

Description

This full-featured thermostat is designed for cooling and heating systems in residential and commercial buildings. The thermostat can be configured for use with air handlers, fan coils, VAV, modulating valves and practically any HVAC application. All models support bacnet and modbus protocol which allows easy integration with the big name control systems like Niagara, Siemens, Honeywell, Johnson Controls, Delta, Reliable and Kreuter to name a few. There are five relay outputs. These outputs can be configured using the free software. There are more than 300 settings with many options for each of the settings so it's possible to configure these devices for most any application. Once the unit is configured, save the config file for copying to other controllers and backing up project settings. Options are available for occupancy sensor, wifi, and humidity/enthalpy. Tstat 9 derivative products have light sensor function by default except for basic Tstat9.



Highlights

- Modbus TCP/IP protocols over WIFI.
- Well documented register list for easy integration with other systems.
- 5 relay outputs, each rated at 100~220V, 5 amps.
- Color LCD display
- Easily configure the thermostat for practically any application.
- Clock with infinite life supercap battery backup.
- Uses 32 bit Arm CPU with 12 bit analog readings.
- Fits in regular 3in*3in*1.4in(88mm*88mm*35mm) electrical box



Typical Application



Specifications

Outputs	5 relay outputs
Operating range	-30~70°C(-22~158°F) / 0 to 99% RH
Supply voltage	100~220VAC, 50-60Hz
Power consumption	200mA
Relay contacts	5 relays, 2A @ 220VAC
Plastic Housing	Flammability rating UL 94 file E56070
Enclosure rating	IP31
Protocols	Bacnet MSTP and Modbus TCP/IP
Baudrate	9600, 19200, 38400, 57600, 115200
Temperature sensor	10K thermistor $\pm 0.5^{\circ}\text{C}$
Analog Input	10K thermistor
AnalogOutput	0-10VDC
Setup Software	Free, no licensing, open source

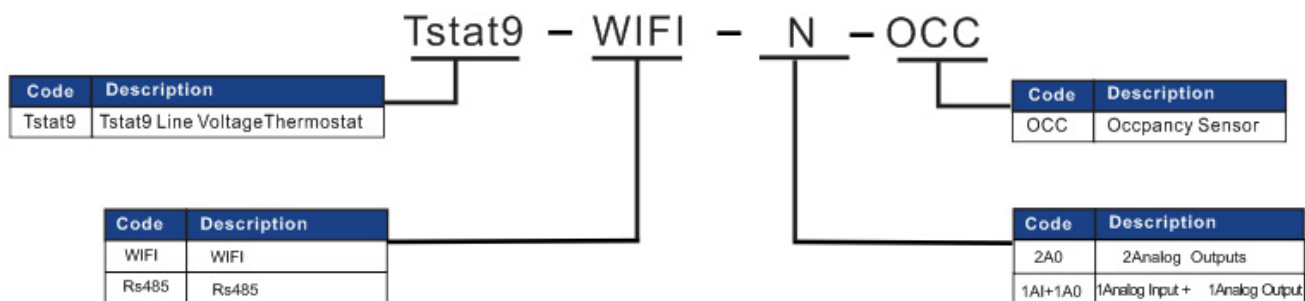
Approvals

Plastic Enclosure	PA66 UL94 V0 File E56070
PCB	FR-4 Epoxy Glass Cloth UL E479892
Terminal Block	PA66 UL94V-0

