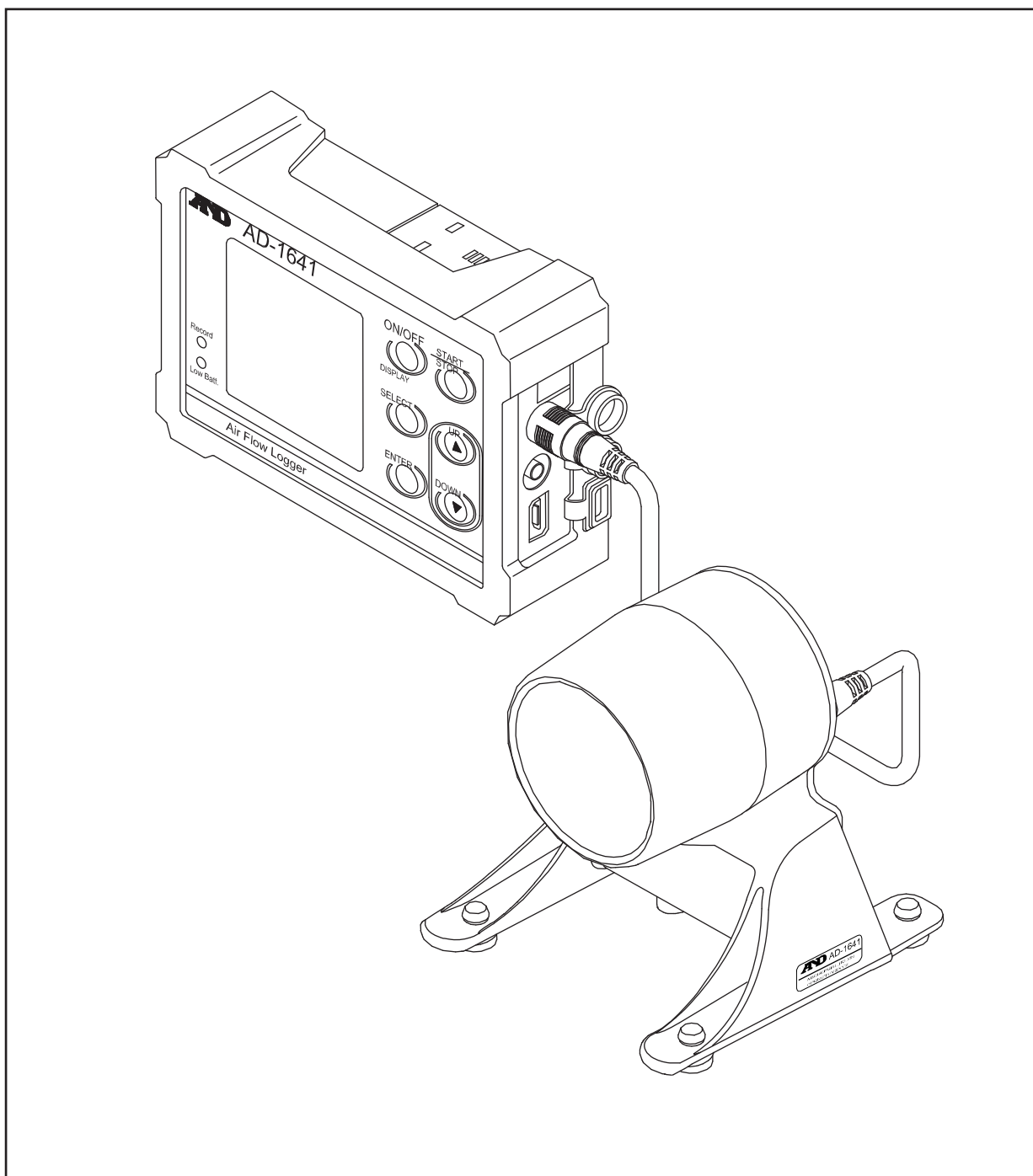


AD-1641

Air Flow Logger

Instruction Manual



AD
A&D Company, Limited

WARNING DEFINITIONS

The warnings described in this manual have the following meanings:



Caution

A potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the instrument.

Note

Information or cautions to use the device correctly.

This manual is subject to change without any prior notice to improve the product. No part of this manual may be photocopied, reproduced, or translated into another language without the prior written consent of the A&D Company, Limited.

Product specifications are subject to change without any obligation on the part of the manufacturer.

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1 Introduction

This manual describes how the AD-1641 works and how to maximize performance. Please read this manual completely before using the AD-1641. This device conforms to FCC rules and CE mark EMC directives.

1.1 Features

- The AD-1641 is a data logger equipped with 5 sensors: air flow, temperature, humidity, barometric pressure and vibration. Air flow sensor part is independent from the instrument and can be installed to any desired location for measurement.
- By connecting the output of the AD-1641 to the RS-232C of the instrument, it is possible to record weighing data and environmental data sets so data can be saved without the computer.
- The AD-1641 has a built-in clock. This allows the date and time to be stored along with the data.
- A maximum of 10,000 data can be stored.
- The environmental data is stored in CSV format and can easily be used by software such as spreadsheet applications.
- The stored data can be read by a computer after the AD-1641 is recognized as USB memory so no special software is required.
- The AD-1641 can transmit data to programs in the computer (Ex: Excel, etc) using the USB interface. (Real time transmission mode)
- When connecting any combination of weighing instrument or computers, the power is supplied for the AD-1641 by them. In this case, AD-1641 batteries are not used.

1.2 Caution During Use

When operating this instrument, be sure to observe the following.

