REMOTE I/O R30 SERIES

PC CONFIGURATOR SOFTWARE
Model: R30CFG Ver. 1.17

Users Manual

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1. INTRODUCTION

1.1 GENERAL DESCRIPTION

The R30CFG is used to program parameters for the Interface and I/O Modules of the R30 Series Remote I/O (referred hereunder as 'device'). The following major functions are available:

- Edit parameters
- Download parameters to the device, upload parameters from the device
- Save parameters as files, read parameters from files

1.2 APPLICABLE DEVICES

The R30CFG is applicable to the following products:

FUNCTION	MODEL
EtherCAT Interface Module	R30NECT1
CC-Link IE Field Interface Module	R30NCIE1
Modbus/TCP Interface Module	R30NE1
Network Module for OPC UA server	R30NOUA1
CC-Link IE TSN Interface Module	R30NCIT1
Tablet Recorder	TR30*1
Web Data Logger	DL30*2
Discrete Input Module, 16 points	R30XN16x
Discrete Output Module, 16 points	R30YN16x
DC Voltage/Current Input Module, 4 points (2 points)	R30SV4 (R30SV2)
High-speed DC Voltage/Current Input Module, 4 points	R30SVF4
Universal Input Module, 4 points (2 points)	R30US4 (R30US2)
DC Voltage Output Module, 4 points	R30YV4
DC Current Output Module, 4 points	R30YS4
Thermocouple Input Module, 4 points	R30TS4
RTD Input Module, 4 points	R30RS4
Potentiometer Input Module, 4 points	R30MS4
AC Current Input Module, 4 points	R30CT4E
Totalized Pulse Input Module, 2 points	R30PA2
CC-Link IE Filed Network Interface Module	R30GCIE1
EtherCAT Interface Module	R30GECT1
Network Interface Module for OPC UA server	R30GOUA1

*1. R30 I/O modules can be configured via TR30. Use TRGCFG to configure TR30.
*2. R30 I/O modules can be configured via DL30. Use DL30GCFG to configure TR30.

The latest version of the R30CFG is downloadable at our web site if you need higher version software.

1.3 PC REQUIREMENTS

The following PC performance is required for adequate operation of the R30CFG.

PC	IBM PC COMPATIBLE
OS	Windows 7 (SP1) (32-bit, 64-bit) Windows 8.1 (32-bit, 64-bit) Windows 10 (32-bit, 64-bit) Note 1: Windows RT is not included. Note 2: Not assuring operations in all environments.
CPU	Must meet the relevant Windows' requirements.
Memory	Must meet the relevant Windows' requirements.
Communication port	COM port (COM1 through COM16)

For connecting a device to a PC, use a commercially available USB cable (Type A Mini B).

1.4 DRIVER SOFTWARE

An FTDI's chip is used for the R30 Interface Module, and a dedicated driver software is required to be installed on a PC where the R30CFG is installed in order to connect the R30CFG to each device.
When the driver software is installed on the PC, it will add a new serial port. Select this port as COM.

1.4.1 INSTALLING DRIVER SOFTWARE

- With a PC connecting to the Internet, the R30 USB Driver is automatically installed with the function of Windows Update in connecting to the R30 Interface Module.
- The R30 USB Driver is downloadable at our web site.

1.5 INSTALLING & DELETING THE PROGRAM

INSTALL

The program is provided as compressed archive. Decompress the archive and execute 'setup.exe' to start up the R30CFG installer program. Follow instructions on the Windows.
Log on as administrator to start installation.

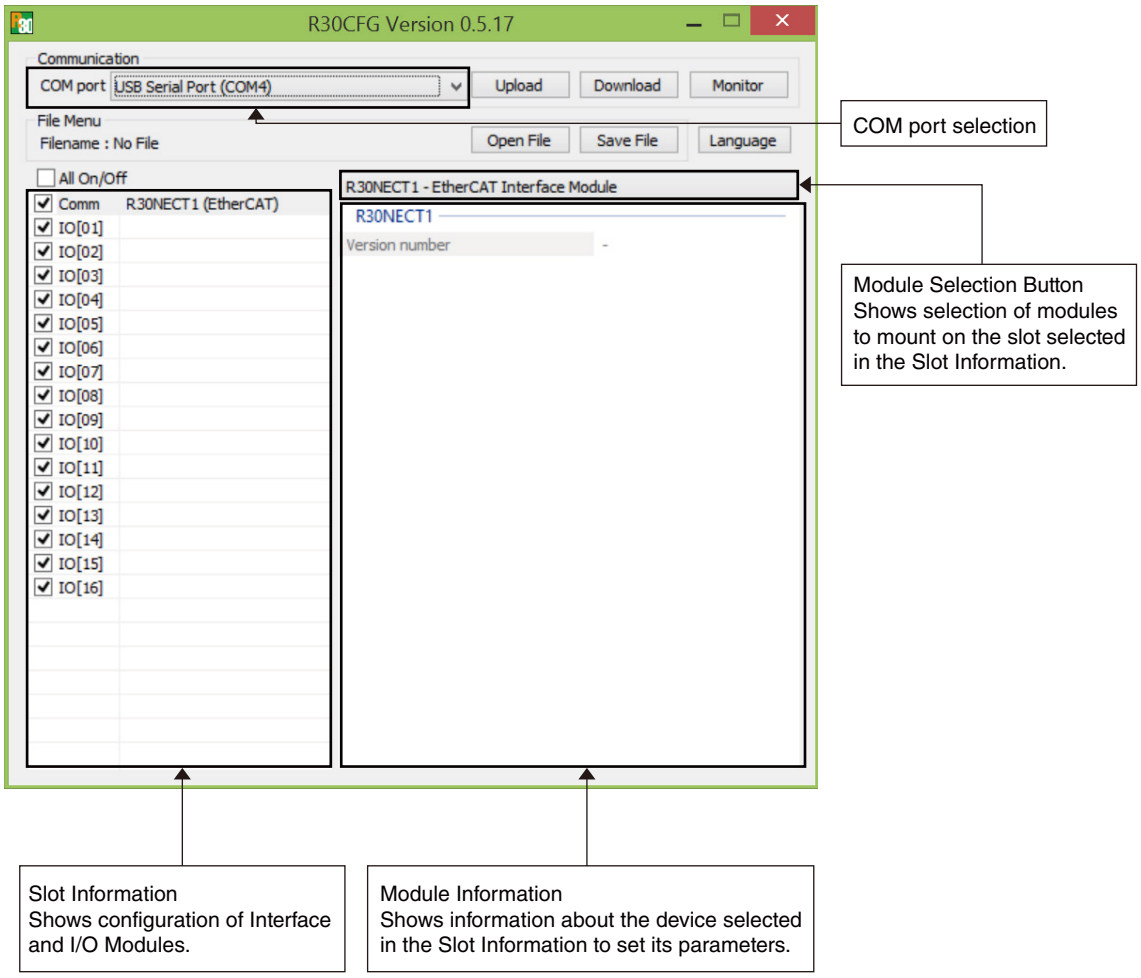
DELETE

Open Uninstall a program, or Uninstall or change a program. Select the R30CFG from the program list and click on Remove or Uninstall button (Windows 7 and 8.1).
Find and double-click R30CFG from 'Apps and Features', and then follow the instruction on the screen (Windows 10).

2. GETTING STARTED

2.1 STARTING THE R30CFG

Open the R30CFG program on the Windows PC. The following window appears on the screen.



2.1.1 SELECTING COM PORT

Select a COM port added in installing the R30 USB Driver adequately. The added COM port number depends on the PC.

2.1.2 SELECTING SLOTS

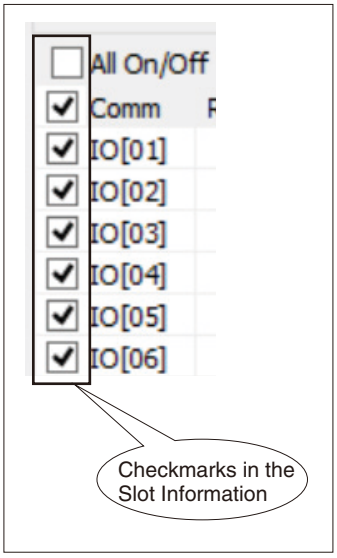
1) [Upload] and [Download] functions are applicable to the slots with checkmarks only.
2) [Monitor], [Open File] and [Save File] functions are applicable to all slots, regardless of the checkmarks.

2.2 MODIFYING PARAMETERS

Whenever you need to modify parameters stored in a device, first read (upload) the present parameters from the device, modify whatever parameters you need, and then write (download) the new parameters to the device.

2.2.1 READING PARAMETERS FROM DEVICE (UPLOAD)

1) Choose the COM port number to which the device is connected.
2) Click on [Upload] button at the top of the window.
   Then the program starts to communicate with the device to read the present parameters. If an error message appears, confirm the hardware connection and the setting again before retrying.
3) The device's present parameters are uploaded and shown on the screen.

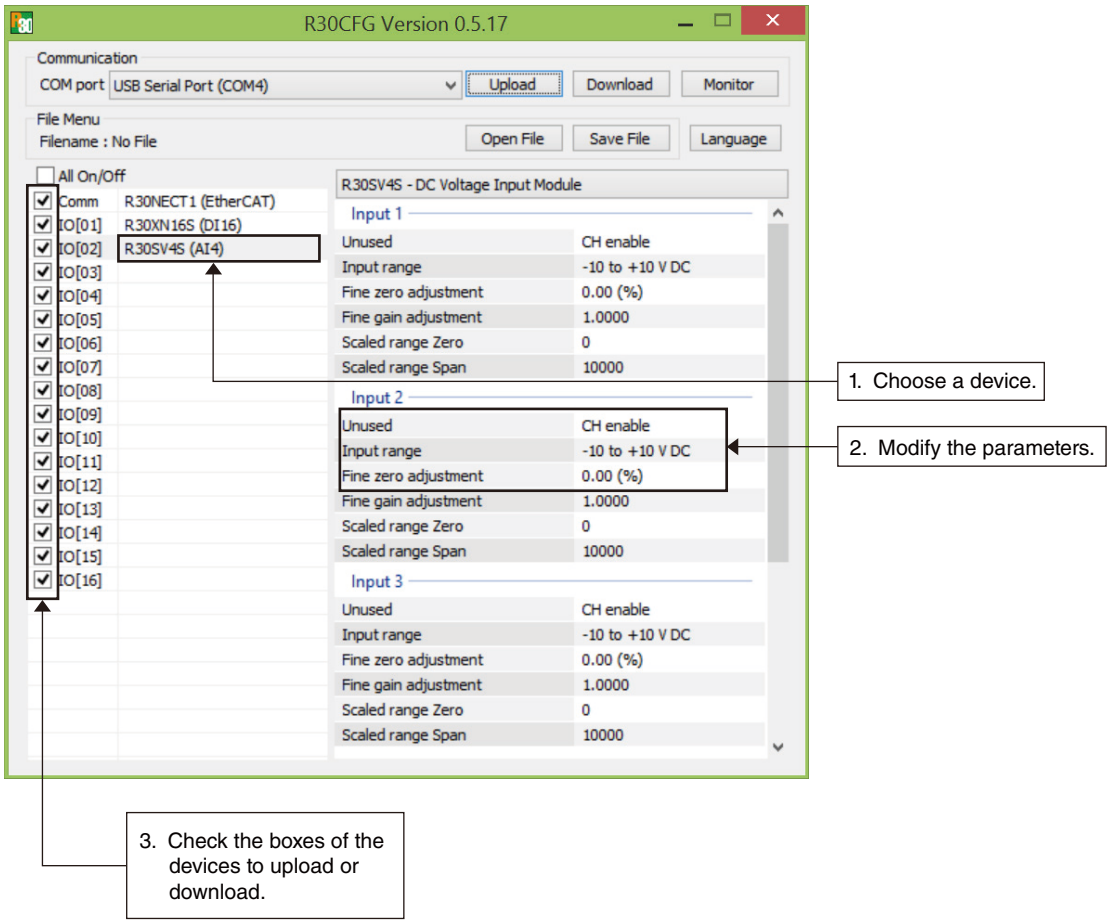


NOTE

The parameters of the slots without the checkmarks are not uploaded.

2.2.2 MODIFICATION EXAMPLE

The initial view is composed of the R30 module configuration to the left and the parameters of the selected module to the right.
The example below shows the R30NECT1 Interface Module, Discrete Input Module (slot 1) and DC Voltage/Current Input Module (slot 2).



Parameters available to each type of module are explained in the later sections.

2.2.3 WRITING NEW PARAMETERS (DOWNLOAD)

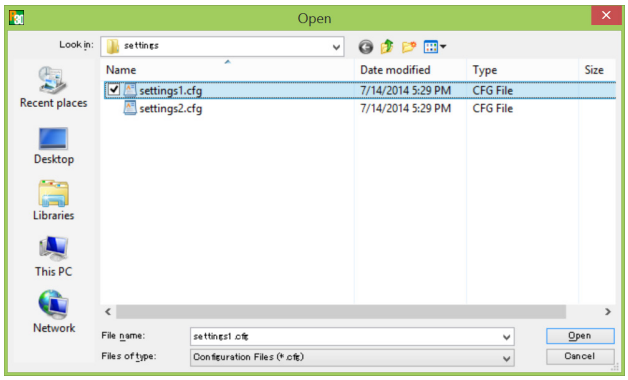
1) Click on [Download] button at the top of the window.
2) When the indicator showing progress of the download reaches the right end without showing any error message, the new parameters are correctly updated, downloaded to the device, and immediately valid.

2.3 SAVING & READING PARAMETERS IN A FILE

Parameters edited on the screen can be saved as a file, and read out on the screen from the file.
By combining [Upload] / [Download] functions with [Save File] / [Open File], a backup file of those presently used in the device can be created.

2.3.1 READING PARAMETERS SAVED AS FILE

Clicking on [Open File] button calls up the Windows-standard Open dialog box, depending on the PC's operating system on which the program is running.

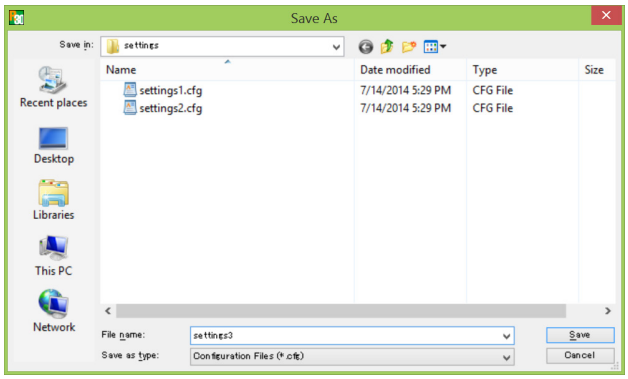


NOTE
The dialog box is displayed in the language of the OS.

Select a parameter file and click on [Open] button to show a stored parameter setting.

2.3.2 SAVING PARAMETERS IN A FILE

Clicking on [Save File] button calls up the Windows-standard Save dialog box, depending on the PC's operating system on which the program is running.

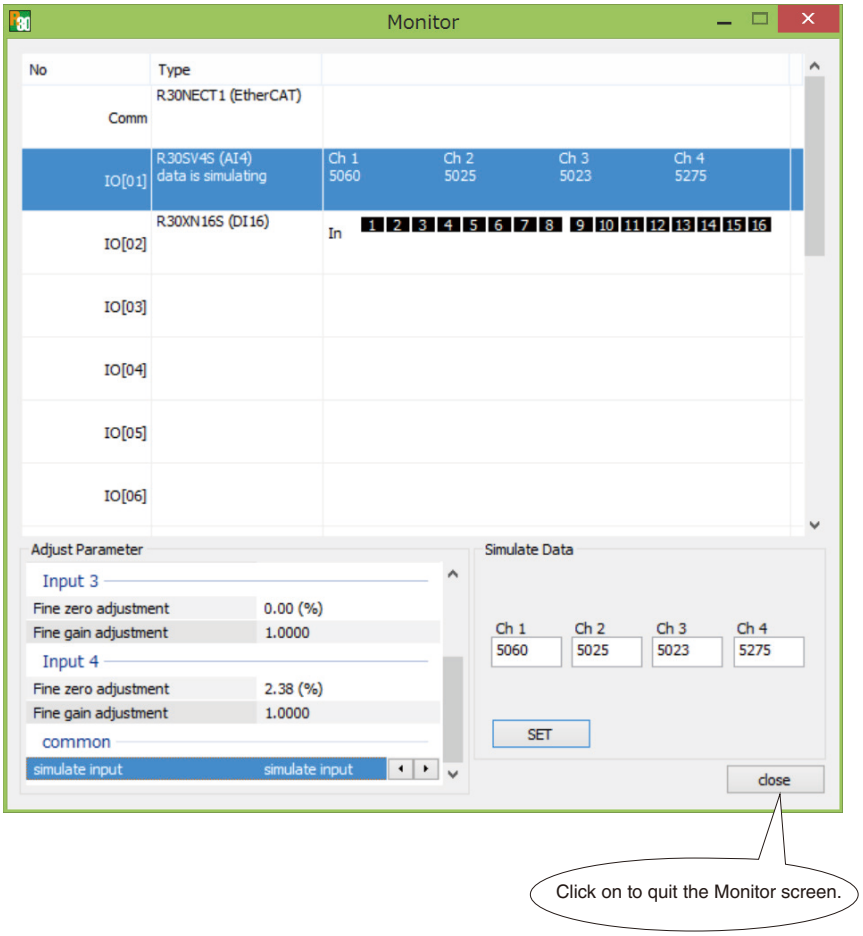


NOTE
The dialog box is displayed in the language of the OS.

Enter a desired file name to File Name field and click on [Save] button to store a parameter setting.

2.4 MONITORING I/O STATUS

The Monitoring function is used to show I/O status of each device connected to the PC on the window, conduct fine adjustments, and set simulate I/O.
Click on [Monitor] button. When the communication is established, the following window appears on the screen.
(The window shows an example where the R30SV4 and the R30YN16A are mounted to the base.)



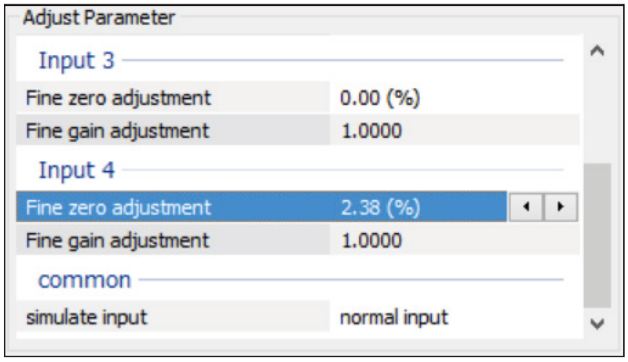
The following table explains the window above.

ITEMS	DESCRIPTION
(1) I/O	Shows the types of modules mounted to the base, followed by each I/O status with scaled value. Click on an I/O module to show 2) the fine zero/gain adjustments and 3) the simulate I/O.
(2) Fine adjustment	Conduct the fine zero/gain adjustments for the analog I/O. Also enable or disable the simulate I/O. The setting is immediately valid. When temperature channels of R30US2/US4 (T/C or RTD input), R30TS4 or R30RS4 are selected, the setting of these parameters are not available if the same value is set to the zero base and full base. This area is blank for the I/O modules without the fine adjustment function.*1 For R30PA2, it is required to set the preset value in this area.
(3) Simulate I/O	Set simulate I/O value. Click on [SET] button and the setting is immediately valid. Set the scaled value. (This area is blank for the I/O modules without the simulate I/O function.) For simulated I/O, input available range is -32768 to 32767. When an out-of-range value is entered, it is changed to -32768 or 32767. (For R30CT4E, refer to 4.11.8)

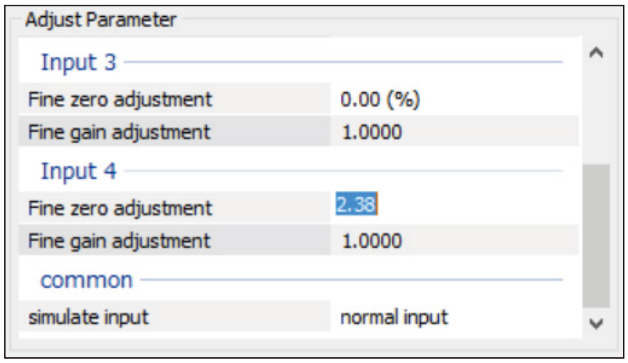
*1. Refer to 4.10.2 for R30MS4.

