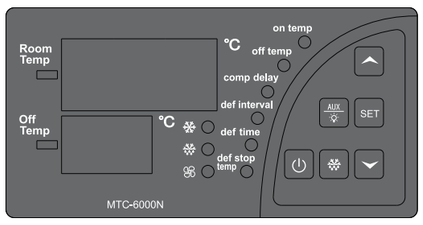
JC-8.871.923

MTC-6000N Microcomputer Controller User Manual

Overview

MTC-6000N temperature controller is designed to control temperatures in cold room. It features various control functions such as cooling, defrost, fan, auxiliary output and RS-485 communication. It also has the functions of temperature measurement, display, control and calibration, high / low temperature alarm, over range alarm and sensor failure alarm. If used as a control terminal connected to a relay module and accessing network, the controller will obtain remote monitoring and setting functions.

Appearance



◆ LED Indicators
◇ on temp: the temperature when compressor is on.
◇ off temp: the temperature when compressor is off.
◇ comp delay: compressor output delay when switched on/off.
◇ def interval: the interval between two defrosts.
◇ def time: the duration of one defrost.
◇ def stop temp: the temperature when defrost stops.

◇ ❄: cooling
◇ ❄: defrost
◇ ֍: fan

Dimensions:
Panel Size: 100 (L) x 21 (W) mm
Product Size: 100 (L) x 51 (W) x 82.5 (D) mm
Mounting Size: 92 (L) x 44 (W) mm
Sensor Cable Length: 2m (probe length included)

Specifications:

◆ Power supply: 220VAC±10%, 50Hz/60Hz
◆ Temperature measuring range: -50°C~50°C
◆ Temperature control range: -50°C~50°C
◆ Temperature accuracy: ±1°C(-40°C~50°C), ±1.5°C(others)
◆ Temperature resolution: 0.1°C
◆ Sensor cable length: 2m (probe length included)
◆ Storage temperature: -30°C~75°C
◆ Operating ambient temperature: 0°C~60°C
◆ Sensor type: NTC (10KΩ/25°C, B value = 3435K)

Product Versions:

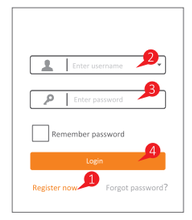
The controller has two versions: RS-485 version and Wi-Fi version.

1. RS-485 Version
This version features a RS-485 communication interface and adopts MUDBUS-RTU protocols. Its communication address is defined by F23.

2. Wi-Fi Version
Before configuring Wi-Fi, press and hold AUX button for more than 15 seconds until Room Temp window (upper window) displays “rst” and Off Temp window (lower window) displays “wif”.
After about 20 seconds, these two windows will display the normal temperature values, indicating the Wi-Fi is reset successfully.

Access to Network

Network Configuration on Mobile App:
1. Download Elitech app in the App Store or Google Play.
2. Register an account and login.
Note:
If you have no Elitech account, please follow 1 (shown in below picture) to register.
If you have the account, follow 2 to 3 to enter your username and password to log in.



Add device

After login, click "+" on top right to add device GUID. Refer to step 5.

1) Enter device GUID:
Scan the QR code to add the GUID. See step 6 below.
Type in the GUID (20 numbers) manually. See step 7 below.
2) Customize your device name. See step 8 below.
3) Click “Add”. See step 9 below.

Network Configuration on Webpage

1. Login
Open the browser and enter the Elitech Cloud url in the address bar: http://www.i-elitech.com.
Enter the username and password, click “Login” (Refer 1 to 5 shown below).
If you have no account yet, please register one first.

