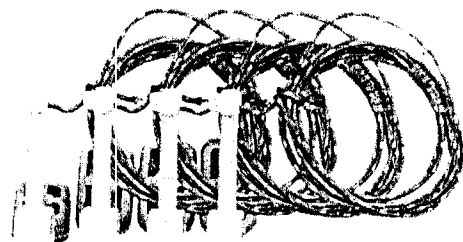


M-4294/0306

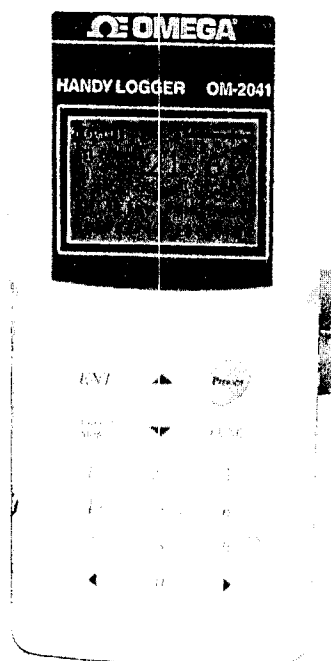
1 YEAR  
WARRANTY



# User's Guide



INSTRUCTION MANUAL  
(DATA READ SOFTWARE)  
OPERATION MANUAL



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MANCHESTER, UK

## OM-2041 SERIES Handy Logger

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## ■ Installing the Software

The following describes how to install the software.

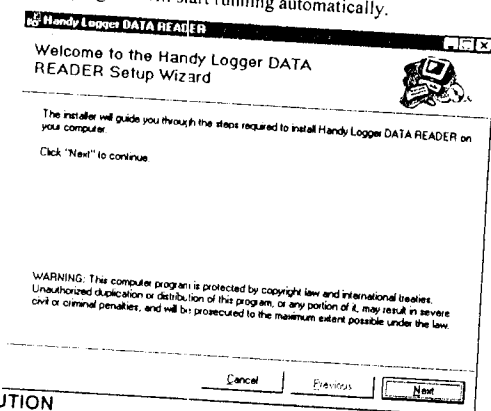
1. Power ON the personal computer to start up Windows.

### CAUTION

If other applications are running when installing this software, such application may adversely affect the installation of the software. To avoid such troubles, exit all currently running applications completely before starting the installation.

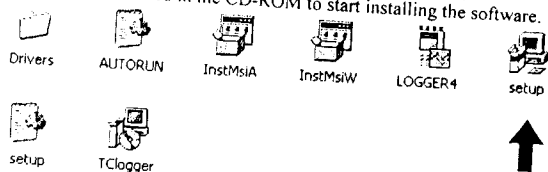
2. Set the software CD-ROM supplied with this data read software package in the CD drive.

The setup program will start running automatically.



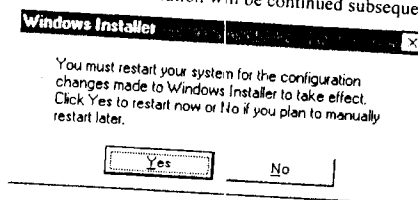
### CAUTION

If the installation of the software is not started up even though the CD-ROM is set, double-click the [setup.exe] file contained in the CD-ROM to start installing the software.



### CAUTION

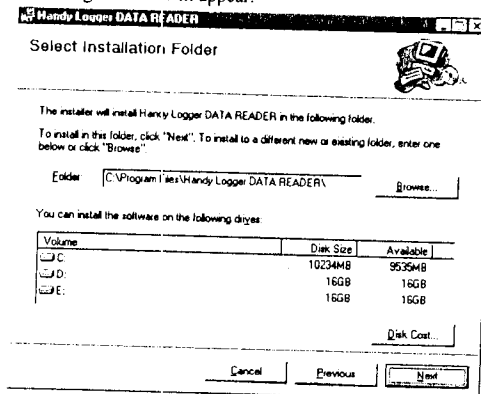
If the Windows installer is not installed on your computer, the following window will appear. Follow the instructions that appear in the window and click the [Yes] button. The system will be restarted, but the installation will be continued subsequently.



1. From the [Start] menu select [Settings] and [Control Panel] in that order.

### 3. "Select Installation Folder"

The following window will appear.



Specify a folder where you wish to install the software. The default folder is "C:\Program Files\Handy Logger DATA READER\". Normally, the software is installed into this folder.

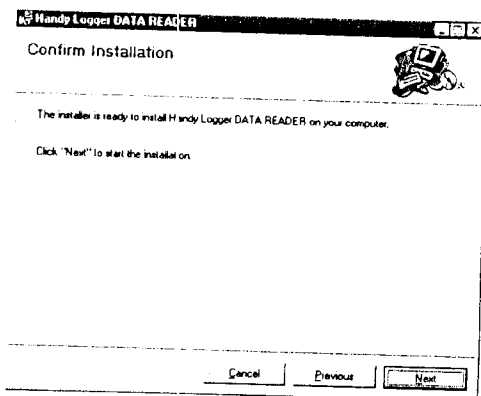
If you accept this default folder, click [Next] to proceed the installation.

#### CAUTION

The drive No. (such as "C:") that appears in the window may vary depending on the system configuration of the personal computer you are using. When reading the message shown in the above window, change the drive No. to that corresponding to your personal computer environment.

### 4. "Confirm Installation"

The following confirmation window will appear. Clicking the [Next] button will start installing the software.

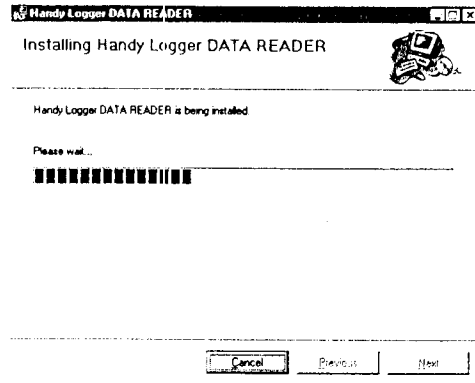


#### CAUTION

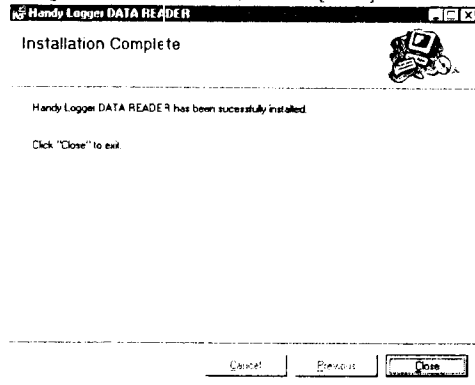
If other applications are running when installing this software, such application may adversely affect the installation of the software. To avoid such troubles, exit all currently running applications completely before starting the installation.

## 5. "Installing Handy Logger DATA READER"

The software installation will be started.



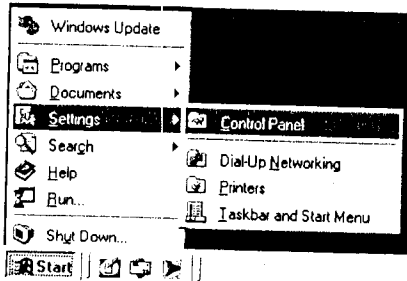
After the software has been installed completely, the following window will appear. After checking the message shown in the window, click the [Close] button to exit the software installation.



## ■ Uninstalling (Deleting) the Software

The following describes how to uninstall (delete) the handy logger data read software from your personal computer.

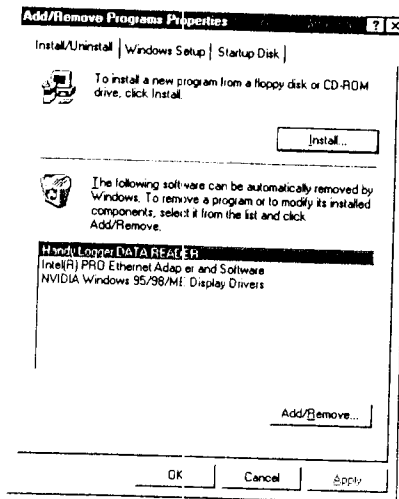
1. From the [Start] menu, select [Settings] and [Control Panel] in that order.



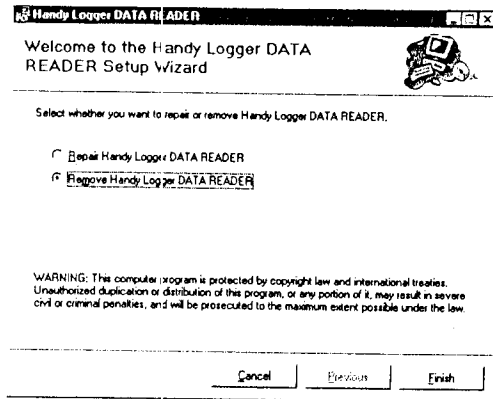
2. Double-click [Add/Remove Programs].



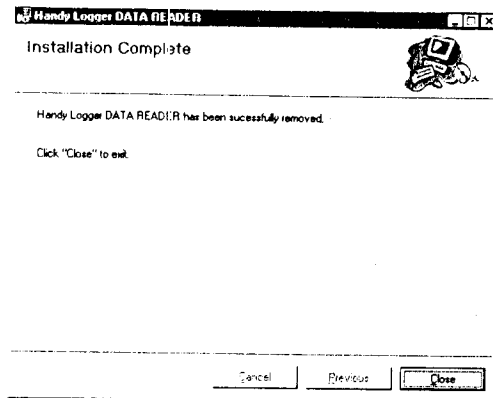
3. Select [Handy Logger DATA READER] and click the [Add/Remove] button.



4. Check on [Remove Handy Logger DATA READER] and click the [Finish] button.



After the software has been uninstalled successfully, the following dialog box will appear. Click the [Close] button to exit the software uninstallation.



## ■ Connecting to the Logger (USB)

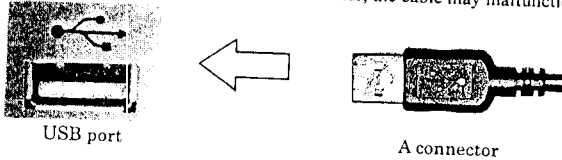
When this unit is connected to your PC (personal computer) with the special USB cable, the recorded data can be read and saved into a file on the PC. The setting of recording can be written from the PC too. Also, the special USB cable (supplied with the charged software) is naturally required to communication the data with the PC.

### 1 Connecting the special cable to the logger

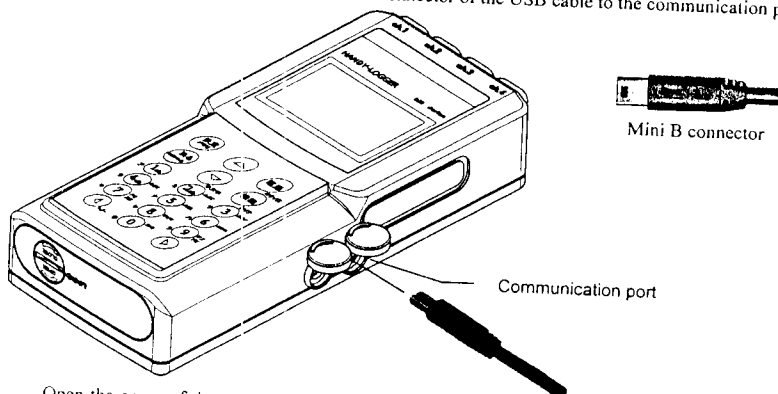
[On the side of PC] Connect the A connector of the USB cable to the USB port.

#### CAUTION

- Hold the plug of the cable and pull it out when disconnecting the cable connector.
- If the lead cable is pulled to disconnect the connector, the cable may malfunction.



[On the side of the unit] Connect the mini B connector of the USB cable to the communication port.



Open the cover of the communication port with the "PC" marking and insert the plug of the USB cable firmly into the communication port until it is in contact with the far side. Also, use the special cable supplied with the charged software.

#### CAUTION

- Hold the plug and pull it out when disconnecting the cable connector.
  - If the lead cable is pulled to disconnect the connector, the cable may malfunction.
  - Use the special cable (supplied with the software) only.
  - Close the cover firmly if the port is not used.
- Otherwise, the drip-proof performance may be damaged.



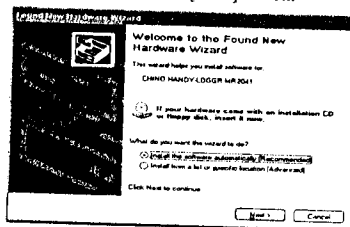
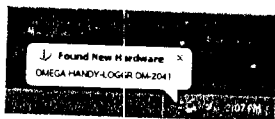
## ■ Installing USB driver

### Notes

This paragraph describes the installation of the driver software for MR2041 on your OS.  
For the installation of this driver software on your personal computer with plural USB ports, we recommend to choose one USB port only for using this unit and then install this software.  
\* When you change the USB port, the installation of this software for a new USB port may be necessary.

### Installation in Windows2000 or WindowsXP (For Windows98 and WindowsME, refer to Page 11.)

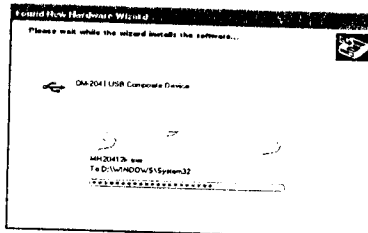
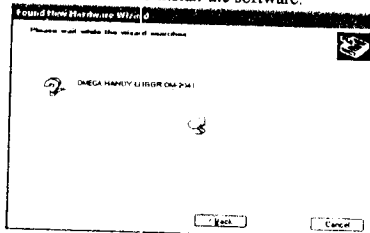
- 1 Power on your personal computer and start Windows. (Don't connect the logger at this moment.)  
\* Wait until the desktop screen appears.  
Caution: For Windows XP/2000, log on as a user belonging to Administrators group.
- 2 After Windows starts, insert the CD-ROM.  
The installation of application will start but cancel it.
- 3 Connect the logger to a USB port. The below screen will appear.  
After several seconds, the right screen will appear.  
Select the [Install the Software Automatically.] and click the [Next] button.



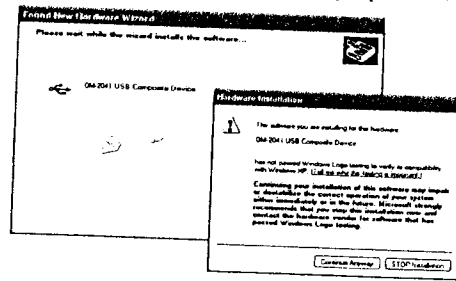
### Notes

The above screen may appear when you connect the logger to other USB port. In this case, install the software with the same procedure.  
The above screen will not appear when you re-connect the logger to the USB which you connected this unit once and completed the installation successfully.  
If the above screen does not appear on condition that the installation is not completed, the following cause is considered.  
Cause: The logger is not correctly connected to the USB port.  
→ Confirm that the logger is correctly connected to the USB port again.  
→ Change the USB port to other port for the connection with the logger and try again.

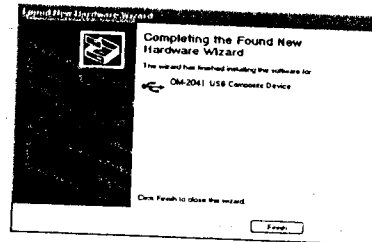
- 4 The below screen will appear. By clicking the [Next] button, the right screen will appear and the wizard will start to install the software.



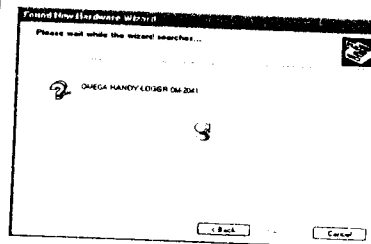
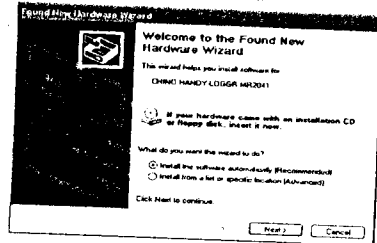
When below screen will appears, click the [Continue Anyway] button.  
The wizard will be continued to the following step.



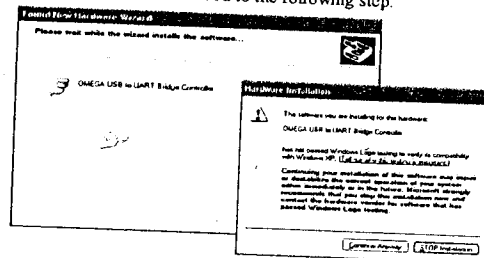
- 5 The below screen will appear. By clicking the [Finish] button, the right screen will appear and the next hardware will be searched.



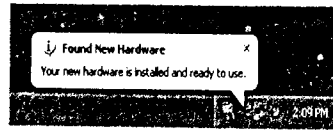
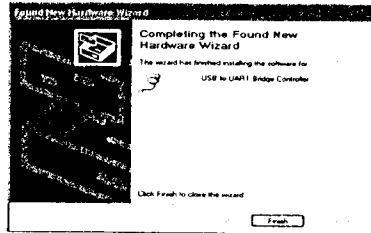
- 6 The Found New Hardware Wizard will appear. By clicking the [Next] button, the wizard will detect the software and start to install it.



When below screen will appears, click the [Continue Anyway] button.  
The wizard will be continued to the following step.



- 7 The below screen will appear when the installation is complete. By clicking the [Finish] button, the right screen will appear and the logger becomes ready-to-use.

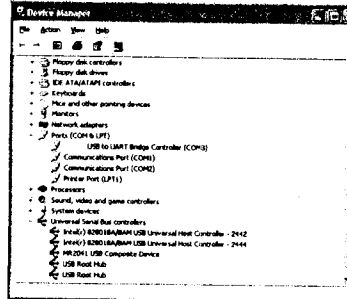


### Verification of connections after the installation of the driver (Windows2000, WindowsXP)

The following procedure is for your verification that the driver has been installed correctly and the logger has been recognized.

