R1 Series Remote I/O
R1X PC CONFIGURATOR
Model: R1CON

Users Manual

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CONTENTS

1. GENERAL

In this manual, user is assumed that he/she is already familiar with operating Windows and terminology used in these operating systems.

If you need to know about particular operation or terminology on Windows, please refer to manuals provided with the system.

1.1 FEATURES OF R1CON

The model R1x can accept direct sensor inputs from thermocouples and other sensors, with independent sensor type and temperature range settings for each channel. Most of the general settings are configured on the hardware, therefore the user does not need to use the R1CON PC Configurator Software except for advanced settings.

Available R1x models are:

R1M-GH2	DC mV, V, mA and thermocouple inputs, 16 points
R1C-GH2	DC mV, V, mA and thermocouple inputs, 16 points, CC-Link
R1D-GH2	DC mV, V, mA and thermocouple inputs, 16 points, DeviceNet
R1MS-GH3	DC mV, V, mA and thermocouple inputs, 8 points, channel-to-channel isolation
R1M-J3	RTD and potentiometer inputs, 8 points
R1M-A1	Contact inputs, 32 points
R1M-D1	Open collector (alarm) outputs, 32 points
R1M-P4	Totalized counter inputs, 4 points; Contact inputs, 8 points; Contact outputs, 8 points

The R1CON software is used to help you program input type, burnout action, cold junction compensation, filter time constant of model R1x, connected via the special cable.

General functions of the R1CON are as follows:

■ COMMUNICATION CONFIGURATION

Parameters concerning Modbus communication such like node address or baud rate can be configured.

■ PARAMETERS CONFIGURATION FOR EACH CHANNEL

For models R1x-GH2 and R1MS-GH3, thermocouple type and voltage/current range per channel can be programmed.
For model R1M-J3, RTD type and potentiometer range per channel can be programmed.

■ FILE MANAGING

The parameter configuration for each channel can be saved as a file on the PC. Therefore, you can configure a set of parameters without actually connecting the R1x to your PC.
Reading (downloading) parameter files helps you to configure multiple modules easily and accurately.

■ MONITORING

You can check analog input data using configured data.
For discrete I/O modules, ON/OFF status of each channel can be monitored. For model R1M-A1 Ver. 3.0 or higher, the totalized count and the preset count are also monitored.
For model R1M-P4, the totalized count, the preset count and the momentary count value can be monitored.

■ CALIBRATION

For models R1x-GH2 and -J3 and R1MS-GH3, zero and span adjustments, adjustment required when replacing the CJC sensor are available.
For model R1M-J3, leadwire resistance compensation is available.

1.2 HARDWARE REQUIREMENTS

- PC with Windows 10 (32-bit / 64-bit) or Windows 11 (64-bit) appropriately installed
- PC configurator cable, model MCN-CON or COP-US

1.3 INSTALLING & DELETING THE PROGRAM

The program, provided as compressed archive, can be downloaded at our web site.

■ INSTALL

Decompress the archive and execute 'setup.exe' to start up the R1CON installer program. Follow instructions on the Windows.

■ DELETE

For Windows 10, open Settings from Start menu > Apps > Apps & features.

Select the R1CON from the program list and click [Uninstall] button.

Follow the instructions on the screen to uninstall the program.

For Windows 11, open Settings from Start menu > Apps > Installed apps.

Select the [...] of R1CON from the program list and click [Uninstall] button.

Follow the instructions on the screen to uninstall the program.

CAUTION !
If you have already the R1CON program installed in your PC, remove it before installing a new one.

2. BASIC OPERATIONS

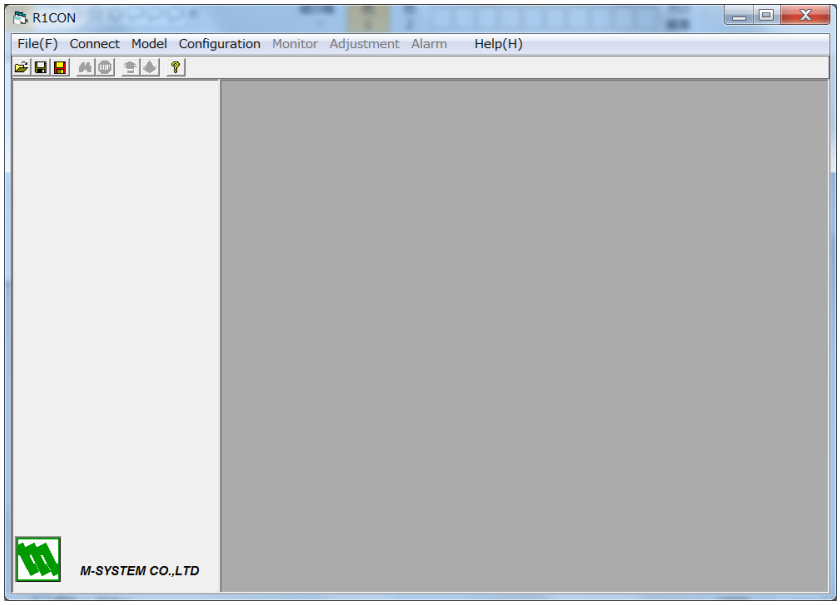
Connect the R1x module to the PC. Confirm the hardware connection in order to write the setting data to the remote I/O module.

2.1 STARTING / QUITTING THE R1CON

Display images shown in this manual may change in detail when the software version is updated.

■ STARTING THE R1CON

Press [Start] on the task bar and choose [R1CON] from [Program] menu. The main view appears on the screen as shown below.



■ QUITTING THE R1CON

Choose [End] from [File] menu to quit the program.

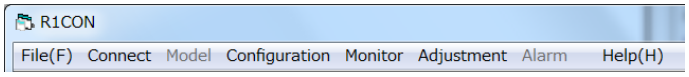
CAUTION !
Clicking [X] button at the right end of the title bar does not end the program.

2.2 VIEW COMPONENTS AND FUNCTIONS

The R1CON view is composed of the menu bar and tool buttons at the top, the hardware type and version information window at the left, and the configuration window for each channel with several popping-up sub-windows at the right.

In this section, functions of menu bar and various buttons, and of each frame are explained.

■ MENU BAR

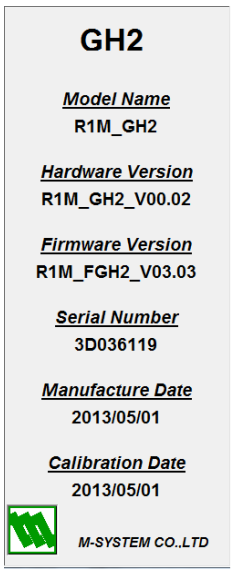


Menu	Submeu	Function
File(F)	Open	Reading the specified file and displaying its contents.
	Save	Saving the configuration of all the channels as the current file.
	Save as	Saving the configuration of the all the channels as a new file.
	End	Quitting the R1CON program.
Connect	Connect	Connecting to the communication line.
	Disconnect	Disconnecting from the communication line.
Model	GH2	Displaying the configuration window for type GH2.
	J3	Displaying the configuration window for type J3.
	GH3	Displaying the configuration window for type GH3.
Configuration	Modbus	Opening the Modbus Communication Parameter Setting window.
	Burnout Type	Opening the Burnout Type setting window.
	Filter time const.	Opening the Filter Time Constant setting window.
	Line noise filter	Opening the Line Noise Filter Type window (model R1MS-GH3).
	CJM	Used when replacing the Cold Junction Compensation sensor.
	Count Set	Opening the Count Settings window for all channels.
	Upload	Uploading the configuration.
	Download	Downloading the configuration.
Monitor	Start	Starting monitoring of input signals.
	Stop	Stopping monitoring of input signals.
Adjustment	Zero/Span	Opening the Zero/Span Adjustments window.
	Compensation	Opening the Leadwire Compensation window.
Alarm	Alarm out	Opening the Alarm Output Set window.
Help(H)	Index	Not available
	Contents	Not available
	Version	Indicating Version No. of the R1CON.

