

## 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 relays and two analog outputs as well as 8 universal inputs. These i/o can be configured using the free software. There are more than 300 settings with many options for each of the settings so its 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.

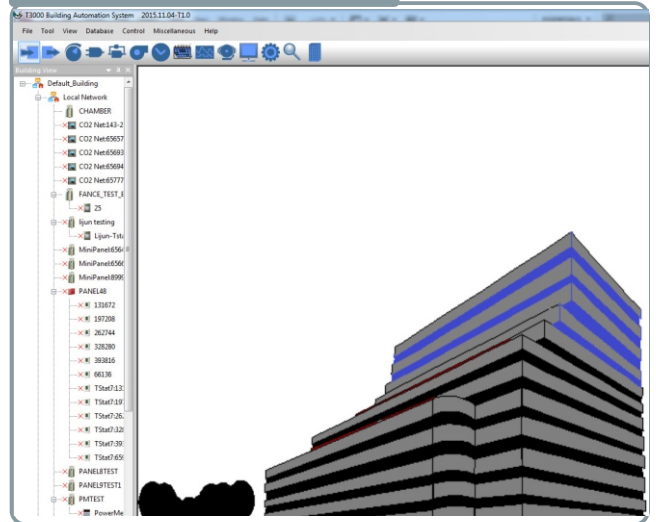
Options are available for occupancy sensor, zigbee, and humidity / enthalpy.



## Highlights

- Bacnet MSTP and Modbus RTU protocols over RS485.
- Baudrates : 1.2k,4.8k,9.6k,14.4,19.2k, 38.4k, 57.6k, 76.8k and 115.2k
- Well documented register list for easy integration with other systems.
- 8 universal inputs for external temperature sensors, contacts, etc.
- 5 relay outputs, each rated at 12~24vac, 2 amps.
- 2 analog outputs, 0-10V @ 100ma.
- Color LCD display with scroll bar.
- 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.