2.4.1 SETTING FINE ZERO / GAIN ADJUSTMENTS

Click on [Fine zero adjustment] or [Fine gain adjustment] to display buttons.
Each time you click on the left or right arrow of buttons, the fine adjustment value will be incremented or decremented (by 0.01 for the fine zero adjustment, and by 0.0001 for the gain).

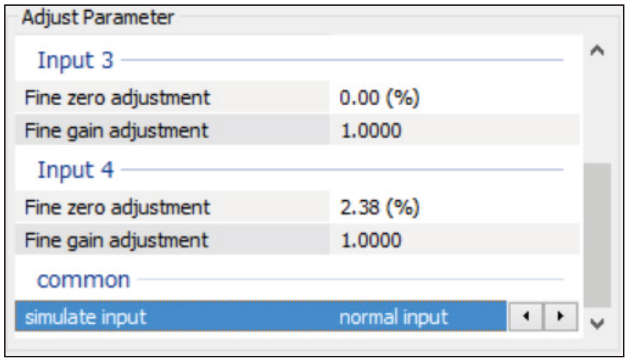


Double-click on [Fine zero adjustment] or [Fine gain adjustment] to enter the value.

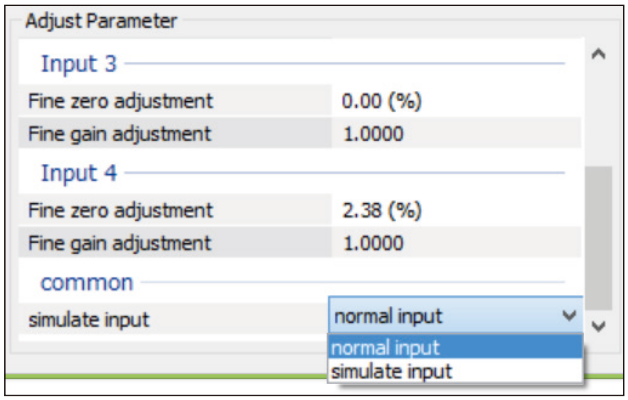


2.4.2 SETTING SIMULATE INPUT/OUTPUT

Click on [Simulate input] ([Simulate output]) to display buttons.
Click on the right arrow to select the simulate input (simulate output) or the left arrow to select the normal input (normal output).



Double-click on [Simulate input] ([Simulate output]) and select the simulate input (simulate output) or normal input (normal output) from the drop-down menu.



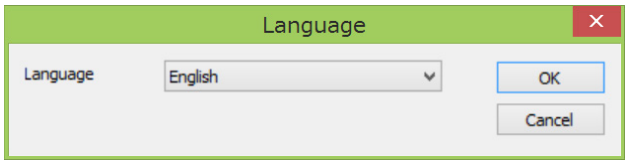
NOTE

Each time the fine zero/gain adjustment or the simulate I/O is set on the Monitor screen, the program communicates with the device to write the settings to it.
After closing the Monitor screen, the initial view still shows the previous settings.
To reflect the new settings on the screen, click on [Upload] button.

* The simulate I/O setting returns to the normal input (normal output) mode in starting up the device.

2.5 SWITCHING LANGUAGE

Clicking on [Language] button opens the Language dialog box. Choose one of the available languages. Note that the PC's operating system on which the program is running must be compatible with the selected language in order to show all characters correctly on the window.



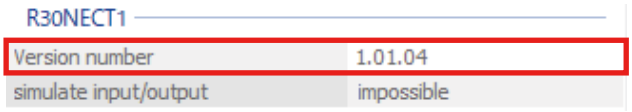
3. PARAMETER DETAILS OF INTERFACE MODULE

3.1 R30NECT1 - EtherCAT INTERFACE MODULE

The R30NECT1 does not have setting items, only displaying.

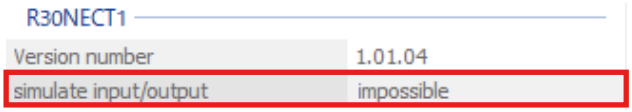
3.1.1 VERSION NUMBER

Version number of the firmware is displayed.
This is not editable.
When not uploaded, "–" is displayed.



3.1.2 SETTING SIMULATE INPUT/OUTPUT

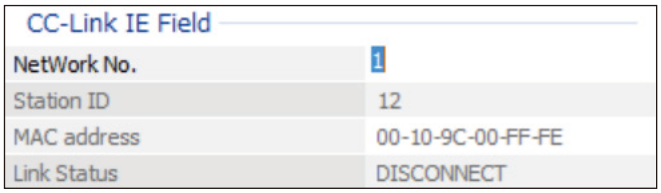
Displays possible/impossible of the simulation input/output for R30XN16Sx, R30YN16Sx.
This is not editable.
Simulation input/output is possible when the the version of the interface module is 3.00 or later.
For the analog I/O module supporting simulation I/O, Simulation I/O is available regardless of the indication.



3.2 R30NCIE1 - CC-Link IE FIELD NETWORK INTERFACE MODULE

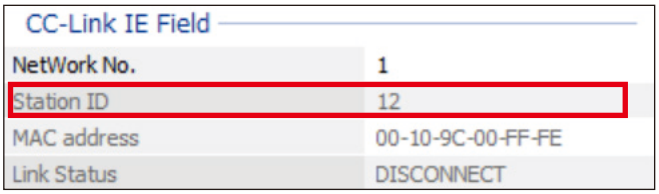
3.2.1 NETWORK NO

Set the network No.
The range is 1 to 239, initial value is 1.



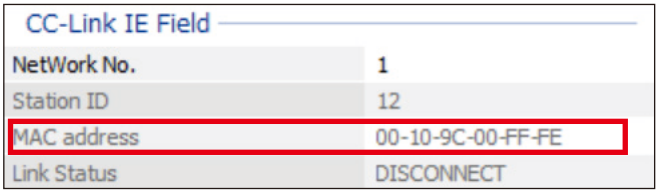
3.2.2 STATION ID

Station ID set in the R30NCIE1 is displayed. It is not available to change.
When not uploaded, "–" is displayed.



3.2.3 MAC ADDRESS

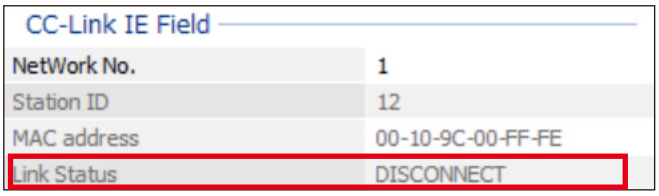
MAC address of the R30NCIE1 is displayed. It is not available to change.
When not uploaded, "–" is displayed.



3.2.4 LINK STATUS

Data link status at upload is displayed. It is not available to change.
Upload when display needs update.
When not uploaded, "–" is displayed.

- CYCLIC: Cyclic communication status
- TOKEN-PASS: Token-pass status
- DISCONNECT: When communication is not established.

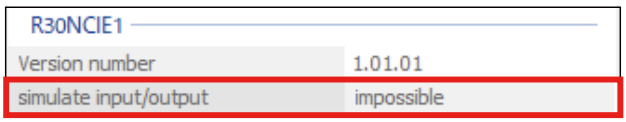


3.2.5 VERSION NUMBER

Version number of the firmware is displayed.
This is not editable.
When not uploaded, "–" is displayed.

3.2.6 SIMULATE INPUT/OUTPUT

Displays the availability of simulate input/output in R30XN16Sx and R30YN16Sx.
This is not editable.
This is available with the network module version 3.00 or later.
Analog I/O modules that support simulate input/output can perform simulate input/output regardless of the display.



3.3 R30NE1 - Modbus/TCP INTERFACE MODULE

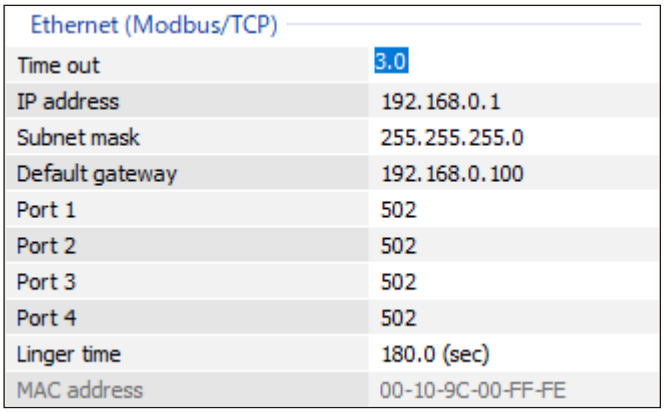
IMPORTANT

Be sure to reboot R30NE1 when its settings have changed.
The new settings are effective only after turning off and on the power supply to R30NE1.

3.3.1 TIME OUT

Set the communication timeout period.
When there is no communication within this time period, RUN LED turns off, RUN contact turns off, and each output module which is connected enters the state of 'output at the loss of communication'.

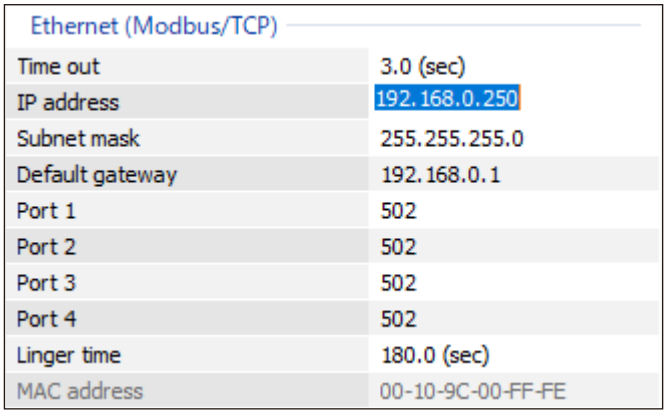
Setting range: 0.2 to 3200.0 sec.
Factory default: 3.0 sec.



3.3.2 IP ADDRESS, SUBNET MASK, DEFAULT GATEWAY

Setting range: 0 to 255
Factory default:

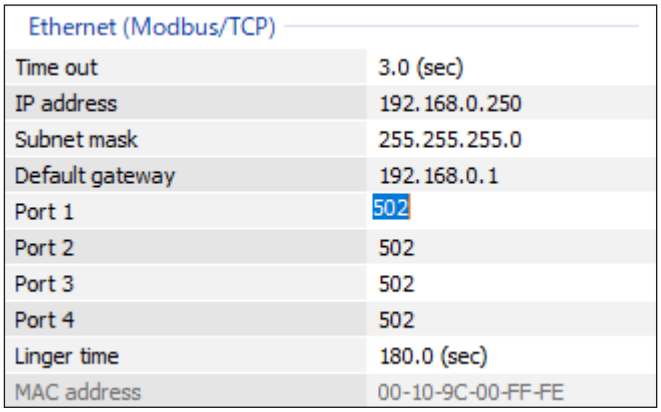
IP address	192.168.0.1
Subnet mask	255.255.255.0
Default gateway	192.168.0.100



3.3.3 PORT NUMBER 1 TO 4

Set the Port Number.
It is normally set to 502.

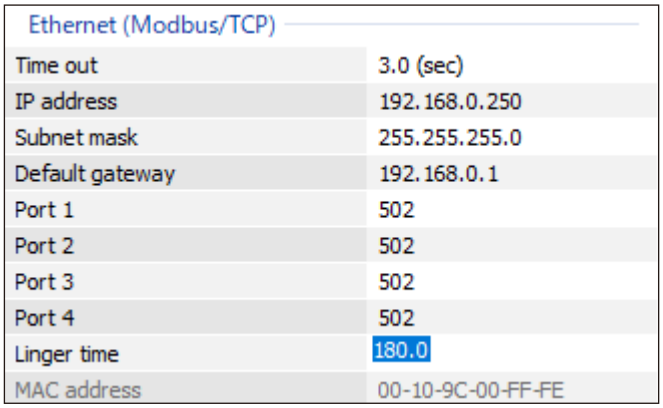
Setting range: 1 to 32000
Factory default: 502



3.3.4 LINGER TIME

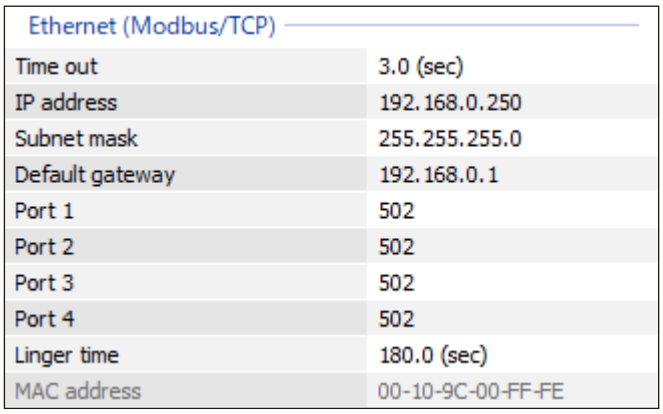
Linger time is set for monitoring no communication time.
When there is no communication within the preset time period, communication is disconnected.

Setting range: 3.0 to 3200.0 sec.
Factory default: 180.0 sec.



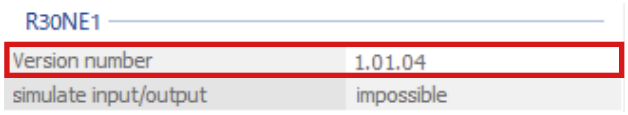
3.3.5 MAC ADDRESS

MAC address of R30NE1 is displayed.
The MAC address is not editable.
'–' is displayed when it is yet to be uploaded.



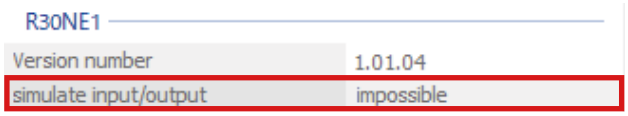
3.3.6 FIRMWARE VERSION

The firmware version of R30NE1 is displayed.
This is not editable.
'–' is displayed when it is yet to be uploaded.



3.3.7 SIMULATE INPUT/OUTPUT

Displays the availability of simulate input/output in R30XN16Sx and R30YN16Sx.
This is not editable.
This is available with the network module version 3.00 or later.
Analog I/O modules that support simulate input/output can perform simulate input/output regardless of the display.

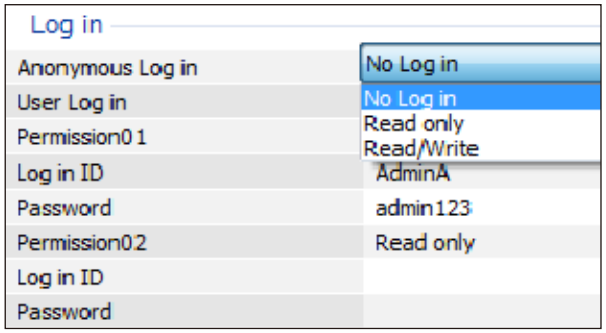


3.4 R30NOUA1 - NETWORK MODULE FOR OPC-UA DA SERVER

3.4.1 ANONYMOUS LOGIN

Set whether or not to allow anonymous login (No user authentication).

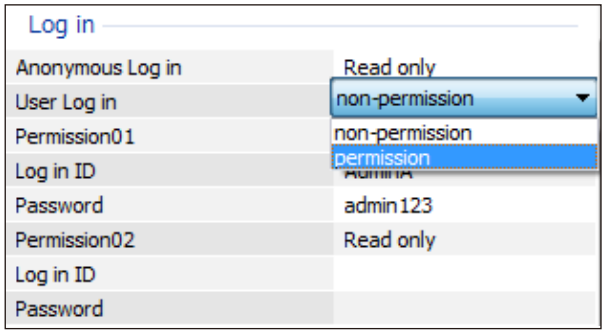
To allow anonymous login, select the data access level between 'Read only' and 'R/W'.



3.4.2 USER LOGIN

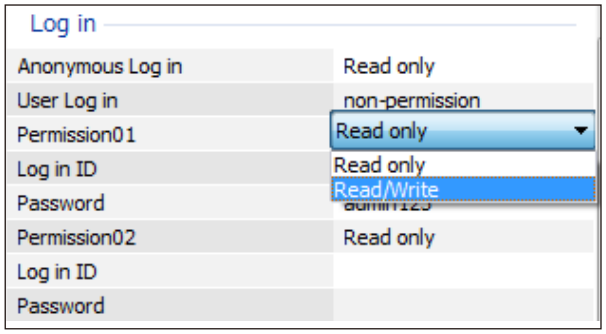
Set whether or not to allow user login (User authentication by username and password).

When user login is allowed, up to 2 sets of username and password can be set.



3.4.3 PERMISSION01 / 02

Set the data access level for each Log In ID.



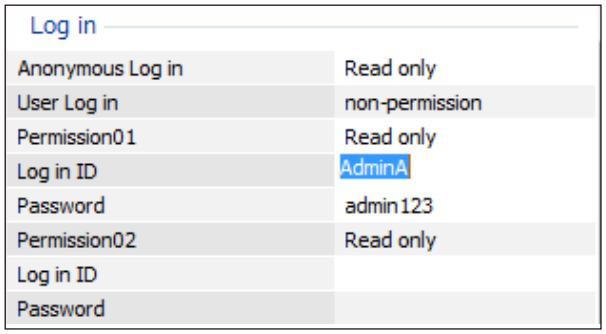
3.4.4 LOG IN ID & PASSWORD

Set User name and Password for each Log In ID.

Use alphanumerical characters (upper & lower cases) only.

Log In ID: If the parameter is left blank, the password will be initialized and user login becomes invalid.

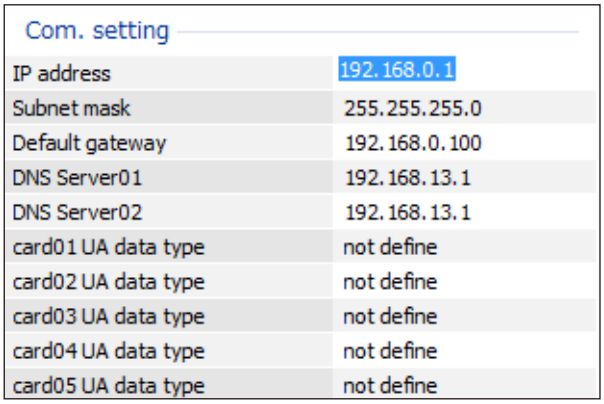
Password: If the parameter is left blank, user login becomes invalid.



3.4.5 IP ADDRESS, SUBNET MASK, DEFAULT GATEWAY, DNS SERVER

Setting range: 0 to 255

Default values
IP address : 192.168.0.1
Subnet mask : 255.255.255.0
Default gateway : 192.168.0.100
DNS server : 192.168.13.1



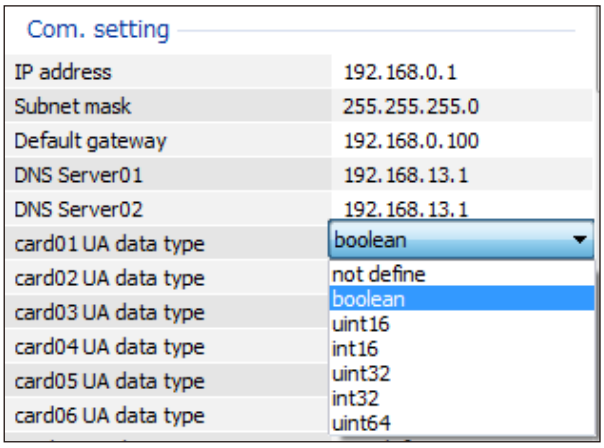
3.4.6 DATA TYPE

Set the data types for I/O modules mounted on the respective slots of the R30 installation base.

