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IT-480
Data Acquisition

User Manual

CODE:GZ0000476567

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Preface

This manual describes the operation of the IT-480, Data Acquisition.
Be sure to read this manual before using the product to ensure proper and safe operation of the product. Also safely store the manual so it is readily available whenever necessary.

Product specifications and appearance, as well as the contents of this manual are subject to change without notice.

System Requirements

- This software functions on personal computers (referred to as PC in the rest of this document) or tablets installed with either the 32-bit or 64-bit version of Windows 7, Windows 8, Windows 8.1, and Windows 10.
- At least 1 GB of hard disk space is required to install this software.
- A screen resolution of at least 1280 dots × 800 dots (100% scaling ratio) is recommended.

Trademarks

- Windows is registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

Other company names and brand names are either registered trademarks or trademarks of the respective companies. (R), (TM) symbols may be omitted in this manual.

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Manual Information

Description in this manual

Note

This interprets the necessary points for correct operation and notifies the important points for handling the product.

Reference

This indicates the part where to refer for information.

Tip

This indicates reference information.

Original language

This is the English translation of an original Japanese document.

Documents related to this product

The following documents are related to this product.

■ Instruction manual for the IT-480

This volume mainly discusses Infrared Thermometer IT-480.

■ User Manual for the IT-480 Data Acquisition (this manual)

This volume mainly discusses the IT-480 Data Acquisition.

■ Reference Manual for the IT-480 Virtual COM Port Driver

This volume mainly discusses the IT-480 Virtual COM Port Driver.

Version of Windows in operating

This manual indicates operating in Windows 7. When operating in a different version, procedures is different.

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1 Outline

"IT-480 Data Acquisition" is a dedicated software for the infrared thermometer IT-480 series. When installed on a PC that is connected to the IT-480 via USB, this software is used to view and change IT-480 settings, verify operation, and acquire data.

2 Preparation

2.1 Installation

Operation procedure

1. **Access the download page at the HORIBA website (http//www.horiba.com/software/it-480/).**
2. **Download and unzip either the 32bit.zip file or 64bit.zip file that contains the IT-480 Data Acquisition.**
   Download the 32-bit version of the software when using 32-bit Windows. Download the 64-bit version of the software if using 64-bit Windows.
   A folder named 32bit or 64bit will be created after the file is unzipped.
3. **Double-click the Setup.exe file in the 32bit folder or 64bit folder to open the installation screen.**

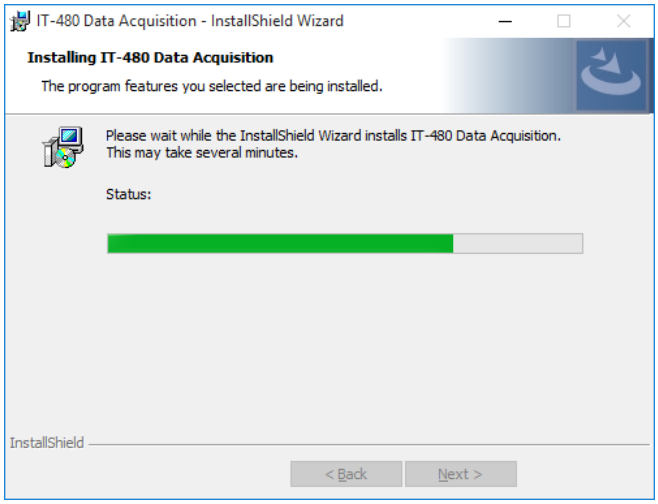


Fig. 1 Installation screen

Follow the on-screen instructions to complete the installation.
IT-480 Data Acquisition shortcut icon is created at the desktop.
[IT-480 Data Acquisition] is added under the [HORIBA] folder in start menu.

4. **Click [Finish] to complete the installation.**

2.2 Connecting IT-480 devices

Connect the IT-480 to a PC with a USB cable. Up to eight IT-480 devices can be connected.
The instrument can be operated by the USB bus power, eliminating the need to connect an external power supply.
However, multiple IT-480s or other USB devices are connected to USB hub causes power shortage. Use a self-powered USB hub that takes external power supply (e.g. AC adapter).

Note

When operated by USB bus power only, performing "4.6 Current output test" (page 13) is not available. If you need to perform the current output test, also connect an external power supply.

