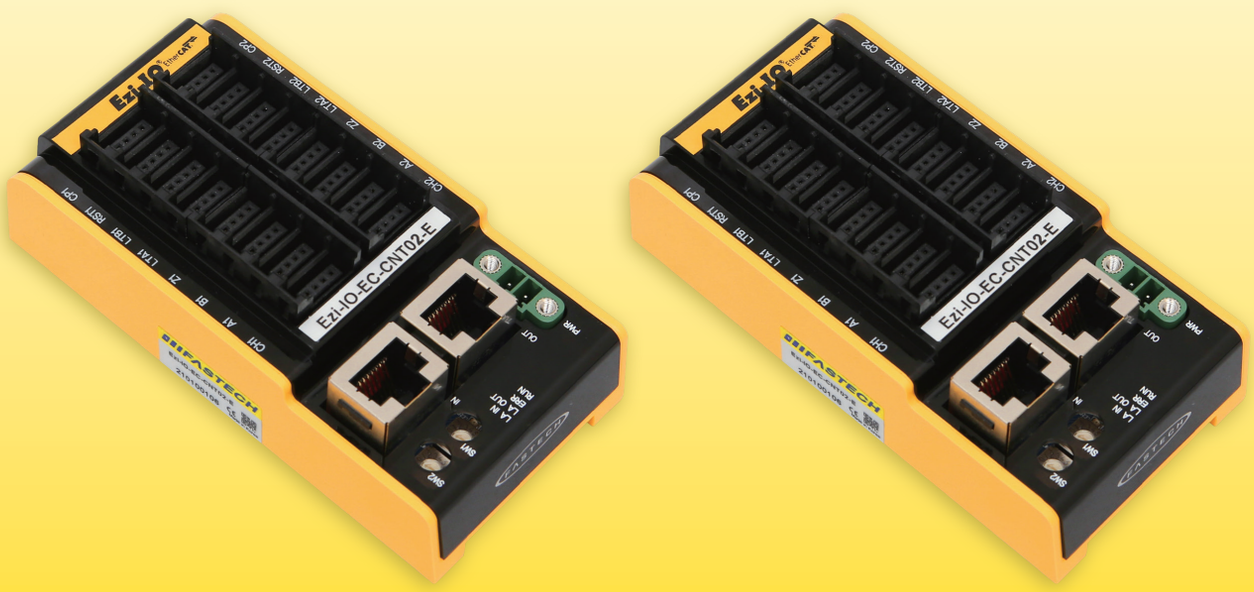
# Ezi-IO®

## Input/Output Module

- EtherCAT Based High Speed Counter Module
- All EtherCAT Synchronization Modes Supported
- Simple and Easy Wiring
- Line receiver and DC input type provided
- Equipped with comparison output function

