INSTRUCTION MANUAL

HANDHELD THERMOMETER

HD-1500 Series

4th edition Jul., 2018

AE-100236

ANRITSU METER CO., LTD.

2-4-5 Shimomeguro, Meguro-ku,
Tokyo 153-0064, Japan
Tel +81-3-3491-9181
Fax +81-3-3493-6792

TO ENSURE SAFE AND RELIABLE OPERATION

Please observe the following matters to ensure safe and reliable operation of products.

⚠Caution

- This product should not be used for any purpose except temperature measurement.
- Stop using as soon as any problems are discovered.
- Do not take the unit apart or remodeling.
- Use the specified battery cells or specified AC-adaptor.
- Readings may fluctuate in environments subject to electromagnetic fields.
- Avoid contact with input plugs in environments susceptible to static electricity.

※ This product is not rechargeable model.

Concerning the battery cell

Please observe the following matters to guard the battery leakage, exothermic reaction and ignition.

⚠ Warning

- Do not throw away the battery cells in the fire, and avoid short between electrodes.
- Do not charge or heat.
- Use the specified battery cells.

⚠ Caution

- Set the battery cells correctly 「+」 and 「−」.
- Remove the battery cells when the battery life is finished, or long time no using.
- Do not mix old and new, or variety battery cells.
- The battery life will be affected by the environmental temperature.

Windows is a registered trademark of Microsoft Corporation.
Excel is a registered trademark of Microsoft Corporation.

Preface

Thank you for purchasing this product from ANRITSU METER CO., LTD.
We prepared this manual so that you can use this product with ease and confidence.
Please read this manual carefully and understand each functions of this product for your safety and correct using.

Caution

- This contents and the specification of this product are subject to change without notice.
- Reproduction in part or whole of any material from this booklet is prohibited by low.
- We surely make this manual, however if there are any error or not clear, please contact the place of purchase or us.
- We are not responsible for the consequences of using this product.

After-sales Service

ANRITSU METER CO., LTD. ships products after severe company's inspection. Should you find any failure resulting from poor material and workmanship or accident during transportation, please contact the place of purchase or us.

We recommend that you may use the original packaging for this product when you send it to us for repairing or periodical checkup. If you no longer have the original carton, be sure to use plenty of wrapping to guard against damage during shipping.

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1. General

This handheld thermometer allows easy temperature measurement.
These general-purpose thermometers can be used for on-site temperature measurement and various other applications.
A microprocessor is used for constant compensation of zero-point and full scale, thus ensuring extremely stable, high precision measurement.
The memory function allows measurement data to be stored in memory and transferred to a PC.
Stored data is retained indefinitely, even if the batteries of the main unit run out.

2. Unpacking

2. 1. Unpacking

Open the carton and the check that the following are provided. If any of them is missing or out of order, please contact the place of purchase or us.

1. Main unit
2. Soft case
3. Hand strap
4. USB cable
5. CD-R (AMS-100)
6. AA-size alkaline battery cells
7. Instruction manual
8. Test Report

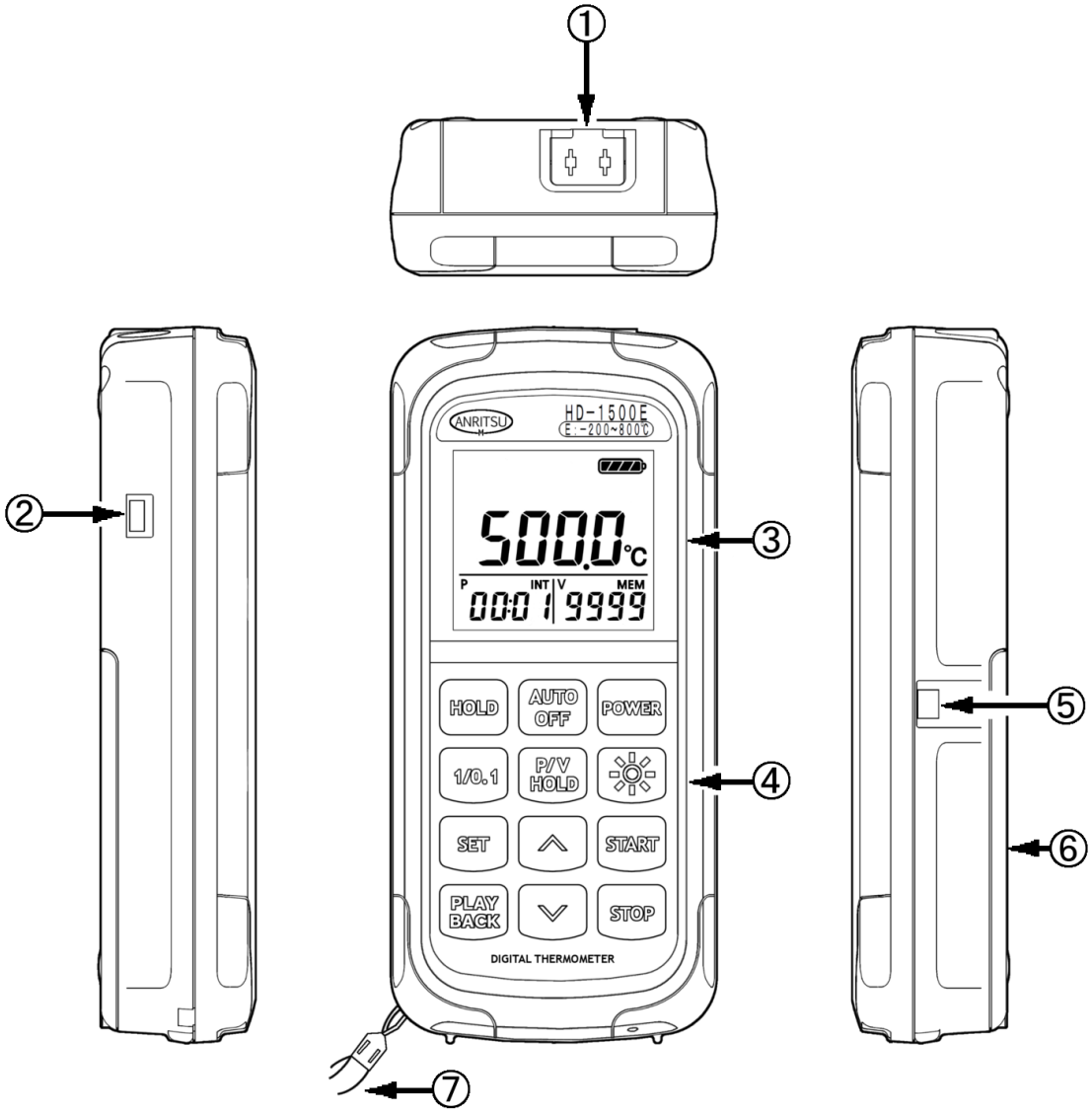
2. 2. Repacking

Use the original carton of the instrument for its transportation by mail or car. If the original case is not available, carefully wrap the instrument in shock-absorbing material (polystyrene form and the like). Wrapping material should be dry and free of dust generation otherwise the instrument may be damaged.

3. Name of Components

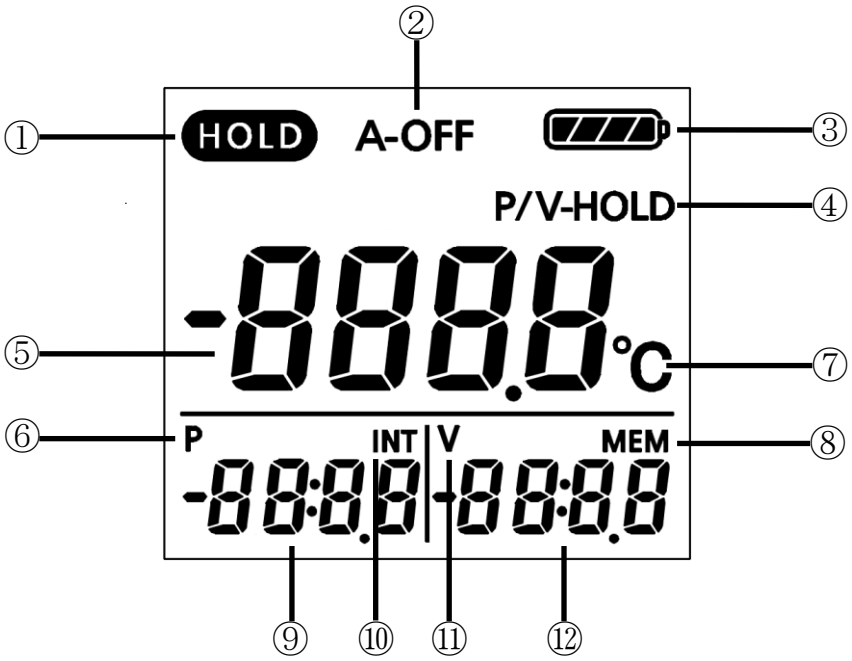
3. 1. Name of Components

(MODEL: HD-1500)



① Sensor Input connector
② USB connector
③ LCD Display
④ Key switch panel
⑤ AC-adaptor jack
⑥ Battery housing
⑦ Hand strap

3. 2. Display of all segments

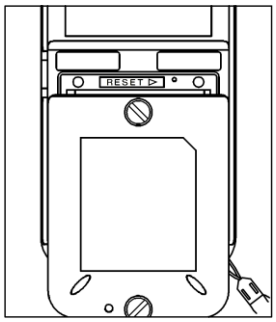


① Hold
② Auto power off
③ Battery Indicator
④ P/V hold
⑤ Main Display
⑥ Peak
⑦ ℃
⑧ Memory
⑨ Sub-display1
⑩ Interval
⑪ Valley
⑫ Sub-display2

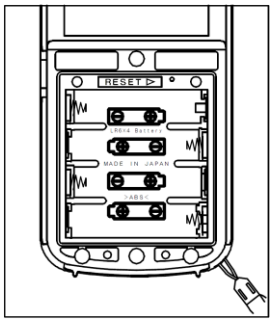
4. Preparation for Operation

4. 1. Battery Installation

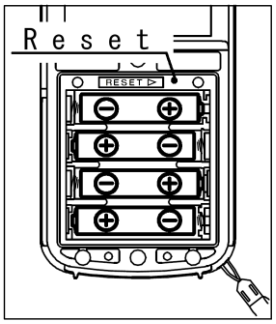
Be sure to keep the power OFF during the battery cells change.



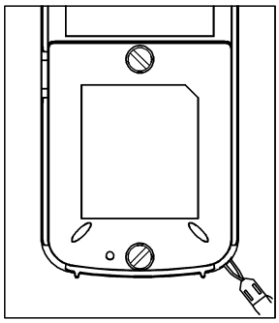
(1) Remove the two screws and detach the battery housing cover.



(2) Set battery cells correctly.



(3) After setting battery cells, press the Reset switch.



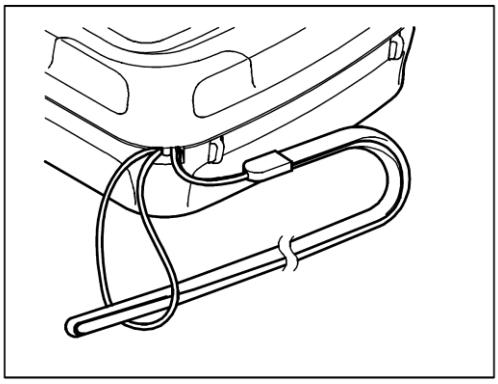
(4) Reattach the battery housing cover, tighten the two screws and press the edges of the battery housing cover firmly.

※ The Reset switch is a small push button in the upper section of the battery housing. Use a thin stick to lightly press it. Please do not push with the breakable object.

4. 2. How to Use Hand Strap

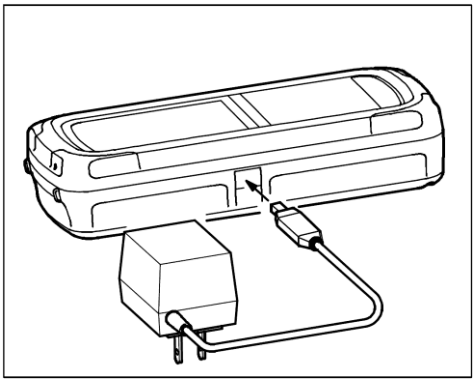
Hang the hand strap around the hand to prevent in advertent drop of the instrument.

Thread the fine cord end of the hand strap through the strap attachment on the instrument. Pull the hand strap end through the loop.



4. 3. AC-power Supply

(1) After turning power OFF, connect the AC-adaptor connection plug to the main unit as shown.



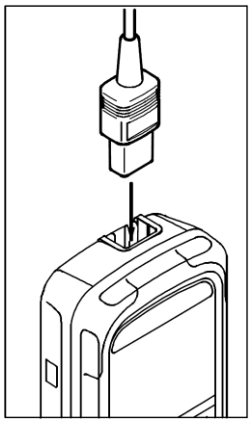
(2) Connect the power plug of the AC-adaptor to commercial power.

※ Be sure to use the specified AC-adaptor.