After installing the driver and connecting an IT-480, the message screen as illustrated in Fig. 2 appears. (This screen sometimes does not appear.)

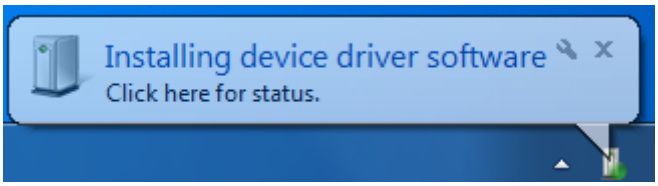


Fig. 2 Connection in progress screen

The IT-480 connection status can be checked in Windows Device Manager.

Windows 7 procedure

Open the start menu and select [Control Panel]. Open [Device Manager] and select [Ports (COM & LPT)].
Fig. 3 is a system configuration in which four IT-480 devices are connected to COM ports 33 to 36.

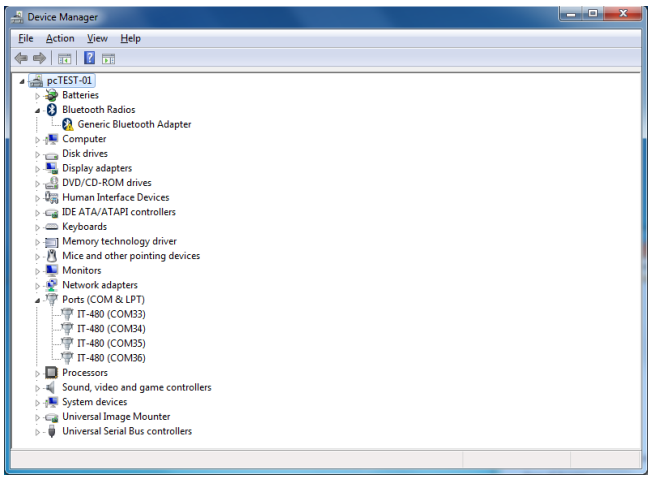
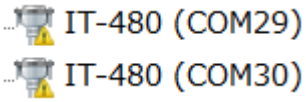


Fig. 3 Device manager window (example)

Note

- The COM port number depends on the customer environment.
- If the ⚠ icon appears next to the IT-480 device as illustrated in the figure below, or the connected IT-480 does not appear in device manager, wait a few moments and check the connection status again.

  If the ⚠ icon still appears, the device may be not successfully connected. Disconnect and reconnect the USB cable and USB hub. It may take several minutes before the USB cable reconnection is recognized.
  If the device is still not successfully connected, connect the USB cable to other USB port or replace the USB hub and/or the USB cable.



3 Basic Operation

3.1 Software startup

- **Starting from the desktop**

  Double-click [IT-480 Data Acquisition] icon.

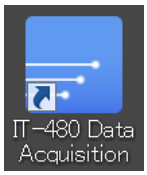


Fig. 4 [IT-480 Data Acquisition] icon

- **Starting from the start menu**

  Windows 7 procedure

  Select [IT-480 Data Acquisition] under the [HORIBA] folder.

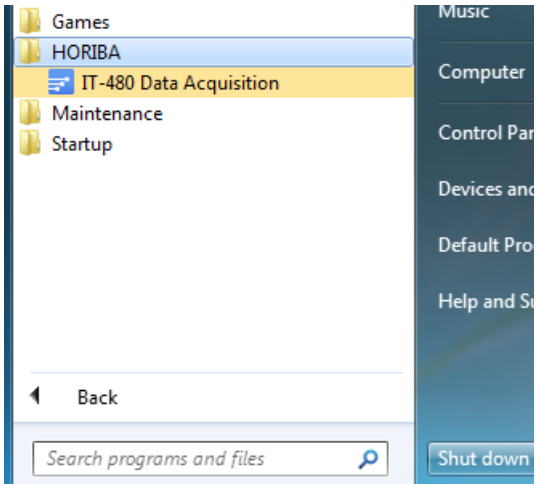


Fig. 5 Starting the software from the start menu

3.2 Mode selection

Starting the software displays the mode selection window.