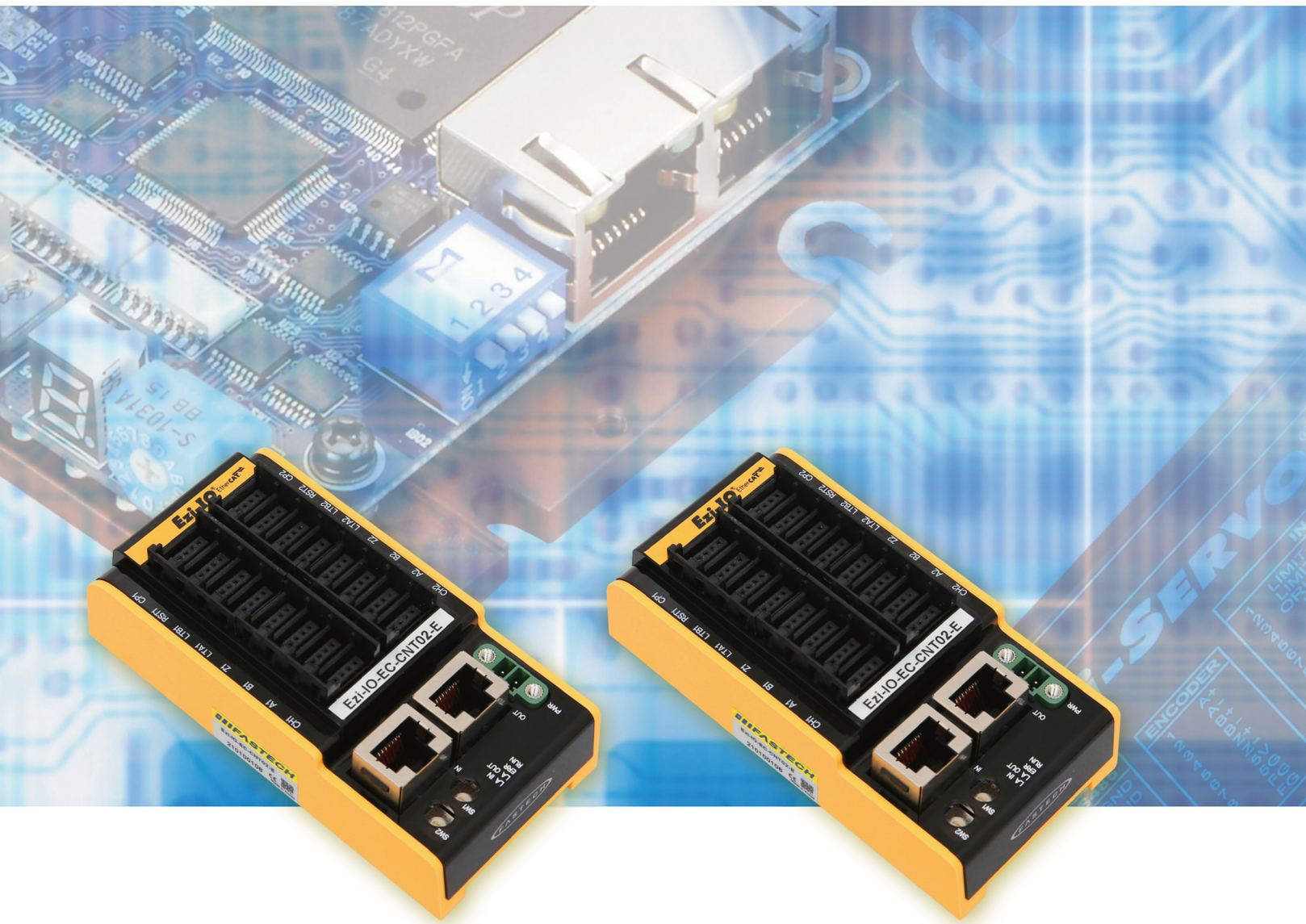
EtherCAT®

**CNT**




FASTECH

*Fast, Accurate, Smooth Motion*

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# Ezi-IO®

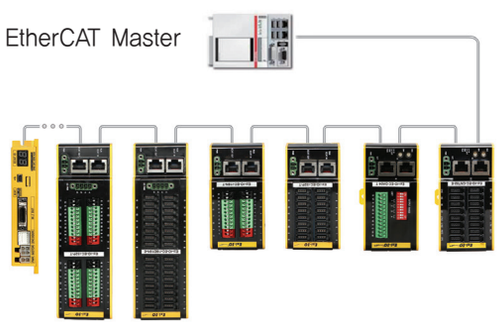
EtherCAT®

## Input/Output Module

CNT

## 1 EtherCAT Based High Speed Counter Module

Ezi-IO EtherCAT CNT is a Counter module which supports EtherCAT, a fieldbus based on high speed Ethernet (100Mbps, Full-Duplex). Ezi-IO EtherCAT CNT is an EtherCAT Slave module which supports CoE(-CAN Application layer over EtherCAT). It can be connected to the EtherCAT master without topology limitation.




## 2 Simple and Easy Wiring

Ezi-IO EtherCAT CNT uses 4-pin e-CON connectors. The e-CON connector is widely used in the sensor connector industry, and making the wiring much simpler and easier.

## 3 EtherCAT Synchronization Modes

Ezi-IO EtherCAT CNT supports all EtherCAT synchronization modes. You can select from Free Run, SM Event, DC SYNC Event synchronization mode according to the purpose of use.

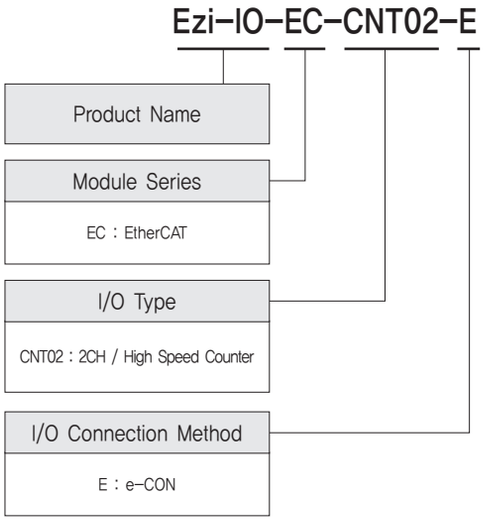
## 4 Various Input Types Supported

Ezi-IO EtherCAT CNT can be connected to various external devices without special input setting because the counter input circuit of Ezi-IO EtherCAT CNT supports both open collector output and line drive output.

## 5 Comparison Output Available

Comparison output function outputs ON/OFF signals by comparing the reference value and the current value of the counter. Up to 60 comparison position values can be set for each channel. Comparison output function supports TTL output and open collector output.

