-proof
Current consumption from U_S (without sensor current)	130 mA	130 mA
Electrical isolation	500 V	500 V
Operating temperature	-25…+60 °C	-25…+60 °C
Approvals	CE, UL in preparation	CE, UL in preparation
Further information	www.beckhoff.com/EQ1008	www.beckhoff.com/EQ1809

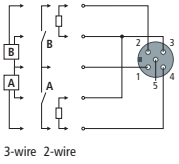
Digital output | **24 V DC, positive switching**

	8-channel digital output, 24 V DC, M12, I_{MAX} = 0.5 A	16-channel digital output, 24 V DC, M12, I_{MAX} = 0.5 A
Technical data	**EQ2008-0002**	**EQ2809-0022**
Connection technology	M12, screw type	M12, screw type
Load type	ohmic, inductive, lamp load	ohmic, inductive, lamp load
Max. output current	0.5 A each channel, individually short-circuit-proof, total current max. 4 A	0.5 A each channel, individually short-circuit-proof, total current max. 4 A
Number of outputs	8	16
	 The EQ2008 EtherCAT Box with digital outputs connects binary control signals from the controller on to the actuators at the process level. The eight outputs handle load currents of up to 0.5 A. The signals are connected via M12 screw type connectors. The outputs are short-circuit-proof and protected against inverse connection.	 The EQ2809 EtherCAT Box with digital outputs connects the binary control signals from the controller on to the actuators at the process level. The 16 outputs handle load currents of up to 0.5 A each, although the total current is limited to 4 A. This makes these modules particularly suitable for applications in which not all of the outputs are active at the same time, or in which not all of the actuators draw 0.5 A current. The signal state is indicated by means of light emitting diodes. The signals are connected via M12 screw type connectors. The outputs are short-circuit-proof and protected against inverse connection.
Nominal voltage	24 V DC (-15 %/+20 %)	24 V DC (-15 %/+20 %)
Current consumption from U_S (without sensor current)	120 mA	130 mA
Distributed clocks	–	–
Short circuit current	typ. 1.5 A	typ. 1.5 A
Auxiliary power current	typ. 20 mA + load	typ. 20 mA + load
Electrical isolation	500 V	500 V
Operating temperature	-25…+60 °C	-25…+60 °C
Approvals	CE, UL in preparation	CE, UL in preparation
Further information	www.beckhoff.com/EQ2008	www.beckhoff.com/EQ2809

Digital combi | **24 V DC, positive switching**

16-channel digital input or output,
freely configurable, 24 V DC, M12,
I_{MAX} = 0.5 A

Technical data	EQ2339-0022
Connection technology	M12, screw type
Specification	EN 61131-2, type 1/3
Input filter	3.0 ms
Number of channels	16 digital inputs or outputs, freely configurable



The EQ2339 EtherCAT Box has 16 freely configurable digital inputs or outputs in one device. A filter constant of 3.0 ms is available for the inputs. The outputs are short-circuit-proof and protected against inverse polarity. They handle load currents of up to 0.5 A each, although the total current is limited to 4 A. The signals are connected via M12 screw type connectors. The sensors are powered by the load voltage U_P.

Nominal voltage	24 V DC (-15 %/+20 %)
Max. output current	0.5 A each channel, individually short-circuit-proof, total current max. 4 A
Load type	ohmic, inductive, lamp load
Sensor supply	from load supply voltage, max. 0.5 A total, short-circuit-proof
Distributed clocks	–
Short circuit current	typ. 1.5 A
Auxiliary power current	typ. 20 mA + load
Current consumption from U_S (without sensor current)	130 mA
Electrical isolation	500 V
Operating temperature	-25…+60 °C
Approvals	CE, UL in preparation
Further information	www.beckhoff.com/EQ2339


IN
OUT
24V
EQ3174-0002
BECKHOFF
EQ2339-0022
BECKHOFF

Analog input | -10…+10 V, 0/4…20 mA, temperature

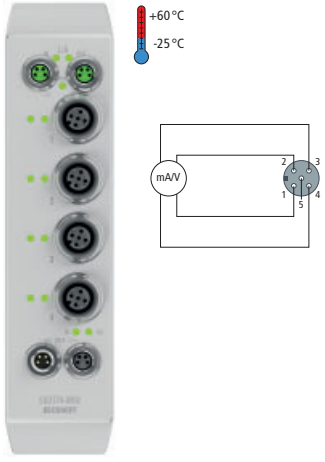
The EQ3174 EtherCAT Box evaluates analog standard signals within the range of -10/0 V to +10 V or 0/4 mA to 20 mA with 16-bit resolution. The signal form is separately configurable for each channel. The EQ3174 evaluates the difference between the two input signals Input+ and Input-. These must be referred to the ground potential of the load voltage U_P. The DC component does not affect the measurement, as long as it is in the common mode range.