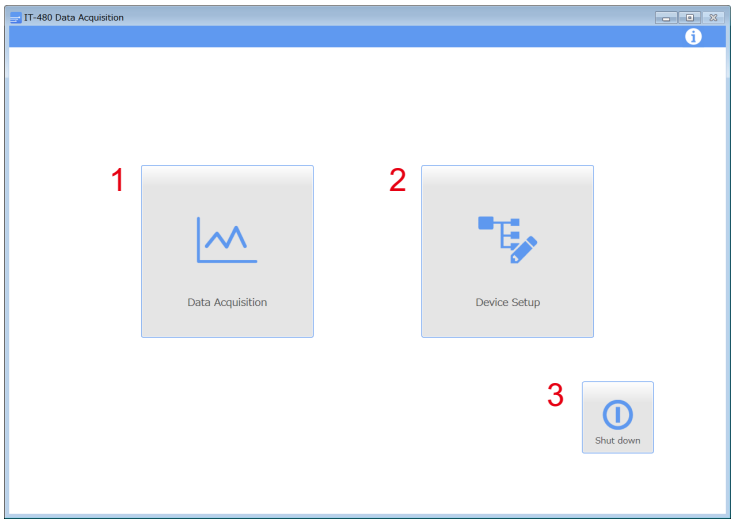


Fig. 6 Mode selection window

Table 1 List of mode selection window buttons

No.	Button name	Description
1	[Data Acquisition]	Clicking this switches to the data acquisition mode and displays the data acquisition window. The data acquisition mode acquires temperature data.
2	[Device Setup]	Clicking this switches to the device setup mode and displays the device setup window. The device setup mode can view and change the device setting and verify operation.
3	[Shut down]	Clicking this closes the mode selection window.

3.3 IT-480 setup - Device setup mode

At the mode selection window, click the [Device Setup] button to open the device setup window.

Fig. 7 Device setup window

The following operations can be performed at the device setup window.
Refer to "4 Device Setup Mode" (page 9) for more information.

- View and change labels and IDs
- View and change settings
- Emissivity automatic adjustment
- Read and display temperature measurement results in chart format
- Current output test

Click in the upper-right corner of the window to return to the mode selection window.

3.4 Temperature data acquisition - Data acquisition mode

At the mode selection window, click the [Data Acquisition] button to open the data acquisition window.

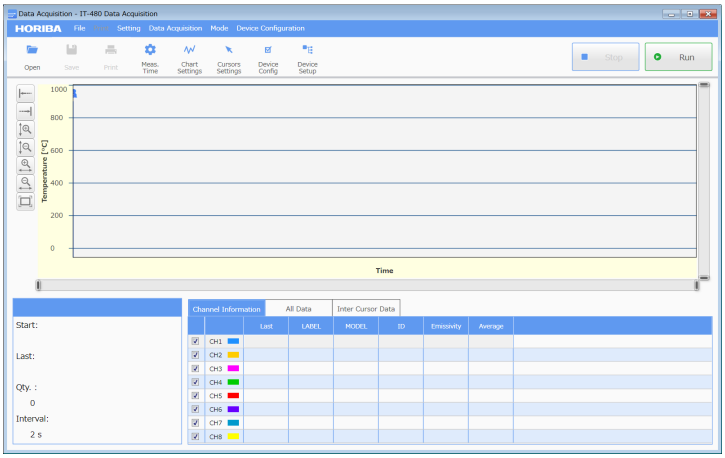


Fig. 8 Data acquisition window

At the data acquisition window, temperature data can be acquired from up to eight IT-480 devices and measurement results can be saved and loaded.
Saved data can be loaded into the software. The scale of displays and cursor position can also be changed.
Refer to "5 Data Acquisition Mode" (page 14) for more information.

Click in the upper-right corner of the window to return to the mode selection window.

3.5 Exiting the software

Clicking the [Shut down] button on the mode selection window or at the menu on either the device setup window or data acquisition window, select [File] and then [Exit] to close IT-480 Data Acquisition.

4 Device Setup Mode

4.1 Device selection

● Single IT-480 device connected to a PC

The IT-480 device label, ID, settings values, and temperature measurement results appear in the device setup panel.

● Multiple IT-480 devices connected to a PC

Labels and IDs lists of connected IT-480 devices appear in the device selection panel.
Selecting and clicking on a target device changes the background color to blue and displays the label, ID, settings values, and temperature measurement results in the device setup panel.