## ● Ezi-IO EtherCAT CNT Part Numbering




## ● Ezi-IO EtherCAT CNT Part Number

| Part Number |
| --- |
| Ezi-IO-EC-CNT02-E |

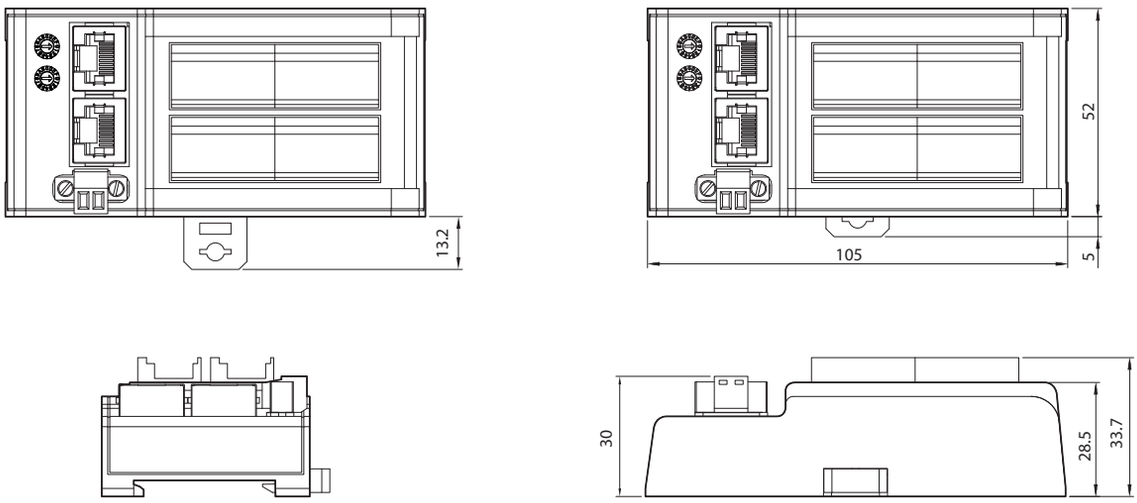
## ● Specifications of Module

| Model | | | Ezi-IO-EC-CNT02-E | |
|---|---|---|---|---|
| Input Voltage | | | DC24V±10% | |
| Current Consumption | | | Max. 160mA (DC5V Encoder supply current and Except load current) | |
| Operating Condition | Ambient Temperature | | · In Use : 0~50℃<br>· In Storage: -20~70℃ | |
| | Humidity | | · In Use : 35~85%RH (Non-Condensing)<br>· In Storage: 10~90%RH (Non-Condensing) | |
| | Vib. Resist. | | 0.5g | |
| Function | Number of Channels | | 2CH | |
| | Count Range | | 0~4,294,967,295 (32bit) | |
| | Counter Function | | · Counter Value Latch<br>· Counter Value Reset<br>· Counter Value Preset<br>· Pulse Rate Measurement<br>· Comparison Output | |
| | Pulse Input | Input Signal | 3 dedicated Inputs (A phase, B phase, Z phase) for each channel | |
| | | Input Type | Line Receiver Input (Line Driver Output Support) | DC Input (NPN/PNP Open Collector Output Supported) |
| | | Rated Input Voltage | DC5V | DC24V, DC5V |
| | | Rated Input Current | 6.3mA | |
| | | Pulse Input Method | · Phase Differential Pulse Input (Multiplication X2, X4)<br>· 1 Pulse Input (Pulse/Direction Input)<br>· 2 Pulse (CW/CCW Input) | |
| | | Max Response Frequency | · A Phase, B Phase:<br>– Phase Differential Pulse Input: 1MHz (When multiplied by 4, 4MHz)<br>– 1 Pulse / 2 Pulse Input: 4MHz<br>· Z Phase: 100kHz | |
| | | Isolation Method | Photocoupler Isolation | |
| | Control Input | Input Signal | 3 dedicated Inputs (Latch A, Latch B, Reset) for each channel | |
| | | Input Type | DC Input (NPN/PNP Open Collector Output Supported) | |
| | | Rated Input Voltage | DC24V | DC5V |
| | | Rated Input Current | 4.4mA | 4.6mA |
| | | Off→On Response Time | 3μs or lower | |
| | | On→Off Response Time | 3μs or lower | |
| | | Isolation Method | Photocoupler Isolation | |
| | Comparison Output | Output Signal | 1 dedicated Input (Comparison Output) for each channel | |
| | | Output Type | TTL Output | Open Collector Output (Transistor Output) |
| | | Rated Output Voltage | DC5V | DC30V or lower |
| | | Rated Output Current | Max. 20mA | Max. 20mA |
| | | Off→On Response Time | 150ns or lower | About 20μs* |
| | | On→Off Response Time | 150ns or lower | About 20μs* |
| | | Isolation Method | None | Photocoupler Isolation |
| LED Display | | | · Power Status (PWR)<br>· EtherCAT Status (RUN)<br>· Operation Error (ERR)<br>· EtherCAT Connection (LA IN, LA OUT)<br>· Counter Operation Status (CH1, CH2)<br>· I/O Status<br>(A1, B1, Z1, LTA1, LTB1, RST1, CP1, A2, B2, Z2, LTA2, LTB2, RST2, CP2) | |
| EtherCAT | Protocol | | CoE, FoE (Firmware Download) | |
| | Synchronization | | Free Run, SM Event, DC SYNC Event | |
| | Bus Interface | | 2×RJ45 Connector | |
| | Cable | | STP (Shielded Twisted Pair) Cable, Category 5e or higher / Max. 100m | |

* This is the value when 24V DC power and a load resistance of 2kΩ are connected, and the value may change depending on the circuit configuration.

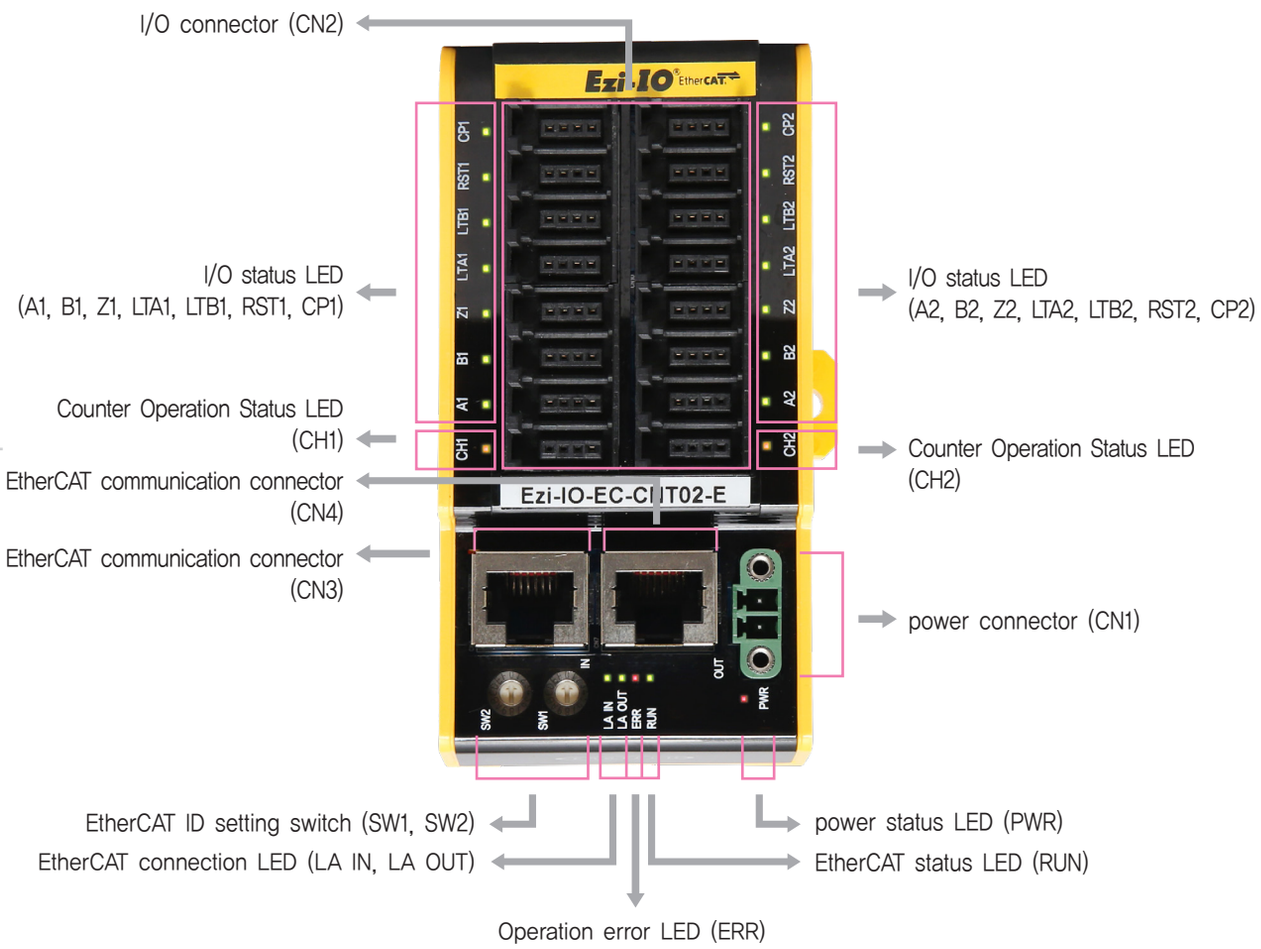
## ● Dimensions of Module [mm]

