User's Manual

54011

TM20 Thermo-Collector

YOKOGAWA ◆
Yokogawa Meters & Instruments Corporation

This instruction manual describes how to operate the TM20 Termo-Collector.

■ Intended readers

This manual is addressed to those who actually measure temperatures with a TM20 Thermo-Collector and those who set up a TM20 Thermo-Collector and perform data processing with a TM20 Thermo-Collector, i.e., operators and engineers.

■ Structure of this manual

This manual is composed of four parts:

● Before Use

Be sure to read this part before using the TM20. This part explains fundamentals such as the name and functions of each part of the TM20 and how to input characters.

● Preparing for Measurement

Read this part before measuring a temperature. This part explains the Thermo-Collector software and how to set up your TM20.

● Measuring Temperatures

Read this part when measuring temperatures. This part explains major operations required to actually measure temperatures.

● Working with Measured Data

Read this part when using and analyzing the data measured by a TM20. This part explains how to transfer the measured data to a personal computer and print them.

■ Checking contents of package

When a TM20 Thermo-Collector is delivered, visually check it to ensure that it is not damaged. Also make sure that the following items have been supplied. If any of the items are missing, please contact the dealer from which you purchased the TM20.

Keep this box in case this product needs to be returned to the manufacturer for repair.

Item name	Quantity
TM20 Thermo-Collector	1
Floppy disks of Thermo-Collector software installer	3
ANSI AA (IEC LR6) alkaline batteries	2
Dust-proof seals (for sealing screw holes at the rear of TM20 Thermo-Collector)	2
Instruction Manual (this document)	1
Waterproof cover	1

■ Safety precautions

● About this manual
- Read this manual to gain a thorough understanding of this product before use.
- This manual only describes the functions of the product and makes no warranty of any kind, including but not limited to, implied warranties of merchantability and suitability for a particular purpose.
- All rights reserved. No part of this manual may be reproduced in any form without Yokogawa Meters & Instruments Corporation's written permission.
- The contents of this manual are subject to change without notice.
- Should the user find any errors, or unclear or missing information in this manual, contact the dealer from which you purchased the product or the Marketing Department of Yokogawa Meters & Instruments.

● Disassembly or modification
- DO NOT disassemble or modify the product. Only service personnel qualified by Yokogawa M&C are allowed to disassemble and service the product.

● Handling precautions
- Only parts and consumables specified by Yokogawa Meters & Instruments should be used in the product.
- Do not store the product in a location where it will be exposed to direct sunlight or high temperatures, otherwise it may be discolored or deformed.

● Warnings, cautions, and notes
- Follow the safety instructions in this manual when handling a TM20 or its connected accessories. Yokogawa Meters & Instruments assume no liability for safety if conduct contradicts the safety instructions.
- The ⚠ WARNING mark at the rear of the TM20 indicates the precautions that must be observed when handling the TM20. Refer to this manual for handling of the TM20.
- Throughout this manual, the following safety conventions are used:

⚠ Warning

Indicates hazard where a risk of severe injury and loss of life of the user exists.

⚠ Caution

Indicates hazard where a risk of injury of the user or damage to the product or other equipment exists.

⚠ Note

Draws attention to important information about handling of the product or helpful information about the operations and functions of the product.

TIP

Provides a tip or information supplementary to the main text.

See Also

Provides one or more references to related topics in this document.

■ Precautions for handling of components

Be sure to observe the following precautions to avoid injury and loss of life of personnel, and damage to the equipment used.

● Probe

⚠ Warning

Do not point the tip of the needle themo probe at a person. It is very sharp and may cause injury.

⚠ Caution

- **Do not touch the stylus (metal part) of a probe that has just been used to measure a high temperature as it may cause a burn.**
- **Make sure that the potential differences between probes do not exceed 1 V.**
- **Do not use a worn or damaged probe, which may be incapable of correct temperature measurements.**
- **Before removing a probe from the TM20, pull the probe away from the object measured.**
- **When using a probe for liquids, such as a needle probe, insert it into the liquid to be measured by approximately half the dimension of the probe's stylus (metal part). Inserting it too deeply may cause a burn due to heat transfer to the probe grip as well as cause damage to the probe itself.**
- **The probe grip and the cable connected from the TM20 must be maintained at a temperature between –20°C and 50°C. Unlike the stylus of a probe, these parts have a low resistance to heat.**
- **When sending data in real-time, use an ungrounded probe.**

● **Batteries**

> ⚠ **Caution**
>
> - Be sure to remove the batteries if the product will not be used for a long period. Otherwise, the battery liquid may leak and damage the circuitry, resulting in a malfunction.
> - Whenever replacing batteries, be sure to replace both batteries with new ones. Changing only one battery may result in the charge current from the new battery flowing to the old one.

■ Disclaimer of guarantee

- Yokogawa M&C Corporation does not guarantee this product in any way, except as set forth in the terms and conditions of the certificate.
- Yokogawa M&C Corporation shall not be liable for any consequent or inconsequent damages to the customer or a third party arising from the use of the product due to any defect in materials or workmanship beyond the control of Yokogawa Meters & Instruments Corporation.

■ Figures in this manual

For ease of understanding, figures and illustrations in this manual may not precisely depict the actual product or software.

■ Care of product

- If there is a need to clean the casing, wipe the surfaces with a wrung wet cloth.
- To remove tough stains, use a cloth dampened with a diluted neutral detergent. Do not use any solvent, other detergent, or chemical other than neutral detergents to prevent the product from being damaged.
- Keep the connectors and other conductive parts dry to prevent the product from being damaged.
- When using the product in a place where water may splash the product, use the waterproof case that comes with the product to prevent the product from becoming dirty and enhance the product's water resistance.

■ Maintenance service

When the product needs to be serviced or repaired, contact the dealer from which you purchased the product.

◆ Trademarks

- Microsoft, Windows, Windows 95, Windows 98, Windows NT, and Excel are trademarks or registered trademarks of Microsoft Corporation, United States.
- Other company and product names appearing in this document are trademarks or registered trademarks of the respective holders.

CONTENTS

Before Use

Preparing for Measurement

Measuring Temperatures

Working with Measured Data

1 Features of This Product

**This product is a handy-type thermometer that can measure a temperature and make a record of it. It has a "collector function" to record the measured temperatures and measurement conditions under the specified tag, and a "logging function" to automatically measure and record temperatures at given intervals.
The TM20 can simultaneously measure temperatures of channels A and B as well as being able to measure a potential difference. The following describes the collector and logging functions.**

■ Collector function

The collector function is used when the measured temperature and measurement conditions are recorded under the specified "tag".

In the "tag", the tag name (i.e. "what"), date and time (i.e. "when"), operator name (i.e. "who"), and alarm (i.e. "judgment on the measured data") are recorded as the measurement conditions, in addition to the measured temperature.

						Tag name ("what")
[Line A]	HiAlarm=0080.0	LoAlarm=0060.0				
- -						Measurement temperature
No.	Date	Data	Hi	Lo	Person	
00001	99/10/08/18:00:00	56.0°C	OK	NG	Smith	Operator name ("who")
00002	99/10/08/18:00:10	57.5°C	OK	NG	Smith	Date and time ("when")
00003	99/10/08/18:00:25	58.5°C	OK	NG	Smith	
00004	99/10/08/18:00:35	59.8°C	OK	NG	Smith	Alarm
00005	99/10/08/18:00:45	61.2°C	OK	OK	Smith	("measured data judgment")
00006	99/10/08/19:00:00	62.0°C	OK	OK	Smith	NG = No Good
00007	99/10/08/19:00:11	62.0°C	OK	OK	Smith	
00008	99/10/08/19:00:26	70.0°C	OK	OK	Smith	
00009	99/10/08/19:00:34	75.0°C	OK	OK	Smith	
00010	99/10/08/19:00:47	81.0°C	NG	OK	Smith	

Printout of image from a recommended printer

It is possible to use maximum 50 tags, and in these 50 tags, a total of 5,000 pieces of temperature measurement data can be recorded. However, the more the data is saved with the logging function, the less number of measurements can be made with the collector function.

[TIP]

At the two-channel simultaneous measurement, 2 data can be recorded in every measurement. If no data is recorded at the two-channel simultaneous measurement, 2,500 measurements can be recorded.

Set up the following tag items in advance to use the collector function.

- Tag name
- Input channel
- Alarm
- Operator name

See Also

For more information, refer to the "Preparing for Measurement" part.

■ Logging function

The logging function is used to automatically measure temperatures at given measurement intervals and to continue to record the result data. This function is useful when a temperature variation within a certain period of time (e.g. temperature variation in a refrigerator being transported) needs to be recorded.

With this logging function, the temperatures and date (year/month/day) and time will be recorded as a "log". Unlike the collector function, the logging function does not record the operator name and alarm (measured data judgment).

```
                                                        ─── Log name

  [Line B ]        Interval=00:00:10 ───────────────── Measurement interval
  - - - - - - - - - - - - - - - - - - - - - - - - - - - -
    No.          Date              Data
  00001    99/10/09/20:00:00    -10.5°C ───────────── Temperature
  00002    99/10/09/20:00:10    -10.5°C
                                                        Date and time
  00003    99/10/09/20:00:20   -11.0°C
  00004    99/10/09/20:00:30    -10.5°C
  00005    99/10/09/20:00:40    -10.5°C
  00006    99/10/09/20:00:50    -11.0°C
  00007    99/10/09/20:01:00    -10.5°C
  00008    99/10/09/20:01:10    -10.5°C
  00009    99/10/09/20:01:20    -11.0°C
  00010    99/10/09/20:01:30    -10.5°C
```

Printout of image from a recommended printer

It is possible to use maximum 10 logs, and in these 10 logs, a total of 20,000 pieces of data can be recorded. However, the more the data is saved with the collector function, the less number of measurements can be made with the logging function.

[TIP]

At the two-channel simultaneous measurement, 2 data can be recorded in every measurement. If no data is recorded at the two-channel simultaneous measurement, 10,000 measurements can be recorded.

Set up the following items in advance to use the logging function.
- Log name
- Input channel
- Measurement interval
- Measurement period

See Also

For more information, refer to the "Preparing for Measurement" part.

2 Names and Functions of Each Part

Top face

[1]

Front face

[4]
[7]
[8]
[5]
[6]
[9]
[10]
[11]
[12]
[13]
[14]

Back face

[15]
[16]

Bottom face

[2] D
[3] RS232C
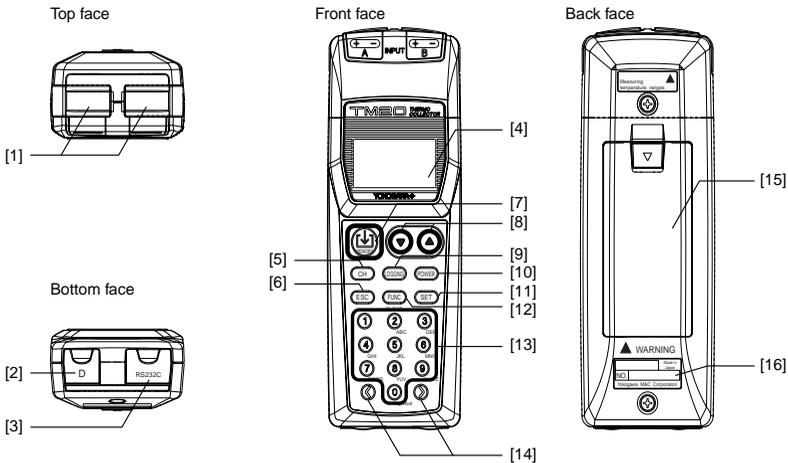
[1] External probe jacks (channels A and B)
Used to plug in the cables of thermocouple type K, J, E, or T probes or voltage measurement (±100 mV or ±1 mV range) sensors. (A voltage measurement probe has a U-shaped omega connector.)

[2] Non-contact thermo probe jack (channel D)
Used to connect a non-contact thermo probe.

[3] RS-232C communication terminal
Used to output data from this instrument to a personal computer or printer.

[4] Display (LCD)
Displays Thermo-Collector conditions, various setup information, measurement temperature, etc.

[5] [CH] key
Used to switch over the input channel between channels A, B, and D. Channel D is for a non-contact thermo probe.

[6] [ESC] key
Used to cancel the previous operation and return to the previous screen.

[7] [Memory] key
Used to commence a temperature measurement with either the collector function or the logging function.

[8] [▼] [▲] key
Used to select an appropriate tag, log, or function.

[9] [LOGGING] key
Used to switch between the collector and logging functions. Also used to modify alphanumeric characters from uppercase to lowercase.

[10] [POWER] key
Used to turn the power supply on and off.

[11] [Set] key
Used to make the setup contents valid for operation.

[12] [Func] key
Used to set up the selected function.
Also used to delete the measured data.

[13] [1],...,[9], and [0] keys
Used to enter alphabets and numbers.
The [0] key is also used for switching the unit of temperature display. If, for example, this [0] key is pressed in the Home screen, the unit is switched to "°F". Another pressing of the same key will restore the unit to "°C".

[14] [<] and [>] keys
Used to retrieve the logged tag data or log data, or to select the character input position.

[15] Battery compartment
Accommodates two ANSI AA (IEC LR6) alkaline batteries.

[16] Name plate

3 **Setting the Battery**

Two ANSI AA (IEC LR6) alkaline batteries are included with this instrument.

1. **Open the battery compartment cover at the back of the main unit.**

   See Also
   For the position of the battery compartment, refer to Chapter 2, "Names and Functions of Each Part".

2. **Observing the correct polarity, install the two ANSI AA (IEC LR6) alkaline batteries in the battery compartment.**

⚠ **Caution**

Observe the correct polarity when installing the batteries in the battery compartment. The main unit may be damaged if the batteries are installed incorrectly.

3. **Close the battery compartment cover.**

                                                                    -End of procedure-

⚠ **Caution**

Remove old batteries from the compartment. Battery liquid leakage may cause the main unit to malfunction or may damage it. A "BatteryEmpty" message will appear on the LCD shortly before the battery life expires. When this message appears, replace the batteries.

🖐 **Note**

• Whenever replacing batteries, be sure to replace both batteries with new ones. Changing only one battery may result in the charge current from the new battery flowing to the old one.

• If temperature suddenly change, condensation may occur. Set the batteries after acclimatizing the batteries and TM20 to the ambient temperature.

4 Turn ON/OFF of the Power Supply

■ Turn the power supply to ON

Press the [POWER] key.
The time display screen appears on the LCD.

```
INPUT              ⬍         AUTO OFF
L A    19:13:15

       – – – – –
```

The power of the main unit is turned on.

■ Turn the power supply to OFF

Hold down the [POWER] key for about three seconds.
The power to the main unit will be shut down after a short beep has been sounded.

5 Screen (LCD) Displays
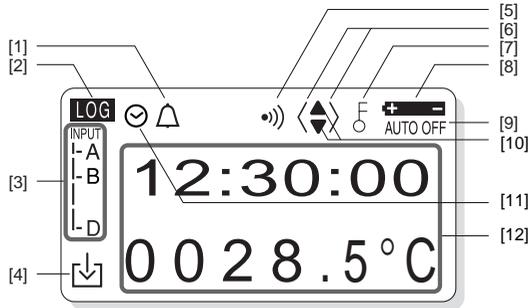
[1]   Indicates that the chime function is being set.

[2]   Indicates whether the current mode is the collector mode or logging mode. If **LOG** is displayed, the current mode is the logging mode. If it is not displayed, the current mode is the collector mode.

[3]   Indicates the input channels currently used for measurement.

[4]   Indicates that the measurement data is being logged into the instrument.

The "↓" mark indicates the status that the "Real-time data transmission" can be used.

[5]   Indicates that the alarm is set.

[6]   Indicates that either the [<] or [>] key can be used.

[7]   Indicates that either the key lock or FUNC lock is set. If the key lock function is on, all the keys are disabled. In the FUNC lock state, only the temperature measurement keys can be used.

See Also

For information about canceling the lock state, refer to Chapter 7, "Other Useful Functions" in the "Measuring Temperatures" part.

[8]   Indicates that the battery is almost used up. Replace the battery as soon as possible after this symbol is displayed.

[9]   Indicates that the instrument is set so that the power to the main unit will be automatically turned off if no operation is made in a predetermined period of time.

[10] Indicates that either the [▲] or [▼] key can be used.

[11] Indicates that the timer function is on and the instrument is in the wait state.

[12] A tag name, log name, and temperature will be displayed.

[TIP]

If this instrument is used in a location where the ambient temperature is low, the characters may be displayed slowly. Note that this does not indicate the main unit being at a malfunction.

6 **How to Input Characters**

This section explains the character input procedure. Alphabets and numbers can be entered.
The procedure used to input characters into Thermo-Collector is similar to the method used to enter characters in a cellular phone.

■ **Entering characters**

Use the ⓪ to ⑨ keys to enter characters. These keys are also used to enter alphabets.

For example, the ② key can be used to enter "A" to "C", and "2". To enter "C", press the ② key three times.

To enter "2", press the ② key four times.

Mode Key	Alphanumeric input mode
①	1
② ABC	→ A → B → C → 2 →
③ DEF	→ D → E → F → 3 →
④ GHI	→ G → H → I → 4 →
⑤ JKL	→ J → K → L → 5 →
⑥ MNO	→ M → N → O → 6 →
⑦ PQRS	→ P → Q → R → S → 7 →
⑧ TUV	→ T → U → V → 8 →
⑨ WXYZ	→ W → X → Y → Z → 9 →
⓪ Symbol	→ 0 → ! → # → $ → % → & → (→) → + → - → → = →

■ **Entering lowercase characters**

1. **Enter a character to be made small.**

2. **Position the cursor on the character and press the [LOGGING] key.**
This character is made small.

- End of procedure

1   Overview of Preparation for Measurement

Before measuring temperatures, set the tag names, etc., on the main unit. There are two methods for making the settings. One is for the main unit and the other is for a personal computer. For efficiency, use a personal computer to set many items.

○ Setting up the main unit
  • Setting the date and time
  • Setting the name of the main unit

Setting up TM20 from PC   Setting up TM20 via TM20's faceplate

○ Make settings (using a tag/log table) for:
  • Collector function
    such as the tag names, input channel(s) used, alarms, name of the operator, and comments.
  • Logging function
    such as the log name, input channel(s) used, measurement interval, and measurement period.

○ Make settings for:
  • Collector function
    such as the tag names, input channel(s) used, alarms, name of the operator, and comments.
  • Logging function
    such as the log name, input channel(s) used, measurement interval, and measurement period.

○ Download:
  • Settings.
  • Name of the operator.

○ Measure the temperature

: Setup to be performed in this part

2 Setting Up the Main Unit

2.1 Setting the date and time

Home screen

```
INPUT
L A          ↕
       18:54:27
          25.9°C
```

[TIP]

This screen which displays the current time is referred to as the "Home" screen. All the functions in the main unit are accessed from this screen.

1. **Press the [FUNC], [6], and [1] keys, in order.**
The "ClockSet" screen appears on the LCD.

```
INPUT
L A          ↕
       F61
       ClockSet
```

2. **Press the [SET] key.**
A screen for setting the date appears.

```
INPUT
L A            〉
       Date
       98/11/11
```

3. **Enter the date.**
Use the [0] to [9] keys for input. The [<] or [>] key moves the cursor.

4. **Press the [SET] key.**
A screen for setting the time appears.

```
INPUT
L A            〉
       Time
       18:56:14
```

5. **Enter the time.**

6. **Press the [SET] key.**
The specified time is set.

```
INPUT
L A          ↕
       F61
       ClockSet
```

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

Preparing for
Measurement

2.2 Setting the name of the main unit

If more than one Thermo-Collector is used at a time, a individual name must be set for each.