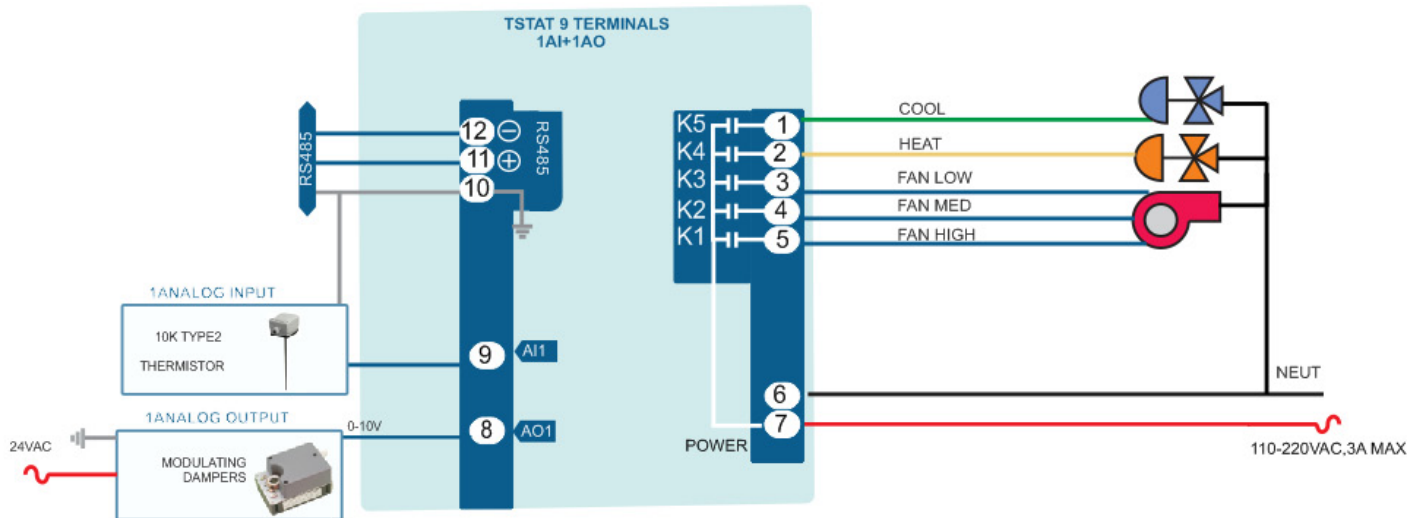
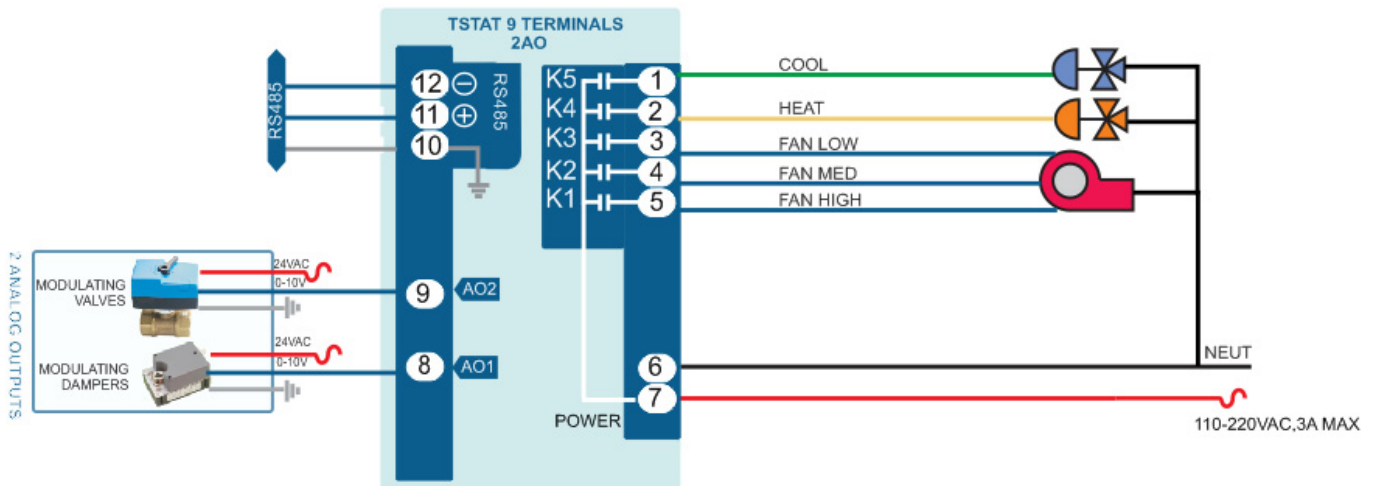
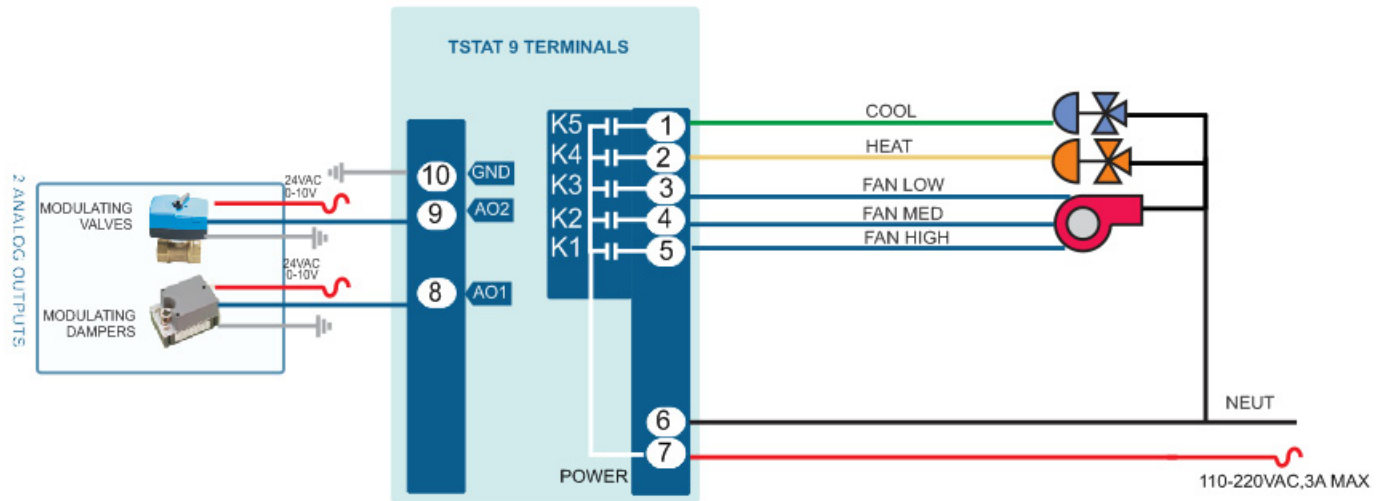
Software