■ TOOL BUTTONS

Name (from left to right)	Function
Open File	Reading the specified file and displaying its contents.
Save	Saving the configuration of all the channels as the current file.
Save as	Saving the configuration of the all the channels as a new file.
Start	Starting monitoring of input signals.
Stop	Stopping monitoring of input signals.
Upload	Uploading the configuration.
Download	Downloading the configuration.
Help	Not available

■ HARDWARE TYPE & VERSION INFORMATION WINDOW



Name	Function
Model Name	Model No. of the R1x
Hardware Version	Hardware version No.
Firmware Version	Firmware version No.
Serial Number	Serial No. of the R1x
Manufacture Date	Manufacturing date of the R1x
Calibration Date	Date of latest calibration

2.3. SETTING EXAMPLE

The R1CON can be used on-line or off-line (the R1x connected or disconnected to/from communication line. In this section, the following procedures are explained with examples.

i) On-line operation with types GH2, GH3 and J3

ii) On-line operation with types A1 and D1

iii) Off-line operation

2.3.1 ON-LINE OPERATION WITH TYPES GH2 / GH3 / J3

(1) Starting up the R1CON program

(2) Connecting to the communication line

(3) Confirming the hardware type (GH2 or J3) and current setting

(4) Modifying parameters

(5) Downloading the parameters to the R1x

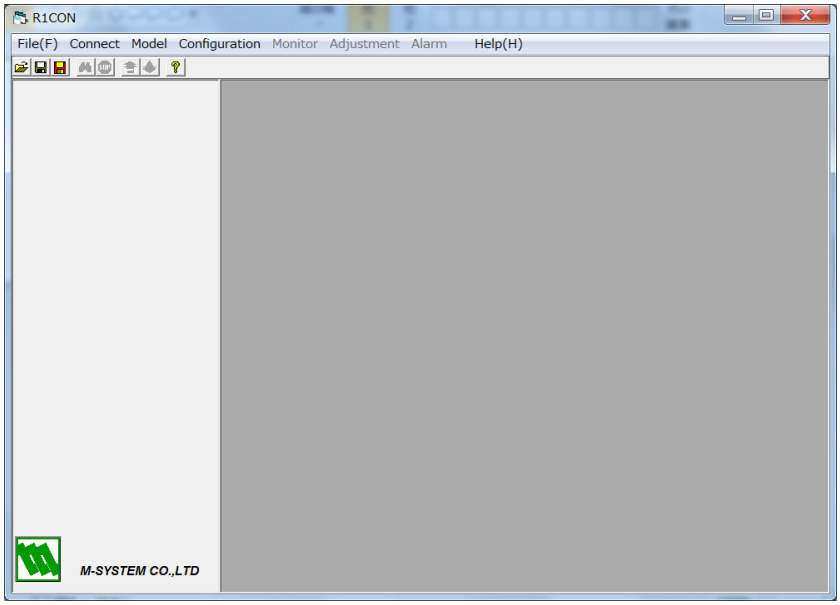
(6) Confirming new configuration

(7) Monitoring

(8) Closing the communication line

■ STARTING UP THE R1CON PROGRAM

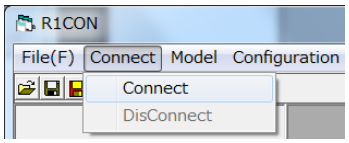
Press [Start] on the task bar and choose [R1CON] from [Program] menu. The main view appears on the screen as shown below.

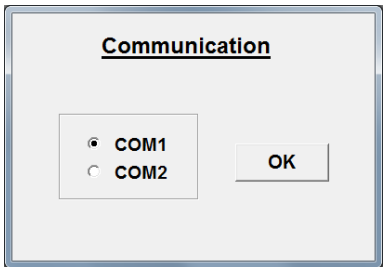


■ CONNECTING TO THE COMMUNICATION LINE

Connecting the R1x module to the communication line.

Choose [Connect] from [Connect] on the menu bar and the following dialog box appears on the screen.





Confirm that the power is supplied to the R1x and that the configurator jack of the R1x and the COM1 port of the PC is firmly connected with the attached cable.

Choose COM1 (See left) and click OK.

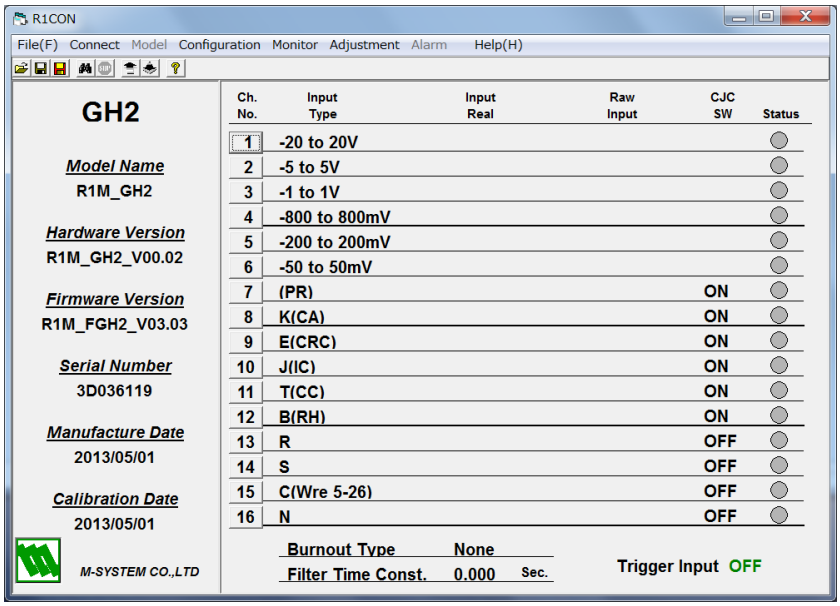
With the communication line established, the version No. of the hardware and current parameter setting are displayed.

If a message appears saying that the connection is unsuccessful, confirm again the connection between the R1x and PC, and the COM1 port driver status on the PC.

Only COM1 and COM2 can be specified as standard. In order to use COM3 and other communication ports, change the port numbers following instructions in the appendix.

■ CONFIRMING THE HARDWARE TYPE & CURRENT SETTING

With the communication line established, the type No. and version No. of the hardware (left) and current parameter setting (right) are displayed on the screen. The example below and the following explanation is one with model R1C-GH2.



