SMART SENSOR ®

AIR FLOW ANEMOMETER
INSTRUCTION MANUAL

Version：SZ856-0

PRECAUTION

➤ Thank you for purchasing our company Air Flow
Anemometer

➤ This manual provides relative information on how to use
the Air Anemometer and warning in operation Pls make
some simple test measurement to ensure proper
performance of the unit

➤ To Make the best use of this Anemometer ,read this
Manual Throughtly before use it .Pls Keep this Manual
Handy for reference

2. Warranty:

➤ About relative warranties please read provided warranty card.

➤ We disclaims any liability due to: transportation damages; incorrect use or operation; manipulation, alterations or repair attempts; without warranty card, invoice.

📄 Specific Declarations:
  a. The product design and the manual updating, repairing by technician authorized by us, do not try any alternations or repair attempts.
  b. Dispose of battery should in accordance with local laws and regulations.

IntelliSafe CE ISO 9001 UKAS QUALITY MANAGEMENT 005

CONTENTS

1、Before Use Notice

Check up

Carefully unpack your kit and ensure that you have the following Items . In case that any items is missing or if you find any mismatch or damage .promptly contact your local dealer .

➤ Air Flow Anemometer unit-------------------------- 1pcs
➤ Auxiliary Fans --1pcs
➤ Software Disc For Anemometer ------------------- 1pcs
➤ USB Computer connecting cable -------------------1pcs
➤ AA1.5V* -- 4pcs
➤ Enlish/Chinese Instruction Manual --------------1pcs
➤ Warranty Card --------------------------------------- 1pcs
➤ PP Packing box --------------------------------------1pcs

Maintenance & Warranty

1). Maintenance:

➤ Replacing the battery and product maintenance:
  a. Remove the battery from the unit if it is not required for extended periods of time in order to avoid damage to the battery compartment and the electrode resulting from a leaking battery.
  b. After power on, if a symbol " ▭ " appears on the LCD, indicates that you should replace the battery in order to avoid inaccurate measuring reading. Otherwise the battery is very possible leak that will seriously damage the unit life.
  The battery compartment is on the down rear of the unit, open the battery door, replace the old battery for a new 9V one (notice the battery polarity), close the battery door with a screw knife to lock up.
➤ Cleaning the casing:
➤ Never use alcohol or thinner to clean the unit casing that will especially erode the LCD surface; just clean the unit lightly as needed with little clean water.
  Never impact the unit or used on humidity condition.
➤ Do not store or use the unit in following locations where the unit may be subject to:
  a. Splashes of water or high levels of dust.
  b. Air with high salt or sulphur content.
  c. Air with other gases or chemical materials.
  d. High temperature or humidity (above50℃, 90%,) or direct sunlight.

Other items

➤ You can also print measurement data and wind velocity / flow curve graph, and export Excel data file, for details please see Help file.

3. Other Items

Familiar trouble shooting

The following is a list of actions to be taken if the unit is not working properly:

1). Screen is blank

Check the battery is inserted correctly. Open the battery door on the bottom rear of the unit. The "+" "-" symbols on the battery should match the corresponding "+" "-" symbols on the inside of the battery compartment.

2). If the unit can not connect to PC normally, please check the USB cable is OK, if the cable can not be used formally, please replace for a new one.

3). If the unit can not read the wind flow value properly, please check if the vane is block or not.

4). If the unit can not read the wind temperature value properly, please check if the heat resistor is fall off or damaged by manual.

5). If the unit can not read data properly, please check it is operated under the rule temperature and humidity situation.

🗎 Note:

When not connecting to PC, the unit will power off automatically after 10 minutes if no any operation after power on.

Features

➤ Measurement of wind velocity, temperature and flow
➤ Unit conversion of wind velocity, temperature and flow
➤ Measurement of maximum and minimum wind velocity
➤ Measurement of 2/3 Vmax and average wind flow
➤ Data holding, storing and deleting function
➤ Low battery indicating function
➤ Auto power off function (Power off automatically if no any operation for 10 Minutes)
➤ Memory of 500 records
➤ Backlight function
➤ Connecting to PC by USB cable
➤ Audio key pressing alert
➤ Large LCD display
➤ wind Handle Can Elongate

