

**Remote I/O R6 Series**

**PC CONFIGURATOR SOFTWARE**

**Model: R6CON Ver. 1.5**

**Users Manual**

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# 1. INTRODUCTION

## 1.1 GENERAL DESCRIPTION

M-System R6CON is used to program parameters for the Network and I/O Modules of the R6 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 R6CON is applicable to the following products:

Function	Model No.	Version
Modbus Interface Module (for 32-point analog signals)	R6-NM1	1.0
Modbus Interface Module (for 64-point analog signals)	R6-NM2	1.2
Ethernet Interface Module (Modbus/TCP, for 32-point analog signals)	R6-NE1	1.0
Ethernet Interface Module (Modbus/TCP, for 64-point analog signals)	R6-NE2	1.2
CC-Link Interface Module	R6-NC1	1.1
CC-Link Interface Module	R6-NC3	1.3
	R6-NC3/W	1.3
DeviceNet Interface Module	R6-ND1	1.1
T-Link Interface Module (Fuji Electric T-Link use)	R6-NF1	1.2
Profibus-DP Interface Module	R6-NP1	1.4
DC Voltage Input Module, 2 points	R6x-SV2	1.0
DC Current Input Module, 2 points	R6x-SS2	1.0
4 – 20 mA Input Module with 2-wire transmitter excitation	R6x-DS1	1.3
DC Voltage Output Module, 2 points	R6x-YV2	1.0
DC Current Output Module, 2 points	R6x-YS2	1.0
Discrete Input Module, 4 points	R6x-DA4	1.0
Transistor Output Module, 4 points	R6x-DC4A	1.0
	R6x-DC4B	
RTD Input Module	R6x-RS2	1.1
Thermocouple Input Module	R6x-TS2	1.1
Thermocouple Input Module, high-accuracy	R6x-TS2A	1.5

The lowest software version applicable to each hardware model is indicated in the above table. Confirm that the software you have is compatible with the hardware you have.

The latest version of the R6CON is downloadable at M-System's web site ([www.m-system.co.jp](http://www.m-system.co.jp)) if you need higher version software.

### 1.3 PC REQUIREMENTS

The following PC performance is required for adequate operation of the R6CON.

<b>PC</b>	IBM PC compatible
<b>OS</b>	Windows 7 (32 bits, 64 bits), Windows 8 (32 bits, 64 bits), Windows 10 (32 bits, 64 bits) The software may not operate adequately in certain conditions.
<b>CPU</b>	Must meet the relevant Windows' requirements.
<b>Memory</b>	Must meet the relevant Windows' requirements.
<b>Network port</b>	COM1 through COM16

**Note 1:** Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and other countries.

**Note 2:** The operation on a touch screen is not supported.

One of the following PC Configurator Cables is also required to connect the device to the PC.

<b>Port</b>	PC Configurator Cable Model
<b>RS-232-C</b>	MCN-CON
<b>USB</b>	COP-US

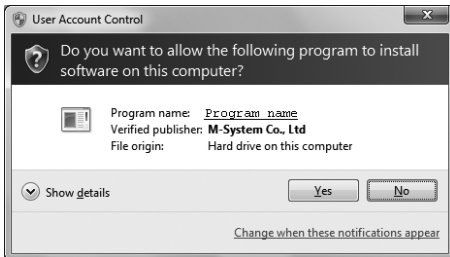
### 1.4 INSTALLING & DELETING THE PROGRAM

#### • INSTALL

The program is provided as compressed archive. Decompress the archive and execute 'setup.msi' to start up the R6CON installer program. Follow instructions on the Windows.

For Windows 7, log on as administrator but you still need to clarify your administrative right before proceeding. When User Account Control window appears, choose 'Yes' on Windows 7.

Windows 7 / 8



'R6CON' is displayed instead of 'Program name'.