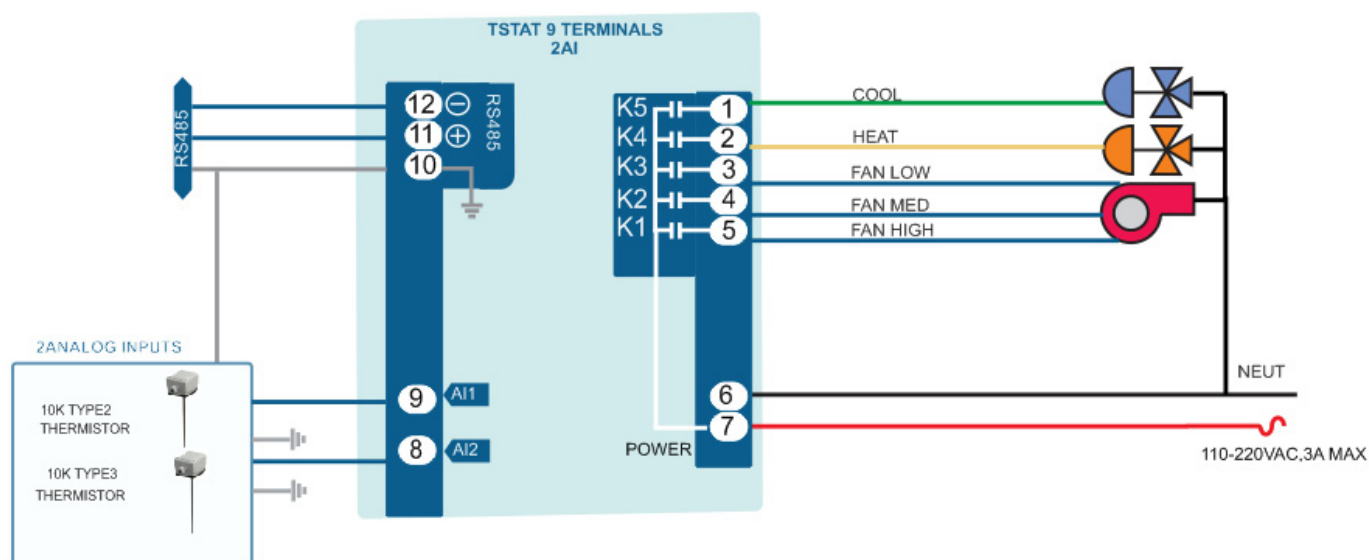
- 5 digital outputs
- Industry standard Modbus protocols
- User screen displays
- Day at home, work time, night at home, sleep, holiday
- 3 PID controllers

Part Number Scheme



Wiring Diagram







Variable	Modbus Register and Description
0	Baudrate 96=9600 192=19200 384=38400 576=57600 1152=115200 unit:bps
1	Station Number
2	Protocol switch.0=MODBUS,1=MSTP
3	Instance Number
4	Schedule enable/disable 1:enable 0:disable
5	Occupied/Home/Day setpoint
6	Unoccupied/Work/Night setpoint
7	Fan mode setting 0:unoccupied mode,1:user mode1 2: user mode2,3: user mode3 4:occupied mode
8	Firmware Version
9	Current Mode of Operation 0:coast mode 1:cool mode2:heat mode
10	Temperature Unit 0:degreeC 1:degree F
11	System Mode 0:auto 1:heat 2:cool,if set to0, system will control by PID,if set to1,system will be heat only mode and 2 will be cool only mode
12	spare
13	Override Timer Unit:minute
14	Pid loop2 occupied setpoint
15	Pid loop2 unoccupied setpoint
16	Output Manual/Auto,each bit indicate each output0:auto 1>manual

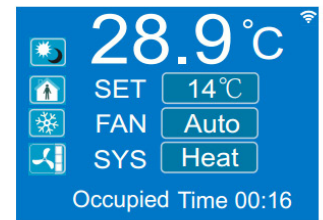
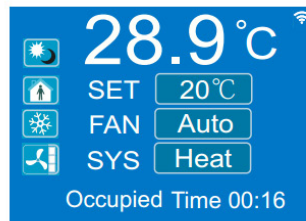
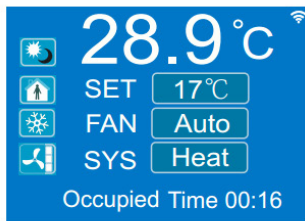
AI	Bacnet Register and Description	
AI1	Analog input1	spare
AI2	Analog input2	
AI3	Analog input3	
AI4	Analog input4	
AI5	Analog input5	
AI6	Analog input6	
AI7	Analog input7	
AI8	Analog input8	
AI9	Internal temperature value	
AI10	Humidity value	
AI11	CO2 value if it has CO2sensor present	spare







BO	Bacnet Register and Description	
BO1	Binary output1 state 1:on 0:off	
BO2	Binary output1 state 2:on 0:off	
BO3	Binary output1 state 3:on 0:off	
BO4	Binary output1 state 4:on 0:off	
BO5	Binary output1 state 5:on 0:off	



AO	Bacnet Register and Description	
AO1	Analog output1 value	
AO2	Analog output2 value	

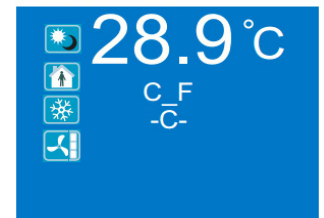
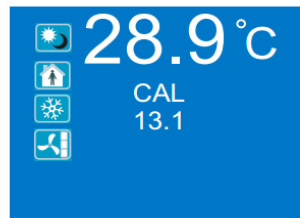
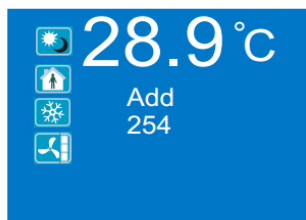
LCD Screen Display

1. When you press  or , it will decrease or increase the set point value. The value will flash two times, then it will confirm the setting automatically.



