

AMS-350

User's Manual

AE-100295

Fifth edition (Jan. 2023)

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This manual is subject to change without prior notice.
Should you find any spelling or typographical errors, or have any feedback, comments or thoughts to improve this manual, please do not hesitate to contact us.

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1 General

AMS-350 is an application software that collects data from the HR-15*0 handheld thermometer and the HRM-150 high-precision handheld thermometer. It easily enables tasks such as creating graphs, tables, and files in addition to printing.

The following operating environment is required to use the software.

Supported OS: Microsoft Windows 10/Microsoft Windows 11

PCs that can run the above operating systems normally.

- We cannot guarantee that the software is operable on all PCs with the recommended environment.
- The software can be operated only by users with system administrator privileges (Administrator).
- Macintosh computers are not supported.
- Microsoft® Windows® 10 and Windows® 11 are registered trademarks or trademarks of Microsoft Corporation in the U.S.A., Japan, and other countries.

2 Types of Supported Measuring Instruments

This software supports the following measuring instruments. At the time of communication, connect the measuring instrument to the PC with a dedicated USB communication cable*.

Product type	Model name	Communication type
Handheld thermometer	HR-15*0	USB 2.0 interface
High accuracy thermocouple thermometer	HRM-150	

This software cannot be used with the AM-8000 series or earlier models or with the FL-2000/FL-2400.

***: For USB communication cables, please use the dedicated USB cable that is included. If there is a need to use a commercially available cable, use a product with the following specifications:**

USB 2.0-compatible; cable length within 1 meter; A: micro-B type, double-shielded

3 Quick Start Guide

- **When using for first time (installing the software)**

Please prepare a PC to install AMS-350 in an Internet-connected environment and follow the steps below.

To use a PC that cannot be connected to the Internet or has certain limitations, please refer to “6 Installing the software”.

- (1) Turn on the power of the measuring instrument and then insert the CD-ROM into the PC's CD-ROM drive.
- (2) Connect the measuring instrument to the PC using a dedicated USB communication cable.
- (3) Install AMS-350.
- (4) Start AMS-350 and set the communication port.

Note: For details, please refer to “5 Installing the Software”.

- **Collecting data stored in the measuring instrument**

- (1) Turn on the power of the measuring instrument.
- (2) Connect the measuring instrument to the PC using a dedicated USB communication cable.
- (3) Start AMS-350 and select [Data input] from the [Communication (C)] menu.

Note: For details, please refer to “7.3 How to Transfer Data from the Measuring Instrument”.

- **Viewing saved files**

- (1) Select [Open (O)] from the [File (E)] menu.
- (2) Input the filename to open the file.

Note: For details, please refer to “7.4 How to Read and Display Existing Files”.

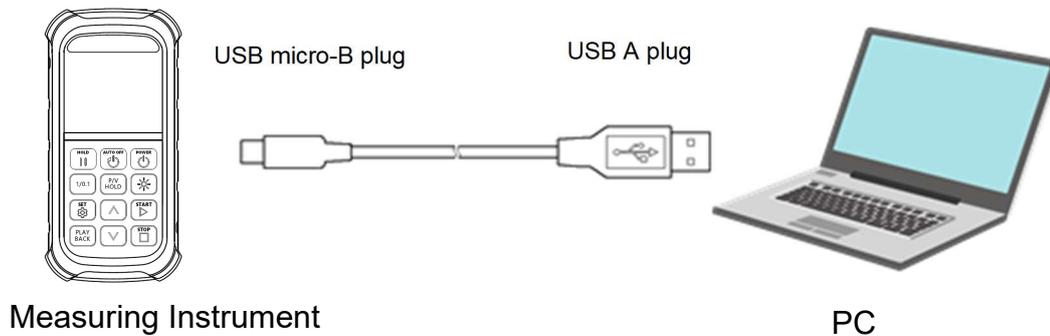
- **Opening saved files in Excel**

- (1) Select [Convert file] from the [File (E)] menu and then select [CSV format].
- (2) Specify the filename and click [OK]. A text file will be created, which can be opened from Excel.

Note: For details, refer to “7.8 How to Use Data in a Spreadsheet Software”.

4 Connections

For the USB communication cable, use one with a USB A plug on the PC side and a USB micro-B plug on the measuring instrument side. Connect the cable to the connector with the USB  mark on the PC.



Notes:

- When not communicating with a PC, always disconnect the measuring instrument from the PC (by removing the USB communication cable).
 - If a different application is used while the measuring instrument is connected to a PC, malfunctions and/or failures may occur.
 - For USB communication cables, please use the dedicated cable that is included.
 - To use a commercially available cable, use a product with the following specifications:
USB 2.0-compatible; cable length within 1 meter; A: micro-B type, double-shielded
- The measuring instrument does not support recharging via USB.

5 Installing the Software

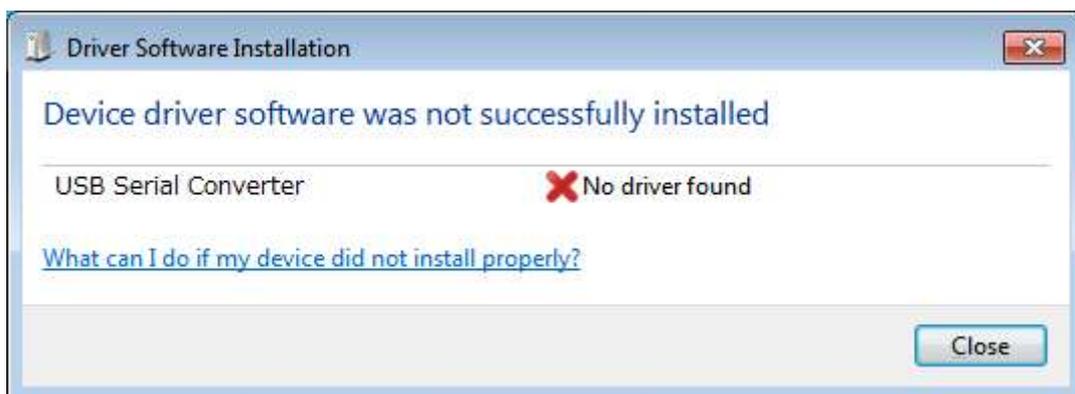
Terminate all application software. If any other application software is running, the installation may not be completed normally.

5.1 Installing the USB Driver

Note: The necessary driver may not be found in the following PCs:

- any PC without administrator privileges. (Please use a PC with administrator privileges.)
- any PC that blocks installation of another USB driver. (Please use a different PC or conduct a PC recovery.)

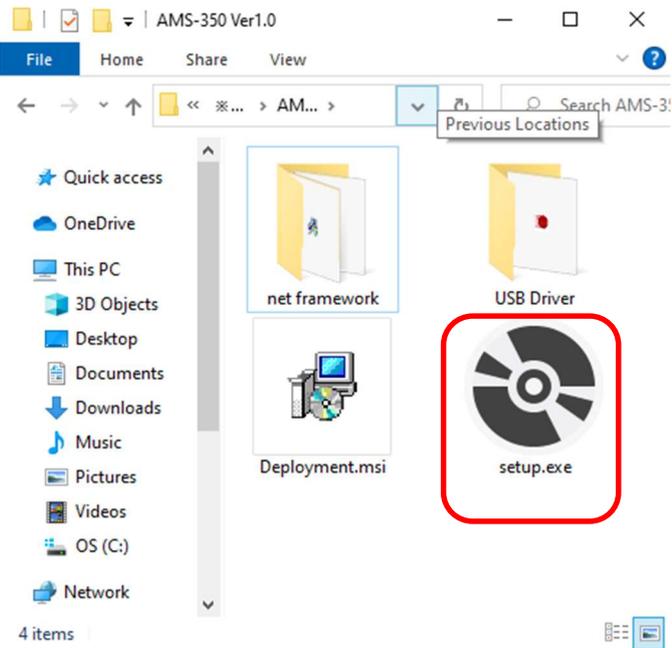
- (1) Connect the measuring instrument to the PC using a dedicated USB communication cable.
- (2) The driver installation will automatically start.



To install the driver in an environment without an Internet connection, run the CDM21228_Setup.exe file that can be found in the USB driver folder on the CD-ROM.

5.2 Installing AMS-350

- (1) Place the AMS-350 CD-ROM into the CD-ROM drive, and then double-click the CD-ROM icon.
- (2) Double-click setup.exe.

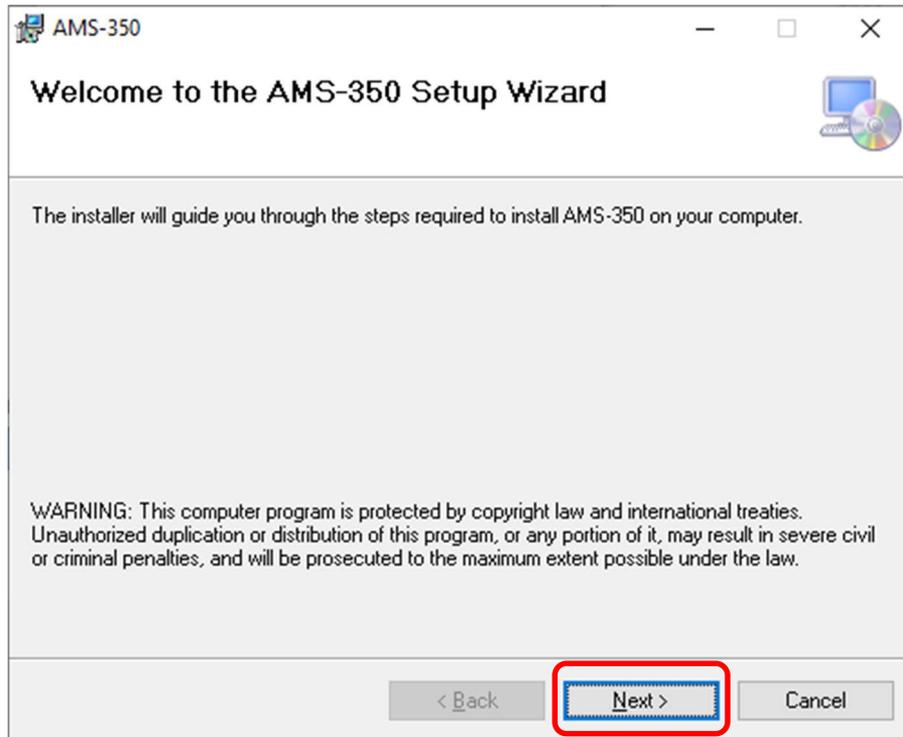


- (3) For AMS-350 to operate normally, the PC installing the software must have Microsoft .NET Framework 4.6.2 or higher installed.
If it is not installed, its setup screen will be displayed. Read the message carefully and if the content is acceptable, please check [Agree (A)] and then click the [Install (I)] button.

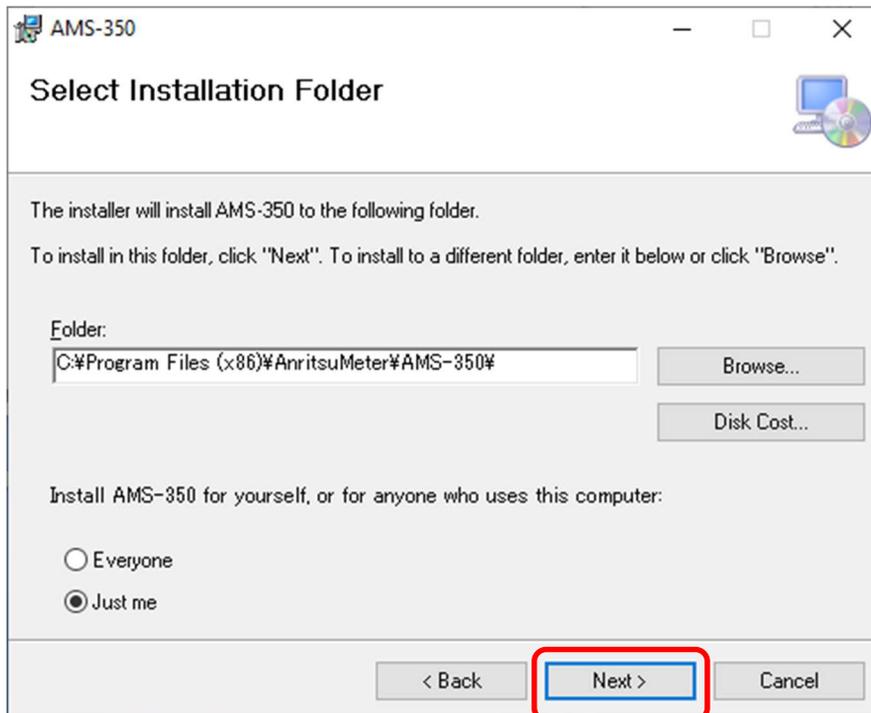
To install Microsoft .NET Framework in an environment where the PC is not connected to the Internet, run NDP462-KB3151800-x86-x64-AllOS-ENU.exe, which is an off-line installer of Microsoft .NET Framework 4.6.2 that can be found in the “net framework” folder in the CD-ROM.

