Honeywell

TB7600 Series Communicating RTU/Heat Pump Thermostats
FOR COMMERCIAL HVAC APPLICATIONS

APPLICATION

The TB7600 Series PI thermostat family is specifically designed for single stage and multi-stage control of heating/cooling equipment such as rooftop and self-contained units. The TB7600 Series are communicating thermostats with models available in BACnet® MS/TP and ZigBee® wireless mesh protocols and can be easily integrated into a WEBs-AX building automation system based on the NiagaraAX® platform. The product features an intuitive, menu-driven, back-lit LCD display, which walks users through the programming steps, making the process extremely simple. Accurate temperature control is achieved due to the product's PI time proportional control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based thermostats.

Depending on the model, up to three remote sensor inputs are available. All models contain a SPST auxiliary switch, which can be used to control lighting or disable the economizer function and a discharge air sensor input. For more advanced applications, an economizer control logic has been integrated onto the thermostat for use with proportional damper economizer actuators.

TB7600 Series Thermostat

TB7600 Series Thermostat with Occupancy Sensor

Thermostats equipped with an occupancy sensor cover provide advanced active occupancy logic, which will automatically switch occupancy levels from Occupied to Unoccupied as required by local activity being present or not. This advanced occupancy functionality provides advantageous energy savings during occupied hours without sacrificing occupant comfort. All thermostats are PIR ready and can be ordered with or without Honeywell occupancy sensor. The occupancy sensor cover is available to order separately if a PIR is needed at a later time.

FEATURES

- **Available in BACnet MS/TP and ZigBee wireless protocols**
- **Backlit LCD display with dedicated function menu keys for simple operation**
- **Built in default profile set-up for easier start up and commissioning**
- **Fully integrated advanced occupancy functionality with a PIR accessory cover on some models**
- **Non-volatile EEPROM memory prevents loss of parameters during power outage**
- **Programmable smart fan operation can provide energy savings during night mode**
- **Password protection to minimize parameter tampering**
- **Three levels of keypad lockout to limit access to change user parameters such as setpoints, system mode, etc.**
- **Gas/oil or electric system compatibility for all type of applications**
- **SPST auxiliary output can be used for lighting and/or economizer override**
- **0 to 10 Vdc economizer output for more retrofit opportunities**
  - Built in dry bulb economizer logic using outdoor temperature sensor
  - Input for supply/mixed air temperature sensor
- **Support single and two stages heat pump with one auxiliary heat stage**

- **Remote indoor averaging sensing with 2, 3, 4, 9 or 16 sensors**
- **Remote discharge air sensor input**
- **Automatic frost protection to prevents costly freeze damage**
- **Anti short cycle and minimum on/off run time protection to reduce wear and maximizes life span of mechanical equipment**
- **Two programmable digital inputs for added flexibility can be use to monitor filter status, activate a remote temporary occupancy switch, and/or used as a general purpose service indicator**
- **7 day programmable models, 2 or 4 events for use in non-networked applications***
- **Six hour reserve prevents the need to reprogram day/time on programmable models after a power outage**

Heat Pump Model Specific Features

- **Selectable single or dual stage compressor stages**
- **High balance point locks out auxiliary heating when outside air temperature is above set value, low balance point locks out heat pump compressor operation when outside air temperature is below the set value**
- **Comfort/economy mode maximizes heat pump use before turning on auxiliary heating**
- **Compressor/auxiliary interlock adds flexibility by locking out heat pump operation during auxiliary heating to prevent high pressure trip when the coil is downstream of the auxiliary heat source**

* Use programmable models only when installing as standalone thermostats that may eventually be added to a WEBs-AX network. When a programmable thermostat is added to a network, schedules should be applied through the WEB-Station-AX.

TB7600 Series Model Selection

Product Number	Description	Outputs	Scheduling[1]	Occupancy Sensor[2]
BACnet Models				
TB7600A5014B	Single Stage RTU	1H/1C	No	
TB7600A5514B	Single Stage RTU	1H/1C	No	X
TB7600B5014B	Multi-stage RTU	2H/2C	No	
TB7600B5514B	Multi-stage RTU	2H/2C	No	X
TB7600H5014B	Heat Pump	3H/2C	No	
TB7600H5514B	Heat Pump	3H/2C	No	X
TB7605B5014B	Economizer RTU	2H/2C	No	
TB7605B5514B	Economizer RTU	2H/2C	No	X
TB7652A5014B	Single Stage RTU	1H/1C	Yes	
TB7652A5514B	Single Stage RTU	1H/1C	Yes	X
TB7652B5014B	Multi-stage RTU	2H/2C	Yes	
TB7652B5514B	Multi-stage RTU	2H/2C	Yes	X
TB7652H5014B	Heat Pump	3H/2C	Yes	
TB7652H5514B	Heat Pump	3H/2C	Yes	X
TB7656B5014B	Economizer RTU	2H/2C	Yes	
TB7656B5514B	Economizer RTU	2H/2C	Yes	X
Wireless Models				
TB7600A5014W	Single Stage RTU	1H/1C	No	
TB7600A5514W	Single Stage RTU	1H/1C	No	X
TB7600B5014W	Multi-stage RTU	2H/2C	No	
TB7600B5514W	Multi-stage RTU	2H/2C	No	X
TB7600H5014W	Heat Pump	3H/2C	No	
TB7600H5514W	Heat Pump	3H/2C	No	X
TB7605B5014W	Economizer RTU	2H/2C	No	
TB7605B5514W	Economizer RTU	2H/2C	No	X
TB7652A5014W	Single Stage RTU	1H/1C	Yes	
TB7652A5514W	Single Stage RTU	1H/1C	Yes	X

Product Number	Description	Outputs	Scheduling[1]	Occupancy Sensor[2]
TB7652B5014W	Multi-stage RTU	2H/2C	Yes	
TB7652B5514W	Multi-stage RTU	2H/2C	Yes	X
TB7652H5014W	Heat Pump	3H/2C	Yes	
TB7652H5514W	Heat Pump	3H/2C	Yes	X
TB7656B5014W	Economizer RTU	2H/2C	Yes	
TB7656B5514W	Economizer RTU	2H/2C	Yes	X
Accessories				
TB-PIR-RTU	RTU Occupancy Sensor Cover			
TB-RA-1014	Wireless Remote Antenna Base			
TB-RP5000W	Wireless Repeater for TB7XXX Series Wireless Thermostats			
TBST-5014W	ZigBee Wireless Survey Toolkit			
TB-VWG-APP-1014	TB7XXX Series Wireless Communication Card			
TB-WALL-1014	Room Sensor 10K NTC Type 2			
TB-WALLOVR-1014	Room Sensor with Override 10K NTC Type 2			

1 Use programmable models only when installing as standalone thermostats that may eventually be added to a WEBs-AX network. When a programmable thermostat is added to a network, schedules should be applied through the WEB-Station-AX.

2 Thermostats ordered without an occupancy sensor cover can be retrofitted with an occupancy sensor cover later if needed.

More Information

We recommend downloading the appropriate integration reference document (wireless or BACnet) and if installing thermostats with occupancy sensor covers, then also downloading the PIR Application Guide before you begin installation. All documentation is available on http://customer.honeywell.com.

— BACnet Integration Manual for TB7600 Series Thermostats (Form No. 63-4523)
— Wireless Installation & Integration Reference Guide for TB7200, TB7300, and TB7600 Thermostats (Form No. 63-4522)
— PIR Application Guide for TB7600 Series Thermostats (Form No. 63-4525)
— Sensors Product Overview Brochure (Form No. 63-9285) for a complete listing of compatible sensors.