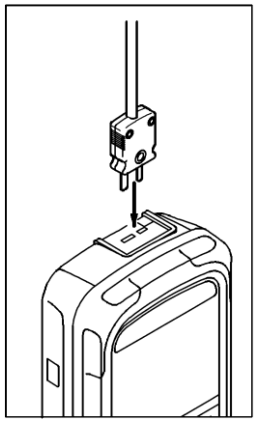
4. 4. Sensor Setting

Set the sensor as shown. The plug is so designed that it will not be set when the polarity is reversed. Forcible insertion will damage the instrument. Be sure to check the polarity.

[HD-1500]



[HD-1550]



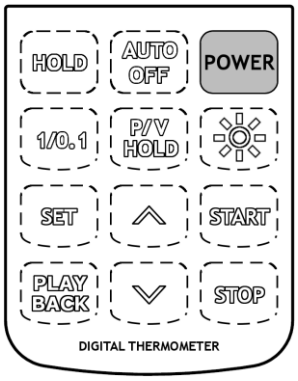
4. 5. Soft case

Use the attached soft case for protection instrument against dirt or flaw.

In case of the combined use attached soft case and the AC-adaptor and USB-cable, please bore the hole at the AC-adaptor and USB-cable jack part of soft case by scissors, etc.

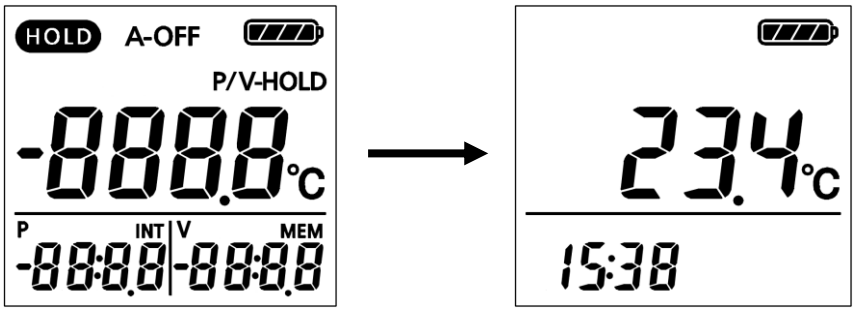
5. Operation

5. 1. Power ON／OFF



Press the POWER key to turn power ON and all segments appear on the display for 1 second, and start measurement as be shown below.

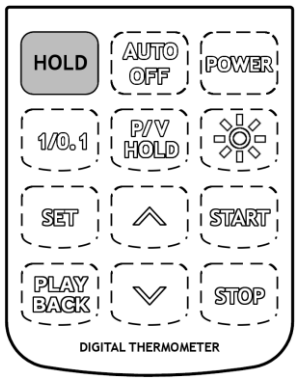
Press the key again to turn power OFF.

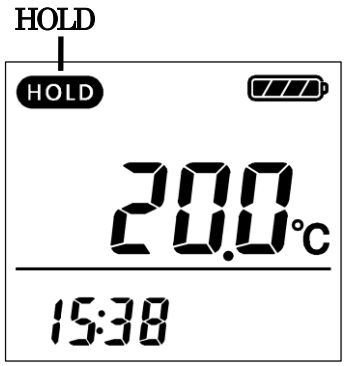


5. 2. Hold

Press the HOLD key to stop measurement and show the measured Temperature on the display.

Then HOLD appears on the display. Press the key again to return to the normal mode.



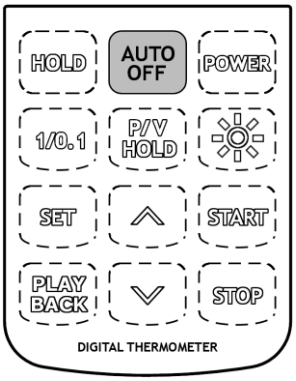


※ The HOLD function is not available when the Memory function is activated.

※ The HOLD function is not available when Burnout or Over range display appears.

5. 3. Automatic Power OFF

Press the AUTO OFF key to enter the Automatic Power OFF mode that is provided to automatically turn Power OFF after a certain period time (about 5 minutes) no key operation. Press the key again to return to normal mode.

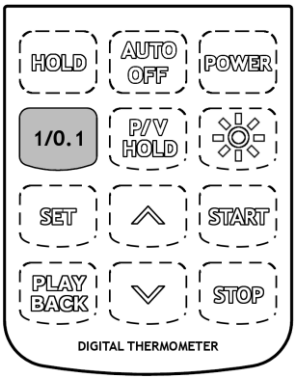


※ AUTO OFF is released when memory measurement is started.

※ AUTO OFF is released when you start communication with the software on the computer (AMS-100).

5. 4. Resolution change

Press the 1/0.1 key to change the resolution of the displayed temperature.



● 0.1℃ resolution

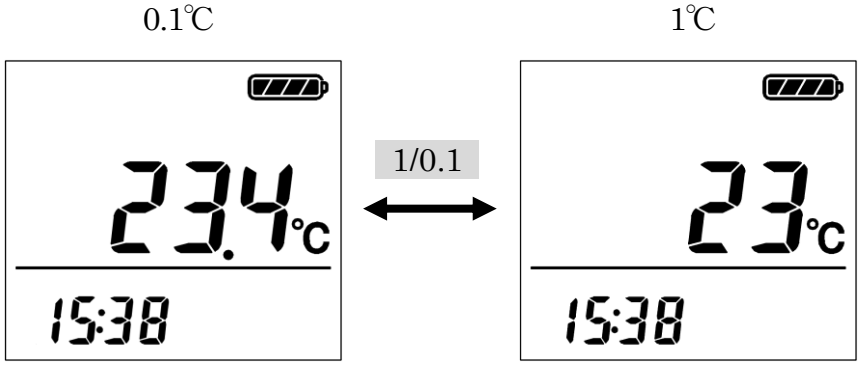
Range is from –104.9～504.9 ℃ at every 0.1℃. When the measured value exceed this range, the resolution changes to 1℃ automatically.

● 1℃ resolution

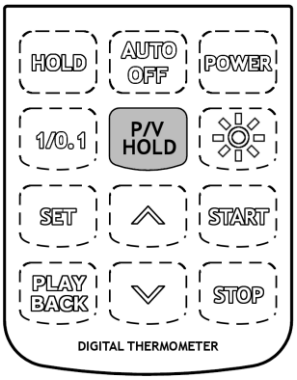
All measurable range at every 1℃.

※ Resolution changing is not available when the memory function is activated.

※ Resolution changing i is not available when Burnout or Over range display appears.



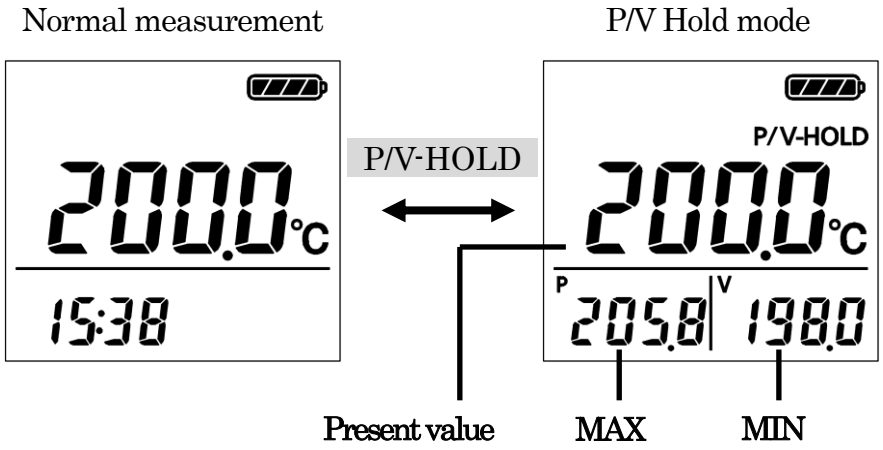
5. 5. P/V Hold



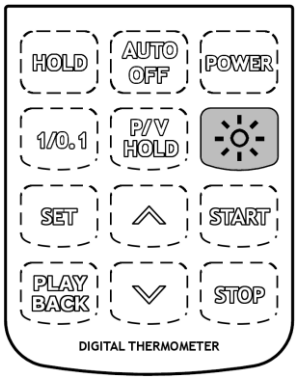
Press the P/V HOLD key to enter P/V Hold mode that the maximum value, the minimum value and the present value are displayed simultaneously.
Press the key again to return normal measurement.

※ The P/V HOLD mode is not available when the memory function is activated.

※ The P/V HOLD mode cannot be set when Burnout or Over range display appears.



5. 6. Backlight



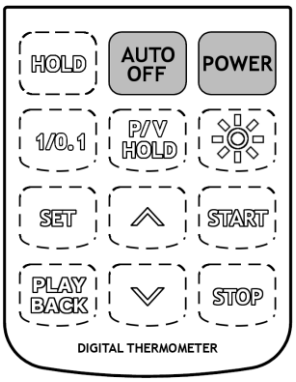
Press the ☀ key to turn the backlight ON, and the display on the screen will be visible even in the dark. Press the key again to turn the backlight OFF.

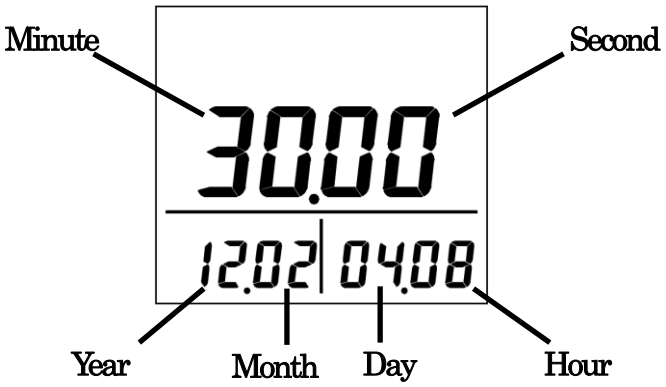
※ The battery consumption is double when the backlight is ON. Be sure to turn OFF the backlight.

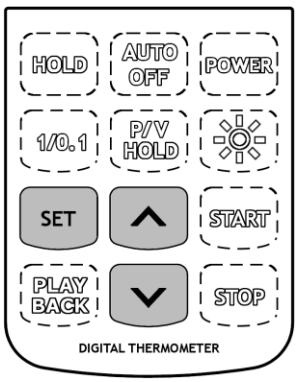
6. Setting the clock

The instrument incorporates a clock function. Set the clock as shown below after purchasing or to reset the clock.

With the instrument off, press the POWER key while holding down the AUTO OFF key. This powers on the instrument.
The clock setting screen appears. The digits selected will flash.







Press the ⩓⩔ key to select the digits to set.
Use the SET key to increment the set values.
Press the SET key with the minutes setting selected to set the seconds readout to "00" and exit clock setup.

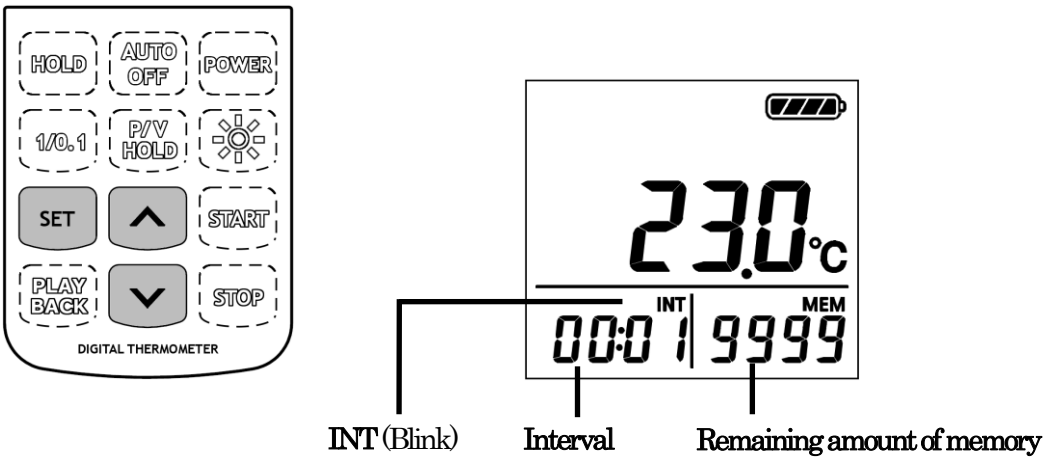
※ The instrument uses a lithium battery to retain clock settings. When the lithium battery is exhausted, the clock setting will be reset and an abnormal time readout error will occur.
If this happens, the lithium battery must be replaced by the place of purchase or by Anritsu Meter. A fee will be charged for this replacement.

7. Memory Function

7. 1. Setting Interval

Press the SET key to make "INT" flash in the bottom left sub-display area and display the interval time.

The interval time changes as follows each time the ⩓ key is pressed: 1 sec → 5 sec → 10 sec → 30 sec → 1 min → 5 min → 10 min → 30 min → 60 min → Manual. Press the ⩔ key to cycle through these options in reverse order. Press the ⩓ key or ⩔ key as necessary until the desired interval time is displayed.



※ Up to 9999 data items can be stored in memory.

※ The remaining memory capacity is displayed in the bottom right sub-display area when the interval is set. The SET key operation is disabled once the remaining memory capacity reaches 0.

※ Press the SET key during interval setting to return to normal measurement.

※ If set, the AUTO OFF function is released when memory measurement is started.