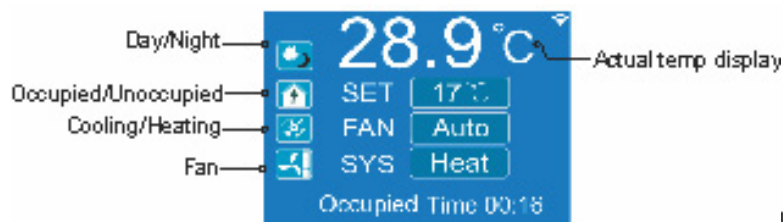
2. In the normal mode, press both  and  at the same time. Hold for several seconds, it will switch to the menu mode. Press  or  to scroll through the menu options such as 'Add', 'CAL', 'bAU', 'UNITS' and many others. To change the values at a particular menu, press  or , the chosen value will be stored automatically.

To change the unit's address, scroll through the menu until you reach 'Add'. Press  or  to increase or decrease the unit's address from 1 to 254.



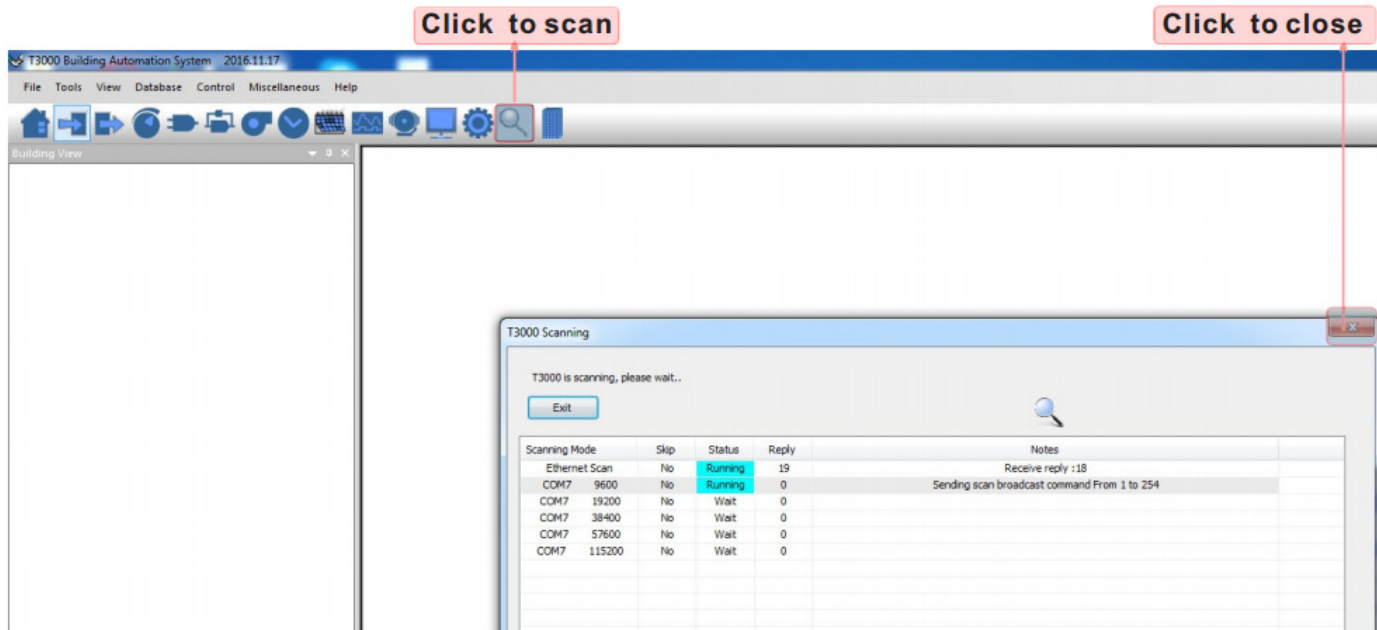
Advanced Menu Item Details


They have several advanced menu items which can be adjusted in the field to suit the application and tune the operation of the thermostat. Generally speaking, all the parameters are set up at the factory on an order-by-order basis and will give satisfactory results out of the box.