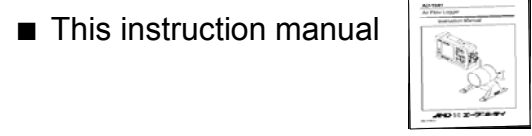
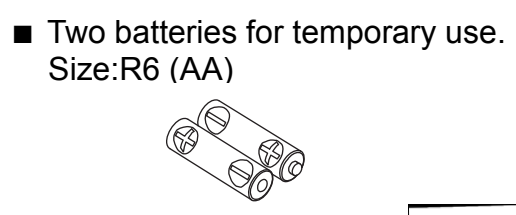
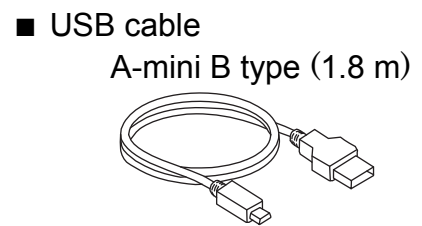
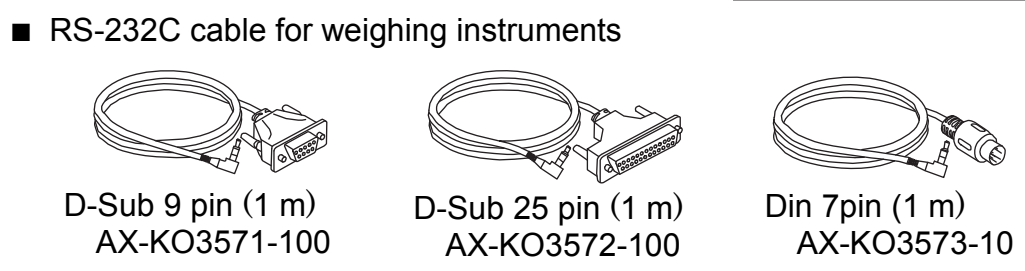
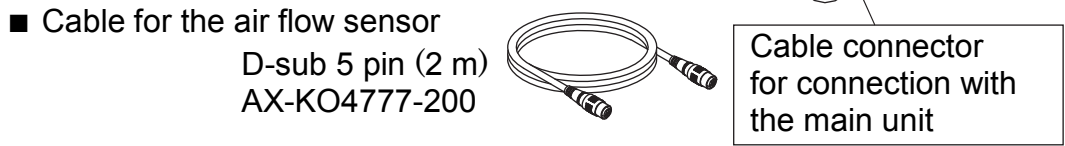
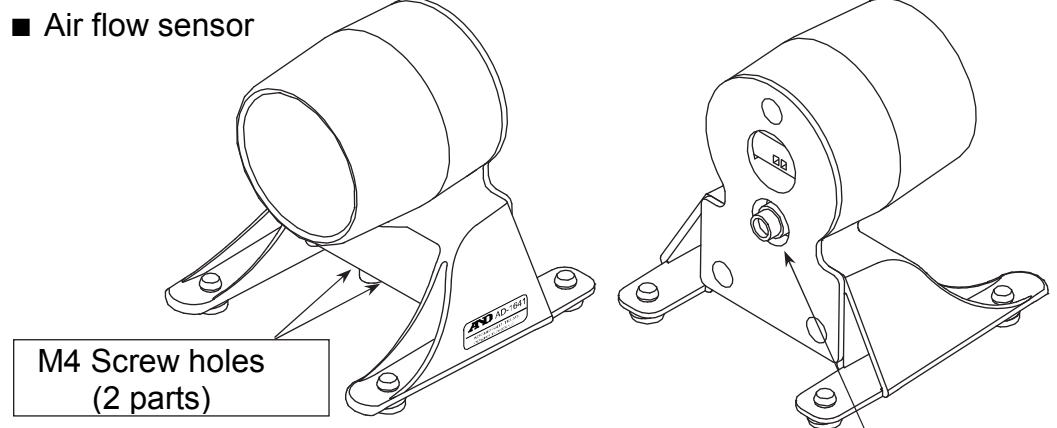
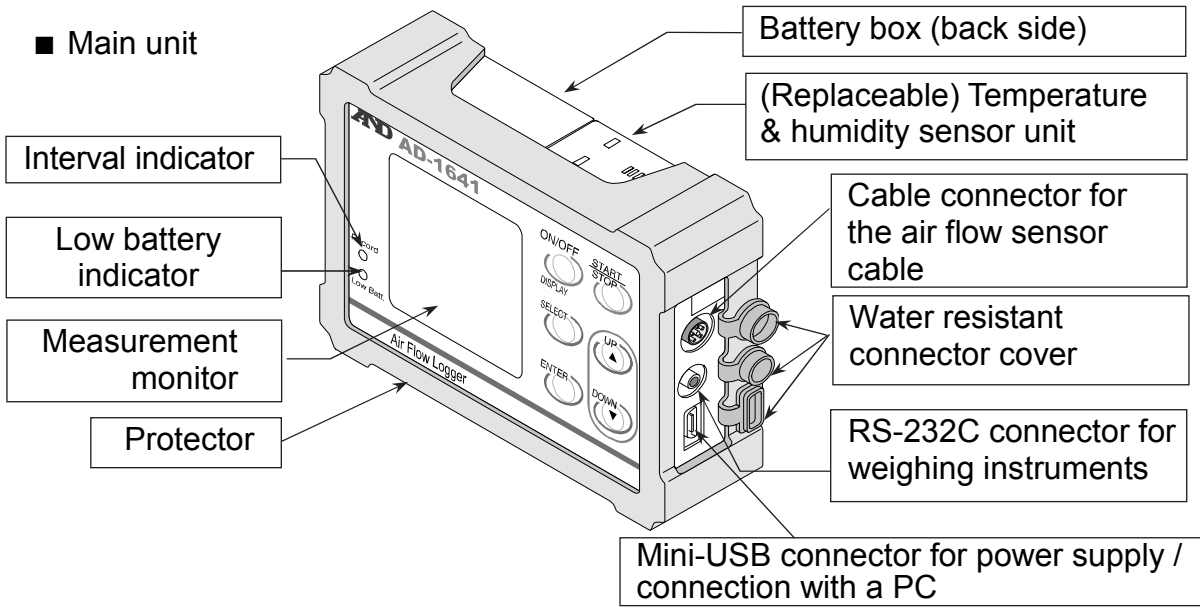
Caution

- Do not open the case to repair the AD-1641. Only authorized personnel can perform repairs. Attempting repairs yourself may cause damage to the AD-1641 and will void the warranty.

Caution

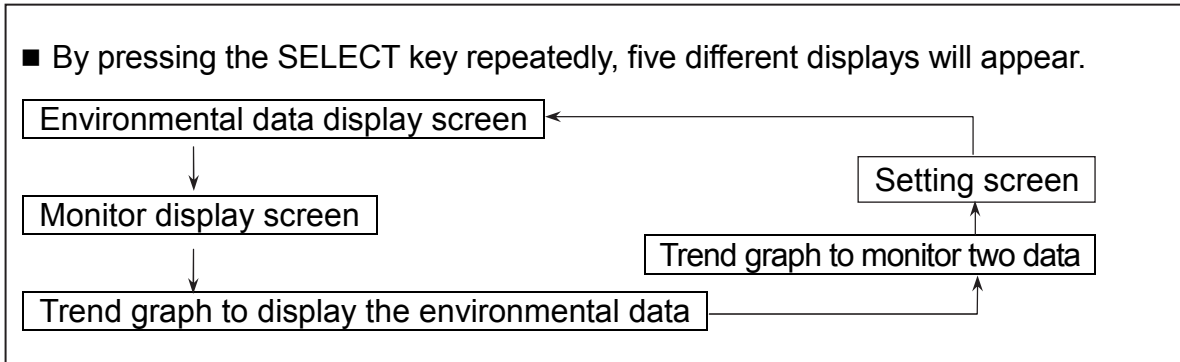
- When the battery cover and temperature & humidity sensor unit are connected to the AD-1641 and the connectors are firmly seated in the water resistant connector covers, the AD-1641 is protected against light water exposure (equivalent to IP 65). Please note that the water resistance will not endure immersion in water or high pressure running water.