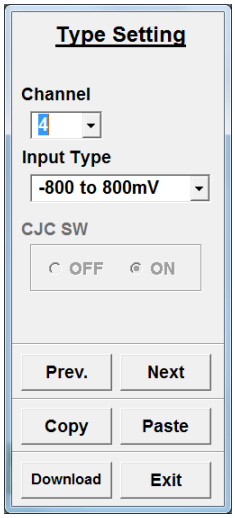
With the R1C-GH2's firmware version V1.xx, the model name may be indicated as 'R1M,' though the programming is performed correctly.

■ MODIFYING PARAMETERS

Click a channel No. button on the right window and Type Setting window appears as shown below.

Modifying [Input Type] of Ch. 4 from '-800 to 800mV' to '-1 to 1V'

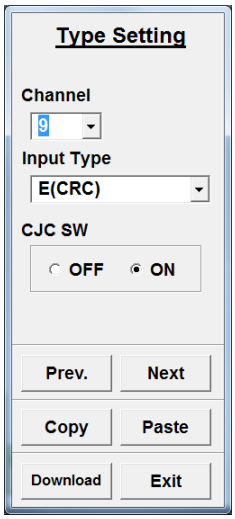
Choose '4' from [Channel] pull-down menu.
Choose '-1 to 1V' from [Input Type].
Confirm the new setting at Ch. 4 on the right window.

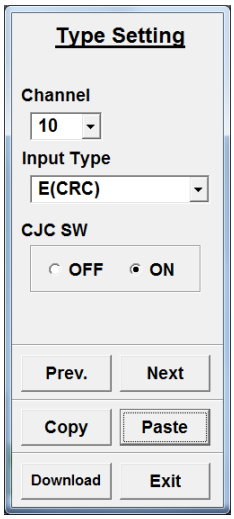


Applying the setting of Ch. 9 to Ch. 10

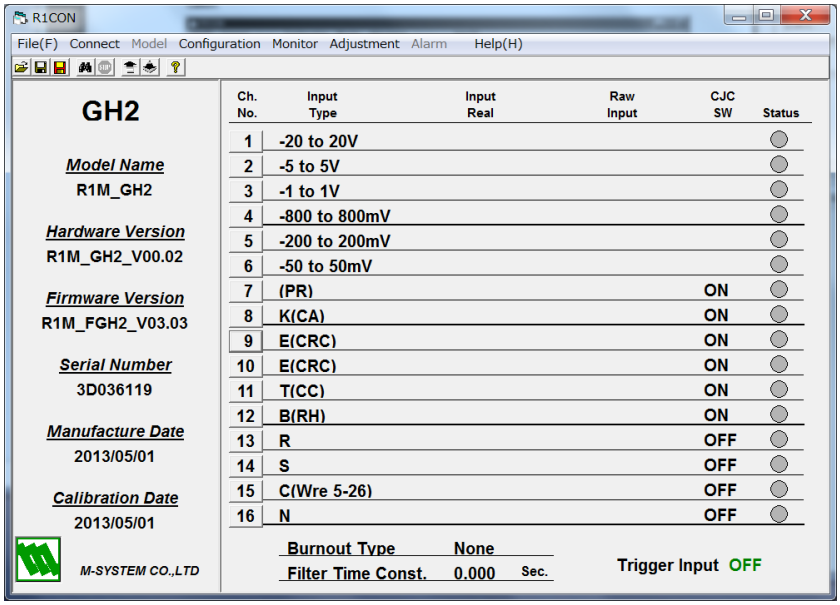
Choose '9' from [Channel] pull-down menu.
Press <Copy> button. Then press <Next> button and confirm that the window shows current setting of Ch. 10.
Press <Paste> button and confirm the new setting on the dialog box.

Confirm the new setting at Ch. 10 on the right window.





Pressing <Exit> button closes the dialog box. The figure below shows the result of the above modification.



CAUTION !
The above new modification is not applied to the device unless the following DOWNLOAD is executed.

■ DOWNLOADING PARAMETERS TO THE R1x

To download the parameters for all channels, choose [Configuration] > [Download] or click < > button.

To download the parameters for single channel, click <Download> in [Type Setting] dialog box of that channel.

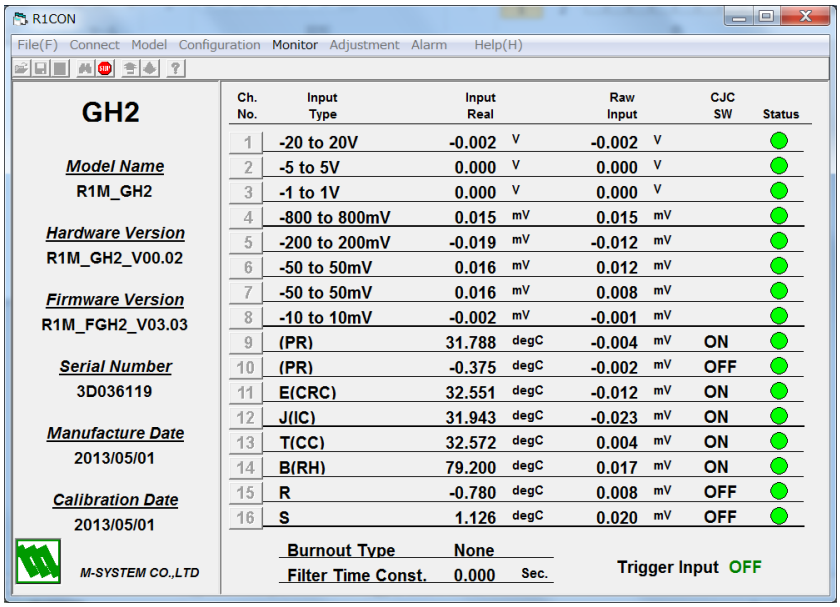
■ CONFIRMING NEW CONFIGURATION

The R1CON automatically uploads the configuration after every downloading. Therefore you can confirm that new configuration has been applied by comparing the currently displayed setting with applied changes.

■ MONITORING

You can monitor analog input values on the display. Choose [Monitor] > [Start] from the menu bar or click < > tool button.

In order to stop monitoring, choose [Monitor] > [Stop] from the menu or click < > tool button.



■ CLOSING THE COMMUNICATION LINE

Disconnecting the R1x module to the communication line. Choose [Disconnect] from [Connect] on the menu bar.