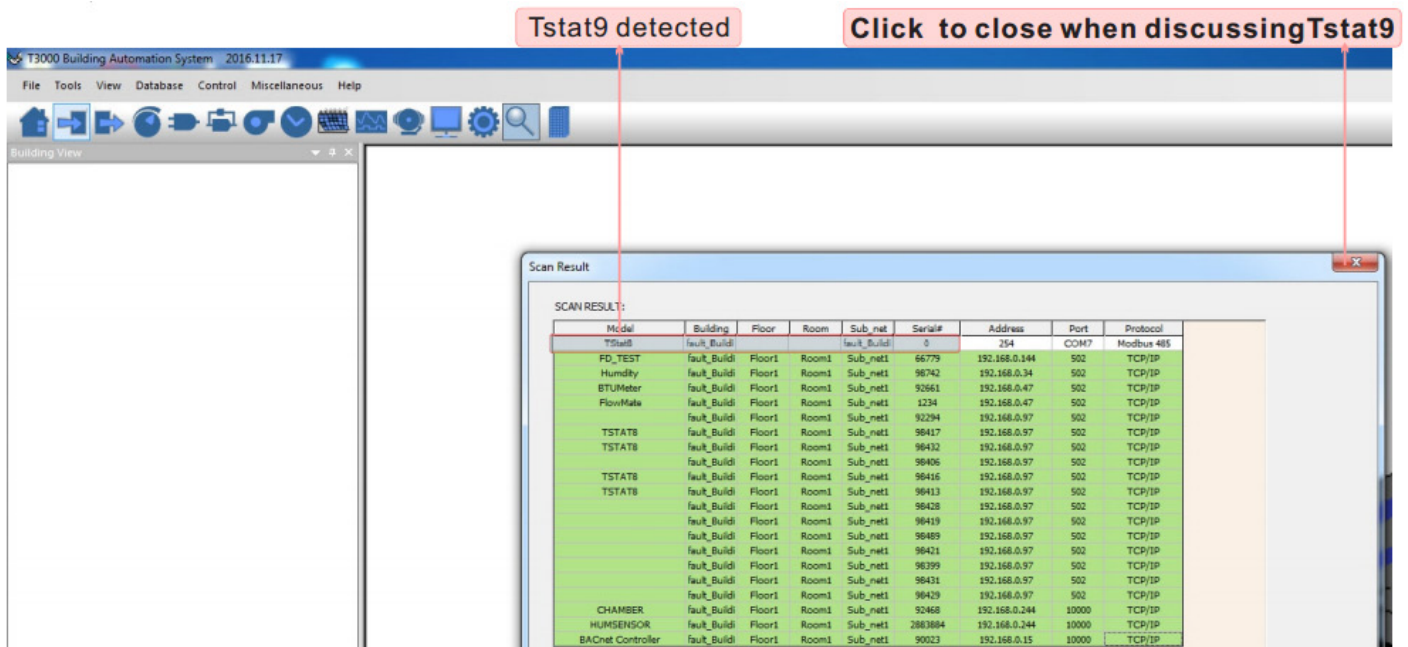



T3000 Operation

1.Connect Tstat9 to PC by RS485, start T3000 software



2.Click the button  to scan, the following view will appear and close it as the picture indicates. When discussing Tstat9,close the view.

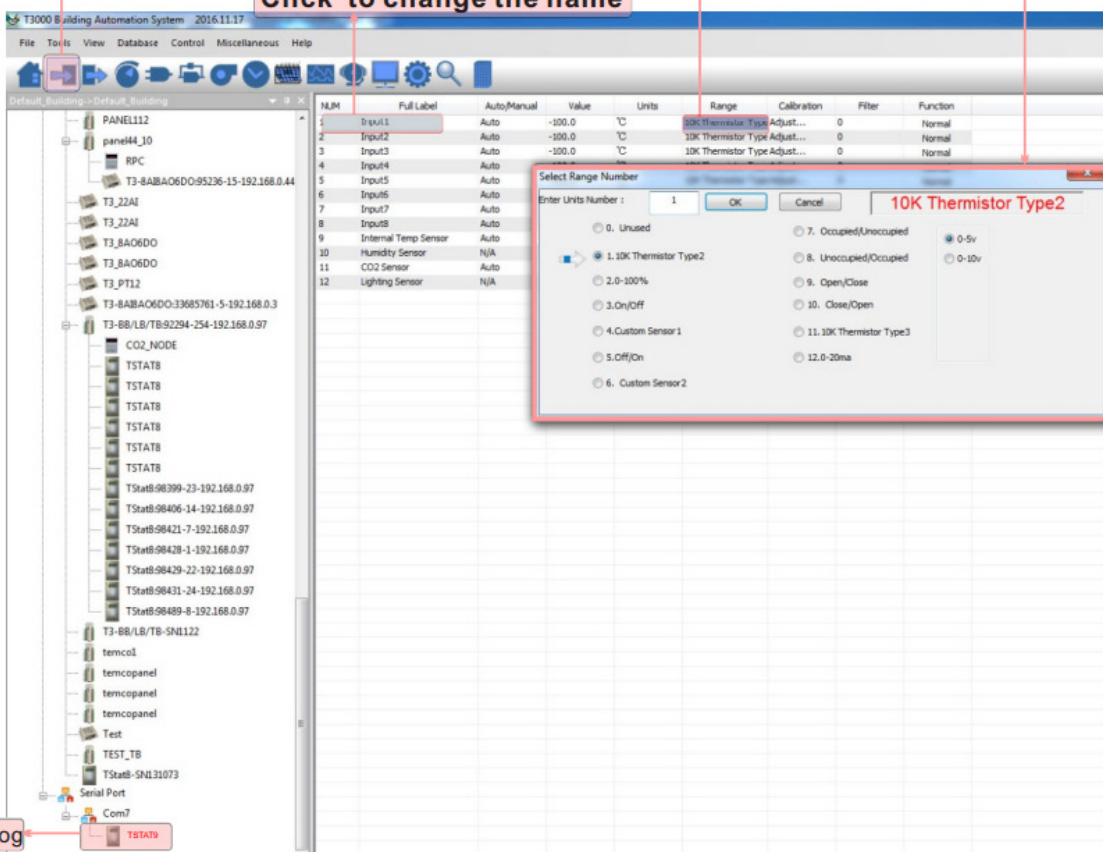


3. Click Tstat9 log, then click "input" , the T3000 will show all the information of it. To change name or choices, click as below.