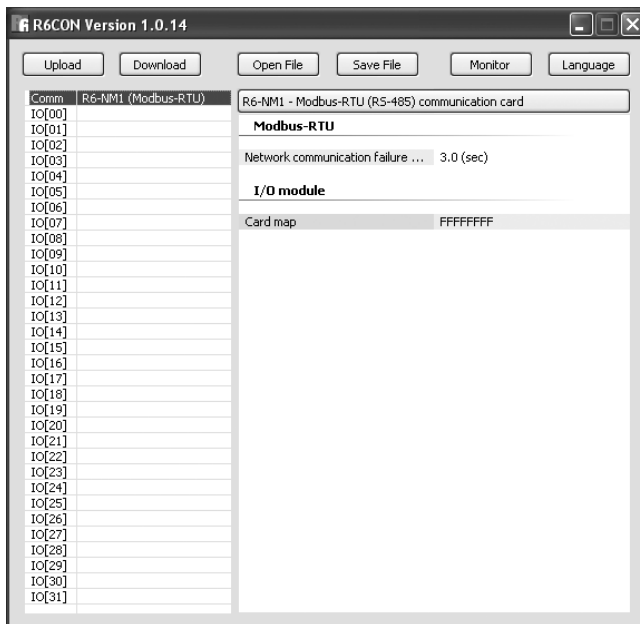
#### • DELETE

Open Control Panel > Add/Remove Programs. Select the R6CON from the program list and click Delete button.

## 2. GETTING STARTED

### 2.1 STARTING THE R6CON

Open the R6CON program on the Windows PC. The following window appears on the screen.

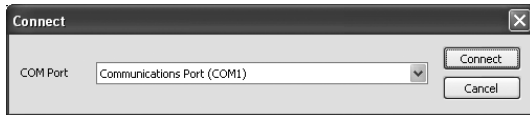


## 2.2 MODIFYING PARAMETERS

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

### 2.2.1. READING PRESENT PARAMETERS (UPLOAD)

- 1) Click [Upload] button at the top of the window.
- 2) Choose the COM port number to which the device is to be connected.



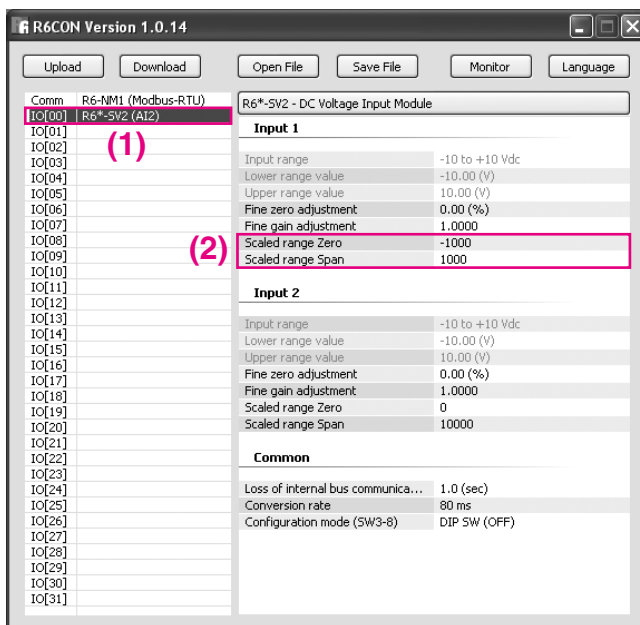
- 3) Connect the device to the PC's COM port with the PC Configurator Cable and click [Connect] button. If an error message appears, confirm the hardware connection and the setting again before retrying.
- 4) The device's present parameters are uploaded and shown on the screen.

### 2.2.2. MODIFICATION EXAMPLE

The initial view is composed of the R6 module configuration to the left and the parameters of the selected module to the right.

The example below shows the R6-NM1 Network Module and the R6x-SV2 DC Voltage Input Module (Address 0).

In order to change the scaled range of the DC voltage input, (1) Choose 'R6\*-SV2 (AI2),' and (2) Enter new values at 'Scaled range Zero' and 'Scaled range Span.'



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

### 2.2.3. WRITING NEW PARAMETERS (DOWNLOAD)

- 1) Click [Download] button at the top of the window.
- 2) Choose the COM port number to which the device is connected.
- 3) Confirm the connection and click [Connect] button.
- 4) When the indicator showing progress of the download reaches the right end without showing any error message, the device configuration is correctly updated and immediately valid.

