EtherCAT Module Labels

Each EtherCAT terminal requires a set of labels to represent its signal and power contacts as well as its module identification. A list of available labels is presented below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Product Number** | **Label** | **Color** | **Usage** |
| BZ1210 | 0...9 | orange | Module identification |
| BZ1211 | 10...19 | orange | Module identification |
| BZ1212 | 20...29 | orange | Module identification |
| BZ1213 | 30...39 | orange | Module identification |
| BZ1214 | 40...49 | orange | Module identification |
| BZ1215 | 50...59 | orange | Module identification |
| BZ1104 | 24V | red | 24V supply voltage |
| BZ1100 | 0V | blue | Return of 24V supply voltage |
| BZ1102 | ‒ | blue | Negative terminal of supply voltage |
| BZ1106 | + | red | Positive terminal of supply voltage |
| BZ1155 | 5V | red | 5V supply voltage |
| BZ1162 | GND | blue | Return of 5V supply voltage |
| BZ1521 | COM | blue | Common return for converters |
| BZ1108 | PE | green | Power earth |
| BZ1134 | S | green | Shield connection |
| BZ1000 |  | white | Blank label |
| BZ1451 | I1 | yellow | Binary and single-ended analog inputs |
| BZ1452 | I2 | yellow | Binary and single-ended analog inputs |
| BZ1453 | I3 | yellow | Binary and single-ended analog inputs |
| BZ1454 | I4 | yellow | Binary and single-ended analog inputs |
| BZ1592 | I5 I6 | yellow | Binary and single-ended analog inputs |
| BZ1593 | I7 I8 | yellow | Binary and single-ended analog inputs |
| BZ1446 | O1 | yellow | Binary and single-ended analog outputs |
| BZ1447 | O2 | yellow | Binary and single-ended analog outputs |
| BZ1448 | O3 | yellow | Binary and single-ended analog outputs |
| BZ1449 | O4 | yellow | Binary and single-ended analog outputs |
| BZ1651 | O5 O6 | yellow | Binary and single-ended analog outputs |
| BZ1652 | O7 O8 | yellow | Binary and single-ended analog outputs |
| BZ1795 | I1+ I2+ | yellow | Differential analog inputs |
| BZ1796 | I3+ I4+ | yellow | Differential analog inputs |
| BZ1797 | I1‒ I2‒ | yellow | Differential analog inputs |
| BZ1798 | I3‒ I4‒ | yellow | Differential analog inputs |
| BZ1799 | Q1+ Q2+ | orange | Differential outputs |
| BZ1800 | Q3+ Q4+ | orange | Differential outputs |
| BZ1801 | Q1‒ Q2‒ | orange | Differential outputs |
| BZ1802 | Q3‒ Q4‒ | orange | Differential outputs |

|  |  |  |  |
| --- | --- | --- | --- |
| BZ1360 | +R1...+R4 | red | 4-wire measurement, positive supply |
| BZ1361 | ‒R1...‒R4 | blue | 4-wire measurement, negative supply |
| BZ1481 | ‒R1...‒R4 | yellow | 4-wire measurement, differential input |
| BZ1482 | +R1...+R4 | yellow | 4-wire measurement, differential input |
| BZ1318 | A1 | yellow | Motor output |
| BZ1319 | A2 | yellow | Motor output |
| BZ1734 | B1 | yellow | Motor output |
| BZ1735 | B2 | yellow | Motor output |
| BZ1124 | A | yellow | Encoder input |
| BZ1126 | B | yellow | Encoder input |
| BZ1692 | 00…47 | yellow | Relay contacts |

1. Available Labels.

# General

A standard EtherCAT module has 10 locations for attaching labels. They are arranged in 2 columns and 5 rows. The top row is used to denote the module number and we only use one location. This leaves 8 locations for marking input, output and power contacts.

|  |  |
| --- | --- |
| **0** | |
| **1** | **2** |
| **3** | **4** |
| **5** | **6** |
| **7** | **8** |

1. ****Label location on standard EtherCAT module.****

# Module Number

We are using an orange number at location 0 to denote the EtherCAT module number, or its position within the stick. This is the same number referenced in the schematics.

# Signal and Supply Contacts

We list each module and its corresponding labels. We mostly follow the examples given in the manual. Some of the communication terminals do not have label positions and stay as they are.

# Coupler: EK1100, EK1101, EK1501

These are usually labeled by the factory. We use the same.

|  |  |
| --- | --- |
| **#** | |
| **24V** | **0V** |
| **+** | **+** |
| **̶** | **̶** |
| **PE** | **PE** |

1. Labels for EtherCAT couplers.

If the terminal is not labeled, the “+” and “-“ labels should be replaced by the supply voltage labels as is described for the power supply terminal EL9400.

