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**User's  
Manual**

**RXA10  
Configuration Software**

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**vigilantplant™**



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## Foreword

Thank you for purchasing the RXA10 Configuration Software (Model: RXA10, hereafter referred to as the “configuration software”).

This manual explains how to use the configuration software on Windows XP and Windows 2000 Service Pack 2 or later. Please read this manual carefully before operating the software to ensure its correct use.

After you have read this manual, keep it in a safe place where it can be referred to anytime a question arises.

## Notes

- This manual describes the RXA10 that is used with the  $\mu$ R10000 and  $\mu$ R20000, version number 1.31 or before.
- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the performance and functions.
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## Revisions

1st Edition	February 2005
2nd Edition	January 2006
3rd Edition	June 2006

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# Recorder Version and Functions Described in This Manual

## Recorder Version and Principal Changes

- **2nd Edition (Recorder Version before 1.31)**

No.	Principal Changes	Reference Section
1	The printout/display format of the date can be changed.	2.4
2	Selectable range of alarm values during linear scaling is -5% to 105% of the scale span.	2.7
3	French and German added to suffix code -2.	2.7
4	Calibration correction (/CC1 option) added.	2.3, 2.4, and 2.7

- **3rd Edition (Recorder Version 1.31)**

No.	Principal Changes	Reference Section
1	Header printout (/BT1 option) added.	2.3, 2.6, and 2.7
2	Customized menu added.	2.7

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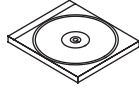
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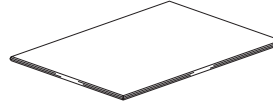
Please check the contents of the package before using this product. If some of the contents are not correct or missing or if there is physical damage, contact the dealer from which you purchased them.

- **Contents of the Package**

RXA10  
Configuration Software  
(CD)



RXA10  
Configuration Software  
User's Manual



Interface Unit  
(for the RXA10-02 model)



- **MODEL and SUFFIX Code**

Model	Suffix Code	Note
RXA10	-01	Configuration software
	-02	Configuration software (with interface unit)

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# How to Use This Manual

## Structure of This Manual

This user's manual consists of the following sections.

Chapter	Title	Description
1	<b>Before Using the Software</b>	Describes the PC system requirements for using the configuration software, the software installation procedure, and the procedure for connecting to the recorder.
2	<b>Configuring the Recorder</b>	Describes how to create the setup data of the recorder and configure the recorder or save the data.
3	<b>Troubleshooting</b>	Describes the error messages and their corrective actions.
<b>Index</b>		Gives an index.

## Scope of the Manual

This manual does not cover the basic operations of the operation systems. For such information, see the Windows user's guide or other relevant documents.

## Conventions Used in This Manual

- **Unit**  
K: Denotes 1024. Example: 100 KB  
k: Denotes 1000.
- **Notations of Menus, Commands, Dialog Boxes, and Buttons**  
Typed in boldface in the operating procedure.
- **Note**  
**Note** Gives useful tips on the operation of the software.

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# 1.1 Overview of the Configuration Software

## Function

This software program is used to configure the  $\mu$ R10000 and  $\mu$ R20000 from a PC. The setup data can be created using any of the methods below to configure the recorder.

- Load the setup data from the connected recorder and change the settings.
- Open a saved setup data and change the settings.
- Create new setup data.

The setup data can be saved to the hard disk on the PC. The setup information can also be printed.

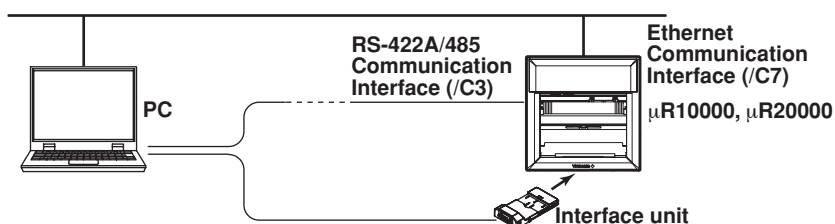
### Note

This program cannot be used to set the following items.

- Date/Time (Setting mode)
- RS-422A/485, Ethernet, and pen and dot printing position adjustment (Basic Setting mode)

## Connecting to the Recorder

A connection to a PC can be made using the RS-422A/485 communication interface (/C3 option) or the Ethernet communication interface (/C7 option) of the recorder. In the case of the RXA10-02, the interface unit can be used to connect to the recorder through the RS-232 communication interface of the PC even if the recorder is not equipped with a communication interface.



### Note

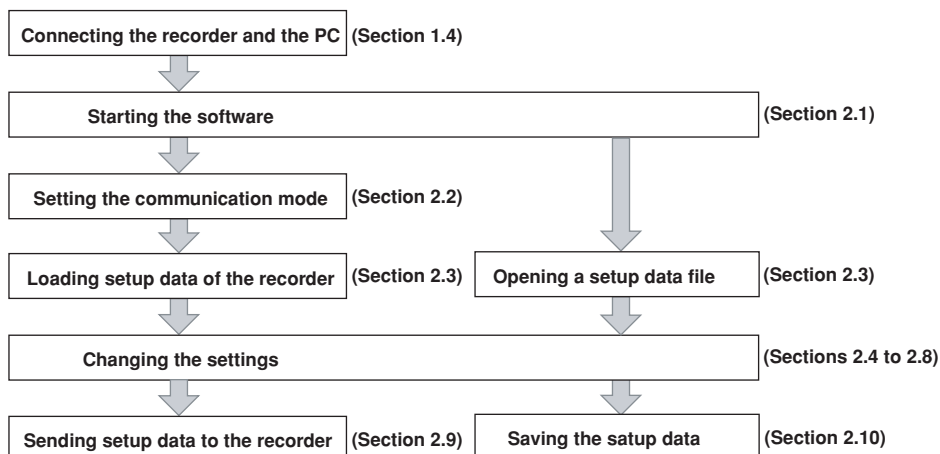
When using the interface unit, turn OFF the device that is connected to the RS-422A/485 communication interface (/C3 option) on the recorder rear panel or disconnect the cable. Data may be sent to the device connected to the RS-422A/485 communication interface on the rear panel when the interface unit is communicating.

## Flow of Operation

The flow of operation of the program is shown below.

To change the settings of the recorder

To change a setup data file



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## 1.2 PC System Requirements

### Hardware

- **PC**  
A PC running Windows XP or Windows 2000 Service Pack 2 or later with a 600-MHz Pentium III CPU or higher (800-MHz Pentium III or higher recommended).
- **Internal memory**  
256 MB or more (512 MB recommended). The necessary amount of RAM may increase depending on other programs that may be running. The necessary amount of memory also varies depending on the OS.
- **Hard disk**  
Free disk space of 10 MB or more (100 MB or more recommended).
- **CD-ROM drive**  
A CD-ROM drive supported by the OS.
- **Mouse**  
A mouse supported by the OS.
- **Display**  
A display supported by the OS with 1024 × 768 resolution and 32K colors or better (64K colors recommended).
- **Communication port**  
An RS-232 port or an Ethernet port supported by the OS.
- **Printer**  
A printer supported by the OS. An appropriate printer driver for the OS is also required.

### Operating System

Windows XP or Windows 2000 Service Pack 2 or later

**Note**

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The PC must have Courier New font installed.

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## 1.3 Installing the Software

A serial number is required to install the configuration software. The serial number is indicated on the CD-ROM case. Please have the serial number ready.

### Installing the Software

1. Start Windows. Log onto Windows as an administrator.
2. Insert the CD-ROM containing the software into the CD-ROM drive.
3. The installation program starts automatically. Proceed with the installation according to the instructions that appear on the screen.

If the installation program does not start automatically, carry out the procedures below.

4. Double-click the CD-ROM icon from "My Computer" to open the CD-ROM drive window.
5. Double-click the "install.exe" file in the root directory. The installation will start after a short time. Then, follow the instructions on the screen.

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### Note

- Exit memory resident programs such as virus protection programs before installation.
  - When reinstalling the software, uninstall it first.
  - To uninstall the program, follow the procedures below.
    1. Double-click "Add/Remove Programs" in the Control Panel and uninstall the program.
    2. As necessary, back up the setup data files with .pul extension in the directory in which the configuration software was installed to a different directory.
    3. Delete the files (various data files and subdirectories) that were created after the installation of the program. Also, delete the directory in which the program was installed.
-

## 1.4 Connecting the Recorder and the PC

### Using the Ethernet Communication Interface (/C7 Option)

For the procedure to connect the recorder and the PC, see section 2.2, "Connecting the Ethernet Interface" in the *μR10000/μR20000 Communication Interface User's Manual (IM 04P01B01-17E)*.

### Using the RS-422A/485 Communication Interface (/C3 Option)

For the procedure to connect the recorder and the PC, see section 3.2, "Terminal Arrangement and Signal Names and the Connection Procedure of the RS-422A/485 Communication Interface" in the *μR10000/μR20000 Communication Interface User's Manual (IM 04P01B01-17E)*.

### Using the Interface Unit (For the RXA10-02)

#### CAUTION

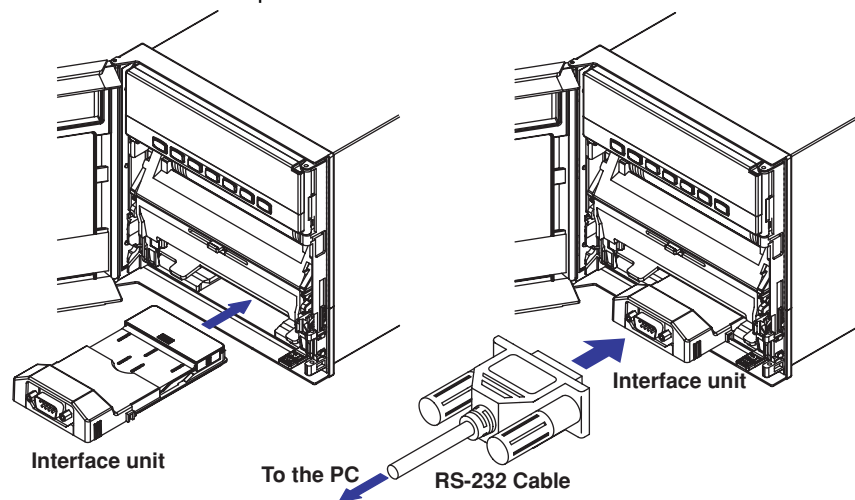
Do not insert or remove the interface unit while the recorder is turned ON. If you do, the internal circuit of the recorder and/or the interface unit may be damaged.

#### Note

- When using the interface unit, turn OFF the device that is connected to the RS-422A/485 communication interface (/C3 option) on the recorder rear panel or disconnect the cable. Data may be sent to the device connected to the RS-422A/485 communication interface on the rear panel when the interface unit is communicating.
- Use a D-Sub 9-pin RS-232 cable (cross cable) to connect the PC and the interface unit (The connector on the interface unit is a D-Sub 9-pin plug (male)).

#### • Connecting the Recorder and the PC

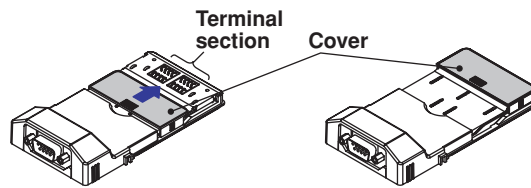
1. Turn OFF the recorder and the PC.
2. Insert the interface unit in the opening under the chart cassette. Insert it until it clicks in place.



3. Connect the interface unit and the PC's RS-232 connector with an RS-232 cable.
4. Turn ON the recorder first and then the PC.

- **Disconnecting the Recorder from the PC**

1. Turn OFF the recorder and the PC.
2. Pull out the interface unit.
3. Place the cover over the terminal section of the interface unit.

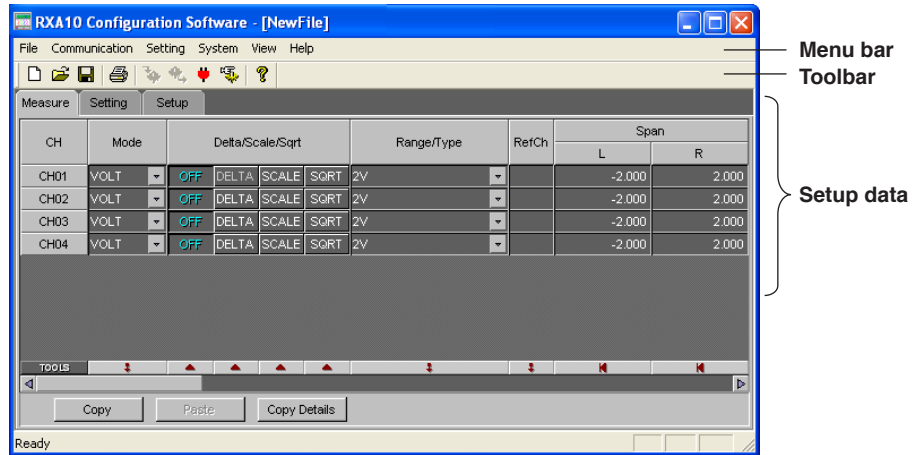


## 2.1 Starting/Closing the Software and Showing Version Information

### Starting the Software

From the task bar, click Start, point to **Programs**, and choose **RXA10 Configuration Software**.