2 Unpacking and Names



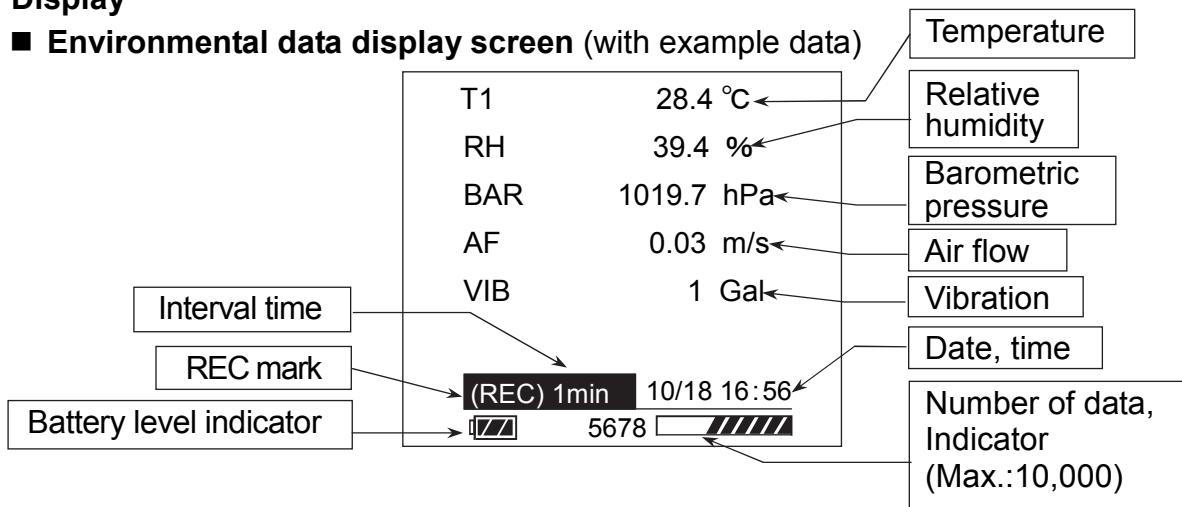
3 Display and Key operations

The following five displays can be selected depending on the intended use.



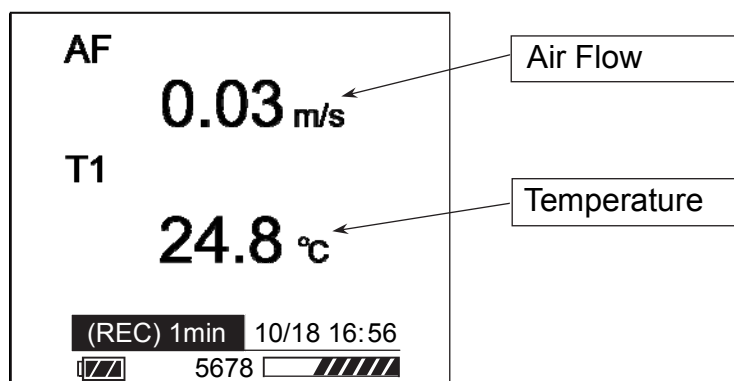
Display

■ Environmental data display screen (with example data)



■ Monitor display screen

This screen displays the two environmental data that were specified in the setting screen. (Refer to "7.2 setting the monitor display")

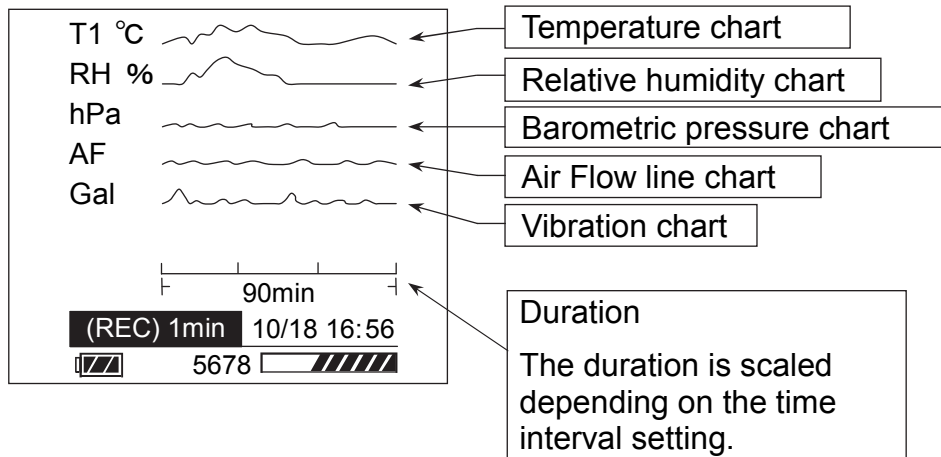


Note

- The battery level indicator is displayed when the battery is used. It is not displayed when external power is used.

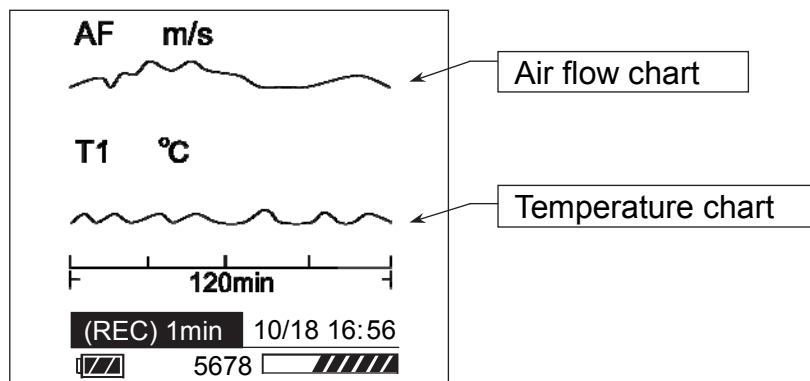
Environmental data

■ Trend graph to display the environmental data (with example)

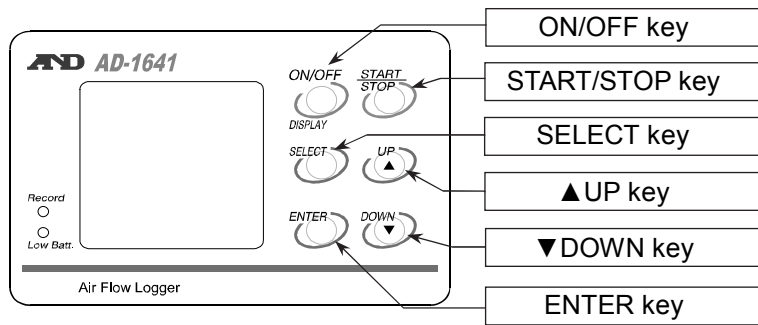


■ Trend graph to monitor two data (with example)

This screen displays the two environmental data that were specified in the setting screen.(Refer to "7.2 setting the monitor display")



