*OPERATING MANUAL*

# POWER/NETWORK MODULE
## (CC-Link IE TSN)

MODEL **R80NCIT1**

CONTENTS

# BEFORE USE ....

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.

## ■ PACKAGE INCLUDES:

Power/network module ........................................................(1)
Protective cover ................................................................(1)

## ■ MODEL NO.

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

## ■ OPERATING MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

## ■ CSP+ file

CSP+ file is downloadable at our web site or CC-Link Partner Association's web site (https://.cc-link.org).

# POINTS OF CAUTION

## ■ 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

## ■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  **DC Power supply:** 24V DC rating
    24V DC ± 10%, approx. 12W
    (@ internal power max. current 1.6 A)
  **Excitation supply (excitation for I/O module):**
    24V DC ± 10%, operational current 10 A
  (From power supply/excitation supply connector, via connector for internal bus, supplied to each I/O module. Power output current consumption must be under operational current.)

## ■ GENERAL PRECAUTIONS

- Before you remove or mount the unit, 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.

## ■ 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.
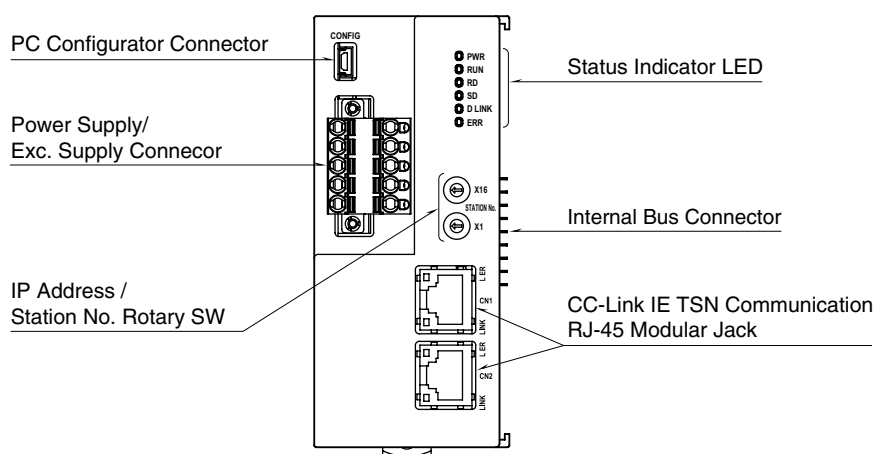
# INSTALLATION

Internal power supply/communication is connected via each module's connector, therefore no backplane base is required, however, hot-swapping of modules is not possible.

## ■ HOW TO MOUNT THE MODULE ON DIN RAIL
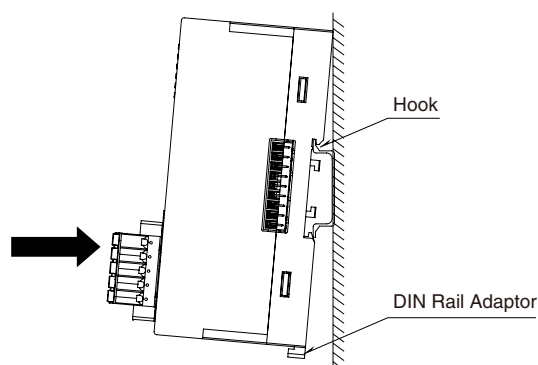


Position the upper hook at the rear on the DIN rail and push in the lower. When removing the module, push down the DIN rail adaptor utilizing a flat-blade screwdriver and pull.

# COMPONENT IDENTIFICATION

PC Configurator Connector

Power Supply/
Exc. Supply Connecor

IP Address /
Station No. Rotary SW

Status Indicator LED

Internal Bus Connector

CC-Link IE TSN Communication
RJ-45 Modular Jack

## ■ STATUS INDICATOR LED

| ITEM | ID | COLOR | FUNCTION | STATUS | DESCRIPTION |
|---|---|---|---|---|---|
| Status Indicator | RUN | Green | Device State | ON | Normal |
| | | | | OFF | Device error |
| | RD | Green | Receiving Data | ON | Receiving |
| | | | | OFF | Unreceived data |
| | SD | Green | Sending Data | ON | Sending |
| | | | | OFF | Unsent |
| | D LINK | Green | Data link Transmitting | ON | In action (Cyclic transmitting) |
| | | | | Blinking | In action (Stopping cyclic transmitting)*1 |
| | | | | OFF | Not complied with |
| | ERR | Red | Error | ON | Critical failure*2 |
| | | | | Blinking | Minor failure*3 |
| | | | | OFF | Normal |
| CN1 | LINK | Green | CN1 Linking Up | ON | Linking up |
| | | | | OFF | Link-down |
| | L ER | Red | CN1 Receiving Data | ON | Abnormality receiving data |
| | | | | OFF | Normality receiving data |
| CN2 | LINK | Green | CN2 Linking Up | ON | Linking up |
| | | | | OFF | Link-down |
| | L ER | Red | CN2 Receiving Data | ON | Abnormality receiving data |
| | | | | OFF | Normality receiving data |

*1. Setting as reservation area, stop linking and etc..
*2. Host communication error, internal bus communication error, and etc..
*3. Non-volatile memory error, IP address / station No. setting rotary switch has been changed after turning on the module.

## ■ IP ADDRESS / STATION NO. SETTING ROTARY SW

Set the fourth octet of IP address and station No. with two rotary switches. The upper rotary SW sets the upper digits (MSB), and the lower rotary SW sets the lowest digit (LSB) with hexadecimal (configurable range is 1 to 254).
Turn off the power supply when setting IP address / Station No. setting Rotary SW, as the setting is activated when turning on the power supply.
Confirm available station numbers in the manual of the master unit (Factory default setting: 01H).
IP address: The first to third octet are common with the first to third octet of IP address for master station.

