



# User Manual

Text

( Rev.01)



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**Manual Version : [ver01]**

적용 GUI version : 6.40.8.13 이상  
초 판 : 2016 년 6 월 30 일

# 1 . Safety Pre-caution and Note on Installation

## ※ Before Operation

- Thank you for purchasing our Ezi-IO Plus-E products.
- Ezi-IO Plus-E is a high-performance 32bit ARM chip embedded Full Digital position control stepping driving unit.
- This manual describe the handling, maintenance, repair, diagnosis and troubleshooting of Ezi-IO Plus-E.
- Before start operation of Ezi-IO Plus-E, thoroughly read this manual.
- After reading this manual, keep the manual near Ezi-IO Plus-E, so that any user can read this manual whenever needed.



## 1 - 1 . Precautions

### ◆ General Precautions

- Contents of this manual are subject to change without prior notice for functional improvements, change of specifications or user's better understanding. Thoroughly read is the manual which is provided with purchased Ezi-IO Plus-E
- In case of manual is damaged or lost, please contact with FASTECH's agent or our company at the address on the last page of this manual.
- FASTECH is not responsible for a product breakdown due to user's dismantling for the product, and such a breakdown is not guaranteed by the warranty.


### ◆ Safety Precaution

- Before installation, operation, repairing the products, thoroughly read the manual and fully understand the contents. Before operating the products, please understand the mechanical characteristics of this products and related safety information and precautions.
- This manual divides safety precautions into **Attention** and **Warning**.



 <b>Attention</b>	If user does not properly handle the products, the user may seriously or slightly injured damages may occur in the machine.
 <b>Warning</b>	If user does not properly handle the products, a dangerous situation (such as an electric shock) may occur resulting in deaths or serious injuries.

- Although precaution is only a **Attention**, a serious result could be caused depending on the situation. Follow safety precaution.



## ◆ ◆ Check the Product

 <b>Attention</b>	<p><b>Check the Product is damaged or parts are missing.</b>          Otherwise, the machine may get damaged or the user may get injured.</p>
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## ◆ Installation

 <b>Attention</b>	<p><b>Please carry the Ezi-IO Plus-E carefully.</b>          Otherwise, the product may get damaged or user's foot may get injured by dropping the product.</p> <p><b>Use non-flammable materials such as metal in the place where the Ezi-IO Plus-E is to be installed.</b>          Otherwise, a fire may occur.</p> <p><b>When installing several Ezi-IO Plus-E in a sealed place, install a cooling fan to keep the ambient temperature of the product as 50°C or lower.</b>          Otherwise, a fire or other kinds of accidents may occur due to overheating.</p>
 <b>Warning</b>	<p><b>The process of installation, Connection, Operation, Checking and Repairing should be done by qualified person.</b>          Otherwise, a fire or other kinds of accidents may occur.</p>


## ◆ Connect Cables

 <b>Attention</b>	<p><b>Keep the rated range of input Voltage for drive.</b>          Otherwise, a fire or other kinds of accidents may occur.</p> <p><b>Cable connection should be following the wiring diagram.</b>          Otherwise, a fire or malfunction of machine may occur.</p>
 <b>Warning</b>	<p><b>Before connecting cables, check if input power is off..</b>          Otherwise, an electric shock or a fire may occur.</p> <p><b>The case of this Ezi-IO Plus-E is installed from the ground of the internal circuit by the condenser, Please Ground the Ezi-IO Plus-E.</b>          Otherwise, an electric shock or a file may occur and a cause of malfunction of machine.</p>

### ◆ Operation & Setting change

 <p><b>Attention</b></p>	<p><b>If a protection function (Alarm) occurs, firstly remove its cause and then release (Alarm reset) the protection function.</b></p> <p>If you operate continuously without removing its cause, the machine may get damaged or the user may get injured.</p> <p><b>Make all input signals to OFF before supply input voltage to Ezi-IO Plus-E drive.</b></p> <p>The machine may get damaged or the user may get injured by motor operation.</p> <p><b>All parameter values are set by default factory setting value. Change this value after reading this manual thoroughly.</b></p> <p>Otherwise, the machine may get damaged or other kinds of accidents may occur.</p>
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### ◆ Check and Repair

 <p><b>Warning</b></p>	<p><b>Stop to supply power to the main circuit and wait sufficient time before checking or repairing this Ezi-IO Plus-E.</b></p> <p>Electricity remaining in the condenser may cause of electric shock.</p> <p><b>Do not change cabling while power is being supplied.</b></p> <p>Otherwise, the user may get injured or the product and machine may get damaged.</p> <p><b>Do not reconstruct the Ezi-IO Plus-E.</b></p> <p>Otherwise, an electric shock may occur or the product and machine get damaged. And the reconstructed product cannot get after service.</p>
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## 1 - 2 . Notes on Installation

