SiO

SiO Controller

SiO2/SiO2PNP
SiO3
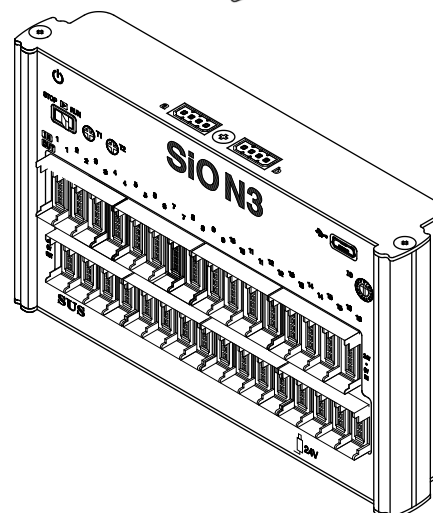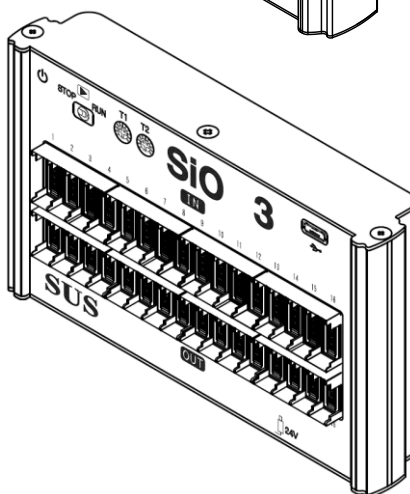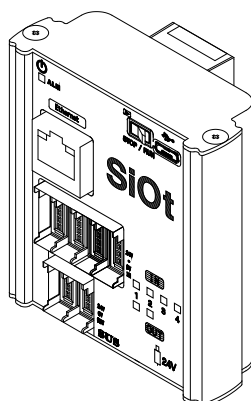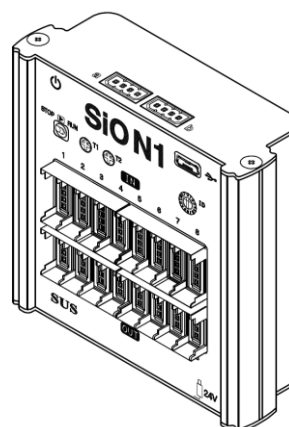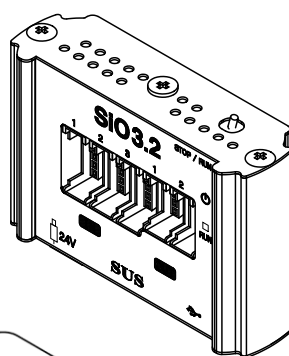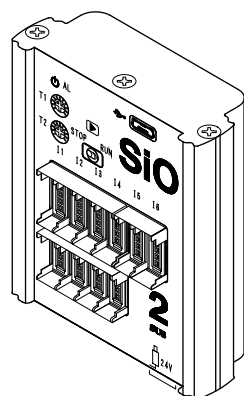SiO-N1
SiO3.2
SiOt
SiO-N3/SiO-N3PNP

Instruction Manual

Version 3.9

SUS

www.sus.co.jp

Scope of Warranty

Warranty Period	One year from purchase

1. The warranty period for this product is one year from the purchase date.
   SUS will repair free of charge any failure due to defects in workmanship.
   However, SUS will only offer carry-in service at our factories.
2. Even within the warranty period, the following cases shall not be covered by the warranty.
   a. Failure due to improper handling or use not based on the instruction manual
   b. Failure due to electrical or mechanical modification
   c. Failure or damage caused by fire, earthquake, or other natural disaster
   d. Any other failure or damage for which SUS is not considered responsible
3. This warranty is valid only in Japan.
4. The warranty covers only the delivered product and does not cover any other damage resulting from failure of the product.

SUS Corporation
http://www.sus.co.jp/

Contact the Snets sales office for inquiries.

53 Nishikata, Kikugawa-shi, Shizuoka
439-0037, Japan, Phone: 0537-28-8700

Prices, specifications, and dimensions are subject to change without prior notice for product improvement.

Oct 2021, Version 3.9

Contents

1. Introduction

Thank you for purchasing the SiO controller.

This instruction manual describes in detail how to handle and operate the product. Read this manual carefully and use the product properly.
After installation, keep this manual beside the product and make sure that everyone who handles the product regularly refers to it.

This manual is for the SiO controller (SiO2/SiO2PNP/SiO3/SiO-N1/SiO3.2/SiOt/SiO-N3/SiO-N3PNP). When using the SiO-C controller, see the "SiO-C Instruction Manual."

The contents of this manual are subject to change without prior notice for product improvement.
For the latest information, visit the SUS website (http://www.sus.co.jp/).

■ ■ 1.1 Accessories ■ ■

When the product is delivered, check the accessories.
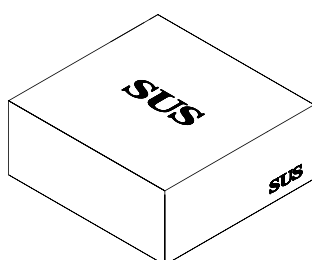
SiO controller   Instruction manual (simplified version)

Not supplied with SiO3.2

This product consists of the controller you have purchased among the following ones and an instruction manual (simplified version).

・SiO2/SiO2PNP   ・SiO3   ・SiO-N1
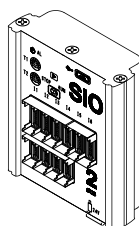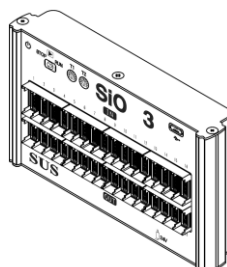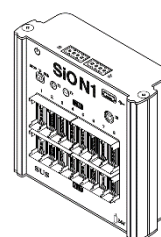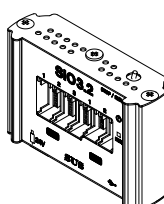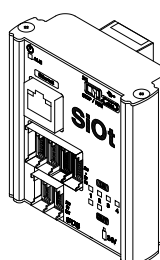
・SiO3.2   ・SiOt   ・SiO-N3/SiO-N3/PNP
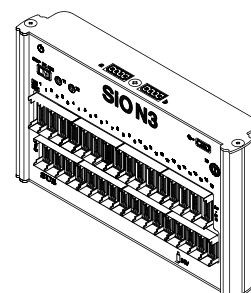
■ ■   1.2   Precautions for Safe Use   ■ ■

Read the following precautions for safe use carefully and use the product properly.
The following precautions are intended to prevent harm to customers and others as well as
damage to property.

⚠ WARNING	Indicates a serious danger that may lead to death or serious injury.
⚠ CAUTION	Indicates a danger that may lead to injury or damage to property.

■■■■■   WARNING   ■■■■■

● In principle, handling and operating the product in any way not described in this manual
  should be regarded as "prohibited."
● Take sufficient safety measures to ensure that the entire system works safely even in the
  event of controller failure, signal line disconnection, or instantaneous power failure.
● The product cannot be used for equipment that may affect a human life.
● When working on the product, be sure to turn OFF the power before starting work.
● Do not touch the controller with wet hands. Doing so may cause an electric shock.
● Install the controller on an incombustible object. Failure to do so may cause a fire.
● Be sure to apply each connector with the voltage specified for the connector.
  Also, connect each connector with the correct polarity.
● Do not disassemble or modify the controller.

■■■■■   CAUTION   ■■■■■

● The controller is a precision instrument. Do not drop it or give it a strong impact.
● When disposing of the controller, treat it as general industrial waste.

■ ■   1.3   Compliance with EC Directive   ■ ■

SUS has confirmed that the products listed below meet the mandatory requirements of the EC
Directive.
The compliance tests have been conducted by a third party, and products that meet the
compliance standards are marked with a certification mark on the case.

| Instrument	Model	EC directive	Standards
SiO controller	SiO2 SiO2PNP SiO3 SiO-N1 SiO3.2 SiOt SiO-N3 SiO-N3PNP	EMC Directive 2014/30/EU	EN61326-1:2013

Certification mark   C E

2. Overview

◆ The SiO controller is a compact, programmable input/output controller.
   It allows the user to set conditions for turning ON and OFF each output using a simple selection type programmer.

SiO controller model list

Model	Input/Output				How to install
	Input	Output	Type	Connector	
SiO-C-G	8	8	NPN	Flat cable connector	GF (N)
SiO-C-D	8	8	NPN	Flat cable connector	DIN rail
SiO-C-P	8	8	NPN	Flat cable connector	Screw mount
SiO2	6	4	NPN	e-CON	GF (N) / DIN rail
SiO2PNP	6	4	PNP	e-CON	GF (N) / DIN rail
SiO3	16	16	NPN	e-CON	GF (N) / DIN rail
SiO-N1	8	8	NPN	e-CON	GF (N) / DIN rail
SiO3.2	3	2	NPN	e-CON	GF (N)
SiOt	4	2	NPN	e-CON	GF (N) / DIN rail
SiO-N3	16	16	NPN	e-CON	GF (N) / DIN rail
SiO-N3PNP	16	16	PNP	e-CON	GF (N) / DIN rail

* See "7. Specifications" for details of each controller.
   For SiO-C controllers, see the "SiO-C Instruction Manual."

Basic configuration

Basically, SiO controllers are used as connected with input and output devices as shown below. Also, the operating condition is registered by connecting a personal computer via USB.
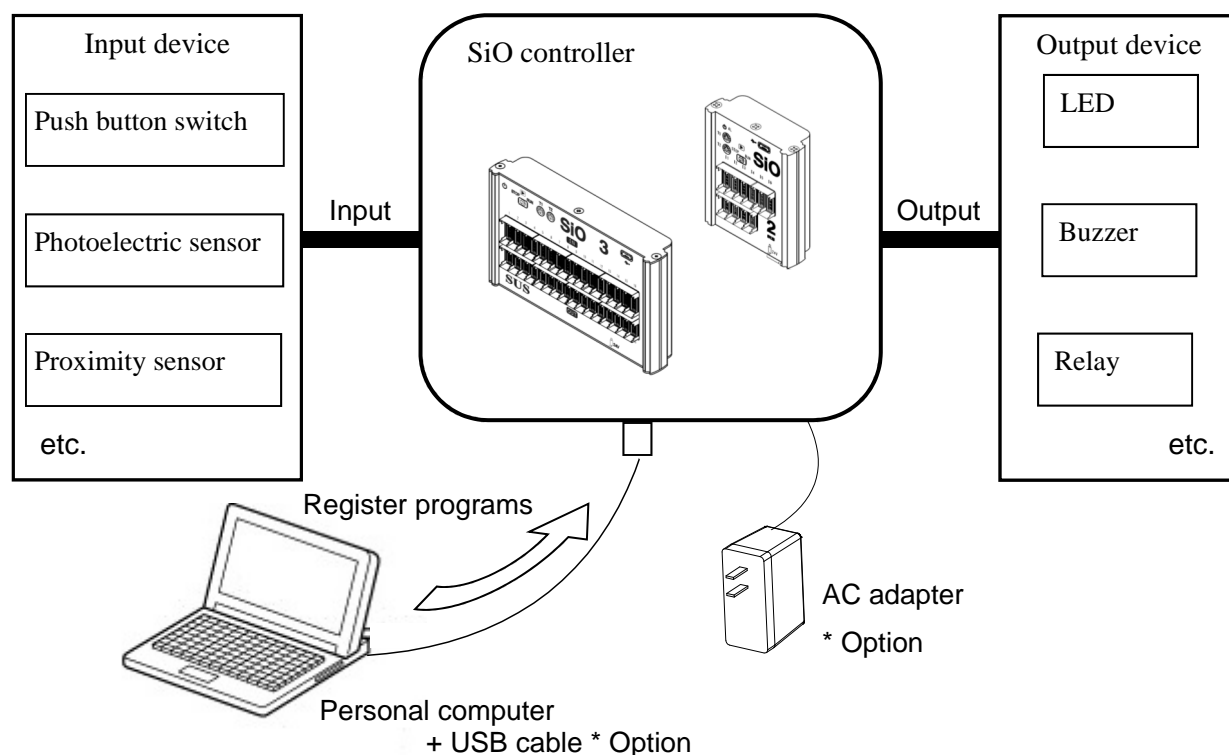
3. Functions

■ ■ **3.1 Part Names and Functions** ■ ■

This section describes the part names, functions, and applications of SiO controllers (SiO2/SiO2PNP/SiO3/SiO-N1/SiO3.2/SiOt/SiO-N3/SiO-N3PNP).