## T3000 software

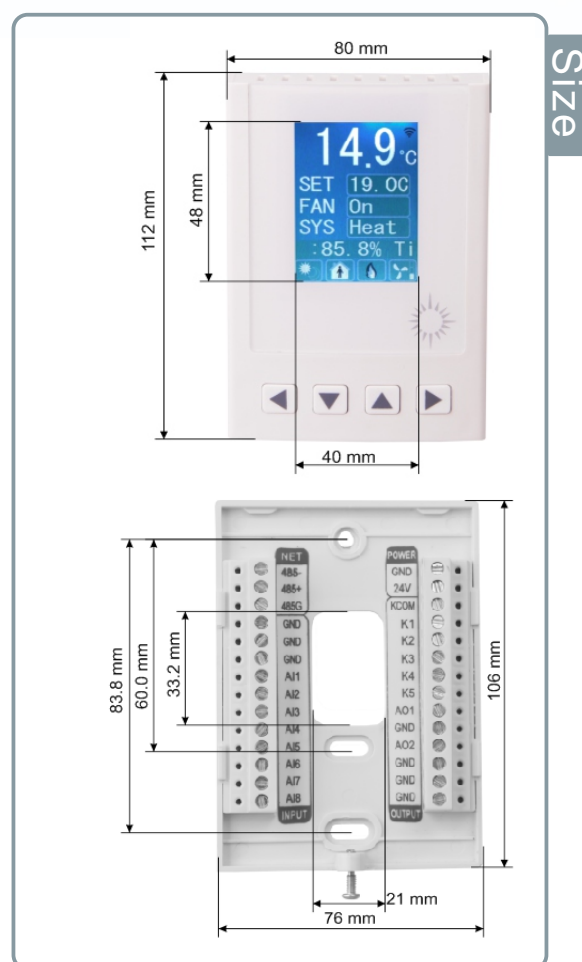


## Typical Application

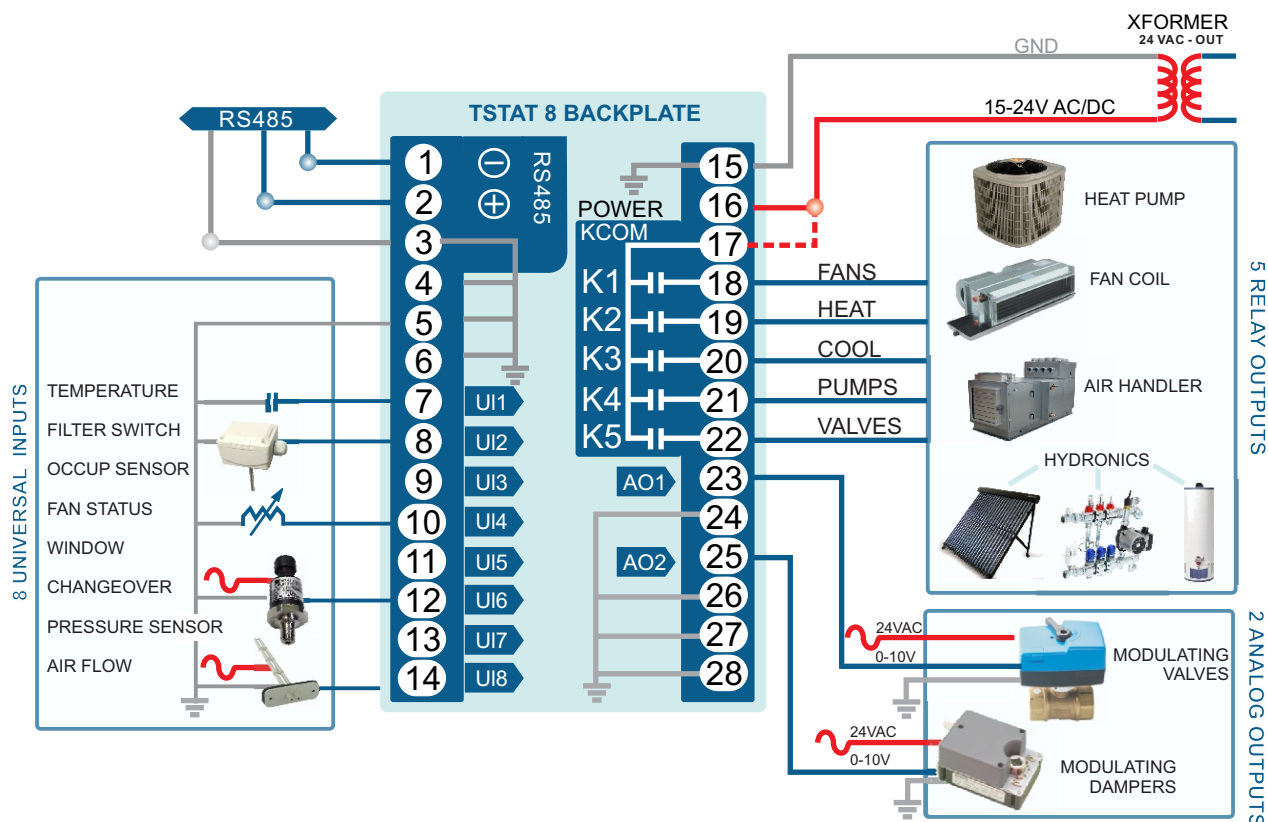


## Specifications

• Outputs	5 relay outputs 2 analog outputs 10V@100mA
• 8 Universal Inputs	10k therm, contacts, 4-20ma, 0-5V, 0-10V
• Operating range	-30~70°C(-22~158°F) / 0 to 99% RH
• Supply voltage	12~24VAC/DC ±20%, 50-60Hz
• Power consumption	100mA at 12VDC
• Relay contacts	5 relays, 2A @ 24VAC UL File No.: E169380
• Plastic Housing	Flammability rating UL 94 file E56070
• Enclosure rating	IP31
• Protocols	Bacnet MSTP and Modbus RTU
• Baudrate	9600, 19200, 38400, 57600, 115200
• Temperature sensor	10K thermistor ±0.5°C
• Setup Software	Free, no licensing, open source



## Wiring Diagram



Approvals

•Relay	UL File No.: E169380
•Plastic Enclosure	PA66 UL 94 V0 file E56070
•PCB	FR-4 Epoxy Glass Cloth UL E479892
•Terminal Block	PA66 UL 94V-0

Software

•8 analog inputs,2 analog outputs;5 digital outputs
•Industry standard Bacnet & Modbus protocols
•User screen displays
•Day at home, work time, night at home, sleep, holiday
•3 PID controllers