[TIP]

Make this setting as necessary.

Home screen

```
INPUT       ↕
 L A
        18:54:27
          25.9°C
```

1. **Press the [FUNC], [9], and [7] keys, in order.**
The "Name" screen appears.

```
INPUT       ↕
 L A
        F97

        Name
```

2. **Press the [SET] key.**

```
INPUT       〈 〉
 L A
       DevName
       Name00
```

3. **Enter the name of the instrument (Example: NO1).**

```
INPUT       〈 〉
 L A
       DevName
       NO1
```

See Also

For how to enter letters and numbers, refer to Chapter 6, "How to Input Characters" in the "Before Use" part.

4. **Press the [SET] key.**
The instrument name is set.
The "Name" screen is restored.

```
INPUT       ↕
 L A
        F97

        Name
```

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

3 Setting Up with the Personal Computer

3.1 Setting up the "Thermo-Collector" software

The setup operation required for the main unit can be performed on a personal computer. The "Thermo-Collector" software must be used to do this. This section explains the procedure used to set up the "Thermo-Collector" software on the personal computer.

Connecting the personal computer and the main unit
↓
Installing the "Thermo-Collector" software on the personal computer
↓
Confirming the communication environment (on the personal computer)
↓
Confirming the communication environment (on the main unit)

■ Connecting the personal computer and the main unit

Purchase an RS-232C cable (Model name: 910 09, round DIN 8-pin to D-sub 25-pin type). Follow the procedure below to connect the main unit to the personal computer.

1. Turn off the power to both the personal computer and main unit.

2. Connect the personal computer and the main unit as shown in the following diagram.

Main unit

Personal computer

Dedicated cable (Model name: 910 09)

Connection between connector pins
(Round DIN 8-pin to D-sub 25-pin)

1	→	4
2	→	2
3	→	5
4	→	3
7	→	7
8	→	7
5, 6 (N.C.)		

Bottom of the main unit (8-pin)

Serial port of the personal computer (with 25-pin connector)

Plug this cable into the connector so that the "←" mark on the grip faces downward.
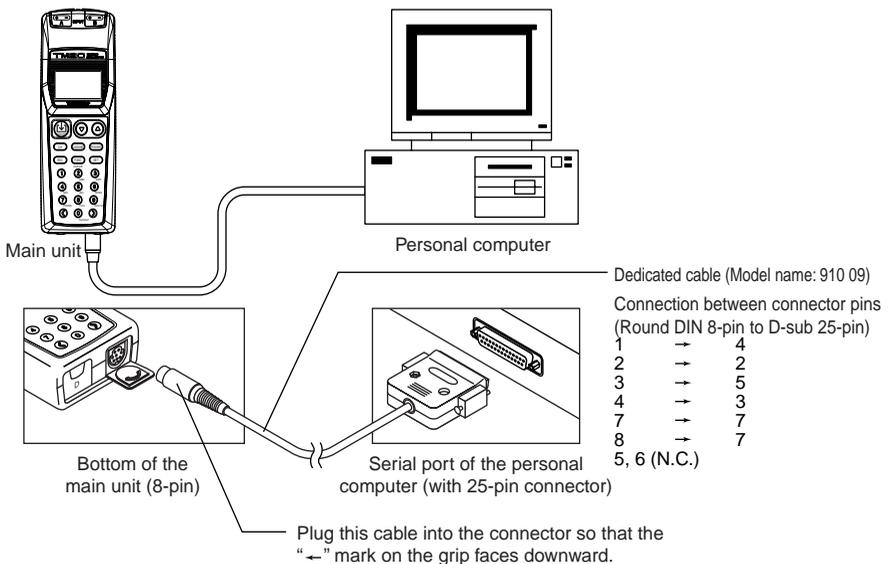
3. First turn on the power to the main unit, then turn on the power to the personal computer.

-End of procedure-

Preparing for Measurement

■ Installing the "Thermo-Collector" software

Install the "Thermo-Collector" software on the personal computer. The three floppy diskettes that come with the main unit are required for this installation.

1. **Place a floppy diskette (Setup Disk #1) in the floppy disk drive of the personal computer.**
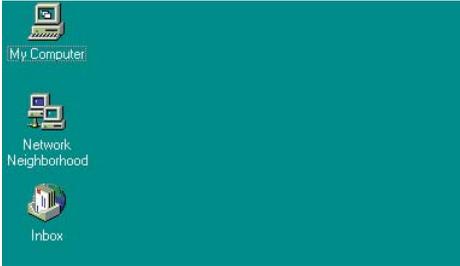
2. **Double-click on the "My Computer" icon.**
The "My Computer" folder is displayed.

3. **Double-click on the floppy disk drive icon (A:drive in the case of a DOS/V machine).**
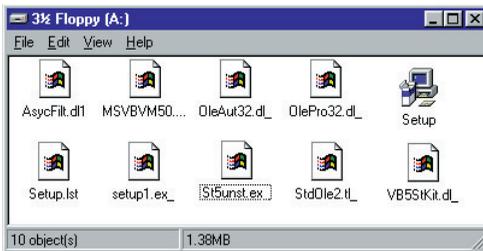
4. **Double-click on "Setup".**
The Setup is initiated and a screen prompting the insertion of the second floppy diskette (Setup Disk #2) appears.

5. **After inserting the second floppy diskette (Setup Disk #2), click on the [OK] button.**
Precautions to be observed prior to installation appears.

6. **Click on the [OK] button.**
The installer of the application program is initiated and the "Thermo Collector Setup" screen is displayed.

7. **Click on the [Start Setup] button.**
A screen prompting the insertion of the third floppy diskette (Setup Disk #3) appears.

8. **After inserting the third floppy diskette (Setup Disk #3), click on the [OK] button.**
[TIP]

Do as follows to change the application install destination.
    1.Click on the [Change Directory] button.
    2.Select a installation destination folder.
    3.Click on the [OK] button.

After installation has been completed, the following confirmation window is displayed.

Thermo Collector Setup
Thermo Collector Setup was completed successfully.
OK
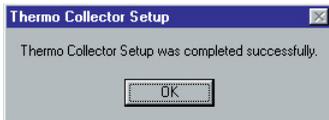
[TIP]

If the another window is displayed, set the new group name and click [Continue] button. (Select the name from "group list" when you already have the name you want to use, and click [Continue] button.

9. **Click on the [OK] button.**

-End of procedure-

Preparing for
Measurement

■ Confirming the communication environment (on the personal computer)

Confirm the settings related to the communication environment on the personal computer.

1. **Select "Thermo-Collector" in the "Programs" accessed from the "Start" menu.**

2. **Select "Properties" from the "Comm" menu.**
The "Properties" window is displayed.

Properties	✕
CommPort	1 ▾
Baud Rate	9600 ▾
Parity	None ▾
Data Bits	8bit ▾
Stop Bits	2bit ▾

(OK) (Cancel)
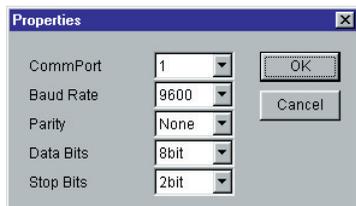
3. **Confirm that the settings are exactly as shown in the above figure.**
If any of the settings are different, set them to the values given below.

Setup item	Setting value
CommPort	1
Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits	2

[TIP]

The communication port setting values vary, depending on the type of personal computer. For more information, refer to the manual supplied with your personal computer.

-End of procedure-

3.2 **Basic operation of Thermo-Collector software**

This section explains the basic operation of the supplied software.

■ **Initiating Thermo-Collector software**

1. **Select "Thermo-Collector" in the "Programs" accessed from the "Start" menu.**
At first, the model (of the Thermo-Collector) selection screen is displayed.

2. **Click the text-box to select the model TM20.**
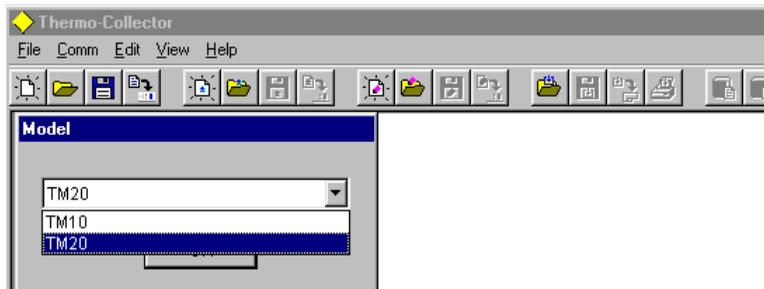
3. **Click on the [OK] button.**
After the main screen of the software is displayed, the "Setup Tags/Logs - New" screen is displayed.
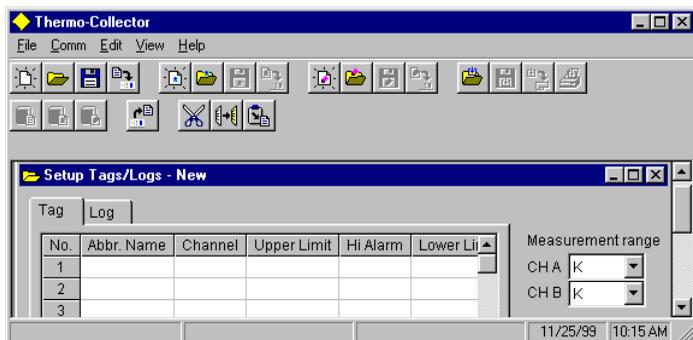
■ Terminating Thermo-Collector software
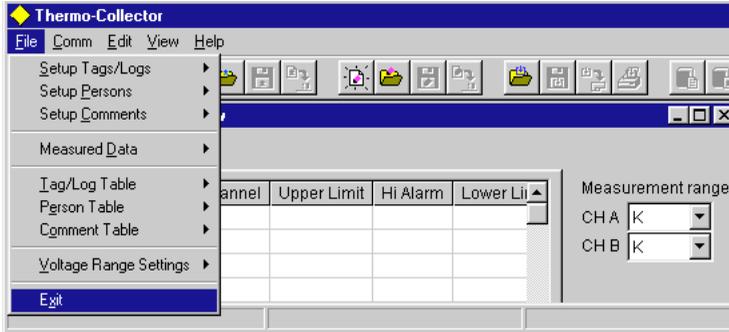
Select "Exit" from the "File" menu.

■ Saving the setup data in a file
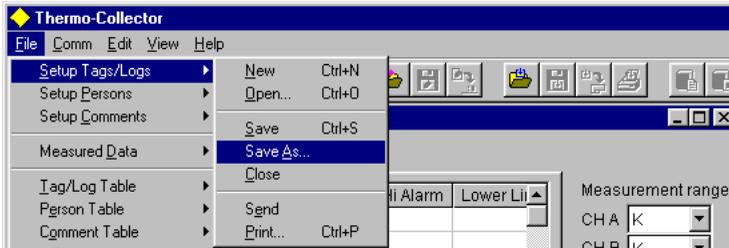
1. **Select "Save As" in the "Setup Tags/Logs" menu accessed from the "File" menu.**
The "Save As" window is displayed.
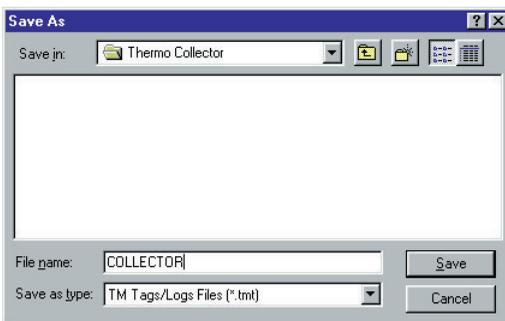
2. **Enter a file name in the "File name" field, then click on the [Save] button.**
The setup data is saved.

-End of procedure-

■ Loading a file containing the setup data

1. **Select "Open" in the "Setup Tags/Logs" menu accessed from the "File" menu.**
The "Open" window is displayed.
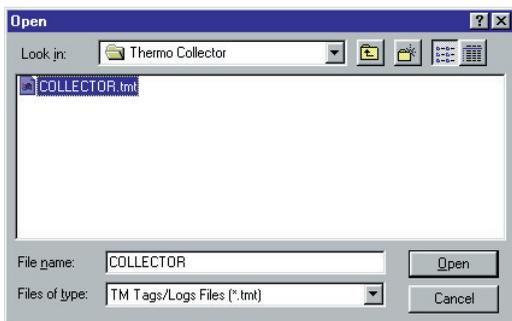
2. **Select a file to be loaded, then click on the [Open] button.**
The specified file containing the setup data is loaded, and the tag and log setup data in the file is displayed.
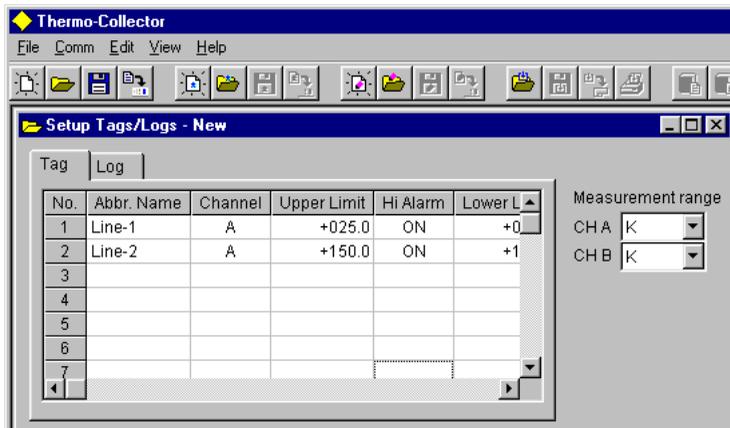
-End of procedure-

■ **Saving the measurement operator name data**

The operator data is saved in a file different from that in which the tag and log data is stored.
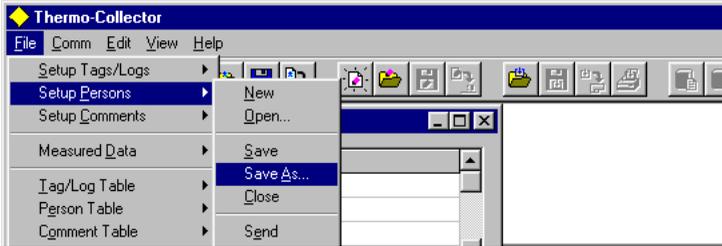
1. **Select "Save As" in the "Setup Persons" menu accessed from the "File" menu.**
   The "Save as" window is displayed.
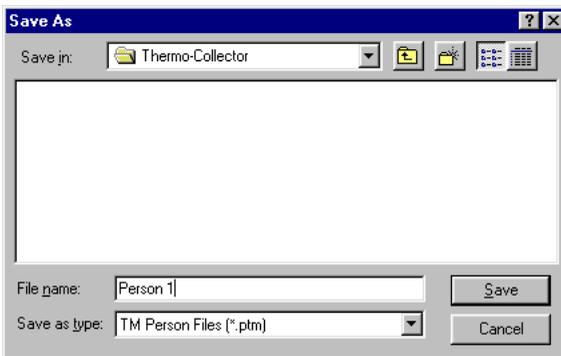
2. **Enter a file name in the "File name" field, then click on the [Save] button.**
   The measurement operator name data being set is saved.

-End of procedure-

<div style="text-align: right;">
Preparing for
Measurement
</div>

■ Loading the measurement operator name file

1. **Select "Open" in the "Setup Persons" menu accessed from the "File" menu.**
The "Open" window is displayed.
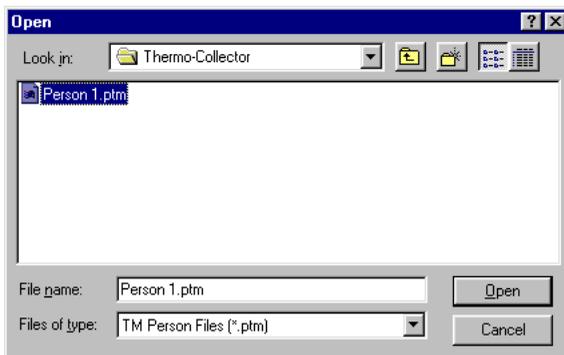
2. **Select a file to be loaded, then click on the [Open] button.**
The measurement operator name file is loaded, and a list of operator names is displayed.

-End of procedure-

■ Other functions (Menu functions)

"Setup Tags/Logs" submenu

New
Creates a new setup file of tags and logs.

Open
Opens a file in which tags and logs have been stored.

Save
Overwrites a file in which tags and logs have been set.

Save As
Saves a file in which tags and logs have been set under a new file name.

Send
Transmits the tag and log setup data to the main unit.

Print
Outputs the tag and log setup data for the printer.

"Setup Persons" submenu

New
Creates a new file for setting up operator names.

Open
Opens a file in which operator names have been stored.

Save
Overwrites a file in which operator names have been set.

Save As
Saves a file in which operator names have been set under a new file name

Close
Closes the operator name setup screen.

Send
Transmits the operator name data file currently opened to the main unit.

Print
Outputs the operator name data for the printer.

"Setup Comment" submenu

New
Creates a new file for setting up comment.

Open
Opens a file in which comment have been stored.

Save
Overwrites a file in which comment have been set.

Save As
Saves a file in which comment have been set under a new file name

Close
Closes the comment setup screen.

Send
Transmits the comment data file currently opened to the main unit.

Print
Outputs the comment data for the printer.

Preparing for
Measurement

"Measured Datas" submenu

Save As
Saves the measurement data in a text format.

Close
Closes the measurement data file.

Transfer
Transfers the measurement data file to Excel.

Print
Outputs the measurement data to the printer.

"Tag/Log Table" submenu

New
Opens a new blank tag/log table.

Open
Opens an existing tag/log table.

Save
Saves the changes to the open tag/log table.

Save As
Saves the open tag/log table under a new filename.

Select Reference Table
Selects the reference tag/log table. Based on this reference table, abbreviated names will be replaced with the respective full names.

Clear Reference Table
Clears the selection of reference tag/log table.

Forward to Tag/Log Setup File
Forwards the settings in the open tag/log table to the setup file.

"Person Table" submenu

New
Opens a new blank person table (a list of operators).

Open
Opens an existing person table.

Save
Saves the changes to the open person table.

Save As
Saves the open person table under a new filename.

Select Reference Table
Selects a person table. Based on this person table, abbreviated person names will be replaced with the respective full names.

Clear Reference Table
Clears the selection of reference person table.

Forward to Person Setup File
Forwards the settings in the open person table to the setup file.

"Comment Table" submenu

New
Opens a new blank comment table.

Open
Opens an existing comment table.

Save
Saves the changes to the open comment table.

Save As
Saves the open comment table under a new filename.

Select Reference Table
Selects a comment table. Based on this comment table, abbreviated comment names will be replaced with the respective full names.

Clear Reference Table
Clears the selection of reference comment table.

Forward to Comment Setup File
Forwards the settings in the open comment table to the setup file.

"Voltage Range Settings" submenu

New
Opens a new blank voltage setting file.

Open
Opens an existing voltage setting file.

Save
Saves the changes to the open voltage setting file.

Save As
Saves the open voltage setting file under a new filename.

Send
Sends (downloads) the settings in the open voltage setting file to the TM20.

Receive
Receives (uploads) the voltage measurement settings inside the TM20.

"Comm" menu

Properties
Set the conditions required to communicate with the personal computer. Below are the setup items
• Communication port
• Baud rate
• Parity
• Data bits
• Stop bits

Receive
Receives from the main unit the measured temperature data and other data set with the main unit.

