I/O CONNECTION MODULE
Model: JC-IO

USERS MANUAL

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1. Introduction

Thank you for choosing us.
Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.
This product is for use in general industrial environments, therefore may not be suitable for applications which require higher level of safety (e.g. safety or accident prevention systems) or of reliability (e.g. vehicle control or combustion control systems).

For safety, installation and maintenance of this product must be conducted by qualified personnel.

1.1 Before Use....

■ PACKAGE INCLUDES:

I/O interlink module.....(1)
Protective cover .....(1)
Ferrite core (ZCAT 3035-1330 TDK) .....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

1.2 Corresponding Versions

■ UNIT VERSION

This Users Manual corresponds to model JC-IO firmware version 1.0.x.
Refer to the 4.5.2 Information (Version, MAC address) to confirm the unit version.
This Users Manual corresponds to PC configurator software version 1.1.x.x.
Refer to the 4.2 Version to confirm the software version.

1.3 Precautions

■ CONFORMITY WITH EU DIRECTIVES

- The equipment must be mounted inside the instrument panel of a metal enclosure.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures* to ensure the CE conformity.
  * For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.

■ GENERAL PRECAUTIONS

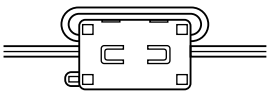
- Before you remove the unit or mount it, turn off the power supply for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
- Twist the power cables 1 turn around the ferrite core at near the unit as shown below.



■ CALENDAR CLOCK

- A backup battery is employed for calendar clock IC. Backup period without power supply is approx. 2 months.
- With power on, the battery is not drained. When power off period is for approx. 2 month, the battery cannot backup the calendar clock data, and the calendar clock cannot keep correct date and time.
  The battery is charged when the power is supplied.
- The battery is not replaceable by customer. When replacement is required, consult us.

■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

1.4 Terms

Table 1. Terms

TERMS	EXPLANATION
Internal register	4 types of data registers are defined in JC-IO. L: a register to save 32-bit data. S: a register to save 16-bit data. B: a register to save 1-bit data. P: a register to save 32-bit data and to output differential value of previous sampling as 16-bit data. Refer to 2.2 Internal Register for details.
Input data	Data that saved the input data acquired from remote I/O and PLC into the internal register.
Output data	Data that send the output data from internal register to remote I/O and PLC.
I/O mapping	Function to connect the input data and output data between remote I/O and PLC via the internal register by registering mapping information of input -> internal register -> output and transmit.
Connection	Definition of the TCP/TP connection destination of remote I/O and PLC. Two types; input connection and output connection.
Sampling cycle	An interval after executing the receiving of the input data or sending of the output data for each channel.
Web server	A web server that connected from browser software of the PC to JC-IO-N by HTTP and enables monitoring the data and conducting maintenance. Unlike a general-purpose web server, CGI and others are not operable.

1.5 Specifications

Table 2. Specifications

ITEM	DESCRIPTION	REMARKS
Power	24 V DC	
Clock	RTC	Year(4 digits). month. date. day. hour. minute. second
Configuration	Web server PC configurator software (JCIOCFG)	Both are available to configurate all parameters
Communication port	Ethernet 10 / 100 BASE-T	
Communication for setting	Modular jack RS-232-C	COP-US (required separately)
RUN contact	ON during operation (WTD)	OFF at detecting CPU abnormally
Indicator	Status indicator LED	POWER, RUN, COM, ERROR
Communication protocol	TCP/IP ICMP DHCP Client SNTP Client HTTP Client Modbus/TCP Client SLMP Client	

Table 3. Related Products

ITEM	MODEL
PC configurator cable	MCN-CON or COP-US
PC configurator software	JCIOCFG

Table 4. General Specifications

ITEM	DESCRIPTION
Power supply, RUN contact output	Tension clamp terminal (Front Twin connection) Unit side connector: MSTB2,5/5-GF-5,08AU Cable side connector: TFKC2,5/5-STF-5,08AU (Applicable wire size: 0.2 - 2.5 mm^2, stripped length 10 mm) Recommended solderless terminal AI0,25-10YE 0.25 mm^2 (Phoenix Contact) AI0,34-10TQ 0.34 mm^2 (Phoenix Contact) AI0,5-10WH 0.5 mm^2 (Phoenix Contact) AI0,75-10GY 0.75 mm^2 (Phoenix Contact) AI1-10RD 1.0 mm^2 (Phoenix Contact) AI1,5-10BK 1.5 mm^2 (Phoenix Contact) AI2,5-10BU 2.5 mm^2 (Phoenix Contact)
Ethernet	RJ-45 connector
Housing material	Flame-resistant resin (gray)
Isolation	Ethernet to power supply to RUN contact output to FE
Calender clock	Year(4 digits). month. date. day. hour. minute. second
Status Indicator LED	POWER, RUN, COM, ERROR
RUN contact output	Photo MOSFET relay (no polarity); (OFF in CPU error detected) •Peak load voltage: 50 V max. •Continuous load current: 50 mA max. •Peak load current: 300 mA max. (≤0.1 sec.)

Table 5. Ethernet Communication

ITEM	DESCRIPTION
Communication Standard	IEEE 802.3u
Transmission:	10BASE-T, 100BASE-TX
Baud rate	10/100 Mbps (Auto Negotiation function)
Protocol	TCP/IP, Modbus/TCP, SLMP, HTTP, SNTP
Transmission media	10BASE-T (STP, Category 5e) 100BASE-TX (STP, Category 5e)
Max. length of fieldbus segment	100 meters
Ethernet Indicator LED	DPLX, LNK
IP Address (factory default setting)	192.168.0.10

Table 6. Installation

ITEM	DESCRIPTION
Power consumption	Approx. 2 W 24 V DC
Operating temperature	-10 to +55°C (14 to 131°F)
Operating humidity	30 to 90 %RH (non-condensing)
Atmosphere	No corrosive gas or heavy dust
Mounting	DIN rail
Weight	190 g (0.42 lb)

Table 7. Calender Clock

ITEM	DESCRIPTION
Calendar clock accuracy	Monthly deviation 2 minutes at 25°C
Battery backup	Approx. 2 months
Battery	Vanadium-lithium secondary battery (undetachable)

1.6 Component Identification

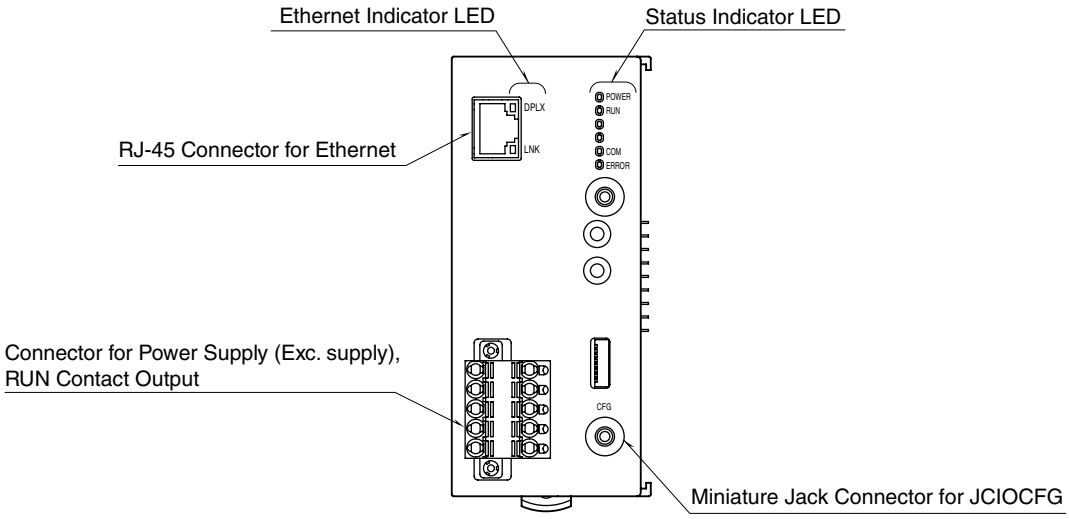


Figure 1. External view

■ STATUS INDICATOR LED

LED	COLOR	FUNCTION
POWER	Green	ON at device operating normally Blinking at Ethernet LINK error Blinking before obtaining DHCP address
RUN	Green	ON at normal operation Blinking at remote I/O communication error
COM	Green	Blinking at communication (except Modbus/TCP & SLMP)
ERROR	Red	ON at CPU error

■ Ethernet INDICATOR LED

LED	COLOR	FUNCTION
DPLX	Green	ON with full-duplex communication
LNK	Yellow	ON at LINK is established

2. SYSTEM CONFIGURATION

2.1 Basic Configuration

JC-IO-N saves the read data from remote I/O for input signal to the internal register, and transmit the data to the remote I/O for output. This is called as I/O mapping.

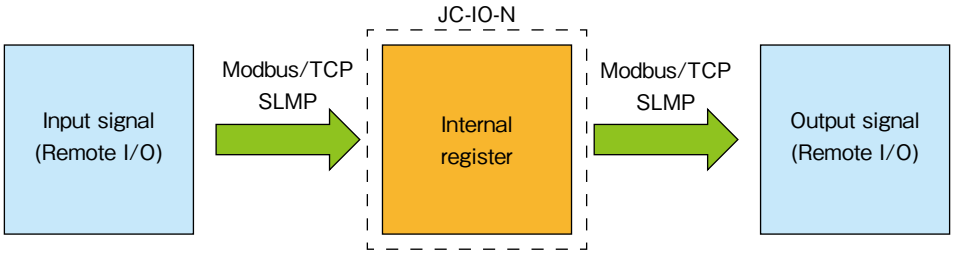


Figure 2. Basic configuration

2.2 Internal Register

JC-IO-N has 4 internal registers by data size.