**\*Please keep the logger connected to the USB port of your PC.**

- 1 Right-click the [My Computer] and click the [Property (R)]. If the [My Computer] is not available, click the [Start] button and then right-click the [My Computer].
- 2 Click the [Hardware] tab and then click the [Device Manager (D)] button.
- 3 Double-click the "USB (Universal Serial Bus) Controller" in the Device Manager screen and verify that the below title is listed.  
MR9504 USB Composite Device
- 4 Double-click the "Port (COM and LPT)" in the Device Manager screen and verify that the below title is listed.  
OMEGA USB to UART Bridge Controller (COMx)  
" The COM port number differs depending on your PC.



After your verification, close the screen.

#### Notes

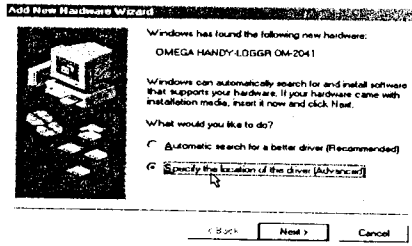
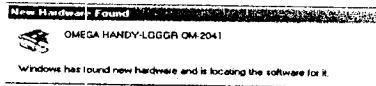
The logger is assigned to a COM port number in ascending order from the COM port 3 in currently unused COM ports of your PC.  
(The COM port number differs depending on your PC.)

- When an OS is installed into your PC, remove the logger from it.
- The logger does not correspond to Standby, Suspend or Sleep condition of your PC.
- Plural sets of the logger can not be used simultaneously.

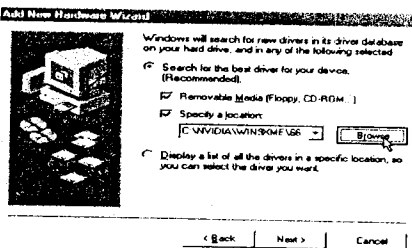
## Installation in Windows98 or WindowsMe

- 1 Power on your personal computer and start Windows. (Don't connect the logger at this moment.)
  - \* Wait until the desktop screen appears.
- 2 After Windows starts, insert the CD-ROM.  
The installation of application will start but cancel it.
- 3 Connect the logger to a USB port. The below screen will appear.

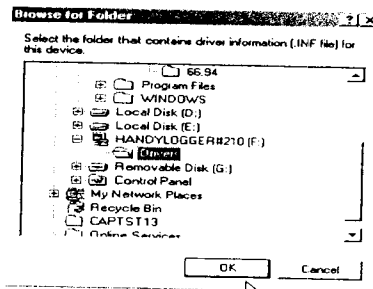
After several seconds, Windows will recognize the logger and the Add New Hardware Wizard will appear. The right screen will appear. Select the radio button of "Specify the location of the driver (advanced)" and then click the [Next] button.



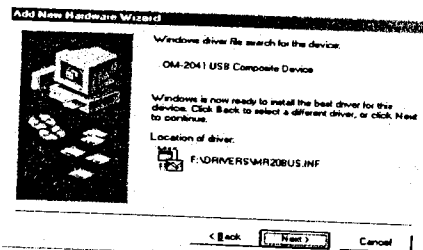
- 4 The right prompt screen will appear. Select the radio button of "Search for the best driver for your device. (Recommended)" and place a check mark in the "Specify a location:" box. Click the [Browse...] button.



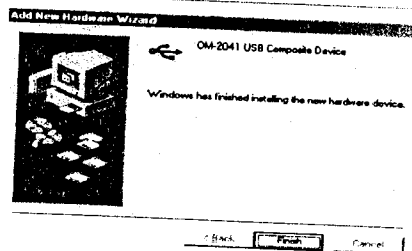
- 5 At the right screen, select the drive that the CD-ROM is inserted and then click its [+] button to display the "Drivers". Highlight the "Drivers" and click the [OK] button. The screen will return to the screen of 4. Click the [Next] button.



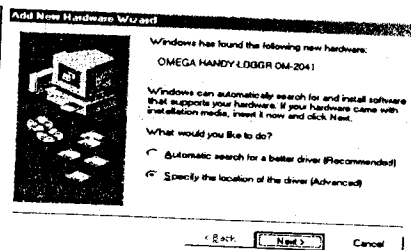
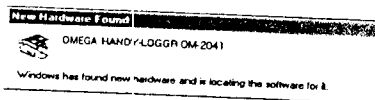
- 6 The right screen will appear. Click the [Next] button.



- 7 The right screen will appear. The installation of one driver in your PC is completed. Click the [Finish] button.

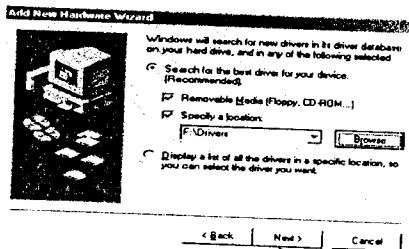


- 8 After several seconds, the right screen will appear for the installation of another driver. Select the radio button of "Search for the best driver for your device. (Recommended)" and then click the [Next] button.

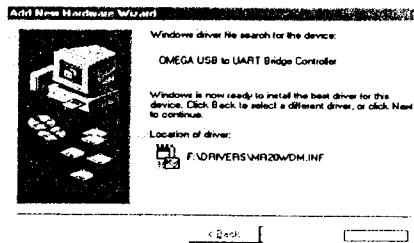


- 9 At the right screen, place a check mark in the "Specify a location:" box.

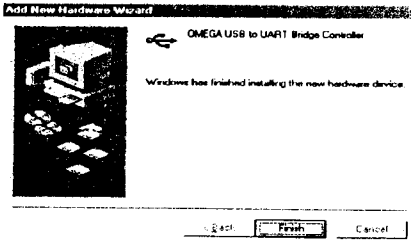
Verify the box indicates "F:\Drivers" that CD-ROM is inserted and then click the [Next] button. If a different location is indicated, refer to 5.



- 10 The right screen will appear. Verify the location of driver is the driver that the CD-ROM inserted and then click the [Next] button.



- 11 The right screen will appear. The installation of another driver in your PC is completed. Click the [Finish] button.



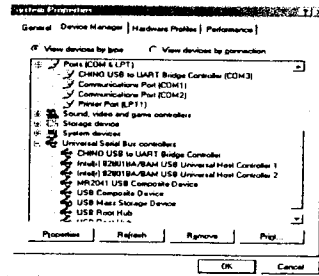
#### Verification of connections after the installation of the driver (Windows98, WindowsME)

The following procedure is for your verification that the driver has been installed correctly and the logger has been recognized.

**\*Please keep this unit connected to the USB port of your PC.**

- 1 Right-click on the [My Computer] icon and select the [Property (R)].
- 2 The right window will appear. Click the [Device Manager (D)] tab.
- 3 Double-click the "USB (Universal Serial Bus) Controller" in the Device Manager screen and verify that the below title is listed.

MR9504 USB Composite Device



- 4 Double-click the "Port (COM and LPT)" in the Device Manager screen and verify that the below title is listed.

OMEGA USB to UART Bridge Controller (COMx)

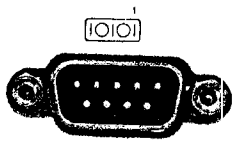
\* The COM port number differs depending on your PC.

After your verification, close the screen.

## ■ Connecting to the Logger (RS-232C)

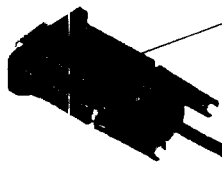
To connect your personal computer to the logger for data communication, use the communication cable supplied with the software.

[Personal computer side] Connect the DSUB 9-pin connector of the communication cable to the COM port on the personal computer (see the Fig. below).



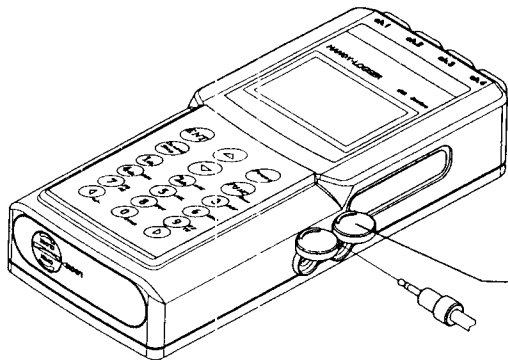
### CAUTION

- Before connecting the communication cable, always power OFF the personal computer completely.
- When disconnecting the cable, hold the plug firmly and pull it out. At this time, do not pull the cable.



DSUB 9-pin connector

[Logger side] Connect the mini jack of the communication cable to the communication port on the logger (see the Fig. below).



Communication port

Open the cover of the communication port with the "PC" marking put and insert the mini jack firmly until it is in contact with the far side.

### CAUTION

- When disconnecting the communication cable, hold the plug firmly and pull it out. At this time, do not pull the cable.
- To connect the personal computer and logger, always use the communication cable supplied with the data read software. Do not use any cable other than that specified.
- The drip-proof performance cannot be kept when the communication cable is connected.
- If the communication cable is not used, close the cover on the port firmly. Failure to do so may cause the drip-proof performance to lower.

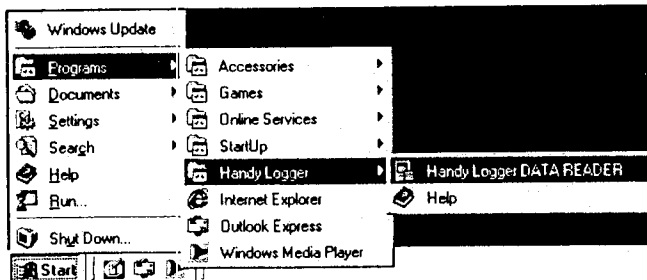
## ■ Starting up the Software

The following describes how to start up the software.

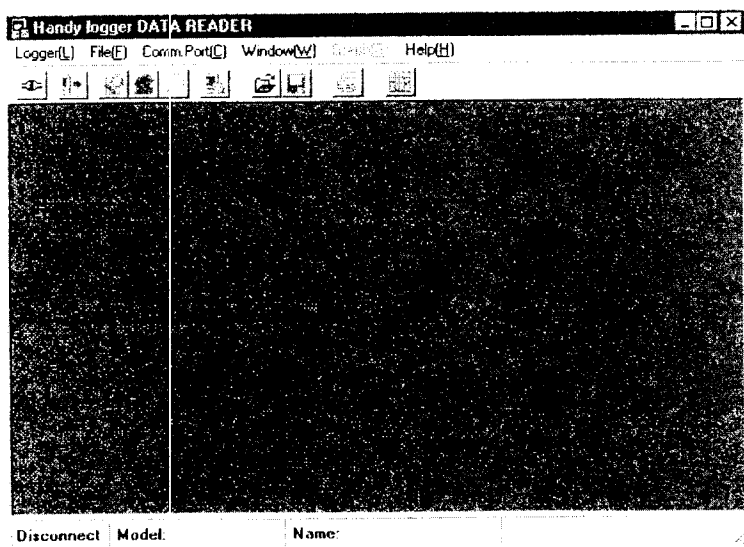
[Starting up procedure 1] Double-click the icon on the desktop.



[Starting up procedure 2] From the [Start] menu, select [Programs], [Handy Logger], and [Handy Logger DATA READER] in that order.



The application will then be started up.





## ■ Making the Initial Settings of the Software

After this software has been installed successfully, first make the [Comm.Port] setting. With this [Comm.Port] menu, specify a communication port that the personal computer uses.

### 1. Connect the logger and personal computer with the cable.

Connect the logger and personal computer while referring to the section ■ Connecting to the logger. Additionally, put the logger in the communication mode that the data communication can be started.

#### [Preparations for logger]

- ① Connect the logger and personal computer correctly with the communication cable.
- ② Power ON the logger and put it in the communication mode.

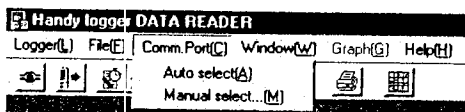
To put the logger in the communication mode, follow the steps below.

- Display the home screen.
- Press [FUNC] key to display the main menu.
- Using the [▲] or [▼] key, select [Communication] and press the [ENT] key.

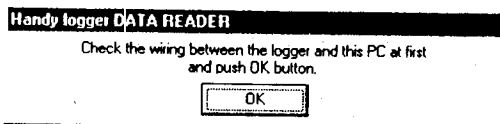
The communication standby screen will appear on the display panel of the logger, and then the logger becomes ready for data communication.

### 2. Start up this software.

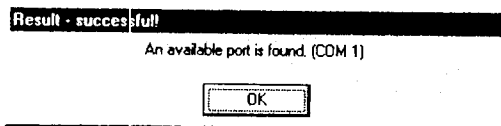
### 3. From the [Comm. Port] menu, select [Auto select].



### 4. Check the cable connection and click the [OK] button.



After that, the software will automatically search for the communication port, to which the logger is connected. When the software searches for the communication port successfully, the following dialog box will appear. (The following dialog box shows that the logger is connected to "COM1".)



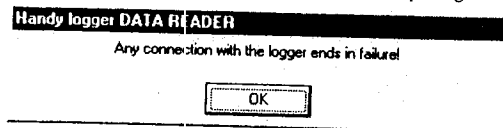
### CAUTION

Once the communication port has been set, this setting is then saved into the personal computer. Therefore, it is not necessary to set the communication port from the next operation.

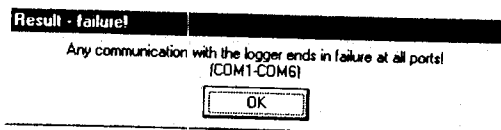
However, it is absolutely necessary to set the communication port if any of the following arises.

- This software is uninstalled, and then it is installed again.
- The communication port, to which the cable is connected, is changed.
- As the system configuration of the personal computer is changed, the communication port setting is changed.

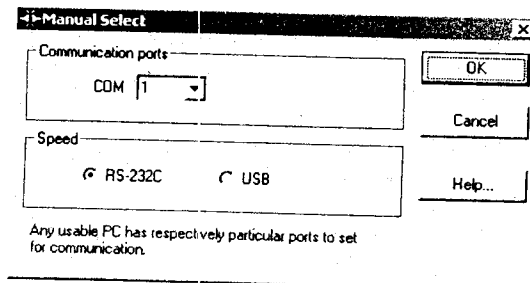
If the connection is failed even though the cable is connected properly and the communication mode of the logger functions correctly, set the communication port again.



× If the auto select is failed:



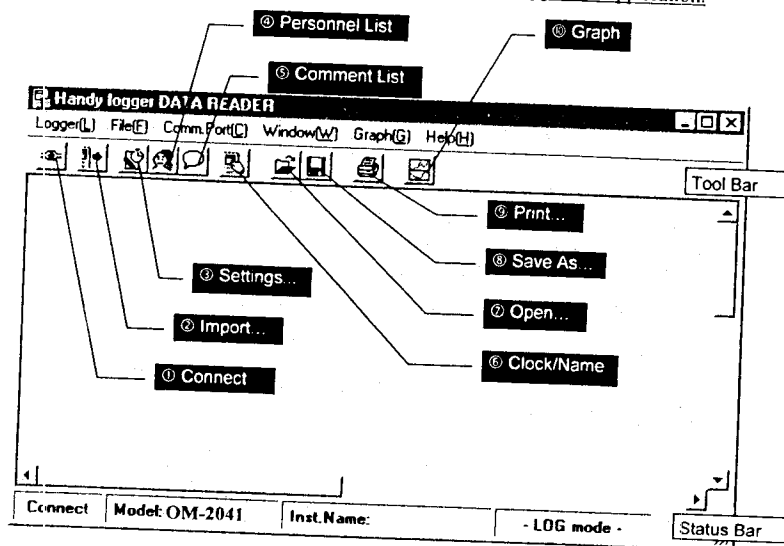
If the above dialog box appears during auto select of the communication port setting and the communication port cannot be found, select [Manual Select] from the [Comm. Port] menu.



## ■ Software Functions and Displays

The following describes the basic functions and displays of the application software.

For details about functions, displays, and operations, run [Help] of the application.



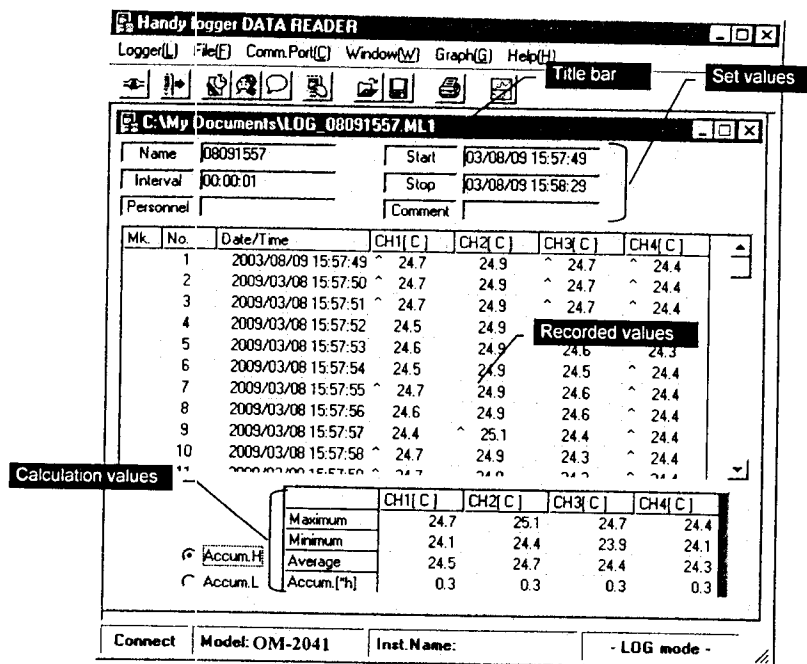
### Toolbar

- Connect Connects the logger and personal computer to make them ready for communication.
- ② Import... Loads the recorded data from the logger to the personal computer.
- ③ Settings... Makes the recording settings (log setting/tag setting) and saves them into the logger.
- ④ Personnel List Registers work personnel and saves them into the logger.
- ⑤ Comment List Registers comments and saves them into the logger.
- ⑥ Clock/Name Changes the logger settings and saves them.
- ⑦ Open... Loads a saved file and displays it on the screen.
- ⑧ Save As... Saves the selected display data with a file name put.
- ⑨ Print... Prints the selected display data in the table format.
- ⑩ Graph Displays and prints the graph of the selected display data.