For setting MSB of Station No. (×16)

For setting LSB of Station No. (×1)

* Station No. setting example
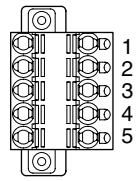IP address / Station No. setting rotary SW are set with hexadecimal.
For example, in the case of setting station No. 175, Set the Station MSB: A and LSB: F.

■ **POWER SUPPLY, EXCITATION SUPPLY CONNECTOR ASSIGNMENT**
Printed-circuit board connector (Phoenix Contact)
 **Unit side connector**: MSTBV2,5/5-GF-5,08AU
 **Cable side connector**: TFKC2,5/5-STF-5,08AU

| PIN No. | ID | FUNCTION |
|---|---|---|
| 1 | 24V | Power supply 24V DC |
| 2 | 0V | Power supply 0V DC |
| 3 | + | Excitation supply 24V DC |
| 4 | – | Excitation supply 0V DC |
| 5 | FE1 | Grounding |

# PC CONFIGURATOR

The following parameter items can be configured with the PC configurator software (model: R80CFG).
Refer to the users manual of the software for detailed operations.

| ITEM | SETTING RANGE | DEFAULT |
|---|---|---|
| No. of I/O modules | 1 to 16 (modules) | 16 (modules) |

# TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

■ **EXTERNAL DIMENSIONS  unit: mm [inch]**
 • **UNIT**

**• PROTECTIVE COVER**

5 (.20)    50 (1.97)

115 (4.53)

■ **CONNECTION DIAGRAM**

CC-Link IE TSN CN1 | RJ-45 MODULAR JACK |    ←→ INTERNAL BUS

CC-Link IE TSN CN2 | RJ-45 MODULAR JACK |

PC Configurator Connector → | USB CONNECTOR |

CONNECTOR

POWER    +24V

0V    → INTERNAL POWER (5V)

EXC. SUPPLY    +

–    → EXC. SUPPLY (24V)

CONNECTOR

FE1
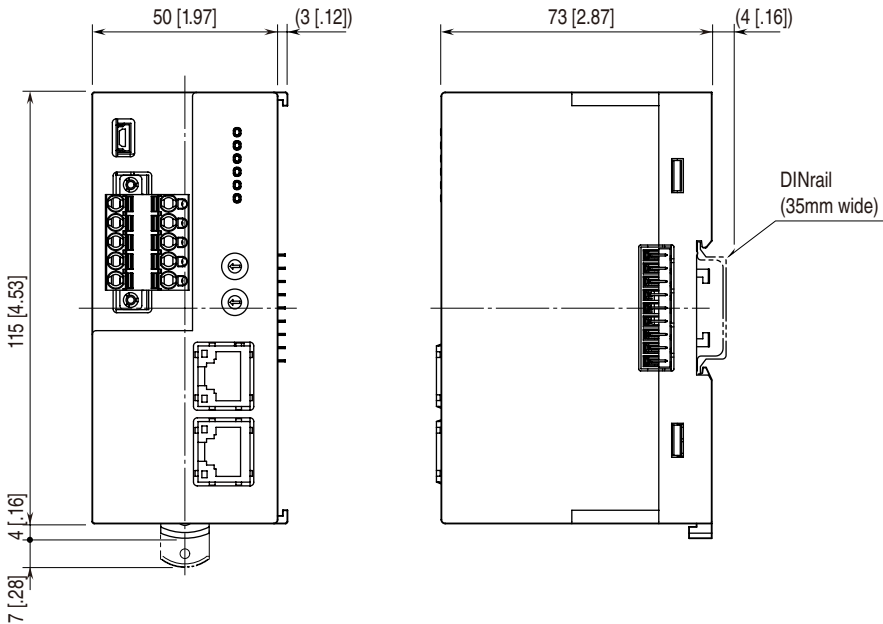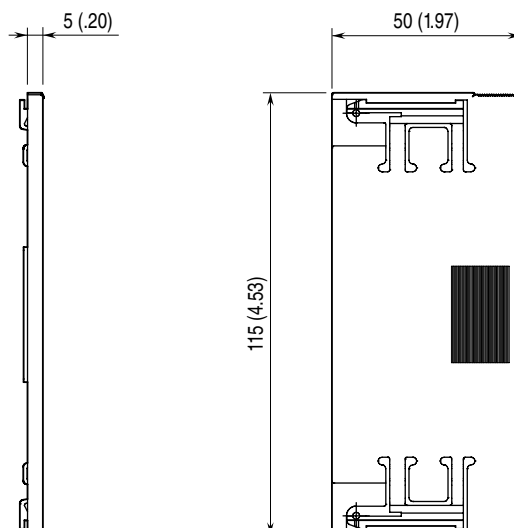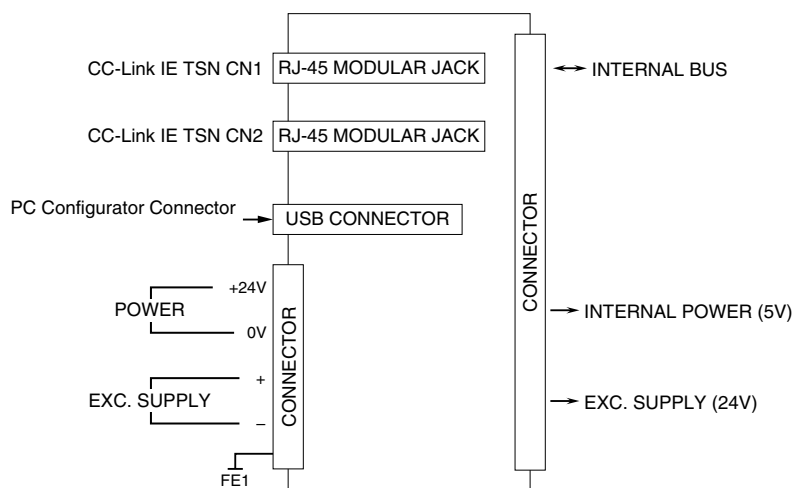
Regarding CN1 and CN2 of RJ-45 connector for CC-Link IE TSN network, there is no restriction for connection order