The software starts.



### Closing the Software

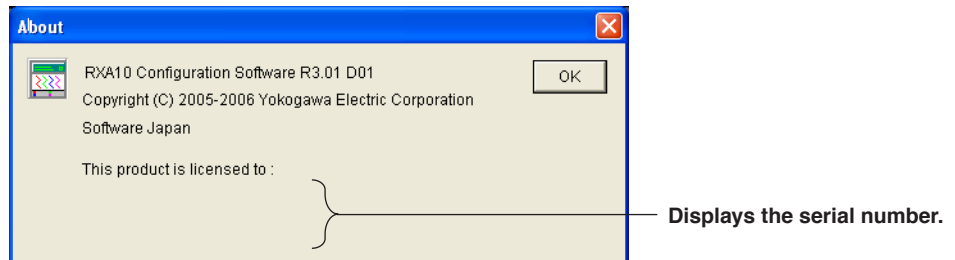
From the **File** menu, choose **Exit**, or click the **X** button.

The configuration software window closes.

### Showing Version Information

From the **Help** menu, choose **About**. You can also click the icon ( ? ) on the toolbar.

The **About** dialog box opens.

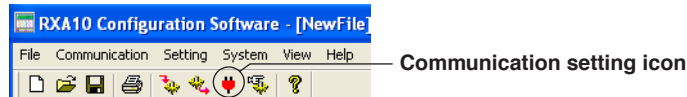


Click **OK** to close the dialog box.

## 2.2 Setting the Communication Mode for Connecting to the Recorder

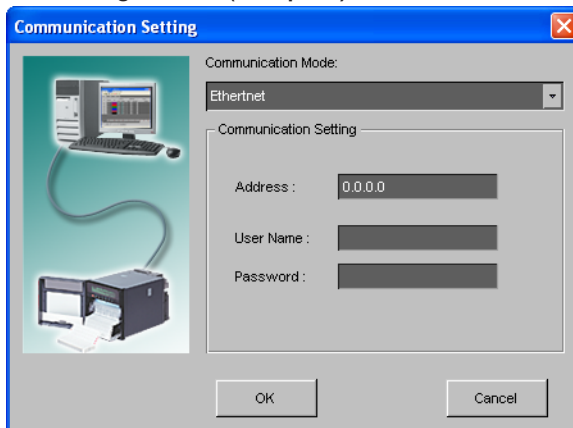
Set the communication mode and parameters according to the type of connection between the PC and the recorder.

1. From the **Communication** menu, choose **Communication Setting**. You can also click the Communication Setting icon on the toolbar. The **Communication Setting** dialog box opens.

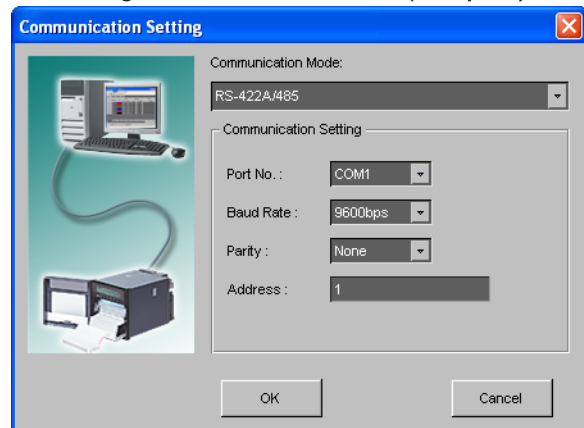


2. Set the communication mode and parameters.

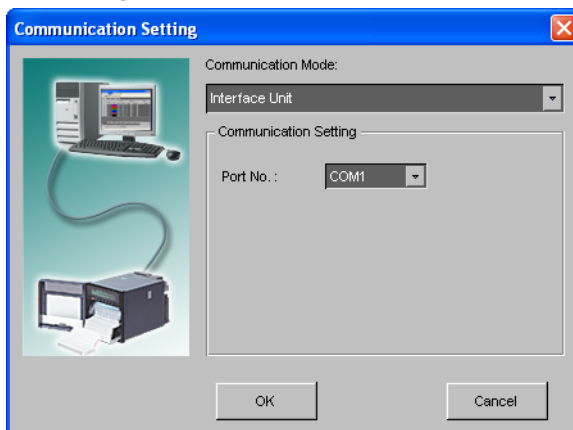
When using Ethernet (/C7 option)



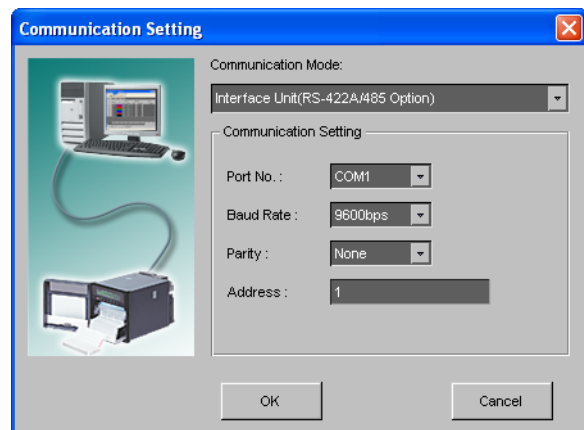
When using the RS-422A/485 interface (/C3 option)



When using the interface unit



When using the interface unit on a model with the RS-422A/485 interface (/C3 option)



3. Click **OK**.  
The dialog box closes, and the communication between the PC and the recorder is enabled.  
Click **Cancel** to cancel the settings and close the dialog box.

### Note

After starting the program, be sure to check the communication settings and click **OK**. After the communication settings are checked, **Receive setting** and **Send setting** of the **Communication** menu become selectable.

- **Ethernet**
  - **Address**

Enter the IP address or host name of the recorder.
  - **User Name and Password**
    - When using the login function on the recorder  
Login as an administrator.
    - When not using the login function on the recorder  
Login with the user name "Admin."  
Password is not necessary.
  
- **RS-422A/485**
  - **Port No.**

Select the port from COM1 to COM9.
  - **Baud Rate and Parity**

Set the same values as the recorder.
  - **Address**

Enter the recorder's address.
  
- **Interface Unit**
  - **Port No.**

Select the port from COM1 to COM9.
  
- **Interface Unit (RS-422A/485 Option)**
  - **Port No.**

Select the port from COM1 to COM9.
  - **Baud Rate and Parity**

Set the same values as the recorder.
  - **Address**

Enter the recorder's address.



## 2.3 Loading the Setup Data or Creating New Setup Data

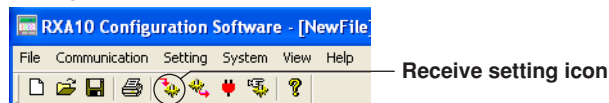
The following three methods are available for creating setup data.

- Load the setup data of the recorder
- Open a setup data file.
- Create new setup data.

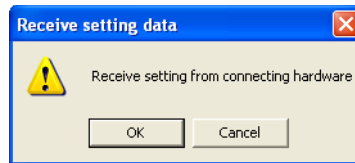
### Loading the Setup Data of the Recorder

Before carrying out the following procedure, check to see that the communication mode and parameters are set correctly. For details, see section 2.2, “Setting the Communication Mode for Connecting to the Recorder.”

1. From the **Communication** menu, choose **Receive Setting**. You can also click the Receive setting icon on the toolbar. A confirmation dialog box for receiving settings opens.



2. Click **OK**.  
The reception starts. When the reception of the settings is complete, a message appears to indicate it.



3. Click **OK**.  
The loaded setup data is displayed.

### Note

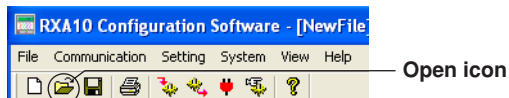
- If the message in the figure below appears, check the following:
  - That the communication settings are matched with the settings on the recorder.
  - That there are no users accessing the recorder or that the maximum number of users is not exceeded.



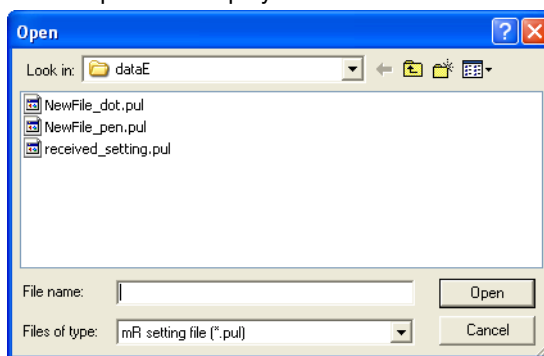
- Note that if setup data is received when the recorder is in Basic Setting mode, the setup data in the middle of the configuration will be received.

## Opening a Setup Data File

1. From the **File** menu, choose **Open**. You can also click the Open icon. The **Open** dialog box opens.



2. Select the desired file, and click **Open**. The setup data is displayed.

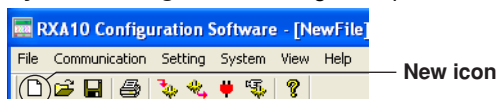


### Note

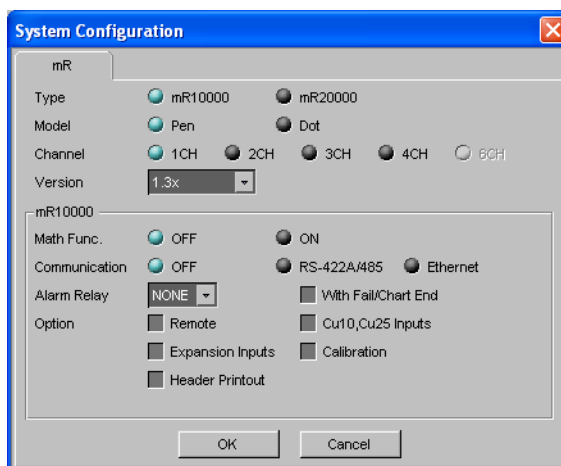
The extension to setup data files is .pul.

## Creating New Setup Data

1. From the **File** menu, choose **New**. You can also click the New icon. The **System Configuration** dialog box opens.



2. Set the system configuration of the recorder, and click **OK**. A setup window with the specified system configuration opens with the settings set to default values.



- **Type, Model, Channel, and Style**

- Type: Recorder types.
- Model: Pen model or dot model.
- Channel: The number of measurement channels on the recorder.
- Style: The style number of the recorder.

## 2.3 Loading the Setup Data or Creating New Setup Data

---

- **Options**

Math Func.:	Computation function (/M1 option)
Communication RS-422A/485:	RS-422A/485 Communication Interface (/C3)
Communication Ethernet:	Ethernet Communication Interface (/C7)
Alarm Relay 2p:	Alarm output relay 2 points (/A1)
Alarm Relay 4p:	Alarm output relay 4 points (/A2)
Alarm Relay 6p:	Alarm output relay 6 points (/A3)
Alarm Relay 12p:	Alarm output relay 6 points (/A4, $\mu$ R20000)
Alarm Relay 24p:	Alarm output relay 6 points (/A5, $\mu$ R20000)
With FAIL/Chart End:	FAIL/Chart End Detection and Output (/F1)
Remote:	Remote Control Input (/R1)
Cu10, Cu25 Inputs:	Cu10, Cu25 RTD Input (/N1)
Expansion Inputs:	Expansion Inputs (/N3)
Calibration:*	Calibration Correction (/CC1)
Header Printout:**	Header Printout (/BT1)

\* Function available on recorders with firmware version 1.21 or later.

\*\* Function available on recorders with firmware version 1.31 or later.

### Checking/Changing the System Configuration of the Setup Data

- **Checking the System Configuration**

With the setup data displayed in the window, choose **System Configuration** from the **System** menu.

The **System Configuration** dialog box opens.

Check the system configuration that is shown, and click **OK**.

The dialog box closes.

- **Changing the System Configuration**

With the setup data displayed in the window, choose **System Configuration** from the **System** menu.

The **System Configuration** dialog box opens.

Change the system configuration, and click **OK**.

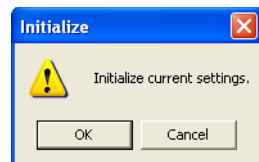
The confirmation dialog box opens. Click **OK** to open a setup window with the specified system configuration with the settings set to default values.

### Initializing the Settings

1. From the **Setting** menu, choose **Initialize**.

The **Initialize** dialog box opens.

2. Click **OK** to initialize the settings.



#### **Note**

For the default settings, see section 4.3, "Menu Structure, Settings, and List of Default Values" in the  $\mu$ R10000 Recorder User's Manual (IM 04P01B01-01E) or  $\mu$ R20000 Recorder User's Manual (IM 04P02B01-01E).

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## 2.4 Setting the Measurement Channels

Click the **Measure** tab. You can also choose **Measure Channels** from the **Setting** menu.

**Note**

The following items may be shown or hidden depending on the settings in the Basic Setting mode. Low-cut, Bias, Calibration Correction (/CC1 option), Alarm Delay, and Partial.