Bacnet Objects

Device	Object identifier;Object name;Object type;Vendor name;Vendor identifier; Model name;Firmware revision;Application software version; Protocol version;Protocol revision;Object list;Max apdu length accepted; Segmentation supported
Universal input	Object identifier;Object name;Description;Object type;Present value; Out of service;Units
Analog output	Object identifier;Object name;Description;Object type;Present value; Out of service;Units;Priority array
Analog value	Object identifier;Object name;Description;Object type;Present value; Out of service;Units;Priority array
Binary output	Object identifier;Object name;Description;Object type;Present value; Out of service;Units;Priority array;Polarity;Relinquish default;Active text; Inactive text

## Part Number Scheme

Tstat8 – H – OCC – B

Code	Description
Tstat8	Thermostat

	Description
B	Black color

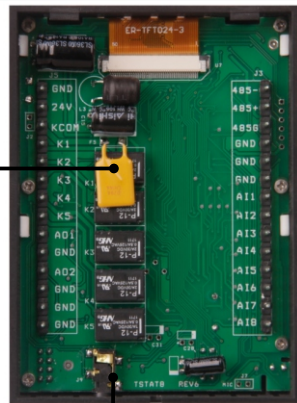
	Description
H	Humidity

	Description
	Basic model temperature and clock
WIFI	WIFI
OCC	Occupancy sensor
220	220V
ZIG	Zigbee

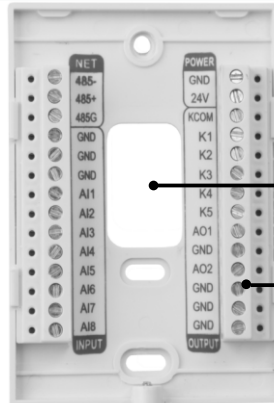
Tstat8-Black : MOQ 50PCS

## Highlights

Self reset fuses



Jack to network



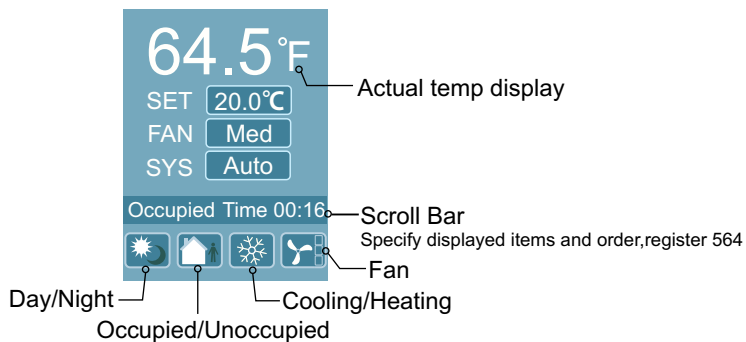
Mounting screw

Mount on electrical box or surface mount

Pluggable base

## Advanced Menu Item Details

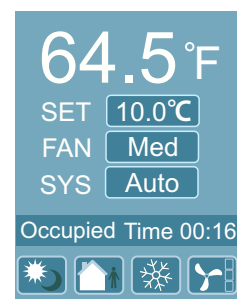
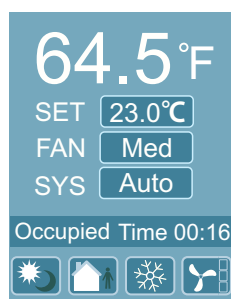
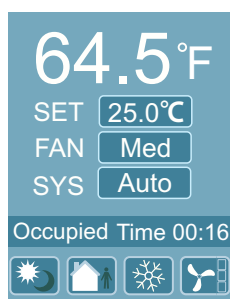
They have several advanced menu items which can be adjusted in the field to suit the application and tune the operation of the thermostat. Generally speaking, all the parameters are set up at the factory on an order-by-order basis and will give satisfactory results out of the box.





## LCD Screen Display

1. When you press ◀ or ▶, it will increase or decrease 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.

To change the baudrate, locate 'bAU' within the menu and use ▲ and ▼ to choose 19200 or 9600.