3.1.1 SiO2/SiO2PNP

* The same applies to SiO2PNP.

Version label

No.	Part	Function
(1)	Power connector	Connect an AC adapter here to supply 24 V DC. * Do not supply power from other connectors.
(2)	Power LED (green)	Lights when the power is ON.
(3)	RUN switch	Set this to RUN (right) to execute the program.
(4)	RUN LED (green)	Lights during RUN.
(5)	Input connectors	A connector used for input (e-CON (4-pole) × 6 inputs)
(6)	Output connectors	A connector used for output (e-CON (3-pole) × 4 outputs)
(7)	IN LED (red)	Lights when the input signal is ON (I1 to I6).
(8)	OUT LED (green)	Lights when the output signal is ON (O1 to O4).
(9)	USB connector	Connect the USB cable here (Micro-B USB 2.0).
(10)	T1	Sets Timer 1.
(11)	T2	Sets Timer 2.
(12)	Ground terminal	Connect this to the earth using an M3×4 screw.
(13)	AL LED (red)	Not used
(14)	GF mount hook	A hook for installation on a GF (N) rail.

3.1.2 SiO3

Version label

No.	Part	Function
(1)	Power connector	Connect an AC adapter here to supply 24 V DC. * Do not supply power from other connectors.
(2)	Power LED (green)	Lights when the power is ON.
(3)	RUN switch	Set this to RUN (right) to execute the program.
(4)	RUN LED (green)	Lights during RUN.
(5)	Input connectors	A connector used for input (e-CON (4-pole) × 16 inputs)
(6)	Output connectors	A connector used for output (e-CON (3-pole) × 16 outputs)
(7)	IN LED (red)	Lights when the input signal is ON (IN1 to IN16).
(8)	OUT LED (green)	Lights when the output signal is ON (OUT1 to OUT16).
(9)	USB connector	Connect the USB cable here (Micro-B USB 2.0).
(10)	T1	Sets Timer 1.
(11)	T2	Sets Timer 2.
(12)	Ground terminal	Connect this to the earth using an M3×4 screw.
(13)	GF mount hook	A hook for installation on a GF (N) rail.

3.1.3 SiO-N1

Version label

No.	Part	Function
(1)	Power connector	Connect an AC adapter here to supply 24 V DC. * Do not supply power from other connectors.
(2)	Power LED (green)	Lights when the power is ON.
(3)	RUN switch	Set this to RUN (right) to execute the program.
(4)	RUN LED (green)	Lights during RUN.
(5)	Input connectors	A connector used for input (e-CON (4-pole) × 8 inputs)
(6)	Output connectors	A connector used for output (e-CON (3-pole) × 8 outputs)
(7)	IN LED (red)	Lights when the input signal is ON (IN1 to IN8).
(8)	OUT LED (green)	Lights when the output signal is ON (OUT1 to OUT8).
(9)	USB connector	Connect the USB cable here (Micro-B USB 2.0).
(10)	T1	Sets Timer 1.
(11)	T2	Sets Timer 2.
(12)	Ground terminal	Connect this to the earth using an M3×4 screw.
(13)	GF mount hook	A hook for installation on a GF (N) rail.
(14)	ID switch	* Not used in single configuration
(15)	485 communication connector a	* Not used in single configuration
(16)	485 communication connector b	* Not used in single configuration

3.1.4 SiO3.2

Version label

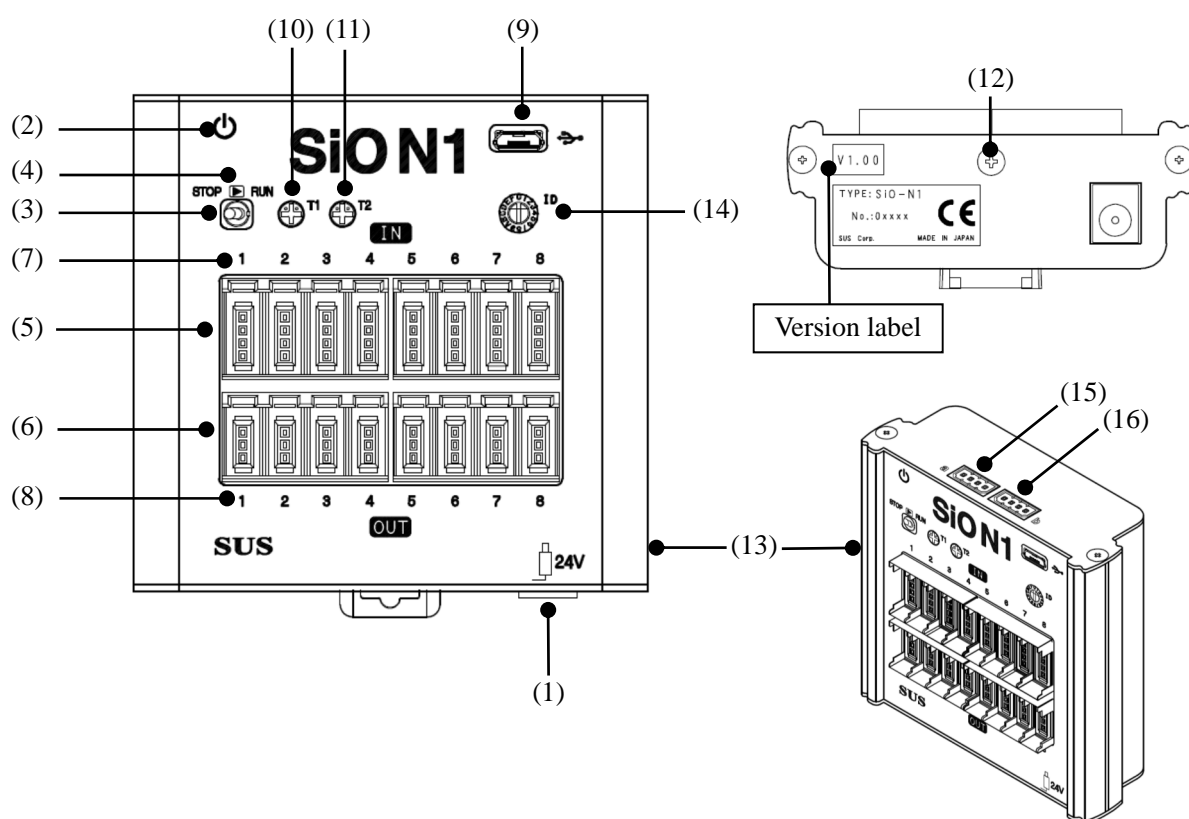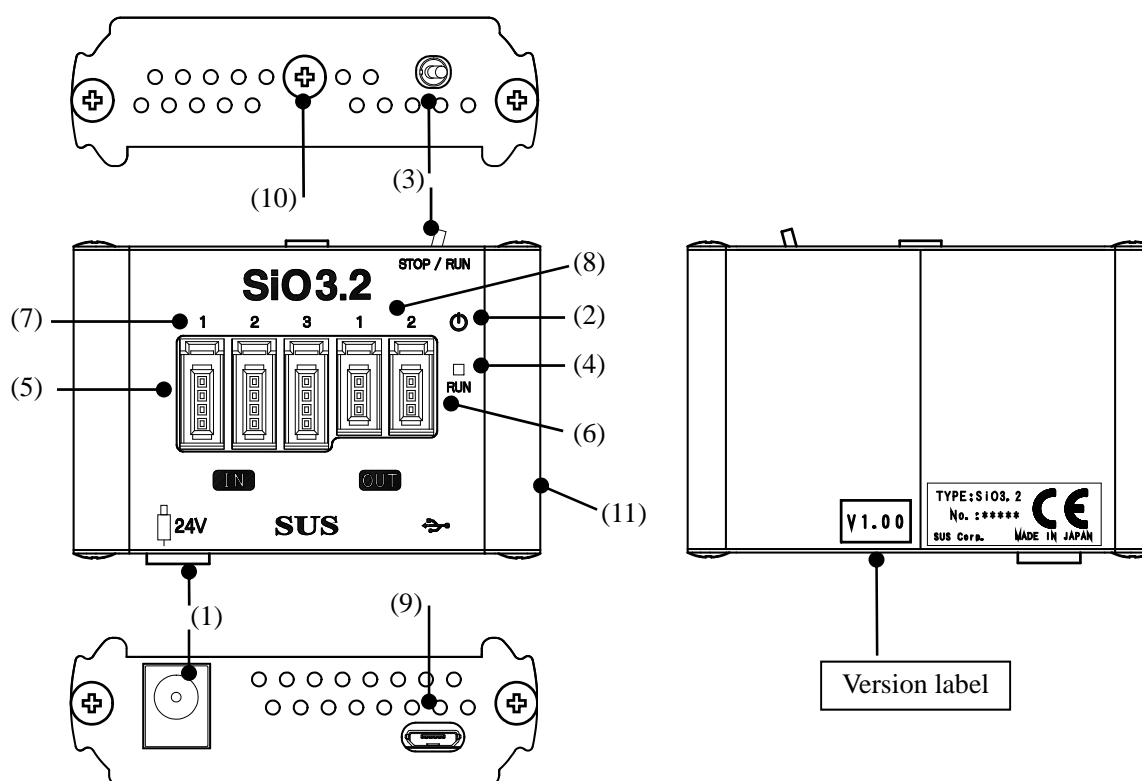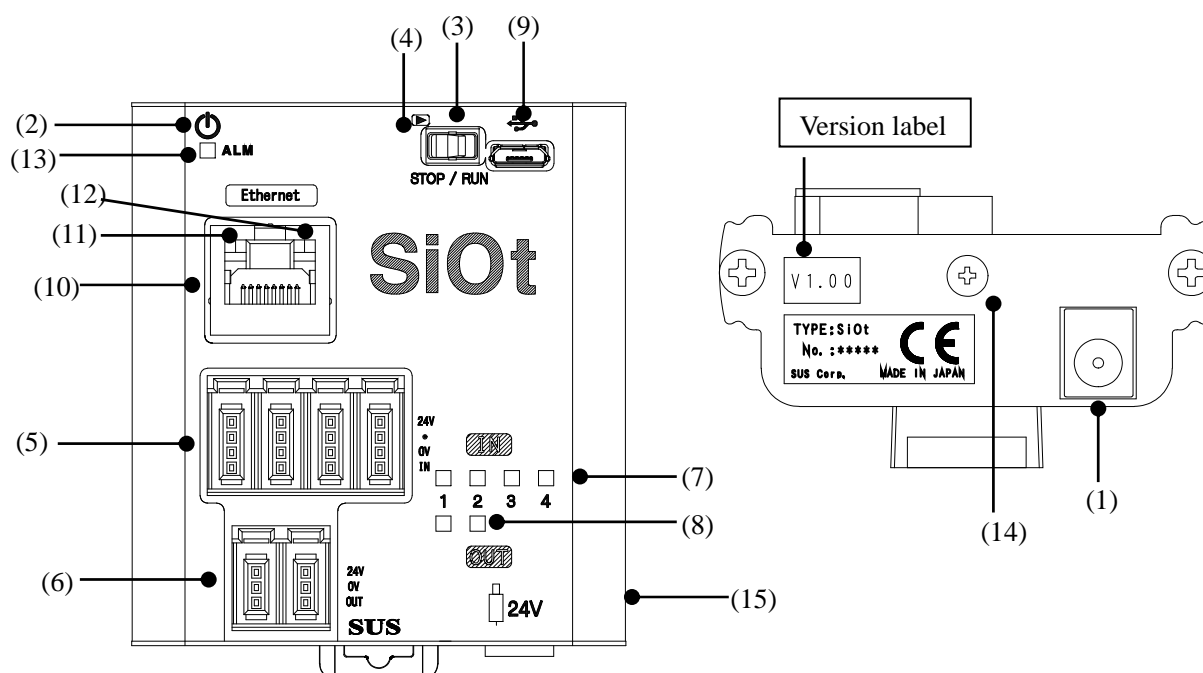| No.	Part	Function
(1)	Power connector	Connect an AC adapter here to supply DC 24 V. * Do not supply power from other connectors.
(2)	Power LED (green)	Lights when the power is ON.
(3)	RUN switch	Set this to RUN (right) to execute the program.
(4)	RUN LED (green)	Lights during RUN.
(5)	Input connectors	A connector used for input (e-CON (4-pole) x 3 inputs)
(6)	Output connectors	A connector used for output (e-CON (3-pole) x 2 outputs)
(7)	IN LED (red)	Lights when the input signal is ON (IN1 to 3).
(8)	OUT LED (green)	Lights when the output signal is ON (OUT1 to 2).
(9)	USB connector	Connect the USB cable here (Micro-B　USB2.0).
(10)	Ground terminal	Connect this to the earth using a M3x4 screw.
(11)	GF mount hook	A hook for installation on a GF (N) rail.