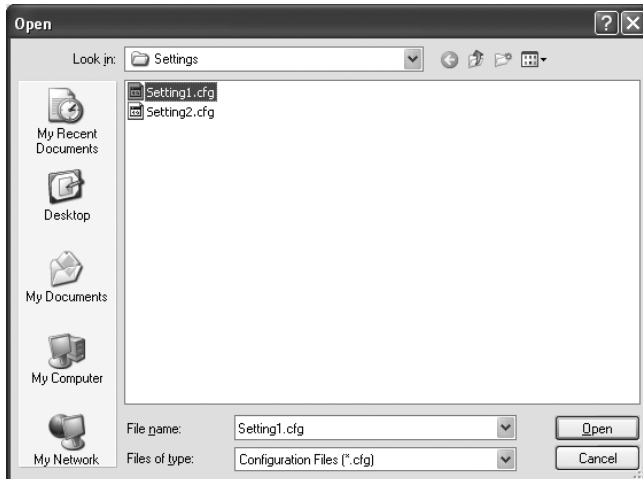
## 2.3 SAVING & READING PARAMETERS IN A FILE

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

### 2.3.1. READING PARAMETERS SAVED AS FILE

Clicking [Open File] calls up the Windows-standard Open dialog box. Select a parameter file to show a stored parameter setting.

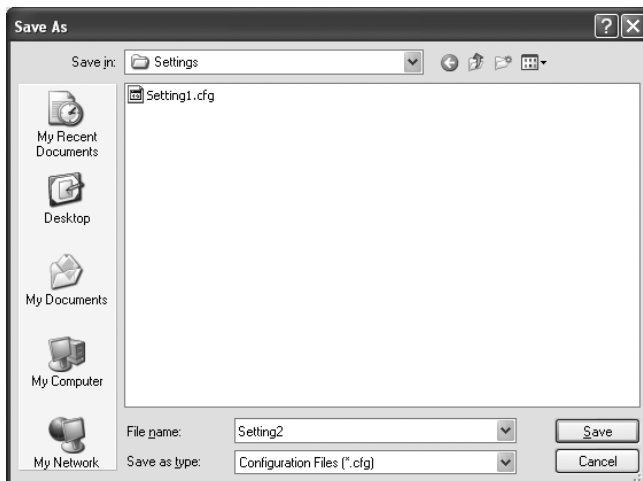
In order to download the parameters to the connected device, click [Download] button.



### 2.3.2. SAVING PARAMETERS IN A FILE

Clicking [Save File] calls up the Windows-standard Save As dialog box. Enter a desired file name to File Name field and click [Save] to store a parameter setting.

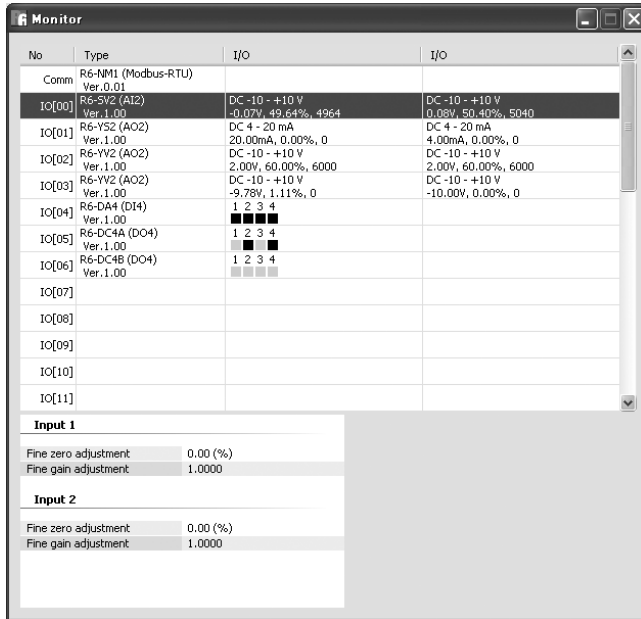
In order to save the parameters of the connected device, click [Upload] first and then save them as a file.



## 2.4 MONITORING I/O STATUS

The Monitoring function is used to show each I/O status on the window and conduct fine adjustments when applicable.

Click [Monitor] button to open the COM Port dialog box. Specify the COM port and click [Connect] to open the COM port. When the communication is established, the following window appears on the screen.



The top half of the window shows the types of modules mounted to the base, followed by each I/O status.

