RZXS CONFIGURATOR
(model: RZMSCFG)

Users Manual

Contents

1. GENERAL

In this manual, user is assumed that he is already familiar with operating Windows XP or Windows 7 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 RZMSCFG

The RZMSCFG software is used to help you program analog input configuration and wire resistance calibration of model RZxS-U9, Universal Input Module to meet the user's particular requirements.
The PC on which the RZMSCFG is installed is connected to the RZxS-U9 at the Modbus connector (RS-232C/RS-485/USB) or the configurator jack. The maximum length of the special cable for the radio jack is of 1.5 meters, while the Modbus cable length could be longer.
General functions of the RZMSCFG are as follows:

• CONFIGURING COMMUNICATION PARAMETERS
Parameters concerning Modbus communication such like baud rate, data bit length, parity bit and floating point transmission can be configured. For use of the RZxS-U9 as PC Recorder, these settings are or have already been adjusted on the hardware in order to simplify their use.

• READING RZxS-U9 MANAGEMENT INFORMATION
The RZXSCFG can access the information on Serial No., Version No., Manufacture date, Factory (manufacturer) calibration date, Field (user) calibration date of the RZxS-U9.
The RZxS-U9 records the latest field calibration date using the PC's calendar.

• CONFIGURING PARAMETERS FOR EACH CHANNEL
Sensor type/range, burnout mode, cold junction compensation mode and filter time constant can be independently seletable for each channel.
Also, zero/span adjustment, cold junction compensation and wire resistance compensation for RTD inputs can be enabled/disabled.

• SETTING MEASUREMENT MODE
Service channel numbers, ADC speed, line noise filter frequency are selectable.

• FIELD CALIBRATION
The RZMSCFG can access the zero and span calibration data and adjust them for each channel.
For RTD inputs, wire resistance compensation is available.

• MANAGING FILES
The parameter configuration for each channel can be saved as a file on the PC. The field calibration data can also be saved as a file which can then be downloaded to the RZxS-U9.
By downloading these files, you can configure a set of parameters quickly and accurately, even without actually connecting the RZxS-U9 to the PC.
This is especially beneficial when you need to replace a failed module or to conduct regular calibrations.

• MONITORING
The following items can be continuously monitored on the screen at once for all the channels:
Analog input in engineering unit (V or mV for DC, °C for temperature, % for potentiometer)
Analog input raw data (V or mV for DC, mV for T/C, Ω for RTD, % for potentiometer)
Trigger input status (ON or OFF)
Alarm output status (ON or OFF)

• TESTING ALARM TRIP
You can manually change the alarm output status for testing the output device operation.

1.2 HARDWARE REQUIREMENTS

- DOS/V compatible PC with Windows XP SP3 or Windows 7 (32 bit/64 bit) appropriately installed.
- Radio jack cable included in the RZMSCFG package or RS-232C straight cable provided by the user

1.3 REVISION HISTORY

This instruction manual is applicable to the RZMSCFG program version 2.01.
The program's version No. can be checked at [Help] – [Version] on the menu bar.

2. GETTING STARTED

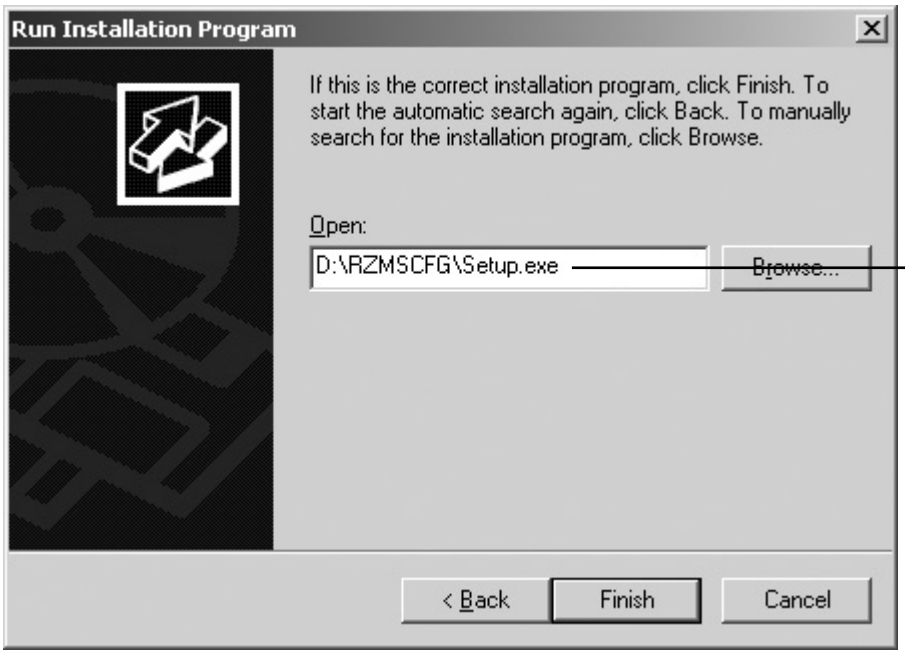
2.1 INSTALLING THE RZMSCFG

2.1.1 INSTALLING WITH CD

(1) Start up Windows.
(2) Insert RZMSCFG Setup CD-ROM into the CD drive on your PC. The Setup program automatically starts.

⚠ If the program does not automatically start, install manually following the instructions below.

(3) Press Start on the task bar and choose Control Panel from Settings menu. (Double-click My Computer icon on the desktop and choose Control Panel.)
–> Control Panel appears on the display.
(4) Double-click Add/Remove Programs.
–> "Property" dialog box of Add/Remove Programs appears on the display.
(5) Choose Setup (or Install).
–> "Install Program From Floppy Disk or CD-ROM" dialog box appears on the display.
(6) Choose Next.



Check the drive name to which you have inserted the CD and the file name "Setup.exe" in the "Command line for installation program" field (e.g. D:\RZMSCFG\Setup.exe)

–> "Run Installation Program" dialog box appears on the display.
(7) Click OK.
–> Windows starts the installation program SETUP.EXE. Follow instructions on the screen.
Now the RZMSCFG program has been installed.

2.1.2 DOWNLOAD FROM WEBSITE

(1) Start up Windows.
(2) Go to M-System's web site (http://www.m-system.co.jp). Download and save the RZMSCFG archive in your PC's local hard disk.
(3) Confirm the size and version number of the downloaded archive ('x' in the file name as shown below).
RZMSCFG_Vx.exe or RZMSCFG_Vx.zip
(4) Double-click the file's icon and locate 'RZMSCFG_Vx' folder.
(5) Start up setup.exe in the folder and follow instructions on the screen.
Now the RZMSCFG program has been installed.

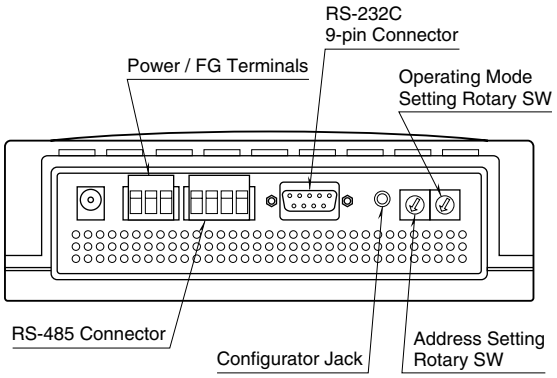
⚠ If you have already the RZMSCFG program installed in your PC, remove it following the procedure explained in 2.2. before installing a new one.

2.2 UNINSTALLING THE RZMSCFG

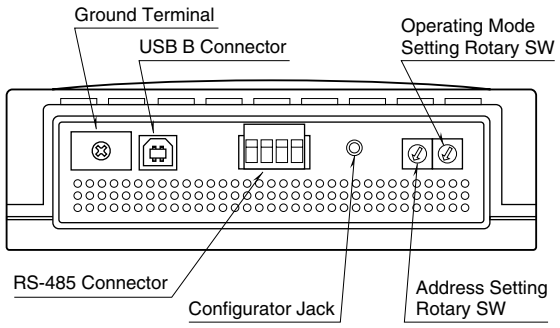
(1) Press Start on the task bar and choose Control Panel from Settings menu. (Double-click My Computer icon on the desktop and choose Control Panel.)
–> Control Panel appears on the display.
(2) Double-click Add/Remove Programs.
–> "Property" dialog box of Add/Remove Programs appears on the display.
(3) Choose RZMSCFG among the list of installed applications.
(4) Choose Add/Remove.
(5) "Remove Programs From Your Computer" dialog box appears on the display. Click OK.
–> All files installed with the RZMSCFG are removed.

2.3 CONNECTING THE RZxS-U9 WITH THE PC

When you use the PC configurator cable (model: MCN-CON or COP-US), connect its radio jack end to Config. port at the rear of the RZxS-U9 module, and its 9-pin D-sub connector end to COM port of the PC. You can also configure the RZxS-U9 via Modbus. With the RZMS-U9, connect the RS-232C cable between the RS-232C port at the rear side and the PC's COM port. With the RZUS-U0, connect the USB cable between the USB port at the rear side and the PC's USB port.
Turn the Operating Mode Setting rotary switch to the position '0.' Whenever the switch position is changed, turn the power supply to the RZxS-U9 off and on. (Unplug and plug the USB cable for RZUS-U9.)



