



KCM-TH Intelligent Temperature/ Humidity Controller

1. Features:

1.1 Input Sensor Types

Temperature and Humidity Sensor(10K NTC & 0-3V Analog quantity)

1.2 Temperature Output ALM1: Relay contact: 250 V AC, 3 A (Resistive load).

1.3 Humidity Output ALM2: Relay contact: 250 V AC, 3 A (Resistive load).

1.4 Use this controller within the following allowable range:

Allowable ambient temperature: -0 to +55 °C

Allowable ambient humidity: 5 to 85 % RH.

2. Parts Description:

(1) **PV display:** Displays Temperature Measured value or various Parameter symbols.

(2) **SV display:** Displays Humidity Measured value or various Parameter set values.

values.

(3) **ALM1:** lamp Lights when Event occurs.

(4) **ALM2 lamp:** Lights when Event occurs

(5) **AT lamp:** Flashes during Manual operation

(6) **Set (SET) key:** Used for Parameter calling up and set value registration.

(7) **Shift key:** -Shift digits when settings are changed.

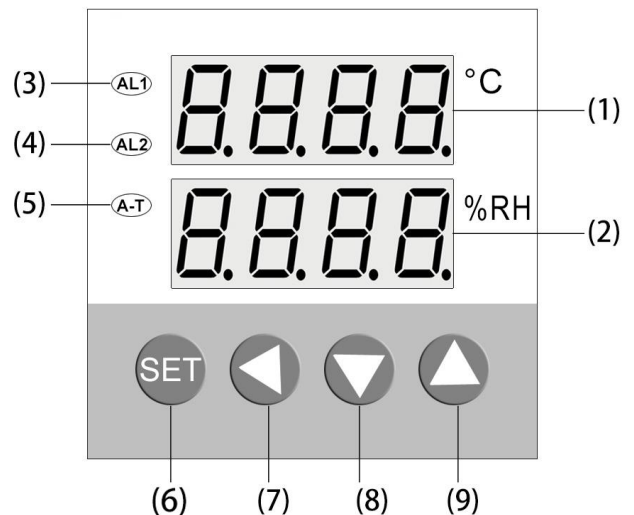
-Press the key about 1S into the manual regulation

(8) **Down key:** -Decrease numerals;

-Turn the ALM1 relay on or off, during Manual operation.

(9) **Up key:** -Increase numerals.

-Turn the ALM2 relay on or off, during Manual operation.



3. Parameters

ID	Code	Name	Data range	Description	Ex-Fac
0	AL1	Temperature Alarm set value	-20.0~80.0	Refer to ALP1 for the alarm mode suitable.	50.0
1	HY1	Alarm1 Differential gap	0.1~50.0	Relay contact may repeat its turning ON and OFF due to input fluctuation if measured value (PV) is near the alarm set value. the differential gap setting can prevent the relay contact from ON or OFF repetition.	0.5
2	AL2	Humidity Alarm set value	0.0-100.0%	Refer to ALP2 for the alarm mode suitable.	80.0
3	HY2	Alarm 2 Differential gap	0.1~50.0	-	0.5
4	SL1	Temperature Bias	±10.0	The value set in the PV bias is added to the correct the input value.	0
5	SL2	Humidity Bias	±10.0%		0
6	ALP1	Temperature Alarm mode	0~2	0: Alarm function OFF;	1

7	<i>ALP2</i>	Humidity Alarm mode		1: Process high alarm; 2:Process low alarm;	
8	<i>PF</i>	Digital Filter	0~80	This is a 1st-order lay filter by software prepared in order to reduce fluctuations of measured value (PV) by noise.	20
9	<i>Lock</i>	Set data lock	0~250	LOCK=18, all the parameter can be set. Otherwise, all the parameter can't be set	18
10	<i>Addr</i>	Slave address	0-250	Communication address can be set from 0 to 255	1
11	<i>bAud</i>	baud rate	—	1200; 2400; 4800; 9600;	9600
12	<i>[F</i>	Temperature unit select	C F	C: Celsius F: Fahrenheit	C