Some of the I/O modules have fine adjustment capabilities. The adjustments are conducted by monitoring actual status and entering calibration values in the tables shown at the bottom half of the window.

## 2.5 SWITCHING LANGUAGE

Clicking [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

#### 3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE

Parameter	Factory Setting
Communication Failure Detection Time	3.0 (sec.)
Card map	FFFFFFFF

• **COMMUNICATION FAILURE DETECTION TIME**

When there is no communication with the host device for the specified time period, the RUN contact opens across the terminals 2 – 3 on the Power Supply Module as an abnormal communication status.

Selectable between 0.0 and 3200.0 seconds.

• **CARD MAP (ACTIVE MODULE MAP)**

Between each cycle of I/O data exchange, the network module provides also 'Active Module Map,' indicating the slots where I/O modules are mounted on the base.

The scanning takes only several milliseconds\* every time, which is short enough not to affect the overall scan cycles. It is usually not necessary to change the value from its factory setting.

\* 2 milliseconds per cycle [Number of I/O modules x 2 (ms)]

On the other hand, the total processing time can be trimmed to a peak efficiency by pre-defining the map using the R6CON so that the procedure is skipped as far as all mounted I/O modules are functioning properly.

The map data is composed of a 32-bit hexadecimal (00000000 to FFFFFFFF). Each bit indicates the corresponding slot (module address) is occupied (data = 1) or not (data = 0). The LSB is allotted to the address 0 slot, while the MSB is allotted to the address 31 slot.

For example, the map data 0000FFFF means that only the address 0 through 15 modules are used, while the address 16 through 31 are not necessary to be scanned.

## 3.2 R6-NE1 / R6-NE2 – Ethernet (Modbus/TCP) INTERFACE MODULE

Parameter	Factory Setting
Communication Failure Detection Time	3.0 (sec.)
IP address	192.168.0.1
Port 1	502
Port 2	502
Port 3	502
Port 4	502
TCP connection close time 1	180.0 (sec.)
TCP connection close time 2	180.0 (sec.)
TCP connection close time 3	180.0 (sec.)
TCP connection close time 4	180.0 (sec.)
Card map	FFFFFFFF

### • COMMUNICATION FAILURE DETECTION TIME

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

### • IP ADDRESS

Specify the IP address of the Network Module.

### • PORT NUMBER

Specify the port numbers to accept the Modbus/TCP connection. The R6-NE1 can use at the maximum of four (4) ports at once.

The Modbus/TCP standard port number, 502, is set to all four ports as default. A new port number to all ports or independent port numbers to each port can be specified if required by the host device. Do not change this standard port number unless it is necessary.

### • TCP CONNECTION CLOSE TIME

If the TCP connection is severed without closing the port in normal procedures, the port remains unavailable unless it is specifically re-opened. The TCP connection close time specifies the time to wait until such abnormal port is forcibly closed to be automatically re-opened again.

Specify between 1.0 and 3200.0 seconds.

### • CARD MAP (ACTIVE MODULE MAP)

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

### 3.3 R6-NC1 / R6-NC3 – CC-Link INTERFACE MODULE

Parameter	Factory Setting
Communication Failure Detection Time	3.0 (sec.)
Card map	FFFFFFFF

- **COMMUNICATION FAILURE DETECTION TIME**

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

- **CARD MAP (ACTIVE MODULE MAP)**

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

### 3.4 R6-NC3/W – CC-Link INTERFACE MODULE

Parameter	Factory Setting
Communication Failure Detection Time	3.0 (sec.)
Main-operation Restart Delay Time	0 (msec.)
Card map	0 – 31

- **COMMUNICATION FAILURE DETECTION TIME**

Refer to Section 3.1 on page 9. However, the range is selectable between 0.3 and 3200.0 sec. for the R6-NC3/W. The range of 0.2 is unable.

- **MAIN-OPERATION RESTART DELAY TIME**

Install 2 interface modules on 1 base with the dual system.

One of them operates as main network and the other as sub network. The signal to the output module is adopted from the module operating as main.

If there is any error occurring on the network via the main module, the network is removed from the R6 communication and control system, then the main-operation sending the signal to the output module is taken over by the sub network module. Once the error is solved, the main network module takes over the main-operation.