Default setting: 'not define'

* When the setting is 'not define', the data type is automatically set depending on the type of I/O module.
  Discrete module: 'boolean'
  Analog module: 'int16'

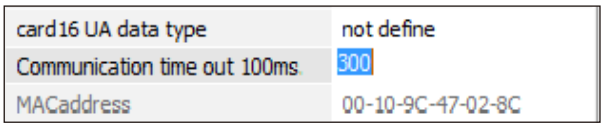
* For example, when the R30PA2 module is used, set as 'uint32' so that data is handled in 32 bits (2-word) and will not be separated.



3.4.7 COMMUNICATION TIMEOUT MONITORING TIMER

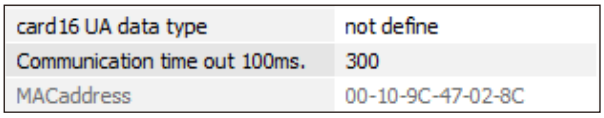
Set the timer value for communication timeout. When there is no access from an OPC-UA client before the time-out period elapses, a timeout error occurs.

Setting range: 0 to 32757 (0 to 3275.7 seconds)
Set to 0 for no monitoring.
Default setting: 300 (30 seconds)



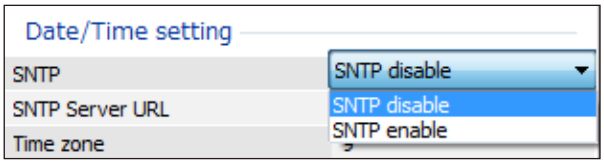
3.4.8 MAC ADDRESS

MAC address of the R30NOUA1 is indicated, which is not editable.
'–' is displayed when the parameters are yet to be uploaded from the device.



3.4.9 SNTP TIME SYNCHRONIZATION

Set whether or not to allow time synchronization with the SNTP server.
When set to 'SNTP enable', time synchronization is performed at power-on, 0:00, 06:00, 12:00, and 18:00.



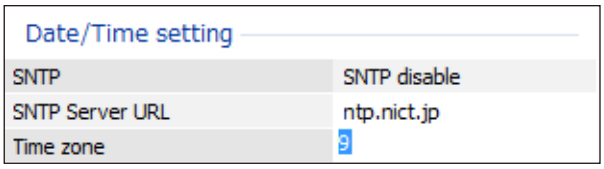
Default setting: 'SNTP disable'

* When set to 'SNTP enable', be sure to set 'DNS Server', 'SNTP Server URL', and 'Time zone'.

3.4.10 TIME ZONE

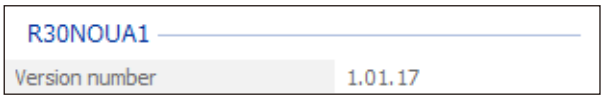
Set the UTC time zone.

Setting range: -12 to 14
Default setting: 9 (Japan time)



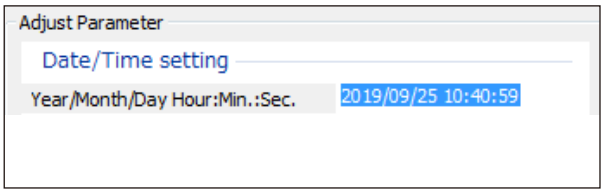
3.4.11 CONFIRMING VERSION NO.

The firmware version of the R30NOUA1 is indicated, which is not editable.
'–' is displayed when the parameters are yet to be uploaded from the device.



3.4.12 DATE / TIME SETTING

Date and time can be set on the Monitor screen.
Edit 'yyyy/mm/dd hh:mm:ss' and press "Enter" to validate the new setting.
In order to minimize time until the set date and time is reflected, it is highly recommended to perform data/time setting with no I/O module but the R30NOUA1 mounted on the base.



Setting range

Year	: 2001 to 2099
Month	: 1 to 12
Date	: 1 to 31
Hour	: 0 to 23
Min.	: 0 to 59
Sec.	: 0 to 59

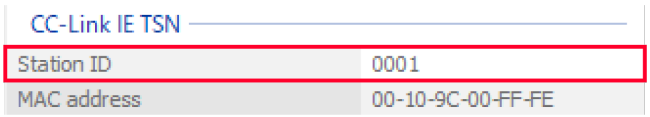
Default value : 2013/01/01 00:00:00

Do NOT enter a date which does not exist (e.g., February 31).
If such a date is entered, the value will not be reflected and the setting will remain unchanged.

3.5 R30NCIT1 - CC-Link IE TSN Interface Module

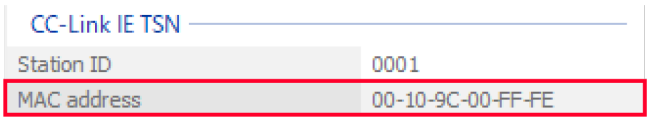
3.5.1 STATION ID

Station ID set in the R30NCIT1 is displayed. It is not available to change.
When not uploaded, "–" is displayed.



3.5.2 MAC ADDRESS

MAC address of the R30NCIT1 is displayed. It is not available to change.
When not uploaded, "–" is displayed.



3.5.3 VERSION NUMBER

Version number of the firmware is displayed.
This is not editable.
When not uploaded, "–" is displayed.

3.5.4 SIMULATE INPUT/OUTPUT

Displays the availability of simulate input/output in R30XN16Sx and R30YN16Sx.
This is not editable.
This is available with the network module version 3.00 or later.
Analog I/O modules that support simulate input/output can perform simulate input/output regardless of the display.

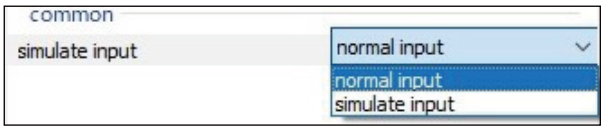
4. PARAMETER DETAILS OF I/O MODULES

4.1 R30XN16x - DISCRETE INPUT MODULE, 16 POINTS

When the version of the network module is 3.00 or higher, the simulate input setting can be configurable.
When the version is 2.xx or earlier or DL30, the R30XN16x does not have any setting items.

4.1.1 SIMULATE INPUT SETTING

Switching normal input or simulate input.
Also configurable in fine adjustment on monitor screen.
Set the simulate input value on monitor screen.

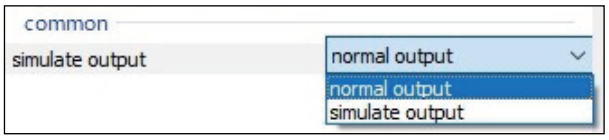


4.2 R30YN16x - DISCRETE OUTPUT MODULE, 16 POINTS

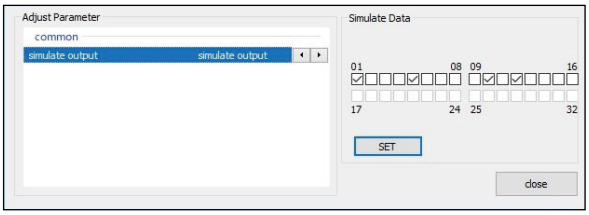
When the version of the R30YN16x is 3.00 or higher, the simulate input setting can be configurable.
When the version is 2.xx or earlier or DL30, the R30YN16x does not have any setting items.

4.2.1 SIMULATE OUTPUT SETTING

Switching normal output or simulate output.
Also configurable in fine adjustment on monitor screen.
Set the simulate output value on monitor screen.



*How to Perform Simulate Input/Output



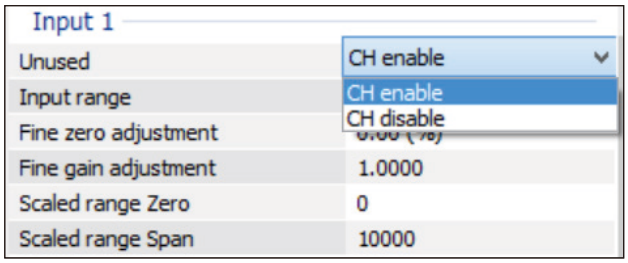
Select the I/O module on the monitor screen, and select the simulate data in the "adjust parameter".
Check the channel to output (input) the simulate data, and click SET button to activate the simulate data.
In case of simulate input, the discrete input status indicator LEDs of R30XN16x will not turn on.

4.3 R30SV4 (R30SV2) - DC VOLTAGE/CURRENT INPUT MODULE, 4 POINTS (2 POINTS)

The number of inputs for R30SV2 is 2 points.

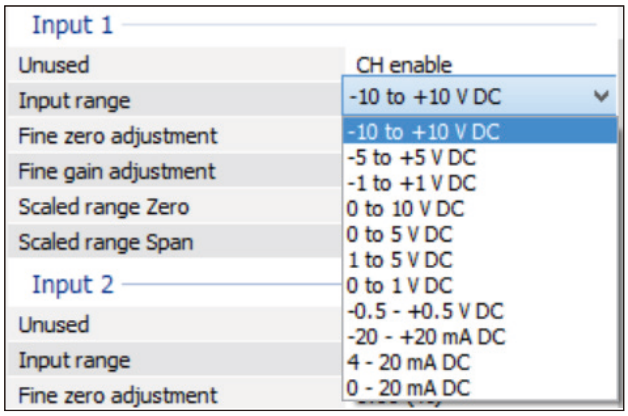
4.3.1 SETTING UNUSED INPUT

Enable or disable each input.
Disable the unused inputs.



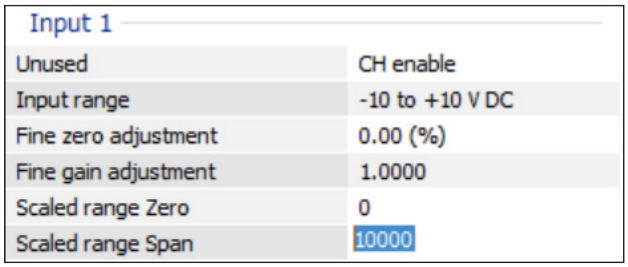
4.3.2 SETTING INPUT RANGE

Choose the input range for the enabled inputs.



4.3.3 SETTING FINE ZERO / GAIN ADJUSTMENTS, AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure below shows an example for setting the scaled range Span.



PARAMETER	DESCRIPTION	AVAILABLE RANGE
Fine zero adjustment	Zero (bias) adjustment value	-320.00 to +320.00
Fine gain adjustment	Gain (span) adjustment value	-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%	-32000 to +32000
Scaled range Span	Scaled value 100%	-32000 to +32000

NOTE

Calculation is carried out in the order of the fine gain, fine zero, and scaled range Zero/Span.

- **Calculation example of fine zero/gain adjustments**

  Used for fine adjustment such as calibration.
  Fine zero adjustment = 100.00 (%), fine gain adjustment = 2.0000
  With the raw value 50.00%,

$$50.00\ (\%) \times \underbrace{2.0000}_{\text{Fine gain adj.}} + \overbrace{100.00}^{\text{Fine zero adj.}}\ (\%) = \underbrace{200.00}_{\text{Calculated input value}}\ (\%)$$

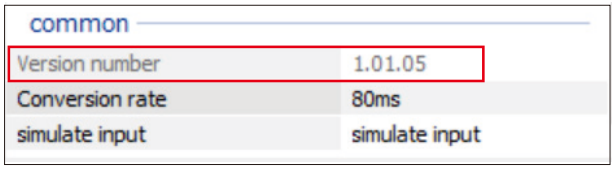
- **Calculation example of scaled range Zero / Span**

  Scaled range Zero = -10000, scaled range Span = 10000
  With the measured value 50.00% (5000) after calculating the fine adjustments with the scaled range Zero 0 and Span 10000,

$$(\overbrace{10000}^{\text{Scaled range Span}} - \underbrace{(-10000)}_{\text{Scaled range Zero}}) / \underbrace{10000}_{\substack{\text{(Scaled range Span - Scaled range Zero)} \\ \text{in measuring 50.00\%}}} \times \overbrace{5000}^{50.00\ (\%)} + \overbrace{(-10000)}^{\text{Scaled range Zero}} = \underbrace{0}_{\text{Calculated scaled value}}\ (0.00\%)$$

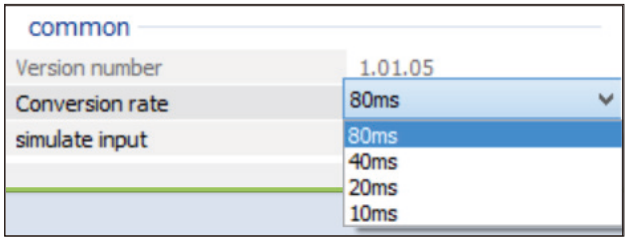
4.3.4 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



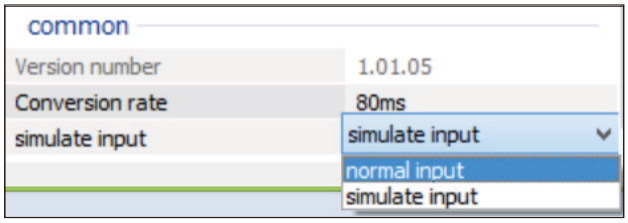
4.3.5 SETTING CONVERSION RATE

Choose one of the input signal conversion rates among 10, 20, 40 and 80 milliseconds.
The conversion accuracy depends on the rate. Refer to the data sheet of R30SV4 (R30SV2) for the detailed information.
Setting per input is not available. Set the rate for all inputs.



4.3.6 SETTING SIMULATE INPUT

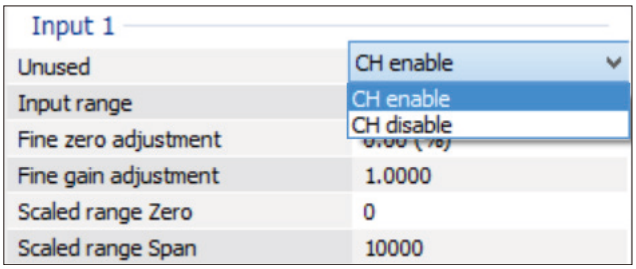
Choose normal input or simulate input.
The setting is also available on the Monitor screen.
Specify the simulate input value between -32768 and +32767. If entering a value under -32768, -32768 is set. If above +32767, +32767 is set.



4.4 R30SVF4 - HIGH-SPEED DC VOLTAGE/CURRENT INPUT MODULE, 4 POINTS

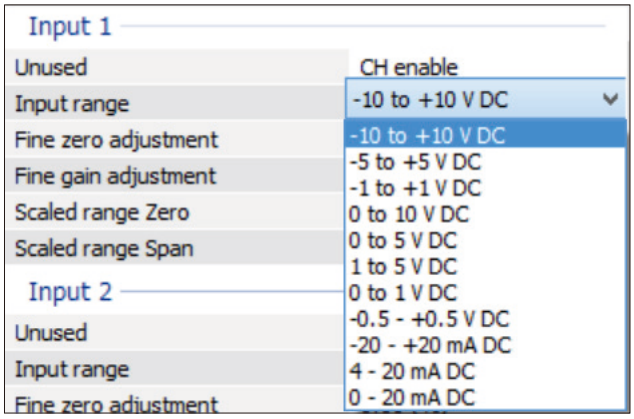
4.4.1 SETTING UNUSED INPUT

Enable or disable each input.
Disable the unused inputs.



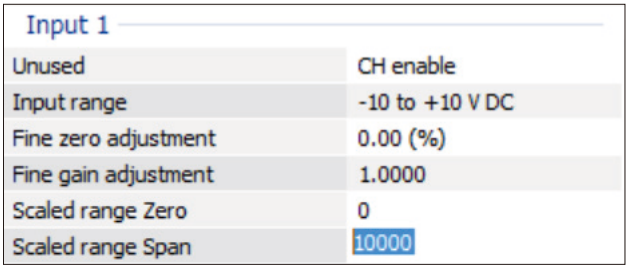
4.4.2 SETTING INPUT RANGE

Choose the input range for the enabled inputs.



4.4.3 SETTING FINE ZERO / GAIN ADJUSTMENTS, AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure below shows an example for setting the scaled range Span.



PARAMETER	DESCRIPTION	AVAILABLE RANGE
Fine zero adjustment	Zero (bias) adjustment value	-320.00 to +320.00
Fine gain adjustment	Gain (span) adjustment value	-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%	-32000 to +32000
Scaled range Span	Scaled value 100%	-32000 to +32000

NOTE

Calculation is carried out in the order of the fine gain, fine zero, and scaled range Zero/Span.

- **Calculation example of fine zero/gain adjustments**

  Used for fine adjustment such as calibration.
  Fine zero adjustment = 100.00 (%), fine gain adjustment = 2.0000
  With the raw value 50.00%,

$$50.00\ (\%) \times \underbrace{2.0000}_{\text{Fine gain adj.}} + \overbrace{100.00}^{\text{Fine zero adj.}}\ (\%) = \underbrace{200.00}_{\text{Calculated input value}}\ (\%)$$

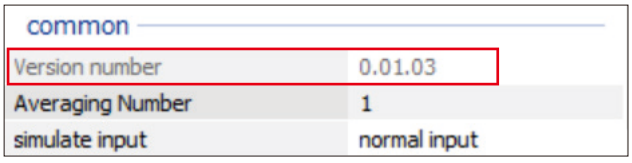
- **Calculation example of scaled range Zero / Span**

  Scaled range Zero = -10000, scaled range Span = 10000
  With the measured value 50.00% (5000) after calculating the fine adjustments with the scaled range Zero 0 and Span 10000,

$$\overbrace{(10000}^{\text{Scaled range Span}} - \underbrace{(-10000)}_{\text{Scaled range Zero}}) / \underbrace{10000}_{\substack{\text{(Scaled range Span - Scaled range Zero)} \\ \text{in measuring 50.00\%}}} \times \overbrace{5000}^{50.00\ (\%)} + \overbrace{(-10000)}^{\text{Scaled range Zero}} = \underbrace{0}_{\text{Calculated scaled value}}\ (0.00\%)$$

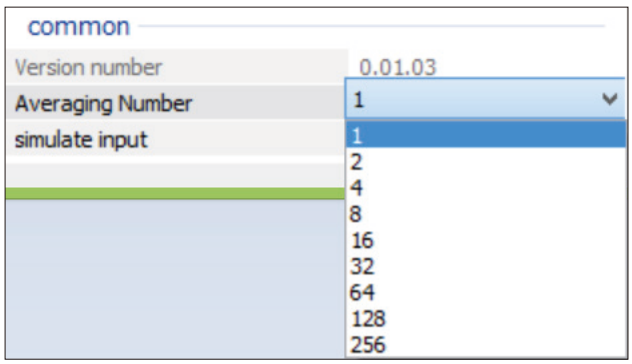
4.4.4 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



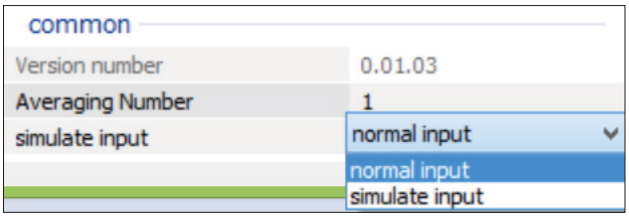
4.4.5 SETTING AVERAGING NUMBER

Choose the averaging number.
Setting per input is not available. Set the averaging number for all inputs.



4.4.6 SETTING SIMULATE INPUT

Choose normal input or simulate input.
The setting is also available on the Monitor screen.
Specify the simulate input value between -32768 and +32767. If entering a value under -32768, -32768 is set. If above +32767, +32767 is set.