### Status bar

- [Connect/Disconnect] Displays the logger connection status.
- [Model] Displays the model name of the connected logger.
- [Inst.Name] Displays the instrument name of the connected logger.
- [Mode] Displays the current operation mode (log mode/tag mode).

## Data display [Log mode]



- On the title bar, "LOG□□" (01 to 20) is shown when the data read from the logger is displayed.
- File location (path) is shown when the data read from the file stored in the PC is displayed.

### [Set values]

Name: 8-digit numeric value automatically allocated during recording.  
(For example, "05231456" means "14:56 on May 23".)

Interval: Data recording interval

Start: Data recording start date and time

Stop: Final data recording date and time

Personnel: Work personnel recorded during data recording

Comment: Comment recorded during data recording

### [Recorded values]

Mk.: Mark put during data recording

No.: Data No.

Date/Time: Date and time when the data was recorded.

CH1-CH4: Measured value of each channel

### [Calculation values]

Max.: Maximum value of each channel

Min.: Minimum value of each channel

Average: Average value of each channel

Accum.: Accumulation value of each channel

## Data display [Tag mode]

**Handy logger DATA READER**

Logger(L) File(F) Comm.Port(C) Window(W) Graph(G) Help(H)

**TAG01**

No.	Date/Time	CH1(C)	CH2(C)	CH3(C)	CH4(C)	Personnel	Comment
5	2003/08/16 14:24:03	27.9	28.0	30.4	27.9	NAN	
6	2003/08/16 14:24:09	27.8	27.8	30.4	28.0	NAN	
7	2003/08/16 14:24:18	27.8	27.9	30.5	28.0	NAME0002	COMMENT1
8	2003/08/16 14:26:01	28.1	27.9	30.5	27.9	NAME0002	COMMENT1
9	2003/08/16 14:26:04	28.0	28.0	30.6	27.9	NAME0002	COMMENT1
10	2003/08/16 14:26:52	27.7	27.7	30.3	27.9	NAME0002	COMMENT1
11	2003/08/16 14:26:57	27.6	27.8	30.3	27.8	NAME0002	COMMENT3
12	2003/08/16 14:27:02	27.9	27.5	30.2	27.8	NAME0002	COMMENT3
13	2003/08/16 14:28:08	27.5	27.7	30.2	27.8	NAME0003	COMMENT2
14	2003/08/16 14:28:15	27.5	27.5	30.2	27.6	NAME0003	COMMENT2
15	2003/08/16 14:28:21	27.5	27.4	30.0	27.6	NAME0003	COMMENT2

	CH1(C)	CH2(C)	CH3(C)	CH4(C)
Maximum	28.1	28.1	30.7	28.1
Minimum	27.5	27.4	29.9	27.6
Average	27.8	27.8	30.4	27.9

Connect Model: OM-2041 Inst. Name: - TAG mode -

■ On the title bar, "TAG01" (01 to 20) is shown when the data read from the logger is displayed.  
File location (path) is shown when the data read from the file is displayed.

[Set values]

Name: TAG01 to TAG20 (Tag name cannot be changed.)

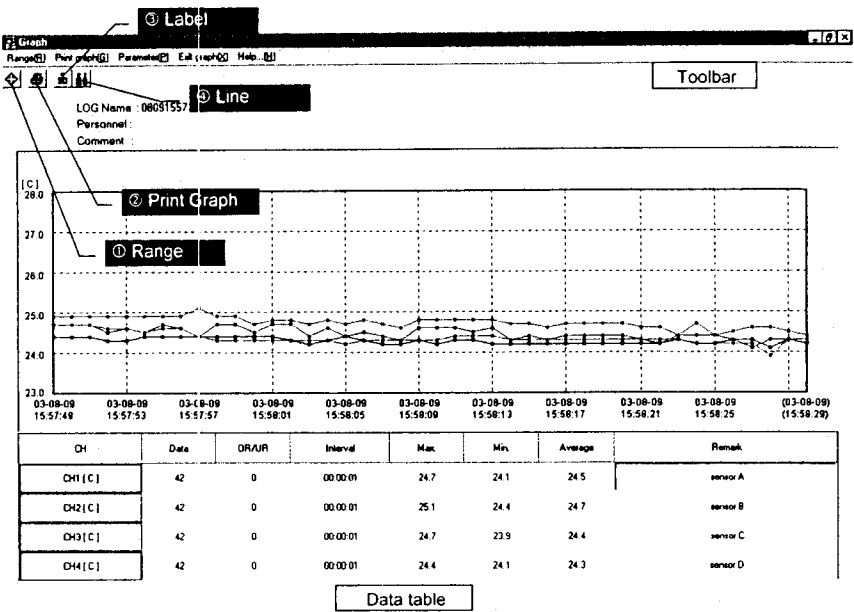
[Recorded values]

No.: Data No.  
Date/Time: Date and time when the data was recorded.  
CH1-CH4: Measured value of each channel  
Personnel: Work personnel recorded during data recording  
Comment: Comment recorded during data recording

[Calculation values]

Max.: Maximum value of each channel  
Min.: Minimum value of each channel  
Average: Average value of each channel

Graph display (Log mode only)



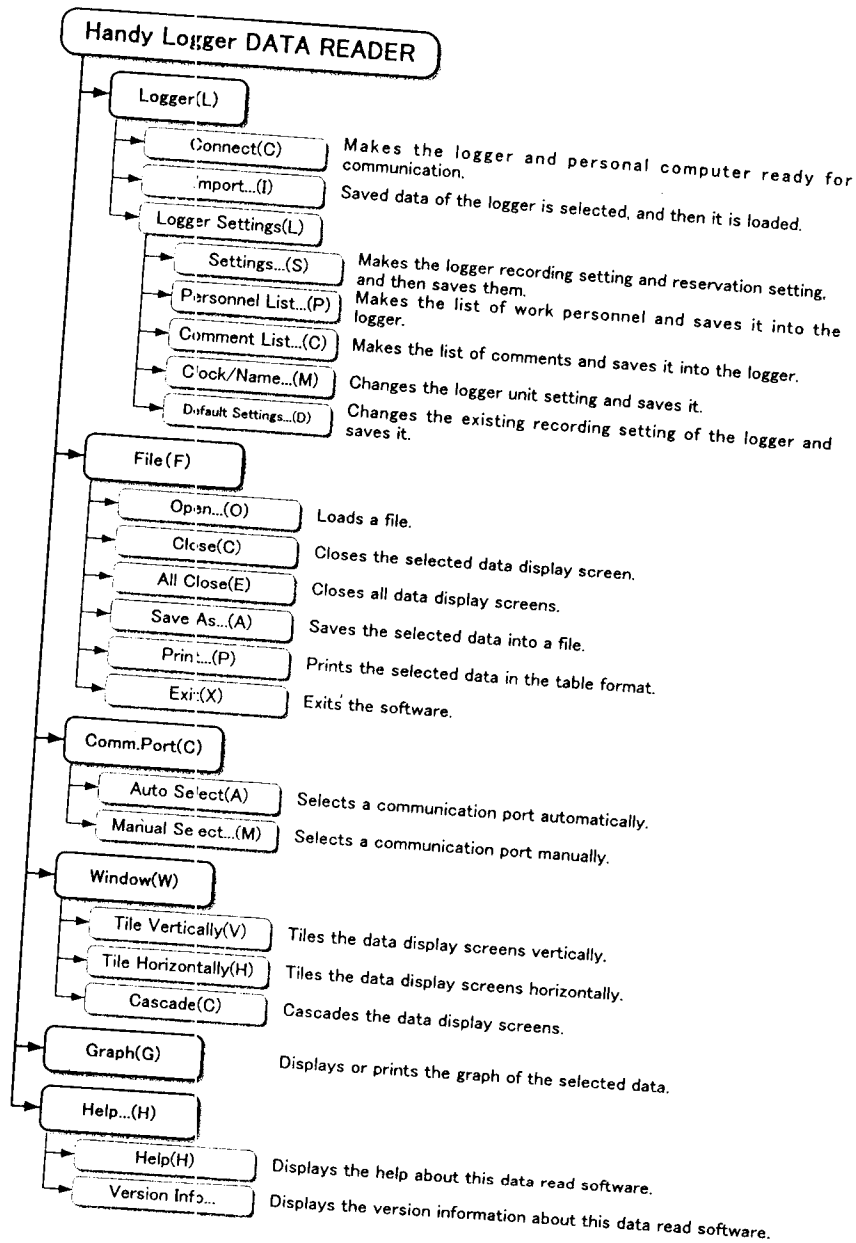
Toolbar

- ① Range Changes the graph range (X-axis and Y-axis).
- ② Graph Print Prints the displayed graph.
- ③ Label Displays the data label (recorded date and time, and recorded values).
- ④ Line Changes the line width of the graph (thin/thick).

Data table

- CH Displays the channel No. and unit.
- Date Displays the number of data in the graph display area.
- OR/UR Displays the number of over/under range data in the graph display area.
- Interval Displays the data recording interval.
- Max. Displays the maximum value in the graph display area.
- Min. Displays the minimum value in the graph display area.
- Average Displays the average value in the graph display area.
- Remark Allows inputting of a comment for each channel.

## ■ Function Flow



## ■ Troubleshooting

Trouble	Cause	Corrective action
The logger connection is failed.	The communication cable is not connected correctly.	Connect the communication cable correctly. For details, see ■ Connecting to the logger.
	The logger is not ready for communication.	Put the logger in the communication mode. For details, see ■ Making the initial settings of the software.
	The connection port is incorrect.	Select the correct port using the [Comm. Port] menu of the software. For details, see ■ Making the initial settings of the software.
The data reading from the logger is failed.	The floppy disk is accessed during communication (Window98, etc.).	When the OS is Windows98 or ME, the communication error may occur. Do not access the floppy disk when using such OS.
	The screen saver is started up. (Win98, etc.)	Deactivate the screen saver or other application.
The software operation is slow.	Other applications are running at the same time.	This software needs relatively large memory area for operation. If the operation is slow, exit other applications currently running.
	The memory capacity is insufficient.	
	The remaining capacity of the hard disk drive is insufficient.	If the capacities of both the memory and hard disk drive become insufficient, the operation may become too slow.



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## ■ Introduction

Thank you for your purchasing of this handy logger model OM2041 Series.

Read this instruction manual thoroughly previous to the use and operate this unit safely by understanding the proper operating procedures and safety precautions.

Keep this manual at hand for future reference.

### □ Items to check previous to the use

- Check the package contents carefully as unpacking this product.  
Contact your local sales representative or sales office if any package contents are missing.
- No batteries have been mounted in this product before shipment from the factory.  
Mount the batteries (alkaline AA batteries (4 pcs.)) attached to the product according to the section of this manual; Mounting and replacement of the batteries.

Name	Qty
OM2041 Series main unit	1
Alkaline AA battery	4
Mounting holder	1
Holder screw	2
Holder washer	2
Instruction manual (this manual)	1
Battery replacement adaptor	1

### □ About this instruction manual



- All rights reserved. / Copyright reserved.
- The contents of this manual are subject to change without prior notice.
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#### [Indemnities]

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## ■ Safety precautions

- Cautions stated in this manual indicate important contents about operational safety. Therefore, read the contents carefully and follow the instructions strictly.
- In this instruction manual, the following warning labels are provided to indicate probable dangers and to ensure operational safety.

	<b>WARNING</b>	This denotes dangers which COULD result in <u>death</u> or <u>serious personal injury</u> , if not avoided.
	<b>CAUTION</b>	This denotes dangers which COULD result in <u>minor personal injury</u> and/or <u>product or property damage</u> , if not avoided.

### [Safety precautions]



#### WARNING

- Do not use this unit for medical applications, such as body temperature measurement of a person or an animal.
- Do not touch the sensor immediately after the high temperature or low temperature part has been measured. Otherwise, burn damage may occur.
- Do not measure any object which is charged with electricity not to cause an electrical shock.
- Do not use this unit for measurement other than the specified.



#### CAUTION

- Do not use any battery or power supply unit other than the specified one. Otherwise, fluid leak or explosion may occur, and malfunction or personal injury may result.
- Do not measure temperature beyond the specified measurement range not to cause the unit to malfunction or to be damaged.
- Never attempt to disassemble or modify this unit.
- Use always the parts specified by OMEGA on the replacement of any parts or expendables.
- Do not put any foreign object in the sensor insertion port, external power supply port, or communication port. Otherwise, an electrical shock, a fire, or other damage to the unit may occur.
- Do not operate or store this unit in a place where it is exposed to the direct sunlight or the temperature is high. Additionally, do not leave this unit in a place where the high temperature continues for an extended period of time, such as inside of a car. Otherwise, the discoloration or the deformation may occur on the unit.
- If the battery cover is removed with the main unit getting damp, the water may enter the unit. Before replacing the batteries, dry the main unit completely.
- In addition to the main unit, on the handling of any accessories to be connected to the main unit, follow always the safety precautions stated in this manual.
- OMEGA shall not be held responsible for any defect arising from negligence of such cautions and instructions.
- Any relevant measures for safety such as sufficient tolerance and failsafe means shall be taken into consideration when using this unit for an application that may seriously affect the human life or property.

## ■ Handling precautions

- Connect "special connector", "SM connector", or "thermocouple mini connector" applicable to "ASTM E1684-96 Standard Specification for Miniature Thermocouple Connectors" to the connector port.  
Otherwise, malfunction may occur.
- Do not put any foreign object inside the connector port. Otherwise, malfunction may occur.
- Lock the battery cover firmly after the replacement of the batteries.  
If the packing of the battery case is not in place or if any dust is caught in, the leakage of water may occur.
- Store it with the batteries removed if this unit is not used for a long period.
- Otherwise, the leakage of battery fluid may occur and cause the main unit to malfunction.
- If a battery is swallowed, serious personal injury may be caused.  
Put and keep batteries carefully in a safe place where a child cannot get access to them.
- Observe strictly the cautions stated on the batteries to handle correctly them.
- Replace all of four AA batteries with new ones immediately if the low battery alarm occurs (see section 1. Starting up).
- The service life of the battery may vary depending on the service conditions or the brand of the battery.
- Do not press the display panel or keypad strongly. Otherwise, the display panel or keypad may break.
- Do not drop the unit or apply any strong impact to it as it is a precise instrument.
- Do not operate this unit under the water.
- Keep this unit away from any equipment producing the strong static electricity or electromagnetic wave, such as television set, microwave oven, or radio receiver as much as possible.  
Otherwise, malfunction or trouble may occur.
- Keep this unit away from any equipment producing the strong high frequency or surge as much as possible. Otherwise, malfunction or trouble may occur.
- Wipe it off lightly with a cloth, which is wrung out with neutral detergent, to clean this unit.  
Do not use a dry solvent, such as benzene, paint thinner, or alcohol, or bleach at any case.
- This unit has a washable structure (protection grade IP64).  
However, if the unit is left with the water splashed for a long time, the water may enter the unit.  
Wipe off the unit with a dry cloth rag as soon as possible after washing.
- Mount the connector covers, the plug-covers, and battery cover firmly whenever washing.
- Remove the dirt or water content sticking to the sensor or main unit completely, and store them safely after the measurement.
- Do not operate or store the main unit in a place where the temperature becomes  $-20^{\circ}\text{C}$  or less or  $55^{\circ}\text{C}$  or more, or the relative humidity becomes 90% or more.
- Do not operate or store the unit in an environment where there are direct sunlight, or fine particle dust, or high temperature and humidity, or any corrosive ingredient.
- Contact your nearest sales representative or sales office for any after-sale service such as repair.
- Do not stick the sensor protector to a hard substance. Otherwise, the sensor protector may be broken or bent. Do not bend the protector intentionally. Never use the bent sensor.
- Do not stretch the sensor cable strongly.

Otherwise, the breakage of wiring and malfunction may occur.

- Do not use a sensor with any deterioration or damage.

Otherwise, the temperature may not be measured correctly.

- Insert the measurement part of the probe into a substance by 50% of its length when using a needle-type one.