This module enables the configuration of the delay time, between the error solving and the signal sending restart. The configuration range is within 0 – 32000 msec.

- **CARD MAP**

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

### 3.5 R6-ND1 – DeviceNet INTERFACE MODULE

Parameter	Factory Setting
Card map	0 to 31

- **CARD MAP**

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

### 3.6 R6-NF1 – T-Link INTERFACE MODULE (Fuji Electric T-Link use)

Parameter	Factory Setting
Communication Failure Detection Time	3.0 (sec.)
Card map	FFFFFFFF

- **COMMUNICATION FAILURE DETECTION TIME**

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

- **CARD MAP (ACTIVE MODULE MAP)**

Refer to “3.1 R6-NM1 / R6-NM2 – Modbus INTERFACE MODULE” on page 9

### 3.7 R6-NP1 – Profibus-DP INTERFACE MODULE

Parameter	Factory Setting
Card map	1 to 31

- **CARD MAP**

Refer to Section 3.1 on page 9, except for the Address 0 to which I/O modules can not be mapped.

### 3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE

Parameter	R6x-SV2 Factory Setting	R6x-SS2 Factory Setting
Input range	-10 to +10 (V DC)	-40 to +40 (mA DC)
Lower range value	-10.00 (V)	4.00 (mA)
Upper range value	10.00 (V)	20.00 (mA)
Fine zero adjustment	0.00 (%)	0.00 (%)
Fine gain adjustment	1.0000	1.0000
Scaled range Zero	0	0
Scaled range Span	10000	10000
Loss of internal bus communication detection time	1.0 (sec.)	1.0 (sec.)
Conversion rate	80 (msec.)	80 (msec.)
Configuration mode (SW3-8)	DIP switch (OFF)	DIP switch (OFF)

#### • INPUT RANGE / LOWER RANGE VALUE / UPPER RANGE VALUE

Choose an approximate input range first and then specify the exact lower and upper range values within the following ranges:

Type	Input Range	Available Lower / Upper Range
R6-SV2	-10 to +10 V DC	-10.00 to +10.00 V
	-1 to +1 V DC	-1.00 to +1.00 V
R6-SS2	-40 to +40 mA DC	-40.00 to +40.00 mA
	-1 to +1 mA DC	-1.00 to +1.00 mA

These parameters can be changed on the R6CON only when the specified module is set to PC Configuration Mode (SW3-8 set to ON) both by the hardware DIP switch and by the R6CON program.

#### • FINE ZERO ADJUSTMENT / FINE GAIN ADJUSTMENT

A field input signal is converted into a digital value of 0.00 to 100.00% proportional to the specified lower/upper range. The fine zero and gain adjustments are applied to this value using the following equation:

$$\text{Calibrated value \%} = [\text{Non-calibrated value}] \times [\text{Fine gain adjustment}] + [\text{Fine zero adjustment}]$$

Specify the zero between -320.00 and +320.00%, and the gain between -3.2000 and +3.2000.

#### • SCALED RANGE ZERO / SCALED RANGE SPAN

The calibrated input value (after fine zero/gain adjustments) is then converted into the specified scaled range value, which is supplied to the Network Module and then read out by the host device.

Specify between -32000 and +32000.

#### • LOSS OF INTERNAL BUS COMMUNICATION DETECTION TIME

The host communications are monitored by the Network Module as far as it is functioning normally. If the communication is lost, I/O modules proceed accordingly upon notified by the Network Module through the internal bus.

This means the I/O modules cannot detect host communication errors if the Network Module is removed.

In order to ensure adequate I/O functions in such events, the I/O modules can be set with an independent 'Loss of Communication Detection' time to detect errors of the internal bus communication with the Network Module.

Specify between 0.0 and 99.9 seconds. The function is cancelled when it is set to 0.0.

#### • CONVERSION RATE

Choose one of the input signal conversion rates among: 10, 20, 40 and 80 milliseconds.

Higher is the rate, lower is the conversion accuracy.

#### • CONFIGURATION MODE

Some of the I/O module parameters can be specified both by the hardware DIP switch and by the R6CON program.

When you set these parameters using the R6CON program, be sure to set the SW3-8 to ON position and specify PC Configuration Mode on the R6CON.