Note: NDP462-KB3151800-x86-x64-AllOS-JPN.exe is a Japanese language package. First, install Microsoft .NET Framework 4.6.2 using the off-line installer and then install this package.

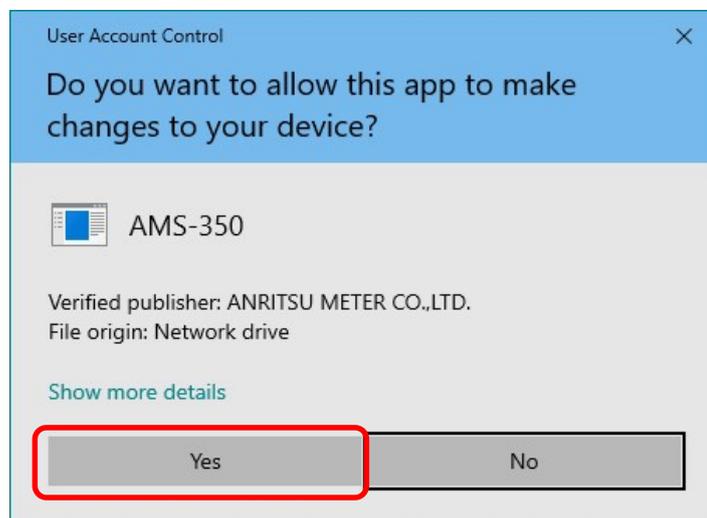
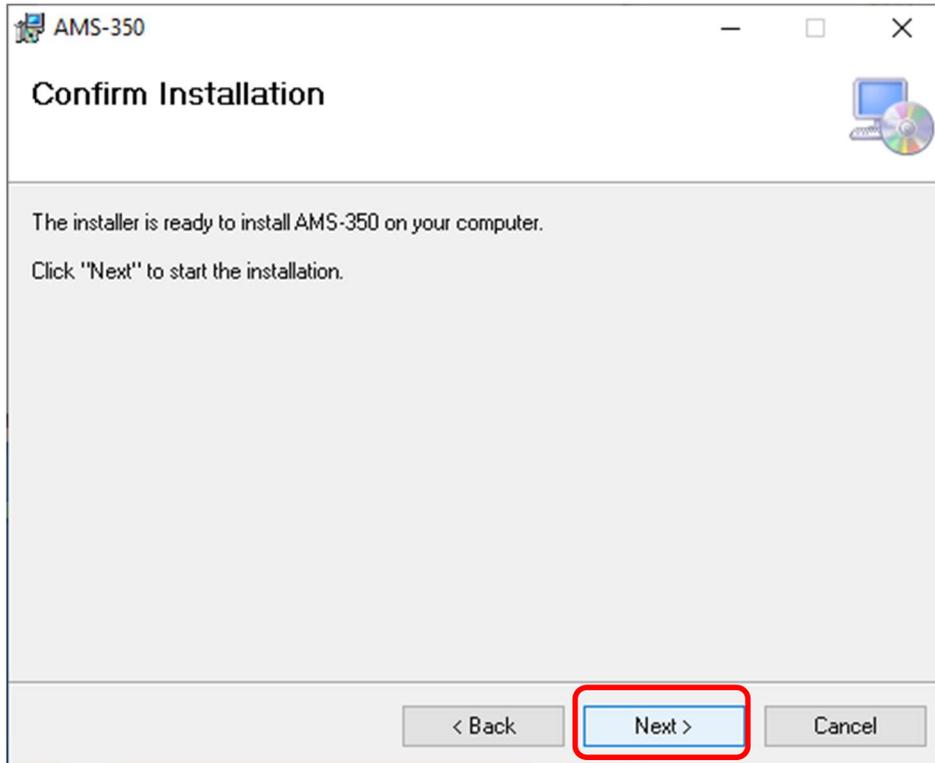
(4) Next, install AMS-350. Follow the instructions on the screen to install the software.



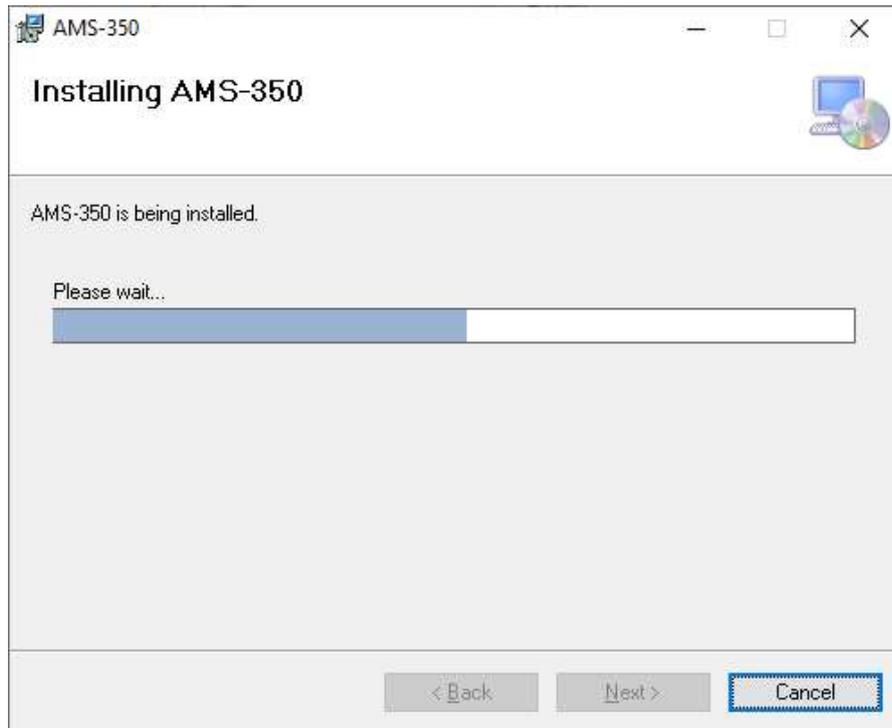
Select a folder to install AMS-350. Normally, the software will install in the default folder displayed in the dialog. Select [Just me] radio button.



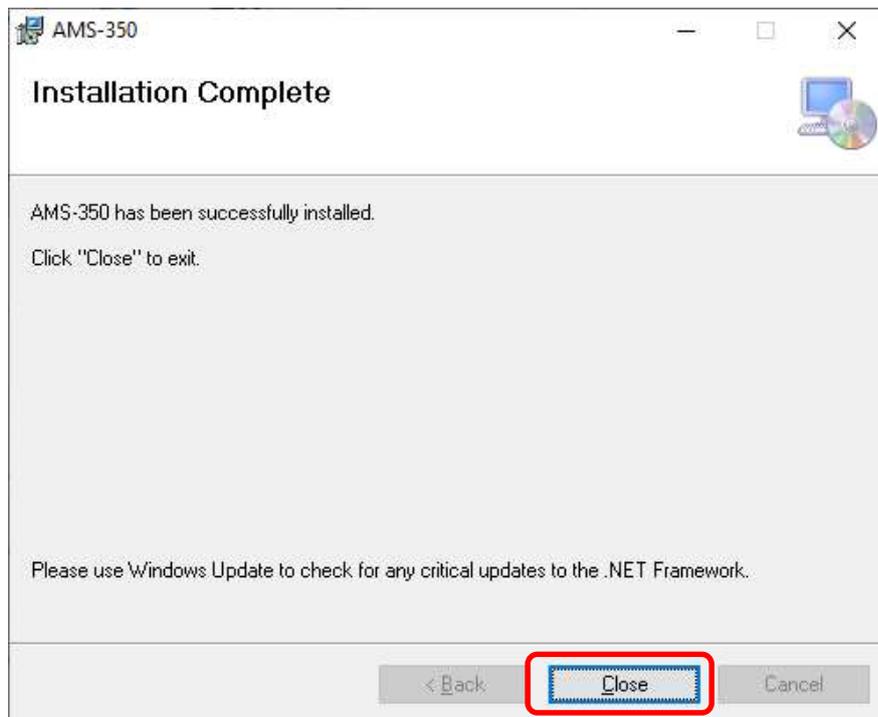
Click [Next] to start the installation of AMS-350.



During the process, when the User Account Control screen (above) is displayed, select [Yes].

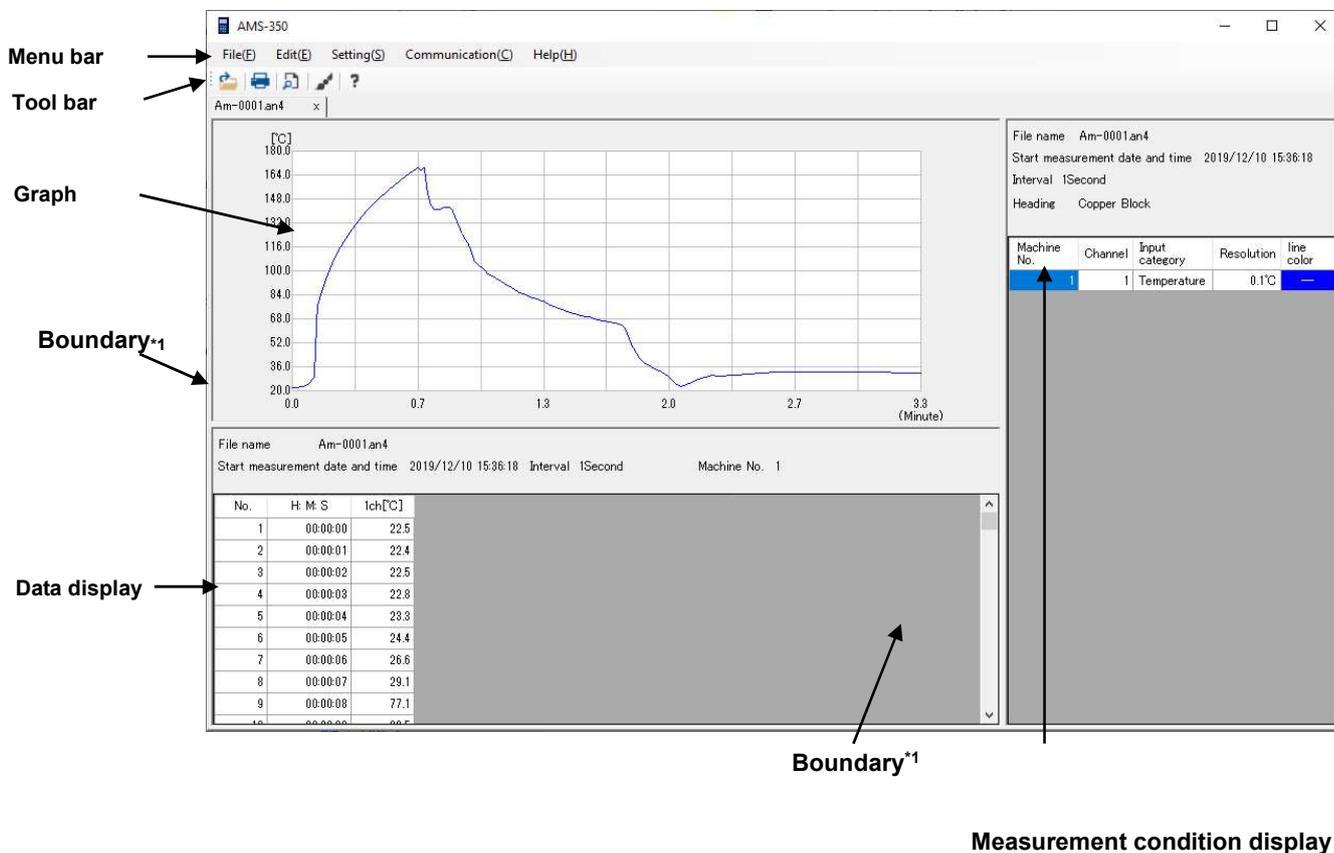


- (5) When the installation of AMS-350 is completed, the screen below will be displayed. Click [C]lose to complete the installation. "AMS-350" will be registered in the Windows Start menu. In addition, a shortcut will be created on the desktop.



6 Screen Configuration

6.1 Names and Functions of the Main Screen



Menu bar: Used to set up functions or perform measurements.

Tool bar: Frequently used functions are represented by buttons.

Graph display screen: Displays measured data as a graph.

Data display screen: Displays measured data.

Measurement condition display screen: Displays measurement settings of channels.

*1: By moving the boundaries, the size of each screen can be changed as appropriate.

6.2 How to Operate the Software

<Operation by mouse>

Click on an item on the menu bar or tool bar to select an item.

In the data display or graph display screen, you can use the scrolling function of the mouse.

<Operation by keyboard>

You can select an item on the menu bar or tool bar by using the keyboard.

