THM80X Series Operation Manual

Industry Degree Temp. & Humidity Transmitter

V 0.1

Table of Contents

Oder Code：

選 型 表

型號	THM80	3	—	T	48	1	H	00	1	—	D	N	S	2	
安裝方式	掛壁型 風管型 分離型	1 2 3	— — —												
物理量輸出1	溫度輸出 濕度輸出 露點溫度 霜點溫度 濕球溫度 水蒸氣分壓 混合比 絕對濕度 比焓 RS-485 (預設溫度)			T H D F W E R V S N											
物理量範圍1	0 ... 50℃ 0 ... 80℃ 0 ... 100℃ 0 ... 120℃ 0 ... 180℃ 0 ... 200℃ -20 ... +40℃ -40 ... +60℃ -40 ... +120℃ -40 ... ~+180℃ -40 ... +200℃ -70 ... +180℃ 依物理量測範圍表 (H, F, W, E, R, V, S) 特殊範圍				30 38 40 42 48 47 13 14 16 18 20 49 00 YY										
訊號輸出1	4 ... 20 mA 0 ... 20 mA 0 ... 10 V 0 ... 5 V 0 ... 1 V RS-485					1 2 6 7 8 9									
物理量輸出2	溫度輸出 濕度輸出 露點溫度 霜點溫度 濕球溫度 水蒸氣分壓 混合比 絕對濕度 比焓 RS-485 (預設濕度)						T H D F W E R V S N								
物理量範圍2	0 ... 50℃ 0 ... 80℃ 0 ... 100℃ 0 ... 120℃ 0 ... 180℃ 0 ... 200℃ -20 ... +40℃ -40 ... +60℃ -40 ... +120℃ -40 ... ~+180℃ -40 ... +200℃ -70 ... +180℃ 依物理量測範圍表 (H, F, W, E, R, V, S) 特殊範圍							30 38 40 42 48 47 13 14 16 18 20 49 00 YY							
訊號輸出2	4 ... 20 mA 0 ... 20 mA 0 ... 10 V 0 ... 5 V 0 ... 1 V RS-485								1 2 6 7 8 9						
顯示	無 有										X D				
電氣連接座	M16金屬電纜固定座 M12金屬連接座											N M			
濾頭	S.S.金屬網濾頭 金屬燒結濾頭												M S		
分離型導線長度 (最長10米)	2米TEFLON線材 5米TEFLON線材 特殊長度													2 5 —	
Option或其它要求	其它要求 RS-485 + 類比訊號														W U

1. Features

- IP67 protection degree, rugged aluminum case, fit in variety harsh environment
- Capable of temperature compensation
- Linear adjustment temperature & humidity by computer, analogue output or option RS-485
- Measure high accuracy temperature & humidity, reaction quickly, the sensor can work well after temporary condensation, long term stable in high humidity environment
- Process temp. : up to 200℃, S.S. probe proof pressure : 10 bra, metal connector :installation repeatedly
- Switch multifunction physical quantities：[%RH]、[℃]、[mbar]、[g/kg]、[g/m3]、[kj/kg]
- Calibration physical quantities, measuring range, analogue output, station, etc
- Free calibration software : data logger / record 65535 datas/ charts

Applications

- Industrial Process Monitoring / Air Conditioning/ Environmental Ventilation Control
- Buildings, factories, hospitals, clean rooms, laboratories, weather stations Environmental monitoring
- Storage rooms, environmental chambers, greenhouses, mushroom farms
- Semiconductor, electronics, paper, printing, textiles, steel and iron Industry, food, chemical, pharmaceutical, biotechnology industry

2. Security considerations

Please read this Specification carefully, prior to use of this, and keep the manual properly, for timely reference.

Solemn Statement:

This product can not be used for explosion-proof area.
Do not use this product in a situation where human life may be affected.

This product can not be used for explosion-proof area.
Do not use this product in a situation where human life may be affected.

EYC-TECH will not bear any responsibility for the results produced by the operators.

CE
EN 61326-1:2006　EN61326-2-2:2006
Emissions
EN55011:2009/A1:2010
Immunity
IEC 61000-4-2:2008，IEC 61000-4-3:2006/A1:2007/A2:2010，IEC 61000-4-8:2009)

Warning!!

●Installation and wring must be performed by qualified personnel in accordance with all applicable safety standards.

●This product must be operated under the operating conditions specified in manual to prevent equipment damages.

●Please using the product under the ordinary pressure, or it will influence safe problem.

●This product must be operated under the operating condition specified in this manual to prevent equipment damages.

●This product must be operated under the normally atmospheric condition to prevent equipment damages.

● To prevent products damage, always disconnect the power supply from the product before performing any wiring and installation.

● All wiring must comply with local codes of indoor wiring and electric installation rules.

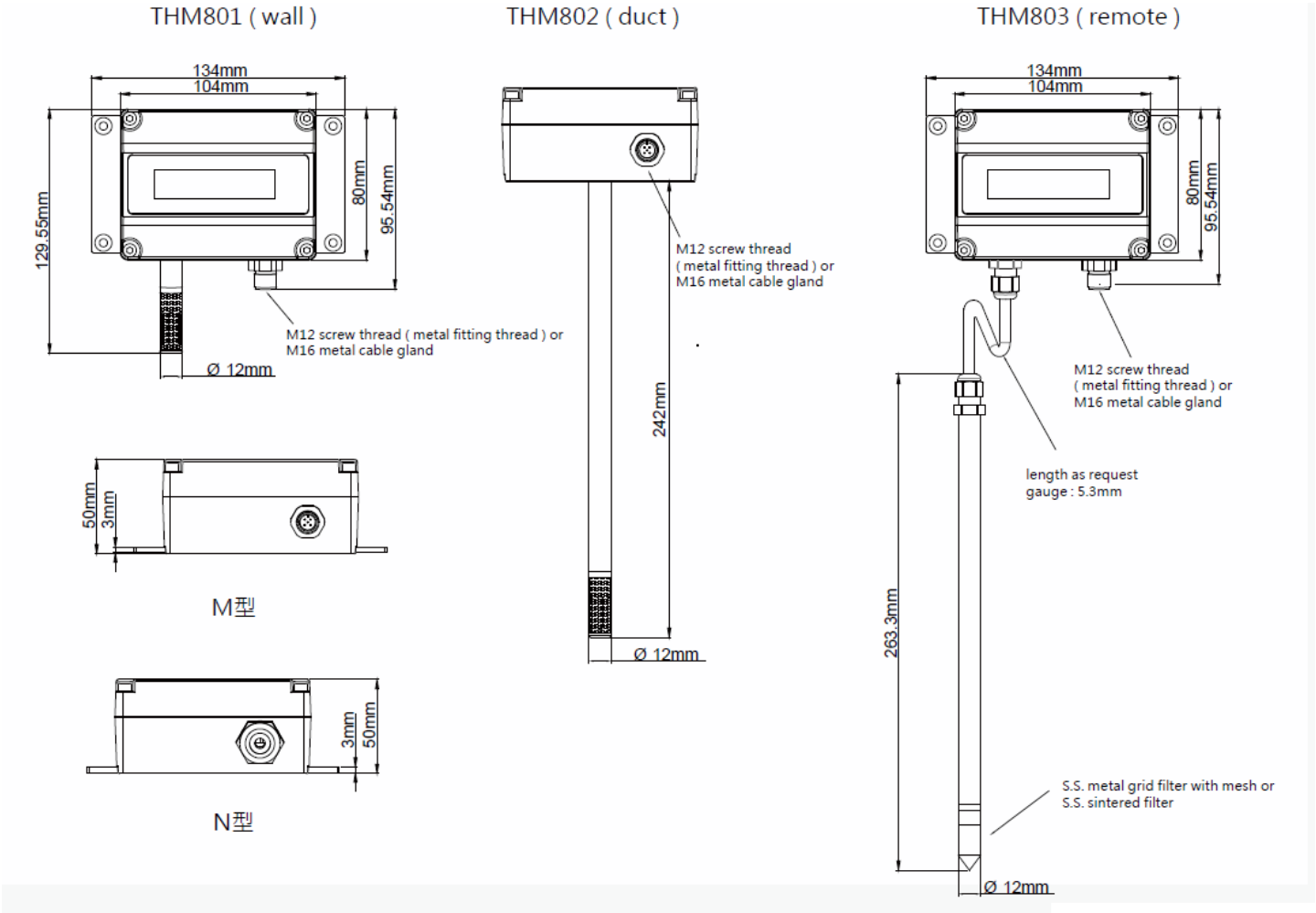
● Please use crimp type terminal.

● To prevent personal injury, do not touch the moving part of product in operation.

● It may cause high humidity atmosphere during the product was breakdown. Please take safety strategy.

3. Installation

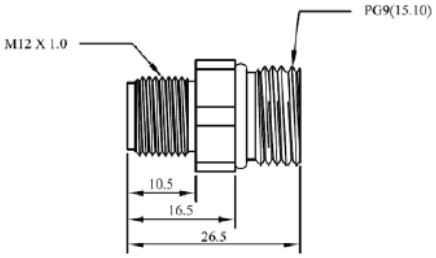
3.1 Dimension

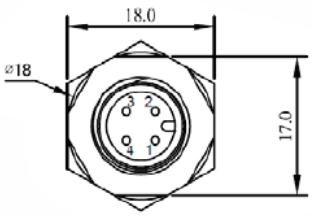


3.2 Electric Connector Dimension

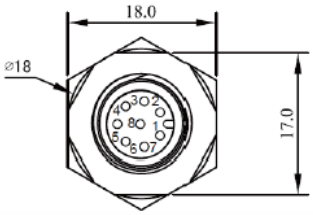
unit : mm

【M type (M12-4PIN metal connector】
RS-485 or analogue

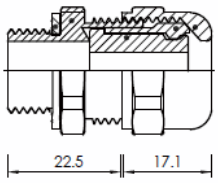


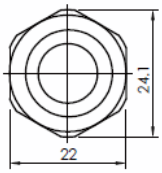


【M type (M12-8PIN metal connector)】
RS-485+analogue



【N type (M16 cable gland)】RS-485+analogue





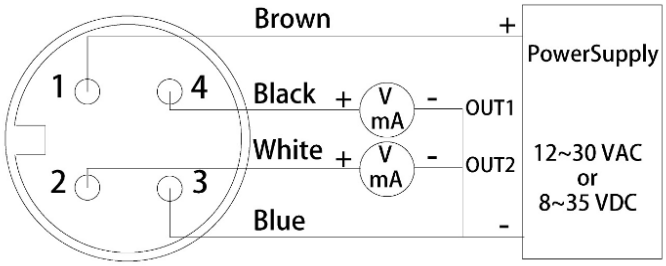
3.3 Option accessory

Filter SPEC.：

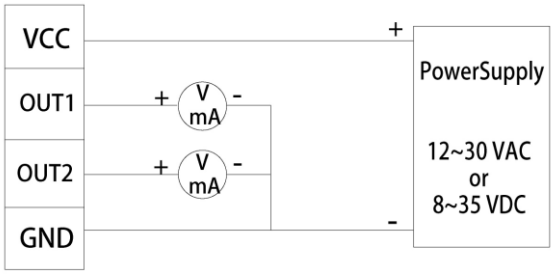
Order code	Name	Description	Features
4425000011	SUS sintered filter 	Material：SUS316L Sinter type HD：40μm OD：12mm L：34.5mm	Excellent filterable, and pollution, corrosion and pressure resistance. Max. Temper.：200℃ max
8203104011	Metal grid filter with mesh 	Material：SUS304 OD：12mm L：32mm	Common resisting pollution. React quickly. Endure high temp. Nice ventilation. Max. temp.:200℃

4. Connection

4.1 Analogue Diagram

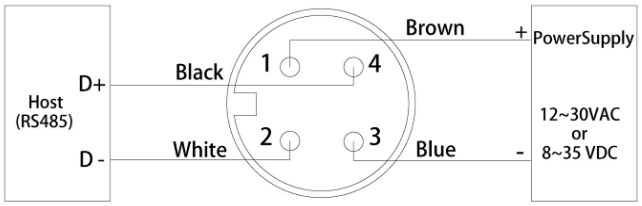


Analogue, M12 4P

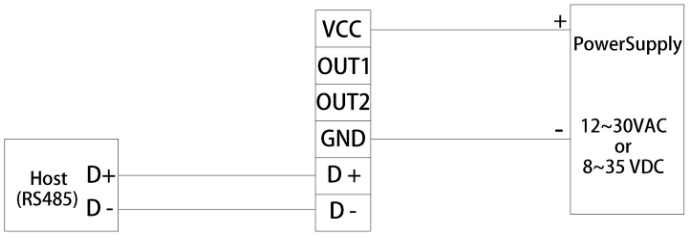


Analogue, 4P Terminal

4.2 RS-485 Diagrams

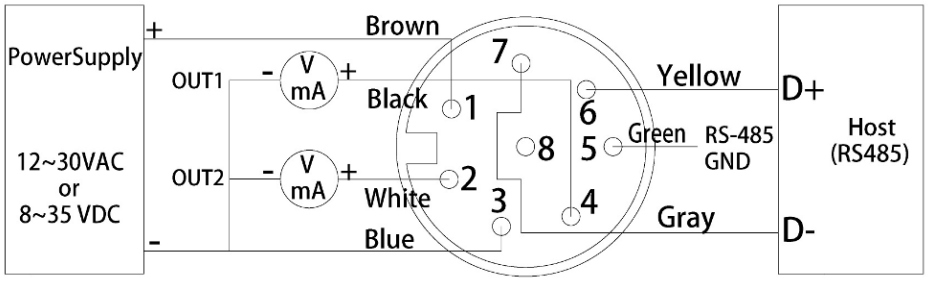


RS-485, M12 4P

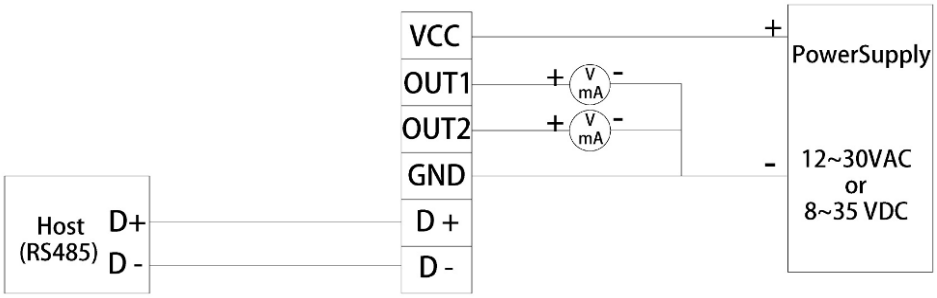


RS-485, 6P Terminal

4.3 Analogue + RS-485 Diagram



Analogue+ RS-48, M12 8P



Analogue+RS-485, 6P Terminal

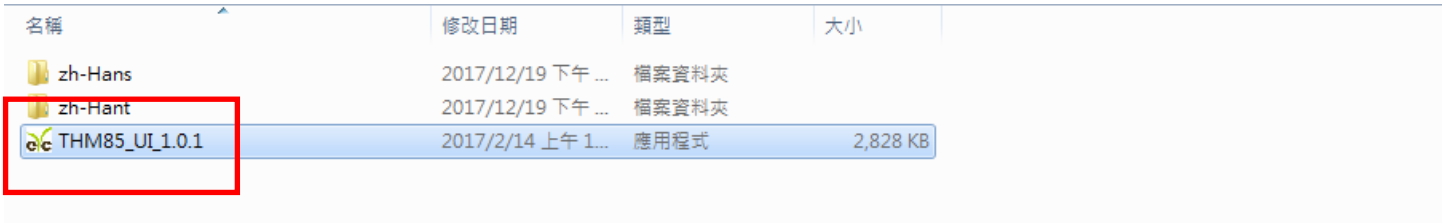
5. Software and calibration operation step

5.1 Application Program statement

1. Free installation program：THM85_UI_1.0.1.exe
（※Please use installation program when free program doesn’ t execute）
2. Installation program：THM85_UI_XXXXXXXX(date)_1.0.1(EXE).rar

a. Operating System requirements：above Windows XP

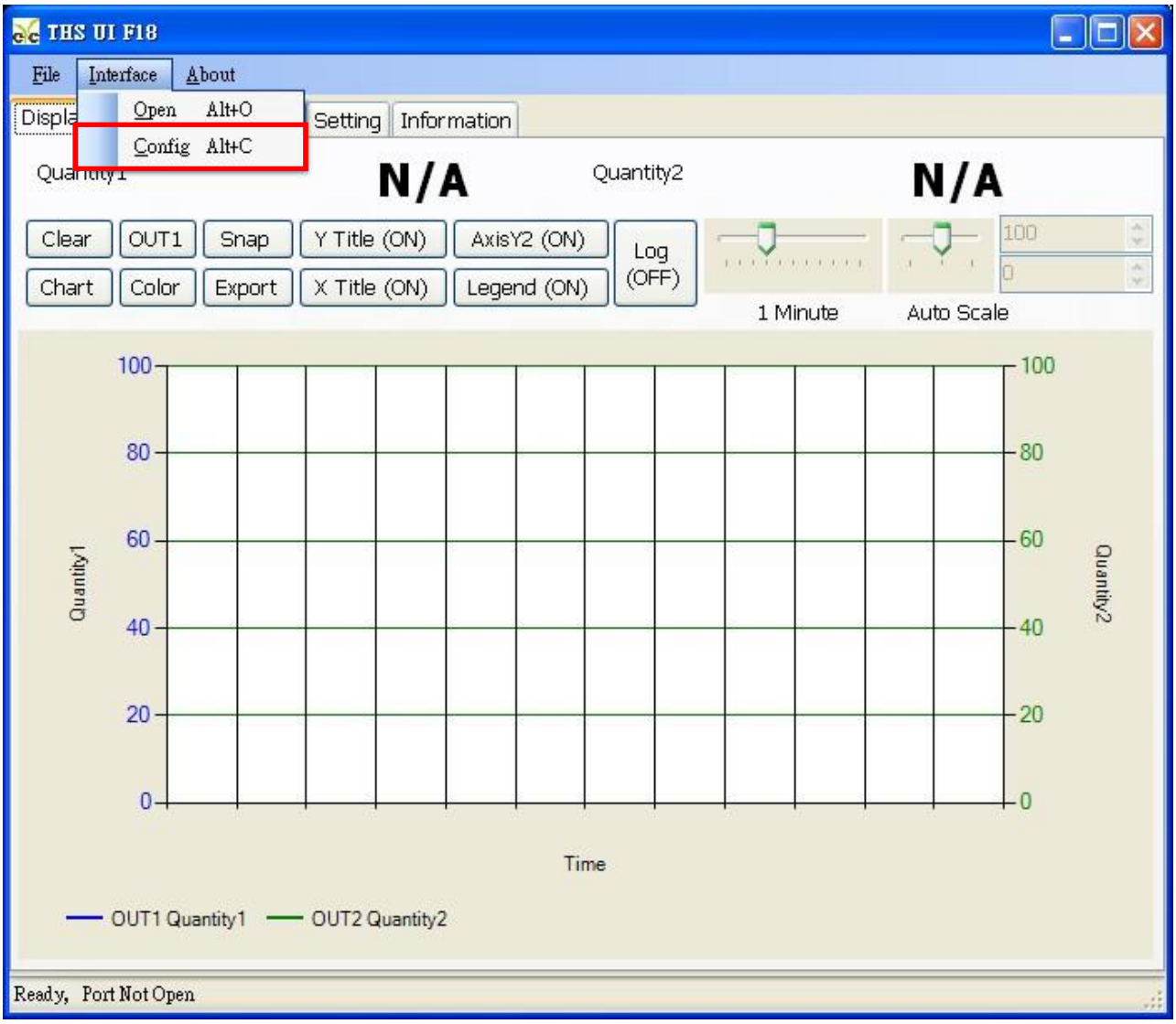
b. Click Setup to install



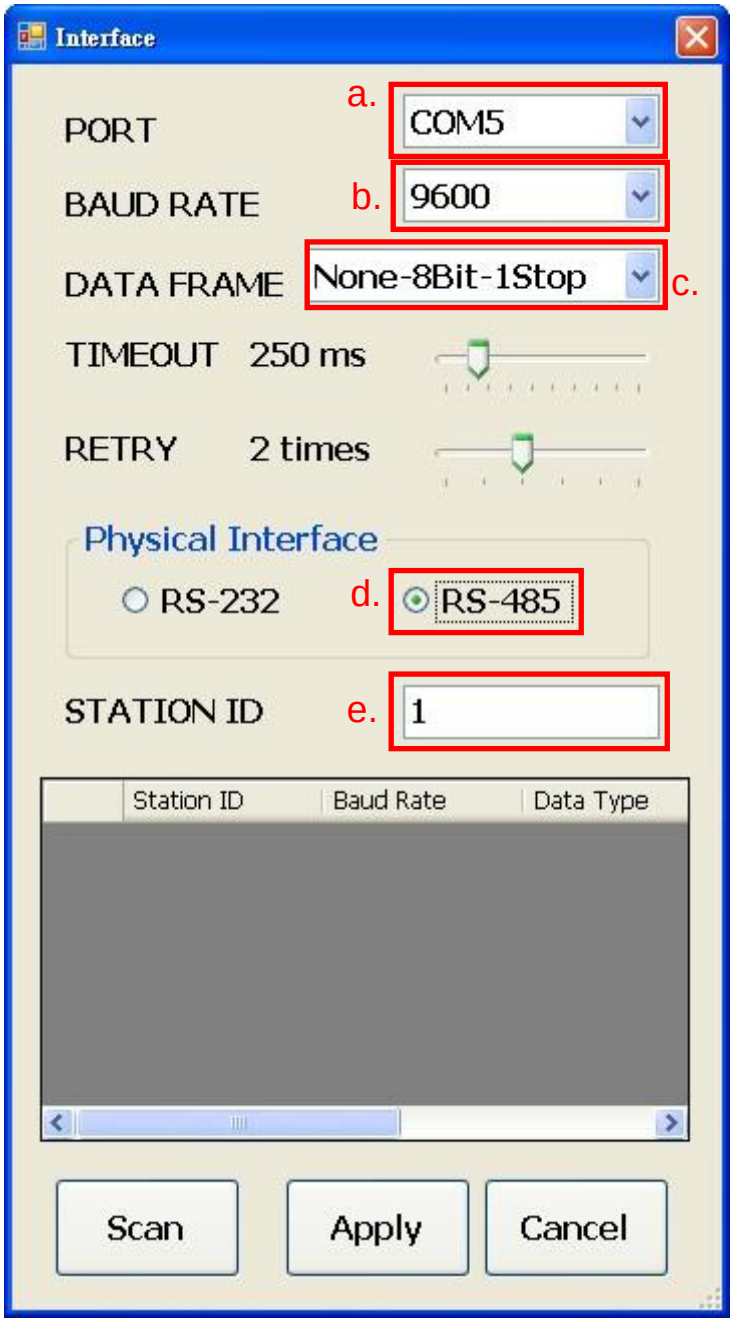
3. Other application program requirements：above Microsoft Office 2003