This setting is provided to double-check that the hardware DIP switch is correctly set as the user has intended. If they do not match, the R6CON alerts it and aborts the process when you try to download parameters to the module.

### 3.9 R6x-DS1 – 4 – 20 mA INPUT WITH 2-WIRE TRANSMITTER EXCITATION

Parameter	Factory Setting
Lower Range Value	4.00 (mA)
Upper Range Value	20.00 (mA)
Fine Zero Adjustment	0.00 (%)
Fine Gain adjustment	1.0000
Scaled range Zero	0
Scaled range Span	10000
Loss of internal bus communication detection time	1.0 (sec.)
Conversion Rate	80 (msec.)
Configuration mode (SW3-8)	DIP switch (OFF)

#### • FINE ZERO/GAIN ADJUSTMENTS

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

#### • SCALED RANGE ZERO/SPAN

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

#### • LOSS OF INTERNAL BUS COMMUNICATION DETECTION TIME

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

#### • CONVERSION RATE

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

#### • CONFIGURATION MODE (SW3-8)

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

### 3.10 R6x-YV2 – DC VOLTAGE OUTPUT MODULE / R6x-YS2 – DC CURRENT OUTPUT MODULE

Parameter	R6x-YV2 Factory Setting	R6x-YS2 Factory Setting
Output range	-10 to +10 (V DC)	4-20 (mA DC)
Lower range value	-10.00 (V)	4.00 (mA)
Upper range value	10.00 (V)	20.00 (mA)
Fine zero adjustment	0.00 (%)	0.00 (%)
Fine gain adjustment	1.0000	1.0000
Scaled range Zero	0	0
Scaled range Span	10000	10000
Initial output at the startup (scaled range)	0	0
Fixed output at the loss of communication (scaled range)	-1500	-1500
Loss of internal bus communication detection time	1.0 (sec.)	1.0 (sec.)
Output function at the loss of communication	Hold the last normally received data	Hold the last normally received data
Configuration mode (SW3-8)	DIP switch (OFF)	DIP switch (OFF)

#### • OUTPUT RANGE / LOWER RANGE VALUE / UPPER RANGE VALUE

Choose an approximate output range first and then specify the exact lower and upper range values within the following ranges:

Type	Output Range	Available Lower / Upper Range
R6-YV2	-10 to +10 V DC	-10.00 to +10.00 V
	-1 to +1 V DC	-1.00 to +1.00 V
R6-YS2	4-20 mA DC	4.00 to 20.00 mA

These parameters can be changed on the R6CON only when the specified module is set to PC Configuration Mode (SW3-8 set to ON) both by the hardware DIP switch and by the R6CON program.

#### • FINE ZERO ADJUSTMENT / FINE GAIN ADJUSTMENT

The fine zero and gain adjustments are applied to a digital value of 0.00 to 100.00%, converted from the scaled range signal, using the following equation:

$$\text{Calibrated value \%} = [\text{Non-calibrated value}] \times [\text{Fine gain adjustment}] + [\text{Fine zero adjustment}]$$

Specify the zero between -320.00 and +320.00%, and the gain between -3.2000 and +3.2000.

#### • SCALED RANGE ZERO / SCALED RANGE SPAN

Specify the scaled range of the output data supplied through the Network Module, between -32000 and +32000.

#### • INITIAL OUTPUT AT THE STARTUP

The output module fixes its output signals at a specific value until data is received from the host network.

Specify a scaled range value between -32000 and +32000.

#### • FIXED OUTPUT AT THE LOSS OF COMMUNICATION

The output signals can be fixed at a specific value when a loss of communication is detected.

Specify a scaled range value between -32000 and +32000.

This setting is valid only when 'Fixed output as specified' is selected for 'Output function at the loss of communication' setting.

#### • LOSS OF INTERNAL BUS COMMUNICATION DETECTION TIME

Refer to "3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE" on page 13

#### • OUTPUT FUNCTION AT THE LOSS OF COMMUNICATION

Specify the output module's function among the following when no output data is received from the network due to a loss of communication:

Hold the last normally received data

Fixed output as specified

#### • CONFIGURATION MODE

Refer to "3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE" on page 13

### 3.11 R6x-DA4 – DISCRETE INPUT MODULE

Parameter	Factory Setting
Loss of internal bus communication detection time	1.0 (sec.)
Sampling cycle	10 (msec.)