4. Operation

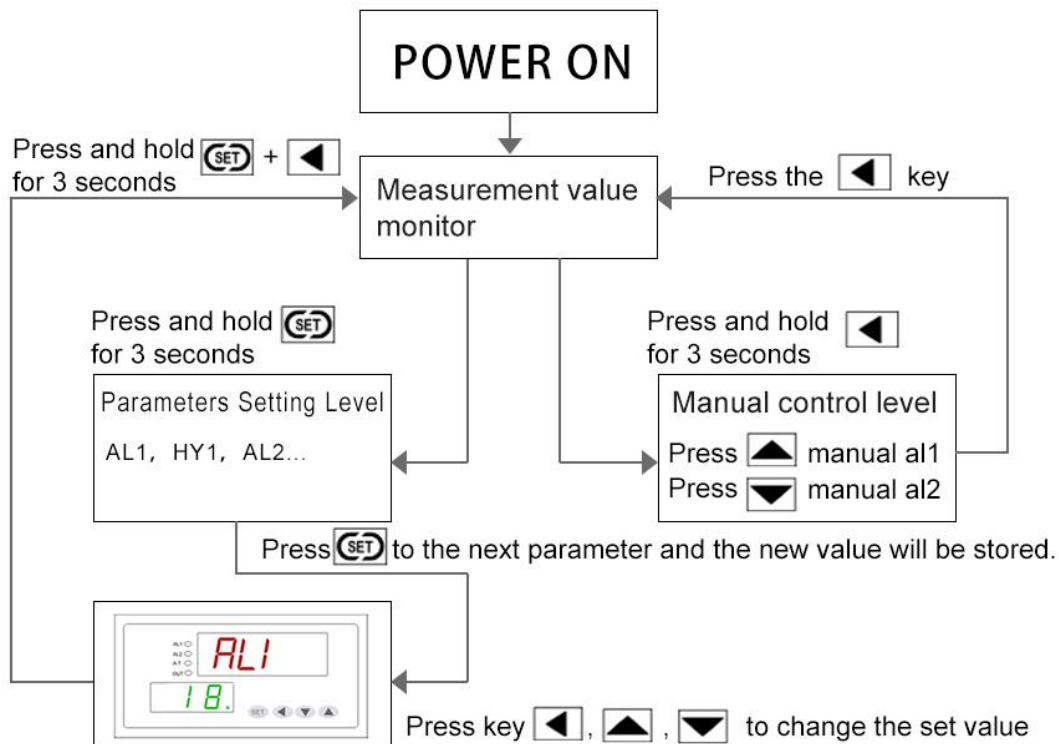
4.1 Basic Setting Level:

Press the key SET 3 seconds to go to the main Parameters, the controller will display the Parameter code(1~12)in the window at the upper tube, and display the Parameter data at the lower tube. Press Key ▲、▼ or ◀ to adjust the Parameters, and then press the Key SET to next parameter and the new value will be saved.

Display returns to the PV monitor if no key operation is performed within 10 seconds , and the set value will be saved.

4.3 Manual Control Operation:

Press the ◀ key about 3S to go to the manual regulation, AT lamp will be turn on, in this time can turn on or switch off the alm1 relay and alm2 relay by Key ▲、▼.



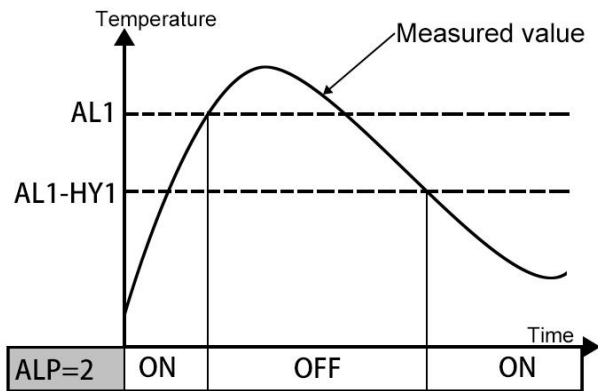
5. Alarm function

Alarm (ALM) function sets up the alarm status when the measured value (PV) or the deviation reaches the alarm set values. In the alarm status, the alarm output is output from the digital output terminals, and the alarms are used to drive the equipment danger signals or the safety equipment.