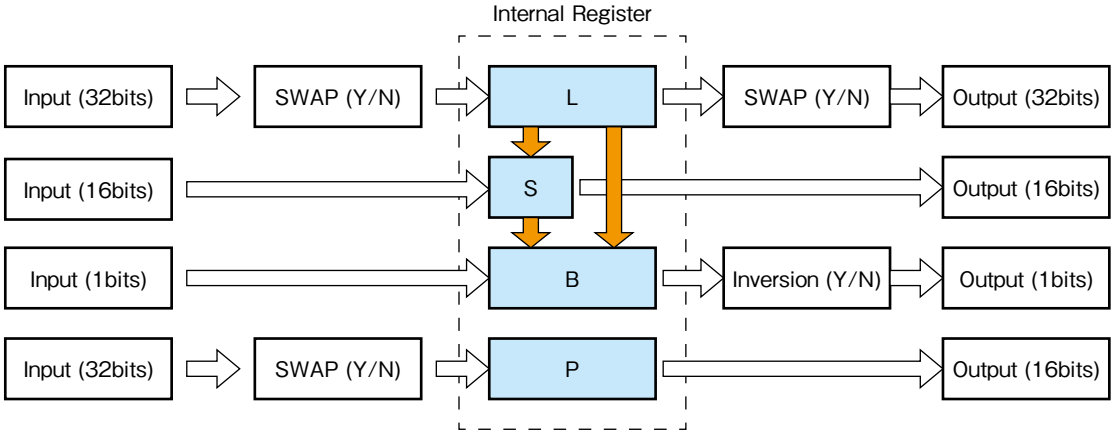


Figure 3. Internal Register

Table 8. Internal Register

REGISTER	BIT	NO. OF POINTS	DESCRIPTION
L	32	256	A register to save 32-bit data. Concatenate the two 16-bit data and handle as a 32-bit data. In this case, set the upper/lower swap (SWAP) as necessary. Set SWAP for the output in the same way.
S	16	256	A register to save 16-bit data. Transferring upper 16-bit data or lower 16-bit data of L register is possible.
B	1	512	A register to save 1-bit data. Transferring the specified 1-bit in the L or S register is possible. For output inverting the data is also possible.
P	32 -> 16	256	Handles 32-bit data as input, and outputs differential value of previous sampling as 16-bit data. For input data, SWAP setting, same as L register is available.

*The entire register is cleared to zero when the device is started up or when the setting is changed.
*Sampling (reading input signals) is performed in the order of L -> S -> B -> P.

2.3 Variable Type

JC-IO-N can handle the following variable types

Table 9. Variable Type

VARIABLE TYPE	RANGE	INTERNAL REGISTER	REMARKS
BIT	0, 1	B	0 or 1
SHORT	-32,768 to 32,767	S	Signed 16-bit integer
USHORT	0 to 65,535	S	16-bit integer
LONG	-2,147,483,648 to 2,147,483,647	L	Signed 32-bit integer
ULONG	0 to 4,294,967,295	L	32-bit integer
FLOAT	±1.175494e-038 to ±3.402823e+038	L	Compliant with IEEE 754

2.4 Configuration

JC-IO-N is configurable in two ways.
Refer to following linked page for details

Table 10. Configuration

CONFIGURATION	DESCRIPTION
JCIOCFG	Refer to 4. JCIOCFG
Web server	Refer to 5. WEB SERVER

3. I/O COMMUNICATION

3.1 Connection

JC-IO-N can define up to 32 connections (TCP connection) for the connection for I/O communication.
Refer to 4.4.3 C (Connection) for setting.

Table 11. Connection

FUNCTION	DESCRIPTION
No. of connection	max. 32 (C0 to 31)
Protocol	Select from Modbus/TCP or SLMP
Connecting Device	Set the IP address, and port number.

3.2 Output Conditions

The JC-IO-N updates the internal register when acquiring the input data from input connection or "manual operation".
After the first update of the internal register, output connection starts outputting.
Internal register is not updated when a communication error is occurred after starting the communication.
In this case, keep outputting the latest input data before occurring the error to the output connection.

3.3 Communication Error Output

Communication error output is settable for each connection.
The data type of this output data is BIT.
Outputs 0 for normal operation, outputs 1 for abnormal operation, and when the communication error returns to normal, the communication error output also returns automatically.

For this communication error output, use remote I/O modules installed on a highly reliable internal LAN.
Refer to 4.4.4 Communication Error Output for setting.

3.4 Modbus/TCP

The JC-IO-N supports Modbus/TCP as I/O communication, so communicable with Modbus/TCP supported remote I/O and PLCs is possible.

Table 12. Modbus/TCP

ITEM	DESCRIPTION	
Request	TYPE	OPERATION
	Read Coil Status (01)	Reading out Coil Status(0X)
	Read Input Status (02)	Reading out Input Status(1X)
	Read Holding Register (03)	Reading out Holding Register(4X)
	Read Input Register (04)	Reading out Input Register(3X)
	Force Multiple Coils (15)	Write to Coil(0X)
	Preset Multiple Registers (16)	Write to Holding Register(4X)
Internal register	TYPE	SELECTABLE Modbus REGISTER TYPE
	L	3X, 4X
	S	3X, 4X
	B	0X, 1X
	P	3X, 4X
	Communication error output	0X
Unit identification number	Set the common number with connection (C), or set individual number for each internal register.	

Refer to the web page of Modbus Organization for details of Modbus/TCP.

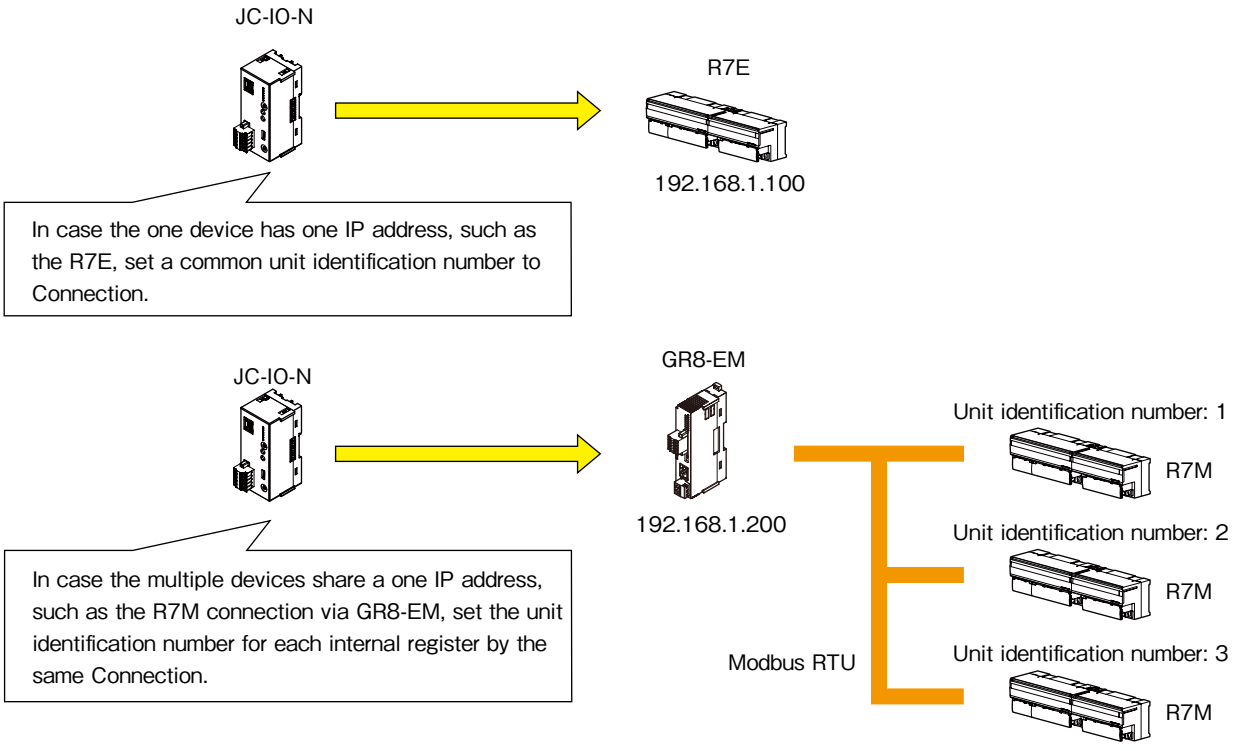


Figure 4. Unit Identification Number

3.5 SLMP

The JC-IO-N supports SLMP as I/O communication, so communicable with Mitsubishi programmable-controller.
Compatible to sub-command of 16-bit and 32-bit. MELSEC iQ-R, Q, and iQ-F are operation tested.
Refer to the following table for compatible MELSEC devices for internal register.

3.5.1 Input (S, L, P)

Table 13. Input (S, L, P)

DEVICE	DEVICE CODE	16bits					32bits				
		Command	Sub-command	Compatible programmable controller			Command	Sub-command	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
D	00A8H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SD	00A9H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
R	00AFH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
ZR	00B0H	0403H	0000H	✓	✓	×	0403H	0002H	✓	×	×
W	00B4H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SW	00B5H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
TN	00C2H	0403H	0000H	✓	✓	✓*	0403H	0002H	✓	×	×
CN	00C5H	0403H	0000H	✓	✓	✓*	0403H	0002H	✓	×	×
STN	00C8H	0403H	0000H	✓	✓	✓*	0403H	0002H	✓	×	×
Z	00CCH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
RD	002CH	0403H	0000H	×	×	×	0403H	0002H	✓	×	×

*When using L and P, enable SWAP, as the small address is upper and the large address is lower.