Drag the pointer while holding down the left mouse button to select multiple channels.  
 Click twice to unselect the channel.  
 Double-click to open a setup dialog box for the respective channel.  
 Input type  
 Delta input  
 Linear scaling  
 Square root computation  
 Input range  
 Reference channel for delta input  
 Recording span

CH	Mode	Delta/Scale/Sqrt			Range/Type	RefCh	Span	
		Delta	Scale	Sqrt			L	R
CH01	VOLT	OFF	DELTA	SCALE	2V		-2.000	2.000
CH02	VOLT	OFF	DELTA	SCALE	2V	1	-2.000	2.000
CH03	1-5V	OFF	DELTA	SCALE	1-5V		1.000	5.000
CH04	VOLT	OFF	DELTA	SCALE	2V		-2.000	2.000
CH05	TC	OFF	DELTA	SCALE	TypeR		0.0	1760.0
CH06	DI	OFF	DELTA	SCALE	LEVEL		0	1

Tools: Copy Paste Copy Details

Set collectively.  
 Sets the settings of the first channel to the other channels.  
 Sets the default value.

Scale value of linear scaling  
 Decimal point position  
 Leftmost value  
 Rightmost value  
 Unit  
 Turns the low-cut function ON/OFF  
 Low-cut value  
 Either "Bias" or "Calibration" (/CC1 option) is displayed depending on the settings in Basic Setting mode (see page 2-25).

Point	Scale		Unit	Low-cut	Bias		Calibration	
	L	R			Value(%)	Value	Mode	Point
1	-200.0	600.0	°C	OFF	OFF	0.000	Revise	4
2	0.00	200.00	m~h	ON	5.0	OFF	Abs.	5

Sets the maximum possible value.  
 Sets the minimum possible value.  
 Toggles ON/OFF collectively for each click.

Alarm 1  
 Alarm type  
 Alarm value  
 Output relay number  
 Alarm 2  
 Alarm 3

Alarm 1			Alarm 2			Alarm 3	
Type	Value	Relay	Type	Value	Relay	Type	Value
HI	0.000	NONE	OFF	0.000	NONE	OFF	0
OFF	0.000	NONE	OFF	0.000	NONE	OFF	0
OFF	0.0	NONE	OFF	0.0	NONE	OFF	
OFF	0.00	NONE	OFF	0.00	NONE	OFF	
OFF	0.0	NONE	OFF	0.0	NONE	OFF	
OFF	0	NONE	OFF	0	NONE	OFF	

The tool buttons apply to the selected range of channels when channels are selected. They apply to all channels when a channel is not selected.

## 2.4 Setting the Measurement Channels

Alarm 4

Alarm delay time

Sampling count of moving average (dot model) or filter time constant (pen model)

Tag

Recording zone

Alarm 4				Alarm Delay	Moving Ave	Tag	Zone	
Type	Value	Relay					L	R
OFF	0.000	NONE		10 sec	OFF	1	0	100
OFF	0.000	NONE		10 sec	OFF	2	0	100
OFF	0.0	NONE		10 sec	OFF	3	0	100
OFF	0.00	NONE		10 sec	OFF	4	0	100
OFF	0.0	NONE		10 sec	OFF	5	0	100
OFF	0	NONE		10 sec	OFF	6	0	100

Bar graph display mode

Partial expanded recording

Channel recording color (dot model)

Turns trend recording ON/OFF (dot model)

Turns ON/OFF periodic printout

Types of measured values to be printed periodically

Bar Graph	Partial			Color	Print Out		Periodic Print	
	Expand(%)	Boundary			Trend	Periodic	Mode	SUM Scale
Normal	OFF	50	0.000		ON	ON	AVE	OFF
Normal	OFF	50	0.000		ON	ON	AVE	OFF
Normal	OFF	50	0.0		ON	ON	AVE	OFF
Normal	OFF	50	0.00		ON	ON	AVE	OFF
Normal	OFF	50	0.0		ON	ON	AVE	OFF

### Correction Points for Calibration Correction (/CC1 Option)\*

\* For recorders with firmware version 1.21 or later

Set the correction points for each channel to use the calibration correction. You can set these points after setting the **Calibration** on the **Measure** tab.

Click the **Calibration** tab. You can also choose **Calibration** from the **Setting** menu.

Drag the pointer while holding down the left mouse button to select multiple correction points. Click twice to unselect the correction points.

Value at the correction point

Correction value

Measure								
No.	CH01		CH02		CH03		CH04	
	Datums	Value	Datums	Value	Datums	Value	Datums	Value
01	-2.000	0.000	-2.000	0.000				
02	2.000	0.000	2.000	0.000				
03	2.000	0.000	2.000	0.000				
04	2.000	0.000	2.000	0.000				
05			2.000	0.000				
06								

TOOLS

Copy

Set the settings of the first point in the selected range to the other points.

Given channels are copied and pasted to other channels.

Calibration Copy Details

Source: CH01 - CH01

Destination: CH01 - CH01

OK Cancel

Channel range to be copied.

Channel range to be pasted.

Click OK to copy and paste.

## Input (Mode, Range/Type, and Span)

Set the input type (Mode, Range/Type) and the recording span (Span).

Mode	Relevant Settings
VOLT (voltage)	Range/Type, Span L, and Span R
TC (thermocouple)	Range/Type, Span L, and Span R
RTD (resistance temperature detector)	Range/Type, Span L, and Span R
1-5V (1-5V)	Range/Type, Span L, and Span R
DI (voltage level/contact input)	Range/Type, Span L, and Span R
SKIP (Measurement OFF)	None

### Note

- Click the Default button (⌘) for Span L to set the minimum value within the measurable range. Click the Default button for Span R to set the maximum value within the measurable range.
- The span L and R values that have been changed are displayed in orange, but the values are valid. When data adjustment (see section 2.8) is executed, the values change back to white.
- When a value outside the measurable range is entered or when the span L and span R values are set to the same value, they are corrected when the data is checked.
- If SKIP is selected, other settings are discarded.

## Delta Computation (Delta and RefCh)

Measures the difference between the input value of its own channel and that of the reference channel. Delta computation can be specified when the Mode setting is VOLT, TC, or RTD.

### Delta/Scale/Sqrt

Select DELTA.

### RefCh

Select the reference channel.

Specify a channel that is smaller in channel number than itself for the reference channel.

## Square Root Computation

The square root of the input value is calculated, the result is scaled to a value in the appropriate unit, and used as the measured value of the channel. Also, the low-cut function can be used. This setting can be used only when the input mode is set to VOLT.

### Delta/Scale/Sqrt

Select SQRT.

## Low-cut

This appears when low-cut is enabled (see page 2-25) in Basic Setting mode.

### For Square Root Computation

ON: Sets measured values below the specified value to 0 (the leftmost value of the scale).

Value (%): The measured value to be low-cut. Set the value in the range of 0.0% to 5.0% of the recording span.

### For 1-5V Input

ON: Sets measured values below 0% input to 0 (the leftmost value of the scale).

## Linear Scaling

### Scale (Point, L, and R)

The input values are scaled to values in the appropriate unit to be used as measured values. Set the leftmost value of the scale (L) and the rightmost value of the scale (R) using a mantissa and decimal point position.

Mantissa: -20000 to 30000

Decimal position: 0 (the number of digits right of the decimal is 0) to 4 (the number of digits to the right of the decimal is 4)

## 2.4 Setting the Measurement Channels

### Note

The L and R values that have been changed are displayed in orange, but the values are valid. When data adjustment (see section 2.8) is executed, the values change back to white.

### Unit

Enter the unit using up to six characters. The characters that can be used are as follows (see section 2.12):

Alphabet, numbers, symbols (% , # , ° , @ , + , - , \* , / , ( , ) , μ , Ω , <sup>2</sup> , <sup>3</sup> , . , ) , and space

### Bias

This appears when bias is enabled (see page 2-25) in Basic Setting mode.

#### ON/OFF and Value

Select ON to use bias.

The range of bias that can be specified is ±10% of the measurable range of the input range. For example, the range is -0.4 V to 0.4 V for the 2 V input range. For channels on which scaling is set, the range is ±10% of the scaling range span. A bias cannot be set on channels set to ON/OFF input (DI).

### Calibration (/CC1 Option)\*

\* For recorders with firmware version 1.21 or later

#### Settings on the Measure Tab

Setting items are displayed when the calibration correction is enabled in Basic Setting mode (see page 2-25).

- **Mode**

Select **Revise** or **Abs.** to specify correction values. See the table below.

- **Point**

Input number of correction points (up to 16 points) including first and last points.

- **ON/OFF**

Select **ON** to use the calibration correction.

#### Settings on the Calibration Tab

- **Datums**

Set a value of the correction point (input value). Follow the conditions below.

Datum of first correction point < Datum of second correction point ≤ Datum of third correction point ≤ Datum of fourth correction point ≤ .....

- **Value**

Set a correction value corresponding to the datum. Follow the conditions below.

- **When Mode is set to Revise**

“Datum + Value” of first correction point < “Datum + Value” of second correction point < “Datum + Value” of third correction point < .....

- **When Mode is set to Abs.**

Value of first correction point < Value of second correction point < Value of third correction point < .....

The table below shows some examples.

Datum (Correction point)	Value after Correction	Value (Correction value)	
		when Mode is Revise	when Mode is Abs.
9.8°C	10.0°C	0.2°C	10.0°C
90.5°C	90.0°C	-0.5°C	90.0°C

### Note

If the difference between values of the correction points, or the difference between values after correction, are small, for example several digits, an error may occur when you send the setup data to the recorder. In that case, change the set values.

## Alarm 1 to 4

Four alarms (Alarm 1 to 4) can be specified on each channel.

### Type

Type Values	Description
H	An alarm occurs when the measured value exceeds the specified value.
L	An alarm occurs when the measured value falls below the specified value.
h(dH)*	An alarm occurs when the difference in the input values of two channels is greater than or equal to the specified value.
l(dL)*	An alarm occurs when the difference in the input values of two channels is less than or equal to the specified value.
R(RH)	The rate-of-change of the measured values is checked over a certain time (interval). An alarm occurs if the rate-of-change of the measured value in the rising direction is greater than or equal to the specified value.
r(RL)	The rate-of-change of the measured values is checked over a certain time (interval). An alarm occurs if the rate-of-change of the measured value in the falling direction is greater than or equal to the specified value.
T**	An alarm occurs when the measured value remains above the alarm value for the specified time period.
t**	An alarm occurs when the measured value remains below the alarm value for a specified time period.

\* Can be specified on channels set to delta computation.

\*\* T and t can be selected when the alarm delay function is enabled in Basic Setting mode.

### Alarm Value

Alarm is generated using the specified value as the boundary. The selectable range of alarm values vary depending on the input mode and range.

### Relay

To output relays, select the output relay number. Otherwise, select NONE.

### Alarm Delay

An alarm occurs when the measured value remains above or below the alarm value for a specified time period (alarm delay time).

## Filter and Moving Average

### Filter (Pen Model)

To use the input filter, select the time constant (2 s, 5 s, or 10 s).

### Moving Average (Dot Model)

To use the moving average, select the sampling count (2 to 16).

## Tag

Enter the tag using up to 7 characters. The characters that can be used are as follows (see section 2.12):

Alphabet, numbers, symbols (% , # , ° , @ , + , - , \* , / , ( , ) , μ , Ω , <sup>2</sup> , <sup>3</sup> , .), and space

### Note

The setting of whether to use channel numbers or tags for printing is specified in Print Setting under the Setup tab.

## Zone

Sets the zone in which the measured values of each channel are recorded. Set the position (mm) on the chart paper for the leftmost value of the recording zone (L) and rightmost value of recording zone (R).

- Selectable range: 0 to 100 mm (μR10000), 0 to 180 mm (μR20000)  
Set R to a value greater than L, and make the zone width (R – L) greater than or equal to 5 mm.



### Bar Graph

Selects the display mode of the bar graph.

**Normal:** Sets the base point of the graph to the smaller of the values Span L or Span R (or Scale L or Scale R).

**Center:** Sets the base point of the bar graph to the 50% position of the span.

### Partial

This appears when partial expanded recording is enabled in Basic Setting mode.

#### **Expand (%)**

Set the boundary position for the partial expanded recording. The range is from 1 to 99%.

#### **Boundary**

Set the boundary value to a value within the span (within the scale when linear scaling is used).

### Color (Dot Model)

Click the appropriate box in the Color column to open the Recording Color dialog box. Select the recording color of the respective channel.

### Print Out

#### **Trend (Dot Model)**

Turns trend recording ON/OFF.

#### **Periodic**

Turns periodic printout ON/OFF.

### Periodic Printout

Selects the type of measured values to be printed in periodic printout. This setting is activated when Mode for Periodic Print in Print Setting (see page 2-24) in Basic Setting mode is set to Report.

#### **Mode**

**AVE:** Average value over the interval.

**MIX:** Minimum, maximum, and average values over the interval.

**SUM:** Sum value over the interval.

**MIN:** Minimum value over the interval.

**MAX:** Maximum value over the interval.

**INST:** Instantaneous value

#### **SUM Scale**

When the mode is SUM, set the sum scale.

SUM sums the data every computation interval. For flow values that have units /s, /min, /h, or /day, a simple summation results in the actual value not matching the computed result, because the scan interval and the unit of the input values are different. In such cases, set the sum scale to match the unit of the input value. In effect, the sum value with the same unit as that of the input value is calculated.