# WIRING INSTRUCTIONS

■ **TENSION CLAMP TERMINAL**

**Applicable wire size**: $0.2 - 2.5 \ \mathrm{mm^2}$
**Stripped length**: 10 mm
**Recommended solderless terminal**
AI0,25-10YE 0.25 mm² (Phoenix Contact)
AI0,34-10TQ 0.34 mm² (Phoenix Contact)
AI0,5-10WH 0.5 mm² (Phoenix Contact)
AI0,75-10GY 0.75 mm² (Phoenix Contact)
AI1-10RD 1.0 mm² (Phoenix Contact)
AI1,5-10BK 1.5 mm² (Phoenix Contact)
AI2,5-10BU 2.5 mm² (Phoenix Contact)

# TRANSMISSION DATA DESCRIPTIONS

This unit recognize type of I/O module (number of occupied station) configured the same base, and assign it to I/O Modules data with slot order automatically.  However, I/O module assignment is performed only when power is turned on, in the case of changing configuration of I/O module, please turn on power again.

Keep number of station occupied of I/O module under 16, because max. number of occupied station is 64 per a node.

**Station type**: Remote station

**Link device**: RX/RY 128 points, RWw/RWr 64 points

For example, the configuration is as below, data areas are assigned as shown below.

| SLOT NUMBER | MODEL | NUMBER OF OCCUPIED STATION |
|---|---|---|
| 0 | R80DAT16A2 | 1 |
| 1 | R80DCT16A2 | 1 |
| 2 | R80FST4NJ | 4 |
| 3 | R80UST4 | 4 |
| 4 | R80YST4N | 4 |
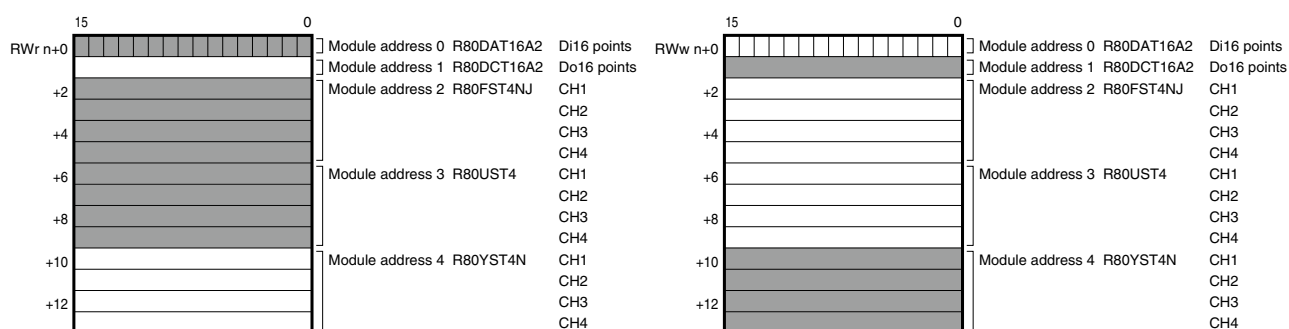


## ■ STATUS DATA
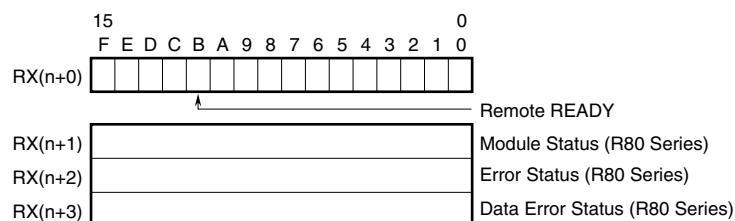


- RX(n+0)B is used as Ready signal, the bit is "1" when this module is in normal.
  When Ready signal is "0", current input data and status are not applied correctly.
  When Ready signal is "1", input data and status are determined valid data.

- Module Status
  RX(n+1)0 to RX(n+1)F indicate whether individual I/O modules of R80 series are mounted or not .
  The bit corresponding to the mounted slot turns to "1", and the unmounted slot to "0".

- Error Status
  RX(n+2)0 to RX(n+2)F indicate error status for each module of R80 series.
  The bit corresponding to such module turns to "1", as described below.
    R80UST4, R80FST4NJ input current in error (AD converter response failure)
    R80YST4N output current in error (DA converter response failure)

• Data Error Status

RX(n+3)0 to RX(n+3)F indicate data error status for each module of R80 series.

The bit corresponding to such module turns to "1", as described below.

R80US4T burnout detecting, or input value error.

(-15% or less, +115% or more, or lower than lower imit, higher than upper limit of measuring range)

R80FST4NJ input value error (lower than lower imit, higher than upper limit of measuring range)

R80YS4T output value error (lower than lower imit, higher than upper limit of measuring range)

| | |
|---|---|
| RX(n+1)0, RX(n+2)0, RX(n+3)0 | R80 series slot 0 |
| RX(n+1)1, RX(n+2)1, RX(n+3)1 | R80 series slot 1 |
| RX(n+1)2, RX(n+2)2, RX(n+3)2 | R80 series slot 2 |
| : | |
| RX(n+1)F, RX(n+2)F RX(n+3)F | R80 series slot F |

# I/O DATA DESCRIPTIONS

## ■ OPERATION IN CASE OF A COMMUNICATION ERROR WITH I/O MODULES

When the communication between the network module and the I/O modules is lost due to an error in an input module, the last process values are held until the communication is re-established.

## ■ MODULE STATUS, ERROR STATUS, DATA ERROR STATUS
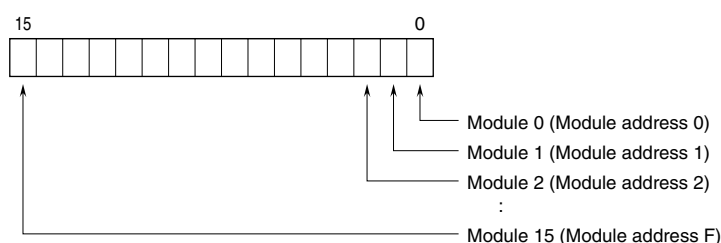


## ■ ANALOG DATA (16-bit data, models: R80UST4, R80FST4NJ, etc.)

16-bit binary data.