2.3.2 ON-LINE OPERATION WITH TYPES A1 / D1

(1) Starting up the R1CON program (See 2.3.1)

(2) Connecting to the communication line (See 2.3.1)

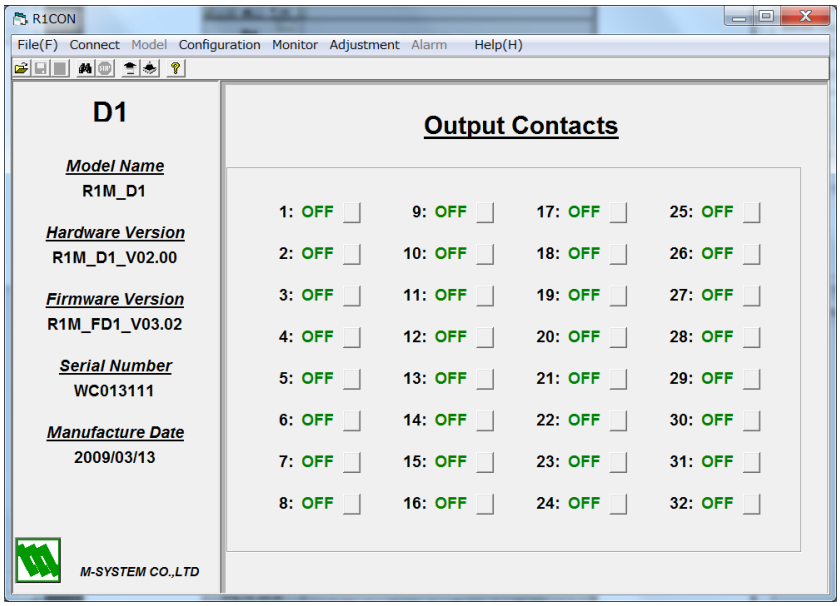
(3) Confirming the hardware type (A1 or D1) and current setting

(4) Monitoring

(5) Closing the communication line (See 2.3.1)

■ CONFIRMING THE HARDWARE TYPE & CURRENT SETTING

With the communication line established, the type No. and version No. of the hardware (left) and current parameter setting (right) are displayed on the screen. The example below and the following explanations is one with model R1M-D1.



■ MODIFYING PARAMETERS

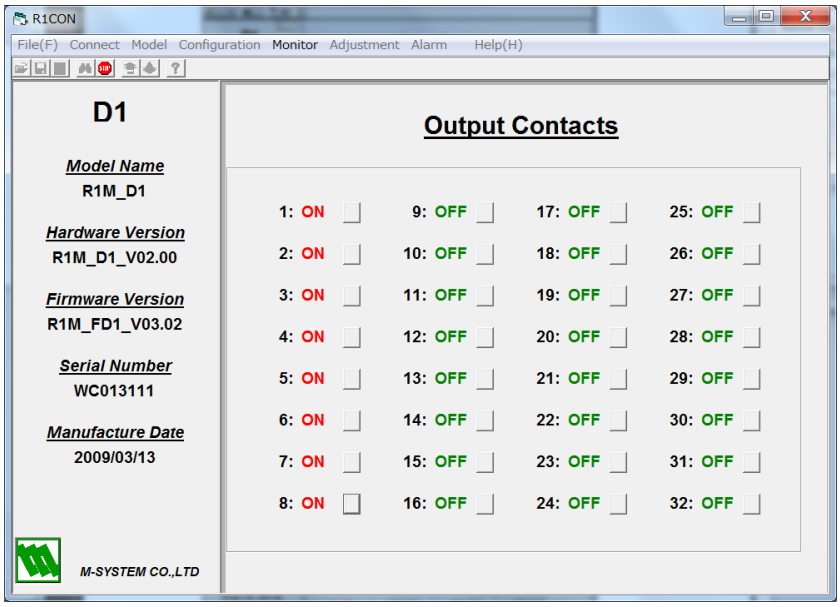
First, start monitoring. Choose [Monitor] > [Start] from the menu bar or click < > tool button. All contacts are at OFF state at default. Buttons to the right of each channel No. are alternate buttons to switch ON/OFF, indicating their state at the same time.

Turning the contact outputs ON for Ch. 1 to Ch. 8.

Click the buttons to the right of Ch. 1 to Ch. 8 and confirm that they turned ON on the screen.

Confirm also that the LEDs for these channels on the R1M-D1.

In order to stop monitoring, choose [Monitor] > [Stop] from the menu or click < > tool button.



2.3.3 OFF-LINE OPERATION

(1) Selecting the hardware type

(2) Creating or modifying parameters

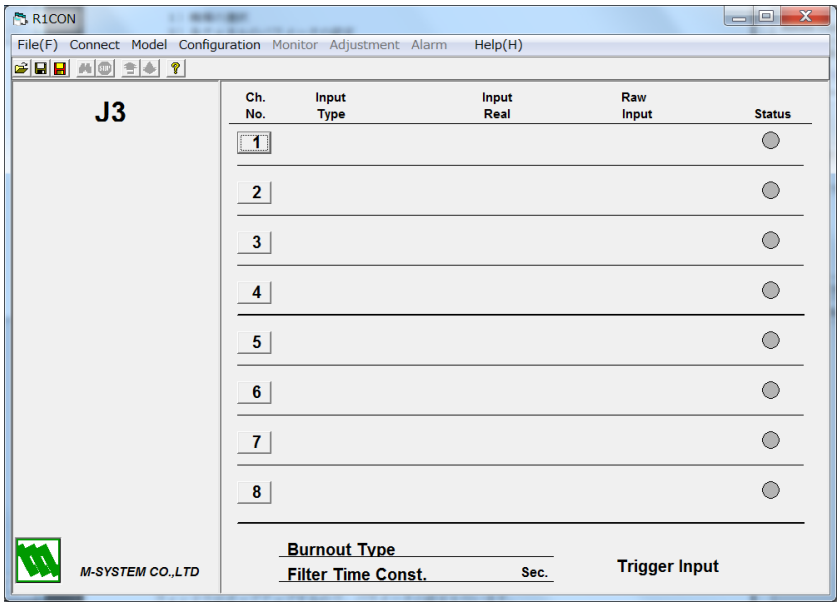
(3) Saving parameter files

■ SELECTING THE HARDWARE TYPE

When creating a new parameter file, choose the hardware type from [Model] pull-down menu.

If you want to modify an existing file, choose [File] > [Open] from the menu bar and select the file name.

The following window appears when type J3 is selected for a new file.

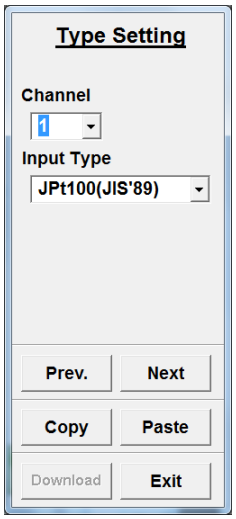


■ CREATING OR MODIFYING PARAMETERS

Click a channel No. button on the right window and Type Setting window appears as shown below.

Specifying [Input Type] of Ch. 1 as 'JPt100 (JIS '89)' and [Burnout Type] to 'None' (no burnout protection)

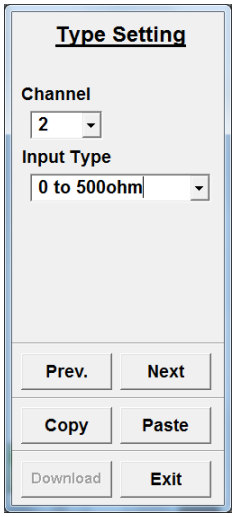
Choose '1' from [Channel] pull-down menu.



Choose 'JPt100 (JIS '89)' from [Input Type].
Confirm the new setting at Ch. 1 on the right window.