On the right of the items of the menu bar, you can find an alphabet mark (like "File (E)". Follow the instructions below:

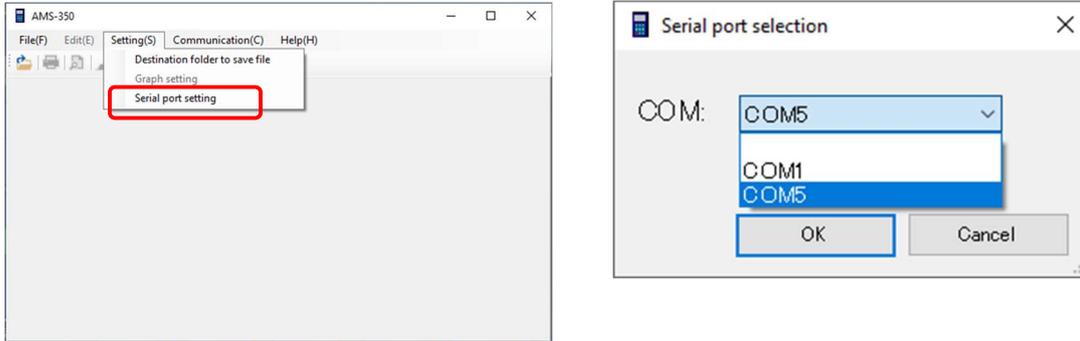
- Menu bar: **ALR(GRPH) + symbol** (File (E), Communication (C), etc.)
- Pulldown menu: **Symbol** (Open (O), Print (P), etc.)
- TAB keys: **Moves the cursor position** (ex. Move between items in the dialog box, etc.)

Note: To communicate between AMS-350 and the measuring instrument, always do so with the power of the measuring instrument on. Otherwise, AMS-350 will become stuck in a "Waiting for response" status and then AMS-350 will be forced to shut down.

7 How to Operate the Software

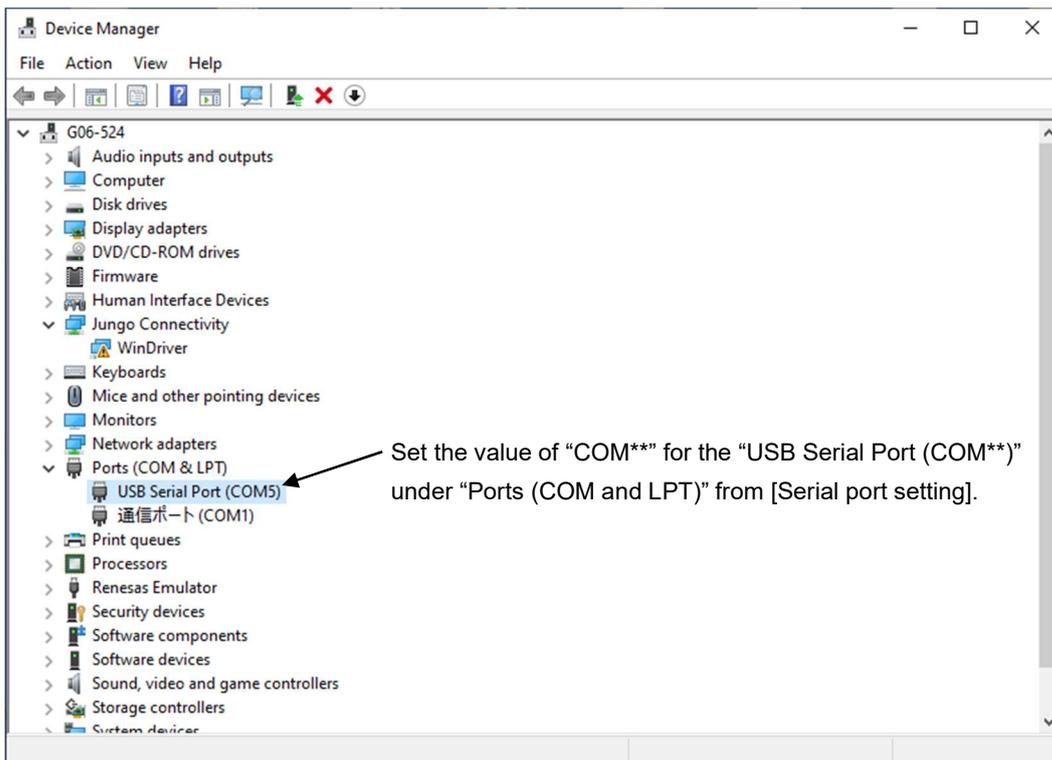
7.1 Communication Port Settings

From the [Setting (S)] menu, select the serial port number to be used for communication.



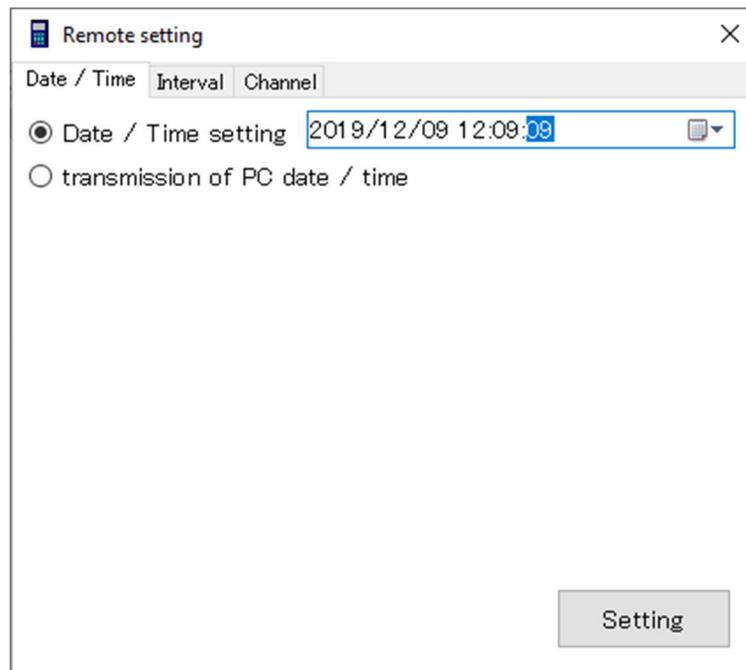
*If the serial port number is unknown or to check the USB connection, perform the following operation:

- (1) Connect the measuring instrument to the PC with a dedicated USB communication cable and turn on the power of the measuring instrument.
- (2) Right-click on the Windows Start  icon and select [Device Manager].
- (3) Check the following item:



7.2 How to Change the Settings of the Measuring Instrument

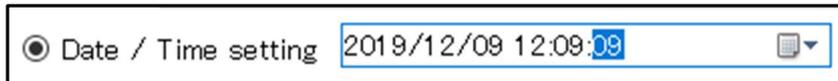
- (1) Connect the measuring instrument to the PC with a dedicated USB communication cable and then turn on the power of the measuring instrument.
- (2) Select [Serial port setting] from the [Settings (S)] menu and select the serial port to be used.
- (3) Select [Remote setting] from the [Communication (C)] menu.
Note: If the wireless function is used, processing may take extra time, depending on the communication conditions.
- (4) Setting items are distributed on tabs. Select the tab with the item to be set up.
- (5) Settings must be done for individual tabs. When an item has been changed, click the [Setting] button.



A. Clock settings

Sets the date and time of the measuring instrument. Select the [Date/Time] tab.

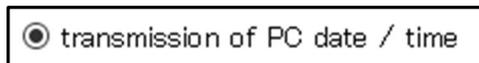
<Manual setting>



Select the radio button on the left, and then enter the numerical values in the input field for the date and time.

Note: The backspace or delete key cannot be used in the input field. If an incorrect entry is made, re-input the numerical value.

<Using the PC's clock>

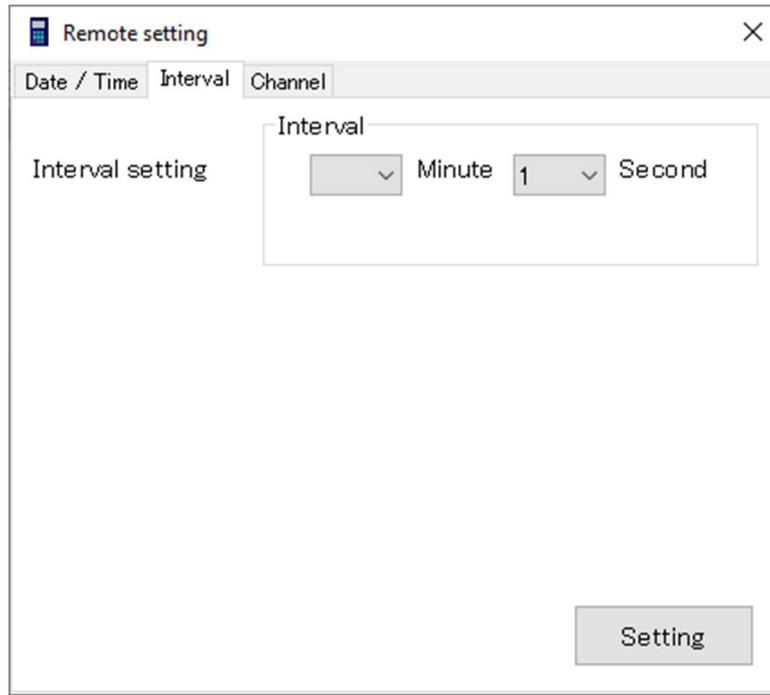


Select the radio button on the left. The measuring instrument will be synchronized with the date and time of the PC.

B. Interval settings

Sets measurement intervals.

Select the [Interval] tab and then select the setup values for minutes and seconds from the pull-down menu.



Notes:

- Interval times that can be set for individual models is a fixed value as shown in the table below.
- No combination setting of minutes and seconds is available.

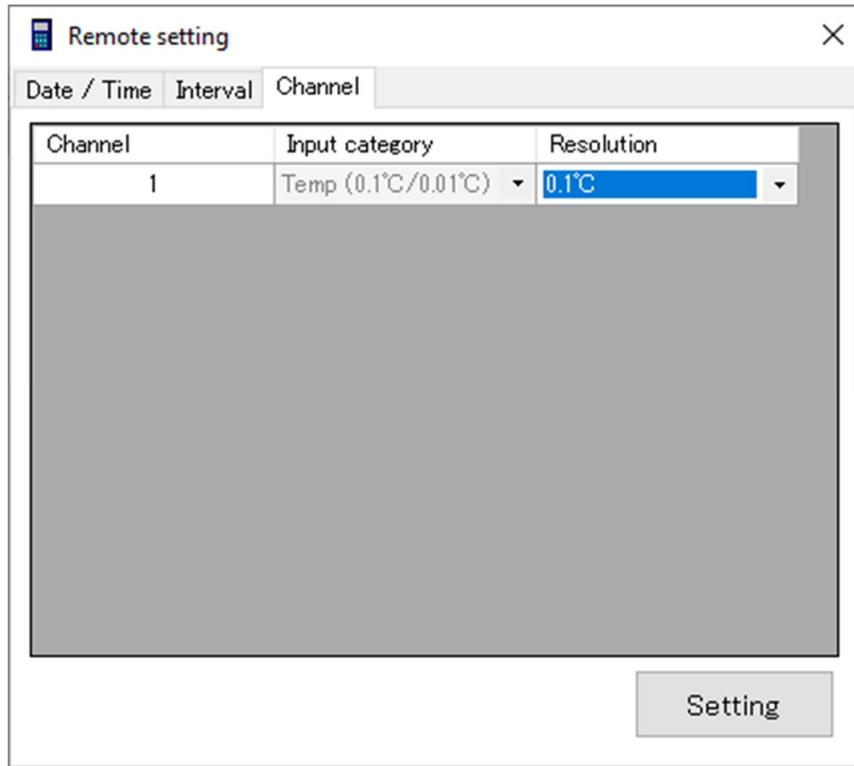
Model	Interval
HR-15*0 / HRM-150	1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute, 10 minutes, 30 minutes, 60 minutes

C. Channel setting

Sets the channel to be used for measurements. Select the [Channel] tab.

Channel and input type are automatically set up.

Select the resolution. (Resolutions can be set differently from model to model.)



Note: With regard to the HRM Series high-precision handheld, the resolution setting is available only when a dedicated sensor is used.

7.3 How to Transfer Data from the Measuring Instrument

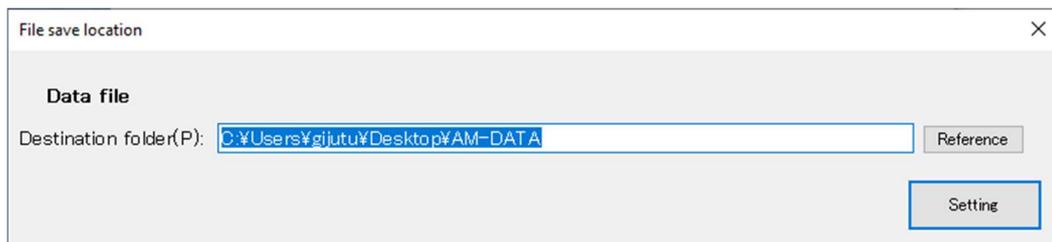
When data stored in the measuring instrument is transferred to a PC, files will be created.

As data are separated by blocks, the files will be created with blocks as units. First, save the location for the measured data to be set up. Once the save location is specified, data will always be saved in that specified location.