Need To know
Before use

DIAGRAM OF THE UNIT

---
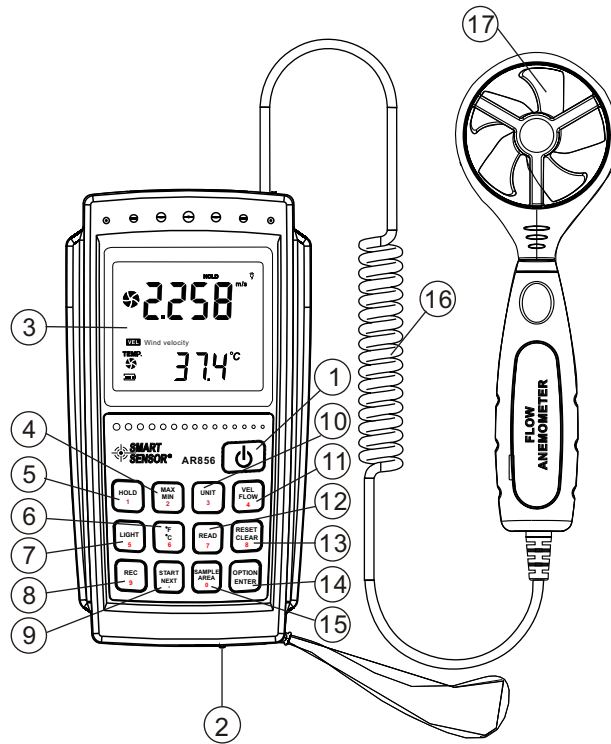
7). Download of measurement data:
Click the "Import Data" in "File" menu bar or Import Data button on tool bar will enter download contact interface of measured data, click the Im port button on bottom to import the stored data into computer, as shown in figure 10:
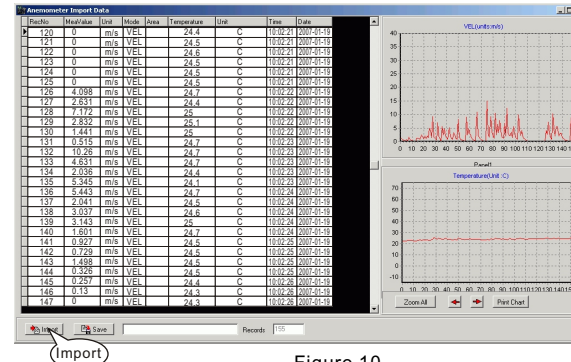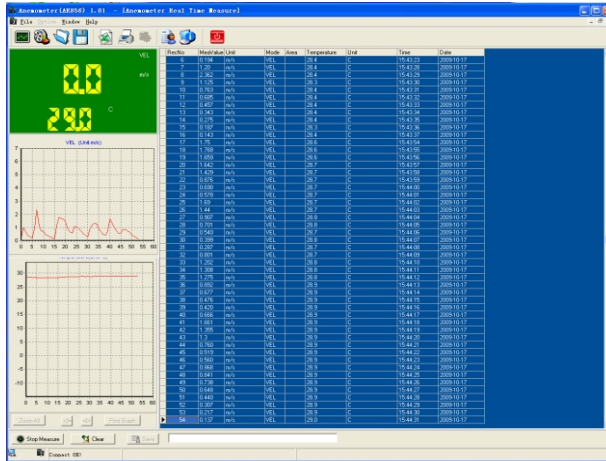

Figure 10

➤ Button introduction:

BUTTON	Function
Import	Click to download data from anemometer. In download process, please don't switch over the picture in order to avoid appearing over time mistake "Over Time".
Save	Click to save the downloaded data, input file name in pop-up window, click to save then. (Saved as LAB format)
ZOOM ALL	Click which display all wind velocity and temperature wave graphic
←	Click it the Wind Velocity and Temperture move left side
→	Click it the Wind Velocity and Temperture move right side
Print Graph	Click it can print right meterage wave graphic

Figure 9

➢ Button introduction:

| Button	Function
Start to Measure	Click to start real time measurement
Stop Measure	Click to stop real time measurement
Clear	Click to clear out real time measured data
Save	Click to store real time measured data, input file name in pop-up window, click to save, then also may click FILE\SAVE. (Saved as LAB format)
ZOOM ALL	Click which display all wind velocity and temperature wave graphic
←	Click it the Wind Velocity and Temperture move left side
→	Click it the Wind Velocity and Temperture move right side
Print Graph	Click it can print right wind velocity and temperature wave graphic

1). ON/OFF key: press once to power on, again to power off

2). USB interface: insert one end of the connecting cable to this interface, another to the available USB port of the computer.