5.2 Setting RS-485connection

1. Connect product to PC via RS-485 cable
2. Execute “THM UI”
3. Click “Interface > Config”

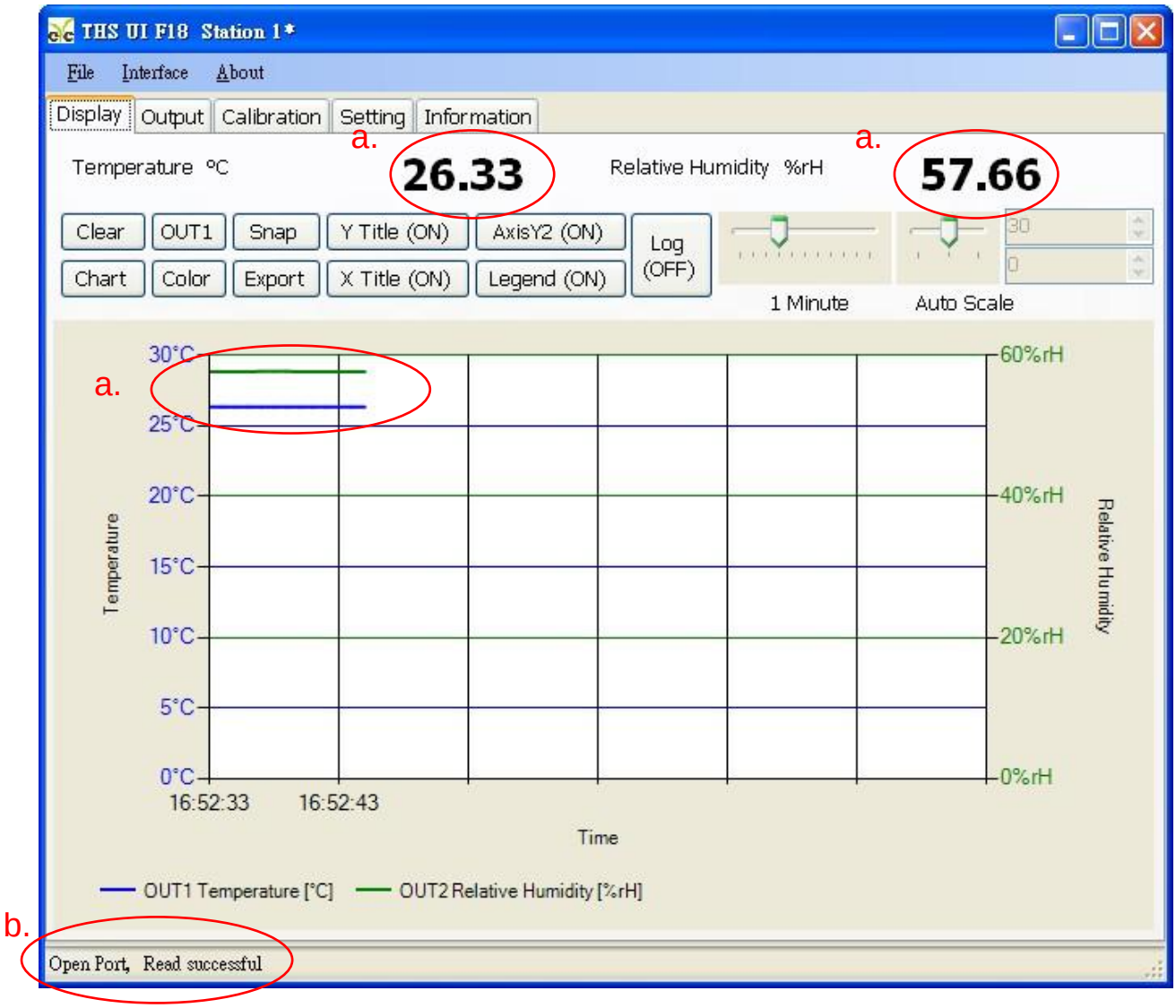


4. Select the corresponding values of com port as fallowing :



5. Click “Apply”

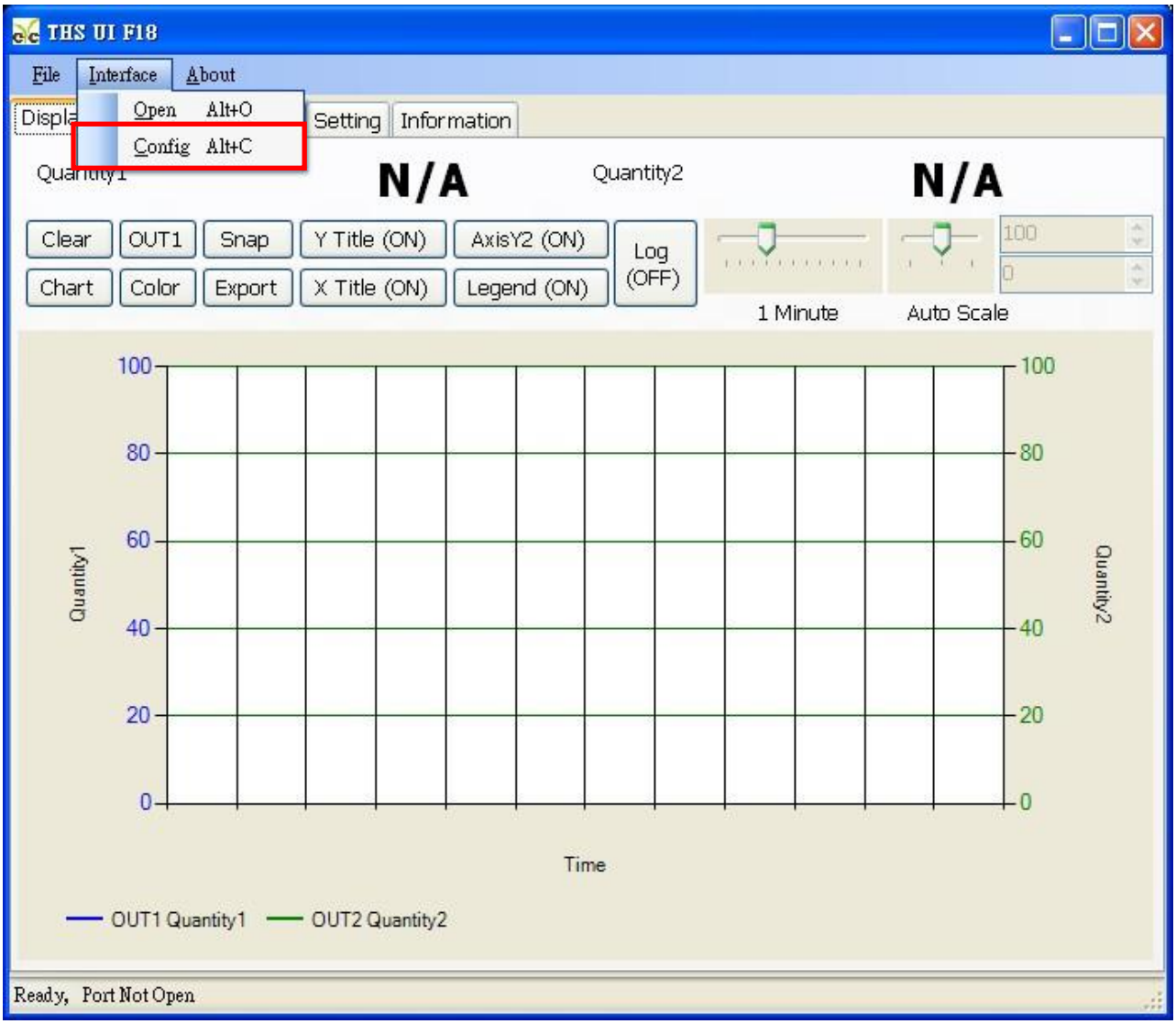
6. Connect successfully
   a. Show value and trend chart of Temperature and Relative Humidity
   b. Show Open port, Read successful



6.3 Scan RS-485 connection

※Use scan function to connect when forgetting the connection information or having more facilities.

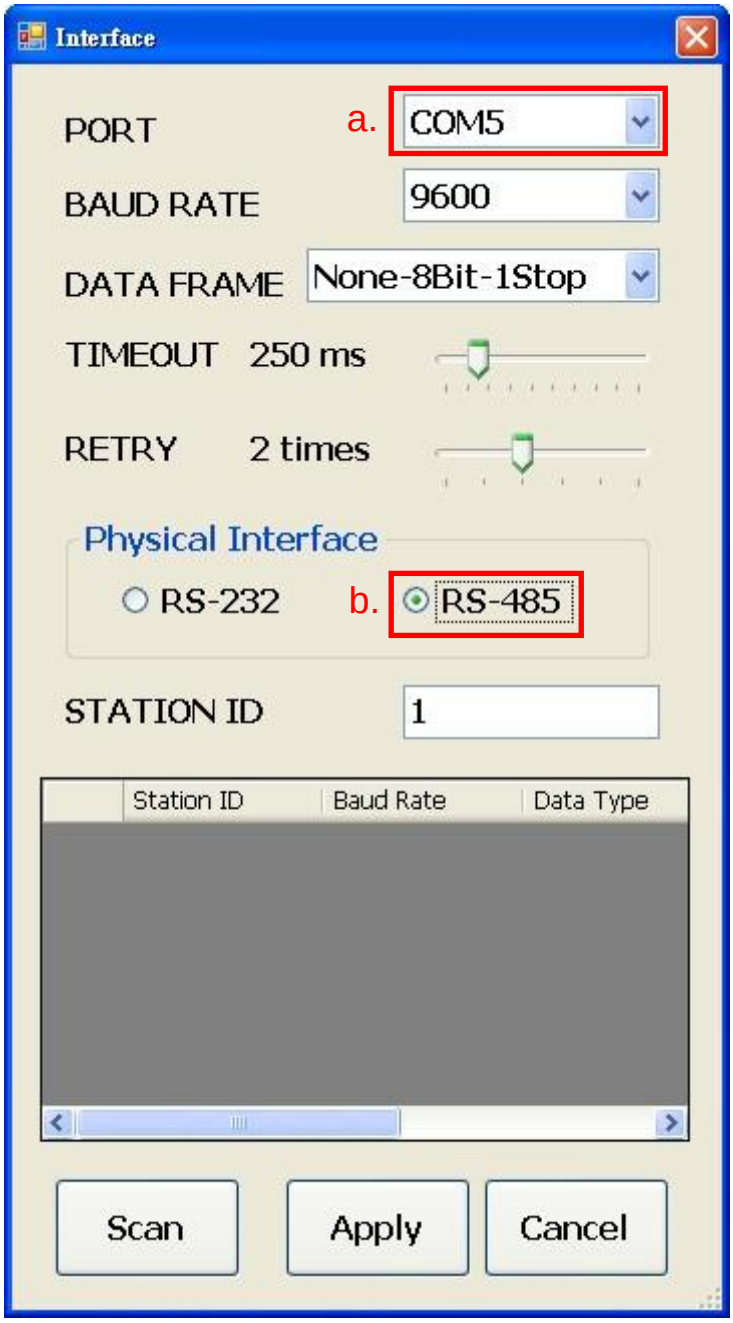
1. Connect the product to PC via RS-485 cable
2. Execute “THS UI”
3. Click “Interface > Config”



4. Select the corresponding values of com port as fallowing:

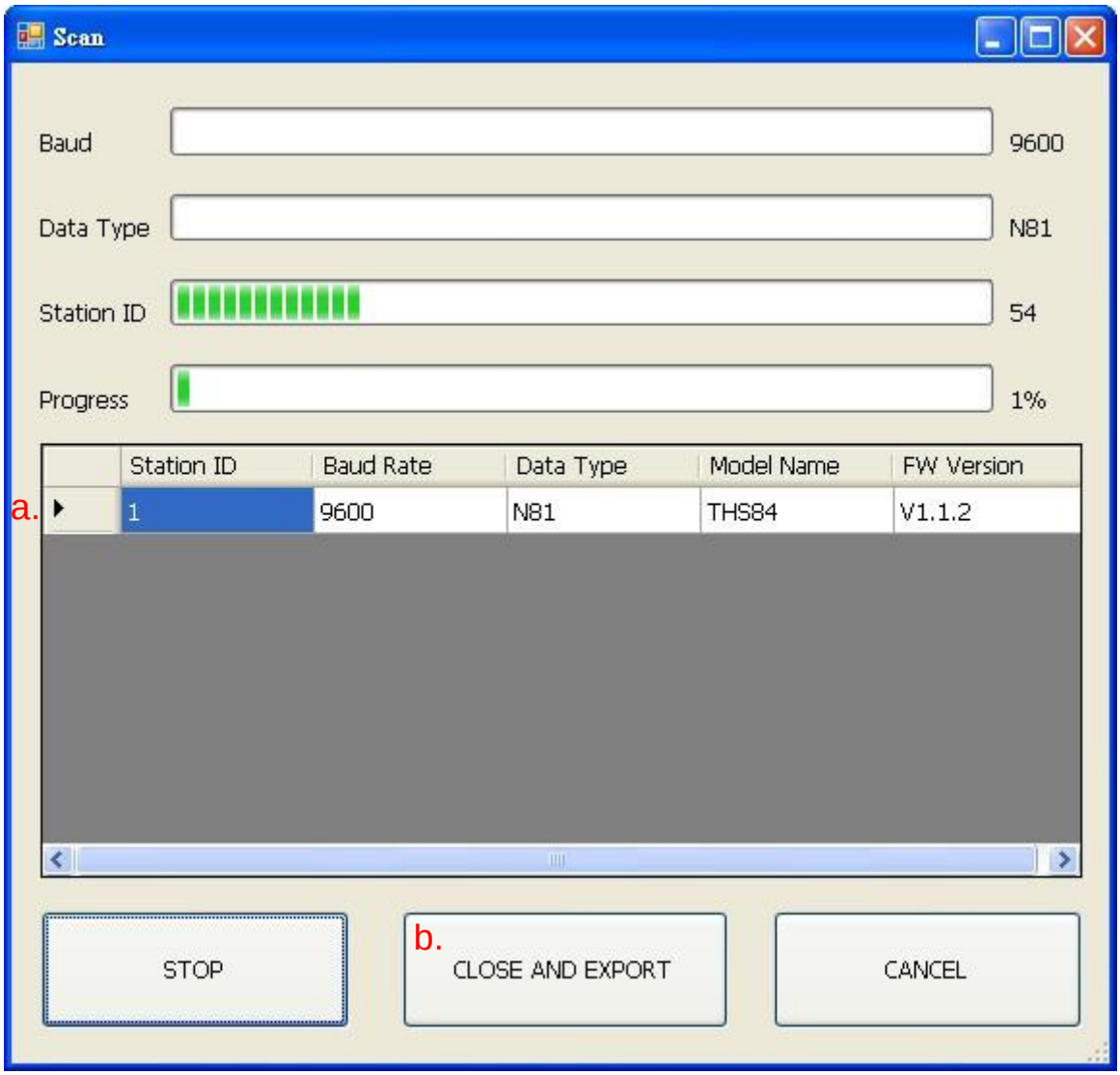
   a. Port：

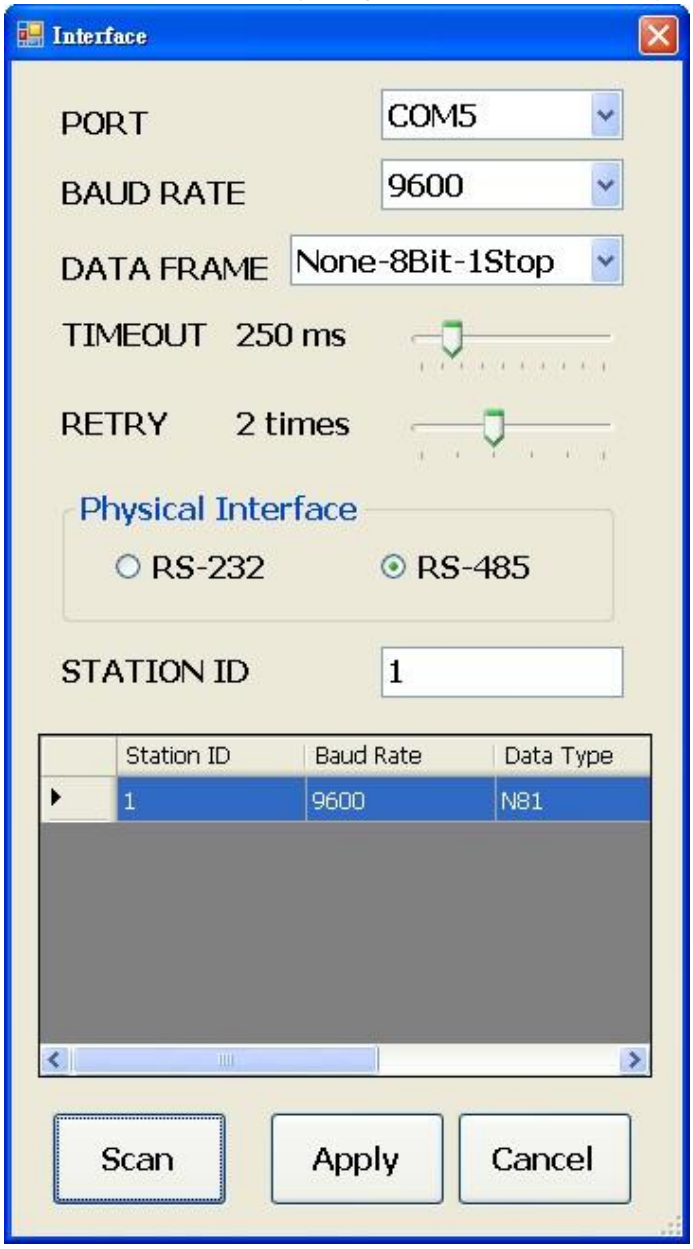
   b. RS-485



4. Click “Scan” to execute connection facilities

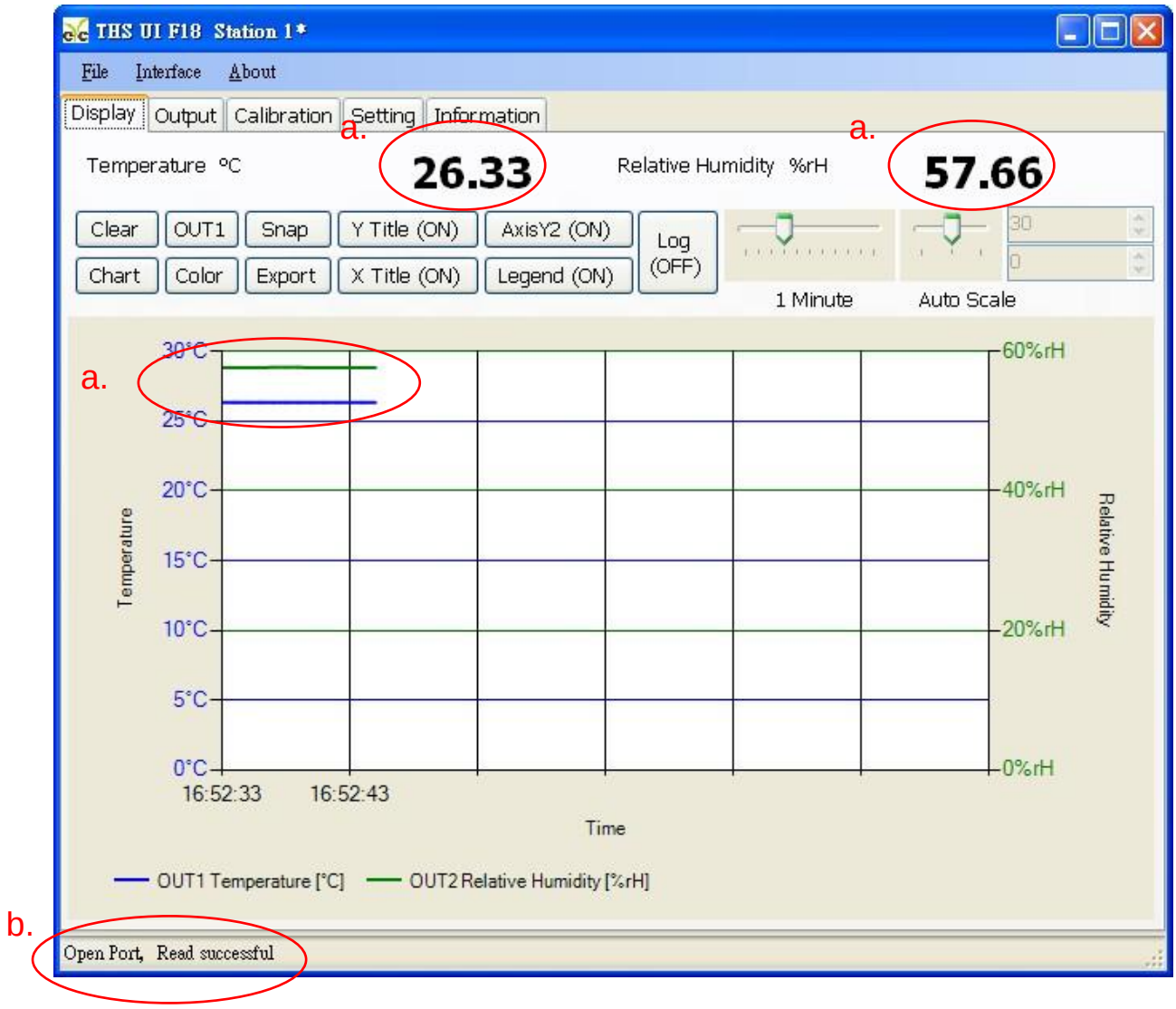
5. Scan connection facilities and set up
   a. Select “Station ID”
   b. Click ” CLOSE AND EXPORT”





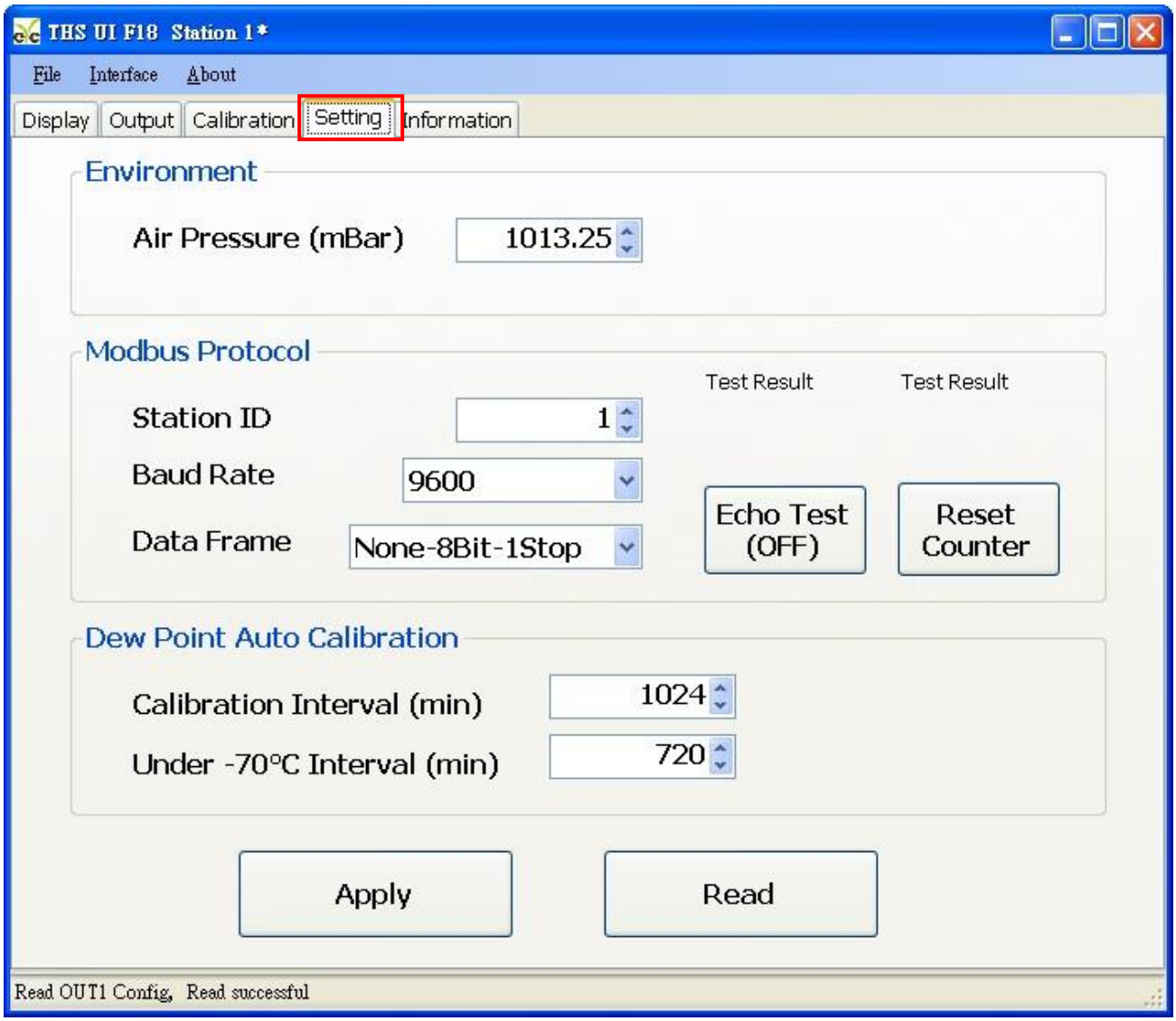
6. Click "Apply"

7. Connect successfully
   a. Show values and trend chat Temperature and Relative Humidity
   b. Show Open port, Read successful



5.4 Setting RS-485 ModBus Protocol

1. Setting RS-485 connection step as step 5.1
2. Click “Setting”

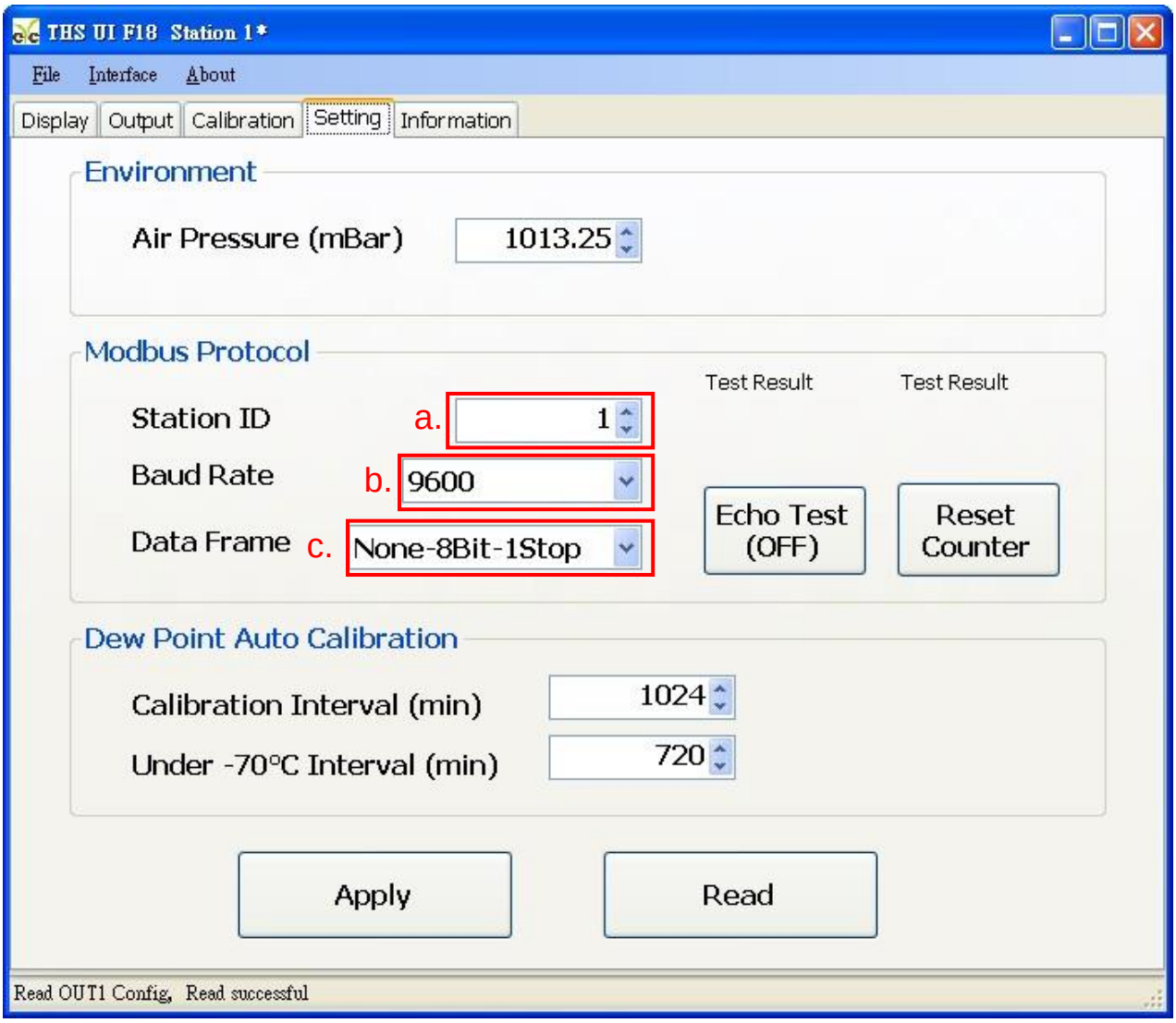


3. Select Modbus Protocol parameter

a. Station ID：1~247

b. Baud Rate：9600, 19200, 38400, 57600, 115200

c. Data Frame：None-8Bit-1Stop, None-8Bit-2Stop, Even-8Bit-1Stop, Even-8Bit-2Stop, Odd-8Bit-1Stop, Odd-8Bit-2Stop