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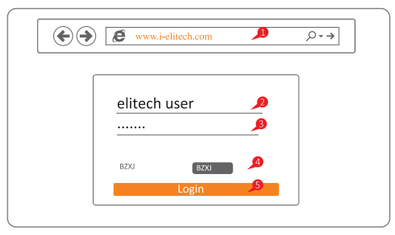
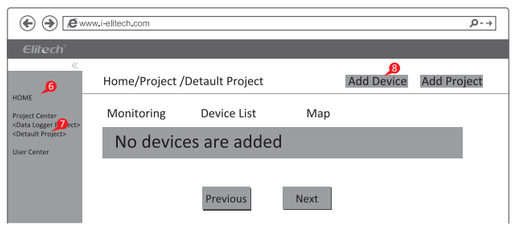
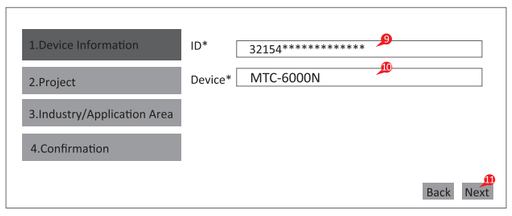


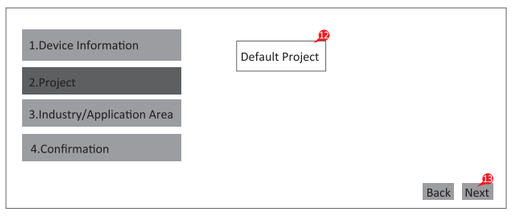
2. Add Device
After login, follow 6 to 8 to add a device:



A window pops up and requires entering the device GUID and name. Click “Next”. (Refer 9 to 11 shown below).



Select "Default Project" and click "Next" (Refer 12 & 13 shown below).



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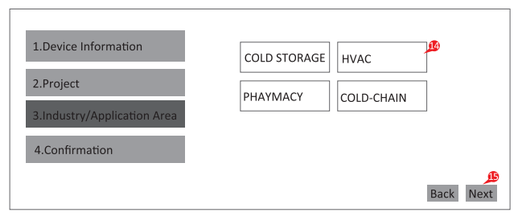
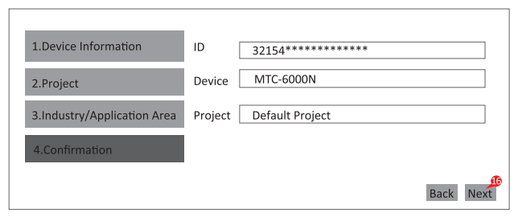
Select the scenario the device to be used and click "Next" (Refer 14 & 15 shown below).



Relative device information appears. Confirm it and click "Finish" (Refer 16 shown below).



When the device is added, refresh the home page to display this added device.

User Menu Viewing

Under normal running status, press and hold SET button for more than 5 seconds until On Temp indicator turns on, user can view parameters. Press SET button again to scroll through parameters. Press AUX button or keep the controller inactive for more than 10 seconds it will exit from viewing status.

User Menu Settings

Under normal running status, press and hold SET button for more than 10 seconds until SET shows in the Room Temp window, user can set parameter values. Press SET button again to set the parameter value. Repeat this operation to set each parameter value. Use ∧ or ∨ button to change parameter value. Then press AUX button or keep the controller inactive for 10 seconds to save the settings and exit.

User Menu

Item	Setting Range	Default	Note
ON temp	OFF temp~+50.0℃	10.0℃	Compressor is switched on when this set-point is reached.
OFF temp	-50.0℃~ ON temp	-10.0℃	Compressor is switched off when this set-point is reached.
Compressor delay	0~120 min	3 min	The minimum interval between the switch-off of the compressor and its successive switch-on.
Defrost Interval	0~120 min	6h	The interval between two defrosts.
Defrost Time	0~120 min	30 min	The duration of one defrost
Defrost Stop Temp	-50~+50℃	10.0℃	If the temperature measured by defrost sensor exceeds this set-point, defrost is inactive.

❹

媒体编号

技术要求：
1.尺寸：280*400mm ，公差±0.5mm
2.105g哑粉纸，黑白印刷
3.符合ROHS，红色虚线不印刷，边缘线不印刷

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Operation Instructions (System Menu)

Under running status, press and hold SET and ⌄ buttons for more than 5 seconds until code F1 shows in Room Temp window, user can set system parameter values. Press SET button again to set the parameter value. Repeat this operation to set each parameter value. Use ⌃ or ⌄ button to change parameter value, which is displayed in Off Temp window. At this moment, all the parameter indicators are off. Under this status, hold SET button for more than 3 seconds or keep the controller inactive for 10 seconds, it will save settings and exit.