### ◆ Ezi-IO-EC-CNT02-E

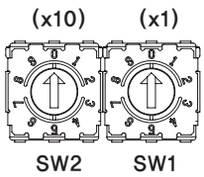



* Install the product on a din rail with a width of 35 mm.

## ● Settings and Operation [Ezi-IO-EC-CNT02-E]



## 1. EtherCAT ID Setting Switch (SW1, SW2)




They are switches to set the EtherCAT ID (ECAT Device ID) node address, and they represent a decimal number.
SW1 indicates the units digit (×1), and SW2 indicates the tens digit (×10).

## 2. Status LED

- Power status LED

| Name | Color | Status | Description |
|---|---|---|---|
| PWR | Red | OFF | Power is OFF |
| | | ON | Power is ON |

- EtherCAT Status LED

| Name | Color | Status | Description |
|---|---|---|---|
| RUN | Green | OFF | State INIT or Power OFF |
| | | Blinking | State PRE-OPERATIONAL |
| | | Single Flash | State SAFE-OPERATIONAL |
| | | ON | State OPERATIONAL |
| | | Flickering | State BOOTSTRAP |

- Operation Error LED

| Name | Color | Status | Description |
|---|---|---|---|
| ERR | Red | OFF | No Error or Power OFF |
| | | Blinking | Invalid Configuration |
| | | Single Flash | Local Error |
| | | Double Flash | Watchdog Time Out |

- EtherCAT Connection LED

| Name | Name | Status | Description |
|---|---|---|---|
| LA IN / LA OUT | Green | OFF | Link not Established |
| | | ON | Link Established |
| | | Flickering | Link Established and in Operation |

- Counter Operation Status LED

| Name | Name | Status | Description |
|---|---|---|---|
| CH1 / CH2 | Yellow | OFF | CH1 / CH2 is not ready to count |
| | | ON | CH1 / CH2 is ready to count |

• I/O Status LED

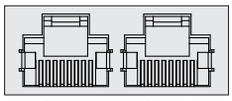
| Name | Color | Status | Description |
|---|---|---|---|
| A1 / A2 | Green | OFF | A signal is OFF |
| | | ON | A signal is ON |
| B1 / B2 | Green | OFF | B signal is OFF |
| | | ON | B signal is ON |
| Z1 / Z2 | Green | OFF | Z signal is OFF |
| | | ON | Z signal is ON |
| LTA1 / LTA2 | Green | OFF | LTA(Latch A) signal is OFF |
| | | ON | LTA(Latch A) signal is ON |
| LTB1 / LTB2 | Green | OFF | LTB(Latch B) signal is OFF |
| | | ON | LTB(Latch B) signal is ON |
| RST1 / RST2 | Green | OFF | RST(Reset) signal is OFF |
| | | ON | RST(Reset) signal is ON |
| CP1 / CP2 | Green | OFF | CP(Comparison Out) signal is OFF |
| | | ON | CP(Comparison Out) signal is ON |

## 3. Power Connector (CN1)

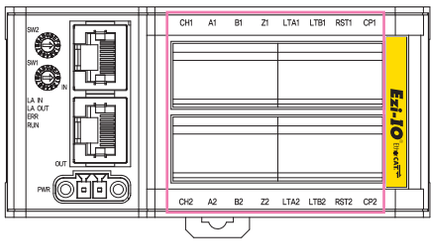
| No. | Function | I/O |
|---|---|---|
| 1 | DC24V | Input |
| 2 | GND | Input |

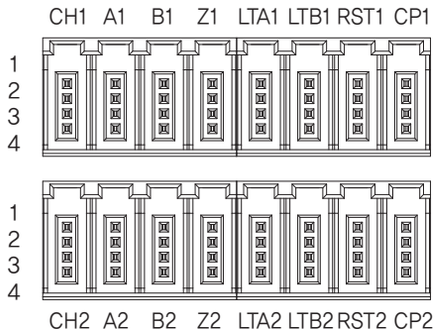

## 4. EtherCAT Communication Connection (CN3, CN4)

| No. | Function |
|---|---|
| 1 | TD+ |
| 2 | TD− |
| 3 | RD+ |
| 4 | ---- |
| 5 | ---- |
| 6 | RD− |
| 7 | ---- |
| 8 | ---- |
| Connector Hood | F.GND |