3.1.5   SiOt

No.	Part	Function
(1)	Power connector	Connect an AC adapter here to supply DC 24 V. * Do not supply power from other connectors.
(2)	Power LED (white)	Lights when the power is ON
(3)	RUN switch	Set this to RUN (right) to execute the program.
(4)	RUN LED (blue)	Lights during RUN
(5)	Input connectors	A connector used for input (e-CON (4-pole) x 4 inputs)
(6)	Output connectors	A connector used for output (e-CON (3-pole) x 2 outputs)
(7)	IN LED (red)	Lights when the input signal is ON (IN 1 to 4)
(8)	OUT LED (green)	Lights when the output signal is ON (OUT 1 to 2)
(9)	USB connector	Connect the USB cable here (Micro-B USB2.0)
(10)	Ethernet connector	Connect the Ethernet device
(11)	Ethernet. Connection LED(green)	Light when a device is Ethernet connected
(12)	Ethernet. Communication LED(yellow)	Lights during Ethernet communication.
(13)	ALM LED	Does not use.
(14)	Ground terminal	Connect this to the earth using a M3x4 screw.
(15)	GF mount hook	A hook for installation on a GF (N) rail.

3.1.6 SiO – N3 / SiO – N3PNP

* The same applies to
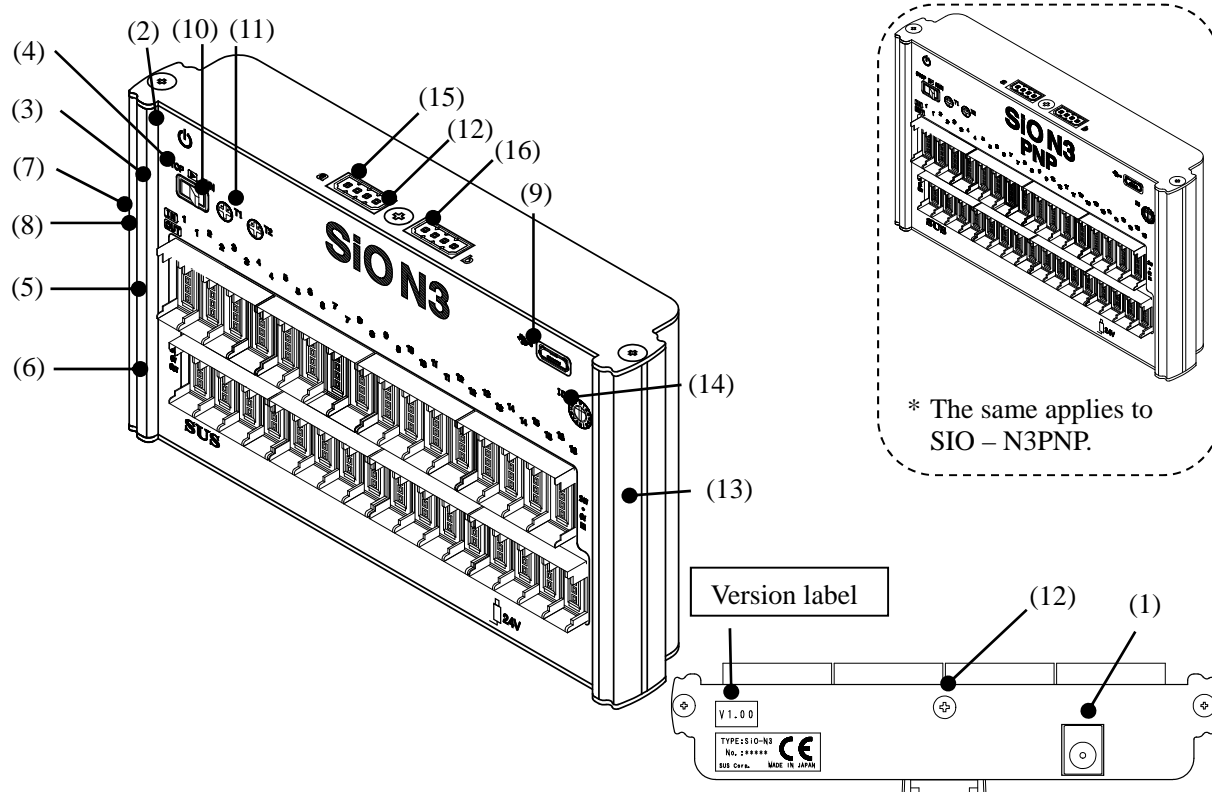SIO – N3PNP.

Version label

No.	Part	Function
(1)	Power connector	Connect an AC adapter here to supply 24 V DC. * Do not supply power from other connectors.
(2)	Power LED (white)	Lights when the power is ON.
(3)	RUN switch	Set this to RUN (right) to execute the program.
(4)	RUN LED (blue)	Lights during RUN.
(5)	Input connectors	A connector used for input (e-CON (4-pole) × 16 inputs)
(6)	Output connectors	A connector used for output (e-CON (3-pole) × 16 outputs)
(7)	IN LED (red)	Lights when the input signal is ON (IN 1 to 16)
(8)	OUT LED (green)	Lights when the output signal is ON (OUT 1 to 16)
(9)	USB connector	Connect the USB cable here (Micro-B USB 2.0).
(10)	T1	Sets timer 1.
(11)	T2	Sets timer 2.
(12)	Ground terminal	Connect this to the earth using an M3×4 screw.
(13)	GF mount hook	A hook for installation on a GF (N) rail.
(14)	ID switch	※Not used in standalone configuration
(15)	485 communication connector a	※Not used in standalone configuration
(16)	485 communication connector b	※Not used in standalone configuration

SUS Corporation

■ ■ **3.2   Principle of Operation**   ■ ■

3.2.1   Program

The SiO controller program sets the conditions for turning ON each output and how long it is kept turned ON.

Programs are edited and registered by using the dedicated software, SiO-Programmer.

The following four items are set.

1. ON conditions: Conditions for turning ON each output

2. Status: Conditions or waiting time for turning ON each output

3. OFF conditions: Conditions for turning OFF each output

4. Output method: Method of output

Example: When turning ON OUT1 for 5 seconds after IN1 turns ON

OUT	CONDITION1		CONDITION2		DURATION TIME(UNTIL)			OUTPUT TYPE
	1	2		1	2			
OUT1	IN1	ON	–	–	–	THEN	D-TIME	0.0 s later	D-TIME	5.0 sec	–	–	–	OUT1 is	ON

```
IN1        ┌──────┐
     ──────┘      └────────────────

              ↓

OUT1          ┌────────────┐
     ─────────┘            └────────
              ◄────────────►
                 5 seconds
```
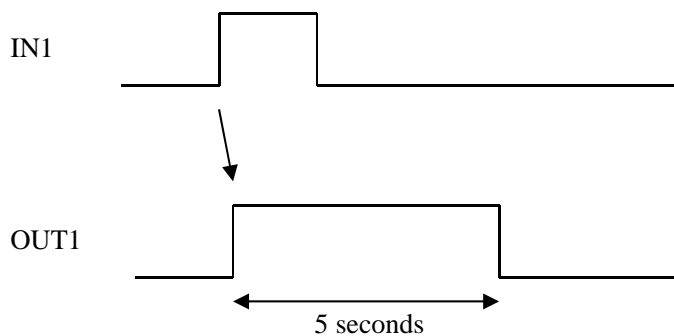
For details, see "4 SiO-Programmer" or the "SiO-Programmer Instruction Manual."

3.2.2 Cycle Time

```
 ┌─────────────────►┐
 │         ┌─────────────────────┐
 │         │   Input processing   │
 │         │    (Acquire data)    │
 │         └─────────────────────┘
 │                   │
 │                   ▼
 │         ┌─────────────────────┐
 │         │      Program         │
 │         │     processing       │
 │         └─────────────────────┘
 │                   │
 │                   ▼
 │         ┌─────────────────────┐
 │         │  Output processing   │
 │         │     (Set data)       │
 │         └─────────────────────┘
 │                   │
 └───────────────────┘
```
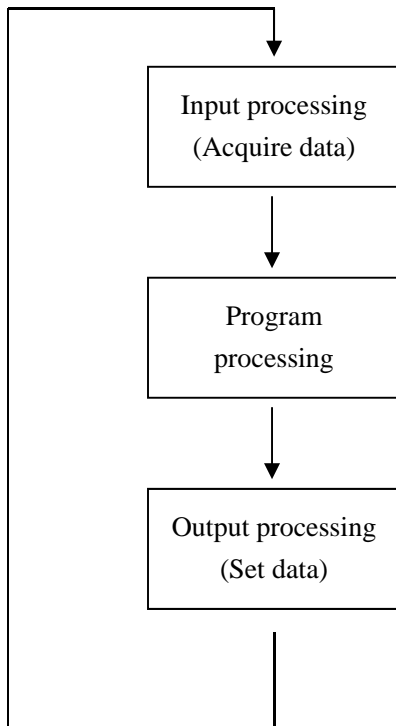
The SiO controller repeats the above processes.

The time required to execute these three processes once is called cycle time.

The cycle time of the SiO controller is 5 msec.

It is constant regardless of the number of registered programs.

3.2.3 Input Response Time

The input ON/OFF time must be set to 10 msec or more.

Failure to do so may fail to read programs.

Therefore, the input response time is 10 msec + cycle time.

■ ■ **3.3 Installation ■ ■**

3.3.1 Installation of Controller

Install the controller observing the following precautions.

◆ Avoid installation in direct sunlight.

◆ Prevent foreign matter from entering the controller.

◆ Avoid using in a place with high temperature, high humidity, dust, iron powder, cutting oil, or the like.

3.3.2 Wiring to Controller

Wire the AC adapter and I/O cables as follows.

Be sure to turn OFF the power before wiring.

1. Wiring to controller and power connector

   Connect 24 V DC to the power connector. It is recommended to use the dedicated AC adapter.

   Otherwise, prepare a plug of the following size:

   ⚠CAUTION Do not supply power except from the power connector.

   Because it does not pass through the protection circuit,Controller may fail.

   5.5 mm (OD) ✕ 2.1 mm (ID),   Wiring symbol: ⊕——◉——⊖

   Plug   Jack

2. Connection of I/O cables

   Connect I/O cables to the input/output connectors.