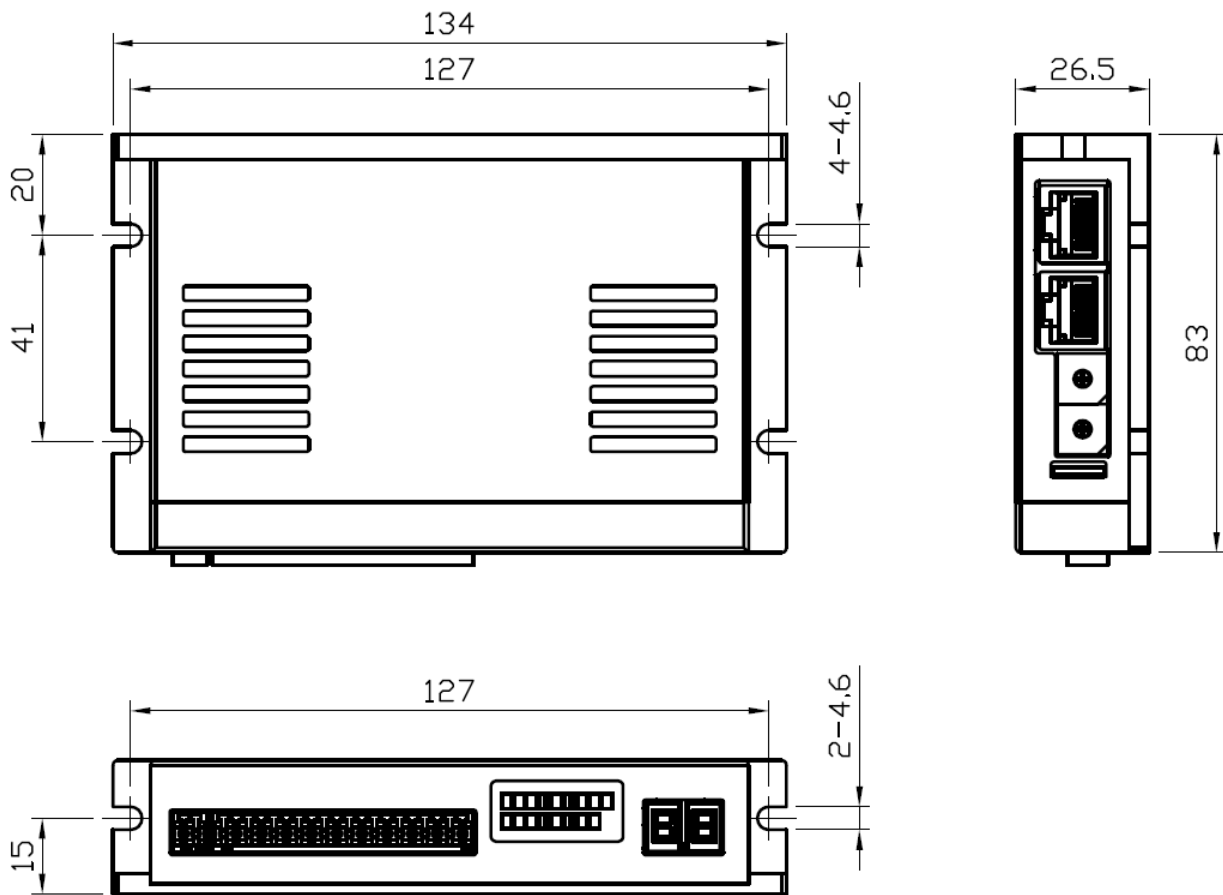
- 1) This product has been designed for indoor uses. The ambient temperature of the room should be 0°~ 55°C .
- 2) If the temperature of the case is 50°C or higher, radiate heat outside for cooling down.
- 3) Do not install this product under direct rays or near magnetic or radioactive objects.
- 4) If more than 2 drives are installed in a line, keep the interval of 20mm or more vertically and 50mm or more horizontally at least.