RZMS-U9 REAR VIEW



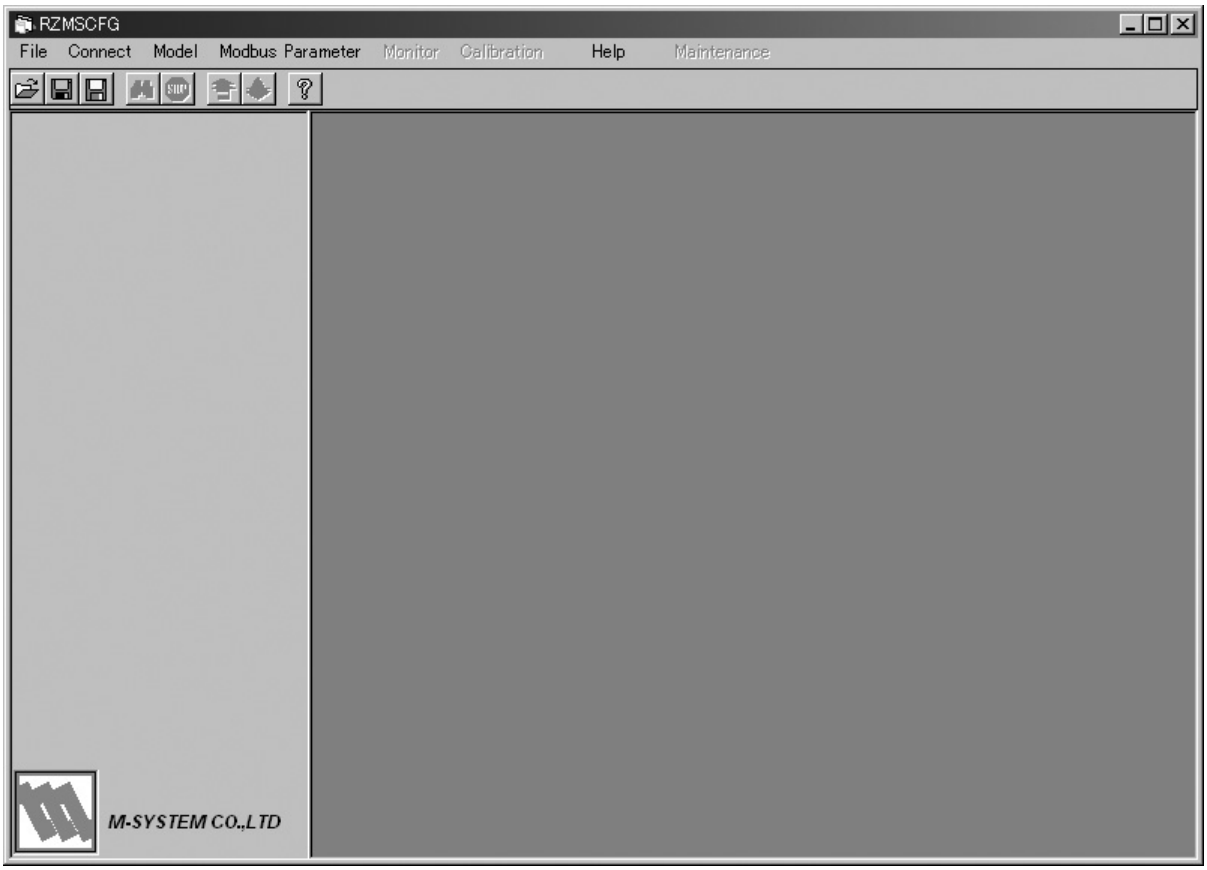
RZUS-U9 REAR VIEW

2.4 STARTING / QUITTING THE RZMSCFG

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

2.4.1 STARTING THE RZMSCFG

Press Start on the task bar and choose “RZMSCFG” from Program menu. The main view appears on the screen as shown below.



2.4.2 ENDING THE RZMSCFG

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

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

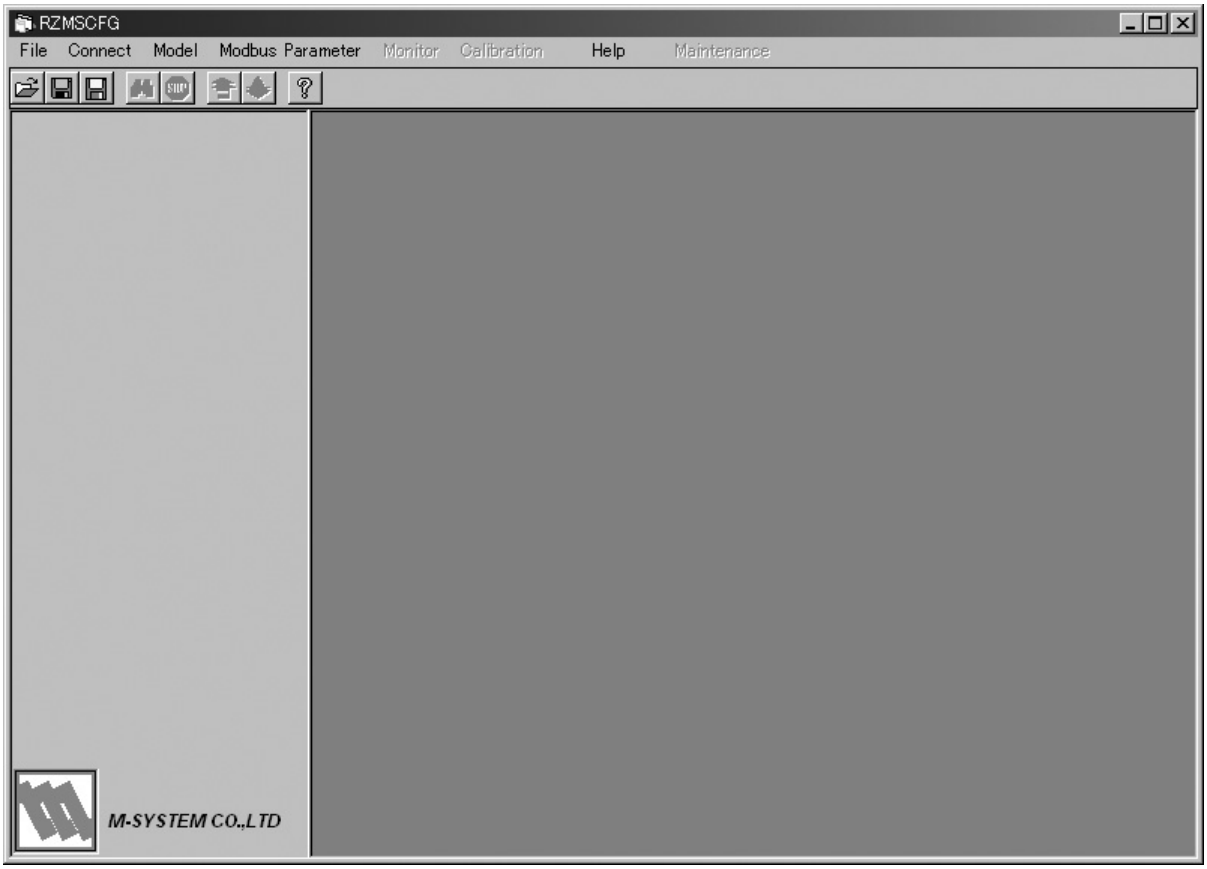
3. HOW TO USE THE RZMSCFG

3.1 ON-LINE OPERATION

(1) Starting up the RZMSCFG program
(2) Connecting to the communication line
(3) Confirming the version information and current setting of the connected device
(4) Setting the measuring mode
(5) Monitoring the trigger input status and alarm output status; setting the alarm output mode
(6) Modifying parameters for each channel
(7) Downloading the parameters to the RZxS-U9
(8) Confirming new configuration
(9) Monitoring
(10) Closing the communication line
(11) Saving data to files

3.1.1 STARTING UP THE RZMSCFG PROGRAM

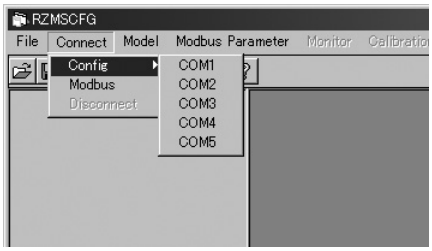
Press Start on the task bar and choose “RZMSCFG” from Program menu. The main view appears on the screen as shown below.



3.1.2 CONNECTING TO THE COMMUNICATION LINE

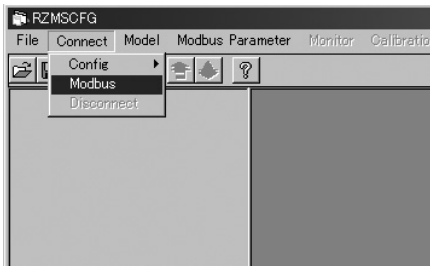
Connecting the RZxS-U9 module to the communication line.

Connecting via Configuration Jack

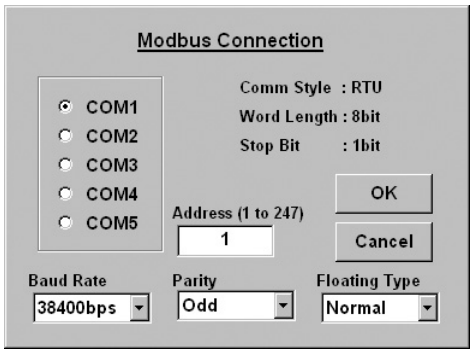


Connect the RZxS-U9 module to the PC via the PC configurator cable (model: MCN-CON or COP-US)
Choose [Config] from [Connect] on the menu.
Confirm that the power is supplied to the RZxS-U9 and that the configurator jack of the RZxS-U9 and one of the COM ports of the PC is firmly connected with the attached cable.
Choose COM port number in the submenu.

Connecting via Modbus



Connect the RZxS-U9 module to the PC via a RS-232C straight cable.
Choose [Modbus] from [Connect] on the menu bar and the Modbus Connection dialog box appears on the screen.