Basically, 0 to 100% of the selected I/O range is converted into 0 to 10000 (binary).

Negative percentage is represented in 2's complements.



## ■ ANALOG DATA (16-bit data, models: R80UST4, etc.)

16-bit binary data.

With °C temperature unit, raw data is multiplied by 10. For example, 25.5°C is converted into 255.

With °F temperature unit, the integer section of raw data is directly converted into the data.  For example, 135.4°F is converted into 135.

Minus temperature is converted into negative values, represented in 2's complements.



## ■ DISCRETE DATA (models: R80DAT16A2, R80DCT16A2, etc.)
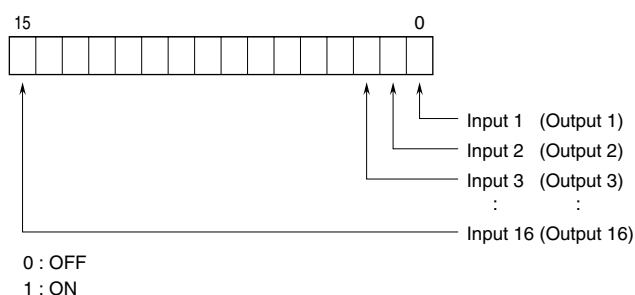
# SETTING

## ■ SUMMARY

Follow the setting procedure below for configuring R30NCIT1 by using GX Works3 of Mitsubishi Electric (hereinafter referred to as GX Works3).

## ■ REGISTRATION FOR PROFILE

This unit supports CC-Link Family system profile (CSP+).
CSP+ can be downloaded from our web site or CC-Link Partner Association's web site (https://www.cc-link.org).
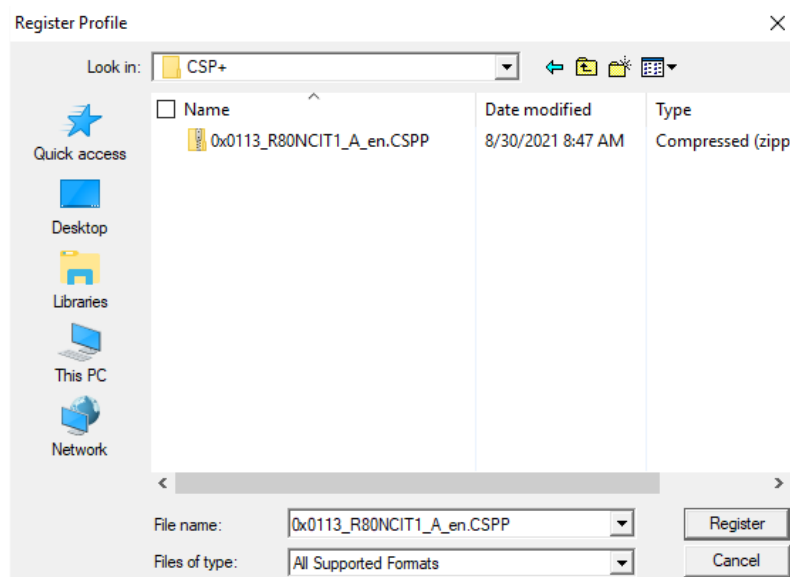However, registration of CSP+ is optional. If CSP+ is not needed, skip this section and move on to [Construction of System].

1) Start GX Works3.


GX Works3
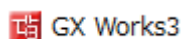
2) From the main menu, select [Tool] → [Register Profile].
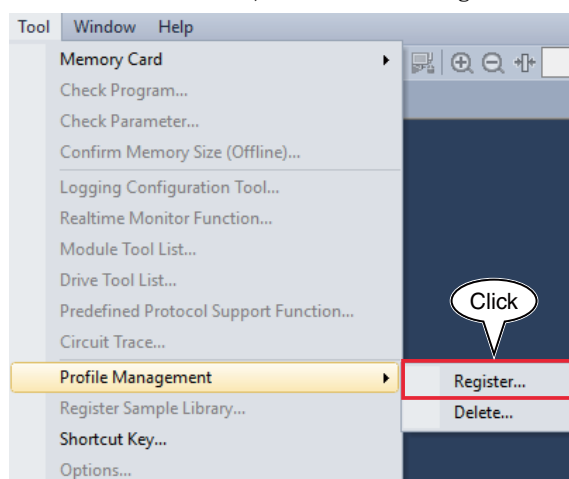


3) Select the downloaded CSP+ file, and click [Register] to finish registration.

■ **CONSTRUCTION OF SYSTEM**

The below figure shows an exemplary configuration of line connection.
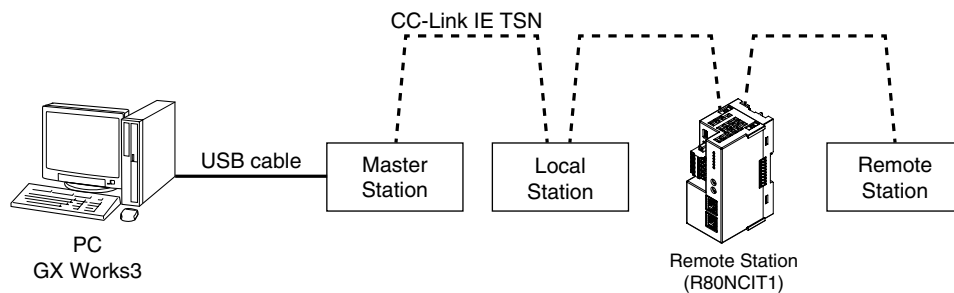


1) Master station, Local Station and Remote Station (R30NCIT1) are connected by Ethernet cable. CN1 and CN2 of CC-Link IE TSN Network RJ-45 modular jacks can be connected in any order.
   Before wiring, make sure to turn off the power of each unit.
2) After wiring is completed, turn on each unit.