Fig. 9 Device setup window

Note

- Channel numbers (CH) are assigned in order of device IDs.
- If a connected IT-480 device does not appear in device selection panel, return to the mode selection window and reconnect the IT-480 device, and then select the device setup mode again.

4.2 Viewing and changing labels, IDs, and settings

4.2.1 Viewing Labels, IDs, and settings

Select a device to display the label, ID, and settings in the device setup panel.
Refer to "4.1 Device selection" (page 9) for more information.

4.2.2 Changing labels, IDs, and settings

Operation procedure

1. **Select a device in the device selection panel, and click the [Edit] button in the device setup panel.**
   The background color of input fields changes to white indicating that settings can be edited.
   The [Edit] button changes to the [Write] button.

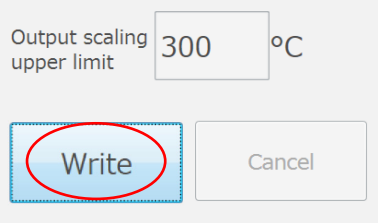


Fig. 10 Changeng labels, IDs, and settings

2. **Change the values in the input fields as desired and then click the [Write] button.**
   Settings for the selected device are updated.
   Click the [Cancel] button to discard any value and text changes. The original settings for the selected IT-480 device appear in the device setup panel.

4.2.3 Details of the selected device

● Labels and IDs

Labels and IDs are text strings used to identify devices.
These text strings can be up to 30 single-byte alpha-numeric characters in length.
By default, [Label]s are configured with the product model name, and [ID]s are configured with a sequence number from "#001" to "#999".
Channel numbers used in the device setup mode and the data acquisition mode are assigned in order of device IDs.

● Emissivity setting

The emissivity setting must be set in alignment with the emissivity of the object to reduce measurement error.
The emissivity setting can be configured up to three decimal points.
The configurable range is between 0.100 to 1.999. The default setting is 0.950.
Emissivity auto-configuration can be used when the temperature of the object can be clarified.
Refer to "4.3 Emissivity automatic adjustment" (page 12) for more information.

Tip

The default setting 0.950, which is appropriate for rubber plastic, paper, glass, ceramics, foods and various painted surface, is effective enough for accurate temperature measurements.

● Moving average count setting

The configurable range is between 1 and 1000.
The default setting is below.

- IT-480S, IT-480N, IT-480L, IT-480W: 10 times (0.2 s)
- IT-480F, IT-480P: 50 times (1.0 s)

The IT-480 device calculates temperature and updates current output repeatedly ever 0.02 seconds.
As such, the moving average count is for one second when the moving average count setting is set to 50.
The moving average count applies to both current output and USB temperature data.
Increasing the moving average count setting reduces the output fluctuation width, but slows the response speed.

● Current output scaling (Output scaling lower/upper limit)

Output scaling lower limit of current output is equivalent to 4 mA, and the output scaling upper limit of current output is equivalent to 20 mA.
Values can be configured up to one decimal point.

Note

Even if the settings are within the allowed setting range, the difference between the output scaling lower limit and upper limit settings cannot be less than 10°C.

The following table describes the configurable ranges and default settings.

Table 2 Output scaling lower/upper limit settings

Product model	Configurable range	Default setting
IT-480S/N/L/W	-50°C to 500°C	Output scaling lower limit: 0°C Output scaling upper limit: 500°C
IT-480F/P	-50°C to 1000°C	

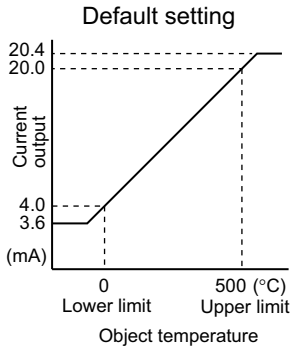


Fig. 11 Output scaling lower/upper limit and current output characteristic

4.3 Emissivity automatic adjustment

Click the [Emissivity Automatic Adjustment] button in the device setup panel to display the emissivity automatic adjustment window.