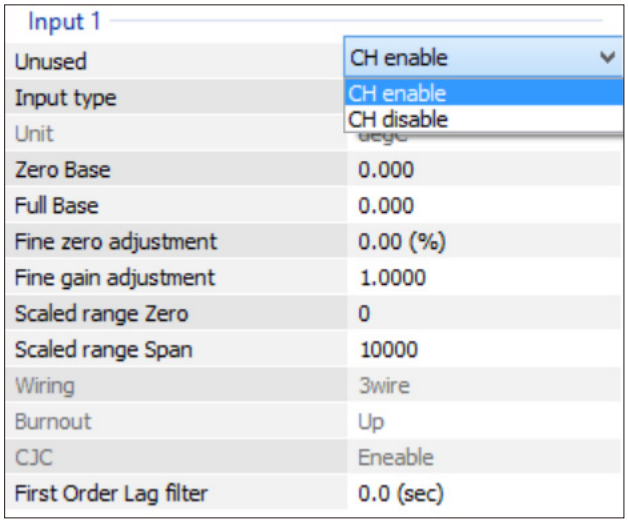


4.5 R30US4 (R30US2) - UNIVERSAL INPUT MODULE, 4 POINTS (2 POINTS)

The number of inputs for R30US2 is 2 points.

4.5.1 SETTING UNUSED INPUT

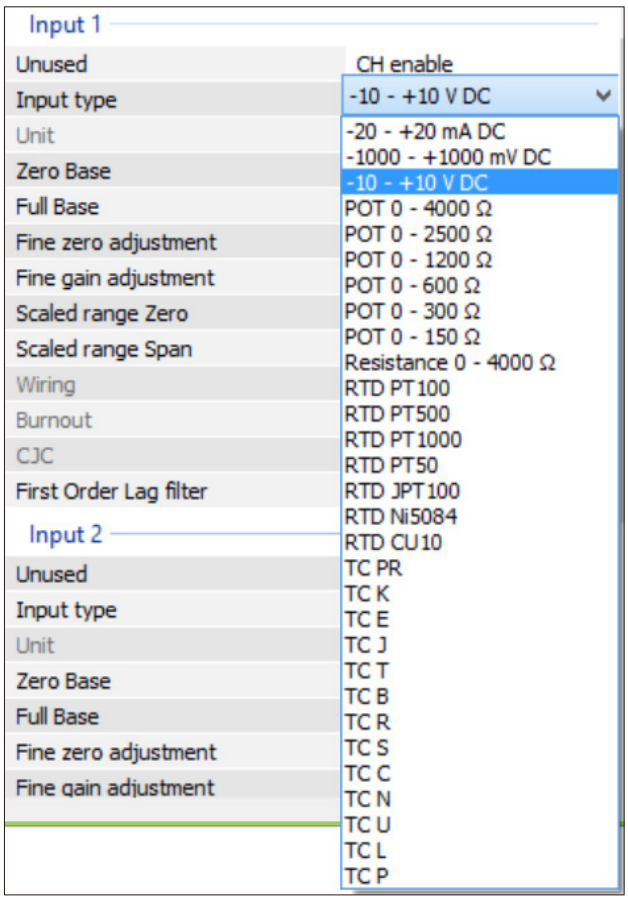
Enable or disable each input.
Disable the unused inputs.



4.5.2 SETTING INPUT TYPE

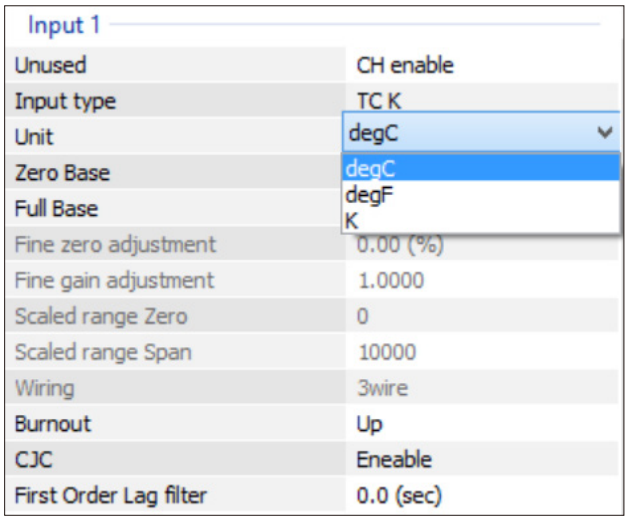
Choose the input type for the enabled inputs.
Depending on the input type, some parameters are unavailable and grayed out.

- **DC Current**
  -20 - +20 mA DC
- **DC Voltage**
  -1000 - +1000 mV DC
  -10 - +10 V DC
- **Potentiometer**
  POT 0 - 4000 Ω
  POT 0 - 2500 Ω
  POT 0 - 1200 Ω
  POT 0 - 600 Ω
  POT 0 - 300 Ω
  POT 0 - 150 Ω
- **Resistor**
  Resistance 0 - 4000 Ω
- **Thermocouple**
  TC PR
  TC K
  TC E
  TC J
  TC T
  TC B
  TC R
  TC S
  TC C
  TC N
  TC U
  TC L
  TC P



4.5.3 SETTING TEMPERATURE UNIT

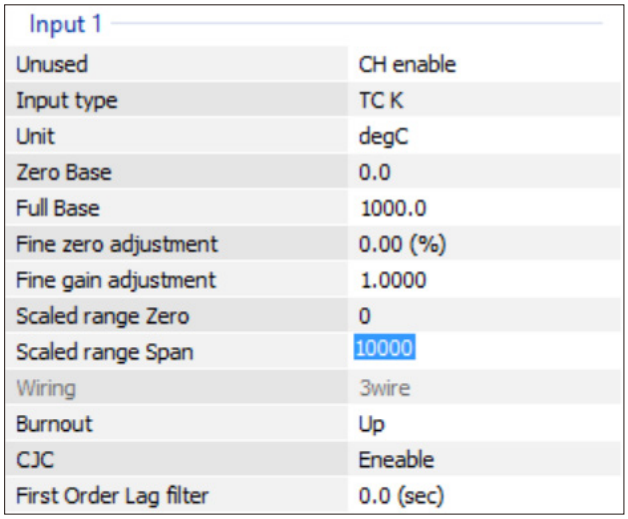
Choose the temperature unit from degC (Centigrade), degF (Fahrenheit) and K (absolute temperature).
This parameter is available only when a thermocouple or RTD is selected for the input type.



4.5.4 SETTING ZERO / FULL BASES, FINE ZERO / GAIN ADJUSTMENTS, AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure below shows an example for setting the scaled range Span.

If the same value is entered for the zero base and full base, the scaled values are not calculated but the engineering unit temperature values are returned for thermocouple and RTD inputs. Also, the input ranges corresponding to the individual input types are scaled for DC current, DC voltage, potentiometer and resistor inputs. (e.g. If "-10 - +10 V DC" is specified for the input type and "0" is entered for both the zero base and full base, the scaling calculation is conducted by regarding the zero base to be "-10.0" and full base "10.0.")



*1. Factory settings for the zero base and full base are "0."
*2. If the zero base and full base parameters having the same value are downloaded and then uploaded, "0" is shown for the zero base and full base.
*3. If the zero base and full base parameters having the minimum and maximum values in the input range respectively are downloaded and then uploaded, "0" is shown for the zero base and full base. (e.g. When "-10 - +10 V DC" is specified for the input type, if the zero base and full base parameters having the values "-10.0" and "+10.0" respectively are downloaded and then uploaded, "0" is shown for the zero base and full base.

PARAMETER	DESCRIPTION	INPUT TYPE	AVAILABLE RANGE
Zero Base / Full Base	0% setting value / 100% setting value	-20 - +20 mA	-32.000 to +32.000
		-10 - +10 V	
		POT	-320.00 to +320.00
		-1000 - +1000 mV	-3200.0 to +3200.0
		RTD, TC (degC, K)	
		RTD, TC (degF)	-32000 to +32000
		0 - 4000 Ω	
Fine zero adjustment	Zero (bias) adjustment value	Independent from the input type	-320.00 to +320.00
Fine gain adjustment	Gain (span) adjustment value		-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%		-32000 to +32000
Scaled range Span	Scaled value 100%		-32000 to +32000

NOTE
Calculation is carried out in the order of the zero base/full base, fine gain, fine zero, and scaled range Zero/Span.

- **Calculation example of zero base/full base**
  Convert engineering unit value to 0 – 100% value
  Zero base = -100.0 (°C), full Base = 100.0 (°C)
  With the measured value 50.0 (°C),

$$(\underbrace{50.0}_{\text{Measured value (°C)}} - (\overbrace{-100.0}^{\text{Zero base (°C)}})) / (\overbrace{100.0}^{\text{Full base (°C)}} - (\underbrace{-100.0}_{\text{Zero base (°C)}})) \times \underbrace{10000}_{\text{Fixed value}} = \underbrace{7500}_{\text{0 - 100\% conversion value}} (75.00\%)$$

- **Calculation example of fine zero/gain adjustments**
  Used for fine adjustment such as calibration.
  Fine zero adjustment = 100.00 (%), fine gain adjustment = 2.0000
  With the raw value 50.00% (with the 0 – 100% conversion value of the zero base/full base 50.00% for temperature),

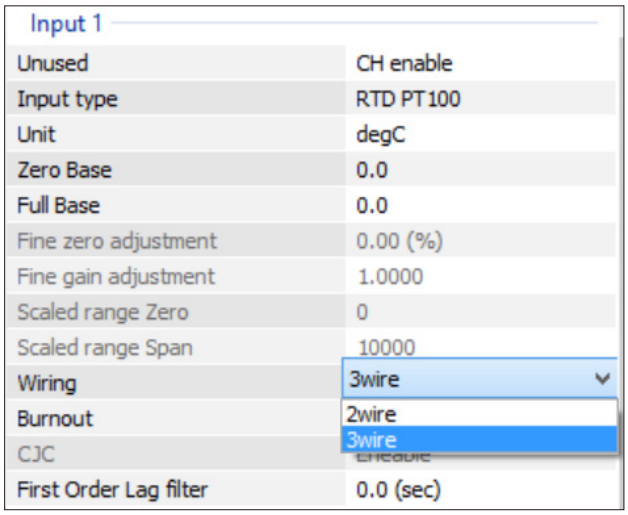
$$50.00\ (\%) \times \underbrace{2.0000}_{\text{Fine gain adj.}} + \underbrace{100.00}_{\text{Fine zero adj.}}\ (\%) = \underbrace{200.00}_{\text{Calculated input value}}\ (\%)$$

- **Calculation example of scaled range Zero / Span**
  Scaled range Zero = -10000, scaled range Span = 10000
  With the measured value 50.00% (5000) after calculating the fine adjustments with the scaled range Zero 0 and Span 10000,

$$(\overbrace{10000}^{\text{Scaled range Span}} - (\underbrace{-10000}_{\text{Scaled range Zero}})) / \underbrace{10000}_{\text{(Scaled range Span - Scaled range Zero) in measuring 50.00\%}} \times \overbrace{5000}^{\text{50.00 (\%)}} + \overbrace{(-10000)}^{\text{Scaled range Zero}} = \underbrace{0}_{\text{Calculated scaled value}}\ (0.00\%)$$

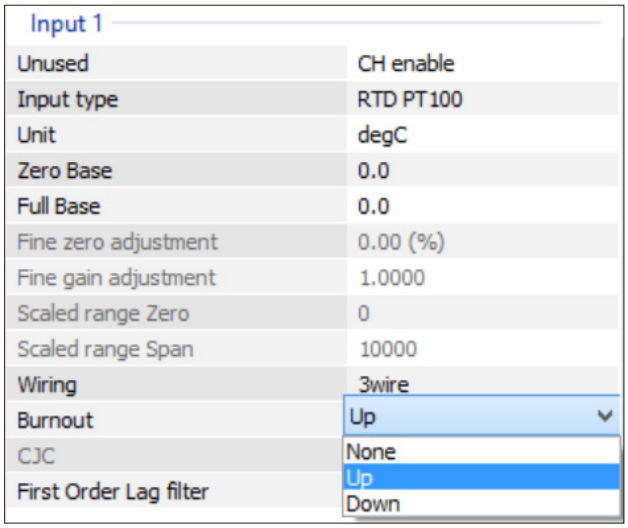
4.5.5 SETTING WIRING (RTD CONNECTION)

Choose “2wire” or “3wire” in accordance with the number of connection wires of the RTD or resistor.
This parameter is available only for the input types of RTD and resistor.



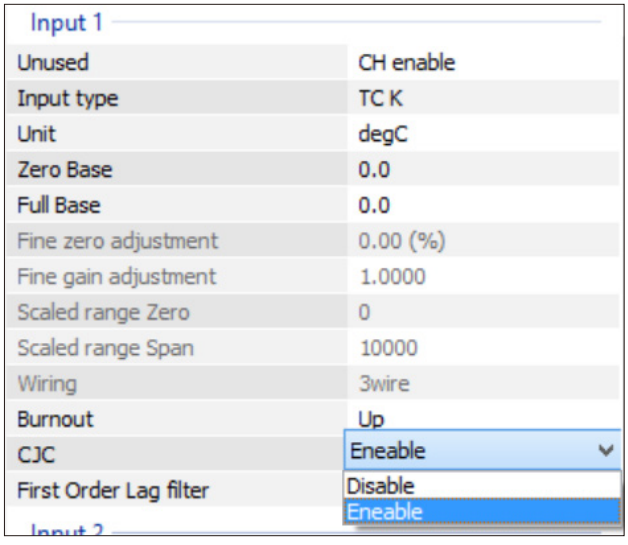
4.5.6 SETTING BURNOUT

Specify the direction for the burnout.
This parameter is available only for the input types of thermocouple, RTD, potentiometer, and resistor.



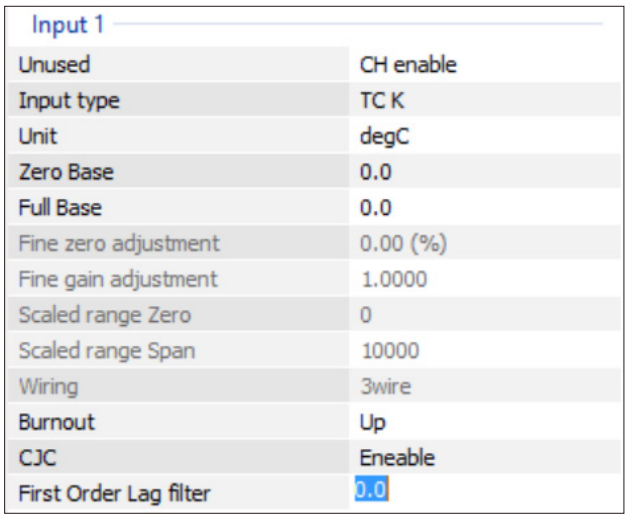
4.5.7 SETTING CJC

Specify whether or not to enable cold junction compensation when using a thermocouple.
This parameter is available only for the input types of thermocouple.



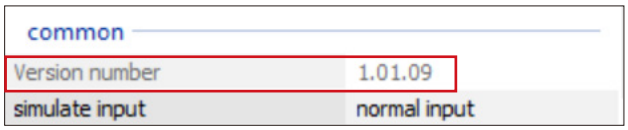
4.5.8 SETTING FIRST ORDER LAG FILTER

Specify the time constant for the first order lag filtering.
Filtering is not performed when “0.0” is entered for this parameter.
Available range: 0.5 – 60.0 (seconds)



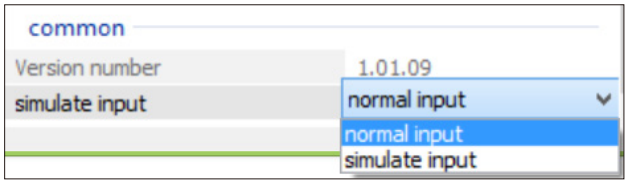
4.5.9 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
“–” is shown when not uploaded.



4.5.10 SETTING SIMULATE INPUT

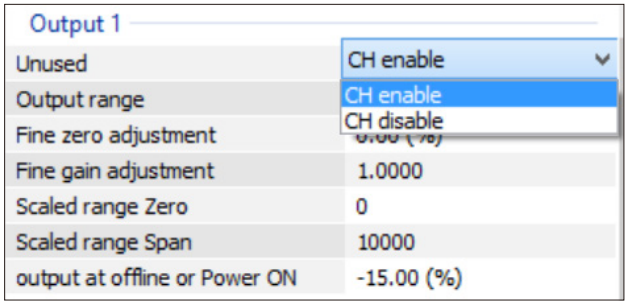
Choose normal input or simulate input.
The setting is also available on the Monitor screen.
Specify the simulate input value between -32000 and +32000. If entering a value under -32000, -32000 is set.
If above +32000, +32000 is set.



4.6 R30YV4 - DC VOLTAGE OUTPUT MODULE, 4 POINTS

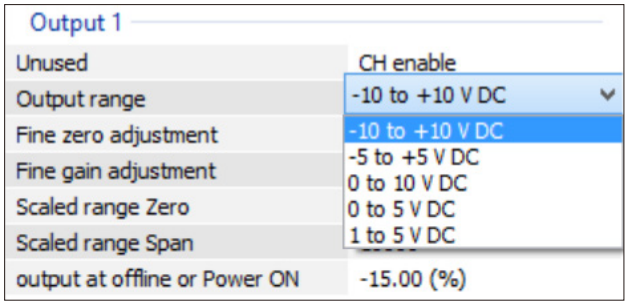
4.6.1 SETTING UNUSED OUTPUT

Enable or disable each output.
Disable the unused outputs.



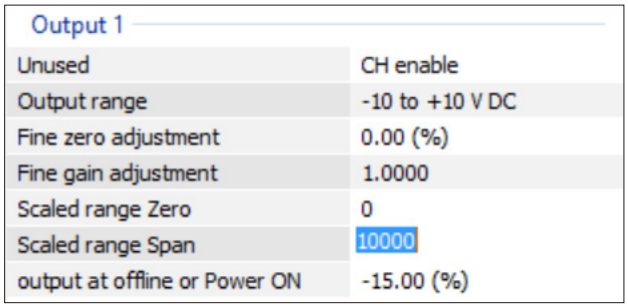
4.6.2 SETTING OUTPUT RANGE

Choose the output range for the enabled outputs.



4.6.3 SETTING FINE ZERO / GAIN ADJUSTMENTS AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure below shows an example of setting the scaled range Span.



PARAMETER	DESCRIPTION	AVAILABLE RANGE
Fine zero adjustment	Zero adjustment value	-320.00 to +320.00
Fine gain adjustment	Gain adjustment value	-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%	-32000 to +32000
Scaled range Span	Scaled value 100%	-32000 to +32000

NOTE

Calculation is carried out in the order of the scaled range Zero/Span, fine zero, and fine gain.

- **Calculation example of scaled range Zero / Span**

  Scaled range Zero = -10000, scaled range Span = 10000

  With the output setting value 50% (5000),

$$(5000 - (-10000)) \times 10000 / (10000 - (-10000)) = 7500\ (75.00\%)$$

Scaled range Zero (-10000) — Scaled range Zero (-10000)

5000: Output setting value

10000: Scaled range Span

7500 (75.00%): Calculated scaled value (value converted to 0 - 10000 scale)

- **Calculation of fine zero/gain adjustments**

  Used for fine adjustment such as calibration.

  Fine zero adjustment = 5.00 (%), fine gain adjustment = 1.0100

  With the output setting value (value converted to 0 - 10000 scale) 75.00%,

$$75.00\ (\%) \times 1.0100 + 5.00\ (\%) = 80.75\ (\%)$$

1.0100: Fine gain adj. — 5.00: Fine zero adj. — 80.75 (%): Calculated output setting value

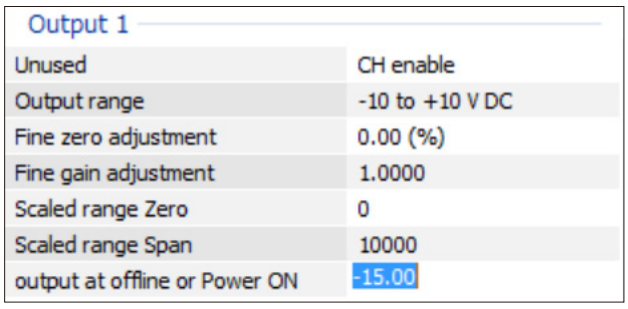
* The calculation of scaled range zero/span and fine zero/gain adjustment are calculated by signed 16 bit value. When the process or result of calculation overflows, it is calculated by replacing with upper limit or lower limit of signed 16 bit value. Therefore result may not be the value calculated by above mentioned calculation formula.

