

Acrel-2000T/A instruction of  
wireless temperature measuring  
equipment

## Claims Ming Ming

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# 1 Installation Guide

## 1.1 Product Overview

Acrel-2000T/A wireless temperature measuring and collecting equipment is suitable for temperature monitoring of high voltage switchgear contacts and contacts, knife switch, middle head of high voltage cable, dry transformer, low voltage high current and so on. A device can be used in conjunction with a wireless temperature measuring transceiver to achieve up to 240 wireless temperature measuring sensor data, including ATE100、ATE200、ATE300B 、ATE300、ATE400. matching sensors Wireless temperature sensor and transceiver exchange through wireless signal transmission, will not affect the insulation performance of the system, more safe to use. The device has the characteristics of complete isolation, convenient installation, strong anti-interference ability and reliable operation, which solves the safety problem of contact temperature monitoring in high voltage state.

## 1.2 Key technical indicators

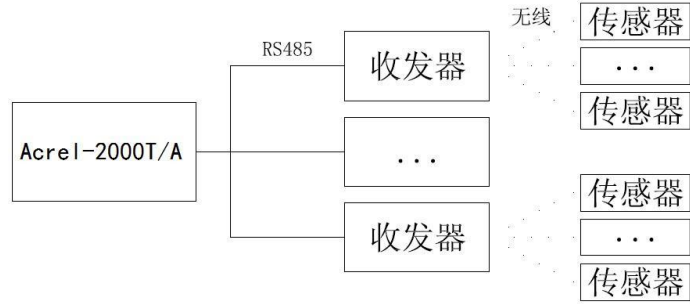
Table 1 ATP Series of wireless temperature measurement centralized acquisition touch screen technology

Project		Indicators
Working Power		DC 220V ( $\pm 10$ per cent)
Points of access to temperature measurement		Up to 240 points
Scope of temperature measurement		$-40^{\circ}\text{C}\sim 125^{\circ}\text{C}$
Temperature accuracy		$\pm 2^{\circ}\text{C}$
Sensor battery life		$\geq 5$ years
Communications	Interface	RS485/ Ethernet
	Agreement	MODBUS-RTU
Environment	Working temperature	$-10^{\circ}\text{C}\sim 55^{\circ}\text{C}$

ntal requireme nts	Relative humidity	$\leq 95\%$
	Altitude	$m \leq 3000$

### 1.3 Product Topology

#### 1.3.1 Active Wireless Programme





1.

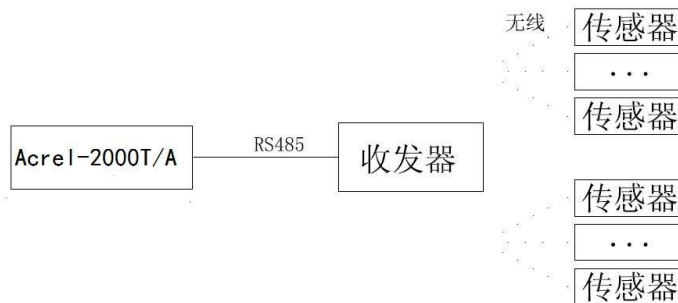
Active Wireless Temperature Measurement Configuration		
Name of name	Model	Quantity
Subject	ATP007/ATP010	1
Wireless Temperature Transceiver	ATC200	Up to 20
Wireless Temperature Sensor	ATE100 or ATE200	Up to 240



2.

Active Wireless Temperature Measurement Configuration		
Name of name	Model	Quantity
Subject	ATP007/ATP010	1
Wireless Temperature Transceiver	ATC400	1
Wireless Temperature Sensor	ATE300B	Up to 240

### 1.3.2 Passive wireless scheme



1.

Configuration of Passive Wireless Temperature Measurement Scheme		
Name of name	Model	Quantity
Subject	ATP007/ATP010	1
Wireless Temperature Transceiver	ATC400	1
Wireless Temperature Sensor	ATE300	Up to 240

2.