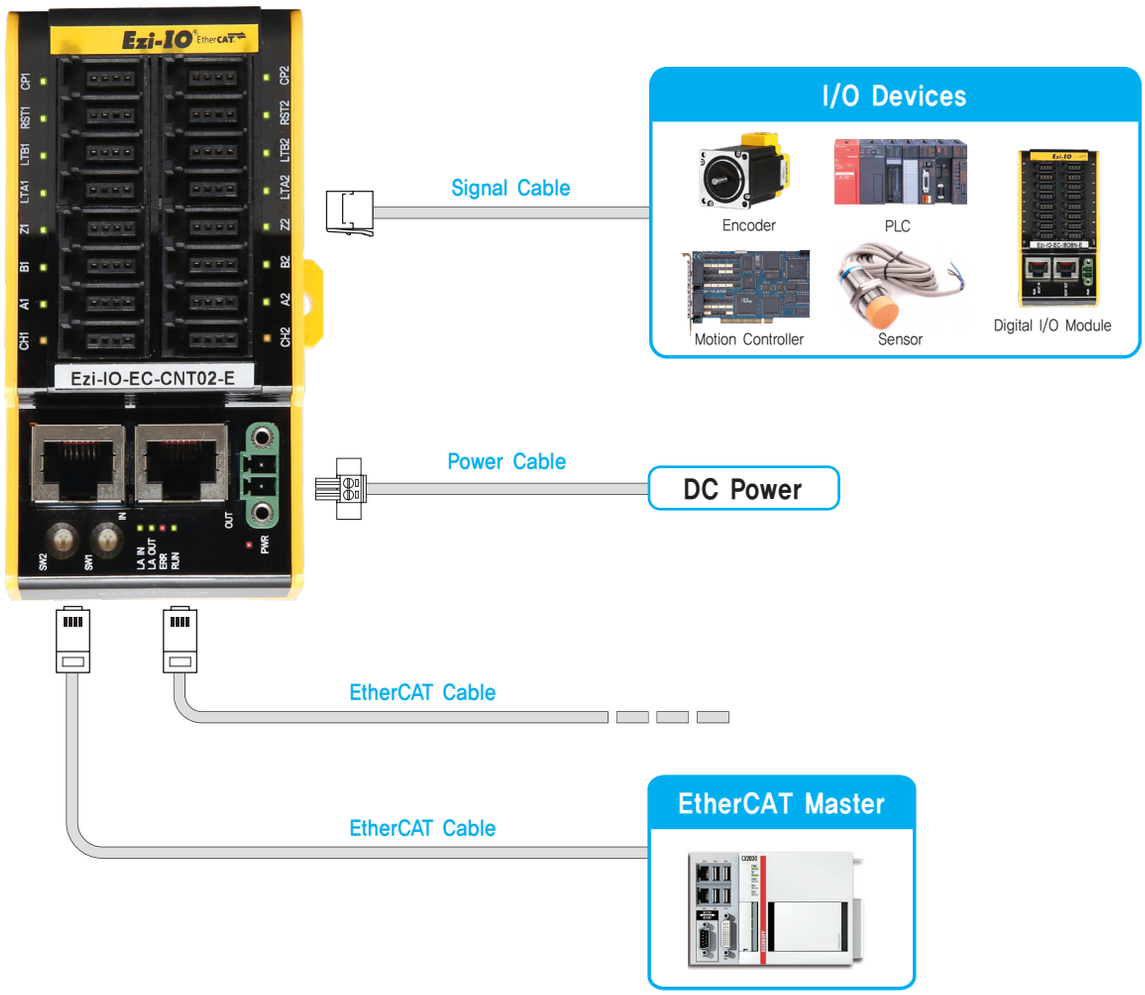
## 5. I/O Signal Connector (CN2)




| CN1 | | | | | CN2 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mark | No. | Name | Function | I/O | Mark | No. | Name | Function | I/O |
| CH1 | 1 | NC | ---- | ---- | CH2 | 1 | NC | ---- | ---- |
| | 2 | 5V | DC5V | Output | | 2 | 5V | DC5V | Output |
| | 3 | GND | GND | Output | | 3 | GND | GND | Output |
| | 4 | NC | ---- | ---- | | 4 | NC | ---- | ---- |
| A1 | 1 | AV1 | A Pulse Input Power (24V) | Input | A2 | 1 | AV2 | A Pulse Input Power (24V) | Input |
| | 2 | A1+ | A+ | Input | | 2 | A2+ | A+ | Input |
| | 3 | A1− | A− | Input | | 3 | A2− | A− | Input |
| | 4 | AG1 | A Pulse Input GND | Input | | 4 | AG2 | A Pulse Input GND | Input |
| B1 | 1 | BV1 | B Pulse Input Power (24V) | Input | B2 | 1 | BV2 | B Pulse Input Power (24V) | Input |
| | 2 | B1+ | B+ | Input | | 2 | B2+ | B+ | Input |
| | 3 | B1− | B− | Input | | 3 | B2− | B− | Input |
| | 4 | BG1 | B Pulse Input GND | Input | | 4 | BG2 | B Pulse Input GND | Input |
| Z1 | 1 | ZV1 | Z Pulse Input Power (24V) | Input | Z2 | 1 | ZV2 | Z Pulse Input Power (24V) | Input |
| | 2 | Z1+ | Z+ | Input | | 2 | Z2+ | Z+ | Input |
| | 3 | Z1− | Z− | Input | | 3 | Z2− | Z− | Input |
| | 4 | ZG1 | Z Pulse Input GND | Input | | 4 | ZG2 | Z Pulse Input GND | Input |
| LTA1 | 1 | LAV1 | Latch A Input Power (24V) | Input | LTA2 | 1 | LAV2 | Latch A Input Power (24V) | Input |
| | 2 | LTA1+ | Latch A(+) | Input | | 2 | LTA2+ | Latch A(+) | Input |
| | 3 | LTA1− | Latch A(−) | Input | | 3 | LTA2− | Latch A(−) | Input |
| | 4 | LAG1 | Latch A Input GND | Input | | 4 | LAG2 | Latch A Input GND | Input |
| LTB1 | 1 | LBV1 | Latch B Input Power (24V) | Input | LTB2 | 1 | LBV2 | Latch B Input Power (24V) | Input |
| | 2 | LTB1+ | Latch B(+) | Input | | 2 | LTB2+ | Latch B(+) | Input |
| | 3 | LTB1− | Latch B(−) | Input | | 3 | LTB2− | Latch B(−) | Input |
| | 4 | LBG1 | Latch B Input GND | Input | | 4 | LBG2 | Latch B Input GND | Input |
| RST1 | 1 | RV1 | Reset Input Power (24V) | Input | RST2 | 1 | RV2 | Reset Input Power (24V) | Input |
| | 2 | RST1+ | Reset(+) | Input | | 2 | RST2+ | Reset(+) | Input |
| | 3 | RST1− | Reset(−) | Input | | 3 | RST2− | Reset(−) | Input |
| | 4 | RG1 | Reset Input GND | Input | | 4 | RG2 | Reset Input GND | Input |
| CP1 | 1 | UCP1+ | User Comparison Output(+) | Output | CP2 | 1 | UCP2+ | User Comparison Output(+) | Output |
| | 2 | 5CP1 | 5V Comparison Output | Output | | 2 | 5CP2 | 5V Comparison Output | Output |
| | 3 | GND | GND | Output | | 3 | GND | GND | Output |
| | 4 | UCP1− | User Comparison Output(−) | Output | | 4 | UCP2− | User Comparison Output(−) | Output |