Theory of Operation

The TB7600 uses a proprietary adaptive logic algorithm to control the space temperature. This algorithm controls the heating/air conditioning system to minimize overshoot while still providing comfort. It provides exceptional accuracy due to its unique PI time proportioning control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based on/off thermostats.
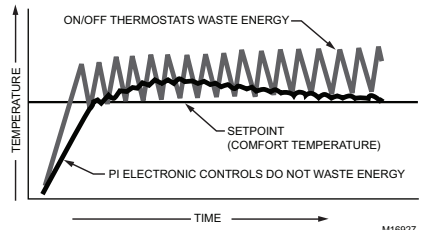
INSTALLATION AND WIRING

Mounting Locations

- Do not install on an outside wall.
- Must be installed away from any heat source.
- Should not be installed near an air discharge grill.
- Should not be mounted in direct sun radiation.
- Nothing must restrain vertical air circulation to the thermostat.
- Wall surface must be flat and clean.

IMPORTANT
- *If replacing an old thermostat, label the wires before removal of the old thermostat.*

Fig. 1. On/Off mechanical control vs. PI electronic control.

⚠ CAUTION

Electronic controls are static sensitive devices. Discharge yourself properly before manipulation and installing the thermostat.

Short circuit or wrong wiring may permanently damage the thermostat or the equipment.

Anti-short cycling can be set to 0 minutes for equipment that has an anti-cycling timer. Do not set to 0 unless the equipment has an internal anti-cycling timer or damage to equipment can occur.

All TB7600 Series thermostats are to be used only as operating controls. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user to add safety devices and/or alarm system to protect against such catastrophic failures.

Thermostat Installation

1. Open up by pulling on the bottom side of thermostat. (Fig. 2)

2. Remove wiring terminals.

3. Open the thermostat PCB to the left by pressing the PCB retaining tabs. (Fig. 3).
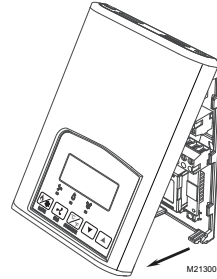
4. Pull cables 6 inches out of the wall.

Fig. 2. Remove cover of thermostat

5. Thread cable through the central hole of the base.

6. Align the base and mark the location of the two mounting holes on the wall. Install proper side of base up.

7. Install anchors in the wall.

8. Insert screws through the mounting holes on each side of the base and mount base on wall. (Fig. 3).

9. Gently swing back the circuit board back to the base and push on it until the tabs lock it in place.
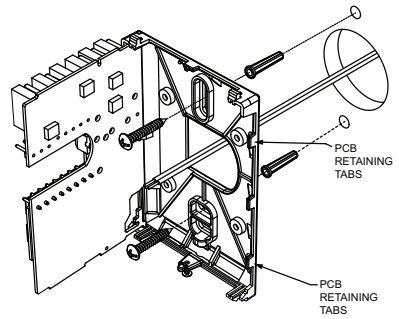

Fig. 3. Location of PCB retaining tabs and mounting screws

10. Strip each wire 1/4 inch.

11. Wire the terminals. See Table 1 for terminal descriptions and wiring diagram.

12. Gently push back excess cable into hole.

13. Install wiring terminals in correct location (Fig. 4).

14. Reinstall the cover (top first).

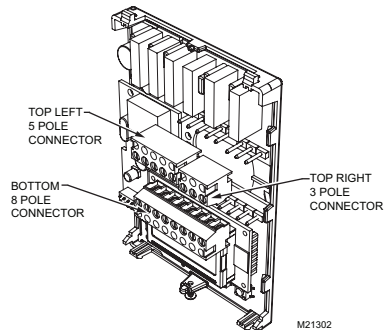15. Install security screw on the bottom, center of the thermostat cover.

Fig. 4. Terminal blocks

Wiring Identification and Screw Terminal Arrangement

Table 1. Terminal identification

Model Number	Multistage				1H/1C		Model Number	Heat Pump	
	TB7656B	TB7605B	TB7652B	TB7600B	TB7652A	TB7600A		TB7652H	TB7600H
Programmable	Yes	No	Yes	No	Yes	No	Programmable	Yes	No
Top left terminal block									
1- Cool Stage 2	Y2	Y2	Y2	Y2	Blank	Blank	1- Compressor Stage 2	Y2	Y2
2- Cool Stage 1	Y1	Y1	Y1	Y1	Y1	Y1	2- Compressor Stage 1	Y1	Y1
3- Fan	G	G	G	G	G	G	3- Fan	G	G
4- 24 V - Hot	RC	RC	RC	RC	RC	RC	4- 24 V - Hot	RC	RC
5- 24 V - Com	C	C	C	C	C	C	5- 24 V - Com	C	C
Top right terminal block									
6- RH	RH	RH	RH	RH	RH	RH	6- RH	RH	RH
7- Heat Stage 1	W1	W1	W1	W1	W1	W1	7- AUX Heat	W1	W1
8- Heat Stage 2	W2	W2	W2	W2	Blank	Blank	8- O/B	O/B	O/B
Bottom terminal block									
9- Econo	EC	EC	Blank	Blank	Blank	Blank	9- Not Used	Blank	Blank
10- Auxiliary Output	Aux	Aux	Aux	Aux	Aux	Aux	10- Auxiliary Output	Aux	Aux
11- Digital Input 1	DI1	DI1	DI1	DI1	DI1	DI1	11- Digital Input 1	DI1	DI1
12- Digital Input 2	DI2	DI2	DI2	DI2	DI2	DI2	12- Digital Input 2	DI2	DI2
13- Remote Sensor	RS	RS	RS	RS	RS	RS	13- Remote Sensor	RS	RS
14- Scom	S COM	S COM	S COM	S COM	S COM	S COM	14- Scom	S COM	S COM
15- Remote Outdoor Sensor	OS	OS	OS	OS	OS	OS	15- Remote Outdoor Sensor	OS	OS
16- Mixed Air Sensor	MS	MS	MS	MS	MS	MS	16- Mixed Air Sensor	MS	MS
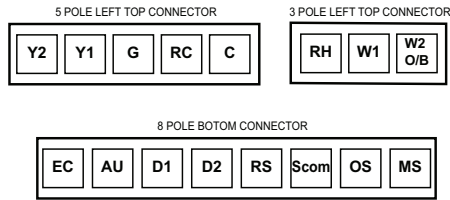
Fig. 5. Screw terminal arrangement

NOTES:
— If auxiliary output is used to toggle occupancy of the electronic control card inside the equipment, configure the relay parameter (**Aux cont)** to the N.O. setting. A second relay can be added for additional functionality of the occupancy output.
— If the same power source is used for the heating stages, install jumper across RC and RH. Maximum current is 2.0 amps.
— Economizer output uses a half bridge rectifier. Reference of the control signal is the common of the power supply of the thermostat (terminal C).
— Electromechanical contacts are to be used with the digital inputs. Electronic triacs cannot be used as mean of switching for the input. The switched leg to the input for the input to activate is terminal C (common).
— The transformer of the unit provides power to the thermostat and the additional loads that will be wired to the thermostat.