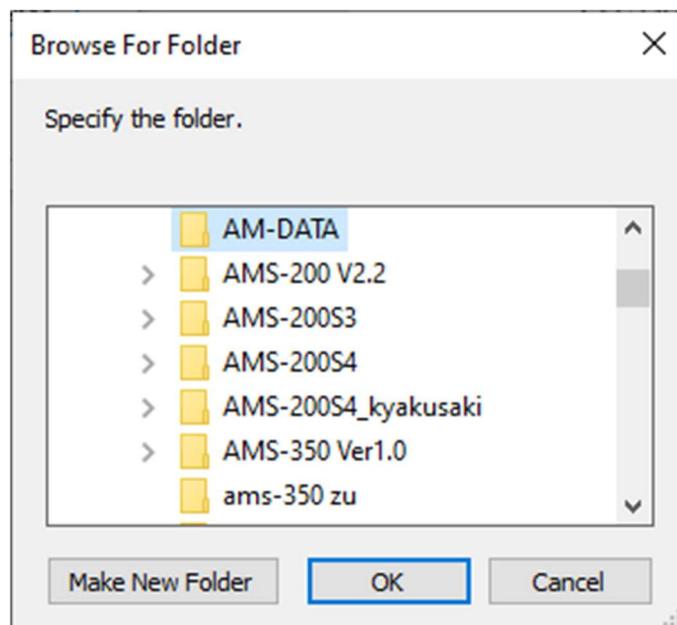
Note: If no save location is set up or exists, there will be an error.

- (1) Connect the measuring instrument to the PC with a dedicated USB communication cable and then turn the power of the measuring instrument.
- (2) Select [Serial port setting] from the [Setting (S)] menu and then select the serial port to be used.
- (3) Select [Destination folder to save file] from the [Setting (S)] menu.
- (4) Specify the location to save the data. When the setting is finished, click the [Setting] button.

In the example below, “AM-DATA” will be created on the desktop.



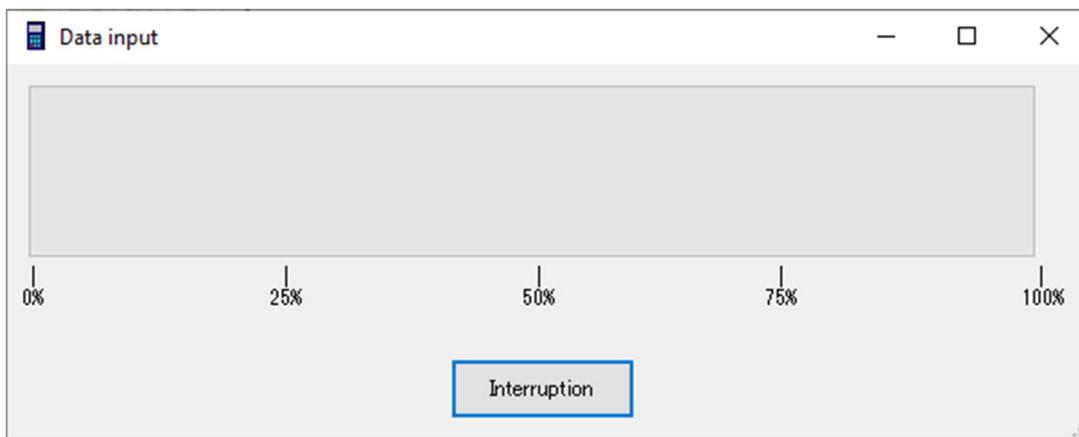
Click the [Reference] button to find a location to save the data. You can create a new folder from this screen. (Click [Make New Folder].)



Note: You cannot save data in the root directory of the C drive due to the User Account Control (security function of Windows). If "C:\\" (default value) is specified, AMS-350 will abnormally terminate.

(5) Select [Data input] from the [Communication (C)] menu. The confirmation prompt will be displayed. Select [Yes]. (To interrupt the process, select [No]).

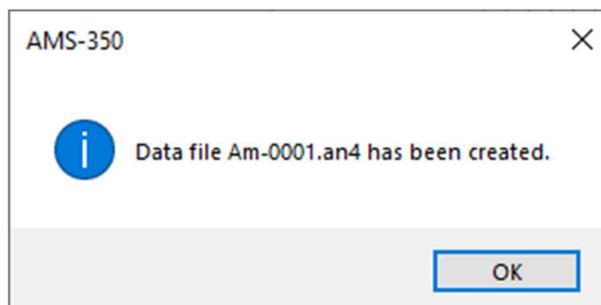
During communication, the transfer bar shown below will be displayed to check on the status of data transfer. By pressing [Interrupt], the communication will be interrupted. Data in the middle of a transfer or those not transferred will not be saved. To transfer a large amount of data, it may take several or dozens of minutes.



Notes:

- Do not operate any key of the measuring instrument during communication. Otherwise, abnormal termination, malfunction, etc. may occur.
- After data transfer, data on the measuring instrument will be retained. If there were any communication errors, etc., please transfer the data again.

When all data inputs are completed, a newly created data file will be displayed.



*** About the filename**

The filename is [Am-****.an4].

The numbers from 0001 to 9999 will be sequentially given to [****] for each folder.

Deleting any file will not affect other file numbers.

For example, if files up to #9999 are saved in the folder, the file #9999 will remain even if files #0001 to #9998 are all deleted.

In this case, as the file with the largest number (9999) is saved, no more data can be saved in this folder. If you want to save new data in this folder, change the filenames.

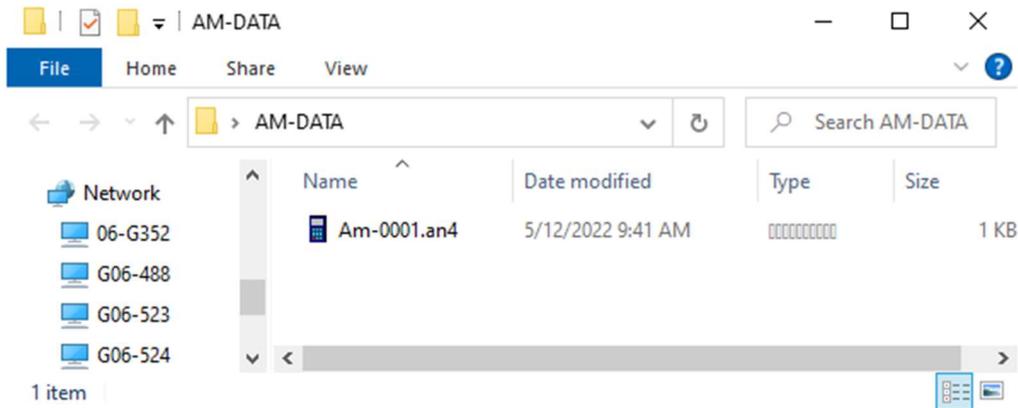
Ex: "Am-9999.an4" is renamed as "experiment1.an4".

Note: ".an4" is a file extension. In the default PC settings, this will not be displayed. Select and right-click the file, select [Rename], and then rename the file.

7.4 How to Read and Display Existing Files

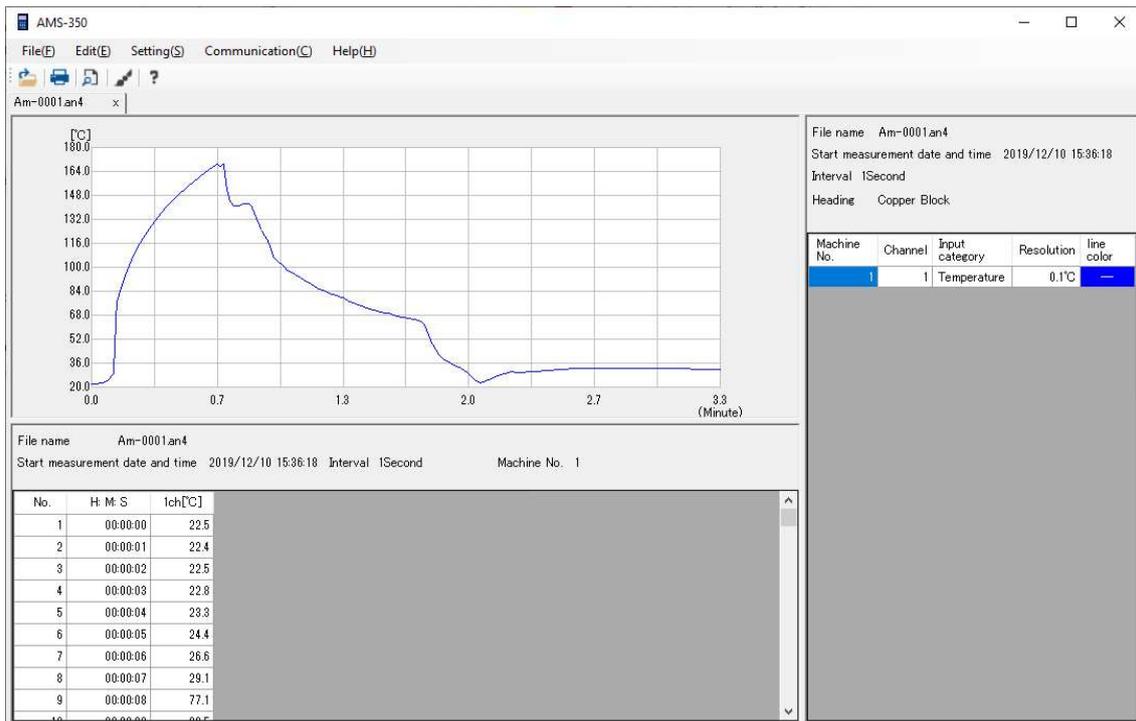
Open a file that is already saved by AMS-350.

(1) Select [Open (O)] from the [File (E)] menu.

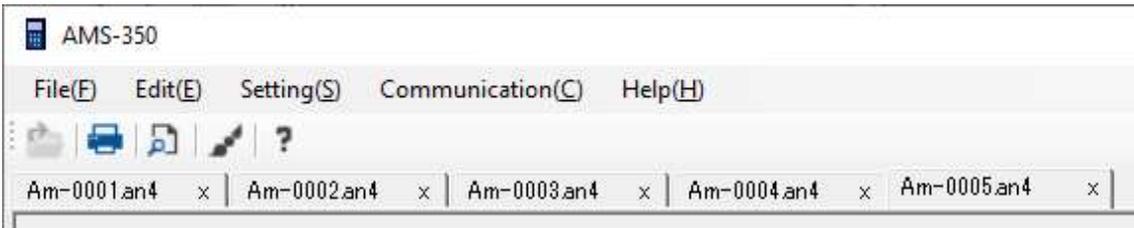


(2) Specify the file and then click [Open].

Note: Before opening the file, confirm that the selected filename is displayed in the [File name] field.



Note: To change the display range of the graph or line color/type, please refer to “8.7 Graph Settings”.

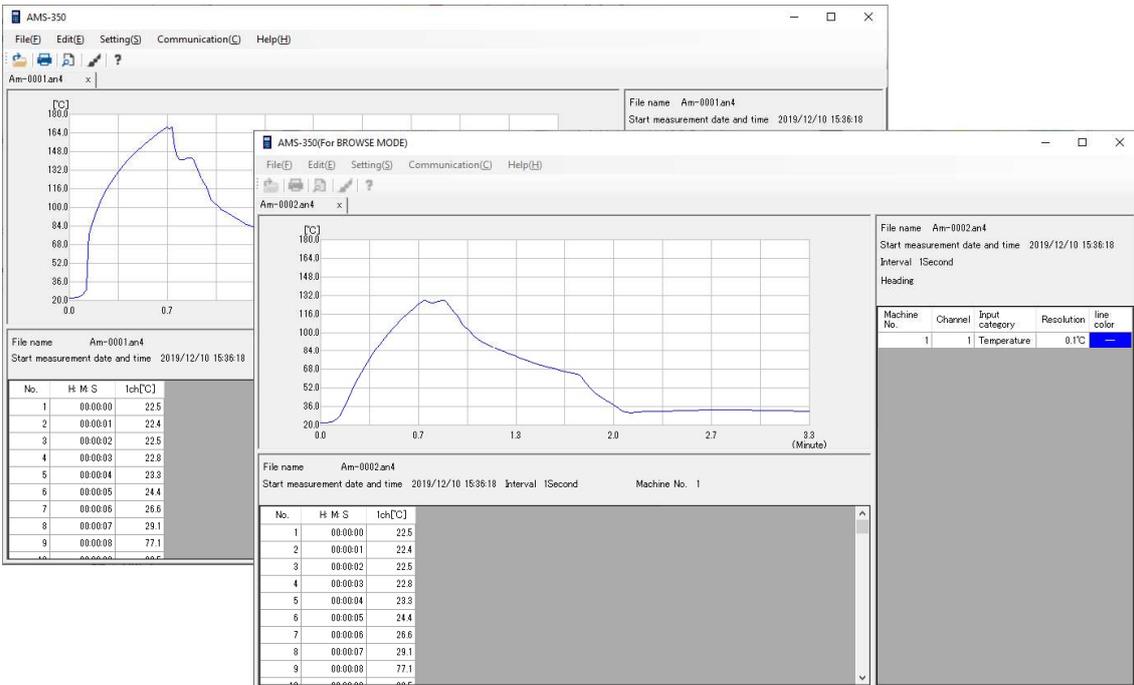


Note: The maximum number of files that can be opened at the same time is five (5). Opened files are separated by tabs.