3.5.2 Input (B)

Table 14. Input (B)

DEVICE	DEVICE CODE	16bits					32bits				
		Command	Sub-command	Compatible programmable controller			Command	Sub-command	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
M	0090H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SM	0091H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
L	0092H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
F	0093H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
V	0094H	0403H	0000H	✓	✓	×	0403H	0002H	✓	×	×
S	0098H	0403H	0000H	×	×	✓	0403H	0002H	×	×	×
X	009CH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
Y	009DH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
B	00A0H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SB	00A1H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
TC	00C0H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
TS	00C1H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
CC	00C3H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
CS	00C4H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
STC	00C6H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×

DEVICE	DEVICE CODE	16bits					32bits				
		Command	Sub-command	Compatible programmable controller			Command	Sub-command	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
STS	00C7H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
LTC	0050H	0403H	0000H	×	×	×	0401H	0002H	✓	×	×
LTS	0051H	0403H	0000H	×	×	×	0401H	0002H	✓	×	×
LCC	0054H	0403H	0000H	×	×	✓	0401H	0003H	✓	×	×
LCS	0055H	0403H	0000H	×	×	✓	0401H	0003H	✓	×	×
LSTC	0058H	0403H	0000H	✓	✓	✓	0401H	0002H	✓	×	×
LSTS	0059H	0403H	0000H	✓	✓	✓	0401H	0002H	✓	×	×

3.5.3 Input (L, P)

Table 15. Input (L, P)

DEVICE	DEVICE CODE	16bits					32bits				
		Command	Sub-command	Compatible programmable controller			Command	Sub-command	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
LTN	0052H	0403H	0000H	×	×	×	0403H	0002H	✓	×	×
LCN	0056H	0403H	0000H	×	×	✓	0403H	0002H	✓	×	×
LSTN	005AH	0403H	0000H	×	×	×	0403H	0002H	✓	×	×
LZ	0062H	0403H	0000H	×	×	✓	0403H	0002H	✓	×	×

3.5.4 Output (S, L, P)

Table 16. Output (S, L, P)

DEVICE	DEVICE CODE	16bits					32bits				
		Command	Sub-command	Compatible programmable controller			Command	Sub-command	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
D	00A8H	1402H	0000H	✓	✓	✓	1402H	0002H	✓	×	×
SD	00A9H	1402H	0000H	✓	✓	✓	1402H	0002H	✓	×	×
R	00AFH	1402H	0000H	✓	✓	✓	1402H	0002H	✓	×	×
ZR	00B0H	1402H	0000H	✓	×	×	1402H	0002H	✓	×	×
W	00B4H	1402H	0000H	✓	✓	✓	1402H	0002H	✓	×	×
SW	00B5H	1402H	0000H	✓	✓	✓	1402H	0002H	✓	×	×
TN	00C2H	1402H	0000H	✓	✓	✓*	1402H	0002H	✓	×	×
CN	00C5H	1402H	0000H	✓	✓	✓*	1402H	0002H	✓	×	×
STN	00C8H	1402H	0000H	✓	✓	✓*	1402H	0002H	✓	×	×
Z	00CCH	1402H	0000H	✓	✓	✓	1402H	0002H	✓	×	×
RD	002CH	1402H	0000H	×	×	×	1402H	0002H	✓	×	×

*When using L and P, enable SWAP, as the small address is upper and the large address is lower.

3.5.5 Output (B, abnormal communication output)

Table 17. Output (B. abnormal communication output)

DEVICE	DEVICE CODE	16bits					32bits				
		Command	Sub-command	Compatible programmable controller			Command	Sub-command	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
M	0090H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
SM	0091H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
L	0092H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
F	0093H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
V	0094H	1402H	0001H	✓	✓	×	1402H	0003H	✓	×	×
S	0098H	1402H	0001H	×	×	✓	1402H	0003H	×	×	×
X	009CH	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
Y	009DH	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
B	00A0H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
SB	00A1H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
TC	00C0H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
TS	00C1H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
CC	00C3H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
CS	00C4H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
STC	00C6H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
STS	00C7H	1402H	0001H	✓	✓	✓	1402H	0003H	✓	×	×
LTC	0050H	1402H	0001H	×	×	×	1402H	0003H	✓	×	×
LTS	0051H	1402H	0001H	×	×	×	1402H	0003H	✓	×	×
LCC	0054H	1402H	0001H	×	×	✓	1402H	0003H	✓	×	×
LCS	0055H	1402H	0001H	×	×	✓	1402H	0003H	✓	×	×
LSTC	0058H	1402H	0001H	×	×	×	1402H	0003H	✓	×	×
LSTS	0059H	1402H	0001H	×	×	×	1402H	0003H	✓	×	×

4. JCIOCFG

4.1 General Specifications

The JC-IO is configurable via JCIOCFG.
Downloadable at our web site.

Table 18. JCIOCFG General specifications

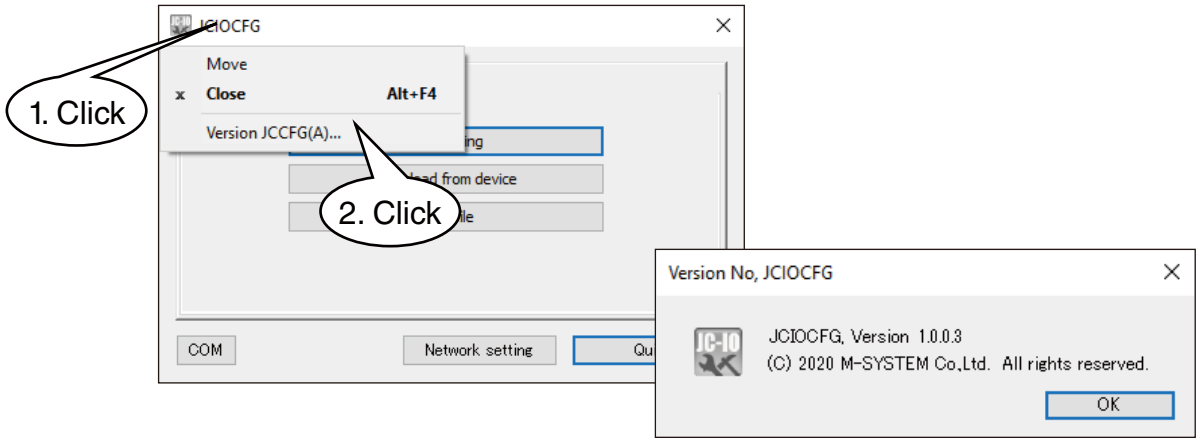
ITEM	DESCRIPTION
Product name	PC Configurator Software for JC-IO
Executable file	JCIOCFG.exe (operable with the exe file only)
PC Requirements	Windows 10 (32-bits, 64-bits), Windows 11 (64-bits)
Connection port	Modular jack RS-232-C (COP-US)
Functions	- Download the configurations from the module - Save the configurations to the file - Download the configurations from the file - Send the configurations to the module - Create new configurations and edit it

To use JCIOCFG, a PC configurator cable (COP-US) is required.
Purchase the COP-US with the JC-IO.
A driver software for COP-US is downloadable at our web site.

Web server can also configurate same parameters as JCIOCFG without COP-US.
Refer to 5. WEB SERVER for details of web server.

4.2 Version

The software version of the JC-IO can be checked as following.



4.3 Basic settings

4.3.1 COM Port

Connecting the COP-US to a Windows PC via USB, and installing the driver software, a Windows PC recognizes the cable as a COM port.
JCIOCFG requires to set COM port number.
Set the COM port number as following.

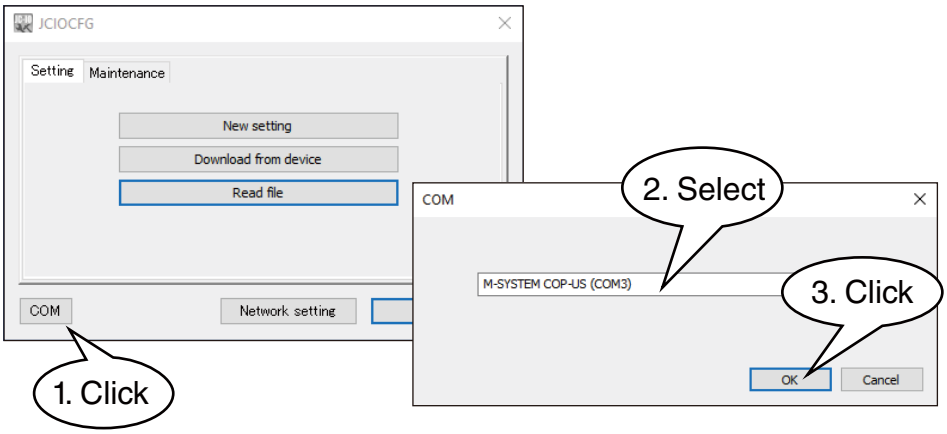


Figure 5. COM Port Setting

4.3.2 Network Setting

After setting the COM port, JCIOCFG is ready to communicate with the JC-IO.
Turn on the JC-IO-N and connect to the Windows PC via COP-US, then set the network as following.

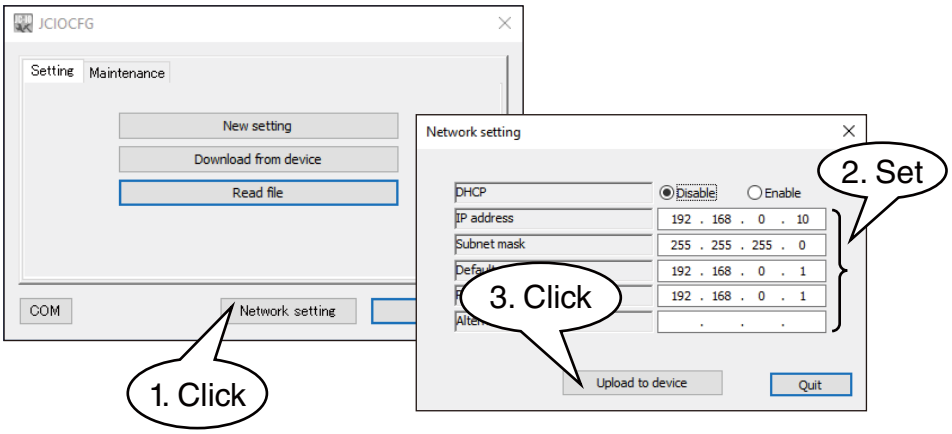


Figure 6. Network Setting

Consult with your network administrator to configurate the settings.
Reboot the unit to apply the settings.

4.4 Setting Value

4.4.1 Starting screen

Starting the JCIOCFG, the screen shown below will appear, and the setting is loadable in three different ways.

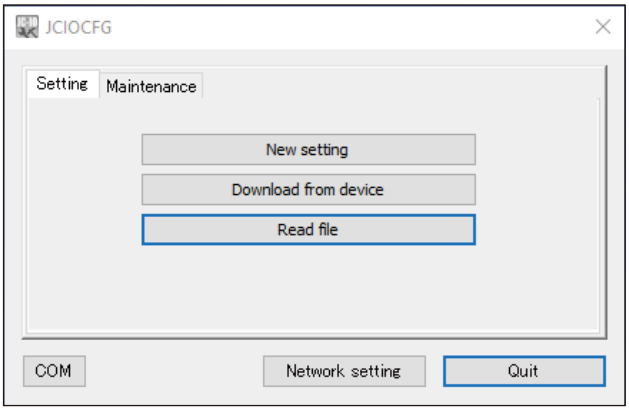


Figure 7. Main Screen of Setting

Table 19. Main Screen of Setting

ITEM	DESCRIPTION
New setting	Create new configurations. All setting Values are initial value.
Download from device	Download the configurations from the JC-IO-N.
Read file	Read out the configurations saved in the file.