4.6.4 SETTING OUTPUT AT OFFLINE OR POWER ON

Specify output for the period from power on until output value is set.

Enter a percent data value.

Available range: -15.00 to +115.00



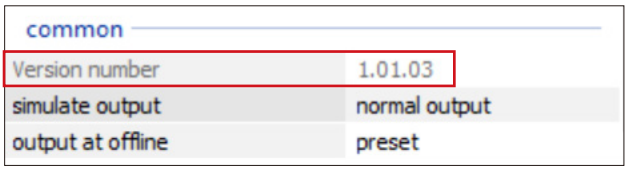
NOTE

Enter a percent data value even if the scaled ranges are specified.

If fine adjustments are specified, the value after adjustments is output.

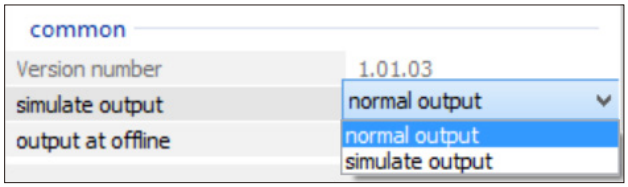
4.6.5 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



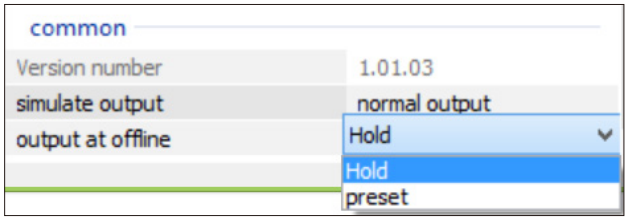
4.6.6 SETTING SIMULATE OUTPUT

Choose normal output or simulate output.
The setting is also available on the Monitor screen.
Specify the simulate output value between -32000 and +32000. If entering a value under -32000, -32000 is set. If above +32000, +32000 is set.



4.6.7 SETTING OUTPUT AT OFFLINE

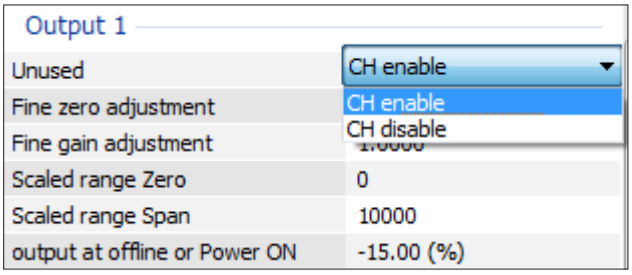
Specify the output value to be used when there is a problem in communication with the host or in R30's internal communication.
When "Hold" is specified, the last value used during normal communication is output. When "preset" is specified, the value entered in "4.6.4 SETTING OUTPUT AT OFFLINE OR POWER ON" is output.
Note that the fine zero/gain adjustments are valid.



4.7 R30YS4 - DC CURRENT OUTPUT MODULE, 4 POINTS

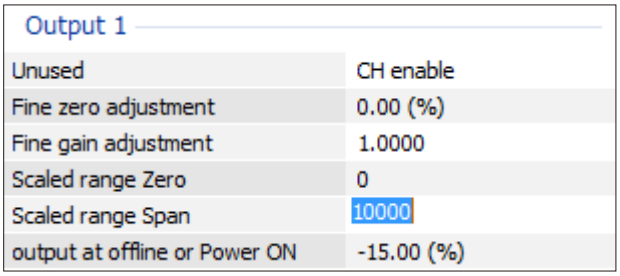
4.7.1 SETTING UNUSED OUTPUT

Enable or disable each output.
Disable the unused outputs.



4.7.2 SETTING FINE ZERO / GAIN ADJUSTMENTS AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure in right shows an example of setting the scaled range Span.



PARAMETER	DESCRIPTION	AVAILABLE RANGE
Fine zero adjustment	Zero adjustment value	-320.00 to +320.00
Fine gain adjustment	Gain adjustment value	-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%	-32000 to +32000
Scaled range Span	Scaled value 100%	-32000 to +32000

NOTE
Calculation is carried out in the order of the scaled range Zero/Span, fine zero, and fine gain.

- **Calculation example of scaled range Zero / Span**

Scaled range Zero = -10000, scaled range Span = 10000
With the output setting value 50% (5000),

$$(5000 - (-10000)) \times 10000 / (10000 - (-10000)) = 7500\ (75.00\%)$$

5000: Output setting value; -10000: Scaled range Zero; 10000: Scaled range Span; -10000: Scaled range Zero; 7500 (75.00%): Calculated scaled value (value converted to 0 - 10000 scale)

- **Calculation of fine zero/gain adjustments**

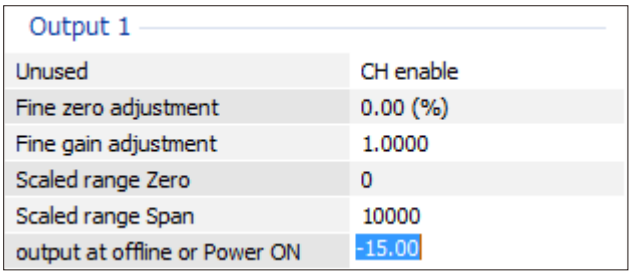
Used for fine adjustment such as calibration.
Fine zero adjustment = 5.00 (%), fine gain adjustment = 1.0100
With the output setting value (value converted to 0 - 10000 scale) 75.00%,

$$75.00\ (\%) \times 1.0100 + 5.00\ (\%) = 80.75\ (\%)$$

1.0100: Fine gain adj.; 5.00: Fine zero adj.; 80.75 (%): Calculated output setting value

4.7.3 SETTING OUTPUT AT OFFLINE OR POWER ON

Specify output for the period from power on until output value is set.
Enter a percent data value.
Available range: -15.00 to +115.00

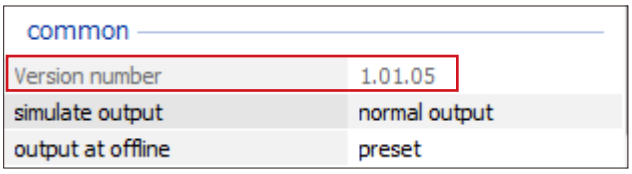


NOTE

Enter a percent data value even if the scaled ranges are specified.
If fine adjustments are specified, the value after adjustments is output.

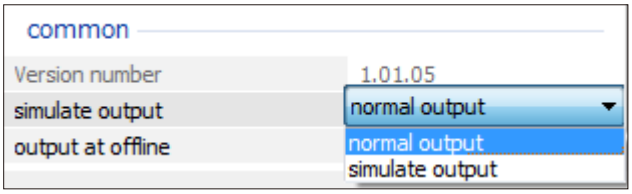
4.7.4 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



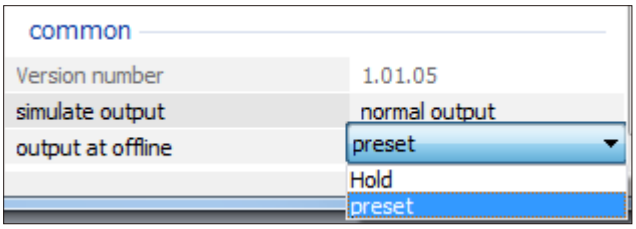
4.7.5 SETTING SIMULATE OUTPUT

Choose normal output or simulate output.
The setting is also available on the Monitor screen.
Specify the simulate output value between -32000 and +32000. If entering a value under -32000, -32000 is set. If above +32000, +32000 is set.



4.7.6 SETTING OUTPUT AT OFFLINE

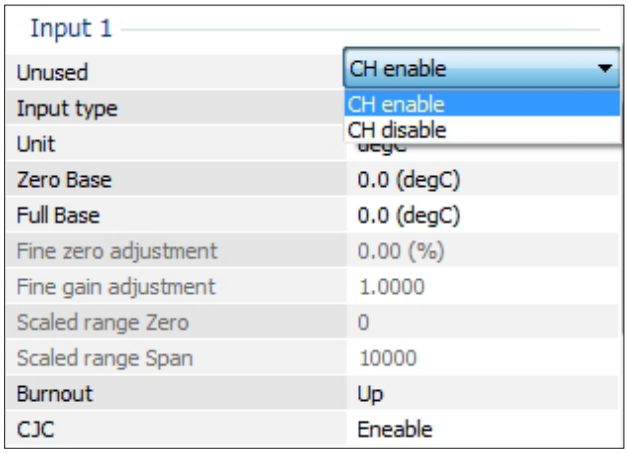
Specify the output value to be used when there is a problem in communication with the host or in R30's internal communication.
When "Hold" is specified, the last value used during normal communication is output. When "preset" is specified, the value entered in "4.7.3 SETTING OUTPUT AT OFFLINE OR POWER ON" is output.
Note that the fine zero/gain adjustments are valid.



4.8 R30TS4 - THERMOCOUPLE INPUT MODULE, 4 points

4.8.1 SETTING UNUSED INPUT

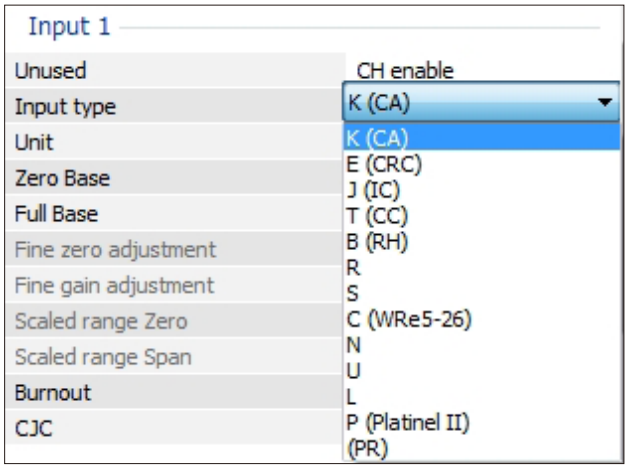
Enable or disable each input.
Disable the unused inputs.



4.8.2 SETTING INPUT SENSOR TYPE

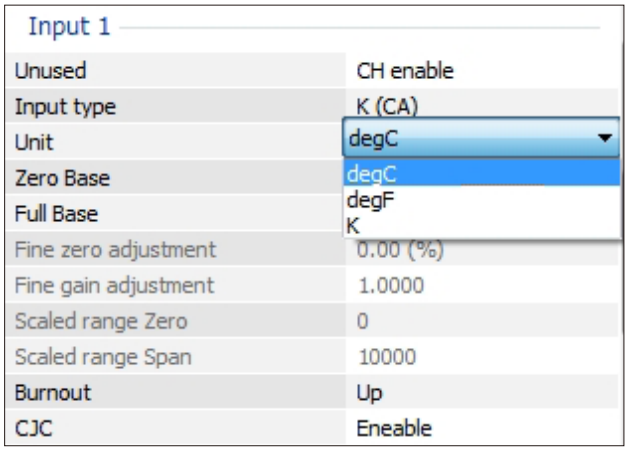
Choose the input sensor type for the enabled inputs.
The sensors shown below are available.

- K (CA)
- E (CRC)
- J (IC)
- T (CC)
- B (RH)
- R
- S
- C (WRe 5-26)
- N
- U
- L
- P (Platinel II)
- (PR)



4.8.3 SETTING TEMPERATURE UNIT

Choose the temperature unit from degC (Centigrade), degF (Fahrenheit) and K (absolute temperature).

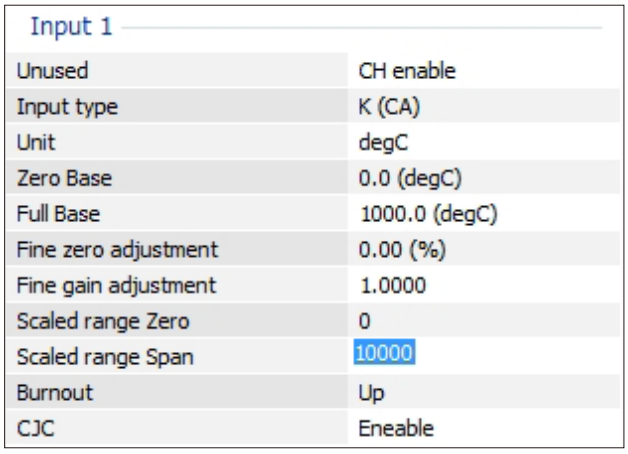


4.8.4 SETTING ZERO / FULL BASES, FINE ZERO / GAIN ADJUSTMENTS, AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure on right shows an example for setting the scaled range Span.

If the same value is entered for the zero base and full base, the scaled values are not calculated but the engineering unit temperature values are returned for thermocouple inputs.

*1. Factory settings for the zero base and full base are “0.”
*2. If the zero base and full base parameters are not set (zero base and full base both are “0”), fine zero/gain adjustment is not available. Fine adjustment processing is invalid.



PARAMETER	DESCRIPTION	TEMPERATURE UNIT	AVAILABLE RANGE
Zero Base / Full Base	0% setting value / 100%setting value	degC, K	-3200.0 to +3200.0
		degF	-32000 to +32000
Fine zero adjustment	Zero (bias) adjustment value	Independent from the input type	-320.00 to +320.00
Fine gain adjustment	Gain (span) adjustment value		-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%		-32000 to +32000
Scaled range Span	Scaled value 100%		-32000 to +32000

NOTE

Calculation is carried out in the order of the zero base/full base, fine gain, fine zero, and scaled range Zero/Span.

CAUTION FOR ZERO BASE/FULL BASE SETTING

- **Example of zero base/full base, scaled range zero and scaled range span**

  When scaling 0 – 100°C to 0 – 10000, set as follows.
  Zero base = 0 (°C), Full base = 100 (°C)
  Scaled range zero = 0, Scaled range span = 10000

- **Calculation example of zero base/full base**

  Convert engineering unit value to 0 – 100% value
  Zero base = 0 (°C), full Base = 100.0 (°C)
  With the measured value 50.0 (°C),

Zero base (°C) Zero base (°C)

$$(\underbrace{50.0}_{\text{Measured value (°C)}} - (\underbrace{0}_{\text{Zero base (°C)}})) / (\underbrace{100.0}_{\text{Full base (°C)}} - (\underbrace{0}_{\text{Zero base (°C)}})) \times \underbrace{10000}_{\text{Fixed value}} = \underbrace{5000}_{\text{0 - 100\% conversion value}} (50.00\%)$$

- **Fine adjustment calculation**

  % value, which is converted by zero base/full base, is compensated by following formula.
  Value after compensation = % value x gain adjustment value + zero adjustment value
  Refer to "7.1 SETTING EXAMPLE OF FINE ADJUSTMENT" for setting example.

- **Calculation example of scaled range Zero / Span**

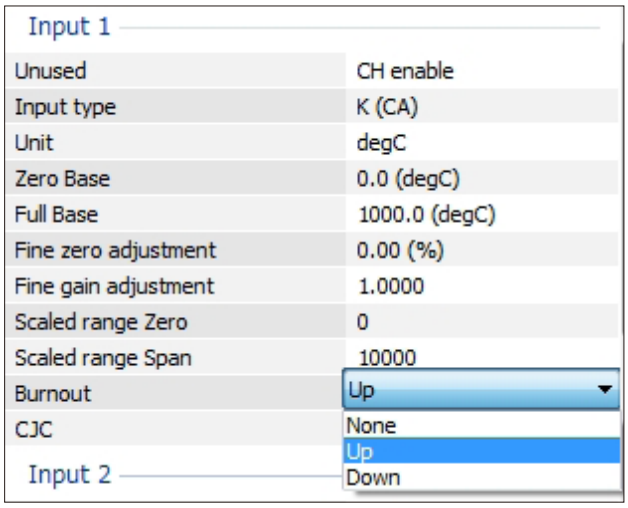
  Scaled range Zero = -10000, scaled range Span = 10000
  With the measured value 50.00% (5000) after calculating the fine adjustments with the scaled range Zero 0 and Span 10000,

Scaled range Zero 50.00 (%) Scaled range Zero Calculated scaled value

$$(\underbrace{10000}_{\text{Scaled range Span}} - (\underbrace{-10000}_{\text{Scaled range Zero}})) / \underbrace{10000}_{\text{(Scaled range Span - Scaled range Zero) in measuring 50.00\%}} - \underbrace{5000}_{50.00\ (\%)} + (\underbrace{-10000}_{\text{Scaled range Zero}}) = \underbrace{0}_{\text{Calculated scaled value}} (0.00\%)$$

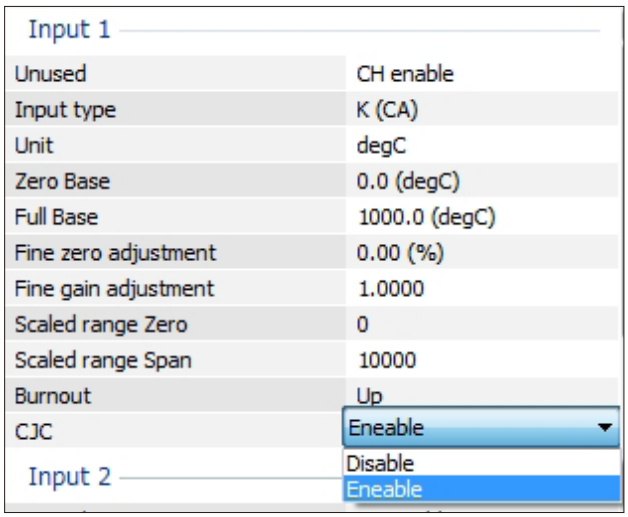
4.8.5 SETTING BURNOUT

Specify the direction for the burnout.



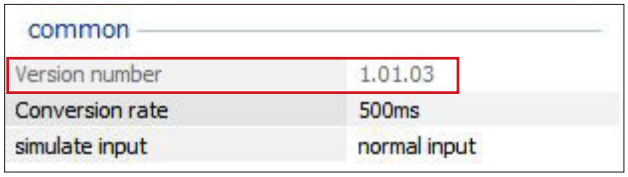
4.8.6 SETTING CJC

Specify whether or not to enable cold junction compensation.



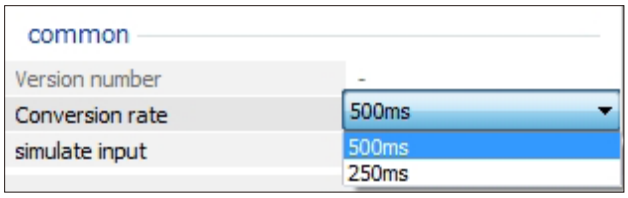
4.8.7 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



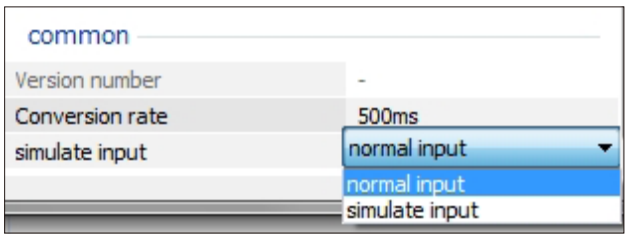
4.8.8 SETTING CONVERSION RATE

Choose one of the input signal conversion rates for R30TS4.
Setting per input is not available. Set the rate for all inputs.