The excessive insertion may cause burn damage and the probe to be damaged by the heated-up grip

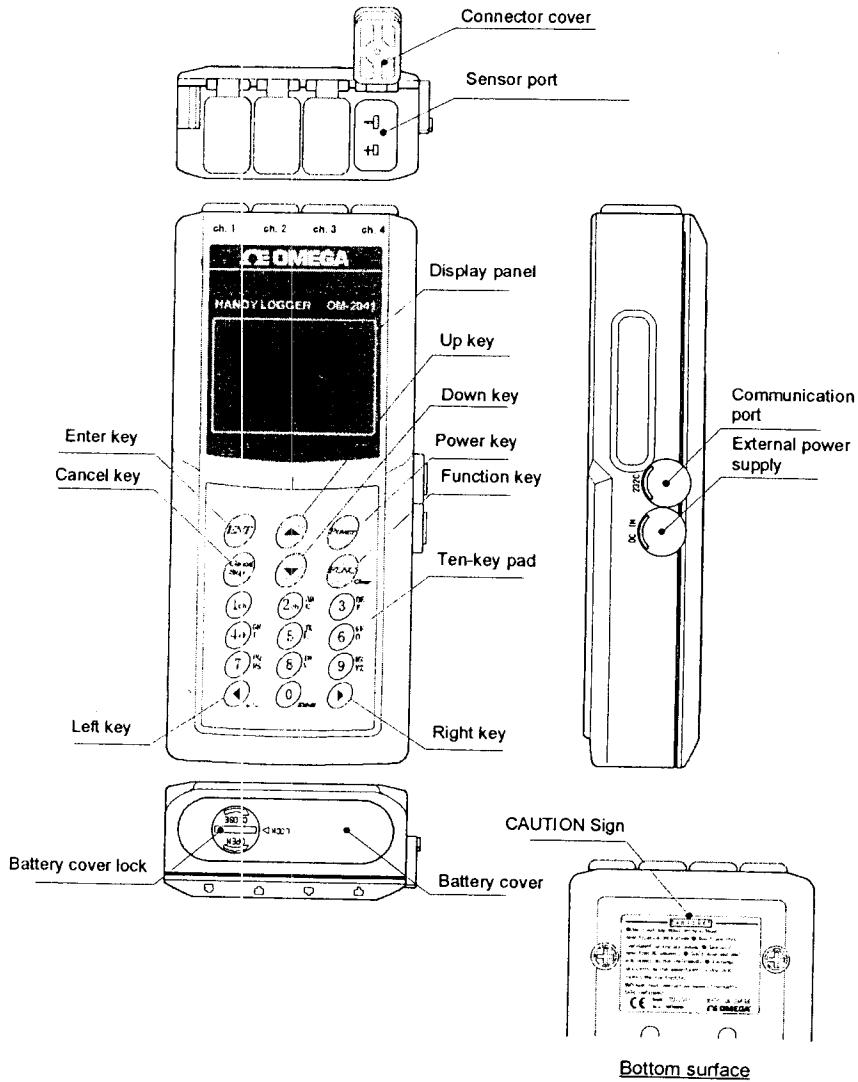
- Use always the probe grip and the connection cable unit within the specified temperature range.

The heat resistance of such part is low in comparison with the measurement part of the probe (metallic portion).

- The sheath thermocouple wire is intended for the fixed wiring.

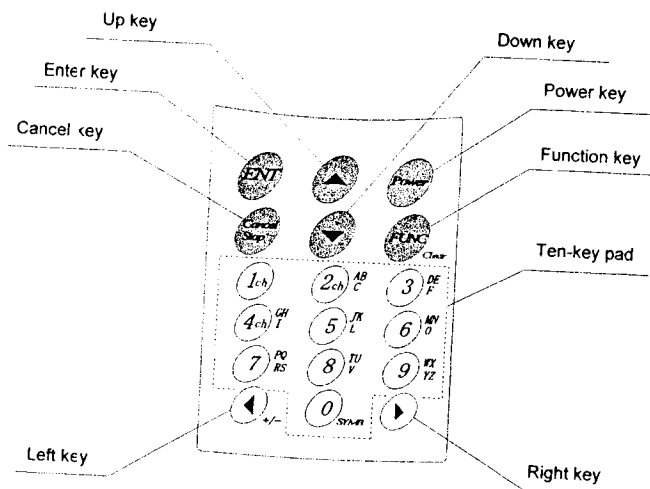
Avoid the winding, the twist, the stretch, friction and vibration for the wire repeatedly not to cause the wiring or the insulator to be damaged or to be deteriorated.

## ■ Part names



## ■ Key names and functions









[Key names]



[Key functions]











Key	Function
ENT	Setting and registration of the data and movement to the next screen Start of the recording operation
Cancel Stop	Cancellation of each item and return to the previous screen Stop of the recording operation
▲	Up movement of the cursor Backward movement of the recorded data in the successive order as checking data
▼	Down movement of the cursor Forward movement of the recorded data in the successive order as checking data
Power	Turning(ON or OFF) of the power or display
FUNC	Display of the main menu
Clear	Clearance of the character at the cursor position as inputting characters
0 to 9	Input of a numeric value or character Change of the display mode (1, 2, 4)
←	Left movement of the cursor Change of the display channel in the 1&2-channel display mode Change to "-" input as inputting numeric values
→	Right movement of the cursor Change of the display channel in the 1&2-channel display mode

[How to input numeric values]

Input character	Input method
"0" to "9"	Move the cursor to a position to be input by  or  key, and input a numeric value using  to  key. The cursor is moved to the right after a numeric value is input.
"-" (minus)	Move the cursor to the left end of the input line by  key, and then further press  key to display "-". Hereupon, as pressing  key repeatedly, the display is alternately switched between "-" and "" (blank). , press  key to move the cursor to the right to set "-" or "" (blank).

[How to input alphanumeric characters]


The character is changed by the times of pressing ten-key.

Times of pressing the key	1 time	2 times	3 times	4 times	5 times	6 times	7 times	8 times	9 times	10 times
 1ch	1									
 2ch <sup>AB</sup> / <sub>C</sub>	A	B	C	2	a	b	c	2		
 3 <sup>DE</sup> / <sub>F</sub>	D	E	F	3	d	e	f	3		
 4ch <sup>GH</sup> / <sub>I</sub>	G	H	I	4	g	h	i	4		
 5 <sup>JK</sup> / <sub>L</sub>	J	K	L	5	j	k	l	5		
 6 <sup>MN</sup> / <sub>O</sub>	M	N	O	6	m	n	o	6		
 7 <sup>PQ</sup> / <sub>RS</sub>	P	Q	R	S	7	p	q	r	s	7
 8 <sup>TV</sup> / <sub>U</sub>	T		V	8	t	u	v	8		
 9 <sup>WX</sup> / <sub>YZ</sub>	W	X	Y	Z	9	w	x	y	z	9
 0 <sup>XY</sup> / <sub>Z</sub>	O	%	!	(	)	O	+	-	*	/



## ■ Change of the Recording Mode

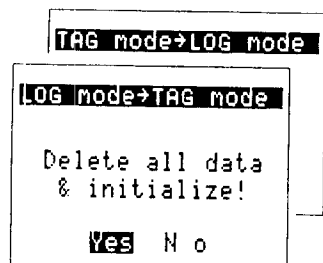
The recording mode is changed with the key operation while starting up.

- 1 Press  key to turn OFF the power.

Stop recording if the unit is currently recording the data.

- 2 Press  key with  key kept pressed.

(The screen is changed to the confirmation screen of the recording mode.)



Select [Yes] by the [<] or [>] key, and then press [ENT] key.

When [No] is selected, the operation is started up without changing of the mode. (Normal startup)

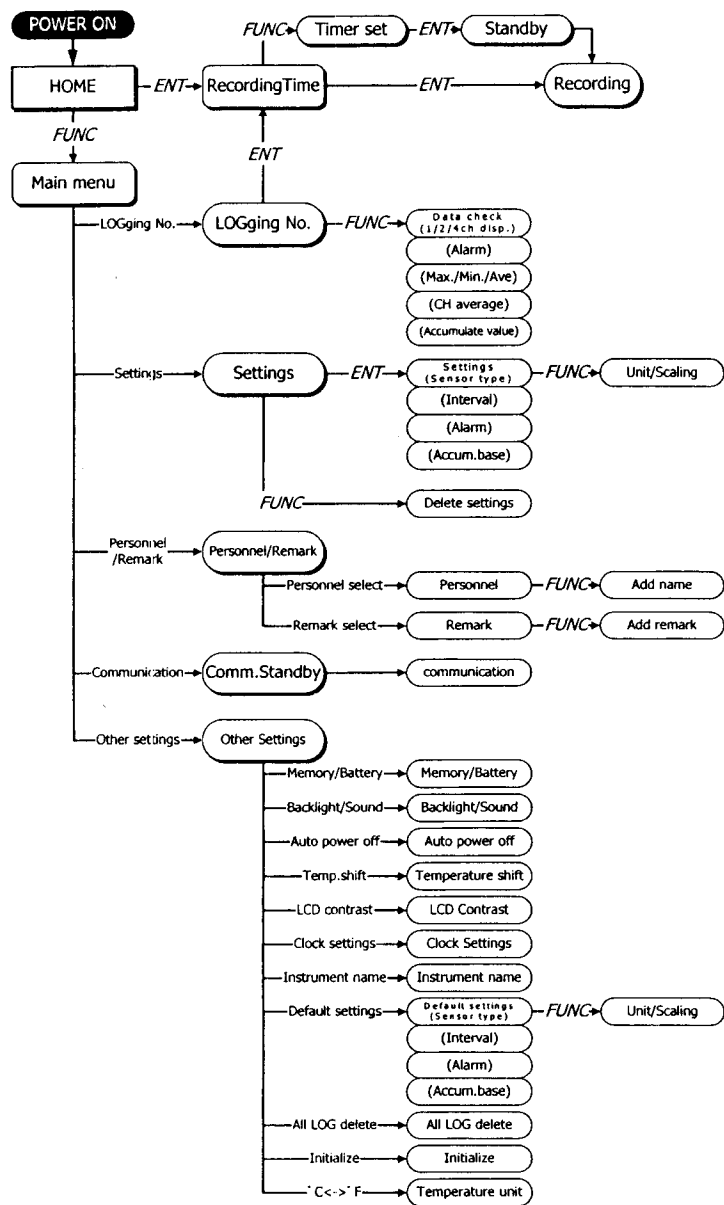
The operation is started up with the mode changed (log mode to tag mode or tag mode to log mode).  
The home screen will appear.

### CAUTION

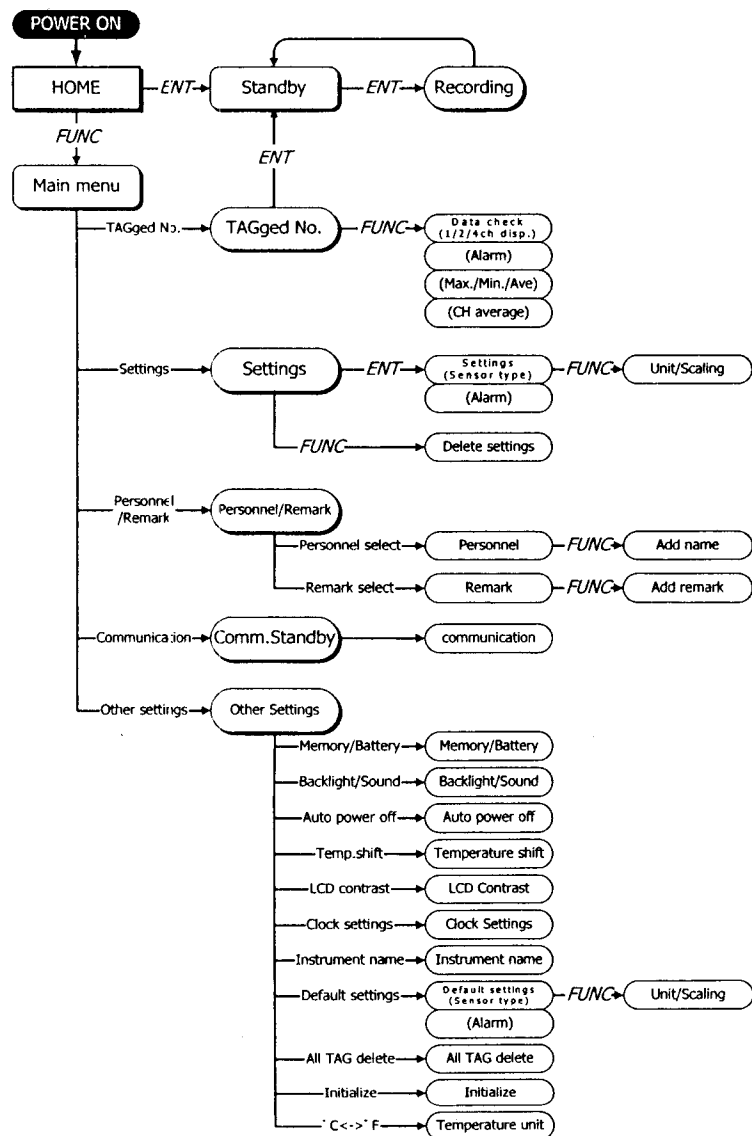
- When the mode is changed, the recorded data and the setting in the previous mode are cleared completely.

Therefore, please be sure to save the data before changing the mode.

## ■ Operation Flow (Log Mode)




## ■ Operation Flow (Tag Mode)



# 1. Starting up (Home Screen)

This section describes the home screen that appears when the power is turned ON/OFF and when the unit is started up.

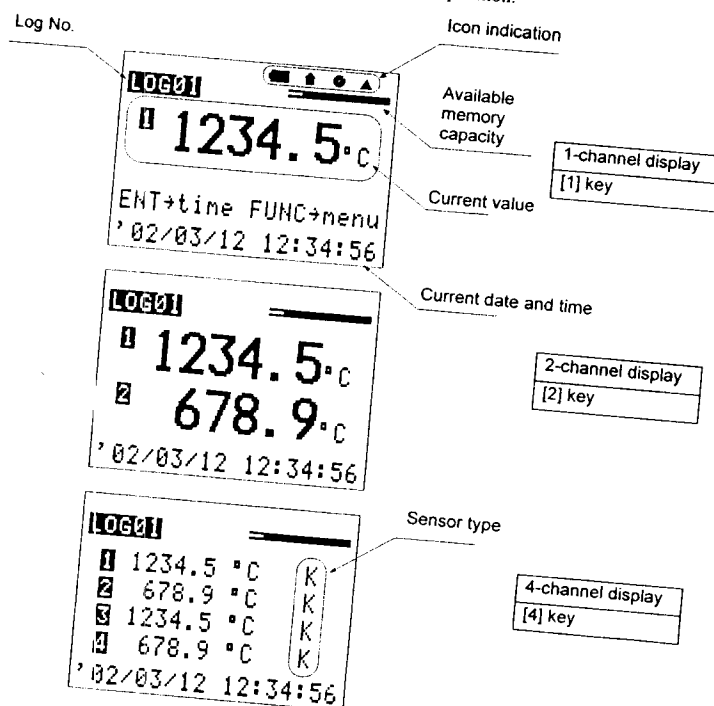
- 1 Press  key to turn ON the power.

The home screen appears on the LCD panel.

On the home screen, the current value of each channel is updated at intervals of 1 sec. The currently selected log (tg) No. is shown at the upper left portion of the screen.

Additionally, the current date and time are shown at the lower portion of the screen.

The home screen provides three kinds of display modes depending on the channel number to display on it. This display mode can be changed by the one-touch operation.

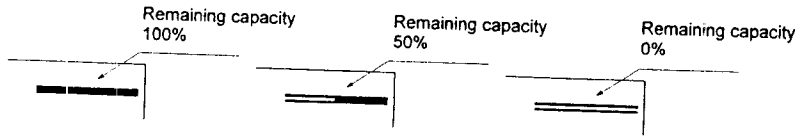


Change the display channel by the [<] or [>] key in the 1-channel and 2-channel display modes.

Key	1-channel display	2-channel display
>	CH1→CH2→CH3→CH4→CH1...	CH1/2→CH3/4→CH1/2...
<	CH1→CH4→CH3→CH2→CH1...	

#### [Available memory]

The remaining capacity of the memory, into which the data is recorded, is indicated by the bar graph (50 steps). The number of data to be recorded to this unit may vary depending on the recording mode, that is, log mode or tag mode.



#### ● Log mode

In the log mode, the data can be recorded until the total number of data recorded to 20 logs reaches 40000.

One number of data corresponds to the data volume used for one recording at one channel.

Therefore, the number of data to be recorded may vary depending on the number of channels to be used.

The available recording cycles is calculated from the following formula.

$$\text{Available recording cycles [cycles]} = \frac{\text{Free memory capacity [data]}}{\text{Number of channels in use [ch]}}$$

The available recording time is calculated from the following formula.

$$\text{Available recording time [time]} = \text{Number of remaining cycles [cycles]} \times \text{Recording interval [time]}$$

#### [Example]

If the free memory capacity is "1000", all of four channels are used, and data is recorded at intervals of 5 min., the available recording time is 1250 min.

$$1000 (\text{free memory capacity}) \div 4\text{ch} (\text{number of channels in use}) \times 5 \text{ min. (recording interval)} = 1250 [\text{min}]$$

#### ● Tag mode

In the tag mode, the data can be recorded until the total number of data recorded to 20 tags reaches 10000.

One number of data corresponds to the data volume used for one recording at one channel.

However, the number of data to be consumed may vary depending on the number of channels in use.

Number of channels in use	Calculation formula of remaining recording cycle
1	Available recording cycles = Free memory capacity [data] $\times 11 \div 11$
2	Available recording cycles = Free memory capacity [data] $\times 11 \div 14$
3	Available recording cycles = Free memory capacity [data] $\times 11 \div 17$
4	Available recording cycles = Free memory capacity [data] $\times 11 \div 20$

#### [Example]

If the free memory capacity is "1000" and the data is recorded using three channels, up to 647 data records can be recorded.

$$1000 (\text{free memory capacity}) \times 11 \div 17 (\text{coefficient}) = 647 [\text{data}]$$

[Sensor types]

The currently selected input type of each channel is indicated. In the unit, “K”, “T”, “E”, or “J” type thermocouple are available as the temperature sensor.

Additionally, when using the optional voltage/current adaptor (sold separately), it is also available for the DC voltage or DC current signals.

Symbol	K	T	E	J	V	
Input type	"K" thermocouple	"T" thermocouple	"E" thermocouple	"J" thermocouple	Voltage/Current adaptor	No connection

● Voltage/Current signal input

In this unit, the DC voltage (0 to 5 V) or DC current (0 to 20mA) signals can be measured as using the optional adaptor of voltage or current input.