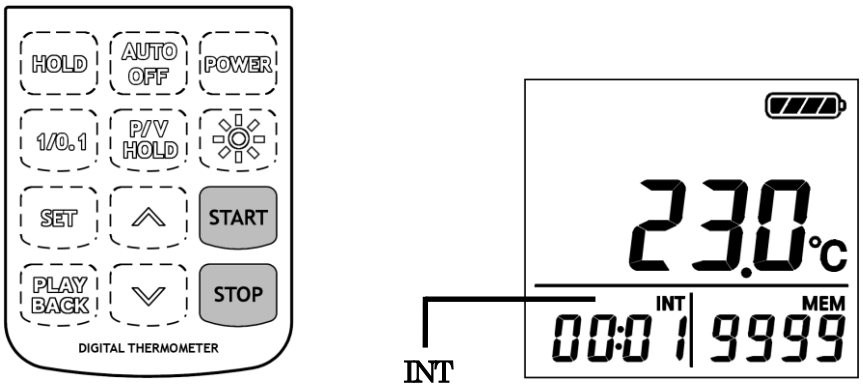
※ The interval display reads "−−−−" if manual measurement is set.

※ Always use the AC adapter (sold separately) when measuring with long intervals.

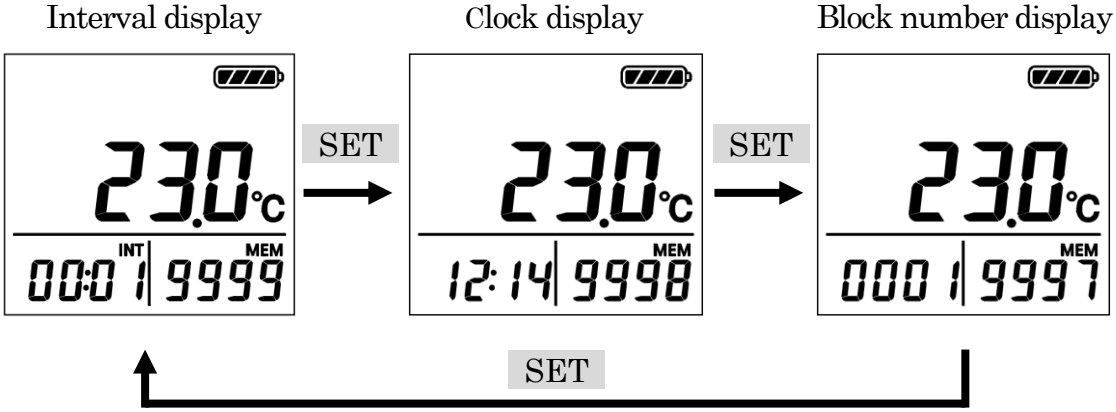
※ The POWER key operation is disabled during memory measurement.

7. 2. Starting Memory Measurement

Press the START key to display "INT" and start memory measurement using the interval time displayed. Press the STOP key to stop memory measurement.
Press the STOP key to allow transfer of memory data to a PC as a single data block. (Up to 2,000 data blocks can be handled.)



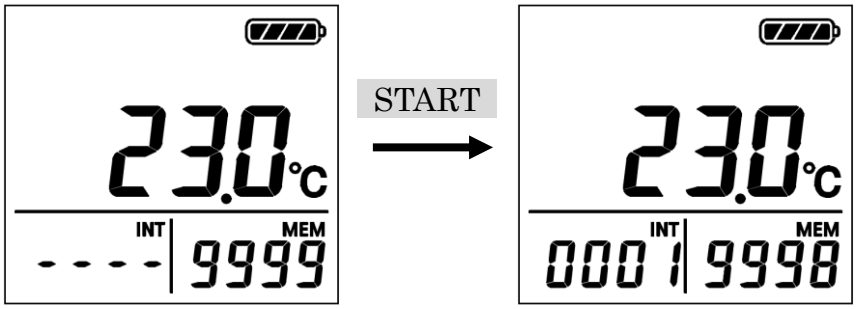
During memory measurement, the sub-display in the bottom left area changes as follows each time the SET key is pressed: interval display → clock display → block number display.



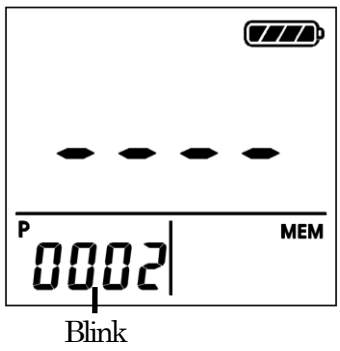
Memory measurement ends when the remaining memory capacity reaches zero.

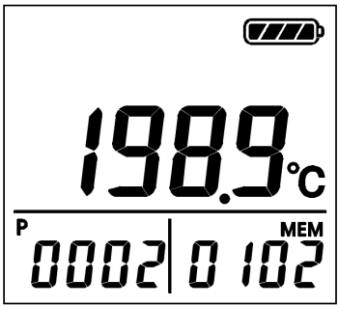
7. 3. Manual Measurement

In manual measurement, pressing the START key increments the interval display and decrements the memory display. The measured temperature readout is refreshed every 300 ms, as normally.



7. 4. Memory playback





Press the PLAY BACK key. The letter P and the measurement block number (bottom left) blink. Press the ⩓ key or ⩔ key to select the desired block number to be displayed and press the SET key to accept the selection.

Press the SET key again to return to the block number setting.

※ If the memory contains only one block, the block number remains unchanged when the ⩓ key or ⩔ key is pressed.

※ Up to 2,000 data blocks can be stored in memory.

When a block number is set for display, the letters MEM and the memory number display (bottom right) blink. The main display indicates the temperature in the memory for the selected memory number.

When the desired memory number is selected with the ⩓ key or ⩔ key, the temperature in the memory for the selected memory number appears on the main display.

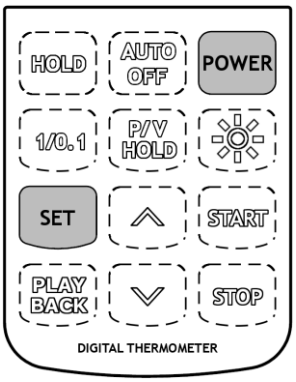
※ Hold the ⩓ key or ⩔ key down to quickly move through the numbers forward or backward.

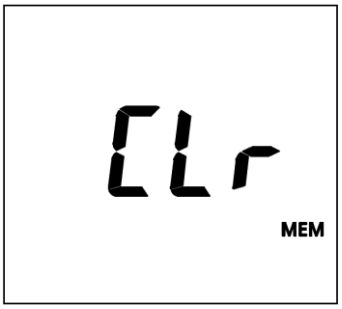
Press the PLAY BACK key again to return to the normal measurement (the state before the PLAY BACK key is pressed).

7. 5. Clearing Data

With the instrument off, press the POWER key while holding down the SET key. This powers on the instrument.

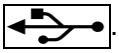
The memory clear display appears. To clear the data, press the SET key. To cancel without clearing the data, press the STOP key.

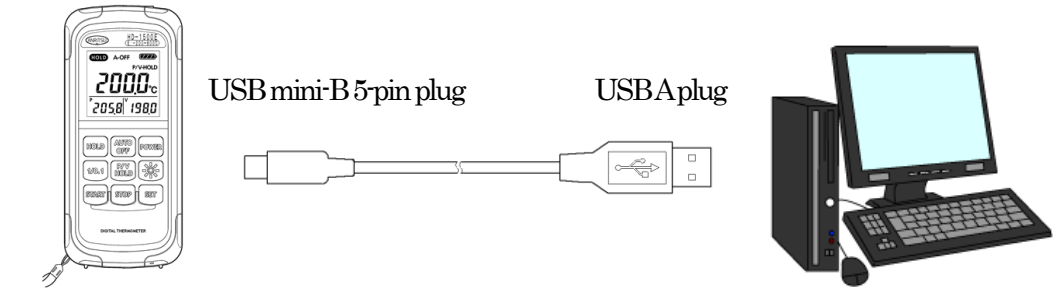




※ Note that data cannot be restored once cleared.

8. Connecting the Measuring Instruments

Use a USB communication cable which has the USB A plug on the PC side and the USB mini-B 5-pin plug on the measuring instrument side. For connection to the PC side, plug the cable into the connector marked with  .



※ Do not connect the instrument to a PC while measurement is underway. This may result in unreliable readings or malfunctions.

9. AMS-100 (dedicated HD-15*0 application)

To transfer data stored in the memory of the HD-15*0 to a PC, you must install the application software found on the CD-ROM provided with the product.

OS : Microsoft Windows 7
Microsoft Windows 8.1
Microsoft Windows 10

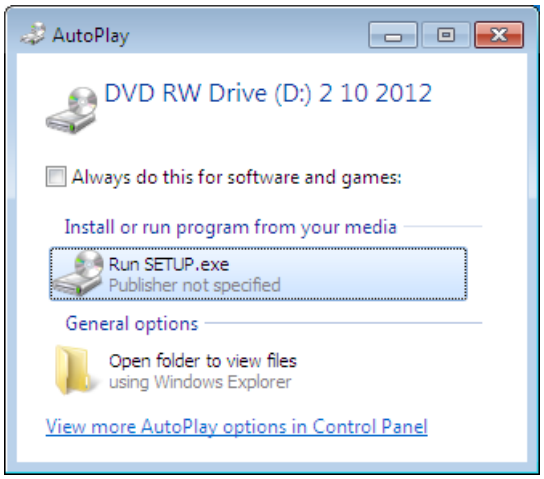
Requires a PC of specifications sufficient to run the above operating systems.

※ All PCs under the recommended environment are not guaranteed to work successfully with AMS-100.
※ AMS-100 can be used only by the user that has a system administrative right (Administrator).
※ AMS-100 does not support Mac OS.
※ Microsoft® Windows® 7, Windows® 8.1 , Windows® 10 are registered trademarks of Microsoft Corporation in the United States and other countries.

9. 1. Installation

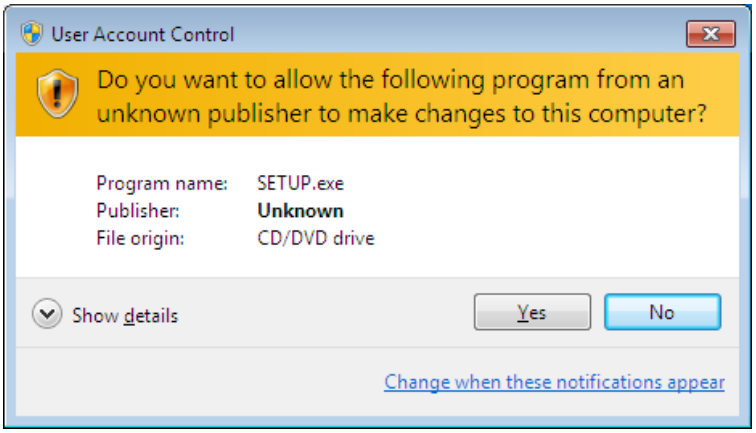
Close all of the currently active software applications.
AMS-100 may not be installed correctly if another software application is running.

Insert the AMS-100 CD-ROM in the CD-ROM or DVD-RW drive.
Run "SETUP.exe" when the "AutoPlay" window opens.



※ If the "AutoPlay" window does not open automatically, double-click the CD-ROM or DVD-RW drive icon in My Computer.

※ The "User Account Control" window may appear on some computers. Select "Yes."



"SETUP.exe" launches, and the language selection window appears. Select English or Japanese to launch the installer for the language required. Check the details and install as instructed by the on-screen prompts. Once installation is complete, the software will be added to "Programs" in the Windows Start menu and a shortcut created on the desktop.

9. 2. Installing the USB Device Driver

Please note that the file may not be found on a computer in the following status.

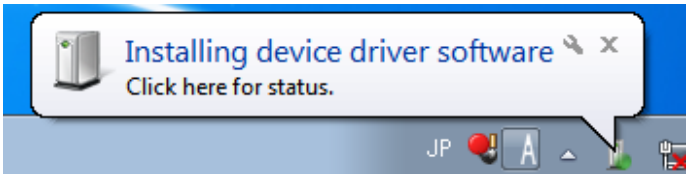
- Computer without the system administrator privileges
- Computer set to restrict a third-party USB driver to install other USB drivers (In this case, please use a different computer, or perform computer recovery.)

<Windows7>

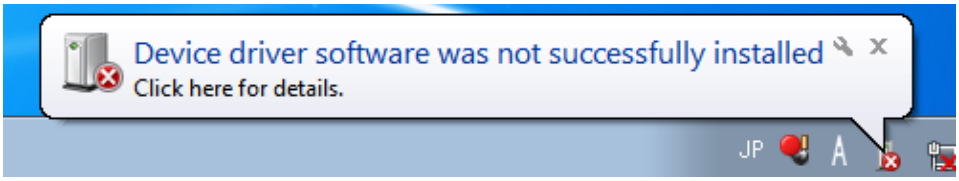
(1) Connect the measuring instrument and computer with the USB communication cable.