4.8.9 SETTING SIMULATE INPUT

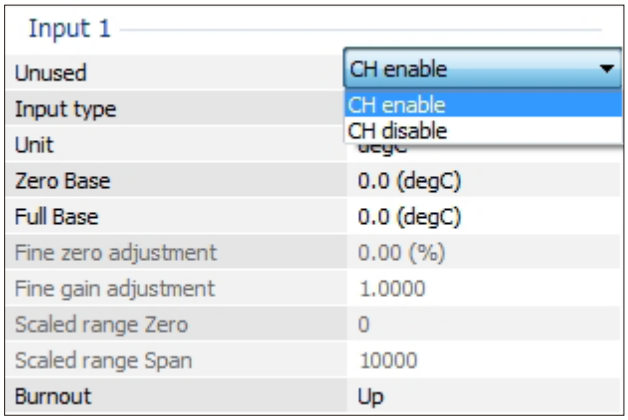
Choose normal input or simulate input.
The setting is also available on the Monitor screen.
Specify the simulate input value between -32768 and +32767. If entering a value under -32768, -32768 is set. If above +32767, +32767 is set.



4.9 R30RS4 - RTD INPUT MODULE, 4 points

4.9.1 SETTING UNUSED INPUT

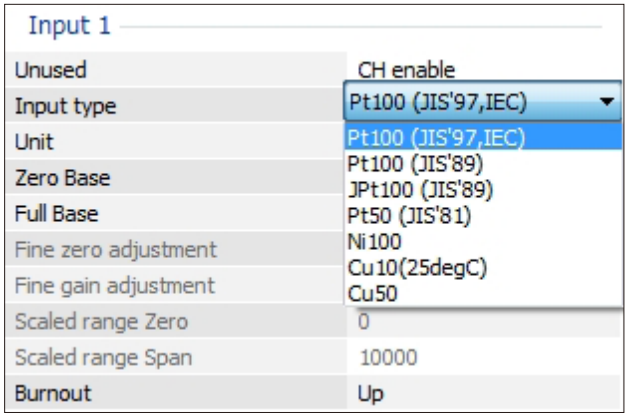
Enable or disable each input.
Disable the unused inputs.



4.9.2 SETTING INPUT SENSOR TYPE

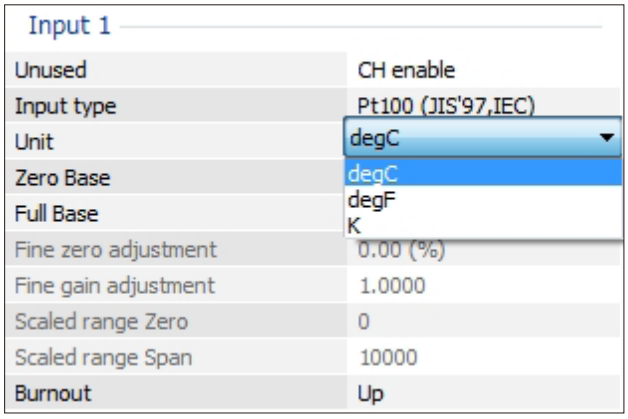
Choose the input sensor type for the enabled inputs.
The sensors shown below are available.

- Pt100 (JIS '97, IEC)
- Pt100 (JIS '89)
- JPt100 (JIS '89)
- Pt50 (JIS '81)
- Ni100
- Cu10 (25°C)
- Cu50



4.9.3 SETTING TEMPERATURE UNIT

Choose the temperature unit from degC (Centigrade), degF (Fahrenheit) and K (absolute temperature).

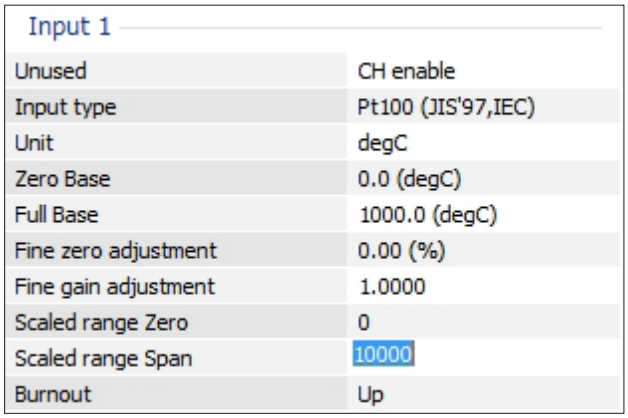


4.9.4 SETTING ZERO / FULL BASES, FINE ZERO / GAIN ADJUSTMENTS, AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure on right shows an example for setting the scaled range Span.

If the same value is entered for the zero base and full base, the scaled values are not calculated but the engineering unit temperature values are returned for RTD inputs.

*1. Factory settings for the zero base and full base are “0.”
*2. If the zero base and full base parameters are not set (zero base and full base both are “0”), fine zero/gain adjustment is not available. Fine adjustment processing is invalid.



PARAMETER	DESCRIPTION	TEMPERATURE UNIT	AVAILABLE RANGE
Zero Base / Full Base	0% setting value / 100%setting value	degC, K	-3200.0 to +3200.0
		degF	-32000 to +32000
Fine zero adjustment	Zero (bias) adjustment value	Independent from the input type	-320.00 to +320.00
Fine gain adjustment	Gain (span) adjustment value		-3.2000 to +3.2000
Scaled range Zero Scaled range Span	Scaled value 0% Scaled value 100%		-32000 to +32000

NOTE

Calculation is carried out in the order of the zero base/full base, fine gain, fine zero, and scaled range Zero/Span.

CAUTION FOR ZERO BASE/FULL BASE SETTING

- **Example of zero base/full base, scaled range zero and scaled range span**

  When scaling 0 – 100°C to 0 – 10000, set as follows.
  Zero base = 0 (°C), Full base = 100 (°C)
  Scaled range zero = 0, Scaled range span = 10000

- **Calculation example of zero base/full base**

  Convert engineering unit value to 0 – 100% value
  Zero base = 0 (°C), full Base = 100.0 (°C)
  With the measured value 50.0 (°C),

$$\underbrace{(50.0}_{\text{Measured value (°C)}} - \overbrace{(0)}^{\text{Zero base (°C)}}) \,/\, \underbrace{(100.0}_{\text{Full base (°C)}} - \overbrace{(0)}^{\text{Zero base (°C)}}) \times \underbrace{10000}_{\text{Fixed value}} = \underbrace{5000}_{\substack{\text{0 - 100\%} \\ \text{conversion value}}} (50.00\%)$$

• **Fine adjustment calculation**

% value, which is converted by zero base/full base, is compensated by following formula.

Value after compensation = % value x gain adjustment value + zero adjustment value

Refer to "7.1 SETTING EXAMPLE OF FINE ADJUSTMENT" for setting example.

• **Calculation example of scaled range Zero / Span**

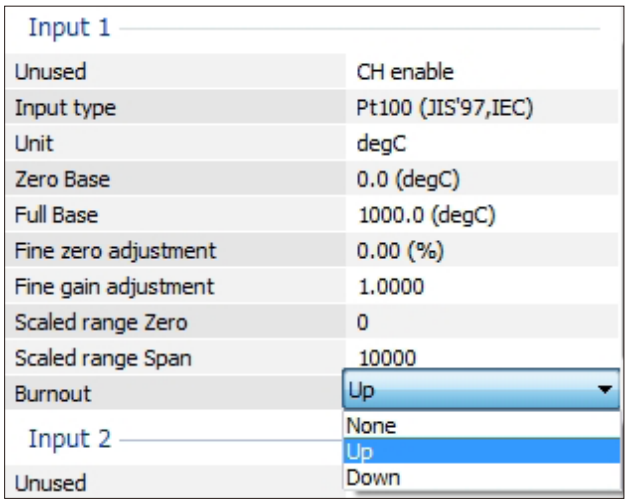
Scaled range Zero = -10000, scaled range Span = 10000

With the measured value 50.00% (5000) after calculating the fine adjustments with the scaled range Zero 0 and Span 10000,

$$\underbrace{(10000}_{\text{Scaled range Span}} - \overbrace{(-10000)}^{\text{Scaled range Zero}}) \,/\, \underbrace{10000}_{\substack{\text{(Scaled range Span - Scaled range Zero)} \\ \text{in measuring 50.00\%}}} - \overbrace{5000}^{50.00\ (\%)} + \overbrace{(-10000)}^{\text{Scaled range Zero}} = \overbrace{0}^{\text{Calculated scaled value}}\ (0.00\%)$$

4.9.5 SETTING BURNOUT

Specify the direction for the burnout.

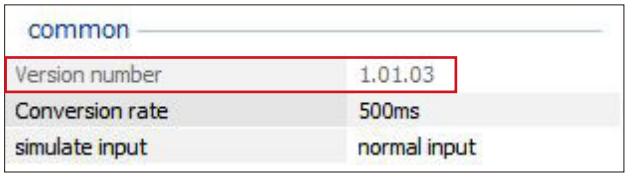


4.9.6 CONFIRMING VERSION NO.

The firmware version is shown.

This is not editable.

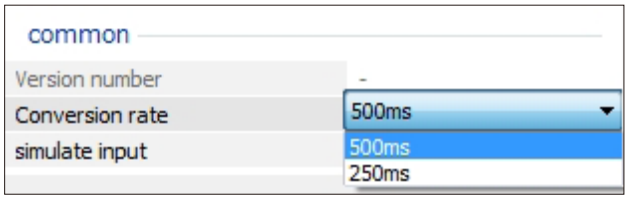
"–" is shown when not uploaded.



4.9.7 SETTING CONVERSION RATE

Choose one of the input signal conversion rates for R30RS4.

Setting per input is not available. Set the rate for all inputs.

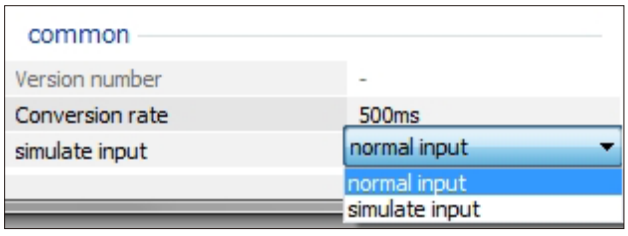


4.9.8 SETTING SIMULATE INPUT

Choose normal input or simulate input.

The setting is also available on the Monitor screen.

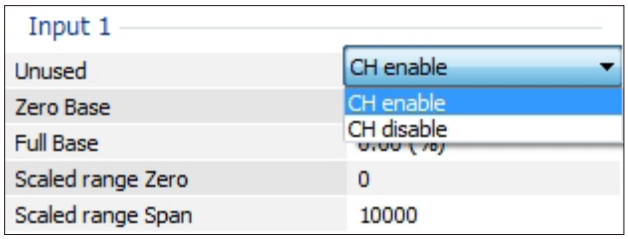
Specify the simulate input value between -32768 and +32767. If entering a value under -32768, -32768 is set. If above +32767, +32767 is set.



4.10 R30MS4 - POTENTIOMETER INPUT MODULE, 4 points

4.10.1 SETTING UNUSED INPUT

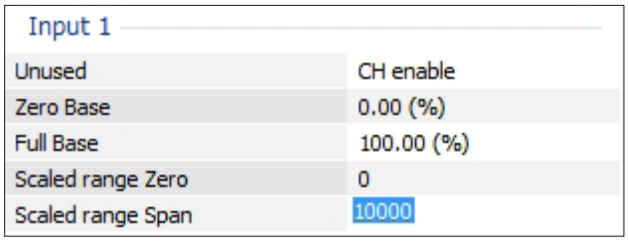
Enable or disable each input.
Disable the unused inputs.



4.10.2 SETTING ZERO / FULL BASES AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure on right shows an example for setting the scaled range Span.

If the same value is entered for the zero base and full base, the scaled values are not calculated.



*1. Factory settings for the zero base and full base are “0.00” and “100.00”.
*2. If the zero base and full base parameters are not set (zero base and full base both are same value), scaling is calculated as zero base and full base are “0.00” and “100.00”.

PARAMETER	DESCRIPTION	AVAILABLE RANGE
Zero Base / Full Base	0% setting value / 100% setting value	-320.00 to +320.00
Scaled range Zero Scaled range Span	Scaled value 0% Scaled value 100%	-32000 to +32000

NOTE
Calculation is carried out in the order of the zero base/full base, scaled range Zero/Span.

CAUTION FOR ZERO BASE/FULL BASE SETTING

- **Example of zero base/full base, scaled range zero and scaled range span**

  For R30MS4, fine adjustment is performed by setting of zero base/full base, scaled range zero and scaled range span.
  Set zero base to the no scaled value of 0% input (0% position of potentiometer), full base to the no scaled value of 100% input (100% position of potentiometer). The no scaled value is indicated on the monitor screen (Refer to "4.10.6 MONITOR SCREEN AND FINE ADJUSTMENT"). Set scaled range zero to the scale value of 0% input (0% position of potentiometer), scaled range span to the scale value of 100% input (100% position of potentiometer).
  When no scaled value: 0.20 at 0% input, no scaled value: 99.85 at 100% input, setting as follow to scale the value zero/span adjusted to 0 to 10000.

  Zero base: 0.20, Full base: 99.85
  Scaled range zero: 0, Scaled range span: 10000

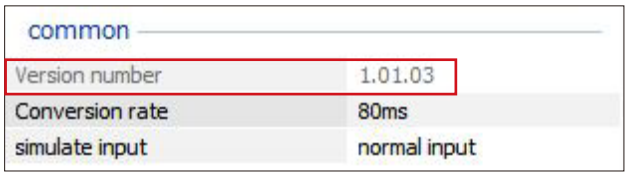
- **Calculation example of scaled range Zero / Span**

  Scaled range Zero = -10000, scaled range Span = 10000
  With the measured value 50.00% (5000) with the scaled range Zero 0 and Span 10000,

$$\underbrace{(10000}_{\text{Scaled range Span}} - \overbrace{(-10000)}^{\text{Scaled range Zero}}) \Big/ \underbrace{10000}_{\substack{\text{(Scaled range Span - Scaled range Zero)} \\ \text{in measuring 50.00\%}}} - \overbrace{5000}^{\text{50.00 (\%)}} + \overbrace{(-10000)}^{\text{Scaled range Zero}} = \overbrace{0}^{\text{Calculated scaled value}} \ (0.00\%)$$

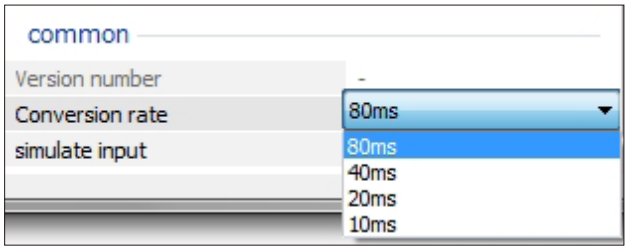
4.10.3 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



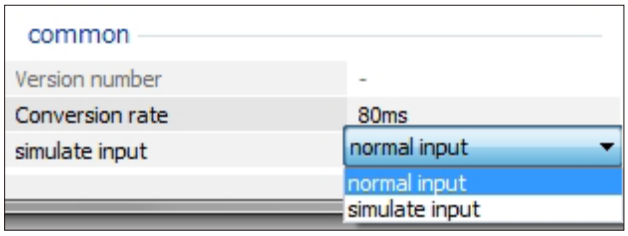
4.10.4 SETTING CONVERSION RATE

Choose one of the input signal conversion rates for R30MS4.
The conversion accuracy depends on the rate. Refer to the data sheet of R30MS4 for the detailed information.
Setting per input is not available. Set the rate for all inputs.

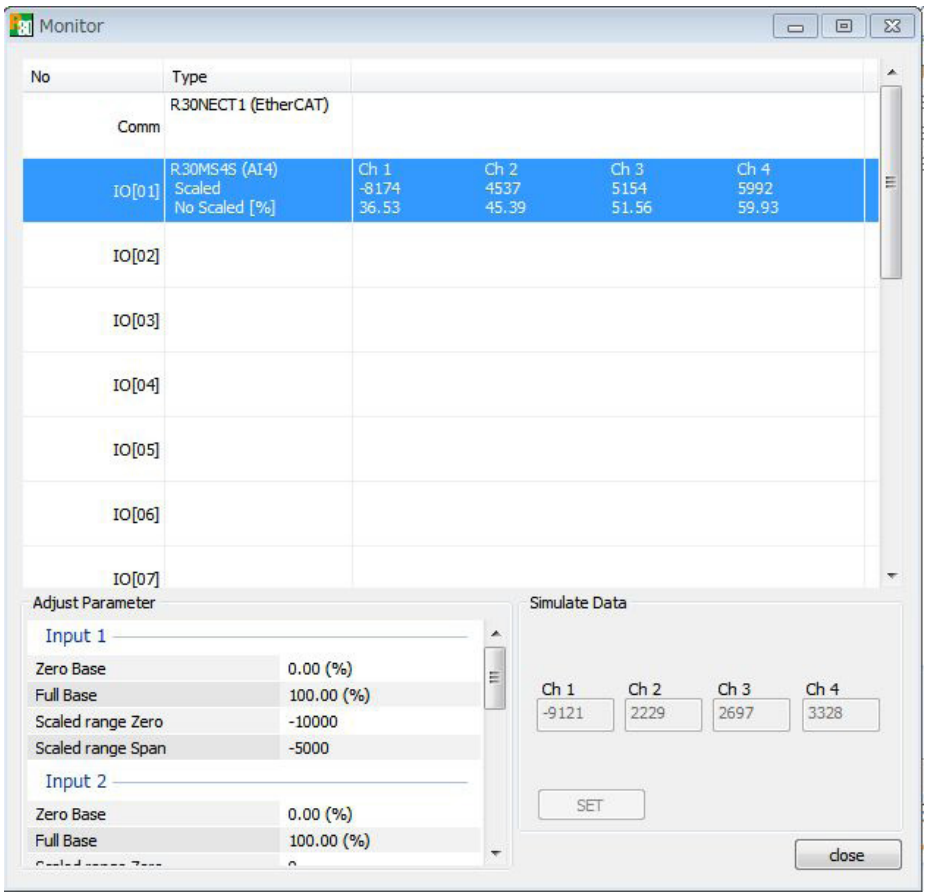


4.10.5 SETTING SIMULATE INPUT

Choose normal input or simulate input.
The setting is also available on the Monitor screen.
Specify the simulate input value between -32768 and +32767. If entering a value under -32768, -32768 is set. If above +32767, +32767 is set.



4.10.6 MONITOR SCREEN AND FINE ADJUSTMENT

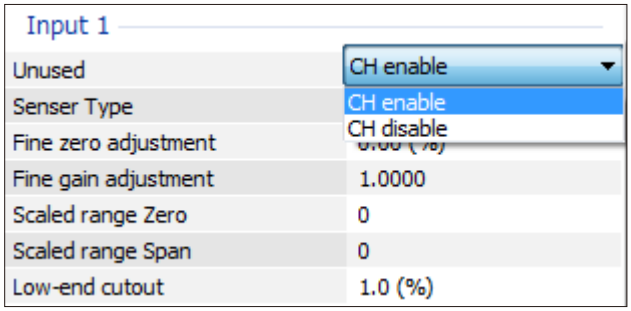


- For monitor screen of R30MS4, also no scaled value is indicated. (0 to 100% data before scaling). Zero/Span adjustment is performed with use of no scaled value. (Refer to "4.10.2 SETTING ZERO / FULL BASES AND SCALED RANGE ZERO / SPAN".)
- Zero/Span adjustment is performed with the settings of zero/full base, scaled range zero and scaled range span in the column "Adjust Parameter".

4.11 R30CT4E - AC CURRENT INPUT MODULE, 4 points

4.11.1 SETTING UNUSED INPUT

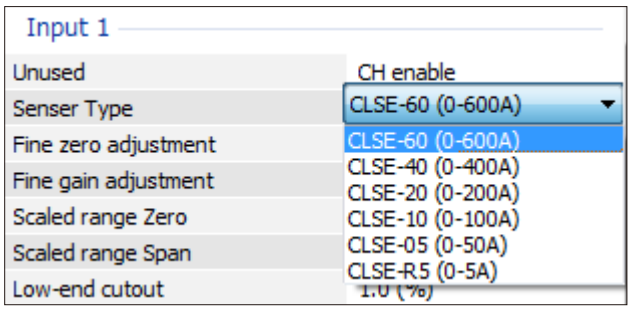
Enable or disable each input.
Disable the unused inputs.