Key Operations



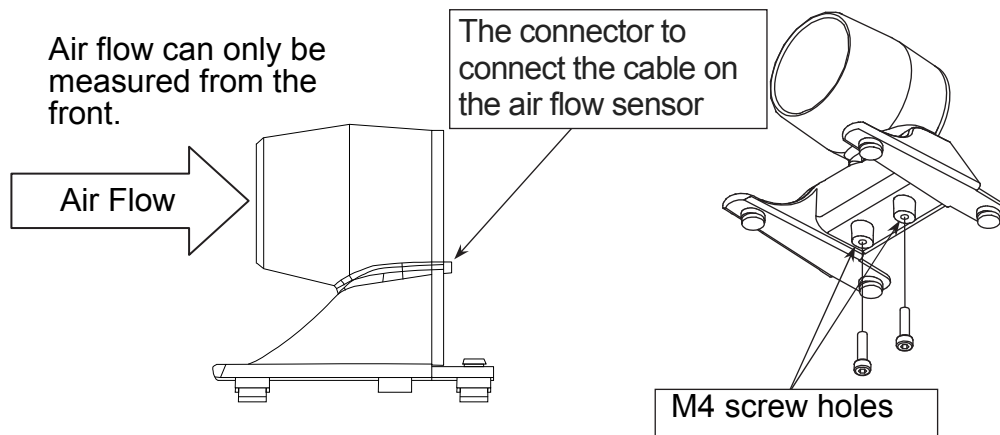
Key	<i>Press</i> : Press and release the key immediately	<i>Long press</i> : Press and hold the key for 1 second or more.
ON/OFF (DISPLAY)	Shows the current monitor *1 Cancels the setting operation	Turns the AD-1641 on or off.*2
START/STOP	Starts the interval measurement. Cancels the setting operation.	Stops the interval recording
SELECT	Changes the current display.	—
ENTER	Confirm settings recording.	
▲UP, ▼DOWN	Changes the parameter.	

*1 : When the interval recording is executed and the display is off.

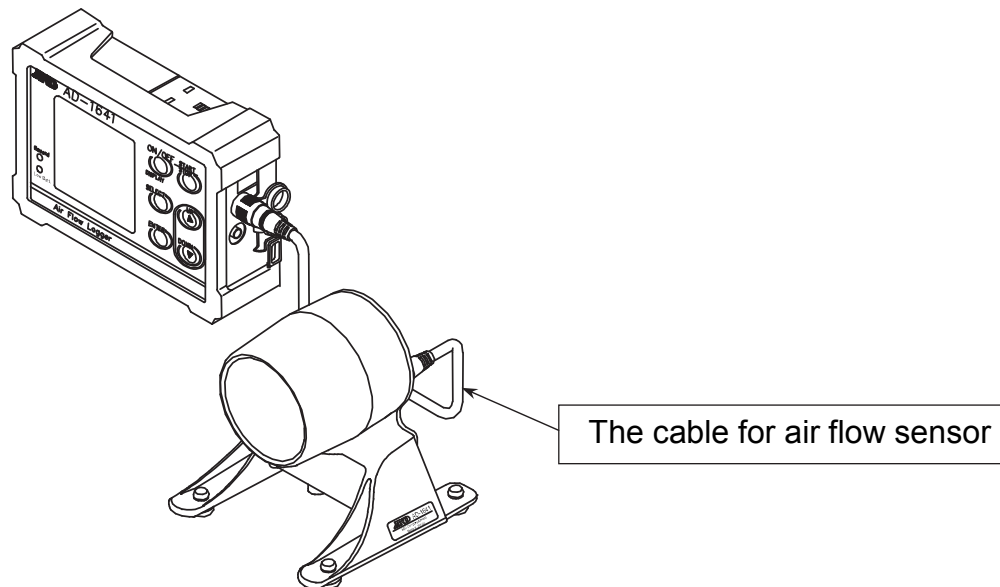
*2 : The power will be not turned off when executing the interval recording or supplying power except when battery power used.

4 How to use

- Step 1** Install the air flow sensor unit in an arbitrary location.
(Since there are two M4 screw holes in the bottom of the Air Flow sensor, it can be fixed to the floor surface .)



- Step 2** Connect the air flow sensor and the main unit with the cable.



- Step 3** Turn on the power.
- In the case of the AC adapter:
The power turns on automatically. Select 「EXT.POWER」 ,press ENTER key.
 - In the case of battery drive:
When pressing and holding the ON/OFF key,the AD-1641 will turn on.
For inserting of batteries, please refer to the "9.Replacement for batteries and Sensor Unit".
- Step 4** The basic operation will use the keys below:
- SELECT key (Press):
Switches the display.
 - START/STOP key (Press):
Starts the interval recording,and the REC sign will be displayed.
 - START/STOP key (Hold down):
Stops the interval recording, and the REC sign will be turned off.
 - ON/OFF key (Hold down):

Turn off the AD-1641 (except during the interval recording or when power is supplied from a source other than batteries)

Note

- If the air flow sensor is not connected to the main unit, air flow cannot be measured. "AF" is only displayed when the air flow sensor cable is connected.
- The air flow sensor only measures air flow that comes from the front.
- If the measurement value is not zero when there is no air flow calibrate the AD-1641 referring to "calibration of wind speed values" in "5.Air Flow Calibration" before using the AD-1641.
- The air flow measurement battery life is approximately 20 hours.
- Display turn off time can be changed in the "time to display off (POWER SAVE)" of "7.4.Internal settings." If there has been no operation for over one minute, the display will turn off automatically when battery power is being used.(The factory setting)
- During the interval recording, should the recording data memory become full, the interval recording stops automatically and, the power is turned off.(The factory default recording system "FUNCTION" setting is "ONE-TIME".)
- Temperature and humidity sensor unit is replaceable (life approximately 2 years).

5 Air Flow Calibration

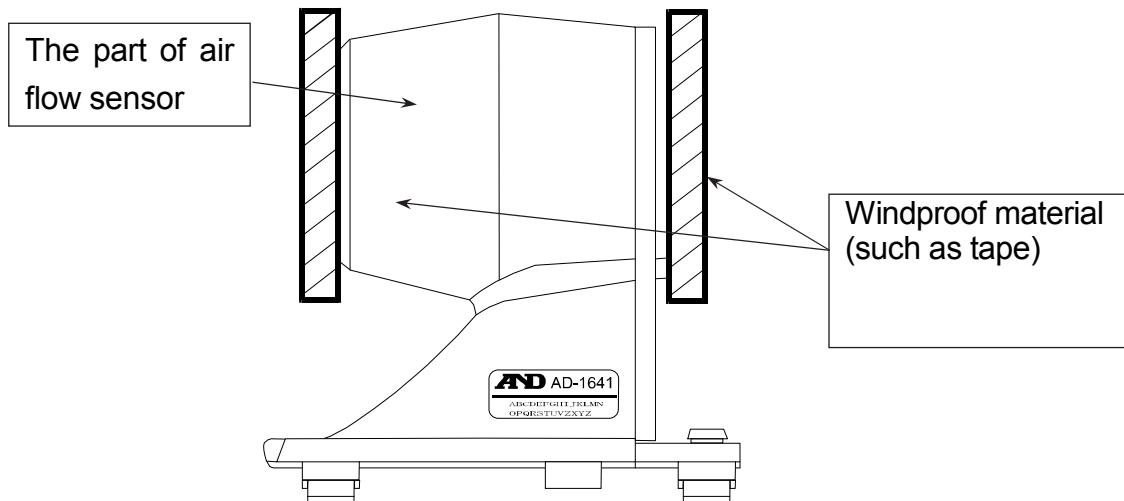
You can calibrate the air flow in order to measure under severe management.
(To calibrate 0 m/s in no air flow.)

Step 1 Please set the air flow sensor in an arbitrary location.