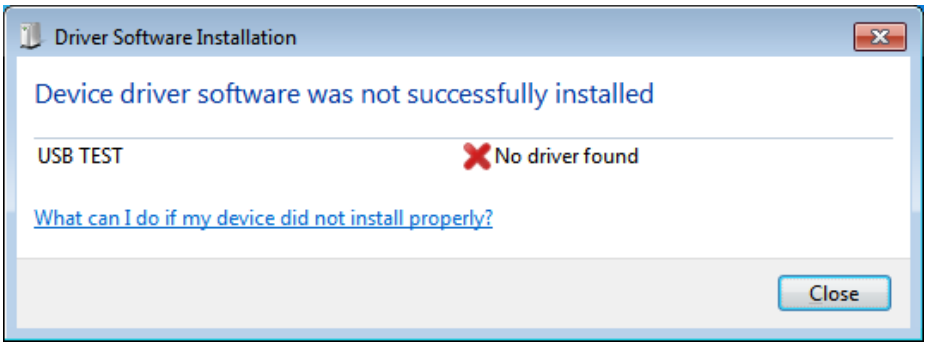
(2) Turn on the power to the measuring instrument.

(3) Computer will detect the new USB connection and start the automatic installation.



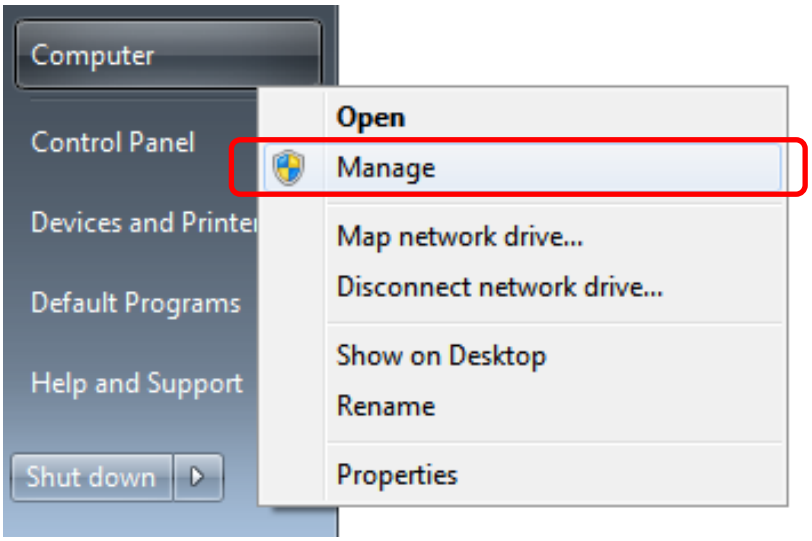
※If the driver is not installed, the following message is displayed.





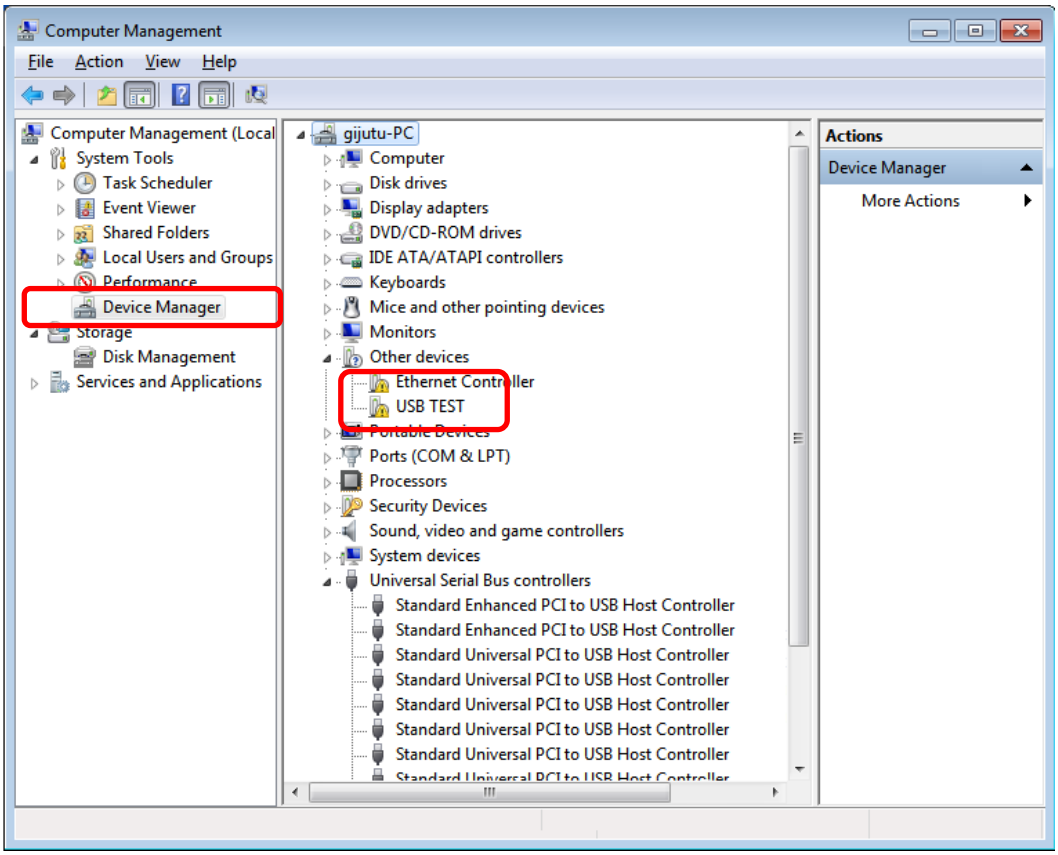
※Depending on the configuration of computer the message may not be displayed. Install the driver by the method described below in that case as well.

(4) Right-click [Computer] in the Start menu. Select the [Manage].

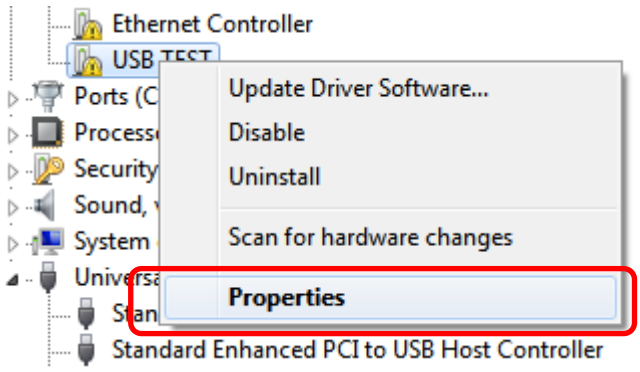


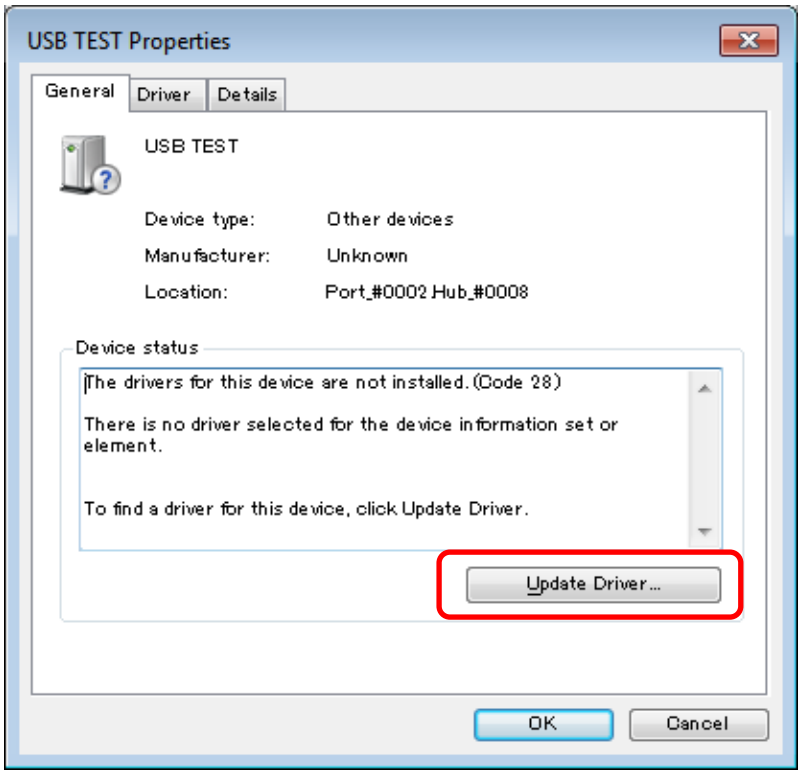
(5) Click the [Device Manager].

Make sure that you have USB TEST in the [Other devices].



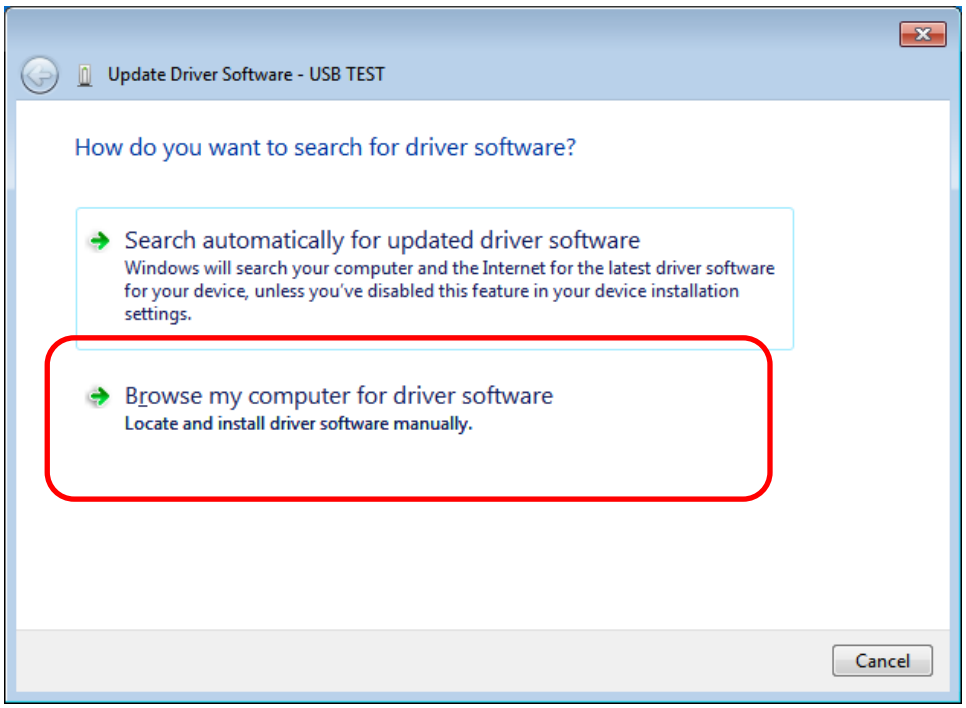
⑹ Right-click USB TEST and select [Properties]. Then, click [Update Driver].



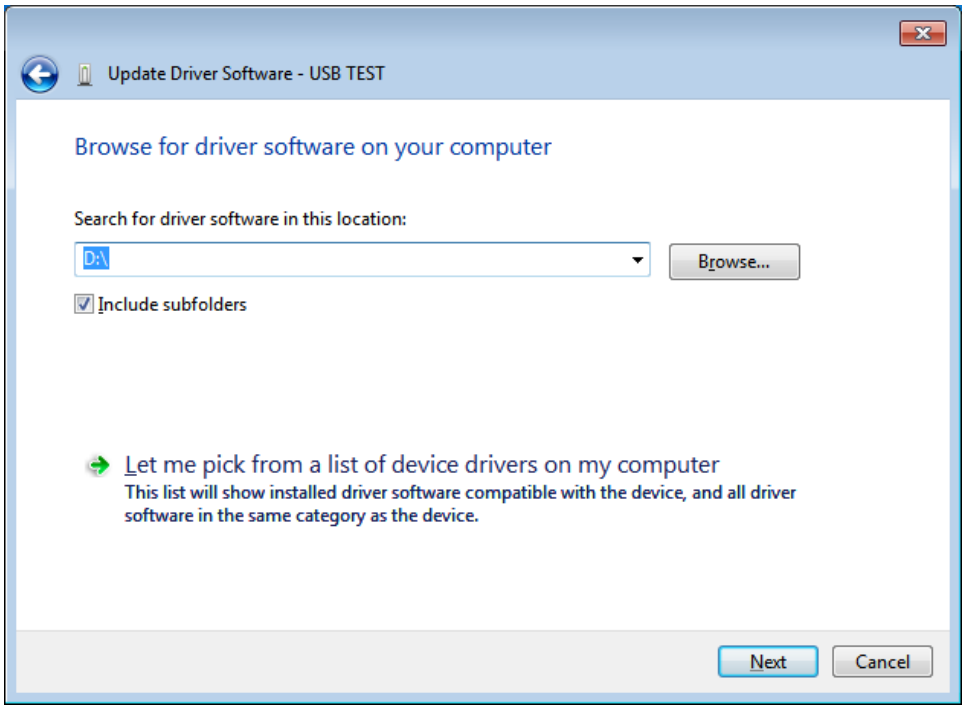


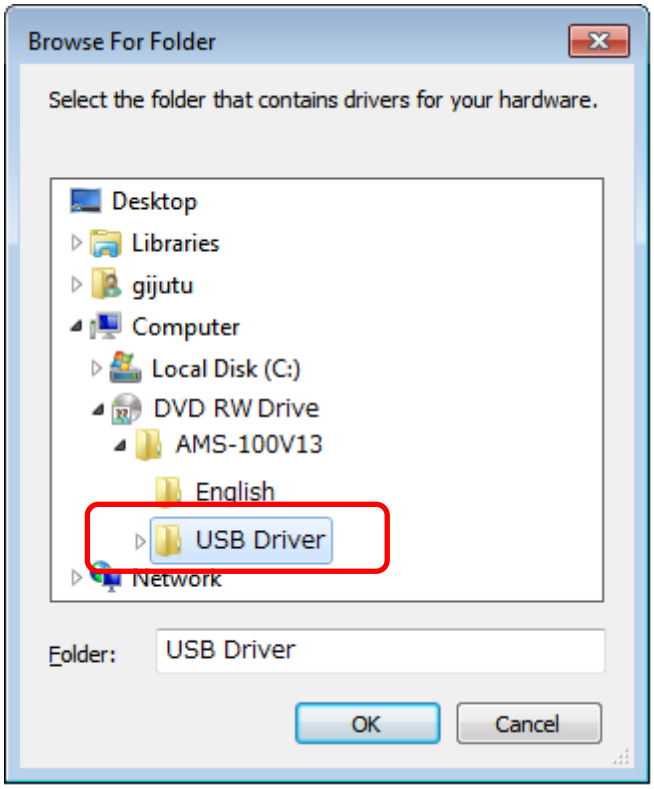
※Same screen opens when double-clicking USB TEST.