4.4.2 Communication (HTTP/SNTP)

After reading the configurations, following screen will appear.
Following items are configurable in the [Communication.] tab.

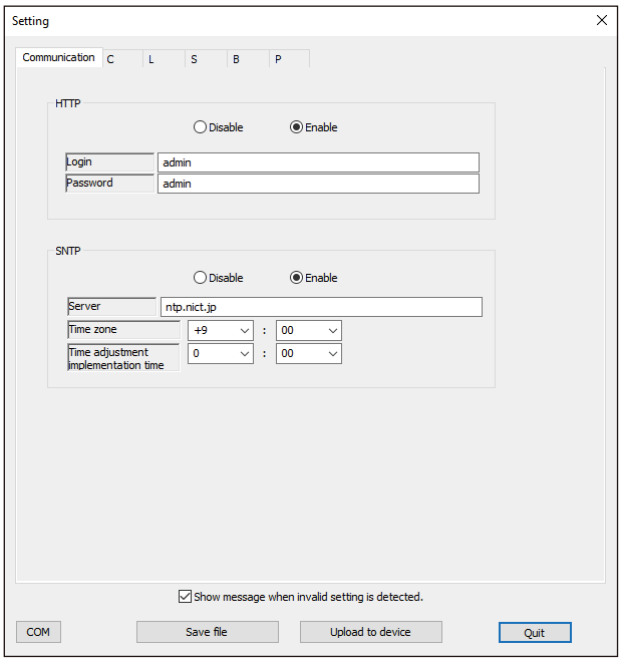


Figure 8. Communication Setting Screen

Table 20. Communication setting

ITEM	DESCRIPTION
HTTP	Set whether or not to use the Web server function, and set the login information when using. 32 characters or less, and alphanumeric characters and underscore are allowed for login information (login and password).
SNTP	Set whether or not to use the automatic time correction function, and set the necessary information when using. Enter the domain name of the SNTP server in 32 characters or less with ASCII characters to the "Server" field. In the Time Zone field, set to +09:00 in case of using in Japan. Setting the start time of the time correction. When connecting multiple JC-IO-N units to one router, set this time a few minutes apart.
COM	Change the COM port number.
Save file	Save the current configurations to the file.
Upload to device	Upload the current configuration to the device.
Quit	Quit the configuration and back to the initial starting screen.

Consult with your network administrator to configurate the settings.
Reboot the unit to apply the settings.

4.4.3 C (Connection)

Set the Connection on this screen.
Refer to 3.1 Connection for details of the Connection.

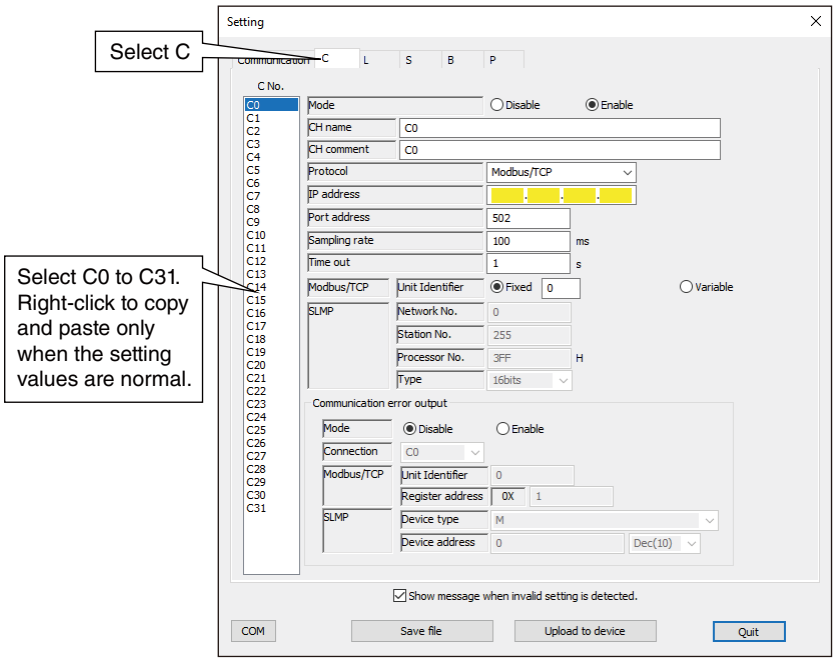


Figure 9. C (Connection) Setting Screen

Table 21. C (Connection) Setting Parameters

ITEM	DESCRIPTION	
Mode	Enable / Disable Connection. Following parameters are configurable when Enable is selected.	
CH name / CH comment	Enter the CH name and comment in 32 characters or less.	
Protocol	Select Modbus/TCP or SLMP.	
IP address	Set the IP address of the connecting device.	
Port address	Set the connecting port address from 0 to 65535.	
Sampling rate	Set the sampling rate of the Connection from 0 to 30000 (msec.).	
Timeout	Set the communication timeout from 1 to 60 (sec.)	
Modbus/TCP	Unit Identifier	Select Fixed / Variable. When Fixed is seleced, set the common unit identifier to Connection. When Variable is selected, set the unit identifier individually for each internal register. Refer to 3.4 Modbus/TCP
SLMP	Network No.	Set the network No. of the programmable controller.
	Station No.	Set the station No. of the programmable controller.
	Processor No.	Set the processor no. of the programmable controller in the hexa-decimal number from 0x0000 to 0xFFFF.
	Type	Select the sub-command type of SLMP from 16-bits or 32-bits. Refer to 3.5 SLMP

4.4.4 Communication Error Output

JC-IO-N can set communication error output for each Connection.
Refer to 3.3 Communication Error Output

ITEM	DESCRIPTION
Mode	Enable / Disable the communication error output. Following parameters are configurable when Enable is selected.
Connection	Set the Connection to output communication error. Own connection is not settable.
Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the communication error output register. When the unit identifier is set to variable, set the unit identification number.
SLMP	When the protocol of the specified Connection is set to SLMP, set the communication error output device. The display format for device address can be switched between octal, decimal, and hexadecimal.

4.4.5 L (32-bit)

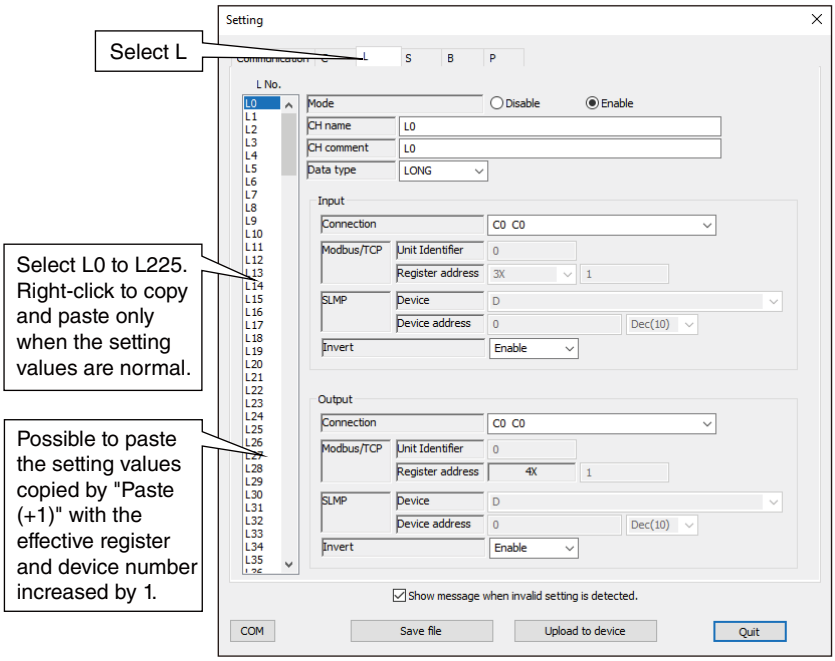


Figure 10. L (32-bit) Setting Screen

Table 22. L (32-bit) setting Parameters

ITEM	DESCRIPTION		
Mode	Enable / Disable L register. Following parameters are configurable when Enable is selected.		
CH name / CH comment	Enter the CH name and comment of L register in 32 characters or less.		
Data type	Select from LONG / ULONG / FLOAT. (Use to manual setting from web server)		
Input	Connection	Select from C0 to C31	
	Register	Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the input register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When the protocol of the specified Connection is set to SLMP, set the input device. The display format for device address can be switched between octal, decimal, and hexadecimal.
	SWAP	Select Enable / Disable. Modbus/TCP Eneble: small address is lower, large address is upper Disable: small address is upper, large address is lower SLMP Differs between PLC and device. Set in necessary. Refer to 3.5 SLMP	

ITEM	DESCRIPTION		
Output	Connection	Select from C0 to C31 or disabled. Following parameters are configurable when Cx is selected.	
	Register	Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the output register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When the protocol of the specified Connection is set to SLMP, set the output device. The display format for device address can be switched between octal, decimal, and hexadecimal.
	SWAP	Select Enable / Disable. Modbus/TCP Enable: small address is lower, large address is upper Disable: small address is upper, large address is lower SLMP Differs between PLC and device. Set in necessary. Refer to 3.5 SLMP	