Note: To compare files

To compare data by showing files side by side, double-click the data file icon, instead of selecting [Open (O)] from the File (F) menu.

For data in the second file and thereafter, AMS-350 (For BROWSE MODE) will be launched.



Note: If multiple data files are opened at the same time, AMS-350 (For BROWSE MODE) will be launched for the data in the second file, and thereafter individually. This may result in a malfunction or error.

It is highly recommended to open data files one at a time when launching AMS-350 (For BROWSE MODE).

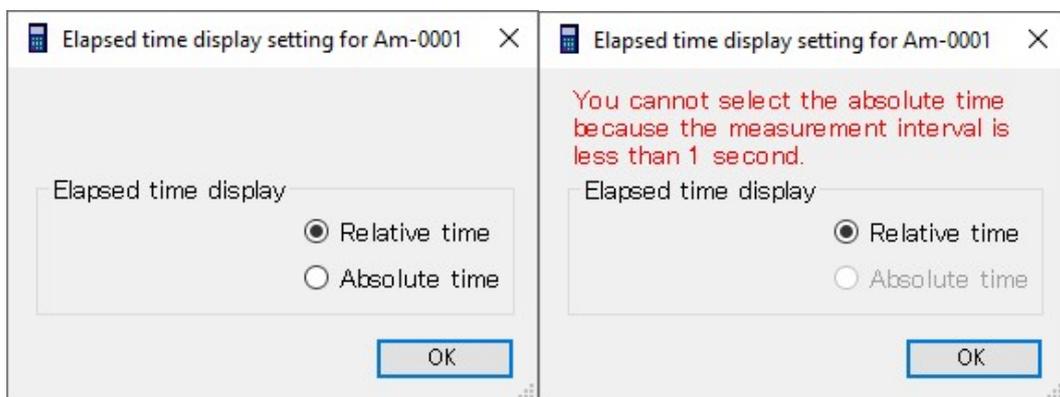
7.5 Incorrect Input Conversion

The HR-15*0/HRM-150 does not support a function for incorrect input conversion.

7.6 Printing

To print data displayed on the screen:

- (1) Launch AMS-350 and open the data file to be printed. (Refer to 8.6.)
- (2) Select [Print] from the [Print] in the [File (E)] menu and then click [OK] to print.
- (3) Select the time format for printing, and click [OK] to print.

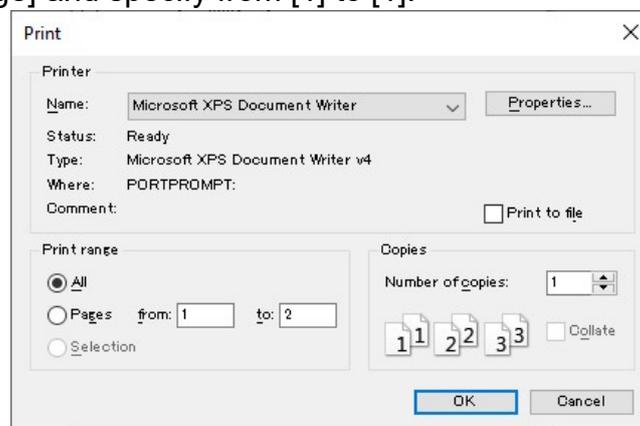


Notes:

· Whichever relative or absolute time you choose, data files acquired in manual mode do not show hours, minutes, or seconds.

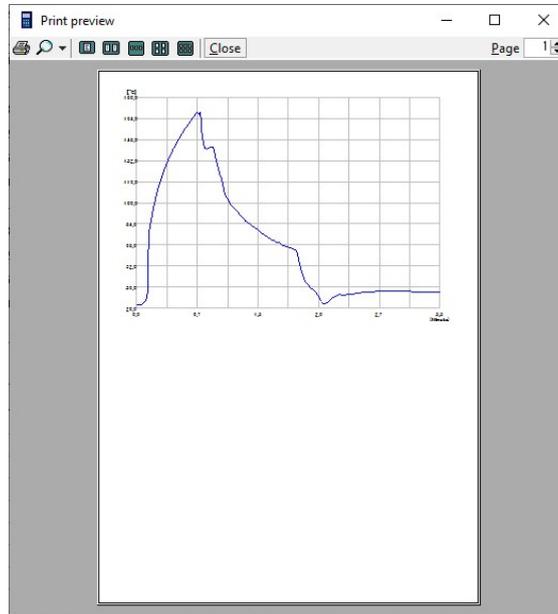
"Absolute time" cannot be selected for data files that are acquired at measurement intervals in milliseconds.

Graphs and data will be printed. To print graphs only, select [Pages] in the [Printing range] and specify from [1] to [1].



Direction of printing as well as black/white or color printing depends on the printer models.

Select [Print preview] from [Print] in the [File (E)] menu to display print preview.



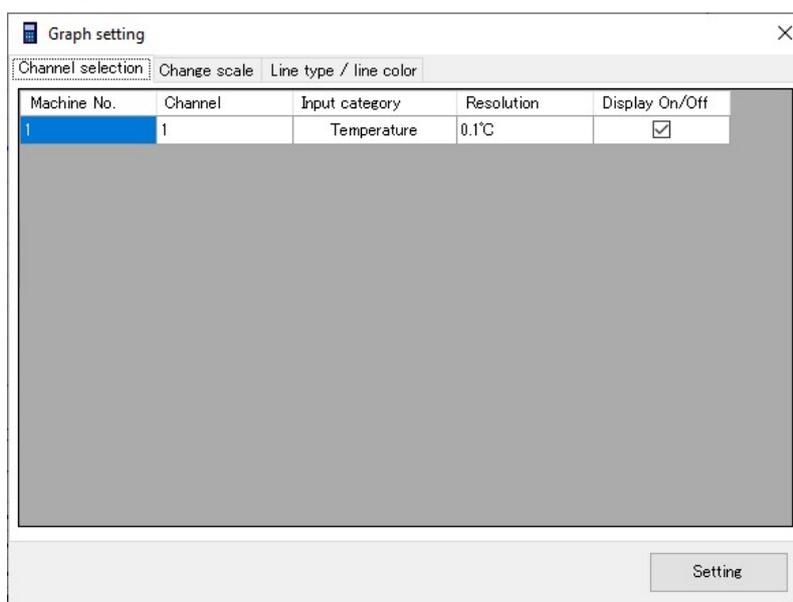
Notes:

- [Print preview] supports vertical direction only.
- If the number of data samples is too many, graphs will not be displayed in print preview, but they will be properly printed.

7.7 Graph Settings

- (1) Launch AMS-350 and open a data file. (Refer to 8.4.)
- (2) Select [Graph settings] from [Settings (S)] menu.
- (3) Setting items are distributed on tabs. Select the tab with the item to be set up.

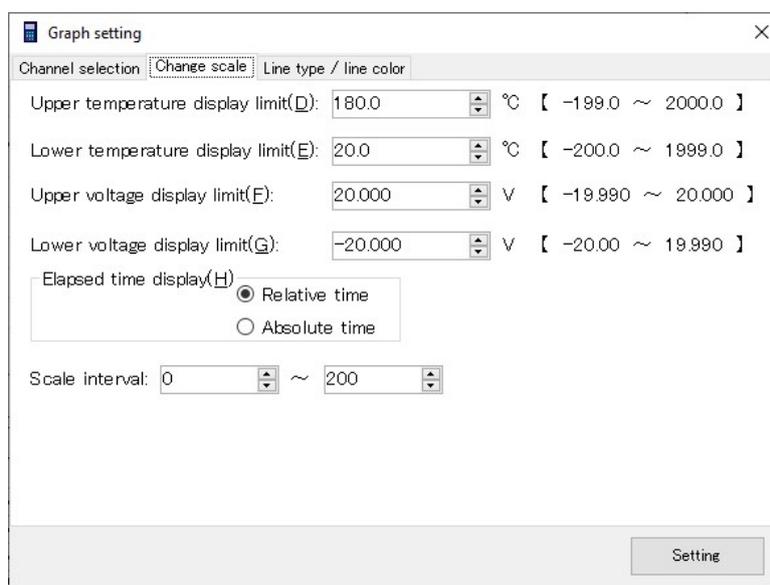
A. Channel setting confirmation



Use the checkbox in the [Display On/Off] column to select whether the channel is shown.

Other items cannot be edited.

B. Changing scales



(a) Changing scales (horizontal axis)

Scale interval: ~

The number of samples displayed in a graph can be set by using the scale interval.

Set the range of sample numbers to display. Max. 99999999

(b) Changing scales (vertical axis)

Upper temperature display limit(D):	<input type="text" value="180.0"/>	°C	【 -199.0 ~ 2000.0 】
Lower temperature display limit(E):	<input type="text" value="20.0"/>	°C	【 -200.0 ~ 1999.0 】
Upper voltage display limit(F):	<input type="text" value="20.000"/>	V	【 -19.990 ~ 20.000 】
Lower voltage display limit(G):	<input type="text" value="-20.000"/>	V	【 -20.00 ~ 19.990 】

Set the upper and lower limits of the display values to set the display range of the vertical axis.

Temperature settings are “Upper temperature display limit (D)” and “Lower temperature display limit (E)”.

Voltage settings are “Upper voltage display limit (F)” and “Lower voltage display limit (G)”

Note: If the difference between upper and lower limits is too small or the number of displayed samples is too many, the graph may be out of its shape. However, the data will not be affected.

(c) Selecting the time display

Elapsed time display(H)

Relative time

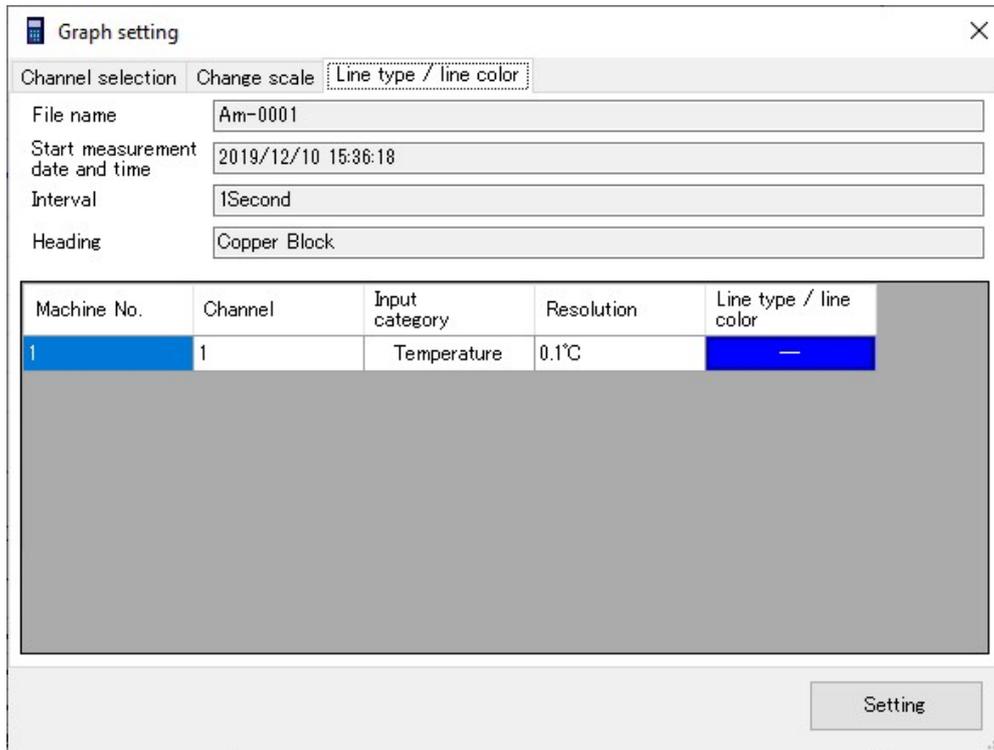
Absolute time

Select the style of the time display.

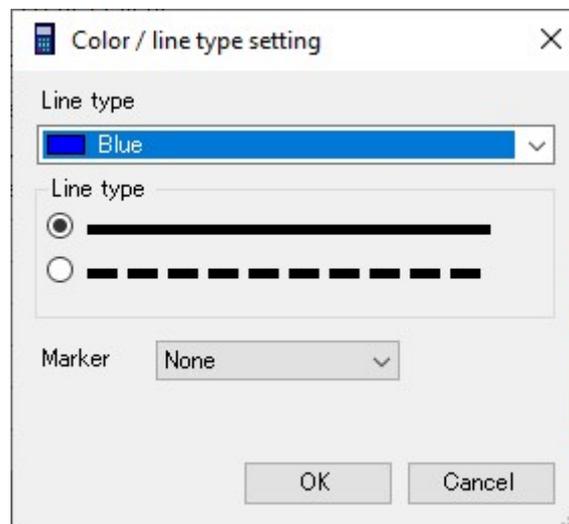
- Relative time displays the time elapsed from the start of measurement.
- Absolute time displays the date and time of measurement.