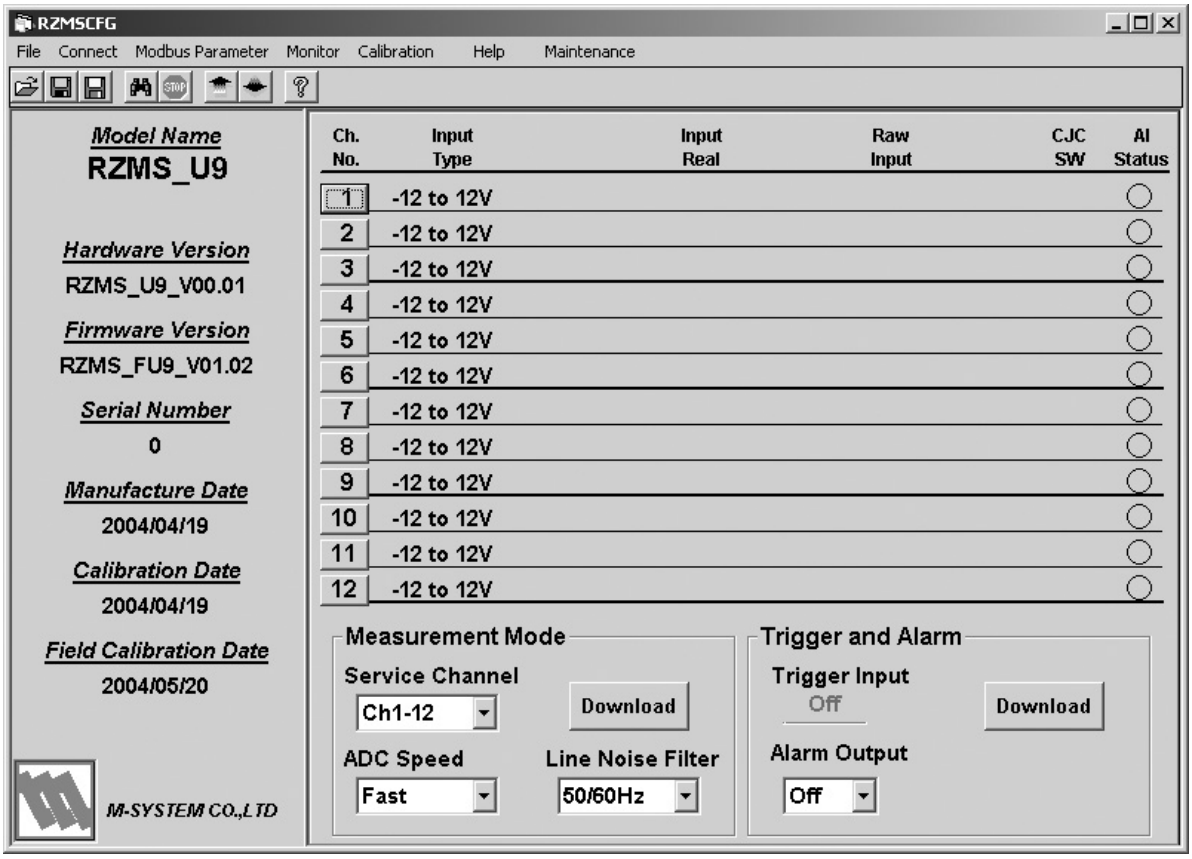
After the Modbus properties have been set, click OK.
With the communication line established, the version No. of the connected device and current parameter setting are displayed.

⚠ Be sure to disable the Modbus communication between the RZxS-U9 and the master device before establishing connection to the PC with the RZMSCFG. Operating the RZxS-U9 from the RZMSCFG while another master device is accessing to it may cause an error.

⚠ If a message appears saying that the connection is unsuccessful, confirm again the connection between the RZxS-U9 and PC, power supply to the RZxS-U9. Furthermore, with Modbus connection confirm Modbus parameters and the COM port driver status on the PC.

3.1.3 CONFIRMING THE HARDWARE TYPE & CURRENT SETTING

With the communication line established, the Model No. and version No. of the hardware (left) and current parameter setting (right) are displayed on the screen.

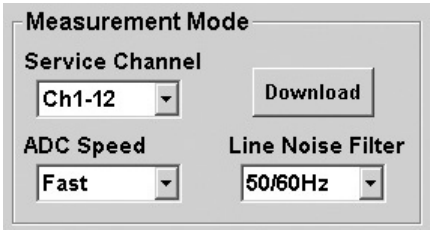


3.1.4 MEASUREMENT MODE

Service channel numbers, ADC speed and Line noise filter frequency can be selected. They are common settings for all channels.

Pressing Upload button on the tool bar or selecting Start from Monitor on the menu bar starts reading the RZxS-U9's current configuration.

After the setting has been changed, pressing Download button in the Measurement Mode area or on the tool bar starts writing the new configuration indicated on the screen.



Service Channel

12 channels are available as standard. When you only need 6 or less number of channels and fast sampling time, select 6 channels.

ADC Speed (AD conversion mode)

Slow, Middle and Fast speed settings are available.

With Slow setting, data fluctuations are minimized with limited sampling time (speed). Better normal mode line noise rejection ratio is achieved. With Fast setting, sampling time (speed) can be high through data fluctuations increase.

Line Noise Filter (Frequency)

Line noise filter frequency is at the factory set to 50/60 Hz mode for use with both frequencies. However, better normal mode line noise rejection ratio is achieved if the frequency is tuned to the local line frequency. Select either frequency for the most effective result.

Above three settings affects the actual sampling rate as shown in the table to the right.

LINE NOISE FILTER FREQ.	SERVICE CH. NO.	A/D CONVERSION (sec)		
		MEDIUM	SLOW	FAST
50 Hz	12 ch	0.68	0.94	0.43
	6 ch	0.38	0.53	0.26
50/60 Hz	12 ch	0.63	0.87	0.40
	6 ch	0.35	0.49	0.24
60 Hz	12 ch	0.59	0.80	0.38
	6 ch	0.33	0.45	0.22

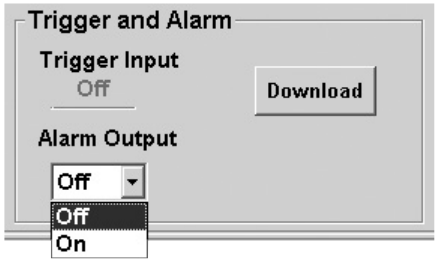
Multplied by two (2) for RTD and potentiometer input.

3.1.5 TRIGGER AND ALARM

Trigger input and alarm output status can be read.

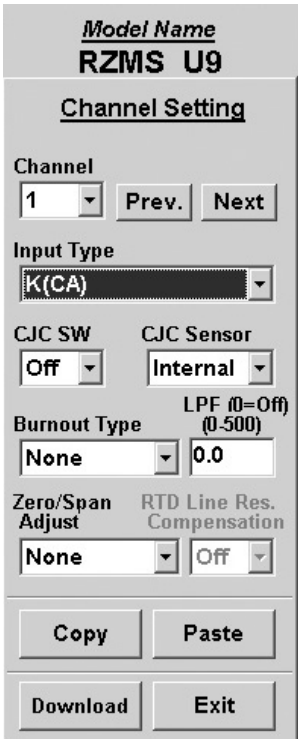
Pressing Upload button on the tool bar or selecting Start from Monitor on the menu bar starts reading the RZxS-U9's current status.

Manually selecting the alarm output is also available.



3.1.6 MODIFYING PARAMETERS

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



< Prev. >	Previous channel
< Next >	Next channel
< Copy >	Copies the present setting shown on the screen.
< Paste >	Pastes the copied setting to the screen.
< Download >	Downloads the present setting shown on the screen.
< Exit >	Closing the dialog box without downloading.

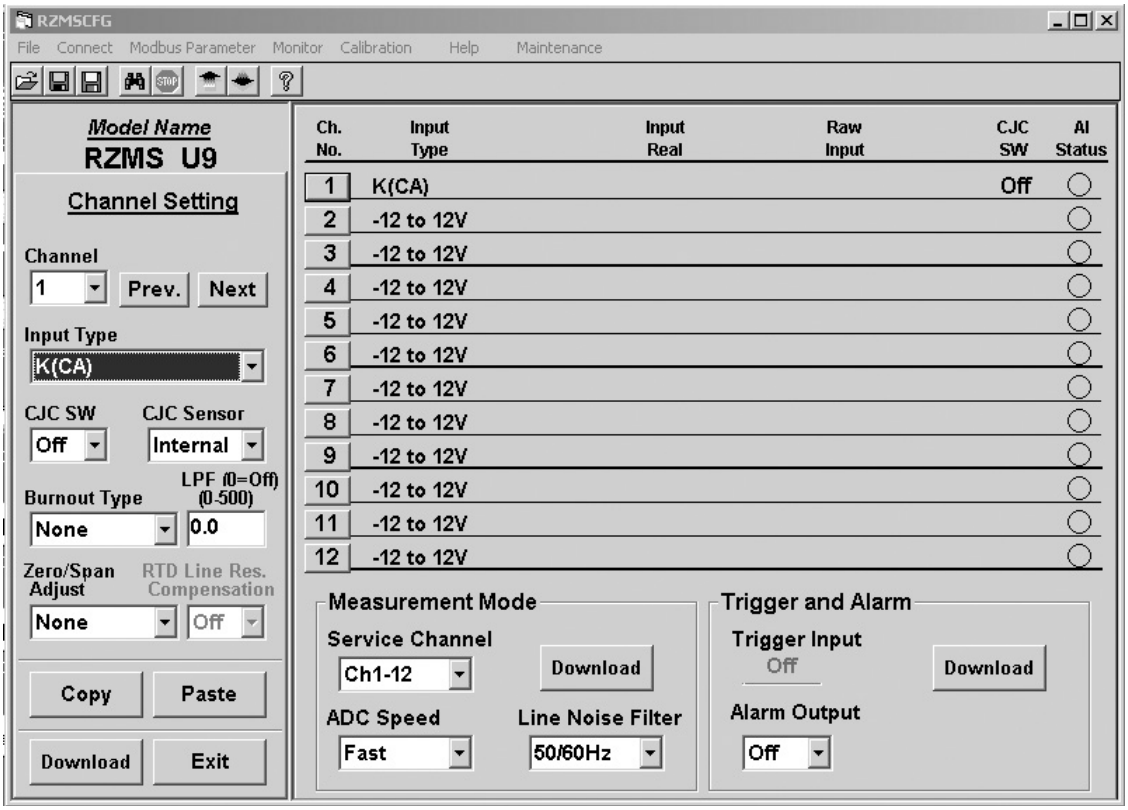
ITEM	FUNCTION	SELECTABLE TYPES & RANGES
Channel	Channel No.	1 through 12
Input Type	Input type	±60mV, ±125mV, ±250mV, ±500mV, ±1000mV, ±3V, ±6V, ±12V (PR), K (CA), E (CRC), J (IC), T (CC), B (RH), R, S, C (WRe 5-26), N, U, L, P (Platinel II) Pt 100 (JIS '89), Pt 100 (JIS '97, DIN, IEC751), Pt 200, Pt 300, Pt 400, Pt 500, Pt 1000, Pt 50Ω (JIS '81), JPt 100 (JIS '89), Ni 100, Ni 120, Ni 508.4Ω, Ni-Fe 604, Cu 10 (@25°C), 200Ω, 500Ω, 5kΩ
CJC SW	Enable/Disable the cold junction compensation	ON : Enable OFF : Disable
CJC Sensor	Reference junction temperature measurement	Internal : By the sensor incorporated in the RZMS-U9 Ch. 1 through 12 : Reference temperature is measured at the specified channel.
Burnout Type	Burnout type	None : No burnout action Upscale : Upscale burnout Downscale : Downscale burnout
Zero/Span Adjust	Enable/Disable the zero and span adjustments	None : The field zero/span calibration is not applied to the measured values. Zero : The field zero (offset) calibration is applied. Zero & Span : The field zero/span (offset/gain) calibration is applied. Zero adjustment is automatically applied after the field zero calibration has been conducted (Zero mode), then Span adjustment is also applied after the field span calibration has been conducted (Zero & Span mode). Changeable to other modes.
RTD Line Res. Compensation	Enable/Disable the line resistance compensation	ON : The field RTD line resistance calibration is applied to the measured values. OFF : The field RTD line resistance calibration is Not applied to the measured values.
LPF	First order lag filter (Low Pass Filter) time constant	0.0 through 500.0 seconds No filtering at 0.0 Error if out-of-range value is downloaded.