When [V] is selected for the input, the unit and scale can be set.

Item	Setting range	Remarks	
Unit	Up to three characters	Alphanumeric characters	
Min. scale	-9999 to 9999	Voltage	Indication at 0V of the input
		Current	Indication equivalent to 0 mA of the input( calculated) Indication span of this unit ÷ output span of the input × (-4mA)
Max. scale	-9999 to 9999	Voltage	Indication at 5V of the input
		Current	Indication at 20mA of the input
Fraction part	0 to 3	Number of digits below decimal point 0:0, 1:0.0, 2:0.00, 3:0.000	

CAUTION

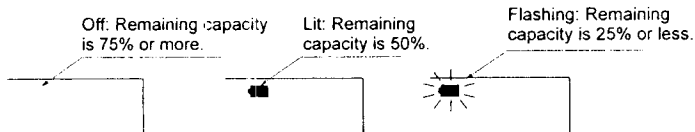
- If “-” (no connection) is set for all channels, the data cannot be recorded.

[Icon indication]

Icons are indicated at the upper right portion of the screen to show various situations.

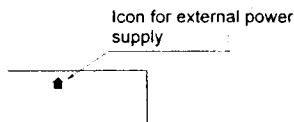
① Battery level

The remaining of battery capacity is always indicated by the battery icon. The remaining capacity is indicated in three steps. Replace the batteries with new ones before recording data for a long time if the remaining capacity becomes 25% or less (icon is flashing).



② External power supply

The icon for external power supply is indicated as using the AC adaptor.



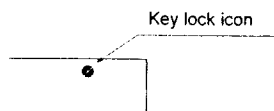
### ③ Key lock

When [CANCEL] key and [↵] key are pressed at the same time on the home screen, this unit enters the key lock state and the icon shown in the right figure is lit.

When the key lock function is activated, no function keys are accepted.

Therefore, only "recording" and "remaining capacity/check of unit name" can be operated.

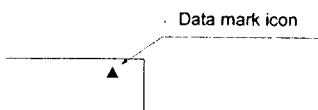
Press [CANCEL] key and [↵] key again at the same time to cancel the key lock.



### ④ Data mark

In the log mode, the mark is able to be put on the recorded data.


The data mark icon is lit when the mark is put on the recorded data or the marked data is shown on the data check screen.



### Check of remaining capacity/ unit name

When pressing the [▲] key while the home screen is being displayed, the battery level and unit name can be checked.

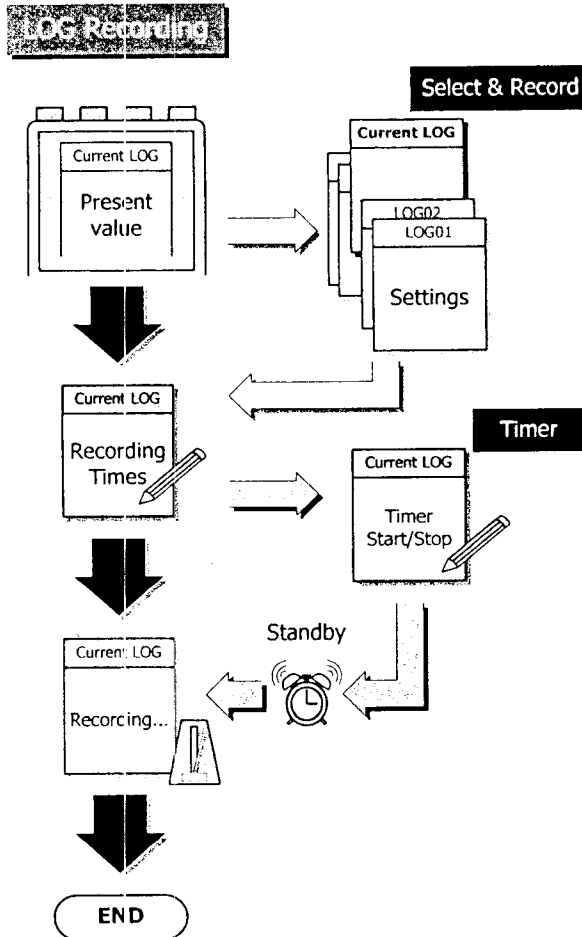
⇒ Press [CANCEL] key to return to the home screen.

2 Keep  key pressed for 3 sec. or longer to turn OFF the power.

## 2. Recording Data in the Log Mode

This unit provides 20 areas (logs) where data is recorded. A log No., to which the data is recorded, can be selected. The log No. to be selected (selected log) is not changed until you select another log next time.

In the log mode, two recording methods are provided, one is "recording" that the data is recorded into the selected log and the other is "selection & recording" that a desired log, to which the data is recorded, is selected, and then the data is recorded to this selected log.



Set the recording time before starting the recording.

Additionally, if the date and time to start/end are set instead of recording time, the unit is available for the timer recording. When the recording is started, the measured value is recorded at specified intervals.

The recording is completed automatically at the set time or at the set time on the set date. Additionally, the recording can also be completed by the key operation.

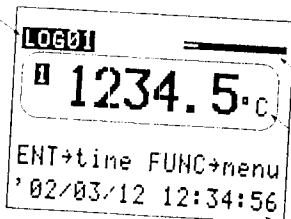


## 2-1. Recording

The data is recorded into the selected log. At this time, however, the data is overwritten onto the data, which has already been recorded.

### 1 Display the home screen.

Log No.



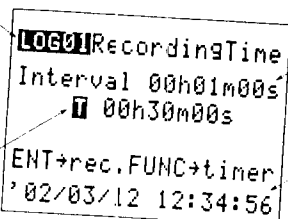
Available memory capacity

Current value

Current date and time

### 2 Press **ENT** key. (The screen is changed to the setting screen of recording time.)

Log No.



Recording interval

Current date and time

Recording time

Set a period of recording time by the ten-key pad, or the **↑** or **↓** key.  
The maximum setting is "99h59m59s".

Additionally, if the time is set at "0s", the data can be recorded continuously.

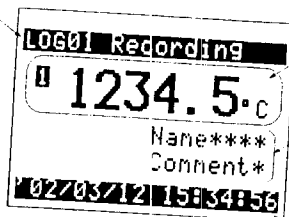
#### CAUTION

- If the remaining memory capacity becomes insufficient for the recording time, the message, "MEMORY!", will appear.

Shorten the recording time or delete unnecessary data (recorded log) if this occurs.

### 3 Press **ENT** key. (The screen is changed to the recording screen.)

Log No.



Current value

Personnel and Comment

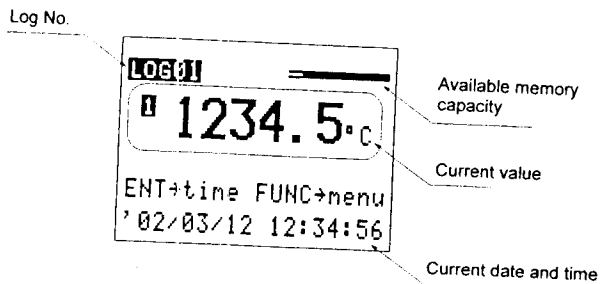
Current date and time

The current value of each channel is updated at intervals of 1 sec. during recording.

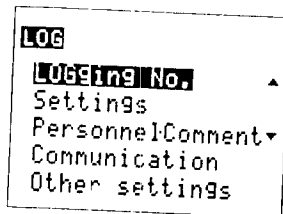
## 2-2. Selection & Recording

A log No. is selected, and then the data is recorded into the selected log. At this time, however, the data is overwritten onto the data, which has already been recorded.

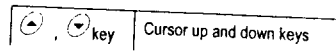
### 1 Display the home screen.



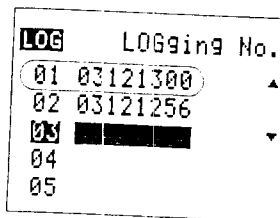
### 2 Press **FUNC** key. (The screen is changed to the main menu screen.)



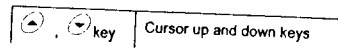
Select [LOGging No.] by the **▲** or **▼** key.



### 3 Press **ENT** key. (The screen is changed to the list screen of log selection.)

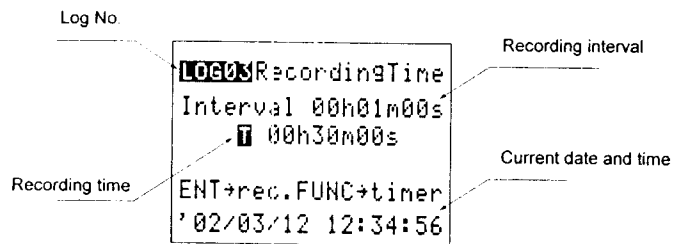


← Selected log



Select a desired log No. from "01" to "20" by the **▲** or **▼** key.

4. Press **ENT** key. (The screen is changed to the setting screen of recording time.)



A log No., to which the data is recorded, is selected, and then the setting screen of recording time is shown.

Press [ENT] key to start recording the data continuously.

⇒ Press [CANCEL] key to return to the home screen if data recording is not performed.

#### CAUTION

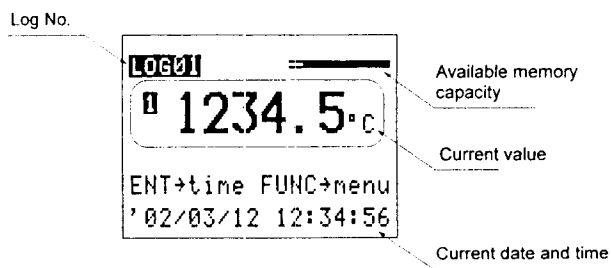
- Even though the screen is returned to the home screen by [CANCEL] key, the log selection has already been selected.

Therefore, the selected log has been changed.

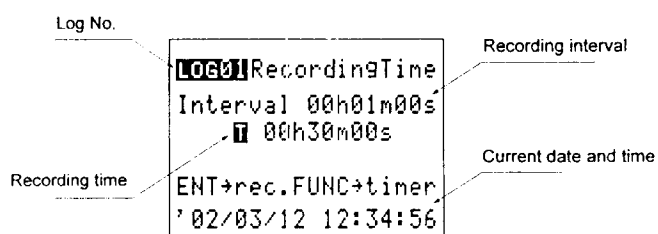
## 2-3. Timer recording



The data is recorded by setting the date and time to start/end recording.

### 1 Display the home screen.




### 2 Press key. (The screen is changed to the setting screen of recording time.)

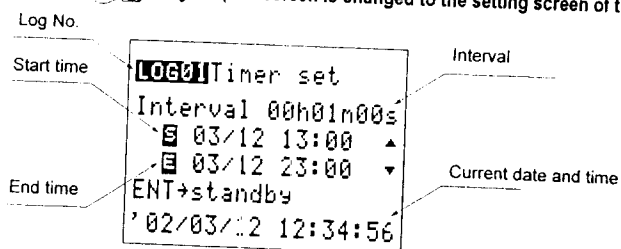




Set a period of recording time by the ten-key pad, or the  or  key.  
The maximum setting is "99h59m59s".

#### CAUTION

- If the remaining memory capacity becomes insufficient for the recording time, the message, "MEMORY!", will appear.


3 Press  key. (The screen is changed to the setting screen of timer.)

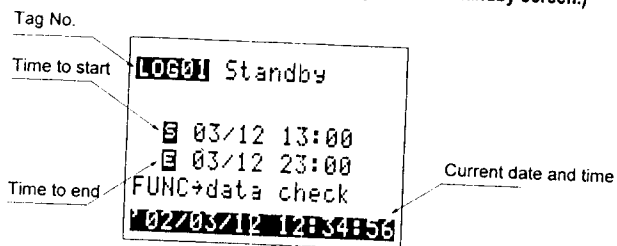


Move the cursor to start time or End time by the  or  key, and then input the date and time by the ten-key pad, or the [ $\leftarrow$ ] or [ $\rightarrow$ ] key.

#### CAUTION

- If any date and time, which are not available, are input, the message, "CHECK! ???", will appear. Check the date and time, and input correct data. in this case.

4 Press  key. (The screen is changed to the standby screen.)



When the timer reaches the date and time to start recording, the data recording is started. The data recording is finished automatically when the timer reaches the date and time to end recording.

# [Checking the current value]

Press [FUNC] key to check the current value during the standby screen. The data is displayed in the same manner as described for the home screen, 1-, 2-, and 4-channel displays. The same ways as described for the home screen is available for changing the display mode or the display channel.

⇒ Press [CANCEL] key to return to the standby screen.

Log No.

LOG01 Standby

1 1234.5 °C

Name\*\*\*\*

Remark\*\*

02/03/12 12:34:56

Current value

Personnel and comment

1-channel display

[1] key

Current date and time

LOG01 Standby

1 1234.5 °C

2 678.9 °C

02/03/12 12:34:56

2-channel display

[2] key

Sensor type

LOG01 Standby

1 1234.5 °C K

2 678.9 °C K

3 1234.5 °C K

4 678.9 °C K

02/03/12 12:34:56

4-channel display

[4] key

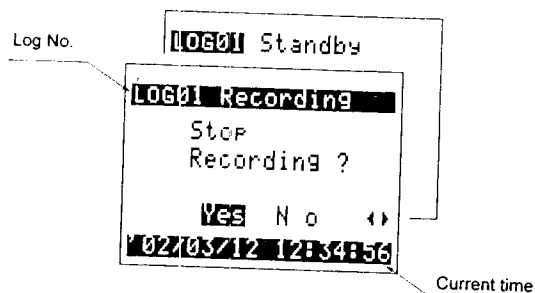
## 2-4. Stop and cancellation of the recording



Follow the steps below to stop the recording halfway or to cancel the standby for the timer recording.

### 1 Display the recording or the standby screen of timer recording.

Press [CANCEL] key to return to the recording screen or the standby screen for the timer recording when the check screen of recording data is displayed during recording or when the check screen of current value is displayed in the standby for the timer recording.

### 2 Press key. (The screen is changed to the confirmation screen to stop recording.)



Move the cursor to [Yes] by the  or  key and press [ENT] key.

⇒ When [No] is selected, the screen is returned to the previous screen, and then the screen is changed to the recording screen or the standby screen.

#### CAUTION

- The recording is actually stopped immediately after the cursor is moved to [Yes] on the confirmation screen to stop recording, and then [ENT] key is pressed. The data recording is continued on the background while the confirmation screen to stop recording is being displayed.
- When the recording is stopped halfway, the data recorded between the start and the stop is saved. Additionally, the date and time when the recording is stopped automatically are overwritten onto the date and time to end.

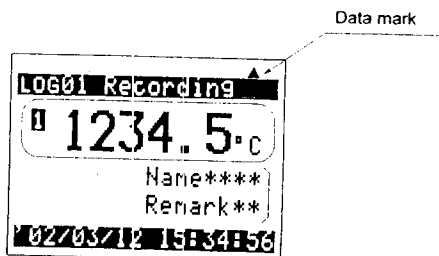
## 2-5. Data marking

This unit provides the data marking that puts the mark on the recorded data.

### 1 Display the recording screen.

Press [CANCEL] key to return to the recording screen when the check screen of current value is displayed.

### 2 Press key. (The data mark icon "▲" is indicated.)



When pressing [ENT] key during recording, the data mark icon will appear at the upper right portion of the screen.


### CAUTION

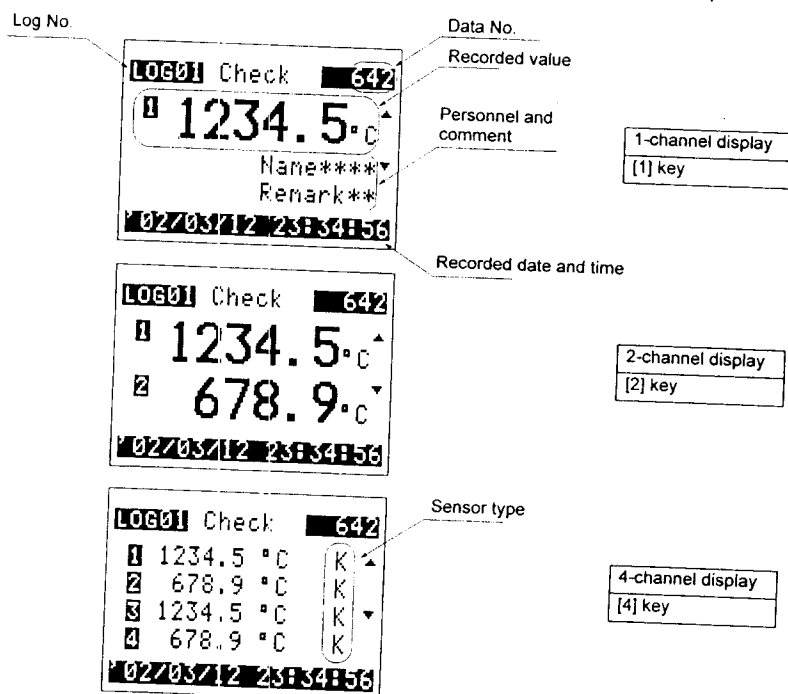
- The data mark is put on the data, which is recorded first immediately after [ENT] key is pressed. Therefore, note that the data mark is not put on the display (current value) on the screen when pressing [ENT] key.
- The number of data markings is not limited.





## 2-6. Check of the data while recording

The recorded data of the current log are able to be checked during recording data.

- 1 Display the recording screen.
- 2 Press  key. (The screen is changed to the check screen of recording value.)




The value of the recorded data of the current log which has been recorded last is indicated.

Press the  or  key, respectively to scroll the display data backward and forward.

The data is displayed in the same manner as described for the home screen, 1-, 2-, and 4-channel displays. The same ways as described for the home screen is available for changing the display mode or display channel.