Note

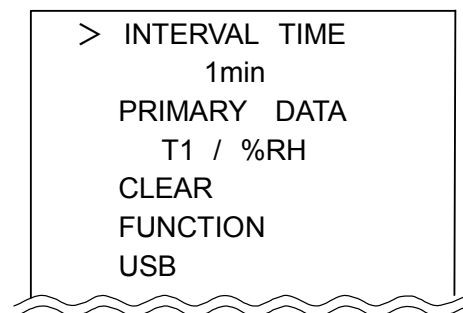
■ When the air flow sensor direction is changed, zero point may change as well.

Step 2 Please block the entrance and exit of the air flow sensor part with windproof material



Step 3 Select the internal setting (FUNCTION) from the setting screen to perform the calibration.

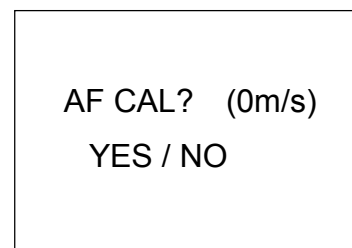
Press the SELECT key several times on the display screen to display the setting screen in the right figure.



Move the ">" mark to "FUNCTION" using ▲UP key or ▼DOWN key and press the ENTER key.

Move the ">" mark to "AF CALIBRATION", the 4th screen (4 of 5), and press the ENTER key.

When the right display appears, select Yes with the ▲UP key or ▼DOWN key to run the calibration.



Step 4 When the "END" is displayed, the calibration is complete.

6 Comparator function (Judgment/Limit)

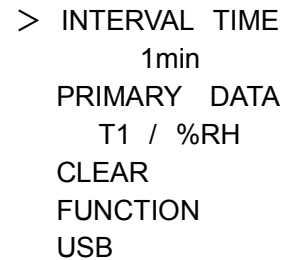
This Comparator function compares data with the upper and lower limit values, displays **HI** or **LO**, and sounds the buzzer when the data exceeds the limit value.

- This function can be set for, air flow, temperature, humidity, and barometric pressure.

Step 1 Press the SELECT key several times on the display screen to display the setting screen in the right figure.

Step 2 Move the ">" mark to "FUNCTION" using ▲UP key or ▼DOWN key and press the ENTER key.

Step 3 Move the ">" mark and set the 4 comparator function items.



```
> INTERVAL TIME
    1min
PRIMARY DATA
  T1 / %RH
CLEAR
FUNCTION
USB
```

JUDGMENT ITEM: Select from, AF (Air Flow), T1 (Temperature), %RH (Relative Humidity), or BAR (Barometric Pressure)

JUDGMENT TIME: Select from at once, 3 sec and 10sec

LIMIT-[HI]: Set the upper limit. (Numbers can be either positive or negative.)

Change the digit place with the SELECT key.

Set the digit number by ▲UP or ▼DOWN key, and confirm using the "ENTER KEY".

LIMIT-[LO]: Set the lower limit. (Numbers can be either positive or negative.)

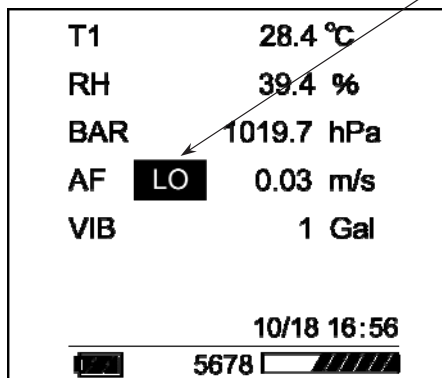
Change the digit place with the SELECT key.

Set the digit number by ▲UP or ▼DOWN key, and confirm using the "ENTER KEY".

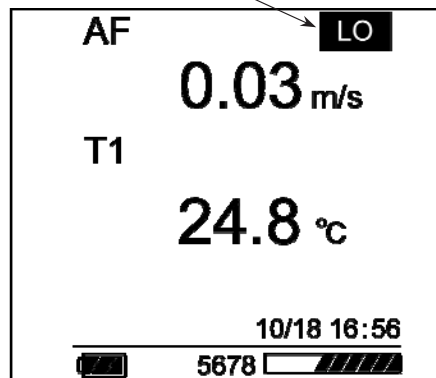
(Example) In the following set, the buzzer will sound when the air flow is below 0.03 m/s for 3 seconds.

JUDGMENT ITEM : AF(Air Flow)
JUDGMENT TIME : 3sec
LIMIT-[HI] : +0001.0
LIMIT-[LO] : +0000.3

The **LO** indicator



Environmental data display screen



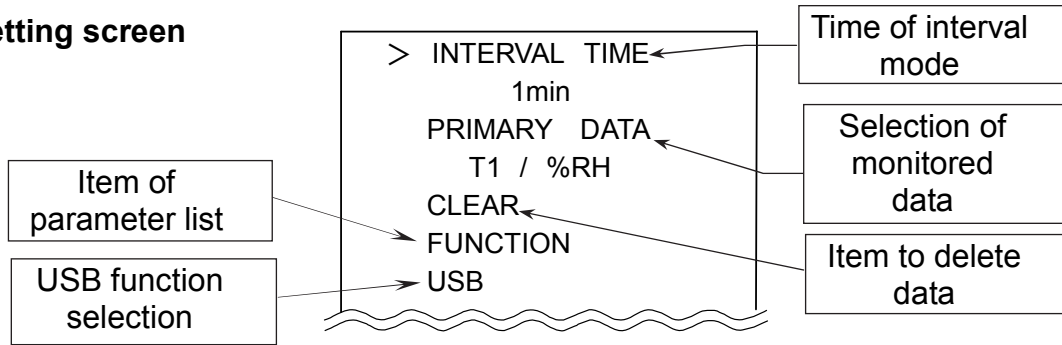
Monitor display screen

Note

- To use the Comparator function, choose the "JUDGEMENT TIME" except for "OFF".
- Please set the upper limit value or lower limit value within the specifications.
- Buzzer will sound from the AIR Flow sensor.
- The "BUZZER" will not sound when the "BUZZER" in the internal setting "FUNCTION" is OFF.

7 Management of Items

Setting screen



Step 1 Display the menu.

SELECT key

Press this key several times to display the menu.

Step 2 Enter to an item of the menu.

▲UP, ▼DOWN key

Selects an item.

ENTER key

Enters into the item.

Step 3 Specify a parameter for the current item.

▲UP, ▼DOWN key

Changes the parameter.

ENTER key

Stores new parameter and proceeds to next item.

ON / OFF key

Cancels and proceeds to next item or menu.

Step 4 Operations after finishing the management.

SELECT key

Proceeds to the intended display

Note

- Selectable items will change depending on operating conditions.

7.1 INTERVAL TIME

Specify the time interval with the interval measurement.

This is the same as item "INTERVAL TIME" of the "7.4.FUNCTION".

7.2 PRIMARY DATA

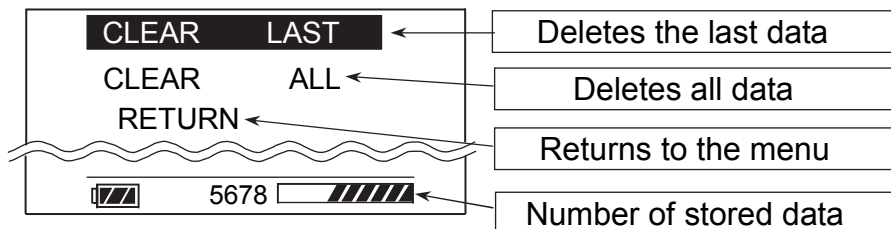
Specify two items to display from the air flow, temperature, relative humidity, barometric pressure, vibration and weighing data with "PRIMARY DATA" display or "trend graph" display.