Specifying [Input Type] of Ch. 2 as '0 to 500 ohm' and [Burnout Type] to 'Up' (upscale burnout)

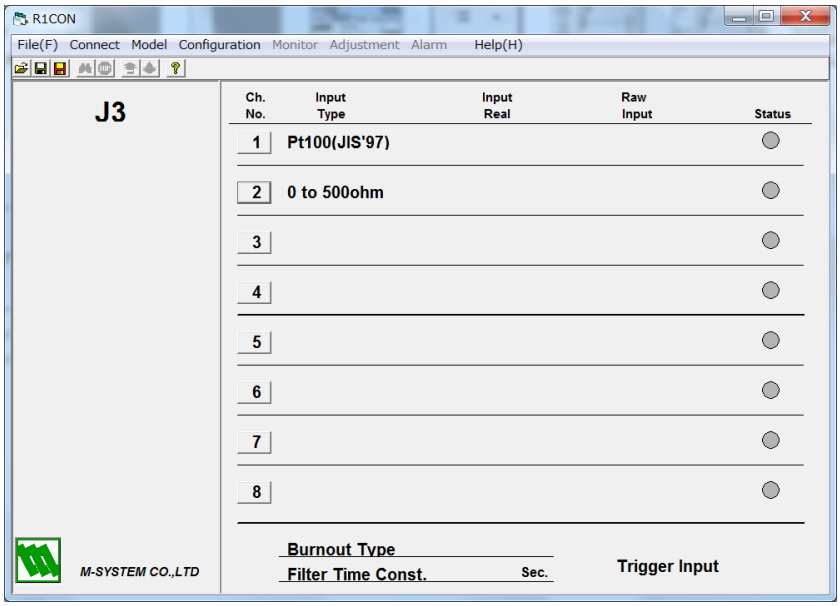
Click < Next > button and Type Setting dialog box for Ch. 2 appears.
Choose '0 to 500 ohm' from [Input Type].



Confirm the new setting at Ch. 2 on the right window.
Pressing < Exit > button closes the dialog box. The figure below shows the result of the above modification.

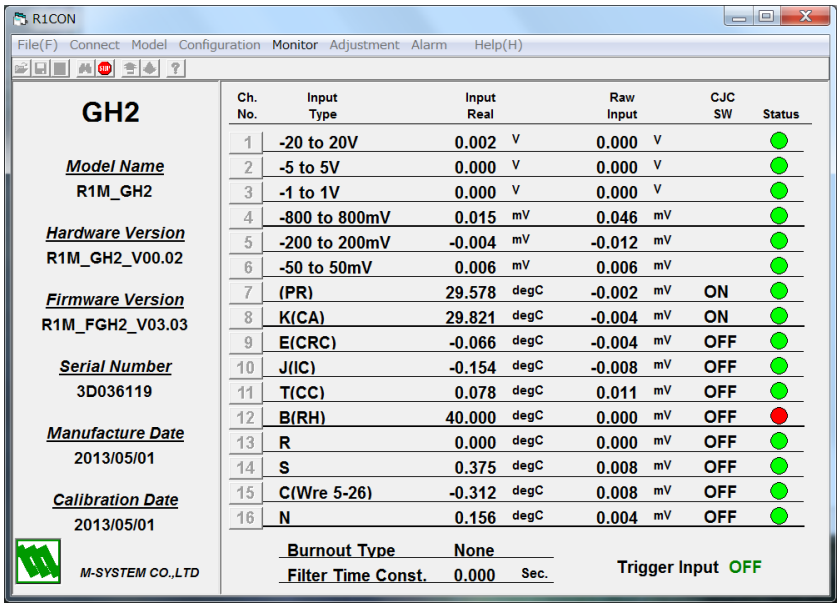
■ SAVING PARAMETER FILES

Choose [Save as] from [File] pull-down menu, or click < > button and specify a file name.



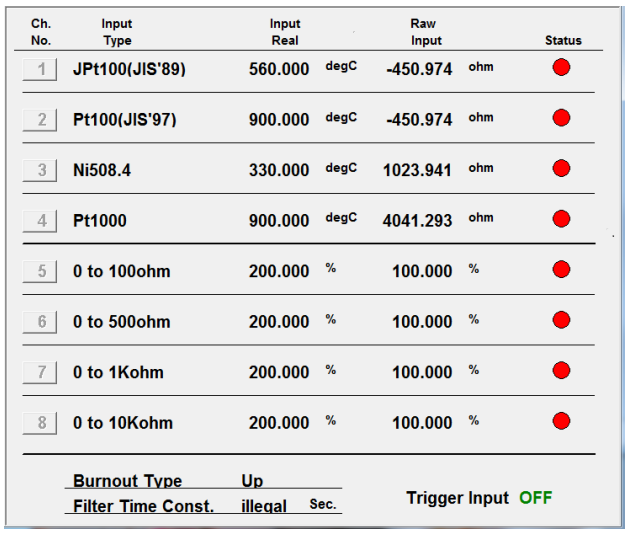
3. CONFIGURATION WINDOW FOR EACH CHANNEL

3.1 R1x-GH2



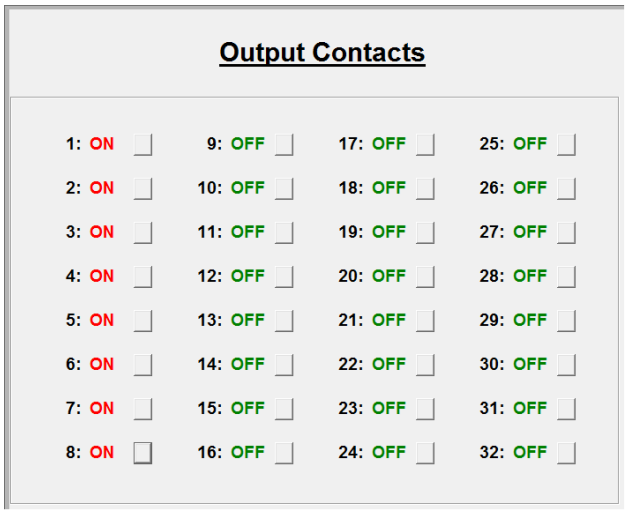
Item	Function
Ch. No.	Channel No.
Input Type	Input Type
Input Real	Input value in engineering unit
Raw Input	Input voltage or resistance before conversion
CJC SW	Enable/disable the cold junction compensation
Status	Analog input status Green ON: Normal input Red ON: Abnormal input (out of range)
Burnout Type	Burnout protection action
Filter Time Const.	Filter's time constant
Trigger Input	Trigger input status

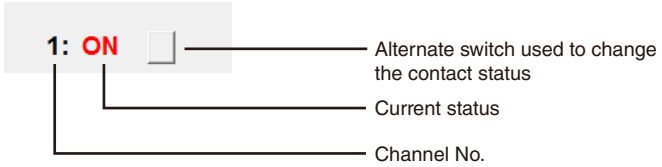
3.2 R1M-J3



Item	Function
Ch. No.	Channel No.
Input Type	Input Type
Input Real	Input value in engineering unit
Raw Input	Input voltage or resistance before conversion
Status	Analog input status Green ON: Normal input Red ON: Abnormal input (out of range)
Burnout Type	Burnout protection action
Filter Time Const.	Filter's time constant
Trigger Input	Trigger input status