## Custom Enclosures and Logos



Black



Tstat8



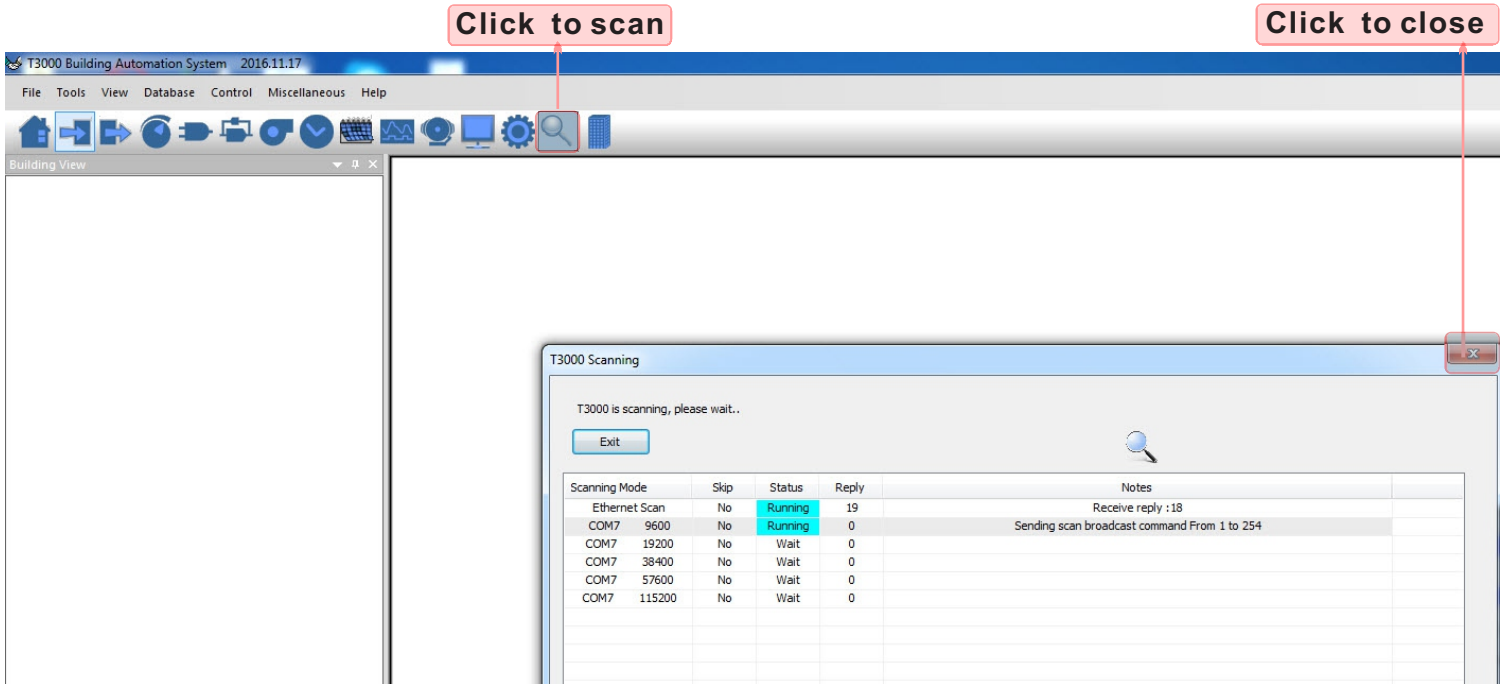
Tstat8-H-OCC




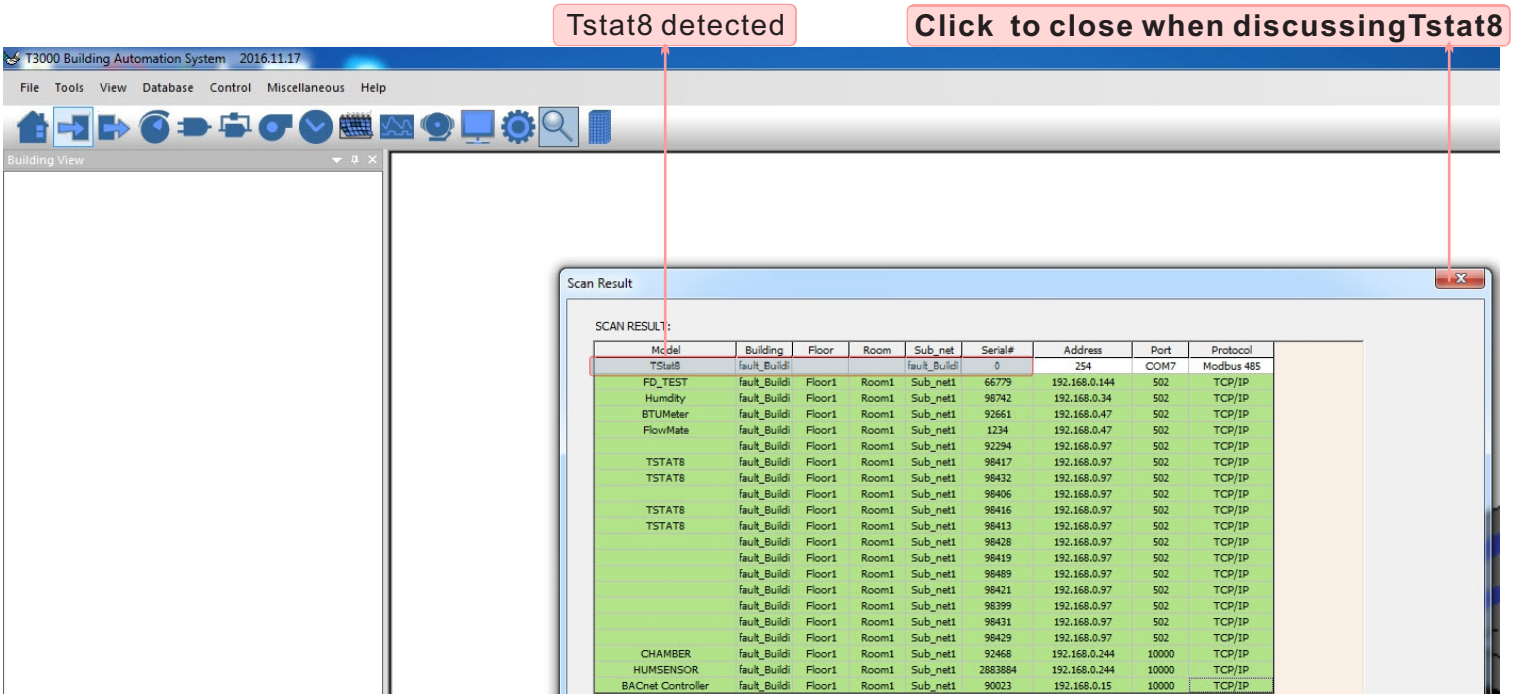
Tstat8-H-Zigbee

# T3000 operation

1. Connect Tstat8 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 Tstat8, close the view.



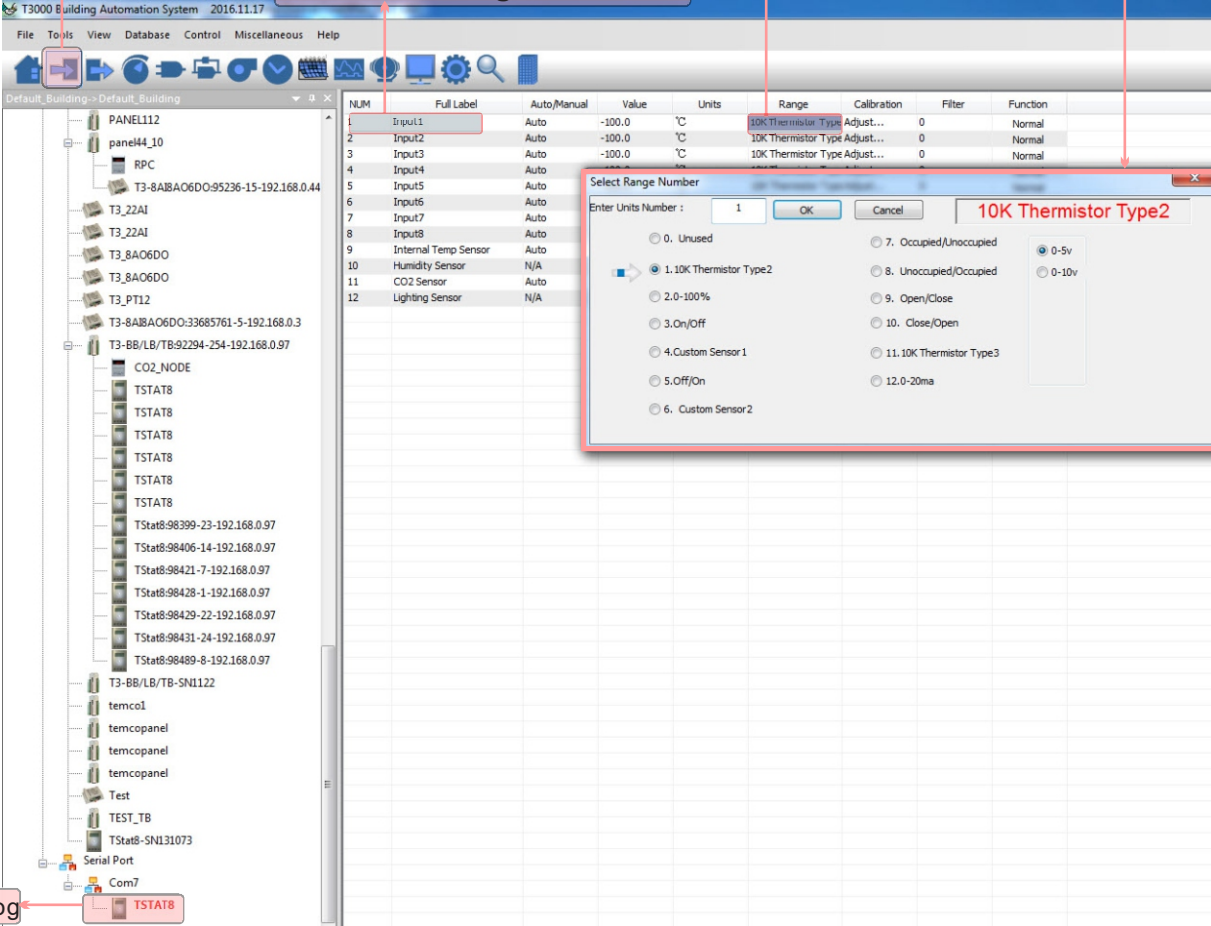
## T3000 operation

3. Click Tstat8 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 