3). LCD display

4). [MAX MIN 2] :Max/Min value switch

5). [HOLD 1] :Data holding key

6). [F C 6] :Temperature unit switch

7). [LIGHT 5] :Backlight on/off key, press down to start the backlight function, again to cancel.

8). [REC 9] :Data record key

9). [START NEXT] :Measuring key for average value of wind flow

10). [UNIT 3] :Unit transform key

11). [VEL FLOW 4] :Wind velocity/flow transform key

12). [READ 7] :Read out recorded data key

13). [RESET CLEAR 8] :Reset key in "READ" mode/clear recorded

14). [OPTION ENTER] :Wind flow AVG 2/3 MAX and figure inpuit

15). [SAMPLE AREA 0] :Duct area input and sampling time setting key

16). Connecting wire

17). Fan

NOTE:

Aforesaid key function descriptions are simple introduction.

pls read operation instructions parts for details.

LCD Display
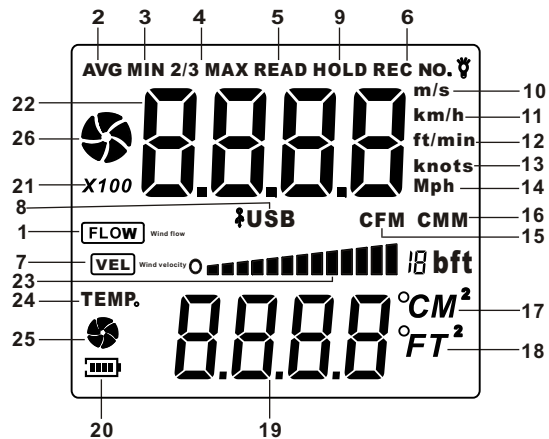
1). FLOW : When measuring wind flow, this symbol appears.
2). AVG : When measuring average values （one of the wind flow measuring Method） This symbol appears.
3). MIN : Showing minimum values.
4). 2/3V MAX : 2/3 of maximum value measurement (one of the wind flow measuring method)
5). READ : this symbol will appear. While Read stored record data.
6). REC : Recording the using number and signals
7). VEL : When measuring wind velocity, this symbol will appears.
8). USB : When connecting PC with USB cable, this symbol appears.
9). HOLD : Data holding
10). m/s : Wind velocity unit (meter/second)
11). km/h : Wind velocity unit (kilometer/hour)

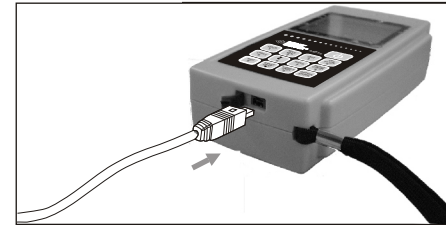4). Insert one end of the connecting cable into the USB interface of the top anemometer host, as shown in figure 7:

Figure 7

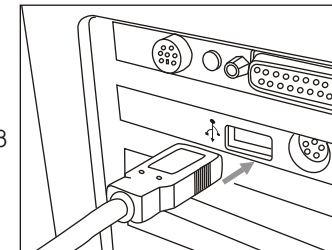5). Insert other end of the connecting cable into free interface port of on the computer back, as shown in figure 8:

Figure 8

6). Online real time Measurement:
➢ Click "Real Time Measure" in "File" menu or , Real Time Measure botton in toolbar will popup following picture, as shown in figure 9, enter real time measuring mode .

Operation Explanations

Order	Order function
RealTi meM easure	Real time data measurement, the measured data will real time be shown on the computer.
Open	Open measurement data file that is saved as the LAB format
Save	Save real time measurement data
ImportD ata	Import data stored in the anemometer to computer
Export To Excel	Export the saved data to excel.
Printer Setup	Printer setup
Print Data Sheet	Print data sheet

➢ Tool bar introduction as shown in following figure:

Button	Function
	Real time data measurement, the measured data will real time be shown on the computer.
	Import data stored in the anemometer to computer
	Open measurement data file that is saved as the LAB format
	Save real time measurement data
	Export the saved data to excel.
	Print the recorded data
	System setup
	Help
	System information
	Close the software