## ● System Configuration [Ezi-IO-EC-CNT02-E]






## 1. Accessories

### ● Connectors

| Purpose | Item | Part Number | Manufacturer |
|---|---|---|---|
| Power (CN1) | Terminal Block | MC421-38102 | DECA |
| Signal (CN2) | e-CON Plug Connector | CNE-P04-YW | Autonics |

※ The connectors above are supplied with the product. If you are using other parts, please make sure they meet the specifications.

## 2. Options

### ● EtherCAT Cable

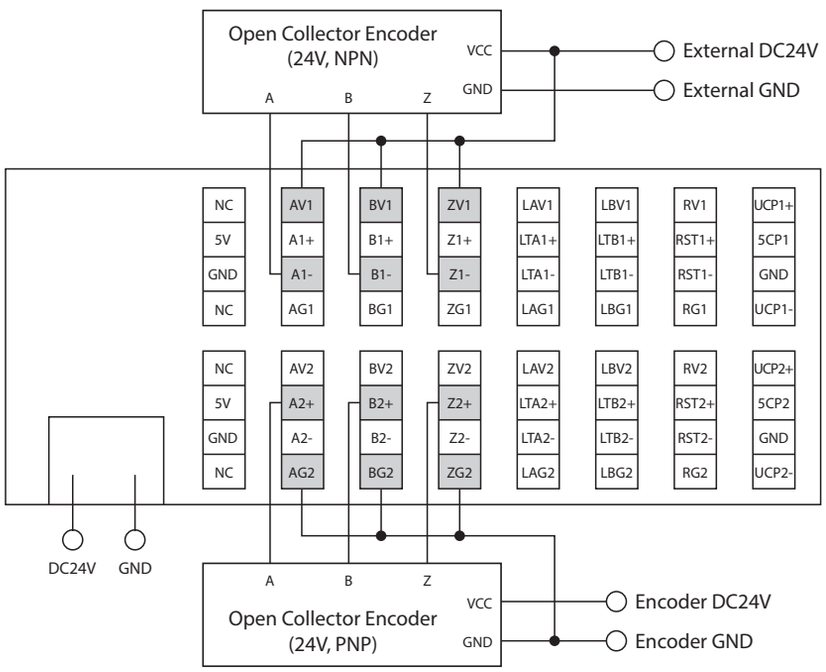
| Purpose | Part Number | Length [m] | Remarks |
|---|---|---|---|
| EtherCAT Connection (CN3, CN4) | CGNR-EC-001F | 1 | · STP(Shielded Twisted Pair) Cable<br>· Category 5e or higher<br>· Maximum Length: 100m<br>· Normal Cable |
| | CGNR-EC-002F | 2 | |
| | CGNR-EC-003F | 3 | |
| | CGNR-EC-005F | 5 | |

※ If you need cables with length(in units of 1m) not listed on the table or robot cables, please contact FASTECH for more information.

# External Wiring Diagram [Ezi-IO-EC-CNT02-E]

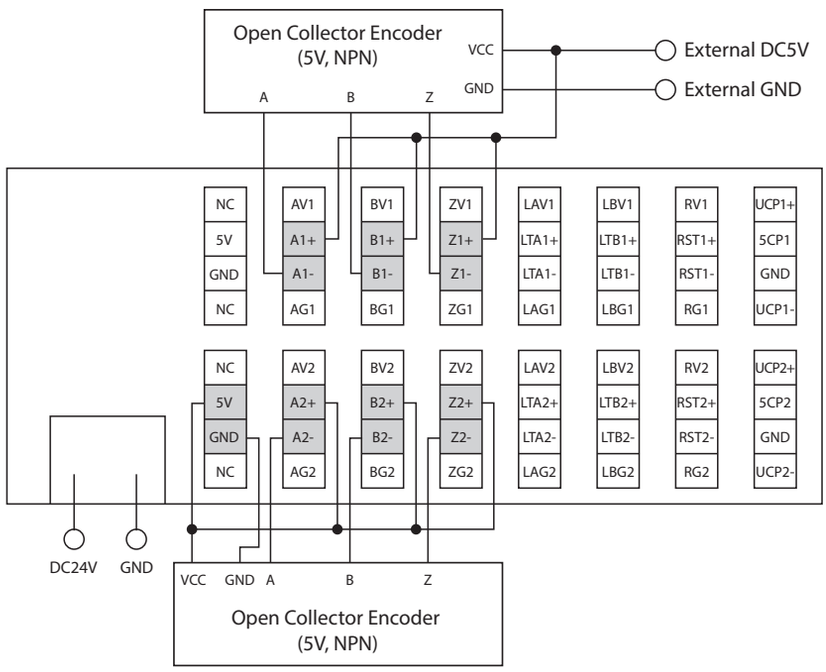
## 1 Pulse Input Part

### 1. When connecting with DC24V open collector output type encoder




※ If the module and the encoder use the same power supply, the photocoupler isolation is not possible.