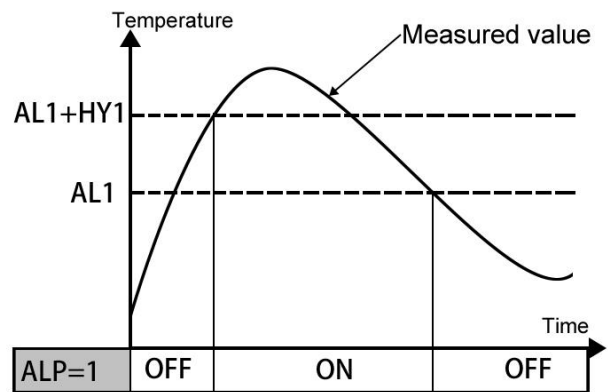
ALP_i	Alarm status[ON]	Alarm status[OFF]
ALP1=1	$PV \geq AL - I$	$PV < AL - I - HY - I$
ALP1=2	$PV \leq AL - I$	$PV > AL - I + HY - I$

PV: Temperature measurement value

Process low alarm:



Process high alarm:



6. Host communication based on MODBUS-RTU protocol(OPTIONAL)

The master controls communication between master and slave. A typical message consists of a request (query message) sent from the master followed by an answer (response message) from the slave. When master begins data transmission, a set of data is sent to the slave in a fixed sequence. When it is received, the slave decodes it, takes the necessary action, and returns data to the master.

6.1 Communication Mode:

Data bit length	Stop bits	Parity bit	Communication time interval
8-bit (Binary)	1,2	NONE	300ms

6.2 Message length of each function (Unit: byte):

Function code (Hexadecimal)	Function	Query message		Response message	
		Min	Max	Min	Max
03H	Read holding registers	8	8	7	7
06H	Preset single register	8	8	8	8

6.3 Message format

Slave address	The slave address is a number from 1 to 255 manually set at the front key panel of the controller.
Function code	Refer to 8.2. Message length of each function
Data	The data to execute the function specified by the function code is sent to the slave and corresponding data returned to the master from the slave.
CRC-16	CRC-16: Cyclic Redundancy Check

6.4 Read holding registers [03H]

The query message specifies the starting register address and quantity of registers to be read.

Slave address	Function code 03H	Register address	Quantity The setting must be 1	CRC16
<p>Example: The contents of the holding register 1001H are the read out from slave address 1. Query message: 01 03 10 01 00 01 D1 0A Response message: 01 03 02 00 FD 79 C5 Explain: 00FD=253,is processed as 25.3</p>				

6.5 Preset single register [06H]

The query message specifies data to be written into the designated holding register. Only R/W holding registers can be specified. The controller EEPROM had a life span of data written to the EEPROM less than 1000,000 times

Slave address	Function code	Register address	Write data	CRC16
<p>Example: Data is written into the holding register 0001H(AL-1) of slave address 1. Query message: 01 06 00 02 FF 38 68 28 Response message: 01 06 00 02 FF 38 68 28 When input ALM1 set value is -20.0,-20.0 is processed as -200,-200=0000H-00C8H=FF38H</p>				

6.6 No response

The slave ignores the query message and does not respond when:

- The slave address in the query message does not coincide with any slave address settings.
- The CRC code of the master does not coincide with that of the slave.
- Transmission error such as overrun, framing, parity and etc., is found in the query message.
- The Communication time interval less than 300ms.

6.7 Register address list:

Symbol	Decimal point	Real Register	Holding Register
Temperature Measured value	YES	1001H	44098
Humidity Measured value:	YES	1002H	44099
Temperature Alarm	NO	1004H	44101
Humidity Alarm	NO	1005H	44102
Controller parameters (<i>Refer to 3. Parameters</i>)			
AL-1	YES	0000H	40001
Hy-1	YES	0001H	40002

AL-2	YES	0002H	40003
Hy-2	YES	0003H	40004
... And so on			
C F	YES	000CH	40013

Refer to this link for more information on MODBUS-RTU Communication Protocol:

<http://www.kcmeter.com/servicesread.asp?id=4>

Or scan QR code for more information:



7 KC-TF Data logger (OPTIONAL)

7.1. Features:

This Data Logger's data could be queried, saved, printed and exported in Excel/TXT format through USB interface.

And it comes with data management software for easy data download to computers through USB interface. With the software, you could analyze data in form of tables and graphs.

