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ELE INTELLIGENT TEMPERATURE AND HUMIDITY CONTROLLER

USER MANUAL

USER MANUAL v 1.0

Thanks for choosing the Intelligent temperature and humidity controller of our company. In order to convenient you to buy and use the controller with safety, please read this manual carefully and note the following points.

CAUTION

1. The device must be installed and maintained by professional personnel

2. The signal and power supply must be cut off before any operations to the internal or external part of the controller

The following conditions will cause damage or abnormality to the controller

1. Auxiliary power source voltage over range
2. Distribute system frequence over range
3. Current, voltage input poles incorrect
4. With electric pull out communication plug
5. No according requirement to connect terminal

⚠ Warning

1. Wiring warning
   If the equipment failure or error occurs, can cause system fault, installation of external protection circuit to prevent such incidents
   In order to prevent the equipment damage or failure, choose the appropriate fuse protection to prevent the power cord and input, output, strong current shock
2. Power supply
   In order to prevent the equipment damage or failure, please use the rated power
   To prevent electric shock, or equipment failure, all wiring complete rear can supply
3. Prohibited to use in the vicinity of flammable gas
   As fire, explosion or equipment damage, banned in flammable, explosive gas, venting occasion use
4. It is forbidden to touch the instrument inside
   To prevent electric shock or burn, it is forbidden to touch the instrument inside, only the company service engineer can check the internal wiring or replacement parts. Instrument with
   high pressure and high temperature parts. Very dangerous.
5. It is forbidden to change instrument
   In order to prevent accidents or equipment failure, it is forbidden to change equipment
6. Maintenance
   Scrapped to prevent electric shock, instrument or fails, only the company's service engineer can be replacement parts
   In order to ensure the instrument is continuous and safe use, should be regular maintenance. Instrument internal some parts may be damaged with longer duration of use

CATALOG

INTRODUCTION

1. Temperature and humidity controller uses a dedicated microprocessor, SMT SMT technology and high precision temperature and humidity sensor. Make the product delicate and cabinet, reliable performance, high precision measurement and control temperature and humidity, strong anti-jamming capability control mode is simple. Can be widely used in industry, agriculture, medical, chemical warehouse where the temperature and humidity measurement and control.
2. Alarm function, this controller has the temperature, humidity process heater disconnection quotation function, communication function, get more extensive application in the field of automation control

Remark:
Process alarm output contact and disconnection alarm for the same.

Main Technical Data

Supply voltage
AC: Switching power supply 85V~265V, 50~60Hz
AC: Transformer 110V, 220V, 380V, 50~60Hz
DC: 24V, 36V, 48V, 110V, 220V

Accuracy class
Temperature: ±0. 5°C
Humidity: 5%±RH
Resolving power: 14 Bit
Cycle of sampling: 0.5 Sec

Measurement range
Temperature: -40~100°C
Humidity: 0~100%RH

Display
Measured values and set values by LED
Output condition and alarming condition by LED lights

Way of operating
Controlling by two-step (settable turn difference)

Control output
Relay output: Contact capability 250VAC 3A (Resistive load)
Voltage pulse output: 0~12 (Suitable for solid relay SSR)

Output contact
Electrical endurance: 1×10 times
Mechanical durability: 1×10 times

Installation
Panel type and embedded

Others
Insulation resistance: ＞50MΩ (500VDC)
Insulation capability: 1500VAC per minute
Power consumption: ＜10VA
Environment: 0~50°C, 30~85%RH no corrosive gas
Weight: About 0.5Kg (The power supply of product is the switching power supply)

Definition of Model No. and Specification Matching

● Model identification

ELE-301
ELE-302
ELE-303
ELE-304

— G D — T

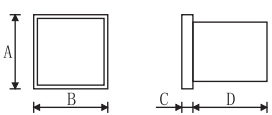
T : Additional communication function
D : Additional circuit alarm
G : Additional process alarm
0 : No function above mentioned

Attention: If DC:24V output is needed, please note that when placing order

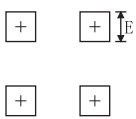
Frame Size and Installation Hole Size and Wiring

● Frame Size and Hole Size

Frame Size



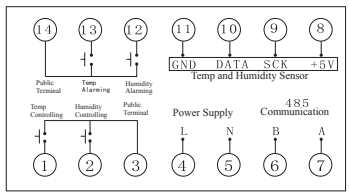
Hole Size



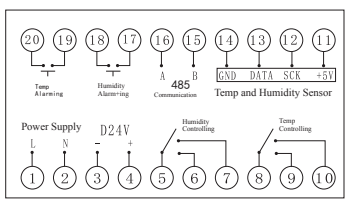
型号	A	B	C	D	E
ELE-301	48	48	5	76	44
ELE-302	72	72	9	65	66
ELE-303	96	96	9	65	92
ELE-304	80	80	7	65	66