Preparing for Measurement

"Edit" menu

Cut
Moves the currently selected data to the pasteboard.

Copy
Copies the currently selected data to the pasteboard.

Paste
Copies the data recorded in the pasteboard to the selected location on the screen.

Delete
Deletes the currently selected data.

Select All
Sets all the data on the currently selected box to the selected condition.

Column and Row (usable only in tag/log table, person table and comment table.)
Add / insert / delete column or row, and modify column's name.

Sort (usable only in tag/log table, person table and comment table.)
Performs data sorting in the columns of "Abbr. Name" and "Full name".

Mark (usable only in tag/log table, person table and comment table.)
Selects "Select All" or "Cancel All" of the selected settings high lighted in yellow for transmitting to the setting file etc.

[TIP]

Measurement data received from the main unit cannot be edited using the "Edit" menu functions.

"Display" menu

Tool Bar
Switches on and off the toolbar display (button icon allowing one-touch operation).

Status Bar
Switches on and off the status bar display (a region in which the date and time are displayed).

"Help" menu

Model
Displays model code of the Thermo-Collector in use.

About Thermo-Collector...
Displays the version information of the Thermo-Collector software.

■ Other functions (Tool icons functions)

For efficiency, single-click on any of the tool icons to instantly execute the assigned function.

Creates a new setup file of tags and logs. This function is the same as "New" in the "Setup Tags/Logs" submenu of the "File" menu.

Loads a file of stored tags and logs. This function is the same as "Open" in the "Setup Tags/Logs" submenu of the "File" menu.

Saves the tag and log setup data file so it overwrites the existing file. This function is the same as "Save" in the "Setup Tags/Logs" submenu of the "File" menu.

Transmits the tag and log setup data currently selected to the main unit. This function is the same as "Send" in the "Setup Tags/Logs" submenu of the "File" menu.

Creates a new file for setting operator names. This function is the same as "New" in the "Setup Persons" submenu of the "File" menu.

Loads the operator name file that has been saved. This function is the same as "Open" in the "Setup Persons" submenu of the "File" menu.

Saves the operator name file so it overwrites the existing file. This function is the same as "Save" in the "Setup Persons" submenu of the "File" menu.

Transmits the operator name data currently displayed on the screen to the main unit. This function is the same as "Send" in the "Setup Persons" submenu of the "File" menu.

Saves the measured data in a text format file. This function is the same as "Save As" or "Save" in the "Measured Datas" submenu of the "File" menu.

Creates a new file for setting comments. This function is the same as "New" in the "Setup Comments" submenu of the "File" menu.

Loads the comment file that has been saved. This function is the same as "Open" in the "Setup Comments" submenu of the "File" menu.

Save the comment file so it overwrites the existing file. This function is the same as "Save" in the "Setup Comments" submenu of the "File" menu.

Transmits the comment data currently displayed on the screen to the main unit. This function is the same as "Send" in the "Setup Comments" submenu of the "File" menu.

Loads the measured data file that has been saved. This function is the same as "Open" in the " Measured Datas" submenu in the "File" menu.

Transfers the measurement data which is going to the personal computer to Microsoft Excel. This function is the same as "Transfer" in the "Measured Datas" submenu of the "File" menu.

Outputs the measurement data received in association with the specified tag and log to the printer. This function is the same as "Print" in the "Measured Datas" submenu of the "Comm" menu.

Forwards the settings in the open tag/log table to the setup file. This function is the same as "Forward to Tag/Log Setup File" in the "Tag/Log Table" submenu in the "File" menu.

Forwards the settings in the open person table to the person setup file. This function is the same as "Forward to Person Setup File" in the "Person Table" submenu in the "File" menu.

Forwards the settings in the open comment table to the comment setup file. This function is the same as "Forward to Comment Setup File" in the "Comment Table" submenu in the "File" menu.

Receives the data from the main unit. This function is the same as "Receive" in the "Comm" menu.

Moves the currently selected data to the pasteboard. This function is the same as "Cut" in the "Edit" menu.

Copies the currently selected data to the pasteboard. This function is the same as "Copy" in the "Edit" menu.

Copies the data recorded in the pasteboard to the currently selected location on the screen. This function is the same as "Paste" in the "Edit" menu.

3.3 Files created on a computer for settings of TM20

Tables of settings for creating setup files.
Each table contains settings required for measurement.

Files that contain settings to be written (downloaded) to a TM20.

Tag/log table i

Setup file 1

Many setup files can be created from the same tag/log table.

Setup file 2
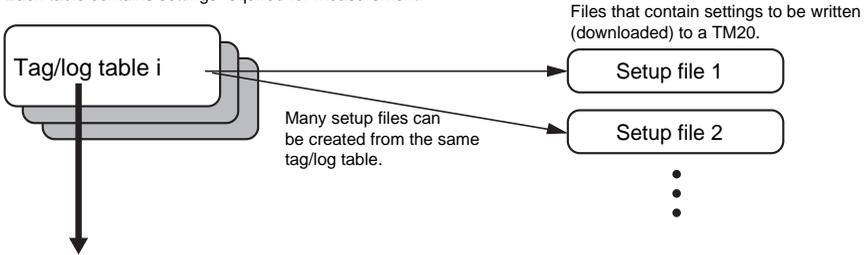
Select Reference Table

Select a tag/log table. Based on this tag/log table, abbreviated names will be replaced with the respective full names.

Abbreviated tag and log names can be replaced with the respective full names.

Person table j

Person setting 1

Person setting 2

Person setting 3
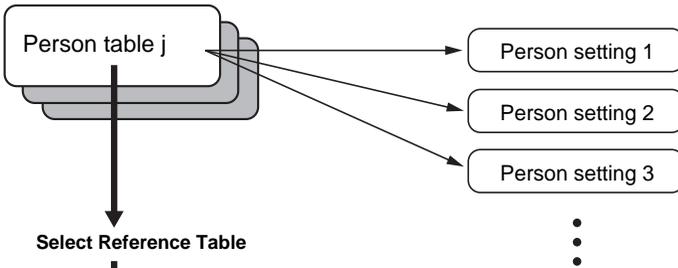
Select Reference Table

Abbreviated person names can be replaced with the respective full names.

Comment table k

Comment setting 1
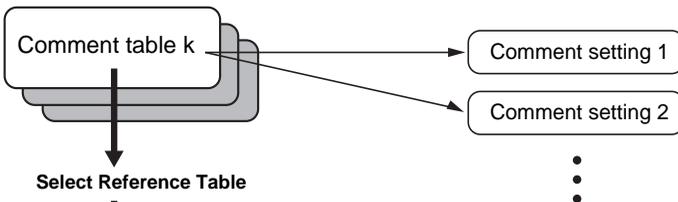
Comment setting 2

Select Reference Table

Abbreviated comment names can be replaced with the respective full names.

Tag/log tables, person tables, and comment tables.
Used previously to make a variety of measurement settings as lists of the respective settings.
By simply choosing an entry from each table, you can create a setup file for your TM20.
Setup files, person settings, and comment setting.
Files containing settings to be written (downloaded) to a TM20.

IM 54011-E

3.4 Setups required to use collector function (setting tag names, alarms, name of person, and comment, and selecting input channel(s))

To use the collector function, you need to set the tags in advance. A convenient way to do so is to create a table of tags and logs, namely, a tag/log table. Once you create a tag/log table and set it to the reference table, Thermo-Collector automatically replaces abbreviated tag names* with more descriptive full names** when receiving the measured data from a TM20.

 * Abbreviated names are 8-digit names that can be displayed on the TM20 screen.

 ** Full names can be displayed on the PC screen without any limitation in length.

■ Setup contents

● Tag name

Put a title for each tag.

● Input channel

Thermo-Collector has multiple input channels and probes for measuring temperatures of substances in a vapor, solid, or liquid phase. Since the probe to be used depends on the measuring object, it is necessary to set the available input channel on a tag in advance.

The following table shows the probe types and their corresponding input channels.

Probe type	Input channel
Thermocouple types K, J, E, and T ±100 mV or ±1 V voltage output sensor (See TIP below.)	A, B

[TIP]

To plug a voltage output sensor into channel A or B, use a U-shaped omega connector.

● Alarm

Set a limit temperature at which the alarm sounds.

• **ON/OFF of the upper-limit alarm and upper-limit temperature**

Make the following settings to sound an alarm when the temperature rises above a preset limit.

The upper-limit temperature cannot be set if the alarm function for the upper limit is set to OFF.

Setting the upper-limit alarm to ON and the upper-limit temperature to 70°C

Temperature

70°C

: Range in which the alarm sounds.

Preparing for Measurement

• **ON/OFF of the lower-limit alarm and lower-limit temperature**

Make the following settings to sound an alarm if the temperature falls below a preset limit.
The lower-limit temperature cannot be set if the alarm function for the lower limit is set to OFF.

Setting the lower-limit alarm to ON and the lower-limit temperature to 50°C

Temperature

50°C
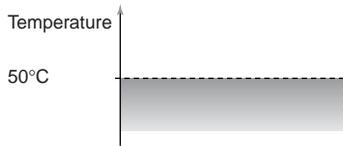
: Range in which the alarm sounds

• **Inverse alarm function ON/OFF**

The settings of the alarm function can be inverted.
Specifically, if this inverse alarm functions is set to ON, an alarm will sound if the temperature falls below the upper limit or if the temperature rises above the lower limit.

If "OFF"   If "ON"

Upper-limit alarm   70°C   Upper-limit alarm   70°C
Lower-limit alarm   50°C   Lower-limit alarm   50°C

Temperature   Temperature

70°C   70°C

50°C   50°C

: Range in which the alarm sounds
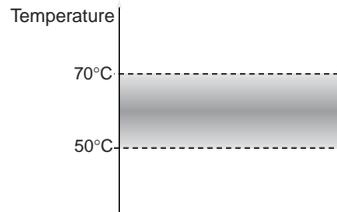
[TIP]

The alarm can also be set to turn off if the temperature exceeds the upper limit, or it can be set to turn on if the temperature falls between the upper and lower limits.

● **Operator name**

Set the name of the operator.

See Also

For how to set the operator name, refer to "■ Registering the measurement operator name".

■ Setting tags

● Make settings using a tag/log table

A variety of tag settings can be set beforehand in a table, and from the table, you can select settings to be downloaded to a TM20 as appropriate.

1. Run Thermo-Collector.
After the Thermo-Collector main window opens, a document window entitled "Setup Tag/Logs - New" opens in it.

2. From the File menu, choose Tag/Log Table then New to open the Tag/Log Table window (a document window).
Tag/Log Table window

3. Enter the tag names in the Abbr. Name column with a maximum of eight alphanumeric characters (for example, Burger).

4. In the Full Name column, enter more descriptive tag names.
There is no limitation in length with full names. If you select this table as the reference tag/log table, Thermo-Collector will replace the abbreviated names with the corresponding full names based on this table when receiving measured data from a TM20.

Preparing for
Measurement

5. **Double-click in the "Channel" column.**
The specified tag name is set and the pull-down menu appears.
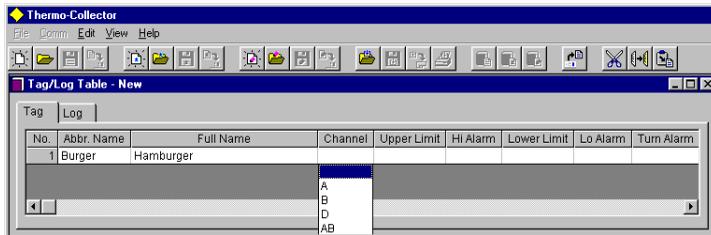
6. **Select either A, B, D, or AB.**
The specified channel is set.

7. **Click in the "Upper Limit" column**
The cursor moves to a cell for the "Upper Limit".
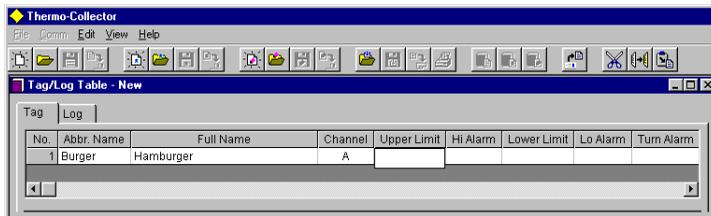
8. **Enter the "Upper Limit" with numeric characters (Example: 150.0).**

[TIP]

Enter a value that does not exceed "Upper Limit" of the probe used for actual measurement. The "Upper Limit" that can be measured varies according to the probe used for measurement.

The specified upper-limit temperature has been set.

9. **Double-click in the "Hi Alarm" column.**

The pull-down menu appears.
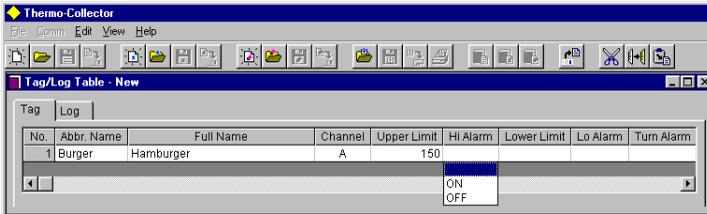
10. **Select either ON or OFF.**

11. **Click in the "Lower Limit" column.**

The upper-limit alarm ON/OFF setting is made and the cursor moves to the "Lower Limit" column.
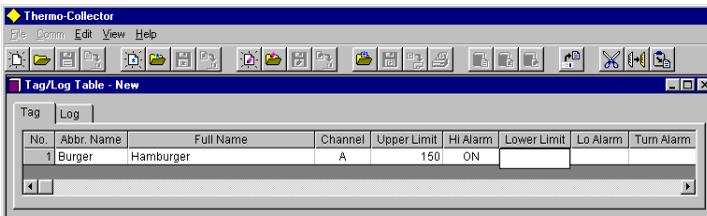
12. **Enter the "Lower Limit" with numeric characters (Example: 135.0).**

[TIP]

Enter a value that does not fall below the "Lower Limit" of the probe used for the actual measurement. The "Lower Limit" that can be measured varies according to the probe used for the measurement.

The specified lower-limit temperature has been set.

13. **Double-click in the "Lo Alarm" column.**

The pull-down menu appears.
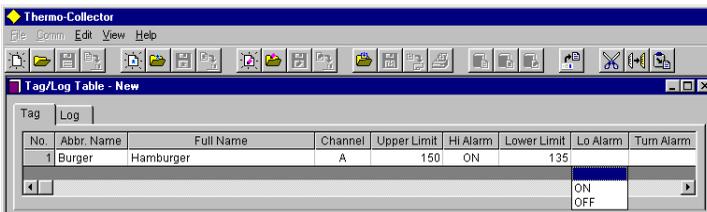
14. Select either ON or OFF.

The lower-limit alarm ON/OFF setting is made.

15. Click in the "Turn Alarm" column.

The pull-down menu appears.
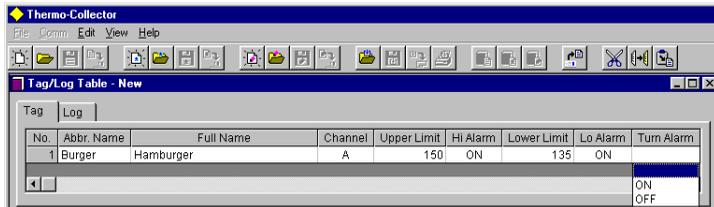
16. Select either ON or OFF.

The alarm condition is set.
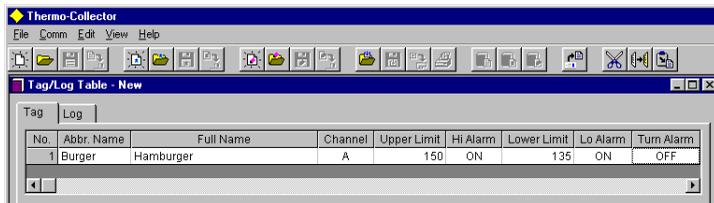
You can insert and add rows by either of the following ways:

• Using a shortcut menu that opens by a right-click

• Using keystrokes of CTRL+I and CTRL+R

Repeat steps 3-16 to set as many tags as necessary.

17. Save the table.

From the "File" menu, choose "Tag/Log Table" then "Save As" to save the table.

-End of procedure-

● **Creating a tag/log setup file to be downloaded to a TM20**

From a tag/log table, select settings to create a tag/log setup file to be downloaded to a TM20.

1. **In the Tag/Log Table window, double-click to select the cell No. of a tag whose setting is to be downloaded to the TM20.**
The row of the selected tag setting then appears highlighted in yellow. To clear the selection, double-click it again.

2. **From the File menu, choose Setup Tags/Logs then New to open the Setup Tags/Logs window of a blank setup file.**

3. **Click ▣ . The selected tag setting is then copied to the Setup Tags/Logs window.**

Tag/log table   Setup file
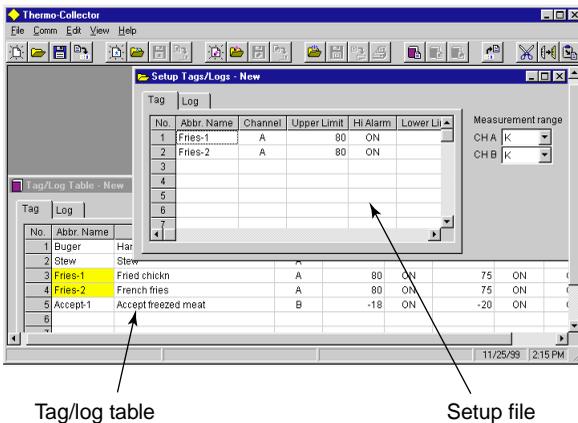
4. **Select the measurement range.**
The measurement range is selected as "K" (meaning thermocouple type K) by default. To set to a different range, click "Channel A" or "Channel B" box, as appropriate, in the Setup Tags/Logs window and choose the desired range from "K", "J", "E", "T", "1V", and "100mV".

5. **Save the setup file.**
The setup file can be saved by choosing "Setup Tags/Logs" then "Save As" from the "File" menu.

[TIP]

A row of data in which the Abbr. Name column is left blank cannot be downloaded to a TM20. Make sure the abbreviated names are set for all tags.

-End of procedure-

● Selecting the reference tag/log table which should be used to replace abbreviated names with full names

Instead of abbreviated tag and log names, the longer, more descriptive full names set in a specified table can be stored along with measured data to an Excel worksheet file. When receiving a batch of measured data from a TM20, Thermo-Collector searches through the Abbr. Name column in the specified reference file of tag/log table for names that match the tag or log names of the received data. If a matching name is found, Thermo-Collector fetches the full name corresponding to the abbreviated name from the reference table, and stores the full name in the Excel worksheet file in place of the abbreviated name.

1. **From the File menu, choose Tag/Log Table then Select Reference Table.**
Then, select the reference table in the dialog box that appears.

2. **Click Yes to confirm the selection.**

Once the reference table is selected, its filename is displayed in the lower-left of the window and the aforementioned automatic name replacement will take place.

[TIP]

Of course, you can directly set entries in a setup file instead of copying settings from a tag/log table.

Next, proceed to operator name setting.

- End of procedure -

■ Setting operator names

● Make settings with a person table

A person table is a list of the set operator names. It is possible at any time to select whichever settings from a person table you want.

1. From the File menu, choose Person Table, then New.
A document window for setting operator names, entitled "Person Table - New" as shown below, then opens.

Person Table window

2. In the Abbr. Name column, enter operator names of up to eight characters.
Abbreviated names stand for shortened operator names of up to 8 alphanumeric characters that can be displayed on the TM20 screen.