is a tree view of the system components. The main window displays a table of inputs:

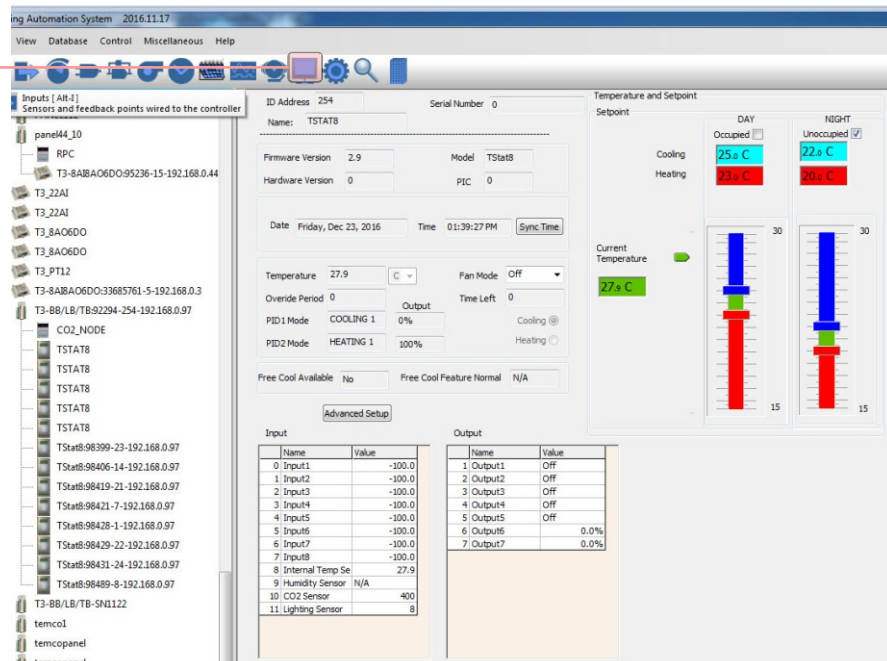
NUM	Full Label	Auto/Manual	Value	Units	Range	Calibration	Filter	Function
1	Input1	Auto	-100.0	°C	10K Thermistor Type2	0		Normal
2	Input2	Auto	-100.0	°C	10K Thermistor Type2	0		Normal
3	Input3	Auto	-100.0	°C	10K Thermistor Type2	0		Normal
4	Input4	Auto						
5	Input5	Auto						
6	Input6	Auto						
7	Input7	Auto						
8	Input8	Auto						
9	Internal Temp Sensor	Auto						
10	Humidity Sensor	N/A						
11	CO2 Sensor	Auto						
12	Lighting Sensor	N/A						

A dialog box titled "Select Range Number" is open, showing various range options. The "10K Thermistor Type2" option is selected. The dialog also includes a "Enter Units Number" field and "OK" and "Cancel" buttons.