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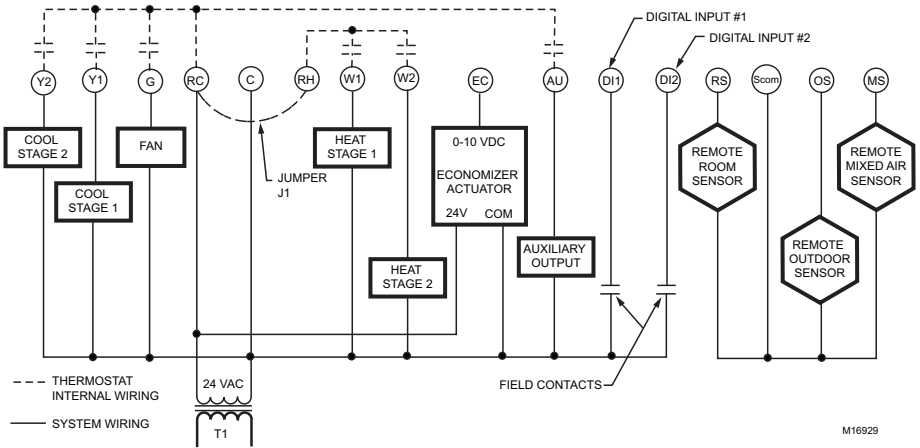## Detailed Wiring Diagrams for Selected Models

Fig. 6. TB7656B5x00(x) 2 Heat/2 Cool/Economizer/Programmable
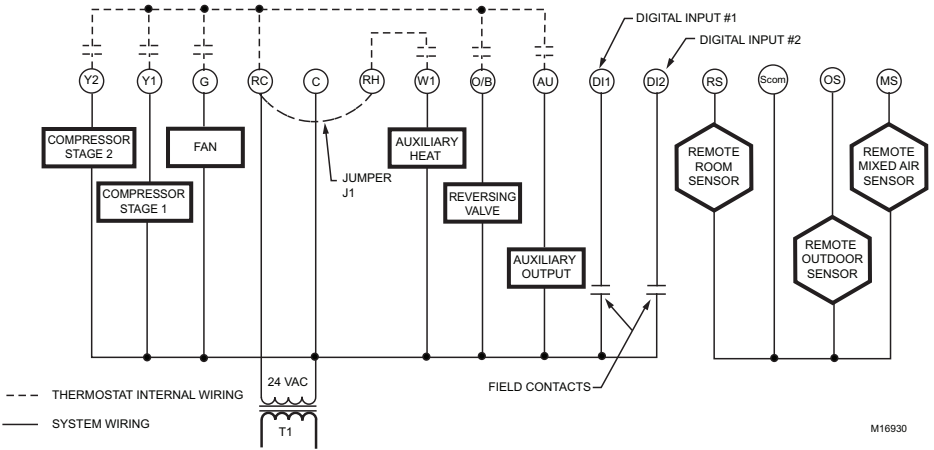

Fig. 7. TB7652H5x00(x) Heat pump/Programmable

Sensor Wiring for all Thermostat Models

Remote mount outdoor temperature sensors must be 10 Kohm NTC @ 77 F.

Remote sensors can be used for:
• Various averaging combinations (3 thermistors with 2 dip switches are provided with each sensor)
• Optional occupancy led
• Optional override key

Table 2. Temperature vs. Resistance for 10 Kohm NTC thermistor ($R_{25°C}$ = 10KW±3%, $B_{25/85°C}$ = 3975K±1.5%)

°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm	°F	°C	Kohm
-40	-40	324.3197	-4	-20	94.5149	32	0	32.1910	68	20	12.4601	104	40	5.3467
-31	-35	234.4009	5	-15	71.2430	41	5	25.1119	77	25	10.0000	113	45	4.3881
-22	-30	171.3474	14	-10	54.1988	50	10	19.7390	86	30	8.0694	122	50	3.6202
-13	-25	126.6109	23	-5	41.5956	59	15	15.6286	95	35	6.5499	131	55	3.0016

REMOTE WIRING 1 SENSOR
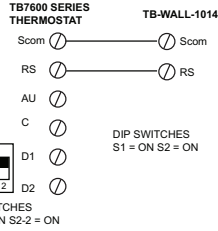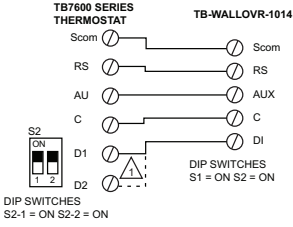
Fig. 8. Wiring example of single remote wall mounted room sensor

REMOTE WIRING 2 SENSORS
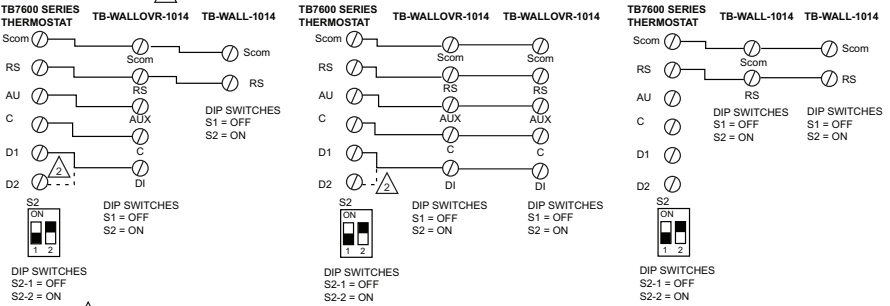
Fig. 9. Wiring examples of two remote wall mounted room sensors for averaging applications

REMOTE WIRING 3 SENSORS
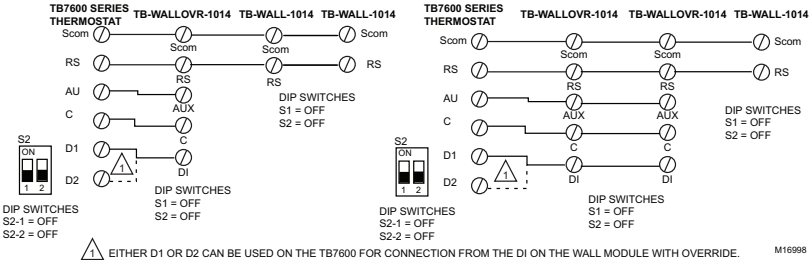
Fig. 10. Wiring examples of three remote wall mounted room sensors for averaging applications

THERMOSTAT USER INTERFACE

The thermostat features a two-line, eight-character display. There is a low-level backlit level that is always active and can only be seen at night. To turn on the back light to high level, press any key on the front panel. The back lit display will return to low level when the thermostat is left unattended for 45 seconds.

When left unattended, the thermostat has an auto scrolling display that shows the actual status of the system. Use the **MenuScro** in the configuration menu to lockout the scrolling display and to only present the room temperature and conditional outdoor temperature to the user. With this option enabled, no local status is given on the system mode or occupancy.

Each item is scrolled one by one with the back lighting in low level mode. Pressing any key will cause the back light to come on to high level. When left unattended for 10 seconds after changes are made, the display will resume automatic status display scrolling.

Fig. 11. Heat pump, multistage and single stage models buttons and display

Table 3. Sequence and possible display options for the auto-scroll display

Room Temp >	Clock status >	System mode >	Schedule status >	Outdoor Temp* >	Alarms
RoomTemp x.x °C or°F	Monday 12.00 AM	Sys mode auto	Occupied	Outdoor x.x °C or°F	Service
		Sys mode off	Occupied hold		Frost ON
		Sys mode heat	Unoccup		SetClock
		Sys mode cool	Unoccup hold		Filter
		Sys mode emergenc	Override		Fan lock

*Network value only

Manual scroll of each menu item is achieved by pressing the **Yes** (scroll) key repetitively. The last item viewed will be shown on the display for 30 seconds before returning to automatic scrolling. Temperature is automatically updated when scrolling is held.

Outdoor air temperature display is only enabled when outdoor air temperature sensor is connected.
- A maximum range status display of 122 F (50 C) indicates a shorted sensor. Associated functions, such as mode lockouts and economizer function are automatically disabled.
- A minimum range status -40 F (-40 C) is not displayed and indicates a opened sensor or a sensor not connected. Associated functions, such as mode lockouts and economizer function are automatically disabled.