4.11.2 SETTING INPUT SENSOR TYPE

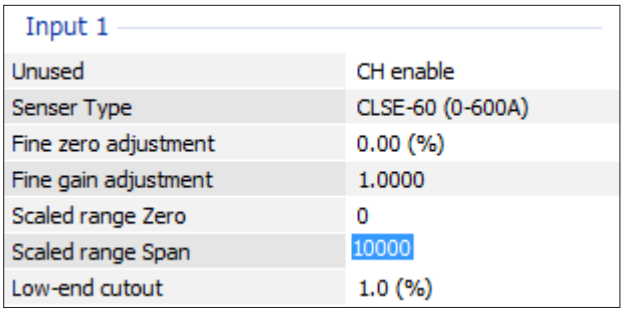
Choose the input sensor type for the enabled inputs.
The sensors shown below are available.

- CLSE-60: 0 – 600 A AC
- CLSE-40: 0 – 400 A AC
- CLSE-20: 0 – 200 A AC
- CLSE-10: 0 – 100 A AC
- CLSE-05: 0 – 50 A AC
- CLSE-R5: 0 – 5 A AC



4.11.3 FINE ZERO / GAIN ADJUSTMENTS, AND SCALED RANGE ZERO / SPAN

Specify the setting values. The figure on right shows an example for setting the scaled range Span.
If the same value is entered for the scaled range zero and span, the scaled values are not calculated but the engineering unit values are returned.



PARAMETER	DESCRIPTION	AVAILABLE RANGE
Fine zero adjustment	0% setting value	-320.00 to +320.00
Fine gain adjustment	100% setting value	-3.2000 to +3.2000
Scaled range Zero	Scaled value 0%	0 to 64000
Scaled range Span	Scaled value 100%	

NOTE
Calculation is carried out in the order of the fine gain, fine zero, and scaled range Zero/Span.

ENGINEERING UNIT VALUE DISPLAY RANGE

SENSOR TYPE	INPUT RANGE	ENGINEERING UNIT VALUE DISPLAY RANGE
CLSE-60	0 – 600 A	0 – 64000
CLSE-40	0 – 400 A	0 – 46000
CLSE-20	0 – 200 A	0 – 23000
CLSE-10	0 – 100 A	0 – 11500
CLSE-05	0 – 50 A	0 – 5750
CLSE-R5	0 – 5 A	0 – 5750

*2. Sometimes display range may be narrower than shown above, due to processing of fine adjustment.

CAUTION FOR SCALED RANGE ZERO/SPAN SETTING

If the same value is entered for the scaled range zero/span, the scaled range zero/span are set so that 'engineering unit value x 100' (For CLSE-R5, engineering unit value x 1000).
E.g. For sensor CLSE-60, scaled range zero is set to '0', scaled range span is set to '60000'.

- **Example of scaled range zero and scaled range span**
  When scaling 0 – 100% to 0 – 30000, set as follows.
  Scaled range zero = 0, Scaled range span = 30000
  For sensor CLSE-60, measurement value for 600 A equals '30000'.

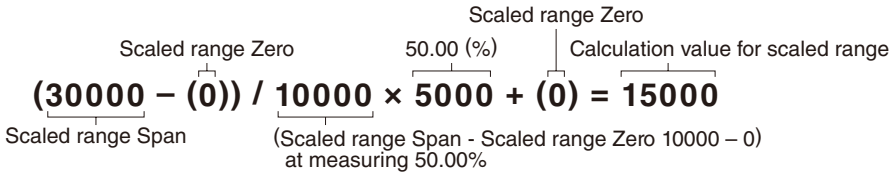
- **Fine adjustment calculation**
  For fine adjustment, % value is compensated by following formula.
  Value after compensation = % value x gain adjustment value + zero adjustment value
  (Zero adjustment value is % value)

- **Setting example of fine adjustment**
  For R30CT4E, as disable dropout is not able, it cannot measure 0% input value. In this example, adjustment is performed with 5% and 100% input value. As fine adjustment is done with % value, scaled range zero is set to '0', scaled range span is set to '10000'. Dropout is set to not greater than 3%. (Fine zero is set to '0', fine gain is set to '1.0')
  Assuming that monitor value when equivalent to 5% input is X_5, monitor value when equivalent to 100% input is X_{100}. Monitor value X_0 when equivalent to 0% input is calculated by following formula.

$$X_0 = (20 \times X_5 - X_{100}) / 19$$

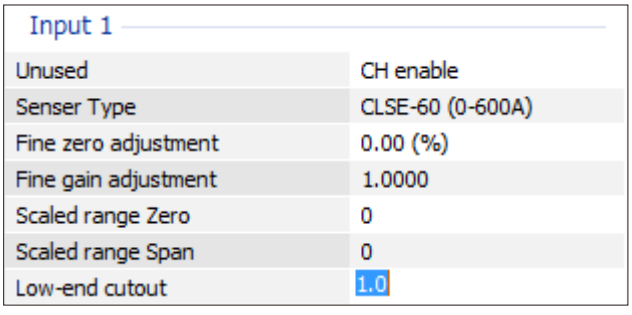
  By using X_0 and X_{100}, fine adjustment setting value is obtained according to "7.1 SETTING EXAMPLE OF FINE ADJUSTMENT". To use with engineering unit value, after fine zero and fine gain are set, set scaled range span to '0'.

- **Calculation example of scaled range**
  Scaled range zero = 0 and Scaled range span = 30000 are set. When measurement value after fine adjustment with Scaled range zero = 0 and Scaled range span = 10000 is 50.00% (5000), scaled range value is '0'. (For using CLSE-60, measurement value is '15000' at 300 A.)



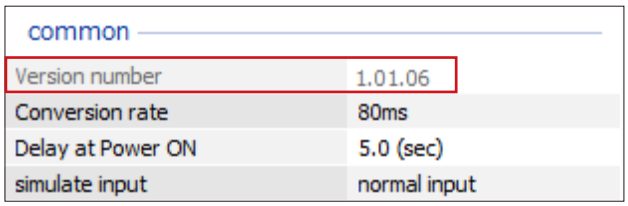
4.11.4 SETTING Low-end CUTOUT

Specify the value for the Low-end cutout. Setting range is 0.5 to 50.0%, factory setting is 1.0%. The value below the setting value for Low-end cutout is processed as 0%. The Low-end cutout is performed on the value after fine adjustment process.



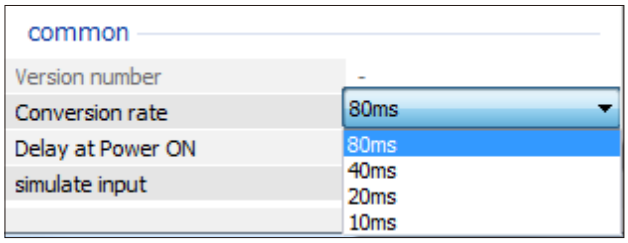
4.11.5 CONFIRMING VERSION NO.

The firmware version is shown.
This is not editable.
"–" is shown when not uploaded



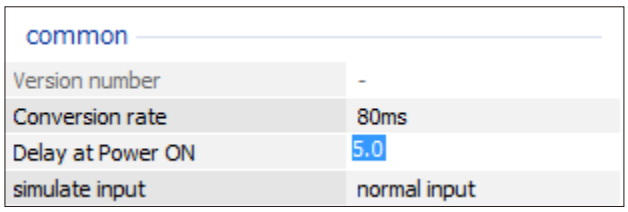
4.11.6 SETTING CONVERSION RATE

Choose one of the input signal conversion rates for R30CT4E.
Measuring accuracy is different by conversion rate. For detailed information, refer to the specification sheet for R30CT4E. Setting per input is not available. Set the rate for all inputs.



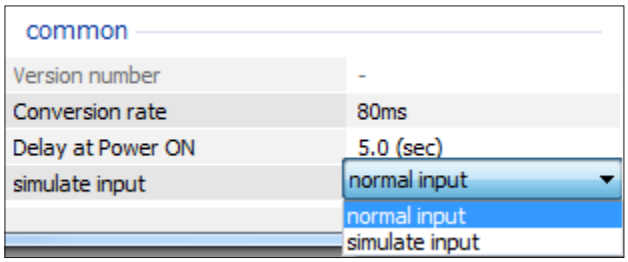
4.11.7 DELAY AT POWER ON

Specify the time from power on to start measuring. Setting the time to stabilize the measuring circuit.
Setting per input is not available. Set the time for all inputs.
Setting range: 0.0 to 60.0 sec.



4.11.8 SETTING SIMULATE INPUT

Choose normal input or simulate input.
The setting is also available on the Monitor screen.
Specify the simulate input value between 0 and 65535. If entering a value under 0, 0 is set. If above 65535, 65535 is set.

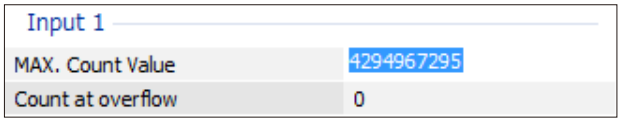


4.12 R30PA2 - TOTALIZED PULSE INPUT MODULE, 2 points

4.12.1 SETTING MAXIMUM COUNT VALUE OF TOTALIZED PULSE

Specify the upper limit of pulse count value.
When the pulse count value reaches the MAX. Count Value and then a pulse is input, the value becomes the value of Count at overflow.

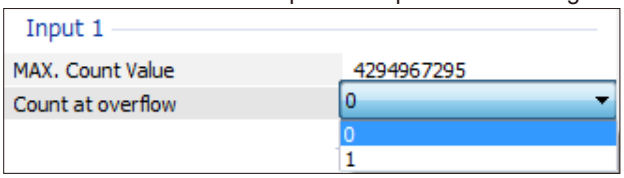
Setting range: 1 – 4294967295
Factory setting: 4294967295



4.12.2 SETTING COUNT AT OVERFLOW

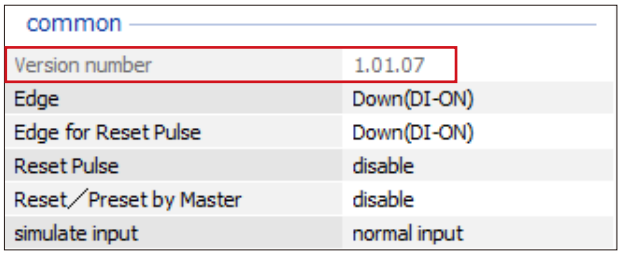
The Count at overflow is the value to which the pulse count value is set back when a pulse is input after reaching the Max. Count value.

Setting range: 0 or 1
Factory setting: 0



4.12.3 CONFIRMING VERSION NO.

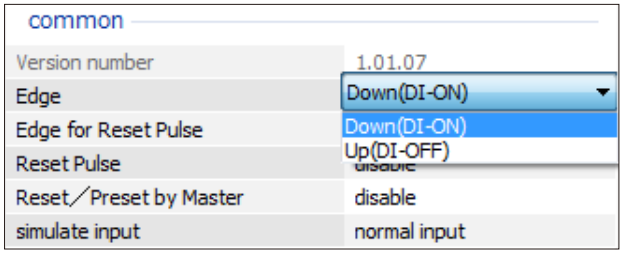
The firmware version is shown.
This is not editable.
"–" is shown when not uploaded.



4.12.4 COUNTING INPUT PULSE UP/DOWN EDGES

Set the edge direction for counting pulses. All the channels are set collectively, so this setting is not available for each channel.

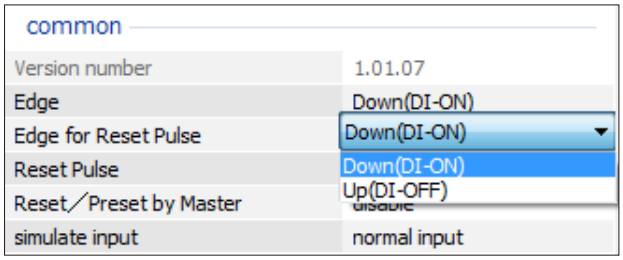
Setting range: Down (DI-ON)
Up (DI-OFF)
Factory setting: Down (DI-ON)



4.12.5 DETECTING EDGE DIRECTION OF RESET PULSE

Set the edge direction for resetting count value by terminal input.

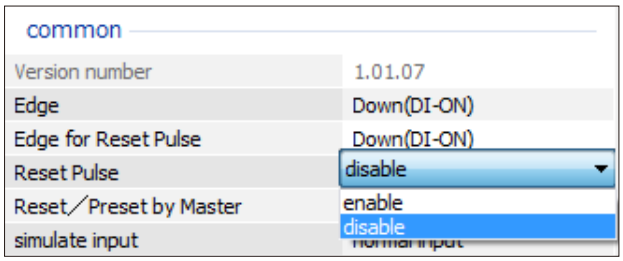
Setting range: Down (DI-ON)
Up (DI-OFF)
Factory setting: Down (DI-ON)



4.12.6 EDGE DETECTION OF RESET PULSE

Set enable or disable for whether to reset count value by terminal input.
In the case of not using the reset pulse, set disable in order to prevent unwanted resets caused by noises.

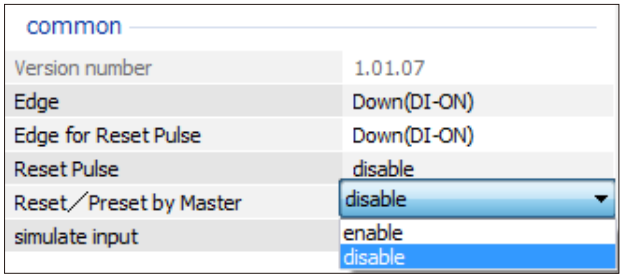
Factory setting: disable



4.12.7 RESETTING/PRESETTING BY MASTER

Set 'enable' or 'disable' for whether to reset/preset by master via network.

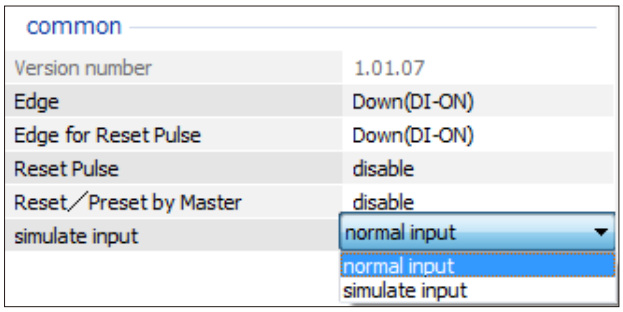
Factory setting: disable



4.12.8 SETTING SIMULATE INPUT

Choose normal input or simulate input.
The setting is also available on the Monitor screen.
The simulate input setting is not written to R30PA2 even if downloaded. The device starts in normal input mode when powered on.

Factory setting: normal input



■Setting simulate input value

Set the simulate input value on the Monitor screen.

Without being limited by the setting values of MAX. Count Value and Count at overflow, the simulate input value is settable within the range below.
However, for the disabled channel, the input value of Count at CH Disable is overridden.

If a negative number is specified, which is modified to 0. If a number greater than 4,294,967,295 is specified, which is modified to 4,294,967,295.

Setting range: 0 – 4,294,967,295

4.12.9 PRESETTING PULSE COUNT

It is possible to set in advance any value within the specified range of the pulse count value. Set the preset value on the Monitor screen. Enter the preset value and press "Enter" key so that the setting is enabled.

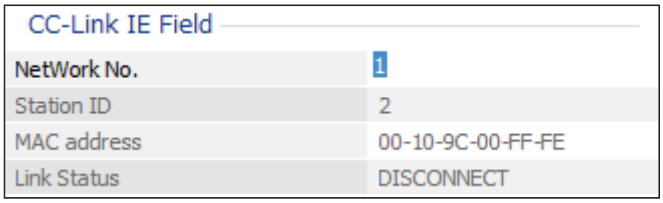
Preset setting range: 0 – MAX. Count Value of totalized pulse.

IF a value from more than the MAX. Count Value to 4,294,967,295 is specified, which will be ignored (The error massage is not displayed.).

4.13 R30GCIE1 - CC-Link IE Field NETWORK INTERFACE MODULE

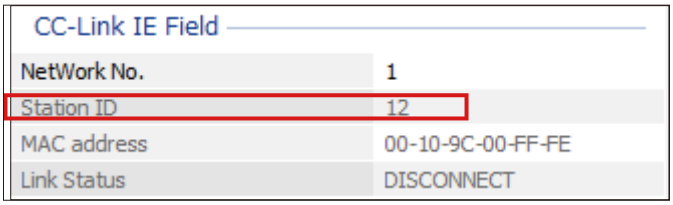
4.13.1 NETWORK NO.

Set the network No.
The range is 1 to 239, initial value is 1.



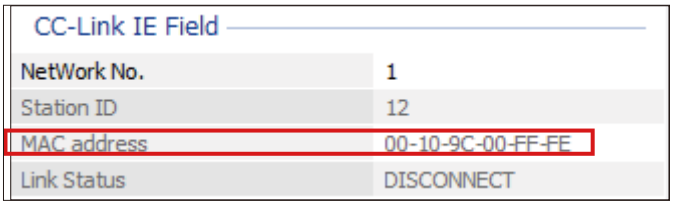
4.13.2 STATION ID

Station ID set in the R30GCIE1 is displayed. It is not available to change.
When not uploaded, "–" is displayed.



4.13.3 MAC ADDRESS

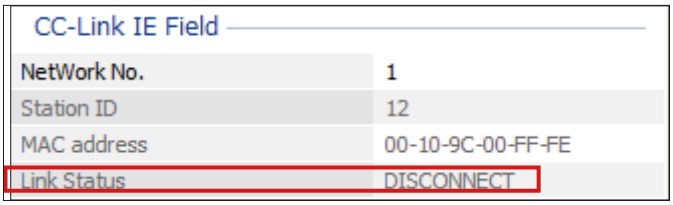
MAC address of the R30GCIE1 is displayed. It is not available to change.
When not uploaded, "–" is displayed.



4.13.4 LINK STATUS

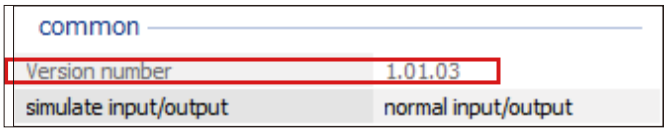
Data link status at upload is displayed. It is not available to change.
Upload when display needs update.
When not uploaded, "–" is displayed.

- CYCLIC: Cyclic communication status
- TOKEN-PASS: Token-pass status
- DISCONNECT: When communication is not established.



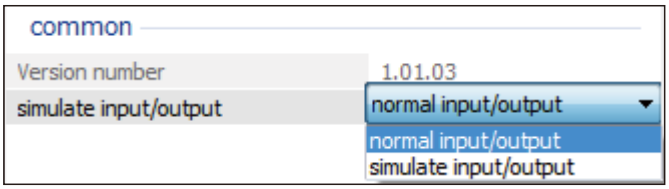
4.13.5 VERSION NUMBER

Version number of the firmware is displayed.
This is not editable.
When not uploaded, "–" is displayed.