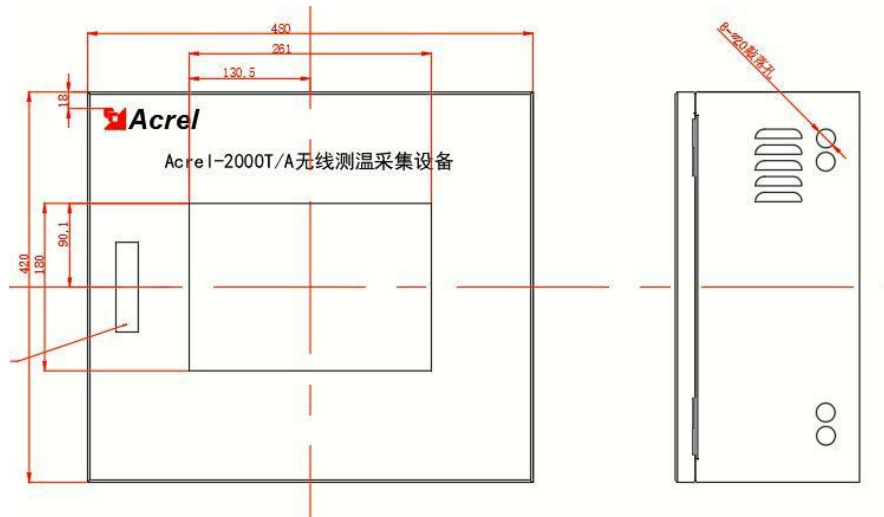


Configuration of Passive Wireless Temperature Measurement Scheme		
Name of name	Model	Quantity
Subject	ATP007/ATP010	1
Wireless Temperature Transceiver	ATC450-C	1
Wireless Temperature Sensor	ATE400	Up to 240

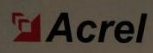
## 1.4 Product installation

### 1.4.1 Installation Method of Acrel I-2000T/A Wireless Temperature Measuring Acquisition Equipment

The size and appearance of the Acrel-2000T/A wireless temperature measuring and collecting



equipment are shown in the following figure:  
cabinet size :420 (L) 480 (W) 200 (H) mm.



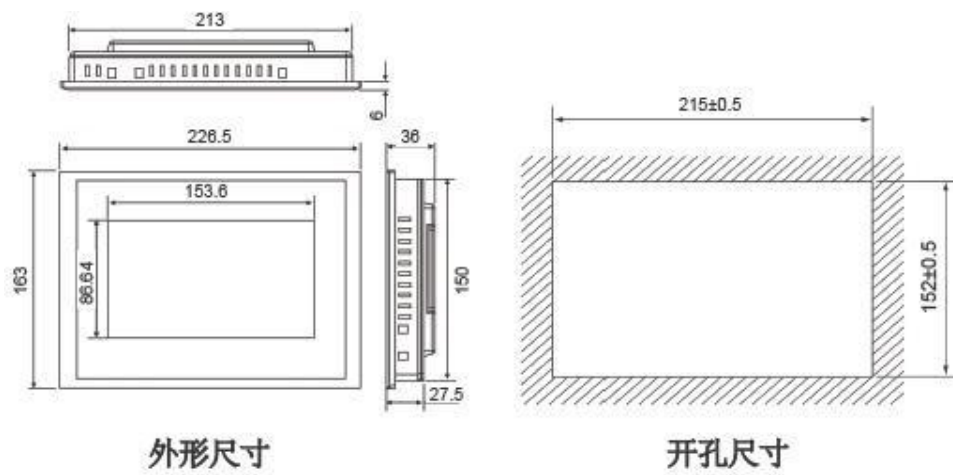
Acrel-2000T/A无线测温采集设备

The screen displays a data table with the following content:

MCC8				
MCC8				
101	124	107	126	125
102	125	108	127	126
103	126	109	128	127
104	127	110	129	128
105	128	111	130	129
106	129	112	131	130
107	130	113	132	131
108	131	114	133	132
109	132	115	134	133
110	133	116	135	134
111	134	117	136	135
112	135	118	137	136
113	136	119	138	137
114	137	120	139	138
115	138	121	140	139
116	139	122	141	140
117	140	123	142	141
118	141	124	143	142
119	142	125	144	143
120	143	126	145	144
121	144	127	146	145
122	145	128	147	146
123	146	129	148	147
124	147	130	149	148
125	148	131	150	149
126	149	132	151	150
127	150	133	152	151
128	151	134	153	152
129	152	135	154	153
130	153	136	155	154
131	154	137	156	155
132	155	138	157	156
133	156	139	158	157
134	157	140	159	158
135	158	141	160	159
136	159	142	161	160
137	160	143	162	161
138	161	144	163	162
139	162	145	164	163
140	163	146	165	164
141	164	147	166	165
142	165	148	167	166
143	166	149	168	167
144	167	150	169	168
145	168	151	170	169
146	169	152	171	170
147	170	153	172	171
148	171	154	173	172
149	172	155	174	173
150	173	156	175	174
151	174	157	176	175
152	175	158	177	176
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171	194	177	196	195
172	195	178	197	196
173	196	179	198	197
174	197	180	199	198
175	198	181	200	199
176	199	182	201	200
177	200	183	202	201
178	201	184	203	202
179	202	185	204	203
180	203	186	205	204
181	204	187	206	205
182	205	188	207	206
183	206	189	208	207
184	207	190	209	208
185	208	191	210	209
186	209	192	211	210
187	210	193	212	211
188	211	194	213	212
189	212	195	214	213
190	213	196	215	214
191	214	197	216	215
192	215	198	217	216
193	216	199	218	217
194	217	200	219	218
195	218	201	220	219
196	219	202	221	220
197	220	203	222	221
198	221	204	223	222
199	222	205	224	223
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224	247	230	249	248
225	248	231	250	249
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238	261	244	263	262
239	262	245	264	263
240	263	246	265	264
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242	265	248	267	266
243	266	249	268	267
244	267	250	269	268
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250	273	256	275	274
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252	275	258	277	276
253	276	259	278	277
254	277	260	279	278
255	278	261	280	279
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263	286	269	288	287
264	287	270	289	288
265	288	271	290	289
266	289	272	291	290
267	290	273	292	291
268	291	274	293	292
269	292	275	294	293
270	293	276	295	294
271	294	277	296	295
272	295	278	297	296
273	296	279	298	297
274	297	280	299	298
275	298	281	300	299
276	299	282	301	300
277	300	283	302	301
278	301	284	303	302
279	302	285	304	303
280	303	286	305	304
281	304	287	306	305
282	305	288	307	306
283	306	289	308	307
284	307	290	309	308
285	308	291	310	309
286	309	292	311	310
287	310	293	312	311
288	311	294	313	312
289	312	295	314	313
290	313	296	315	314
291	314	297	316	315
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324	347	330	349	348
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372	395	378	397	396
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374	397	380	399	398
375	398	381	400	399
376	399	382	401	400
377	400	383	402	401
3				



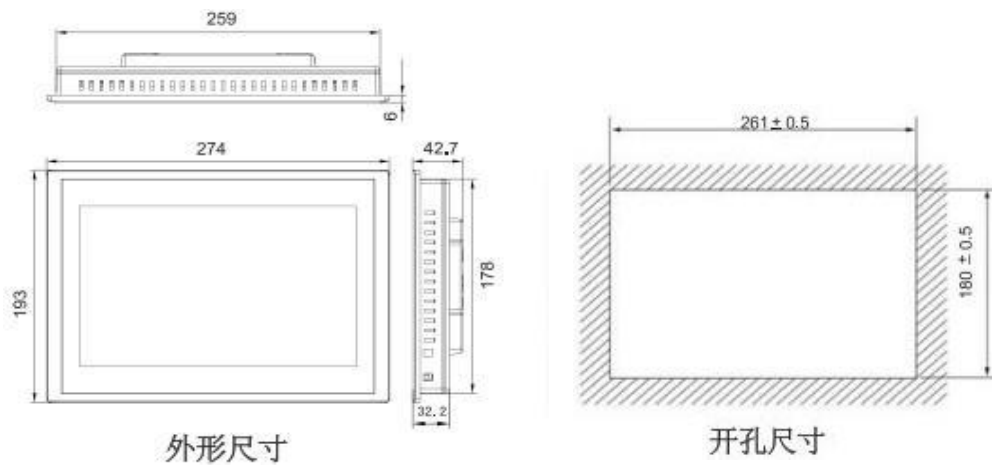
The touch screen used by the device is embedded panel installation, touch screen size is divided into two types are 7 inches and 10 inches, installation hole size as shown below:



外形尺寸

开孔尺寸

Figure :7-inch touch screen hole size (unit mm)



外形尺寸

开孔尺寸

Figure :10 inch touch screen hole size (unit mm)

The installation method is shown below:

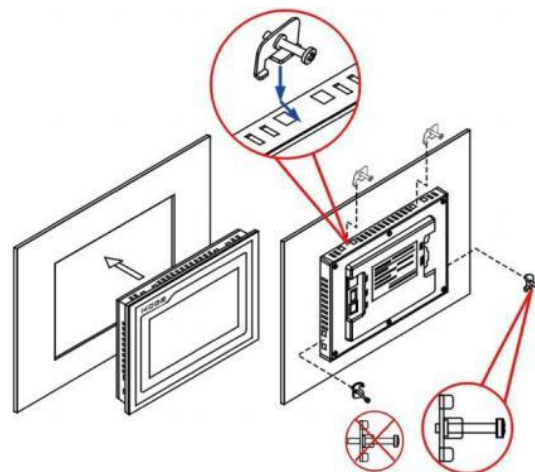


Figure: Touch screen installation method

### 1.4.2 Installation of wireless temperature transceivers

A wireless temperature measuring transceiver may be installed using a guide rail (DIN35mm) or bolted, as shown below:

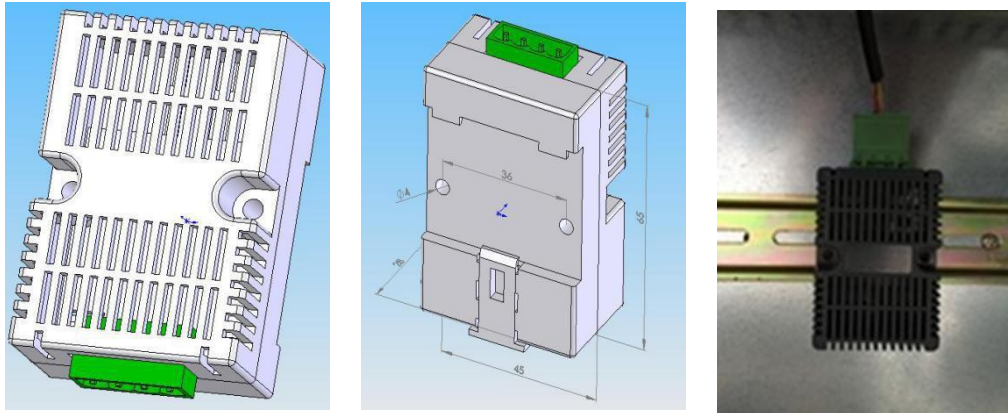
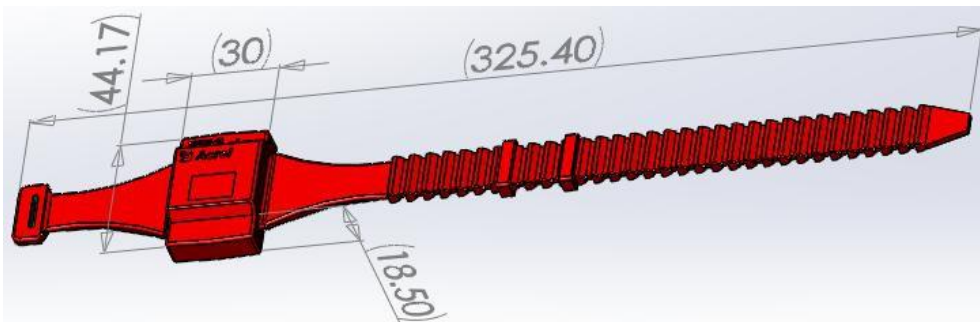


Figure: Wireless Temperature Transceiver Profile and Installation Example

### 1.4.3 Installation of wireless temperature sensors

Wireless temperature sensor has a variety of models, corresponding to bolt fixing, strap fixing, strap binding, alloy plate fixing and other installation



methods.