If alarms are detected, they will automatically be displayed at the end of the status display scroll. During an alarm message display, the back lit screen will light up at the same time as the message and shut off during the rest of the status display. Two alarms maximum can appear at any given time. The priority for the alarms is as follows:
- **Frost ON:** Indicates that the heating is energized by the low limit frost protection room temperature setpoint 42 F (5.6 C)
- **SetClock:** Indicates that the clock needs to be reset. There has been a power failure which has lasted longer than 6 hours
- **Service:** Indicates that there is a service alarm as per one of the programmable digital input (DI1 or DI2)
- **Filter:** Indicates that the filters are dirty as per one of the programmable digital input (DI1 or DI2)
- **Fan lock:** Indicates that the heating and cooling action are locked out due to a defective fan operation
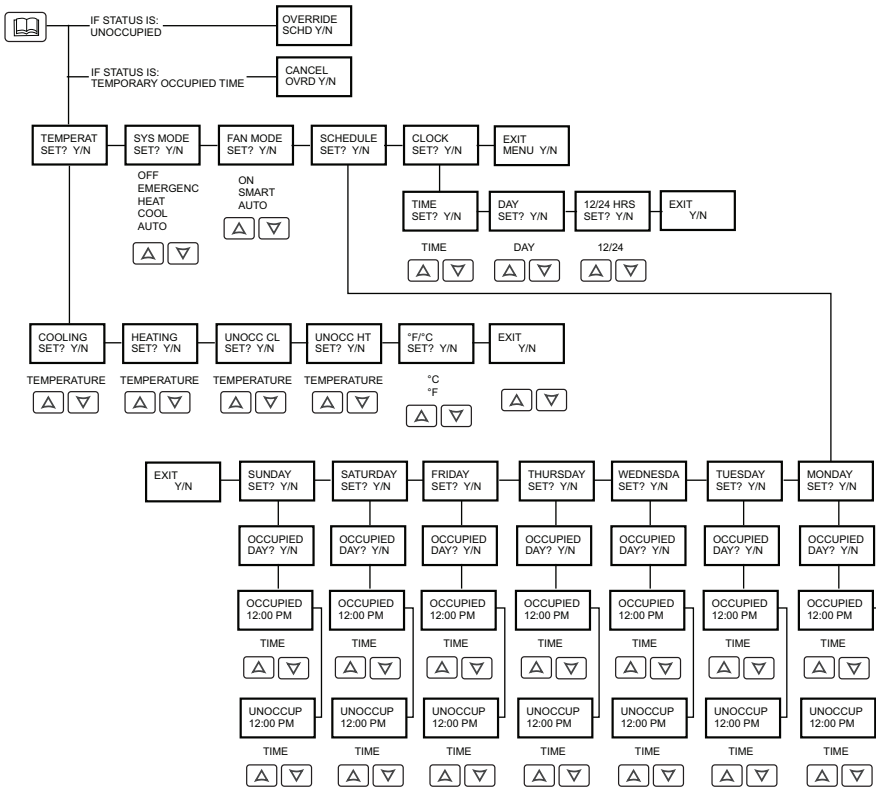
Three status LEDs on the thermostat cover are used to indicate the status of the fan, a call for heat, or a call for cooling. See Table 4 for more details.

Table 4. LED Status

LED operation	Heat pump models TB76xxH	Multistage and single stage models TB7600A, TB7652A, TB7600B and TB7652B	Multistage economizer models TB7605B and TB7656B
Fan LED on	When G Fan terminal operates	When G Fan terminal operates	When G Fan terminal operates
Heating LED on	When Y1 and/or W1 terminal(s) operate in heating mode	When W1 terminal operate in heating mode	When W1 terminal operate in heating mode
Cooling LED on	When Y1 terminal operate in cooling mode	When Y1 terminal operate in cooling mode	When Y1 terminal operate in cooling mode and or economizer output is in function

User menu flow chart

NOTE: **Prompts may not all be present depending on model selected**

| IF STATUS IS: UNOCCUPIED | → | OVERRIDE SCHD Y/N |
| IF STATUS IS: TEMPORARY OCCUPIED TIME | → | CANCEL OVRD Y/N |

TEMPERAT SET? Y/N → SYS MODE SET? Y/N → FAN MODE SET? Y/N → SCHEDULE SET? Y/N → CLOCK SET? Y/N → EXIT MENU Y/N

SYS MODE: OFF / EMERGENC HEAT / COOL / AUTO [△][▽]

FAN MODE: ON / SMART / AUTO [△][▽]

CLOCK: TIME SET? Y/N → DAY SET? Y/N → 12/24 HRS SET? Y/N → EXIT Y/N

TIME [△][▽]   DAY [△][▽]   12/24 [△][▽]

COOLING SET? Y/N → HEATING SET? Y/N → UNOCC CL SET? Y/N → UNOCC HT SET? Y/N → °F/°C SET? Y/N → EXIT Y/N

TEMPERATURE [△][▽]   TEMPERATURE [△][▽]   TEMPERATURE [△][▽]   TEMPERATURE [△][▽]   °C °F [△][▽]

EXIT Y/N → SUNDAY SET? Y/N → SATURDAY SET? Y/N → FRIDAY SET? Y/N → THURSDAY SET? Y/N → WEDNESDA SET? Y/N → TUESDAY SET? Y/N → MONDAY SET? Y/N

OCCUPIED DAY? Y/N (×7)

OCCUPIED 12:00 PM (×7)   TIME [△][▽] (×7)

UNOCCUP 12:00 PM (×7)   TIME [△][▽] (×7)

M16931

User Control Options

The TB7600 Series thermostat features an intuitive, menu-driven, back-lit LCD display that walks users through the programming steps, making the programming process extremely simple. This menu is typically accessed by the user to modify system setting such as temperature or system mode, fan mode, etc.

It is possible to bring up the user menu at any time by pressing the **MENU** key. The status display automatically resumes after exiting the user-programming menu.

If the user pauses at any given time during programming, **Auto Help** text is displayed to help and guide the user through the usage and programming of the thermostat. When left unattended for 45 seconds, the display will resume automatic status display scrolling.

User options are accessed and programmed using 5 keys on the thermostat cover and are described in Table 5.

Table 5. User Control with Thermostat Keys

✓ M16911	The **YES** key is used to confirm a selection, to move onto the next menu item and to manually scroll through the displayed information.
✕ M16912	The **NO** key is used when you do not desire a parameter change, and to advance to the next menu item. Can also be used to toggle between heating and cooling setpoints.
📖 M16913	The **MENU** key is used to access the Main User Menu or exit the menu.

▼ M16914	The down arrow key is used to decrease temperature setpoint and to adjust the desired values when programming and configuring the thermostat.
▲ M16915	The up arrow key is used to increase temperature setpoint and to adjust the desired values when programming and configuring the thermostat.

Table 6. Sequence of user menu:

Override Resume	Temperature setpoints	System mode setting	Fan mode setting	Schedules setting	Clock setting
Override schd Y/N**	Temperat set Y/N	Sys mode set Y/N	Fan mode set Y/N	Schedule set Y/N	Clock set Y/N
Cancel ovrd Y/N***					

**Appears only in unoccupied mode
***Appears only in override mode

There is a default profile set in the thermostat from the factory. This enables the thermostat to operate as a non-programmable unit in day mode operation at start up.

Programmed default temperature setpoints:
Occupied cooling setpoint = 75 F (24 C)

Occupied heating setpoint = 72 F (22 C)

Unoccupied cooling setpoint = 82 F (28 C)

Unoccupied heating setpoint = 65 F (18 C)

Fahrenheit scale

Setpoint type = permanent

Programmed default modes:
System mode = Auto

Fan mode = Smart (for models with a communication module or programmable stand-alone models)

Fan mode = Auto (for non-programmable stand-alone models)
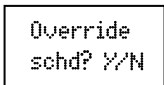
Programmed default schedules:
Monday through Sunday

Occupied time is: 12 00 AM

Unoccupied time is: 11:59 PM

NOTE: There will be a 1 minute unoccupied period every night at 11:59 PM with this default configuration.