3. In the Full Name column, enter the longer, more descriptive names of the operator.
Full names have no limitation in length. If you select this table as the reference person table, Thermo-Collector will replace the abbreviated names with the corresponding full names based on this table when receiving measured data from a TM20.

4. Add and insert rows as necessary.
You can insert and add rows by either of the following ways:
• Using a shortcut menu that opens by a right-click
• Using keystrokes of CTRL+I and CTRL+R

5. Click the Abbr. name cell of the next row and set.
Enter the abbreviated and full names again.

6. Save the table.
From the File menu, choose Person Table then Save As to save the table.

- End of procedure -

Preparing for
Measurement

● Creating a person setup file to be downloaded to a TM20

From a person table, select settings to create a person setup file to be downloaded to a TM20.

1. **In the Person Table window, double-click to select the cell No. of an entry which is to be downloaded to the TM20.**
The row of the selected entry then appears highlighted in yellow. To clear the selection, double-click it again.

2. **From the File menu, choose Setup Persons then New to open the Setup Persons window of a blank setup file.**

3. **Click [icon] . The selected operator name entry is then copied to the Setup Persons window.**

<div align="right">

- End of procedure -

</div>
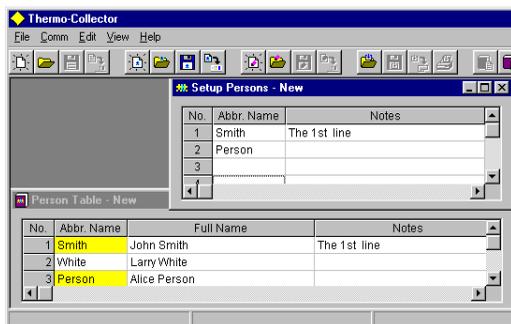
● Selecting the reference person table which should be used to replace abbreviated names with full names

1. **From the File menu, choose Person Table then Select Reference Table.**
Then, select the reference table in the dialog box that appears.

When receiving a batch of measured data from a TM20, Thermo-Collector searches through the Abbr. Name column in the specified reference file of person table for names that match the operator names of the received data. If a matching name is found, Thermo-Collector fetches the full name corresponding to the abbreviated name from the reference table, and stores the full name in the Excel worksheet file in place of the abbreviated name.

Once the reference table is selected, its filename is displayed in the lower-middle part of the window and the aforementioned automatic name replacement will take place.

[TIP]

- The person table can be saved by choosing Person Table then Save As from the File menu.
- Of course, you can directly set entries in a setup file instead of copying settings from a person table.

■ Setting comments

Comments for recording in a TM20 can be set. Up to 32 previously set comments can be stored in the memory of a TM20 together with each measured value. For example, setting a comment describing the action taken when the result of measurement is no good, such as "Re-measure" or "Discard," records the action that was performed consequently.

● Setting comments in a new comment table

1. From the File menu, choose Comment Table, then New.

A document window titled "Comment Table," as shown below, then opens.

Comment Table window

2. Enter comments.

Abbreviated comments can be up to eight characters long, whereas there is no limit to the number of characters for full names. Set a descriptive comment for each full name. When uploading measured data from a TM20 to the PC, the abbreviated comments are replaced with the corresponding full names.

Rows can be added and inserted using commands on the shortcut menu which opens by a right-click, or by using the keystrokes CTRL+R and CTRL+I.

3. Save the comment table.

To save the table of comments you set, click "File" and choose "Comment Table" then "Save As".

- End of procedure -

● **Creating a comment setting file**

Select a comment from a comment table and write (download) it to the connected TM20.

1. **In the Comment Table window, double-click to select the comment to be set in the TM20.**

The row of the selected comment setting then appears highlighted in yellow. To clear the selection, double-click it again.

2. **Then, click [icon]. The selected comment is then copied to the Setup Comments window.**

- End of procedure -

● **Selecting a reference table for replacing abbreviated comments with full comments**

1. **From the File menu, choose Comment Table then Select Reference Table.**

Selecting the reference comment table enables the following automatic replacement.

When importing a batch of measured data from the TM20 into an Excel worksheet file, Thermo-Collector searches through the Abbr. Comment column in the specified comment list file for those that match the comments in the received data. If it is found, Thermo-Collector fetches the full comment corresponding to the abbreviated comment from the list, and stores that full comment in the Excel worksheet file instead of the abbreviated comment.

Once the reference comment list file is selected, its filename is displayed in the lower left of the window.

- End of procedure -

● **Downloading comments to TM20**

To load the comments which have been set, click [icon].

3.5 Setups required to use the logging function (setting the log name, input channel, measurement interval, and measurement period)

Settings relating to the logging function must be made here.

A convenient way to do so is to create a table of tags and logs, namely, a tag/log table. Once you create a tag/log table and set it to the reference table, Thermo-Collector automatically replaces abbreviated tag names* with more descriptive full names** when receiving the measured data from a TM20.

* Abbreviated names are 8-digit names that can be displayed on the TM20 screen.

** Full names can be displayed on the PC screen without any limitation in length.

■ Setup contents

● Log name

Put a title to each log. A log name can consist of a maximum of eight alphanumeric characters.

● Input channel

Thermo-Collector has multiple input channels and probes for measuring temperatures of substances in a vapor, solid, or liquid phase. Since the probe to be used depends on the measuring object, it is necessary to set the available input channel on a tag in advance.

The following table shows the probe types and their corresponding input channels.

Probe type	Input channel
Thermocouple types K, J, E, and T ±100 mV or ±1 V voltage output sensor (See TIP below.)	A, B

[TIP]

To plug a voltage output sensor into channel A or B, use a U-shaped omega connector.

● Measurement interval

Set an interval at which the temperature is periodically measured. The interval can be set to between 1 second to 24 hours.

● Measurement period

Set a period through which the temperature is measured continuously. The period can be set to between 1 second to 999 days.

Preparing for
Measurement

■ Setting logs

● Make settings using a tag/log table

A variety of tag settings can be set beforehand in a table, and from the table, you can select settings to be downloaded to a TM20 as appropriate.

1. Run Thermo-Collector.
After the Thermo-Collector main window opens, a document window entitled "Setup Tag/Logs - New" opens in it.

2. From the File menu, choose Tag/Log Table then New to open the Tag/Log Table window (a document window).
Tag/Log Table window
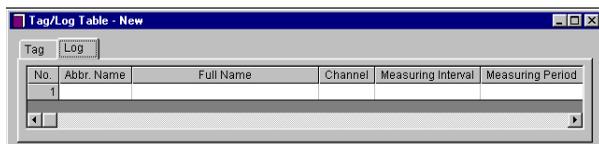
3. Enter the log names in the Abbr. Name column with a maximum of eight alphanumeric characters (for example, Convey).

4. In the Full Name column, enter more descriptive tag names.
There is no limitation in length with full names. If you select this table as the reference tag/log table, Thermo-Collector will replace the abbreviated names with the corresponding full names based on this table when receiving measured data from a TM20.

5. Double-click in the "Channel" column.
The specified log name is set and the pull-down menu appears.
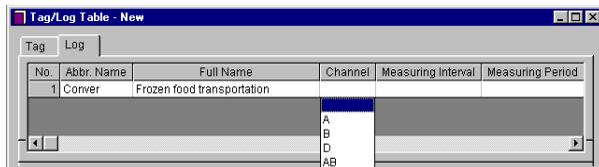
6. Select either A, B, D, or AB.
The specified channel is set.

7. Click in the "Measuring interval" column.
The cursor moves to a cell for the measurement interval.
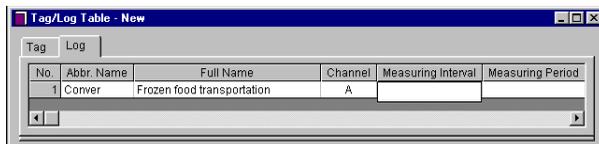
8. Enter the measurement interval with numeric characters and colons ":" (Example: 00:10:00).

[TIP]

Use numeric characters and colons to enter a measurement interval. The input range is: hh < 25, mm < 60, and ss < 60, where "hh" denotes hours, "mm" denotes minutes, and "ss" denotes seconds.
All the interval data must be eight characters or less (i.e. "hh:mm:ss". h, m, and s are optional numeric characters).

The specified measurement interval has been set.

9. Click in the "Measuring period" column.

Enter the measurement period with numeric characters, a backslash, and colons (Example: 003/20:30:00).

[TIP]

Use numeric characters, a backslash, and colons to enter a measurement period. The input range is: ddd < 1000, hh < 24, mm < 60, and ss < 60, where "ddd" denotes the number of days, "hh" denotes hours, "mm" denotes minutes, and "ss" denotes seconds.
All the period data must be twelve characters or less (i.e. "ddd:hh:mm:ss". d, h, m, and s are optional numeric characters).

The specified measurement period has been set.

You can insert and add rows by either of the following ways:

•   Using a shortcut menu that opens by a right-click

•   Using keystrokes of CTRL+I and CTRL+R

10. Save the table.
From the "File" menu, choose "Tag/Log Table" then "Save As" to save the table.

-End of procedure-

Preparing for
Measurement

3.6 Downloading the setup data to the main unit

If the setup operation for the personal computer has been completed, download the setup data of the tag, log, and operator name to the main unit.
Tag setup data and log setup data is downloaded in a batch and as one file. The operator data is downloaded separately.

⚠ NOTE

If the setup data is downloaded to the main unit, the setup data and measurement data that existed in the main unit before download is deleted.

■ Preparation for downloading

1. **Confirm that the power to the personal computer and main unit is OFF.**

2. **Connect the personal computer and main unit with the supplied cable.**

See Also
For how to connect the personal computer and main unit, refer to "■ Connecting the personal computer and main unit" in Section 3.1.

3. **Turn on the power of the main unit.**

See Also
For how to turn on the power to the main unit, refer to Chapter 4, "Turn ON/OFF of the Power Supply" in the "Before Use" part.

4. **Turn on the power of the personal computer.**
Now it is ready for downloading.

-End of procedure-

■ Downloading the tag and log setup data to the personal computer

1. **Initiate Thermo-Collector software.**
After the main screen of Thermo-Collector software has been displayed, the "Setup Tags/Logs - New" screen is displayed.

2. **Load a file in which the tag and log setup data is stored.**

See Also
For how to load a file containing tag and log data, refer to "■ Loading a file containing the setup data" in Section 3.2.
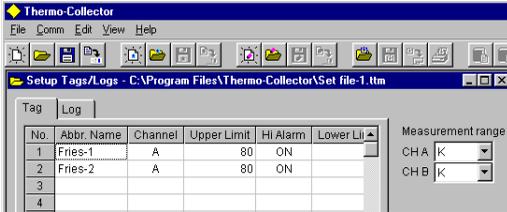
3. **Select "Send" in the "Setup Tags/Logs" submenu accessed from the "File" menu.**
The confirmation dialog box appears.
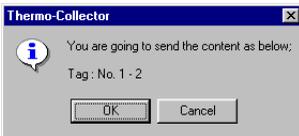
4. **Click on the [OK] button.**
A dialog box indicating the progress of data downloading is displayed. At the same time, "Communicating ..." is displayed on the main unit.

After the downloading of the tag and log setup data has been completed, the screen indicating the progress of data downloading and the screen displaying the "Communicating ..." message on the main unit disappears.

-End of procedure-

Preparing for
Measurement

■ Downloading the measurement operator name data

1. **Load a file in which the operator name to be downloaded is stored.**
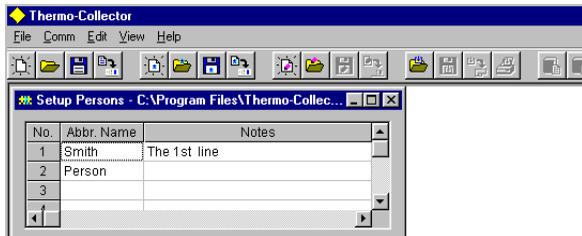
See Also

For how to load a file containing operator names, refer to "■ Loading a file containing the setup data" in Section 3.2.

2. **Select "Send" in the "Setup Persons" menu accessed from the "File" menu.**

A dialog box indicating the progress of downloading is displayed.
At the same time, "Communicating ..." is displayed on the main unit.

After the downloading of the operator data has been completed, the screen indicating the progress of data downloading and the screen displaying the "Communicating..." message on the main unit disappears.

-End of procedure-

■ Downloading comment settings

1. **Open the comment setting file you want to download.**
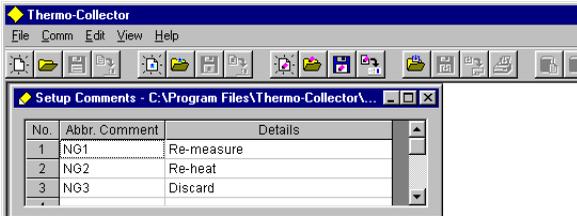
2. **From the File menu, choose Setup Comments then Send.**
The dialog box appears and informs you that Thermo-Collector is downloading the settings. At the same time, the "Communicating..." message appears on the TM20's LCD.

- End of procedure -

Preparing for Measurement

4 Setting Up with the Main Unit

4.1 Setups required to use collector function (setting tag names, alarms, name of person, and comment, and selecting input channel(s))

Before using the collector function, the following tag setups must be made.

■ Setup contents

See Also

For information about each setup item, refer to Section 3.4, "Setups required to use collector function (settintg tag names, alarms, name of person, and comment, and selecting input channel(s))".

- **Tag name**
- **Input channel**
- **Alarm**
- **Operator name**
- **Comment**

■ Creating a new tag

Create new tags for recording the measurement data.

Home screen

```
INPUT  ⬍
L A
      18:54:27
      25.9°C
```

1. **Press the [FUNC], [1], and [3] keys, in order.**
The "Tag Ins" screen appears.

```
INPUT  ⬍
L A
      F13
      Tag  Ins
```

2. **Press the [SET] key.**
A screen for selecting the tag name appears.

```
INPUT  ▼
L A
      Burger
              0
```

[TIP]

If no tag has been created in the main unit, [NewTag] is displayed on the screen.

3. **Press the [▼] key repeatedly until [NewTag] is displayed on the screen.**

```
INPUT  ▲
L A
      [NewTag]
              0
```

4. **Use the [CH] key to select the input channel.**
The input channel of the [INPUT] gage changes.

```
INPUT  ▲
L A
L B
      [NewTag]
              0
```

[TIP]

Select "A" and "B" at the two-channel simultaneous measurement.

5. **Press the [SET] key.**
A screen for entering a new tag name appears.

```
INPUT        〉
L A
L B
      [NewTag]
```

[TIP]

If a new tag is created while [NewTag] is displayed, the created tag is added to the end of the list. If the [SET] key is pressed while [NewTag] is not displayed, the created tag is inserted immediately before the selected tag.

6. **Enter the tag name.**

```
INPUT        〈 〉
Ⅰ-A
Ⅰ-B  Convey
    [NewTag]
```

[TIP]

A tag name can consist of a maximum of eight alphanumeric characters.

See Also

For information about entering a character or number, refer to Chapter 6, "How to Input Characters" in the " Before Use" part.

7. **Press the [SET] key.**
A screen asks you to confirm the setting.

```
INPUT
Ⅰ-A
Ⅰ-B  Insert?
    Yes1/No0
```
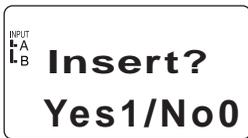
8. **Press the [1] key.**
A new tag is created.

```
INPUT        ⬍
Ⅰ-A
Ⅰ-B  Convey
           0
```

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

■ **Setting the alarm function for each tag**

The alarm function can be set according to different tag conditions, or the same alarm function can be set for all tags.

The following procedure is used to set the alarm function for different conditions.

See Also

To set the same alarm function for all tags, proceed to "■ Batch-setting the alarm function".

Home screen

```
INPUT        ⬍
Ⅰ-B  18:54:27
        25.9°C
```

1. **Press the [FUNC], [7], and [2] keys, in order.**
The "1File" screen appears on the LCD.

```
INPUT        ⬍
Ⅰ-B  F72
    1 F i l e
```

2. **Press the [SET] key.**
A screen for selecting a tag name appears.

```
INPUT        ▼
Ⅰ-B  Convey
           0
```

3. **Press the [▼] key repeatedly until the desired tag name number is called up.**

4. **Press the [SET] key.**
A screen for setting the "Hi Alarm" function ON/OFF appears.

```
INPUT        ⬍
Ⅰ-B  Hi  Alarm
          ON
```

Preparing for Measurement
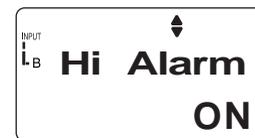
5. Use either the [▼] or [▲] key to set the upper-limit temperature alarm function ON/OFF.

6. If ON has been selected, press the [SET] key.

The "Hi Alarm" setting screen appears.
If OFF has been selected in step 5, this screen will not appear. In this case proceed to step 8.

INPUT
L̇B **Hi Alarm**
0000.0°C

7. Enter the upper-limit temperature.

INPUT
L̇B **Hi Alarm**
0020.0°C

[TIP]

To set a negative value, press either the [▼] or [▲] key. "0" on the screen will change to a "-" symbol.

8. Press the [SET] key.

The specified upper-limit temperature is set and the screen for setting the "Lo Alarm" function ON/OFF appears.

INPUT
L̇B **Lo Alarm**
ON

9. Use either the [▼] or [▲] key to set the lower-limit temperature alarm function ON/OFF.

10. If "ON" has been selected, press the [SET] key.

The "Lo Alarm" setting screen appears.
If "OFF" has been selected in step 9, this screen will not appear. In this case proceed to step 12.

INPUT
L̇B **Lo Alarm**
0000.0°C

11. Enter the lower-limit temperature.

INPUT
L̇B **Lo Alarm**
0020.0°C

[TIP]

To set a negative value, press either the [▼] or [▲] key. "0" on the screen will change to a "-" symbol.

12. Press the [SET] key.

The specified lower-limit temperature is set and the "Turn" screen appears.

INPUT
L̇B **Turn**
OFF
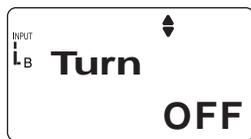
13. Use either the [▼] or [▲] key to select whether the operation of the alarm function is to be inverted. If ON is selected, the alarm function will operate under the inverse conditions.

14. Press the [SET] key.

The range in which the alarm sounds is displayed. Then, the screen asks you to confirm the setting.

INPUT
L̇B **Change?**
Yes1/No0

15. Press the [1] key.

The alarm function is set for each tag.

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

■ Batch-setting the alarm function

The following procedure is used to set the same alarm function for all tags.

Home screen

```
INPUT        ⬍
Ḷʙ  18:54:27
        25.9°C
```

1. Press the [FUNC], [7], and [1] keys, in order.

The "All File" screen appears on the LCD.

```
INPUT        ⬍
Ḷʙ  F71
    A l l   F i l e
```

2. Press the [SET] key.

A screen for setting the "Hi Alarm" function ON/OFF appears.

```
INPUT        ⬍
Ḷʙ  Hi  Alarm
            ON
```
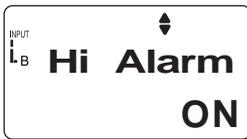
3. Use either the [▼] or [▲] key to set the upper-limit temperature alarm function ON/OFF.

4. If ON has been selected, press the [SET] key.

The "Hi Alarm" setting screen appears.
If OFF has been selected in step 3, this screen will not appear. In this case proceed to step 6.

```
INPUT        ⬍〉
Ḷʙ  Hi  Alarm
    0000.0°C
```

5. Enter the upper-limit temperature.

```
INPUT       〈⬍
Ḷʙ  Hi  Alarm
    0020.0°C
```

[TIP]

To set a negative value, press either the [▼] or [▲] key. "0" on the screen will change to a "-" symbol.