⑺ Click “Browse my computer for driver software”.

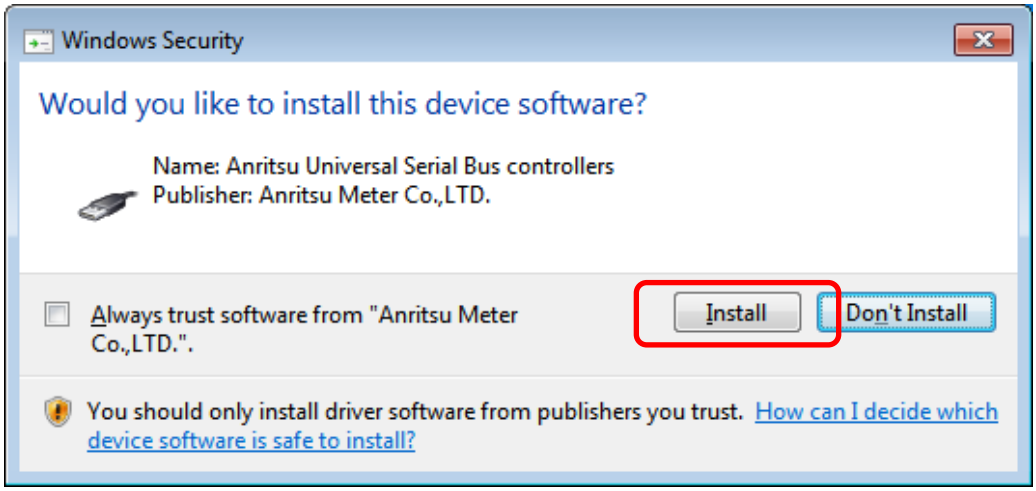


⑻ Insert the CD into your PC. Click [Browse] select the CD from lists and click [Next].

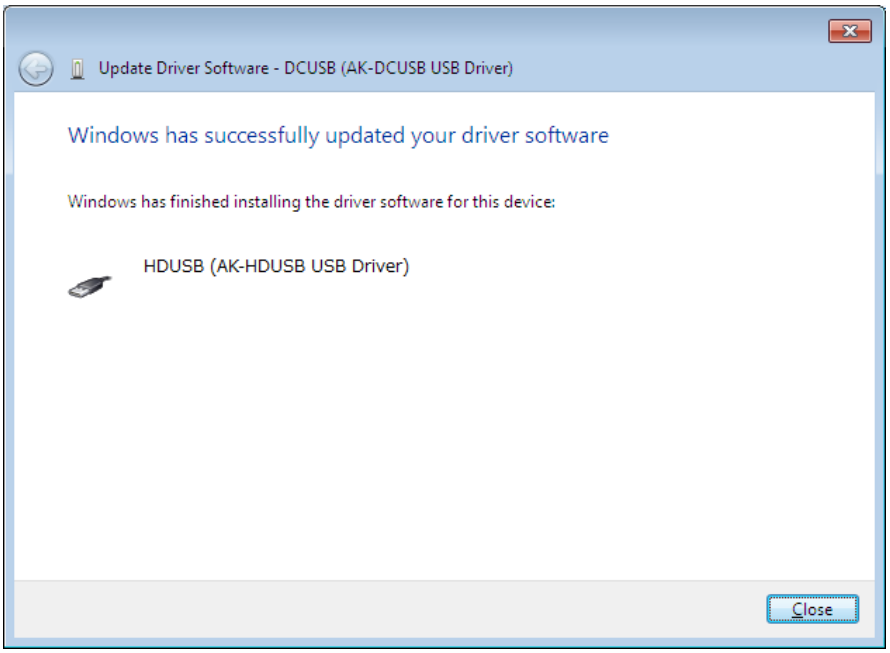




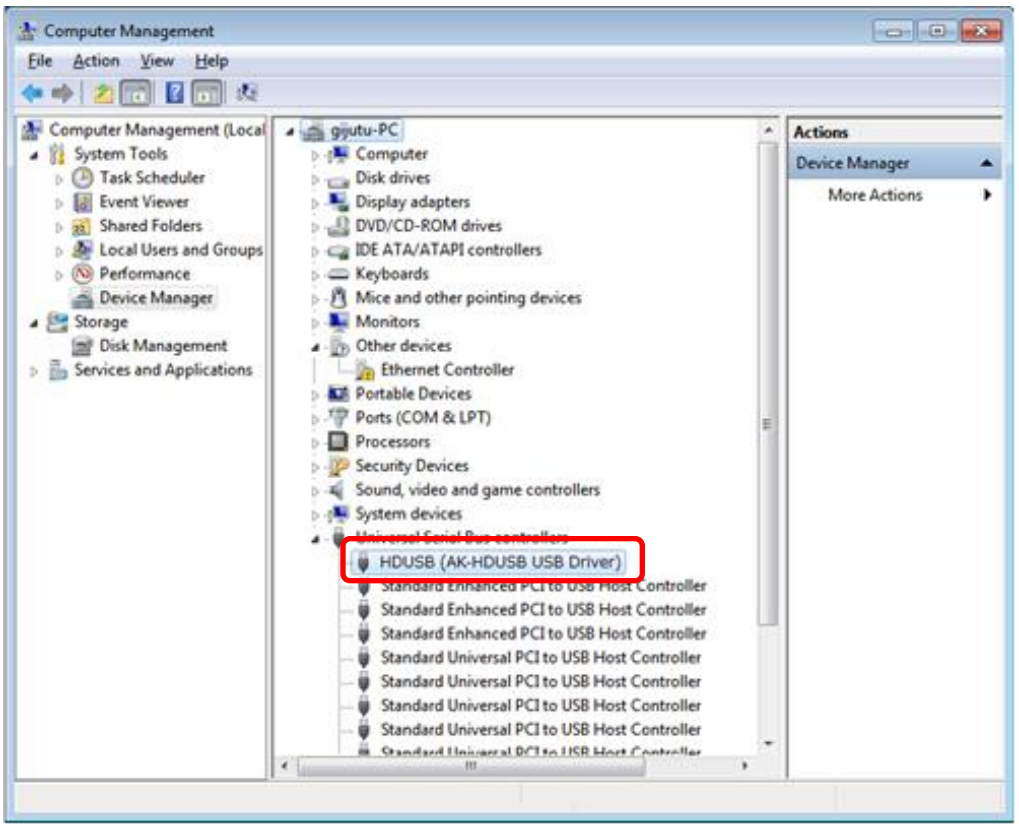
※Click【Install】



(9) When the installation is completed, the Add Hardware wizard shown below will be displayed. Click Finish.



(10) Check to see that "DCUSB" is found below the heading "Universal Serial Bus controllers."

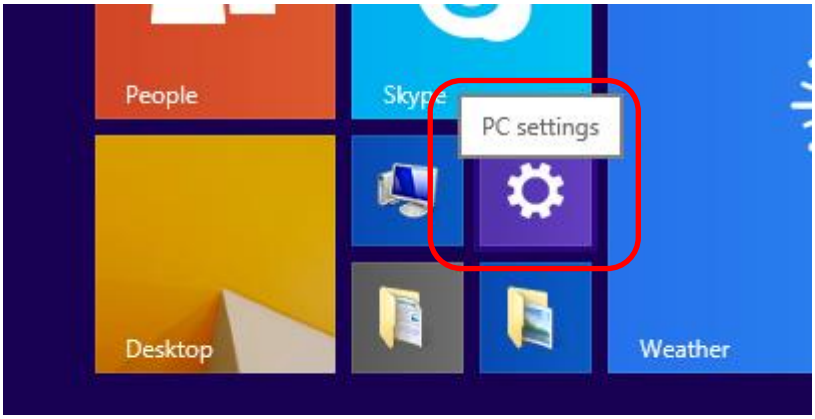


<Windows 8.1>

(1) Connect the measuring instrument and computer with the USB communication cable.

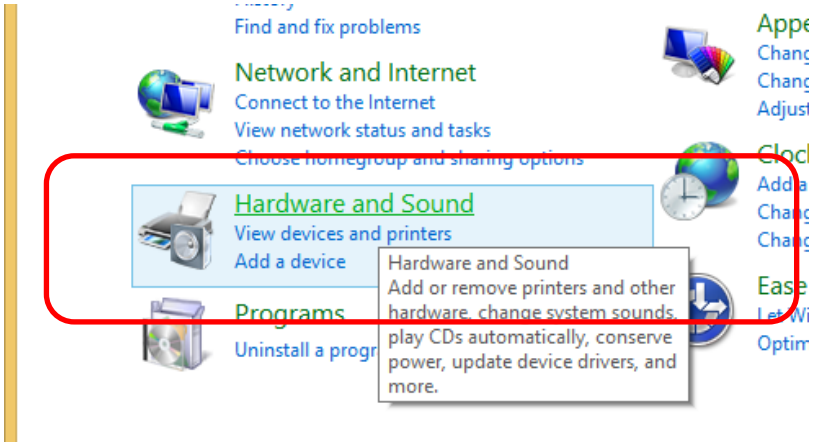
(2) Turn on the power to the measuring instrument.

(3) Click [PC settings] in the Start menu.



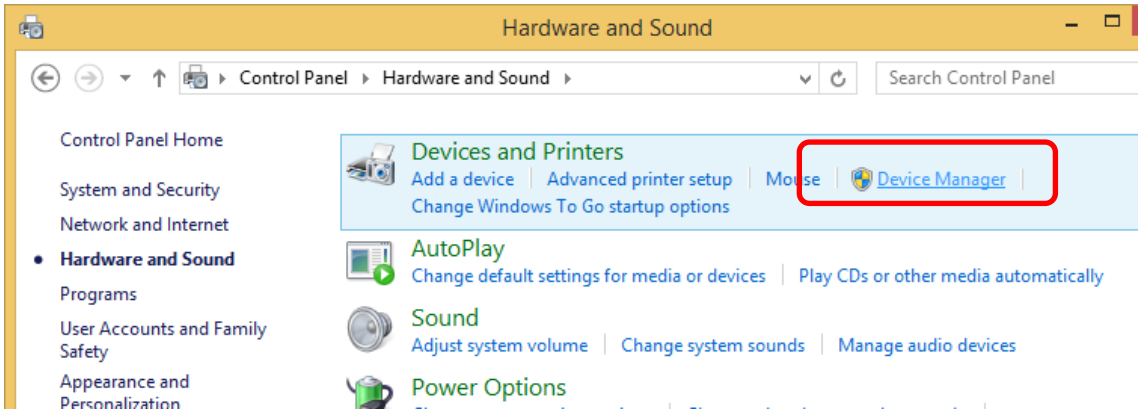
(4) Click [Control Panel] in the menu.