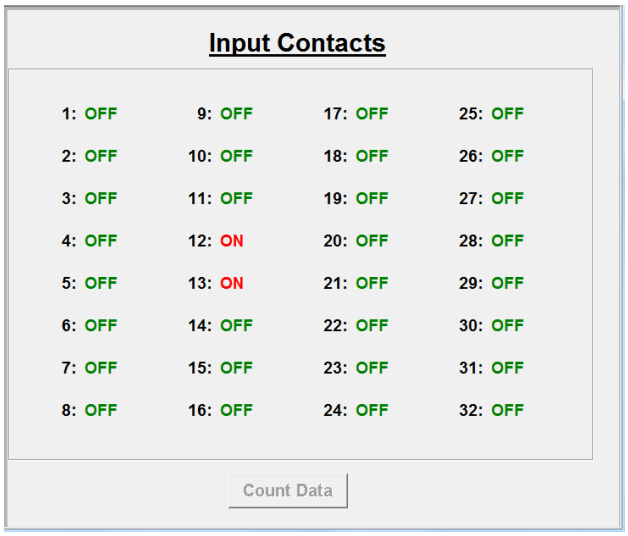
3.3 R1M-D1

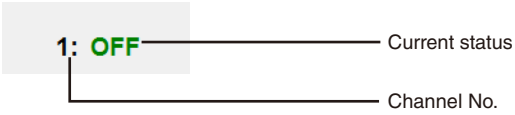




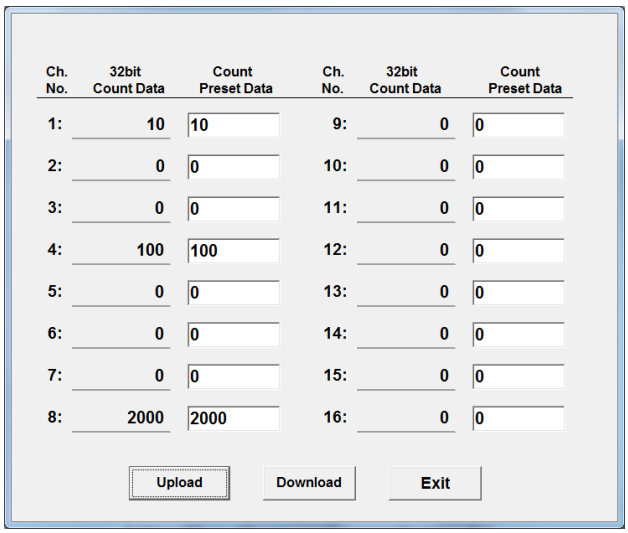
3.4 R1M-A1

■ Versions earlier than 3.0





■ Ver. 3.0 or later versions

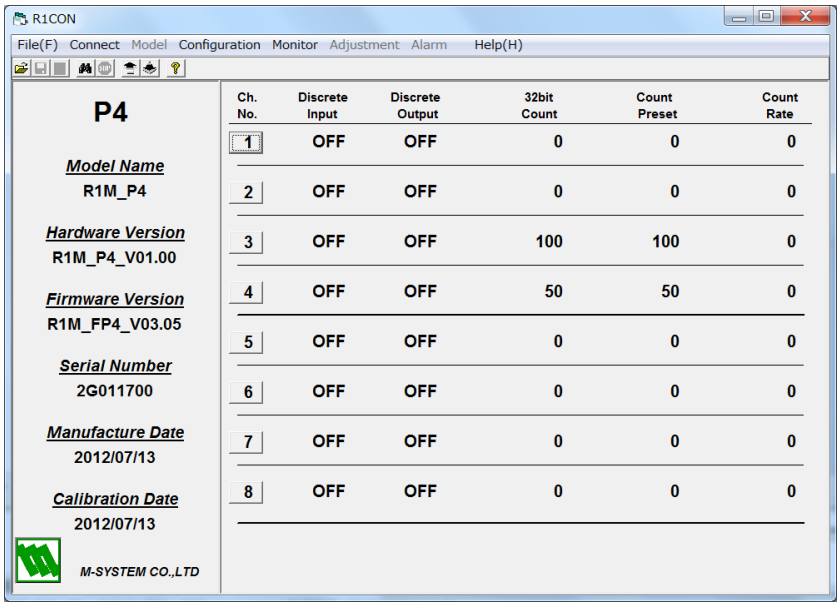


<Upload> button Upload the current setting for the R1x module to the window.
<Download> button Download the setting on the current display to the R1x module.
<Exit> button Close the window.

Item	Function
Ch. No.	Channel No., 1 through 16
32 bit Count Data	Totalized count, 0 to 999 999 999
Count Preset Data	Counter's preset count, 0 to 999 999 999

3.5 R1M-P4

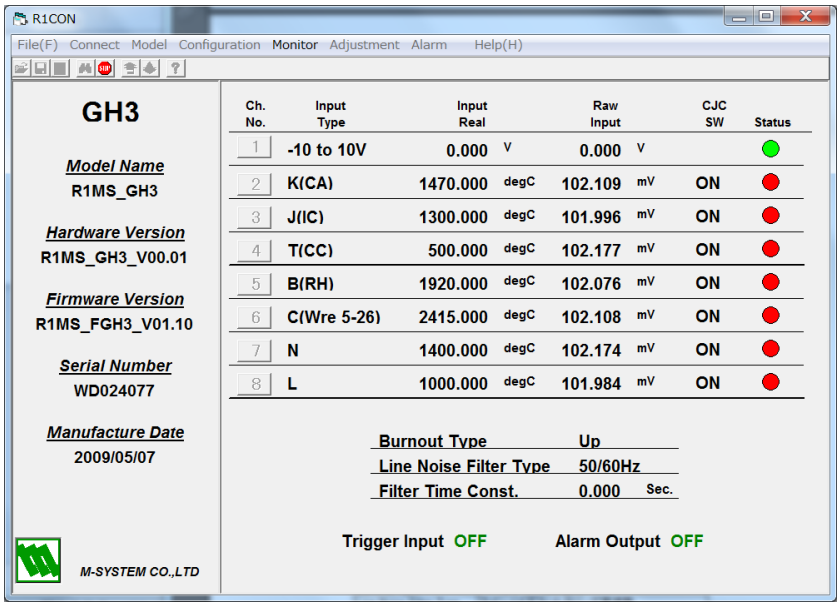
Pulse channel inputs (channel numbers A through D) are not available on this window.



Item	Function
Ch. No.	Channel No., 1 through 16
Discrete Input	Discrete input status
Discrete Output	Discrete output status
32 bit Count	Totalized count
Count Preset	Counter's preset count
Count Rate	Counter's momentary value

3.6 R1MS-GH3

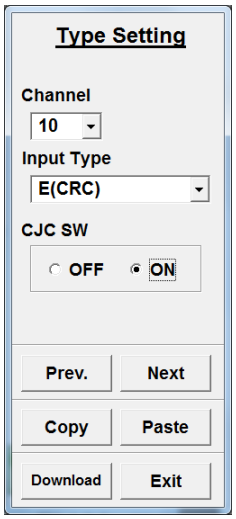
In order to be able to use the R1CON to change the R1MS-GH3 setting, be sure to set the operating mode setting, rotary switch located at the rear of the unit, to '0.'