6. Press the [SET] key.

The specified upper-limit temperature is set and the screen of selecting ON/OFF of the "Lo Alarm" function appears.

```
INPUT        ⬍
Ḷʙ  Lo Alarm
            ON
```

7. Use either the [▼] or [▲] key to select ON/OFF of the lower-limit temperature alarm function.

8. When ON has been selected, press the [SET] key.

The "Lo Alarm" setting screen appears.

If OFF has been selected in step 7, this screen will not appear. In this case proceed to step 10.

```
INPUT        ⬍〉
Ḷʙ  Lo Alarm
    0000.0°C
```

9. **Enter the lower-limit temperature.**

```
        ⟨⇕⟩
INPUT
L B   Lo Alarm
      0020.0°C
```

[TIP]

In order to set a negative value, press either the [▼] or [▲] key. "0" on the screen will change to a "-" symbol.

10. **Press the [SET] key.**

The specified lower-limit temperature is set and the "Turn" screen appears.

```
           ⇕
INPUT
L B   Turn
              OFF
```
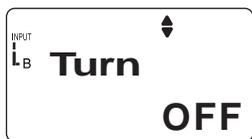
11. **Use either the [▼] or [▲] key to select whether the operation of the alarm function is to be inverted. If ON is selected, the alarm function will operate under the inverse condition.**

12. **Press the [SET] key.**

The range in which the alarm sounds is displayed. Then, the screen asks you to confirm the setting.

```
           ⇕
INPUT
L B   Change?
      Yes1/No0
```

13. **Press the [1] key.**

The range in which the alarm function is active is set for all tags as a batch.

Press the [ESC] key repeatedly to return to the Home screen.

[TIP]

If another alarm function is batch-set for all tags after one alarm function has been batch-set, only the latest one is effective.

-End of procedure-

■ Registering the measurement operator name

Home screen

```
           ⇕
INPUT
L B   18:54:27
      25.9°C
```

1. **Press the [FUNC], [8], and [3] keys, in order.**

```
           ⇕
INPUT
L B   F83
      Entry
```

2. **Press the [SET] key.**

A screen for registering an operator name appears.

```
           ⇕
INPUT
L B              1
      Smith
```

3. **Press the [▼] key repeatedly until the desired operator name number is called up.**

```
           ⇕
INPUT
L B              2
```

[TIP]

Up to 10 operators, which are serially numbered, can be set in a TM20.

See Also

For how to enter letters and numbers, refer to Chapter 6, "How to Input Characters" in the "Before Use" part.

4. **Press the [SET] key.**

5. **Enter the operator name with a maximum of eight characters.**
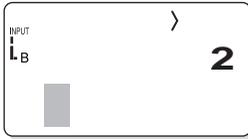
> INPUT
> I͟.B ⟩
> 2

See Also

For how to enter a character or number, refer to Chapter 6, "How to Input Characters" in the "Before Use" part.

6. **Press the [SET] key.**
The screen for confirming the settings appears.

> INPUT
> I͟.B Entry?
> Yes1/No0
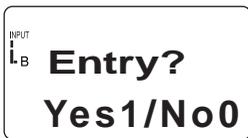
7. **Press the [1] key.**
The specified operator name has been set.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

■ Setting comments

Home screen

> INPUT
> I͟.B ⬍
> 18:54:27
> 25.9°C

1. **Press the [FUNC], [0], and [2] keys in order.**

> INPUT
> I͟.B ⬍
> F02
> Comment

2. **Press the [SET] key.**
A screen for setting comments then appears.

> INPUT
> I͟.B ⬍
> 1
> Discard

3. **Press the [▼] key repeatedly until the desired comment number is called up.**

> INPUT
> I͟.B ⬍
> 2

[TIP]

Up to 32 comments, which are serially numbered, can be set in a TM20.

See Also

For how to enter letters and numbers, refer to Chapter 6, "How to Input Characters," in the "Before Use" part.

4. **Press the [SET] key.**

5. **Enter a comment of up to 8 characters.**

> INPUT
> I͟.B ⟩
> 2

6. **Press the [SET] key.**
The screen asks you to confirm the setting.

> INPUT
> I͟.B Entry?
> Yes1/No0
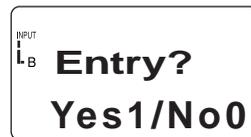
7. **Press the [1] key.**
The comment is then set.

Press the [ESC] key repeatedly to return to the home screen.

- End of procedure -

4.2 Setups required to use the logging function (setting the log name, input channel, measurement interval, and measurement period)

Before using the logging function, it is necessary to make logs settings.

■ Setup contents

See Also

For more information about each setup item, refer to Section 3.2, "Setups required to use the log (Setting the log name, input channel, measurment interval, and measurement period)"

- **Log name**
- **Input channel**
- **Measurement Interval**
- **Measurement period**

■ Operation procedure

Home screen

INPUT
A

18:54:27

25.9°C

1. **Press the [FUNC], [2], and [3] keys, in order.**
The "Log Ins" screen appears on the LCD.

INPUT
A

F23

Log Ins

2. **Press the [SET] key.**
A screen for selecting the log name appears.

INPUT
A

Accept1

0
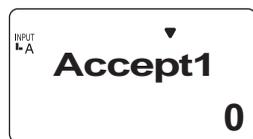
[TIP]

If no log has been created in the main unit, [NewLog] is displayed on the screen.

3. **Press the [▼] key repeatedly until [NewLog] appears on the screen.**

INPUT
A

[NewLog]

0

4. **Use the [CH] key to select the input channel.**
The channel indication below "INPUT" changes accordingly.

INPUT
A
B

[NewLog]

0

[TIP]

Select "A" and "B" at the two-channel simultaneous measurement.

5. **Press the [SET] key.**
A screen for entering a new log name appears.

INPUT
A
B

[NewLog]

[TIP]

If a new log is created while [NewLog] is displayed, the created log is added to the end of the list. If the [SET] key is pressed while [NewLog] is not displayed, the created log is inserted immediately before the selected log.

6. **Enter the log name.**

INPUT
A
B

Accept2

[NewLog]

[TIP]

A log name can consist of a maximum of eight alphanumeric characters.

See Also

For how to enter letters and numbers, refer to Chapter 6, "How to Input Characters" in the "Before Use" part.

7. **Press the [SET] key.**

A screen for setting the measurement interval appears.

```
INPUT        〉
L A
L B    Interval
       00:00:10
```

8. **Enter the hour, minute, and seconds.**

```
INPUT        〈
L A
L B    Interval
       01:15:30
```
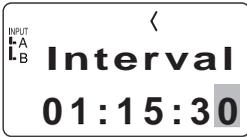
[TIP]

• Set "2 seconds" or more as measurement interval at the two-channel simultaneous measurement.

• The definition and range of each input value is given below.

```
00:00:00
         └── Indicates the seconds.
             The input range is between 0
             and 59 seconds
          ── Indicates the minutes.
             The input range is between 0
             and 59 minutes
          ── Indicates the hours.
             The input range is between 0
             and 24 hours.
```
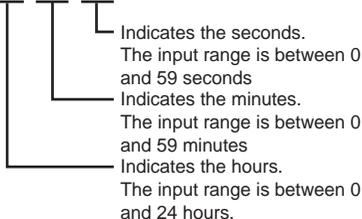
9. **Press the [SET] key.**

The specified measurement interval is set and the screen for setting the measurement period (select the number of days from the options, which also includes the number of hours, minutes, and seconds) is displayed.

```
INPUT        〉
L A
L B    ProdDay
          002
```

10. **Enter the number of days.**

11. **Press the [SET] key.**

The screen for setting the measurement period (select the number of hours, minutes and seconds from the options, which also includes the number of days) is displayed.

```
INPUT        〉
L A
L B    ProdTime
       00:00:00
```

12. **Enter the number of hours, minutes, and seconds.**

```
INPUT        〈
L A
L B    ProdTime
       01:30:00
```

[TIP]

The definition and range of each input value are given below.

```
00:00:00
         └── Indicates the seconds.
             The input range is between 0
             and 59 seconds
          ── Indicates the minutes.
             The input range is between 0
             and 59 minutes
          ── Indicates the hours.
             The input range is between 0
             and 23 hours.
```
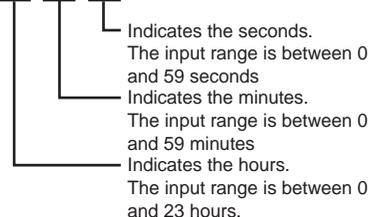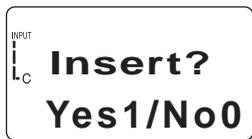
13. **Press the [SET] key.**
The screen for confirming the settings appears.

INPUT
L_C
Insert?
Yes1/No0

14. **Press the [1] key.**
The specified measurement period has been set.

INPUT
L_B^A
Accept2
0

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5 Confirm, Modify, Clear, or Delete the Data with the Main Unit

5.1 Confirming the number of pieces of tag data

This section explains the procedure for confirming the number of pieces of tag data.

Home screen

```
INPUT         ↕
 A
      18:54:27
          25.9°C
```

1. Press the [FUNC], [1], and [1] keys, in order.
The "Curr Tag" screen appears on the LCD.

```
INPUT         ↕
 A
    F11
      Curr Tag
```

2. Press the [SET] key.

```
INPUT         ▼
 A
      Burger
               12
```

3. Press the [▼] key repeatedly until the tag to be confirmed is displayed on the screen.
The tag name and the measurement data recorded in association with the tag is displayed.

```
INPUT         ↕
 A
      Beef
                5
```

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.2 Modifying the tag name

This section explains the procedure for modifying the tag name.

Home screen

```
INPUT         ↕
 A
      18:54:27
          25.9°C
```

1. Press the [FUNC], [1], and [2] keys, in order.
The "TagChnge" screen appears on the LCD.

```
INPUT         ↕
 A
    F12
      TagChnge
```

2. Press the [SET] key.

```
INPUT         ▼
 A
      Burger
               12
```

3. Press the [▼] key repeatedly until the tag to be modified is displayed on the screen.

```
INPUT
 A
      Beef
                5
```

4. Use the [CH] key to select the input channel.
The channel indication below "INPUT" changes accordingly.

Preparing for
Measurement

5. **Press the [SET] key.**

INPUT
A ⟩

Beef

5

6. **Enter a new tag name to be modified.**

INPUT
A ⟨ ⟩

Pork

5

[TIP]

A tag name that has not been modified is displayed. If it needs to be modified, overwrite it with a new tag name.

See Also

For how to enter letters and numbers, refer to Chapter 6, "How to Input Characters" in the "Before Use" part.

7. **Press the [SET] key.**
The confirmation dialog box appears.

INPUT
A

Change?

Yes1/No0

8. **Press the [1] key.**
The tag name after modification is displayed.

INPUT
A ↕

Pork

5

The tag name has been modified.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.3 Clearing the measurement data associated with the tag

This section explains the procedure used to clear the measurement data obtained with the collector function. However, the setup data (tag name) will not be cleared.

Home screen

INPUT
A ↕

18:54:27

25.9°C

1. **Press the [FUNC], [4], and [1] keys, in order.**
The "1TagFile" screen appears on the LCD.

INPUT
A ↕

F41

1 T a g F i l e

2. **Press the [SET] key.**

INPUT
A ▼

Burger

12

3. **Press the [▼] key repeatedly until a tag with measurement data that is to be cleared is displayed on the screen.**

INPUT
A ↕

Chicken

27

4. **Press the [SET] key.**
The confirmation dialog box appears.

INPUT
A

TagClr?

Yes1/No0

5. **Press the [1] key.**

INPUT
L A

Chicken

0

All the measurement data of the selected tag is cleared.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.4 Deleting the tag

This section explains the procedure used to delete the tag from the main unit.

⚠ Note

**Before deleting the tag, save the measurement data associated with the tag to a personal computer, etc.
Once the tag has been deleted, all the measurement data associated with the tag is completely lost.**

See Also
For how to save the measurement data, refer to Chapter 1, "Receiving the Data on the Personal Computer" in the "Working with Measurement Data" part.

Home screen

INPUT
L A

18:54:27

25.9°C

1. **Press the [FUNC], [1], and [4] keys, in order.**
The "Tag Del" screen appears on the LCD.

INPUT
L A

F14

Tag Del

2. **Press the [SET] key.**

INPUT
L A

Burger

12

3. **Press the [▼] key repeatedly until the tag to be deleted is displayed on the screen.**

INPUT
L A

Chicken

0

4. **Press the [SET] key.**
The confirmation dialog box appears.

INPUT
L A

Delete?

Yes1/No0

5. **Press the [1] key.**
The selected tag and its associated measurement data is deleted.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

Preparing for
Measurement

5.5 Confirming the log setup data

This section explains the procedure used to confirm the log setup data.

Home screen

```
INPUT
L A        ⬍
    18:54:27
       25.9°C
```

1. **Press the [FUNC], [2], and [1] keys, in order.**
The "Curr Log" screen appears on the LCD.

```
INPUT
L A        ⬍
    F21
    Curr  Log
```

2. **Press the [SET] key.**

```
INPUT
L A        ▼
    Convey
           12
```

3. **Press the [▼] key repeatedly until the log to be confirmed is displayed on the screen.**

```
INPUT
L A        ⬍
    Accept
           0
```

4. **Press the [SET] key.**
The current interval is displayed.

```
INPUT
L A
    Interval
    00:00:10
```

5. **Press the [SET] key.**
The current period (the number of days selected from the options, including also the number of hours, minutes, and seconds) is displayed.

```
INPUT
L A
    ProdDay
            2
```

6. **Press the [SET] key.**
The current period (the number of hours, minutes, and seconds from the options including also the number of days) is displayed.

```
INPUT
L A
    ProdTime
    00:00:30
```

[TIP]

If the [SET] key is pressed, the screen used to confirm the interval set in step 4 is restored.

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.6 Modifying the log name and setup data (measurement interval and period)

This section explains the procedure used to modify the log name, measurement interval, and measurement period.

Home screen

```
INPUT
L A        ⬍
    18:54:27
       25.9°C
```

1. **Press the [FUNC], [2], and [2] keys, in order.**
The "LogChnge" screen appears on the LCD.

```
INPUT      ↕
 A
     F22
  LogChnge
```

2. **Press the [SET] key.**
A screen for selecting a log is displayed.

```
INPUT      ▼
 A
   Convey
            12
```

3. **Press the [▼] key repeatedly until the log to be modified is displayed on the screen.**

```
INPUT      ↕
 A
   Accept
             0
```

4. **Use the [CH] key to select the input channel.**
The input channel of the [INPUT] gage is modified.

5. **Press the [SET] key.**
A screen for modifying the log name is displayed.

```
INPUT        ⟩
 B
   Accept
             0
```
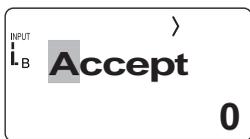
6. **Enter a new log name to be modified.**

```
INPUT     ⟨ ⟩
 B
   Carry
             0
```

[TIP]

• A log name can consist of a maximum of eight alphanumeric characters.
• A tag name that has not been modified is displayed on the screen. If it needs to be modified, overwrite it with a new tag name.

See Also
For how to enter letters and numbers, refer to Chapter 6, "How to Input Characters" in the "Before Use" part.

7. **Press the [SET] key.**
A screen for modifying the measurement interval appears.

```
INPUT         ⟩
 B
   Interval
   00:00:10
```

8. **Enter the hours, minutes, and seconds.**

```
INPUT        ⟨
 B
   Interval
   00:00:30
```

[TIP]

The definition and range of each input value is given below.

00:00:00
Indicates the seconds.
The input range is between 0 and 59 seconds
Indicates the minutes.
The input range is between 0 and 59 minutes
Indicates the hours.
The input range is between 0 and 24 hours.

Preparing for
Measurement

9. Press the [SET] key.

The measurement interval is modified and a screen for modifying the measurement period (the number of days from the options, which also includes the number of hours, minutes, and seconds) is displayed.

```
INPUT
└A                    〉

       ProdDay

             000
```

10. Enter the number of days.

[TIP]

Between 0 and 999 days can be inputted.

11. Press the [SET] key.

A screen for modifying the measurement period (the number of hours, minutes, and seconds from the options, which also includes the number of days) is displayed.

```
INPUT
└A                    〉

       ProdTime

       00:00:30
```

12. Enter the number of hours, minutes, and seconds.

```
INPUT
└A                  〈

       ProdTime

       00:00:45
```

[TIP]

The definition and range of each input value is given below.

00:00:00
└ Indicates the seconds.
The input range is between 0 and 59 seconds
Indicates the minutes.
The input range is between 0 and 59 minutes
Indicates the hours.
The input range is between 0 and 23 hours.

13. Press the [SET] key.

The confirmation dialog box appears.

```
INPUT
└A

       Change?

       Yes1/No0
```
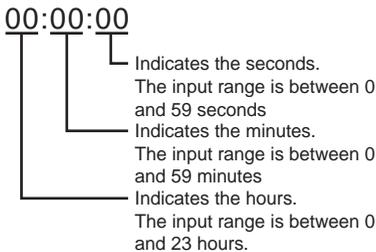
14. Press the [1] key.

The measurement period has been set.

```
INPUT
└A                  ↕

       Carry

                    0
```

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.7 Clearing the measurement data associated with the log

This section explains the procedure for clearing the measurement data obtained with the logging function. However, the setup data (log name, measurement interval, and measurement period) will not be cleared.

Home screen

```
INPUT         ♦
L A
     18:54:27
          25.9°C
```

1. **Press the [FUNC], [4], and [2] keys, in order.**
The "1LogFile" screen appears on the LCD.

```
INPUT         ♦
L A
     F42
     1 L o g F i l e
```

2. **Press the [SET] key.**

```
INPUT         ▼
L A
     Convey
             1 2
```

3. **Press the [▼] key repeatedly until a log with measurement data that is to be cleared is displayed on the screen.**

```
INPUT         ♦
L A
     Accept
             3
```

4. **Press the [SET] key.**
The confirmation dialog box appears.

```
INPUT
L A
     LogClr?
     Yes1/No0
```

5. **Press the [1] key.**

```
INPUT         ♦
L A
     Accept
             0
```

All the measurement data of the selected log is cleared.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.8 Deleting the log

This section explains the procedure used to delete the log from the main unit.

⚠ Note

Before deleting the log, save the measurement data associated with the log to a personal computer, etc.
If the log has already been deleted, all the measurement data associated with the log is completely lost.

See Also

For how to save the measurement data, refer to Chapter 1, "Receiving the Data on the Personal Computer" in the "Working with Measurement Data" part.

Home screen

```
INPUT         ♦
L A
     18:54:27
          25.9°C
```

Preparing for
Measurement

1. **Press the [FUNC], [2], and [4] keys, in order.**
The "Log Del" screen appears on the LCD.

```
INPUT
L A          ↕
    F24

    Log  Del
```

2. **Press the [SET] key.**

```
INPUT
L A          ▼
    Convey

             12
```

3. **Press the [▼] key repeatedly until the log to be deleted is displayed on the screen.**

```
INPUT
L A          ↕
    Accept

              0
```

4. **Press the [SET] key.**
The confirmation dialog box appears.

```
INPUT
L A
    Delete?

    Yes1/No0
```

5. **Press the [1] key.**
The selected log and its associated measurement data is deleted.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.9 Batch-clearing the measurement data associated with both the tag and log

This section explains the procedure used to clear all the measurement data associated with both the tag and log. However, note that the setup data will not be cleared.