At the bottom left, a red box highlights the "Tstat8 log" icon in the tree view.

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 settings tab selected. The settings are for a thermostat named "TSTAT8".

**Inputs [AIR-1]**  
Sensors and feedback points wired to the controller

**Temperature and Setpoint**


Setpoint: DAY (Occupied) 25.0 C, NIGHT (Unoccupied) 22.0 C

Current Temperature: 27.9 C

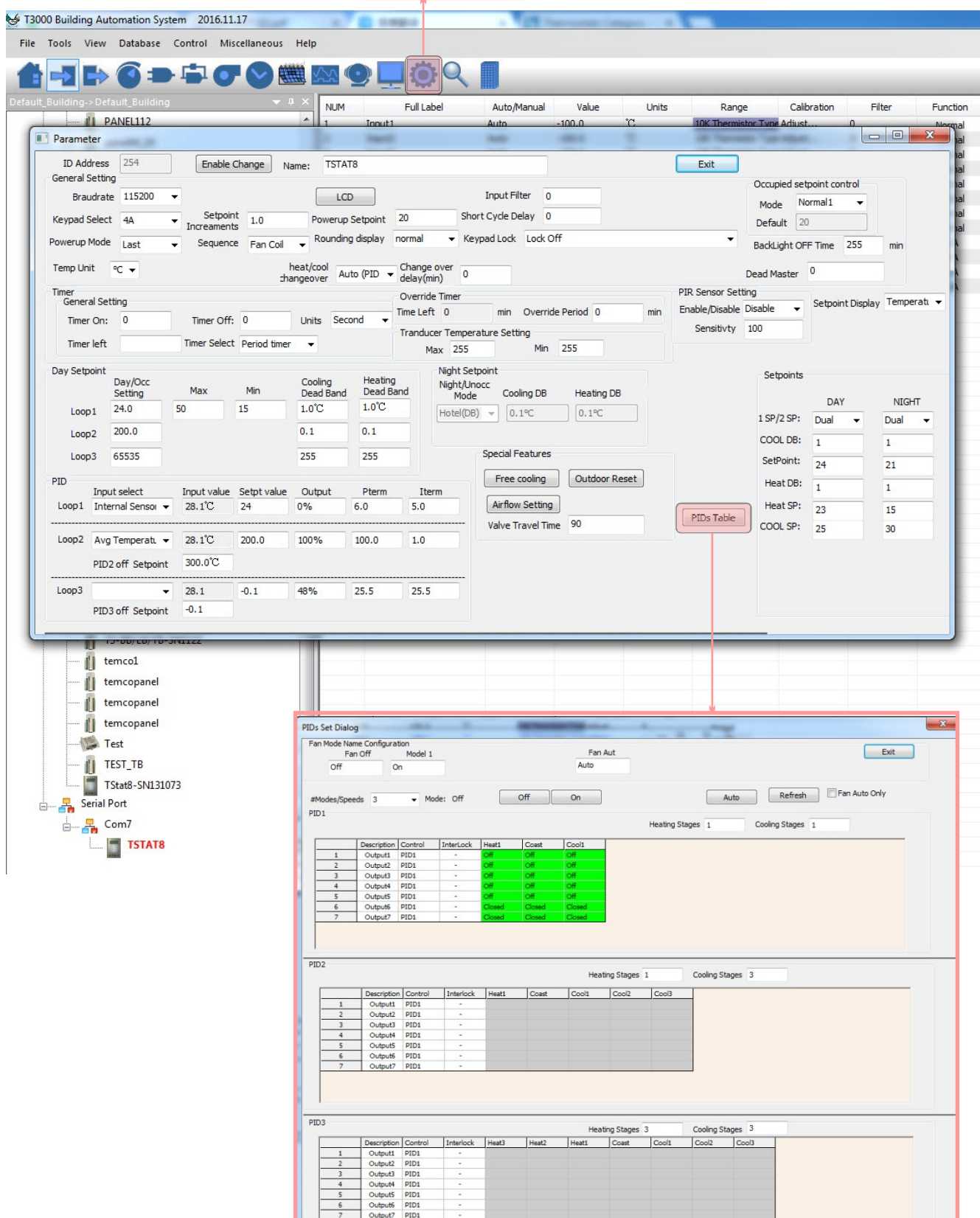
**Advanced Setup**

Input	Name	Value	Output	Name	Value
0	Input1	-100.0	1	Output1	Off
1	Input2	-100.0	2	Output2	Off
2	Input3	-100.0	3	Output3	Off
3	Input4	-100.0	4	Output4	Off
4	Input5	-100.0	5	Output5	Off
5	Input6	-100.0	6	Output6	0.0%
6	Input7	-100.0	7	Output7	0.0%
7	Input8	-100.0			
8	Internal Temp Se	27.9			
9	Humidity Sensor	N/A			
10	CO2 Sensor	400			
11	Lighting Sensor	8			

## T3000 operation

5. Click  to do settings, you can see a tab below about parameter. Click PIDs tables, you can find PIDs set Dialog.

Click to do settings



The 'Parameter' dialog for TSTAT8 includes the following sections:

- General Setting:** ID Address 254, Name: TSTAT8, Braudrate 115200, KeyPad Select 4A, Powerup Mode Last, Temp Unit °C, Input Filter 0, Powerup Setpoint 20, Short Cycle Delay 0, Occupied setpoint control Mode Normal1, Default 20, BackLight OFF Time 255 min, Dead Master 0.
- Timer General Setting:** Timer On: 0, Timer Off: 0, Units Second, Timer left, Timer Select Period timer, Override Timer Time Left 0 min, Override Period 0 min, Transducer Temperature Setting Max 255, Min 255.