Refer to item "PRIMARY DATA" of the "7.4.FUNCTION".

7.3 CLEAR

The AD-1641 can delete stored data with the following keys.

- | | | |
|--------|------------|-------------------------|
| Step 1 | CLEAR key | Shows the display below |
| Step 2 | ▲UP, ▼DOWN | Selects a method. |
| Step 3 | ENTER key | Performs selected item. |



7.4 FUNCTION (Function Table)

The function table can specify each action of the function and the communication of the AD-1641. Items of each function are stored as a parameter. These parameters are stored in the AD-1641 even without power.

Item	Parameter and Detail	
INTERVAL TIME	1, 2, 5, 10, 15, 20, 30 seconds, 1,*2, 5, 10, 15, 20, 30, 60 minutes	
PRIMARY DATA	T1*.....Temperature %RH*.....Humidity BARBarometric pressure AF.....Air Flow VIB.....Vibration WT.....Weighing data	
TEMP.UNIT	°C*.....Celsius °F.....Fahrenheit	
RECORDING TYPE	ONE-TIME .*...Stops at full memory ENDLESS.....Overwrites at full memory	
BUZZER	OFFNot sounded ON *.....Sounds buzzer	
DECIMAL POINT	•*.....dot ;comma	
Balance Setting	BAUD RATE	600, 1200, 2400 *, 4800, 9600, 19200 bps
	BITS PARITY	7bits/EVEN*, 7bits/ODD, 8bits/NONE
	TERMINATOR	CR LF * CR
POWER SAVE	OFF, 30 seconds, 1*, 2, 5 or 10 minutes	
DATE FORMAT	yyyy/mm/dd*, mm/dd/yyyy, dd/mm/yyyy year : yyyy, month : mm, day : dd	
DATE SETTING	Example : 2015 / 12 / 31	
TIME SETTING	Example : 13 : 15 : 30	

ID NUMBER	8 characters. Example : ROOM-NO1 The factory setting is a serial number (Refer to "7.4.1.CSV file name")	
CONTRAST	25 ~ 40 * ~ 50	
Comparator Function	JUDGMENT ITEM	AF (Air Flow) * T1 (Temperature), %RH (Humidity), BAR (Barometric pressure) (Refer to "6.COMPARISON FUNCTION")
	JUDGMENT TIME	OFF*, at once, 3sec or 10sec (Refer to "6.COMPARISON FUNCTION")
	LIMIT-[HI]	Set the upper limit of the specification range (Refer to "6.COMPARISON FUNCTION")
	LIMIT-[LO]	Set the lower limit of the specification range (Refer to "6.COMPARISON FUNCTION")
AF CALIBRATION	Calibrate the zero point of the Air Flow (0 m/s) (Refer to "5.Air Flow Calibration")	
PEAK HOLD	PeakHold OFF:*...Record the value of the air flow and vibration at the time of recording PeakHold ON:....Record the maximum value of the air flow and vibration in the interval time (Refer to "8.1. Record the maximum value of the air flow and vibration")	
Weighing value interval recording mode WEIGHING DATA	Every.*...Save at the time of receipt of the data Interval...Save data for each interval time (Refer to "8.3.2. Record the weight value of the balance at regular intervals)	
Initialization of internal setting FUNCTION INIT	It returns the internal settings to factory settings. It should be noted that the date/time settings are not changed.	
RETURN	Returns to the menu	

* : Factory setting

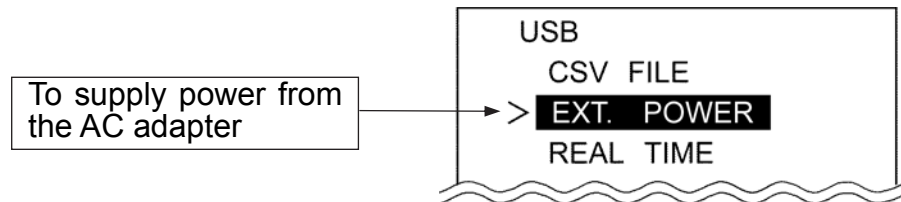
7.4.1 About CSV file name (ID NUMBER)

- The CSV file name that is stored in the AD-1641 will be "AD-1641_ID number .CSV"
- You can create a new name which is easier to manage by changing the ID number.
(Example) ID number : ROOM-NO1
CSV file name : AD-1641_ROOM-NO1.CSV
- The factory setting is a serial number on the ID number.
- Changing the ID number creates a CSV file with a new name. Leaving old files will reduce storage free space, may not store up to 10000 data.
Remove all old files using operations " CLEAR ALL" specified in 7.3.CLEAR.

7.5 USB function selection

When connecting AD-1641 and the computer with a USB cable, the screen to select which function to use is displayed. For each function and method of operation, please see "8.3 Connecting To The computer"

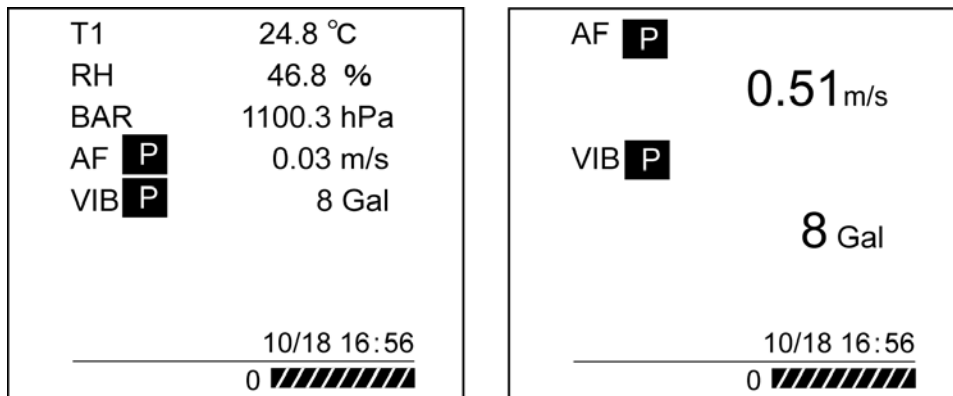
Even when powered by USB cable from the AC adapter, screen for selecting the function appears. Please select "EXT.POWER" at this time. In this case, even if other functions are selected, they would be invalidated. When USB cable is not connected, this function is not available.



8 Applied Function Setting

8.1 Record the Maximum Value of The Air Flow and Vibration (PEAK HOLD)

- In the Factory setting "PeakHold OFF", the value of the air flow and vibration to be recorded in the AD-1641 is the value of the interval recording. If "PeakHold ON" mode is set, which records the maximum value of the air flow and vibration, the peak value during each interval time is held and recorded, the peak value during each interval time is held and recorded.
- When in the PeakHold mode, **P** will be displayed next to AF and VIB of the display screen.