Item	Parameter Name	Setting Range	Default	Unit	Note
F1	Calibration Temperature	-10.0~+10.0	0	℃	Increase or decrease F1 value for calibration if displayed temperature offsets.
F2	Alarm Offset	0~50.0	10.0	℃	Alarm will be triggered if room temperature > On Temp + F2 or room temperature < Off Temp - F2.
F3	Types Of Defrost	0: Electric defrost; 1: Hot gas defrost; 2: Defrost with compressor off	0	/	
F4	Defrost Counting Type	0: Controller operating time 1: Compressor operating time	0	/	
F5	Dripping Time	0~120	3	min	The time interval after defrosting.
F6	Fan Start Mode	-30~-1: Fan starts running 1 to 30 minutes earlier than compressor. 0~30: Fan starts running 0 to 30 minutes later than compressor. C: Fan runs continuously.	0	/	Fan stops running during defrosting. If F6=0 and F7=0, fan & compressor are switched on and off simultaneously. If F6=C or F7=C, fan runs continuously.
F7	Fan Stop Mode	0~30: Fan stops running 0 to 30 minutes later than compressor. C: Fan runs continuously.	0	/	
F8	Alarm Delay	0~120	30	min	Alarm will be triggered if the temperature goes out of temperature set-point and F8 elapses.
F9	Alarm Delay After Power On	0~120	2	h	When controller is powered on, alarm will not be triggered within F9 set-point.
F10	Auxiliary Output Options	0: Disable 1: Alarm output 2: Condenser pump output 3: Auxiliary output 4: Light output	1	/	
F11	Water Prefilling Time	3~255	3	s	Water pump starts first if cooling is activated. After F11 elapses, the compressor is switched on.
F12	Pump Stop Delay	3~255	3	s	If the compressor is switched off, water pump stops running after F12 elapses.
F13	Defrost Sensor Options	0: Disable 1: Enable	1	/	
F14	Fan Activity During Defrost	0: Off 1: On	0	/	
F15	Digital Input Options	0: Disable 1: Door switch 2: High/low pressure input 3: Auxiliary input	2	/	
F16	Type of Digital Input	0: Closed to take effect 1: Open to take effect	1	/	
F17	Door Switch Input	0: Compressor and evaporator fan are switched off. 1: Evaporator fan is switched off. 2: Cold room light is turned on. 3: Compressor and evaporator fan are switched off, and cold room light is turned on. 4: Evaporator fan is switched off and cold room light is turned on.	2	/	
F18	Door Switch Alarm Delay	0~120	0	min	
F19	Password	0~999	0	/	
F20	Defrost Probe Calibration	-10.0 ~ +10.0	0	℃	Increase/decrease F20 value for calibration if the temperature read by defrost sensor offsets.
F21	Pause Duration	1~240	15	min	System pauses until F21elapses.
F22	Backup Sensor Options	0: Disable 1: Enable - automatically active as a room temperature sensor to control output in the event of a faulty room temperature sensor. 2: Enable - used as a room temperature sensor to measure temperature but not control output. 3: Enable - used together with the room temperature sensor. The average temperature measured by the two sensors is used to control output.	1		
F23	Communication Address	1~127	1		

Instruction of Buttons

1) Defrost button ❄
In the non-defrosting, non-parameter setting and non-parameter viewing status, if the defrost interval is not set to 0 and the temperature read by defrost sensor is lower than the defrost stop temperature set-point, press and hold ❄ button for more than 5 seconds to enter manual defrost status. Hold ❄ button again for more than 5 seconds to exit manual defrost status.
2) ⌃ button(mainly in Wi-Fi status)
Under running status, press and hold ⌃ button, Room Temp window will display “NET” and Off Temp window will display the current network status.

Display in Off Temp window	Value and its meaning	
First digit	0: Network module does not exist or fails.	
	1: Network module exists but has no signal.	
	2: Wi-Fi is not configured.	
	3: Wi-Fi has been connected.	
	4: 2G network has been connected.	
	5: 4G network has been connected.	
Second digit	0: No signal.	The second digit works only when the first digit is more than 3.
	1: Weak signal.	
	2: Moderate signal.	
	3: Strong signal.	
	4: Very strong signal.	