For example, if the scan interval is 1 s, and the input value is 100 m<sup>3</sup>/min, a simple summation would add 100 every 1 s resulting in 6000 after one minute. However, if the sum scale is set to /min, then 1 s/60 s is multiplied every scan interval before the value is added giving a result with an m<sup>3</sup>/min unit.

**OFF:** Simply sums the measured values.

**/s:** Sums by converting the measured values to a value over 1 second.

**/min:** Sums by converting the measured values to a value over 1 minute.

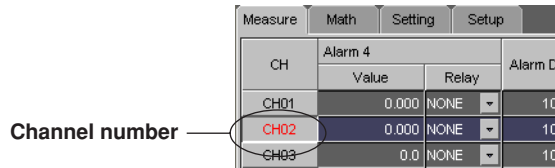
**/h:** Sums by converting the measured values to a value over 1 hour.

**/day:** Sums by converting the measured values to a value over 1 day.

### Copying and Pasting the Settings

The settings specified for a given channel can be copied and pasted to other channels.

1. Click the copy source channel number. To select multiple channels, drag the pointer while holding down the left mouse button.

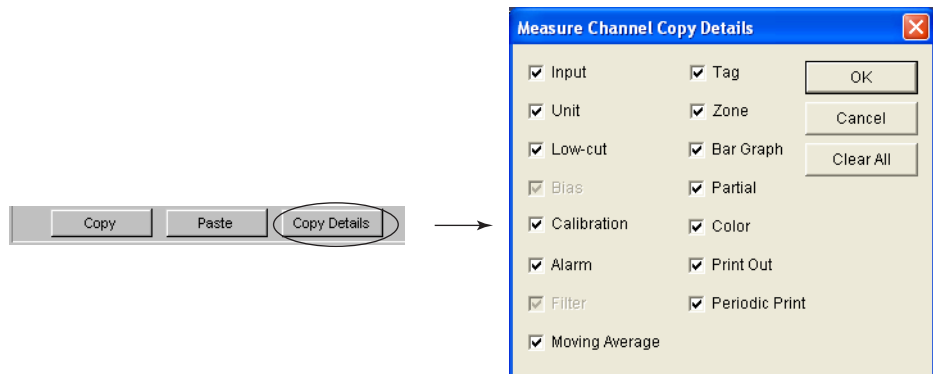


2. Click **Copy** ( ).
3. Click the copy destination channel number. To select multiple channels, drag the pointer while holding down the left mouse button.
4. Click **Paste** ( ).

The items that are to be copied/pasted can be limited

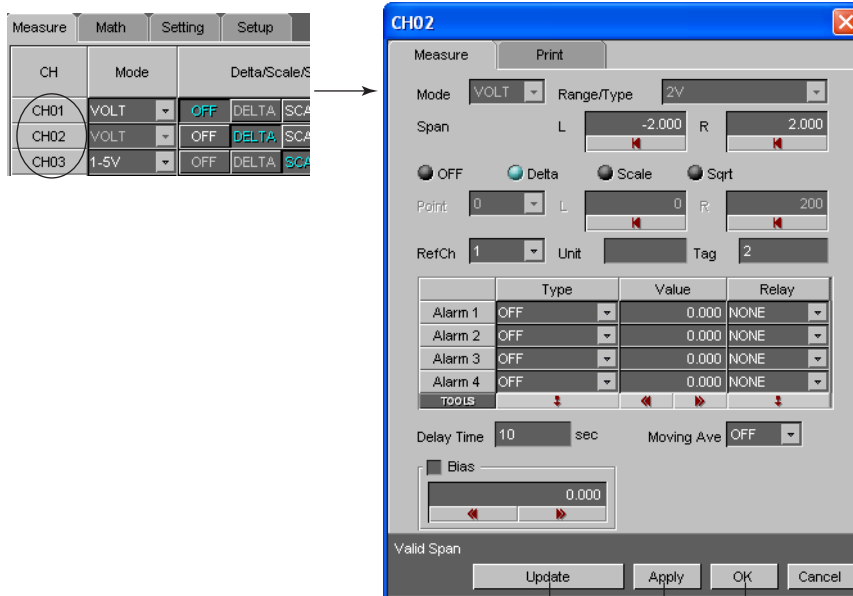
Click **Copy Details** to open the **Channel Copy Details** dialog box.

Select the check boxes for the items you wish to copy/paste, and click **OK**.



### Setting Each Channel

Double-click a channel number. The dialog box for that channel opens.



Set each item, and click here.  
**Applies the settings.**  
**Applies the settings specified on the [Measure] tab.**

The settings in this dialog box are the same as those on the Measure tab.

## 2.5 Setting the Computation Channels (/M1 Option)

Click the **Math** tab. You can also choose **Math Channels** from the **Setting** menu.

Drag the pointer while holding down the left mouse button to select multiple channels.  
 Click twice to unselect the channel.  
 Double-click to open a setup dialog box for the respective channel.  
 Turning ON/OFF computation  
 Equation  
 Constants used in equations

CH	Expression	Point	Constant
CH0A	01	2	K01
CH0B	01	2	K02
CH0C	01	2	K03
CH0D	01	2	K04
CH0E	01	2	K05
CH0F	01	2	K06
CH0G	01	2	K07
CH0J	01	2	K08
CH0K	01	2	K09
CH0L	01	2	K10

Sets the settings of the first channel in the selected range to the other channels.  
 Toggles ON/OFF collectively for each click.

Recording span  
 Alarm 1

Decimal point position    Leftmost value    Rightmost value    Unit    Alarm type    Alarm value    Output relay number

Point	Span		Unit	Type	Alarm 1		Relay	Type
	L	R			Value	Relay		
2	-200.00	200.00		OFF	0.00	NONE	OFF	
2	-200.00	200.00		OFF	0.00	NONE	OFF	
2	-200.00	200.00		OFF	0.00	NONE	OFF	
2	-200.00	200.00		OFF	0.00	NONE	OFF	

Sets the default value.

Sets the maximum possible value.  
 Sets the minimum possible value.

Alarm 4    Alarm delay time    Tag    Recording zone

Value	Relay	Alarm Delay	TLOG		Tag	Zone	
			Timer	SUM Scale		L	R
0.00	NONE	10 sec	Periodic	OFF	A	0	100
0.00	NONE	10 sec	Periodic	OFF	B	0	100
0.00	NONE	10 sec	Periodic	OFF	C	0	100
0.00	NONE	10 sec	Periodic	OFF	D	0	100

Bar graph display mode  
 Partial expanded recording  
 Channel recording color (dot model)  
 Turn trend recording ON/OFF (dot model)  
 Turns ON/OFF periodic printout  
 Types of measured values to be printed periodically

Bar Graph	Partial		Color	Print Out		Periodic Print	
	Expand(%)	Boundary		Trend	Periodic	Mode	SUM Scale
Normal	OFF	50	0.00	ON	ON	AVE	OFF
Normal	OFF	50	0.00	ON	ON	AVE	OFF
Normal	OFF	50	0.00	ON	ON	AVE	OFF
Normal	OFF	50	0.00	ON	ON	AVE	OFF

The tool buttons apply to the selected range of channels when channels are selected. They apply to all channels when a channel is not selected.

**Turning ON/OFF Computation**

Turns ON/OFF computation.

**Expression**

Enter the expression using up to 120 characters. For details on the expression, see section 9.2, "Setting the Computing Equation" in the *μR10000 Recorder User's Manual (IM 04P01B01-01E)* or *μR20000 Recorder User's Manual (IM 04P02B01-01E)*.

**Constant**

Sets the constants to be used in computing equations. Up to 30 constants can be specified.

Range of values (maximum significant digits is 5):

–9.9999E+29 to –1.0000E–30, 0, 1.0000E–30 to 9.9999E+29

**Span**

Set the recording span.

**Span (Point, L, and R)**

Set the leftmost value of the span (L) and the rightmost value of the span (R) using a mantissa and decimal point position.

Mantissa: –9999999 to 99999999

Decimal position: 0 (the number of digits right of the decimal is 0) to 4 (the number of digits to the right of the decimal is 4)

**Unit**

Enter the unit using up to six characters. The characters that can be used are as follows (see section 2.12):

Alphabet, numbers, symbols (% , # , ° , @ , + , – , \* , / , ( , ) , μ , Ω , <sup>2</sup> , <sup>3</sup> , .), and space

**Alarm 1 to 4**

For the procedure, see section 2.4, "Setting the Measurement Channels."

The alarm types that can be specified on a computation channel is high limit (H), low limit (L), delay high limit (T), and delay low limit (t).

**TLOG Computation (TLOG)**

Sets TLOG computation and the printing of the computed values.

**Timer**

Sets the timer used in TLOG computation and printout to Periodic (periodic printout timer), 1 (timer 1), or 2 (timer 2). For a description of the timer setting, see page 2-24.

**SUM Scale**

Sets the sum scale when determining the sum value in TLOG computation. For a description of sum scale, see page 2-12.

**Tag, Zone, Bar Graph, Partial, Color (Dot Model), and Trend**

For the procedure, see section 2.4, "Setting the Measurement Channels."

**Copying and Pasting the Settings**

The settings specified for a given channel can be copied and pasted to other channels. For the procedure, see "Copying and Pasting the Settings" on page 2-13.

## 2.5 Setting the Computation Channels (/M1 Option)

### Setting Each Computation Channel

Double-click a channel number. The dialog box for that channel opens.

The image shows two dialog boxes. The top one is the 'CH0B' dialog box, which is used for configuring a computation channel. It has tabs for 'Math' and 'Print'. The 'Math' tab is active, showing radio buttons for 'Not' and 'Use', and an 'Ope.' button. Below this are fields for 'Exp.' (01), 'Point' (2), 'L' (-200.00), and 'R' (200.00). There are also fields for 'Unit' and 'Tag' (B). A table of alarm settings is shown below, with columns for 'Alarm', 'Type', 'Value', and 'Relay'. The 'Timer' is set to 'Periodic' and 'SUM Scale' is 'OFF'. The 'Delay Time' is 10 seconds. At the bottom are 'Update', 'Apply', 'OK', and 'Cancel' buttons.

The bottom dialog box is the 'Select Operator' dialog box. It has two tabs: 'Basic' and 'Logical'. The 'Basic' tab is active, showing buttons for '+ Addition', '- Subtraction', '\* Multiplication', '/ Division', and '\*\* Power'. The 'Logical' tab shows buttons for 'ABS() Absolute value', 'SQR() Square root', 'LOG() Common logarithm', and 'EXP() Exponent'. A 'Close' button is at the bottom right. Brackets on the right side of the dialog box label the buttons as 'Buttons to select the operator type' and 'Operator buttons'.

### Setting the Equation

Click the **Ope.** button to open the **Select Operator** dialog box.

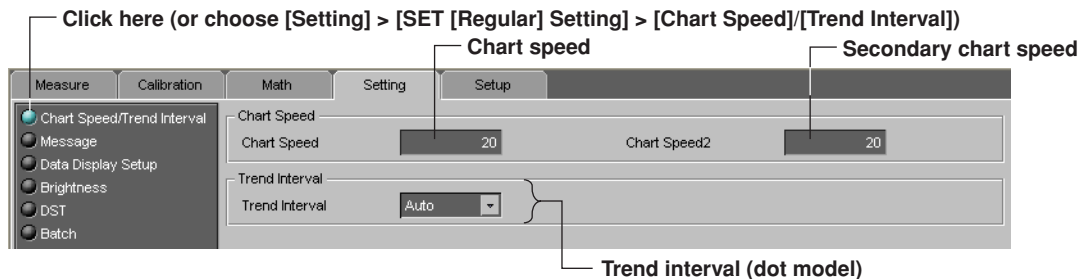
Select the operator type to switch the displayed operator buttons. Click a operator button to enter the operator in **Exp.**

The items in the math channel tab can be configured for each channel. The settings in this dialog box are the same as those on the Math tab.

## 2.6 Setting the Items in Setting Mode and the Data Display Method

Click the **Setting** tab. You can also select the item by choosing **SET [Regular] Setting** from the **Setting** menu.

### Chart Speed/Trend Interval



### Chart Speed

- **Pen Model**

The chart speed can be selected from 82 settings shown below.

#### Chart speed on the pen model (unit: mm/h)

5	6	8	9	10	12	15	16	18	20
24	25	30	32	36	40	45	48	50	54
60	64	72	75	80	90	96	100	120	125
135	150	160	180	200	225	240	250	270	300
320	360	375	400	450	480	500	540	600	675
720	750	800	900	960	1000	1080	1200	1350	1440
1500	1600	1800	2000	2160	2250	2400	2700	2880	3000
3600	4000	4320	4500	4800	5400	6000	7200	8000	9000
10800	12000								

- **Dot Model**

The chart speed can be set in the range of 1 to 1500 mm/h in 1 mm steps.