Example 1: Modifying [Input Type] of Ch. 1 from "-12V to 12V" to "K (CA)"

Click "1" on the Channel No. list.

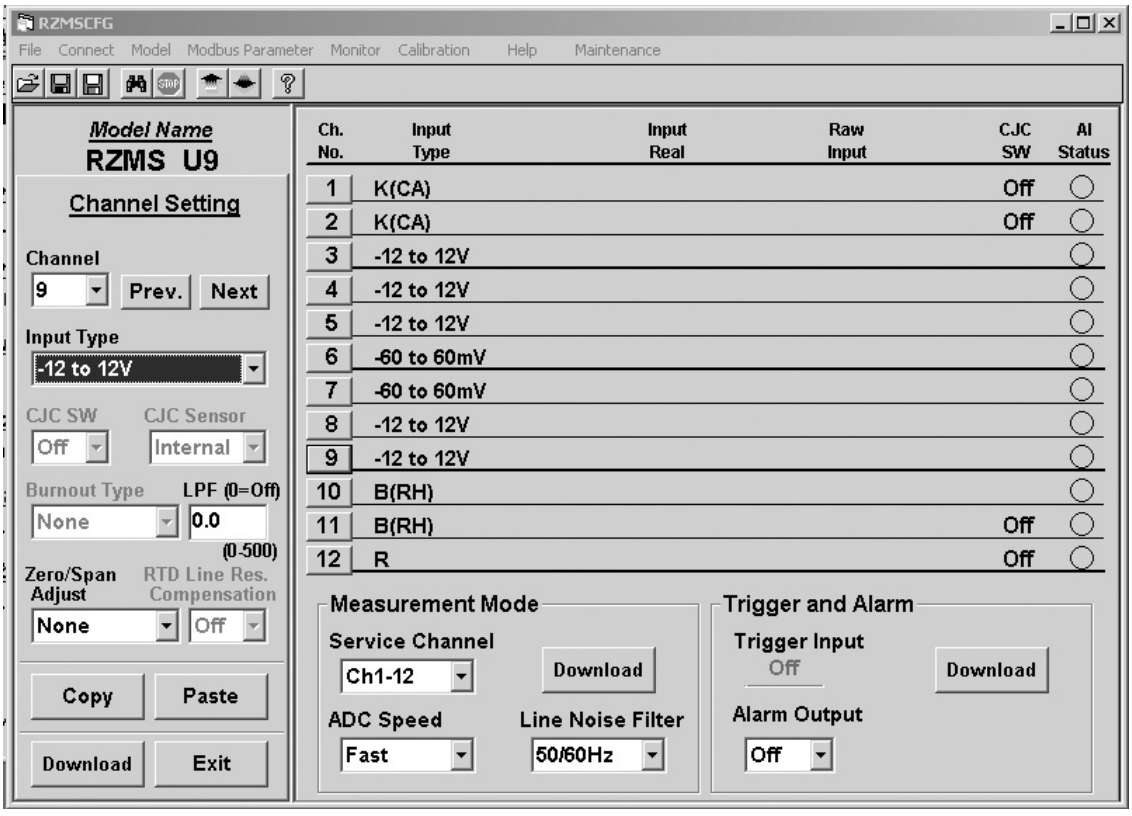
Choose "K (CA)" from [Input Type].

Confirm the new setting at Ch. 1 on the right window.

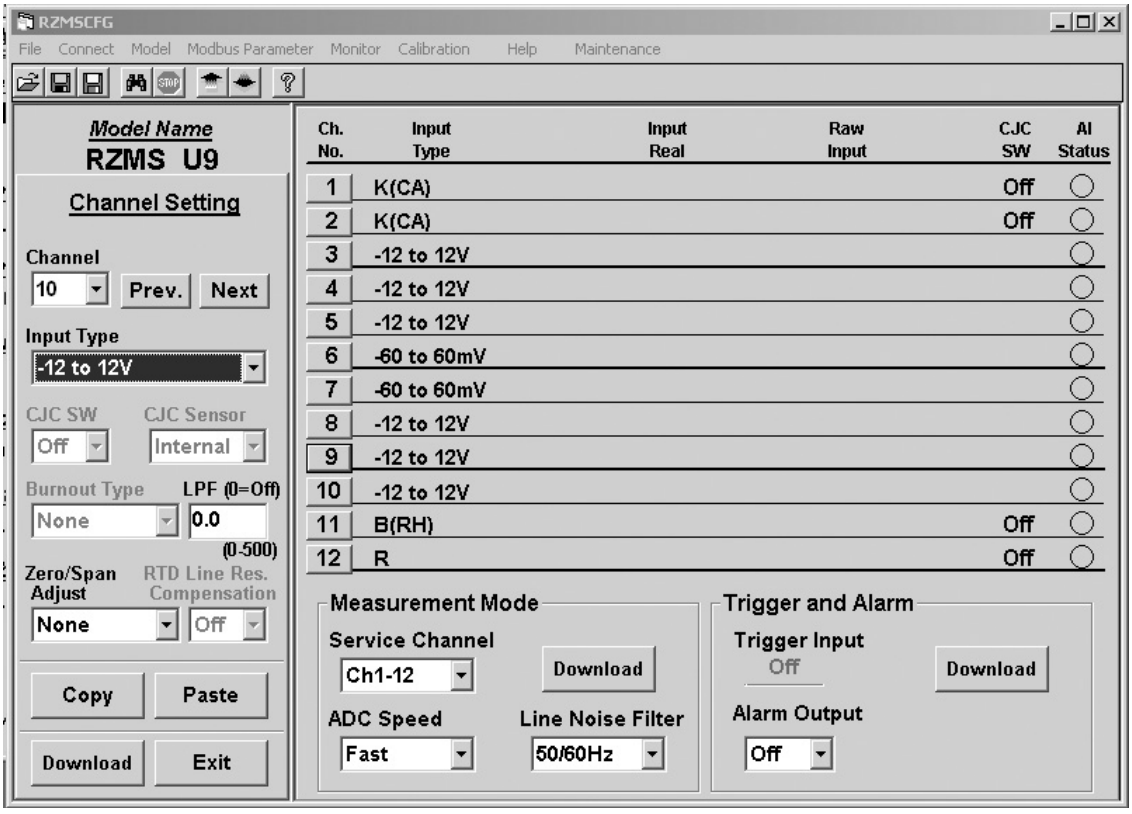


Example 2: Applying the setting of Ch. 9 to Ch. 10

Choose "9" on the Channel No. list.

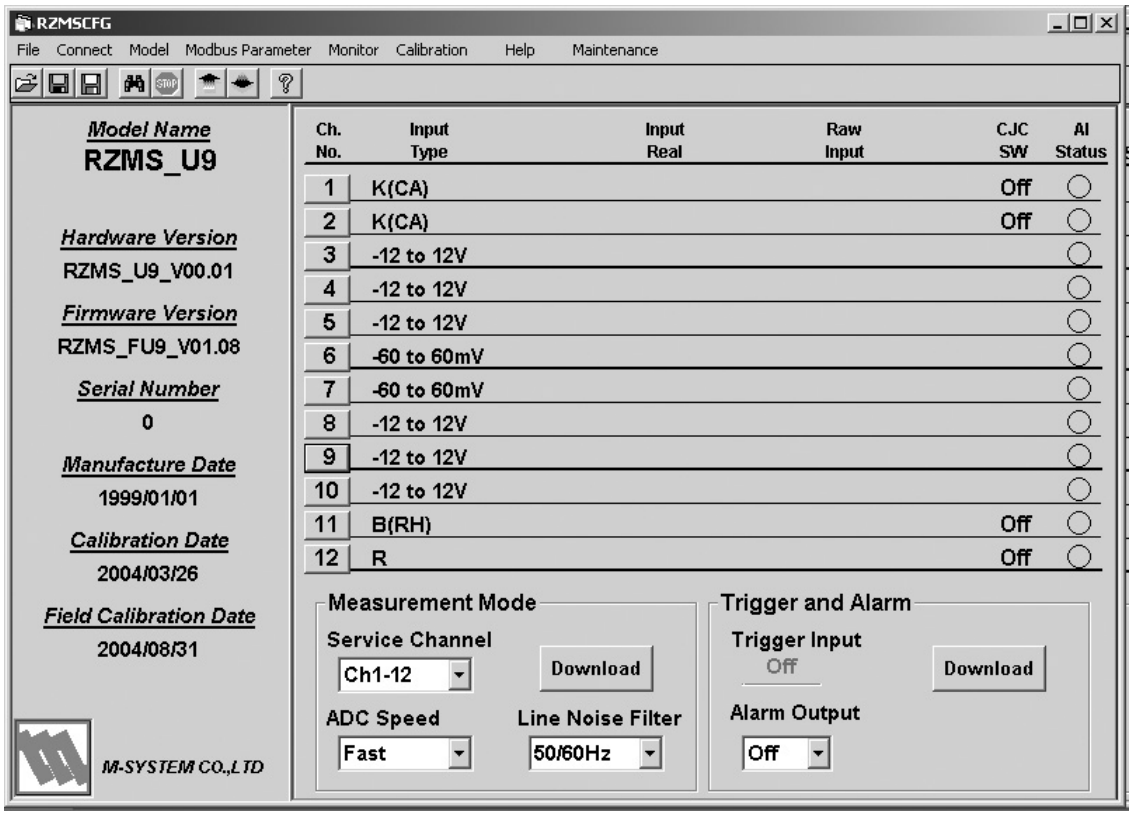


Press < Copy > button. Then press < Next > button and confirm that the window shows current setting of Ch. 10.
Press < Paste > button and confirm the new setting on the dialog box.
Confirm the new setting at Ch. 10 on the right window.