⇒ Press [CANCEL] key to return to the display screen of current value.

### CAUTION




- The data is being recorded on the background even while checking the data with the above operation.
- The recorded data up to the latest one can be checked with the above operation (press the  key).

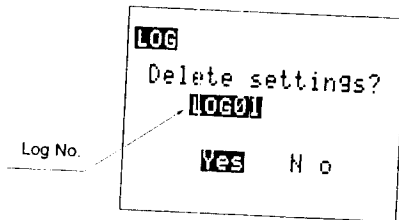
## 2-7. Deletion of a log



A log No. is selected, and then it is deleted.


The data contained in the deleted log is cleared and the free memory capacity is increased by the deleted data volume.

Additionally, the settings of the deleted log are also returned to the default values.

- 1 Display the home screen and press  key.  
(The screen is changed to the main menu screen.)
- 2 Select [Setting] and press  key.  
(The screen is changed to the screen of log selection.)
- 3 Select a log No. to delete and press  key.  
(The screen is changed to the confirmation screen of log deletion.)



Move the cursor to [Yes] by the  or  key.

- 4 Press  key to delete the data. (The screen is returned to the main menu screen.)

⇒ When [No] is selected on the confirmation screen of log deletion and [ENT] key is pressed, the screen is returned to the main menu screen without deletion of data.

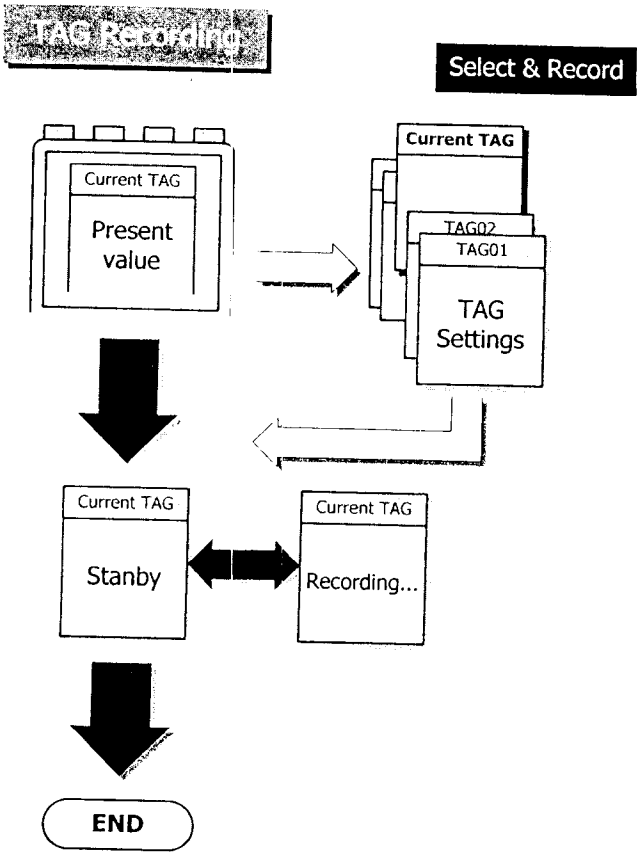
### CAUTION

- When the log is deleted, the data is cleared and the set values are also returned to the default values.  
Further, when "working person/remark" is selected, this data is selected continuously.

### 3. Recording Data in the Tag Mode

This unit provides 20 areas (tags) where data is recorded. A tag No., to which the data is recorded can be selected. The current tag (selected tag) is not changed until you select another tag next time.

In the tag mode, two recording methods are provided, one is "recording" that the data is recorded in the selected tag as additional data and the other is "selection & recording" that a desired tag, in which the data is recorded, is selected, and then the data is recorded to this selected tag.

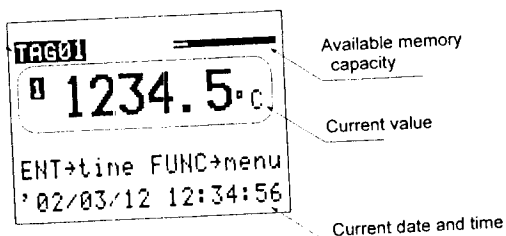


### 3-1. Recording

The data is recorded in the selected tag as additional data.

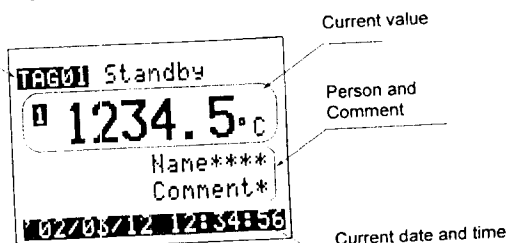
#### 1 Display the home screen.

Tag No.



#### 2 Press **ENT** key. (The screen is changed to the setting screen of recording time.)

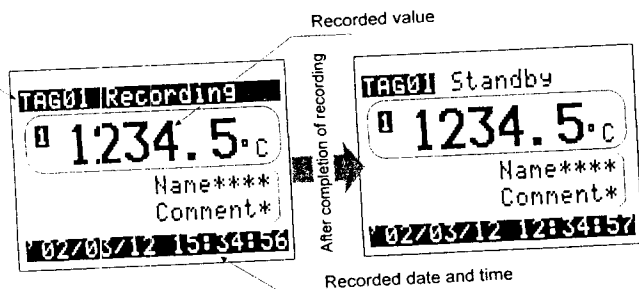
Tag No.



The current value is displayed on the standby screen recording and is updated at intervals of 1 sec.

#### 3 Press **ENT** key. (The data is recorded once, and then the screen is returned to the standby screen of recording.)

Tag No.

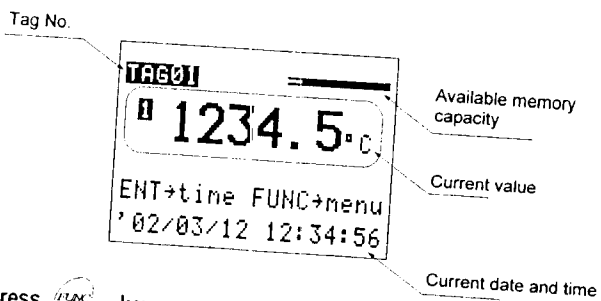


The measured value is recorded once when [ENT] key is pressed.  
After the measured value has been recorded completely, the screen is returned to the standby screen of recording.

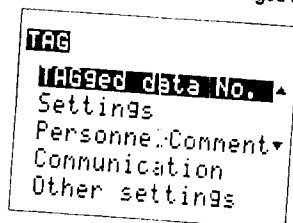
### 3-2. Selection & Recording

The data is recorded in the tag through a temporary selection as additional data.

#### 1 Display the home screen.

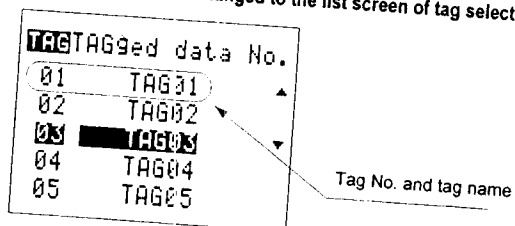


#### 2 Press key. (The screen is changed to the main menu screen.)



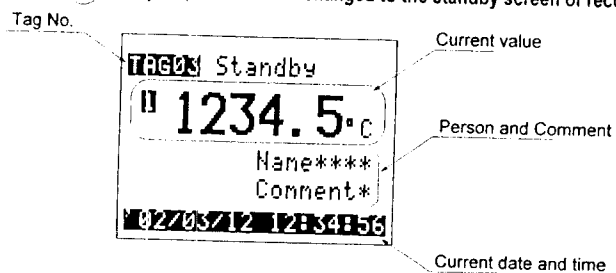
Select [TAGged data No.] by the [▲] or [▼] key.

#### 3 Press key. (The screen is changed to the list screen of tag selection.)



Select a desired tag No. from "01" to "20" by the [▲] or [▼] key.

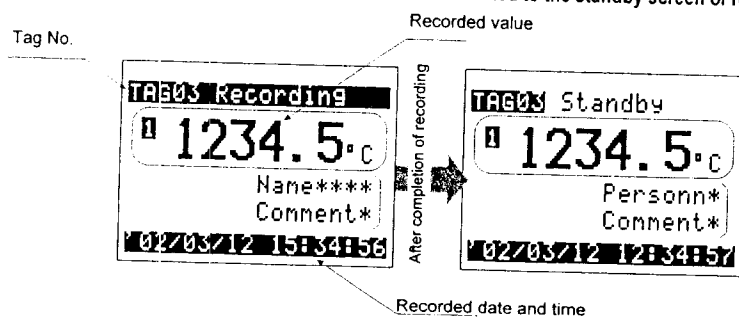
- 4 Press **[ENT]** key. (The screen is changed to the standby screen of recording.)



The current value is displayed on the standby screen of recording and is updated at intervals of 1 sec.

- 5 Press **[ENT]** key.

(The data is recorded once, and then the screen is returned to the standby screen of recording.)



The measured value is recorded once when **[ENT]** key is pressed.

After the measured value has been recorded completely, the screen is returned to the standby screen of recording.

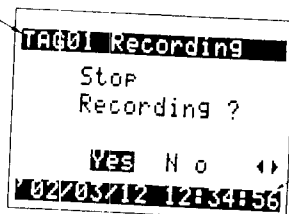
### 3-3. Stop of the recording

Follow the steps below to stop the recording.

1. Press  key.

(The screen is charged to the confirmation screen of stopping the recording.)

Tag No.




Current date and time

Move the cursor to [Yes] by the [<] or [>] key.

#### CAUTION

- When the confirmation screen of recorded data is displayed, the screen is returned to the standby screen of recording by [CANCEL] key.  
When pressing [CANCEL] key further, the confirmation screen of stopping the recording is displayed.

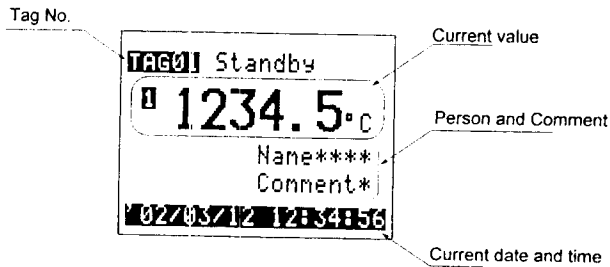
2. Press  key to stop the recording. (The screen is returned to the home screen.)

⇒ Select [No] on the confirmation screen of stopping the recording and press [ENT] key. The screen is then returned to the standby screen of recording.

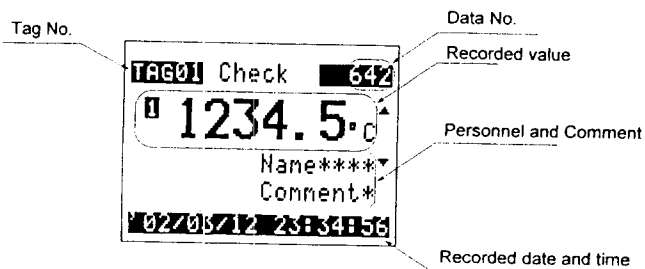
### 3-4. Check of the data while recording

The recorded data of the current tag are able to check during recording data.

#### 1 Display the standby screen of recording.



#### 2 Press key. (The screen is changed to the check screen of recording data.)



The recorded data of the current tag, which has been recorded last, is indicated.

Press the [▲] and [▼] keys, respectively to scroll the display data backward and forward.

The data is displayed in the same manner as described for the home screen, 1-, 2-, and 4-channel displays. The same ways as described for the home screen are available for changing the display mode or display channel.

⇒ Press [CANCEL] key to return to the standby screen of recording.

#### CAUTION

- Even though [ENT] key is pressed while the check screen of recorded data is being displayed, the data is not recorded.





### 3-5. Deletion of a tag


A tag No. is selected, and then it is deleted.

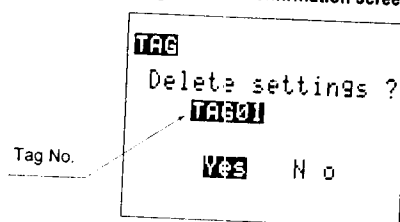
The data contained in the deleted tag is cleared and the free memory capacity is increased by the deleted data volume.

Additionally, the settings of the deleted tag are also returned to the default values.


- 1 Display the home screen and press  key.  
(The screen is changed to the main menu screen.)

- 2 Select [Setting] and press  key.  
(The screen is changed to the screen of tag selection.)

- 3 Select a tag No. to delete and press  key.  
(The screen is changed to the confirmation screen of tag deletion.)



Move the cursor to [Yes] using the [<] or [>] key.

- 4 Press  key to delete the data. (The screen is returned to the main menu screen.)

⇒ When [No] is selected on the confirmation screen of tag deletion and [ENT] key is pressed, the screen is returned to the main menu screen without deletion of data.

#### CAUTION

- When the tag is deleted, the data is cleared and the set values are also returned to the default values. Further, when "personnel/comment" is selected, this data is selected continuously.

## 4. Checking the recorded data

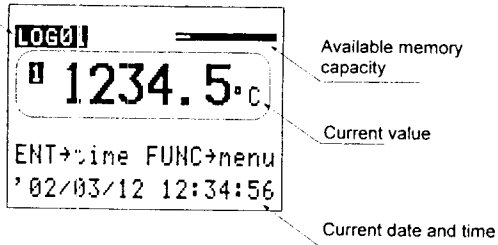
Log mode

Tag mode

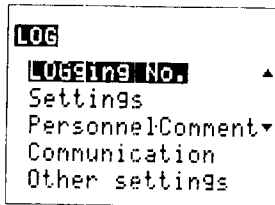
The data recorded into each log (tag) can be checked on the screen.

### 1 Display the home screen.

Log No.

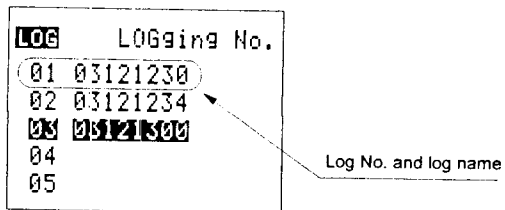


### 2 Press key. (The screen is changed to the main menu screen.)



Select [LOGging No.] by the [▲] or [▼] key.

### 3 Press key. (The screen is changed to the screen of log selection.)



Select a log (tag) No. to check by the [▲] or [▼] key.

#### [Key operation and transition to each confirmation screen]


There are five kinds of data display modes. The display mode is changed every time by [FUNC] key. The display mode is changed in the following order.

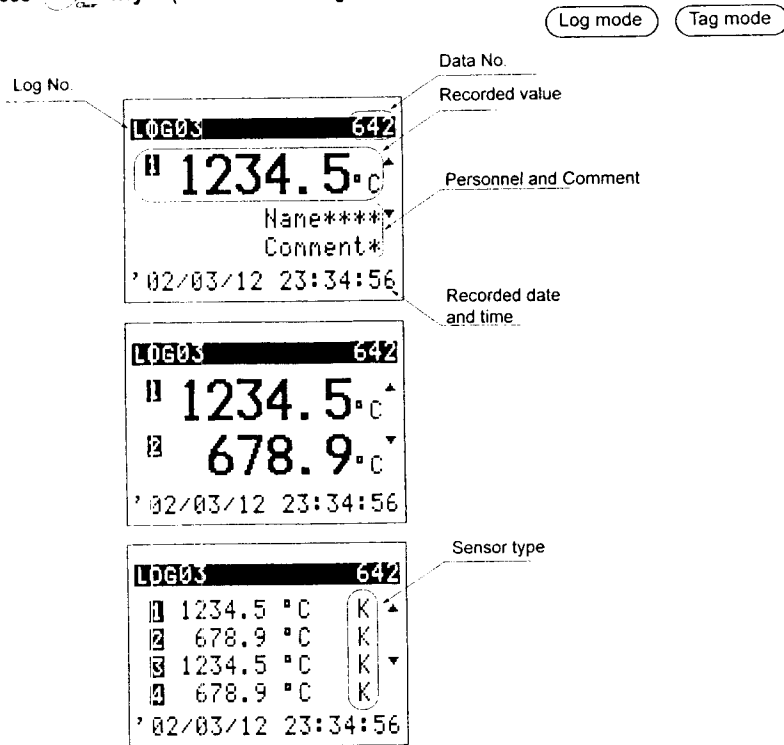
① Recorded data, ② Alarm value, ③ Calculation value, ④ Accumulation value, ⑤ Average value among channels

(In the tag mode, the display is shown in order, ①, ②, ③, and ⑤.)

When pressing [FUNC] key further, the display is returned to ①.

Press [CANCEL] key to return to the log (tag) selection screen when the confirmation is completed.

4 Press  key. (The screen is changed to the confirmation screen of recorded data.)



The recorded data of the log (tag), which has been recorded last, is indicated.


Press the [▲] and [▼] keys, respectively to scroll the display data backward and forward.

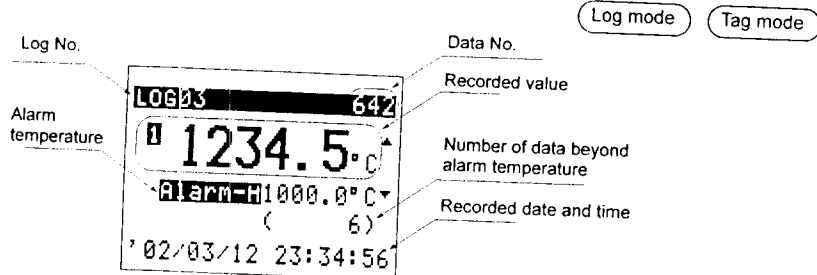
The data is displayed in the same manner as described for the home screen, 1-, 2-, and 4-channel displays. The same ways as described for the home screen are available for changing the display mode or the display channel.