## 2 . Specifications of the Drive

### 2 - 1 . Characteristic Table

Type of Drive		Ez-IO-PE series	
		Ez-IO-PE-I16 series ( Input )	Ez-IO-PE-O16 series ( output )
Input Voltage		24VDC $\pm$ 10%	
Control Method		ARM-based 32-bit MCU	
Ethernet connection		Standard Ethernet (Maximum 254 Module operating)	
Current Consumption		Max. 500mA	
Operating condition	Ambient Temperature	In Use : 0~50°C In Storage : -20~70°C	
	Humidity	In Use : 35~85%RH (Non-condensing) In Storage : 10~90%RH (Non-condensing)	
	Viv. Resist	0.5G	
Function	Input Signal	16CH input (Photo coupler input, Source/Sink) Latch (Rising /Falling) for 16CH input Latch Pulse Width : Min. 25[us] Latch count for 16CH input <b>Input Voltage : 24[VDC]</b> Allowable current : Max 10[mA]	
	Output Signal		16CH output(Photocoupler) TRIGGER output function (Can be set to CH unit) - 50% duty, PW = Min. 1[ms] <b>Input Voltage : [24VDC]</b> Allowable current : Max 200[mA] / CH <b>- Simultaneous operation standard for all CH</b>
	LED Display	Power status for input control(Red) Input status(Green)	Power status for output control(Red) Output status(Green)
Communication interface		Ethernet UDP communication with PC, Dual port Ethernet switch embedded, Communication Speed : 10/100base-T/TX Full duplex	
GUI		User interface Program for Windows	
Software		Motion Library (DLL) For Windows 2000/XP/Vista/7/8/10	