   * Be sure to insert each connector until it clicks.
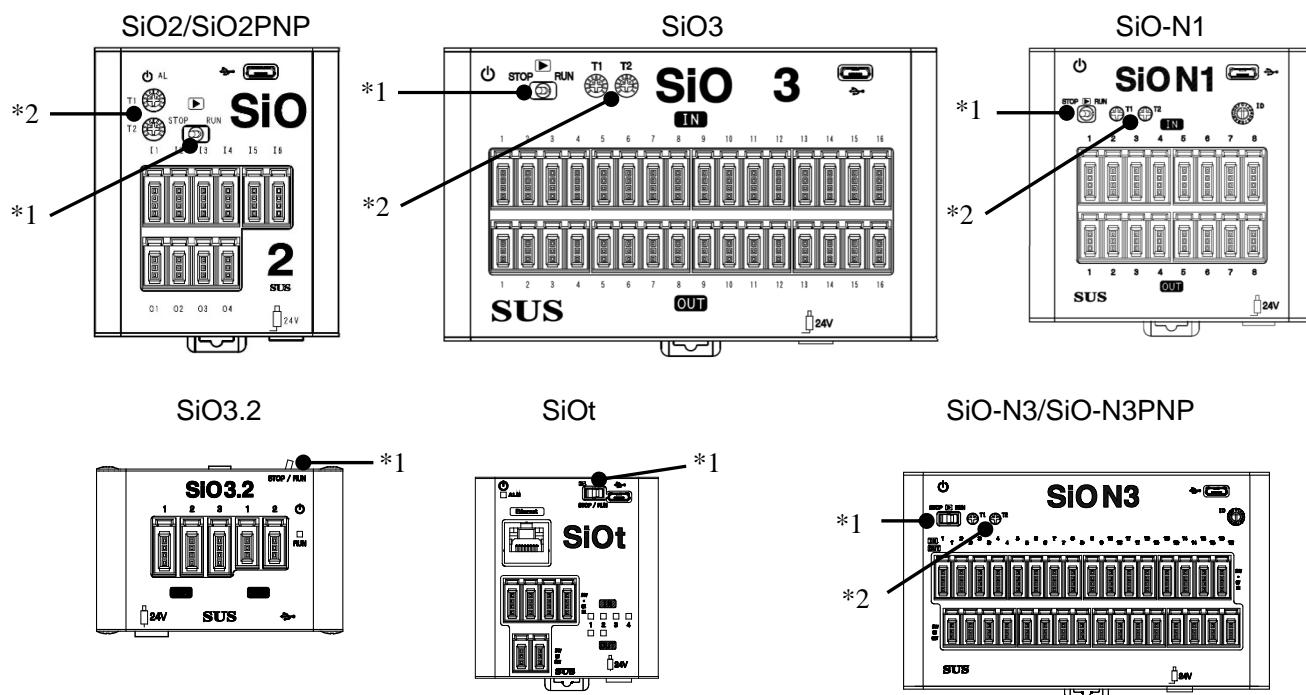
   Before connection   After connection

   ⚠CAUTION Be sure to push down the lever before disconnecting the connector.
   Forcibly pulling out the connector may result in a break in the wire.

■ ■ **3.4 Settings** ■ ■

SiO2/SiO2PNP

*2

*1

SiO3

*1

*2

SiO-N1

*1

*2

SiO3.2

*1

SiOt

*1

SiO-N3/SiO-N3PNP

*1

*2

* 1: RUN switch,   * 2: Timer 1 / Timer 2, Not provided to SiO3.2,SiOt

3.4.1 RUN Switch

Operate the RUN switch to run and stop the program.

Slide the switch to "RUN" (right) to run, and to "STOP" (left) to stop the program.

When the program stops, outputs are all turned OFF.

Be sure to set the RUN switch to "STOP" before registering a program from the SiO-Programmer.

3.4.2 Timer Setting

The SiO controller has two timer setting trimmers.

They are used when T1 or T2 is selected by the program.

*: SiO3.2 / SiOt has no timers.

The maximum value applies when T1 or T2 is selected by the program.

SiO2/SiO2PNP/SiO3/SiO-N1/SiO-N3/SiO-N3PNP

Short   Long
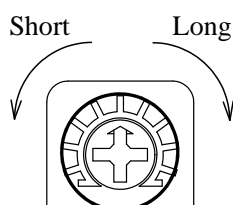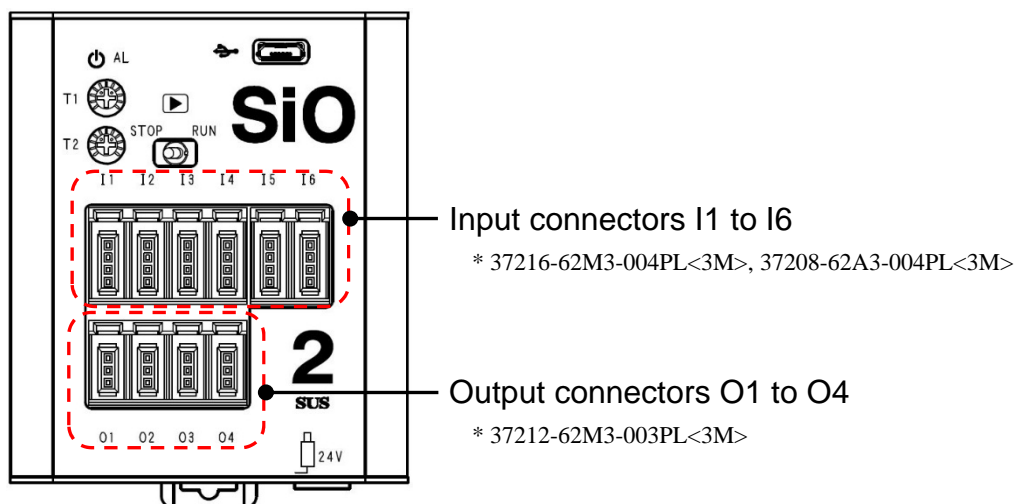

The setting range is 0 to 5 (initial) seconds.

The maximum value can be changed by using the SiO-Programmer.

⚠ CAUTION • Operate the trimmer using a small flat-head screwdriver.

■ ■ 3.5 Input/Output ■ ■

3.5.1 Input/Output Connectors (SiO2/SiO2PNP)

Input connectors I1 to I6
* 37216-62M3-004PL<3M>, 37208-62A3-004PL<3M>

Output connectors O1 to O4
* 37212-62M3-003PL<3M>

Connector	Input/Output	Signal	Connector type
Input connectors I1 to I6	Input	IN1 to IN6	e-CON (4-pole) *
Output connectors O1 to O4	Output	OUT1 to OUT4	e-CON (3-pole) *

* When connecting input/output connectors, use e-CON-compatible connectors.

SUS also provides various cables with e-CON.

Visit the SUS website mentioned in "5. Options."

Input (e-CON 4-pole) pin arrangement

Pin No.	Signal
1	24V *
2	-
3	0V *
4	Input signal

Output (e-CON 3-pole) pin arrangement

Pin No.	Signal
1	24V *
2	0V *
3	Output signal

* 24V and 0V are respectively connected to 24 V and 0 V of the power supply input inside the controller.

3.5.2 Input/Output Connectors (SiO3)

Input connectors IN1 to IN16
* 37216-62M3-004PL<3M>

Output connectors OUT1 to OUT 16
* 37212-62M3-003PL<3M>

Connector	Input/Output	Signal	Connector type
Input connectors IN1 to IN16	Input	IN1 to IN16	e-CON (4-pole) *
Output connectors OUT1 to OUT16	Output	OUT1 to OUT16	e-CON (3-pole) *

* When connecting input/output connectors, use e-CON-compatible connectors.

   SUS also provides various cables with e-CON.

   Visit the SUS website mentioned in "5. Options."

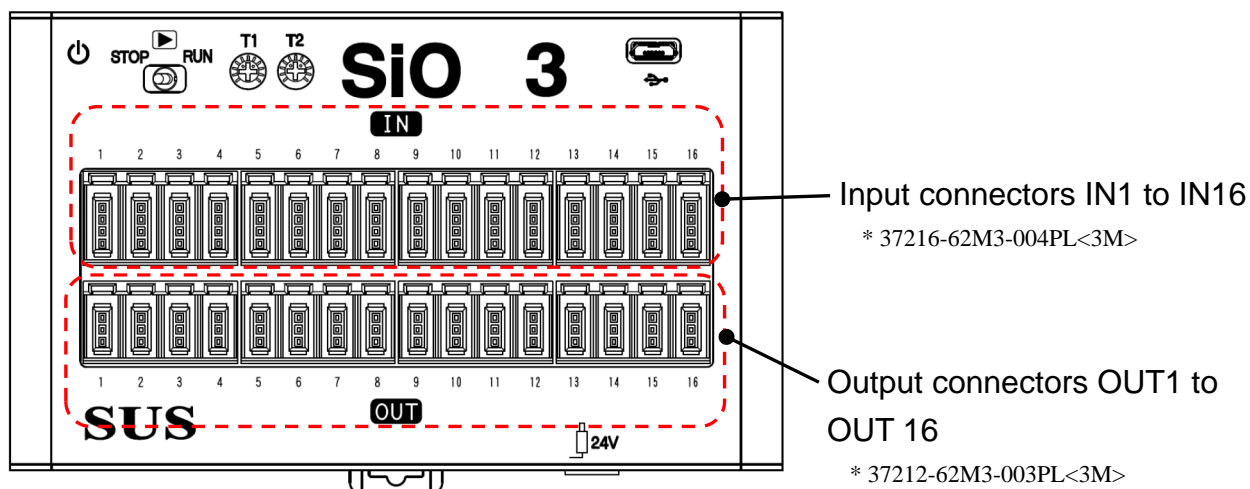Input (e-CON 4-pole) pin arrangement

Pin No.	Signal
1	24V *
2	-
3	0V *
4	Input signal

Output (e-CON 3-pole) pin arrangement

Pin No.	Signal
1	24V *
2	0V *
3	Output signal

* 24V and 0V are respectively connected to 24 V and 0 V of the power supply input inside the controller.

3.5.3 Input/Output Connectors (SiO-N1)

Input connectors IN1 to IN8
* 37216-62M3-004PL<3M>

Output connectors OUT1 to OUT8
* 37212-62M3-003PL<3M>

Connector	Input/Output	Signal	Connector type
Input connectors IN1 to IN8	Input	IN1 to IN8	e-CON (4-pole) *
Output connectors OUT1 to OUT8	Output	OUT1 to OUT8	e-CON (3-pole) *

* When connecting input/output connectors, use e-CON-compatible connectors.

 SUS also provides various cables with e-CON.