#### • LOSS OF INTERNAL BUS COMMUNICATION DETECTION TIME

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

#### • SAMPLING CYCLE

Choose one of the input signal conversion rates among: 1, 5, 10, 20, 50, 70, 100 and 200 milliseconds.

### 3.12 R6x-DC4A / R6x-DC4B – TRANSISTOR OUTPUT MODULE

Parameter	Factory Setting
Initial output at the startup	0000
Loss of internal bus communication detection time	1.0 (sec.)
Output function at the loss of communication	Hold the last normally received data
Configuration mode (SW3-8)	DIP switch (OFF)

#### • INITIAL OUTPUT AT THE STARTUP

The output module fixes its output signals at a specific state until data is received from the host network.

The data is composed of a hexadecimal (0000 to 000f). Each bit indicates the corresponding output channel is ON (data = 1) or OFF (data = 0). The LSB is allotted to Output 1, while the MSB is allotted to Output 4.

For example, the data 0003 means that Outputs 1 and 3 are fixed at ON while 2 and 4 are at OFF at the startup.

#### • LOSS OF INTERNAL BUS COMMUNICATION DETECTION TIME

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

#### • OUTPUT FUNCTION AT THE LOSS OF COMMUNICATION

Specify the output module's function among the following when no output data is received from the network due to a loss of communication:

Hold the last normally received data

Fix at OFF

#### • CONFIGURATION MODE

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13



### 3.13 R6x-RS2 – RTD INPUT MODULE / R6x-TS2 and R6x-TS2A – THERMOCOUPLE INPUT MODULE

Parameter	R6x-RS2 Factory Setting	R6x-TS2 Factory Setting
Sensor type	Pt100 (JIS'97,IEC)	K (CA)
Lower range value	0.00 (degC)	0.00 (degC)
Upper range value	0.00 (degC)	0.00 (degC)
Fine zero adjustment	0.00 (%)	0.00 (%)
Fine gain adjustment	1.0000	1.0000
Scaled range Zero	0	0
Scaled range Span	10000	10000
Burnout	Upscale	Upscale
Loss of internal bus communication detection time	1.0 sec.	1.0 (sec.)
Conversion rate	500 msec.	500 (msec.)
Temperature unit	degC	degC
CJC	-	ON
Limit	-15 to +115 (%)	-15 to +115 (%)
Configuration mode (SW3-8)	DIP switch (OFF)	DIP switch (OFF)

#### • SENSOR TYPE / LOWER RANGE VALUE / UPPER RANGE VALUE

Choose a sensor type and specify the exact lower range value and upper range value according to the tables shown in the next page.

When both the lower range value and the upper range value are set to 0.00, fine adjustment is not necessary, 10 times of temperature value will be transmitted to the host device (Fahrenheit temperature value will be transmitted by the same value).

These parameters can be changed only when the specified module is set to PC Configuration Mode (SW3-8 is set to ON) by both the hardware DIP switch and the R6CON software. When SW3-8 is set to OFF, the sensor works without scaling.

For some special sensors with specified specifications, the factory settings are based on the customer's requests. Please don't make these settings for standard products. R6x-RS2 SENSOR TYPE AND AVAILABLE TEMPERATURE RANGE

• **R6x-RS2 SENSOR TYPE AND AVAILABLE TEMPERATURE RANGE**

SENSOR TYPE	AVAILABLE TEMPERATURE RANGE		
	Centigrade (degC)	Fahrenheit (degF)	Absolute (K)
Pt100 (JIS'97,IEC)	-240.00 to +900.00	-400.00 to +1652.00	33.15 to 1173.15
Pt100 (JIS'89)	-240.00 to +900.00	-400.00 to +1652.00	33.15 to 1173.15
JPt100 (JIS'89)	-236.00 to +560.00	-392.80 to +1040.00	37.15 to 833.15
Pt50 (JIS'81)	-236.00 to +700.00	-392.80 to +1292.00	37.15 to 973.15
Ni100	-100.00 to +252.00	-148.00 to +485.60	173.15 to 525.15
Cu10	-212.00 to +312.00	-349.60 to +593.60	61.15 to 585.15
Cu50	-100.00 to +200.00	-148.00 to +392.00	173.15 to 473.15
Special sensor*	-273.00 to +3000.00	-459.40 to +5432.00	0.15 to 3273.15