Pressing < Exit > closes the Channel Setting window on the left.

⚠ Pressing <Exit > simply closes the window without applying any setting modification on the screen. Be sure to press < Download > before closing.



3.1.7 DOWNLOADING PARAMETERS TO THE RZxS-U9

For downloading the parameters for all channels, choose [Configuration] – [Download] or click < > button.

For downloading the parameters for single channel, click < Download > in [Channel Setting] dialog box of that channel.

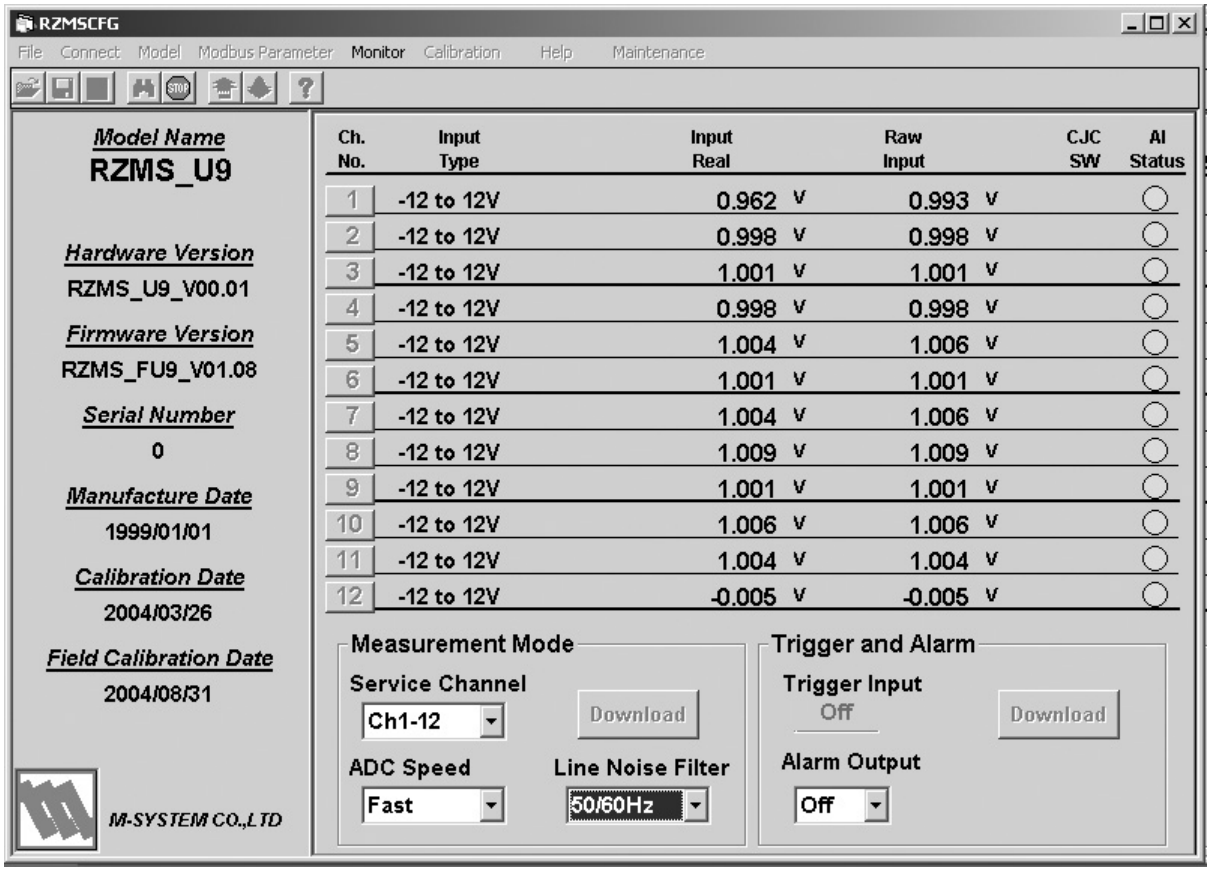
3.1.8 CONFIRMING NEW CONFIGURATION

The RZMSCFG 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.

3.1.9 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.



3.1.10 ERROR

Communication Error message as shown below appears on the screen whenever the communication fails during the RZxS-U9 is connected online.

Press either < Retry > or < Abort >.

If < Abort > is pressed, the program returns to the status before Modbus communication has been established. In order to resume, re-connect to the Modbus (See 3.1.2).

Frequent errors may be caused by noise interference. Check the environment in such cases.

3.1.11 CLOSING THE COMMUNICATION LINE

Disconnecting the RZxS-U9 module from the communication line.
Choose [Disconnect] from [Connect] on the menu bar.

3.1.12 SAVING THE CONFIGURATION FILE

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

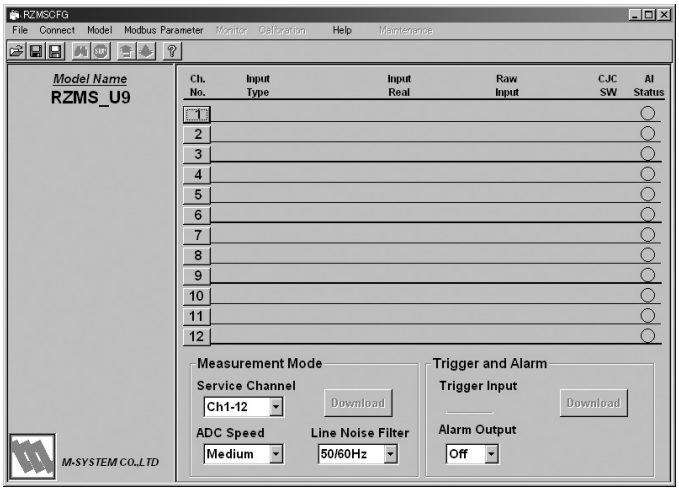
3.3 OFF-LINE OPERATION

The following functions are available while the communication is disconnected.

(1) Creating or modifying parameters
(2) Saving parameter files

3.3.1 SELECTING THE HARDWARE TYPE

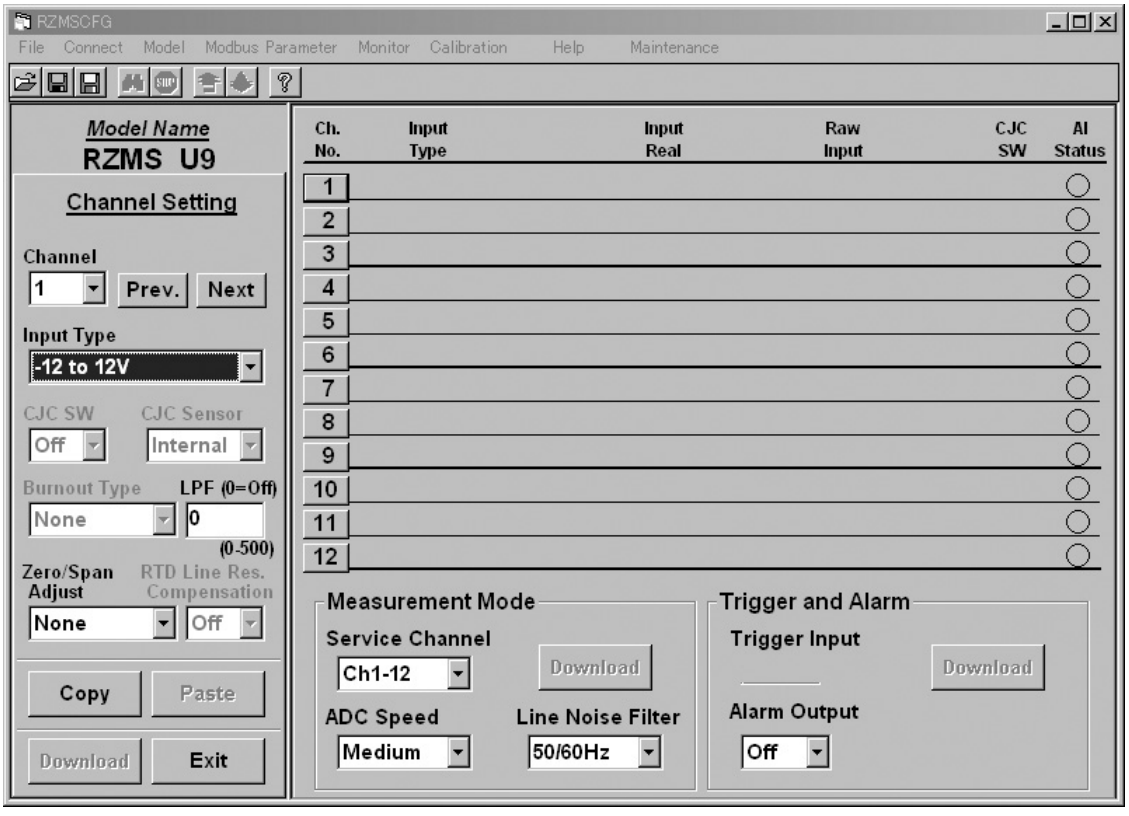
When creating a new parameter file, choose [RZMS-U9] or [RZUS-U9] from [Model] pull-down menu.
If you want to modify an existing file, choose [File] – [Open] from the menu bar and select the file name.
The following window appears for a new file.