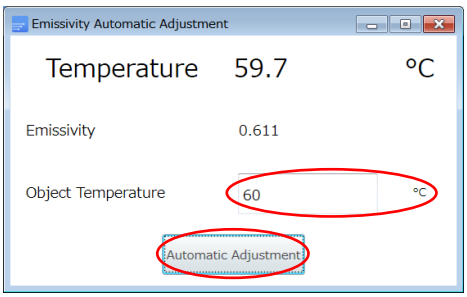


Fig. 12 Emissivity automatic adjustment window

Operation procedure

1. **As illustrated in the figure, enter the target temperature in the [Object Temperature] field and then click the [Automatic Adjustment] button.**
   The Emissivity automatic adjustment process starts.
   The Emissivity automatic adjustment process takes four to five seconds to update the emissivity setting of the IT-480 device.
   The Emissivity automatic adjustment process is canceled in the following scenarios.
   - The difference in temperature between the IT-480 device and the object is less than 20°C.
   - The temperature of the object is unstable.
   - The temperature of the IT-480 device is unstable.

4.4 Saving and loading settings

Settings that were edited on a PC can be saved as XML files.

Operation procedure

1. **Click the [Write] button in the device setup panel, click the [Save] button and then specify the file name and storage location.**

Click the [Open] button to load the settings saved on a PC. Select the folder and file name to load and update the settings into the software.

4.5 Reading and displaying temperature measurement results in chart format

Temperature measurement results read from the IT-480 device can be displayed in numerical and chart format.
The temperature axis (vertical axis) on charts represents the current output range. (Refer to "Current output scaling (Output scaling lower/upper limit)" (page 11).)
The scale of the time axis (horizontal axis) is in minutes and seconds.
The chart window can accommodate time axes of up to three minutes in length before the chart needs to be scrolled.

4.6 Current output test

As illustrated in the figure, click the [Current Output Test] button in the device select window to display the current output test window.

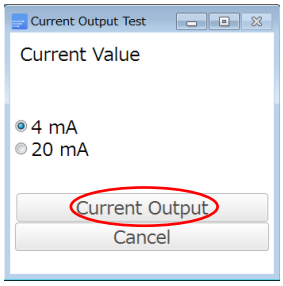


Fig. 13 Current output test window

Operation procedure

1. **Click the [Current Output] button.**
   Current selected with radio button is output.
   The [Current Output] button changes to the [Stop Current Output] button.

Click the [Stop Current Output] button to stop the current output test and return to normal operation.
Click the [Cancel] button to return to normal operation even during testing and close the current output test window.

5 Data Acquisition Mode

5.1 Preparation for measurements

5.1.1 Device configuration

Operation procedure

1. **At the data acquisition window, click the [Device Config] button to display the device configuration window.**

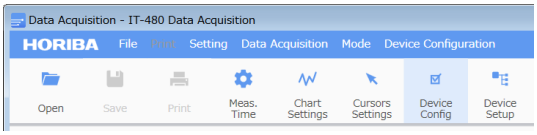


Fig. 14 [Device Config] button

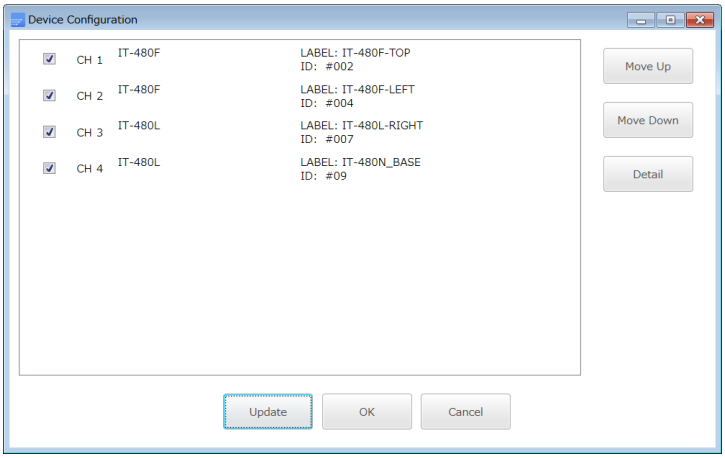


Fig. 15 Device configuration window

The last connection state appears.
Click the [Update] button to display the latest state of connections in order of device IDs.

2. **Click the check boxes to select the device for use in the measurement.**
Use the [Move Up] and [Move Down] buttons to change channel assignments.
3. **Click the [OK] button to close the device configuration window.**
The Data Acquisition window is updated with the selected device.
Click the [Cancel] button to discard device selection and channel assignments and close the device configuration window.