12) **ft/min** : Wind velocity unit (foot /minute)
13) **knots** : Wind velocity unit (sea mile/hour)
14) **mph** : Wind velocity unit (mile/hour)
15) **CFM** : Wind flow unit (cube foot/minute)
16) **CMM** : Wind flow unit (cube meter/minute)
17) **CM^2** : M^2 IS used to indicate duct area in square meter when in flow function "℃" Is used to indicate wind temperature in metric.
18) **FT^2** : "℉T^{2}" Is used to indicate duct area in square feet when in flow function ;℉ is used to indicate wind temperature in metric.
19) **8.8.8.8** : Duct area display area
20) : Low battery indicating symbol, please replace battery if this symbol appeared.
21) **X100** : If measured value is over 9999, the symbol "X10" or "X100" will appear.
22) **8.8.8.8** : Wind velocity and flow display area
23) : When backlight is on, this symbol will appear.
24) **TEMP** : Wind temperature singal
25) : small fan signal: indicate the Wind Temperature status.
26) : Bigs fans : indicate wind velocity /flow status, which was subject to Wind Velocity and revolving

SPECIFICATIONS

1. Wind Velocity Range :

Unit	Wind Velocity	Resolution	Lowest Point of start value	Accouracy
m/s	0.0-45.0	0.001	0.3	±3%±0.1
Ft/min	0.0-8800	0.01/0.1/1	60	±3%±20
Knots	0.0-88.0	0.01/0.01	0.6	±3%±0.2
Km/h	0.0-140.0	0.001	1.0	±3%±0.4
Mph	0.0-100	0.001/0.01	0.7	±3%±0.2

2. Wind flow range :

CMM：0-999900m^3/min
CFM：0-999900 ft^3/min

Unit	Range	Resolution	Area
CFM(FT^3/MIN)	0-999900	0.001-100	0.001-9999
CMM(M^3/MIN)	0-999900	0.001-100	0.001-9999

3. Unit Conversatin :

	m/s	Ft/min	Knots	Km/h	Mph
1m/s	1	196.87	1.944	3.60	2.24
1ft/min	0.00508	1	0.00987	0.01829	0.01138
1knots	0.5144	101.27	1	1.8519	1.1523
1km/h	0.2778	54.69	0.54	1	0.6222
1mph	0.4464	87.89	0.8679	1.6071	1

4. Air Temperature Range :

Wind Temperature

Unit	Scale	Resolution	Accuracy
℃	0.0-45.0	0.1	±1.0℃
℉	32.0-113.0	0.1	±1.8℉
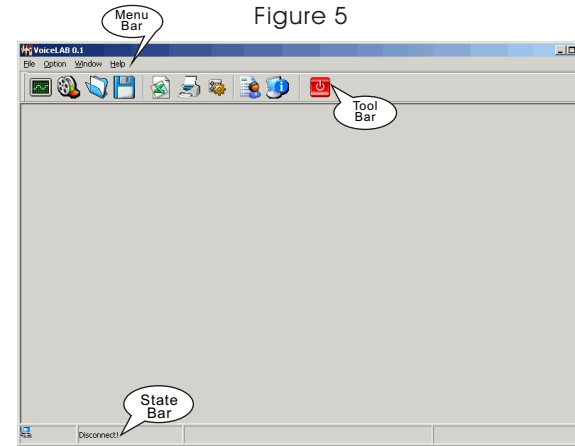
Figure 5

➢ Menu Introduction as below as show in figure6:
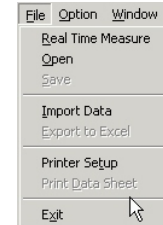
File menu bar:

Figure 6

NOTE:
You can check if Anemometer is connected well with the computer on the state colume:
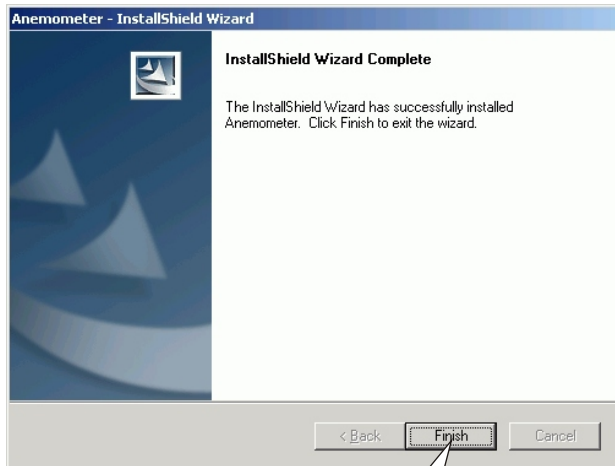Connect ok : Connection in good state
Disconnect : Failed in connection

Figure 4

Finish

> Click "Finish" to complete the software installation ,and the program will be automatically generated on the Tabletop of the PC.