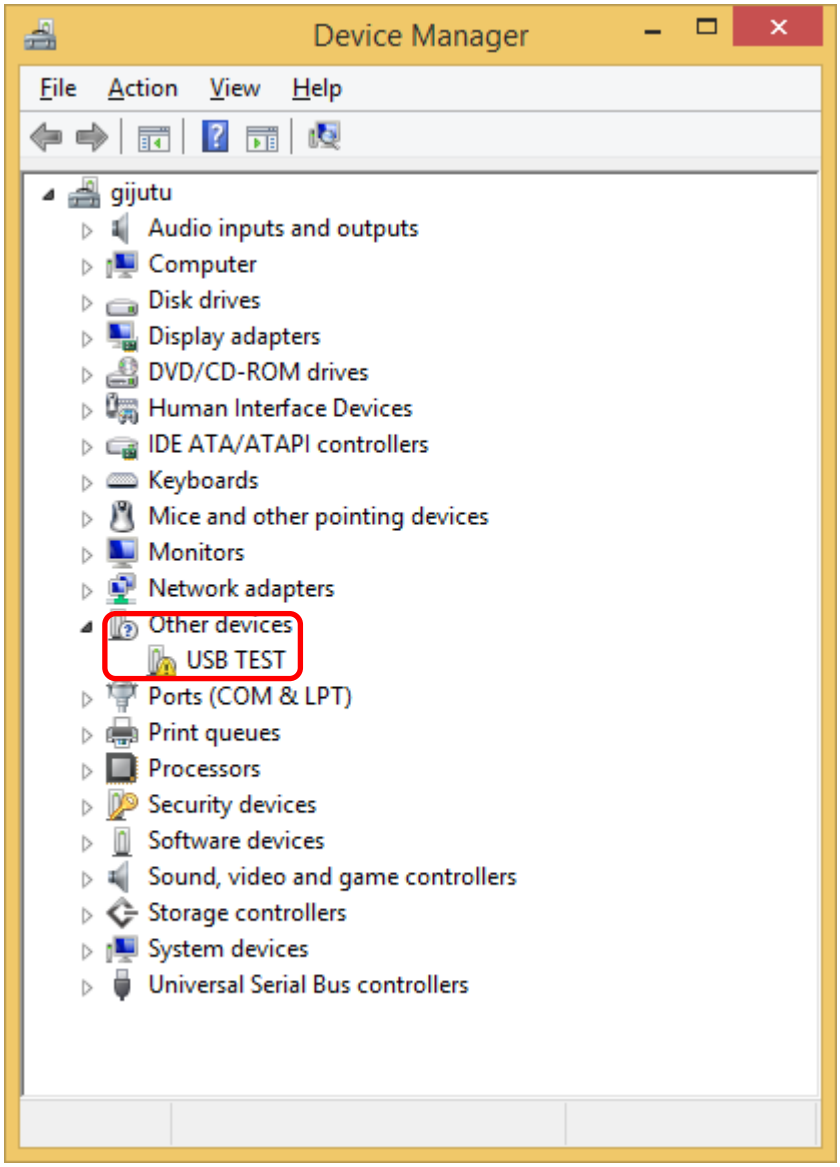
(5) Click [Hardware and Sound].



(6) Click the [Device Manager].

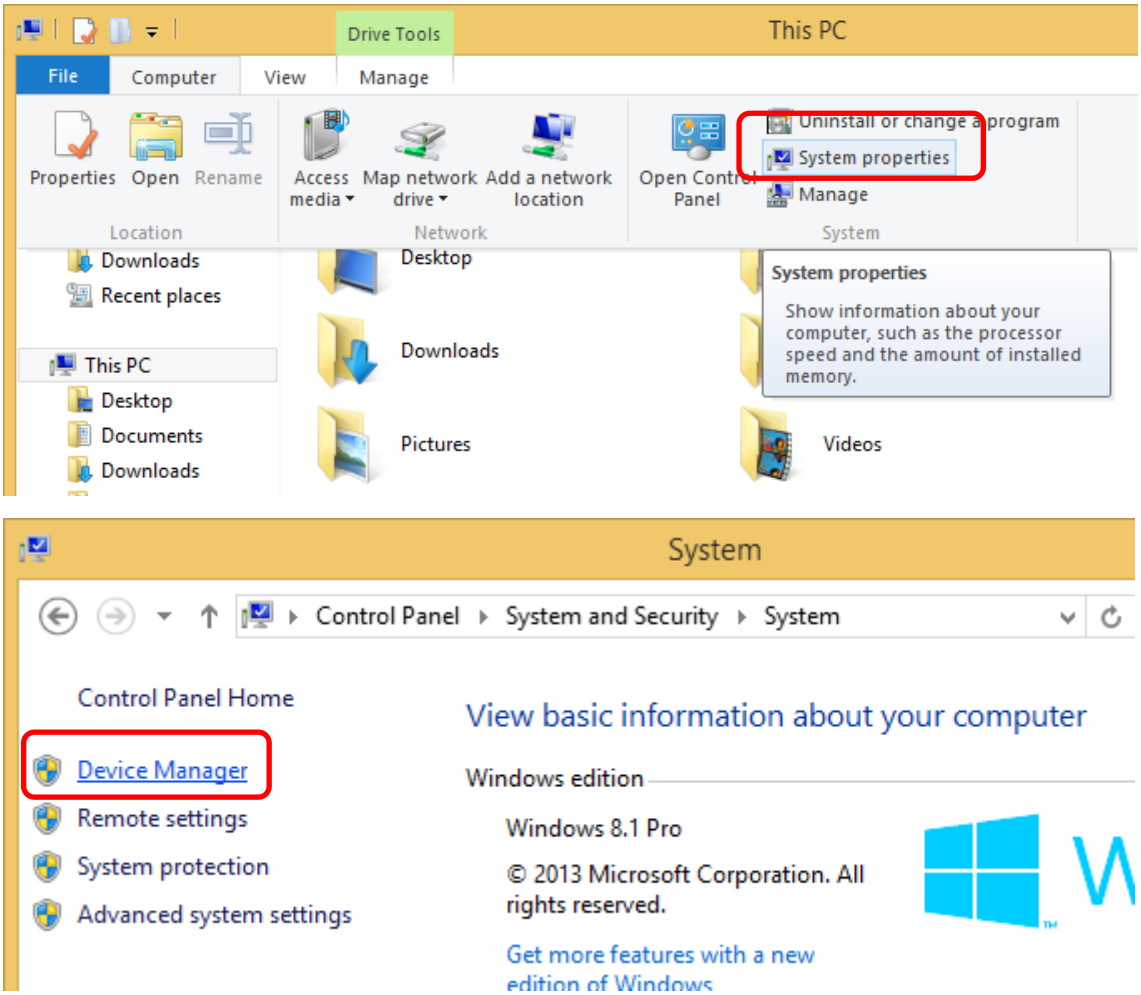
Make sure that you have USB TEST in the [Other devices].





(7) Right-click USB TEST and select [Properties]. Then, click [Update Driver].
Follow the instructions from (6) on Windows7 the installation.

※Select the [Devices manager] in the System properties.

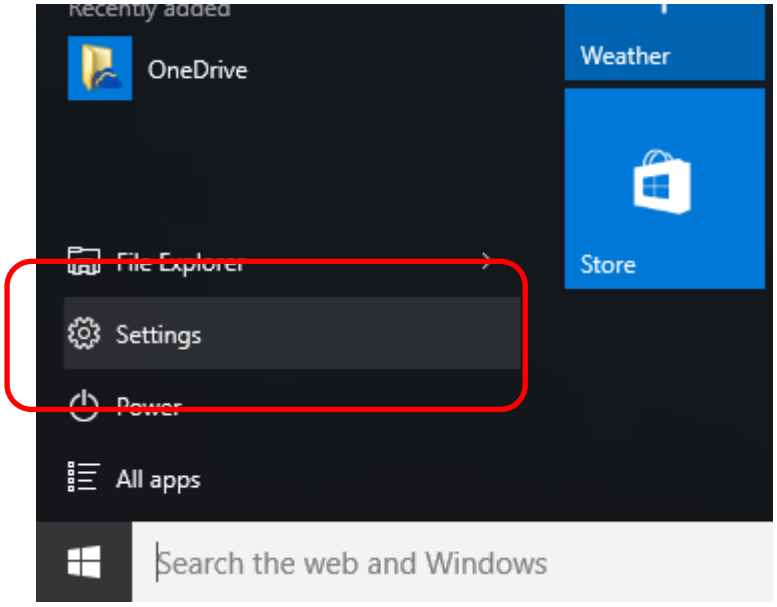


<Windows 10>

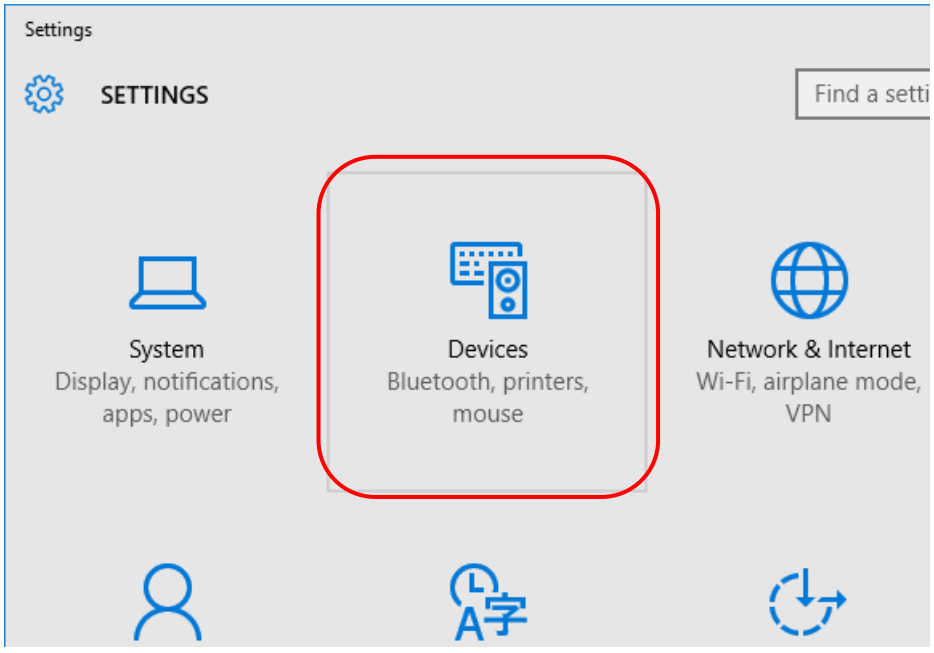
(1) Connect the measuring instrument and computer with the USB communication cable.

(2) Turn on the power to the measuring instrument.

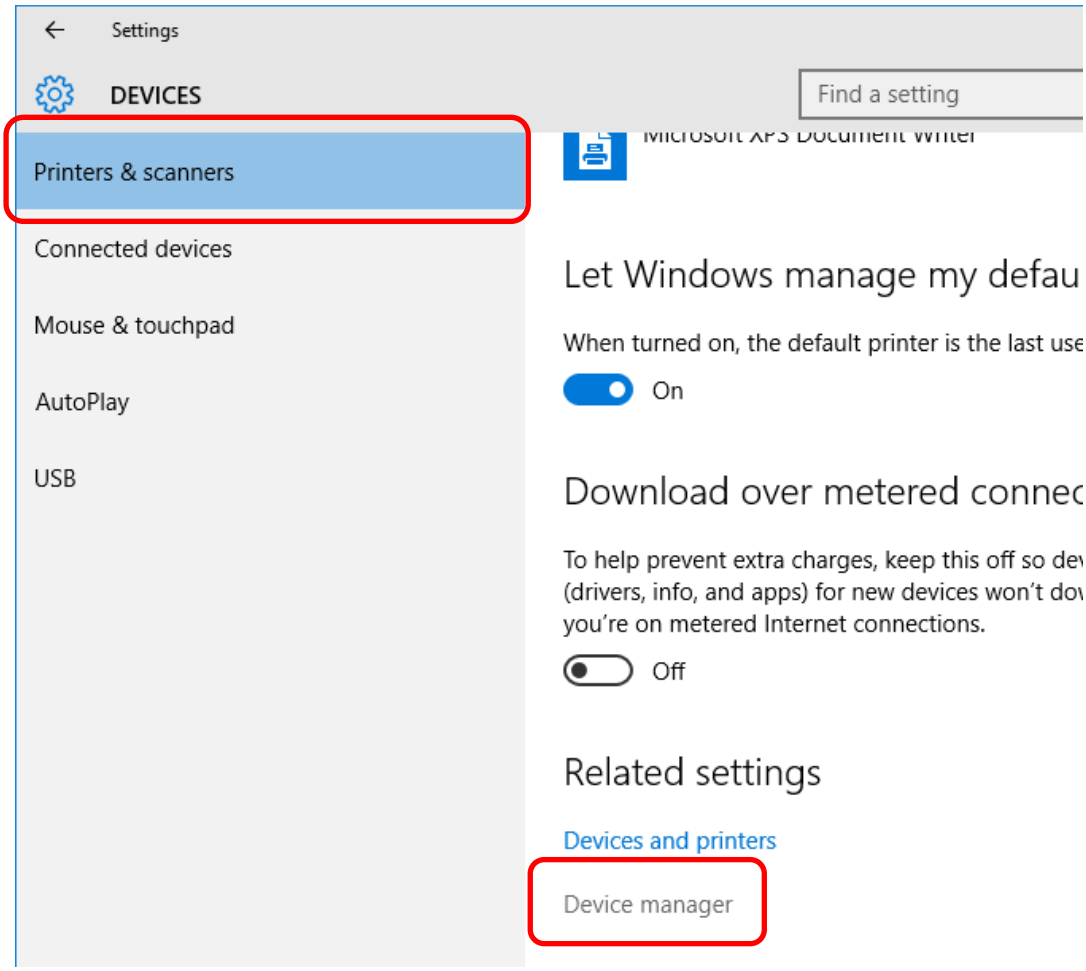
(3) Click [Settings] in the Start menu.

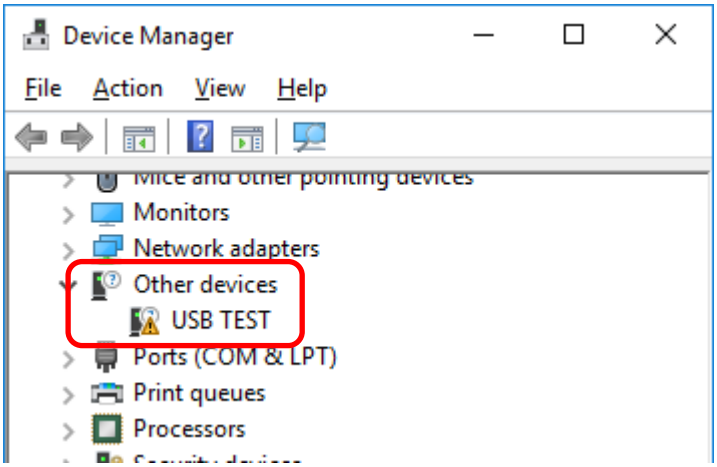


(4) Click [Devices].