⇒ Press [CANCEL] key to return to the screen of log (tag) selection.

#### CAUTION

The recorded data can be displayed only when the input is "K", "T", "E", "J", or "V".

5 Press  key. (The screen is changed to the confirmation screen of alarm value.)



If any recorded data is beyond the alarm temperature set for upper limit or lower limit, this data is shown as alarm.


The channel to be displayed is changed by the [ $\leftarrow$ ] or [ $\rightarrow$ ] key.

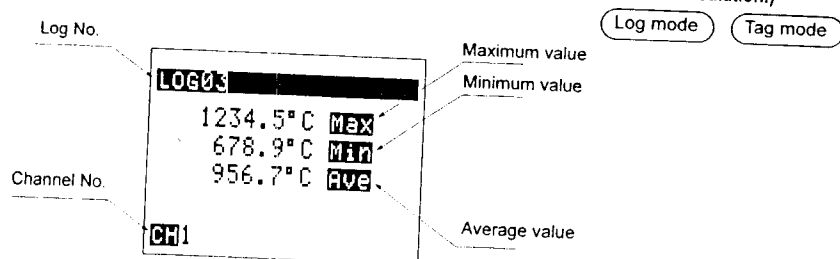
Press the [ $\uparrow$ ] and [ $\downarrow$ ] keys, respectively to scroll the display data backward and forward.

⇒ Press [CANCEL] key to return to the selection screen of log (tag).

#### CAUTION

- The alarm is shown only when the input signal type is "K", "T", "E", or "J".
- If the input signal type is "V", the recorded data is not included in the calculation. Additionally, the data recorded from a channel, which has not been selected, is not also included in the calculation.

6 Press  key. (The screen is changed to the confirmation screen of calculation.)




The maximum value, minimum value, and average value of the recorded data are displayed.

The channel to be displayed is changed by the [ $\leftarrow$ ] or [ $\rightarrow$ ] key.

⇒ Press [CANCEL] key to return to the selection screen of log (tag).

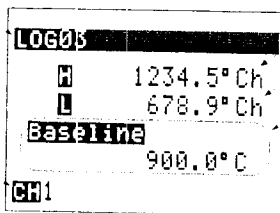
#### CAUTION

- The calculation is shown only when the input signal type is "K", "T", "E", or "J".
- If the input signal type is "V", the recorded data is not included in the calculation. Additionally, the data recorded from a channel, which has not been selected, is not also included in the calculation.

7 Press  key. (The screen is changed to the confirmation screen of accumulation data.)

Log mode

Log No.



H accumulation value

L accumulation value

Accumulation reference temperature

Channel No.

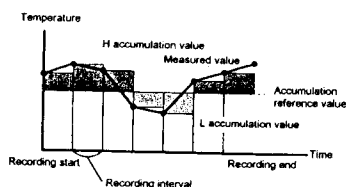
The successive accumulation value (unit: °Ch) of the difference between the recorded temperature and reference temperature for accumulation is displayed. (For details, see the right figure.)

However, note that the latest data is not included.

There are two kinds of accumulation values, H accumulation that accumulates the difference more than the accumulation reference temperature and L accumulation that accumulates the difference lower than the accumulation reference temperature.

The channel to be displayed is changed by the [<] or [>] key.

⇒ Press [CANCEL] key to return to the selection screen of log.



#### CAUTION

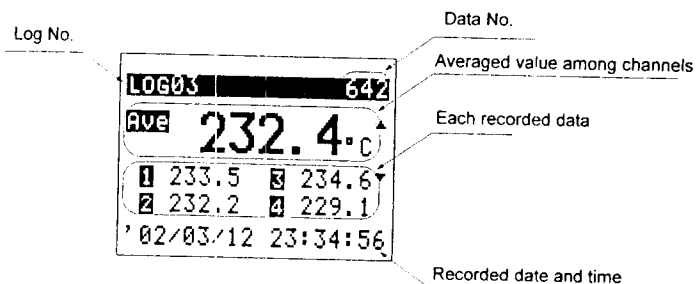
- The accumulation data is displayed only when the input signal type is "K", "T", "E", or "J".
- If the input signal type is "V", the recorded data is not included in the calculation. Additionally, the data recorded from a channel, which has not been selected, is not also included in the calculation.
- The accumulation is not provided in the tag mode.

8 Press  key.

(The screen is changed to the confirmation screen for the average value among channels.)

Log mode

Tag mode



The average value among channels is displayed.

Press the [▲] and [▼] keys, respectively to scroll the display data backward and forward.

⇒ Press [CANCEL] key to return to the selection screen of log (tag).

#### CAUTION

- The average value among channels is displayed only when the input signal type is "K", "T", "E", or "J". Even though each channel has a different input type, the calculation can be made.
- If the input signal type is "V", the recorded data is not included in the calculation. Additionally, the data recorded from a channel, which has not been selected, is not also included in the calculation.

## 5. Settings for the recording

Log mode

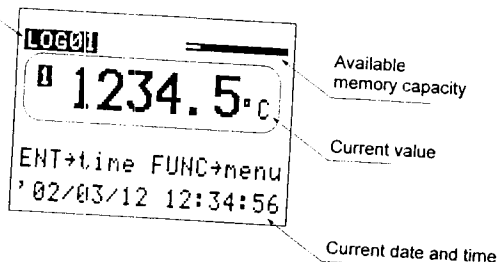
Tag mode

The recorded log (tag) data is deleted when the setting for recording is changed. Therefore, it is necessary to save the recorded data before the settings.

The settings can be made individually for each log (tag).

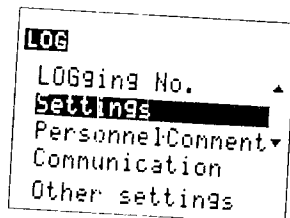
### 1 Display the home screen.

Log No.

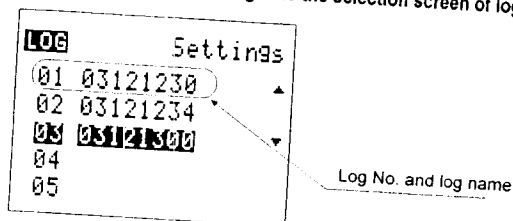


### 2 Press key. (The screen is changed to the main menu screen.)

Select [Settings] by the [ $\uparrow$ ] or [ $\downarrow$ ] key.



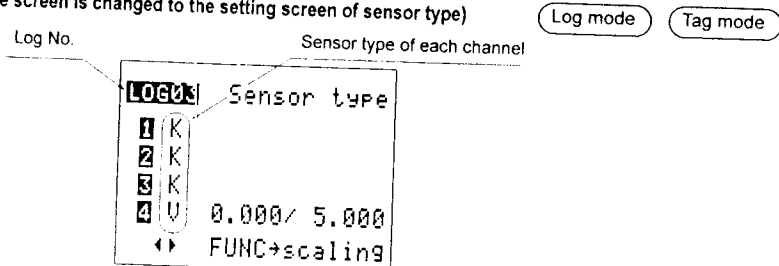
### 3 Press key. (The screen is changed to the selection screen of log (tag).)



Select a log (tag) No. to set from "01" to "20" by the [ $\uparrow$ ] or [ $\downarrow$ ] key.

4 Select a log (tag) No. to set and press **[ENT]** key.

(The screen is changed to the setting screen of sensor type)



The following Kinds of temperature sensor are available. These are the "K", "T", "E", or "J" type thermocouple. Additionally, when using the optional voltage input adaptor or current input adaptor (sold separately), DC voltage (0 to 5V) or DC current (0 to 20 mA) signals can be measured.

Move the cursor to a channel to set by the [ $\Delta$ ] or [ $\nabla$ ] key, and change the input type by the [<] or [>] key.

Symbol	K	T	E	J	V	-
Input type	"K" thermocouple	"T" thermocouple	"E" thermocouple	"J" thermocouple	Voltage/Current adaptor	No connection

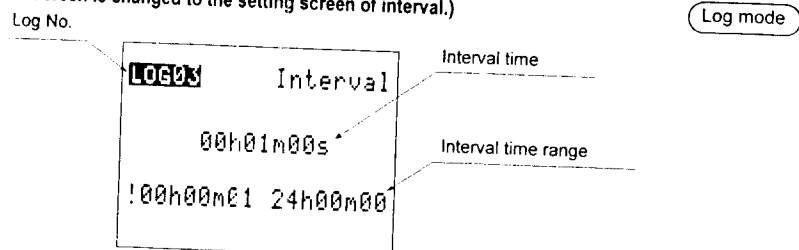
⇒ Press [CANCEL] key to return to the previous screen.

**CAUTION**

- When the input signal type is set to "V", the desired unit and scale can be set.
- If "-" (no connection) is set for all channels, the data cannot be recorded.

5 Set an appropriate sensor type for each channel, and press **[ENT]** key.

(The screen is changed to the setting screen of interval.)



Input a numeric value by the [<] or [>] key, or the ten-key pad.

⇒ Press [CANCEL] key to return to the previous screen.

**CAUTION**

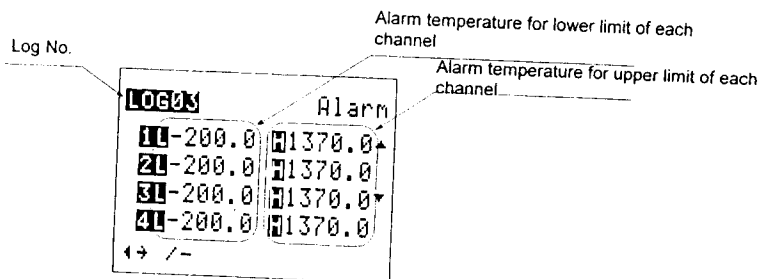
- The step of the interval is set to 1 sec. at a time, when the interval is from 1 sec. to 30 sec. and the step of the interval is set to 1 min. at a time when it is from 1 min. to 24 hrs.
- In other case, the selected interval cannot be set even though [ENT] key is pressed. The interval is automatically corrected to a settable value. Press [ENT] key after checking or correcting a value to be set.



6 Set a recording interval and press **ENT** key.

(The screen is changed to the setting screen of alarm temperature for upper and lower limit.)

Log mode Tag mode



Each one of alarm temperature for upper and lower limit can be set for each channel. The alarm is given if the recorded data becomes more than the alarm temperature for upper limit (H alarm) or lower than the alarm temperature for lower limit (L alarm). The alarm sound can also be given during recording data.

Move the cursor to a desired channel by the [ $\uparrow$ ] or [ $\downarrow$ ] key, and set the upper or lower limit by the [<] or [>] key, or the ten-key pad.

The settable temperature may vary depending on the input type.

Input type	Alarm setting range
K	-200.0 to 1370.0°C
T	-200.0 to 400.0°C
E	-200.0 to 700.0°C
J	-200.0 to 700.0°C

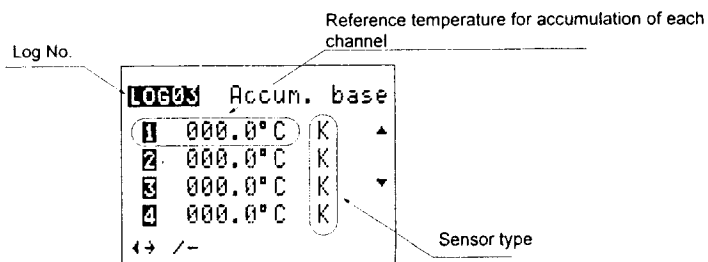
⇒ Press [CANCEL] key to return to the previous screen.

#### CAUTION

- The setting cannot be made if the input signal type is "V". The setting cannot be made for a channel, which has not been selected.

- 7 Set each alarm temperature for upper and/or lower limit, and set **ENT** key.  
 (The screen is changed to the setting screen of reference temperature for accumulation.)

Log mode



One reference temperature for accumulation can be set for each channel.

Move the cursor to a desired channel by the [ $\uparrow$ ] or [ $\downarrow$ ] key and set reference temperature accumulation by the [<] or [>] key, or the ten-key pad.

The settable temperature may vary depending on the input type.

Input type	Alarm setting range
K	-200.0 to 1370.0°C
T	-200.0 to 400.0°C
E	-200.0 to 700.0°C
J	-200.0 to 700.0°C

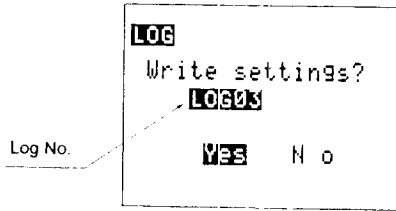
⇒ Press [CANCEL] key to return to the previous screen.

#### CAUTION

- The setting cannot be made if the input signal type is "V". The setting cannot also be made for a channel, which has not been selected.

- 3 Set reference temperature for accumulation and press **ENT** key.  
(The screen is changed to the conformation screen of writing the settings.)

Log mode



Move the cursor to [Yes] by the [<] or [>] key.

**CAUTION**

- The confirmation screen of writing the setting cannot be returned to the previous screen even though [CANCEL] key is pressed.

Press **ENT** key to register each settings to the log.  
(The screen is returned to the home screen.)

**CAUTION**





- Move the cursor to [No] by the [<] or [>] key and press [ENT] key. The screen is then returned to the log (tag) selection screen without changing of the settings.

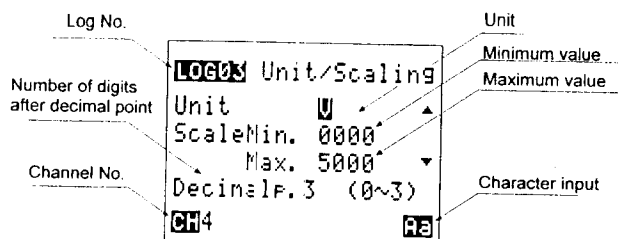
## ◆ Setting of the unit/scale

Log mode

Tag mode

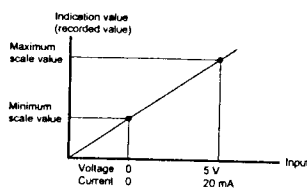
The scaling and displaying of the input value is available for the voltage/current input mode.

- 1 Display the home screen and press  key.
- 2 Select [Setting] and press  key.
- 3 Select a log (tag) to set, and then press  key.  
(The screen is changed to the setting screen of input type.)
- 4 Select [V] for the input signal type and press  key.  
(The screen is changed to the setting screen of unit/scale.)



Move the cursor to a setting item by the [ $\uparrow$ ] or [ $\downarrow$ ] key, and input the unit (up to three characters), maximum scale value, minimum scale value, and the number of digits after the decimal point.

Input a numeric value or character by the ten-key pad or the [<] or [>] key.



Item	Setting range	Remarks	
Unit	Up to three characters	Alphanumeric characters (Character input: Aa)	
Min. scale	-9999 to 9999	Voltage	Indication at 0V of the input
		Current	Indication equivalent to 0mA of the input (calculated) Indication span of this unit ÷ output span of the input × (-4mA)
Max. scale	-9999 to 9999	Voltage	Indication at 5V of the input
		Current	Indication at 20mA of the input
Fraction part	0 to 3	Number of digits below decimal point 0:0, 1:0.0, 2:0.00, 3:0.000	

### [Scaling]

For example, when connecting a unit having an external output of 4 to 20 mA using an indication scale of 0.0 to 100.0 %rh., make the settings as shown in the Table on the right.

An input of 4 to 20mA is shown as "0.0 to 100.0%rh".

⇒ Press [CANCEL] key to return to the previous screen.

Item	Set value	Remarks
Unit	"%rh"	
Scale Min.	"-25"	$(100-0) \div (20-4) \times (-4) = -25$
Scale Max.	"100"	Unit indication value when the unit output is 20mA.
Decimal point	"1"	1 digit after the decimal point

## 6. Recording of personnel and comment

Log mode

Tag mode

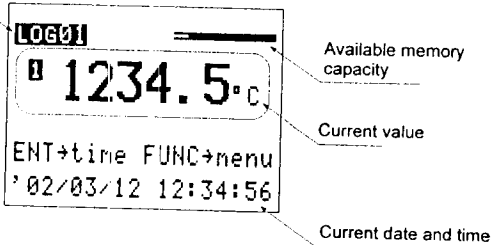
The name of working person and the remark can be recorded together with the data. They can be selected from registered 20 working persons and 20 comments.

When selecting [Personnel/comment], the same person name and comment are put on the recorded data until the person name or comment is selected next time.

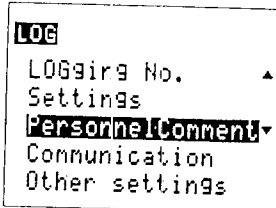
Please refer to "■Registration of personnel and comment" (p.43) of an "Setup Manual" to register the personnel names and the comments.

### 1 Display the home screen.

Log No.



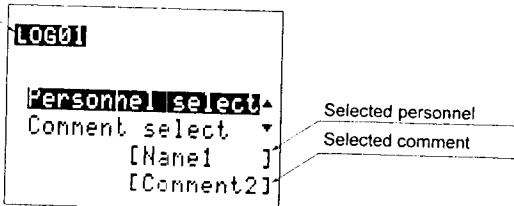
### 2 Press **FUNC** key. (The screen is changed to the main menu screen.)



Select [Personnel/Remark] by the [▲] or [▼] key.

### 3 Press **ENT** key. (The screen is changed to the selection screen of personnel/remark.)

Log No.






On this screen, a working person and comment can be set (selected or added).

## 6-1. Selection of a working person

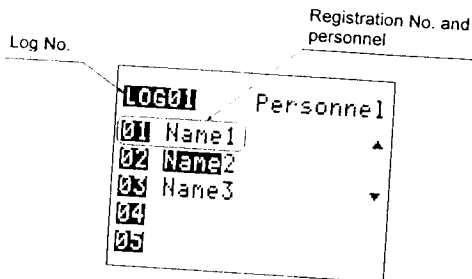
Select a working person from 20 registered personnel.