Note: Time display cannot be selected during manual measurements.

C. Setting line colors/types



- (1) Click on [Line type line color] of the channel to be changed. The [Color/line type setting] screen will be displayed.



- (2) Select the line color from the drop-down list. The HTML color code will be applied to the colors.
- (3) Select either a solid or dotted line.
- (4) Markers have the following nine (9) types:

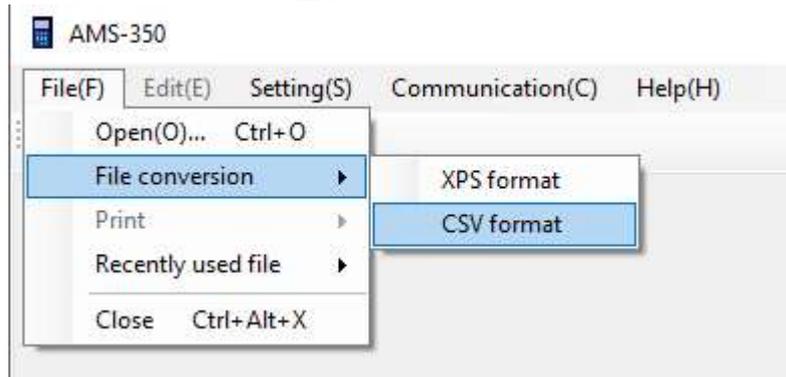
“None, ●, ◆, ■, ▲, ▼, ✱, ✕, +”

Note: If the line type or color is changed when the number of channels that are used is too many, it may take longer to draw graphs when line types or markers are changed.

7.8 How to Use Data in a Spreadsheet Software

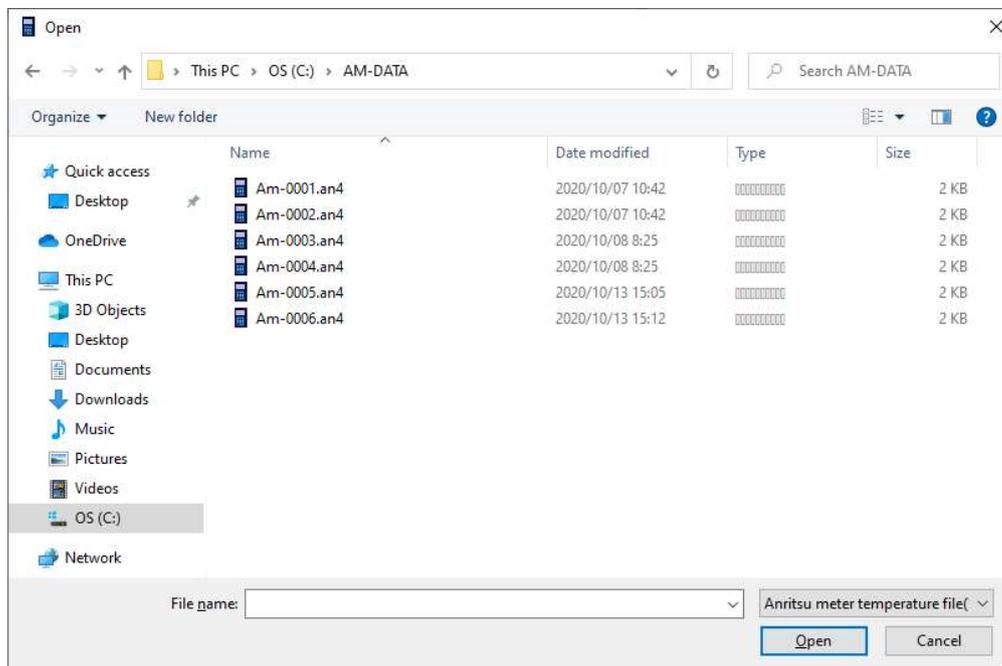
By converting data files created by this software to a CSV file, they can be used in Excel and other spreadsheet applications.

(1) Select [Convert file] from the [File (E)] menu and then select [CSV format].



(2) Specify the file to be converted and then click [Open].

The converted file will be created in the same directory as the original file. The filename of the converted file will have the same filename as the original file, but with the extension changed to “.csv”.



(Example)

Original file: C:\Users\Users\AMS-350\Data\Am-0001.an4

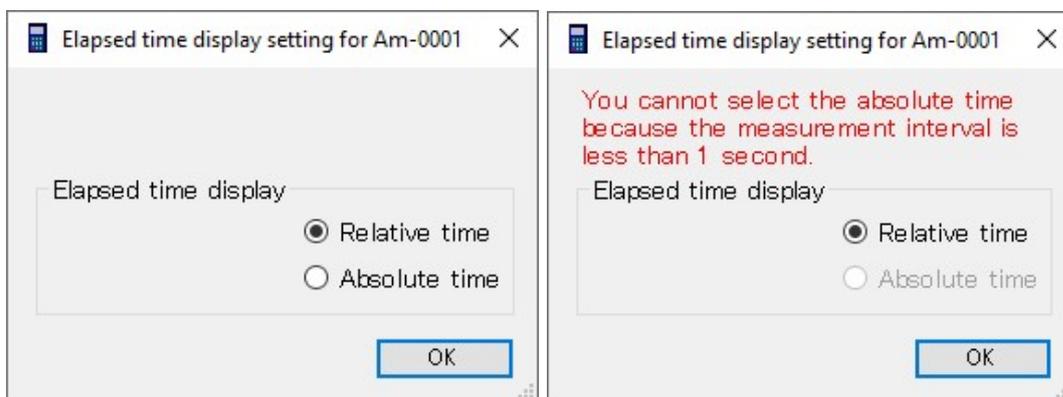
Converted file: C:\Users\Users\AMS-350\Data\Am-0001.csv

Notes:

- “.an4” and “.csv” are file extensions. In the default setting of a PC, it is not displayed.
- CSV files can be identified by the icon on the left of the filename such as in Excel.

(3) Select the style of the time to be displayed when a text file is created.

- Relative time displays the time elapsed from the start of measurement.
- Absolute time displays the date and time of measurement



Notes:

- **With a data file measured in the manual mode, no “hour:minute:second” will be displayed regardless of whether “Relative time” or “Absolute time” has been selected.**
- **“Absolute time” cannot be selected for data files whose measurement interval is in the order of milliseconds.**
- **If “Relative time” is selected, the time will be displayed in the range from “00:00:00” to “23:59:59” (hour:minute:second), and if the duration of measurement data exceeds 24 hours, it will be in the range from “*.00:00:00” to “*.23:59:59” (elapsed days. hour:minute:second).**
- **If “Absolute time” is selected, the time will be displayed in the range from “00:00:00” to “23:59:59” (hour:minute:second). If the duration of measurement data exceeds 24 hours, this display will be repeated.**

(4) Double-click on a text file with mouse to launch the spreadsheet software.

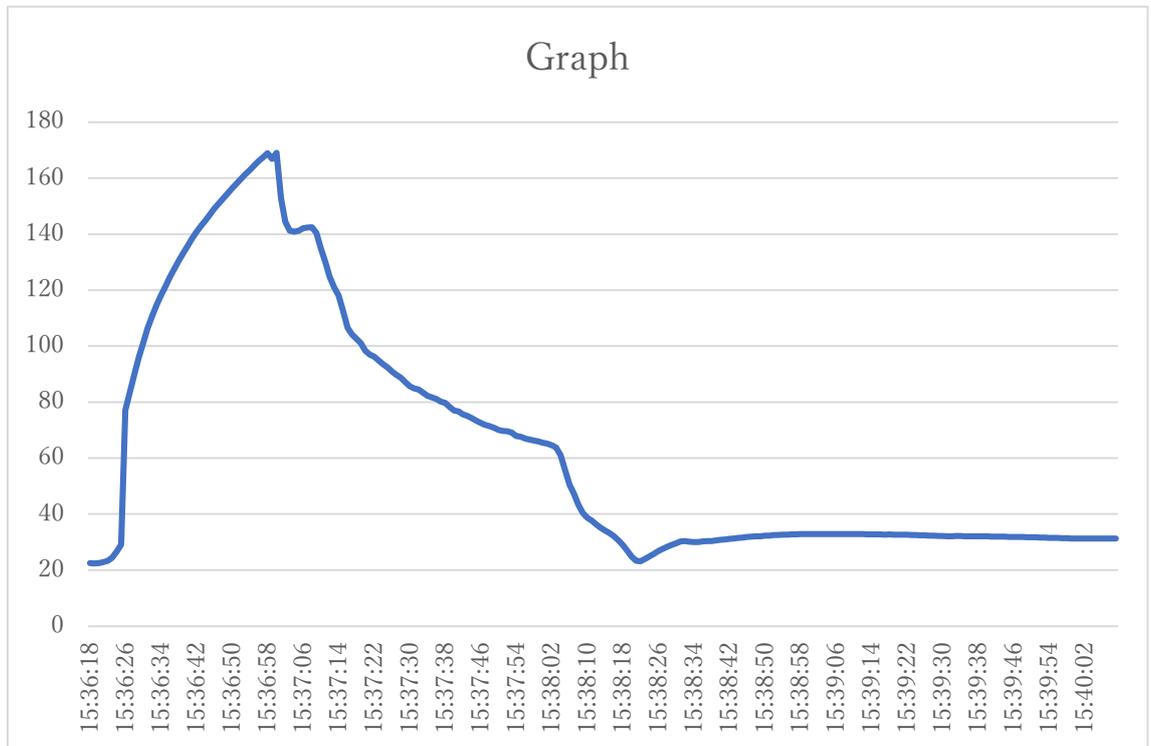
Excel will display a sheet as shown in the sample below. You can use Excel functions to draw graphs.

<Time display: Relative time>

<Time display: Absolute time>

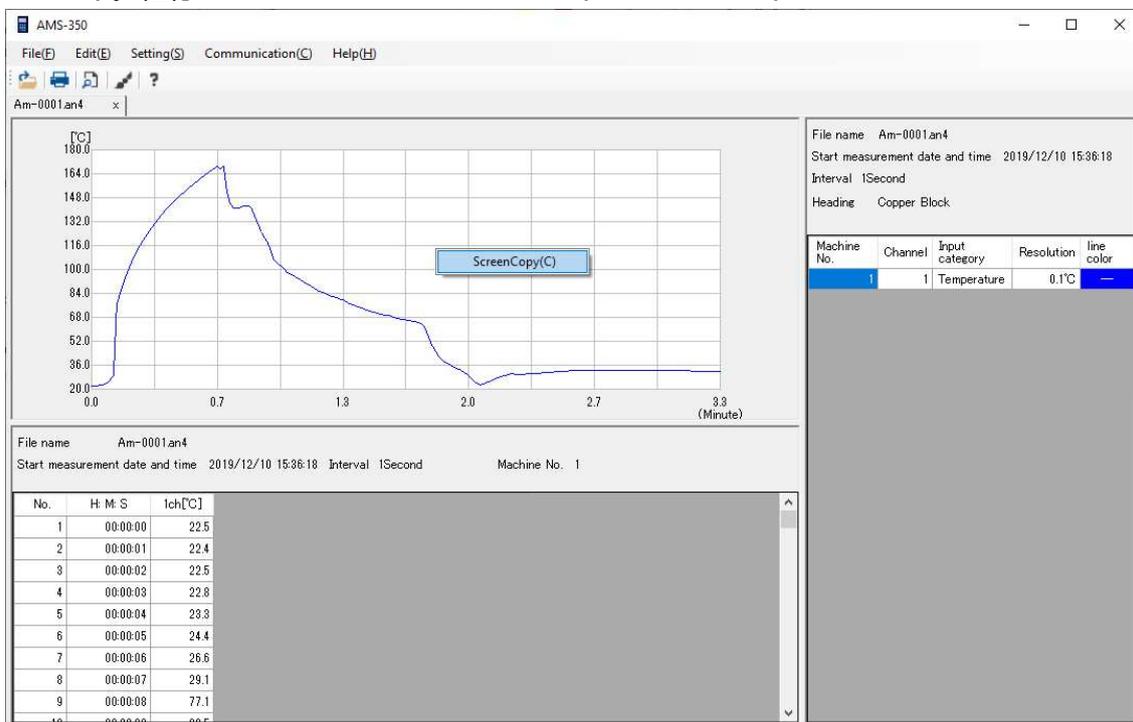
No.	Interval	Ich[°C]
1	0:00:00	22.5
2	0:00:01	22.4
3	0:00:02	22.5
4	0:00:03	22.8
5	0:00:04	23.3
6	0:00:05	24.4
7	0:00:06	26.6
8	0:00:07	29.1
9	0:00:08	77.1
10	0:00:09	83.5
11	0:00:10	89.9
12	0:00:11	96
13	0:00:12	101.3
14	0:00:13	106.3
15	0:00:14	110.6
16	0:00:15	114.6
17	0:00:16	118.2
18	0:00:17	121.4
19	0:00:18	124.6
20	0:00:19	127.5
21	0:00:20	130.5
22	0:00:21	133.2
23	0:00:22	135.9
24	0:00:23	138.4
25	0:00:24	140.8
26	0:00:25	142.9
27	0:00:26	144.9
28	0:00:27	147
29	0:00:28	149.1
30	0:00:29	150.9
31	0:00:30	152.7
32	0:00:31	154.5
33	0:00:32	156.4