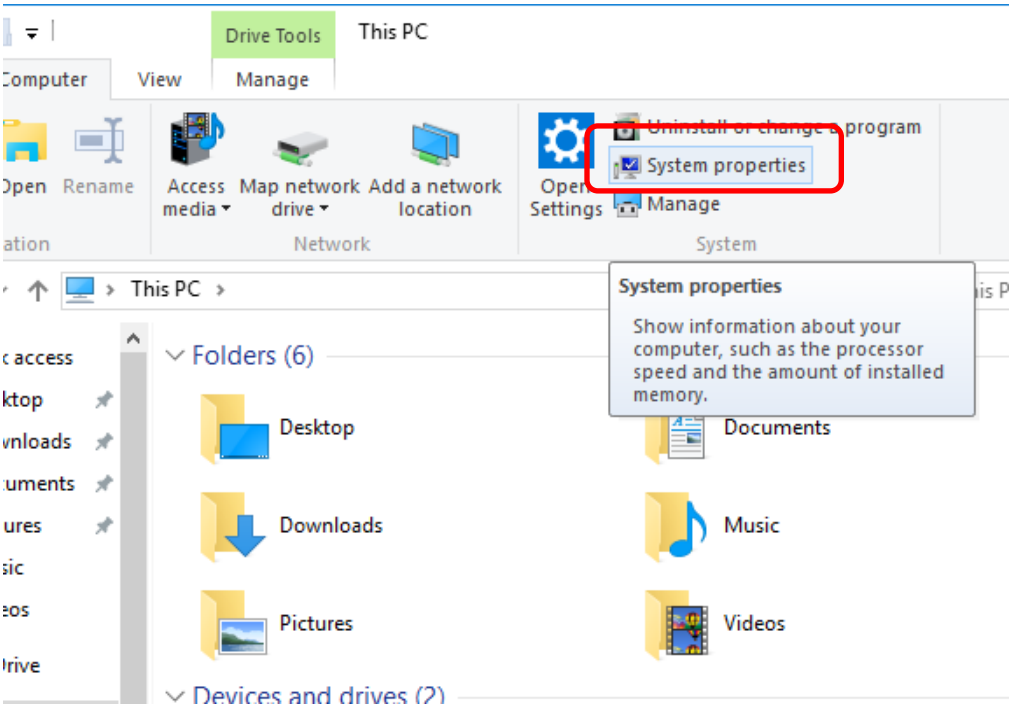
(5) Click [Device manager] in the Printers & scanners.
Make sure that you have USB TEST in the [Other devices].

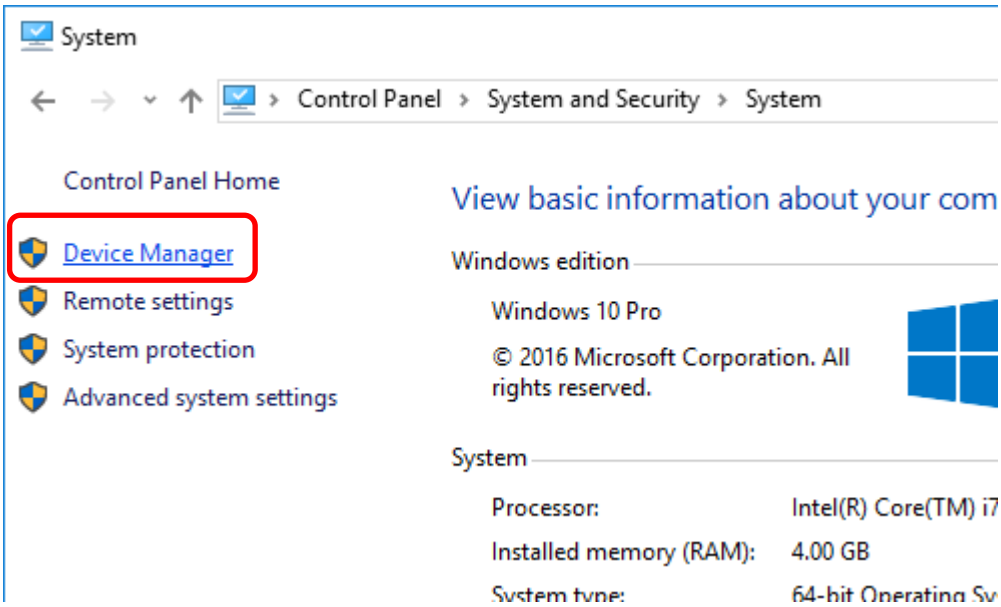




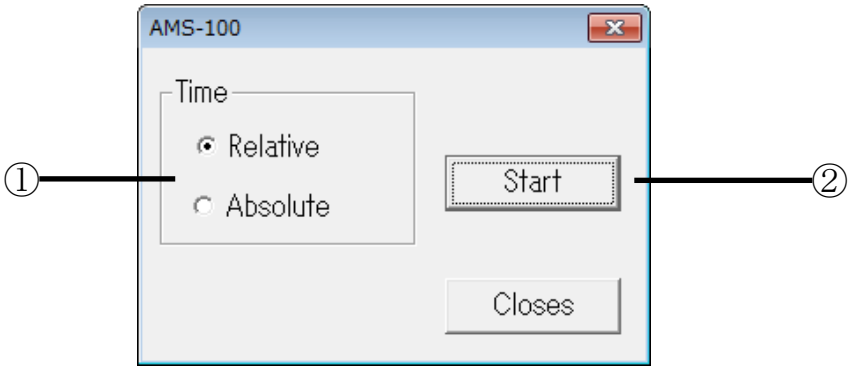
(6) Right-click USB TEST and select [Properties]. Then, click [Update Driver].
Follow the instructions from (6) on Windows7 the installation.

※Select the [Devices manager] in the System properties.





9. 3. Screen Configuration



① Selection buttons for the elapsed time display method

② Data transfer start button

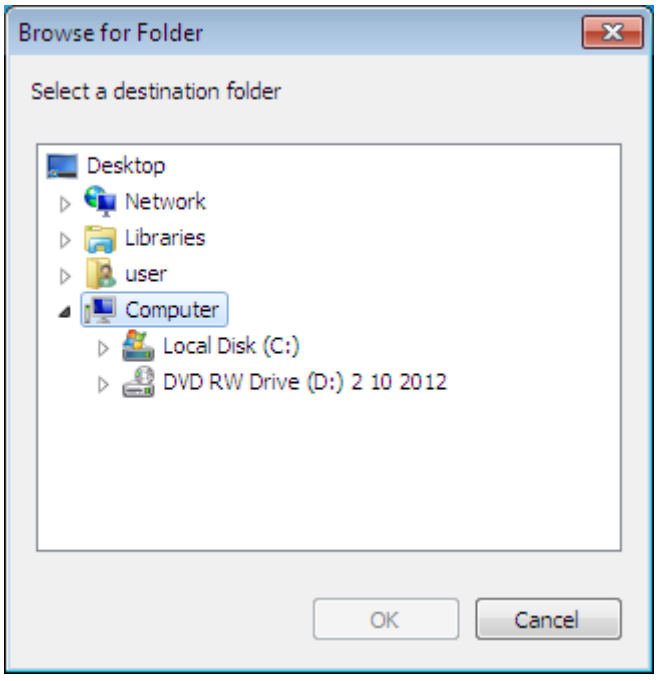
※ It may take more than 5 minutes for this communication process depending on the amount of data involved.

9. 4. Transferring Data

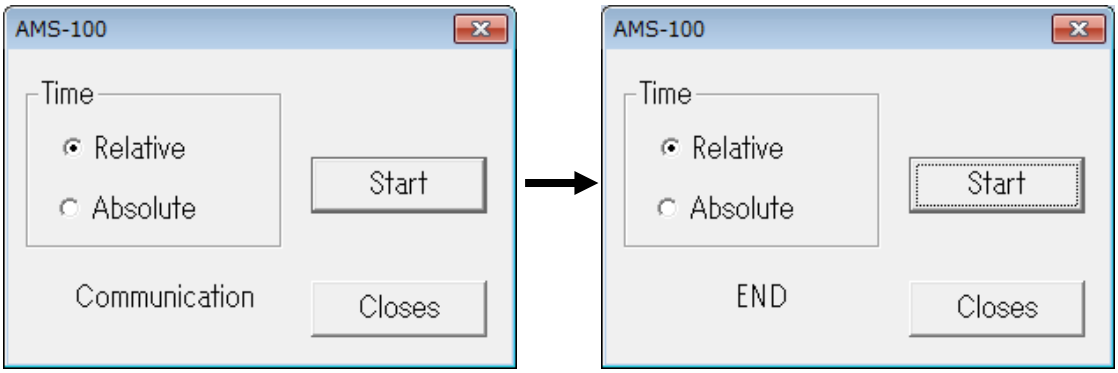
Connect the measuring instrument and computer with the USB communication cable, and turn on the power to the measuring instrument.

Select the elapsed time display method and press the “Start” button to display the folder selection window. Select the destination to which to save data.

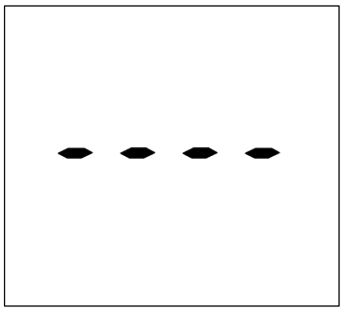
Press “OK” to begin transferring data.



“Communication” will flash while data is being transferred, as shown below.
Do not disconnect the USB cable until “END” is displayed.



Instrument display during data transfer



※ It may take more than 5 minutes for this communication process depending on the amount of data involved.

※ Do not press any keys on the measuring instrument during communication, as this will terminate transfer or cause a malfunction.

※ Since the data in the measuring instrument is retained even after you selected to run Data Input, if a communication error, etc. occurs during communication, reselect Data Input.

The transferred data is saved as a CSV format file in the HD-DATA folder. (The HD-DATA folder is created automatically in the destination folder, if not already present.)
The file are named "HD-****.csv". The **** part in the file name denotes a number assigned for each directory from 0001 to 9999. Even if a file is deleted, all other file numbers remain unchanged.
No more data can be saved in the HD-DATA folder if it contains a file with the maximum number (9999). To save more data, either rename the folder or rename the files.

9. 5. Using Data in Spreadsheet Software

CSV files can be opened and edited in spreadsheet software.

If you are using Microsoft Excel, the file will be displayed in a manner similar to the samples shown below. You can create a graph the file by making use of the functions of Microsoft Excel.

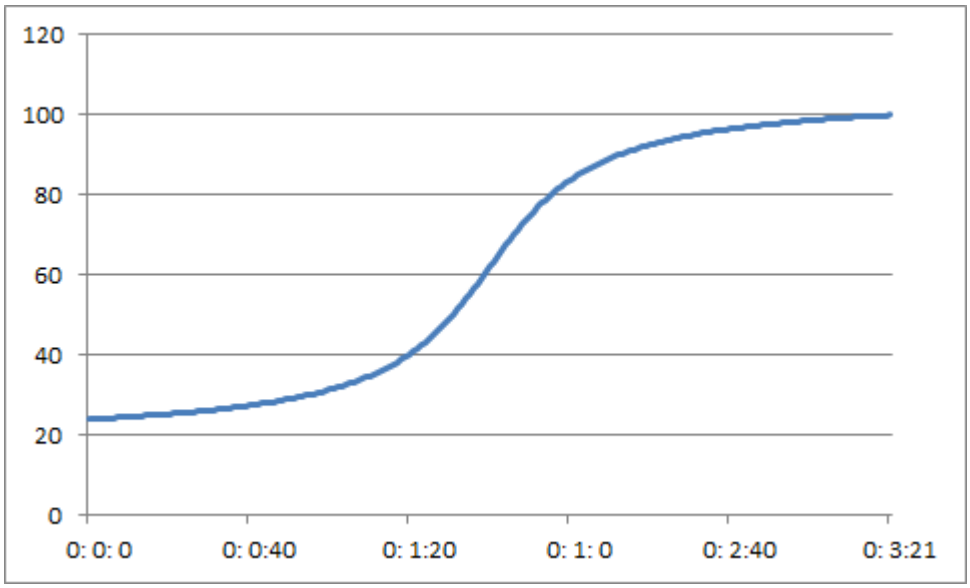
<Time display : Relative time>

	A	B	C	D	E	F	G
1	File name	HD-0001					
2	Start time	2012/2/20	8:03:15				
3	Interval	00min01sec					
4	SampleNo.	H:M:S	℃				
5	0	0:0:0	25				
6	1	0:0:1	25				
7	2	0:0:2	25				
8	3	0:0:3	25				
9	4	0:0:4	25				
10	5	0:0:5	25				
11	6	0:0:6	25				
12	7	0:0:7	25				
13	8	0:0:8	25				
14	9	0:0:9	25				
15	10	0:0:10	25				
16	11	0:0:11	25				
17	12	0:0:12	25				
18	13	0:0:13	25				
19	14	0:0:14	25				
20	15	0:0:15	25				
21	16	0:0:16	25				
22	17	0:0:17	25				
23	18	0:0:18	25				
24	19	0:0:19	25				

< Time display : Absolute time>

	A	B	C	D	E	F
1	File name	HD-0001				
2	Start time	2012/2/20	8:30:15			
3	Interval	00min01sec				
4	SampleNo.	Y/M/D	H:M:S	℃		
5	0	12/2/20	8:30:15	25		
6	1	12/2/20	8:30:16	25		
7	2	12/2/20	8:30:17	25		
8	3	12/2/20	8:30:18	25		
9	4	12/2/20	8:30:19	25		
10	5	12/2/20	8:30:20	25		
11	6	12/2/20	8:30:21	25		
12	7	12/2/20	8:30:22	25		
13	8	12/2/20	8:30:23	25		
14	9	12/2/20	8:30:24	25		
15	10	12/2/20	8:30:25	25		
16	11	12/2/20	8:30:26	25		
17	12	12/2/20	8:30:27	25		
18	13	12/2/20	8:30:28	25		
19	14	12/2/20	8:30:29	25		
20	15	12/2/20	8:30:30	25		
21	16	12/2/20	8:30:31	25		
22	17	12/2/20	8:30:32	25		
23	18	12/2/20	8:30:33	25		
24	19	12/2/20	8:30:34	25		

Displayed in graph form using the Microsoft Excel graph function



※ In manual measurement, the time when data measurement was performed is displayed.