5.1.2 Measurement time settings

Operation procedure

1. **At the data acquisition window, click the [Meas. Time] button to display the measurement time setting window.**

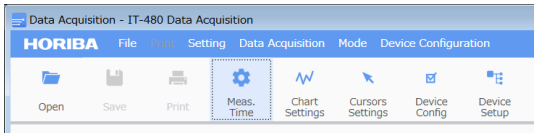


Fig. 16 [Meas. Time] button

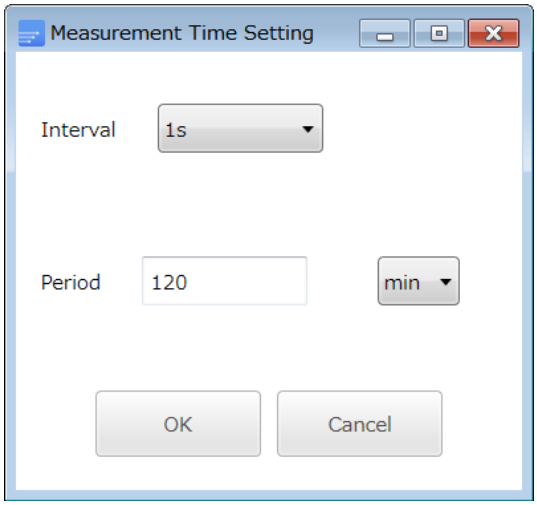


Fig. 17 Measurement time setting window

2. **Set the measurement interval and measurement period.**
   Select [Interval] by selecting from 1s, 2s, 5s, 10s, 20s, 30s (seconds) and 1m, 2m, 5m, 10m (minutes).
   Configure [Period] by selecting a unit of measure and entering an integer value.
   Period cannot be configured with a value that would result in a value exceeding 10000 if divided by the measurement interval.
3. **Click the [OK] button to close the measurement time settings window.**

5.2 Starting and stopping measurements

At the data acquisition window, click the [Run] button to start the measurement.

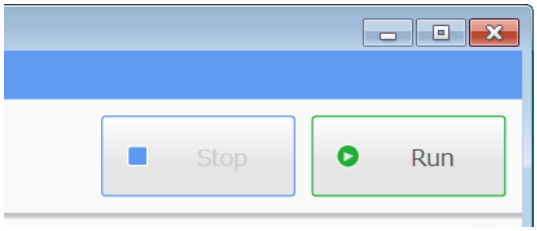


Fig. 18 Starting measurement

The measurement stops when the [Stop] button is clicked or after the measurement is finished.

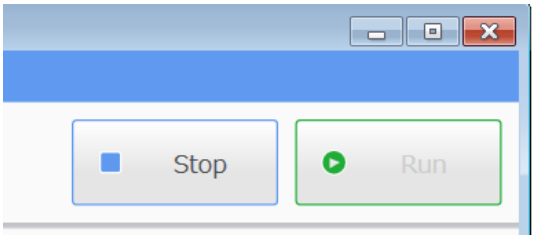


Fig. 19 Stopping measurement

Note

- When the USB cable is disconnected during the measurement, the measurement stops with error message.
- If the connection of the device is changed, reconnect the USB cable and operate the device configuration procedure again. You can not click the [Run] button until the latest state of connections is displayed on the device configuration window. (Refer to "5.1.1 Device configuration" (page 14).)

5.3 Settings

5.3.1 Chart settings

Chart settings including the temperature axis and time axis scales, chart colors, and line types can be changed at any time before, during, or after the measuring process.
Click the [Chart Settings] button to open the chart settings window.