# Extension: EK1110

This terminal has no contacts. Cover empty locations with white or gray blank labels.

|  |  |
| --- | --- |
| **#** | |
|  |  |
|  |  |
|  |  |
|  |  |

1. Labels for the extension terminal EK1110.

# Power Supply Terminal: EL9400/EL9410

The power contacts can be used for different voltages. We distinguish 5V supply terminals and 24V supply terminals.

|  |  |
| --- | --- |
| **#** | |
| **24V** | **0V** |
| **5V** | **5V** |
| **GND** | **GND** |
| **PE** | **PE** |

1. Labels for 5V power supply terminal.

|  |  |
| --- | --- |
| **#** | |
| **24V** | **0V** |
| **24V** | **24V** |
| **0V** | **0V** |
| **PE** | **PE** |

1. Labels for 24V power supply terminal.

# Feed Terminal: EL9190

The power contacts can be used for different voltages. We distinguish 5V feed terminals and 24V feed terminals. Cover empty locations with white or gray blank labels.

|  |  |
| --- | --- |
| **#** | |
|  |  |
| **5V** | **5V** |
| **GND** | **GND** |
|  |  |

1. Labels for 5V power supply terminal.

|  |  |
| --- | --- |
| **#** | |
|  |  |
| **24V** | **24V** |
| **0V** | **0V** |
|  |  |

1. Labels for 24V power supply terminal.

# Analog Input: EL3102

This terminal has a separate common contact to set the ground voltage of the internal converter.

|  |  |
| --- | --- |
| **#** | |
| **I1+** | **I2+** |
| **I1‒** | **I2‒** |
| **COM** | **COM** |
| **S** | **S** |

1. Labels for the 2-channel 16 bit analog input terminal EL3102.

# Analog Input: EL3104

This terminal does not have a separate common contact to set the ground voltage of the internal converter. The converter ground is provided by the power contact ground (on the side).

|  |  |
| --- | --- |
| **#** | |
| **I1+** | **I2+** |
| **I1‒** | **I2‒** |
| **I3+** | **I4+** |
| **I3‒** | **I4‒** |

1. Labels for the 4-channel 16 bit analog input terminal EL3104.

# Temperature Input PT100: EL3202-0010

This terminal uses a 4-wire hookup to accurately measure the resistance of a PT100 element. The supply voltage is provided by the red +R and blue –R contacts. The measurement is done between the yellow +R and –R contacts.

|  |  |
| --- | --- |
| **#** | |
| **+R1** | **+R2** |
| **+R1** | **+R2** |
| **‒R1** | **‒R2** |
| **‒R1** | **‒R2** |

1. Labels for the 2-channel 16 bit analog input terminal EL3202-0010.

# Resistance Measurement 10 mΩ…10 MΩ, high-precision: EL3692

This terminal uses a 4-wire hookup to accurately measure the resistance. The supply voltage is provided by the red +R and blue –R contacts. The measurement is done between the yellow +R and –R contacts.

|  |  |
| --- | --- |
| **#** | |
| **+R1** | **+R2** |
| **+R1** | **+R2** |
| **‒R1** | **‒R2** |
| **‒R1** | **‒R2** |

1. Labels for the 2-channel 16 bit analog input terminal EL3692.

# 4...20mA Analog Input: EL3154

This terminal uses the 24V supply on the power contacts (side) to provide power to the sensors. The current loop is closed through the measurement contacts (Ix).

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **24V** | **24V** |
| **I3** | **I4** |
| **24V** | **24V** |

1. Labels for the 4-channel 16 bit 4...20mA analog input terminal EL3154.

# Analog Output: EL4132

This terminal has a common contact that sets the ground voltage of the internal converter and is used as the ground of the signal output. It has to be wired to the ground of the connected device. Cover empty locations with white or gray blank labels.

|  |  |
| --- | --- |
| **#** | |
| **O1** | **O2** |
|  |  |
| **COM** | **COM** |
| **S** | **S** |

1. Labels for the 2-channel 16 bit analog output terminal EL4102.

# Analog Output: EL4134

This terminal does not have a separate common contact. The converter ground is provided by the power contact ground (on the side). The output stages of the converter are powered by the power contact for 24V (on the side).

|  |  |
| --- | --- |
| **#** | |
| **O1** | **O2** |
| **COM** | **COM** |
| **O3** | **O4** |
| **COM** | **COM** |

1. Labels for the 4-channel 16 bit analog output terminal EL4104.

# Digital Input: EL1124

This terminal has to be supplied with 5V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **5V** | **5V** |
| **GND** | **GND** |
| **I3** | **I4** |