Click to show input information

Click to change the name

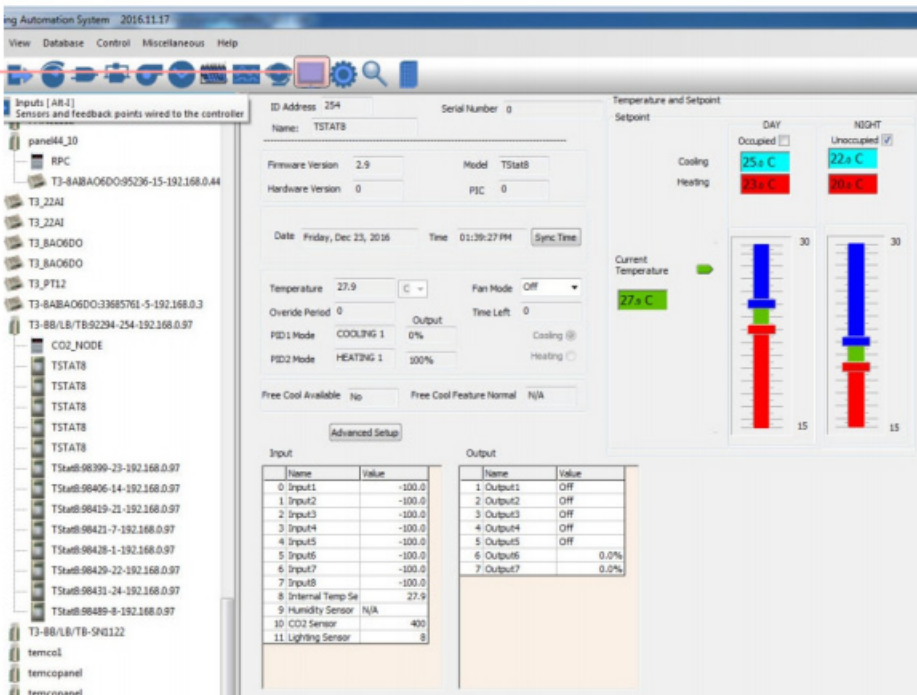
Press range to different choices



The screenshot shows the T3000 Building Automation System interface. On the left, a tree view shows the system hierarchy. In the center, a table lists inputs with columns: NUM, Full Label, Auto/Manual, Value, Units, Range, Calibration, Filter, and Function. A dialog box titled 'Select Range Number' is open, showing options for '10K Thermistor Type2' and '10K Thermistor Type3'. The dialog also includes a 'Range' section with various sensor type options.

4. Click  to do settings, you can see a tab below about setpoint and temperature.

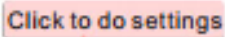
Click to do settings



The screenshot shows the T3000 Building Automation System interface with the TSTAT8 settings window open. The window displays various configuration options for the thermostat, including setpoints, modes, and advanced settings. The 'Temperature and Setpoint' section shows a setpoint of 25°C and a current temperature of 27.9°C. The 'Advanced Setup' section shows input and output values.

Input	Name	Value
0	Input1	-100.0
1	Input2	-100.0
2	Input3	-100.0
3	Input4	-100.0
4	Input5	-100.0
5	Input6	-100.0
6	Input7	-100.0
7	Input8	-100.0
8	Internal Temp Se	27.9
9	Humidity Sensor	N/A
10	CO2 Sensor	400
11	Lighting Sensor	8

Output	Name	Value
1	Output1	Off
2	Output2	Off
3	Output3	Off
4	Output4	Off
5	Output5	Off
6	Output6	0.0%
7	Output7	0.0%



WIFI configuration setting

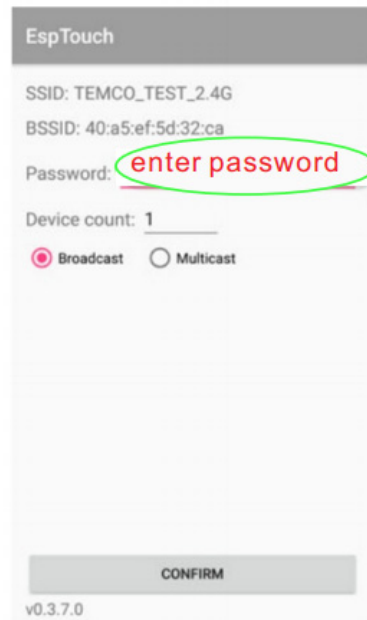
There are two methods which are EspTouch and T3000 to set IP address

1.Set up via EspTouch

First click the link to download, install the app in Android phone, then connect the phone to WiFi router and turn on tstat 9.