Figure: Watchband wireless temperature sensor ATE200

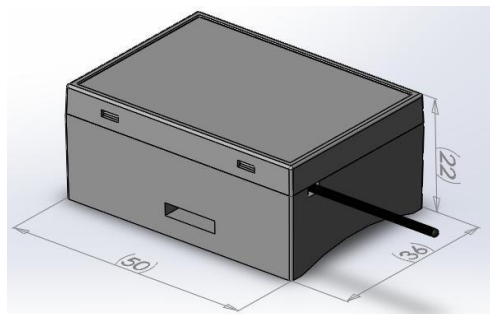
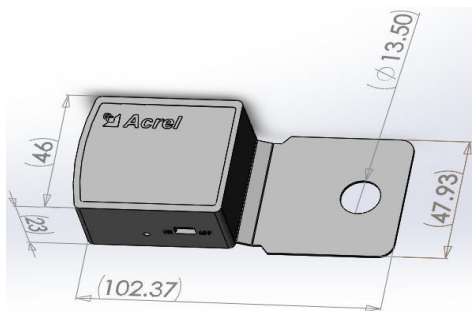


Figure: Bolted wireless temperature sensor ATE100 Figure: Banded wireless temperature sensor ATE300B

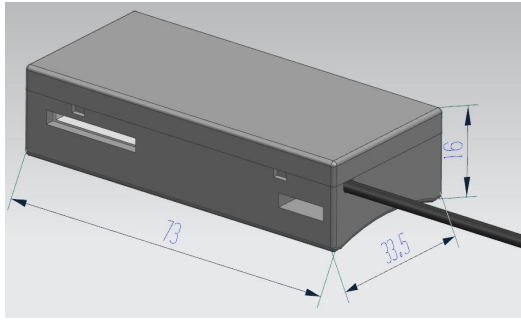


Figure: Passive wireless temperature sensor ATE300

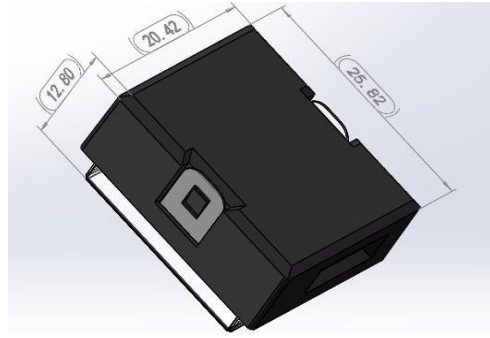


Figure: Passive wireless temperature sensor ATE400

Structure description ATE300 bundled passive wireless temperature sensor :1—  
— passive wireless temperature sensor main body