 Visit the SUS website mentioned in "5. Options."
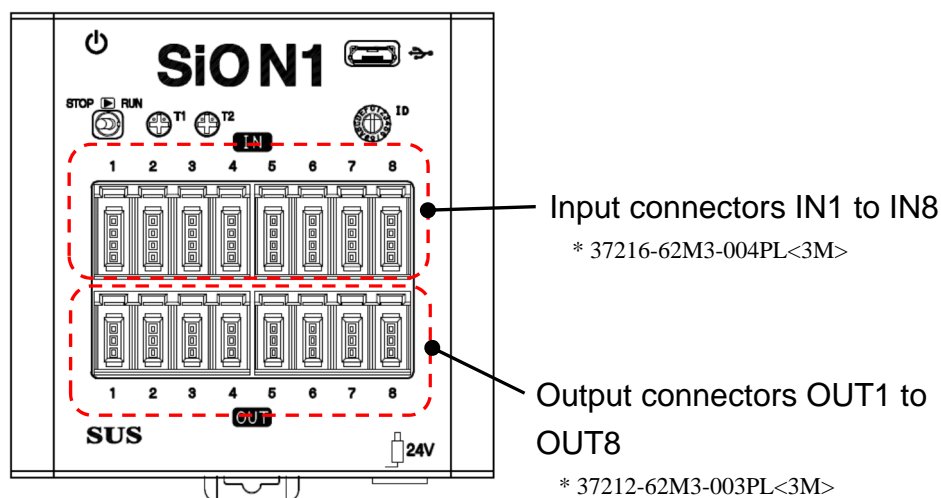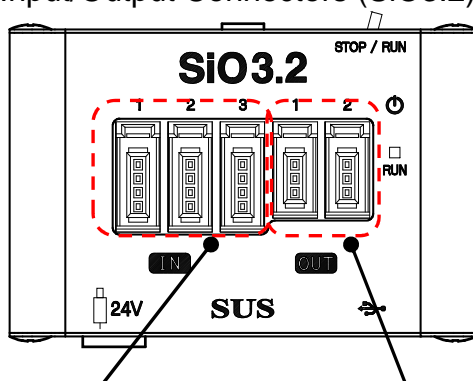
Input (e-CON 4-pole) pin arrangement

Pin No.	Signal
1	24V *
2	-
3	0V *
4	Input signal

Output (e-CON 3-pole) pin arrangement

Pin No.	Signal
1	24V *
2	0V *
3	Output signal

* 24V and 0V are respectively connected to 24 V and 0 V of the power supply input inside the controller.

3.5.4　Input/Output Connectors (SiO3.2)

Input connectors IN1 to IN3　　Output connectors OUT1 and OUT2
　　* 37204-62M3-004PL<3M>　　　　　　* 37203-62M3-003PL<3M>

Connector	Input/Output	Signal	Connector type
Input connectors IN1 to IN3	Input	IN1 to IN3	e-CON (4-pole) *
Output connectors OUT1 and OUT2	Output	OUT1 to OUT2	e-CON (3-pole) *

* When connecting input/output connectors, use e-CON-compatible connectors.

　SUS also provides various cables with e-CON.

　Visit the SUS website mentioned in "5. Options."

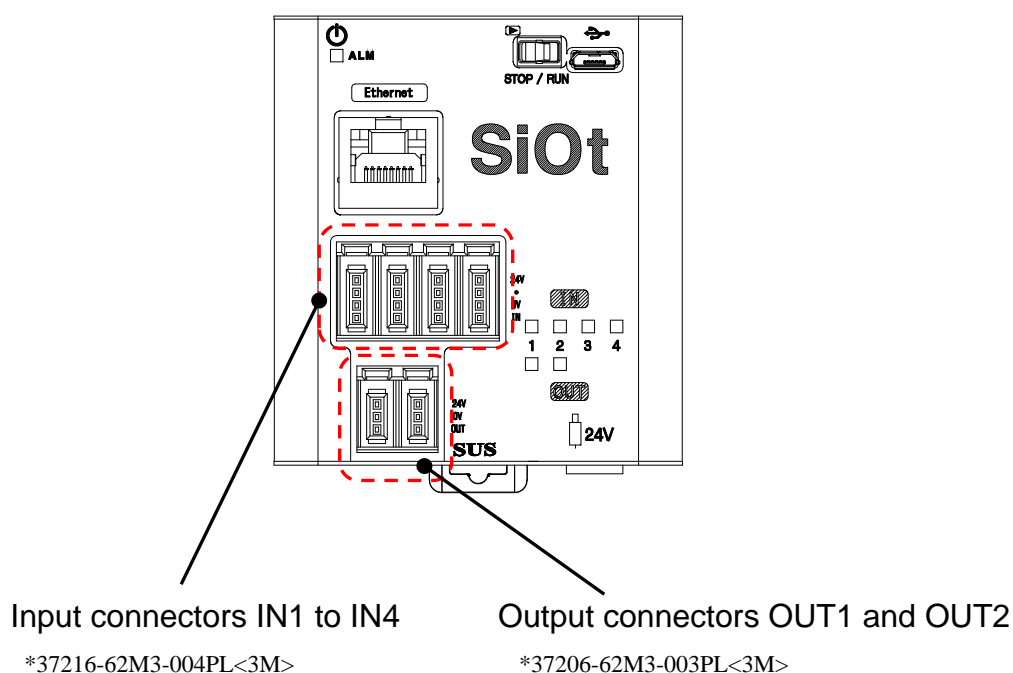Input (e-CON 4-pole) pin arrangement　　　Output (e-CON 3-pole) pin arrangement

Pin No.	Signal
1	24V *
2	-
3	0V *
4	Input signal

Pin No.	Signal
1	24V *
2	0V *
3	Output signal

* 24V and 0V are respectively connected to 24 V and 0 V of the power supply input inside the controller.

3.5.5　Input/Output connector（SiOt）

Input connectors IN1 to IN4
*37216-62M3-004PL<3M>

Output connectors OUT1 and OUT2
*37206-62M3-003PL<3M>

Connector	Input/Output	Signal	Connector type
Input connectors IN1 to IN4	Input	IN1 to IN4	e-CON(4-pole) *
Output connectors OUT1 and OUT2	Output	OUT1 to OUT2	e-CON(3-pole) *

　* When connecting input/output connectors, use e-CON-compatible connectors.

　　SUS also provides various cables with e-CON.

　　Visit the SUS website mentioned in "5. Options."
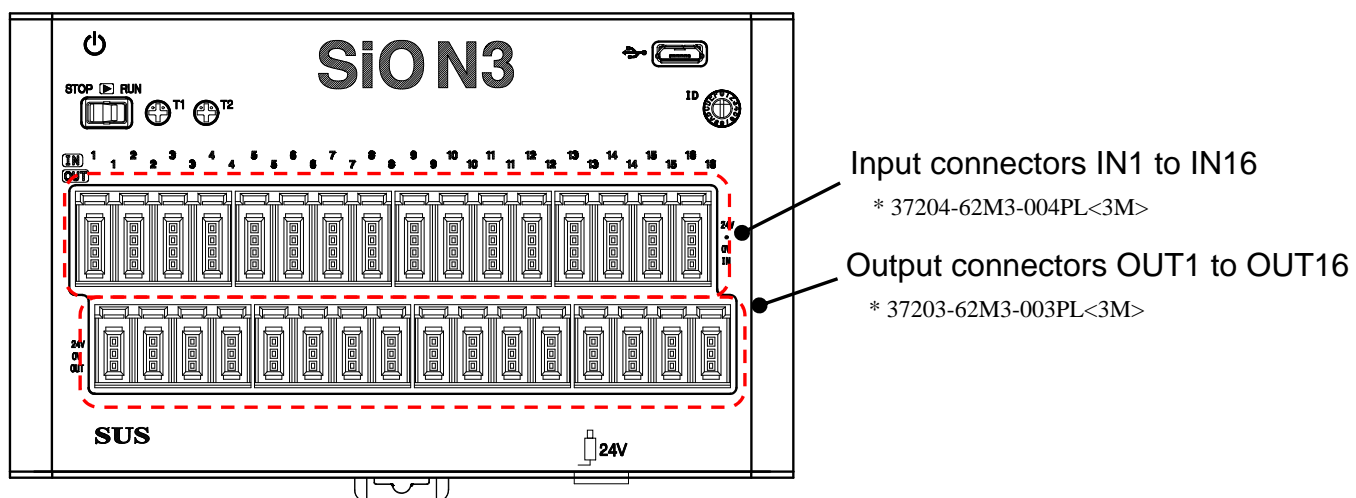
Input (e-CON 4-pole) pin arrangement

Pin No.	Signal
1	24V *
2	-
3	0V *
4	Input signal

Output (e-CON 3-pole) pin arrangement

Pin No.	Signal
1	24V *
2	0V *
3	Output signal

　* 24V and 0V are respectively connected to 24 V and 0 V of the power supply input inside the
　　controller.

3.5.6   Input/Output connector（SiO-N3 / SiO-N3PNP）

Input connectors IN1 to IN16
  * 37204-62M3-004PL<3M>

Output connectors OUT1 to OUT16
  * 37203-62M3-003PL<3M>

Connector	Input/Output	Signal	Connector type
Input connectors IN1 to IN16	Input	IN1 to IN16	e-CON(4-pole) *
Output connectors OUT1 to OUT16	Output	OUT1 to OUT16	e-CON(3-pole) *

  * When connecting input/output connectors, use e-CON-compatible connectors.

     SUS also provides various cables with e-CON.

     Visit the SUS website mentioned in "5. Options."

Input (e-CON 4-pole) pin arrangement

Pin No.	Signal
1	24V *
2	-
3	0V *
4	Input signal

Output (e-CON 3-pole) pin arrangement

Pin No.	Signal
1	24V *
2	0V *
3	Output signal

  * 24V and 0V are respectively connected to 24 V and 0 V of the power supply input inside the
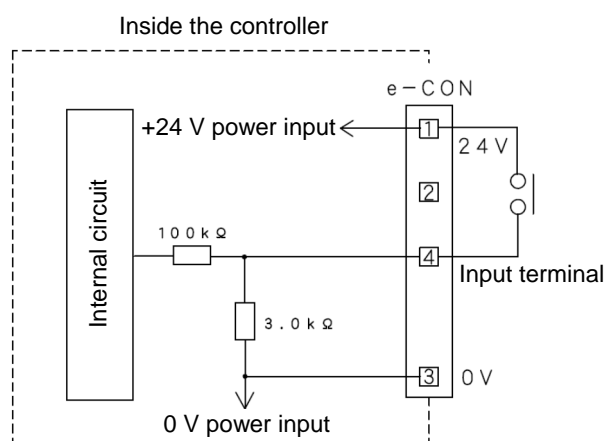
     controller.

3.5.5 Input Circuit Specifications

(1) SiO2, SiO3, SiO-N1, SiO3.2,SiOt,SiO-N3

Item	Specification
Number of inputs	6 (SiO2) 16 (SiO3) 8 (SiO-N1) 3 (SiO3.2) 4(SiOt) 16(SiO-N3)
Input voltage	24 V DC ± 10%
Input current	Approx. 7 mA / 24 V DC
Insulation system	Non-insulated

Inside the controller
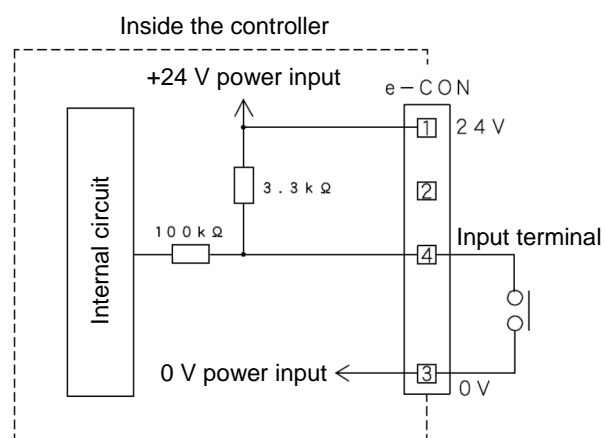
(2) SiO2PNP,SiO-N3PNP

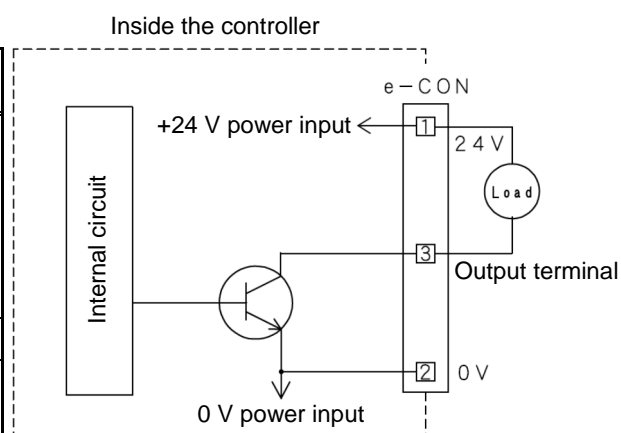| Item	Specification
Number of inputs	6 (SiO2PNP) 16(SiO-N3PNP)
Input voltage	24 V DC ± 10%
Input current	Approx. 7 mA / 24 V DC
Insulation system	Non-insulated

Inside the controller

When externally connecting a non-contact circuit, the leakage current must be 1 mA or less per point when the switch is OFF.