OVERRIDE AN UNOCCUPIED PERIOD

```
Override
schd? Y/N
```
M16937

This menu will appear only when the thermostat is in unoccupied mode. The unoccupied mode is enabled either by the internal timer scheduling or by a remote NSB contact via DI1 or DI2. If DI1 or DI2 is configured to operate as a remote temporary override contact, this menu will be disabled.

Answering **Yes** to this prompt will cause the thermostat to go into occupied mode for an amount of time equal to the parameter **TOccTime** (1 to 12 hours).

RESUME REGULAR SCHEDULING
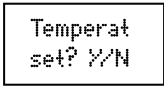
```
Cancel
ovrd? Y/N
```
M16938
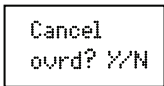
This menu does not appear in regular operation. It will appear only when the thermostat is in Unoccupied override mode.

Answering **Yes** to this question will cause the thermostat to resume the regular programmed setpoints and scheduling.

TEMPERATURE SETPOINTS
Permanent setpoint changes

Temperat
set? Y/N

M16939

This menu permits the adjustment of all permanent temperature setpoints (occupied and unoccupied) as well as the desired temperature units (°F or °C) as shown in Table 7. Permanent setpoints are written to RAM and EEPROM.

Temporary setpoint changes

Temporary setpoints can be modified through the Up arrow key (▲) and the Down arrow keys (▼).

User will be prompted with the present mode (**Heating** or **Cooling**) of the thermostat and its setpoint.

The Up (▲) arrow key will increment the setpoint by 0.5 degree (F or C). The Down (▼) arrow key will decrement the setpoint by 0.5 degree (F or C). Press the **Yes** key to accept the new setpoint.

Local changes to the heating or cooling setpoints made by the user directly using the up or down arrow are temporary. They will remain effective for the duration specified by **ToccTime** parameter.

Setpoints will revert back to their default value after internal timer **ToccTime** expires. If a permanent change to the setpoints is required, use the **Temperat set ?** menu as described above in the Permanent Setpoint Changes section.

Table 7. Permanent Temperature Setpoint Changes User Menu Sequence

Cooling setpoint Occupied mode		Heating setpoint Occupied mode		Cooling setpoint Unoccupied mode		Heating setpoint Unoccupied mode		°F or °C display setting	
Cooling set?Y/N	No next → Yes down ↓	Heating set?Y/N	No next → Yes down ↓	Unocc CL set? Y/N	No next → Yes down ↓	Unocc HT set? Y/N	No next → Yes down ↓	F or C set?Y/N	No next → Yes down ↓
Use ▲ ▼ to set value, **Yes** key to confirm									
Cooling 70.0°F	Use ▲ ▼ To set value	Heating 68.00°F	Use ▲ ▼ To set value	Unocc CL 80.0°F	Use ▲ ▼ To set value	Unocc HT 60.0°F	Use ▲ ▼ To set value	Units °F	Use ▲ ▼ To set value

SYSTEM MODE SETTING

Sys mode
set? Y/N

M16940

This menu is accessed to set system mode operation. Use ▲ ▼ to set value, Yes key to confirm.
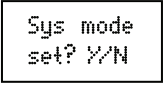
- **Sys mode auto**: Automatic changeover mode between heating and cooling operation
- **Sys mode cooling**: Cooling operation mode only
- **Sys mode heating**: Heating operation mode only
- **Sys mode emergency**: (Heat pump models only) Forced auxiliary heat operation mode only
- **Sys mode off**: Normal cooling or heating operation disabled. If enabled in installer parameters, only the automatic heating frost protection at 50 F (10 C) is enabled

FAN MODE SETTING
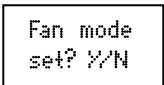
Fan mode
set? Y/N

M16941

This section of the menu is permits the setting of the fan mode operation. Use ▲ ▼ to set value, Yes key to confirm

- **Fan mode On**: Fan is on continuously, even when system mode is OFF.
- **Fan mode Auto**: Fan cycles on a call for heating or cooling for both occupied and unoccupied periods.
- **Fan mode Smart**: During occupied periods, fan is on continuously. In unoccupied mode, fan cycles on a call for heating or cooling. This selection is available on all models.

SCHEDULE SET (2 OR 4 EVENTS)
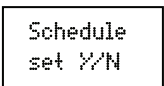
Schedule
set Y/N

M16942

The scheduling option at the thermostat can only be used if the thermostat is not connected to the WEBs-AX building control network. Once the thermostat is connected to the network, all scheduling should be done through the WEBs-AX Workbench/Supervisor. Schedules set through the network cannot be viewed on the thermostat. Thermostats with local scheduling can have 2 or 4 events per day. Whether 2 or 4 events per day are allowed is set in the configuration parameter 2/4 event.

If set for 2 events, the user can set two events per day, establishing occupied and unoccupied times. If set for 4 events, the user can set four events per day, establishing occupied and unoccupied times. Each day can be tailored to specific schedules if needed.

NOTE: 12:00 PM = Noon

2 Event Schedule Setup and Examples

Table 8. Set 2 Events Per Day Menu Navigation

Monday timer Schedule set		Tuesday timer Schedule set		Wednesday timer Schedule set		Other days are identical
Monday set?Y/N	No next → Yes down ↓	Tuesday set? Y/N	No next → Yes down ↓	Wednesda set? Y/N	No next → Yes down ↓	Selects the day to be programmed or modified
Yes key to access day scheduling, **No** key to jump to next day						
Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Yes = Daily schedules will be accessed No = Unoccupied mode all day
Yes key to access day scheduling, **No** key to jump to next day						
		Copy Y/N Previous	Yes next → No down ↓	Copy Y/N Previous	Yes next → No down ↓	Yes = Will copy previous day schedule No = Daily schedules will be accessed
Yes key to copy previous day, **No** key to set new time value for each day						
Occupied 00:00 AM	Use ▲ ▼ To set value	Occupied 00:00 AM	Use ▲ ▼ To set value	Occupied 00:00 AM	Use ▲ ▼ To set value	Sets Event # 1 Occupied time Will activate occupied setpoints
Use ▲ ▼ to set value, **Yes** key to confirm						
Unoccup 00:00 AM	Use ▲ ▼ To set value	Unoccup 00:00 AM	Use ▲ ▼ To set value	Unoccup 00:00 AM	Use ▲ ▼ To set value	Sets Event # 2 Unoccupied time Will activate unoccupied setpoints
Use ▲ ▼ to set value, **Yes** key to confirm						

Table 9. Example 1 - Office building closed all weekend

Event	Period #1 - Event #1		Period #1 - Event #2		
	Occupied		**Unoccupied**		**Daily Occupancy**
	Cool	**Heat**	**Cool**	**Heat**	
Setpoint	**72 F**	**70 F**	**80 F**	**62 F**	
Monday	7.00 AM		6.00 PM		Day time only
Tuesday	7.00 AM		6.00 PM		Day time only
Wednesday	7.00 AM		6.00 PM		Day time only
Thursday	7.00 AM		6.00 PM		Day time only
Friday	7.00 AM		6.00 PM		Day time only
Saturday	12.00 PM *		12.00 PM *		Unoccupied
Sunday	12.00 PM *		12.00 PM *		Unoccupied

* Programming consecutive events to the same time will cause the thermostat to choose the last event as the time at which it will set its schedule. In the above example, the thermostat will control to the unoccupied set point until 7:00 AM Monday.