4.4.6 S (16-bit)

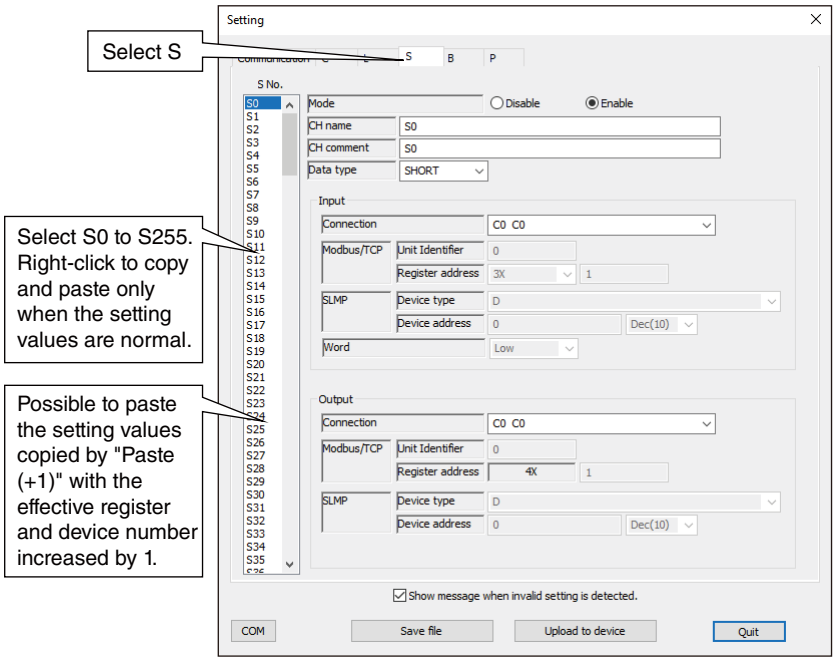


Figure 11. S (16-bit) Setting Screen

Table 23. S (16-bit) Setting Parameters

ITEM	DESCRIPTION		
Mode	Enable / Disable S register. Following parameters are configurable when Enable is selected.		
CH name / CH comment	Enter the CH name and comment of S register in 32 characters or less.		
Data type	Select SHORT / USHORT. (Use to set manually from web server)		
Input	Connection	Select from C0 to C31 or L0 to L255	
	Register	Modbus/TCP	When C is selected to Connection and the protocol is set to Modbus/TCP, set the input register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When C is selected to Connection and the protocol is set to SLMP, set the input device. The display format for device address can be switched between octal, decimal, and hexadecimal.
	Word	When L is selected for the Connection,specify Upper /Lower. Upper: Upper 16-bit data of L register Lower: Lower 16-bit data of L register	
Output	Connection	Select from C0 to C31 or disabled. Following parameters are configurable when Cx is selected.	
	Register	Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the output register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When the protocol of the specified Connection is set to SLMP, set the output device. The display format for device address can be switched between octal, decimal, and hexadecimal.

4.4.7 B (1-bit)

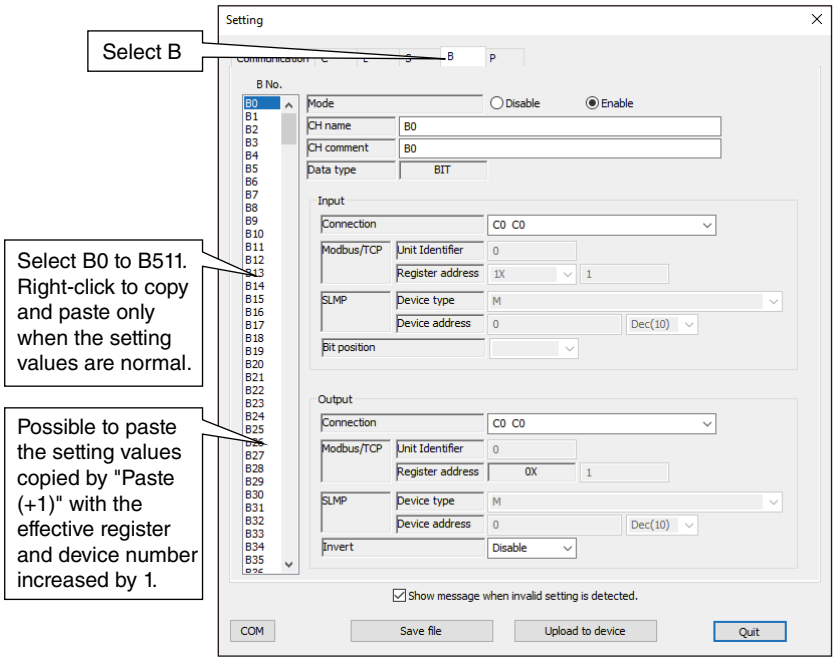


Figure 12. B (1-bit) Setting Screen

Table 24. B (1-bit) Setting Parameters

ITEM	DESCRIPTION		
Mode	Enable / Disable B register. Following parameters are configurable when Enable is selected.		
CH name / CH comment	Enter the CH name and comment of B register in 32 characters or less.		
Data type	Select SHORT / USHORT. (Use to set manually from web server)		
Input	Connection	Select from C0 to C31, L0 to L255, S0 to S255.	
	Register	Modbus/TCP	When C is selected to Connection and the protocol is set to Modbus/TCP, set the input register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When C is selected to Connection and the protocol is set to SLMP, set the input device. The display format for device address can be switched between octal, decimal, and hexadecimal.
	Bit position	When L or S is selected to Connection, specify the bit position.	
Output	Connection	Select from C0 to C31.	
	Register	Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the output register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When the protocol of the specified Connection is set to SLMP, set the output device. The display format for device address can be switched between octal, decimal, and hexadecimal.
		Invert	Invert the output when Enable is selected.

4.4.8 P (32-bit, Pulse Transmission)

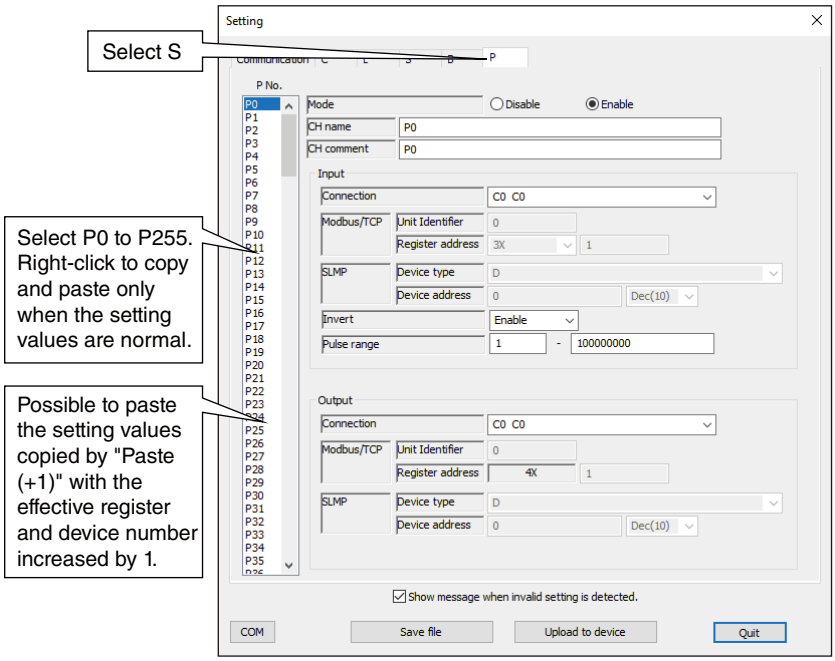


Figure 13. P (32-bit, pulse transmission) Setting Screen

Table 25. P (32-bit, pulse transmission) Setting Parameters

ITEM	DESCRIPTION		
Mode	Enable / Disable P register. Following parameters are configurable when Enable is selected.		
CH name / CH comment	Enter the CH name and comment of P register in 32 characters or less.		
Input	Connection	Select from C0 to C31.	
	Register	Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the input register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When the protocol of the specified Connection is set to SLMP, set the input device. The display format for device address can be switched between octal, decimal, and hexadecimal.
	SWAP	Select Enable / Disable. Modbus/TCP Enable: small address is lower, large address is upper Disable: small address is upper, large address is lower SLMP Differs between PLC and device. Set in necessary. Refer to 3.5 SLMP	
	Pulse range	JC-IO accumulates the difference of pulse counter between sampling. Set the same value as the pulse range set in the remote I/O. Setting range is as following. Low limit: 0 to 1,000 High limit: 10,000 to 4,294,967,295	
Output	Connection	Select from C0 to C31.	
	Register	Modbus/TCP	When the protocol of the specified Connection is set to Modbus/TCP, set the output register. When the unit identifier is set to variable, set the unit identification number.
		SLMP	When the protocol of the specified Connection is set to SLMP, set the output device. The display format for device address can be switched between octal, decimal, and hexadecimal.

4.5 Maintenance

4.5.1 Date/Time

Sets the current time to record in the system log.

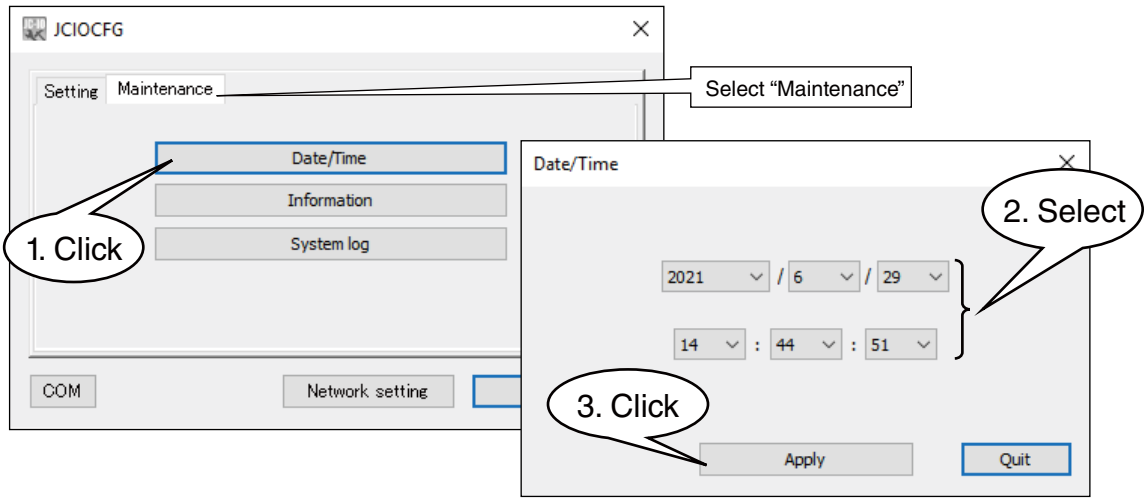


Figure 14. Data/Time Setting VIew

4.5.2 Information (Version, MAC address)

Firmware version of the JC-IO-N and the Ethernet MAC address can be checked.