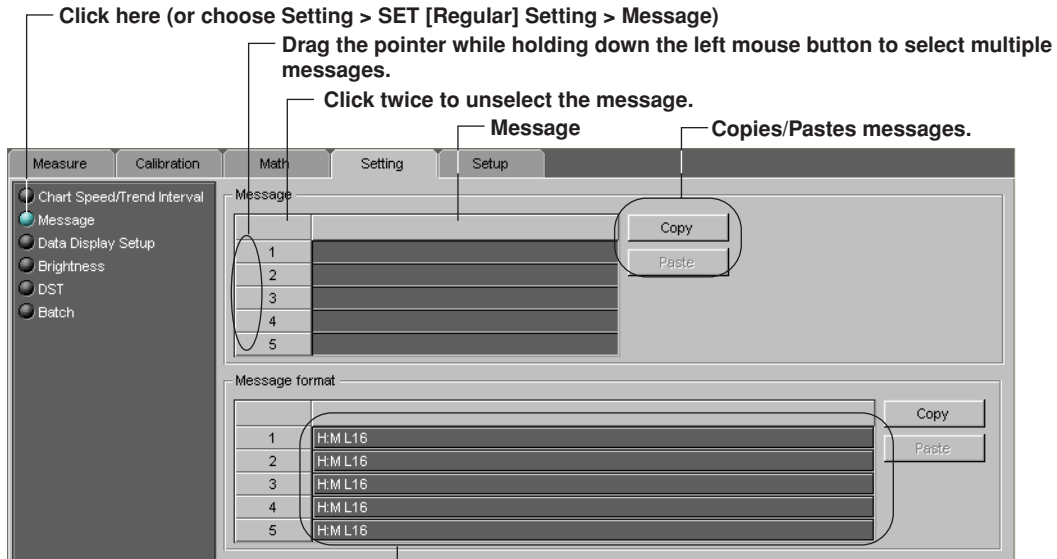
#### Trend Interval (Dot Model)

**Auto:** The trend recording interval is set according to the chart speed in the range of 10 s to 90 s so that the dots do not overlap.

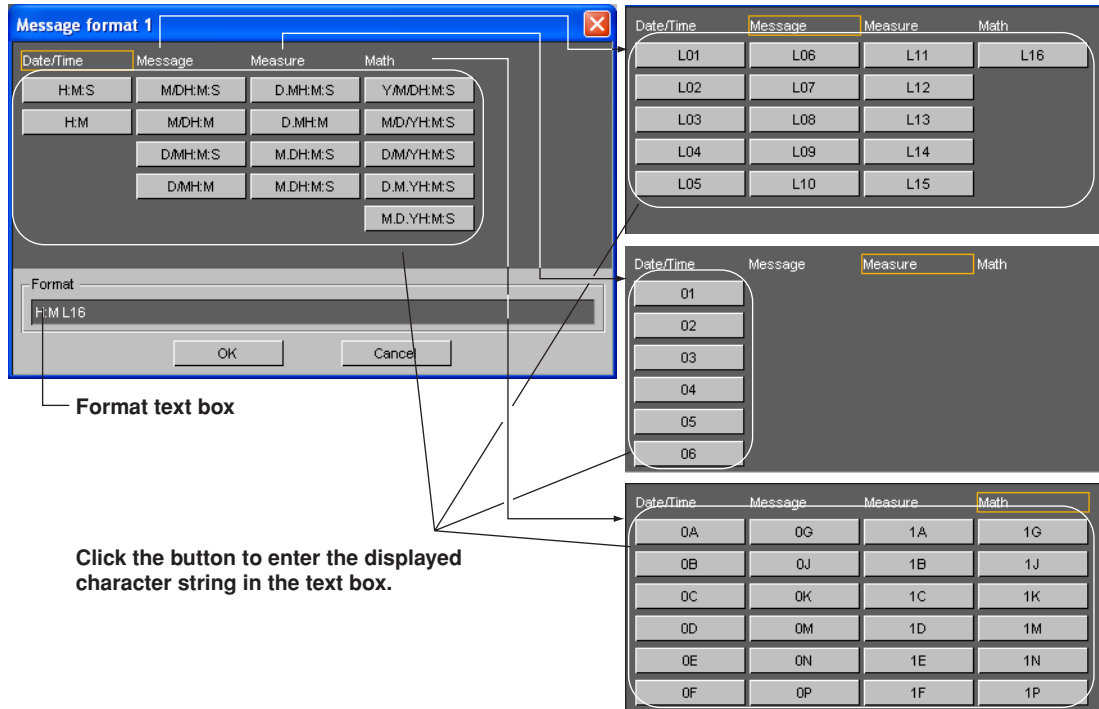
**Fix:** The trend recording interval is fixed to 10 s/6 dots. On models with the computation function (/M1 option), the dot printing interval varies depending on the number of measurement and computation channels to be trend recorded.

2.6 Setting the Items in Setting Mode and the Data Display Method

Message



Click a text box from 1 to 5. A dialog box used to set the message format opens.



Messages

Set a message using up to 16 characters.

The characters that can be used are as follows (see section 2.12):

Alphabet, numbers, symbols (% , # , ° , @ , + , - , \* , / , ( , ) , μ , Ω , <sup>2</sup> , <sup>3</sup> , .), and space

**Message Format (/BT1 Option)\***

\* Function available on recorders with firmware version 1.31 or later.

Set the message format.

Click a text box from 1 to 5. A dialog box used to set the message format opens. Set the format using the selectable items displayed in the dialog box and space.

Number of characters per message: Up to 35 (μR10000) and up to 69 (μR20000).

**Format symbols and number of characters used**

Symbol	Num. of Chars	Symbol	Num. of Chars	Symbol	Num. of Chars
H:M	5	H:M:S	8	L01 to L16	1 to 16
M/D H:M	11	M/D H:M:S	14	01 to 24	7
D/M H:M	11	D/M H:M:S	14	0A to 1P	9
D.M H:M	11	D.M H:M:S	14		
M.D H:M	12	M.D H:M:S	15		
Y/M/D H:M:S	19	M/D/Y H:M:S	19		
D/M/Y H:M:S	19	D.M.Y H:M:S	19		
M.D.Y H:M:S	20				

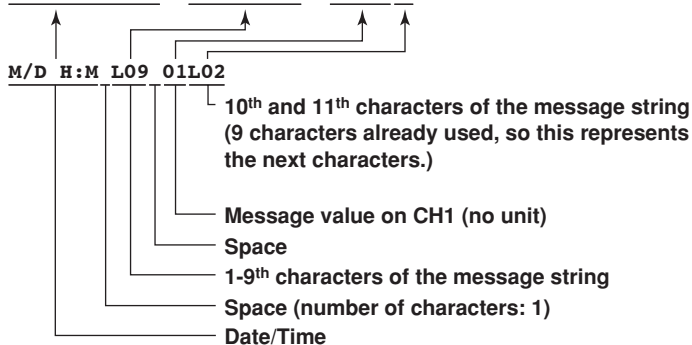
H, M, and S are hour, minute, and second, respectively, for H:M and H:M:S.  
 M, D, and Y are month, day, and year, respectively for M/D, D/M, D.M , M.D,  
 Y/M/D, M/D/Y, D/M/Y, D.M.Y, and M.D.Y.

**Setup Example**

Message 1 string of the standard function: **Process-1°C**

Message 1 printout result: **06/30 10:10 Process-1 134.8°C**

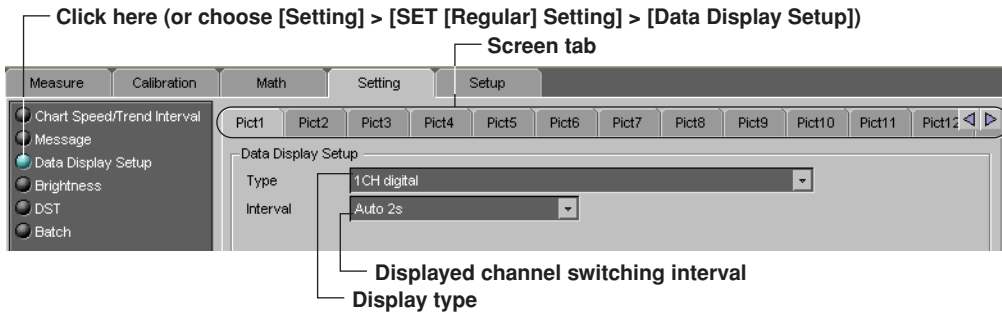
Message format 1:



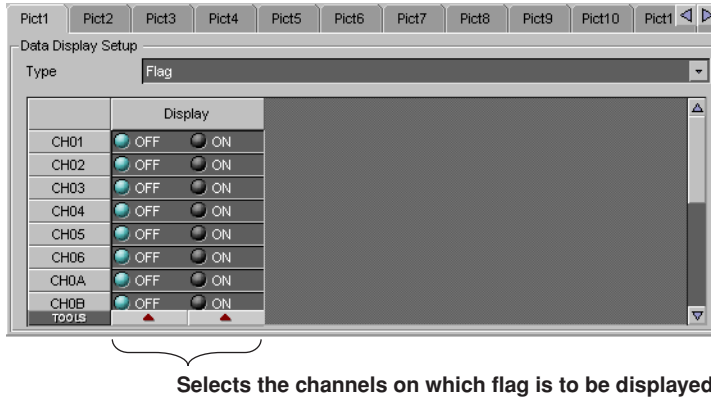


## 2.6 Setting the Items in Setting Mode and the Data Display Method

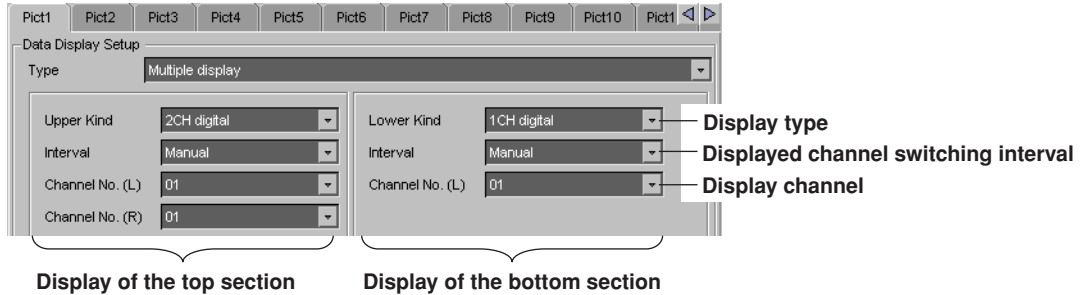
### Data Display Setup



#### When display type is [Flag]



#### When display type is [Multiple display]



#### Pict1 Tab to Pict15 Tab

Corresponds to Screen 01 to Screen 15.

- **Type**

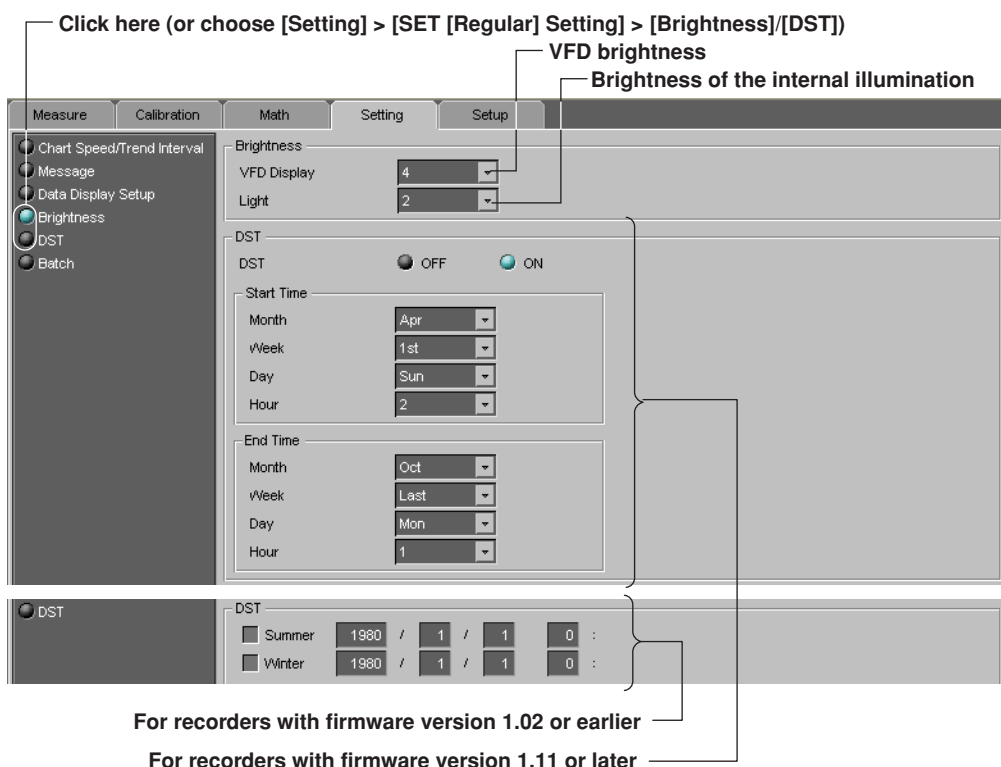
The following display types available. For details on the display types, see section 12.4, "Display Function Specifications" in the *μR10000 Recorder User's Manual (IM 04P01B01-01E)* or *μR20000 Recorder User's Manual (IM 04P02B01-01E)*.