Table 10. Example 2 - Commercial building that is occupied all weekend

Event	Period #1 - Event #1		Period #1 - Event #2		
	Occupied		**Unoccupied**		**Daily Occupancy**
	Cool	**Heat**	**Cool**	**Heat**	
Setpoint	**72 F**	**70 F**	**80 F**	**62 F**	
Monday	8.00 AM		5.00 PM		Day time only
Tuesday	8.00 AM		5.00 PM		Day time only
Wednesday	8.00 AM		5.00 PM		Day time only
Thursday	8.00 AM		5.00 PM		Day time only
Friday	8.00 AM		5.00 PM		Day time only
Saturday	12.00 AM **		11.59 PM **		Occupied
Sunday	12.00 AM **		11.59 PM **		Occupied

**To program a day as occupied for 24 hours, set that day Occupied time to 12:00 AM and Unoccupied time to 11:59 PM There will be a 1 minute unoccupied period every night at 11:59 PM with this schedule configuration.

4 Event Schedule Setup and Examples

Table 11. Set 4 Events Per Day Menu Navigation

Monday timer Schedule set		Tuesday timer Schedule set		Wednesday timer Schedule set		Other days are identical
Monday set? Y/N	No next → Yes down ↓	Tuesday set? Y/N	No next → Yes down ↓	Wednesda set? Y/N	No next → Yes down ↓	Selects the day to be programmed or modified
Yes key to access day scheduling, **No** key to jump to next day						
Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Yes = Daily schedules will be accessed No = Unoccupied mode all day
Yes key to access day scheduling, **No** key to jump to next day						
		Copy Y/N Previous	Yes next → No down ↓	Copy Y/N Previous	Yes next → No down ↓	Yes = Will copy previous day schedule No = Daily schedules will be accessed
Yes key to copy previous day, **No** key to set new time value for each day						
Occupied 00:00 AM	Use ▲ ▼ To set value	Occupied 00:00 AM	Use ▲ ▼ To set value	Occupied 00:00 AM	Use ▲ ▼ To set value	Sets Event # 1 Occupied time Will activate occupied setpoints
Use ▲ ▼ to set value, **Yes** key to confirm						
Unoccup 00:00 AM	Use ▲ ▼ To set value	Unoccup 00:00 AM	Use ▲ ▼ To set value	Unoccup 00:00 AM	Use ▲ ▼ To set value	Sets Event # 2 Unoccupied time Will activate unoccupied setpoints
Use ▲ ▼ to set value, **Yes** key to confirm						
Occupie2 00:00 AM	Use ▲ ▼ To set value	Occupie2 00:00 AM	Use ▲ ▼ To set value	Occupie2 00:00 AM	Use ▲ ▼ To set value	Sets Event # 3 Occupied time Will activate occupied setpoints
Use ▲ ▼ to set value, **Yes** key to confirm						
Unoccup2 00:00 AM	Use ▲ ▼ To set value	Unoccup2 00:00 AM	Use ▲ ▼ To set value	Unoccup2 00:00 AM	Use ▲ ▼ To set value	Sets Event # 4 Unoccupied time Will activate unoccupied setpoints
Use ▲ ▼ to set value, **Yes** key to confirm						

Table 12. Example 1 - Four event retail establishment schedule

Event	Period 1 - Event 1 Occupied		Period 1 - Event 2 Unoccupied		Period 2 - Event 3 Occupied		Period 2 - Event 4 Unoccupied		
	Cool	Heat	Cool	Heat	Cool	Heat	Cool	Heat	Daily Occupancy
Setpoint	72 F	70 F	80 F	62 F	72 F	70 F	80 F	62 F	
Monday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Tuesday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Wednesday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Thursday	7.00 AM		5.00 PM		7.00 PM		10.30 PM		Day/evening time only
Friday	7.00 AM		5.00 PM		7.00 PM		10.30 PM		Day/evening time only
Saturday	12.00 PM *		12.00 PM *		12.00 PM *		12.00 PM *		Unoccupied
Sunday	12.00 PM *		12.00 PM *		12.00 PM *		12.00 PM *		Unoccupied

* Programming events to the same time will cancel the last period and leave the thermostat in unoccupied mode

Table 13. Example 2 - Residential

Event	Period 1 - Event 1 Occupied		Period 1 - Event 2 Unoccupied		Period 2 - Event 3 Occupied		Period 2 - Event 4 Unoccupied		
	Cool	Heat	Cool	Heat	Cool	Heat	Cool	Heat	Daily Occupancy
Setpoint	72 F	70 F	80 F	62 F	72 F	70 F	80 F	62 F	
Monday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Tuesday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Wednesday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Thursday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Friday	6:00 AM		8:00 AM		4:00 PM		11:30 PM		Day/evening time only
Saturday	8:00 AM *		8:00 AM *		8:00 AM *		11:59 PM *		Day time only
Sunday	12:00 AM *		12:00 AM *		12:00 AM *		11:59 PM *		Occupied all day

* Programming consecutive events to the same time will cause the thermostat to choose the last event as the time at which it will set its schedule. In the above example for Saturday, the thermostat will control to the occupied set point from 8:00 AM until 11:59 PM. Since it is desired to be in occupied mode throughout the night, then it is necessary to program the first event on Sunday at 12:00 AM. The thermostat will force a one minute unoccupied period for a one minute period (between 11:59 PM and 12:00 AM on Saturday)

CLOCK/DAY SETTINGS

```
Clock
set? Y/N
```
M16943

This section of the menu permits the user to set the time and day.
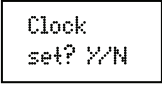
Time setting		Day setting		Time format setting	
Time set? Y/N	No next → Yes down ↓	Day set? Y/N	No next → Yes down ↓	12/24hrs set? Y/N	No = exit Yes down ↓
Time 0:00	Use ▲ ▼ To set value	Day Monday	Use ▲ ▼ To set value	12/24hrs 12 hrs	Use ▲ ▼ To set value

INSTALLER CONFIGURATION PARAMETER MENU

This section describes the parameters available for TB7600 Series thermostat configuration. The TB7600 Series can be programmed at the thermostat or through WEBStation-AX, with the following exception: Wireless models must have the **Com Addr**, **PAN ID**, and **Channel** set at the thermostat before adding to the wireless network or doing any programming in WEBStation-AX.

To program the thermostat through WEBStation-AX, refer to the BACnet Integration Reference Guide for BACnet models (Form No. 63-4524) or the Wireless Installation and Integration Reference Guide for TB7200, TB7300, TB7600 Thermostats (Form No. 63-4522) for wireless models.

Local configuration:
1. To enter configuration, press and hold the **Menu** button for 8 seconds
2. If a password lockout is active, **Password** is prompted. Enter password value using the ▲ and ▼ arrows and press **Yes** to gain access to all configuration properties of the thermostat. A wrong password entered will prevent local access to the configuration menu.
3. Once in the configuration menu, press the **No** button repetitively to scroll between all the available parameters.
4. When the desired parameter is displayed, press **Yes** to adjust it to the desired value using ▲ and ▼ arrows. Once set, press **Yes** to scroll to the next parameter.