When using mechanical contacts (such as relays and switches), consider their lifetimes from the cycle time and others. Also, use those with a contact for minute electric current.

### 3.5.6 Output Circuit Specifications

(1) SiO2, SiO3, SiO-N1, SiO3.2,SiOt,SiO-N3

Inside the controller

Item	Specification
Number of outputs	4 (SiO2) 16 (SiO3) 8 (SiO-N1) 2 (SiO3.2) 2(SiOt) 16(SiO-N3)
Load voltage	24 V DC ± 10%
Maximum load voltage	100 mA/pt (*1)
Insulation system	Non-insulated

e－CON

+24 V power input

24 V

Load

Output terminal

0 V power input

0 V

(2) SiO2PNP, SiO-N3PNP

Inside the controller

Item	Specification
Number of outputs	4 (SiO2PNP) 16(SiO-N3PNP)
Load voltage	24 V DC ± 10%
Maximum load voltage	100 mA/pt (*1)
Insulation system	Non-insulated

+24 V power input

e－CON

24 V

Output terminal

Load

0 V power input

0 V
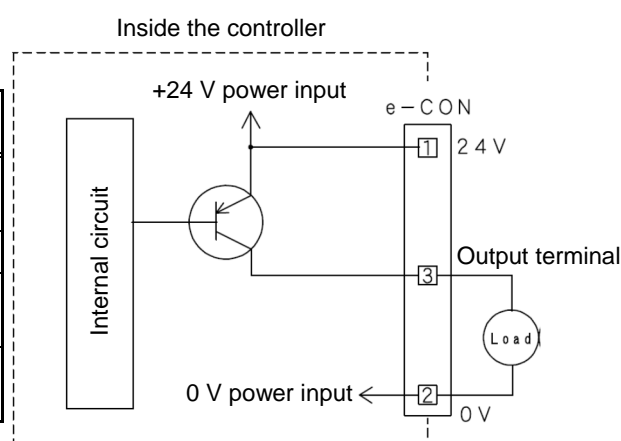
The internal circuit of this output element will be broken in the event of a load short circuit or if a current above the rated current flows.

When connecting an inductive load such as a relay, check the load current of the relay before use.

Also, be sure to connect a back electromotive force absorption diode to the coil.

(* 1) The total load current per controller must be 1.0 A or less.

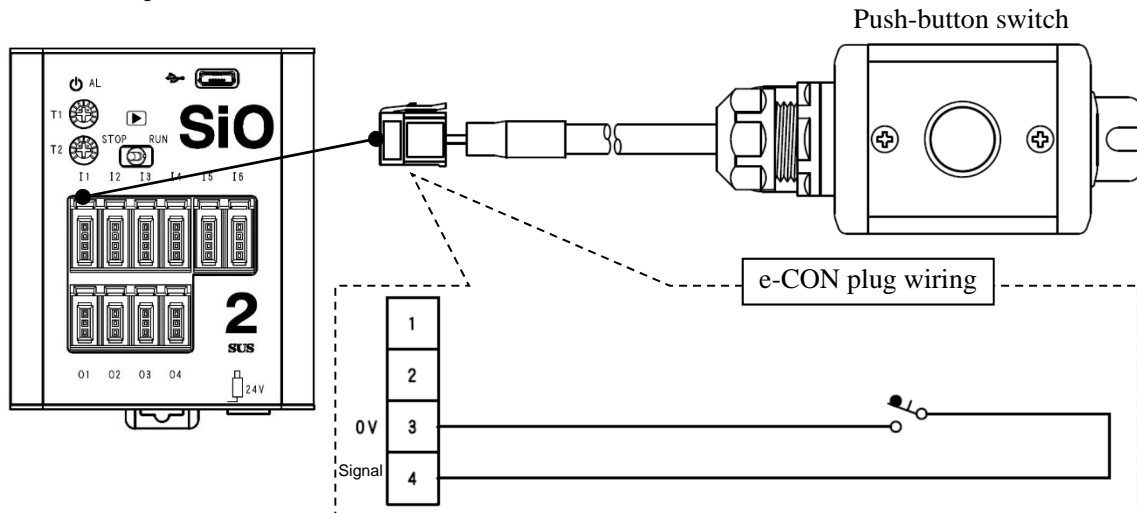SUS also provides various cables with e-CON as options.

For details, visit the SUS website mentioned in "5. Options."

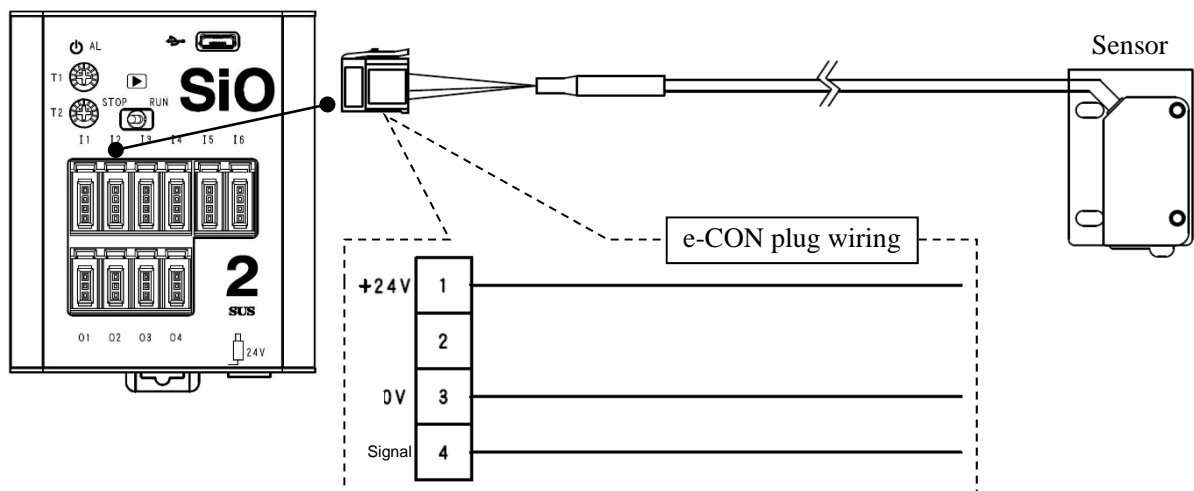### 3.5.7   Examples of Input/Output Connection

The following are examples of connecting e-CON type SiO and input/output devices.
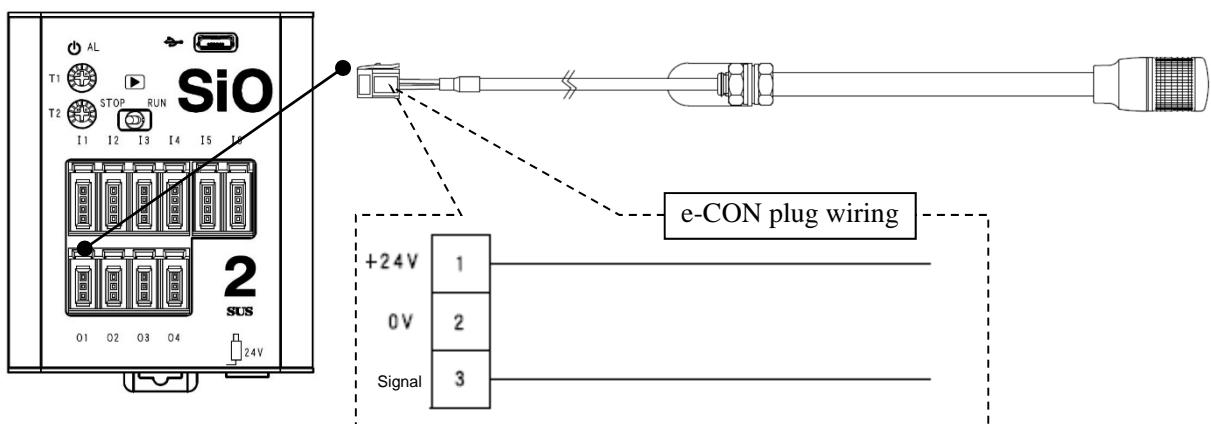
* Connection example of NPN type

1. Connect a push-button switch to IN1.

2. Connect a sensor to IN2.

3. Connect an LED to OUT1.

■ ■ **3.7 About Ethernet communication (SiOt) ■ ■**

Input / output status of SiOt controller from Ethernet compatible device such as PC
It can be read.
You can also control the Ether flags that can be used programmatically.

SiOt controller operates as a TCP server.
Please set the connection destination to the client and use it.
For details, see to "SiOt Ethernet Communication Instruction Manual".

3.7.1 Communication specifications

Item	Contents
Number of channels	1 channel
Communication speed	10 Mbps and 100 Mbps
Communication method	Full-duplex communication and half-duplex communication

3.7.2 Setting items
From SiO-Programmer to the IP address of the SiOt controller, subnet mask,Register the default gateway and port number.

3.7.3 Ethernet cable connection
Connect the Ethernet cable to the Ethernet connector.
* It is a normal fit to make a clicking sound.

4.   SiO-Programmer

The SiO-Programmer allows the user to set programs.

Programs can be downloaded from the SUS website free of charge.   http://www.sus.co.jp/

*   A USB cable (Micro-B USB 2.0) is necessary for communication with the personal computer.
    Visit the SUS website or see the SiO-Programmer Instruction Manual for the use
    environment, including supported OS, and how to operate the programmer.

[Main Functions]

1.   Edit programs
     Sets conditions for turning ON each output.
     Edited programs can be saved as a file and also printed out.

2.   Check the input/output status
     Displays the input/output status.

3.   Read and register programs from and to the controller
     Reads and registers programs.
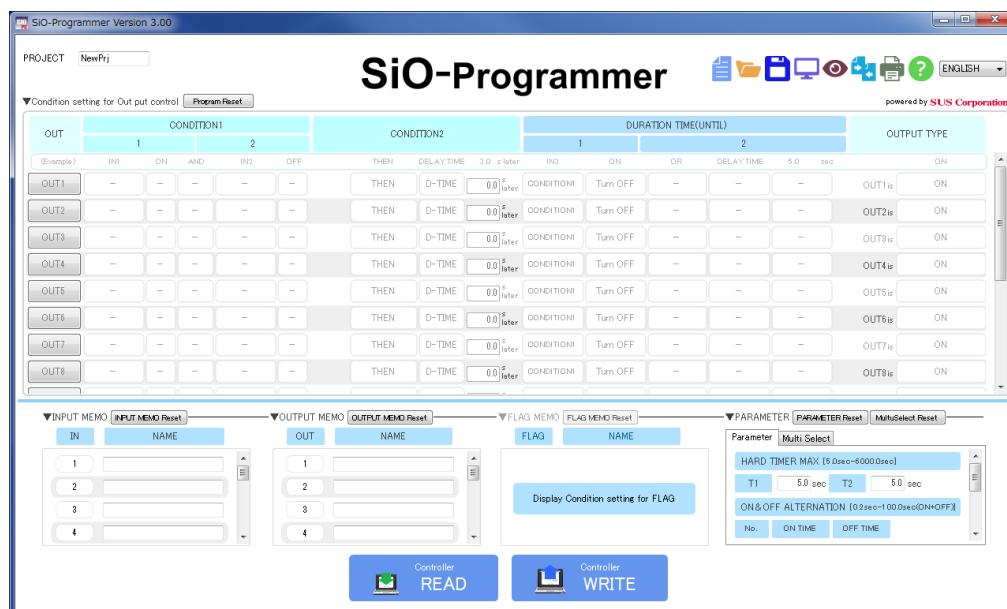
USB cable connection

Connect the USB cable to the USB connector.