■ **CREATION OF PROJECT**

Connect the PC and the master station, and create a project of the master station with GX Works3 installed in the PC.

1) Start GX Works3.
2) From the main menu, select [Project] → [New] to create a new project.
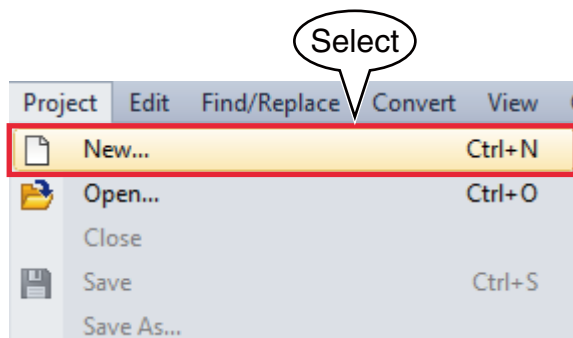


3) Select the series, type, and program language, and click OK.
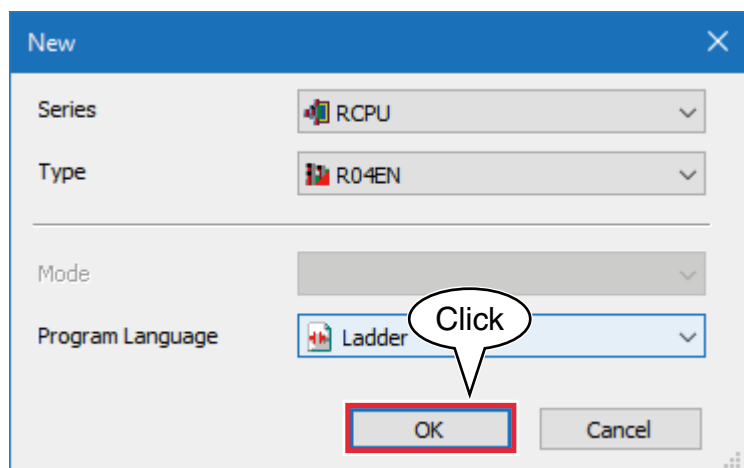
4) In the following window, when [Module Label: Not use] is displayed in Module Setting, click [Setting Change] to open the option window, and change to [Use].
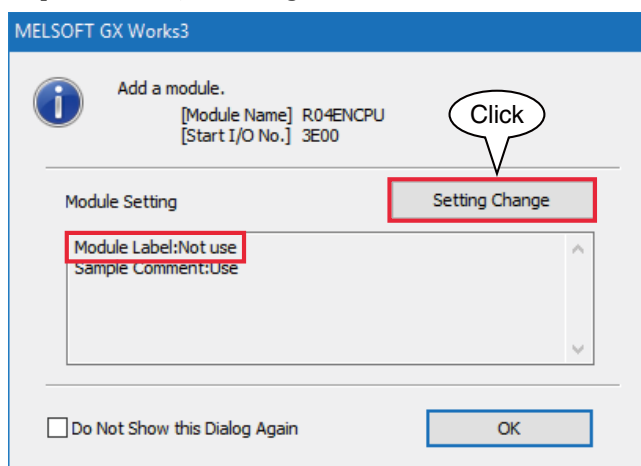