Table 14. Configuration Parameters for all models

Configuration parameters	Significance Default value	Adjustments
Pswrd	Configuration parameters menu access password Default value = 0 (no password prompted) Range is: 0 to 1000	This parameter sets a protective access password to prevent unauthorized access to the configuration menu parameters. A default value of "0" will not prompt a password or lock the access to the configuration menu.
Com addr	Thermostat networking address Default value = 254 Range is: 0 to 254	If the thermostat is installed as a stand-alone unit, this parameter will not be used or displayed For BACnet models valid range to use is from 0 to 127. Default value of 254 disables BACnet communication for the thermostat. For wireless models valid range is 0 to 254 with a maximum of 30 thermostats per WEB-2xx controller and 50 thermostats per WEB-6xx/-7xx controller.
PAN ID	Personal Area Network Identification Default value = 0 Range is: 0 to 500	**Conditional parameter to wireless models (TB76xxX5x14W)** This parameter will only appear on wireless thermostats. If the thermostat is BACnet, this parameter will not be used or displayed. This parameter (Personal Area Network Identification) is used to link specific thermostats to a single specific WEBs controller with a wireless communication card (TB-VWG-APP-1014). For every thermostat reporting to a WEBs controller and wireless communication card (maximum of 30 thermostats per WEB-2xx controller and 50 thermostats per WEB-6xx/-7xx controller) be sure you set the ***SAME* PAN ID** value both at the wireless communication card and the thermostat(s). The default value of 0 is *NOT* a valid PAN ID. The valid range of available PAN ID is from 1 to 500
Channel	Channel selection Default value = **10** Set to: **15** or **25** Range is: 10 to 26	**Conditional parameter to wireless models (TB76xxX5x14W)** This parameter will only appear when a wireless network adapter is present. If the thermostat is installed as a stand-alone unit or is a BACnet model, this parameter will not be used or displayed. This parameter (Channel) is used to link specific thermostats to a specific WEBs controller with a wireless communication card. For every thermostat reporting to a gateway (maximum of 30 thermostats per WEB-2xx controller and 50 thermostats per WEB-6xx/-7xx controller) be sure you set the *SAME* channel value both at the wireless communication card and the thermostat(s). **Honeywell recommends using only the channels 15 (2425 MHz) or 25 (2575 MHz).** The default value of 10 is *NOT* a valid channel. Although the valid range of available channels is from 11 to 26 use only channel 15 or 25 to avoid interference with other wireless devices.

Table 14. Configuration Parameters for all models (Continued)

Configuration parameters	Significance Default value	Adjustments
Get From	Get From another thermostat configuration utility Default value = **255** Range is: 0-254	**Conditional parameter to wireless models (TB76xxX5x14W)** This parameter is only available for wireless thermostats. This parameter lets you to copy the configuration parameter settings from a like Honeywell TB7200 thermostat. To use this command, the thermostat you want to copy parameters from must be on the wireless network with a network address (**Com addr**) and must be the same model number as the thermostat you want to copy to. On the thermostat you want to copy parameters to, enter the network address (**Com addr**) of the thermostat you want to copy parameters from. This process can be completed locally at the thermostat or using the WEBStation-AX. If the parameters copy successfully, the **Get From** address returns to **255**. If the parameters do not copy successfully, **254** is displayed. If the copy was not successful, verify the following: • The thermostat to be copied is the same model as the one being copied to. • The thermostat to be copied is on the network. • The correct network address (**Com addr**) value for the thermostat to be copied was entered. Leaving the **Get From** parameter value at **255** means that configuration parameters will be set manually.
DI 1	Digital input no.1 configuration Open contact input = function not energized Closed contact input = function energized Default value = **None**	None, No function will be associated with the input Rem NSB, remote NSB timer clock input. Will disable the internal scheduling of the thermostat. The scheduling will now be set as per the digital input. The time is still displayed as information, but the menu part related to scheduling is disabled and no longer accessible. • Open contact = occupied setpoints • Closed contacts = unoccupied setpoints This option provides low cost setback operation via an occupancy sensor or from a dry contact RemOVR Temporary override remote contact. Disables all override menu function of the thermostat. The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode. With this function enabled it is now possible to toggle between unoccupied and occupied setpoints for the amount of time set by parameter (**TOccTime**) temporary occupancy time. When Override is enabled, an Override status message will be displayed. **Filter**, a back-lit flashing Filter alarm will be displayed on the thermostat LCD screen when the input is energized. **Service**, a back-lit flashing Service alarm will be displayed on the thermostat LCD screen when the input is energized. Input can be tied in to the AC unit control card, which provides an alarm in case of malfunction. Fan lock, a back-lit flashing Fan lock alarm will be displayed on the thermostat LCD screen when the input is not energized. Used in conjunction with a local airflow sensor connected to the input. Locks out the thermostat heating and cooling action if no airflow is detected 10 seconds after the fan (G terminal) is energized. • Open contact = no airflow • Closed contacts = airflow present
DI 2	Digital input no. 2 configuration Default value = None	Same as above. It is possible to configure both inputs to have the same function.
MenuScro	Menu scroll Default value = On = Scroll active	Removes the scrolling display and only presents the room temperature to the user. With this option enabled, no status is given of mode, schedule and outdoor temperature. Outdoor temperature only displays if a network variable is received. On = Scroll active **Off = Scroll not active**
Lockout	Keypad lockout levels Default value = 0 No lock	0= No lock 1= Low level 2= High level See Table 15 for **Lockout** level details

Table 14. Configuration Parameters for all models (Continued)

Configuration parameters	Significance Default value	Adjustments

Table 15. Keypad Lock Out Levels

Level	Resume/Override scheduling	Permanent Occupied and Unoccupied Setpoints	Temporary setpoints using arrows	System mode setting	Fan mode setting	Schedules setting	Clock setting	Permanent hold
	Resume sched Y/N	RoomTemp set Y/N	Up key (▲) Down key (▼)	Sys mode set Y/N	Fan mode set Y/N	Schedule set Y/N	Clock set Y/N	Schedule hold Y/N
0	Yes access	Yes access	Yes access	Yes access	Yes access	Yes access	Yes access	Yes access
1	Yes access	No access	Yes access	No access	No access	No access	Yes access	No access
2	No access	No access	No access	No access	No access	No access	Yes access	No access

Configuration parameters	Significance Default value	Adjustments
Pwr del	Power-up delay Default value = 10 seconds	On initial power up of the thermostat (each time 24 Vac power supply is removed and re-applied) there is a delay before any operation is authorized (fan, cooling or heating). This can be used to sequence start up multiple units/thermostat in one location. **10 to 120 seconds**
Frost pr	Frost protection enabled Default value = Off On heat pump models the system mode will be forced to EMERGENCY mode if frost protection is activated	Off: no room frost protection On: room frost protection enabled in all system mode at: 42 F (5.6 C) Frost protection is enabled even in system Off mode **Off or On**
Heat max	Maximum heating setpoint limit Default value = 90 F (32 C)	Maximum occupied and unoccupied heating setpoint adjustment. Heating setpoint range is: **40 F to 90 F (4.5 to 32.0 C)**
Cool min	Minimum cooling setpoint limit Default value = 54 F (12 C)	Minimum occupied and unoccupied cooling setpoint adjustment. Cooling setpoint range is: **54 F to 100 F (12.0 to 37.5 C)**
Pband	Proportional Band setting Default value **2** = 2.0 F (0.6 C)	Adjust the proportional band used by the thermostat PI control loop. ⚠ **CAUTION** Note that the default value of 2.0 F (1.1 C) gives satisfactory operation in most normal installation cases. The use of a superior proportional band different than the factory one is normally warranted in applications where the thermostat location is problematic and leads to unwanted cycling of the unit. A typical example is a wall mounted unit where the thermostat is installed between the return and supply air feeds and is directly influenced by the supply air stream of the unit.