Item	Function
Ch. No.	Channel No.
Input Type	Input Type
Input Real	Input value in engineering unit
Raw Input	Input voltage or resistance before conversion
CJC SW	Enable/disable the cold junction compensation
Status	Analog input status Green ON: Normal input Red ON: Abnormal input (out of range)
Burnout Type	Burnout protection action
Line Noise Filter Type	Filtering frequency for the line noise filter
Filter Time Const.	Filter's time constant
Trigger Input	Trigger input status
Alarm Output	Alarm output status

4. CONFIGURATION SUB-WINDOWS

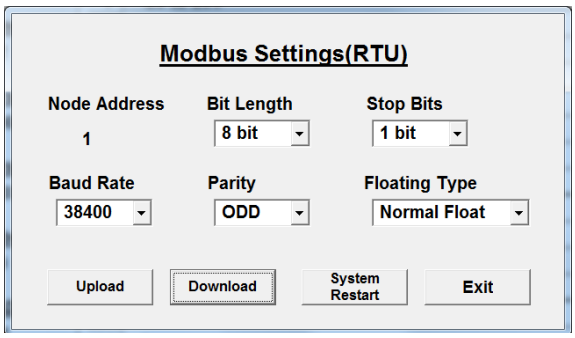
4.1 TYPE SETTING



<Prev.> button	Move to the previous channel.
<Next> button	Move to the next channel.
<Copy> button	Copy the setting on the current display.
<Paste> button	Paste the copied setting.
<Download> button	Download the setting on the current display to the R1x module.
<Exit> button	Close the window without downloading the current setting.

Item	Function	Selections for GH2	Selections for J3	Selections for GH3
Channel	Channel No.	1 to 16	1 to 8	1 to 8
Input Type	Input type	-20 to 20 V	JPt 100 (JIS '89)	-10 to 10 V
		-5 to 5 V	Pt 100 (JIS '89)	
		-1 to 1 V	Pt 100 (JIS '97, IEC)	
		-800 to 800 mV	Pt 50 (JIS '81)	
		-200 to 200 mV	Ni 508.4	
		-50 to 50 mV	Pt 1000	
		-10 to 10 mV		
		(PR)	0 to 100 ohms	(PR)
		K (CA)	0 to 500 ohms	K (CA)
		E (CRC)	0 to 1k ohms	E (CRC)
		J (IC)	0 to 10k ohms	J (IC)
		T (CC)		T (CC)
		B (RH)		B (RH)
		R		R
		S		S
		C (Wre 5-26)		C (Wre 5-26)
		N		N
		U		U
		L		L
		P (Platinel II)		P (Platinel II)
CJC SW	Enable/disable CJC	ON or OFF		ON or OFF

4.2 MODBUS SETTINGS (RTU)



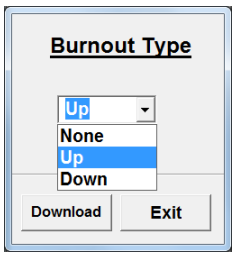
Item	Selection
Node Address	Displaying the current node address setting.
Baud Rate	9600 / 19200 / 38400 (*)
Bit Length	8 bit
Parity	NONE / ODD (*) / EVEN
Stop Bits	1 bit (*) / 2 bit
Floating Type	Normal Float (*) / Swapped Float

With the model R1C and R1D, Modbus setting is not necessary.

Do not operate Modbus settings (Upload, Download, and System Restart).

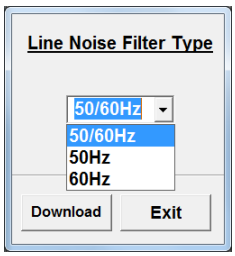
* Factory default setting

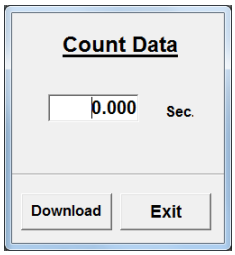
4.3 BURNOUT TYPE



Selection	Function
Up	Upscale burnout
Down	Downscale burnout
None	No burnout

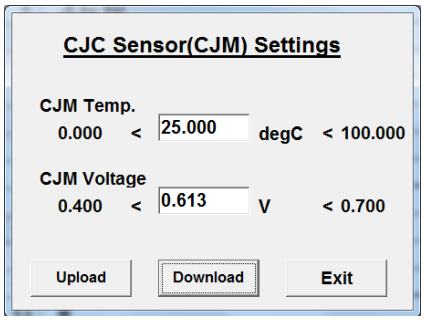
4.4 COUNT DATA





<Download> button Download the setting on the current display to the R1x module.
<Exit> button Close the window without downloading the current setting.

Item	Selection
Count Data	0.1 to 500 seconds



CAUTION !
Filter time constant is not available for the R1M-GH2 or -J3, R1C-GH2, Ver. 2.01 or earlier versions.

4.5 LINE NOISE FILTER TYPE

<Upload> button Upload the current setting for the R1x module to the window.
<Download> button Download the setting on the current display to the R1x module.
<Exit> button Close the window without downloading the current setting.

Selection	Function
50 Hz	50 Hz mode
60 Hz	60 Hz mode
50/60 Hz	50/60 Hz mode

4.6 CJC SENSOR (CJM) SETTINGS

This setting is used only when replacing the CJC sensor. DO NOT change this setting when you have the CJC sensor originally calibrated at the factory and attached to the product.

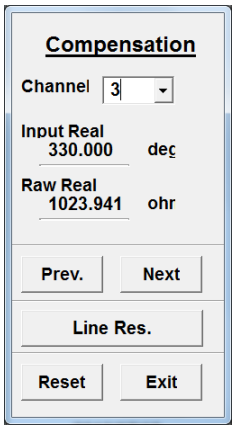
<Download> button Download the setting on the current display to the R1x module.
<Exit> button Close the window without downloading the current setting.

Item	Function
CJM Temp.	Reference junction temperature in °C
CJM Voltage	Reference junction voltage (V)

4.7 LEADWIRE RESISTANCE COMPENSATION

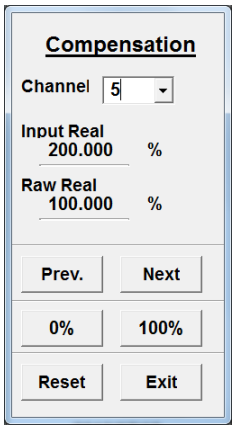
RTD

Shortcircuit the leadwires when conducting the leadwire resistance compensation for an RTD.



POTENTIOMETER

Set the potentiometer at 0% for 0% compensation, at 100% for 100% compensation.



<Prev.> button	Move to the previous channel.
<Next> button	Move to the next channel.
<Line Res.> button	Requesting resistance compensation for the RTD.
<0%> button	Requesting resistance compensation of 0% value for the potentiometer.
<100%> button	Requesting resistance compensation of 100% value for the potentiometer.
<Reset> button	Reset the compensation value.
<Exit> button	Close the window without downloading the current setting.