3.Software Introduction
> Double click the software quick way on the tabletop (start by menu, the route is Start/Programme /smart sensor/ Amemometer /Amenometer) software interface showing as below as show in figure5:

5. Operation Conditions :

	Temperature	Humidity
Host	0-50℃ (32℉~122℉)	≤80% RH
Fan	0-60℃ (32℉~140℉)	

6. Storage Conditions :

Temperature	-40℃~60℃ (-40℉~140℉)
Humidity	≤80%RH

7、Power supply : AA 1.5V *4

8、Low battery indicating： 4.4v±0.2V

9、Stand by current ≤2uA

10、Operating Current ≤18Ma

11、Battery use life :20H (Continuous Use)

12、Dimensions:

    Meter :149.89*80.38*38.92mm

    Vane: 251*72*30mm

13、Net Weight : 320.5G (Not Included Battery)

2、**Operation**

Measurement of Wind Velocity and Temperature

➤ Recover the battery door , and install the batteries properly as shown in figure 1:
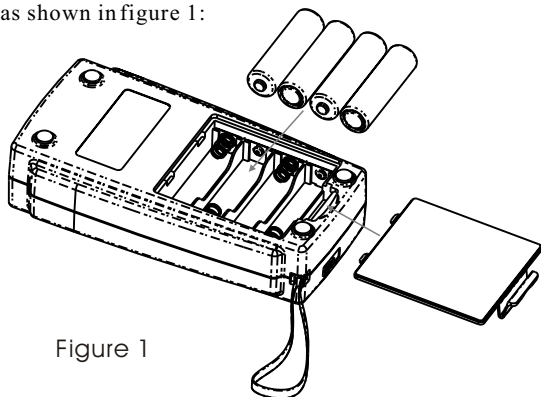

Figure 1

➤ Press The "ON/OFF" key, all the symbols will be shown on the screen for 1 second, then the unit goes into current wind velocity and temperature measuring mode, the LCD screen shows as following figure:
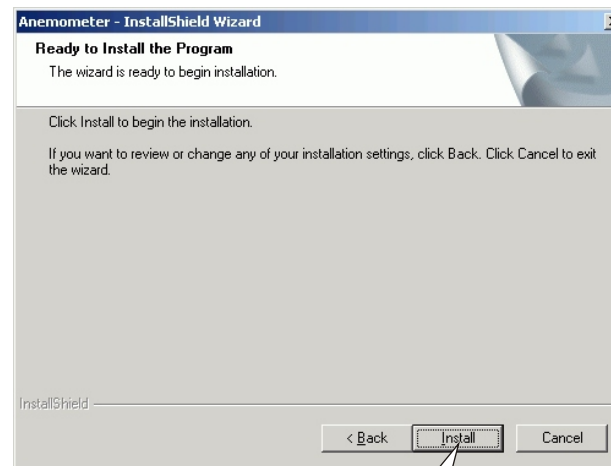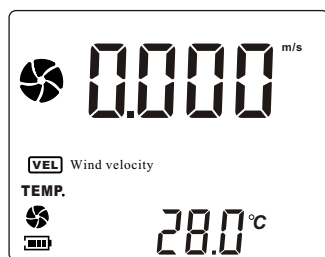

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Figure 3   Install

➤ Click "INSTALL" to install the the program in your hard disk ,then showing the interface as below as show in figure4:

📄 Note:
If you want to delete this software ,pls open " Controlling Panel " then double check "add/delete program"Choose "Anemometer " on the list then click the "delete" button.

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➢ Press "Next STEP" Showing the customer Information as show in figure2:


Figure 2

➢ Input your user name and company name ,click "NEXT" to enter Next step ,Installation interface as below as show in figure3:

➢ Select your desired wind velocity and temperature unit
（1）Press the "UNIT" key, the wind flow unit will be auto change from (m/s 、km/h 、ft/min、knots、mph), (default unit is m/s)
（2）Press the " ℃/℉ "，The temperature will be change between℃/℉ mode, defaulted as ℃.

➢ Hold the Anemometer with your hand ,place the vane in the air flow with the air direction matching the direction of the arrows printed on the inner walls of the vane (Pls do not extruded the fan leaf,Otherwise will cause the inaccuracy measurement)

Figure 4
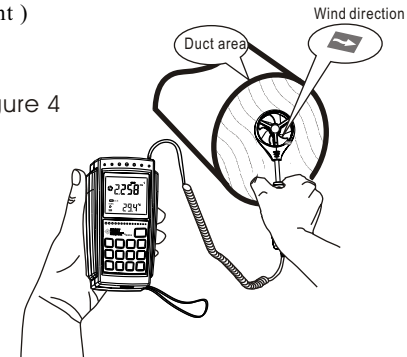
（1）Wait for two Sec,to make the data stability
（2）Place the vane in the same direction of the wind to capture the accurate data ,temperature within 20℃
（3）Press "LIGHT" Key to start the Backlight Function, Signal will be display on the LCD press 7 sec the led will lighten while the Vane is revolving ,then press "LIGHT" BUTTON the LED Will cut off ,signal will disappear and the light function will turn off.