The wiring diagram(subject to the product itself the wiring diagram)

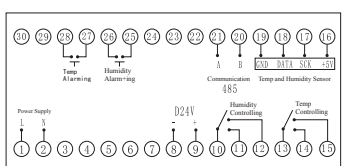
●



ELE-301

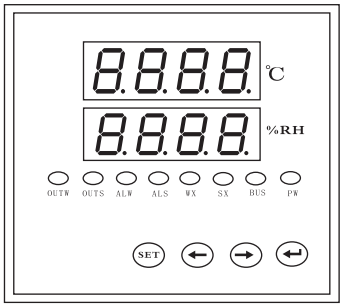


ELE-302 ELE-304



ELE-303

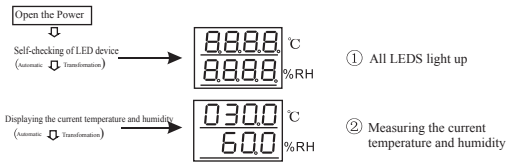
Panel Explaination and Each Function



NO	Panel show	Content description
1.	℃	Temp Measuring / Display value model
2.	%RH	Humidity Measuring / Mode content parameter values
3.	OUTW	Temperature control output indicator light
4.	OUTS	Humidity control output indicator light
5.	ALW	Temperature process alarm indicator lights
6.	ALS	Humidity process alarm indicator lights
7.	WX	Temperature disconnection alarm indicator lights
8.	SX	Humidity disconnection alarm indicator lights
9.	BUS	The communications light
10.	PW	Instrument power light work
11.	←	↑ Increasing Key / Up Key
12.	→	↓ Decreasing Key / Down Key
13.	SET	→ Displacement Key / Mode Key
14.	↵	Confirm Key / Quit Key

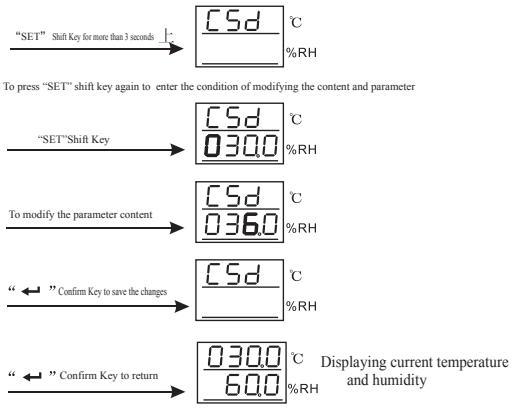
Operation Process

● Boot Up Process



● Set the mode and modify the parameter

In normal display mode of ℃/%RH, press the "SET" button to enter the temperature and humidity controlling and alarming settings. Press the "SET" button for more than 3 seconds to enter the setting mode condition.



At this time the parameter can be modified by pressing the shift key "SET", Increasing key " ←", reducing key " → Click the confirm button " ↵" to save the data after modification. If you need continue to modify other parameter, press the increasing key " ←and reducing key " →election need to modify the pattern. In setting mode, if modified, and then click the confirm button " ↵" to return to normal state

Attention

This controller has automatic returning function. When the operator set parameter modification operation etc and forget to return to the main display mode, the instrument after 30 seconds automatically return to the main display mode

Before using the controller or modifying the parameter of the controller, please read the following instructions carefully.

● Mode content and parameter list

Display	Name	Instruction	Setting range	Default setting
	℃	Temperature measured values / Mode display values	-40～100℃	Actual measured values
	%RH	Humidity measured values / Mode display values	0～100%RH	Actual measured values
CSd	CSD	Temperature controlling setting values	-40～100℃	30
HSd	HSD	Humidity controlling setting values	0～100%RH	70
COU	COU	Temperature controlling alternative mode	0：Heat up ； 1：Cool	0
HOU	HOU	Humidity controlling alternative mode	0：Humidification 1：Dehumidification	0
CHY	CHY	Temperature controlling hysteresis error setting	0.1～20.0℃	5
HHY	HHY	Humidity controlling hysteresis error setting	1～50%RH	10
CPV	CPV	Temperature measurement value correction	-10～+10.0℃	0
HPV	HPV	Humidity measurement value correction	1～10%RH	0
CRd	CRD	Temperature heater disconnection alarming condition	0：OFF ； 1：ON	0
HRd	HRD	Humidity heater disconnection alarming condition	0：OFF ； 1：ON	0
CRb	CRB	Temperature process alarming setting values	-40～+100.0℃	40
HRb	HRB	Humidity process alarming setting values	0～100%RH	80
CRL	CRL	Temperature process alarming condition	0：OFF ； 1：ON	0
HRL	HRL	Humidity process alarming condition	0：OFF ； 1：ON	0
CRC	CRC	Temperature process alarming mode alternative setting	0：Lower deviation alarming ； 1：Higher deviation alarming	1
HRC	HRC	Humidity process alarming mode alternative setting	0：Lower deviation alarming ； 1：Higher deviation alarming	1
CRY	CRY	Temperature process alarming hysteresis error setting	0.1～+20.0℃	5
HRY	HRY	Humidity process alarming hysteresis error setting	1～50%RH	10
no.	No.	Communication address range of controller	1～247	1
bUd	BUD	Communication velocity of controller	1：1200； 2：2400； 3：4800； 4：9600	2
dR-R	DR-R	Data format of controller	1：N，8，1；2：0，8，1；3：E，8，1	3
d ISL	DISL	LED display brightness of controller	1～3， 3 is the lightest brightness	1
RESF	RESF	Back to the factory default setting	Password： 1111	0000