<Example of a created graph>

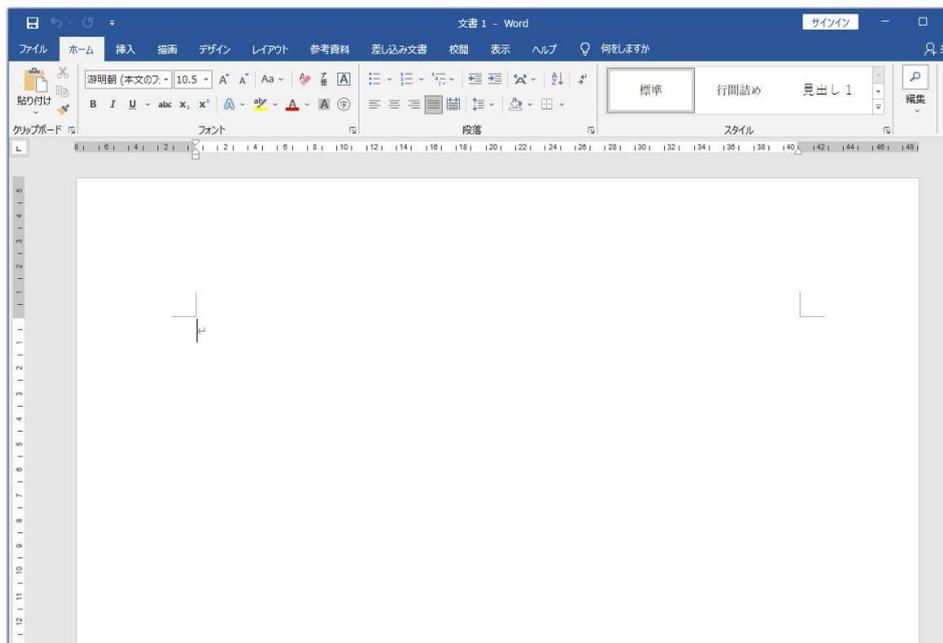


7.9 How to Paste Data in a Document File

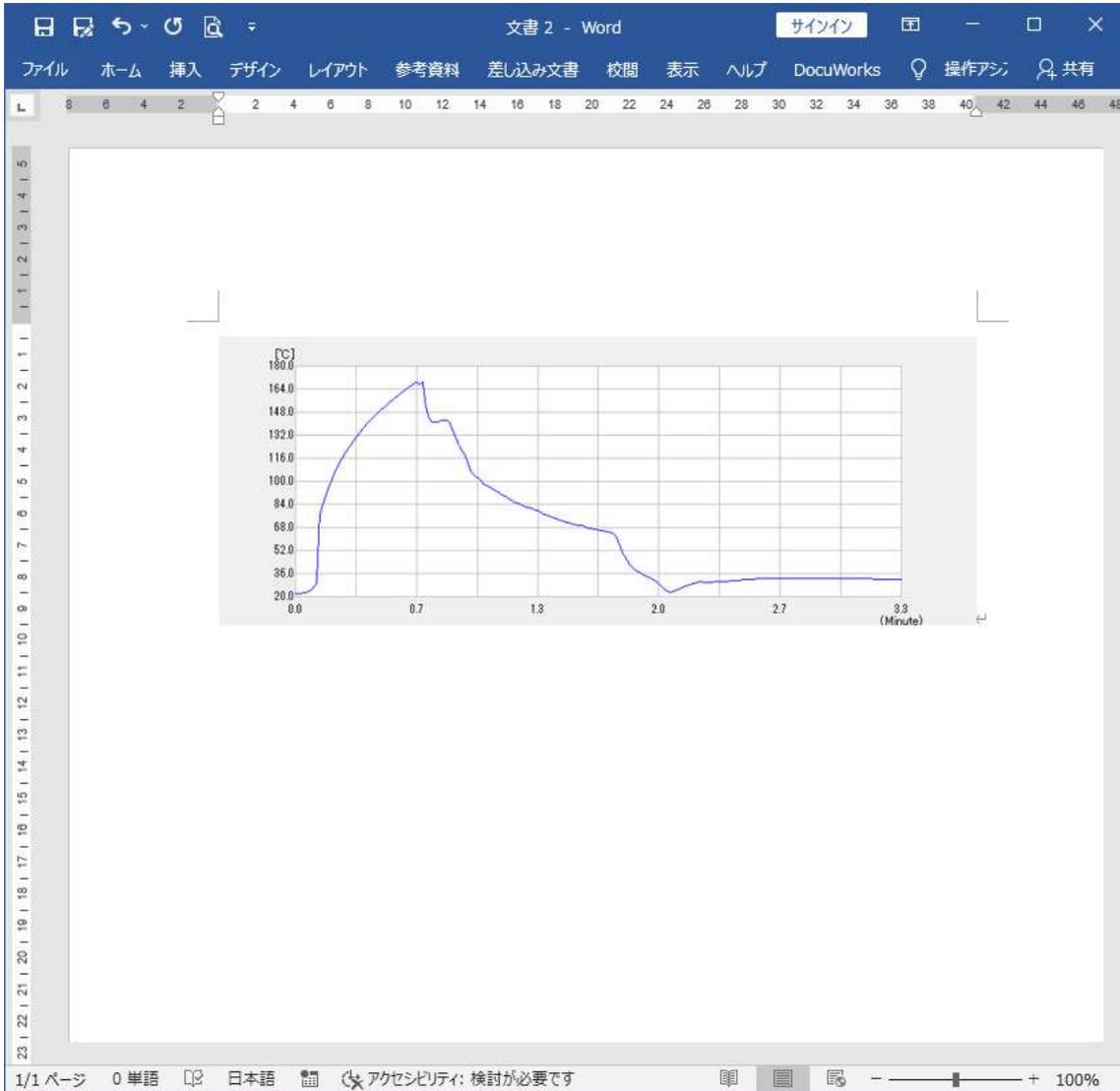
- (1) Launch AMS-350 and then open a data file. (Refer to 8.4.)
- (2) Select the data screen to be copied and then right-click to select [Screen Copy (C)]. The screen data will be copied to the clipboard.



- (3) Open a Microsoft Word file or another document file type.



(4) Move the mouse over the document, determine the location, and then paste the data.

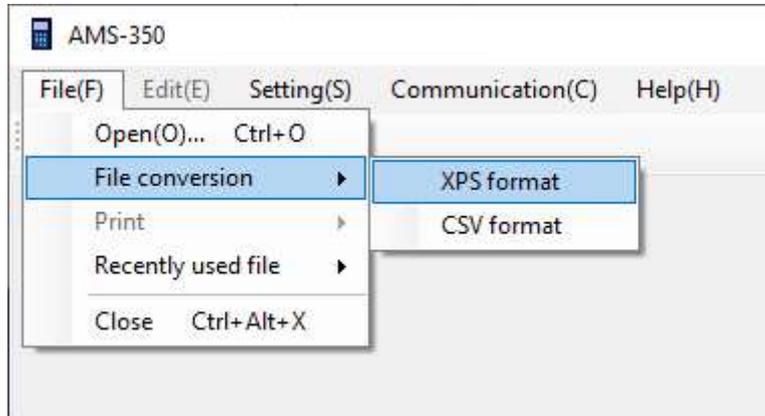


Note: In this description, a Microsoft Word screen is used. You can also use other word processing software.

7.10 Preventing Data Falsification

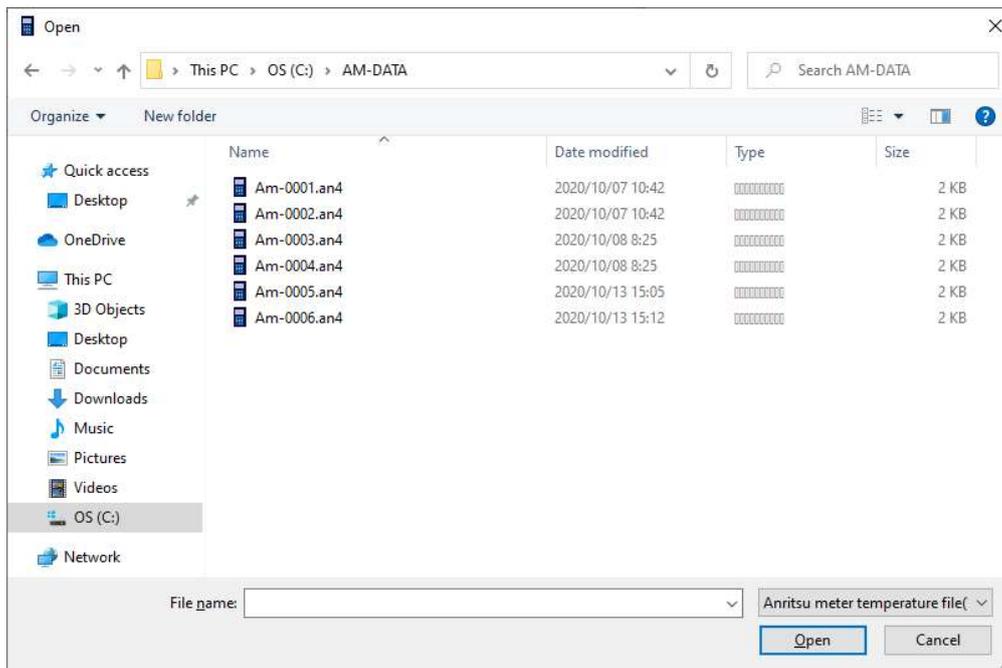
By converting data files created by this software to XPS files, data falsification can be prevented.

(1) Select [XPS format] in [Convert file] in the [File (E)] menu.



(2) Specify the file to be converted and then click [Open].

The converted files will be created in the same folder as the original file. The filename of the converted file will have the same filename as the original file, but with the extension changed to “.xps”.



(Example)

Original file: C:\Users\Users\AMS-350\Data\Am-0001.an4

Converted file: C:\Users\Users\AMS-350\Data\Am-0001.xps

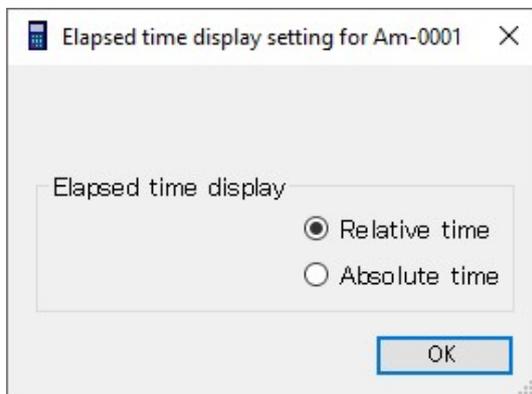
Notes

· “.an4” and “.xps” are file extensions. In the default setting of a PC, it is not displayed. XPS files can be identified by the icon on the left of the filename such as in the XPS Viewer.

· If the XPS Viewer is not installed, please follow the steps below to install it:

- (i) Select [**Settings**] from the [**Start**] menu.
- (ii) When [**Settings**] is opened, follow the order of **Apps > Apps & Features > Manage optional features**.
- (iii) Click [**+ Add a feature**].
- (iv) Select [**XPS Viewer**] from the list of additional functions and then click [**Install**].