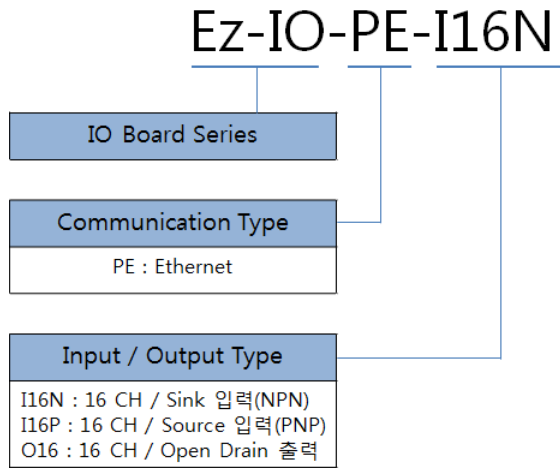
## 2 - 2 . Dimensions



### 3 . Configuration

#### 3 - 1 . Part Numbering

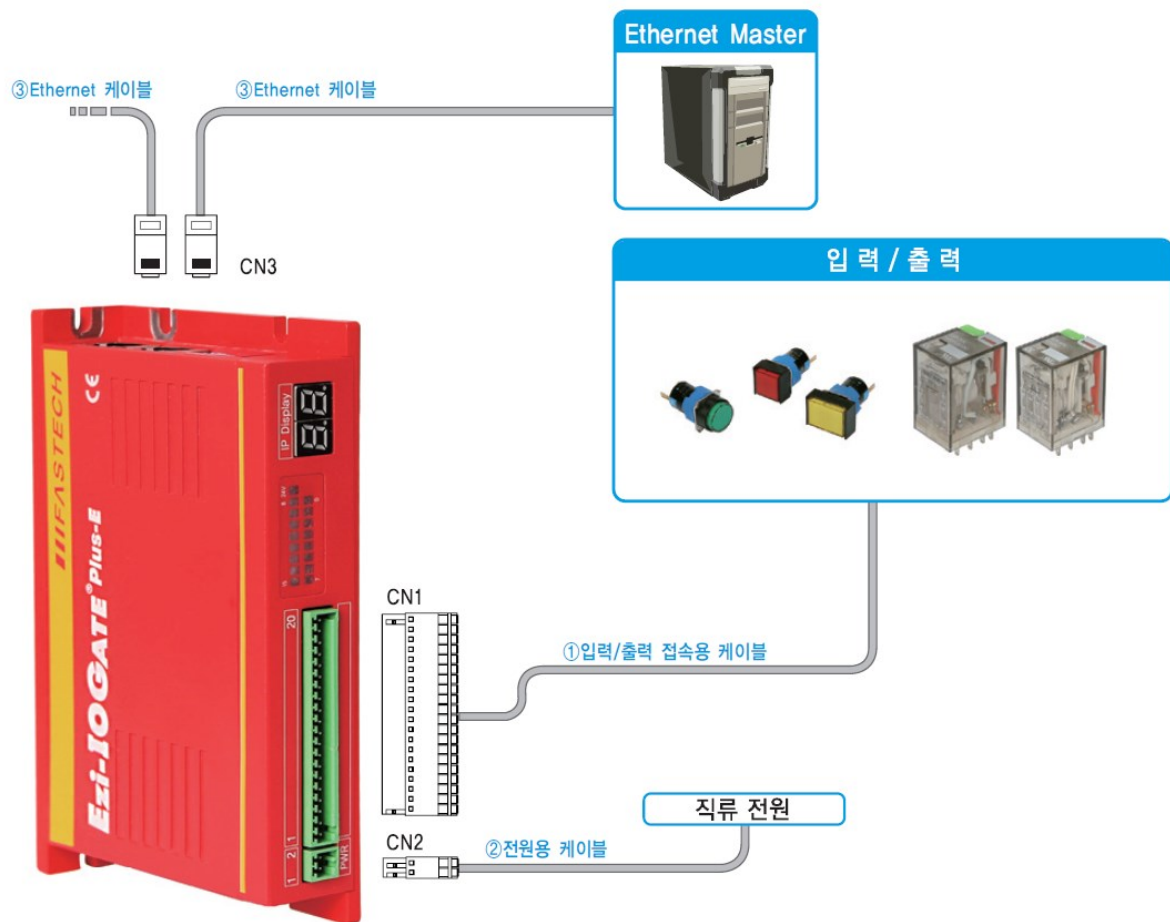
##### 1) Ezi-IO Plus-E Part Numbering





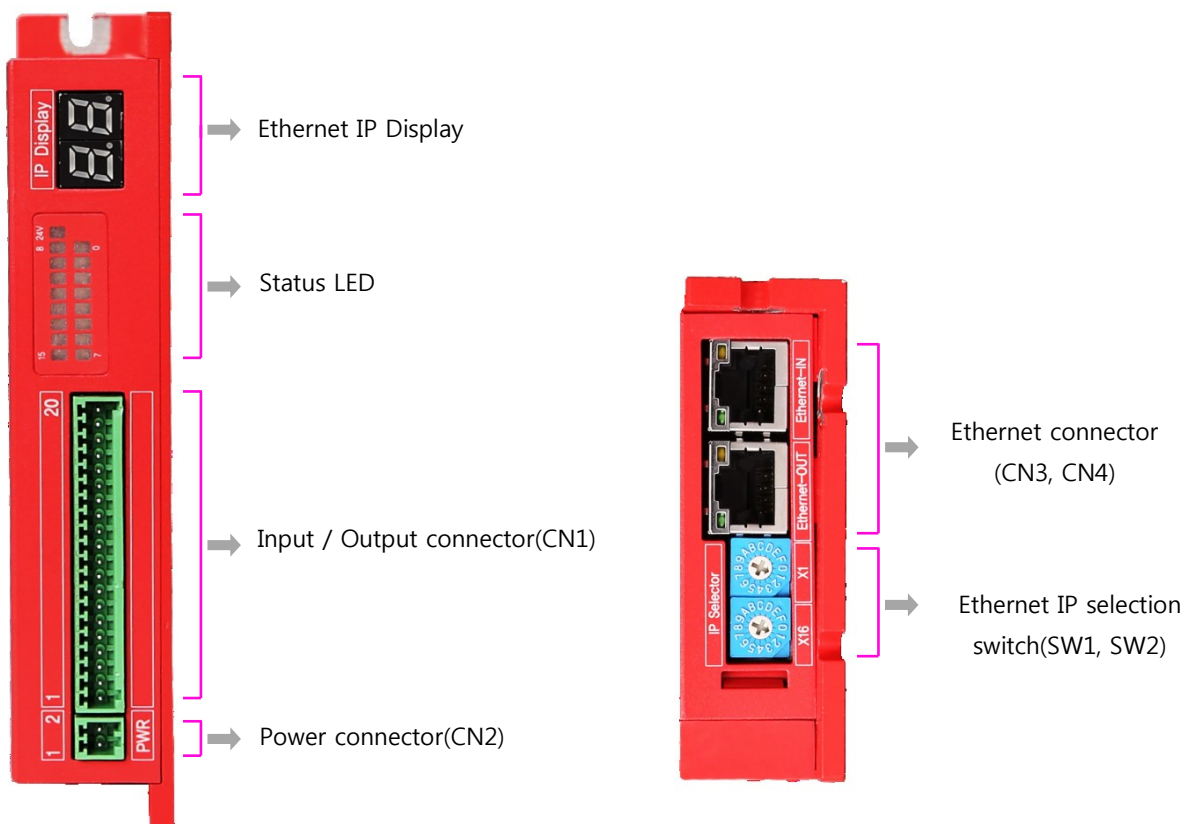
## 3 - 2 . System Configuration

### 1) Ezi-IO Plus-E configuration



## 4 . External Name and Function Setting of Ezi-IO Plus-E

### 4 - 1 . Appearance and Part name

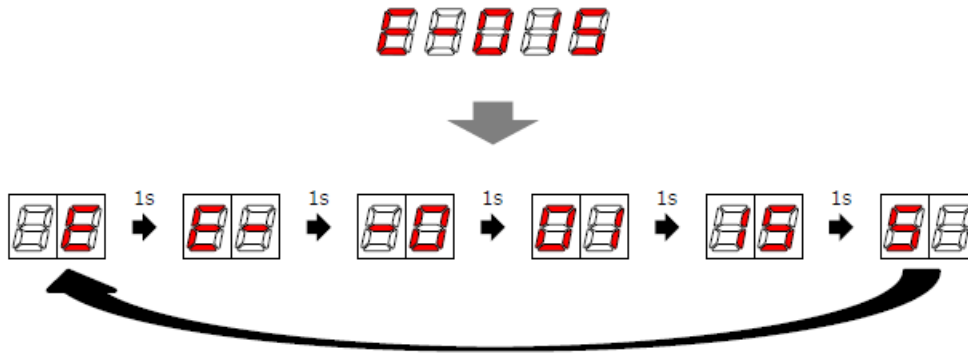


### 4 - 2 . Status LED

Display	Color	Function	On / Off Condition
Ext.24V	Red	External 24V power indication	Light on when power is applied.
Input or Output	Green	Input or Output status indication	Input : Light On when input signal is On Output : Light On when output signal is On

### 4 - 3 . Ethernet IP Display

- 1) It displays the setting ID of SW1,2 (Drive ID Selection Switch)
- 2) In case of ID setting after power input status, 7-Segments are flushing and changed ID is not applied.
  - The IP must be changed when power off status.
- 3) When Alarm generating from drive, Alarm value is displayed on 7-Segment, not ID value. Alarm value is displayed on 7-Segment as 'E-000' type with one each dial. This dial is changing every one second. (ex. Display of Alarm No. 15)



- 4) It displays the all of set ID on the drive after power input, it displays end number of IP address as hex code.