- Day Setpoint:** Loop1: 24.0, 50, 15, 1.0°C, 0.1, 0.1; Loop2: 200.0, 255, 255, 1.0°C, 0.1, 0.1; Loop3: 65535, 255, 255, 1.0°C, 0.1, 0.1.
- Night Setpoint:** Night/Unocc Mode Hotel(DB), Cooling DB 0.1°C, Heating DB 0.1°C.
- PID Table:**

Loop	Input select	Input value	Setpt value	Output	Pterm	Iterm
Loop1	Internal Sensor	28.1°C	24	0%	6.0	5.0
Loop2	Avg Temperatu	28.1°C	200.0	100%	100.0	1.0
Loop3		28.1	-0.1	48%	25.5	25.5
- Special Features:** Free cooling, Outdoor Reset, Airflow Setting, Valve Travel Time 90.
- Setpoints:**

	DAY	NIGHT
1 SP/2 SP:	Dual	Dual
COOL DB:	1	1
SetPoint:	24	21
Heat DB:	1	1
Heat SP:	23	15
COOL SP:	25	30

The 'PIDs Set Dialog' window shows the configuration for PIDs 1, 2, and 3. It includes a table for each PID with columns for Description, Control, Interlock, Heat1, Coast, Cool1, and others.

**PID1 Table:**

Description	Control	Interlock	Heat1	Coast	Cool1
1 Output1	PID1	-	Off	Off	Off
2 Output2	PID1	-	Off	Off	Off
3 Output3	PID1	-	Off	Off	Off
4 Output4	PID1	-	Off	Off	Off
5 Output5	PID1	-	Off	Off	Off
6 Output6	PID1	-	Closed	Closed	Closed
7 Output7	PID1	-	Closed	Closed	Closed

**PID2 Table:**

Description	Control	Interlock	Heat1	Coast	Cool1	Cool2	Cool3
1 Output1	PID1	-					
2 Output2	PID1	-					
3 Output3	PID1	-					
4 Output4	PID1	-					
5 Output5	PID1	-					
6 Output6	PID1	-					
7 Output7	PID1	-					

**PID3 Table:**

Description	Control	Interlock	Heat3	Heat2	Heat1	Coast	Cool1	Cool2	Cool3
1 Output1	PID1	-							
2 Output2	PID1	-							
3 Output3	PID1	-							
4 Output4	PID1	-							
5 Output5	PID1	-							
6 Output6	PID1	-							
7 Output7	PID1	-							