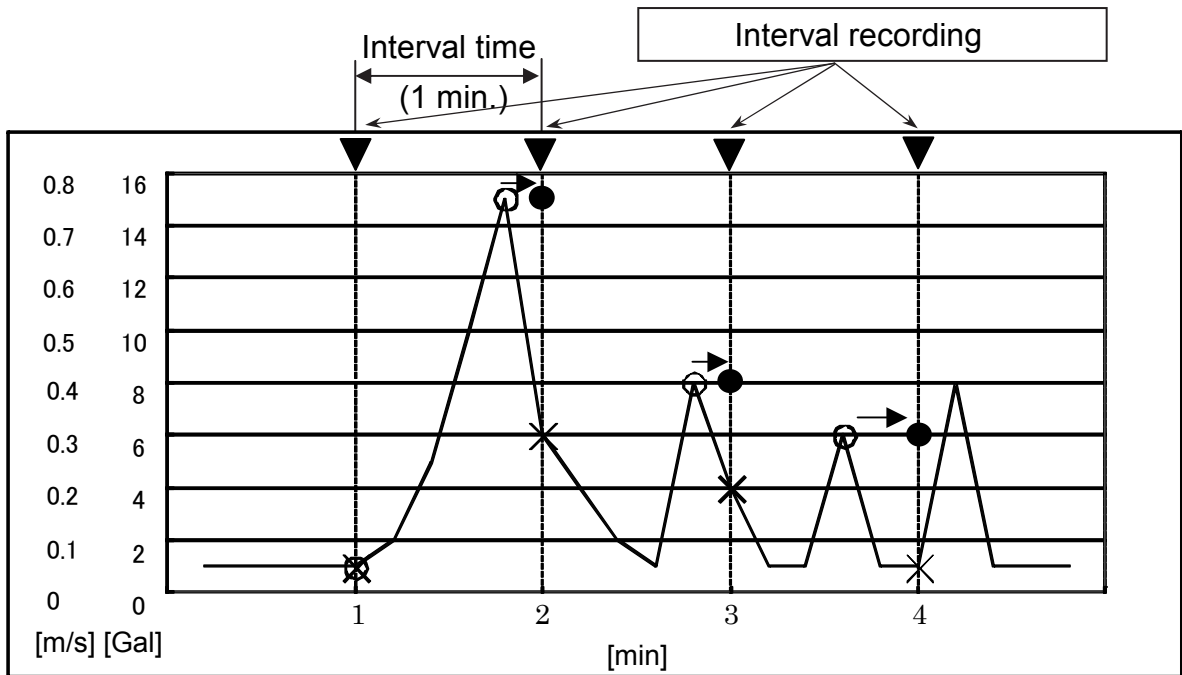


(Example) To record at 1minute interval time

Line : Air flow and vibration values received by the AD-1641.

× : The value of air flow and vibration to be recorded in the factory setting "PeakHold OFF"

○ : The value of air flow and vibration to be recorded in the peak-hold mode "PeakHold ON"



Recorded value

Recording time [min]	1 min		2 min		3 min		4 min	
	Airflow	Vibration	Airflow	Vibration	Airflow	Vibration	Airflow	Vibration
Peak Hold OFF	0.05 m/s	1Gal	0.30 m/s	6 Gal	0.20 m/s	4 Gal	0.05 m/s	1 Gal
Peak Hold ON	0.05 m/s	1Gal	0.75 m/s	15 Gal	0.40 m/s	8 Gal	0.30 m/s	6 Gal

Note

1. In the peak hold mode, the power is always ON to because sampling speed is fast.
("POWER SAVE" in the "7.4.FUNCTION" is disabled.)
2. To avoid battery depletion, connecting the AC adapter is recommended.
3. When only the battery power is available, please power OFF by holding down the ON/OFF key after finishing the measurement.

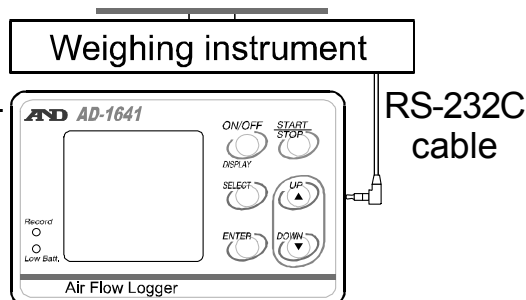
8.2 Connecting To The Weighing Instrument

- The AD-1641 saves the weighing data and environment data at the same time when receiving the weighing data.

8.2.1 The management of the weighing data

Step 1 Connect the AD-1641 and A&D's weighing instrument using the provided RS-232C cable.

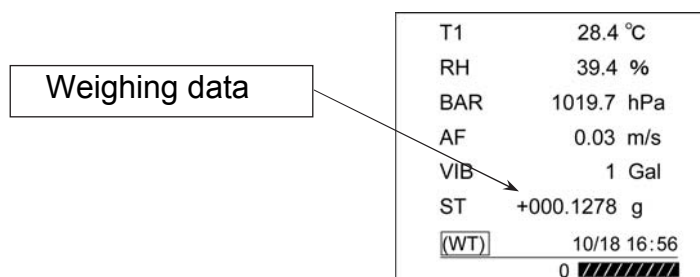
Step 2 Press the data output key (Ex. PRINT key) of the weighing instrument to transmit data. The AD-1641 receives data and the indicator REC is shown for 1second.



Step 3 Stored data is shown for 5 seconds in the measurement monitor.

8.2.2 The Interval Measurement For The Weighing Instrument

- By setting 7.4.Function table "Weighing value interval recording mode (WEIGHING DATA)" of the AD-1641 to "Interval", it is possible to save the weighing data sent from the weighing instrument continuously (stream output) at each interval.



Step 1 Select the "Interval" in 7.4.Function table "Weighing value interval recording mode" (WEIGHING DATA)

WEIGHING DATA : Interval (The factory setting is "Every")

Step 2 Connect the Weighing instrument that has been set in the stream output. In the case that the AD-1641 has received the weighing data, (WT) is displayed at lower left corner of the screen of the AD-1641, and weighing data is displayed. In this case, the weighing data is not saved.

Step 3 Pressing the START/STOP key, at the timing set by the interval time, starts saving weighing data.

Note

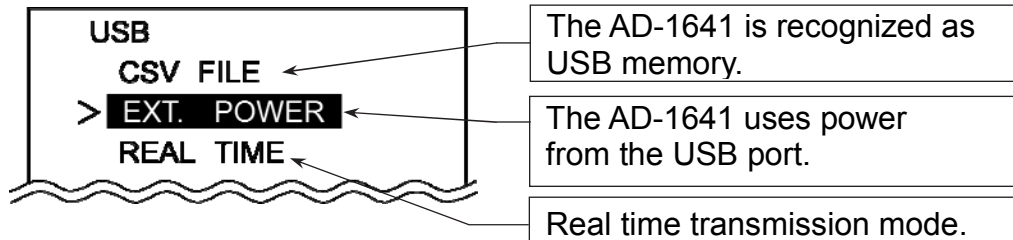
- A recording interval might deviate for a few seconds due to time lags in data reception.
- To set the display format of weighing data or to set the stream output of the weighing instrument, please refer to the "internal setting" "data format" of each instrument manual.
- When the AD-1641 body has received the weighing data, weighing data is displayed.