1. Labels for the 4-channel TTL digital input terminal EL1124.

# Digital Input: EL1012

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **24V** | **24V** |
| **GND** | **GND** |
| **PE** | **PE** |

1. Labels for the 2-channel 24V digital input terminal EL1012.

# Digital Input: EL1014

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **24V** | **24V** |
| **24V** | **24V** |
| **I3** | **I4** |

1. Labels for the 4-channel 24V digital input terminal EL1014.

# Digital Input: EL1018

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **I3** | **I4** |
| **I5** | **I6** |
| **I7** | **I8** |

1. Labels for the 8-channel 24V digital input terminal EL1018.

# Digital Input: EL1094

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **GND** | **GND** |
| **GND** | **GND** |
| **I3** | **I4** |

1. Labels for the 4-channel 24V digital input terminal EL1094 (switching to negative potential).

# Digital Input: EL1098

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **I1** | **I2** |
| **I3** | **I4** |
| **I5** | **I6** |
| **I7** | **I8** |

1. Labels for the 8-channel 24V digital input terminal EL1098 (switching to negative potential).

# Digital Output: EL2124

This terminal has to be supplied with 5V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **O1** | **O2** |
| **5V** | **5V** |
| **GND** | **GND** |
| **O3** | **O4** |

1. Labels for the 4-channel TTL digital output terminal EL2124.

# Digital Output: EL2002

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **O1** | **O2** |
| **24V** | **24V** |
| **GND** | **GND** |
| **PE** | **PE** |

1. Labels for the 2-channel TTL digital output terminal EL2002.

# Digital Output: EL2004

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **O1** | **O2** |
| **GND** | **GND** |
| **GND** | **GND** |
| **O3** | **O4** |

1. Labels for the 4-channel TTL digital output terminal EL2004.

# Digital Output: EL2008

This terminal has to be supplied with 24V through the power feed side contacts.

|  |  |
| --- | --- |
| **#** | |
| **O1** | **O2** |
| **O3** | **O4** |
| **O5** | **O6** |
| **O7** | **O8** |

1. Labels for the 8-channel TTL digital output terminal EL2008.

# Relay Output: EL2624

This terminal does not use the power feed side contacts, but passes them through.

|  |  |
| --- | --- |
| **#** | |
| **13** | **23** |
| **14** | **24** |
| **33** | **43** |
| **34** | **44** |

1. Labels for the 4-channel relay digital output terminal EL2624.

# Safety Digital Input: EL1904

This terminal has to be supplied with 24V through a power feed terminal.

|  |  |
| --- | --- |
| **#** | |
| **I1+** | **I2+** |
| **I1‒** | **I2‒** |
| **I3+** | **I4+** |
| **I3‒** | **I4‒** |

1. Labels for the 4-channel safety digital input terminal EL1904.

# Safety Digital Output: EL2904

This terminal has to be supplied with 24V through a power feed terminal. Cover empty locations with white or gray blank labels.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | | | |
|  |  | **Q1+** | **Q2+** |
| **24V** | **24V** | **Q1‒** | **Q2‒** |
| **GND** | **GND** | **Q3+** | **O4+** |
|  |  | **Q3‒** | **Q4‒** |

1. Labels for the 4-channel safety digital output terminal EL2904.

# Safety PLC Terminal: EL6900

This terminal has no contacts. Cover empty locations with white or gray blank labels.

|  |  |
| --- | --- |
| **#** | |
|  |  |
|  |  |
|  |  |
|  |  |

1. Labels for the safety PLC terminal EL6900.

# Memory Terminal: EL6080

This terminal has no contacts. Cover empty locations with white or gray blank labels.

|  |  |
| --- | --- |
| **#** | |
|  |  |
|  |  |
|  |  |
|  |  |

1. Labels for the memory terminal EL6080.

# Motor Terminal: EL7332

This terminal requires a 24V supply.

|  |  |
| --- | --- |
| **#** | |
| **A1** | **A2** |
| **B1** | **B2** |
| **24V** | **0V** |
| **I1** | **I2** |

1. Labels for the motor terminal EL7332.

# Motor Terminal: EL7342

This terminal has to be supplied with 24V through a power feed terminal. Cover empty locations with white or gray blank labels.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | | | |
| **A** | **B** | **A1** | **A2** |
| **A** | **B** | **B1** | **B2** |
| **24V** | **0V** | **24V** | **0V** |
| **I1** | **I2** | **+** | **‒** |

1. Labels for the 2-channel DC motor output stage 50 V DC, 3.5 A, EL7342.