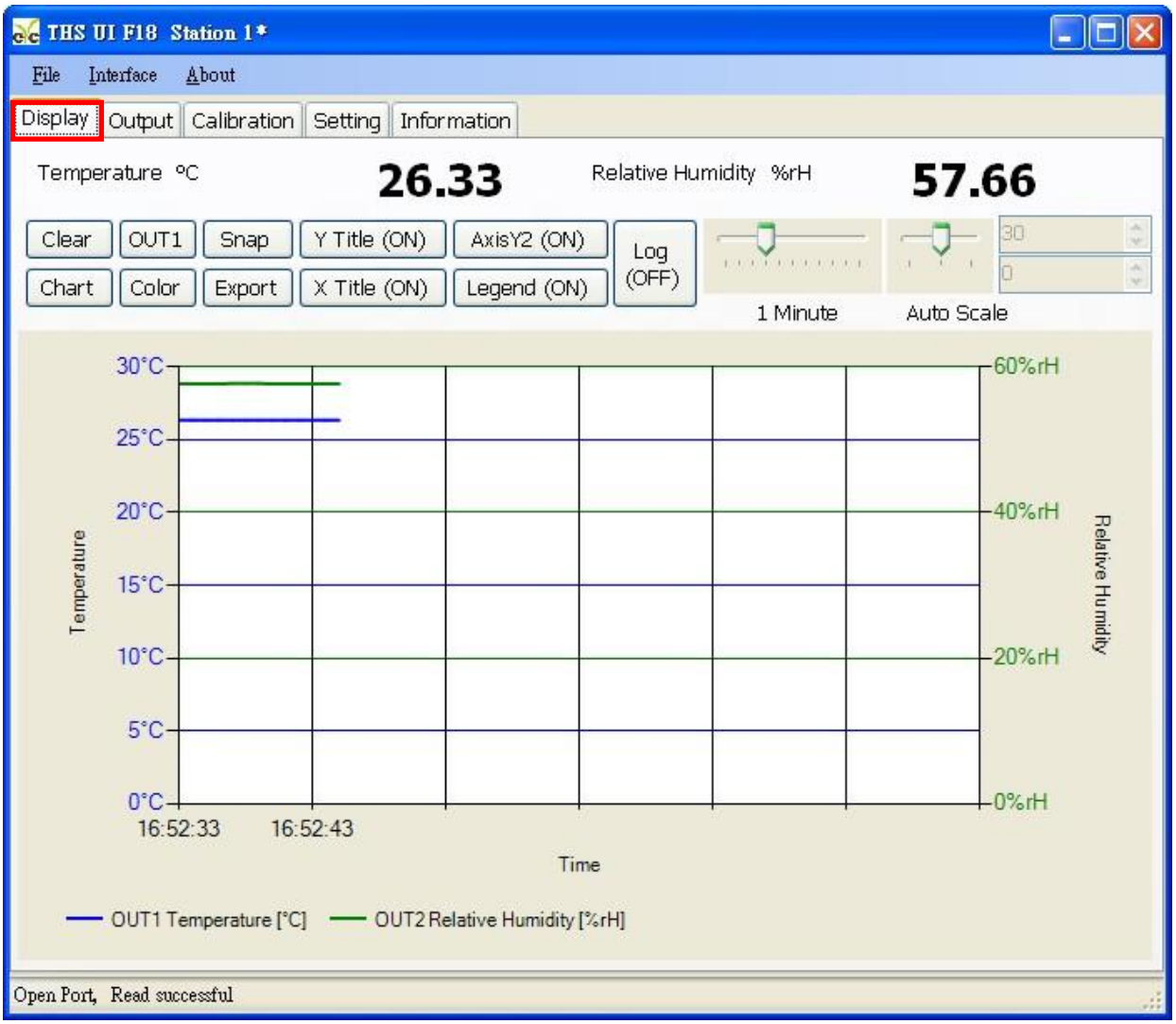


4. Click “Apply”

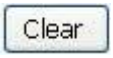
5. Execute connection as step 5.2 or 5.3 again

5.5 Display and save data

1. Show data：Click “Display”

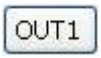


2. Icon function statements



Clear the chart records

Change the chart style



Select the OUTPUT channel

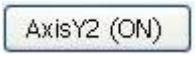
Set line color chosen from OUTPUT

Snap chart

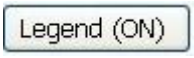
Save the data measuring when the system start connecting before clinking the Export icon

Show/Not show the statement of Y axis

Show/Not show the statement of X axis

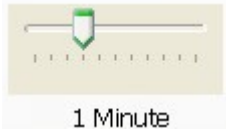


Show/Not show the statement of Y secondary axis



Show/ Not show chart

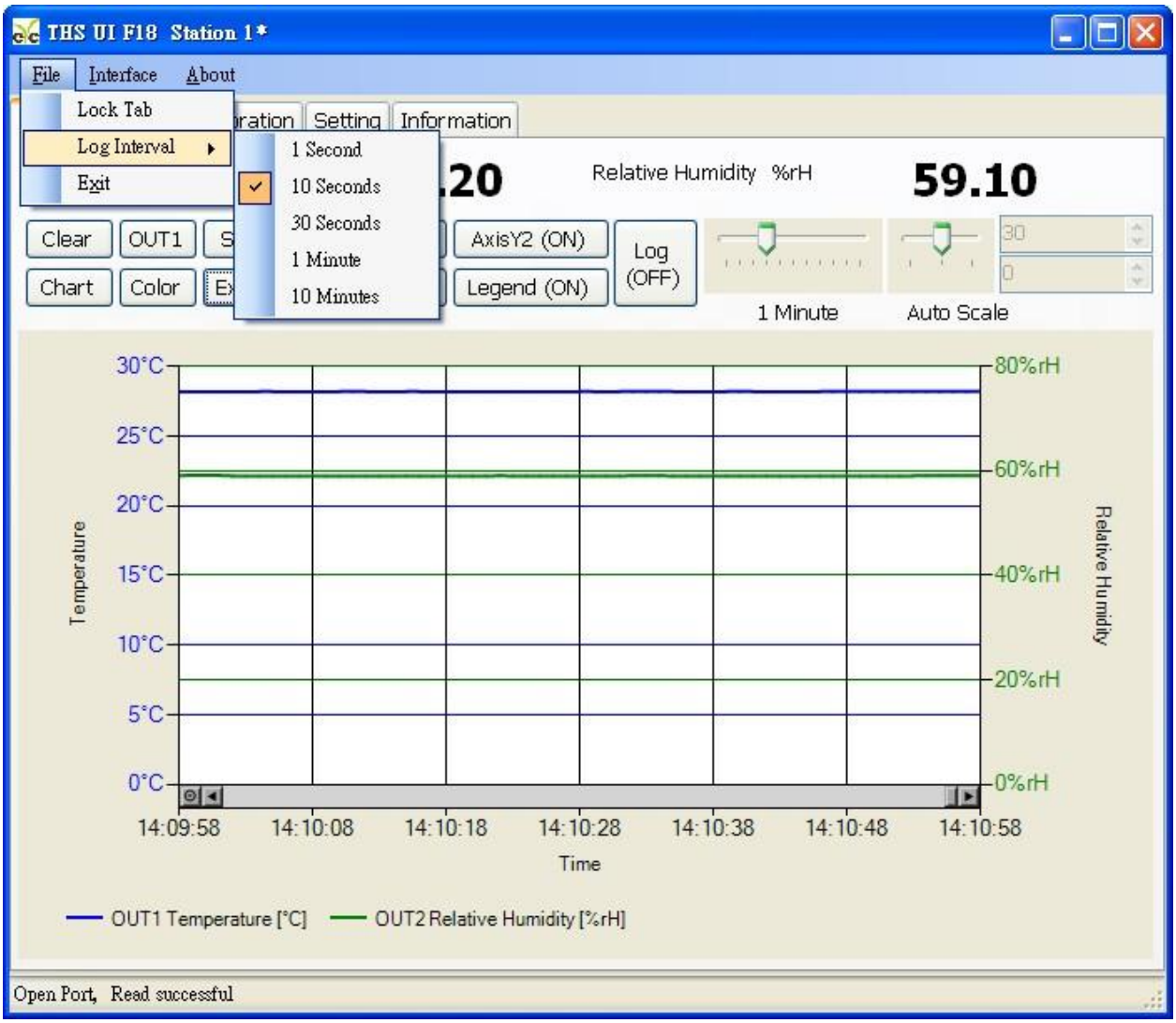
Log/Not Log measuring data



Adjust time range of X axis

Adjust range of Y axis

3. Setting time interval of record
   a. File > Log Interval
   b. Select time interval of record



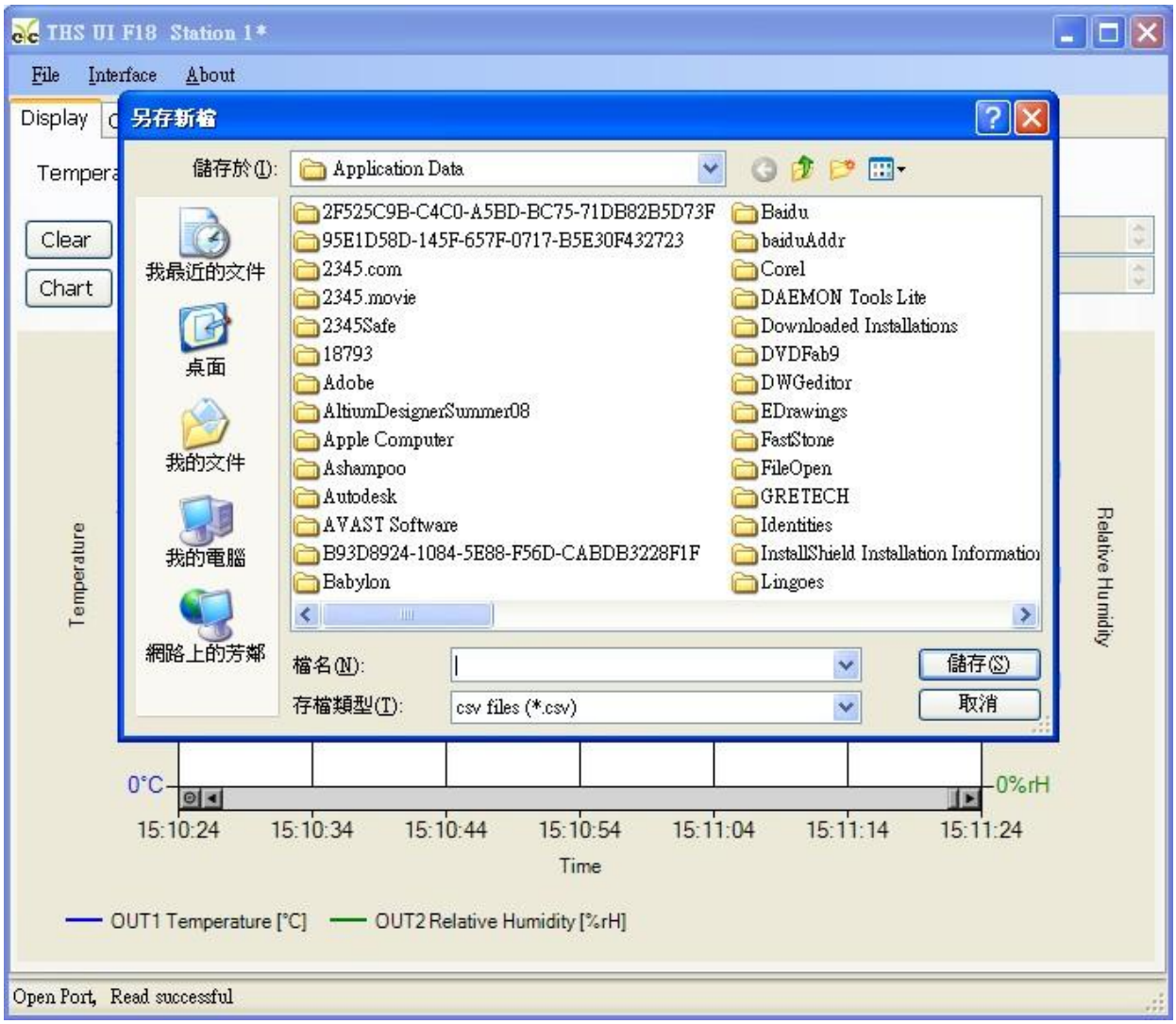
4. Save/Log measuring data

a. Log measuring range：Save the data measuring when the system start connecting before clinking the Export icon

a-1. Click Display > Export

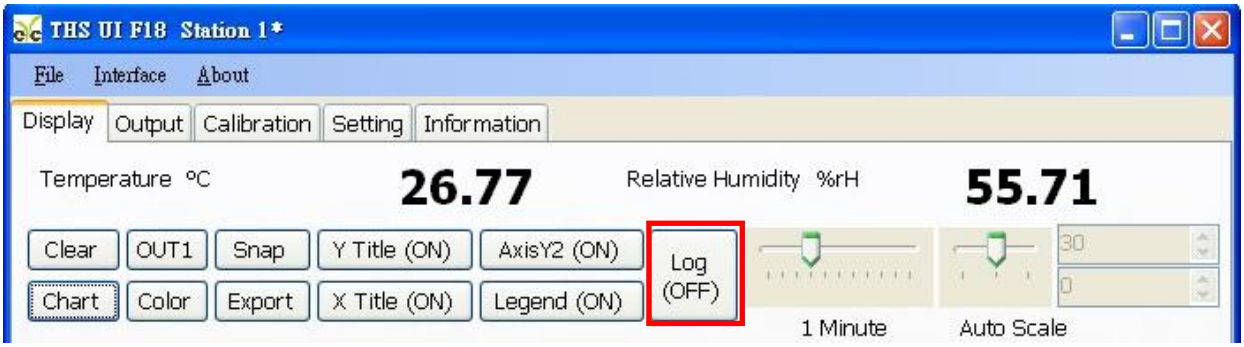
a-2. Appoint path and Key in file name > save

※1. If file name is some as the path name, the original file will be covered.



b. Log measuring data：Log the data which is on from start or off

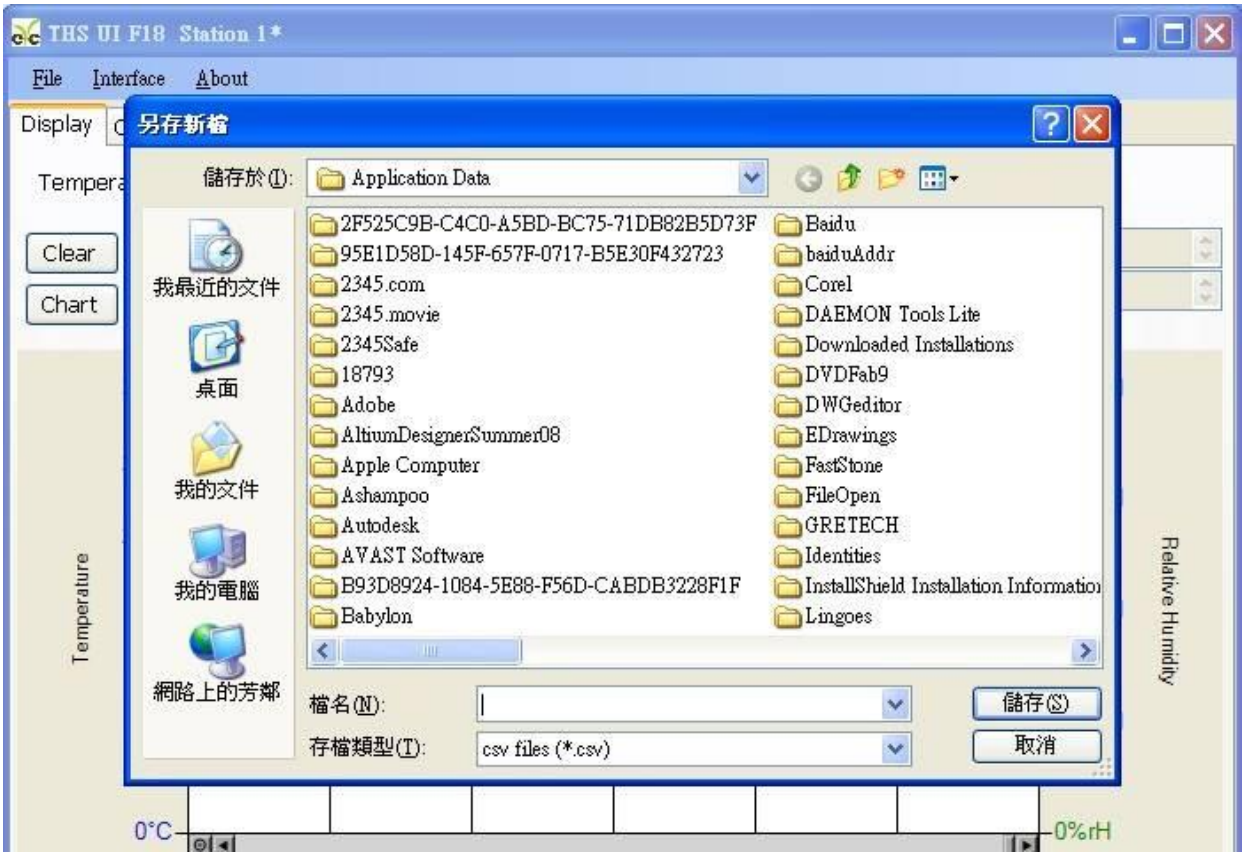
b-1. Display > Log(OFF)

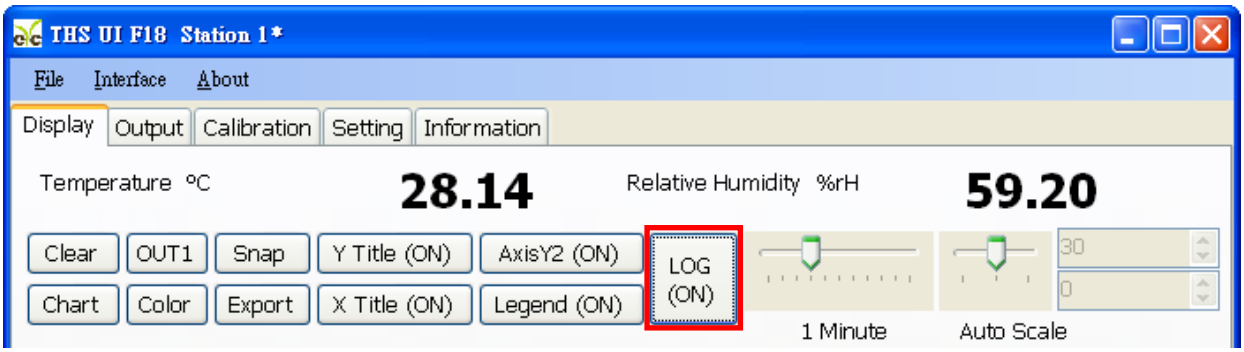


b-1. Appoint path and Key in file name > save > Log(ON)

※1. If file name is some as the path name, the original file will be covered.

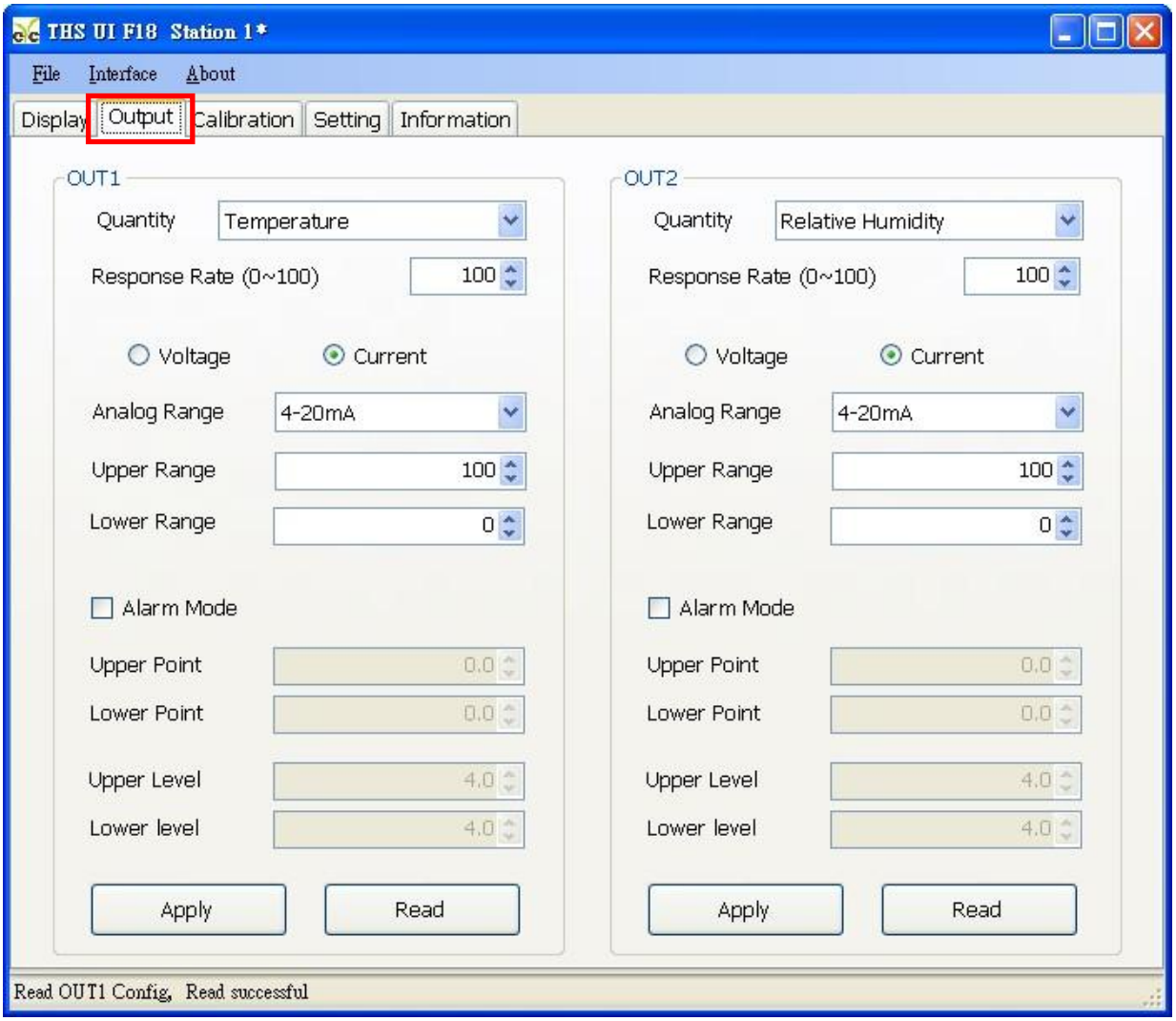
※2. If logging records exceed 65536, the log file will be split 65536 records each file which the file name append "_NNN" and N start from 1.