Select [Yes] for [Use Module Label] in [Operation Setting], and click [OK].
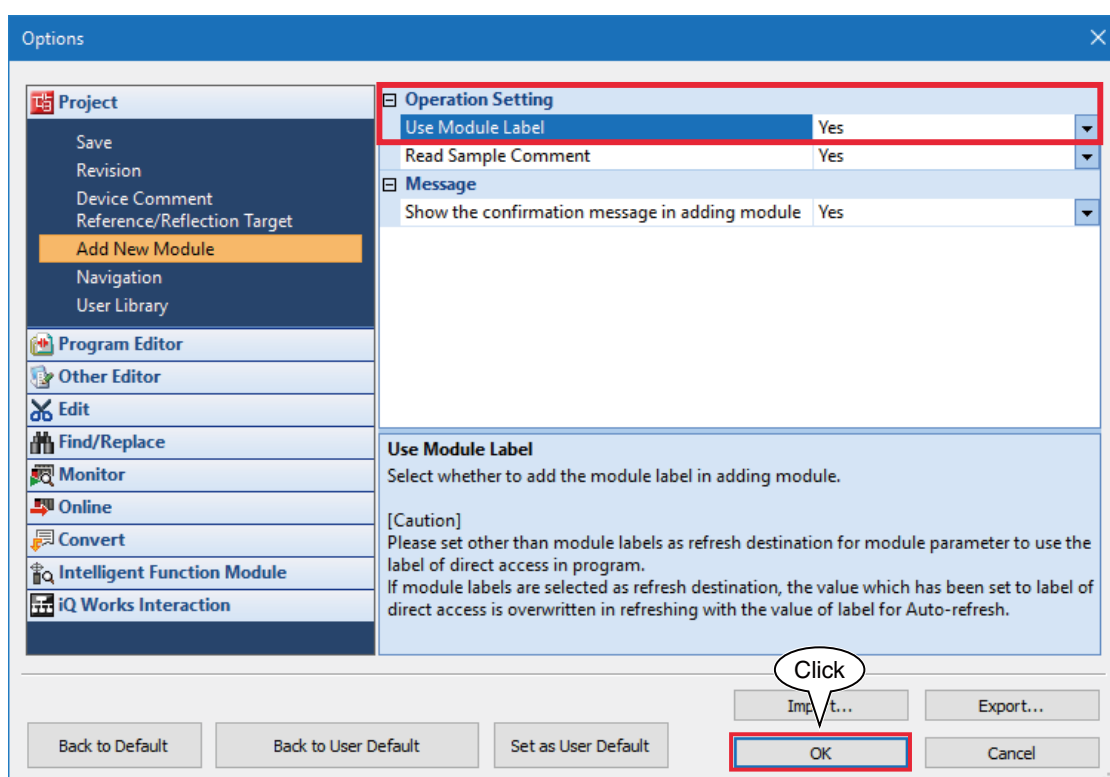
5) Double click [Module Configuration] in the Navigation window to open the [Module Configuration] window. According to the real PLC configuration, select the module from [POU List] of the [Element Selection] window, and drag and drop it to the module configuration diagram.
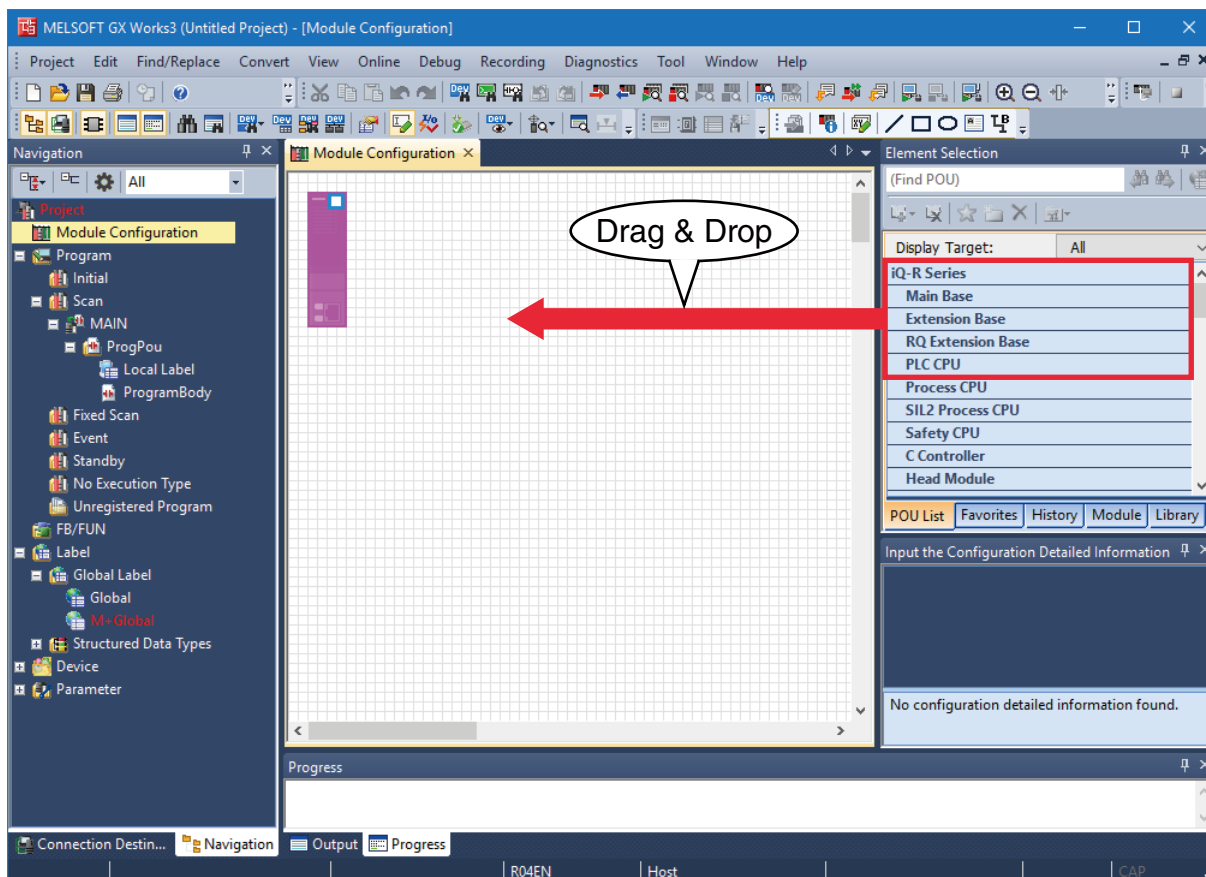


6) Double click [CC-Link IE TSN network module] to open the parameter setting window.
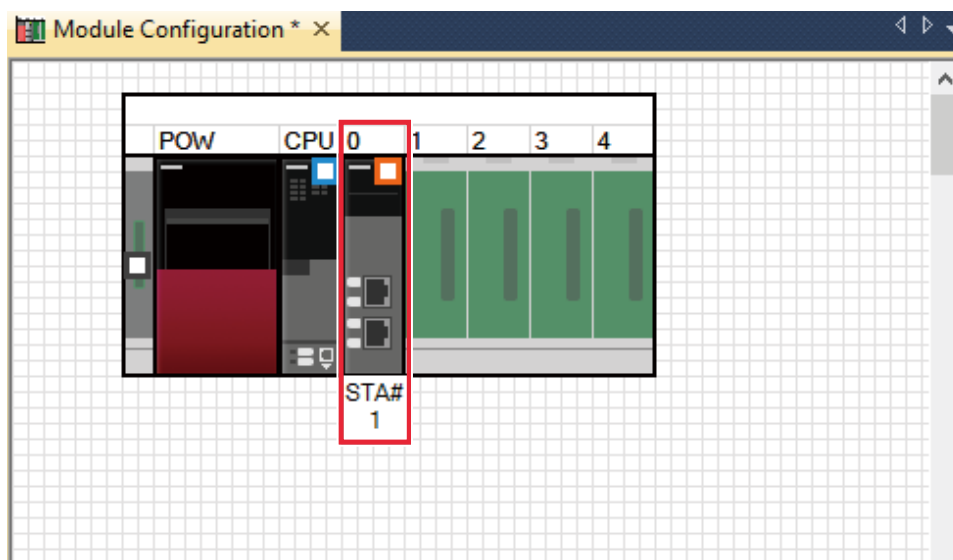
7) Set Station Type to [Master Station], Network No. to 1 in [Required Settings].