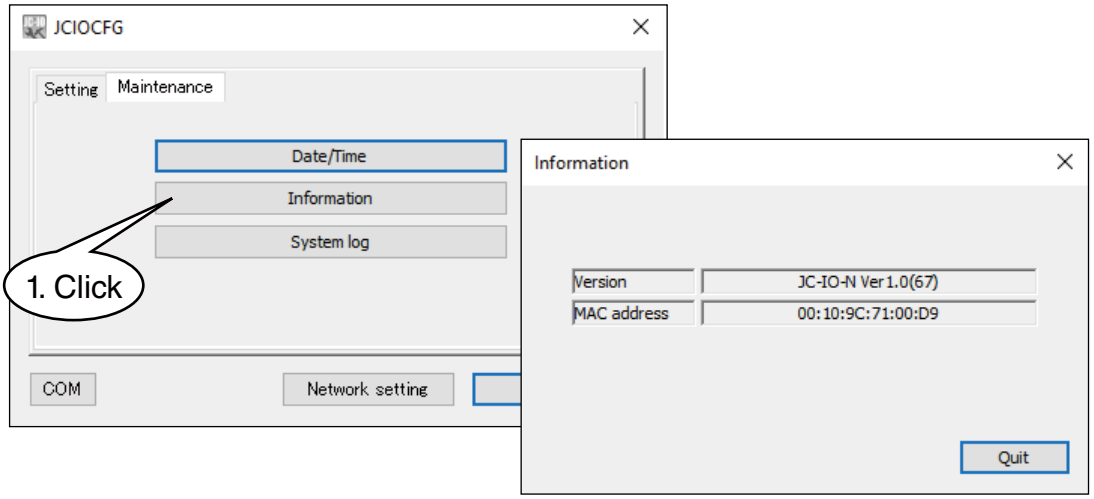


Figure 15. Information

4.5.3 System Log

System log of the unit can be checked.
Click [Reset system log] button to clear the log.

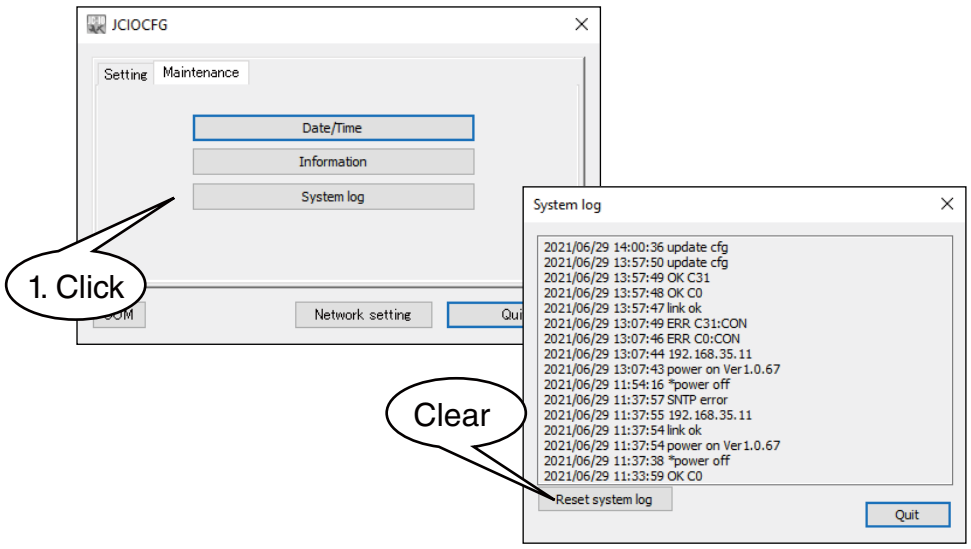


Figure 16. System Log

Table 26. System Log Message (excerpt)

MESSAGE	DESCRIPTION
power on VerX.X.X	Power ON firmware version
*power off	Power OFF
link ok	Ethernet LINK is in normal operation
link error	Ethernet LINK is in abnormal operation

When a problem occurs, our service staff may check the contents of the system log for analysis. Because many of the messages in the system log are unique to us, such as internal processing, the details of each log are not described.

5. WEB SERVER

5.1 Connection

The initial IP address is "192.168.0.10". To access the web server from the LAN-connected PC, enter the following URL to the address field. Even when simply typing "192.168.0.10", the same index screen in Japanese will be displayed.

Table 27. Connecting URL

LANGUAGE	URL
Japanese	http://192.168.0.10/ja/index.html
English	http://192.168.0.10/en/index.html

The default login and password is as following.
Input them to the input dialog appears at connecting.

Table 28. The Default Login and Password

ITEM	DEFAULT SETTING
Login	admin
Password	admin

Following index screen will appears after input the login and password.
If not, reconfirm the network connection and the setting.

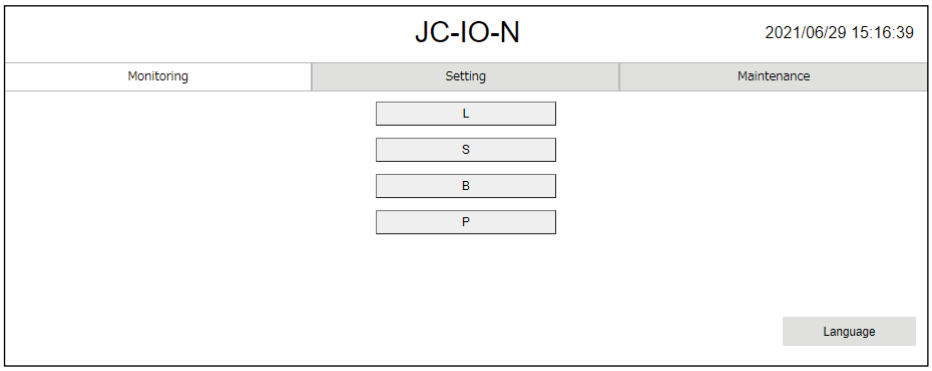


Figure 17. Index Screen

Be sure to change the login and password from the default setting.
The web server function can only be used under a LAN environment. DO NOT access via the Internet.

5.2 Monitoring

5.2.1 Monitoring Index Screen

Click [Monitoring] to show the monitoring index screen.

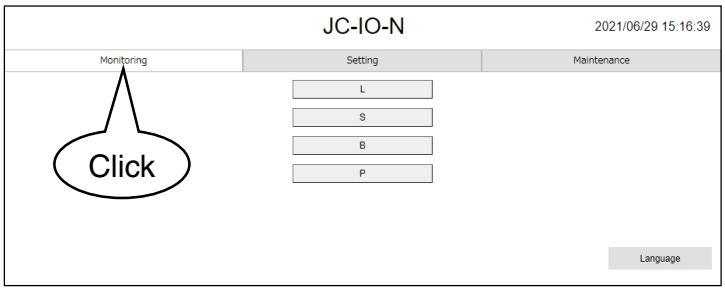


Figure 18. Monitoring Index Screen

5.2.2 Monitoring Screen (L)

Click [L] to show the monitoring screen for L register.
This screen shows the list of L register.
Clicking the "L" button while monitoring the list of L registers the automatic update cycle can be set from 1 to 999 seconds.

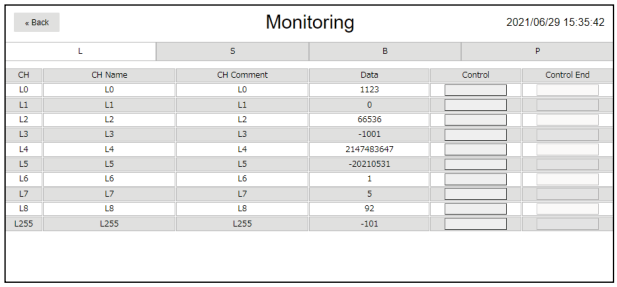


Figure 19. Monitoring Screen (L)

This screen can manipulate output data manually, so in case of emergency, parameters are configurable by manual operation. Click [Control] button of each channel and input the value to the input dialog, then click OK.
The background of the channel under manual operation turns to yellow, as shown in the figure below.
Click [Control End] button to finish manual operation and returns to I/O communicating status.

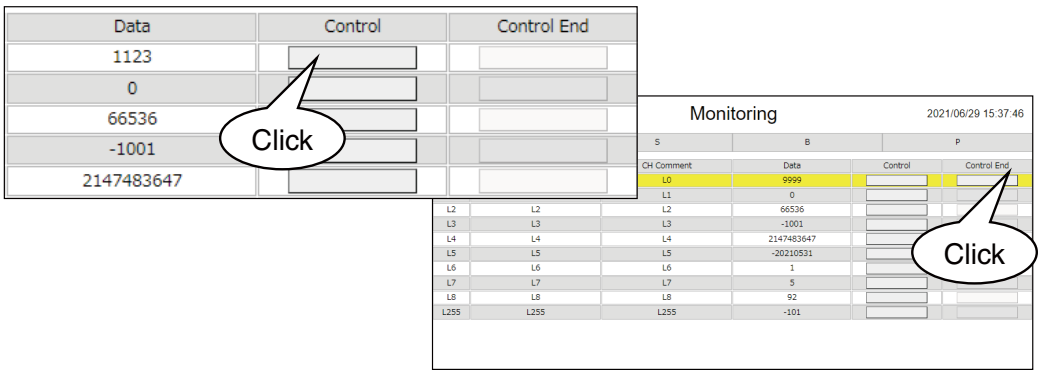


Figure 20. Monitoring Screen (L) Manual Operation

The manual operation status is not retained in the power failure. Refer to 2.2 Internal Register or the relationship with SWAP.

5.2.3 Monitoring Screen (S)

Click [S] to show the monitoring screen for S register.
This screen shows the list of S register.
Clicking the "S" button while monitoring the list of S registers the automatic update cycle can be set from 1 to 999 seconds.

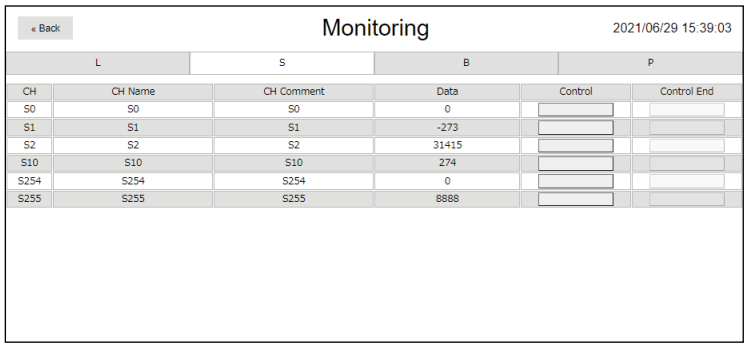


Figure 21. Monitoring Screen (S)

This screen can manipulate output data manually, so in case of emergency, parameters are configurable by manual operation. Click [Control] button of each channel and input the value to the input dialog, then click OK.
The background of the channel under manual operation turns to yellow, as shown in the figure below.
Click [Control End] button to finish manual operation and returns to I/O communicating status.

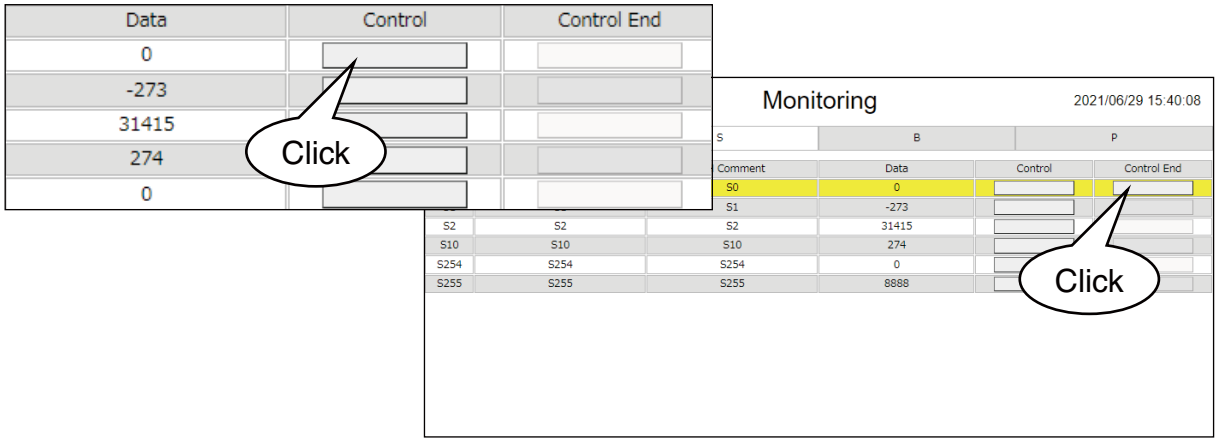


Figure 22. Monitoring Screen (S) Manual Operation

The manual operation status is not retained when the power failure.

5.2.4 Monitoring Screen (B)

Clock [B] to show the monitoring screen for B.
This screen shows the list of B register.
Clicking the "B" button while monitoring the list of B registers the automatic update cycle can be set from 1 to 999 seconds.

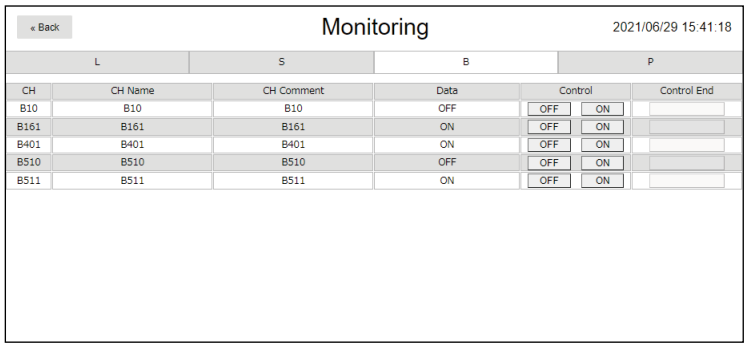


Figure 23. Monitoring Screen (B)

This screen can manipulate output data manually, so in case of emergency, parameters are configurable by manual operation. Click [Control] button of each channel and input the value to the input dialog, then click OK.
The background of the channel under manual operation turns to yellow, as shown in the figure below.
Click [Control End] button to finish manual operation and returns to I/O communicating status.

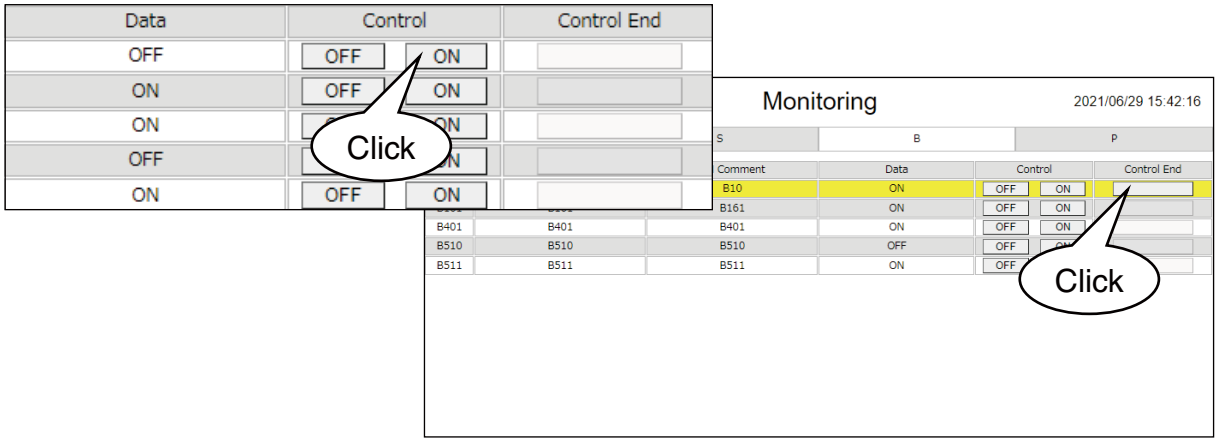
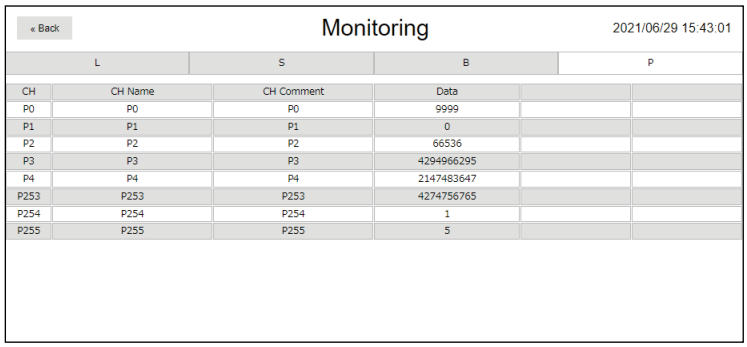


Figure 24. Monitoring Screen (B) Manual Operation

The manual operation status is not retained when the power failure. When the output is set to "Invert", set the value before invert.

5.2.5 Monitoring Screen (P)

Click [B] to show the monitoring screen for B.
This screen shows the list of P register. In this screen, manual operation is invalid.
Clicking the "P" button while monitoring the list of P registers the automatic update cycle can be set from 1 to 999 seconds.



CH	CH Name	CH Comment	Data		
P0	P0	P0	9999		
P1	P1	P1	0		
P2	P2	P2	66536		
P3	P3	P3	4294966295		
P4	P4	P4	2147483647		
P253	P253	P253	4274756765		
P254	P254	P254	1		
P255	P255	P255	5		

Figure 25. Monitoring Screen (P)

Refer to 2.2 Internal Register or the relationship with SWAP.

5.3 Settings

5.3.1 Setting Index Screen

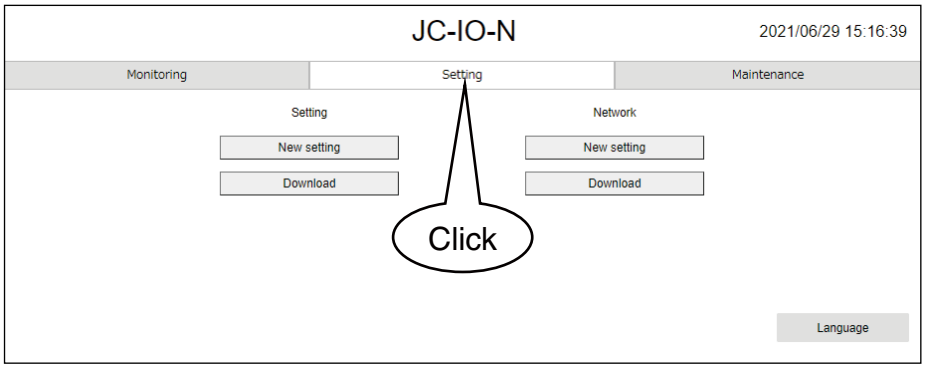


Figure 26. Setting Index Screen

Table 29. Setting Index Screen Button Functions

CATEGORY	BUTTON	FUNCTION
Setting	New setting	The setting screen is shown in the default values.
	Download	The setting screen is shown with the values downloaded from the JC-IO-N.
Network	New setting	The Network setting screen is shown with the default values.
	Download	The Network setting screen is shown with the values downloaded from the JC-IO-N.
	Language	Switch Japanese / English. The setting is not saved.

5.3.2 Setting Screen

The functions of setting screen is common with JCIOCFG.
Refer to 4.4 Setting Value for details of setting screen.
Click [Upload] to upload to the JC-IO-N.

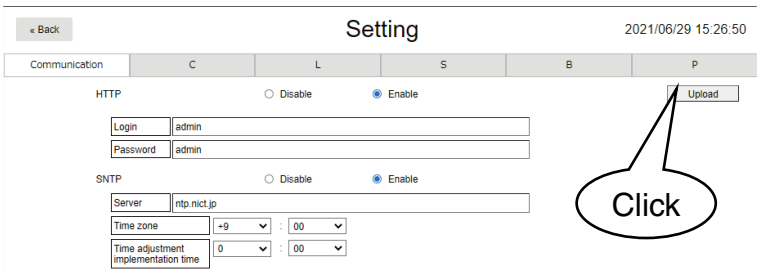


Figure 27. Setting Screen

5.3.3 Network Setting Screen

The functions of network setting screen is common with JCIOCFG.
Refer to 4.3.2 Network Setting for details of setting screen.
Click [Upload] to upload to the JC-IO-N.