Display Type	Display Type
Skip (the screen is not displayed)	Time/Chart speed
1 CH digital	DI/DO
2 CH digital	Multiple display (Display in which different screens can be assigned to the top and bottom sections)
4 CH digital	Tag_1 CH digital
6 CH digital (6-dot models)	Tag_2 CH digital
12 CH digital (12/18/24-dot models, μR20000)	Tag_1 CH digital + 1 CH bargraph
1 CH digital + 1 CH bargraph	Tag_1 CH digital + 4 CH bargraph (pen models)
1 CH digital + 4 CH bargraph (pen models)	Status
2 CH digital + 2 CH bargraph	System
4 CH bargraph (pen models)	Batch Name*
6 CH bargraph (dot models, μR10000)	Lights out (display with no contents)
Flag	
Channel alarm status	

\* Selectable on recorders with firmware version 1.31 or later and header printout (/BT1 option).

- **Interval**  
Sets the displayed channel switching interval. This item appears when the display type requires this setting.  
Auto 1s to Auto 5s: Switches the channel at the specified time interval.  
Manual: Switch the channel manually.
- **Display (For Flag)**  
Selects the channels on which flag is to be displayed.
- **Channel No. (L)/Channel No. (R) (For Multiple display)**  
Specifies the channels to be displayed simultaneously.

## Brightness and DST



### VFD Display

The brightness can be set to an integer between 1 and 8. The darkest setting is 1; the brightest setting is 8.

### Light

The brightness of the internal light can be set to an integer between 1 and 4. The darkest setting is 1; the brightest setting is 4. Select OFF to turn off the internal light.

### DST

Sets the date/time for switching between standard time and DST.

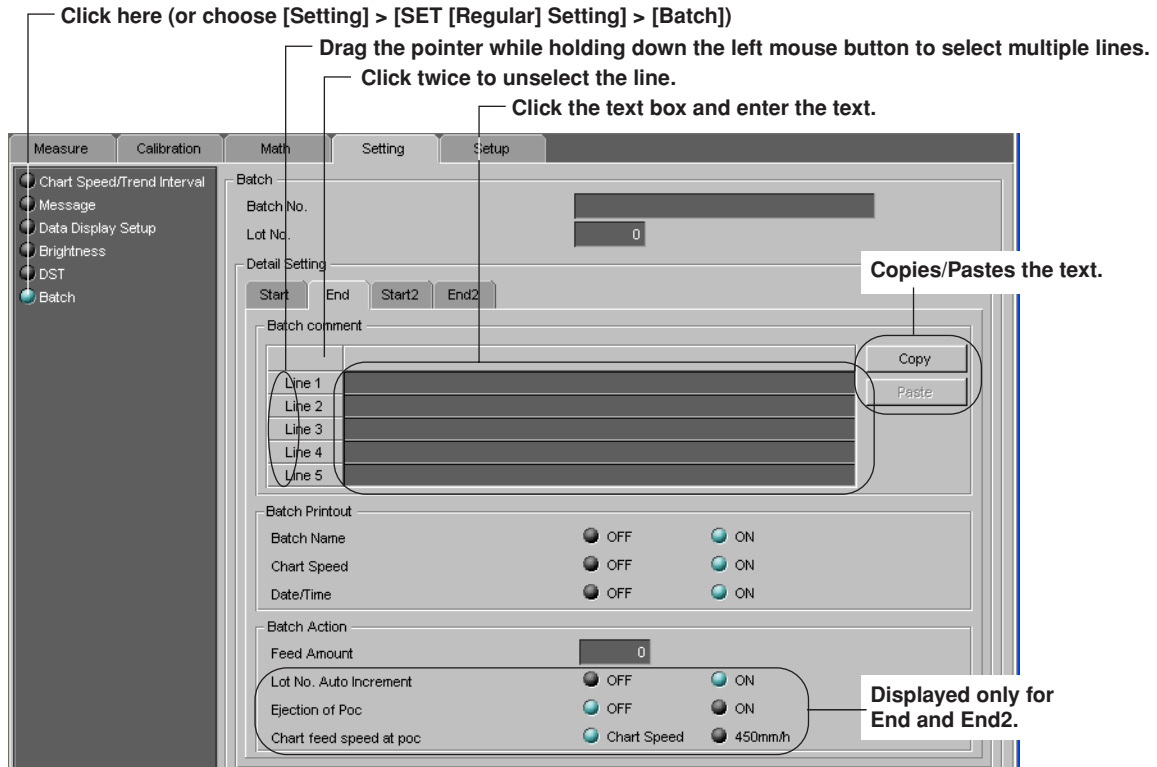
- **For recorders with firmware version 1.02 or earlier**  
Summer: Date/Time when switching from standard time to DST  
Winter: Date/Time when switching from DST to standard time
- **For recorders with firmware version 1.11 or later**  
Start Time: Date/Time when switching from standard time to DST. Specify the day as **n** th day of the week of the month.  
End Time: Date/Time when switching from DST to standard time. Specify the day as **n** th day of the week of the month.

**2.6 Setting the Items in Setting Mode and the Data Display Method**

**Batch (/BT1 Option)\***

\* Function available on recorders with firmware version 1.31 or later.

This appears when batch function is enabled (see page 2-33) in Basic Setting mode.



Set the contents of the start printout and end printout.

The Start2 and End2 tabs are valid when Dual Comment is enabled in Basic Setting mode.

**Batch No.**

Enter the batch number using up to 26 characters.

The characters that can be used are as follows (see section 2.12):

Alphabet, numbers, symbols (% , # , ° , @ , + , - , \* , / , ( , ) , μ , Ω , <sup>2</sup> , <sup>3</sup> , and .), and space

**Lot No.**

This appears when Digit of lot number is specified (see page 2-33) in Basic Setting mode.

Set the number in the range of 0000 to 9999 or 000000 to 999999. Digit of lot number is set in Basic Setting mode.

**Batch Comment**

Set the batch comment using up to 32 characters by 5 lines (μR10000) or 64 characters by 5 lines (μR20000).

The characters that can be used are as follows (see section 2.12):

Alphabet, numbers, symbols (% , # , ° , @ , + , - , \* , / , ( , ) , μ , Ω , <sup>2</sup> , <sup>3</sup> , and .), and space

**Batch Printout**

- **Batch Name**  
On: Prints the batch name.
- **Chart Speed**  
On: Prints the chart speed.
- **Date/Time**  
On: Prints the date and time.

### Batch Action

- **Feed Amount**

Set the length of chart paper to be fed out before start printout or after end printout in 1-mm steps up to 50 mm.

- **Lot No. Auto Increment**

On: Increments the lot number when the header printout is completed.

- **Ejection of POC**

On: Records the portion of the data that remains after recording stops when the pen offset compensation function is enabled on the pen model.

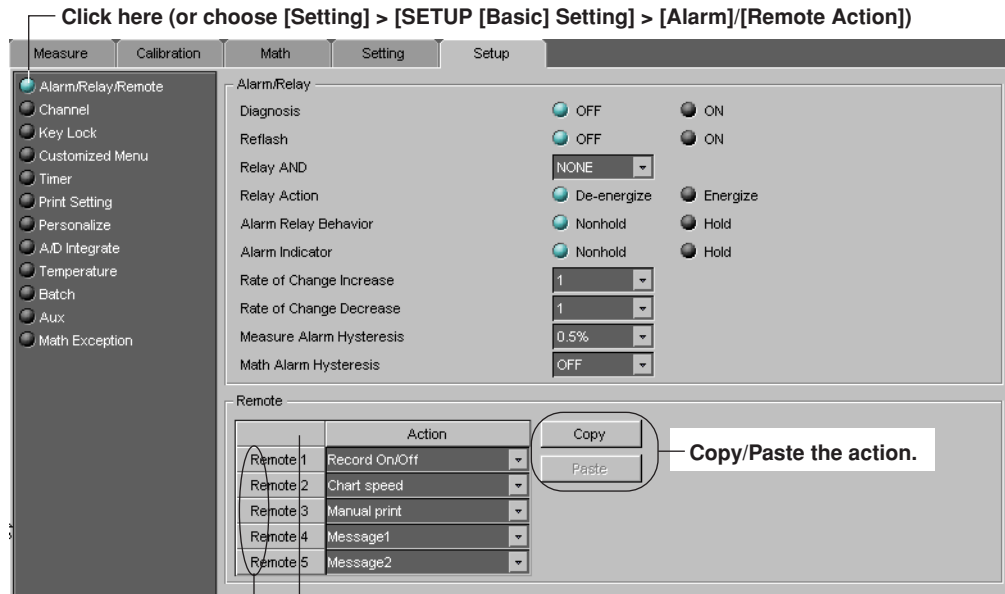
- **Chart feed speed at POC**

Specifies the chart feed speed when recording the portion of the data that remains.

## 2.7 Setting the Items in Basic Setting Mode

Click the **Setup** tab. You can also select the item by choosing **SETUP [Basic] Setting** from the **Setting** menu.

### Alarm/Relay/Remote



#### Diagnosis

ON: Alarm output relay I01 is used for diagnosis output.

#### Reflash

ON: Alarm output relays I01, I02, and I03 are set to reflash alarm operation.

#### Relay AND

Set the range of relays (from alarm output relay I01) to take the AND operation. If NONE is selected, no relays are set to AND operation. All relays are set to OR operation.

#### Relay Action

Sets whether the output relay is energized or de-energized when an alarm occurs.

#### Alarm Relay Behavior

Nonhold: Releases the relay output at the same time the alarm is released.

Hold: Holds the relay output until the alarm ACK operation is executed.

#### Alarm Indicator

Nonhold: Releases the alarm indication at the same time the alarm is released.

Hold: Holds the alarm indication until the alarm ACK operation is executed.

#### Rate of Change Increase and Rate of Change Decrease

Set the interval of the high limit and low limit on rate-of-change alarm to an integer between 1 and 15. The interval is set to scan interval  $\times$  (1 to 15).

The scan interval on the pen model is 125 ms. The scan interval on the dot model is 1 s or 2.5 s.

**Measure Alarm Hysteresis**

Sets the alarm hysteresis of measurement channels in the range of 0.0% (OFF) to 1.0% of the recording span in 0.1 steps. The hysteresis applies to all high limit and low limit alarms of measurement channels.

**Math Alarm Hysteresis (Models with the Computation Function (/M1 Option))**

Sets the alarm hysteresis of computation channels in the range of 0.0% (OFF) to 1.0% of the recording span in 0.1 steps. The hysteresis applies to all high limit and low limit alarms of computation channels.

**Remote (Models with Remote Control Input (/R1 Option))**

Remote 1 to Remote 5 corresponds to remote control input terminals 1 to 5. The following functions can be assigned.

Display	Description
NONE	No function is assigned.
Record On/Off	Starts/stops recording.
Chart speed	Changes the chart speed.
Time adjust	Adjusts the internal clock to the nearest hour.
MATH start/stop	Starts/stops the computation on the computation function (/M1 option).
MATH reset	Resets the computed result of the computation function (/M1 option).
Manual print	Executes manual printout.
Alarm ACK	Executes alarm output release.
message #	Prints message # (where # is a value between 1 and 5).
Priority to Remote Recording*	Starts/stops recording.
Switching Batch Comment*	Switches between start printout and start printout 2. Or, switches between end printout and end printout 2.

\* Selectable on recorders with firmware version 1.31 or later and header printout (/BT1 option).

## 2.7 Setting the Items in Basic Setting Mode

### Channel

Click here (or choose [Setting] > [SET [Basic] Setting] > [Burnout]/[RJC])

Channel	Burnout			RJC		Volt( $\mu$ V)
	OFF	UP	DOWN	Type		
CH01	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH02	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH03	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH04	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH05	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH06	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0

Click twice to unselect the channel.

Drag the pointer while holding down the right mouse button to select multiple lines.

Copies/Pastes the settings of a channel to other channels.

Setup Channel Copy Details

Burnout     RJC    OK

Cancel

#### Burnout

Up: Records off the scale on the 100% side when a thermocouple burnout is detected.

Down: Records off the scale on the 0% side when a thermocouple burnout is detected.

OFF: Disable the burnout detection function.

#### RJC

##### • Type

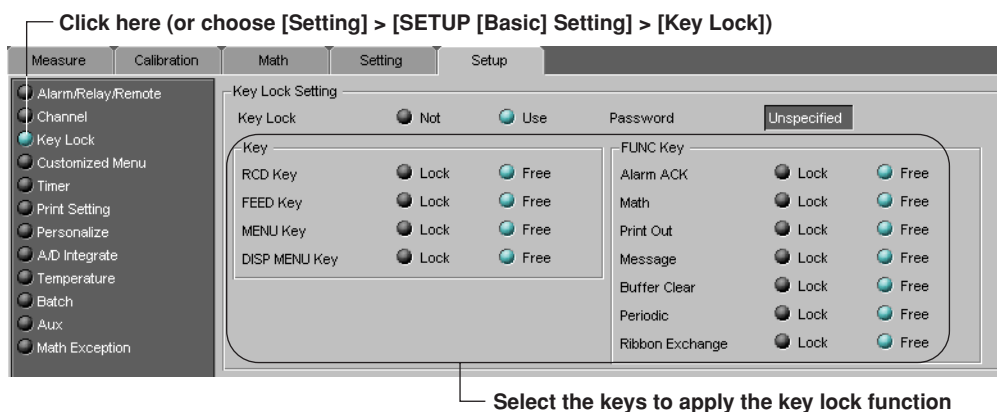
Internal: Uses the RJC function of the recorder.