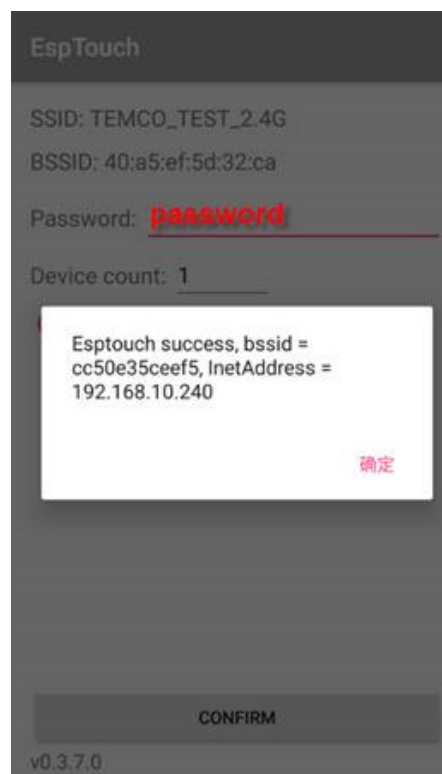
<https://temcocontrols.com/ftp/software/24esptouch.zip>

The app will get the SSID from your phone and you need enter the wifi password, click confirm button then app will send a broadcast message through wifi router to Tstat9



The image shows the EspTouch app interface. At the top, it says 'EspTouch'. Below that, it displays 'SSID: TEMCO_TEST_2.4G' and 'BSSID: 40:a5:ef:5d:32:ca'. The 'Password:' field is highlighted with a green oval and contains the text 'enter password' in red. Below the password field, it shows 'Device count: 1' and two radio buttons: 'Broadcast' (selected) and 'Multicast'. At the bottom, there is a 'CONFIRM' button and the version 'v0.3.7.0'.


After about less than 20 seconds, Tstat9 will get the IP, and can see the message from phone.

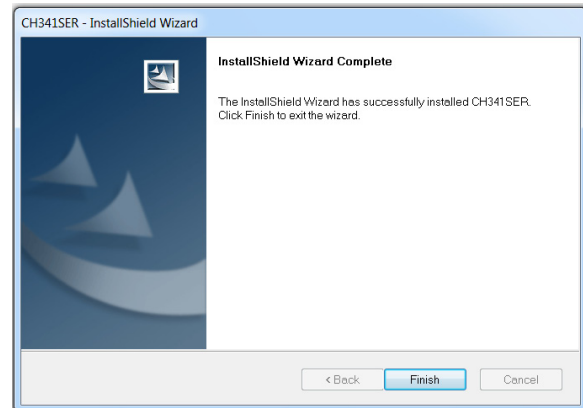


The image shows the EspTouch app interface after a successful configuration. It displays 'SSID: TEMCO_TEST_2.4G' and 'BSSID: 40:a5:ef:5d:32:ca'. The 'Password:' field now contains the text 'password' in red. Below the password field, it shows 'Device count: 1'. A white dialog box is overlaid on the screen, displaying the message: 'Esptouch success, bssid = cc50e35ceef5, lnetAddress = 192.168.10.240'. The dialog box has a red '确定' (Confirm) button. At the bottom, there is a 'CONFIRM' button and the version 'v0.3.7.0'.

2.Set up via T3000

(1)Visit <https://temcocontrols.com/ftp/file/CH340SerSetup.zip>,download serial port drive software and install it.