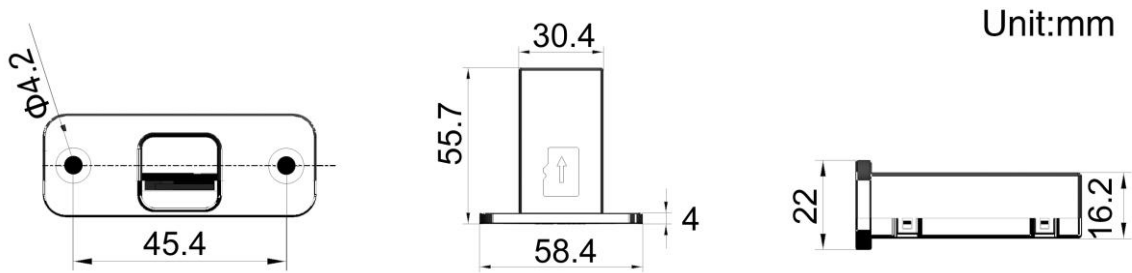
7.2. Specification:

Data storage options: TF / Micro SD Card(formatting the volume using FAT instead of NTFS.)

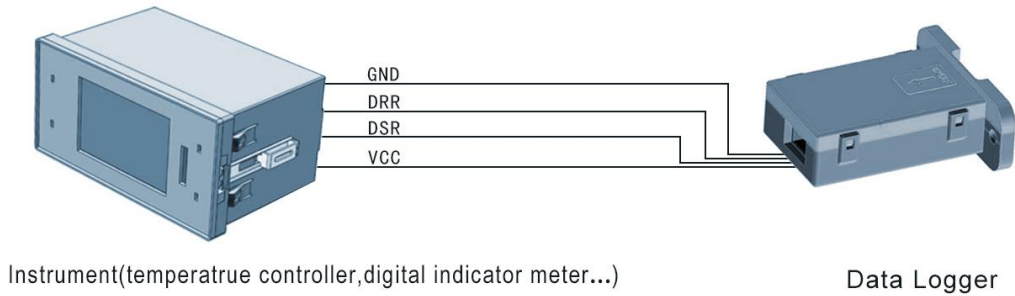
Record interval: 1s~1hour adjustable

Record capacity: A 1GB Micro SD Card can hold more than 15,768,000 points of data

7.3. Dimensions:



7.4. Wiring diagram:



7.5. Operation:

1. Wiring: Connect the data logger to the instrument. Refer to 4. wiring diagram
2. Power On: when turn on the instrument ,the data logger will work.
3. Start recording: when insert a TF card into the logger data, the data logger will start recording
4. Set the interval time: 1S~3600S.
Refer to the manual of the instrument for the parameter of the " Interval".
5. Set the system time:

Press and hold the ▲key and ▼key for 1 second on the instrument, the monitor screen of the instrument will be went to the "set system time mode".

For setting parameters such as year, moth, day... refer to the instrument 's parameter setting.

Parameter list on the instrument for the time system:

T7-1

ID	Symbol	Name	Data range	Factory set value
1	YEAR	Year	2000~2099	20xx
2	MONTH	Month	00~12	—
3	DAY	Day	00~31	—
4	Hour	Hour	00~23	—
5	MIN	Minute	00~59	—

7.6. Red lamp/Green lamp on the logger lights recognition to the logger state:

1. Normal mode:

The green lamp lights at all times, the red lamp flashes(fast) when logger writes the data.

2. Communication failed:

At intervals there is green lamp lights(flash).

3. Be interfered by other signals:

At intervals there is green lamp and red lamp light(flash)

4. TF card is abnormal:

At intervals there is red lamp lights(flash).

Character Symbols: This manual indicates 9-segment display characters as shown below.

A	B	C	D	E	F	G	H	I	J	K	L	M
<i>A</i>	<i>b</i>	<i>C</i>	<i>d</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>	<i>K</i>	<i>L</i>	<i>M</i>
N	O	P	Q	R	S	t	U	Y	T			
<i>n</i>	<i>o</i>	<i>P</i>	<i>q</i>	<i>r</i>	<i>S</i>	<i>t</i>	<i>u</i>	<i>y</i>	<i>T</i>			