External: Uses an external RJC function.

##### • Volt ( $\mu$ V)

Sets the compensation voltage when using an external RJC function. The compensation voltage can be set in the range of  $-20000 \mu$ V to  $20000 \mu$ V.

## Key Lock



### Key Lock

Specify whether to use key lock.

### Password

Sets the password for releasing the key lock. Set the password using numbers and spaces up to 4 digits.

### Note

Note that if the firmware version of the  $\mu$ R10000 is 1.01, a password that starts with spaces is read with the spaces removed on the recorder. The firmware version of the recorder can be checked on the system display (see "Data Display Setup" on page 2-20).

### Keys That Can Be Locked

Below are operations in the FUNC key menu.

- Alarm ACK: Alarm ACK operation
- Math: Math start, stop, and reset operations
- Print Out: Printout start/stop operation
- Message: Message printout operation
- Buffer clear: Operation for clearing the printout buffer memory
- Periodic: Operation for clearing the report data of the periodic printout
- Pen exchange: Operation for moving the pen to a position that is easily accessible for replacement (pen model)
- Ribbon exchange: Operation for moving the printer to a position that is easily accessible for ribbon cassette replacement (dot model)\*

\* For recorders with firmware version 1.11 or later

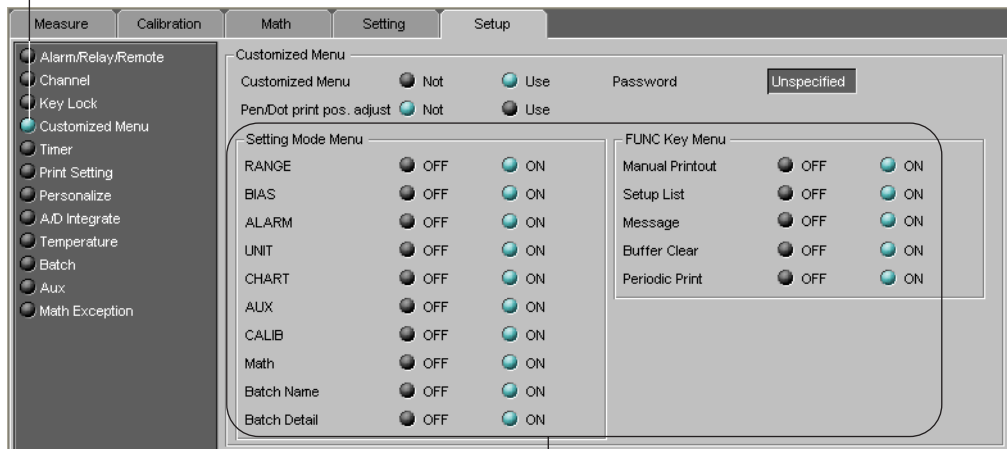


## 2.7 Setting the Items in Basic Setting Mode

### Customized Menu\*

\* Function available on recorders with firmware version 1.31 or later.

Click here (or choose [Setting] > [SETUP [Basic] Setting] > [Customized Menu])



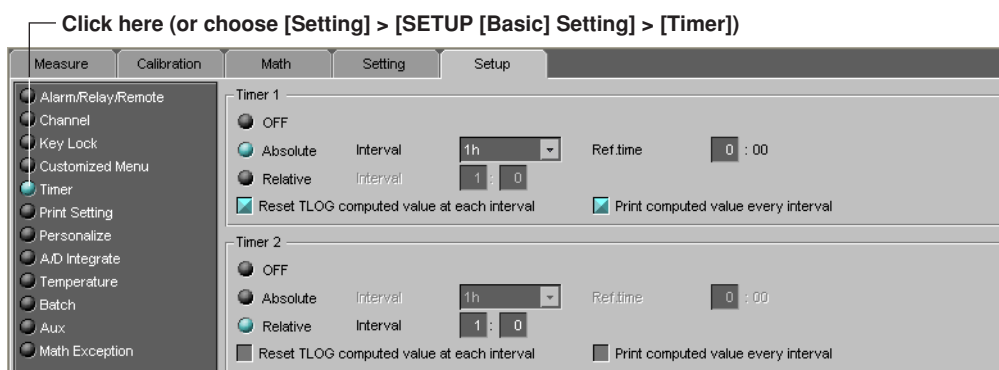
Turn ON/OFF the menu item

#### Customized Menu

The FUNC key menu and Setting mode menu can be customized to display only the menus that you use.

- **Customized Menu**  
Set whether or not to use this function.
- **Password**  
This is the password used to release the customized menu or to enter Basic Setting mode. Set the password using a number up to 4 digits and space.
- **Pen/Dot print pos. adjust**  
Use: Use the pen position adjustment (pen model) and dot printing position adjustment (dot model) without the password.  
Not: Enter the password to enter Basic setting mode to use the pen position adjustment (pen model) and dot printing position adjustment.
- **Setting Mode Menu**  
Menu items of Setting mode.  
OFF: Hides the menu items.
- **FUNC Key Menu**  
Menu items using the FUNC key.  
OFF: Hides the menu items.

## Timer



Can be specified on models with the computation function (/M1 option).

Two timers to be used in TLOG computation (timer 1 and timer 2) can be specified. The timers can be used to print out computed values or reset the computed result when the specified time elapses.

- Absolute: The timer expires at specified intervals from the reference time.
- Relative: The clock is started in sync with the starting of the computation, and the timer expires at specified intervals.

## 2.7 Setting the Items in Basic Setting Mode

### Print Setting

Click here  
(Dot model: select [Setting] > [SETUP [Basic] Setting] > [Print Items]/[Periodic Print]  
(Pen model: select [Setting] > [SETUP [Basic] Setting] > [Print Items]/[Periodic Print]/[Output Pen]/[POC])

Output Pen	Channel
Pen1	01
Pen2	02
Pen3	03
Pen4	04

Displayed on the pen model.  
Displayed on pen models with the computation function (/M1 option)

#### CH/Tag Print

Specifies whether to print channel numbers or tags.

#### Channel Print (Dot Model)

On: Prints the channel number by the trend recording.

#### Alarm Print

ON1: Prints the alarm information when an alarm occurs or releases.

ON2: Prints the alarm information only when an alarm occurs.

OFF: Does not print alarm information.

#### Recording On Print

On: Prints the time and chart speed when recording is started.

#### Chart Speed Change Print

On: Prints the time and chart speed when the chart speed is changed.

#### Scale Print

On: Prints the channel scale at periodic printouts.

#### Pen Color Print (Pen Model)

On: Prints the recording color at periodic printouts.

#### Periodic Print

Select the periodic printout interval mode.

Auto: Automatically sets the printout interval in sync with the chart speed.

Manual: Set the printout interval manually.

- **Interval**

Select the interval from 10, 12, 15, 20, 30 min, 1, 2, 3, 4, 6, 8, 12, and 24 h.

- **Ref. time**

Sets the reference time for determining the times for executing the periodic printout.

The reference time is set in the range of 00 to 23 in 1 hour steps.

- **Mode**

Sets the type of measured values to be printed.

Inst: Prints the measured value at that point.

Report: Prints the report data over the interval. If Report is selected, set the type of report data. See "Periodic Printout" in section 2.4, "Setting the Measurement Channels" and 2.5, "Setting the Computation Channels."

OFF: Does not print measured values.

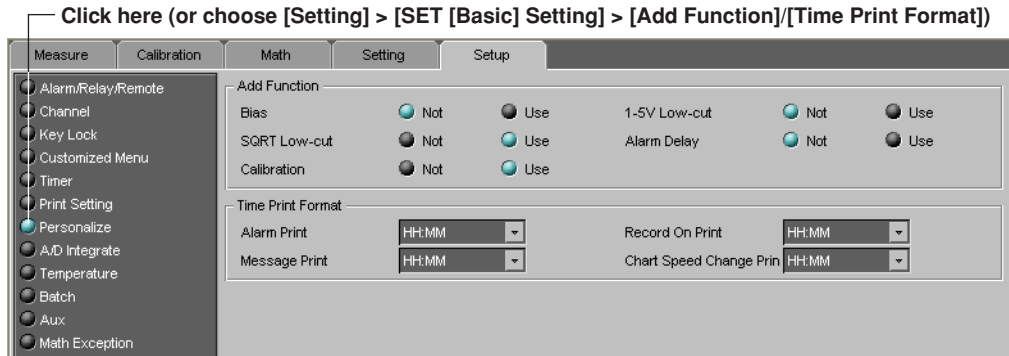
**Output Pen (Pen Model with the Computation Function (/M1 Option))**

Trend can be recorded by arbitrarily assigning measurement channels and computation channels to recording pens.

**Pen Offset Compensation (Pen Model)**

ON: Records by compensating for the pen offset (phase difference) along the time axis.

Personalize



**Add Function**

- **Bias**  
Select **Use** to enable the setting of a bias for the measurement channels. **Bias** and **Calibration** cannot be enabled simultaneously.
- **SQRT Low-cut**  
Enables/Disables the square root low-cut function.  
Select **Use** to enable the setting of the low-cut function when measurement channels are set to square root computation.
- **1-5V Low-cut**  
Enables/Disables the 1-5V low-cut function.  
Select **Use** to enable the setting of the low-cut function when measurement channels are set to 1-5V signals.
- **Alarm Delay**  
Enables/Disables the alarm delay function.  
Select **Use** to enable the selection of the delay high/low limit alarm for the alarm type.
- **Calibration (/CC1 Option)\***  
\* For recorders with firmware version 1.21 or later  
Enables/Disables the calibration correction.  
Select **Use** to enable the calibration correction function. **Bias** and **Calibration** cannot be enabled simultaneously.

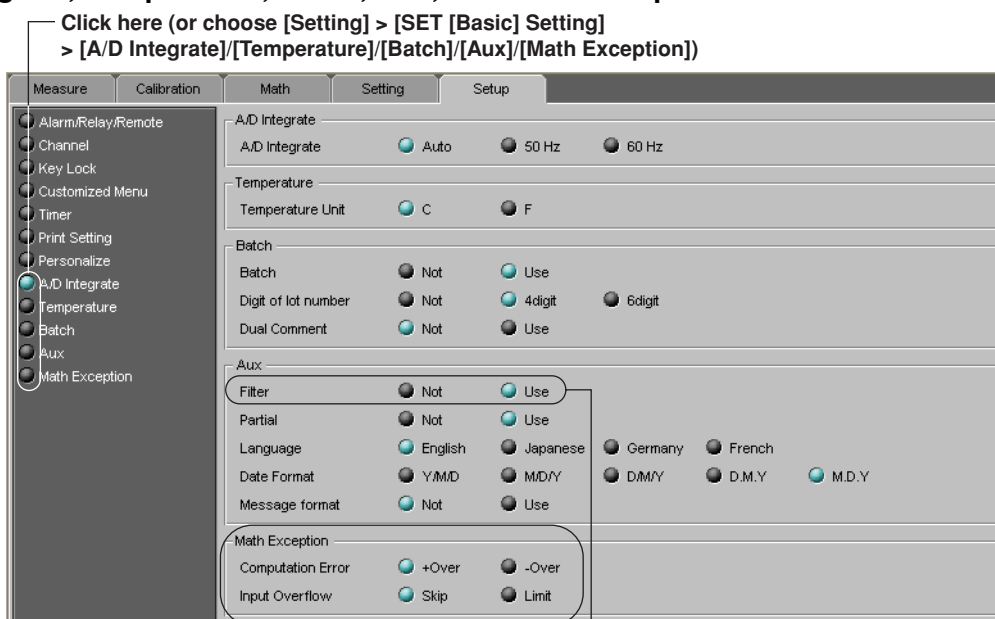
**Time Print Format**

- **Alarm Print, Message Print, Record On Print, and Chart Speed Change Print**  
Sets the time printout format for each type of printout. The format of year, month, and day varies depending on the **Date Format** setting on next page.

Selections	Format (example)	Selections	Format (example)
HH:MM	10:00	M/D H:M:S	Nov.09 10:00:00
HH:MM:SS	10:00:00	YMD H:M:S	Nov.09.2005 10:00:00
M/D H:M	Nov.09 10:00	NONE	Does not print the date/time.*

\* Selectable for Message Print only.

## A/D Integrate, Temperature, Batch, Aux, and Math Exception



Displayed on models with the computation function (/M1 option).

On the pen model, [Filter] is displayed.

Filter  Not  Use

**A/D Integrate (Integration Time of the A/D Converter)**

- 50 Hz: Sets the time to 20 ms.
- 60 Hz: Sets the time to 16.7 ms.
- Auto: Set to the integration time synchronized to the power supply frequency (20 ms or 16.7 ms).
- 100 ms (dot model): Sets the integration time to 100 ms. The scan interval is set to 2.5 s.

**Temperature**

Sets the unit of temperature measurements using thermocouples and RTDs.

- C: Celsius
- F: Fahrenheit

**Batch (/BT1 Option)\***

\* Function available on recorders with firmware version 1.31 or later.

- **Batch**  
Use: Enables start printout, end printout, and batch name.
- **Digit of lot number**  
Sets the number of digits of the lot number.
- **Dual Comment**  
Use: Enables start printout 2 and end printout 2.