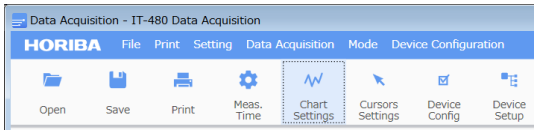


Fig. 20 [Chart settings] button

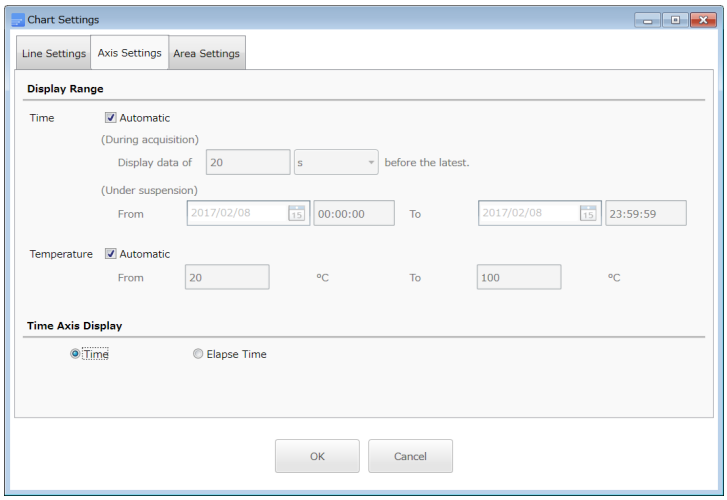


Fig. 21 Chart settings window

Table 3 List of chart settings tabs

Tab name	Setting item
[Line Settings]	Line colors and line types of charts
[Axis Settings]	Background colors, peripheral colors, and grid colors of charts
[Area Settings]	Time and temperature axis settings for charts

5.3.2 Cursors settings

At the data acquisition window, click the [Cursors Settings] button to open the cursors settings window.
The cursors settings window is used to show and hide cursors A and B and set the display position.

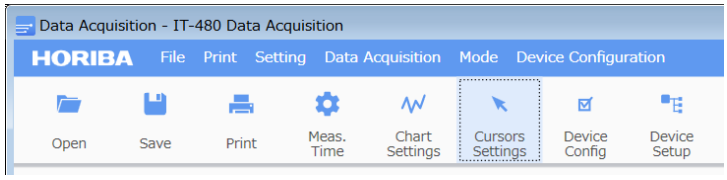


Fig. 22 [Cursors Settings] button

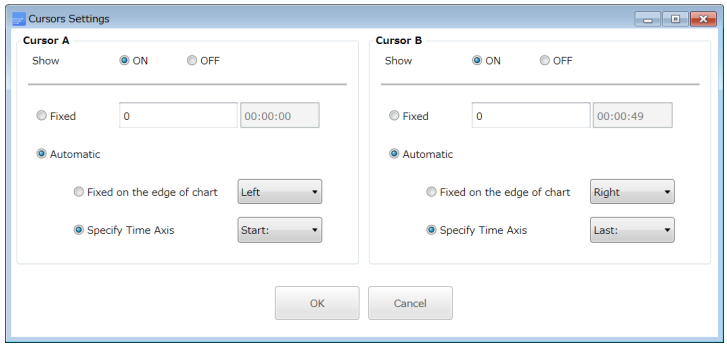


Fig. 23 Cursors settings window

Use a mouse to drag the cursor on the chart or click the move cursor button to move the cursor.

- Click the button labeled as 1 in the figure to move cursor A to the start time of measurements.
- Click the button labeled as 2 in the figure to move cursor B to the end position of the data.

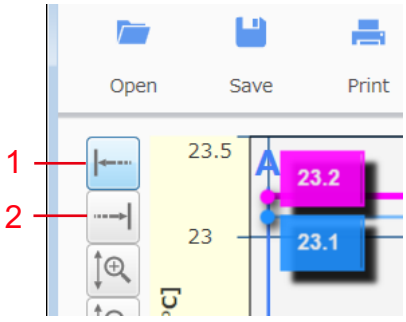


Fig. 24 Move cursor button

5.3.3 Changing the display scale of charts

Click the zoom buttons or drag the ruler cursors to change the display scale of the time and temperature axes in the chart.
Click the scale reset button to reset the display scale in the chart.

Fig. 25 Changing the display scale of charts

5.3.4 Displaying channel information, all data, and inter cursor data

Channel information, all data, and inter cursor data appear in the lower half of the data acquisition window.
The display of channel information, all data, and inter cursor data is changed via their corresponding tabs.