● Communication agreement

1 The physical layer

1．1 RS485 communication interface, the asynchronous half-duplex mode

1．2 Communications speed can be set to 1200-9600 BPS, the factory default 2400 BPS

1．3 Byte transfer formats: one start bit, 8 data bits, parity (N81, E81, 081) optional, factory default E81

2 Digital communication protocol:

The controller provides asynchronous duplex RS485 serial communication interface and adopts the MODBUS-RTU protocol, all kinds of data information can be transmitted on the communications lines. One route can connect to 32 network controller at the same time, each controller can be set different mailing Address (the Address No.), different series controller communication terminal number is different, the communication connection is shielded twisted-pair cable should be used with copper net, wire diameter is not less than 0.55 mm. Wiring should keep communication lines from high voltage cable, or other strong electric field environment, T type is recommended for the network connection (see figure 1), but does not recommend a star or other contact way

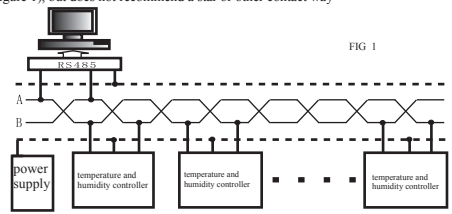


FIG 1

●MODBUS_RTU communication protocol:

The MODBUS-RTU communication protocol uses the master-slave response mode connections on a communication line. First of all, the main computer of the signal only address addressing to a terminal equipment (machine), and then, the response signal from the terminal to transmit to host in the opposite direction, i.e., in a single communication line signal transmission instead of two direction all communication data flow (half duplex working mode). MODBUS protocol is only allowed on the host (PC, PLC, etc.) and the communication between the terminal equipment (see chart 2), and does not allow independent data exchange between terminal equipment, so that each terminal equipment not occupy the communication line when they are initialized again, but only in response to the native query signal

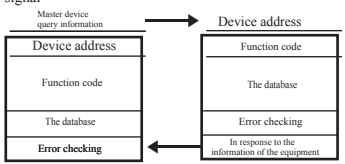


FIG 2

● The host query:

Query message frames includes device address, function code, data, information, check code. Address code informs the machine that is selected to perform the destined function equipment, such as functional code 3 or 4 is for registering the data which is read from the device and return their content; Contains data from the device to perform functions other additional information, such as reading command, data segment additional information start from how to register and number of registers to read; Check code is used to test the correctness of the a frame information, provides from the device with a validation message content is the right approach, it adopts CRC16 calibration rule

●

If from the device to produce a normal response, in response to the message from the machine address code, function code, code and data information CRC16 check code. Data information code, including the data collected from the device, such as register values or state. If there are errors, we agreed from the machine does not respond. Transport refers to a data frame in a series of separate data structure and used for the transmission of data limited rules, defines the RTU mode compatible with MODBUS agreement under the mode of transmission. Each byte: a start bit, 8 data bits, parity bit (,), 1 stop bit (a parity bit) or 1 stop bit (and white parity bits).

● The structure of the data frame:(Message format) Table 1

Table 1

Address Code	Function Code	Data Code	Check Code
ONE BYTE	ONE BYTE	ONE BYTE	TWO BYTE

● Address Code

At the beginning of a frame by a byte (eight binary code), the decimal is 0-255, only use the 1-247 in our system, the other address. These bits indicate the address specified by the user terminal equipment, the device will accept data from the connected to the host. Each terminal equipment address must be unique, only by addressing to the terminal response contains the address of the query. When the terminal sends back a response, in the response from the machine address data and tell the host which terminal is to communicate with them.