The USB connector type is Micro-B (USB 2.0).

To perform USB communication, the USB driver must be installed.

For how to install the USB driver, see the following instruction manual:

→ SiO-Programmer Instruction Manual

⚠CAUTION   After USB communication, disconnect the power cable of the controller body, turn off the power, and then disconnect the USB cable.

SiO2/SiO2PNP

SiO3

SiO-N1

SiO3.2

SiOt

SiO-N3/SiO-N3PNP

5. Options

Many options are available for the SiO controller, including various terminal blocks, input/output devices, cables, and separate connectors.

* Input/output options are not available for SiO2PNP,SIO-N3PNP.

Visit the SUS website for details.

SUS website: http://www.sus.co.jp/

Product list -> SiO -> Compatible devices

6. Troubleshooting

If you find something unusual, such as being inoperative or working but not the same as before, check the following.

Check 1	Is the controller turned ON?
Action	Supply power of 24 V DC, 0.3 A. Make sure that the power indicator on the controller is ON. If the power indicator does not light even though 24 V DC is supplied, the internal fuse may be broken. Please contact SUS.

Check 2	Is the RUN switch set to "RUN"?
Action	To activate the controller, the RUN switch must be set to "RUN." Check the switch.

Check 3	Are the wires connected correctly?
Action	Check the wiring of the connected devices.

| Check 4	The power supply capacity may not be enough.
Action	A power supply capacity of 0.3 A is required. When using an AC adapter other than that supplied by SUS, check the power supply capacity.

Check 5	Check the connection of the power cable and input/output cables.
Action	Check the connection of the power connector and input/output cable connectors. Unplug each connector once and connect it again.

7. Specifications

7.1 SiO2 Specifications

Model	SiO2
Installation method	GF (N) / DIN rail
Power supply voltage	24 V DC ± 10%, 0.3 A, DC plug: 5.5 mm × 2.1 mm
Number of inputs/outputs	6 inputs, 4 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (NPN)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (NPN)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type
Use environment	Temperature: 0 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 107 g

7.2 External Dimensions of SiO2
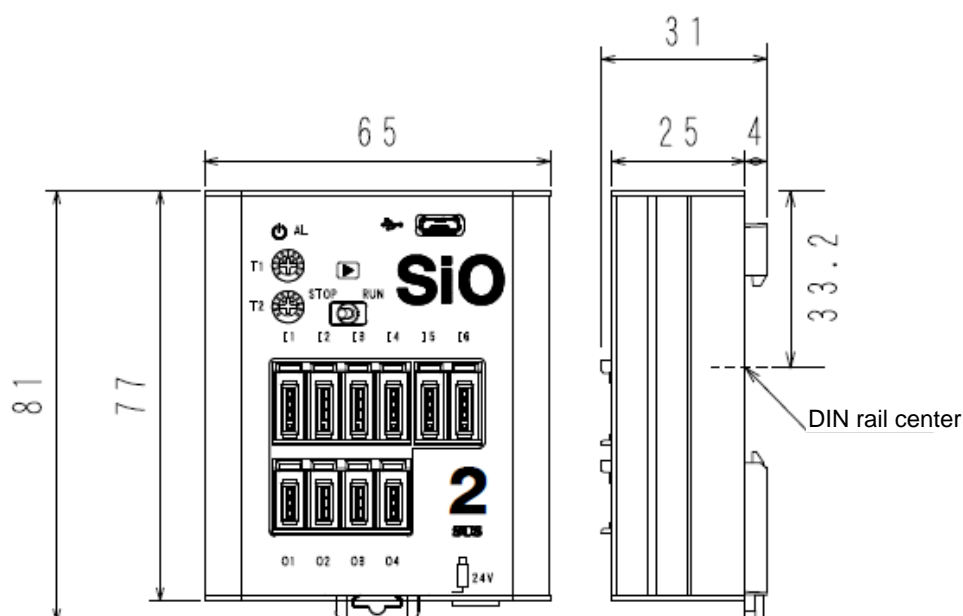
7.3 SiO2PNP Specifications

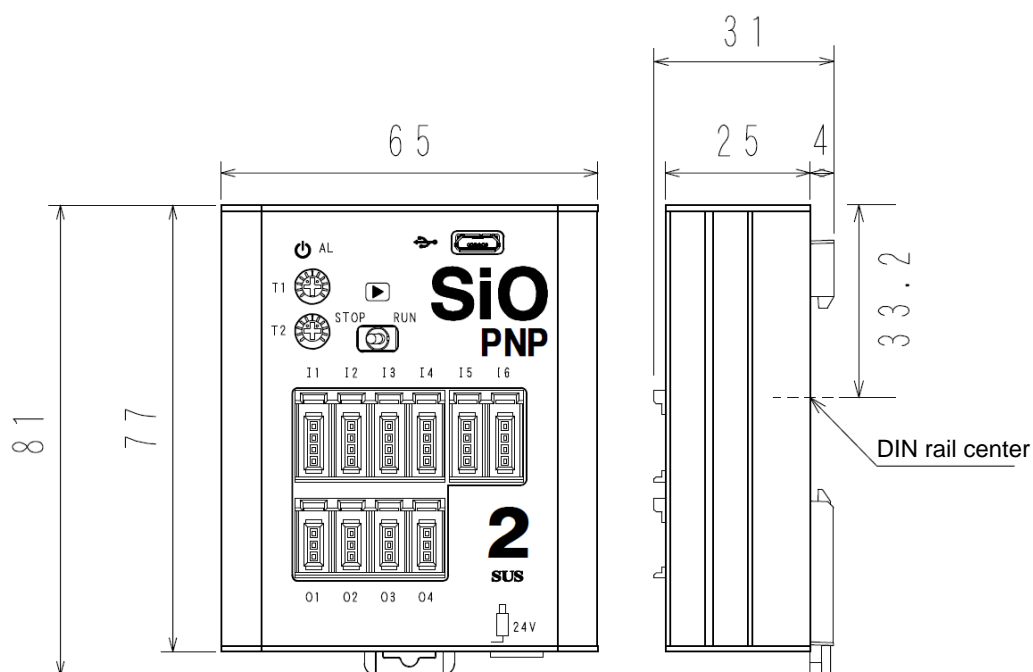| Model	SiO2PNP
Installation method	GF (N) / DIN rail
Power supply voltage	24 V DC ± 10%, 0.3 A, DC plug: 5.5 mm × 2.1 mm
Number of inputs/outputs	6 inputs, 4 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (PNP)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (PNP)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type
Use environment	Temperature: 0 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 107 g

7.4 External Dimensions of SiO2PNP

DIN rail center

7.5   SiO3 Specifications

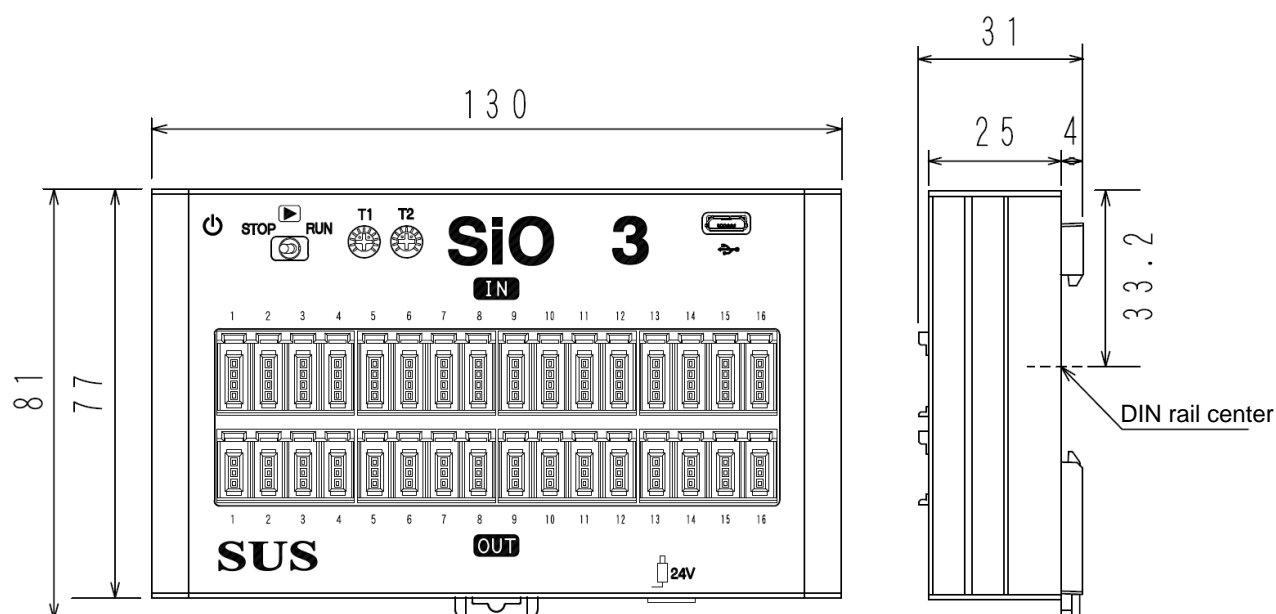| Model	SiO3
Installation method	GF (N) / DIN rail
Power supply voltage	24 V DC ± 10%, 0.3 A, DC plug: 5.5 mm ✕ 2.1 mm
Number of inputs/outputs	16 inputs, 16 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (NPN)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (NPN)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type
Use environment	Temperature: 0 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 178 g

7.6   External Dimensions of SiO3

7.7　SiO-N1 Specifications

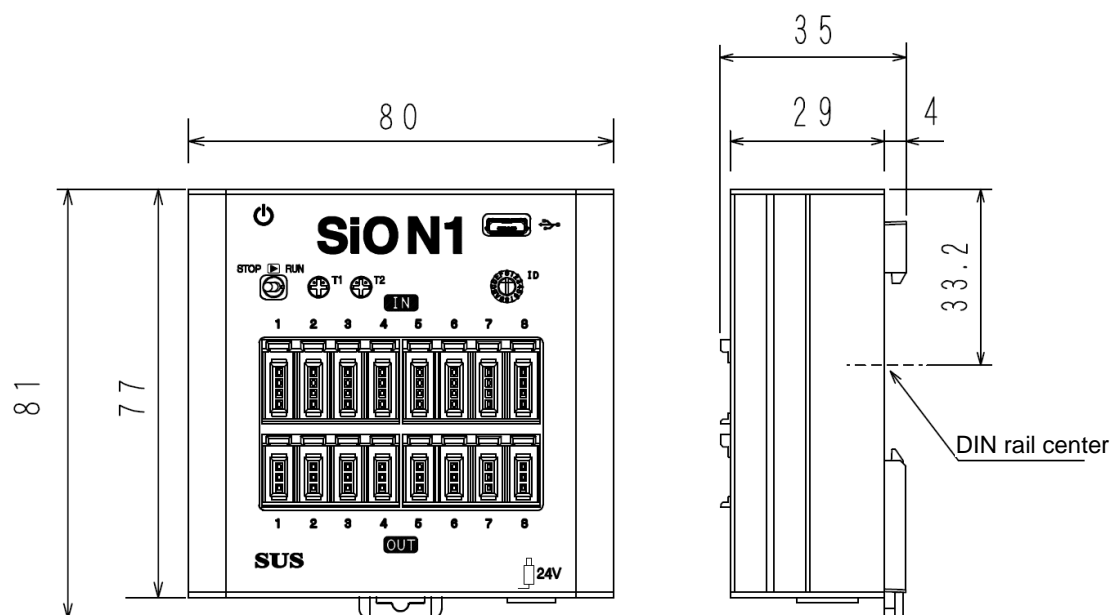| Model	SiO-N1
Installation method	GF (N) / DIN rail
Power supply voltage	24 V DC ± 10%, 0.3 A, DC plug: 5.5 mm × 2.1 mm
Number of inputs/outputs	8 inputs, 8 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (NPN)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (NPN)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type 485 communication: SUS Original ＊ Only used in SiO network
Use environment	Temperature: −10 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 128 g