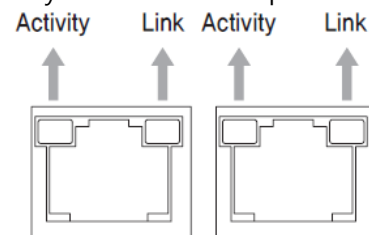
Ex) IP Address: 192.168.0.10

Firstly display 192.168.0.10 → only display 0A

#### 4 - 4 . Ethernet status LED

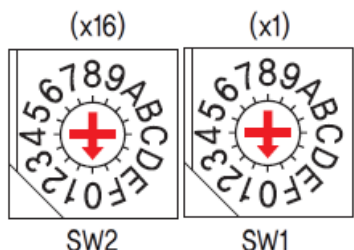
- 1) This LED indicates the Ethernet communication status. The Link1 / Link2 LEDs are located on the top right of each Ethernet connector, and the Activity LED is on the top left.

Name	Color	Status	Description
LINK	Green	OFF	Link deactivated
		ON	Link activated
Activity	Yellow	OFF	Non operation
		Flickering	In operation



#### 4 - 5 . IP Address selection switch (SW1:x1, SW2:x16)

- 1) It can be set from "1 to 254". Please set IP not to overlap.
- "0" and "255" cannot be used for IP setting. Be sure to set it to "1 to 254"..
  - The default gateway is 192.168.0.1. When the switch is set to "1" Change Gateway. Refer to the [Manual - User Program 2-4] section for the change method. If the IP address and gateway are the same, Alarm (201 or 202) occurs.
  - It is recommended to use "2 ~ 254" for IP setting. (Default: SW1: 2, SW2: 0)
- 2) Basic set is "192.168.0.xxx", and xxx are set by switch.



Ex) In case of SW1 : 9, and SW2 : 6

$$9 * 1 + 6 * 16 = 105$$

IP address : 192.168.0.105 (7-Segment display : 69)

- 3) If set to switch as 255(FF), IP Address is setting automatically.

Because it uses DHCP, IP address is set automatically only when using router.