**Aux**

- **Moving Ave (Dot Model)**  
Select Use to enable the setting of the sampling count of the moving average for the measurement channels.
- **Filter (Pen Model)**  
Select Use to enable the setting of the filter constant for the measurement channels.
- **Partial**  
Select Use to enable the setting of the boundary position and boundary value of the partial expanded recording function for measurement channels and computation channels.

## 2.7 Setting the Items in Basic Setting Mode

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- **Language**

English: Uses English for the display and recording.

German: Uses German for the display and recording\*

French: Uses French for the display and recording\*

Japanese: Uses Japanese for the display and recording.

\* For recorders with firmware version 1.21 or later

- **Date Format\*\***

\*\* For recorders with firmware version 1.11 or later

Selections	Printout example	Selections	Printout example	Selections	Printout example
Y/M/D	2005/08/31	M/D/Y	08/31/2005	D/M/Y	31/08/2005
D.M.Y	31.08.2005	M.D.Y	Aug.31.2005		

- **Message Format\*\*\***

\*\*\* Function available on recorders with firmware version 1.31 or later and header printout (/BT1 option).

Use: Allows you to specify the message format.

### **Math Exception**

Can be specified on models with the computation function (/M1 option).

- **Computation Error**

Specifies how to handle the computed result when computation errors occur.

+Over: Set to +over. Displayed/Printed as "+Over."

-Over: Set to -over. Displayed/Printed as "-Over."

- **Input Overflow**

Selects the procedure when a "over" value is input for TLOG.SUM or TLOG.AVE computation.

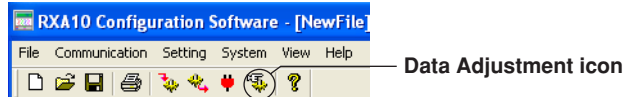
Skip: The "over" value is not used in the computation.

Limit: The limit value is used for the computation.

## 2.8 Checking the Consistency of the Settings

### Checking the Consistency of the Settings

From the **System** menu, choose **Data Adjustment**. You can also click the Data Adjustment icon.



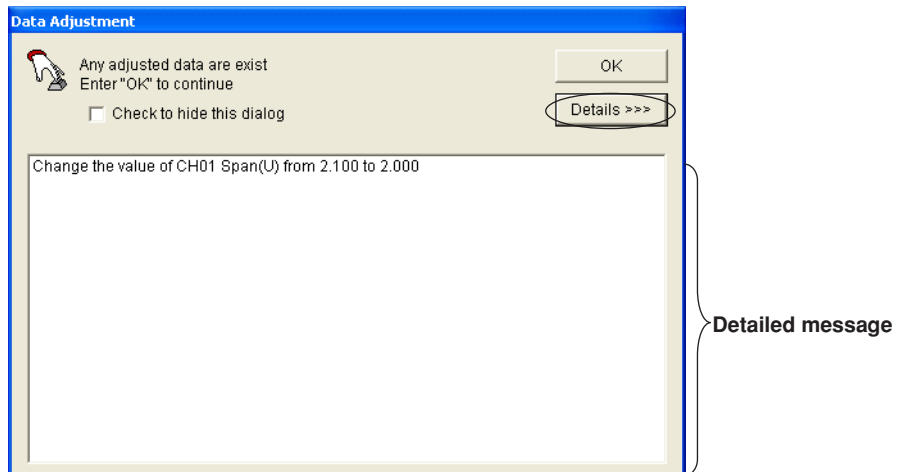
This function checks whether the settings are consistent with the system configuration and setup conditions and automatically corrects the data if they are not.

The data are corrected in the following cases:

- When the values of the items of the Measure/Math tab are outside the selectable range.
- When an invalid character string is used

### Checking the Corrections

From the **View** menu, click **Data Adjustment Dialog** so that a check mark appears beside it. If the data is inconsistent when adjusting the data or when sending the data, the **Data Adjustment** dialog box opens. Click **Details** to display the details of the correction.



### Note

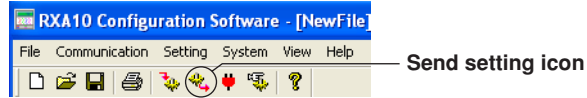
When sending setup data to the recorder, the data is adjusted, and consistent data is sent to the recorder.



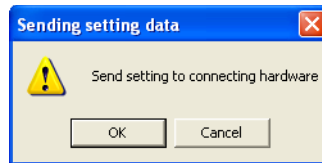
---

## 2.9 Sending Setup Data to the Recorder

1. From the **Communication** menu, choose **Send Setting**. You can also click the Send setting icon on the toolbar. The **Sending setting data** dialog box opens.



2. Click **OK**.  
The transmission starts. When the transmission of the settings is complete, a message appears to indicate it.



3. Click **OK**.

---

### **Note**

- If a message appears, see section 3.1, "Error Messages."
  - If the difference between values of the correction points, or the difference between values after correction, are small, for example several digits, an error may occur when you send the setup data to the recorder. In that case, change the set values.
-

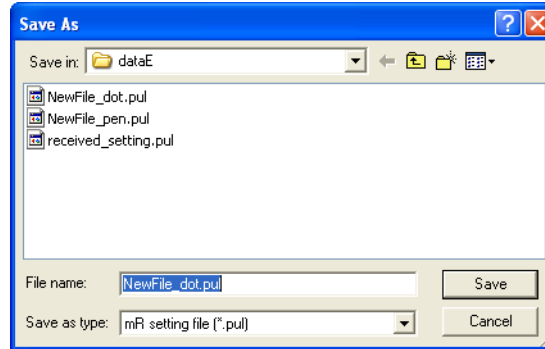
## 2.10 Saving the Setup Data

### Saving to a File by Specifying a Name

The setup data can be saved to a file by specifying the file name. The extension to setup data files is .pul.


1. From the **File** menu, choose **Save As**.

The **Save As** dialog box opens.



2. Specify the save destination, enter the file name, and click **Save**. The setup data is saved.

### Saving (Overwriting) to the File

From the **File** menu, choose **Save**. You can also click the Save icon (). The setup data is saved (overwritten).

## 2.11 Printing the Setup Data

### Setting the Printer

From the **File** menu, choose **Print Setup**. The Print Setup dialog box opens. Set the printer.

### Previewing the Print

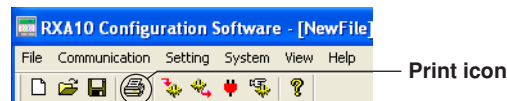
You can preview the print layout before actually printing the data.

From the **File** menu, choose **Print Preview**. The print preview window opens.

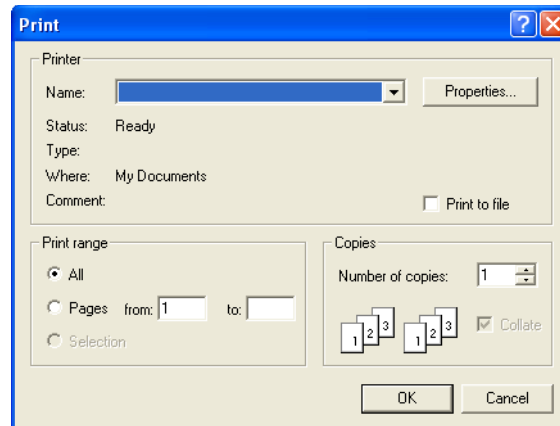
FileName:	NewFile.pul	Model:	Pen	Channel:	4	Math Channel:	8
Type:	mR20000	Math Func.:	ON	Communication:	Ethernet		
Version:	1.3x	With Fail/Chart End:	ON				
Alarm Relay:	4p	Remote	DST	Expansion Inputs	Temperature Unit		
Option:	Cu10,Cu25 Inputs				Calibration		
Alarm/Relay/Remote	Diagnosis				OFF		
	Reflash				OFF		
	Relay AMD				NONE		
	Relay Action				De-energize		
	Alarm Relay Behavior				Monhold		
	Alarm Indicator				Monhold		
	Rate of Change Increase				1		
	Rate of Change Decrease				1		
	Measure Alarm Hysteresis				0.5%		
	Math Alarm Hysteresis				OFF		
	Remote 1				Record On/Off		
	Remote 2				Chart speed		
	Remote 3				Manual print		
	Remote 4				Message1		
	Remote 5				Message2		

### Printing

From the **File** menu, choose **Print**. You can also click the Print icon. The **Print** dialog box opens.



Click **OK** to execute printing.



## 2.12 Characters That Can Be Used

The ASCII character codes of characters that can be used are shown in the table below. The type of characters that can be used are as follows:

Alphabet, numbers, symbols, and space

### Characters for English

#### Note

The characters/symbols  $\mu$ ,  $\Omega$ , <sup>2</sup>, <sup>3</sup>, and  $\circ$  are mapped as shown below. The character inside the parentheses is the corresponding character on the keyboard. On the setup window, the keyboard character is displayed.

$\mu$ : 7BH ({}),  $\Omega$ : 7CH (I), <sup>2</sup>: 7DH (}), <sup>3</sup>: 7EH (~), and  $\circ$ : 5EH (^)

		Upper 4 bits															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 bits	0			SP (space)	0	@	P		p								
	1				1	A	Q	a	q								
	2				2	B	R	b	r								
	3			#	3	C	S	c	s								
	4				4	D	T	d	t								
	5			%	5	E	U	e	u								
	6				6	F	V	f	v								
	7				7	G	W	g	w								
	8			(	8	H	X	h	x								
	9			)	9	I	Y	i	y								
	A			*		J	Z	j	z								
	B			+		K		k	$\mu$								
	C					L		l	$\Omega$								
	D			-		M		m	<sup>2</sup>								
	E			.		N	$\circ$	n	<sup>3</sup>								
	F			/		O		o									

2.12 Characters That Can Be Used

Characters for German and French

**Note**

The character Ω is mapped as shown below. The character inside the parentheses is the corresponding character on the keyboard. On the setup window, the keyboard character is displayed.

Ω: 7CH (I)

		Upper 4 bits															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 bits	0			SP (space)	0	@	P		p				°			à	
	1				1	A	Q	a	q								
	2				2	B	R	b	r				²			â	
	3			#	3	C	S	c	s				³				
	4				4	D	T	d	t					Ä		ä	ô
	5			%	5	E	U	e	u				μ				
	6				6	F	V	f	v						Ö		ö
	7				7	G	W	g	w					Ç		ç	
	8			(	8	H	X	h	x							è	
	9			)	9	I	Y	i	y							é	ù
	A			*		J	Z	j	z							ê	
	B			+		K		k						Ë		ë	û
	C					L		l	Ω						Û		ü
	D			-		M		m									
	E			.		N		n								î	
	F			/		O		o							ï	ß	ï

- Characters for German only  
**Ä Ö Ü ä ö ü ß**
- Characters for French only  
**Ë Î Û Ç é à è ù â ê î ô û ë ï ü ç**

## 3.1 Error Messages

When an error message appears, take appropriate measures by referring to the table below.

### Error Messages

Message	Corrective Action	Reference Section
User name or Password is not right or recorder is already connected by other program!	In the communication settings, check that the user name and password match with the settings on the instrument to be connected. In addition, check that other software programs are not performing communications with the instrument to be connected.	2.2
Connection error, please check communication setting!	In the communication settings, check that the communication mode and parameters match with those of the instrument to be connected.	2.2
Connection timeout.	There may be too much traffic. Retry after a little while.	–
Failed to open file.	If the file cannot be loaded the second time, the file may be corrupt. Select another file.	2.3
Failed to send data.	Displayed when the transmission of the setup data fails. Check that the system configuration matches that of the connected instrument.	2.9
Failed to make file.	Check the capacity of the directory, or check that other programs are not using it.	–
The setting information is mismatch current setting. Please select again.	A unsupported file is selected. Check the file. The extension to setup data files is .pul.	–
Now recording. Can't send settings.	Stop the recording on the $\mu$ R before sending the data.	–
Now calculating. Can't send settings.	Stop the computation on the $\mu$ R before sending the data.	–
Now recording & calculating. Can't send settings.	Stop the recording and computation on the $\mu$ R before sending the data.	–
Sending data is not permitted to the current user level.	Change the user making communication settings to administrator level.	2.2
There is no format string.	Specify the character string in the message format.	2.6
Format string exceeds limit.	The character string written in message format is too long.	2.6
Printed string exceeds limit.	The character string written in message format is too long when it is actually printed.	2.6
Format string is wrong.	There is an error in the message format string.	2.6
Channel selection is wrong.	There is an error in the channel designation in the message format.	2.6
Message selection is wrong.	There is an error in the message designation in the message format.	2.6

### Warnings

#### Message

Some data has been modified, continue sending data?

System configuration has been changed. The input configuration and data will be initialized. Continue?

Contains invalid data. Open this setting?

Hardware and software configurations don't match. Continue sending data?

Any destroyed A/D converter exists. Any settings may be failed to store.

This recorder doesn't match all, Continue or not?

File version x.xx is not supported. Setting data will be changed to latest version x.xx. Do you continue operation?

Version x.xx is not supported. Setting data will be received as latest version x.xx. Do you continue operation?

This device is not supported. Setting data will be received as supported version x.xx device. Do you continue operation?

Connected device is not supported. Some setting data may not be send. Do you continue sending?

Connected device is not supported hardware.

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