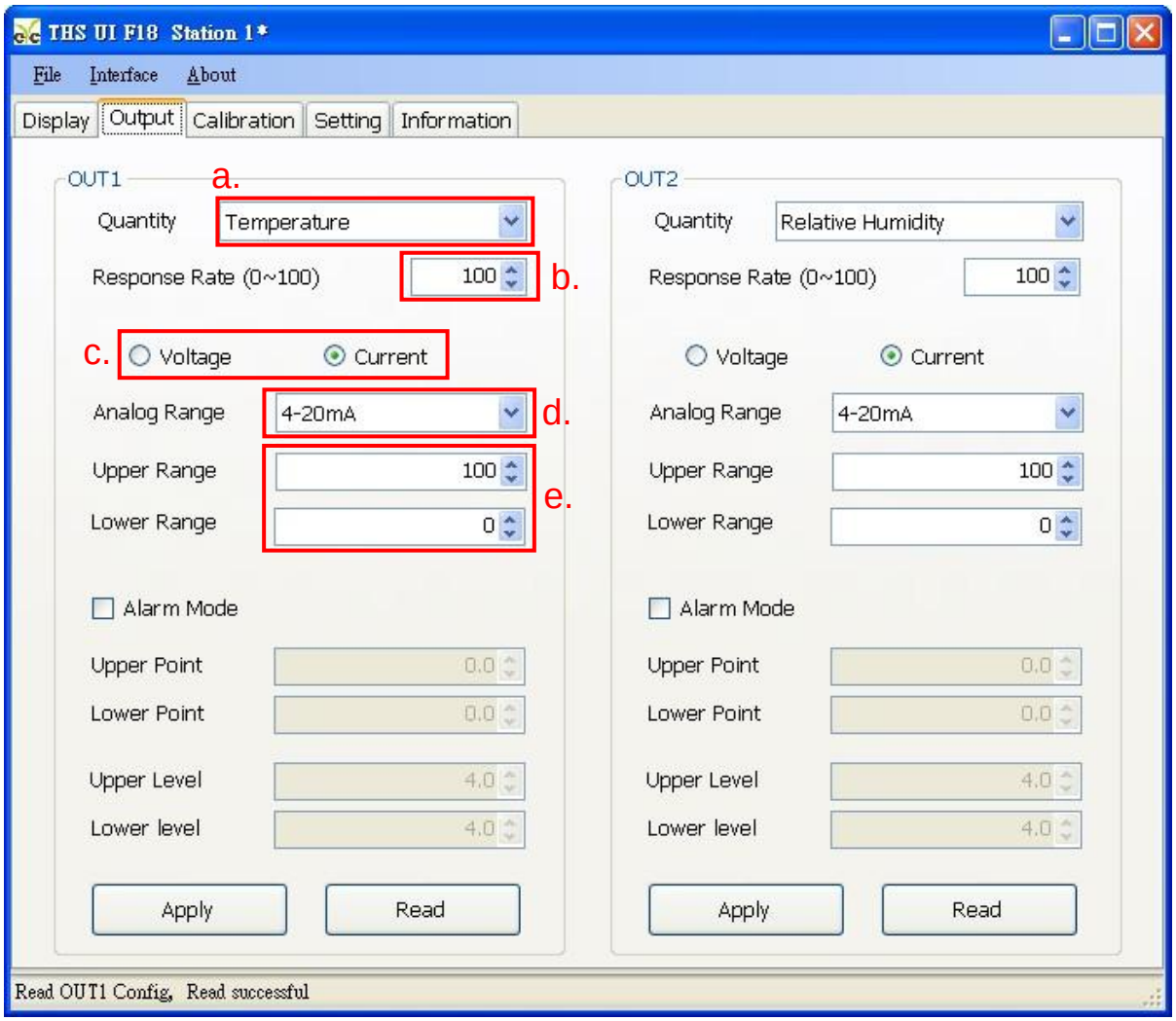


5.6 Choose parameter of Output

1. Click "Output"


THS UI F18 Station 1*
File
Interface
About
Display
Output
Calibration
Setting
Information
OUT1
Quantity
Temperature
Response Rate (0~100)
100
Voltage
Current
Analog Range
4-20mA
Upper Range
100
Lower Range
0
Alarm Mode
Upper Point
0.0
Lower Point
0.0
Upper Level
4.0
Lower level
4.0
Apply
Read
OUT2
Quantity
Relative Humidity
Response Rate (0~100)
100
Voltage
Current
Analog Range
4-20mA
Upper Range
100
Lower Range
0
Alarm Mode
Upper Point
0.0
Lower Point
0.0
Upper Level
4.0
Lower level
4.0
Apply
Read
Read OUT1 Config, Read successful

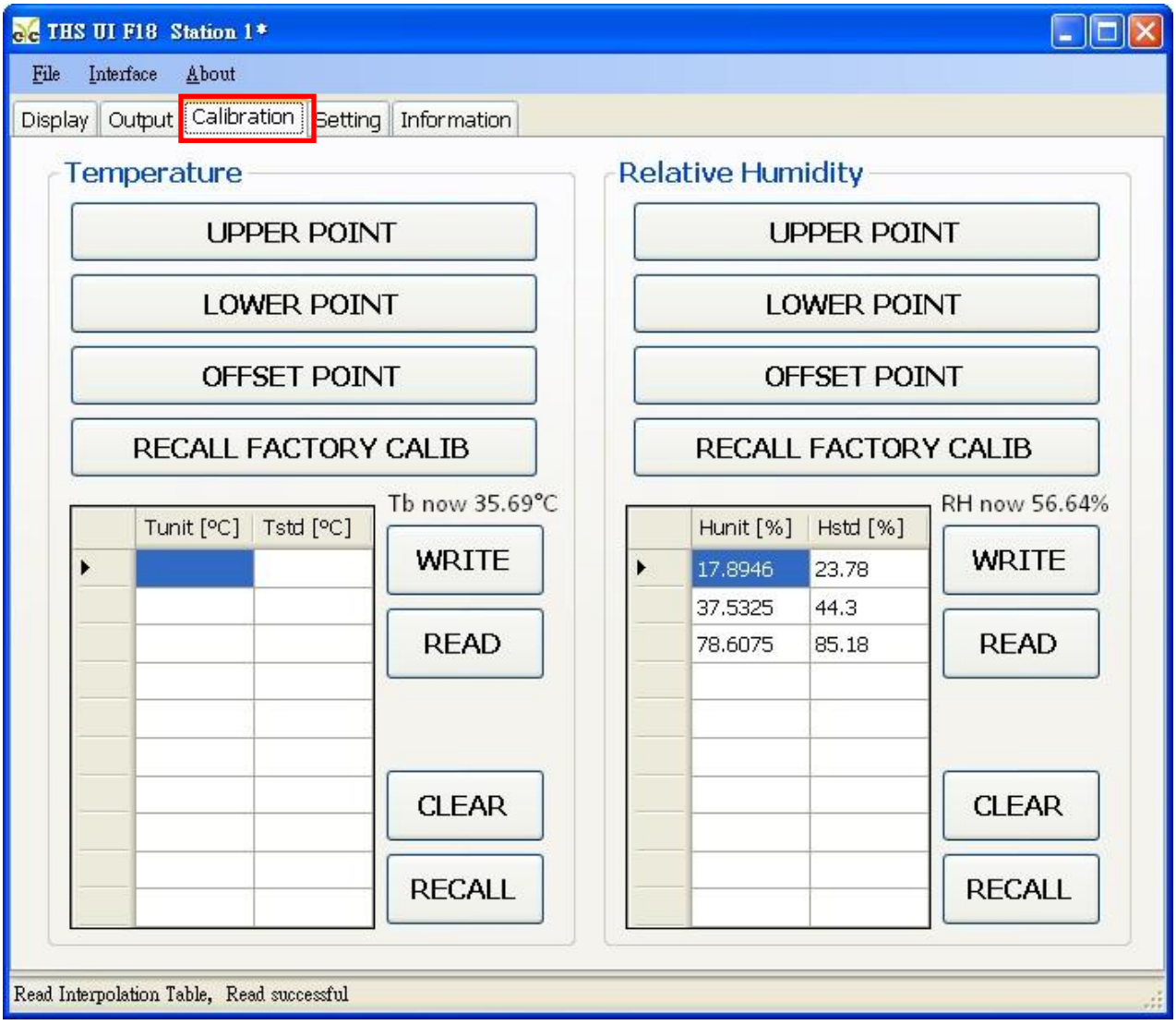
2. Select relative parameters from Output1and Output2
   a. Output selection
   b. Responding time
   c. Voltage or currant Output
   d. Voltage or current analog range
   e. Upper and Lower point of Output



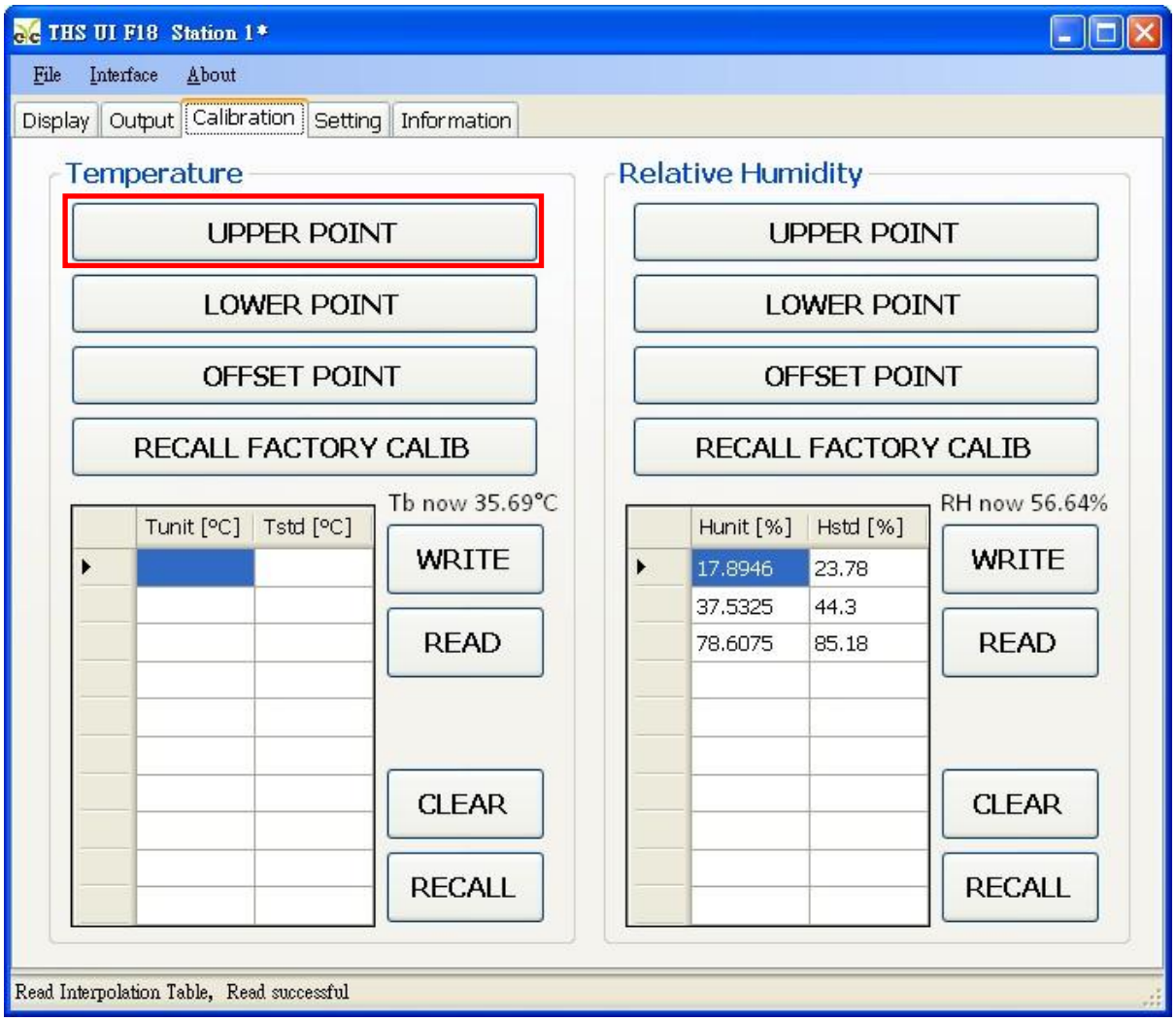
3. Click “Apply”

5.7 Temperature Calibration with two points

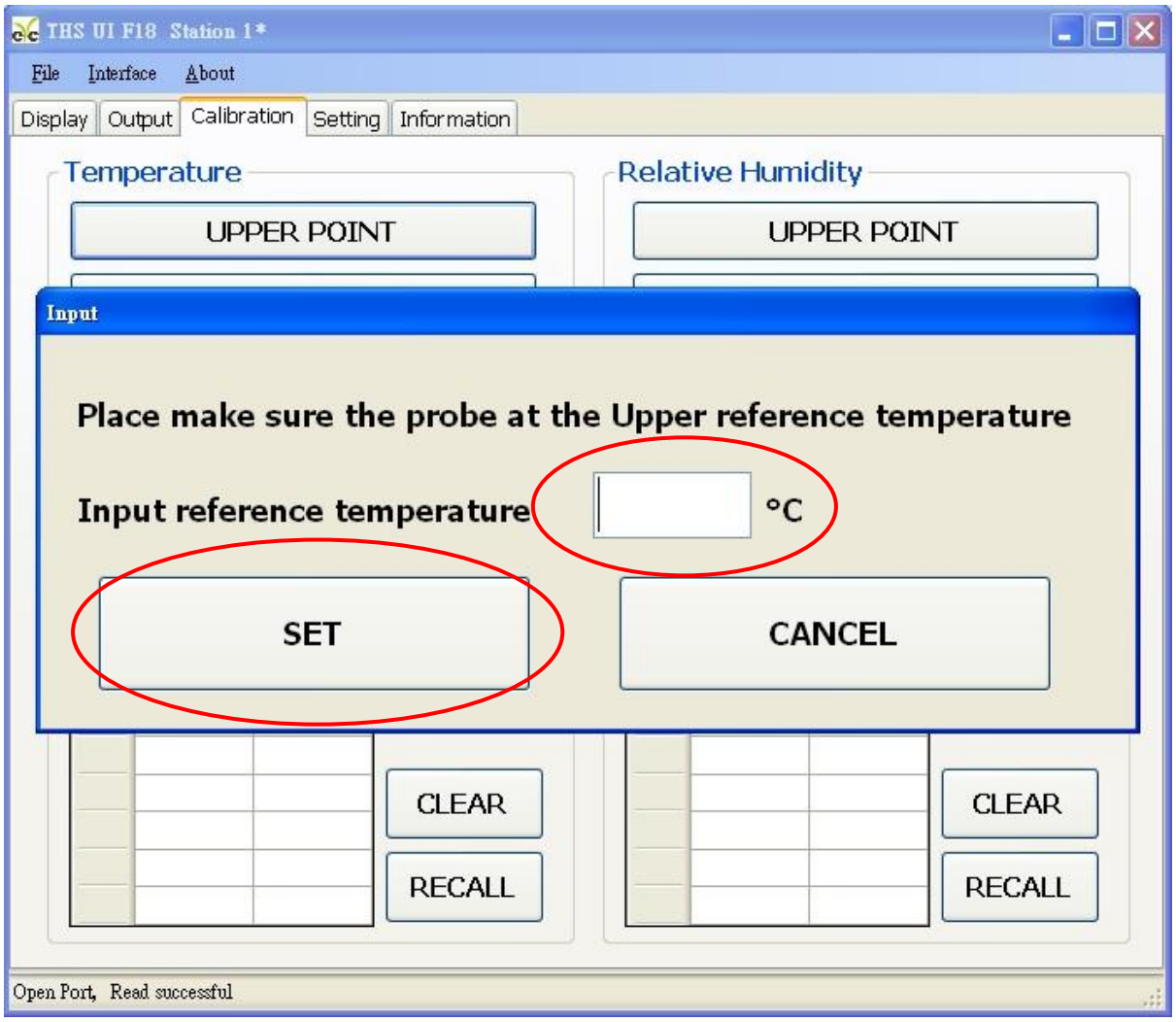
1. Calibrate upper point of temperature
   a. Click "Calibration"



b. Put the sensor unit of product in the temperature control box, and adjust the upper point of temperature (ex: 100℃)
c. Wait the temperature of control box is becoming stable
d. Click Temperature > UPPER POINT

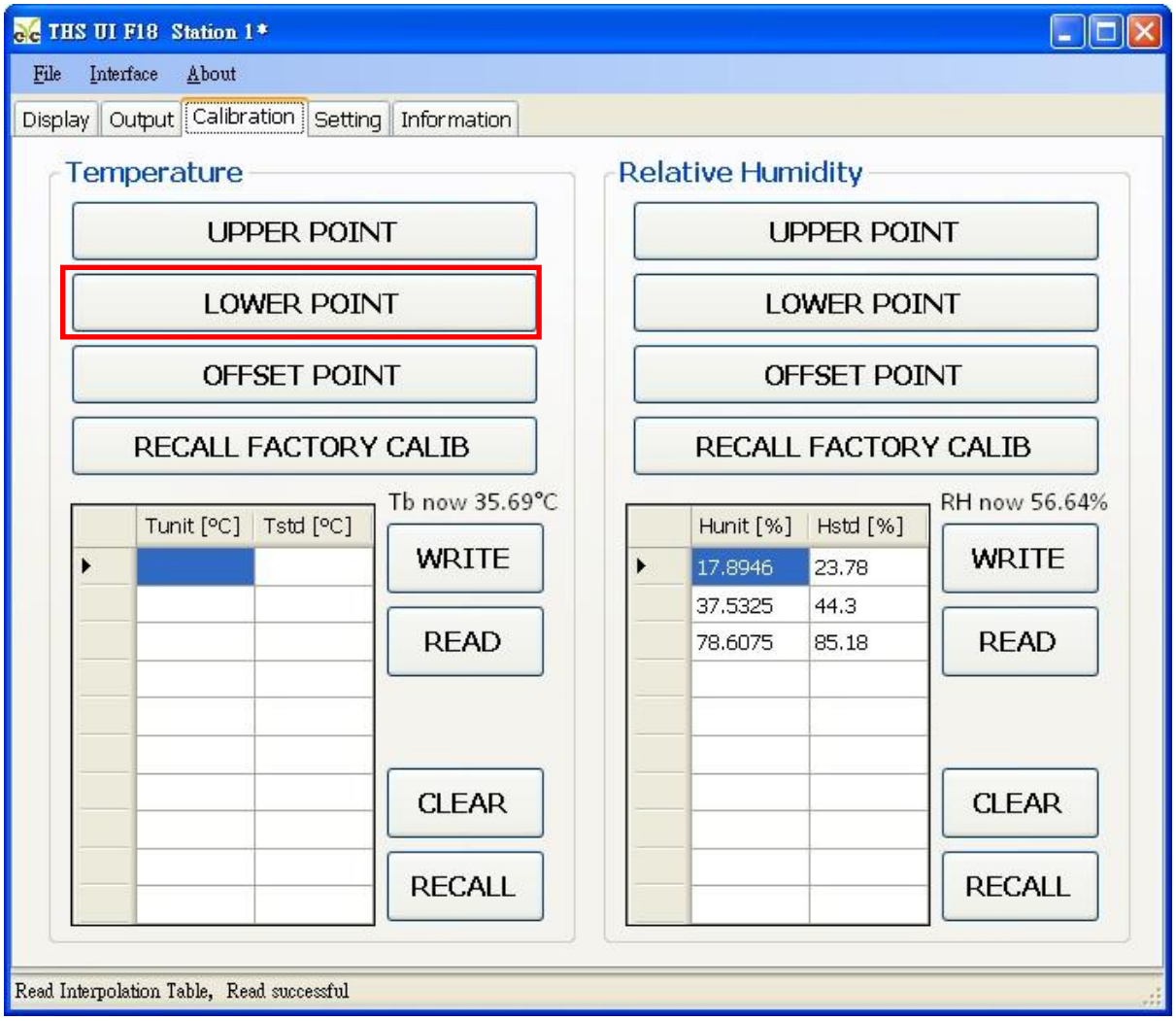


e. Input the reference temperature, then click ” SET”

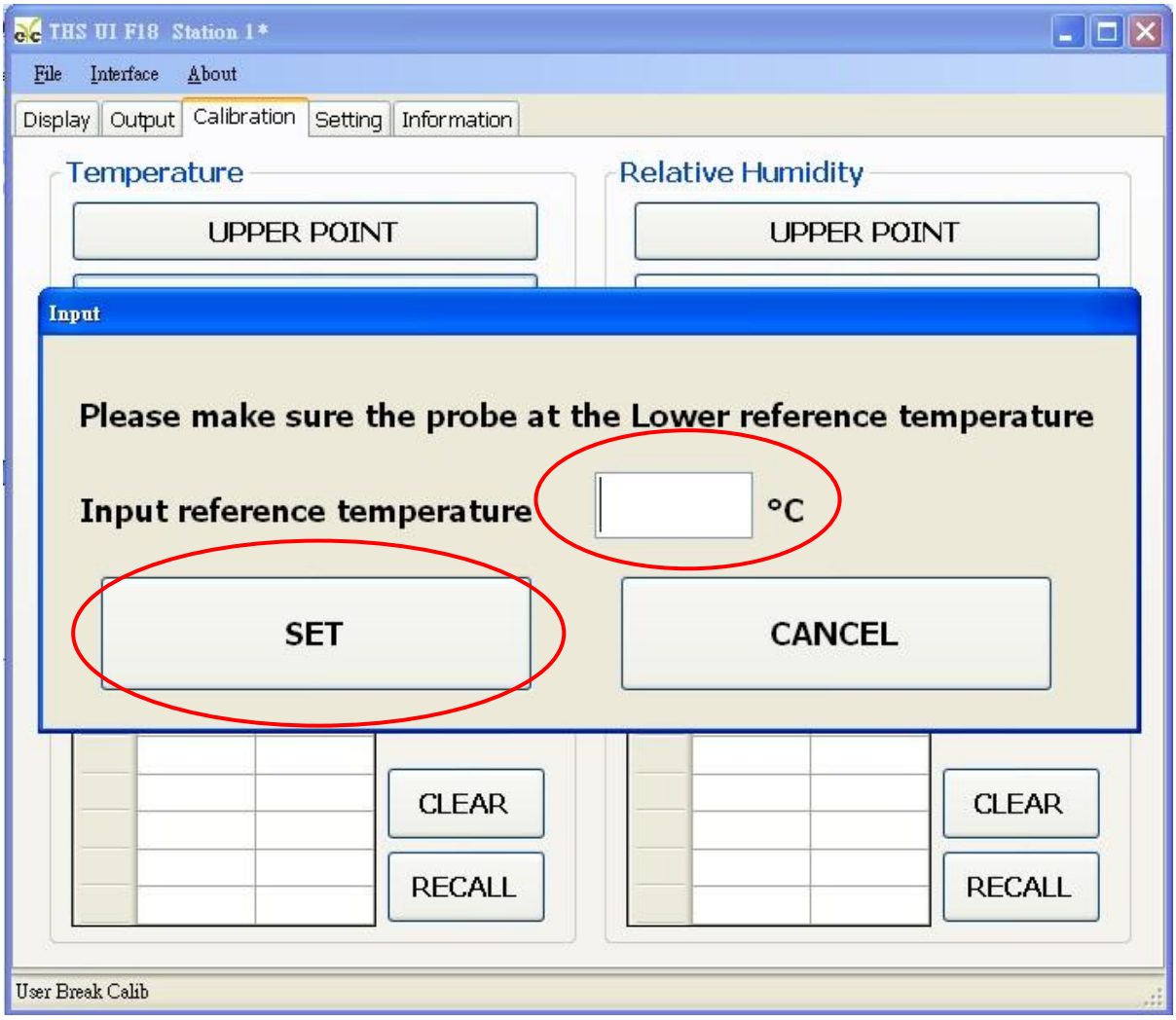


f. That calibrating upper point temperature is done.

2. Calibrate lower point of temperature
   a. Put the sensor unit of product in the temperature control box, and adjust the lower point of temperature (ex: 0℃)
   b. The difference temperature between Upper and Lower point must be at least 30℃.
   c. Wait the temperature of control box is becoming stable
   d. Click Temperature > LOWER POINT



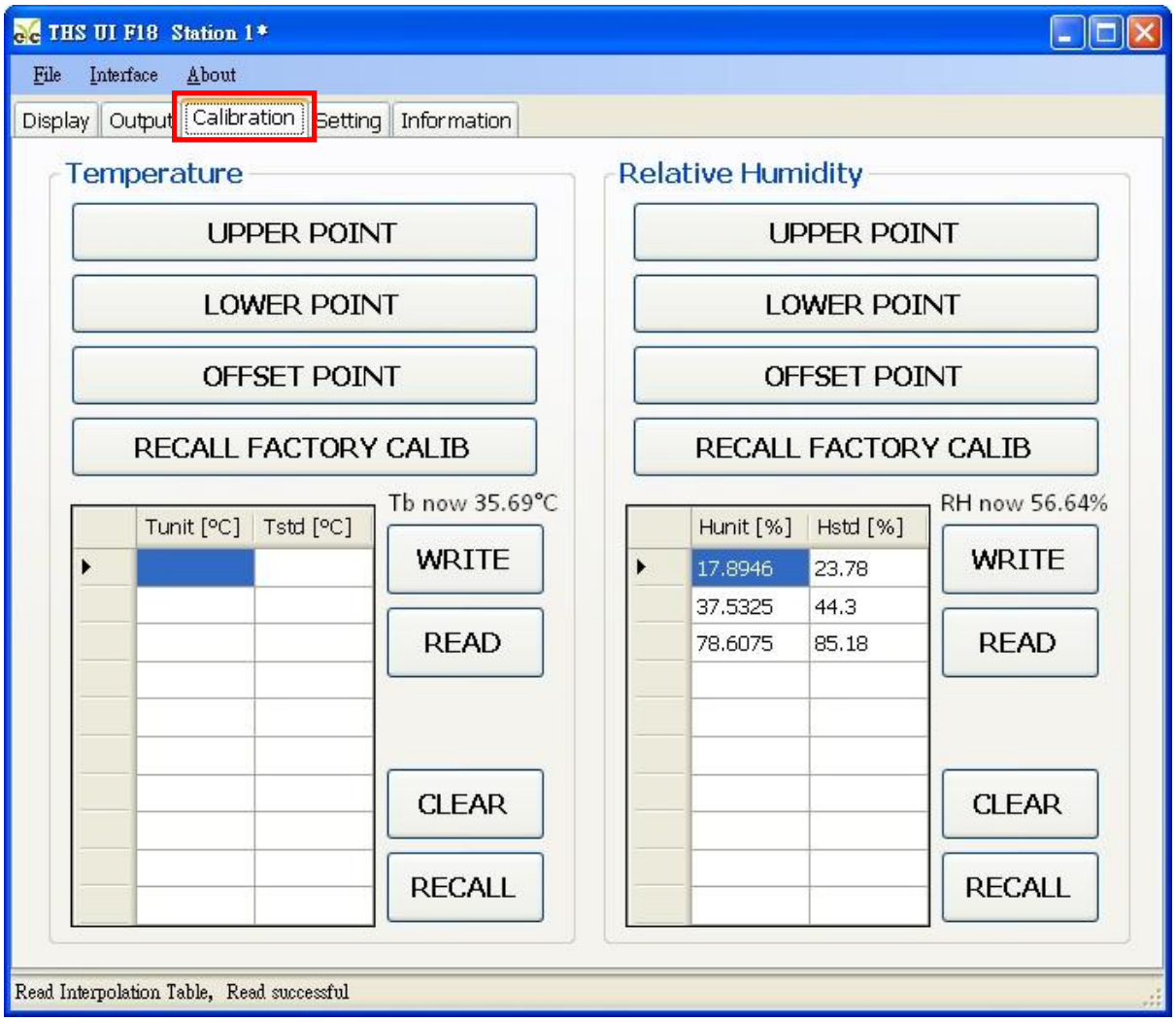
e. Input reference temperature, then click ” SET”



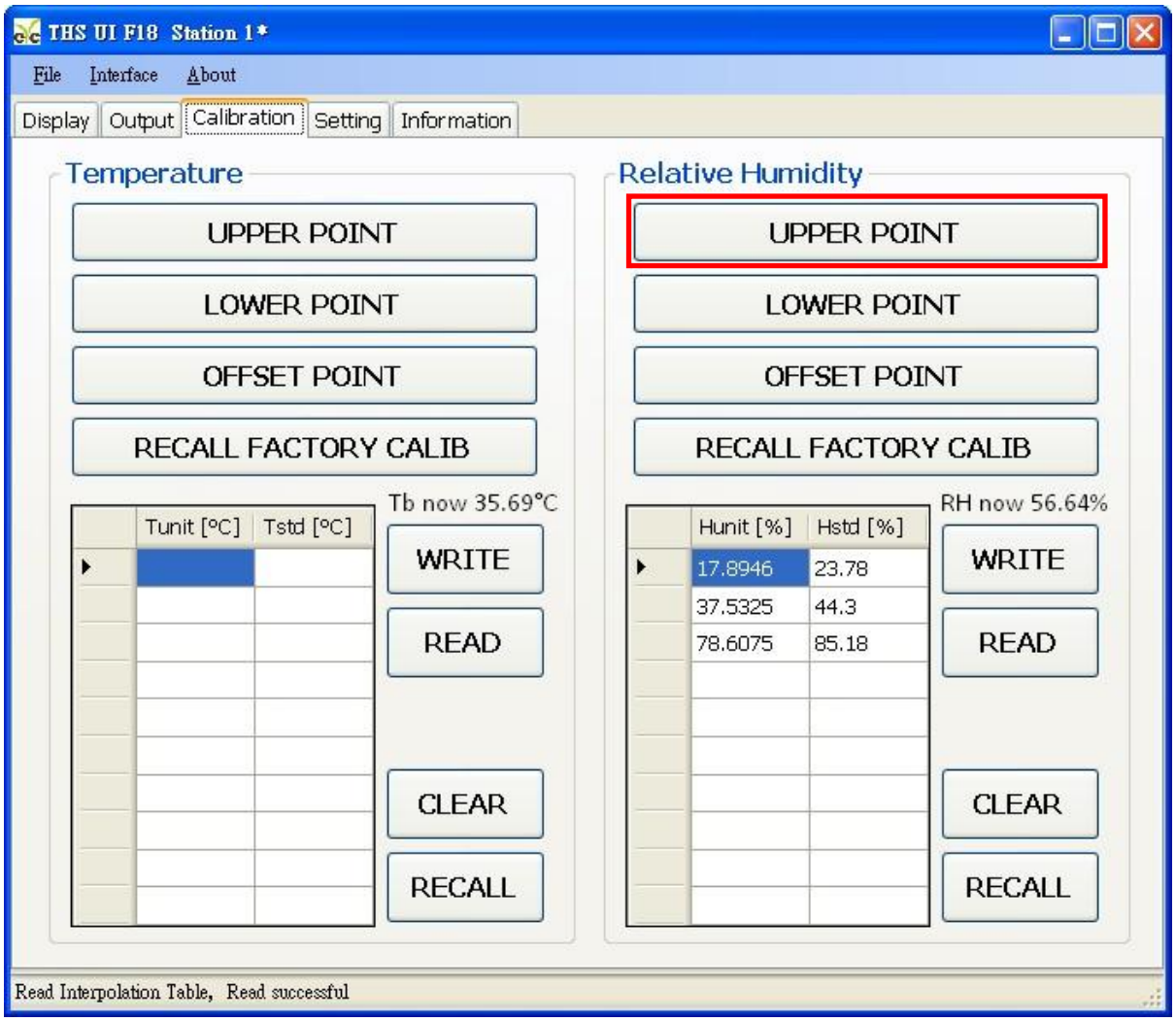
f. That calibrating lower point temperature is done.

5.8 Humidity Calibration with two points

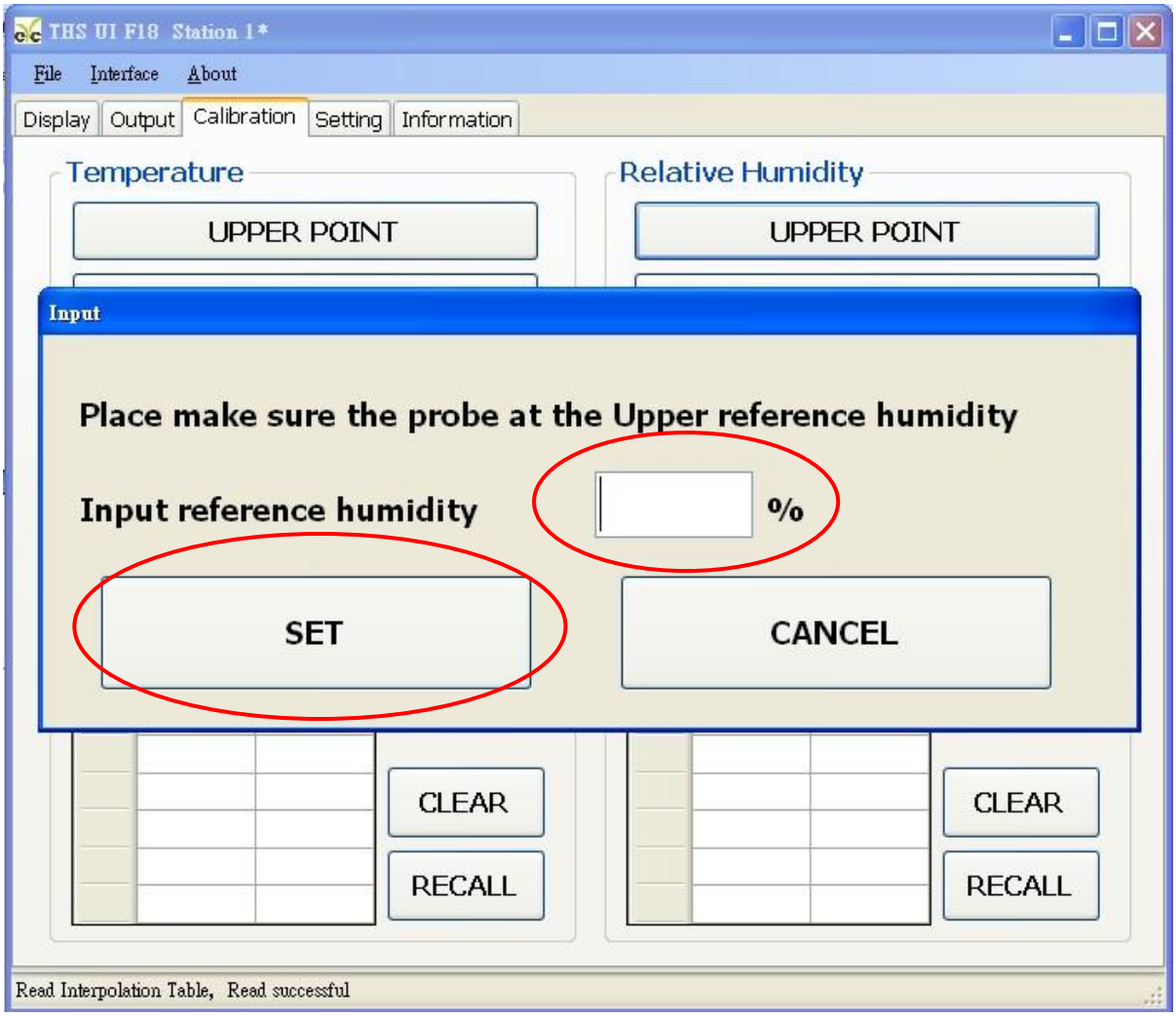
1. Calibrate Upper point of humidity
   a. Click "Calibration"



b. Put the sensor unit of product in the humidity control box, and adjust upper point of humidity (ex: RH 80%)
c. Wait the humidity of control box is becoming stable.
d. Click Relative Humidity > UPPER POINT

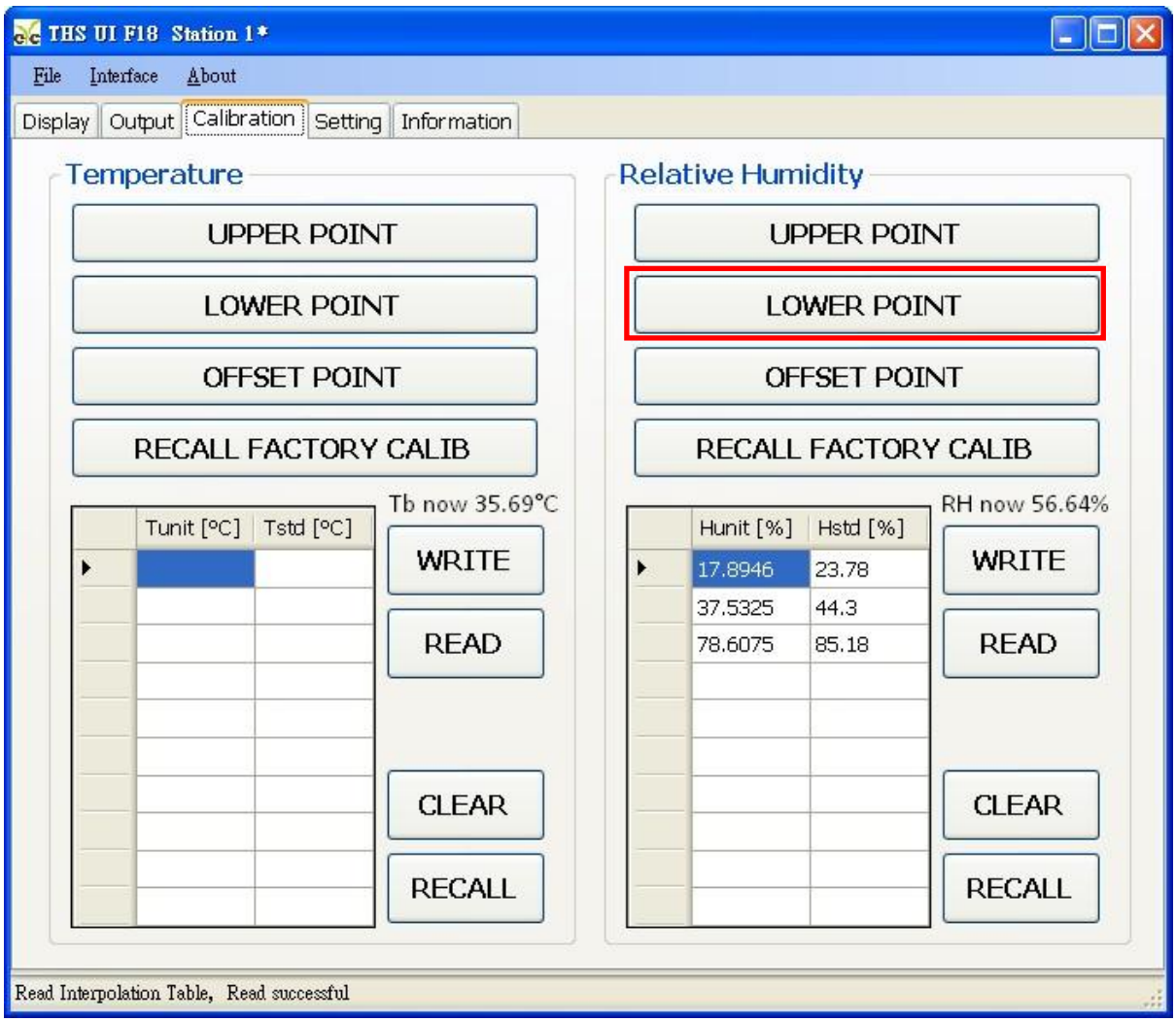


e. Input reference humidity, then click ” SET”

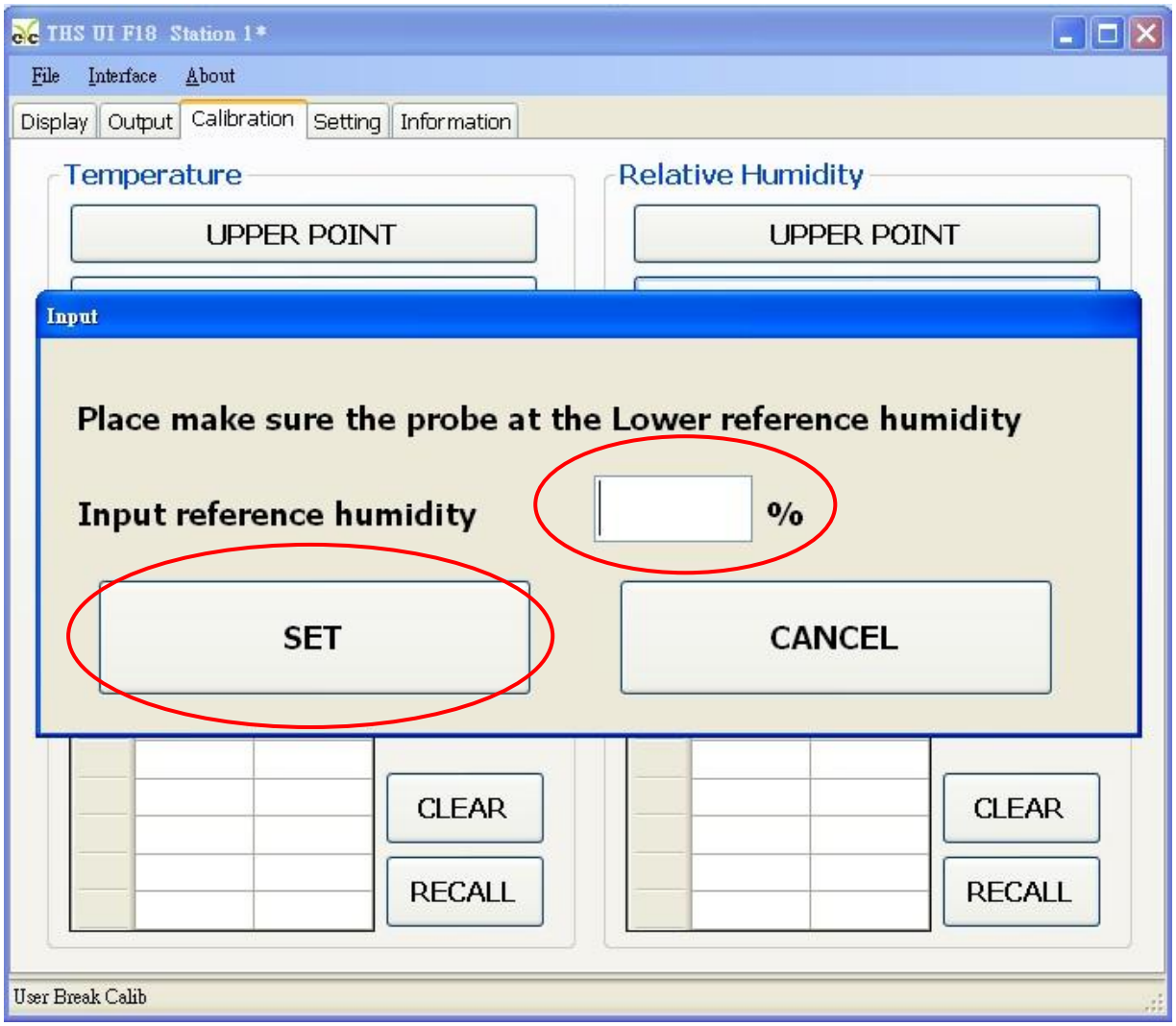


f. That calibrating upper point humidity is done.

2. Calibrate humidity lower point
   a. Put the sensor unit of product in the humidity control box, and adjust lower point of humidity (ex: RH 20%)
   b. Wait the humidity of control box is becoming stable.
   c. Click Relative Humidity > LOWER POINT



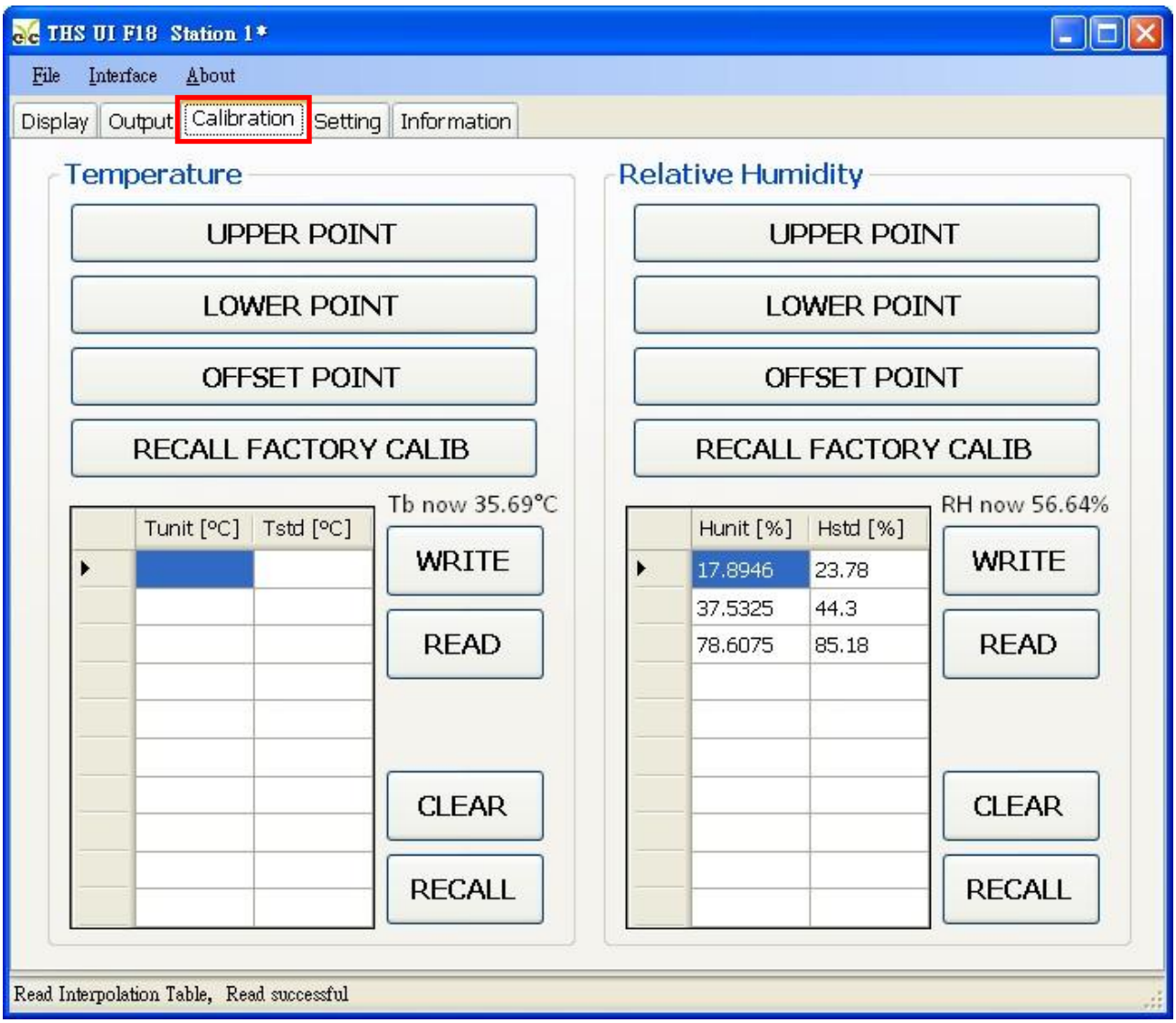
d. Input reference humidity, then click ” SET”



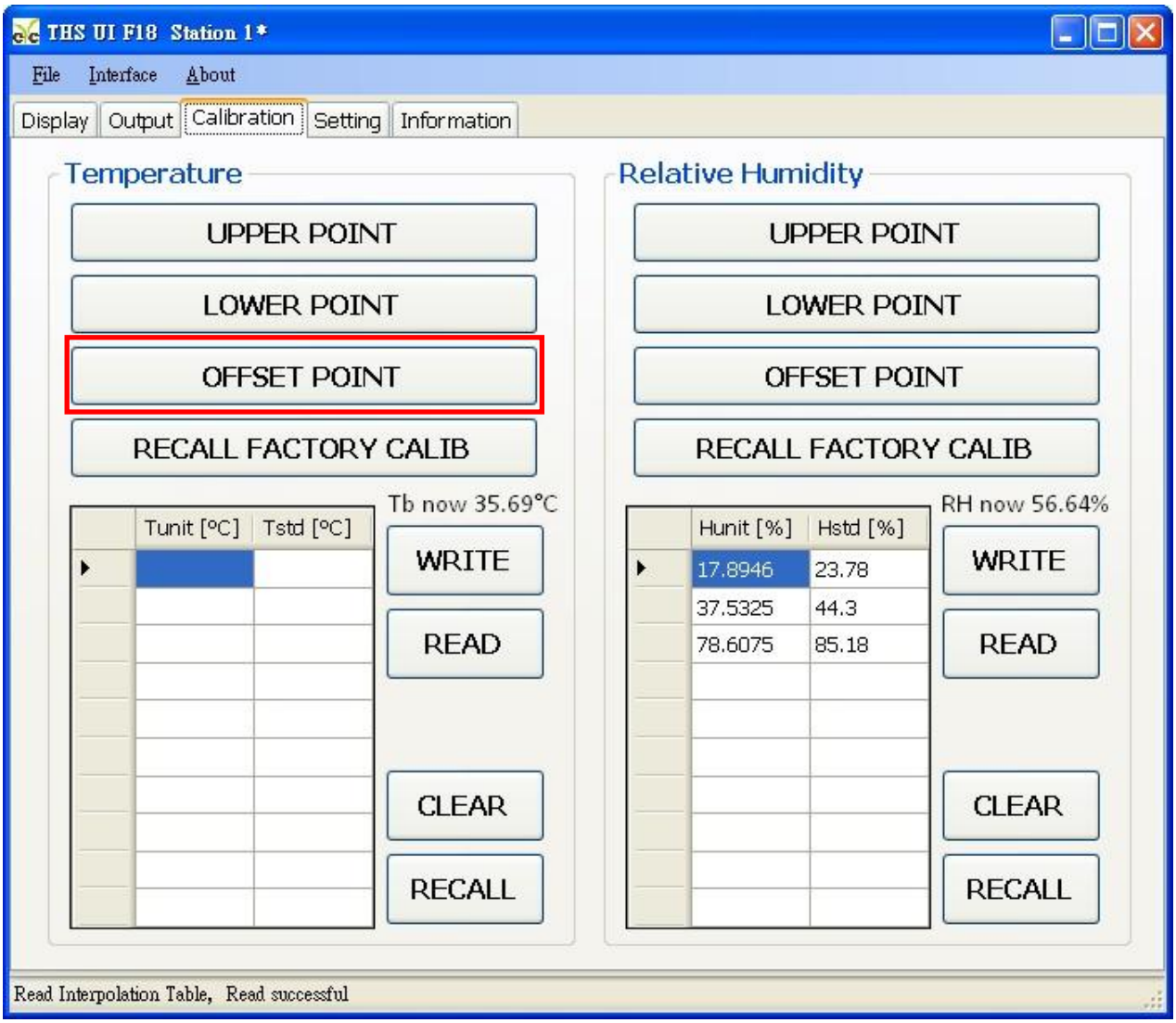
e. That calibrating lower point humidity is done.

5.9 Temperature Calibration with signal points

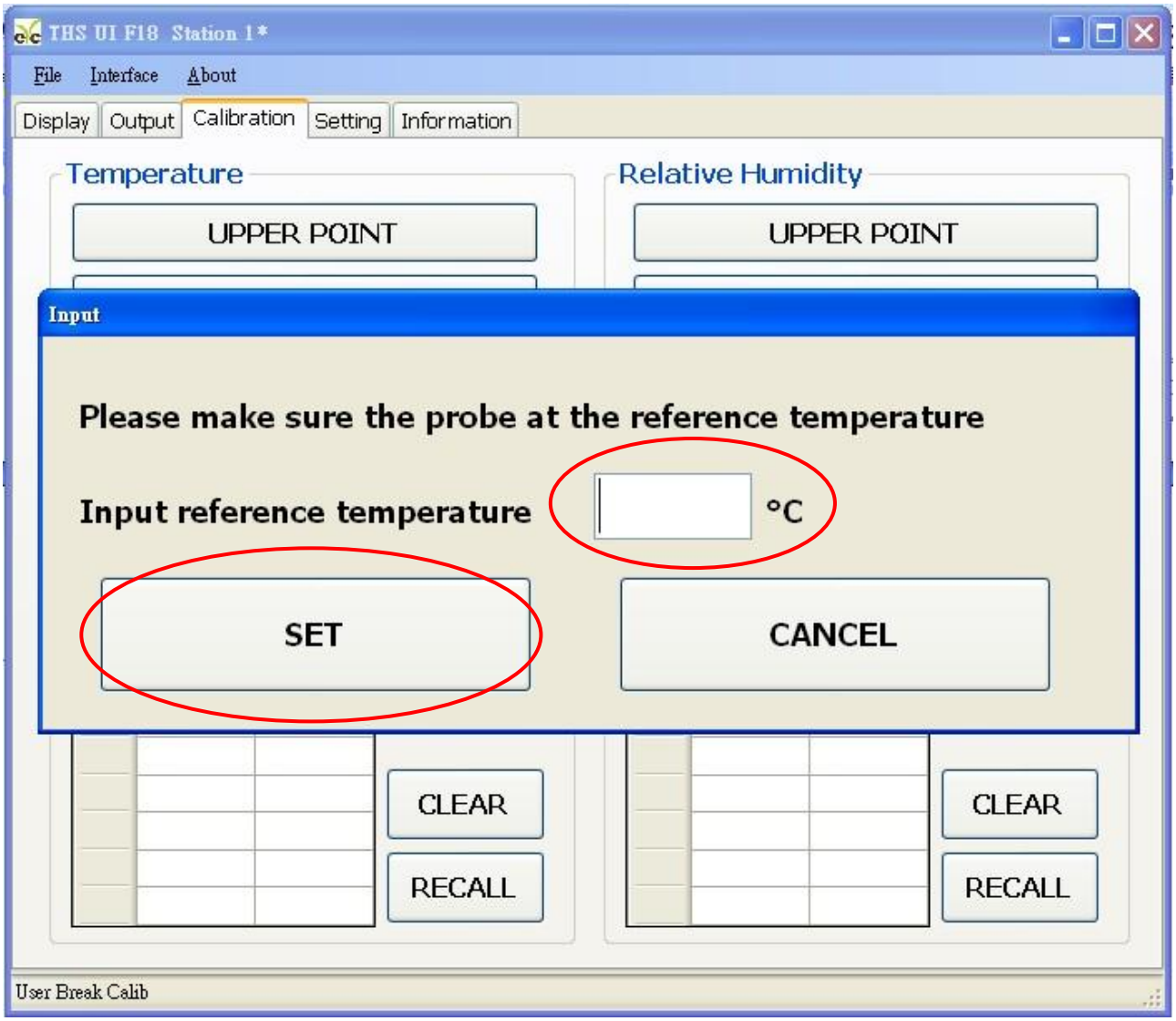
1. Click "Calibration"



2. Put the sensor unit of product in the temperature control box, and adjust the temperature point which you want to calibrate (ex: 50℃)
3. Wait the temperature of control box is becoming stable.
4. Click Temperature > OFFSET POINT



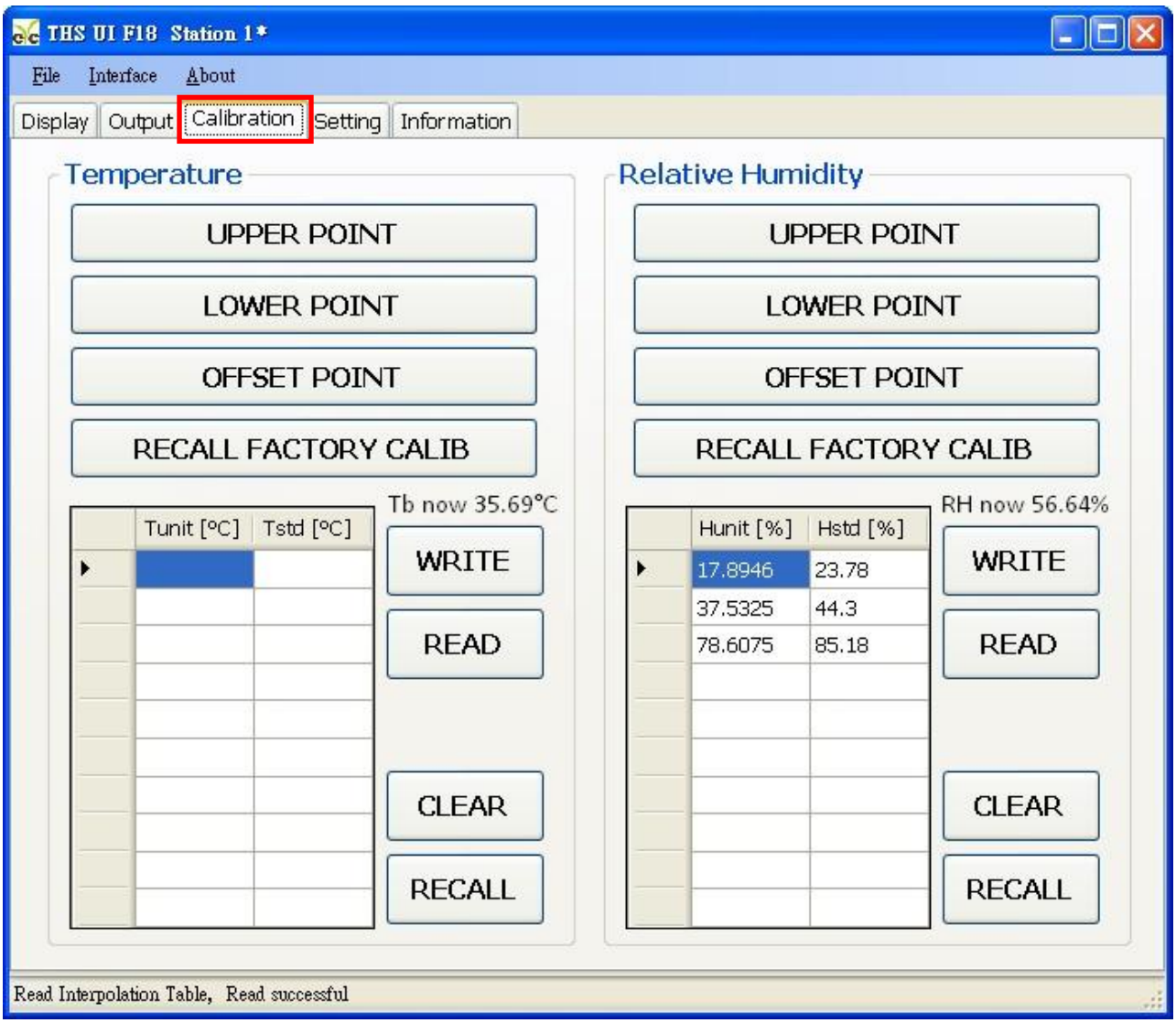
5. Input reference temperature, then click" SET"



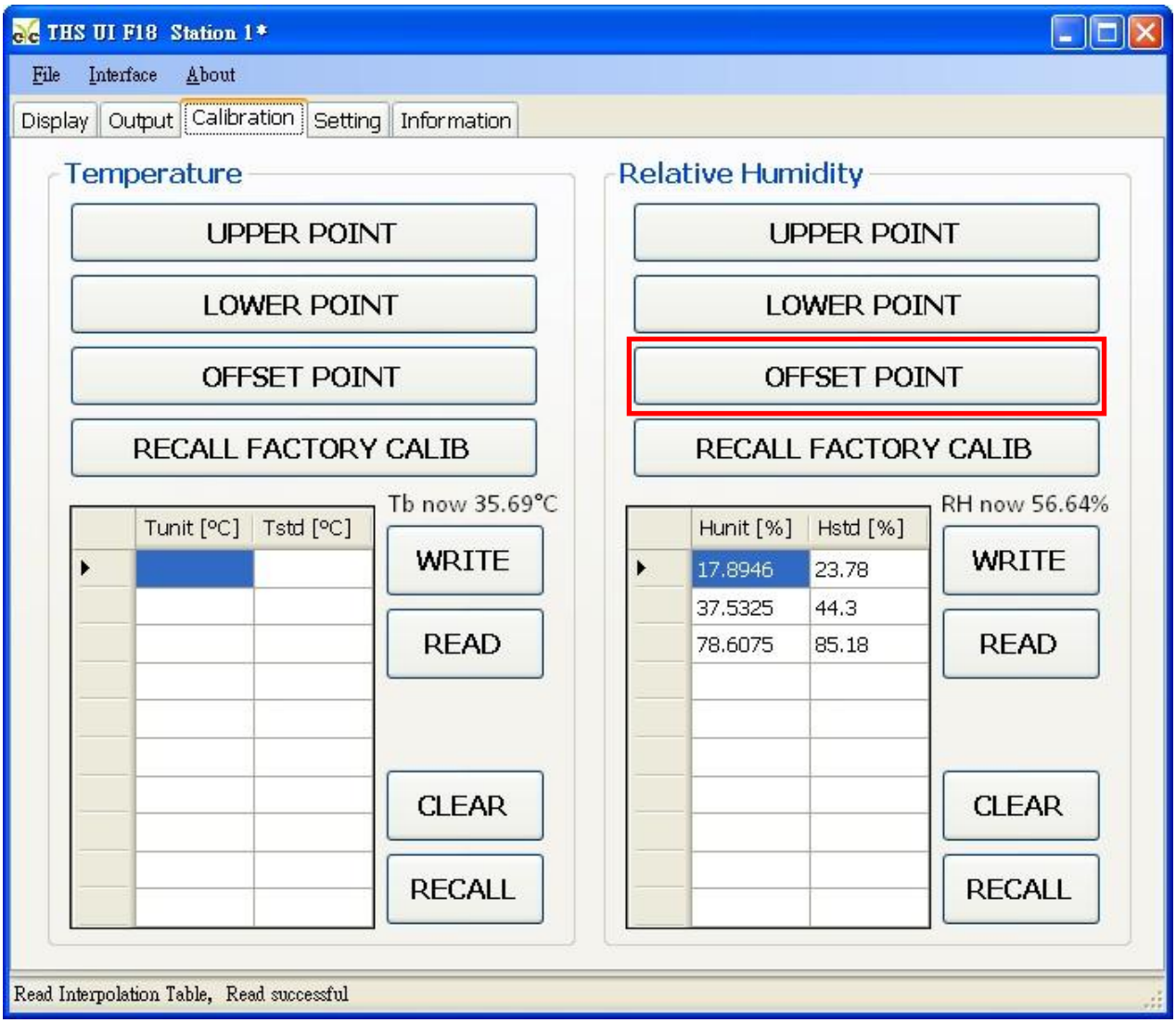
6. That calibrating signal point temperature is done.

5.10 Humidity Calibration with signal point

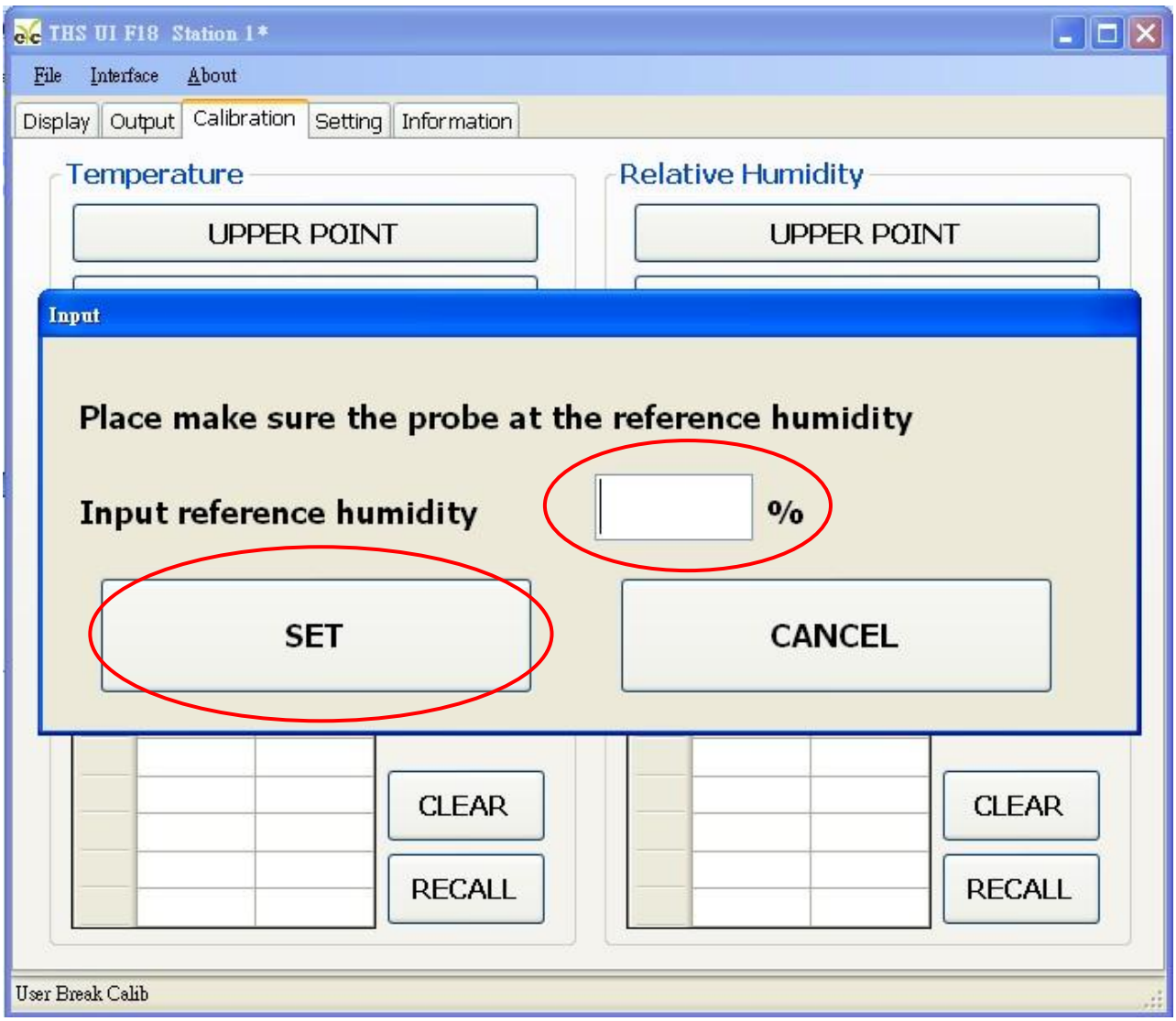
1. Click” Calibration”



2. Put the sensor unit of product in humidity control box, then adjust the humidity point which you want to calibrate (ex: 50%)
3. Wait the humidity of control box is becoming stable.
4. Click Relative Humidity > OFFSET POINT



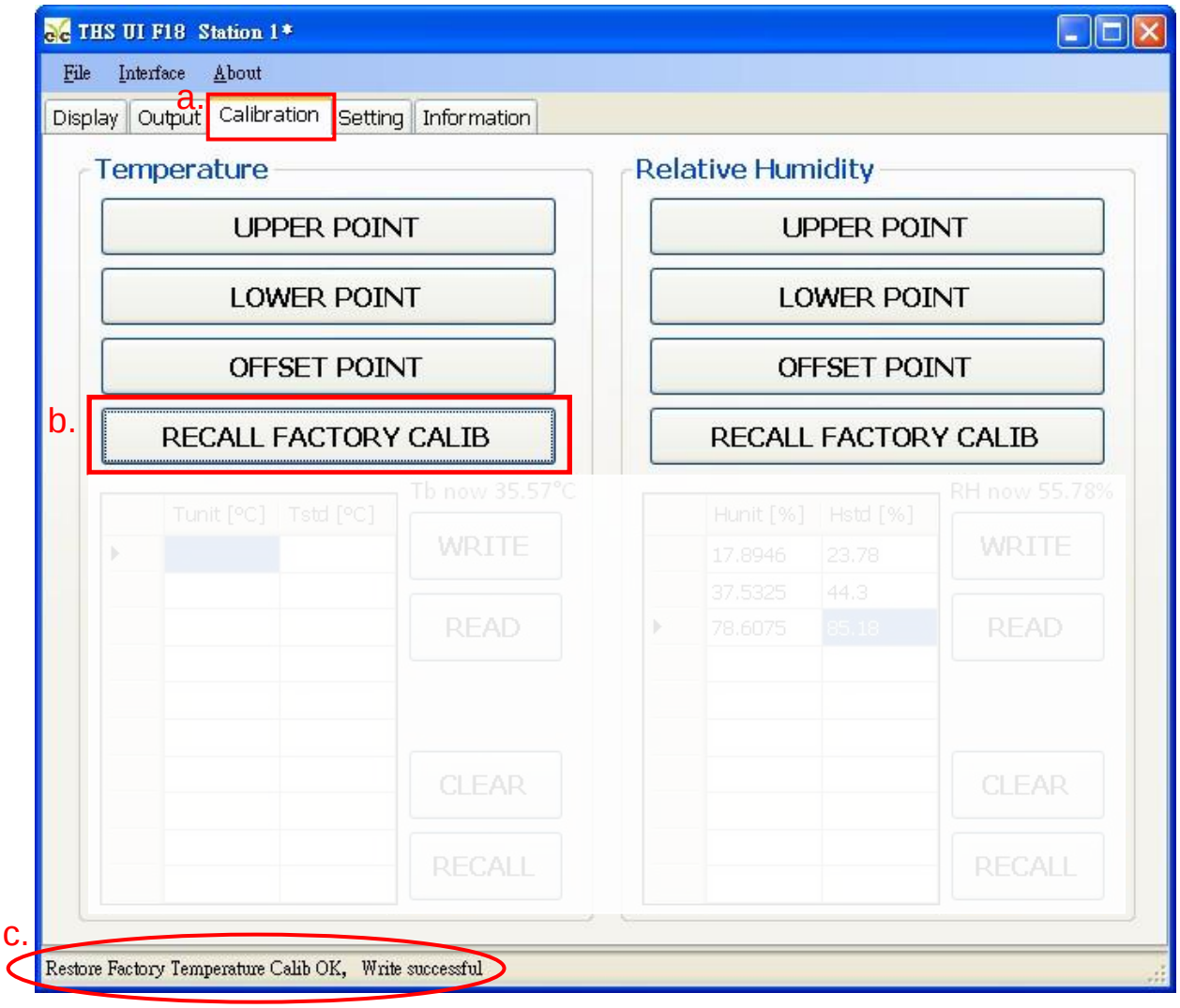
5. Input reference humidity, and then click" SET"



6. That calibrating signal point humidity is done.

5.11 Restore factory setting of signal/two point(s)

1. Restore factory setting temperature
   a. Click “Calibration”
   b. Click temperature > RECALL FACTORY CALIB
   c. Show ” Restore Factory Temperature Calib OK, Write successful”



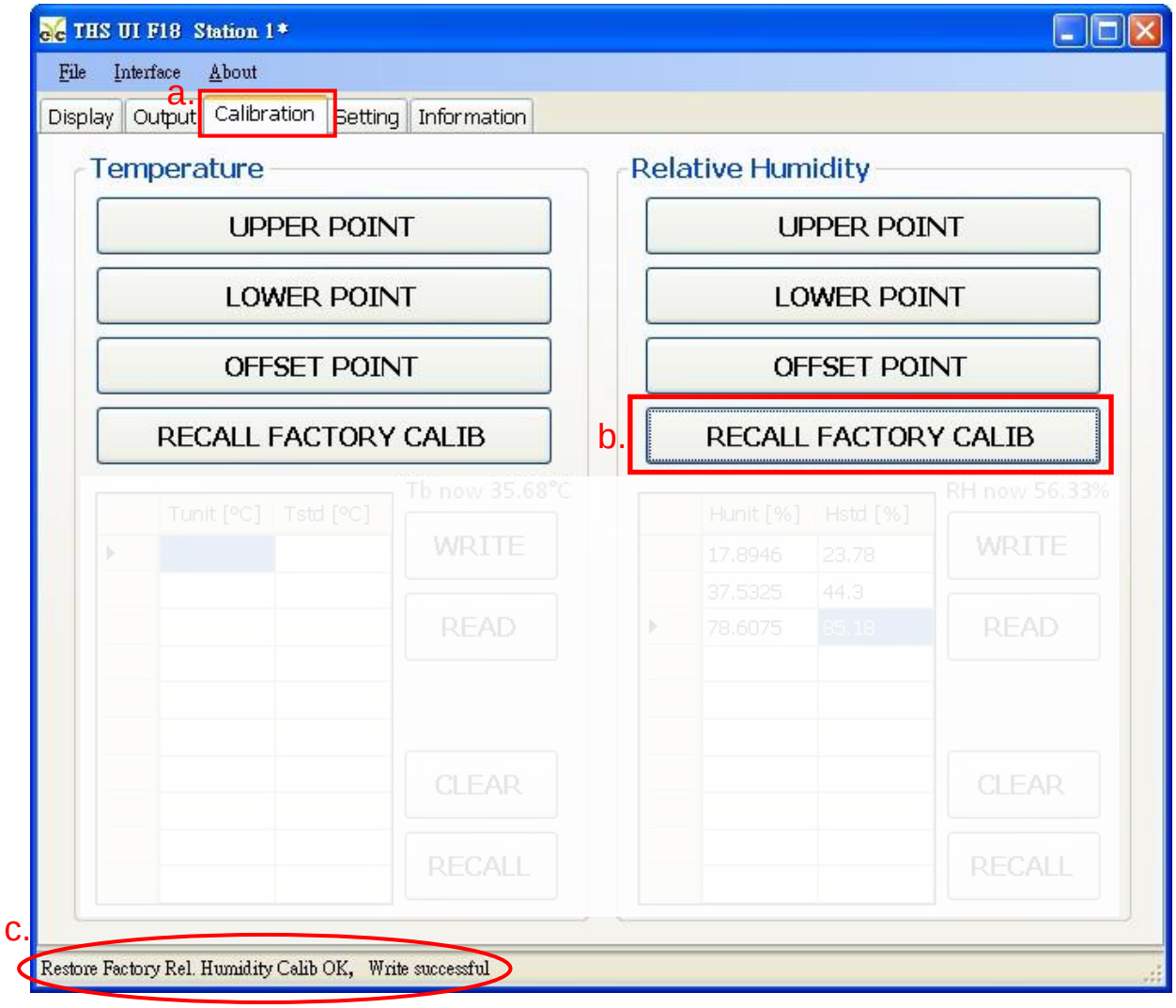
   d. That restore temperature of factory setting is done.

2. Restore humidity of factory setting

a. Click “Calibration”

b. Clock Relative Humidity > RECALL FACTORY CALIB

c. Show ” Restore Factory Rel. Humidity Calib OK, Write successful”

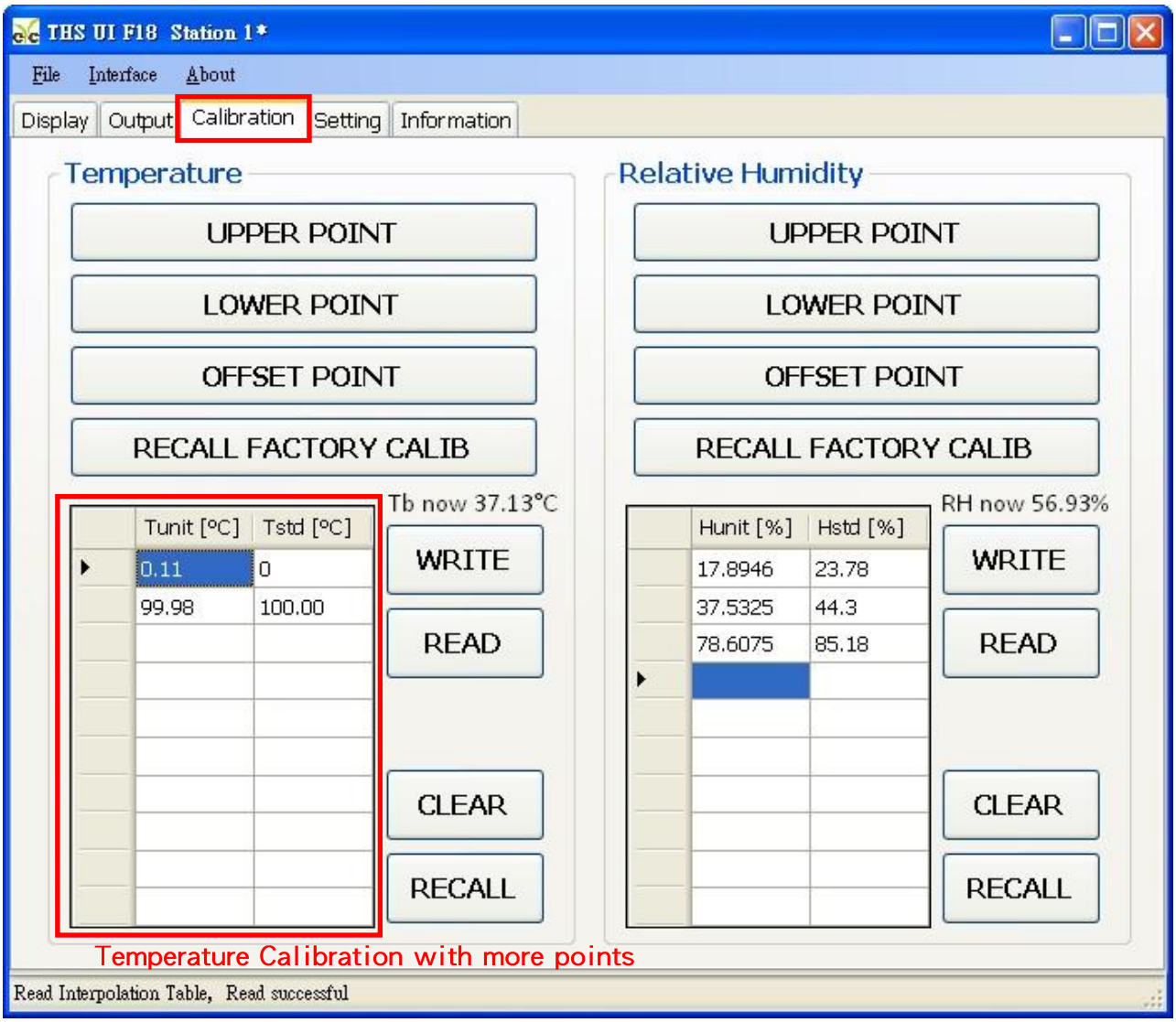


d. That restore humidity of factory setting is done.

5.12 Temperature Calibration with more points

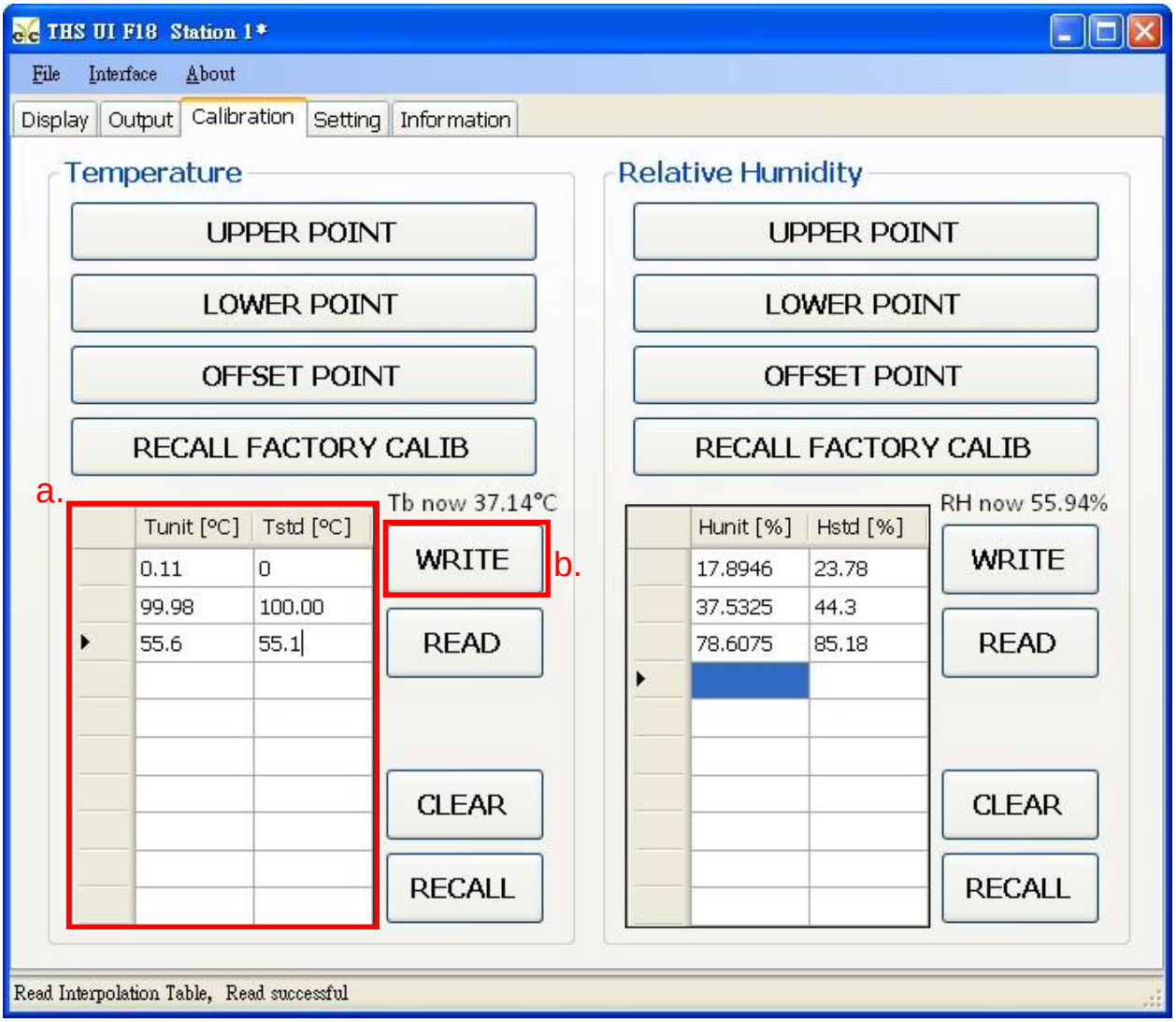
※ Because of that the product has high accuracy and using this calibration way can influence linear accuracy, we do not suggest to use this calibration way.

1. click "Calibration"



Statement：The existing value is record of more points of calibrating which was executed by factory when operators log in Calibration page at the first time.

2. Put the sensor unit of product in the environment of temperature which you want to calibrate
3. Wait the environment of temperature is becoming stable
4. Retain the factory setting：
   a. Input the value which you want to calibrate in the Temperature area (ex: 25℃)
      a-1. Tunit[℃] Value which product shows
      a-2. Tstd[℃] Standard calibration value
      ※1：Please enter calibration points in the blank, 10 points maximal.
      ※2：The interval between two points should be 10℃ above.
      ※3：Execute step 6 when you want to repeat the calibration points and factory setting points or the temperature is less than 10℃.

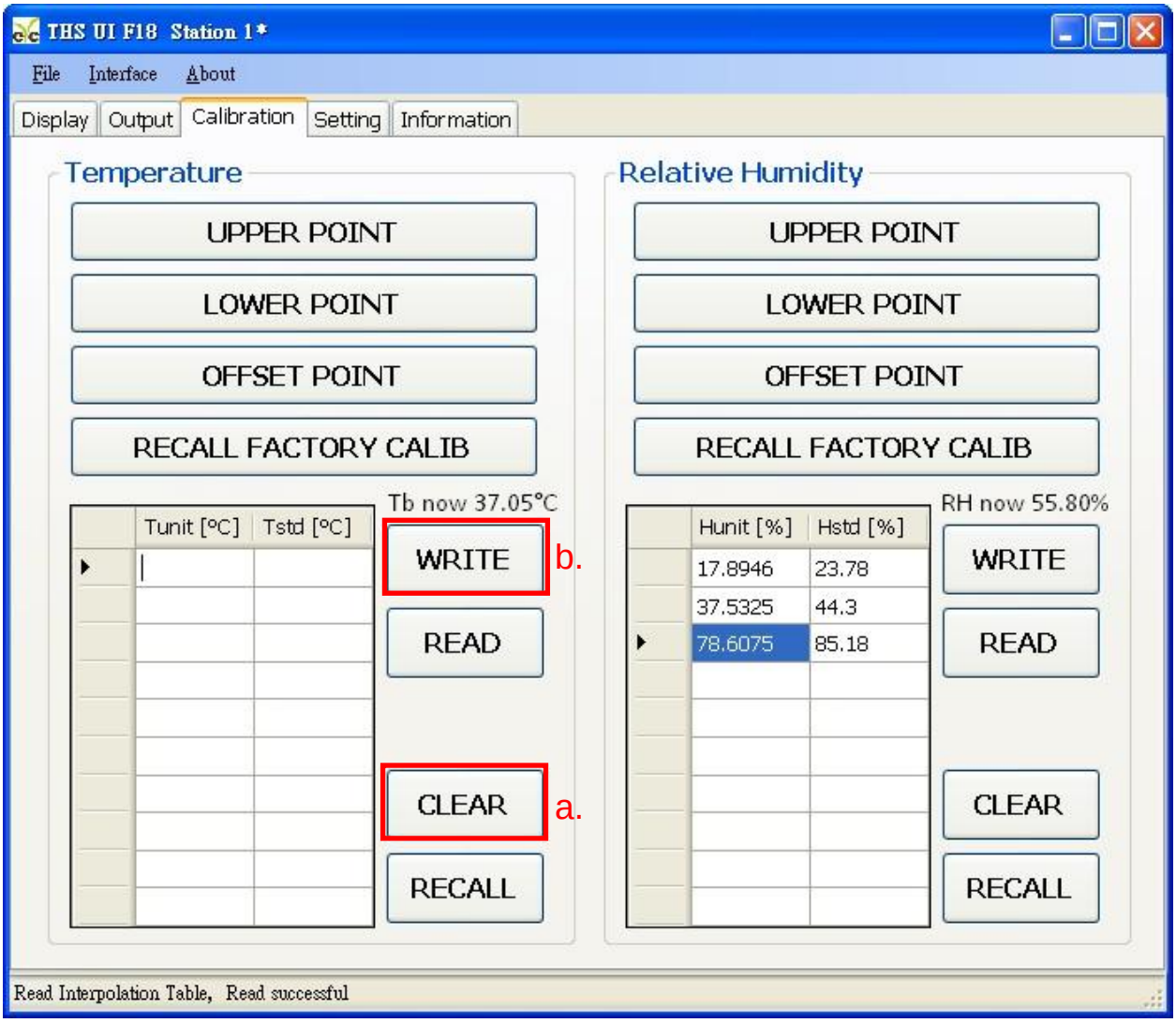


   b. click Temperature > WRITE

5. Delete factory setting：

a. click Temperature > CLEAR (clear data)

b. Click Temperature > WRITE (clear factory setting)



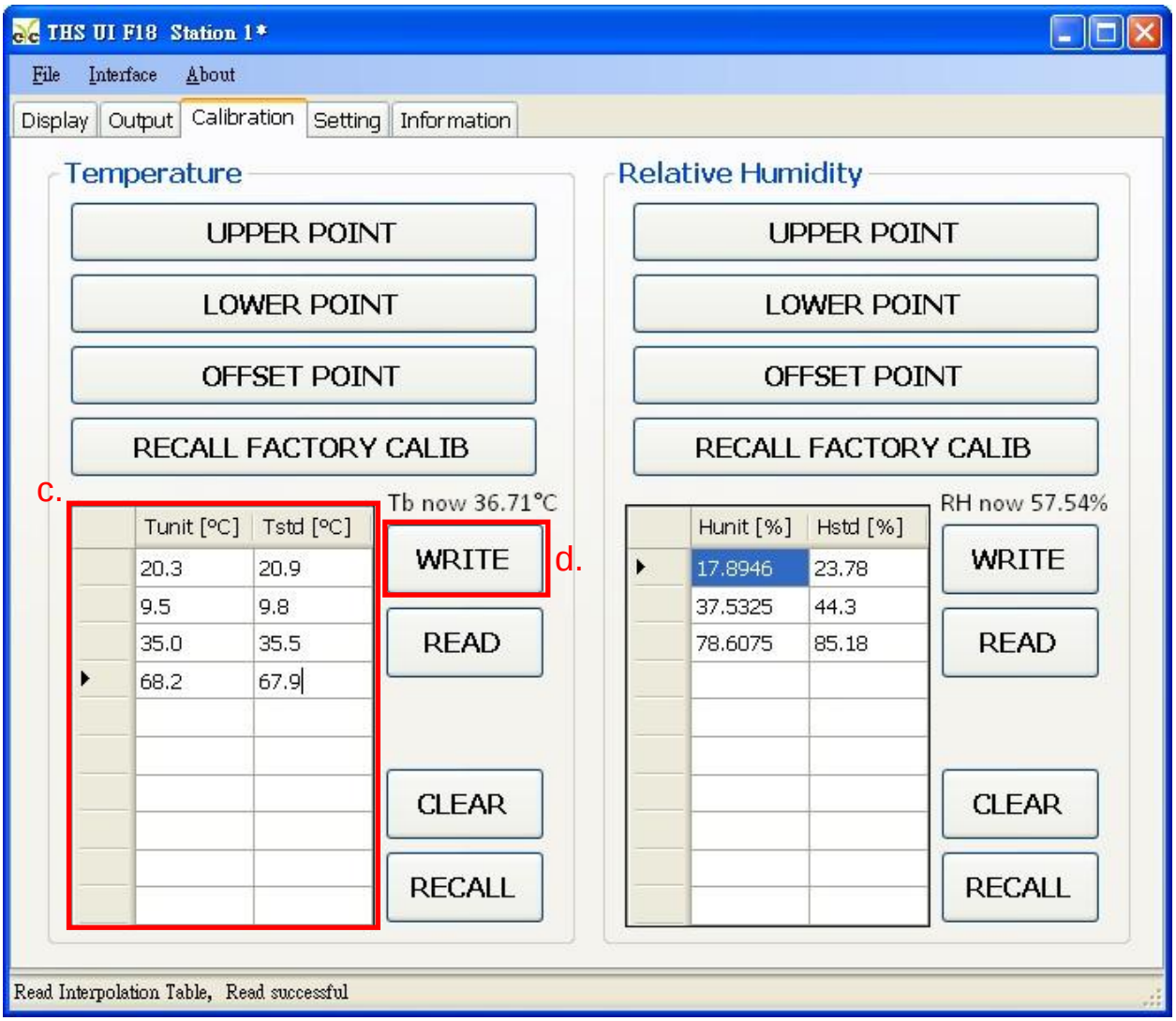
c. Input the value which you want to calibrate

c-1. Tunit[℃]：Value which product shows

c-2. Tstd[℃]：Standard value of calibration

※1：Please enter calibration points in the blank, 10 points maximal.

※2：The interval between two points should be 10℃ above.



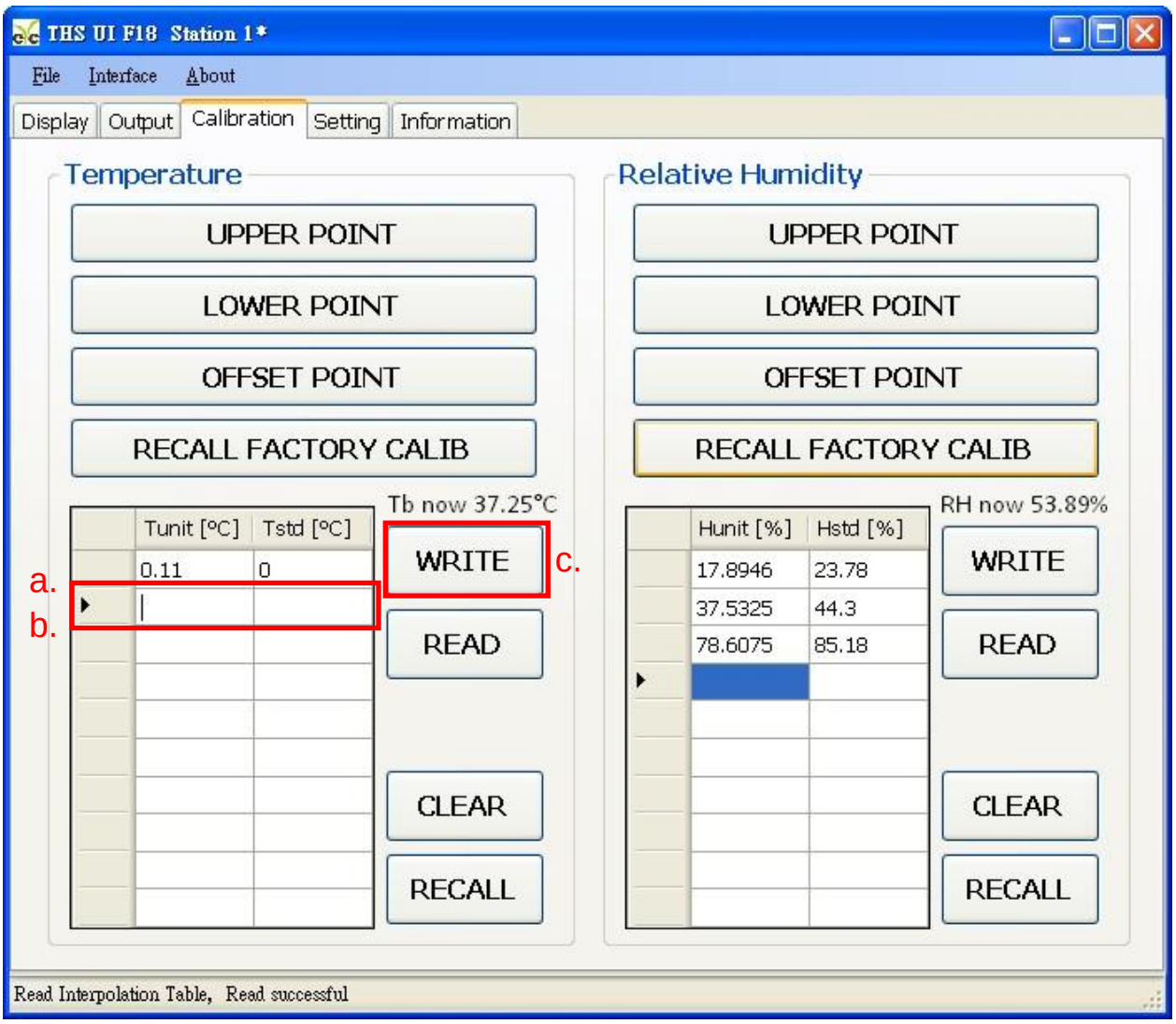
d. click Temperature > WRITE

6. Retain the part of factory setting：

a. Click left keyboard twice on the mouse on the factory setting which you want to delete

b. Click delete icon of Keyboard or right keyboard of mouse to clear data

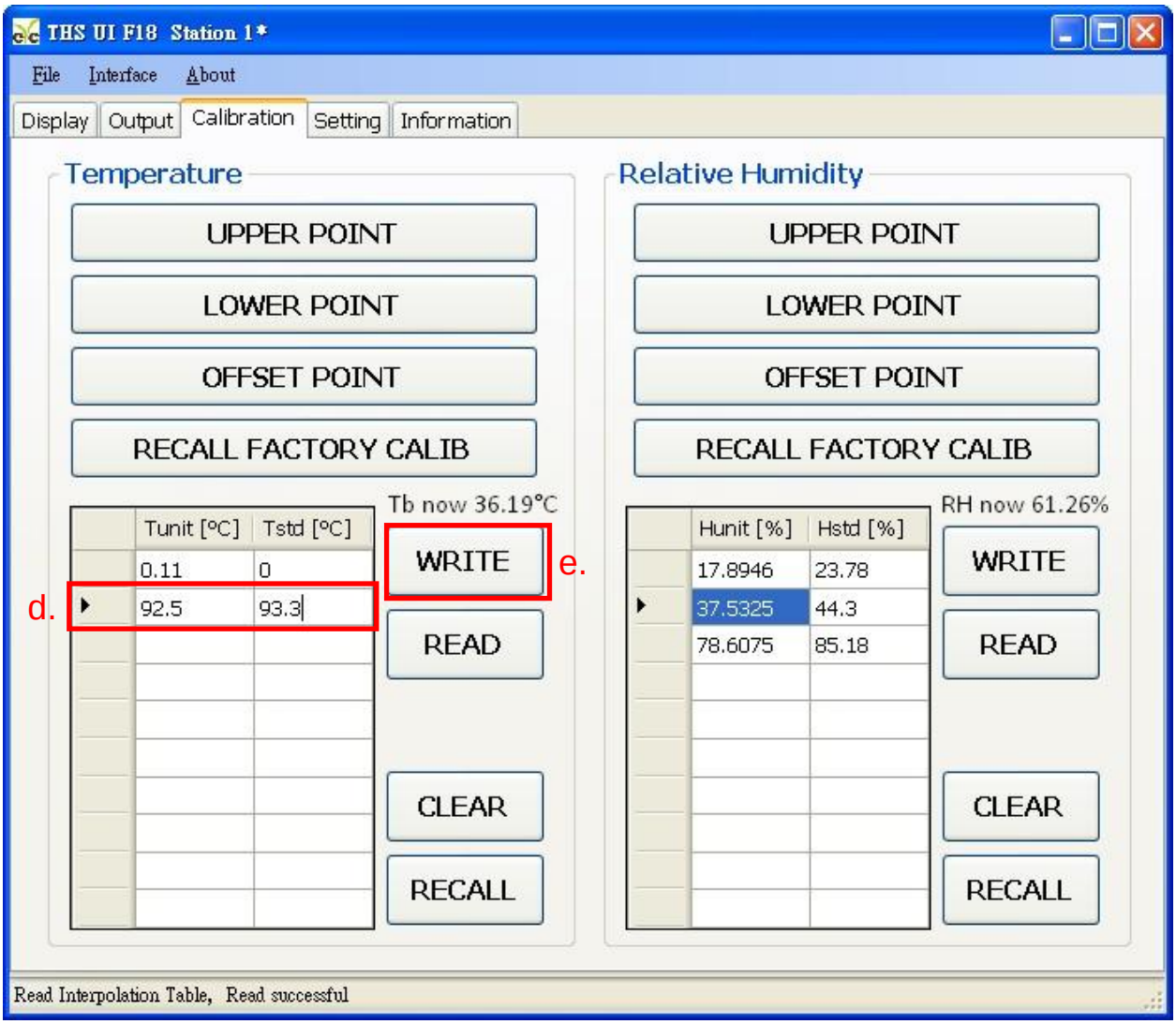
c. Click Temperature > WRITE (clear factory setting)



d. Input the value which you want to calibrate

d-1. Tunit[%]：Value which product shows

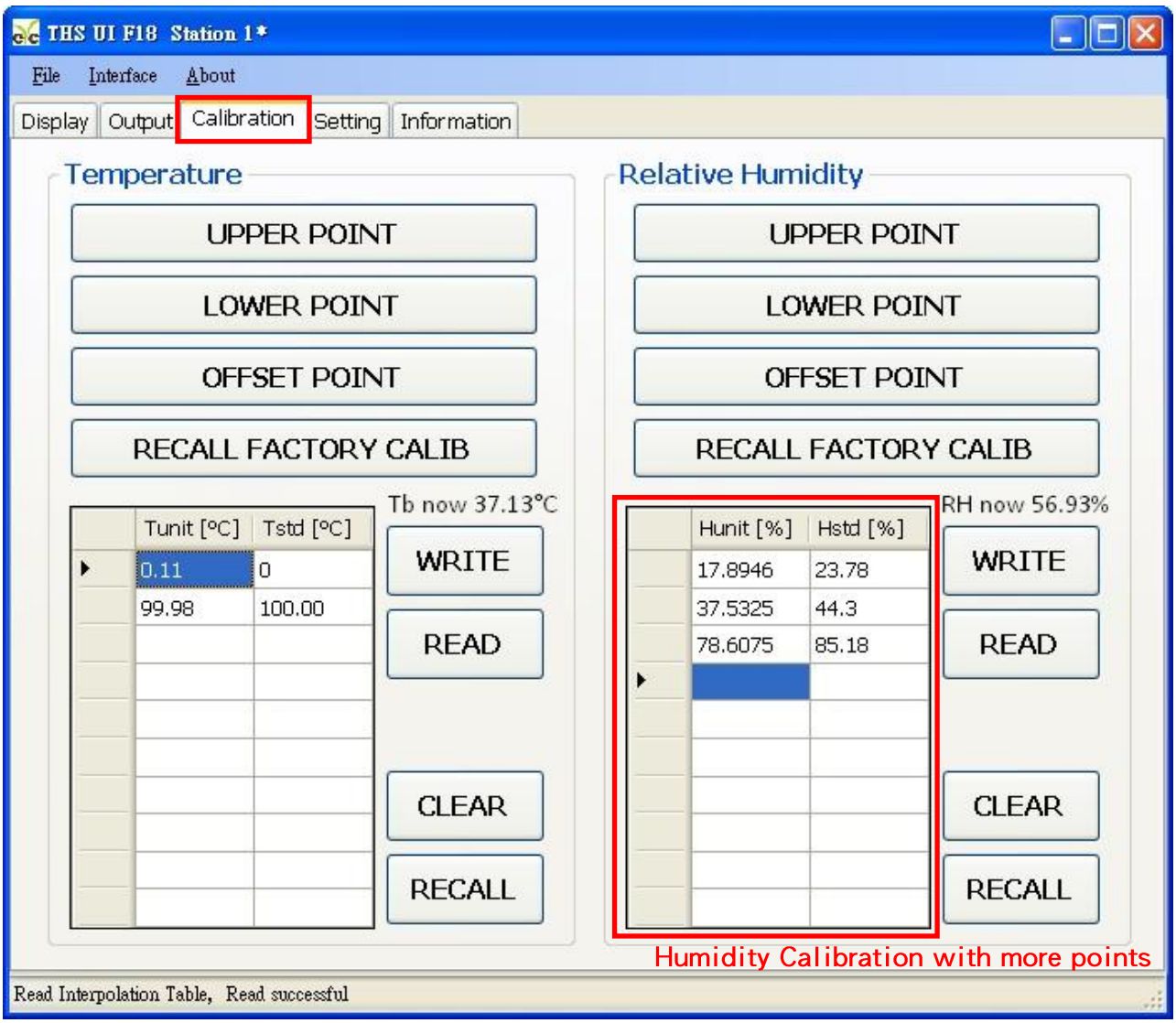
d-2. Tstd[%]：Standard value of calibration



e. click Temperature > WRITE

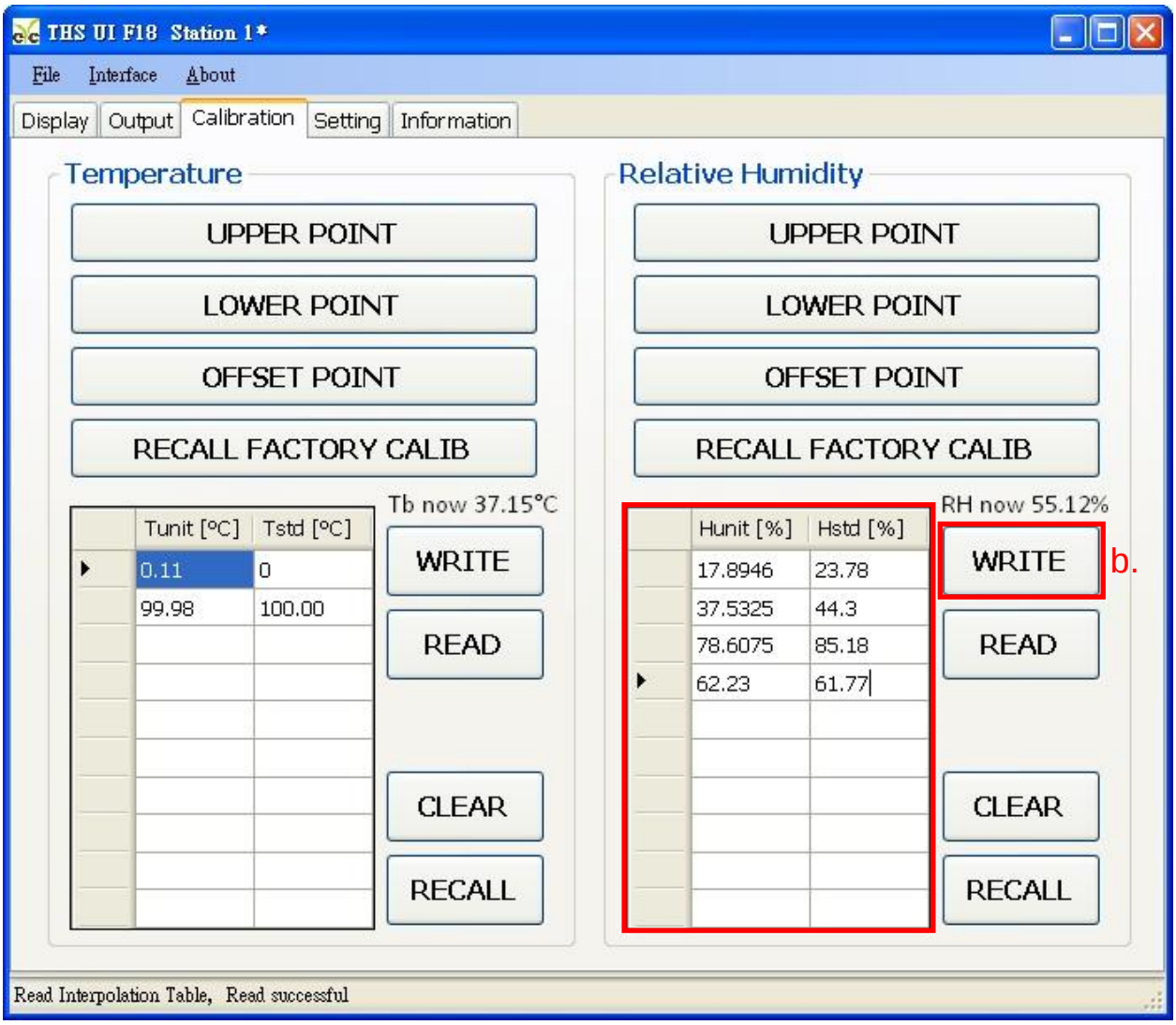
5.13 Humidity Calibration with more points

1. Click "Calibration"



Statement：The existing value is record of more points of calibrating which was executed by factory when operators log in Calibration page at the first time.

2. Put the sensor unit of product in the environmental of humidity which you want to calibrate
3. Wait the environmental of humidity is becoming stable
4. Retain the factory setting：
   a. Input the value which you want to calibrate in the Relative Humidity area
      a-1. Hunit[%]：Value which product shows
      a-2. Hstd[%]：Standard value of calibration
      ※1：Please enter calibration points in the blank, 10 points maximal.
      ※2：The interval between two points should be 10% above.
      ※3：Execute step 6 when you want to repeat the calibration points and factory setting points or the humidity is less than 10%.

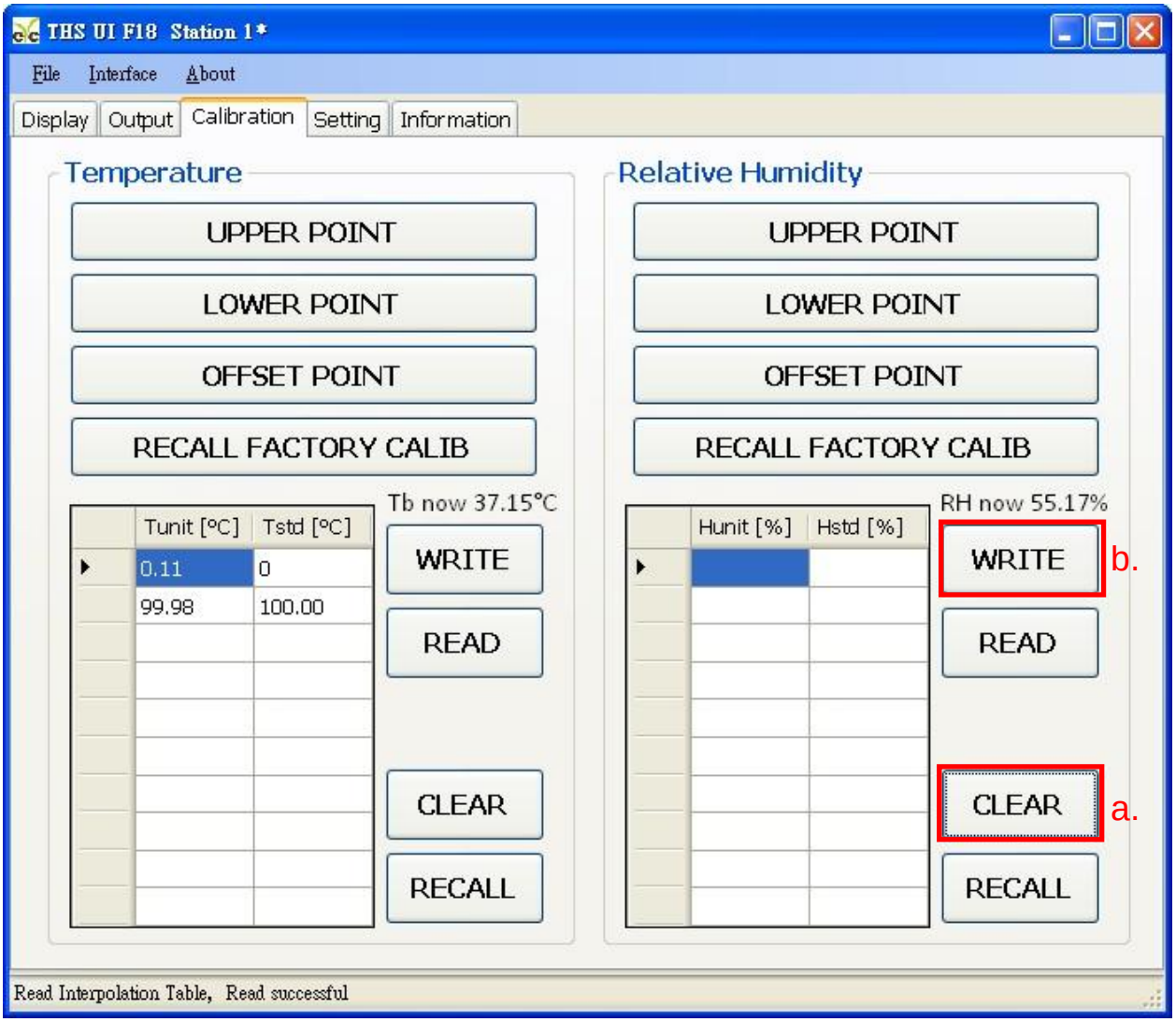


b. click Temperature > WRITE

5. Delete factory setting：

a. click Relative Humidity > CLEAR (clear data)

b. Click Relative Humidity > WRITE (clear factory setting)



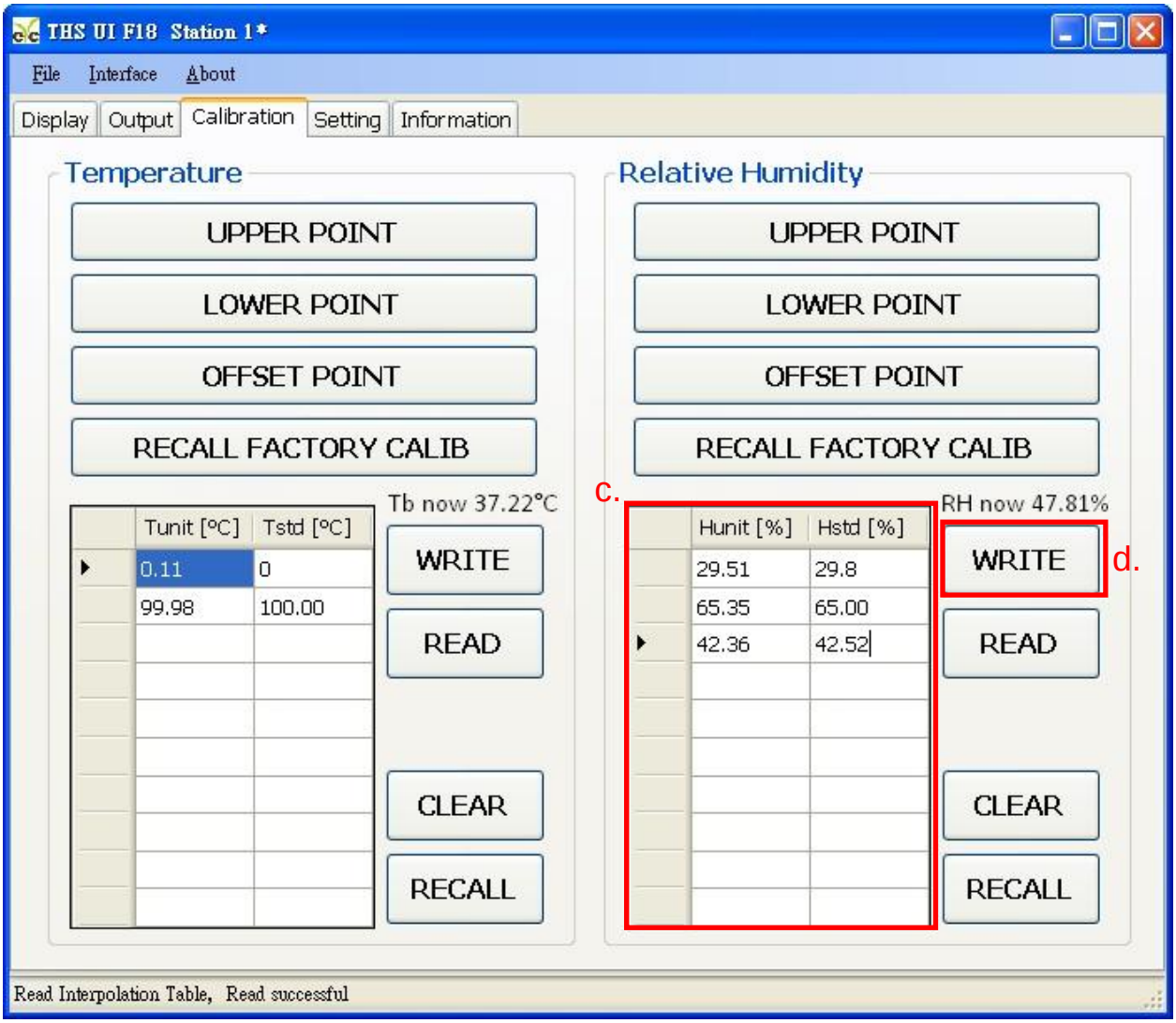
c. Input the value which you want to calibrate in the Relative Humidity area

c-1. Hunit[%]：Value which product shows

c-2. Hstd[%]：Standard value of calibration

※1：Please enter calibration points in the blank, 10 points maximal.

※2：The interval between two points should be 10% above.



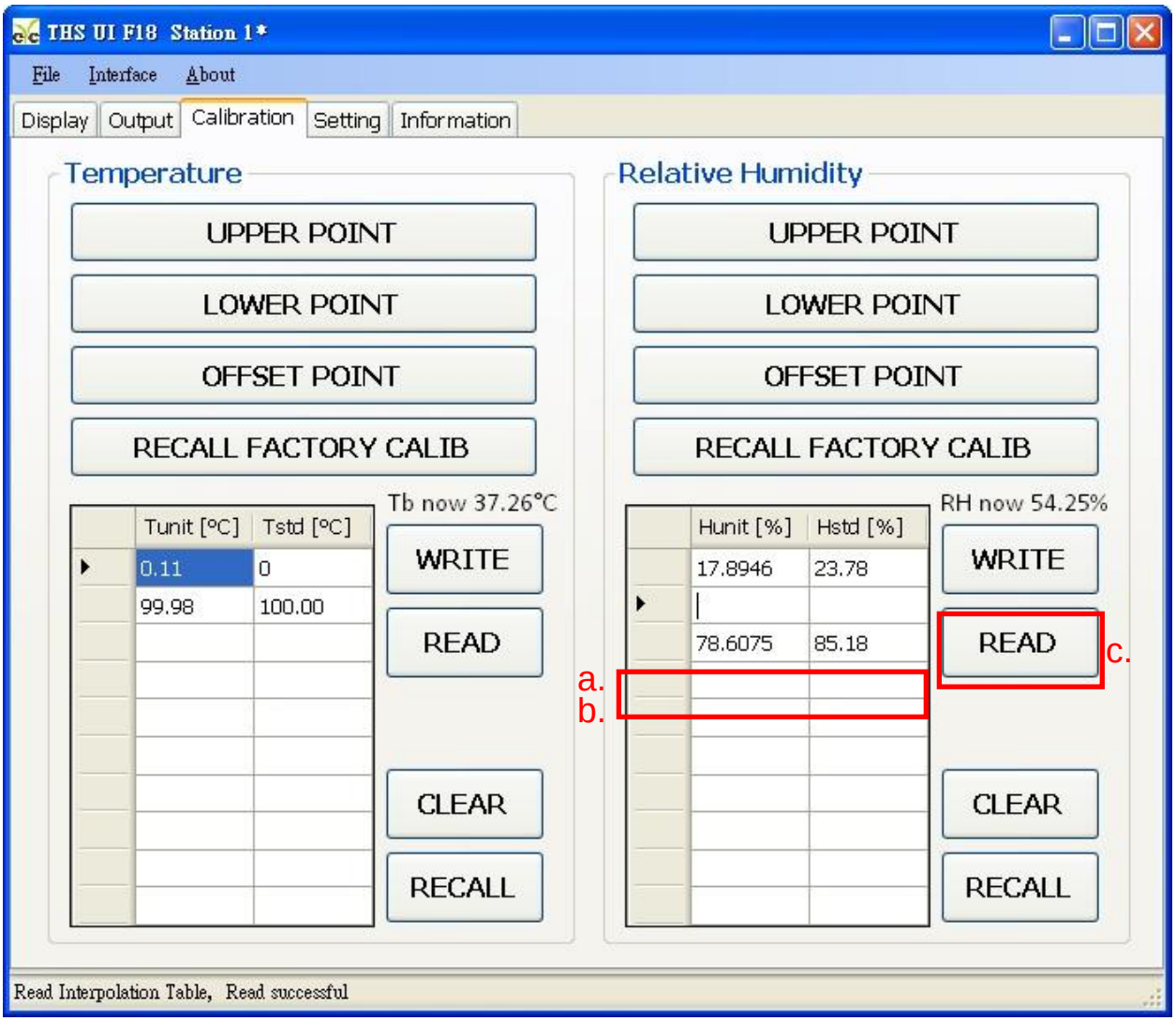
d. click Relative Humidity > WRITE

6. Retain the part of factory setting：

a. Click left keyboard twice on the mouse on the factory setting which you want to delete

b. Click delete icon of Keyboard or right keyboard of mouse to clear data

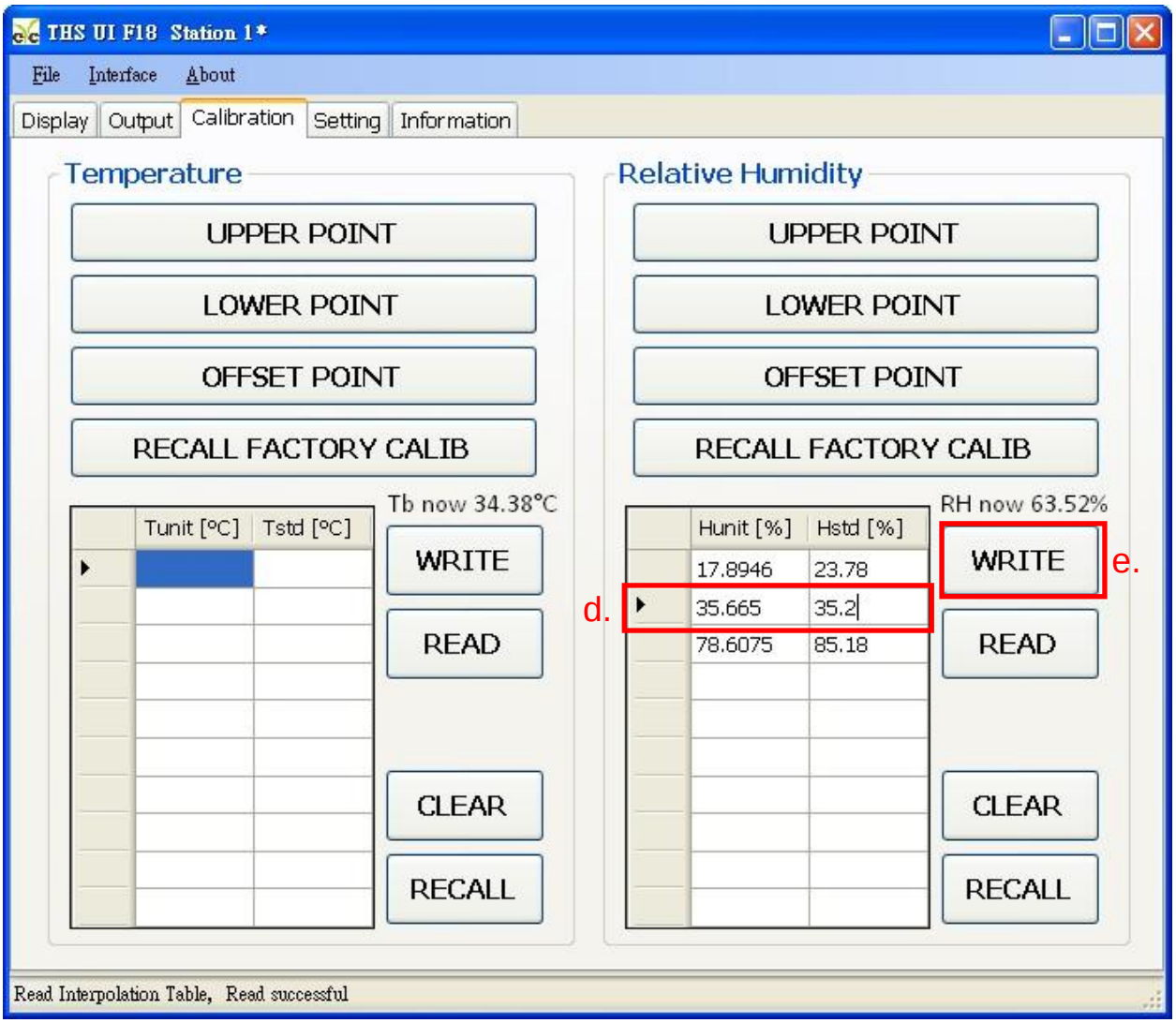
c. Click Relative Humidity > WRITE (clear factory setting)



d. Input the value which you want to calibrate in the Relative Humidity area

d-1. Hunit[%]：Value which product shows

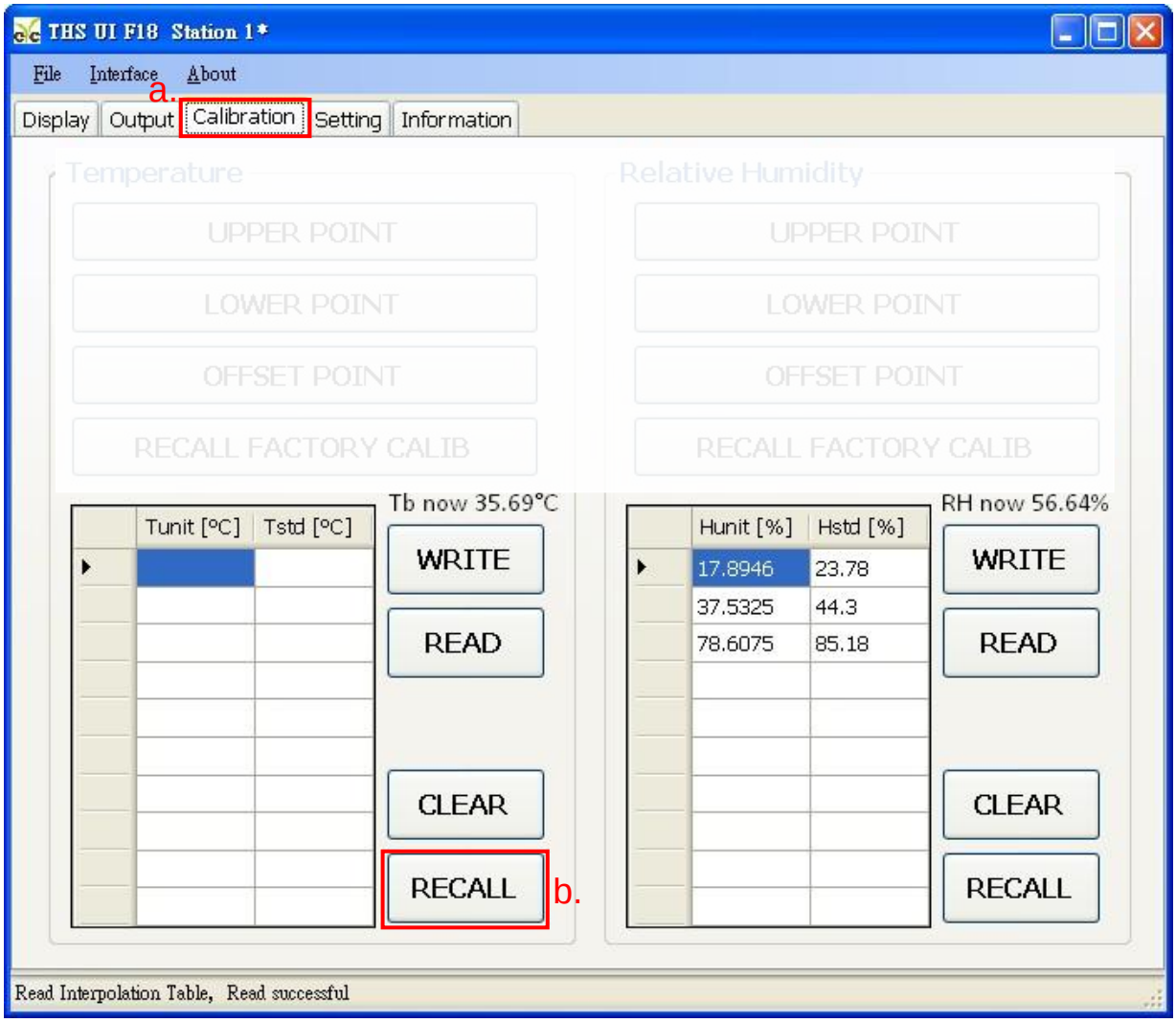
d-2. Hstd[%]：Standard value of calibration



e. Click Relative Humidity > WRITE

5.14 Restore factory setting of more points

1. Recall temperature of factory setting
   a. Click “Calibration”
   b. Click Temperature > RECALL

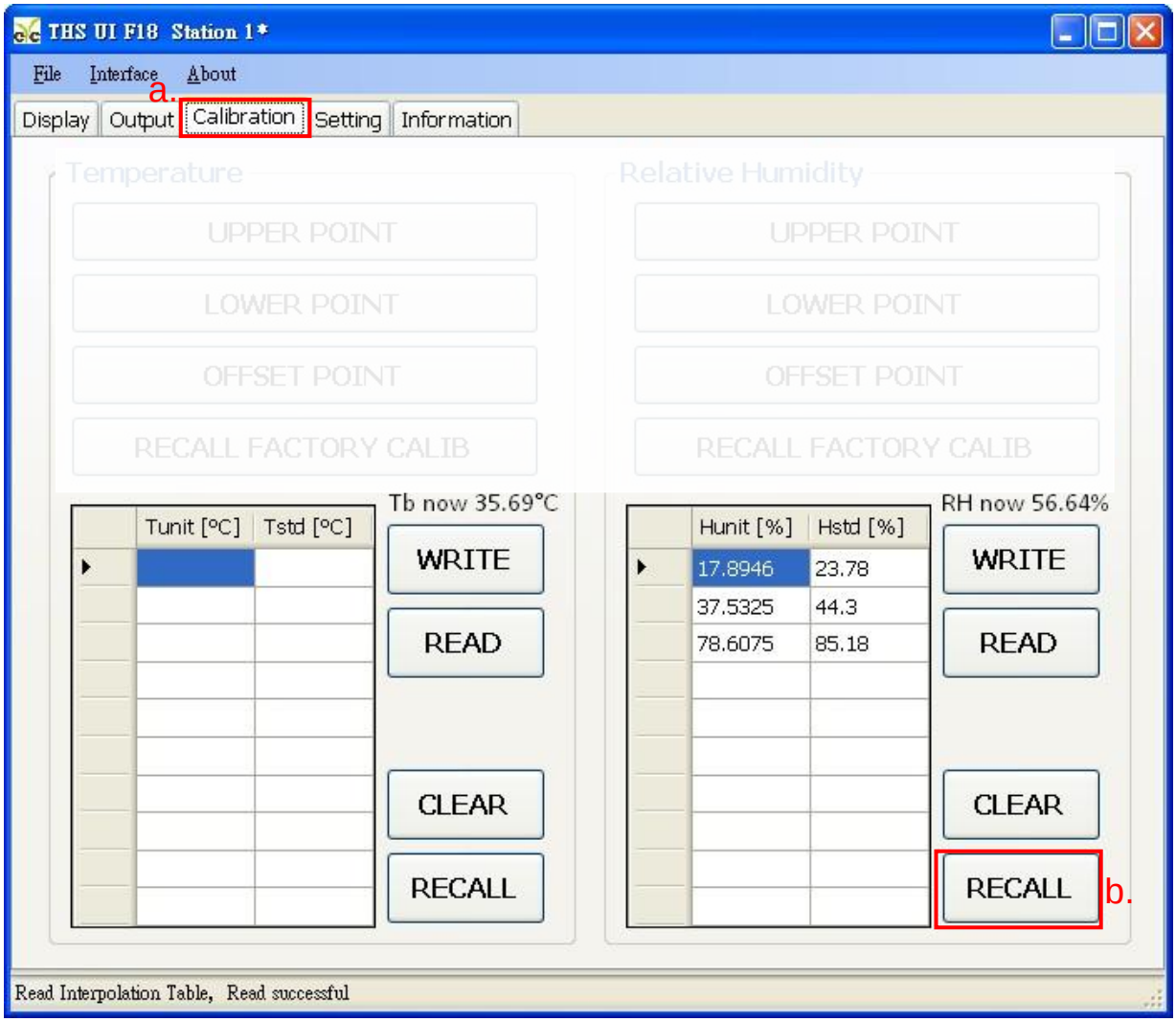


d. That restore more points temperature of factory setting is done.

2. Recall the factory setting of more points of humidity

a. Click “Calibration”

b. Click “Relative Humidity > RECALL



e. That restore humidity of factory setting is done.

6. Inspection and maintenance

1. Maintenance

Since this product is inspected and calibrated for high accuracy at the factory before shipment, no calibration on the installation site is necessary when this product is installed. For inspection and maintenance follow the instructions below：

1) Periodic inspection

Periodically inspect this product for its sensing accuracy, and clean the cover.

Set the period between inspections based on atmospheric dust and other contaminants in the installation environment.

2) Sensor maintenance

Do not damage sensor surface during maintenance process.

3) Troubleshooting

If any problem occurs during operation, refer to the table below for appropriate solutions.

2. Troubleshooting：

Problem	Cleck items	Soluations
●No output ●Unstable output	●Disconnected wiring ●Loose wiring ●Power supply voltage ●Sensor damages	●Re-perform wiring ●crew on terminal tightly or replace wires ●Replace the sensor
●Slow response to output ●Error in output	●Moisture/ condensation on the product ●Check installed location ●Check dust and contamination on the sensor	●Remove the sensor and filter. Dry power-off state sensor in clean air seasoning ●Refer to the section ●Cleaning the filter ●Changing the filter ●Calibrate ●Replace the sensor