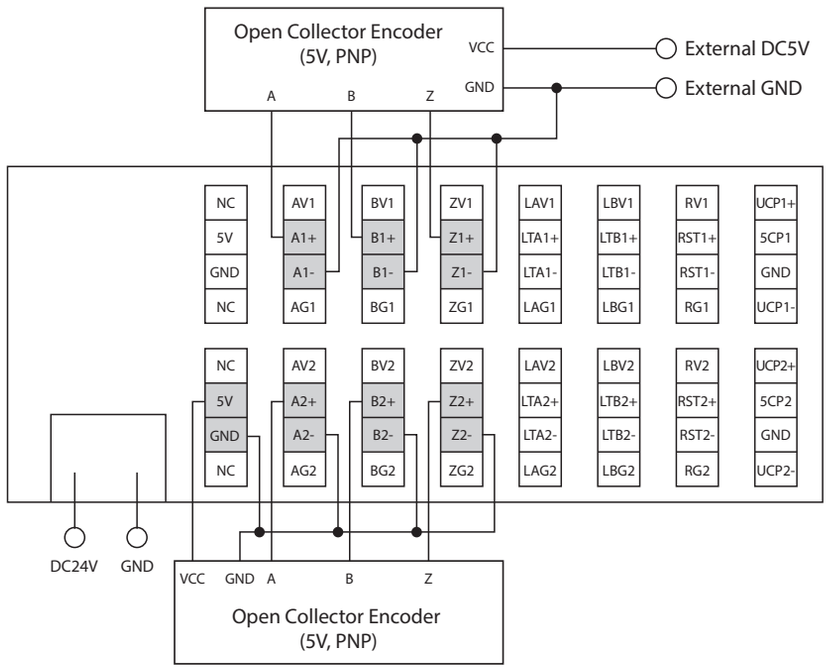
### 2. When connecting with DC5V NPN open collector output type encoder




※ If the DC5V output inside the product is used as the encoder power, photocoupler isolation is not possible.

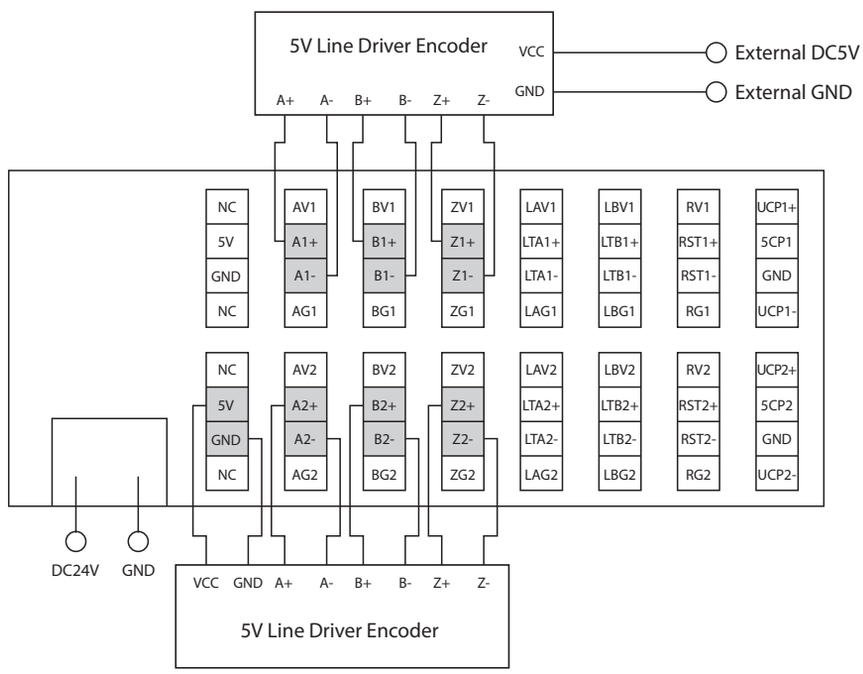
# ● External Wiring Diagram [Ezi-IO-EC-CNT02-E]

## 3. When connecting with DC5V PNP open collector output type encoder




※ If the DC5V output inside the product is used as the encoder power, photocoupler isolation is not possible.

## 4. When connecting with DC5V line driver output type encoder

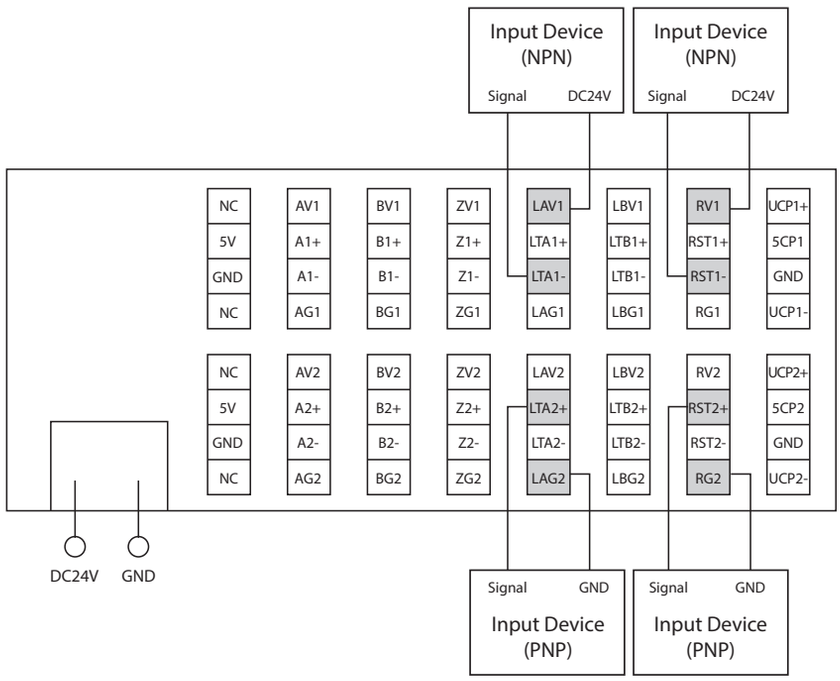



※ If the DC5V output inside the product is used as the encoder power, photocoupler isolation is not possible.