(Connect the Ethernet to Ethernet IN connector)

- When connecting directly to the controller (PC/PLC), it need to be sure to set the OP address with switch
- Set the IP address automatically only when you do not use the default IP address. If IP is set automatically, connect the user program (GUI) and save the IP address. And turn off the power and set the last number of IP with switch
- When the switch is set to 0, the IP setting becomes the initial (default) value.  
In the initial state, communication is not connected.
- Basic IP Address : 192.168.0.xxx, Subnet Mask : 255.255.255.0, Gateway : 192.168.0.1

#### 4 - 6 . Power connector(CN2)

(Connector Type : ESC250V-02P)

No	Function
1	Input Power : 24VDC $\pm$ 10%
2	Input Power : GND

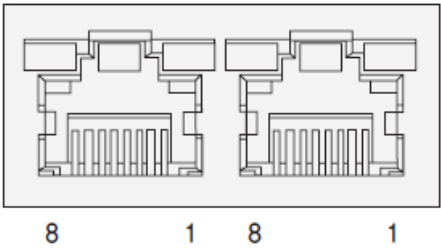
#### 4 - 7 . I/O signal connector (CN1)

(Connector Type : ESC250V-20P)

No	Function
1	+24V external(Input)
2	+24V external(Input)
3	Input0 or Output0
4	Input1 or Output1
5	Input2 or Output2
6	Input3 or Output3
7	Input4 or Output4
8	Input5 or Output5
9	Input6 or Output6
10	Input7 or Output7
11	Input8 or Output8
12	Input9 or Output9
13	Input10 or Output10
14	Input11 or Output11
15	Input12 or Output12
16	Input13 or Output13
17	Input14 or Output14
18	Input15 or Output15
19	+24V GND external(Input)
20	+24V GND external(Input)

4 - 8 . Ethernet Connector

No	Function	No	Function
1	TD+	6	RD-
2	TD-	7	-
3	RD+	8	-
4	-	Connector case	F.G
5	-		



## 5 . Input signal (Ez-IO-PE-I16 series)

### 5 - 1 . Signal cabling

All control I/O signals use connector CN1 as specified below

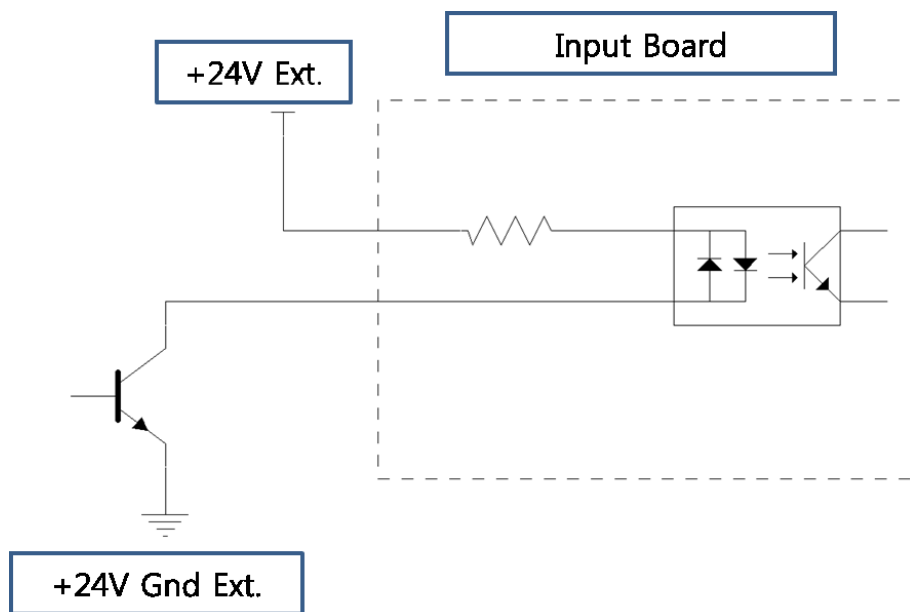
CN1 No.	Signal Name	Function
1	+24V_EXT	External +24V
2	+24V_EXT	External +24V
3	IN1	INPUT0 / LATCH0
4	IN2	INPUT1 / LATCH1
5	IN3	INPUT2 / LATCH2
6	IN4	INPUT3 / LATCH3
7	IN5	INPUT4 / LATCH4
8	IN6	INPUT5 / LATCH5
9	IN7	INPUT6 / LATCH6
10	IN8	INPUT7 / LATCH7
11	IN9	INPUT8 / LATCH8
12	IN10	INPUT9 / LATCH9
13	IN11	INPUT10 / LATCH10
14	IN13	INPUT11 / LATCH11
15	IN13	INPUT12 / LATCH12
16	IN14	INPUT13 / LATCH13
17	IN15	INPUT14 / LATCH14
18	IN16	INPUT15 / LATCH15
19	24G_EXT	External +24V GND
20	24G_EXT	External +24V GND

## 5 - 2 . Connection Circuit

All drive I/O signals are insulated by a photo coupler. The signals display the internal photo coupler status - [ON: Conduction] and [OFF: Non- Conduction], not the signal voltage level.