8) Click <Detailed Setting> of [Network Configuration Settings] in [Basic Settings] to display the [CC IE TSN Configuration] window

According to the real system configuration, select the device from [Module List], and drag and drop it to the device configuration diagram.  Click [Close with Reflecting Setting].
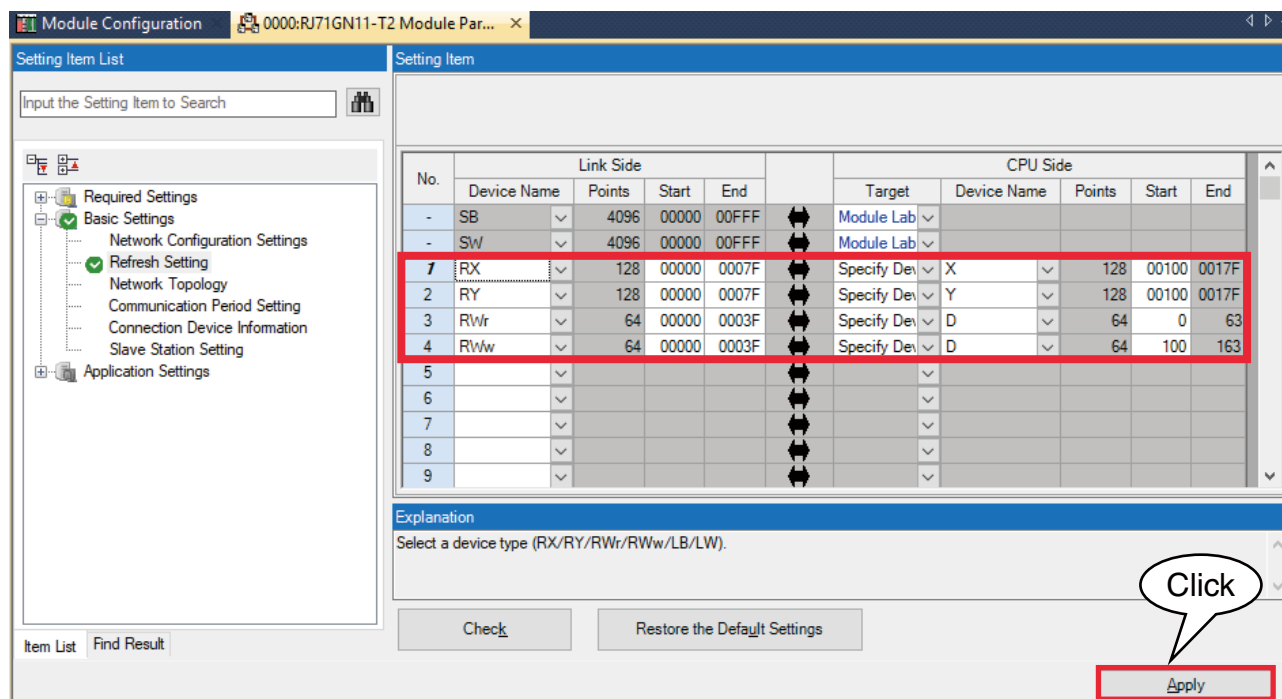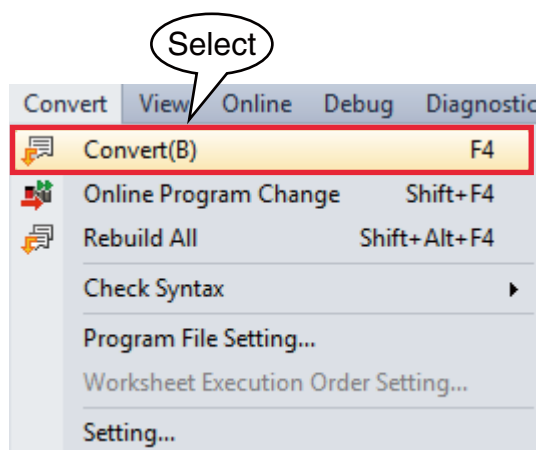 * When CSP+ not registered, select [General CC IE TSN Module].
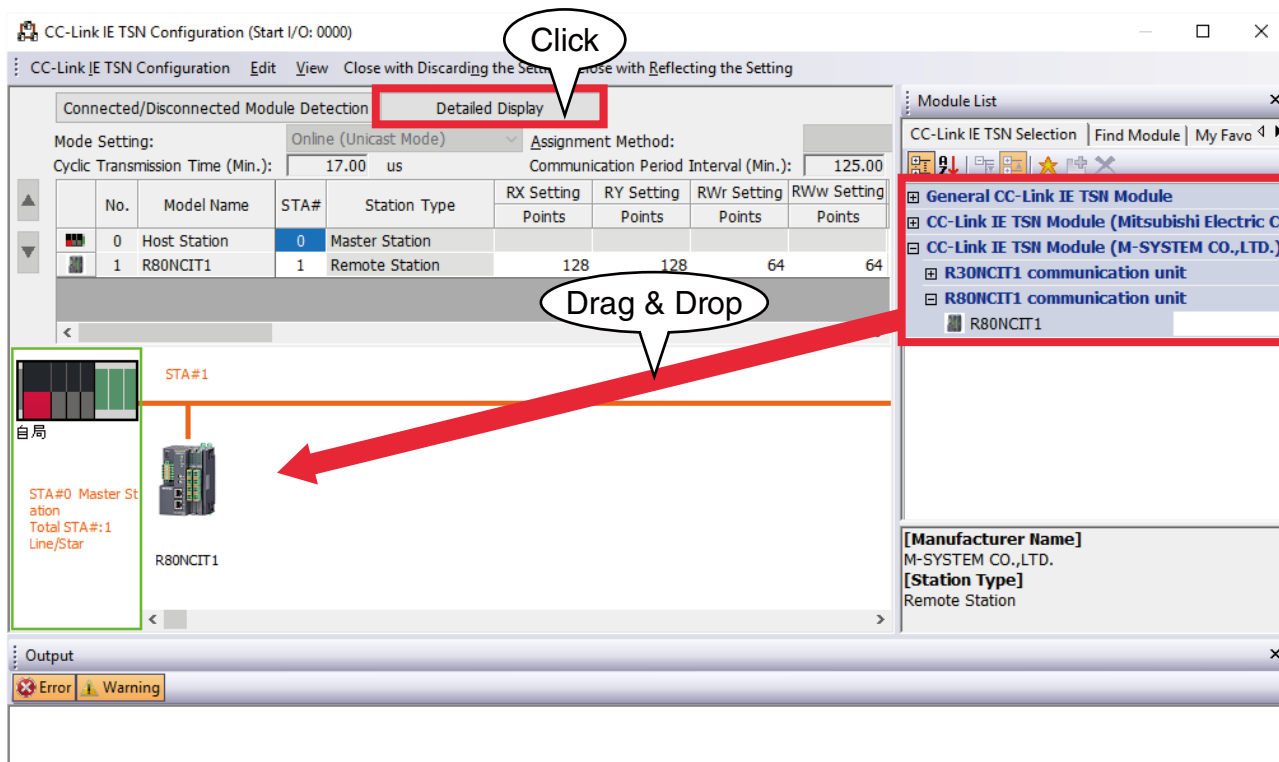