Log mode


Tag mode

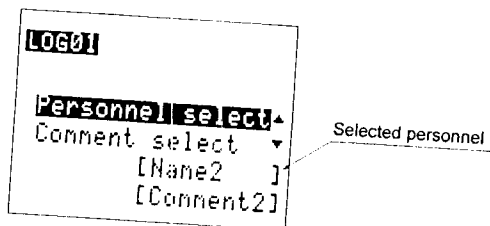
- 1 Display the home screen and press  key.
- 2 Select [Personnel/comment] and press  key.
- 3 Select [Personnel select] and press  key.

(The screen is changed to the selection screen of personnel.)



Select a name of working person from the registered Nos. "01" to "20" by the [▲] or [▼] key.  
⇒ Press [CANCEL] key to return to the previous screen.

- 4 Press  key to select a name of working person.






The selected name of working person is shown in [ ] on the 2nd line from the bottom line on the selection screen of working person el/remark.  
Additionally, this selected name is also shown on the standby screen of recording, recording screen, and confirmation screen of recorded data (1-ch display only).

## 6-2. Selection of a comment

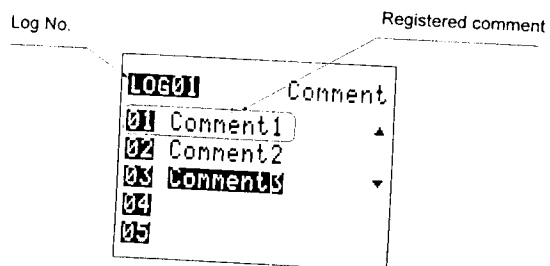
Select a comment from 20 registered ones.

Log mode


Tag mode

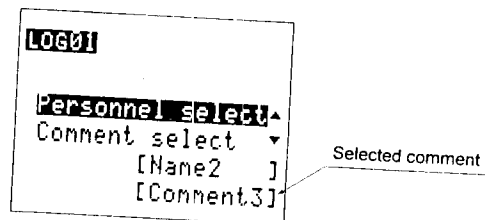
- 1 Display the home screen and press  key.
- 2 Select [Personnel/Comment] and press  key.
- 3 Select [Comment select] and press  key.

(The screen is changed to the screen of comment list.)



Select a comment from registered Nos. "01" to "20" by the [ $\uparrow$ ] or [ $\downarrow$ ] key.  
 ⇒ Press [CANCEL] key to return to the previous screen.

- 4 Press  key to select a comment.






The selected comment is shown in [ ] on the 1st line from the bottom on the selection screen of personnel/comment.

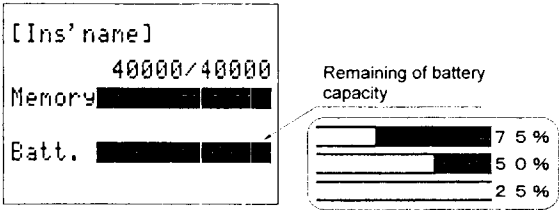
Additionally, the selected comment is also shown on the standby screen of recording, recording screen, and confirmation screen of recorded data (1-ch display only).



■ **Checking the available memory/ battery level**

The remaining memory/battery capacities and the unit name can be checked.

- 1 Display the home screen and press  key.
- 2 Select [Other settings] and press  key.
- 3 Select [Memory/Battery] and press  key.



[Available memory capacity]

The number of data to be recorded into this unit may vary depending on the recording mode, that is, log mode or tag mode.

● **Log mode**

In the log mode, the data can be recorded until the total number of data recorded to 20 logs reaches 40000.

One number of data corresponds to the data volume used for one recording at one channel.

Therefore, the number of data to be recorded may vary depending on the number of channels to be used.

The available recording cycles is calculated from the following formula.

Available recording cycles [cycles] = Free memory capacity [data] ÷ Number of channels in use [ch]

The available recording time is calculated from the following formula.

Available recording time [time] = Number of remaining cycles [cycles] × Recording interval [time]

[Example]

If the free of memory capacity is "1000", all of four channels are used, and data is recorded at intervals of 5 min., the available recording time is 1250 min.

1000 (free memory capacity) ÷ 4ch (number of channels in use) × 5 min. (recording interval) = 1250 [min]

- **Tag mode**

In the tag mode, the data can be recorded until the total number of data recorded to 20 tags reaches 10000.

One number of data corresponds to the data volume used for one recording at one channel.

However, the number of data to be consumed may vary depending on the number of channels in use.

Number of channels in use	Remaining recording cycle calculation formula
1	Available recording cycles = Free memory capacity [data] $\times 11 \div 11$
2	Available recording cycles = Free memory capacity [data] $\times 11 \div 14$
3	Available recording cycles = Free memory capacity [data] $\times 11 \div 17$
4	Available recording cycles = Free memory capacity [data] $\times 11 \div 20$

**[Example]**

If the free memory capacity is "1000" and the data is recorded using three channels, up to 647 data records can be recorded.

$$1000 (\text{free memory capacity}) \times 11 \div 17 (\text{coefficient}) = 647 [\text{data}]$$

**[Battery level]**

The remaining battery capacity is indicated in four steps. Replace the batteries with new ones before recording data if the remaining capacity becomes 25% or less.

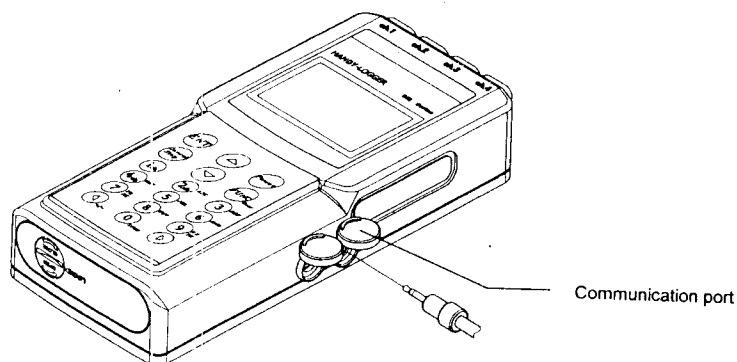
## Connecting to your Personal Computer (RS232C)

When this unit is connected to your PC (personal computer) with the special cable (RS232C), the recorded data can be read and saved into a file on the PC. Also, the setting of recording can be set from the PC.

This unit must be connected to the PC with the special cable to communicate the data with the unit connected to the PC.

The special cable (supplied with the software) is absolutely required to communicate the data with the PC, on which the optional data read software is installed.

### Connecting the special cable to this unit



[per side]

- ① Switch off this unit.
- ② Open the cover of the port with the "PC" marking.
- ③ Insert the plug of the special cable firmly until it is in contact with the far side.
- ④ Switch on this unit.

### CAUTION

- Use the special cable supplied with the software. If any connection cable other than the specified one is used, the unit may malfunction.
- Insert the plug of the special cable firmly into the communication port of the unit until it is in contact with the far side.  
Otherwise, incorrect communication may occur.
- The drip-proof performance cannot be maintained when the special cable is used.
- Hold the plug and pull it out when disconnecting the special cable.  
If the lead cable is pulled to disconnect the connection cable, the unit may malfunction.
- Close the cover firmly if the cable is not used.  
Otherwise, the drip-proof performance may be lost.

## ■ Connecting to your Personal Computer (USB)

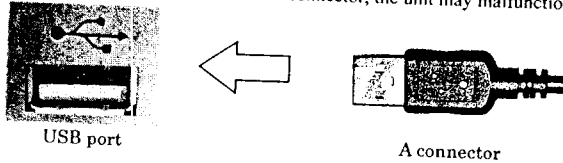
When this unit is connected to your PC (personal computer) with the special USB cable, the recorded data can be read and saved into a file on the PC. The setting of recording can be written from the PC too. Also, the special USB cable (supplied with the optional software) is naturally required to communicate the data with the PC.

### 1 Connecting the special cable to this unit

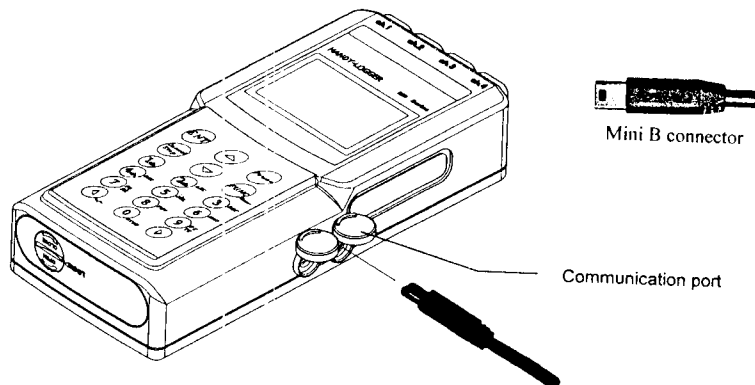
[PC side] Connect the A connector of the USB cable to the USB port.

#### CAUTION

- Hold the plug of the cable and pull it out when disconnecting the cable connector.
- If the lead cable is pulled to disconnect the connector, the unit may malfunction.




[Logger side] Connect the mini B connector of the USB cable to the communication port.

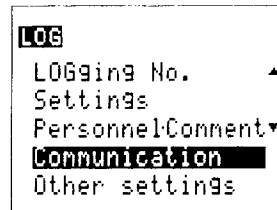


Open the cover of the communication port with the "PC" marking and insert the plug of the USB cable firmly into the communication port until it is in contact with the far side. Also, use the special cable supplied with the charged software.


#### CAUTION

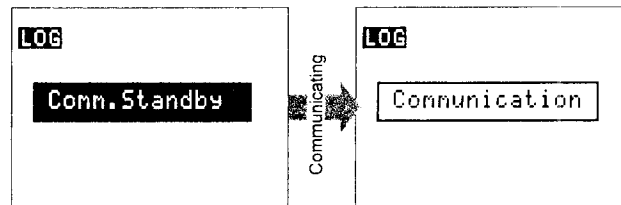
- Hold the plug and pull it out when disconnecting the cable connector.  
If the lead cable is pulled to disconnect the connector, the unit may malfunction.
- Use the special cable (supplied with the software) only.
- Close the cover firmly if the cable is not used.  
Otherwise, the drip-proof performance may be lost.

- 2 Display the home screen and press  key.



Select [Communication] by the [▲] or [▼] key.

- 3 Press  key. (The screen is changed to the communication standby screen.)



Perform the operation via the software. When the communication is started, the message, "Communication", will appear on the communicating screen.

⇒ Press [CANCEL] key to return from the communication standby screen to the previous screen.

See the **instruction manual for software** for further information on software operation.

## ■ Troubleshooting

Trouble	Cause	Corrective action
The screen is not displayed.	The batteries are not put correctly.	Put the batteries correctly. For details, see ■ Mounting and replacing the batteries. (set up manual)
	The batteries run out.	Replace the batteries with new ones. For details, see ■ Mounting and replacing the batteries. (set up manual)
	The AC adaptor is disconnected.	Connect the AC adaptor correctly. For details, see ■ AC adaptor. (set up manual)
The display of recorded value is "—". No numeric values are shown.	The sensor is disconnected.	Insert the sensor connector correctly. For details, see ■ Connecting the sensor. (set up manual)
	The current/voltage input lines are disconnected.	Connect the input lines correctly. For details, see ■ Connecting the sensor. (set up manual)
	The unit is set to "—"(no connection).	Change the setting of input type. For details, see 5. Settings of the recording.
	The over-range trouble occurs.	Check the excessive input or sensor type. For details, see 5. Settings of the recording.
	The sensor is faulty.	Replace the sensor with a new one.
The temperature is measured in error.	The thermocouple type is different.	Set the thermocouple type correctly. For details, see 5. Settings of the recording.
	The offset value is changed.	Change the offset value. For details see page 30 of set up manual.
	The sensor is faulty.	Replace the sensor with a new one.
The indication value fluctuates largely.	The strong static electricity, electromagnetic wave, or high-frequency may adversely affect the unit.	Do not put this unit or sensor close to equipment producing the strong static electricity or electromagnetic wave.
	The sensor is faulty.	Replace the sensor with a new one.
The data cannot be recorded.	All settings are set at "—"(no connection).	Set the input type correctly. For details, see 5. Settings of the recording.
	The remaining memory capacity is insufficient.	Save the recorded data and delete the recorded data.
The recorded data does not exist.	The recording mode is changed.	Save the recorded data certainly before changing the recording mode or recording setting.
	The recording setting is changed.	
Name of working person or remark cannot be displayed.	The Name of working person or remark is not registered or selected.	Register or select the working person or remark. For details, see 6. Recording personnel and comment.

The communication cannot be operated.	The special cable is disconnected.	Connect the special cable correctly. For details, see ■Connecting to your personal computer.
	The data read software is not installed on the personal computer.	Install the data read software. For details, see the instruction manual for software.
	The communication settings are made incorrectly.	Check the input port. See the instruction manual for software.
The display goes out.	The auto power off is activated.	Make the auto power off inactive. For details, see page 29 of set up manual.
The display is dark.	The LCD contrast is low.	Adjust the LCD contrast. For details, see page 31 of set up manual.
The message, "Need to change a backup battery !", is shown.	The backup battery runs out.	Contact your local sales representative or sales office.

Check the above items and take corrective actions. If any malfunction still occurs, stop operation of the unit, and then contact your local sales representative or sales office.

## ■ Specifications

Item	Specifications
Sensor input	Thermocouple multi inputs ("K", "E", "J", "T") and V (voltage, current inputs) DC voltage (0 to 5V) is input with the input adaptor of DC voltage (optional unit). DC current (0 to 20mA) is input with the input adaptor of DC current (optional unit).
Number of input points	4 channels (Input type and ON/OFF of each channel can be selected.)
Input connector	SM connector (applicable to ASTM E1684-96 Standard Specification for Miniature Thermocouple Connectors) and special drip-proof connector (used for optional sensor).
Indication resolution	0.1°C
Measurement temperature range	K thermocouple/-200 to 1370°C, -300 to 2450°F E thermocouple/-200 to 700°C, -300 to 1250°F J thermocouple/-200 to 700°C, -300 to 1250°F T thermocouple/-200 to 400°C, -300 to 700°F
Accuracy	[Thermocouple] $\pm (0.1\% \text{ of read value} + 0.3^\circ\text{C})$ (The measurement temperature range of $-100^\circ\text{C}$ or more.) $\pm (0.1\% \text{ of read value} + 0.6^\circ\text{C})$ (The measurement temperature range of lower than $-100^\circ\text{C}$ .) [Voltage input] $\pm (0.1\% \text{ of read value} + 0.2\% \text{ of range})$ Accuracy is specified under reference operating conditions (at an ambient temperature of $23^\circ\text{C} \pm 3^\circ\text{C}$ ).
Compensation accuracy of reference temperature	This compensation accuracy is added for thermocouples, "K", "E", "J", or "T". $\pm 0.4^\circ\text{C}$ (at an ambient temperature of 15 to $35^\circ\text{C}$ ) $\pm 0.7^\circ\text{C}$ (at an ambient temperature of $-10$ to $15^\circ\text{C}$ or 35 to $50^\circ\text{C}$ ) Accuracy is specified under an ambient temperature variation of $2^\circ\text{C}$ or less.
Temperature coefficient	$\pm 0.01\%/^\circ\text{C}$ of measuring range (specified with an ambient temperature variation of $2^\circ\text{C}$ or less)
Allowable signal source resistance	$100\Omega$ or less (burnout detectable.)
Input resistance	$1M\Omega$ or less at DC voltage
Withstanding voltage between channels	AC400V
Scanning speed	1 sec. (4-ch)
Recording interval	1 sec. to 30 sec. (can be set in steps of 1 sec.) 1 min. to 24 hrs. (can be set in steps of 1 min.)
Number of recorded data	Sum of 20 log data 4ch : 10000 data on each ch. 3ch only: 13333 data on each ch. 2ch only: 20000 data on each ch. 1ch only: 40000 data Sum of 20 tag data 4ch : 5500 data on each ch. 3ch only: 6470 data on each ch. 2ch only: 7855 data on each ch. 1ch only: 10000 data
Display	Semi-transparent type LCD with backlight Dot matrix, 128 x 64 dots. (Display area, 41 x 29 mm)
Operation keys	18 keys including ten-key pad
Communication function	RS232C compatible/Bi-directional communication, start-stop synchronous system
Power supply	AA battery (LR6) x 4 pcs. or special AC adaptor
Service life of battery	500 hrs. or longer (when alkaline batteries (LR6) are used.) This service life is specified assuming that the recording interval is 1 min. at an ambient temperature of $25^\circ\text{C}$ , backlight is turned off, and no keys are operated.
Backup power supply	5 years or longer (with no power supplied.) On the condition that, the unit is left at an ambient temperature of $25^\circ\text{C}$ .



Outside dimensions	70 (W) x 159 (H) x 33 (D) mm, No projections are included.
Weight	Approximately 300g (including batteries)
Case material	Nylon ABS (Antibacterial)
Operating environment	-10 to 50°C, 10 to 80% RH (No condensation allowed.)
Storage environment	-20 to 55°C, 0 to 90% RH (No condensation allowed.)
Water-proof performance	IP64 (Sensor with special drip-proof specification is used.)
EMC standard	CE: EN61326+A1+A2/ClassB, $\pm 5^{\circ}\text{C}$ as operated by batteries (the unit is left at an ambient temperature of 25°C.)

## ■ Accessories

Name	Q'ty
Alkaline AA battery	4
Mounting holder	1
Fixing screw of mounting holder	2
Fixing washer of mounting holder	2
Instruction manual (this manual)	1
Battery replacement adaptor	1