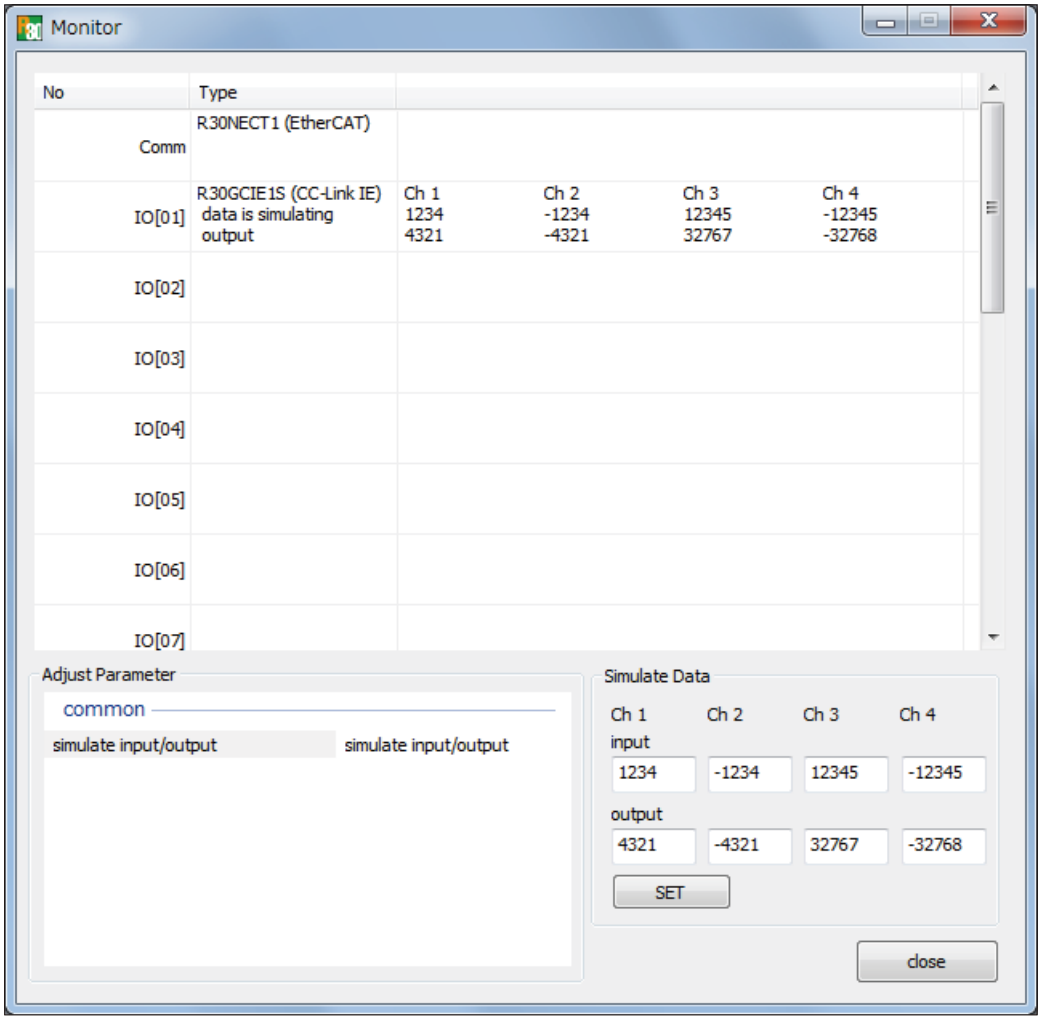


4.13.6 SETTING SIMULATE I/O

Choose normal I/O or simulation data.
The setting is also available on the Monitor screen.
The simulate I/O setting is not written to R30GC1E1 even if downloaded. The device starts in normal I/O mode when powered on.
Factory setting: normal I/O



4.13.7 MONITOR SCREEN AND SIMULATION DATA



On the Monitor screen, input values and out values are displayed as signed integers. As input values, RWw0 (Ch1) to RWw3 (Ch4) are displayed and RWr0 (Ch1) to RWr3 (Ch4) are displayed as output values.

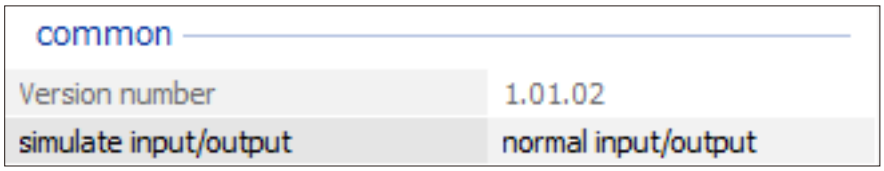
When simulate I/O is selected, simulation data can be set. Specify the simulation data between -32768 and +32767. If entering a value under -32768, -32768 is forcibly set. If above +32767, +32767 is set.

4.14 R30GECT1 - EtherCAT INTERFACE MODULE

Device parameters are not available for R30GECT1.
Only 'simulate input/output' can be set.

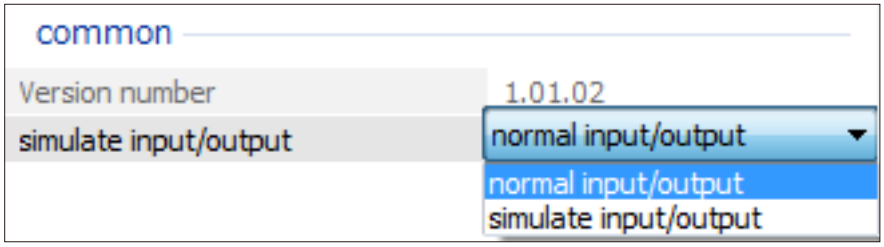
4.14.1 VERSION NUMBER

Version number of the firmware is displayed, which cannot be edited.
When the parameters are yet to be uploaded from the device, '–' is displayed.



4.14.2 SETTING SIMULATE I/O

Select 'normal input/output' or 'simulate input/output'.
The setting is also available on the Monitor screen.
The 'simulate input/output' setting is not written to R30GECT1 even if the parameters are downloaded. The device starts in 'normal input/output' mode when powered on.
Factory setting: normal input/output



4.14.3 MONITOR SCREEN AND SIMULATE INPUT/OUTPUT

On the Monitor screen, input values and output values are displayed as signed integers.

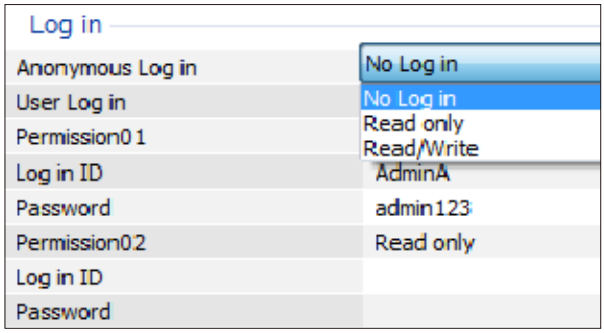
When 'simulate input/output' is selected, simulate input/output can be set.
Set a value within the range of -32768 to +32767.
If the entered value is under -32768, -32768 is forcibly set.
If the value is above +32767, +32767 is set.

4.15 R30GOUA1 - NETWORK INTERFACE MODULE FOR OPC-UA SERVER

4.15.1 ANONYMOUS LOGIN

Set whether or not to allow anonymous login (No user authentication).

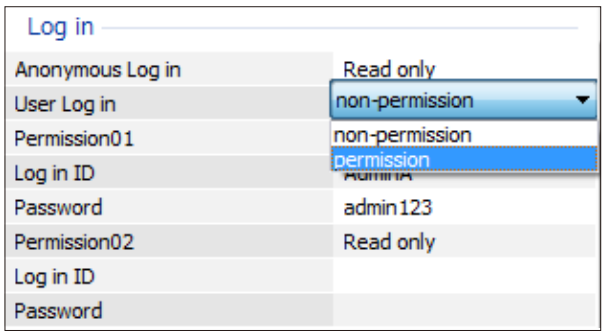
To allow anonymous login, select the data access level between 'Read only' and 'R/W'.



4.15.2 USER LOGIN

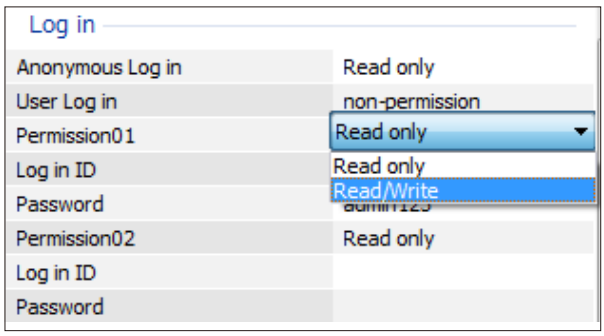
Set whether or not to allow user login (User authentication by username and password).

When user login is allowed, up to 2 sets of username and password can be set.



4.15.3 PERMISSION01 / 02

Set the data access level for each Log In ID.



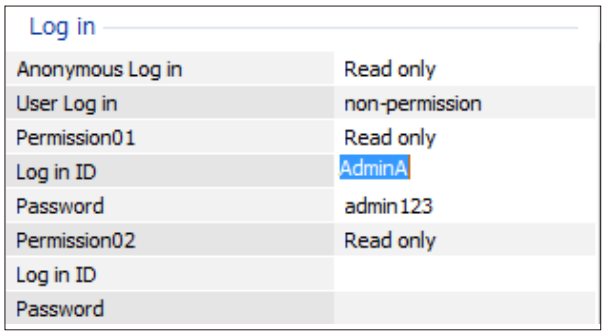
4.15.4 LOG IN ID & PASSWORD

Set User name and Password for each Log In ID.

Use alphanumerical characters (upper & lower cases) only.

Log In ID: If the parameter is left blank, the password will be initialized and user login becomes invalid.

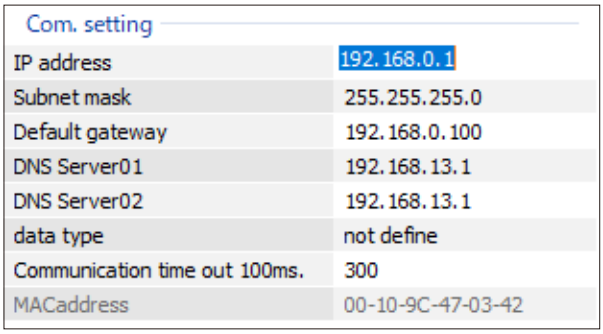
Password: If the parameter is left blank, user login becomes invalid.



4.15.5 IP ADDRESS, SUBNET MASK, DEFAULT GATEWAY, DNS SERVER

Setting range: 0 to 255

Default values
IP address : 192.168.0.1
Subnet mask : 255.255.255.0
Default gateway : 192.168.0.100
DNS server : 192.168.13.1



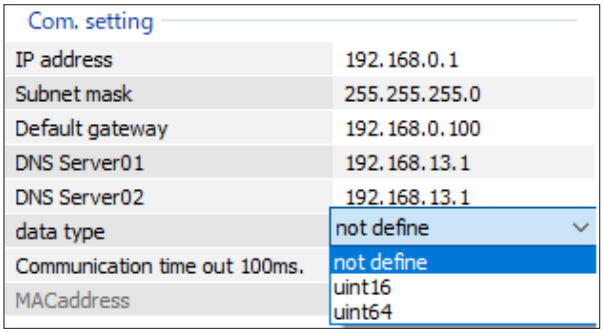
4.15.6 DATA TYPE

Set the data types for R30GOUA1.

Default setting: 'not define'

* When the setting is 'not define', the data type is automatically set 'uint16'

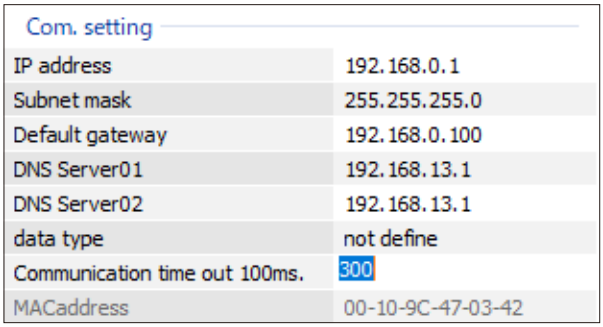
* When the 2-word and 4-word data are used, select 'uint64' to prevent being separated.



4.15.7 COMMUNICATION TIMEOUT MONITORING TIMER

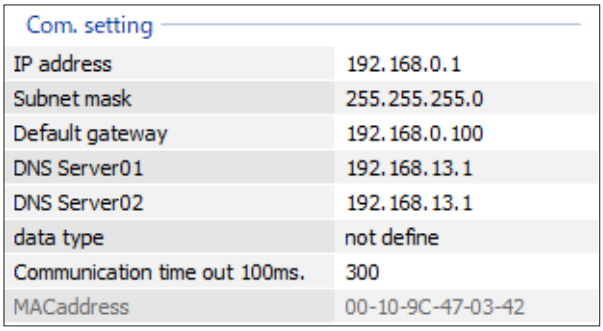
Set the timer value for communication timeout. When there is no access from an OPC-UA client before the timeout period elapses, a timeout error occurs.

Setting range: 0 to 32757 (0 to 3275.7 seconds)
Set to 0 for no monitoring.
Default setting: 300 (30 seconds)



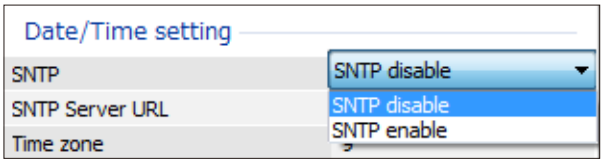
4.15.8 MAC ADDRESS

MAC address of the R30GOUA1 is indicated, which is not editable.
'–' is displayed when the parameters are yet to be uploaded from the device.



4.15.9 SNTP TIME SYNCHRONIZATION

Set whether or not to allow time synchronization with the SNTP server.
When set to 'SNTP enable', time synchronization is performed at power-on, 0:00, 06:00, 12:00, and 18:00.



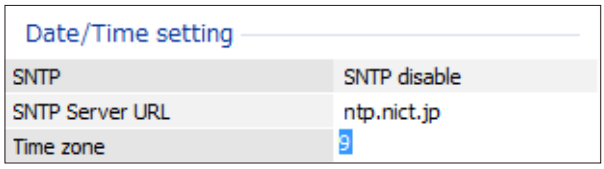
Default setting: 'SNTP disable'

* When set to 'SNTP enable', be sure to set 'DNS Server', 'SNTP Server URL', and 'Time zone'.

4.15.10 TIME ZONE

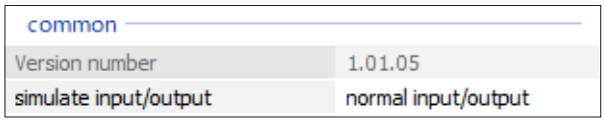
Set the UTC time zone.

Setting range: -12 to 14
Default setting: 9 (Japan time)



4.15.11 CONFIRMING VERSION NO.

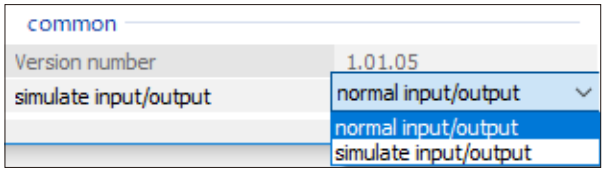
The firmware version of the R30GOUA1 is indicated, which is not editable.
'–' is displayed when the parameters are yet to be uploaded from the device.



4.15.12 SETTING SIMULATE INPUT/OUTPUT

Choose normal input (normal output) or simulate input (simulate output).
The setting is also available on the Monitor screen.
The simulate input (simulate output) setting is not written to R30GOUA1 even if downloaded. The device starts in normal input (normal output) mode when powered on.

Factory setting: normal input (normal output)



4.15.13 MONITOR SCREEN AND SIMULATION DATA

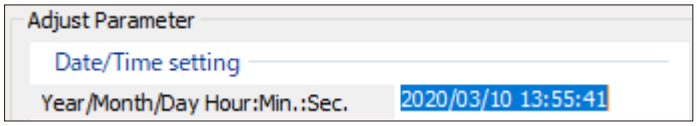
On the Monitor screen, input values and out values are displayed as signed integers.
When simulate I/O is selected, simulation data can be set. Specify the simulation data between -32768 and +32767.
If entering a value under -32768, -32768 is forcibly set. If above +32767, +32767 is set

4.15.14 DATE / TIME SETTING

To set the date and time, connect USB cable to USB connector on the R30GOUA1.
After started up and connected the R30CFG, upload to recognize the R30GOUA1 as interface module.
Date and time can be set on the Monitor screen.
Clicking 'R30GOUA1' in the 'comm' row, 'Date and Time setting' appears in the 'Adjust Parameter'.
Edit 'yyyy/mm/dd hh:mm:ss' and press "Enter" to validate the new setting.

Setting range

Year	: 2001 to 2099
Month	: 1 to 12
Date	: 1 to 31
Hour	: 0 to 23
Min.	: 0 to 59
Sec.	: 0 to 59



Default value : 2013/01/01 00:00:00

Do NOT enter a date which does not exist (e.g., February 31).
If such a date is entered, the value will not be reflected and the setting will remain unchanged.

5. BASIC PARAMETERS OF TABLET RECORDER

5.1 TR30

R30 I/O modules mounted on the same installation base with TR30 can be configured using this program.
Use the dedicated configurator software (model: TRGCFG) to configure basic settings of the TR30.

6. BASIC PARAMETERS OF WEB DATA LOGGER

6.1 DL30

R30 I/O modules mounted on the same installation base with DL30 can be configured using this program.
Use the dedicated configurator software (model: DL30GCFG) to configure basic settings of the DL30.

7. REMARKS

7.1 SETTING EXAMPLE OF FINE ADJUSTMENT

Fine zero/gain adjustment is used for fine adjustment of calibration.

7.1.1 ONLY FINE ZERO ADJUSTMENT IS PERFORMED

Change the fine zero adjustment value on the monitor screen to adjust.
For example, while applying the voltage equivalent to 0% from voltage source, adjust fine zero adjustment value so that monitor value becomes 0%. (When input type is thermocouple, cold junction compensation must be disabled during adjustment.)

7.1.2 FINE ZERO/GAIN ADJUSTMENT IS PERFORMED

Adjustment is available for any two points. Fine adjustment with two points such as Y0 %, Y1 %.
1)
• When input type is thermocouple, cold junction compensation must be disabled during adjustment.
• Set fine zero adjustment to “0.00”, fine gain adjustment to “1.0000”.
• Set scaled range zero to “0”, scaled range span to 10000.

2) While applying the voltage equivalent to Y0 % from voltage source, record the monitor value (X0).
3) While applying the voltage equivalent to Y1 % from voltage source, record the monitor value (X1).
4) Calculate zero/gain adjustment value by following formula.
• Gain adjustment value = (Y1 – Y0) / (X1 – X0)
• Zero adjustment value = Y0 – (X0 x gain adjustment value)

5) Set zero/gain adjustment value obtained at step 4, confirm the monitor value after adjustment on the monitor screen.

E.g. Monitor value at 0% input is -85, monitor value at 100% input is 9810.
Y0 = 0, X0 = -0.85
Y1 = 100, X1 = 98.10
Gain adjustment value = (100 – 0) / (98.10 – (-0.85)) ≈ 1.0106
Zero adjustment value = 0 – (-0.85 x 1.0106) ≈ 0.86

7.2 VERSION HISTORY

Ver.0.1.5 First version, applicable to R30NECT1, R30XN16x and R30YN16x
Ver.0.05.21 Applicable to TR30 and R30SV4
Ver.1.01.32 Applicable to R30US2 and R30US4
Ver.1.03.37 Applicable to R30TS4
Ver.1.03.38 Applicable to R30RS4
Ver.1.04.41 Applicable to R30MS4
Ver.1.05.xx Applicable to R30CT4E
Ver.1.06.xx Applicable to R30YS4
Ver.1.09.xx Applicable to R30SVF4 and R30NCIE1
Ver.1.11.xx Applicable to R30PA2, supports Windows 10
Ver.1.13.xx Applicable to R30GCIE1, R30NE1
Ver.1.14.xx Applicable to R30GECT1, R30NOUA1, and DL30
Ver.1.15.xx Applicable to R30GOUA1
Ver.1.16.xx Applicable to R30NCIT1
Ver.1.17.xx R30XN16x and R30YN16x supported "simulate input/output".