• **R6x-TS2 SENSOR TYPE AND AVAILABLE TEMPERATURE RANGE**

SENSOR TYPE	AVAILABLE TEMPERATURE RANGE		
	Centigrade (degC)	Fahrenheit (degF)	Absolute (K)
K (CA)	-272.00 to +1472.00	-457.60 to +2681.60	1.15 to 1745.15
E (CRC)	-272.00 to +1100.00	-457.60 to +2012.00	1.15 to 1373.15
J (IC)	-260.00 to +1300.00	-436.00 to +2372.00	13.15 to 1573.15
T (CC)	-272.00 to +500.00	-457.60 to +932.00	1.15 to 773.15
B (RH)	24.00 to +1920.00	75.20 to +3488.00	297.15 to 2193.15
R	-100.00 to +1860.00	-148.00 to +3380.00	173.15 to 2133.15
S	-100.00 to +1860.00	-148.00 to +3380.00	173.15 to 2133.15
C (WRe5-26)	-52.00 to +2416.00	-61.60 to +4380.80	221.15 to 2689.15
N	-272.00 to +1400.00	-457.60 to +2552.00	1.15 to 1673.15
U	-252.00 to +700.00	-421.60 to +1292.00	21.15 to 973.15
L	-252.00 to +1000.00	-421.60 to +1832.00	21.15 to 1273.15
P (Platinel II)	-52.00 to +1496.00	-61.60 to +2724.80	221.15 to 1769.15
(PR)	-52.00 to +1860.00	-61.60 to +3380.00	221.15 to 2133.15
Special sensor*	-273.00 to +3000.00	-459.40 to +5432.00	0.15 to 3273.15

\* Basically the temperature of a special sensor can be designated within the ranges showed in the tables. Based on the special sensor's features designated by users, the usable temperature ranges can be different. Please choose the correct temperature ranges which match the sensor's features.

• **FINE ZERO ADJUSTMENT / FINE GAIN ADJUSTMENT**

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

• **SCALED RANGE ZERO / SCALED RANGE SPAN**

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

• **BURNOUT**

When the sensor is detected a burnout, the output can be specified to go upscale or downscale. Please choose the burnout type you want, Upscale or Downscale.

When Upscale or Downscale is selected, Lower range value, Upper range value and Limit are transmitted to the host device as follows.

	Both Lower range value and Upper range value are 0.00.	Neither Lower range value nor Upper range value are 0.00.	
		Limit -15 to +115%	Limit Scaled range Zero / Span
Upscale	Upper limit of available temperature range	$(\text{Scaled range Span} - \text{Scaled range Zero}) \times 1.15 + \text{Scaled range Zero}$	Scaled range Span
Downscale	Lower limit of available temperature range	$(\text{Scaled range Span} - \text{Scaled range Zero}) \times (-0.15) + \text{Scaled range Zero}$	Scaled range Zero

• **LOSS OF INTERNAL BUS COMMUNICATION DETECTION TIME**

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13

• **CONVERSION RATE**

Choose one of the input signal conversion rates, 250ms or 500ms.

The higher the rate is, the lower the conversion accuracy is.

• **TEMPERATURE UNIT**

Choose one of the temperature units, degC, degF or K.

• **COLD JUNCTION COMPENSATION**

Choose either ON or OFF for cold junction compensation. When ON is selected, the sensor is specified to measure the cold junction temperature. When OFF is selected, the thermocouple input terminal’s temperature is taken as 0°C and the cold junction compensation is based on this temperature.

• **LIMIT**

Choose one of the following items for the value range you want after scaling.

-15 to +115%

Scaled range Zero / Span

When -15 to +115% is selected, 15% extra range value will be scaled and transmitted to the host device. When Scaled range Zero / Span is selected, there is no 15% extra range in the scaling range.

• **CONFIGURATION MODE**

Refer to “3.8 R6x-SV2 – DC VOLTAGE INPUT MODULE / R6x-SS2 – DC CURRENT INPUT MODULE” on page 13