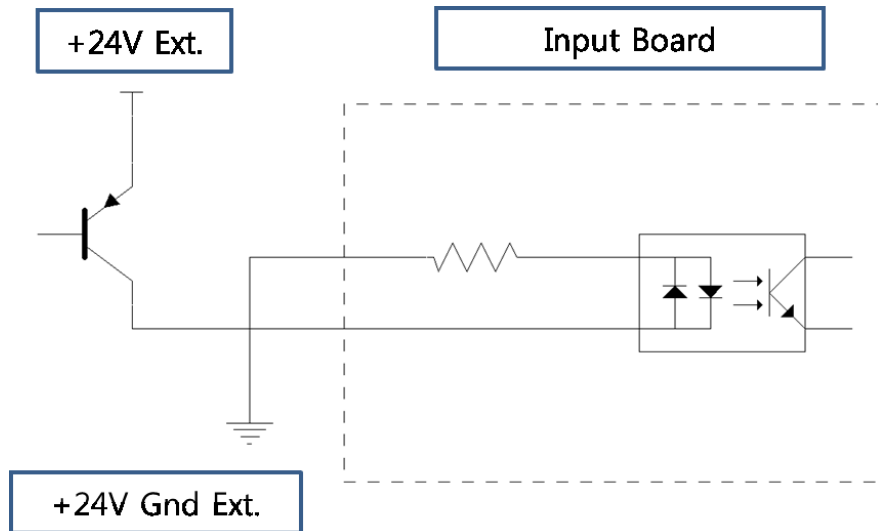
### 1) Ez-IO-PE-I16N(Sink, NPN type)

Input circuit power of  $DC24V \pm 10\%$  (consumed current : about 5mA/circuit) should be separately prepared.



**2) Ez-IO-PE-I16P(SOURCE, PNP type)**

Input circuit power of  $DC24V \pm 10\%$  (consumed current : about 5mA/circuit) should be separately prepared.





## 5 - 3 . Input signal function

### 1) Programmable input .

It is used to check the 16 input status using communication Get command.

### 2) Latch input

It is an input that can detect the change of the input state in a short time which is difficult to confirm using the communication Get command.

The normal input status and the Latch input status can be checked at the same time.

The latch input remains [on] status until the latch clear of the corresponding bit.

The input for checking the latch must be when photocoupler is [on] over 25[us].

(Latch Pulse Width: min. 25 [us])

Latch can be detected by rising / falling edge according to input active level.

(Input active level : Rising edge / Input active level : Falling edge)

- If you change the input active level in the Latch [On] state, the Latch will be [Off] (clear).

### 3) Latch count function

This function automatically counts the number of times the input is received. (Up to 2,147,483,647)

If the maximum count value is exceeded, it is automatically counted from 0 again.

It can count only when the photocoupler is [on] over 25[us].

## 6 . Output signal( Ez-IO-PE-O16 series)

### 6 - 1 . Signal cabling

All control I/O signals use connector CN1 as specified below.

CN1 No.	Signal Name	Function
1	+24V_EXT	External +24V
2	+24V_EXT	External +24V
3	OUT1	OUTPUT0 / TRIGGER0
4	OUT2	OUTPUT1 / TRIGGER1
5	OUT3	OUTPUT2 / TRIGGER2
6	OUT4	OUTPUT3 / TRIGGER3
7	OUT5	OUTPUT4 / TRIGGER4
8	OUT6	OUTPUT5 / TRIGGER5
9	OUT7	OUTPUT6 / TRIGGER6
10	OUT8	OUTPUT7 / TRIGGER7
11	OUT9	OUTPUT8 / TRIGGER8
12	OUT10	OUTPUT9 / TRIGGER9
13	OUT11	OUTPUT10 / TRIGGER10
14	OUT13	OUTPUT11 / TRIGGER11
15	OUT13	OUTPUT12 / TRIGGER12
16	OUT14	OUTPUT13 / TRIGGER13
17	OUT15	OUTPUT14 / TRIGGER14
18	OUT16	OUTPUT15 / TRIGGER15
19	24G_EXT	External +24V GND
20	24G_EXT	External +24V GND