3) ⌄ button
Under running status, press and hold ⌄ button, Room Temp window will display “P2” and Off Temp window will display the current temperature measured by the sensor. Please use ⌃ or ⌄ button to switch between “P2” (the temperature measured by defrost sensor) and “P3” (the temperature measured by backup sensor).
If either sensor is disabled, the corresponding temperature measured will not be viewed. Press AUX button to exit after viewing.

Output Control

1. Cooling

To **switch on compressor**, all following conditions have to be satisfied:
1) Compressor delays longer than the compressor start delay set-point.
2) Pump running time ≥ water prefilling time (F11) (only when F10=2).
3) Room temperature ≥ On Temp set-point.
To **switch off compressor**, one of the following conditions has to be satisfied:
1) Room temperature ≤ Off Temp set-point.
2) Defrost in progress.
3) Cooling is forced to stop.

2. Defrost (if defrost interval = 0, defrost is disabled.)

To **start defrost**, all following conditions have to be satisfied:
1) Defrost interval ≠ 0.
2) Defrost interval elapses or defrost is manually started.

3) The temperature measured by defrost sensor < defrost stop temperature. If defrost sensor is disabled (F13=0), the condition takes no effect.
To **stop defrost,** one of the following conditions has to be satisfied:
1) The temperature measured by defrost sensor reaches defrost stop temperature.
2) Defrost lasts too long and defrost time elapses.
3) Press ❄ button to stop defrosting.

3. Fan

Fan is controlled by compressor running time.
If defrost is not active, C indicates the fan runs continuously (stops during defrost); 0~30 indicates fan starts (stops) running 0 to 30 minutes later than compressor; -1~-30 indicates fan starts running 1 to 30 minutes earlier than compressor;
If defrost is active, F14=0, fan stops running; F14=1, fan starts running.

4. Water Pump (F10=2)

Water pump starts first if cooling is activated. After water prefilling time (F11) elapses, the compressor will be switched on. If cooling is inactive and the compressor is switched off, the water pump will stop after pump stop delay (F12) elapses.

5. Alarm

The buzzer will beep when alarm outputs. Press and release ⌃ button to mute the buzzer.

Alarm Code

Code	Meaning	Effect…
E1	Room sensor faulty	Compressor operates in duty cycle mode.
E2	Defrost sensor faulty	Defrost is controlled by time.
E3	Temperature alarm (room sensor)	Compressor Operates in duty cycle mode.
E4	Temperature alarm (defrost sensor)	Defrost is controlled by time.
E5	Time out alarm	Compressor Operates in duty cycle mode.
E6	Door switch alarm	Per parameter settings
E7	Backup sensor faulty	
E8	High/Low pressure alarm	
E9	EEPROOM error	
E10	High temperature alarm (back sensor)	
E11	High temperature alarm (back sensor)	
Nixie tubes flash.	High/low temperature alarm	

6. Alarm Relay

If auxiliary output is set to alarm output (F10=1), the relay will close in case of an alarm. After all the alarms are removed, alarm relay is disabled.

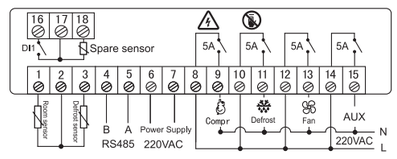
7. On/Off

During normal operation, press and hold ⏻ button for more than 5 seconds, the window shows PAC and the system enters pause status. After pause time (F21) elapses, the system goes into normal running status. In the pause status, press and hold ⏻ button again for 5 seconds, the window shows OFF, the system is switched off, i.e. the controller is turned off and all the outputs are shut down. Press ⏻ button again for more than 5 seconds, the system enters normal operation mode.

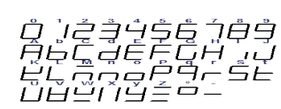
MODBUS-RTU RS-485 Communication

The system adopts the communication protocol of MODBUS-RTU slave mode. Baud rate: 9600, parity: none, data length: 8 bit, stop bit: 1. MODBUS RTU function 03 is used to read holding registers and 06 is used to write a single register.

Wiring Diagram



Appendix: Character Set



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