3.3.2 CREATING OR MODIFYING PARAMETERS

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

Example 1: Specifying [Input Type] of Ch. 1 as "Pt100 (JIS '97, IEC751)"
Choose "1" on the Channel No. list.

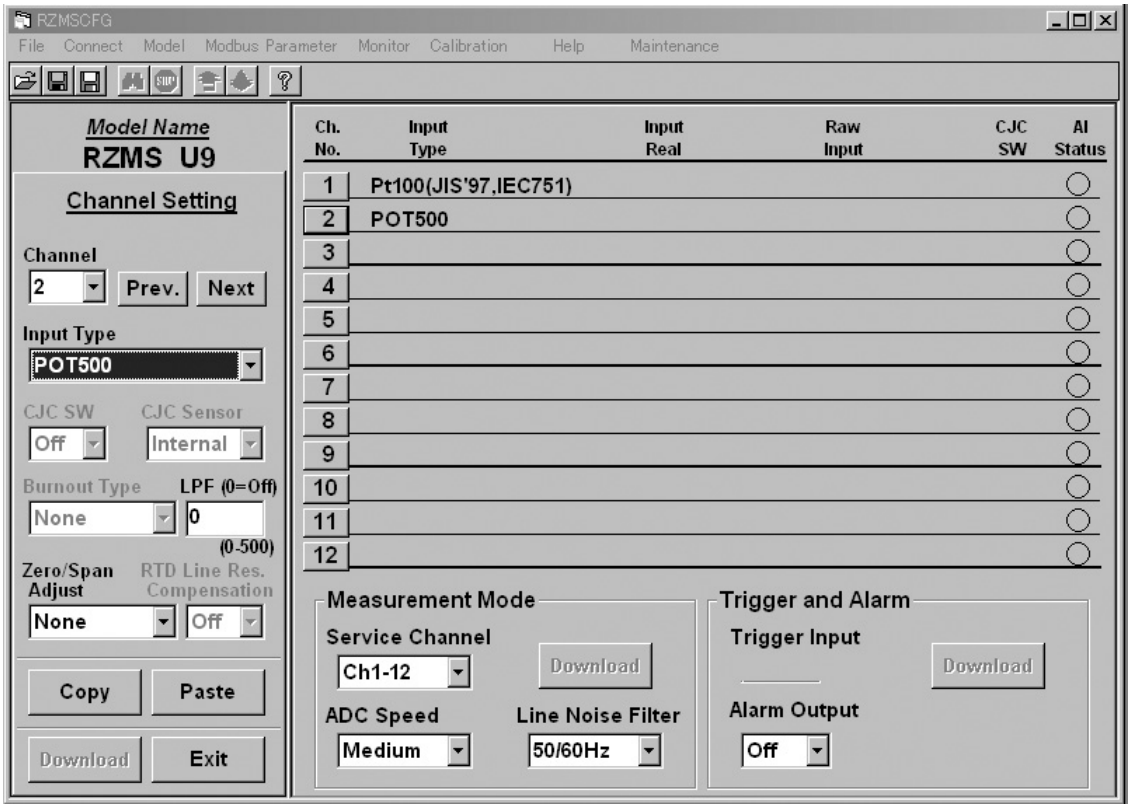


Choose "Pt100 (JIS '97, IEC751)" from [Input Type].
Confirm the new setting at Ch. 1 on the right window.

Example 2: Specifying [Input Type] of Ch. 2 as “POT500”

Click < Next > button and Channel Setting dialog box for Ch. 2 appears.

Choose “POT500” 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.

3.3.3 SAVING PARAMETER FILES

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

4. VIEWS AND OPERATIONS

The RZMSCFG 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.

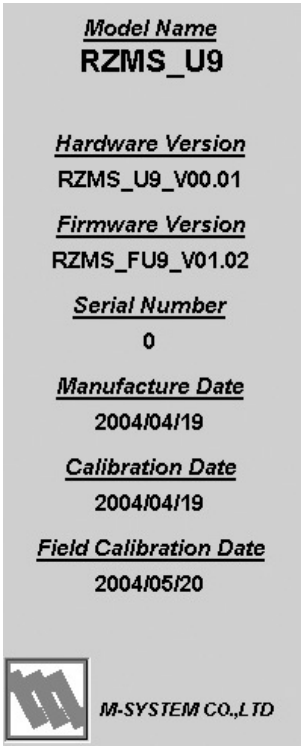
4.1 MENU BAR

Menu	Submeu	Function
File	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 RZMSCFG program.
Connect	Config	Connecting to the communication line via the configurator jack.
	Modbus	Connecting to the communication line via Modbus
	Disconnect	Disconnecting from the communication line.
Modbus Parameter	Modbus Setting	Opening the Modbus Setting window. Not available during Modbus communication. See 4.4.1.
Monitor	Start	Starting monitoring.
	Stop	Stopping monitoring.
Calibration	Zero/Span Calibration	Opening the Zero/Span Calibration window. See 4.4.2.
	RTD Line Res. Calibration	Opening the RTD Line Resistance Calibration window. See 4.4.3.
	File-->RZMS_U9	Writing the calibration information to the RZxS-U9.
	File<--RZMS_U9	Writing the present field calibration information to a file.
Help	Version	Indicating Version No. of the RZMSCFG.
Maintenance	Restart	Restarting the RZxS-U9

4.2 TOOL BUTTONS

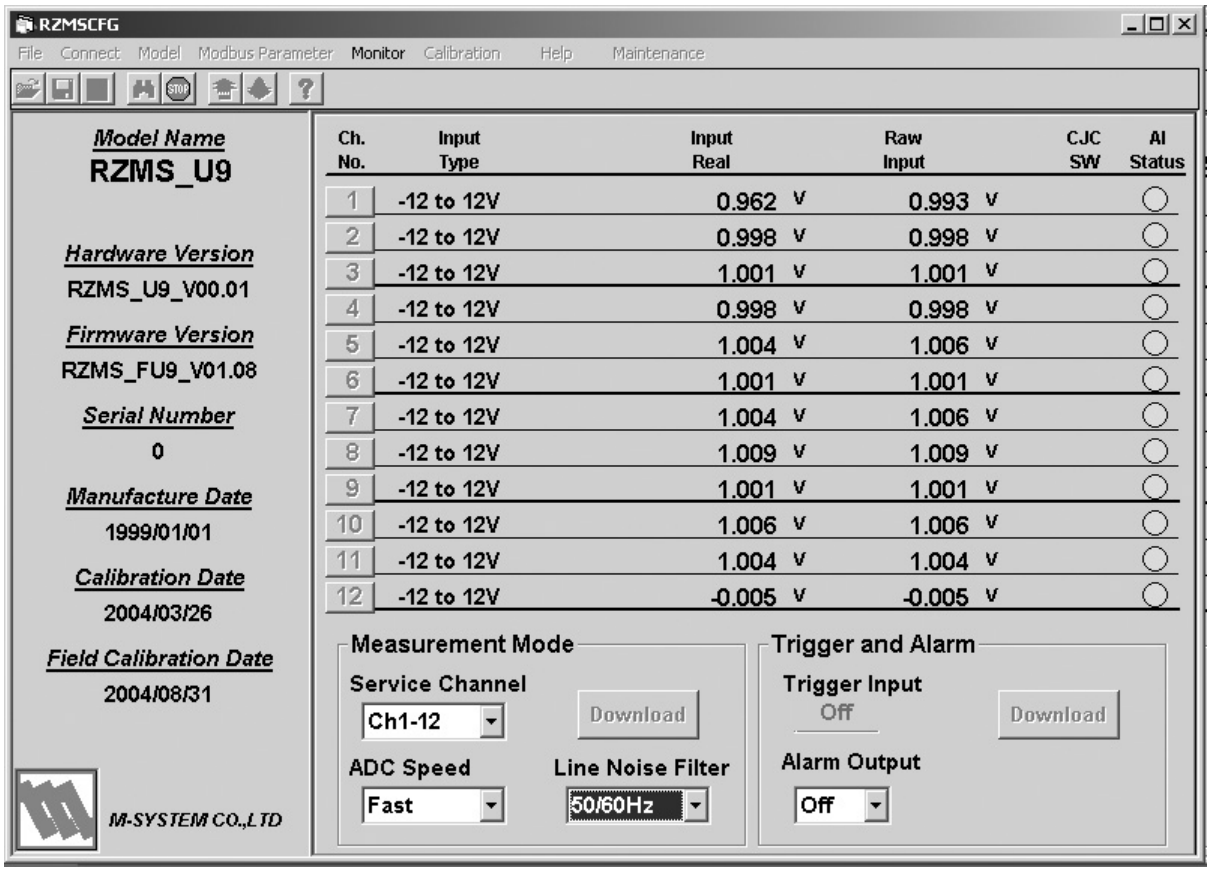
Name (from left to right)	Function
Open File	Reading the specified file and displaying its contents.
Save	Saving the configuration of all the channels as the current file.
Save as	Saving the configuration of the all the channels as a new file.
Start	Starting monitoring.
Stop	Stopping monitoring.
Upload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

4.3 HARDWARE TYPE & VERSION INFORMATION WINDOW



Name	Function
Model Name	Model No. of the RZxS-U9
Hardware Version	Hardware version No.
Firmware Version	Firmware version No.
Serial Number	Serial No. of the RZxS-U9
Manufacture Date	Manufacturing date of the RZxS-U9
Calibration Date	Date of calibration
Field Calibration Date	Date of field calibration

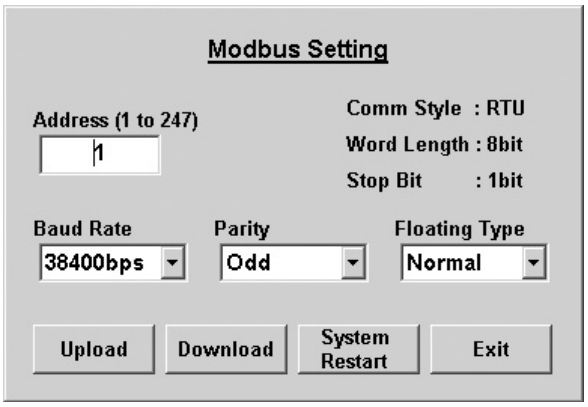
4.4 CONFIGURATION WINDOW FOR EACH CHANNEL



Name	Function
Ch. No.	Channel No.
Input Type	Input Type
Input Real	Input value in engineering unit
Raw input	Input voltage before conversion
CJC SW	Enable/disable the cold junction compensation
AI Status	Analog input status Green ON: Normal input Red ON: Abnormal input (out of range)

4.5 CONFIGURATION SUB-WINDOWS

4.5.1 MODBUS COMMUNICATION SETTINGS



Function	Selection
Address	Displaying the current node address setting.
Baud Rate	9600 / 19200 / 38400 (default)
Parity	NONE / ODD (default) / EVEN
Floating Type	Normal Float (default) / Swapped Float
Comm Style	RTU (fixed)
Word Length	8 bit (fixed)
Stop Bit	1 bit (fixed)

In order to apply a new setting, press < System Restart > or turn off and on the power supply to the RZxS-U9.
These settings cannot be changed while Modbus communication is maintained.