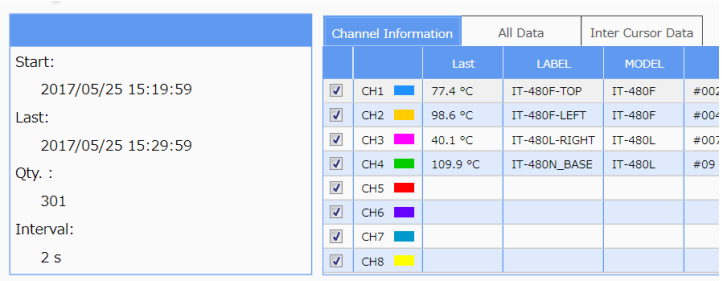


Fig. 26 [Channel Information] tab

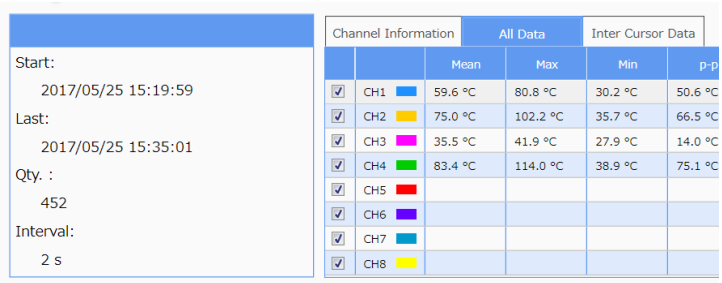


Fig. 27 [All Data] tab

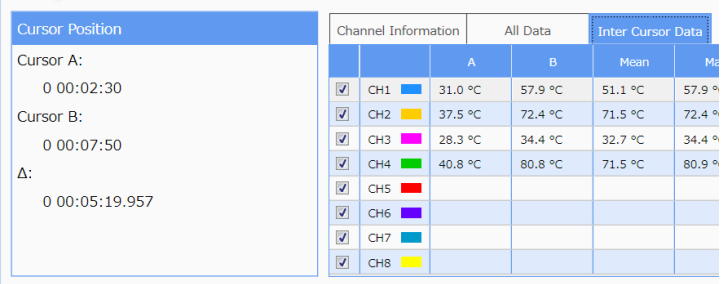


Fig. 28 [Inter Cursor Data] tab

Table 4 List of data acquisition window display items

Tab name	Display item
[Channel Information]	Label, product model, and settings of the device connected to each channel
[All Data]	Minimum, maximum, and average values of all data of each channel from measure start to finish
[inter Cursor Data]	Minimum, maximum, and average values of each channel for the range between cursors A and B

● Changing font sizes

Moving the cursor over and right-clicking the mouse on any value displayed in each tabs. Font sizes can be changed by selecting a font size option from this list.

5.4 Saving and loading data

5.4.1 Saving and loading measurement results

Measurement results can be saved in the proprietary format of this software (extension: .itb).

● Saving in the proprietary format

- From the [File] menu, select [Save].
- Click the [Save] button.

● Loading files save in the proprietary format

- From the [File] menu, select [Open].
- Click the [Open] button.

● Display of file names

When measurement data is saved or a measurement data file is opened, the file name appears to the left side of the [Channel Information] and [All Data] tabs.
Fig. 29 illustrates an example in which measurement data were saved to a file named "sample1".

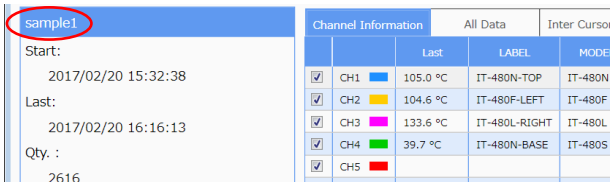


Fig. 29 Display of file names

5.4.2 Saving and loading measuring conditions

Measuring time settings files have an extension of "itc".

● Saving measuring conditions

From the [File] menu, select [Save Measuring Time Settings].

● Loading measuring conditions

From the [File] menu, select [Open Measuring Time Settings Files].

5.4.3 Exporting measurement results

Measurement results can be exported as CSV file or Excel file.
From the [File] menu, select [Export (CSV/Excel)].

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6 Specifications

Item	Minimum	Maximum	Notes
Number of connectible devices	1	8	-
Data acquisition cycle	1 second	10 minutes	Available options: 1, 2, 5, 10, 20, and 30 seconds 1, 2, 5, and 10 minutes
Number of retrievable data	-	10000 data	Per channel
Measuring time	-	100000 minutes equivalent to 69.4 days	10-minute data retrieval cycle

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