10.Default Configuration

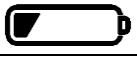
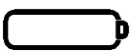
When the instrument turns the power OFF, Reset or Battery exchange, some setting will be canceled. Default Configuration is below tables.

Function	
HOLD	Cancel
Auto Power OFF	Default
P / V Hold	Cancel
Resolution	Default
Backlight	Cancel
Clock	Default ※1
Memory	Default

※ The instrument uses a lithium battery to retain clock settings. When the lithium battery is exhausted, the clock setting will be reset and an abnormal time readout error will occur.
If this happens, the lithium battery must be replaced by the place of purchase or by Anritsu Meter. A fee will be charged for this replacement.

11.Indicator of Battery remain

The battery level is indicated in the upper section of the display.
In accordance with operation hours, the indicator lights go out as shown below.

Indicator	Battery remain
	Over 50 %
	25 ~ 50 %
	10 ~ 25 %
	Under 10 %
	Exhausted Battery

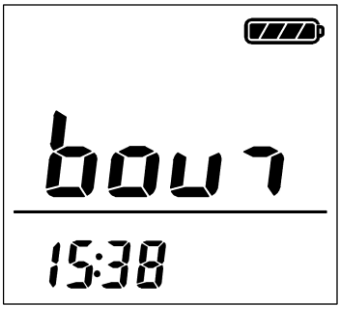
This instrument can work for a while after the Exhausted Battery sign appears. However, Change battery as soon as possible, otherwise satisfactory function will not be available.

12.Error Messages

12. 1. Main Unit Error Messages

This section describes the most common error messages displayed on the measuring instrument. Follow the instructions given if any of the following messages appear.

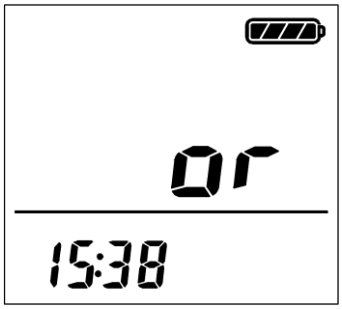
(1) Indication of Sensor Burnout

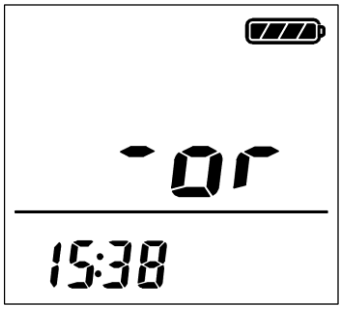


If the sensor burns out or is not coupled, the Burnout display appears shown as left.
Check whether the sensor burns out or does not connect to instrument.

(2) Indication of Over range

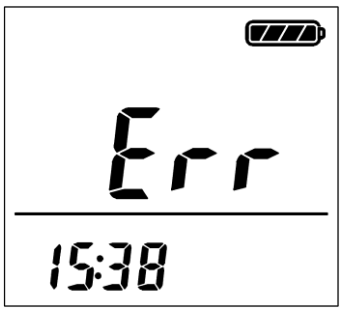
If the temperature exceeds the measurable range during measuring, the Over range display appears shown as right.





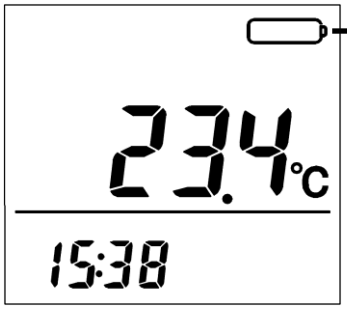
- If the sensor is almost cut, the Over range display sometimes appears. Please check the sensor cut if measuring temperature is in the range.
- The over range display does not damage the instrument, however the sensor will be exhausted. Avoid the sensor to the place in measurable temperature.

(3) **Indication of Error**



The instrument is broken.
Please contact the place of purchase or us.

(4) **Indication of Exhausted Battery**



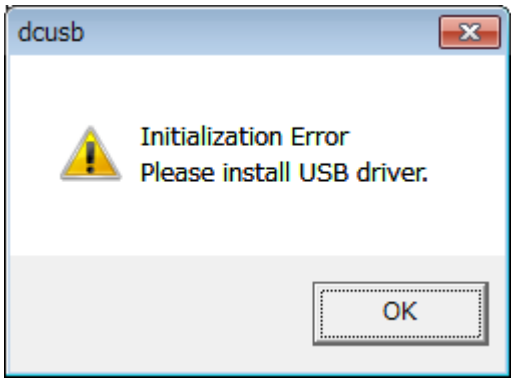
When the battery is exhausted, Battery indicator blinks.
Then replace the old battery cells with new ones.

When the remaining battery is almost empty, a warning alarm sounds and the battery display appears. The battery will turn off immediately.

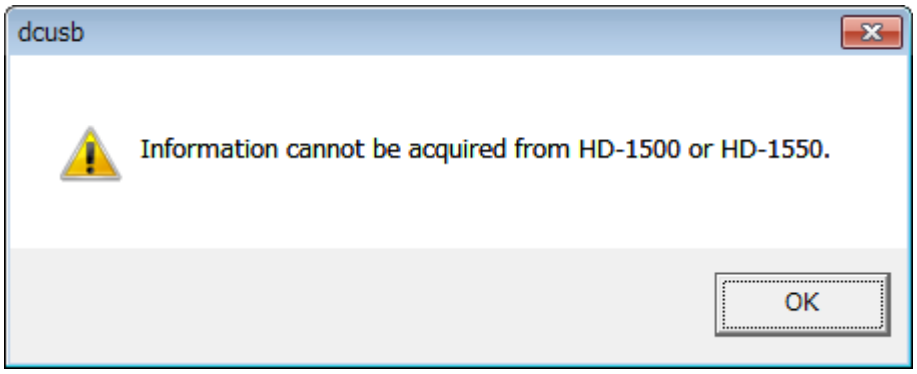
12. 2. Software Error Messages

This section describes the most common error messages displayed by the AMS-100. Follow the instructions given if any of the following messages appear.

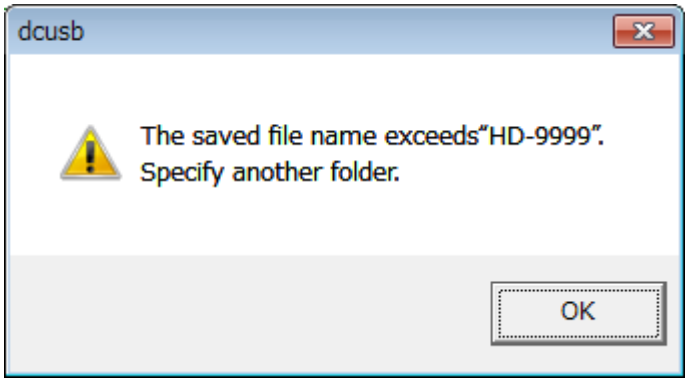
(1) If the instrument is not connected to the computer by USB cable, or if no USB driver can be recognized.



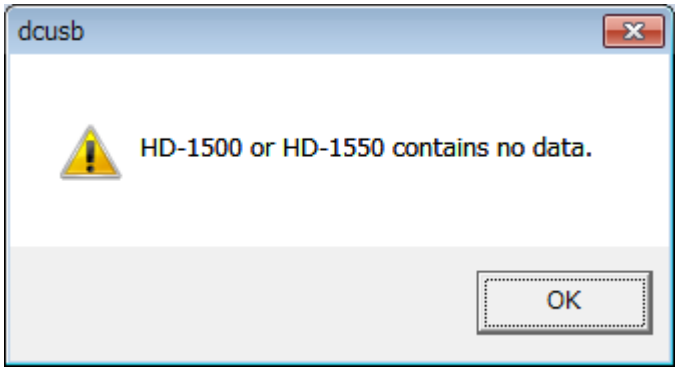
(2) If the measuring instrument cannot be communicated with



(3) If the file name exceeds "9999"



(4) If data is not saved in the measuring instrument



13.Uninstall

- Using the AMS-100 CD-ROM

To uninstall AMS-100, insert the AMS-100 CD-ROM in the CD-ROM or DVD-RW drive and run "SETUP.exe."
Select the language to uninstall the software, and the Setup Wizard will launch. Check the details and follow the on-screen instructions displayed.

- Without using the AMS-100 CD-ROM

1. Open the [Control Panel] from the [Start] button. Click [Programs], then click [Programs and Functions].
2. Select AMS-100 and click [Uninstall].

14.Maintenance

14. 1. Storage

Avoid places subject to the following when storing the instruments.

- Direct Sunlight
- Strong vibration
- High humidity (85% RH or more)
- Hot atmosphere (50℃ or more)
- Dust, corrosive gas, or salt
- Strong electromagnetic field

It is recommended to put the instrument in the original case when storing it for a long time.

14. 2. Case cleaning

When the case is dirty, lightly wipe it with a cloth slightly impregnated with water. Do not use alcohol, thinner or benzene, otherwise the case or keyboard may discolor or deform.

15. In case of Trouble

Issues of instruments operation trouble, please check follows. If your trouble is not solved, please contact the place of purchase or us.

(1) **Display does not show any segments.**

- Push the Reset switch
- Check the pole of battery cells
- Replace the old battery with new ones
- If you use the AC-adaptor, please pull it out.

(2) **Measurement value does not stable.**

- If sensor is deformation or broken junction, please contact us for repairing.
- Pull out and put in the plug of the sensor with the instrument again.
- If the senor does not hold in the correct position, measurement value does not stable.
- If you measure in the environment of strong electromagnetic field (a big motor, etc.), please shield the instruments and the sensor against electrical noise.

(3) **Measurement value error is too big (Not acceptable).**

- If the thermocouple type of the sensor is not corresponded to the instruments, measurement value is not correct.
  Please replace the correct sensor.
- If sensor is deformation, please contact us.

(4) **The key switch is not operated**

- When the Burn out display appears, no operation. Please put the sensor in, or check the sensor broken junction.

16. Specification

Display	7 segments LCD display
Operation key	Membrane switch
Linearizer	Digital (based on JIS C 1602-1995)
Sampling rate	Approximately 300 ms ※
Memory	9999 data
Signal source resistance	500Ω
Power supply	Battery cells (AA) 4 pieces or AC-Adaptor
Internal battery	Lithium Battery (Backup for clock) Battery Life: Approx. 5 years (store at room temperature)
Environmental limit	Operation :0～40℃,0～80%RH Storage : -20～50℃, 0～85%RH
Dimensions	76(W)×167(H)×36(D)mm
Weight	Approximately 350 g
Accessories	Soft case Instruction manual Battery cells (AA) 4 pieces Hand Strap Test Report USB cable CD-R(AMS-100)

※ Sampling period will be a user-selected time interval when time interval is specified at 10 seconds or more.

Battery life

HD-15*0	Approx. 150h

Accuracy

Input	Type E	
Resolution	1℃	0.1℃
Measurement range	-200～800℃	-100.0～500.0℃
Accuracy	**0℃ or more** ±(0.1% of reading + 1℃) **Below 0℃** ±(0.5% of reading + 1℃)	**0℃ or more** ±(0.05% of reading + 0.2℃) **Below 0℃** ±0.5℃
Accuracy Cold-junction compensation	0.2℃ at 25℃±10℃	
Temperature coefficient	±0.01% of F/S／℃ Except 25℃±10℃	

Input	Type K	
Resolution	1℃	0.1℃
Measurement range	-200～1370℃	-100.0～500.0℃
Accuracy	**0℃ or more** ±(0.1% of reading + 1℃) **Below 0℃** ±(0.5% of reading + 1℃)	**0℃ or more** ±(0.05% of reading + 0.2℃) **Below 0℃** ±0.5℃
Accuracy Cold-junction compensation	0.2℃ at 25℃±10℃	
Temperature coefficient	±0.01% of F/S／℃ Except 25℃±10℃	