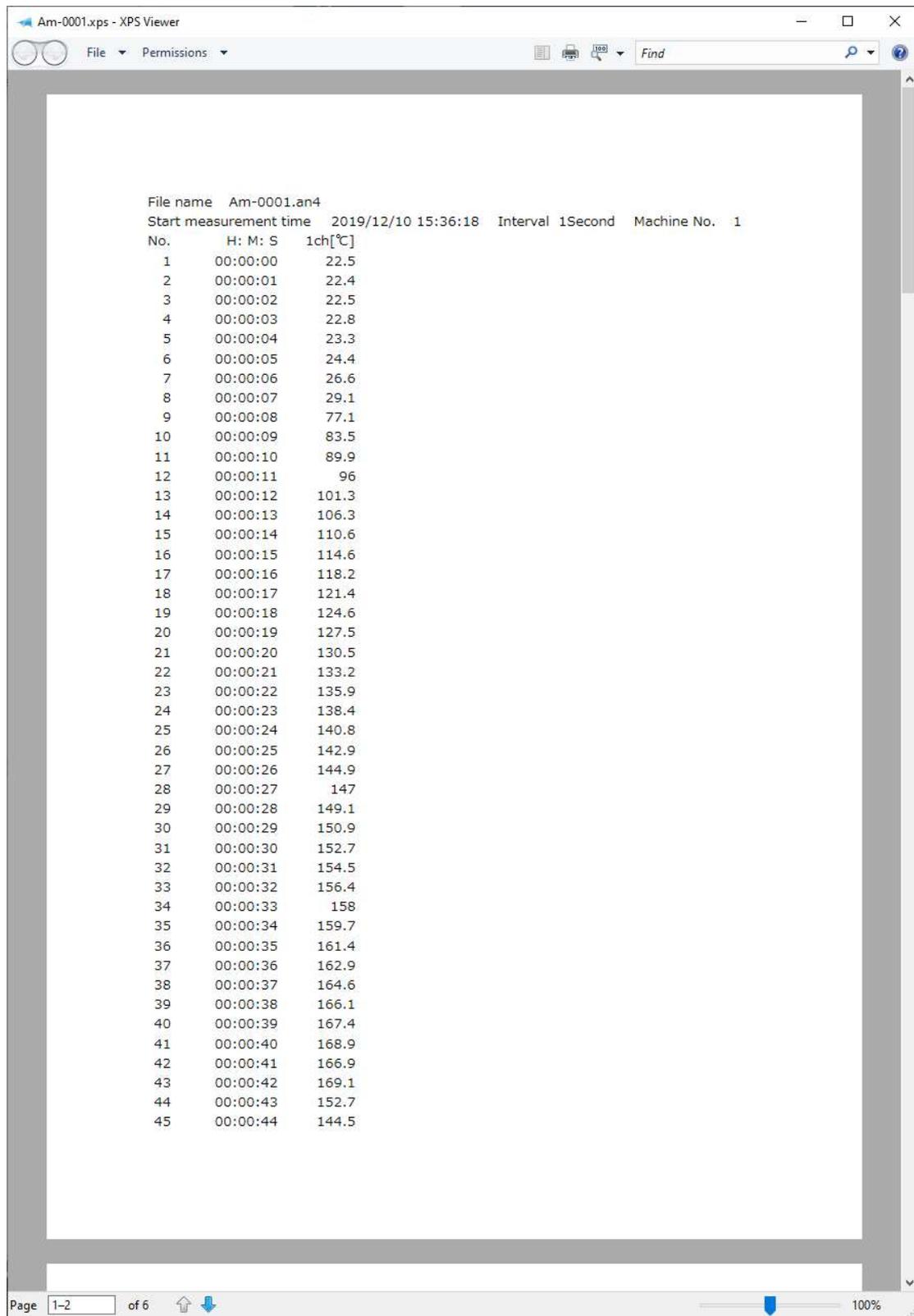
- (3) Select the style of the time to be displayed when an XPS file is created.
 - Relative time displays the time elapsed from the start of measurement.
 - Absolute time displays the date and time of measurement.



Notes:

- Paper direction supports the vertical direction only.
- With a data file measured in the manual mode, no “hour:minute:second” will be displayed regardless of whether “Relative time” or “Absolute time” is selected.
- “Absolute time” cannot be selected for data files whose measurement interval is in the order of milliseconds.
- If “Relative time” is selected, the time will be displayed in the range from “00:00:00” to “23:59:59” (hour:minute:second), and if the duration of measurement data exceeds 24 hours, it will be in the range from “*.00:00:00” to “*.23:59:59” (elapsed days. hour:minute:second).
- If “Absolute time” is selected, the time will be displayed in the range from “00:00:00” to “23:59:59” (hour:minute:second). If the duration of measurement data exceeds 24 hours, this display will be repeated.

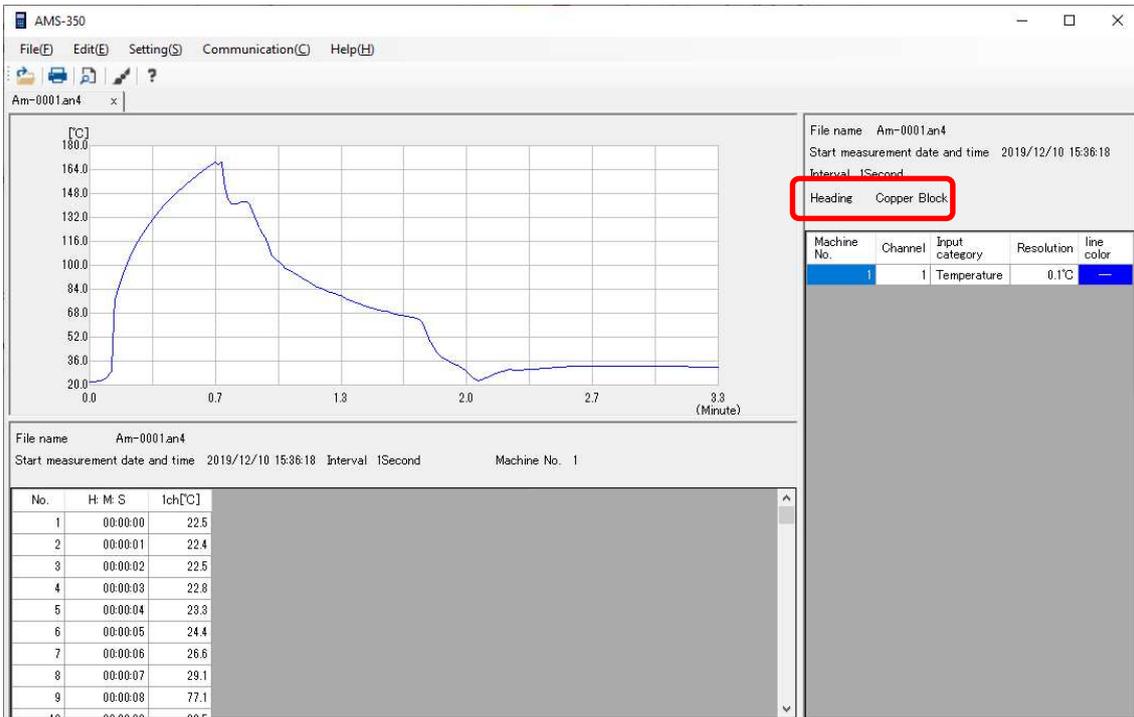
(4) Double-click an XPS file to launch the XPS Viewer.



7.11 Header Settings

- (1) Launch AMS-350 and then open a data file (Refer to 8.4.)
- (2) Select [Edit remark] from [Edit (E)] menu.
- (3) Input data description of the recorded file, environmental conditions at the time of recording, etc.
- (4) A prompt to confirm saving will be displayed. Select [Yes] to save the settings. To revise what was inputted, select [Cancel] to return to the screen to edit remarks.

Headers will be displayed in the [Heading] section of the measurement condition screen.



8 Version Information

To check the software version, select [Version information] from the [Help (H)] menu.

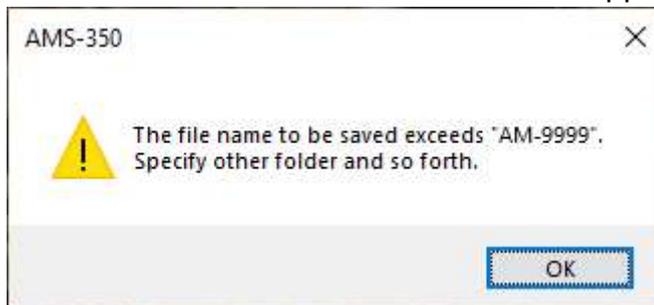


9 Error Messages

This section shows a set of representative error messages of this application software.

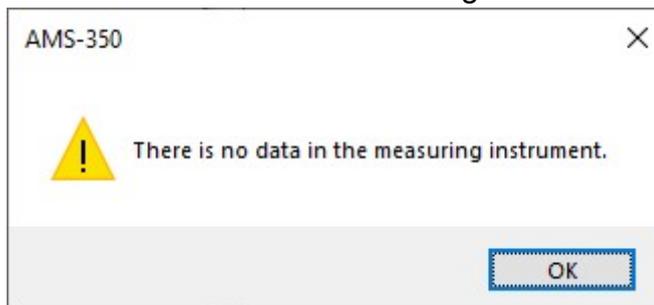
If a message like the following is displayed, follow the instruction in the message.

- (1) If the number of filenames has reached the upper limit:

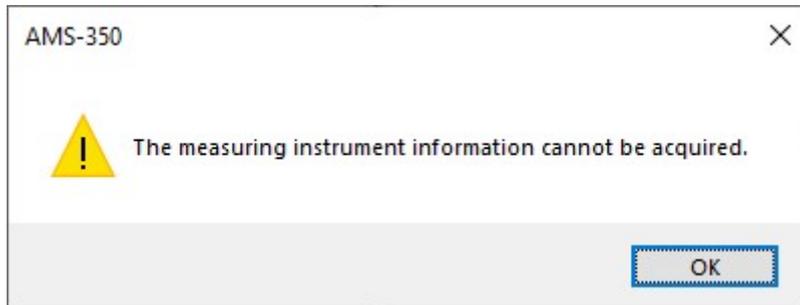


Refer to "8.3 About the filename".

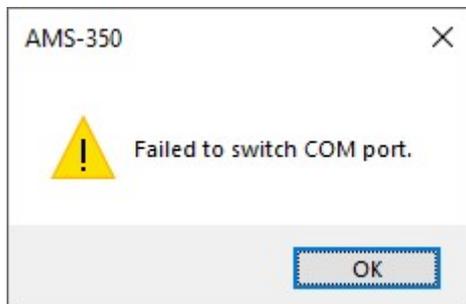
- (2) If no data is stored in the measuring instrument:



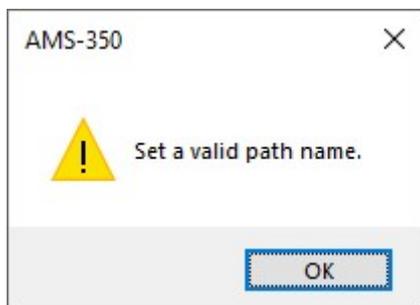
(3) If no communication can be established with the measuring instrument:



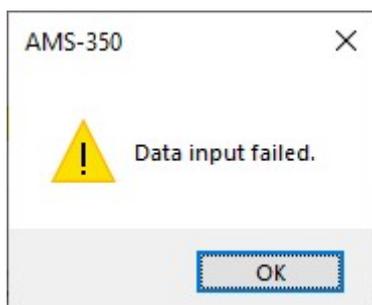
(4) If no serial port is set up:



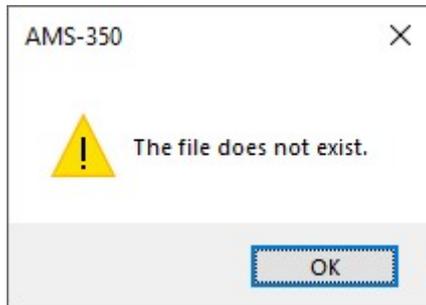
(5) If the pass name is invalid:



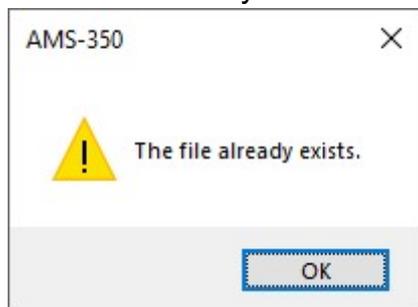
(6) If communication with the measuring instrument is interrupted during data inputting:



(7) If the recently used file does not exist in the specified location:



(8) If the file has already been converted:



Please refer to "8.8 How to Use Data in a Spreadsheet Software" and "8.10 Preventing Data Falsification".

(9) Other cases:



10 Command List

10.1 Description of the Menu Bar

<File (F)>

(1) Open (O)

Opens a data file.

(2) Convert file

(i) **XPS format**

(ii) **CSV format**

Converts the graph screen, data screen, and measurement condition screen to a specified format.

(3) Print

(i) **Print**

(ii) **Print preview**

Prints an active data file or displays a print preview.

(4) Recently used file

The history of data file used are displayed for 10 data.

(5) Close (X)

Terminates AMS-350.

<Edit (E)>

(1) Multiple input error conversion

Not supported by HR-15*0/HRM-150

(2) Editing remarks

Inputs file information, etc.

<Setting (S)>

(1) Save location

Sets the folder to save data.

(2) Graph settings

Sets the graphs.

(3) Serial port setting

Sets the communication port.

<Communication (C)>

(1) Data input

Transfers the data stored in the measuring instrument.

(2) Remote setting

Sets the clock and measurements conditions of the measuring instrument.

(3) Communication test

(i) **START command**

(ii) **END command**

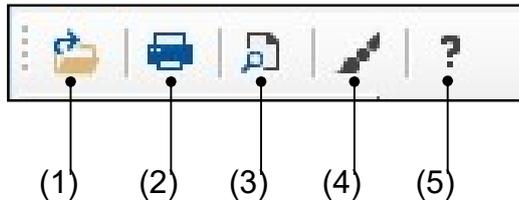
Sends commands to the measuring instrument.

<Help (H)>

Version information

Displays the version information of AMS-350.

10.2 Explanation of the Tool Bar



- (1) Opens a data file.
- (2) Prints graphs and data.
- (3) Previews data to print.
- (4) Sets the line color/type of the graph.
- (5) Displays the version information.