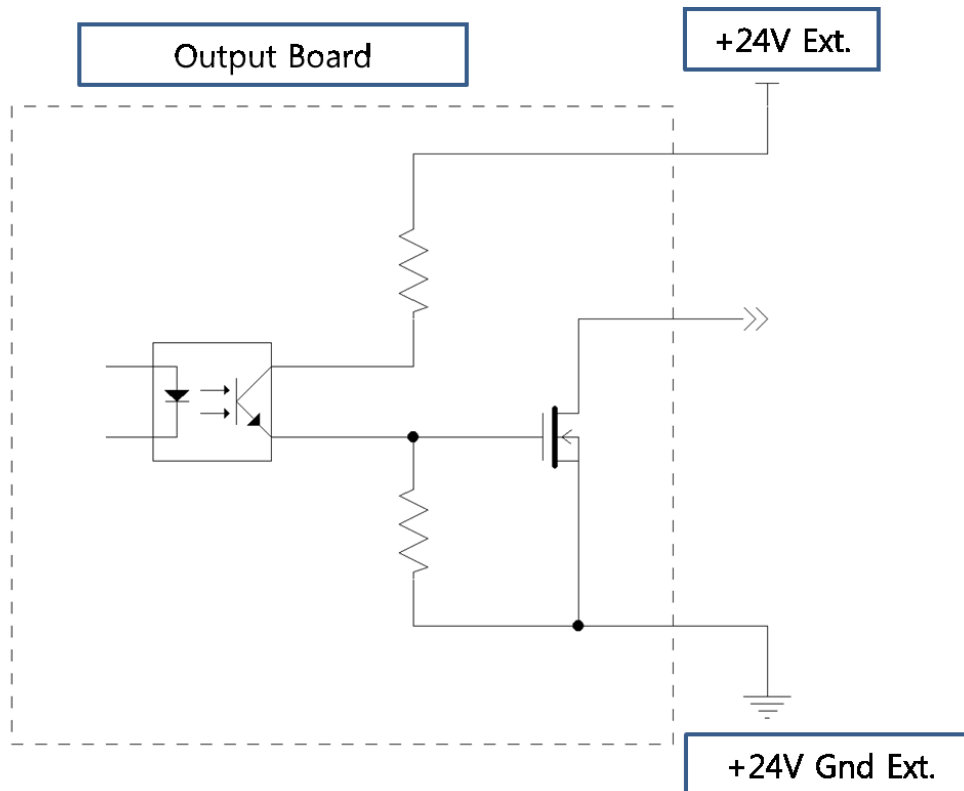
## 6 - 2 . Connection Circuit

All drive I/O signals are insulated by a photo coupler. The signals display the internal photo coupler status - [ON: Conduction] and [OFF: Non- Conduction], not the signal voltage level.

### 1) Ez-IO-PE-O16(Sink type)

Input circuit power of  $DC24V \pm 10\%$  (consumed current : about 5mA/circuit) should be separately prepared.

Output is open drain of optoisolated FET (Max output current : 200[mA]/CH)



If a load capacity is larger than the maximum output current, the board may overheat and break down.

## 6 - 3 . Output Signal Function

### 1) General output

To output the 16CH of output signal by using Library command FAS\_SetOutput

### 2) Trigger pulse output

This function is used when the output signal becomes ON periodically in specific condition. All 16 drive outputs can be used for this Trigger pulse output.

Pulse period and Pulse width can be controlled by [ms].

Setting Item	Description	Range
Pulse period	Setting the pulse period	2[ms]~65,535[ms]
Pulse width	Setting the pulse width	1[ms]~65,534[ms]
Pulse output repeat count	Setting the pulse output repeat count	1~2,147,483,647

- **Pulse period must be longer than Pulse width.**

## 7 . Communication Function

- 1) It has embedded 2 Port Ethernet switching Hub for daisy-chain connection.
- 2) Make an UDP Protocol.
- 3) By using of UDP, two application programs can be connected to one drive, so the provided GUI and user program can be used at the same time.
- 4) Please refer to 「[5.2 System Configuration](#)」 for PC connection example
- 5) The signal contents of the RJ45 connector of the drive are as follows.  
(Same as general Ethernet 10/100 Base-T)

RJ45 Pin No.	Function
1	TD+
2	TD-
3	RD+
4	-
5	-
6	RD-
7	-
8	-
case	Frame GND

- 6) **Basic IP Address : 192.168.0.xxx**  
**Basic Gateway : 192.168.0.1**  
**Basic Subnet Mask : 255.255.255.0**

## 8 . Appendix

### Option : Ethernet cable

Use STP (Shielded Twisted Pair) cable (CAT5E)

Item	Length[m]	Remark
CGNR-EC-□□□F	□□□	Normal cable

□ is cable length.

The unit is 1[m] , maximum length is 100[m].



*Fast, Accurate, Smooth Motion*

### **FASTECH Co., Ltd.**

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