9) Click <Detailed Setting> of [Refresh Setting] to display the Refresh Setting window
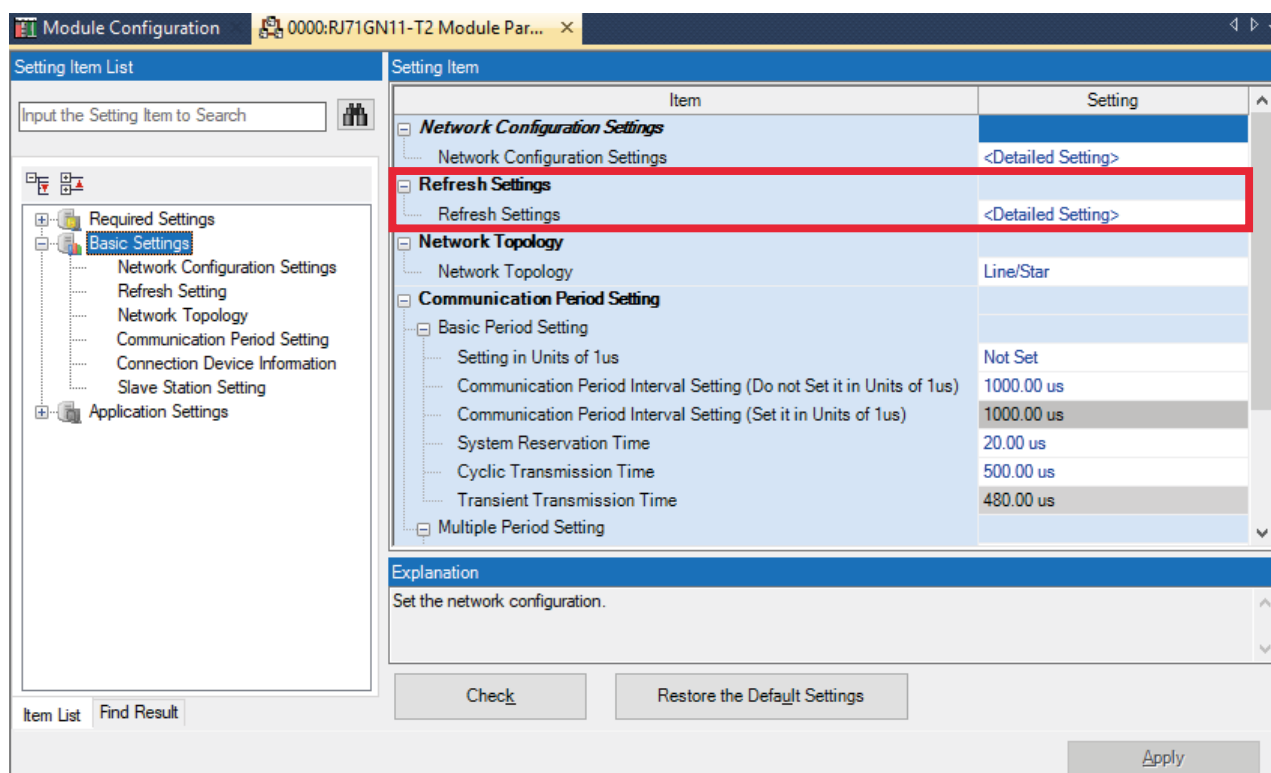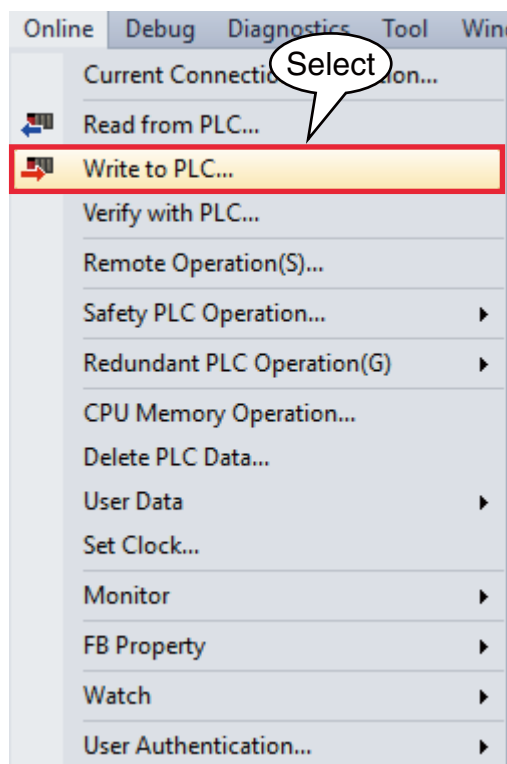
Assign link devices RX/RY/RWr/RWw to devices of the CPU unit, click [Apply] to close the window.



10) Click [Convert] → [Convert] to execute conversion.

11) Click [Write to PLC…] in [Online] on menu bar to open [Online Data Operation] window.



Check necessary items, and click [Execute].