 CH341SerSetup.exe

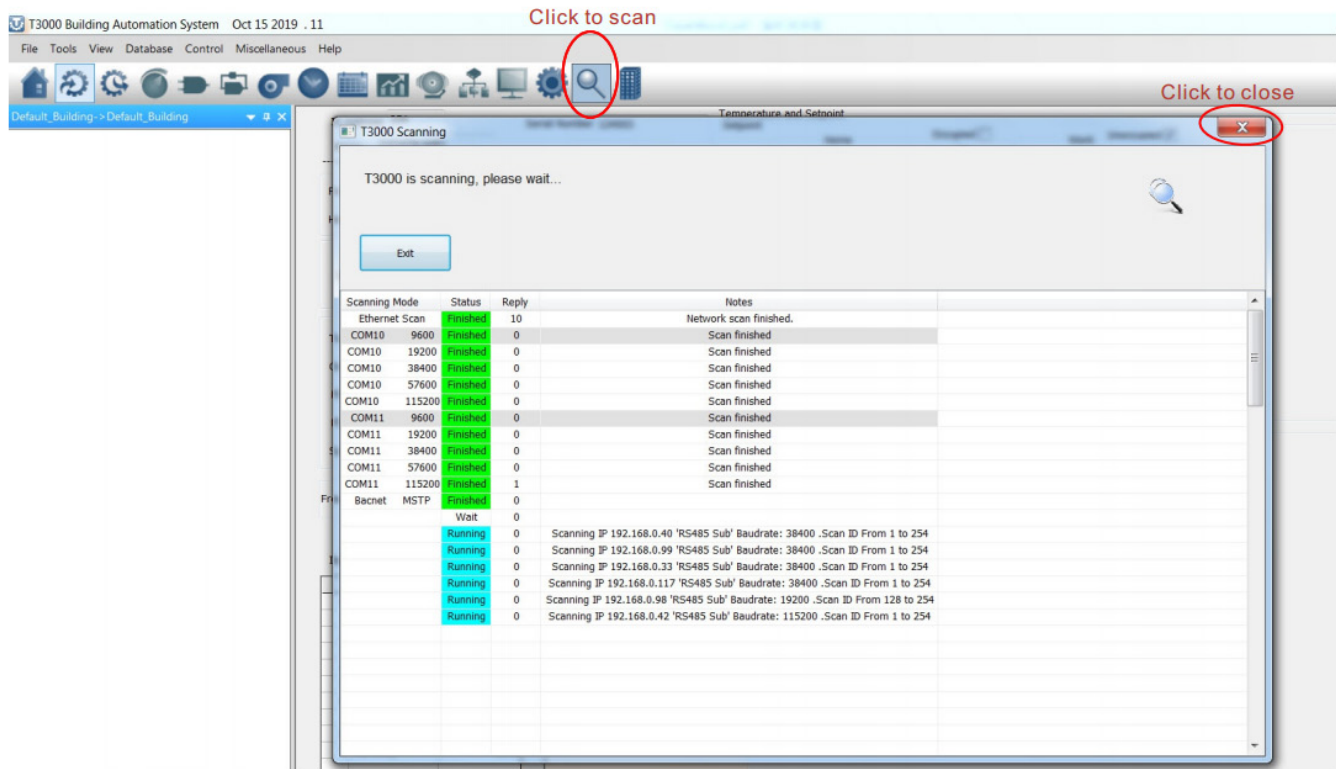


(2)Visit <https://temcocontrols.com/ftp/software/09T3000Software.zip>, download T3000 software and install it;

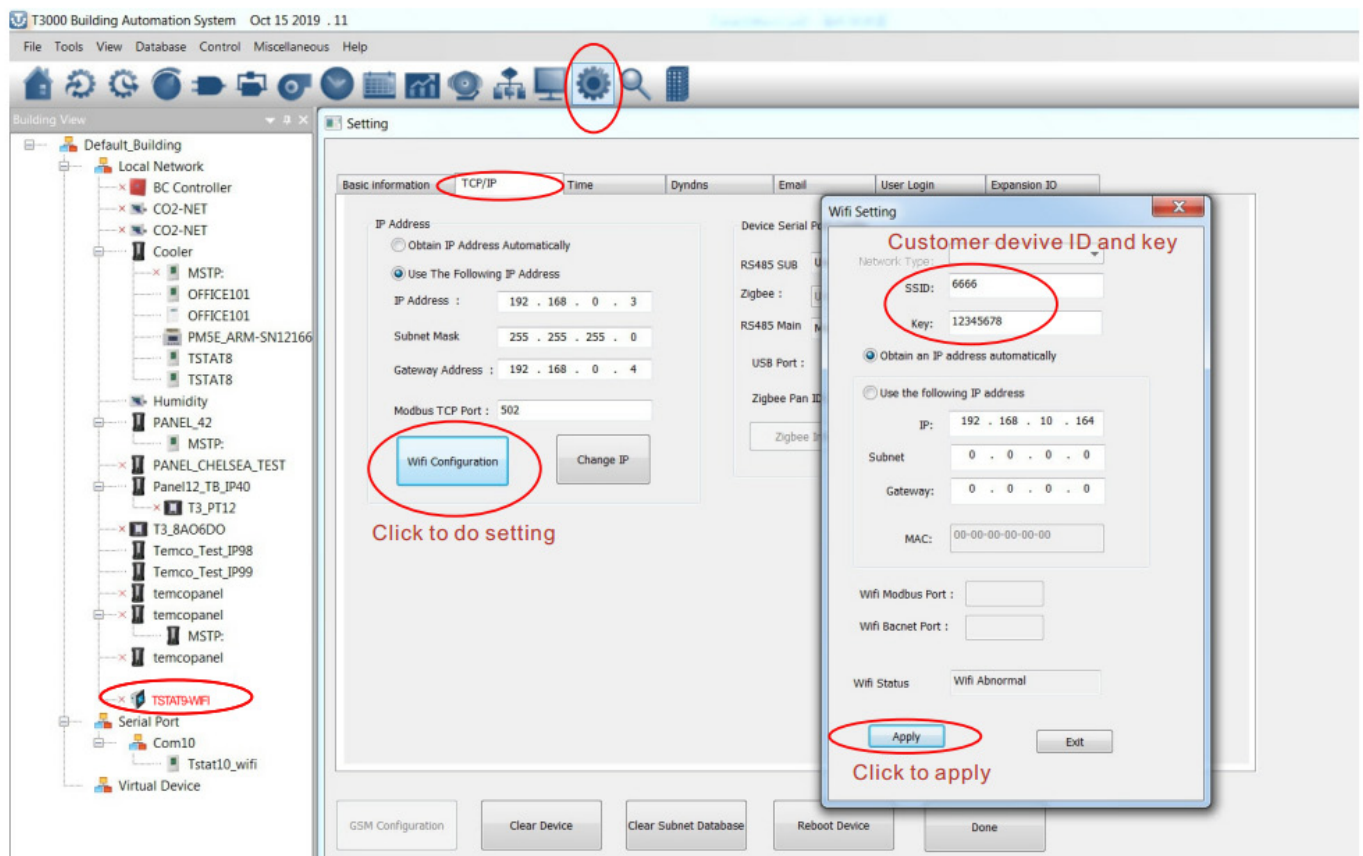
(3)Plug Tstat9-wifi in power,connect it to PC via USB cable;



(4)Start T3000 software,click  to scan.



(5)click  to set,then you can find Tstat9-wifi as below



Tstat9-OCC

The fan Angle is 60 degrees and the range is about 3 meters

Detecting Area View:

