

**PLUG-IN REMOTE I/O R10 SERIES**  
**PC CONFIGURATOR SOFTWARE**  
**R10CFG**

**USERS MANUAL**

**MSYSTEM**  
M-SYSTEM CO., LTD.

5-2-55, Minamitsumori, Nishinari-ku, Osaka 557-0063 JAPAN  
Tel: +81-6-6659-8201 Fax: +81-6-6659-8510

**<https://www.m-system.co.jp/>**

E-mail: [info@m-system.co.jp](mailto:info@m-system.co.jp)

# CONTENTS

<b>1. INTRODUCTION</b> .....	<b>3</b>
1.1. GENERAL DESCRIPTION.....	3
1.2. APPLICABLE DEVICES.....	3
1.3. PC REQUIREMENTS .....	3
1.4. INSTALLING & UNINSTALLING THE PROGRAM .....	3
<b>2. GETTING STARTED</b> .....	<b>4</b>
2.1. STARTING THE R10CFG.....	4
2.2. OPERATION (common setting for each device).....	4
2.2.1. Upload .....	4
2.2.2. Download .....	4
2.2.3. Save file .....	4
2.2.4. Open file.....	4
2.2.5. Monitor.....	4
<b>3. CONFIGURATION</b> .....	<b>5</b>
3.1. CONFIGURATION FOR R10M-US2 .....	5
3.1.1. Setting items .....	5
3.1.2. Analog 1 Settings.....	6
3.1.3. Modbus setting.....	7
3.2. CONFIGURATION FOR R10M-CT4E .....	8
3.2.1. Setting items .....	8
3.2.2. Analog input setting (input 1 - input 4) .....	8
3.2.3. Modbus setting.....	9
<b>4. MONITOR WINDOW</b> .....	<b>10</b>
4.1. MONITORING R10M-US2.....	10
4.1.1. Device information .....	10
4.1.2. Analog input monitor .....	10
4.1.3. Modbus status.....	10
4.1.4. Operation .....	11
4.2. MONITORING R10M-CT4E .....	11
4.2.1. Device information .....	11
4.2.2. Analog input monitor .....	11
4.2.3. Modbus status.....	11
4.2.4. Operation .....	11

# 1. INTRODUCTION

## 1.1. GENERAL DESCRIPTION

M-System R10CFG is used to program parameters for the plug-in remote I/O R10 series.  
The following major functions are available:

- Editing parameters
- Downloading parameters to the device, uploading parameters from the device
- Saving parameters as files, reading parameters from files
- Confirming operating status
- Restarting the device

## 1.2. APPLICABLE DEVICES

The R10CFG is applicable to the following products:

MODEL	SERIES	FUNCTION	R10CFG VERSION
R10M-US2	R10 Series	Modbus I/O module (2 points universal input)	1.0
R10M-CT4E	R10 Series	Modbus I/O module (4 points, RMS sensing)	1.0

The software version applicable to each device is indicated in the above table.

Confirm that the software you have is compatible with the device you have.

If not in the table, the latest software and operation manual corresponding to your device are downloadable at M-System's web site ([www.m-system.co.jp](http://www.m-system.co.jp)).

## 1.3. PC REQUIREMENTS

The following PC performance is required for adequate operation of the R10CFG.

PC	IBM PC compatible
OS	Windows 8.1 (32 bit / 64 bit, except Windows RT) Windows 10 (32 bit / 64 bit) Note: Not assuring operations in all environments.
CPU	Must meet the relevant Windows' requirements.
Memory	
Communication Port	COM port (RS-232-C) or USB port (COM1 through COM16)

One of the dedicated cables as listed below is required to connect the device to the PC.

Port	PC Configurator Cable Model No.
RS-232-C	MCN-CON
USB	COP-US Note: It is necessary to install the driver software in the PC. The driver software is downloadable at M-System's web site.

## 1.4. INSTALLING & UNINSTALLING THE PROGRAM

### INSTALL

The program is provided as compressed archive.

Decompress the archive and execute "setup.exe" to start up the R10CFG installer program.

Follow instructions on the Windows.

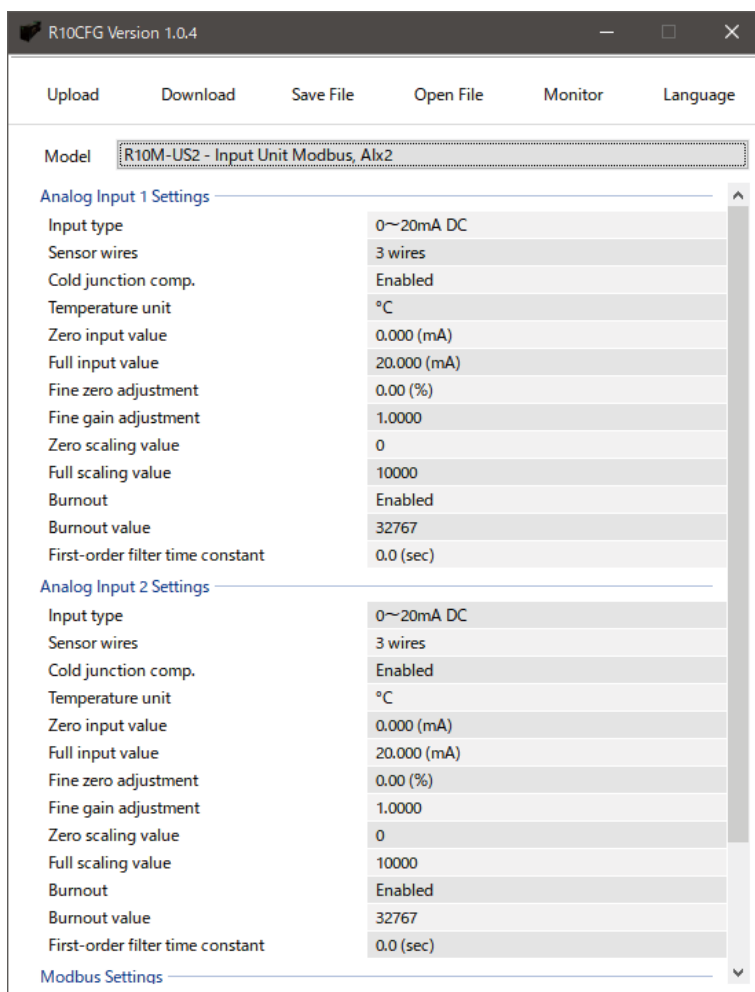
### UNINSTALL

Open Settings from Start menu > System > Apps & features for Windows 10.

## 2. GETTING STARTED

### 2.1. STARTING THE R10CFG

Open the R10CFG program on the Windows PC. The following window appears on the screen.



### 2.2. OPERATION (common setting for each device)

#### 2.2.1. Upload

Click [Upload] button to read parameters in the device via PC configurator cable and to display it on the configuration window. As the window is displayed according to the connected device, there is no need to choose [Model] in advance.

#### 2.2.2. Download

Click [Download] button to write parameters on the configuration window to the device via PC configurator cable.

#### 2.2.3. Save file

Click [Save File] button to save edited parameters in the PC as a file.

#### 2.2.4. Open file

Click [Open File] button to read and open parameters saved in a file.

#### 2.2.5. Monitor

Click [Monitor] button to open the monitor window, where you can monitor the device status and restart the device. For detailed information, refer to [Monitor window] for each device.

### 3. CONFIGURATION

#### 3.1. CONFIGURATION FOR R10M-US2

##### 3.1.1. Setting items

TYPE	ITEM	SETTING RANGE	DEFAULT
Analog 1 setting	Input type	0 - 20mA DC/ -1000 - +1000mV DC/ -10 - +10V DC/ POT: 0 - 4000Ω/ 0 - 600Ω/ 0 - 300Ω/ Resistor 0 - 4000Ω/ RTD: Pt100/ Pt500/ Pt1000/ Pt50Ω/ JPt100/ Ni508.4Ω/ Cu10 (25°C)/ TC: (PR)/ K(CA)/ E(CRC)/ J(IC)/ T(CC)/ B(RH)/ R/ S/ C(WRe5-26)/ N/ U/ L/ P(Platinel II)	0 - 20mA DC
	Wiring	2-wire / 3-wire	3-wire
	CJC	without / with	with
	Temp. unit	°C / °F	°C
	Zero input value	within the available range	0.000 (mA)
	Full input value	within the available range (full input ≥ zero input)	20.000 (mA)
	Zero fine adj.	-5.00 - 5.00 (%)	0.00 (%)
	Gain fine adj.	0.9500 - 1.0500	1.0000
	Zero scaling value	-32000 - 32000	0
	Full scaling value	-32000 - 32000	10000
	Burnout	without / with	with
	Butnout value	-32768 - 32767	32767
	First-order filter time constant	0.0 - 60.0 (sec.)	0.0 (sec.)
Analog 2 setting	Same as analog 1 setting	Same as analog 1 setting	Same as analog 1 setting
Modbus setting	Data mode	Modbus-RTU / Modbus-ASCII	Modbus-RTU
	Address	1 - 247	1
	Baud rate	38400 / 19200 / 9600 / 4800 bps	38400 bps
	Parity	None / Odd / Even	None
	Communication timeout duration	0.1 - 3200.0 (sec.)	3.0 (sec.)

### 3.1.2. Analog Input Settings (analog 1 and 2)

Each channel can be set independently. Describing each setting parameter below.

#### • Input type

Select the input type. For potentiometer, choose optimal range from all resistance value of using potentiometer.

#### • Wiring

Select the system configuration from 2-wire and 3-wire for resistor and RTD.

This setting is disabled with other inputs.

#### • CJC

Select with / without CJC for thermocouple.

This setting is disabled with other inputs.

#### • Temp. unit

Select temperature unit from °C and °F for RTD and thermocouple.

This setting is disabled with other inputs.

#### • Zero input value / Full input value

Set each input value to be scaled as 0% to 100%. For RTD and thermocouple, engineering value (temperature) is sent to the host as analog input data when the both value is set to 0.

In that case, fine adjustment and scaling setting is disabled.

Note: The setting must be zero input value ≤ full input value.

#### • Zero fine adj. / Gain fine adj.

Fine adjustment is performed for the actual input and the input values scaled to percentage by zero input value / full input value settings.

For zero fine adjustment, set a percentage value as an offset value.

For gain fine adjustment, vary tilt corresponding to 0 to 100%.

#### • Fine adjustment method

For example, when 0% input deviates by +0.5% and 100% input deviates by +1.8%, firstly set fine zero adjustment to -0.5%.

This setting clears the deviation from 0 % input and remains the deviation of +1.3% for 100% input. Then, set fine gain adjustment to 0.9872 ( $0.9872 \approx 100/(100 + 1.3)$ ).

By following this method, the deviation from 100% input is cleared without changing 0% input and complete fine adjustment.

#### • Zero scaling value / Full scaling value

Set each scaling value corresponding to zero input value / full input value.

These are transferred to the host as analog input data.

#### Setting example of fine adjustment and scaling value.

[Setting example]

Input type: 0 - 2- mA

Zero / full input value: 4.000 mA / 18.000 mA

Zero / gain fine adjustment: 1.70% / 1.0200

Zero / full scaling value: 5000 / 20000

[Analog data 14.5 mA input the above settings]

$(14.5 - 4) / (18 - 4) = 75\%$  → (input % = 75%)

$(75\% \times 1.02) + 1.7\% = 78.2\%$  → (input % = 78.2%)

$78.2 \times (20000 - 5000) + 5000 = 16730$  → (analog input data = 16730)

#### • Burnout

Select with / without burnout detection for potentiometer, resistor RTD, and thermocouple.

This setting is disabled with other inputs.

- **Burnout value**

Set the value to send to the host when the disconnection of input is detected with burnout detection.

- **First-order filter time constant**

Set the time constant of first-order filter for analog input data.

The time constant is the time required for the analog input data to reach 63.2% of the input step change.

If filtering is not necessary, set it to "0".

### **3.1.3. Modbus setting**

- **Data mode**

Select Modbus-RTU or Modbus-ASCII.

- **Address**

Set the address.

- **Baud rate**

Set the baud rate.

- **Parity**

Set the parity. Stop bit differs depending on the setting of parity, refer to the users manual for the module.

- **Communication timeout duration**

When the module does not receive Modbus query from the host for more than set time, the communication gets disconnected, and Run LED is turned off.

## 3.2. CONFIGURATION FOR R10M-CT4E

### 3.2.1. Setting items

TYPE	ITEM	SETTING RANGE	DEFAULT
Analog 1 setting	Input type	CLSE-R5 CLSE-05 CLSE-10 CLSE-20 CLSE-40 CLSE-60	CLSE-R5
	Zero input value	CLSE-R5: 0.000 - 5.000 CLSE-05: 0.00 - 50.00 CLSE-10: 0.00 - 100.00 CLSE-20: 0.00 - 200.00 CLSE-40: 0.0 - 400.0 CLSE-60: 0.0 - 600.0	0.000 (A)
	Full input value	CLSE-R5: 0.000 - 5.000 CLSE-05: 0.00 - 50.00 CLSE-10: 0.00 - 100.00 CLSE-20: 0.00 - 200.00 CLSE-40: 0.0 - 400.0 CLSE-60: 0.0 - 600.0 (full input ≥ zero input)	0.000 (A)
	Zero fine adj.	-5.00 - 5.00 (%)	0.00 (%)
	Gain fine adj.	0.9500 - 1.0500	1.0000
	Zero scaling value	-32000 - 32000	0
	Full scaling value	-32000 - 32000	10000
	First-order filter time constant	0.0 - 60.0 (sec.)	0.0 (sec.)
	Cutout value	0.0 - 5.0 (%)	1.0 (%)
	Analog 2 setting	Same as analog 1 setting	Same as analog 1 setting
Analog 3 setting	Same as analog 1 setting	Same as analog 1 setting	Same as analog 1 setting
Analog 4 setting	Same as analog 1 setting	Same as analog 1 setting	Same as analog 1 setting
Modbus setting	Data mode	Modbus-RTU / Modbus-ASCII	Modbus-RTU
	Address	1 - 247	1
	Baud rate	38400 / 19200 / 9600 / 4800 bps	38400 bps
	Parity	None / Odd / Even	None
	Communication timeout	0.1 - 3200.0 (sec.)	3.0 (sec.)

### 3.2.2. Analog input setting (input 1 - input 4)

Each channel can be set independently.

#### • Input type

Set the clamp sensor to use.

#### • Zero input value / Full input value

Set each input value to be scaled as 0% to 100%.

In that case, fine adjustment and scaling setting is disabled.

INPUT TYPE	INPUT RANGE	ENGINEERING VALUE DATA
CLSE-R5	0 - 5 (A)	0 - 5000
CLSE-05	0 - 50 (A)	0 - 5000
CLSE-10	0 - 100 (A)	0 - 10000
CLSE-20	0 - 200 (A)	0 - 20000
CLSE-40	0 - 400 (A)	0 - 4000
CLSE-60	0 - 600 (A)	0 - 6000

When the zero input value < full input value, the analog input data is transferred as scaling data (input 0 - 100% corresponding to 0 - 10000 for factory setting value) to the host. In that case, fine adjustment and scaling setting are enabled.



#### • Zero fine adj. / gain fine adj.

Fine adjustment is performed for the actual input and the input values scaled to percentage by zero input value / full input value settings.

For zero fine adjustment, set a percentage value as an offset value.

For gain fine adjustment, vary tilt corresponding to 0 to 100%.

#### • Fine adjustment method

For example, when 0% input deviates by +0.5% and 100% input deviates by +1.8%, firstly set fine zero adjustment to -0.5%. This setting clears the deviation from 0 % input and remains the deviation of +1.3% for 100% input.

Then, set fine gain adjustment to 0.9872 ( $0.9872 \approx 100/(100 + 1.3)$ ).

By following this method, the deviation from 100% input is cleared without changing 0% input and complete fine adjustment.

#### • Zero scaling value / Full scaling value

Set each scaling value corresponding to zero input value / full input value.

These are transferred as analog input data to the host.

#### Setting example of fine adjustment and scaling value.

[Setting example]

Input type: CLSE-R5

Zero / full input value: 1.000 / 5.000 (A)

Zero / gain fine adjustment: 1.70% / 1.0200

Zero / full scaling value: 5000 / 20000

[Analog input data 3.8 mA input the above settings]

$(3.8 - 1) / (5 - 1) = 70\%$  -> <input % = 70%>

$(70\% \times 1.02) + 1.7\% = 73.1\%$  -> <input % = 73.1%>

$73.1 \times (20000 - 5000) + 5000 = 15965$  -> <analog input data = 15965>

#### • First-order filter time constant

Set the time constant of first-order filter for analog input data.

The time constant is the time required for the analog input data to reach 63.2% of the input step change.

If filtering is not necessary, set it to "0".

#### • Cutout value

The input below the set cutout point is handled as 0%.

For the actual value data, set with the corresponding % to the full span of each input type.

For the scaling data, set with the corresponding % of zero / full input value, and fixes to zero scaling value as 0% when the input is less than the set %.