2—— the temperature probe and fasten it to the temperature measuring place

3—— strap for fixing sensor body

4—— alloy sheet for induction

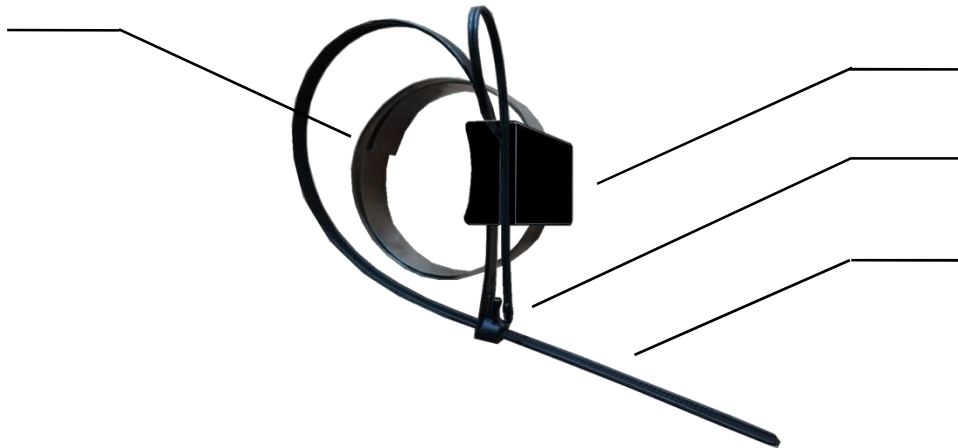


Figure: Description of ATE300 structure

### 1.5 Touch Screen Back Terminal

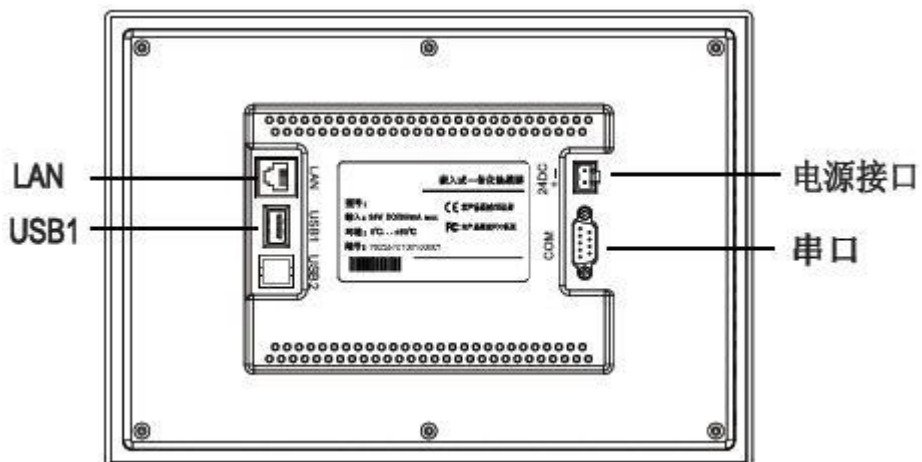
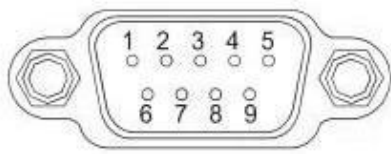


Figure: Touch screen back terminal



串口引脚定义

接口	PIN	引脚定义
COM1	2	RS232 RXD
	3	RS232 TXD
	5	GND
COM2	7	RS485 +
	8	RS485 -
COM3	4	RS485 +
	9	RS485 -

Figure: Serial Pin Definition

Normally, COM2 connect wireless temperature transceiver, serial port COM3 connect background system.

## 2 Product Operational Guidelines

Acrel-2000T/A wireless temperature acquisition equipment and wireless temperature transceiver are installed, and the communication cable between the two is connected, and then the DC24V working power is connected to the two through the power converter. By turning on the switch of the wireless temperature sensor at the temperature measuring point, the temperature of each temperature sensor node can be received and displayed Acrel-2000T/A the wireless temperature measuring and collecting equipment.

### 2.1 Temperature display

Acrel-2000T/A the wireless temperature measurement and acquisition equipment is powered on into the working state, the default is the "real-time



temperature" interface, in which the temperature values collected by each node can be observed.

Figure: Real-time Temperature Interface

## 2.2 Setting setting

After the user "login" ("user" default login password is 0008, can modify the password through the login interface), you can set the high temperature alarm value and name of the wireless temperature sensor group through the "parameter setting" menu. Touch screen displays alarm and buzzer calls. After setting the parameters, be sure to click the Save Settings button, otherwise the set value is not successful.



Figure: Login Management Interface

参数设置											2020-01-19
											16:37:48
节点高温定值设置											
点号	1/2/3	4/5/6	7/8/9	10/11/12	13/14/15	16/17/18	19/20/21	22/23/24	25/26/27	28/29/30	
+0	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+30	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+60	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+90	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+120	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+150	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+180	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
+210	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	80℃	
设备地址	1										
实时温度										1/3 下一页 保存设置	

Figure: Parameter Settings

## 2.3 Alarm information

Enter the current alarm interface to display the current alarm, as shown in figure 2.4; to view all historical alarms, enter the History alarm interface. In the "current alarm" interface to view the real-time alarm, when there is alarm, this interface shows alarm warning, and buzzer calls, when buzzer calls, click confirm alarm, buzzer will stop calling, At the same time, the word color of alarm will turn blue.