Home screen

```
INPUT
L A          ↕
    18:54:27

    25.9°C
```

1. **Press the [FUNC], [4], and [4] keys, in order.**
The "All File" screen appears on the LCD.

```
INPUT
L A          ↕
    F44

    All  File
```

2. **Press the [SET] key.**

```
INPUT
L A
    DataClr?

    Yes1/No0
```

3. **Press the [1] key.**
All the measurement data recorded in the main unit is cleared.
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.10 Initializing the main unit

This section explains the procedure used to initialize the main unit.

> ⚠ **Note**
>
> **Before initializing the main unit, it is recommended to save the setup data and measurement data in the main unit to a personal computer, etc.**
> **When the main unit is initialized, all the setup data and measurement data recorded in the main unit is lost. However, the instrument name, chime setup, and time setup data will not be erased.**

See Also

For how to save the measurement data, refer to Chapter 1, "Receiving the Data on the Personal Computer" in the "Working with Measurement Data" part.

Home screen

```
INPUT        ⬍
L A
        18:54:27
            25.9°C
```

1. **Press the [FUNC], [0], and [1] keys, in order.**
The "Initial" screen appears on the LCD.

```
INPUT        ⬍
L A
        F01
        I n i t i a l
```

2. **Press the [SET] key.**

```
INPUT
L A
        I n i t i a l ?
        Yes1/No0
```

3. **Press the [1] key.**
The initialization process begins.

```
INPUT
L A
        I n i t i a - -
        ▢▢▢
```

In two minutes, all the data set in the main unit is erased and the "Initial" screen is restored,
Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.11 Confirming the current operator name

This section explains the procedure used to confirm the operator name currently set.

Home screen

```
INPUT        ⬍
L A
        18:54:27
            25.9°C
```

1. **Press the [FUNC], [8], and [1] keys, in order.**
The "CurrData" screen appears on the LCD.

```
INPUT        ⬍
L A
        F81
        C u r r D a t a
```

2. **Press the [SET] key.**
The operator name currently set is displayed.

```
INPUT        ⬍
L A
                    1
        S m i t h
```

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

5.12 Modifying the operator

This section explains the procedure used to switch the currently set operator.

Home screen

```
INPUT        ↕
 A
       18:54:27
           25.9°C
```

1. **Press the [FUNC], [8], and [2] keys, in order.**

The "Change" screen appears on the LCD.

```
INPUT        ↕
 A
     F82

     Change
```

2. **Press the [SET] key.**

A screen for modifying the operator is displayed.

```
INPUT        ↕
 A
                  1

     Smith
```

3. **Press the [▼] key repeatedly until the operator to be modified is displayed on the screen.**

Operator names assigned to numbers between 1 and 10 is sequentially displayed.

```
INPUT        ↕
 A
                  2

     White
```

4. **Press the [SET] key.**

The operator set on the main unit is changed.

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

1 Input Channel and Probe

When measuring temperatures with Thermo-Collector, it is necessary to use an appropriate input channel and probe. By combining these items in different ways, it is possible to measure the temperature of various objects. The temperature of the surface and center of a solid, and various types of liquids can be measured. Thermocouple (Type K, J, E, T) or Output voltage ($\pm$100mV/$\pm$1V) can be plugged into channels A and B.
The measured values of channels A and B can be recorded simultaneously.

Input channel A, B	Thermocouple Type: K
Type	Model
Standard sheathed probe for liquid	90020
Fast-response sheathed probe for liquid	90021
Long sheathed probe for liquid	90022
Fast-response injection-needle sheathed probe	90023
Standard injection-needle sheathed probe	90024
Standard surface-temperature straight probe	90030
Standard surface-temperature angle probe	90031
High-surface-temperature straight probe	90032
High-surface-temperature angle probe	90033
Bead TC	245907

⚠ Warning

Do not point the tip of a needle-type thermo probe towards somebody. The needle tip is very sharp and can cause injury.

⚠ Caution

- Handle the needle-type thermo probe carefully so that its stylus is only put into the intended measuring object.
- Do not use this instrument in a location where it may be splashed or dropped in water, otherwise it may malfunction.

Measuring Temperatures
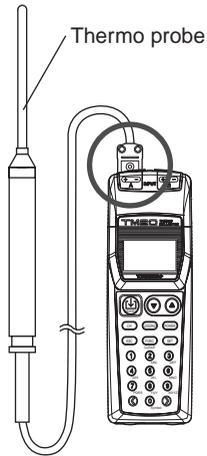
An example of the thermo probe connected to input channel "A"

[TIP]

To plug a voltage output sensor into channel A or B, use a U-shaped omega connector.

Non-contact thermo probe
Model: 90003 (obsolete product)
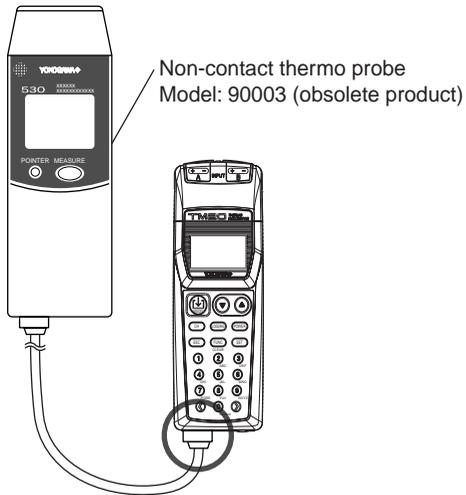
An example of the non-contact thermo probe connected to input channel "D"

2 Measuring Temperatures with the Collector Function

This section explains the procedure for measuring temperatures with the collector function.

⚠️ **NOTE**

Condensation may occur if the instrument is moved to another place where both ambient temperature and humidity are higher / lower, or if the room temperature changes rapidly. In such cases, acclimatize the instrument to the new environment for at least 30 minutes before starting operation.

Home screen

```
INPUT       ⬍
 A  18:54:27
        25.9°C
```

[TIP]
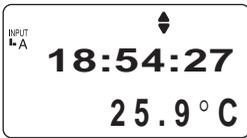
- This screen which indicates the current time is referred to as the "Home" screen. Each function in the main unit is accessed from this screen.
- The [0] key is also used for switching the unit of temperature display. If, for example, this [0] key is pressed in the Home screen, the unit is switched to "°F". Another pressing of the same key will restore the unit to "°C".

1. **Press the [LOGGING] key when the LOG mark is displayed in the upper left corner of the screen.**

   The LOG mark is turned off and the collector mode is entered.

2. **Connect the probe to the appropriate input channel jack.**

   See Also

   For how to connect an input channel to a probe, refer to Chapter 1, "Input Channel and Probe".

3. **Press the [▼] key repeatedly until the tag to be selected is displayed on the screen.**

   The tag name currently set is displayed.

```
INPUT      ⟨▾⟩
 A   Burger
        24°C
```

4. **If the operator name needs to be modified, press the [1] numeric key. If not, proceed to step 7.**

   [TIP]

   If the operator name is not modified at this point, the operator name assigned the registration number "1" will automatically be set. Therefore, the factory-setting operator name must be modified if an operator other than that which is assigned the registration number "1" performs the measurement task.

```
INPUT      ⬍
 A           1
    Smith
```

   A screen for modifying the operator name is displayed.

5. **Press the [▼] key repeatedly until the operator name to be selected is displayed on the screen.**

```
INPUT      ⬍
 A           2
    White
```

Measuring
Temperatures

6. **Press the [SET] key.**
The confirmation screen appears.

```
INPUT
L A          Change?
         Yes1/No0
```

7. **Press the [1] key.**
The operator name is modified and the previous screen displaying the tag name is restored.

```
INPUT          ⟨▾⟩
L A         Burger
              24°C
```

8. **Press the [MEMORY] key.**
A ⤓ mark is displayed in the measurement screen, and the measurement is terminated as soon as the buzzer sounds. The measured value is stored in memory together with the current time.

```
INPUT          ⟨▾⟩
L A         Burger
  ⤓           24°C
```

The ⤓ mark is turned off after the measurement has been completed.

[TIP]

• If the [MEMORY] key is pressed when [NewTag] is being displayed, a new tag will automatically be created. New tags will automatically be assigned tag names such as TAG01 and TAG02.

• If the measurement continues with the selected tag, perform step 7 again after step 8 has been performed. With 50 tags, a total of 5,000 pieces of data can be recorded.

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

The procedure below shows the way to memorize the comments.

1. **Press the [▲] or [▼] key to display the screen "Tag name".**

```
INPUT
L A         Burger
              57°C
```

2. **Press the [4] key.**
The comment which are memorized appears.

```
INPUT                1
L A
         D i s c a r d
```

3. **Press the [▲], [▼] key to select the comment.**

4. **Press the [SET] key.**

```
INPUT
L A         Memory?
         Yes1/No0
```
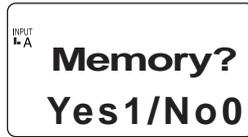
5. **Press the [1] key.**
The comment is stored in memory, then the screen displaying the tag name is restored.

-End of procedure-

3 Measuring Temperatures with the Logging Function

If a log has measured data remaining in it, it is not possible to record new measurement data additionally on the same log. To record new data in the log, it must be cleared beforehand.

⚠ Note

Condensation may occur if the instrument is moved to another place where both ambient temperature and humidity are higher / lower, or if the room temperature changes rapidly. In such cases, acclimatize the instrument to the new environment for at least 30 minutes before starting operation.

See Also

For how to clear the measured data in a log, refer to Section 5.7, "Clearing the measurement data associated with the log" in the "Preparing for Measurement" part.

Home screen

```
INPUT ▲
  A ▼      18:54:27
            25.9°C
```
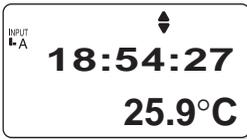
1. Press the [LOGGING] key when the LOG mark is not displayed in the upper left corner of the screen.

The LOG mark is turned on and the logging mode is entered.

```
LOG      ▲
INPUT    ▼
  A      18:54:42
            25.9°C
```

2. Connect the probe to the appropriate input channel jack.

See Also

For how to connect an input channel and a probe, refer to Chapter 1, "Input Channel and Probe".

3. Press the [▼] key repeatedly until the log to be selected is displayed on the screen.

The log name currently set is displayed.

```
LOG      ▲▼
INPUT
  A      Carry
            24°C
```

4. Press the [MEMORY] key.

The interval at which the temperature measurement is performed is displayed.

```
LOG
INPUT
  A      Interval
        00:00:10
```

5. Press the [MEMORY] key again.

Measurement begins. During measurement the 🖫 mark is displayed in the lower left corner of the screen.

```
LOG
INPUT
  A      00:00:07
🖫           24°C
```

[TIP]

• During measurement the number of days or time elapsed can be confirmed with the [▲] key or [▼] key.

• If the [MEMORY] key is pressed when [New Log] is being displayed, a new tag will automatically be created. New tags will automatically be assigned tag names such as TAG01 and TAG02.

• To stop the measurement, hold down the [ESC] key for about two seconds.

Measuring Temperatures

If the measurement has been completed, the previous screen displaying the log name is restored.

Press the [ESC] key repeatedly to return to the Home screen.

-End of procedure-

4 Measuring Temperatures of Channels A and B Simultaneously

For a selected tag or log, the measured values of channels A and B can be recorded simultaneously. However, if data recorded by single-channel measurements remains in the selected tag or log, simultaneous two-channel recording cannot be started. In this case, first delete the data from the record.

See Also
- For how to delete measured data, refer to the following sections in the "Before Use" part:
  - Section 5.3, "Clearing the measurement data associated with the tag"
  - Section 5.7, "Clearing the measurement data associated with the log"
- For basic operations of temperature measurements, refer to the following chapters in the "Measuring Temperatures" part:
  - Chapter 2, "Measuring Temperatures with the Collector Function"
  - Chapter 3, "Measuring Temperatures with the Logging Function"

■ Plugging in probes

Plug probe cables into input channels A and B.

⚠ Note

Use a non-grounded probe for either channel. If there is no choice other than to use grounded probes for both channels, ensure that the potential difference between the channels A and B will not exceed ±1 V. Nevertheless, when performing real-time upload of measured values, non-grounded probes must be used for both channels.

■ Selecting input channels

Using the [CH] key to select two channels.
The channel indications below "INPUT" changes accordingly.

```
INPUT
▪ A
▪ B      Burger
              56.7°C
```

[TIP]

When data recorded by single-channel measurements remains in the selected tag or log, you cannot choose channels A and B at the same time. Or when data recorded by two-channel measurements remains in the selected tag or log, you cannot choose channel A, B, or D. Delete the recorded data in either case.

Measuring
Temperatures

■ Recording measured values

1. **Press the [MEMORY] key to start recording the measured values.**

The current measured value is then displayed.

2. **Press the [SET] key to call up a screen for two-channel measurements.**

INPUT
A
B
Burger
56.7°C

← Measured value of channel A

← Measured value of channel B

Pressing [SET]

INPUT
A
B
A – B
11.6°C

Indication of temperature difference

Pressing [SET]

INPUT
A
B
AVG
50.9°C

Indication of temperature average
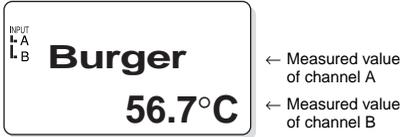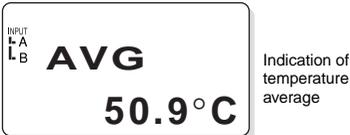
[TIP]

To return to the original screen, press [ESC].

5 Measuring Temperatures with the Non-Contact Thermo Probe

The measurement accuracy of the non-contact thermo probe(Model:90003; Obsolete product) is not reliable below the decimal point. Therefore, before making a temperature measurement with the non-contact thermo probe, set this instrument so that it does not display a fraction of a temperature in the screen of the main unit. The non-contact thermo probe, however, can be used with this instrument to measure temperatures without performing the following setups, but, if this is done, the accuracy of the decimal in the temperature measurement cannot be guaranteed.

■ Switching on/off the decimal portion of the temperature display

Home screen

```
INPUT        ⬍
   18:54:27
       25.0°C
```

**1.** **Press the [FUNC], [9], and [3] keys, in order.**
The "Digit" screen appears on the LCD.

```
INPUT        ⬍
   F93
   Digit
```

2. **Press the [SET] key.**
A screen for switching on/off the decimal portion of the temperature display is displayed.

```
INPUT        ⬍
   Digit
       0.1°C
```

3. **Press the [▼] key.**
The decimal portion of the display is turned off.

```
INPUT        ⬍
   Digit
         1°C
```

[TIP]

Each time the [▼] key is pressed, the decimal portion of the temperature is toggled on/off.

4. **Press the [SET] key.**
The decimal portion of the temperature is no longer displayed.

```
INPUT        ⬍
   F93
   Digit
```

5. **Press the [ESC] key three times.**
The time display screen (i.e. Home screen) is restored.

```
INPUT        ⬍
   18:54:57
         25°C
```

-End of procedure-
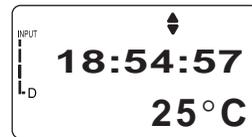
Measuring
Temperatures

■ Measuring with the non-contact thermo probe

⚠ Warning

Do not look into the laser beam which is emitted from the non-contact thermo probe. The laser can cause eye damage and other injuries.

⚠ Note

Before using the non-contact thermo probe, read the instruction manual supplied with the non-contact thermo probe.

1. **Connect the "D" channel jack on the main unit and the non-contact thermo probe.**

[TIP]

• Insert the connector plug so that the "←" mark on the cable grip faces upward.
• The "D" channel jack is located on the left side of the main unit bottom face.

Measuring in the collector mode

2. **Set the main unit to the collector mode, then select a tag and operator name for the measurement.**

See Also

For the collector mode, refer to Chapter 2, "Measuring Temperatures with the Collector Function".

3. **Turn the non-contact thermo probe towards the measuring object, and press the [MEA-SURE] key.**
A laser beam is emitted from the non-contact thermo probe and onto the measuring object.

[TIP]

If the laser beam is not being emitted, press the [POINTER] key on the non-contact thermo probe.

4. **While holding down the [MEASURE] key, press the [MEMORY] key on the main unit.**
The temperature being displayed on the non-contact thermo probe screen will also be displayed on the screen of the main unit. When the buzzer sounds on the main unit, the measured value and current time is stored in memory.

[TIP]

If the measurement continues with the selected tag, perform step 3 again after step 4 has been performed.

-End of procedure-

Measuring in the logging mode

2. **Set the main unit to the logging mode, then select a log for the measurement.**

See Also
For the logging mode, refer to Chapter 3, "Measuring Temperatures with the Logging Function".

3. **While holding down the [MEASURE] key, turn the non-contact thermo probe towards the measuring object.**
A laser beam is emitted from the non-contact thermo probe and onto the measuring object.

[TIP]

If the laser beam is not being emitted, press the [POINTER] key of the non-contact thermo probe.

4. **Press the [MEMORY] key twice.**
Measurement begins.

[TIP]

To stop the measurement, hold down the [ESC] key for about two seconds.

After the specified measurement period elapses, the previous screen displaying the log name is restored.

5. **Hold down the [MEASURE] key on the non-contact thermo probe until the measurement has been completed.**

-End of procedure-

Measuring
Temperatures

6 Changing Measuring Range

The TM20 can display and record voltages from a sensor that can output a voltage signal of ±100 mV or ±1 V (provided that a U-shaped connector is used and the connector and the temperature input jacks are stabilized at the same temperature).

6.1 Available ranges

A measuring range can be chosen from thermocouple types K, J, E, and T, and 1 V and 100 mV.

Channel	Sensor	Unit	
A	External sensor 1	°C	(thermocouple input)
		**	(voltage input)
B	External sensor 2	°C	(thermocouple input)
		**	(voltage input)
D	Non-contact thermo probe	°C	

See Also

For the unit of voltage input represented by the asterisks, see Section 6.3, "Scaling a voltage input range."

6.2 Changing a range

Follow the procedure below to change a measuring range.

Home screen
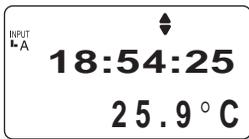
1. **Press the [FUNC], [9], and [9] keys in order.**
"RangSet" is displayed on the screen.

2. **Press the [SET] key.**
The screen changes to allow for channel selection.

3. **Using the [▼] and [▲] keys, call up the channel for which you want to change the range.**

4. **Press the [SET] key.**
The screen changes to allow you to change the range of the selected channel.

5. **Using the [▼] and [▲] keys, call up the desired range.**
The displayed range changes from K, J, E, T, 1V, and then 100mV in order.

6. **Press the [SET] key.**
If you select K, J, E, or T, the screen changes to the one shown in step 8. Or if you select 1V or 100mV, it changes to the one shown in the next step.

7. **The name of the scaling setting and unit set using Thermo-Collector (PC software) are then displayed.**
These settings cannot be made or modified via the TM20 itself.

8. **Press the [SET] key.**

The screen asks you for confirmation.

```
INPUT
┗ A      Change?
         Yes1/No0
```
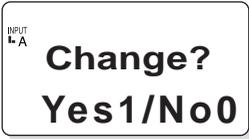
9. **Press the [1] key.**

The setting is changed as you made and the menu screen returns.

To cancel the change, press [0] in place of [1]. The menu screen returns.

-End of procedure-

Measuring
Temperatures

6.3 Scaling a voltage input range

The scaling settings for voltage inputs from channels A and B can be made using Thermo-Collector (PC software).

■ What scaling is

The value *Y* converted from the input voltage level *X* according to the following equation is displayed:

$Y = aX + b$.