8.3 Connecting To The computer

8.3.1 Supplying The Power From USB Port Of Computer

Step 1 Connect the AD-1641 to the USB port of the computer.

Step 2 Select the item "EXT.POWER" and press the ENTER key so that the AD-1641 can use power from the USB port.



8.3.2 Transmitting Data To A Computer (CSV File)

Step 1 Connect the AD-1641 to the USB port of the computer. Select "CSV FILE" and press the **ENTER** key

Step 2 The AD-1641 is recognized as USB memory without special software.

Step 3 The CSV file data can be read by the computer.

Step 4 To delete the CSV file in the AD-1641 use normal computer file operations.

Step 5 Follow the menu "Safely Remove Hardware" when removing the AD-1641 from the USB port of the computer.



8.3.3 Transmitting Data To A Computer (Real-Time Transmission Mode)

This method is used to transmit the environment and weighing data directly to a computer via the USB port.

Data is not stored in the AD-1641. (Special software is not necessary)

8.3.4 Transmitting only Environmental Data

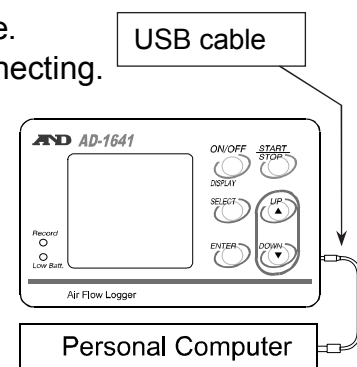
Step 1 Connect the AD-1641 and computer with a USB cable.

The display will change to "8.3.1" display after connecting.

Step 2 Select the item "REAL TIME" and press the ENTER key to use the real time transmission mode.

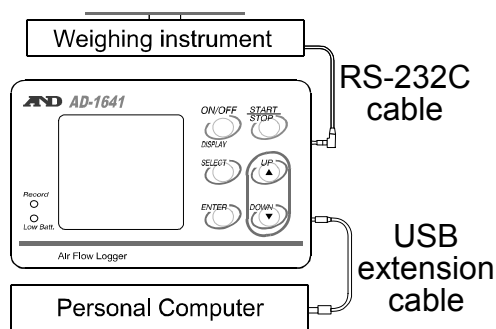
Step 3 Click on a position (cell) on the program (EXCEL etc.) to receive data.

Step 4 Press and hold (Long press) the START/STOP key to transmit environment data.



8.3.5 Transmitting Weighing Data And Environmental Data

- Step 1 Connect the AD-1641 unit to the weighing instrument with the RS-232c cable while the AD-1641 is powered off. After that, connect the AD-1641 unit to the PC with the USB cable. After connecting, the display will change the "8.3.1" display.
- Step 2 Select the item "REAL TIME" and press the ENTER key to use the real time transmission mode.
- Step 3 Click on a position (cell) on the program (EXCEL etc.) to receive data.
- Step 4 Press the data output key (Ex.:PRINT key) of the weighing instrument to send weighing data. When the main unit of AD-1641 receives data, a buzzer sounds and weighing data and environmental data are sent to the computer.
- Step 5 Data is displayed for 5 seconds on the measurement monitor.






Note

- If the timing of the transmission is short, data may not be saved depending on the PC performance.

9 Replacement for Batteries and Sensor Unit

Caution

- Replace with two new batteries of the same type (size AA) and maker when  or  (Low battery mark) is indicated.
- Do not mix an old battery with a new battery.
- Insert each battery with its positive (+) and negative (-) terminals properly aligned with the corresponding symbols in the battery compartment.
- When the batteries are drained completely,  (Low battery mark) does not appear.
- The battery life is dependent upon the environmental temperature, battery type and usage.
- Remove the batteries if the device is not to be used for a long time. The batteries may leak and cause a malfunction.
- The accessory batteries are for operation check and their life may be short.
- The temperature & humidity sensor unit is a consumable.
(Replacement is approx 2 years each)
When the sensor life has been exceeded or condensation is present on the sensor, an abnormal value may be displayed.

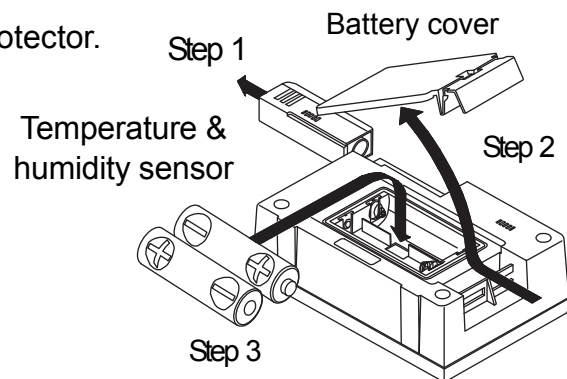
Step 1 Turn of the AD-1641. Remove the protector.

Step 2 Push the side of the battery cover to release hook and open it.




Step 3 Insert two new batteries with the positive (+) and negative (-) terminals properly aligned with the corresponding symbols in the battery compartment.

Step 4 Close the battery cover.

Step 5 In case of replacing the temperature & humidity sensor unit, slide it out and replace with new one.



Battery Indicator

-  Enough remaining battery
-  Batteries are low. Recommend replacing them.
-  Batteries are drained. Replace them with new ones.

10 Specifications

Environmental data

	Units	Range	Accuracy
Air Flow	0.01 m/s	0.00 to 1.00m/s	±0.05m/s (0.10 to 1.00 m/s)
Temperature	0.1 °C	0 to 60 °C	±0.5 °C (20 to 30 °C)
Relative humidity	0.1 % RH	0 to 100 %	±3% (20 to 80 %)
Barometric pressure	0.1 hPa	500 to 1100h Pa	±3hPa (0 to 60 °C)
Vibration	1 Gal	0 to 2000 Gal	Static acceleration±20%

[Refer to A&D homepage for details of AD-1641]

A&D homepage : <http://www.aandd.co.jp>

Connectable equipment	For the weighing instrument (our balance-scales) with RS-232C, please check our websites.
Data capacity	Maximum 10,000 sets (including data & time)
Interval time	1, 2, 5, 10, 15, 20 or 30 seconds, 1, 2, 5, 10, 15, 20, 30 or 60 minutes
Power supply	Two alkaline batteries (LR6, AA), AC adaptor, or USB
Battery life	Approx. 20 hours (Measurement interval:10minutes, alkalinebatteries)
Clock accuracy	Max. ±1minute/month
Adaptable operating systems	Windows 2000/XP/Vista/7/8 (32 bits/64 bits)
Operating environment	0 °C to 60 °C, 85 % RH or less (No condensation)
Dimensions	127(W) × 90(H) × 36(D) mm (including the protector)
The sensor unit dimensions	90(W) × 90(H) × 91(D) mm
AD-1641 body mass	Approx. 280 g (including batteries and protector)
The air flow sensor mass	Approx. 90 g

MEMO

MEMO



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