7.8　External Dimensions of SiO-N1

7.9   SiO3.2 Specifications

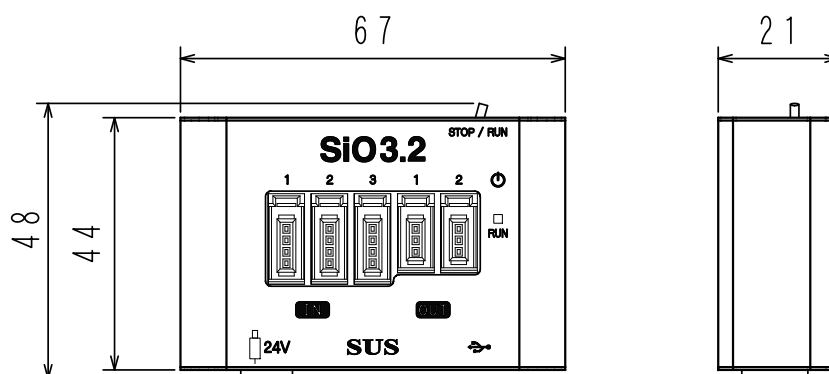|	
Model	SiO3.2
Installation method	GF (N)
Power supply voltage	24 V DC ± 10%, 0.3 A, DC plug: 5.5 mm × 2.1 mm
Number of inputs/outputs	3 inputs, 2 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (NPN)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (NPN)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type 485 communication: SUS Original * Only used in SiO network
Use environment	Temperature: -10 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 62 g

7.10   External Dimensions of SiO3.2

7.11 SiOt Specifications

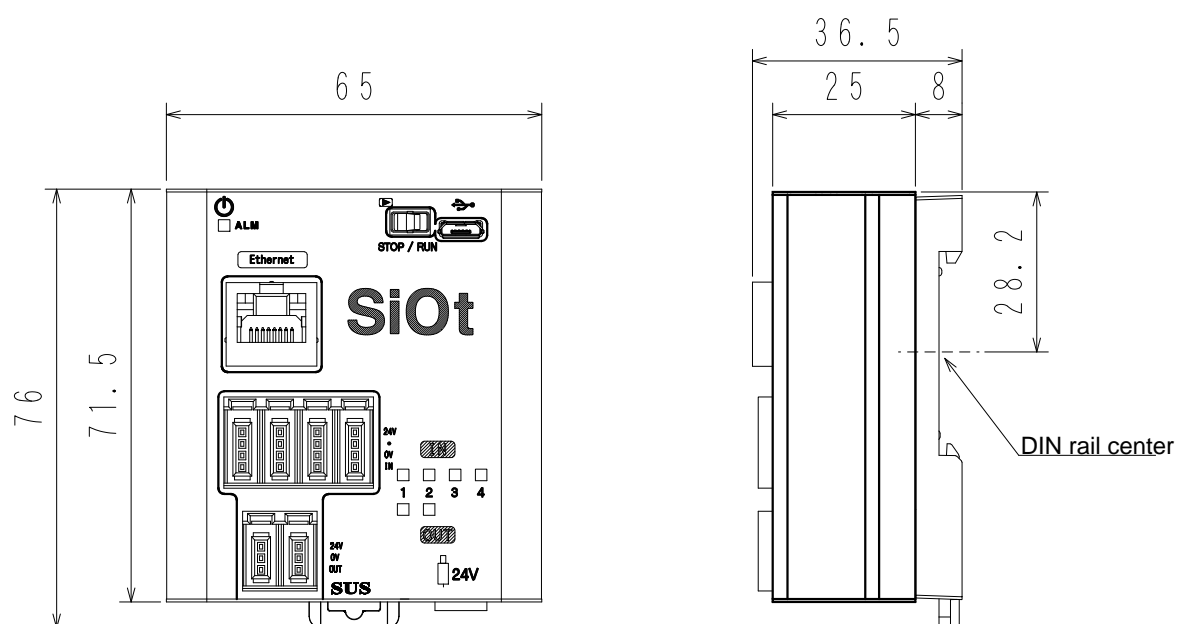| Model	SiOt
Installation method	GF (N) / DIN rail
Power supply voltage	DC24V±10％, 0.3A, DC plug 5.5mm ✕ 2.1mm
Number of inputs/outputs	4 inputs, 2 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (NPN)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (NPN)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type
Ethernet Communication specification	Communication speed: 10 Mbps and 100 Mbps Communication method: Full-duplex communication and half-duplex communication
Use environment	Temperature: -10 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 105 g

7.12 External Dimensions of SiOt

7.13 SiO-N3 Specifications

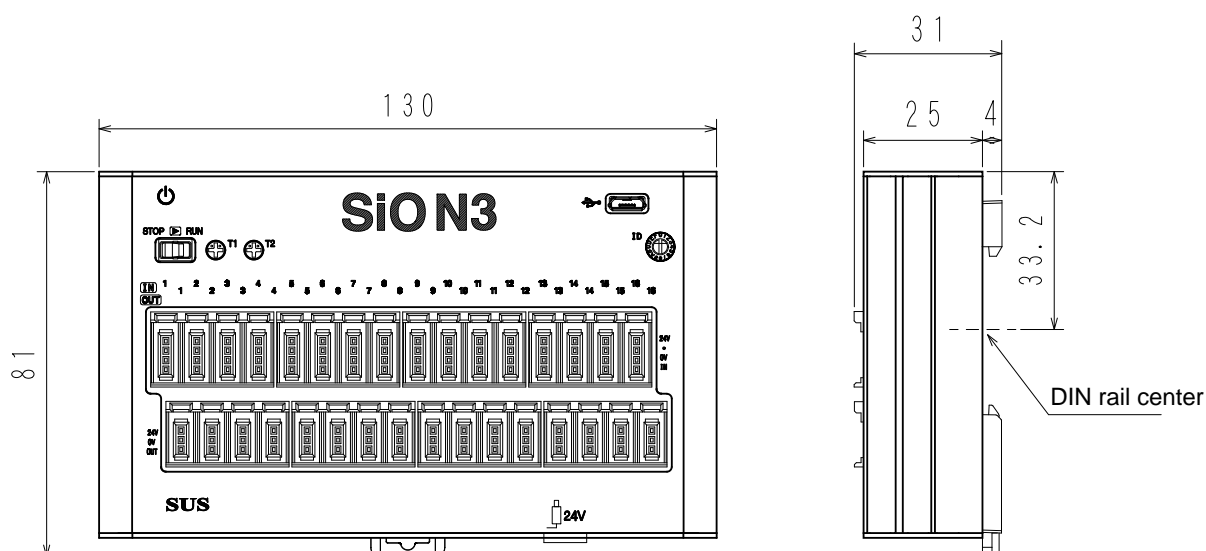| Model	SiO-N3
Installation method	GF (N) / DIN rail
Power supply voltage	DC24V±10%, 0.3A, DC plug 5.5mm × 2.1mm
Number of inputs/outputs	16 inputs, 16 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (NPN)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (NPN)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type 485 communication: SUS Original * Only used in SiO network
Use environment	Temperature: -10 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 180 g

7.14   External Dimensions of SiO-N3

7.15　　　SiO-N3PNP Specifications

| Model	SiO-N3PNP
Installation method	GF (N)　/　DIN rail
Power supply voltage	DC24V±10%, 0.3A, DC plug 5.5mm ✕ 2.1mm
Number of inputs/outputs	16 inputs, 16 outputs
Input specification	24 V DC ± 10%, 7 mA / 24 V DC, Non-voltage contact input (PNP)
Output specification	24 V DC ± 10%, 100 mA / 24 V DC, Open collector (PNP)
Program system	Creation: Selection type program by means of dedicated PC software (free download) Language: SUS Original
Communication specification	USB 2.0 compliant / Micro-B type 485 communication: SUS Original　* Only used in SiO network
Use environment	Temperature: -10 to 40°C, Humidity: 35 to 85%RH, No condensation Indoors without direct sunlight
Use atmosphere	Operable in a place free from corrosive gas, oil mist, flammable gas, and dust
RoHS compliant	Lead-free compliant, RoHS compliant
Weight	Approx. 180 g

7.16　External Dimensions of SiO-N3PNP
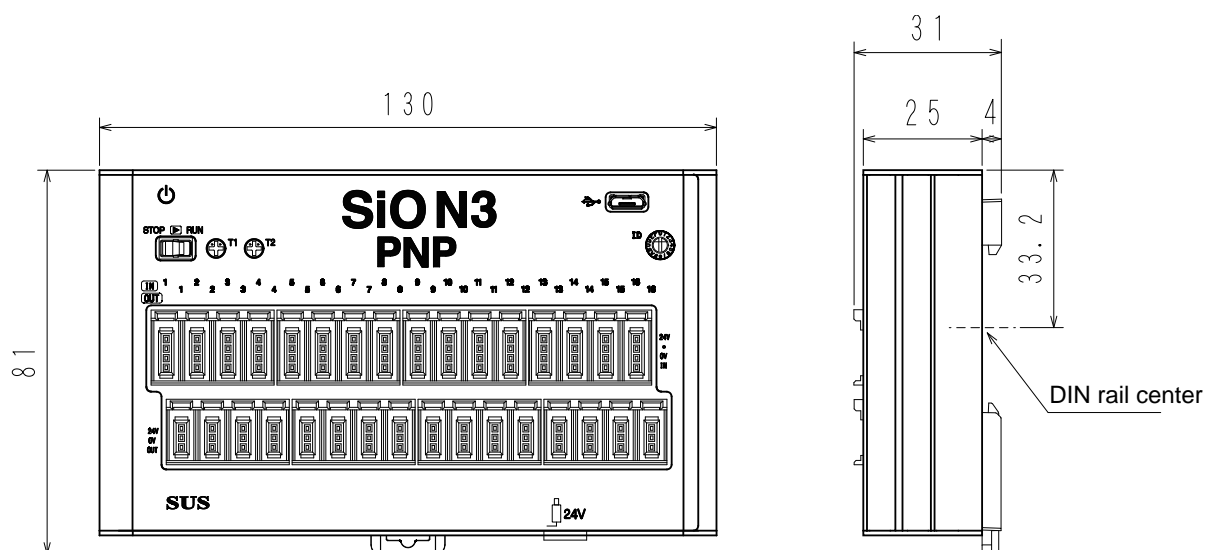
Revision History

Version	Date	Summary of revision	Revised pages
1.0	Jun. 01, 0216	Newly enacted.	
1.1	Jun 27, 2016	1. "Ground terminal" added to "Part Names and Functions." 2. Options modified.	3-1 5-1, 5-2
1.2	Aug. 15, 2016	1. A description added for the connector terminal box. 2. External dimensions modified.	3-10 7-1
2.0	Mar. 01, 2017	1. Modifications corresponding to Ver. 2.00. 2. Basic kits 4 to 7 added to options.	All pages
2.1	Apr. 17, 2017	SiO-E deleted.	1-1 2-1 3-1
3.0	Apr. 27, 2017	SiO2 added.	All pages
3.1	Aug. 30, 2017	SiO2PNP added.	All pages
3.2	Sep. 29, 2017	SiO3 added.	All pages
3.3	Jun. 26, 2018	SiO-N1 added.	All pages
3.4	Apr. 25, 2018	SiO3.2 added. SiO-C deleted (See Appendix.)	All pages
3.5	Jan.31.2020	Precautions for power supply added.	3-1,2,3,4,7
3.6	Sep. 16, 2020	SiOt added.	All pages
3.7	Sep. 30, 2020	SiO-N3/SiO-N3PNP added.	All pages
3.8	Jan. 29, 2021	Use environment updated.	7-1,2,3,4,5,6,7,8
3.9	Mar.17.2021	Added notes after USB communication.	4-2