Scaling setting means to set gain *a* and bias *b*.

For example, if you want to display:

- "0" when the input level is 0 V
- "200" when the input level is 1 V

then the gain and bias should be set as

- $a = 200$
- $b = 0$.

The resulting equation is

$Y = 200X$.

When *X* is 0, *Y* is 0. When *X* is 1, *Y* is 200.
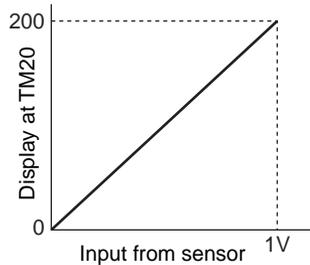
■ Setting procedure

See Also

For how to start Thermo-Collector on the PC, refer to Chapter 3, "Setting Up with the Personal Computer" in the "Preparing for Measurement" part.

1. **From the File menu, choose Voltage Range Settings to open the Voltage Range Settings dialog box.**
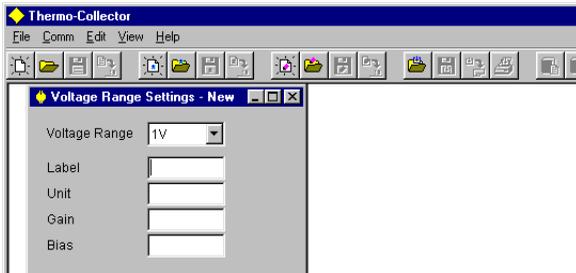
[TIP]

The following shows the default settings.

Range	Name	Unit	Gain a	Bias b
1V	1V	V	1.0	0
100mV	100mV	mV	1.0	0

2. **Select the voltage range from 1V or 100mV.**

3. **Double-click the Name box.**
Type the name up to 8 alphanumeric characters long.

In the respective boxes below, type the unit (up to 2 characters), gain (6 digits), and bias (6 digits). Only alphabetical letters, percent signs, and spaces are allowed for the unit.

4. **From the File menu, choose Voltage Range Settings then Send to download the settings to the TM20 connected.**

-End of procedure-

Measuring
Temperatures

7 Other Useful Functions

■ To instantly confirm or clear the measured data on the main unit

There is a function on the main unit to clear the recorded measurement data.
If the measured data recorded in the main unit is not required anymore or if it needs to be cleared instantly, use this function.

1. Bring up the Home screen.

2. Press the [▼] key repeatedly until the tag to be deleted is displayed.

3. Use either the [<] or [>] key to select the measured data to be deleted.

[TIP]

Press the [<] key once to bring the last piece of measured data recorded for the tag up on the screen.

The measured data is displayed.

4. Press the [FUNC] key.
The confirmation screen appears.

5. Press the [1] key.
The measured data is cleared.

[TIP]

If the [FUNC] key is pressed while the tag name display screen is active, all the data associated with the currently selected tag is cleared (this function can also be applied to logs).

-End of procedure-

■ To start a measurement in the logging mode at a specified time (timer function)

The main unit has a function (timer function) to start logging measurement at a specified time. This is useful to, for example, start logging measurements after one hour.

[TIP]

If the selected log has measurement data remaining in it, this timer function cannot be used. If this is the case, either clear the measured data from the log or select another log.

See Also

For how to clear the measured data in a log, refer to Section 5.7, "Clearing the measurement data associated with the log" in the "Preparing for Measurement" part.

1. Bring up the Home screen.

2. Press the [FUNC], [2], and [5] keys, in order.
The "Timer reserve" screen appears.

3. Press the [SET] key.

4. Press the [▼] key repeatedly until the log to record temperatures are displayed.

5. Press the [SET] key.
The measurement interval set for the selected log is displayed.

6. **Press the [SET] key.**

[TIP]

It is also possible to modify the measurement interval setting before pressing the [SET] key.

7. **Press the [SET] key.**
The measurement period (the number of days from the options which also include the number of hours, minutes, and seconds) is displayed.

[TIP]

It is also possible to modify the number of days setting before pressing the [SET] key.

8. **Press the [SET] key.**
The measurement period (the number of hours, minutes, and seconds from the options which also includes the number of days) is displayed.

[TIP]

It is also possible to modify the number of hours, minutes, and seconds settings before pressing the [SET] key.

9. **Set the date (year/month/day) and time when logging starts.**

10. **Press the [SET] key.**
The confirmation screen appears.

11. **Press the [1] key.**
The ⊘ mark and "Stand by" is displayed in the screen, and the instrument will enter the wait state. When the time set in step 9 is reached, the measurement will automatically begin.

```
┌─────────────────────┐
│ LOG  ⊘              │
│ INPUT               │
│ ▮A 21:30:20         │
│   Stand by          │
└─────────────────────┘
```

[TIP]

To cancel the wait state, hold down the [ESC] key for about two seconds.

-End of procedure-

Measuring Temperatures

■ To quickly search for a tag or log

The main unit has a function to search for a tag or log using a number as the key.

This function is useful if there are many logs and tags set in the main unit and is faster than using the [▼] key.

1. **Bring up the Home screen.**

2. **Press the [▼] key.**

3. **Press the [POWER] key.**

4. **Enter a two-digit number.**

[TIP]

A two-digit number entered is displayed in the "No." field of Thermo-Collector screen. It is recommended to make a note of which tag or log corresponds to which number.

5. **Press the [SET] key.**
The tag (or log) that corresponds to the entered number is displayed on the screen.

-End of procedure-

■ To record measured data if the tag or log has not been set

In addition to the function for creating a tag or log from the Function menu, the main unit has a useful way to create them during measurement.

This is very useful when, for example, the temperature of a steel plate needs to be measured, but a tag for that steel plate has not been set beforehand.

1. **Bring up the Home screen.**

2. **Press the [▼] key repeatedly until [NewTag] or [NewLog] appears on the screen.**
[NewTag] or [NewLog] appears on the screen.

3. **Press the [MEMORY] key.**
The temperature is measured.

[TIP]

Tags (or logs) is temporally assigned a specific name using sequential numbers (Examples: Tag01, Tag02, Log01, Log02....). In this case, the measurement interval for the log is automatically set to 10 seconds, and the measurement period of the log is set to 2 days. However, these temporary tag names and log names can be modified later as required.

See Also

For how to modify tag or log names, refer to Chapter 5, "Confirm, Modify, Clear, or Delete the Data with the Main Unit" in the "Preparing for Measurement" part.

-End of procedure-

■ **To record the start time and finish time of an operation (only with the collector function)**

The main unit has a function to record the start time and finish time of measurement operation.

This is useful when, for example, creating a daily report, since the start time and finish time can be included in Microsoft Excel files or printouts.

● Recording the start time

1. **Press the [▼] key repeatedly until the tag to record temperatures is displayed.**

2. **Press the [2] key.**
The confirmation screen appears.

3. **Press the [1] key.**
The start time is recorded.

-End of procedure-

● Recording the finish time

1. **Press the [3] key if selecting a tag.**
The confirmation screen appears.

2. **Press the [1] key.**
The finish time is recorded.

-End of procedure-

■ **To restrict inputs from the panel keys (the key lock function)**

The main unit has a function called the key lock function that disables all the panel keys for input.
This function is used if the main unit is used only for temperature measurement and a temperature record does not need to be retained, or when the main unit is used as a clock.
This function can be set by pressing the [FUNC], [9], and [5] keys in order and in the Home screen.
While this function is active, the "Key" mark is displayed in the upper right corner of the screen.

[TIP]

In order to cancel this function, hold down the [ESC] key for about two seconds.

Measuring Temperatures

■ To enable only the panel keys (yellow keys) requied for mesurement (FUNC lock function)

The main unit has a function called the FUNC lock function that enables only the panel keys required for measurement. The keys used with this function are given below :

- [MEMORY]
- [▼] and [▲]
- [CH]
- [LOGGING]
- [POWER]
- [ESC]
- [SET]
- [>], [<], [1], [2], [3], and [0] (only if the collector function is on)

This function can also be used when the setup information on the main unit is not to be modified due to an operation error.

This function can be set by pressing the [FUNC], [9], and [6] keys, in order when the Home screen is displayed.

When this function is active, the "Key" mark is displayed in the upper right corner of the screen.

[TIP]

To cancel this function, hold down the [ESC] key for about two seconds.

■ To automatically turn off the power supply if no operation is performed in a specified period of time (Auto Power Off function)

The main unit has a function called Auto Power Off to automatically turn off the power if the main unit is not used in a given period of time (5, 10, 20, or 30 minutes).

This function is useful if you forget to tun off the power.

This function can be set by pressing the [FUNC], [9], and [4] keys, in order when the Home screen is displayed.

When this function is active, the "AUTO OFF" mark is displayed in the upper right corner of the screen.

■ To determine how much more data can be recorded

The main unit has a function to display how much more measurement data can be recorded for the tag or log on the screen.

To activate this function, press the [FUNC], [3], and [1] keys, in order when the Home screen is displayed. Press the [SET] key to display the remaining memory capacity. If the [SET] key is pressed again, the number of measurement data pieces that can be used with the collector function, if selected, is displayed. Furthermore, if the [SET] key is pressed another time, the number of measurement data pieces that can be used with the logging function, if selected, is displayed.

■ To see the number of measured data pieces recorded on the tag or log

The main unit has a function to display the number of measured data pieces recorded on the tag or log.

To activate this function, press the [FUNC], [3], and [3] keys, in order when the Home screen is displayed.

■ To see the average of the measured data

The main unit has a function to calculate the average of the measured data recorded on the tags or logs. This is useful when pieces of data have been collected and the average is required.

To activate this function, press the [FUNC], [3], and [2] keys, in order when the Home screen is displayed.

Also, to obtain the maximum and minimum values, press the [FUNC], [3], and [2] keys, in order when the Home screen is displayed.

■ To sound a chime at the specified time (the chime function)

The main unit has a function called the chime function to sound a chime at a time specified by the operator. This function is similar to an alarm clock.

The chime can be made to sound so as to signal the operator to start temperature measurement.

To activate this function, press the [FUNC], [6], and [2] keys, in order when the Home screen is displayed.

■ To view the screen in a dark place (the backlight function)

The main unit has a backlight function, which provides a light source so that the operator can view the screen in a dark place. To activate this function, press the [FUNC], [9], and [1] keys, in order when the Home screen is displayed.

The backlight is turned off if no operation is performed on the main unit for about 10 seconds.

■ To turn off the electronically generated sound

The main unit has a function to turn off the key operation sound and the alarm. Use this function if the electronically generated sound is disturbing you.

To activate this function, press the [FUNC], [9], and [2] keys, in order when the Home screen is displayed.

■ To view the comments set

To view a list of the comments set in your TM20, press the [FUNC], [0], and [2] keys in order when the Home screen is displayed.

Measuring Temperatures

■ To correct measured temperatures (using the simplified input correction function)

For each of channels A and B, you can set input correction suitable for the thermocouple type that has been selected for the input range. The correction setting for a channel is applied to all values measured by that channel. When the correction is effective, the unit is underlined in the display, such as "°C."

1. When the Home screen is displayed, press the [FUNC], [9], and [8] keys in order.

"Adjust" is displayed on the screen.

Press the [CH] key and choose the channel for which you want to set a correction. (A correction can only be set for channels A and B.)

2. Press the [SET] key.

3. Select ON and press the [SET] key.

The screen changes to allow for correction setting.

4. Enter the correction value.

The range of the correction value is -20.0°C to +20.0°C in units of one tenth of a degree.

The correction value is always added as a bias to the input value. For instance, if you set 1.5°C, the measured value at the input of 100°C is displayed as 101.5°C.

5. Press the [SET] key.

The screen asks you for confirmation.

6. Press the [1] key.

The setting is complete and the menu screen returns.

To cancel the change, press [0] in place of [1]. The menu screen returns in this case, too.

■ To transmit measured values to a PC in real-time

Once real-time transmission is switched on when your TM20 has been connected to a personal computer, pressing the [MEMORY] key immediately starts uploading the measured data to the computer in real-time. To receive these values, run an appropriate application at a computer, such as Hyper Terminal in Accessories of Windows 98.

To switch on real-time transmission in your TM20, follow the procedure below.

1. When the Home screen is displayed, press the [FUNC], [5], and [4] keys in order.

2. Press the [SET] key.

3. Using the [▼] or [▲] key, select ON.

4. Press the [SET] key.

A down-arrow (↓) appears in the lower left of the screen. In this state, starting measurements and pressing the [MEMORY] key to start recording transmits the measured values to the personal computer in real-time.

⚠ Caution

Since the PC interface is not isolated, be sure to use non-grounded probes when transmitting measured values to a PC in real-time.

Measuring
Temperatures

1 Receiving the Data on the Personal Computer

This section explains the procedure used to receive data, such as measurement data with the main unit, on the personal computer. The following data items can be received:

- Measured data associated with tags and logs
- Tag and log setup data
- Operator name data

Received tag and log data can be transferred to Microsoft Excel95 or Microsoft Excel97 (hereinafter referred to as Excel) when the data is received on the personal computer.

■ Preparation before reception

1. Make sure that the power to the personal computer and main unit is turned off.

2. Connect the personal computer and main unit with the supplied cable.

See Also

For how to connect the personal computer and main unit, refer to "■ Connecting the personal computer and the main unit" in Section 4.1 of the "Preparing for Measurement" part.

3. Turn on the power to the main unit.

See Also

For how to turn on the main unit, refer to "■ Turn the power supply to ON" in Chapter 4 of the "Before Use" part.

4. Turn on the power to the main unit.

Now it is ready for reception.

-End of procedure-

■ Receiving the data

1. **Initiate Thermo-Collector software.**
The main screen of Thermo-Collector software is displayed.

2. **Select "Receive" from the "Comm" menu.**
A screen for selecting the data to be received is displayed.
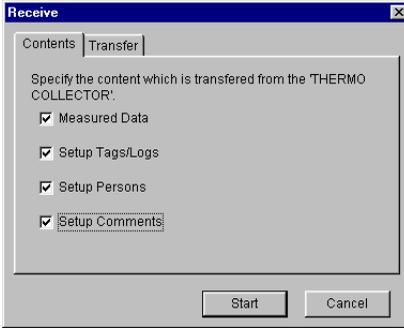
3. **Select the data to be received.**

[TIP]

The following data items can be received

- Measured Datas .... Measured data obtained with the main unit for tags and logs
- Setup Tags/Logs .... Tags and logs setup data recorded in the main unit
- Setup Persons .... Measurement operator data in the main unit
- Setup Comment .... Comment data in the main unit

4. **If the received data is to be transferred to Excel, double-click on the "Transfer" tab. If not, proceed to step 6.**

A screen for selecting to which Excel file and in which format the data is transferred is displayed.
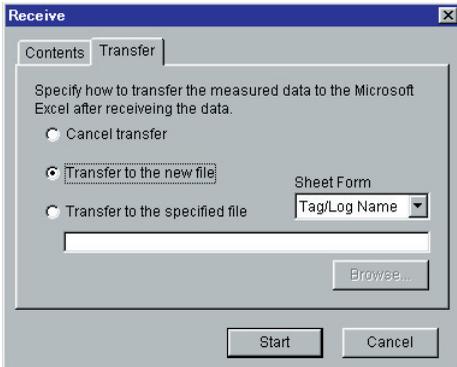
5. **When there is a need to transfer the received measurement data to Excel, select either "Transfer to the new file" or "Transfer to the specified file".**

If "Transfer to the specified file" is selected, click on the "Browse..." tab and select the Excel file to which the data is transferred. (It is also permitted to enter the specified file name.) Then, it is allowed to select "Sheet Form" for designating the data format by which the measurement data is transferred to Excel.

6. **Click on the [Start] button.**

A screen showing the progress of data reception is displayed. "Communicating ..." is also displayed on the screen of the main unit.

When data reception has been completed, the received data is displayed on the personal computer as follows.

(Two-channel simultaneous measurement)   for A channel   for B channel

If "Transfer to Excel" is selected in step 5, Excel will automatically be initiated and the received data is transferred to Excel.

- End of procedure

2 **Outputting Directly from the Main Unit to the Printer**

This chapter explains the procedure to directly output the data from the main unit to the printer (Model name: 970 10, optional).

2.1 Output preparation

Before starting output to the printer, confirm that the printer is connected to the main unit and the setup conditions of the printer.

■ **Printer-main unit connection**

A dedicated cable must be purchased (Model name: 910 10, round DIN 8-pin to D-sub 9-pin straight cable) to connect the printer and this instrument.

Follow the procedure below to connect the printer and main unit.

1. **Turn off the power to the printer.**
The power lamp is turned off.

2. **Refer to the following figure to connect the printer to the main unit.**

Main unit

Printer

Power switch   On-line switch

Bottom of the main unit   Printer serial port (9-pin)

SERIAL

Round DIN 8-pin to D-sub 9-pin straight cable (optional)

- End of procedure

Working with
the Measured Data
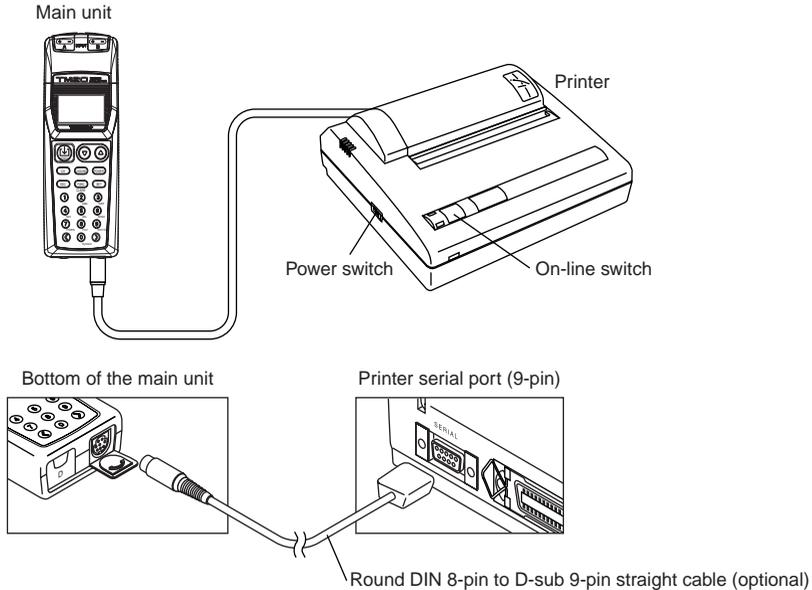
■ Confirming the printer setup conditions

1. **While holding down the [On-line switch] on the printer, turn on the power to the printer.**
The printer setup conditions is outputted to the printer.

2. **Make sure that the contents are identical to that shown in the following figure. If they are different, correct the setup conditions.**

See Also

For how to modify the printer setup, refer to the operation manual supplied with the printer.

```
[DIP SW setting mode]

Dip SW-1
   1 (OFF)    : Input = Serial
   2 (ON)     : Printing Speed = High
   3 (ON)     : Auto Loading = ON
   4 (OFF)    : Auto LF = OFF
   5 (ON)     : Setting Command = Enable
   6 (OFF)    : Printing
   7 (ON)     :   Density
   8 (ON)     :   = 100%
Dip SW-2
   1 (OFF)    : Printing Columns = 80
   2 (ON)     : User Font Back-up = ON
   3 (ON)     : Character Select = Normal
   4 (ON)     : Zero = Normal
   5 (ON)     : International
   6 (ON)     :   Character
   7 (ON)     :   Set
   8 (ON)     :   = Japan
Dip SW-3
   1 (ON)     : Data Length = 8 bits
   2 (ON)     : Parity Setting = No
   3 (ON)     : Parity Condition = Odd
   4 (OFF)    : Busy Control = XON/XOFF
   5 (OFF)    : Baud
   6 (ON)     :   Rate
   7 (ON)     :   Select
   8 (ON)     :   = 9600 bps
```

3. **Turn off the power to the printer.**

- End of procedure

2.2 Outputting the measured data to the printer

[TIP]

Connect the main unit and the printer before turning on the power to the printer. If this is not done, the measured data cannot be outputted to the printer.