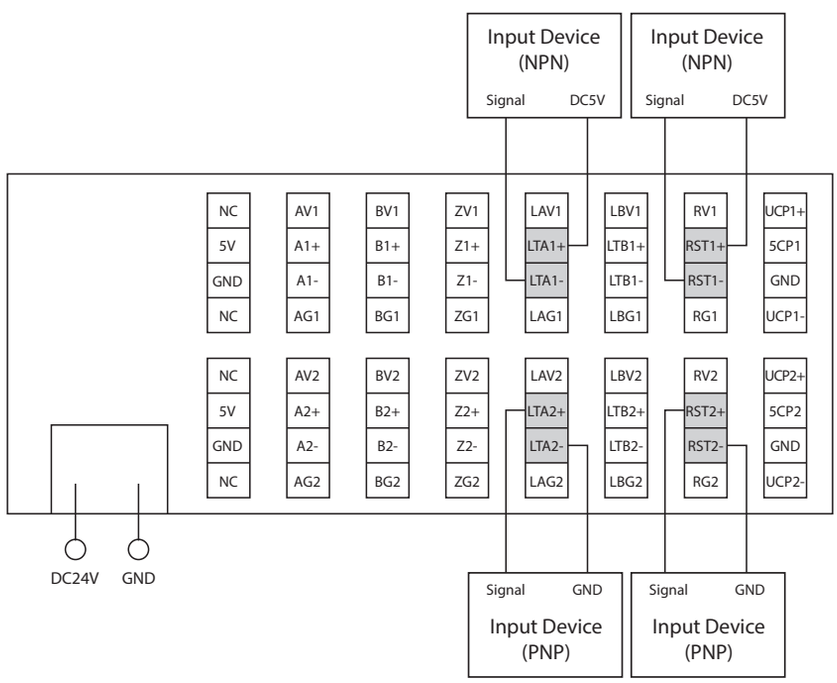
# ● External Wiring Diagram [Ezi-IO-EC-CNT02-E]

## 2 Control Input Part

### 1. When connecting with DC24V open collector output type input device




### 2. When connecting with DC5V open collector output type input device

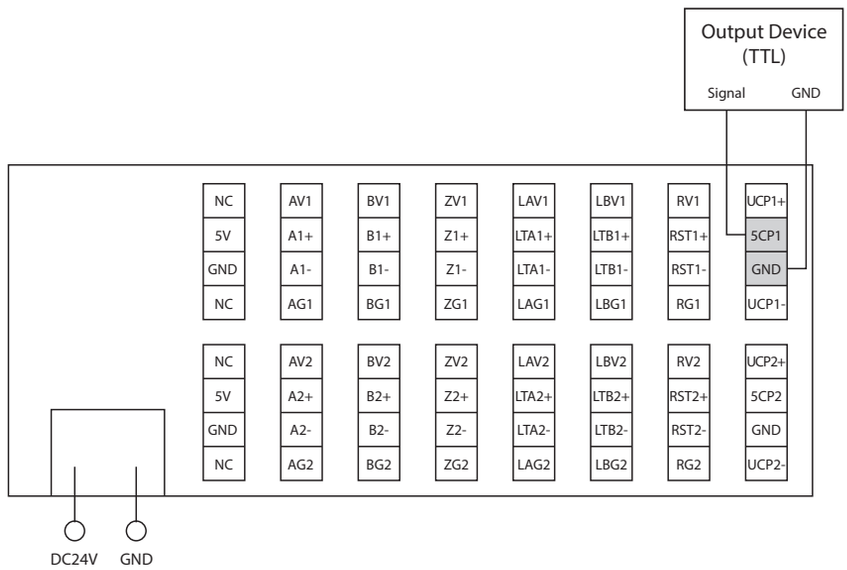



※ e.g.) Input Device : PLC, Motion Controller, Digital Output Module, Limit Sensor , Proximity Sensor, etc.

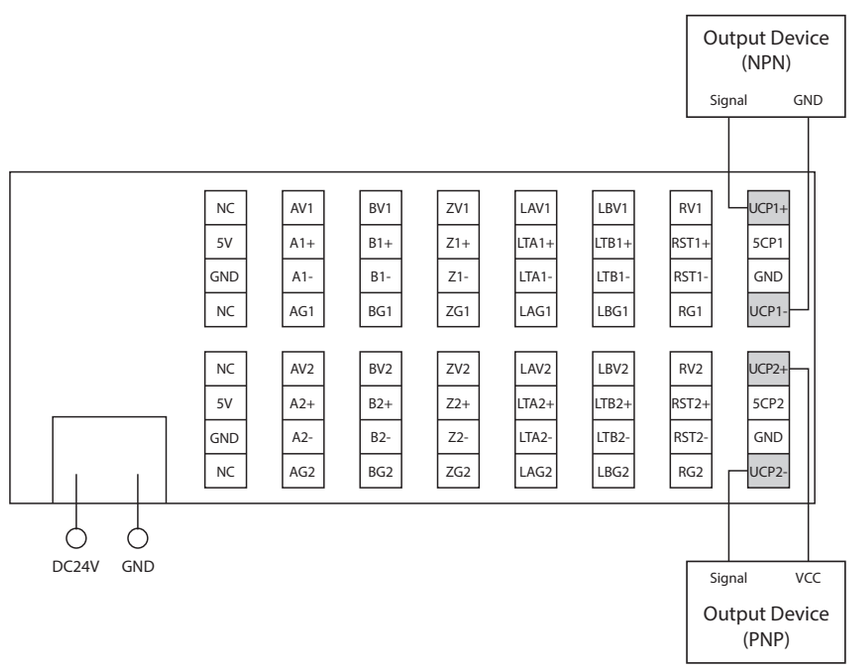
# ● External Wiring Diagram [Ezi-IO-EC-CNT02-E]

## 3 Comparison Output Part

### 1. TTL Output




### 2. Open Collector Output




※ e.g. Output Device: PLC, Motion Controller, Digital Input Module, etc.

# MEMO

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*Fast, Accurate, Smooth Motion*

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