● Function Code: (Table 2)

Tell what is addressing to the terminal to perform the function. Listed in the following table shows the supported code function, and their meaning and function

Table 2

CODE	Meaning	Behavior
01	ONE BYTE	TWO BYTE

● Query data frame (main machine) (Table 3)

Table 3

Address	Command	The starting register address (high)	The starting register address (low)	Quantity of register (high)	Quantity of register (low)	CRC16 (low)	CRC16 (high)
0CH	03H	00H	2BH	00H	03H	74H	DEH

● The response data (from the machine frame) (see table 4)

This function allows the user to change the contents of a register, is written to the data to be highlighted as writable attribute, the number of address range is not more than, this example is written communication

Table 4

Address	Command	The starting register address (high)	The starting register address (low)	Quantity of register (high)	Quantity of register (low)	CRC16 (low)	CRC16 (high)
0CH	03H	00H	2BH	00H	03H	74H	DEH

● Query data frame (the host machine) (see table 5)

Table 5

Address	Command	The starting register address (high)	The starting register address (low)	Quantity of register (high)	Quantity of register (low)	Record the data	CRC16 (low)	CRC16 (high)
0CH	10H	00H	04H	00H	01H	00H 50H	FFH	78H

● Response data (from the machine frame), indicating that the data has been written. (table 6)

Table 6

Address	Command	The starting register address (high)	The starting register address (low)	Quantity of register (high)	Quantity of register (low)	CRC16 (low)	CRC16 (high)
0CH	10H	00H	04H	00H	01H	41H	15H

● Check code:

Error check (CRC) domain are two bytes, containing a 16-bit binary values. CRC value is calculated by the transport equipment, and then attached to a data frame, the receiving device to recalculate the CRC value when receiving data, and then compared with acceptance to the CRC in the domain of value, if the two values are not equal, an error has occurred. As shown in figure 3

● Communication message example

Read data (functional code: 3) : this function can users get the terminal equipment acquisition \ recorded data, as well as the system parameters. Host a request there is no limit to the number of data collected, but not beyond the definition of address range

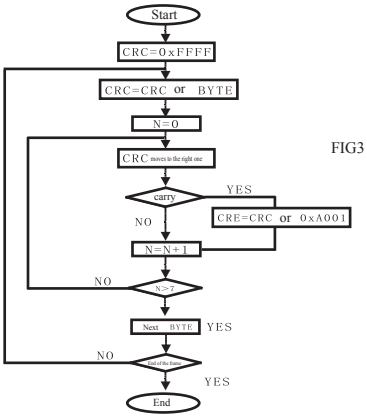


FIG3

● Correspondence address (see table 7)

Table 7

Address (HEX)	Project	Description	Data format	Length of the data (BYTE)	Read and write	Instruction
The basic setting information						
00	℃	Sensor for real-time detecting temperature values	Int16	2	R	The actual measured value
01	%RH	Sensor for real-time detecting humidity values	Int16	2	R	The actual measured value
02	CSD	Temperature controlling setting	Int16	2	R/W	-40～+100.0℃
03	HSD	Humidity controlling setting	Int16	2	R/W	0～100%RH
04	COU	Temperature control mode	char	1	R/W	0：Heat Up； 1：Cool
	HOU	Humidity control mode	char	1	R/W	0：Humidification； 1：Dehumidification

Address (HEX)	Project	Description	The data format	Length of the data (BYTE)	Read and write	Instruction
The basic setting information						
05	CHY	Temperature controlling hysteresis error	Int16	2	R/W	0.1～20.0℃
06	HHY	Humidity controlling hysteresis error	Int16	2	R/W	1～50%RH
07	CPV	Temperature measurement value	Int16	2	R/W	-10～+10.0℃
08	HPV	Humidity measurement value	Int16	2	R/W	1～10%RH
09	CRD	Temperature heater disconnection alarming setting	char	1	R/W	0：OFF； 1：ON
	HRD	Humidity heater disconnection alarming setting	char	1	R/W	0：OFF； 1：ON
0a	CRB	Temperature process alarming setting	Int16	2	R/W	-40～+100.0℃
0b	HRB	Humidity process alarming setting	Int16	2	R/W	0～100%RH
0c	CRL	Temperature process alarming state	char	1	R/W	0：OFF； 1：ON
	HRL	Humidity process alarming state	char	1	R/W	0：OFF； 1：ON
0d	CRC	Temperature process alarming mode	char	1	R/W	0：Lower deviation alarming； 1：Higher deviation alarming
	HRC	Humidity process alarming mode	char	1	R/W	0：Lower deviation alarming； 1：Higher deviation alarming
0e	CRY	Temperature process alarming hysteresis error setting	Int16	2	R/W	0.1～+20.0℃
0f	HRY	Humidity process alarming hysteresis error setting	Int16	2	R/W	1～50%RH
10	No.	controller communication address range	Int16	2	R/W	1～247
11	BUD	controller communication velocity	Int16	2	R/W	1:1200； 2:2400； 3:4800； 4:9600
12	DR¬R	the controller data format	Int16	2	R/W	1:N,8,1；2:0,8,1；3:E,8,1
13	DISL	the IED display brightness	Int16	2	R/W	1～3， 3 is the highest brightness