The EQ3204 analog input module is intended for the direct connection of resistance thermometers. The resistance is measured with a low measuring current, linearised and represented in 0.1 °C. The EtherCAT Box supports 2-, 3- and 4-wire measurement on all four channels. The measurements serve to eliminate or deduct the parasitic resistance of the sensor cable. All inputs are separately configurable for a wide range of sensors, for the three measurement procedures and for the direct measurement of resistance.

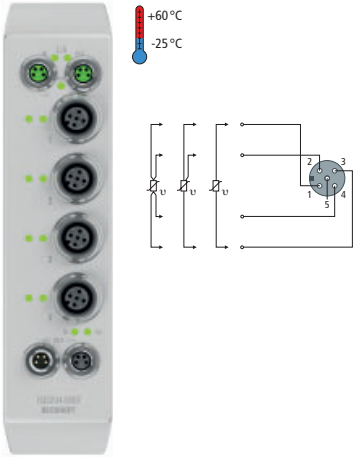
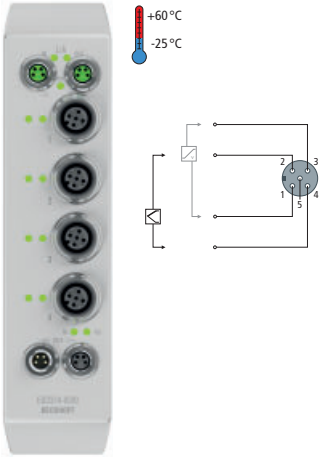
The EQ3314 EtherCAT Box enables the measurement of temperature using thermocouples. The measured thermovoltage is linearised in accordance with the characteristic of the respective type and transferred to the controller as a temperature value in 1/10 °C or 1/100 °C. The inputs are separately configurable for a wide range of different sensor types. Parasitic thermovoltages arise at the interface of the measuring cable and the module, significantly falsifying the measurement. This error is eliminated by a compensation connector.

4-channel analog input,
-10/0…+10 V or 0/4…20 mA,
parameterisable, differential input,
16 bit

Technical data	EQ3174-0002
Connection technology	M12, screw type
Signal type	-10/0…+10 V | 0/4…20 mA
Resolution	16 bit (incl. sign)
Conversion time	~ 100 µs
Number of inputs	4
Measuring error	< ±0.3 % (relative to full scale value)
Distributed clocks	yes
Sensor types	–
Measuring range	–
Internal resistance	> 200 kΩ | 85 Ω typ. + diode voltage
Sensor supply	from load supply voltage U_P, DC, any value up to 30 V
Current consumption from U_S (without sensor current)	120 mA
Operating temperature	-25…+60 °C
Approvals	CE, UL in preparation
Further information	www.beckhoff.com/EQ3174



The EQ3174 EtherCAT Box has four analog inputs which can be individually parameterised, so that they process signals either in the -10…+10 V or the 0/4…20 mA range. The voltage or input current is digitised with a resolution of 16 bit, and is transmitted (electrically isolated) to the higher-level automation device. The four input channels have differential inputs and have a common, internal ground potential. The input filter and therefore the conversion times are configurable in a wide range.

	4-channel analog input, PT100 (RTD), parameterisable, 16 bit	4-channel analog input, thermocouple/mV, parameterisable, 16 bit
	EQ3204-0002	**EQ3314-0002**
	M12, screw type	M12, screw type
	PT100	thermocouple
	0.1 °C per digit	0.1 °C per digit
	800 ms up to 2 ms, see documentation, default: approx. 85 ms	2.5 s up to 20 ms, see documentation, default: approx. 250 ms
	4	4
		
	The EQ3204 EtherCAT Box with analog inputs allows resistance sensors to be connected directly. The module's circuitry can operate the sensors using 2-, 3- or 4-wire connection techniques. Linearisation over the full temperature range is realised with the aid of a microprocessor. The temperature range can be selected freely. The module can also be used for simple resistance measurement. The module's standard settings are: resolution 0.1°C in the temperature range of PT100 sensors in 2-wire connection.	The EQ3314 EtherCAT Box with analog inputs permits four thermocouples to be connected directly. The module's circuit can operate thermocouple sensors using the 2-wire technique. Linearisation over the full temperature range is realised with the aid of a microprocessor. The temperature range can be selected freely. Compensation for the cold junction is made through a temperature measurement in the connecting plugs. This means that standard extension leads can be connected. The EQ3314 can also be used for mV measurement.
	< ±0.5 °C for PT sensors (further types see documentation)	< ±0.3 % for type K (relative to full scale value), further types see documentation
	–	–
	PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni1000 resistance measurement (e.g. potentiometer, 10 Ω…1.2/4 kΩ)	types J, K, L, B, E, N, R, S, T, U (default setting type K), mV measurement
	-200…+850 °C (PT sensors); -60…+250 °C (Ni sensors)	depending on sensor type; preset value is type K, -100…+1,370 °C
	–	–
	–	–
	120 mA	120 mA
	-25…+60 °C	-25…+60 °C
	CE, UL in preparation	CE, UL in preparation
	www.beckhoff.com/EQ3204	www.beckhoff.com/EQ3314