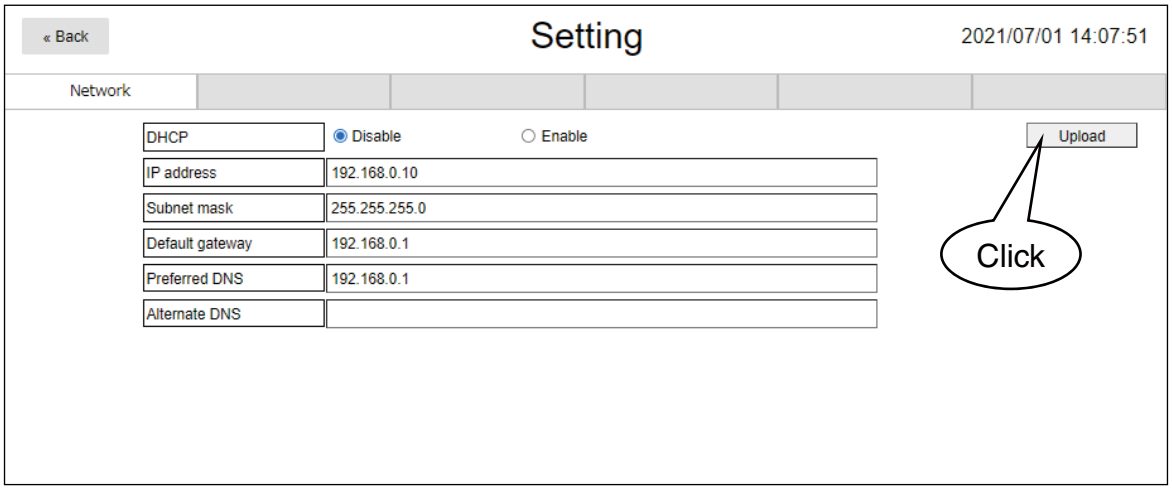


Figure 28. Network Setting Screen

5.4 Maintenance

The functions of maintenance screen is common with JCIOCFG.
Refer to 4.5 Maintenance for details of setting screen.

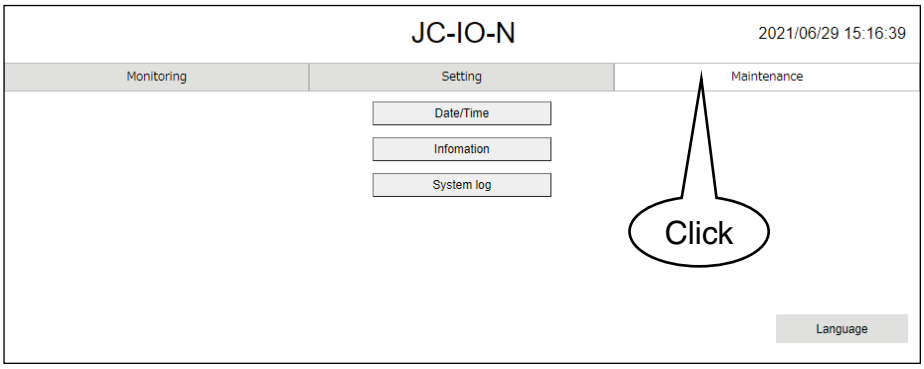


Figure 29. Maintenance Index Screen

6. USAGE EXAMPLES

6.1 I/O Transmission (IP telemeter)

Connect remote I/Os in remote locations via the internet and use JC-IO-N as an IP telemeter.
In the following figure, capture the alarm signal in the factory by the remote I/O and indicate it with the tower light at the remote location.

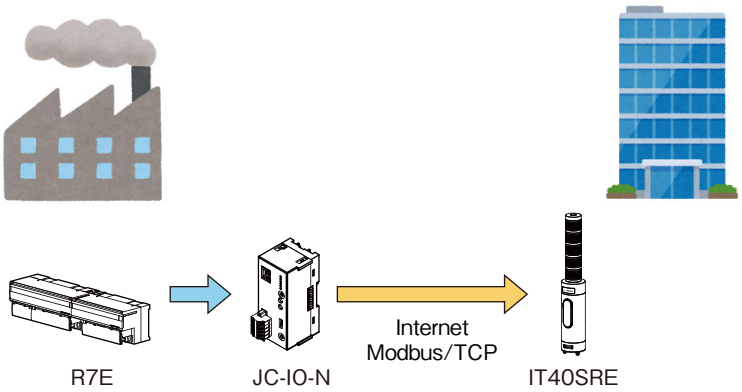


Figure 30. Usage Example (I/O Transmission)

6.2 I/O Extension of PLC

Normally, adding communication-related instruction to the PLC program is needed to extend the I/O of the PLC.
JC-IO has possibility to greatly simplify this process.

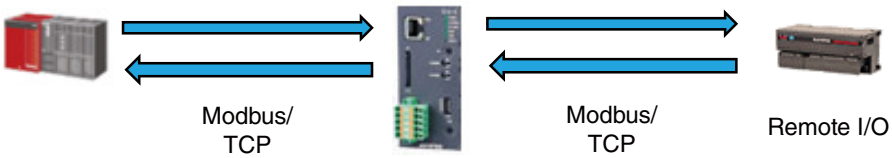


Figure 31. Usage Example (I/O Extension of PLC)

PROCESS	PROCESS OF THE PLC PROGRAM	PROCESS OF THE JC-IO-N
Data input	Read out the input value from the PLC.	Write the input data read out from the remote I/O to the PLC.
Data output	Write the output value to the PLC.	Write the output data read out from the PLC to the remote I/O.

7. TROUBLE SHOOTING

7.1 TROUBLE SHOOTING

7.1.1 JCIOCFG

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
JCIOCFG does not connect to JC-IO via COP-US.	Is COP-US Driver installed?	Install the driver software from the CD attached to COP-US or download from our web site.
	Is COM port correct?	Select the correct COM port No. (Refer to 4.3.1 COM Port)

7.1.2 LED Indication

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
The LED does not come on.	Is the JC-IO powered on?	Check the power supply (24 V DC).
The POWER LED is blinking.	Is the LAN cable connected to the JC-IO?	Connect the LAN cable securely to the HUB and router.
	Is the JC-IO turned OFF and ON after setting IP address to the JC-IO?	Turn OFF and ON the power of the JC-IO.
	Is the IP address allocated from the router such as DHCP server when the JC-IO is in auto IP address setting mode?	Confirm the setting of the using router. (Refer to the users manual of the router.)
The RUN LED is blinking	Is the JC-IO connected to the Modbus server and SLMP device registered by C (Connection) of JCIOCFG?	Confirm the setting of the master device that registered in C (Connection) and the system log of the JCIOCFG. (Refer to 4.5.3 System Log)

7.1.3 LAN Connection

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unable to display the Web browser view.	Is the URL correct?	Check the URL (Refer to 5.1 Connection).
	Is the IP address correct?	Connect using a COP-US, and check the IP address.
	Is the LAN cable breakdown or disconnected from the HUB?	Connect the LAN cable securely. Check the connecting LED of the HUB.
	Is the POWER LED of the JC-IO ON?	Refer to 1.6 Component Identification.
	Is the IP address overlapping with the PC and the JC-IO?	Check the IP address of the PC and the JC-IO.
	Has the same network address been specified in the IP address of the JC-IO and PC?	Check the IP address. Issue the ping command from the PC and check whether there is a response. [Example] JC-IO : 192.168.0.1 PC : 192.168.0.2 Subnet mask: 255.255.255.0
	Have firewall or proxy server setting been configured on the PC?	Check the contents of the firewall and proxy server setting with the network administrator.
	Is there a problem with the terminal or PC being used?	Check the version of the terminal/browser software. Use a different terminal/PC.

7.1.4 Modbus (client)

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unnable to connect to the Modbus server device from the JC-IO.	Is the LAN cable breakdown or disconnected from the HUB?	Connect the LAN cable securely. Check the connecting LED of the HUB.
	Has the IP address been set by manually?	Set the IP address manually. (Refer to 4.3.2 Network Setting)
	Has the same network address been specified in the IP address of the JC-IO and Modbus server device?	Check the network address. [Example] JC-IO: 192.168.0.1 PC: 192.168.0.2 Subnet mask: 255.255.255.0
	Are the IP address of the server device registered by JCIOCFG and the IP address of the JC-IO same?	Check the IP address.
	Is the IP address set to the server device?	Set the IP address for server device. When using our Remote I/O as server device, turn OFF and ON the power after setting IP address. (Refer to the users manual of each Remote I/O for setting of IP address.)

7.1.5 SLMP (client)

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unnable to connect to the SLMP device from the JC-IO.	Is the LAN cable breakdown or disconnected from the HUB.	Connect the LAN cable securely. Check the connecting LED of the HUB.
	Has the IP address been set by manually?	Set the IP address manually. (Refer to 4.3.2 Network Setting)
	Has the same network address been specified in the IP address of the JC-IO and SLMP device?	Check the network address. [Example] JC-IO: 192.168.0.1 PC: 192.168.0.2 Subnet mask: 255.255.255.0
	Are the IP address of the server device registered by JCIOCFG and the IP address of the JC-IO same?	Check the IP address. Refer to 4.4.3 C (Connection))
	Is the IP address set to the SLMP device?	Enable the server function of the SLMP device.

7.2 VERSION HISTORY

7.2.1 JCIOCFG

1. Version 1.1.x.x

- Improved that in Paste (+1) for L, S, B, and P, the valid resister, device number is +1 or +2 depending on the bit length of the copy source.
- Improved that in "Paste (+1)" for L, S, B, P, increment if the end of the channel name and commen is a number.
- Added the "Paste (+1)*N" function, in which "Paste (+1)" of L, S, B, and P is executed continuously.
- Fixed the problem that caused a ZR or SW to be selected when the drop-down list is selected again after selecting some devices such as Z or S for the device type of SLMP.

7.2.2 JC-IO-N

1. Ver1.1.x

- For Modbus/TCP, the module is changed to continue input/output to other nodes even if communication error (except connection error) occurs.

7.3 LICENSE

JC-IO-N and JCIOCFG incorporate exPat.