4.5.2 FIELD ZERO/SPAN CALIBRATION

Zero and span calibration is used to compensate the RZxS-U9's aging variations.
First, go through the field calibration using Zero/Span Calibration, and then apply the calibrated value by selecting Zero/Span Adjust in Channel Setting window.
Either the offset calibration (Zero Calibration) only or the offset and gain calibration (Zero & Span Calibration) is selectable.

Basic field calibration is performed by applying the input signal for each channel at one or two points, and then supplying the expected true value for the points through the RZMSCFG program. The first point is for Zero, and the second is for Span. Span calibration must always be executed after Zero calibration. You can either calibrate Zero and Span channel by channel, or go through Zero Calibration for all channels first and then go through Span Calibration.

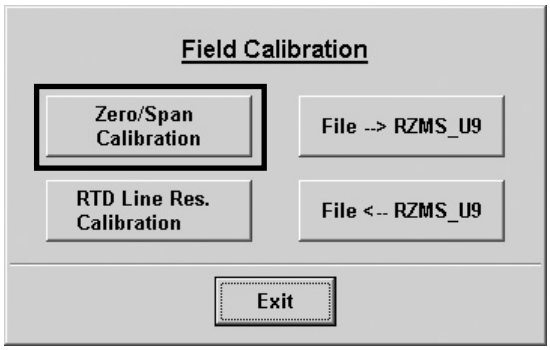
When you have performed Zero Calibration for a certain channel, its Channel Setting is automatically changed to 'Zero' mode; while it is changed to 'Zero & Span' mode after you have performed Span Calibration. Zero/Span Adjust mode setting (Zero, Zero & Span, and None) can be changed anytime. Calibrated data are stored regardless of the selected Zero/Span Adjust mode setting.

Zero & Span Calibration is also used to intentionally set the lower range and upper range values of a potentiometer, inside the actual mechanical full span.

Calibrated data can be stored in a file and written in the RZxS-U9 if you want to reflect the previous calibration result.

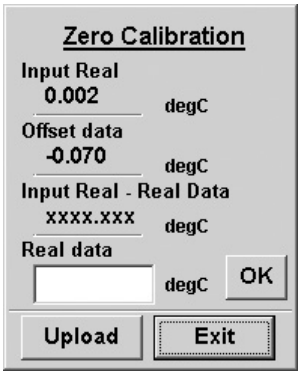
ZERO CALIBRATION

(1) Set the input type and burnout mode properly to the channel for which you want to perform the calibration.
(2) In order to minimize the interference by the input and A/D conversion noise during the calibration process, set A/D conversion mode to Slow, and the low-pass filter time constant to a value as high as 10 seconds for example.
(3) Apply a known and accurate signal value appropriate as Zero point. In Zero mode, an input value around the middle of the actual measuring range will be appropriate. In Zero & Span mode, one around the lower end of the range will be.
(4) Choose Calibration in the menu bar to open Field Calibration window. Press < Zero/Span Calibration > button to open Zero/Span Calib. window.



< Prev. > button	Move to the previous channel.
< Next > button	Move to the next channel.
< Zero > button	Opening the Zero Calibration window.
< Span > button	Opening the Span Calibration window.
< Exit > button	Close the window.

(5) Choose the channel and press < Zero > button.



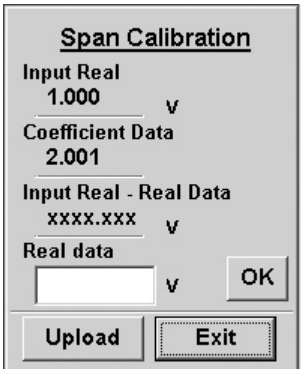
Name	Function
Input Real	Input value in engineering unit
Offset Data	Offset value of the zero point
Real Data	Real value of the zero point
Upload	Reading the previous calibration data

(6) Enter the expected true value in Real Data field and press OK to execute Zero Calibration.
Now Offset Data shows the deviation of the measured value before calibration from the true value, and Input Real shows the input value after calibration. The smaller the difference between Input Real and Real Data is, the higher the calibration performance is.

SPAN CALIBRATION

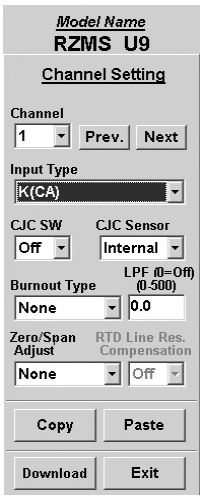
(1) Apply a known and accurate signal value appropriate as Span point. An input value around the upper end of the actual measuring range will be appropriate.

(2) Press < Span > button in Zero/Span Calib. window.
Confirm that the value in Input Real field remains stable after Zero Calibration. Then enter the expected true value in Real Data field and press OK to execute Span Calibration.
Input Real shows the input value after calibration. The smaller the difference between Input Real and Real Data is, the higher the calibration performance is.



Name	Function
Input Real	Input value in engineering unit
Coefficient Data	Coefficient (gain) value calculated from adjustment data
Real Data	Real value of the span point
Upload	Reading the previous calibration data

SELECTING ZERO/SPAN ADJUST MODE



Select either None, Zero or Zero/Span.
Only the offset calibration is applied with Zero, while both offset and gain calibrations are applied with Zero/Span. When None is selected, neither calibration value is applied.

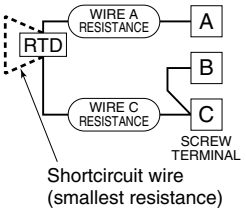
4.5.3 LEADWIRE RESISTANCE COMPENSATION

THREE-WIRE RTD MEASUREMENT

The RZxS-U9 is designed to measure three-wire RTD. In three-wire configuration, it measures leadwire resistance of one of the wires to calculate the total resistance to go and back which is to be subtracted from the measured resistance value, assuming the other wire has equal resistance.
If there is imbalance between two wire's resistances, it is possible to compensate the measured data by measuring such difference in advance.

WIRE RESISTANCE IMBALANCE COMPENSATION

• Measuring RTD resistance:
The RZxS-U9 measures resistance across A - C and wire C resistance in turn to get RTD resistance value.
• Without wire resistance imbalance compensation:
[RTD resistance value] = [resistance across A - C] – [wire C resistance x 2]
Difference between two wire resistances appears as error.
• With wire resistance imbalance compensation:
[RTD resistance value] = [resistance across A - C] – [wire C resistance x 2]
– [field calibration value (wire A resistance – wire C resistance)]
Difference between two wire resistances is compensated.
• Field calibration:
The RZxS-U9 measures resistance at the tip of RTD with a shortcircuit wire (broken line in the figure to the right) to calculate the field calibration value by the following equation:
[Field calibration value] = [resistance across A - C] – [wire C resistance x 2]

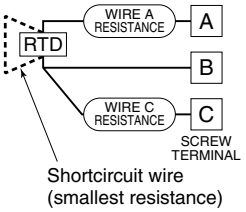


TWO-WIRE RTD MEASUREMENT

The RZxS-U9 is designed to measure three-wire RTD, however, it can be used for two-wire RTD with an appropriate wire compensation. In two-wire configuration, leadwire resistance is not measured, thus the total wire resistance to go and back appears as error.
It is possible to compensate the measured data by measuring the total wire resistance in advance.

WIRE RESISTANCE IMBALANCE COMPENSATION

• Measuring RTD resistance:
The RZxS-U9 measures resistance across A - C and 0z resistance across B - C in turn to get RTD resistance value. (same as three-wire RTD)
• Without wire resistance compensation:
[RTD resistance value] = [resistance across A - C] – [0Ω resistance across B - C x 2]
The total wire resistance appears as error.
• With wire resistance compensation:
[RTD resistance value] = [resistance across A - C] – [0Ω resistance across B - C x 2]
– [field calibration value (total wire resistance)]
The total resistance is compensated.
• Field calibration:
The RZxS-U9 measures resistance at the tip of RTD with a shortcircuit wire (broken line) to calculate the field calibration value by the following equation:
[Field calibration value] = [resistance across A - C]
– [0Ω resistance across B - C x 2]

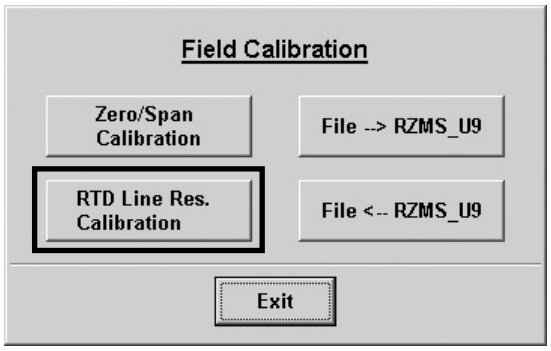


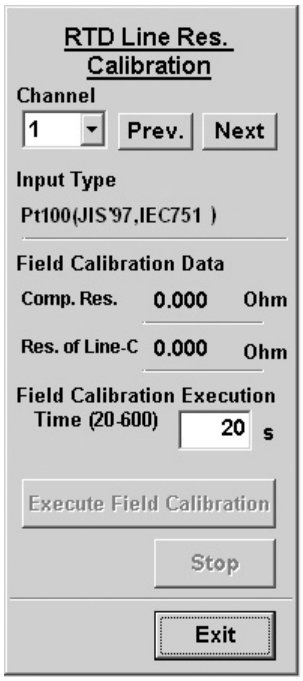
FIELD CALIBRATION

(1) Shortcircuit the tip of RTD with a wire short enough to ensure accuracy. Set the input type and burnout mode properly to the channel for which you want to perform the calibration.