➤ Wind /Air Temperature Measurement
1、Wind temperature will test out when testing Wind
   Velocity , Small Vanes pattern will showing along with
   the display of "TEMP "Symbol.
2、Press button ℃/℉ to Switch ℃/℉ or (number 6 key).

▤ Note:
   a. If current is in wind flow measuring mode (on the
      left top of the LCD will show "FLOW"), you can
      turn it into wind velocity measuring mode by pressing
      the "VEL/FLOW" key, vice versa.
   b. The defaulted setting is wind velocity measuring
      mode " VEL" at each power on.

CONNECTION WITH PC

1.Requirement of computer configuration:
CPU : Pentium 600MHZ Or above ;
One free available USB Connecting Interface;
The lowest screen resolution of monitor is 800*600 (or
much higher),color mode;
At least 8MB available memory;
At least 50MB available disk memory;
Operation system : MICROSOFT WINDOWS 98/ME/
 2000/XP HOME/XP PROFESSIONAL 32BIT

2. Install the software from the disc:
➤ Place the attached Disc in your disc driver open the disc
   driver plate symbol, double click the "setup .exe"
   program logo , Enter Program installation window ,click
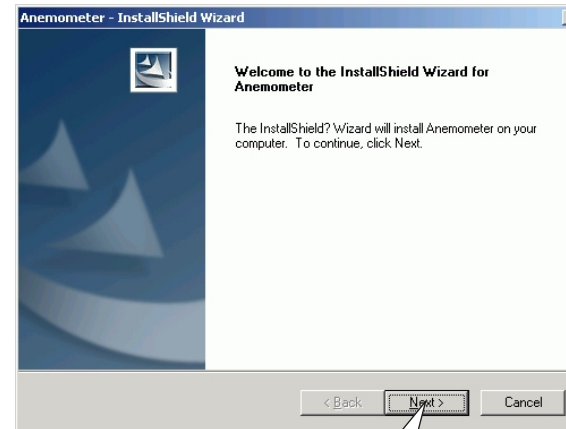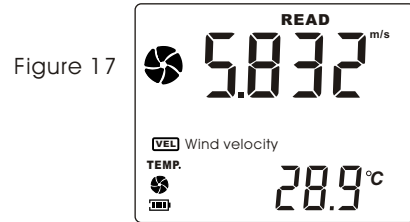   "NEXT" Enter next interface ,as show in figure 1.

Figure 1

Reading Data stored In memory Ramdomly:
On read Status ,Press the "SAMPLE" Key and enter the
number of the record in questions and press "ENTER" Key
then the desired data will be displayed Press "RESET"
Key to exit As shown in figure17:

Figure 17

Clearing the Stored data:
Press down the "CLEAR" Key for 5 seconds then a "CRL"
Logo will be shown on the LCD ,ALL THE stored data
being Cleared. As shown in figure18:

Figure 18
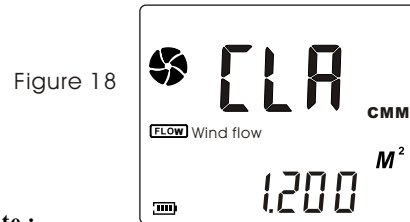
Note :
a.In instantaneous data storeage mode,you should first
  press "SAMPLE" Key and input "o" second ,then press
  "ENTER" to finish the rate set up.
b.You should press the "REC" Key to finish the recording ,
  otherwise the recording will in invalid.
c.The maximum number of readings can be stored 500.
d.If your reading number is bigger then the total quantity
  of data stored in memory ,the LCD will shows the last
 stored store

Measurement of Windflow

Press the "VEL/FLOW" key to get into "FLOW" mode,
at this time the LCD screen as shown in figure 5:

Figure 5

(if the area value
has been set before ,
the last setting
will be shown)
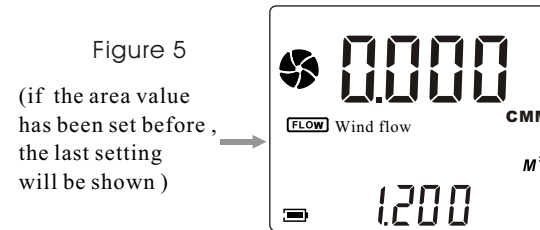
Select your desired unit of wind flow and duct area:
  a. Press the "UNIT" key, the wind flow unit will convert
     between CMM and CFM (the defaulted unit is CMM)
  b. Press the "UNIT" key, the area unit will convert between
     "M2 " and "FT2 ". (the defaulted unit is "M2 ")
  c. Area unit: "M2 " and "FT2 "will convert
     according with the conversion of the wind flow unit.
     If wind flow unit is CMM, the area unit will be "M2";
     If wind flow unit is CFM, the area unit will be "FT2".

Press the "AREA" key, the 4 numbers on the upper LCD
Will be disappeared at this time press numeric keys to
enter a new duct area, such as 1.2, then press the "ENTER"
key to confirm. At this time the LCD screen as shown
in figure 6:

Operation
Explanations

Figure 6

0.000 CMM

FLOW Wind flow

M²

1.200
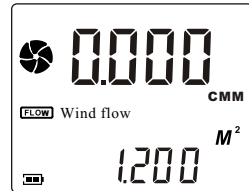
➤ Place the vane in the duct area, take measurement of current wind flow value right away. As shown in figure 7:

Figure 7

$$AREA=\frac{\pi D^2}{4}$$
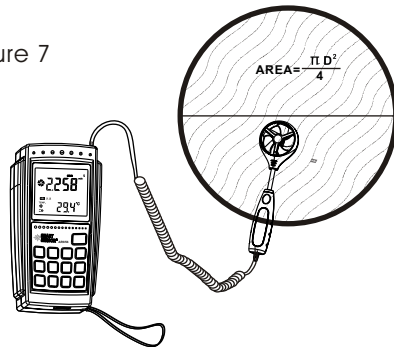
➤ Wind Flow Calculate Formula : Flow =velocity *(Free Area)
➤ Testing Wind velocity : The Bar graphic (showing on the middle of LCD)was subject to the increasing wind Flow/ Velocity
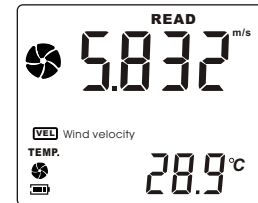
📄 Note:
  a. without enter the duct area will lead to failing in taking measurement of the wind flow.
  b. If wind flow is larger than 9999, the LCD screen will show x10 or x100, and the measured value is also x10 or x100.

Date holding /Storeage/Reading and clearing

➤ Data holding:
  When taking measurement of wind velocity and flow, press the "HOLD" key to freeze the Data , press the "HOLD" key again return to normal operation.

➤ Data storage:
  1. Instantaneous (one-shot) data storage: on "VEL" state, set the sampling rate=0 by pressing "SAMPLE"key and input a "0" sampling time and then press "ENTER". Now, each time "REC"is pressed, the present reading will be stored.
  2. Automatic data storage: on "VEL" state, press the "SAMPLE" key and input sampling rate, (the sampling rate from 1~99 seconds using the numeric keys to enter your desire rate,) then press the "ENTER" key to confirm. Press the "REC" key to begin storing readings in every sampling rate. The "REC" icon will appear on the LCD indicated the data storage function is activated. Press again the "REC"key to finish data storage.
  3. Press "REC" Key stop recording.

➤ Reading data stored sequentially:
  Press the "READ" key, you can read the stored data in memory sequentially, the LCD will first shows serial number then shows the data. Press "RESET" key to return normal operation. As shown in figure 16:

Figure 16

READ

5.832 m/s

VEL Wind velocity

TEMP.

28.9 ℃

Max and min measurement

➢ In wind flow and velocity measuring process, press the "MAX/MIN" key to obtain the maximum and minimum values, press again to exit. For example:

1. When measuring maximum value of wind velocity, a "MAX" will be shown on the upper LCD screen, as shown in figure 14:
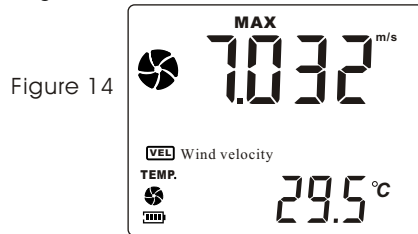
Figure 14