## 3 Newsletter Guide

This chapter mainly describes how to use software to read the temperature of wireless temperature measurement node through communication port. Grasp the content of this chapter requires you to have a MODBUS agreement knowledge reserve and read all the other chapters of this book, have a more comprehensive understanding of the product functions and application concepts.

This chapter includes: communication application format, application details and parameter address table.

### 3.1 Communication Format

The examples in this section will use the format shown in the following table as much as possible, and the data is hexadecimal.

#### 3.1.1 Read data (function code 04 H (read-only register)/03 H (read-write register))

This function allows users to obtain data and system parameters collected and recorded by the device. There is no limit to the number of data requested by the host at a time, but not beyond the defined address range.

For example, the host sends query data frames:

Address	Functional code	Starting address		Number of registers		CRC16 Verification Code	
		High	Low	High	Low	High	Low
01H	03H	00H	30H	00H	03H	05H	C4H

The device returns a response data frame:

Address	Functional code	Number of bytes	Data 1		Data 2		Data 3		CRC16 Verification Code	
			High	Low	High	Low	High	Low	High	Low
01H	03H	06H	00H	00H	00H	00H	00H	00H	21H	75H

#### 3.1.2 preset single register (function code 06 H)

This function code allows the user to change the contents of a single register, through which working parameters can be written to the device.

Address	Functional code	Register address		Preset value		CRC16 Verification Code	
		High	Low	High	Low	High	Low

The device returns a response data frame:

Address	Functional code	Register address		Preset value		CRC16 Verification Code	
		High	Low	High	Low	High	Low
01H	06H	00H	03H	03H	E8H	74H	79H



### 3.1.3 preset multiple registers (function code 10 H)

This function code allows the user to change the contents of multiple registers, through which working parameters can be written to the device.

Address	Function	Starting address		Number of registers		bytes	Preset value 1		Preset value 2		CRC16	
		High	Low	High	Low		High	Low	High	Low	High	Low

01H	10H	00H	03H	00H	02H	04H	00H	28H	00H	64H	59H	32H
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

The device returns a response data frame:

Address	Functional code	Starting address		Number of registers		CRC16 Verification Code	
		High byte	Low byte	High byte	Low byte	High byte	Low byte
01H	10H	00H	03H	00H	02H	B1H	C8H

### 3.2 Address List

Address	Parameters	Property	Numerical range	Data type
0000H	Address	R/W	001~247	UWord
0001H	Reservation	R		UWord
0002H	Alarm status	R	0, no temperature over line ;1, temperature over line alarm.	UWord
0003H	Transceiver ambient temperature	R	-55~125(°C)(×10 integer transfers)	Word
0004H 00F3H	Sensor temperature values	R	-50~125(°C),(×10 integer transmissions), total 240	Word
00F4H 01E3H	ID of sensors	R	Each sensor should have a ID of 240	UWord
01E4H 01F2H	Wireless Temperature Sensor Online status	R	Bit data, bit0~bit239 corresponding to 1~240 respectively The device is online ;0—— offline and 1—— online.	UWord
01F3H 0201H	Wireless Temperature Sensor Battery status	R	Bit data, bit0~bit239 corresponding to 1~240 respectively Battery status 0—— normal 1—— low voltage.	UWord
0202H 0251H	Wireless Temperature Sensor High Temperature setting	R/W	-50~125(°C), for a total of 80(3 sensors per set value); and (i)	Word

Note : [1]R — read only; R/W — readable, writeable.

### 3.3 Communications settings

If all data is required to be passed into the background monitoring system, the correct communication address should be set, the default communication address is 1, the baud rate is 9600, the communication address is set in the parameter setting interface, and in the forward data address input box. Then click Save Settings, or return to default address 1.

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