#### 3.2.3. Modbus setting

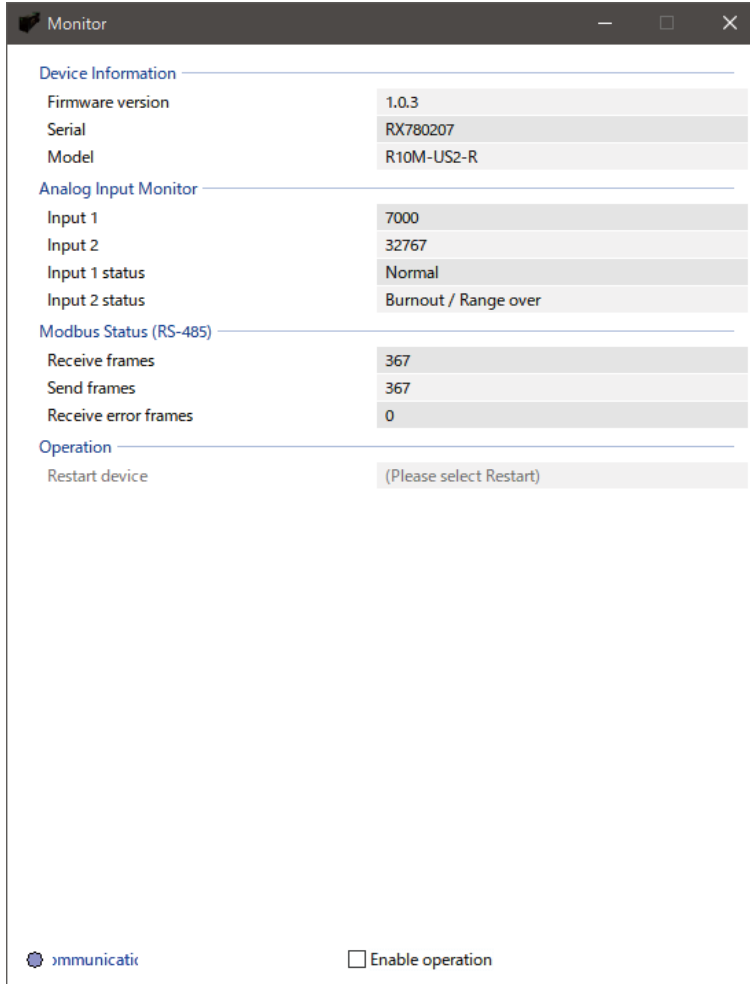
Refer to "3.1.3. Modbus setting"

## 4. MONITOR WINDOW

Clicking [Monitor] button with the PC connected with the device via PC configurator cable enables to open the window on which to monitor statuses. Communication status with the device is indicated at the bottom left on the window.

Each status on the monitor window is automatically updated regularly when the device is connected, and you can also execute operations, such as restarting the device on the window.

Monitor Window (ex. R10M-US2)



### 4.1. MONITORING R10M-US2

#### 4.1.1. Device information

Shows the firmware version, serial number and model.

#### 4.1.2. Analog input monitor

Shows the analog input value and analog input status (normal operation or burnout / input range error) of analog 1 and 2.

#### 4.1.3. Modbus status

Shows the send and receive status of Modbus.

- **Send frames**

Shows the total number of frames sent to Modbus slaves from the device.

The number is reset by turning off the power supply or restarting the slave.

Numerical value range: 0 – 65535 (the number returns to 0 after 65535)

- **Receive frames**

Shows the total number of normal receive frames from Modbus slaves.

The number is reset by turning off the power supply or restarting the slave.

Numerical value range: 0 – 65535 (the number returns to 0 after 65535)

- **Receive error frames**

Shows the total number of receive error frames and receive timeouts.

The number is reset by turning off the power supply or restarting the slave.

Numerical value range: 0 – 65535 (the number returns to 0 after 65535)

#### **4.1.4. Operation**

For R10M-US2, the following operation can be performed.

To enable the operation, check [Enable operation] check box at the bottom of the window.

The greyed out field becomes enabled.

- **Restart device**

Enables to restart the device. Restart in boot mode is used only in updating the firmware.

Note: When you restarted the device in boot mode by mistake, wait for about one minute or turn off and on the power supply.

Then restart it in normal mode.

## **4.2. MONITORING R10M-CT4E**

### **4.2.1. Device information**

Shows the firmware version, serial number and model.

### **4.2.2. Analog input monitor**

Possible to monitor the analog input value and analog input statuses (normal operation / input range error) of analog input 1 - 4.

### **4.2.3. Modbus status**

Shows the send and receive status of Modbus.

Refer to “4.1.3. Modbus status”

### **4.2.4. Operation**

For R10M-CT4E, the following operation can be performed.

- **Restart device**

Refer to “4.1.4. Operation” for details.