Home screen

```
LOG
INPUT
L A          ⬍
     18:54:27
         25.9°C
```

1. **Press the [FUNC], [5] and [2] keys, in order.**
The "1File" screen appears on the LCD.

```
LOG
INPUT
L A          ⬍
     F52
     1File
```

2. **Press the [SET] key.**

```
LOG
INPUT
L A          ▼
     Burger
             11
```

3. **Press the [▼] key repeatedly until the tag or log to be outputted is displayed.**
The tag name or log name and the number of pieces of measured data recorded in the tag or log is displayed.

```
LOG
INPUT
L A          ⬍
     Convey
             11
```

[TIP]

If the [▼] key is pressed repeatedly, "NewTag" appears. Existing tags is displayed before "NewTag" appears. Existing logs are displayed after "NewTag" appears.

4. **Press the [SET] key.**
The confirmation screen appears.

```
LOG
INPUT
L A
     Print?
     Yes1/No0
```

5. **Press the [1] key.**
Printout is performed.

[TIP]

To output all the data recorded on the main unit, press the [FUNC], [5], and [3] keys, in this order, and then press the [SET] and [1] keys.

Press the [ESC] key repeatedly to return to the Home screen.

- End of procedure

Working with Measured Data

An output example from the printer

```
[Line A ]        HiAlarm=0080.0   LoAlarm=0060.0
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  No.         Date          Temp.    Hi    Lo    Person
00001   99/10/08/18:00:00    Start                Smith
00002   99/10/08/18:00:11   56.0°C   OK    NG    Smith
00003   99/10/08/18:00:25   57.5°C   OK    NG    Smith
00004   99/10/08/18:00:35   59.8°C   OK    NG    Smith
00005   99/10/08/18:00:45   61.2°C   OK    NG    Smith
00006   99/10/08/19:00:00   62.0°C   OK    OK    Smith
00007   99/10/08/19:00:11   62.0°C   OK    OK    Smith
00008   99/10/08/19:00:26   70.0°C   OK    OK    Smith
00009   99/10/08/19:00:34   75.0°C   OK    OK    Smith
00010   99/10/08/19:00:47   81.0°C   OK    OK    Smith
```
NG=No Good

Output example (tag)

```
[Line B  ]        Interval=00:00:10
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  No.         Date          Temp.
00001   99/10/09/20:00:00   -10.5°C
00002   99/10/09/20:00:10   -10.5°C
00003   99/10/09/20:00:20   -11.0°C
00004   99/10/09/20:00:30   -10.5°C
00005   99/10/09/20:00:40   -10.5°C
00006   99/10/09/20:00:50   -11.0°C
00007   99/10/09/20:01:00   -10.5°C
00008   99/10/09/20:01:10   -10.5°C
00009   99/10/09/20:01:20   -11.0°C
00010   99/10/09/20:01:30   -10.5°C
```

Output example (log)

■ Thermo-Collector specifications

● Features

Measuring ranges
Thermocouple types K, J, E, and T, and ±100 mV and ±1 V

Input channels
2 channels (A and B) or single channel (D)

Potential difference between channels
Must not exceed ±1 V (when the RS-232-C cable is not connected).

Measured temperature ranges and resolutions
For input channels A and B at a TM20 (not at a PC)

Range setting		Measured temperature range	Resolution
Thermocouple	type K	–200.0 to 1372.0°C	0.1°C
	type J	–200.0 to 1000.0°C	0.1°C
	type E	–200.0 to 700.0°C	0.1°C
	type T	–200.0 to 400.0°C	0.1°C
Voltage input	100 mV	–100.0 to 100.0 mV	0.1 mV
	1 V	–1.000 to 1.000 V	0.001 V

Channel D — Non-contact thermo probe (Model 900 03)
• Measured temperature range: –20.0 to 400.0°C
• Resolution: 1°C

Accuracy

Input channels A and B:
(under the ambient temperature of 23 ±5°C and relative humidity of 20 — 80%, when the low battery alarm is not occurring, and excluding the accuracy of reference junction compensation)

Input type	Range	Accuracy
Thermocouple	≥ –100°C	±(0.1% of reading + 0.3°C)
	< –100°C	±(0.1% of reading + 0.6°C)
Reference junction compensation	—	±0.4°C (when the temperature at input jacks are stabilized)
Voltage	100 mV or 1 V	±(0.1% of reading + 0.2% of range)

Accuracy (error of reading) of input from non-contact thermo probe (channel D):
The error of reading of the input from a non-contact thermo probe that can be connected to the TM20 (i.e., Model 900 03) is ±1°C excluding the error of the probe itself. (For the error of the non-contact thermo probe, see the respective specifications.)

Effects of ambient conditions
Effects of ambient temperature changes on thermocouple inputs (channels A and B):
±(0.01% of reading + 0.03°C)/°C or less
Effects of ambient temperature changes on reference junction compensation:
±0.03°C/°C or less (at ambient temperature of 0 – 50°C)
Effects of ambient temperature changes on voltage inputs (channels A and B):
±(0.01% of reading + 0.02% of range)/°C or less
Effects of humidity changes (at relative humidity of 20 – 80%):
±1 digit or less

Battery life
(when not using the backlight of the LCD)

When using collector function:	Approx. 2 days (under continuous 24-hour operation) (when the RS-232-C cable is not connected.)
	Approx. 5 days (8 hours of measurements and 30 minutes of communication every day)
When using logging function:	Approx. 2 days (measurement intervals < 10 seconds) (when the RS-232-C cable is not connected.)

Approx. 1 month (measurement intervals = 1 minute) (when the RS-232-C cable is not connected.)

Approx. 1.5 months (measurement intervals = 10 minutes) (when the RS-232-C cable is not connected.)

TIP

Approx. 1 day when the RS-232-C cable is connected using collector or logging function.

(The battery life varies greatly with the quality of batteries used and the operating conditions. Shown here are references for the case when ANSI AA (IEC LR6) alkaline batteries of the same model as those that come with the TM20 are used and the when TM20 is used under room temperature.)

●Functions

Measurement mode and interval

Collector mode

While the [LOG] sign is off, measurements will be saved in the internal memory if the [Memory] key is pressed under a condition where an optional tag is being displayed on the screen. A tag name must consist of maximum eight alphanumeric characters. The maximum number of tags is 50. Measurement intervals: Minimum 0.5 second when using only 1 channel; minimum 1 second when using 2 channels.

Person (operator) names: Up to 10 names of up to 8 alphanumeric characters can be set.

Logging mode

While the [LOG] sign is on, measurements will be saved in the internal memory if the [Memory] key is pressed under a condition where an optional log is being displayed on the screen. A log name must consist of maximum eight alphanumeric characters. The maximum number of logs is 10. The measurement period depends on the remaining capacity of the internal memory. The measurement interval should be greater than 1 second and less than 24 hours.

Capacity of the internal memory

5000 pieces of data with the collector function solely. If using only the logging function, the maximum data capacity is 20000 pieces.

However, the measured data collected either with the collector function or with the logging function can co-exist in the internal memory.

Display

Semi-transmission type liquid crystal display (LCD)

8 characters x 2 lines dot matrix display section and icon display section

Display light

Two backlight LEDs for the display section. 10 seconds of duration from the moment when any key is operated (factory setting: OFF).

Clock function

Controls the date (internal data) and time (internal data and display). The accuracy is within 1 minute per month.

Alarm function

This function can be set to the upper-limit temperature and lower-limit temperature. In both cases, it can be set so either the alarm is turned on if the temperature falls within or outside the specified range.

Calculation function

The maximum, minimum, or average within the same tag or log file can be calculated.

The difference between values simultaneously sampled from channels A and B can be displayed.

Key operation sound function

Possible to set on or off of the buzzer sound when the keys are operated (factory setting: ON).

Auto power-off time

Selectable from 5, 10, 20, and 30 minutes, or infinite (factory setting: 5 minutes)

Low battery voltage alarm

A battery symbol turns on if the set LR6 alkaline dry cell almost expires.

Auto Operation Stop at a low battery voltage

When the set LR6 alkaline dry cell is almost used up, the system power will be automatically turned off after the "BatteryEmpty" message appears.

Do not leave the used battery being set in the main unit. This may cause operation errors or battery liquid leakage.

Backup battery

A backup battery backs up the measured data and clock setting when the ANSI AA (IEC LR6) alkaline batteries are not installed. The typical life of the backup battery is approximately 6 years under room temperature (23 ±5°C). After the voltage of the backup battery drops, "Backup.B Empty" appears on the LCD whenever the power is turned on. This message disappears whichever key is pressed. This message indicates that backup may no longer be performed. Please inquire about backup battery replacement service promptly.

Key lock and FUNC lock

Disables the operation keys and function keys other than the Power key (factory setting: OFF).

Least significant digits of display values

The least significant digit of the display values can be selected from the first decimal (0.1°C) and the least digit of the integer (1°C). However, it is fixed for the voltage inputs as the first decimal for the 100-mV range (100.0 mV) and as the third decimal for the 1-V range (1.000 V). (The factory setting of the least significant digit of displayed temperature values is 0.1°C.)

Degree of protection provided by enclosures

Equivalent to IP54 (When using the waterproof cover)

IP 5 4

— Splashing (protection for being subjected to splash)
— Dust-protected (protection for being subjected to dust)
— Protection characteristic symbol (International Protection)
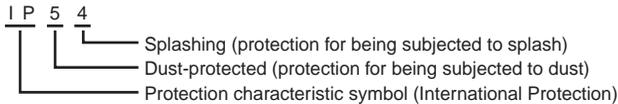
Communication function

RS-232C communication function

- Electrical characteristics ..... Conforms to EIA RS-232C standard
- Baud rate .... 1200, 2400, 4800, <u>9600</u>, 19200 [bps]
- Data length .... 7, <u>8</u> [bit]
- Parity .... Odd parity (odd), Even parity (even), or <u>None (None)</u>
- Stop bit .... 1, <u>2</u> [bit]
- Flow control .... Hardware handshake (RTS, CTS) or <u>no flow control</u>
  Connector .... Round DIN connector with 8 pins (requires a dedicated cable)

*The underline shows the factory settings.

Connector pin assignment

Control lines

Pin No.	Signal line name
1	CTS (Clear to Send)
2	RXD (Received Data)
3	RTS (Request to Send)
4	TXD (Transmitted Data)
5, 6	(N.C.)
7	(SENS) *Note
8	SG (Signal Grounding)
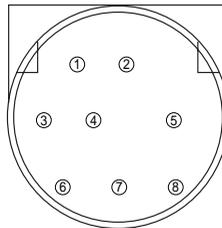
Note: Pin No.7 senses if the RS-232C Connector is plugged. This is connected to No.8 pin of the dedicated cable.

Since the RS-232-C interface is not isolated, use non-grounded probes and voltage output sensors when using this interface.

Digital serial communication function (Note: this is not a USB port)

The digital serial I/O port (D ch) is capable of logging the non-contact thermo probe data.

Simplified input corrections

A bias within a range between –20.0°C and 20.0°C can be set for the measured values of a thermocouple input. The bias is added to (or subtracted from) all values measured by each specified channel. When the correction is effective, the unit is underlined in the display, such as "°C."

Scaling of voltage inputs

Using the PC application (Thermo-Collector) that comes with the TM20, an input value X can be converted to a display value Y according to the equation $[Y = aX + b]$ and a 2-digit unit of alphabetical letters, percent signs, and spaces can be set for each channel for which a voltage input range is selected.

●External dimensions

Approx. 151 (H) x 56 (W) x 33 (D) mm (excluding the projecting sections)

●Weight

Approx. 180 g (including 2 ANSI AA (IEC LR6) alkaline batteries as standard)

●Approvable standards

EMC standards

EMI (interference signal)	EN55011, EN61326-1 (Class B, Group 1)
EMS (immunity)	EN50082-1, EN61326-1

Effect of EMS immunity:

Type K, J, E and T range	±5% of span
1V and 100mV range	±5% of range

(for electromagnetic field with a radio-frequency of 3V/m, under standard use)

Conditions of EMC:

Use External probe and RS-232 cable (less than 3m)

●Battery (reccommded)

ANSI AA (IEC LR6) alkaline battery, 1.5V (two)

●Operation and storage enviroment

Operation temperature/humidity range: 0 to 50°C, 20 to 80%RH (no condensation)
Storage temperature/humidity range: -10 to 60°C, 5 to 95%RH (no condensation)
The operation and storage environment must be free from organic solvent or corrosive gases.

●Accessories

Instruction manual (including the descriptions of the application software)	1 copy
ANSI AA (IEC LR6) alkaline battery	2 units
Application software (on 1.44 MByte floppy diskette)	3 diskettes
Dust-proof seal (for sealing the screw holes on the back face of the main unit)	2 pieces
Waterproof cover	1 piece

●Probe (option) specifications

Type (Thermocouple Type: K)	Model	Measuring ranges	Accuracy
Standard sheathed probe for liquid	90020	-50 to 600°C	0.4% or ±1.5°C
Fast-response sheathed probe for liquid	90021	-50 to 600°C	0.4% or ±1.5°C
Long sheathed probe for liquid	90022	-50 to 600°C	0.4% or ±1.5°C
Fast-response injection-needle sheathed probe	90023	-50 to 500°C	0.4% or ±1.5°C
Standard injection-needle sheathed probe	90024	-50 to 500°C	0.4% or ±1.5°C
Standard surface-temperature straight probe	90030	-20 to 250°C	0.75% or ±2.5°C
Standard surface-temperature angle probe	90031	-20 to 250°C	0.75% or ±2.5°C
High-surface-temperature straight probe	90032	-20 to 500°C	0.75% or ±2.5°C
High-surface-temperature angle probe	90033	-20 to 500°C	0.75% or ±2.5°C
Bead TC	245907	-40 to 260°C	0.75% or ±2.5°C

■ Operation environment of Thermo-Collector software

|	
CPU	: i486DX or higher
OS	: Windows95/Windows98/WindowsNT4.0
FDD	: 3.5", 1.44 MB-formatted
Required space on the HDD	:10 MB or greater
Recommended memory capacity	:16 MB or greater
Serial I/O capability	:A serial port conforming to RS-232C standard should be available.
Software	:Microsoft Excel95, Microsoft Excel97

■ External view and dimensions

Unit: mm
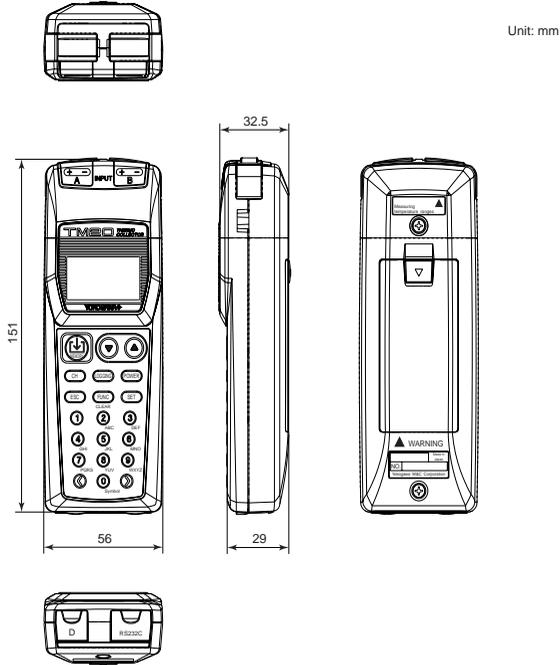
■ Using the waterproof cover (Model 93011 coming with TM20)

We recommend using a waterproof cover to enhance water resistance (splash-proofing capability) and to keep the instrument clean.

1. Detach the strap attached to the instrument.

2. Plug the probe (connector) cable into sensor mounting location (A) on the body (and another to mounting location (B) when using two probes), and then put the cover on the instrument.

3. Lift the probe cable(s) up to fasten it (them) under the Velcro-secured flap. Make sure that the flap is tightly fastened so that the cover will remain closed.

4. Fold the upper part of this flap down and secure it with the Velcro [1].
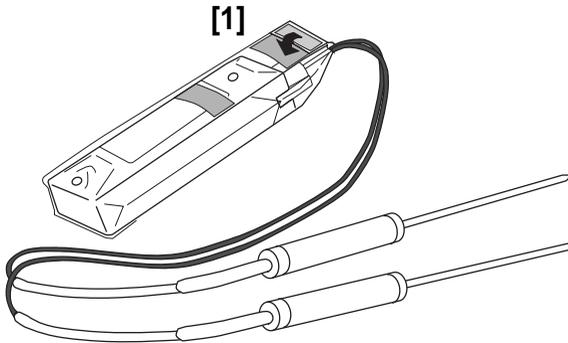
⚠ Caution

• **The degree of protection (Dust-protected/Splash-proof) provided by enclosures of this instrument is equivalent to IP54 when using the waterproof cover.**

• **Be sure to use a waterproof cover in atmospheres of steam (water vapor) and greasy fumes (oil), or when water is being used near the TM20, otherwise the instrument may fail.**

■ Function keys quick reference

Menu No.	Menu	Submenu No.	Submenu	Description
1	Tag Set	1	Curr Tag	Confirming the tag
		2	TagChnge	Modifying the tag name
		3	Tag Ins	Inserting a tag
		4	Tag Del	Clearing the tag
2	Log Set	1	Curr Log	Confirming the log
		2	LogChnge	Modifying the log name
		3	Log Ins	Inserting a log
		4	Log Del	Clearing the log
		5	Reserve	Timer function
3	CurrData	1	Capacity	Confirming the remaining memory capacity
		2	Calc	Confirming the maximum/minimum/average data
		3	Measure	Confirming the number of tag data/log data pieces
4	Data Clr	1	1TagFile	Clearing the measured data associated with the tag
		2	1LogFile	Clearing the measured data associated with the log
		3	1TagData	Clearing one piece of measured data associated with the tag/log
		4	All File	Clearing all measurement data
5	Comm	1	Comm Set	Setting the communication environment
		2	1File	Outputting the tag/log data for the printer
		3	All File	Outputting all data for the printer
		4	RealTime	Switching on/off real-time data transmission
6	Clock	1	ClockSet	Setting the date and time
		2	ChimeSet	Setting the chime function to ON/OFF and the time at which it is turned on/off.
7	AlarmSet	1	All File	Batch-setting the alarm function for all tags
		2	1File	Setting the alarm function for the specified tags
8	Staff	1	CurrData	Confirming the currently selected operator
		2	Change	Modifying the operator
		3	Entry	Registering the operator name
9	Others	1	BkLight	Backlight ON/OFF
		2	KeySound	Key operation sound ON/OFF
		3	Digit	On/Off of the temperature fraction display
		4	APOff	Setting the Auto Power Off function
		5	KeyLock	Key lock ON/OFF
		6	FuncLock	FUNC lock ON/OFF
		7	Name	Setting the instrument name
		8	Adjust	Setting simplified input corrections
		9	RangeSet	Setting measuring ranges
0	Initial	1	Initial	Initializing the setup data and measured data
		2	Comment	Setting comments

YOKOGAWA ◆

Yokogawa Meters & Instruments Corporation

IM3E-2006.2

L4005AE