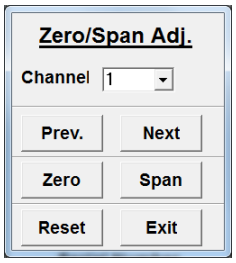
Item	Function
Channel	Channel No.
Input Real	Input value in engineering unit
Raw Real	Input voltage or resistance before conversion

4.8 ZERO/SPAN ADJUSTMENTS

Zero and span adjustments are available independently for each channel. First set Zero and go to Span. <Reset> button clears both of zero and span adjustments automatically.

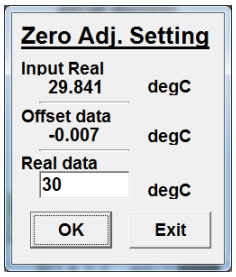
CAUTION !
If you have changed the Input Type for a channel, the zero and span adjustments for this channel are reset.

■ ZERO/SPAN



<Prev.> button	Move to the previous channel.
<Next> button	Move to the next channel.
<Zero> button	Open the Zero Adjustment window.
<Span> button	Open the Span Adjustment window.
<Reset> button	Reset the current zero/span adjustments.
<Exit> button	Close the window without downloading the current setting.

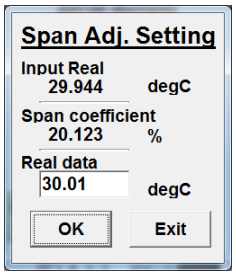
■ ZERO



<OK> button	Apply the zero adjustment data.
<Exit> button	Close the window without downloading the current setting.

Item	Function
Input Real	Input value in engineering unit
Offset data	Offset value of the zero point
Real data	Real value of the zero point

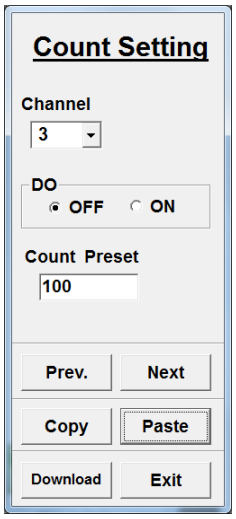
■ SPAN



<OK> button	Apply the span adjustment data.
<Exit> button	Close the window without downloading the current setting.

Item	Function
Input Real	Input value in engineering unit
Span coefficient	Calculated gain
Real data	Real value of the span point

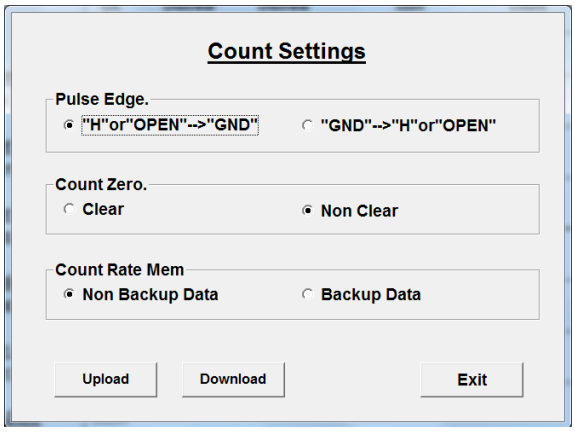
4.9 COUNT SETTING FOR EACH CHANNEL



<Prev.> button	Move to the previous channel.
<Next> button	Move to the next channel.
<Copy> button	Copy the setting on the current display.
<Paste> button	Paste the copied setting.
<Download> button	Download the setting on the current display to the R1x module.
<Exit> button	Close the window without downloading the current setting.

Item	Function & Selection
Channel	Channel No., 1 through 8
DO	Contact output, OFF or ON
Count Preset	Counter's preset count, 0 to 999 999 999

4.10 COUNT SETTING COMMON TO ALL CHANNELS

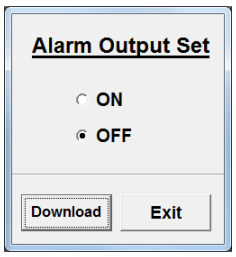


<Upload> button	Upload the current setting for the R1x module to the window.
<Download> button	Download the setting on the current display to the R1x module.
<Exit> button	Close the window without downloading the current setting.

Item	Function
Pulse Edge.	Pulse edge to count
Count Zero.	Clear counters for all channels
Count Rate Mem	Backup memory for momentary values

4.11 ALARM OUTPUT SET

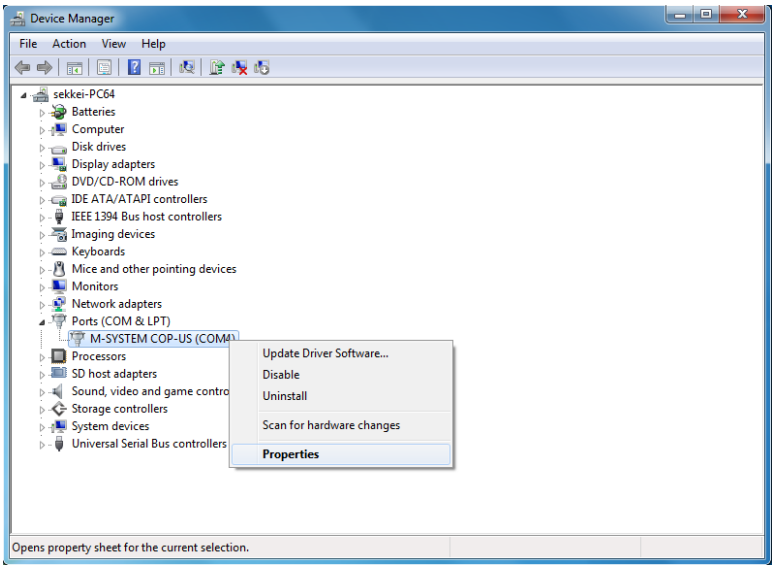
Simulated alarm output for testing purpose is available for the R1MS-GH3.



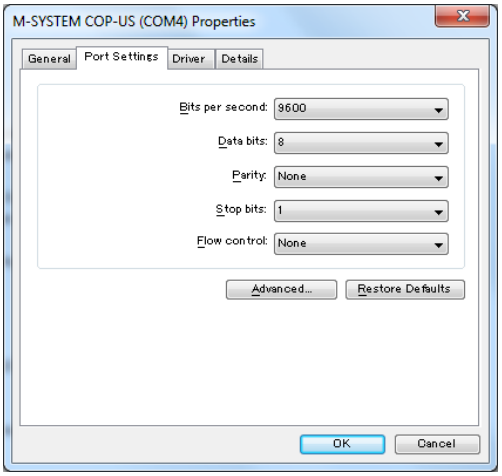
<Download> button Set a simulated alarm output to the R1x module.
<Exit> button Close the window without downloading the current setting.

■ HOW TO CHANGE THE COM PORT NUMBERS

(1) Open Control Panel and double-click System icon and press System Properties in the System dialog box. Choose Hardware tub > Device Manager. (View examples with Windows 7)



(2) Locate the COM port under Port (COM & LPT) of which you wish to change the number and show its properties by clicking it with the right mouse button.



(3) Press Advanced button under Port Setting tub.

(4) Choose a desired COM Port number and press OK.