(2) In order to minimize the interference by the A/D conversion noise during the calibration process, set A/D conversion mode to Slow. It is also recommended to match the line noise filter frequency to the local frequency.

(3) Choose Calibration in the menu bar to open Field Calibration window. Press < RTD Line Res. Calibration > button to open RTD Line Res. Calibration window.

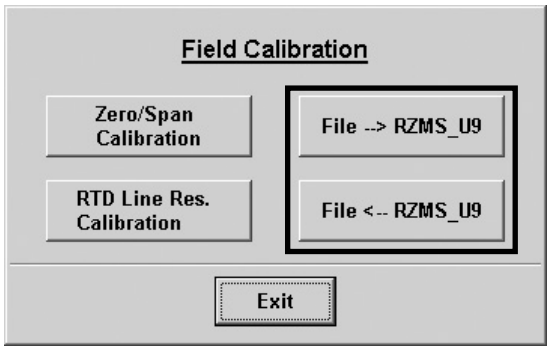




(4) Choose the channel and the execution time, and press < Execute Field Calibration > button.
< Execute Field Calibration > button flashes during the calibration process. In order to pause the process, press < Stop > button. Calibration complete, the flashing stops.
Execution Time is selectable within 20 and 600 seconds. Longer the time, higher the calibration accuracy is.

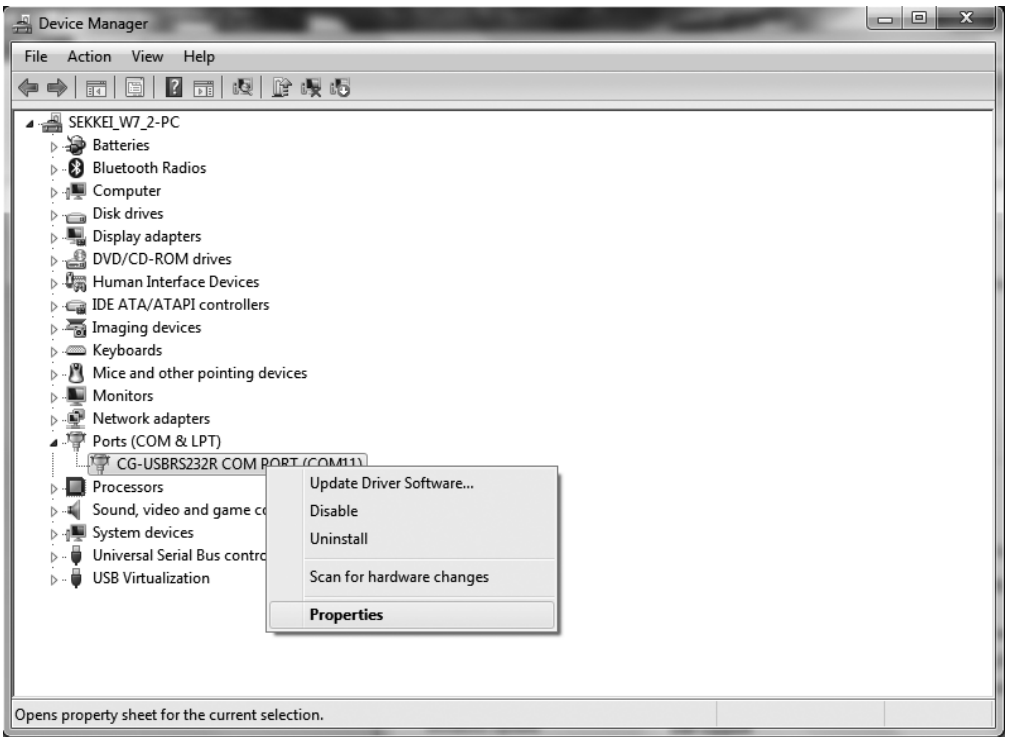
4.5.4 FIELD CALIBRATION FILE

Field calibration data can be stored in a file so that the data would be used for future calibration.
Press < File <-- RZMS_U9 > to save a file in a hard disk, and press < File --> RZMS_U9 > to choose a stored file to write data to the RZxS-U9.



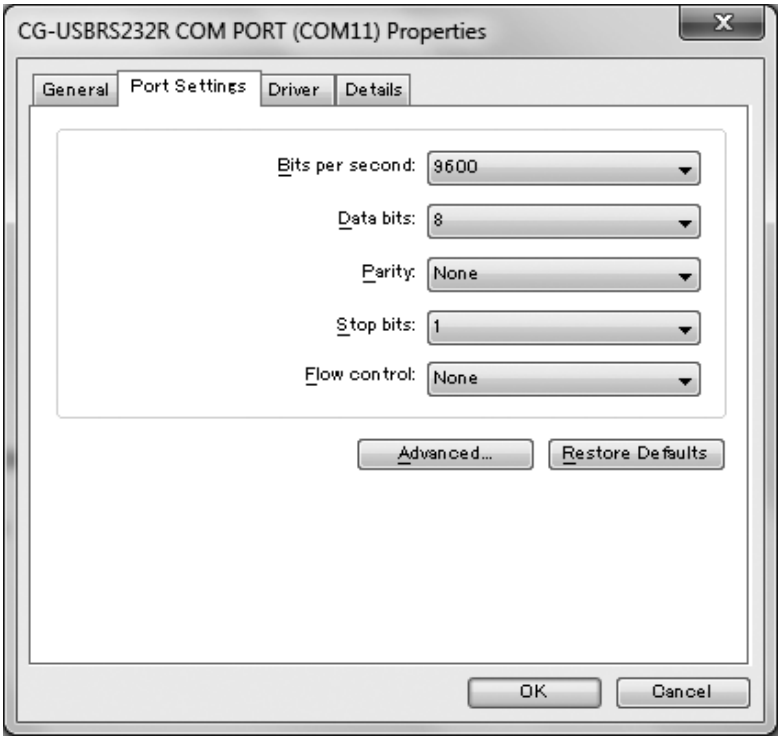
APPENDIX - 1. HOW TO CHANGE THE COM PORT NUMBERS (View examples with Windows 7)

(1) Open Control Panel and double-click System icon and press System Properties in the System dialog box. Choose Hardware tub – Device Manager.

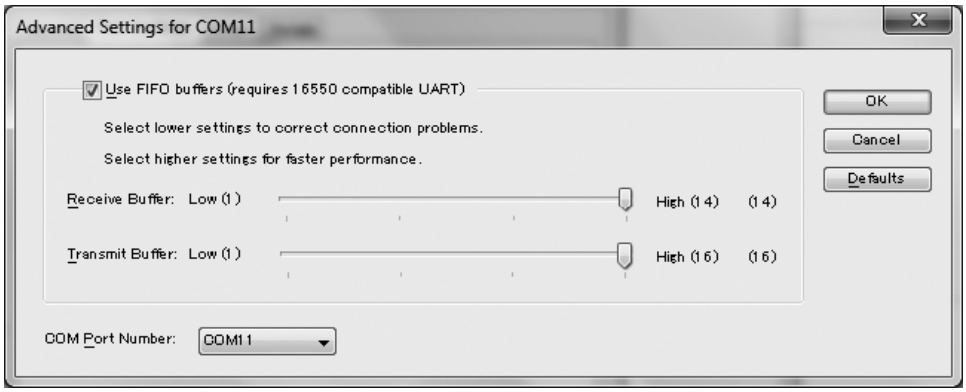


(2) Locate the COM port under Port (COM & LPT) of which you wish to change the number and show its properties by clicking it with the right mouse button.

(3) Press Advanced button under Port Setting tub.



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



M-SYSTEM WARRANTY

1. What is covered.

M-System Co., Ltd. ("M-System") warrants, only to the original purchaser of new M-System products purchased directly from M-System, or from M-System's authorized distributors or resellers, for its own use not for resale, that the M-System products shall be free from defects in materials and workmanship and shall conform to the specifications set forth in the product catalogue applicable to the M-System products for the Warranty Period (see Paragraph 5 below for the Warranty Period of each product).

THE ABOVE WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THE M-SYSTEM PRODUCTS AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

2. What is not covered.

This warranty does not cover any M-System product which has been: (1) modified, altered or subjected to abuse, misuse, negligence or accident; (2) improperly installed or installed in conjunction with any equipment for which it was not designed; or (3) damaged or destroyed by disasters such as fire, flood, lightning or earthquake.

In no event shall M-System be liable for any special, incidental, consequential or other damages, costs or expenses (including, but not limited to, loss of time, loss of profits, inconvenience or loss of use of any equipment).

3. Remedies.

If a defective product is returned to M-System in accordance with the procedures described below, M-System will, at its sole option and expense, either: (1) repair the defective product; (2) replace the defective product; or (3) refund the purchase price for the defective product paid by the purchaser. Except as otherwise provided by applicable state law, these remedies constitute the purchaser's sole and exclusive remedies and M-System's sole and exclusive obligation under this warranty.

4. Warranty Procedure.

If the purchaser discovers a failure of the M-System products to conform to the terms of this warranty within the Warranty Period, the purchaser must promptly (and, in any event not more than 30 days after the discovery of such failure) notify the relevant party as described below either by telephone or in writing at the below address to obtain an Authorized Return (AR) number and return the defective product to the relevant party. The designated AR number should be marked on the outside of the return package and on all correspondence related to the defective product. The purchaser shall return, at purchaser's expense, defective products only upon receiving an AR number. In order to avoid processing delays, the purchaser must include: copies of the original purchase order and sales invoice; the purchaser's name, address and phone number; the model and serial numbers of the returned product; and a detailed description of the alleged defect.

5. Warranty Period.

Signal Conditioner:	36 months from the date of purchase.
M-Rester:	12 months from the date of purchase.
Valve Actuator:	18 months from the date of shipment from M-System or 12 months from the date of its installation, whichever comes first.
Other Products:	36 months from the date of purchase.

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