2. When measuring minimum value of wind velocity, a "MIN" will be shown on the upper LCD screen, as shown in figure 15:
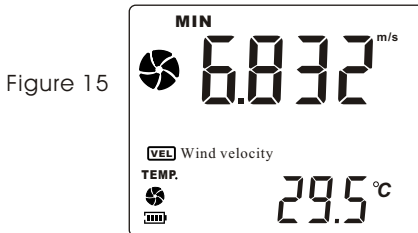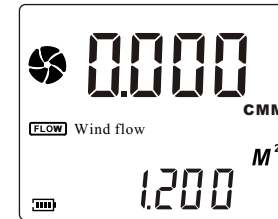
Figure 15

📄 Note:
Operation of Max/Min wind flow measurement is the same as wind velocity.
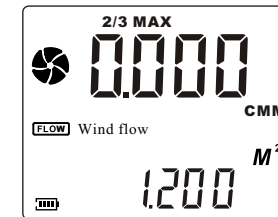
Measurement of 2/3 Vmax Wind Flow

➢ Press the "VEL/FLOW" key to entre "FLOW" mode, the LCD screen shows in figure 8:

Figure 8

➢ Select your desired unit by pressing the "UNIT" key, for example: select CMM for wind flow unit, "M2" for area unit, at this time the LCD screen shows as above diagram.
➢ Press the "SAMPLE " key, Letter on the LCD will disappeared at this time you can input duct area, such as 1.2, press "ENTER" key confirm press again the "OPTION" key to select "2/3 Vmax", here the LCD screen as shown in figure 9:
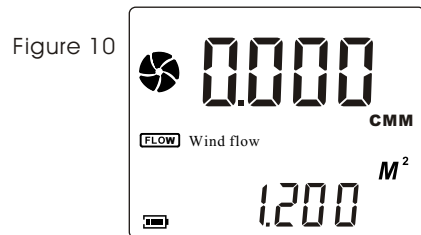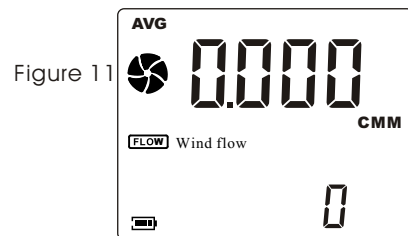
Figure 9

➢ Aim the vane of the attached unit at duct area properly, take measurement of 2/3 V max wind flow right away, press again the "OPTION" key exit to measurement of 2/3 Vmax wind flow.
➢ 2/3 Max Wind flow calculate formula: FLOW =2/3*Max wind Velocity *duct Area
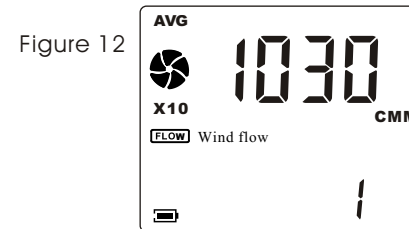
MEASUREMENT OF AVERAGE WIND FLOW

➢ Press the "VEL/FLOW" key to get into "FLOW" mode, the LCD screen shows as in figure 10:

Figure 10

➢ Select your desired unit by pressing the "UNIT" key, for example: select CMM for wind flow unit, "M2" for area unit, at this time the LCD screen shows as above diagram:

➢ Press the "AREA" key, you can input duct area, such as 1.2, press the "OPTION" key to select "AVERAGE", the LCD shows as in figure 11:

Figure 11

➢ Aim the vane at certain point of duct area properly, press the "NEXT" key, on the right bottom of the LCD will show serial number, in the meantime you can take measurement of the first group wind flow values. As shown in figure 12:

Figure 12

Then select another test point, press the "NEXT" key to take measurement of the second group average wind flow values. Repeat above steps to measure as many as 12 groups average wind flow values. As shown in figure 13:

Figure 13
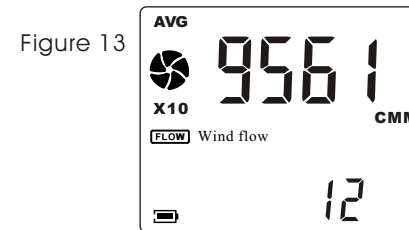
Once again press the "OPTION" key exit to measurment of average wind flow.

➢ Average Wind flow calculate formula
$$Flow = 1/N \sum (Velocity) * (free\ Area)$$

📄 Note

The average vaule only displays by pressing NEXT key, If there is wind in the duct Area, then the LCD Screen will shows the measured Average Wind flow