Value	F scale Pband	C scale Pband
2	2 F	1.1 C
3	3 F	1.7 C
4	4 F	2.2 C
5	5 F	2.8 C
6	6 F	3.3 C
7	7 F	3.9 C
8	8 F	4.4 C

Table 14. Configuration Parameters for all models (Continued)

Configuration parameters	Significance Default value	Adjustments
Anticycle	Minimum on/off operation time for stages Default value = 2 minutes	Minimum on/off operation time of cooling and heating stages. ⚠ **CAUTION** Anti-short cycling can be set to 0 minutes for equipment that has an anti cycling timer. Do not set to 0 unless the equipment has internal anti-cycling timer or damage to equipment can occur. **0, 1, 2, 3, 4 and 5 minutes**
Heat cph	Heating stages cycles per hour Default value = 4 cph For **multi stage** models, heat cph applies to W1 and W2 For **heat pump** models, heat cph applies to W1 only (Emergency heat)	Will set the maximum number of heating stage cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turn ON and OFF in one hour. Note that a higher cph will represent a higher accuracy of control at the expense of wearing mechanical components faster. **3, 4, 5, 6,7 and 8 cph**
Cool cph	Cooling stages cycles per hour Default value = 4 cph For **multi stage** models, cool cph applies to Y1 and Y2 For **heat pump** models, cool cph applies to Y1 and Y2 in cooling and heating independently of the reversing valve position	Will set the maximum number of cooling stage cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turned on and off in one hour. Note that a higher cph will represent a higher accuracy of control at the expense of wearing mechanical components faster. **3 or 4 cph**
Deadband	Minimum deadband Default value = 2.0 F (1.1 C)	Minimum deadband value between the heating and cooling setpoints. If modified, it will be applied only when any of the setpoints are modified. **2, 3 or 4 F (1.0 to 2.0 C)**
Fan cont	Fan control Default value = On For **multi stage** models, fan control applies to W1 and W2 For **heat pump** models, fan control applies to W1 only (Emergency heat)	Fan control in heating mode. When selecting On; the thermostat in all cases will always control the fan (terminal G). Valid for On or Auto fan mode When selecting Off; the fan (terminal G), when heating stages (terminals W1 and W2) are solicited, will not be energized. The fan in this case will be controlled by the equipment fan limit control. Valid only for Auto fan mode. On fan mode will leave the fan always on. **On or Off**
Fan del	Fan delay Default value = Off	Fan delay extends fan operation by 60 seconds after the call for heating or cooling ends. Valid only for Auto fan mode. **On** fan mode will leave the fan always on. **Off or On**
ToccTime	Temporary occupancy time Default value = 3 hours	Temporary occupancy time with occupied mode setpoints when override function is enabled When the thermostat is in unoccupied mode, function is enabled with either the menu or DI1 or DI2 configured as remote override input. **0,1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 hours**
Cal RS	Room air temperature sensor calibration Default value = 0.0 F or C	Offset that can be added/subtracted to actual displayed room temperature **± 5.0 F (± 2.5 C)**
Cal OS	Outside air temperature sensor calibration Default value = 0.0 F or C	Offset that can be added/subtracted to actual displayed outside air temperature **± 5.0 F (± 2.5 C)**
H stage	Number of heating stages. Applicable to 2 stage models only Default value = 2 stages For **heat pump** models, H stage is limited to 1 stage only (W1 – Aux. Heat).	Will revert the operation of 2 stages thermostat to single stage operation only when the second heating step is not needed. **1 or 2 stages**

Table 14. Configuration Parameters for all models (Continued)

Configuration parameters	Significance Default value	Adjustments
C stage Or **HP stage**	Number of cooling stages 2 stages model only Default value = 2 stages For **heat pump** models, HP stage selects the number of compressor stages	Will revert the operation of 2 stage thermostat to single stage operation only when the second cooling step is not needed. **1 or 2 stages**
H lock	Outside air temperature heating lockout Default value = 120 F (49 C)	Disables heating stage operation based on outdoor air temperature. Function will only be enabled if OS (outside air temperature sensor) is connected. **From -15 F up to 120 F (-26 C up to 49 C)**
C lock	Outside air temperature mechanical cooling lockout. Default value = -40 F (-40 C)	Disables cooling stage operation based on outdoor air temperature. On economizer model, free cooling will not be disabled by this function. Function will only be enabled if OS (outside air temperature sensor) is connected. **From -40 F up to 95 F (-40 C up to 35 C)**
Unocc TM	Unoccupied Timer value Default 0.5 hours	Time delay between the moment where the thermostat toggles from occupied to unoccupied after the last movement has been detected by the PIR. Range is: 0.5 to 24.0 hours in 0.5 hr increments
2/4event	Number of events configuration Default value = **2 event**	Available only on models with schedules and for use only when thermostat is not networked. Used only if set up as a standalone, non-networked thermostat. For networked thermostats, schedules should be applied through the WEBs-AX Workbench. **2 events**, will set up programming for the following Event 1 is for Occupied setpoints Event 2 is for Unoccupied setpoints **4 events**, will set up programming for the following Event 1 is for Occupied setpoints Event 2 is for Unoccupied setpoints Event 3 is for Occupied setpoints Event 4 is for Unoccupied setpoints
Aux cont	Auxiliary contact configuration Default value = **N.O. normally open**	This contact can be used to energize peripheral devices such as: lighting equipment, exhaust fans, economizers, etc. This contact will operate in parallel with the internal occupied/unoccupied schedule of the thermostat or the remote NSB contact if DI1 or DI2 is used. When the system is in OFF mode, the contact will remain in its unoccupied status independently of the occupied/unoccupied schedule. 	Configured	Contact occupied status	Contact unoccupied status	 N.O. — Closed — Opened N.C. — Opened — Closed
Prog rec	Progressive recovery enabled Default value = Off Progressive recovery is automatically disabled if DI 1 and/or DI 2 are configured remote NSB	Available only on models with schedules and for use only when thermostat is not networked. Off, = no progressive recovery The programmed occupied schedule time is the time at which the system will restart. On, = progressive recovery active. The programmed occupied schedule time is the time at which the desired occupied temperature will be attained. The thermostat will automatically optimize the equipment start time. In any case, the latest a system will restart is 10 minutes prior to the occupied period time.

Table 16. Additional Configuration Parameters for Heat Pump Models

Configuration parameters	Significance Default value	Adjustments
High bp	High balance point Default value = 90 F (32.0 C) Function will only be enabled if OS (outside air temperature sensor) is connected.	In *Heating or Auto mode*, it is the outside air temperature value at which the auxiliary heat will be cut off. Above that value, only the heat pump will be used to maintain the heating setpoint **34 F to 90 F (1.0 C to 32.0 C)**
Low bp	Low balance point Default value = -12 F (-24 C) Function will only be enabled if OS (outside air temperature sensor) is connected.	In *Heating, Cooling or Auto mode*, it is the outside air temperature value at which the heat pump operation will be cut off. Below that value, only the auxiliary heat will be used to maintain the heating setpoint **-40 F to 30 F (-40 C to -1.0 C)**
Comf/eco	Comfort or economy mode Default value = Comfort	Sets the operation and interaction mode of the heat pump with the auxiliary heat. Comfort mode. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized to satisfy the same heating setpoint. Economy mode. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized to satisfy only when the temperature has dropped 2.0 F (1.1 C) below the heating setpoint. Selecting economy mode will add a deadband between the heat pump and auxiliary heat in heating mode. The actual temperature maintained will be lower than the true heating setpoint to maximize the heat pump operation. When the outdoor air temperature drops below the *low balance point,* the deadband will be eliminated and the auxiliary heat will maintain the true heating setpoint alone. Economy mode. In *Emergency mode.* If *Emergency heat mode* is selected, the setpoint maintained, will be the heating setpoint.
Re valve	Reversing valve operation O/B Default value = O	Heat pump reversing valve operation O will energize the valve in cooling operation. B will energize the valve in heating operation O or B
Comp/aux	Compressor/auxiliary interlock Default value = Off	Sets the operation and interaction mode of the heat pump with the auxiliary heat. Interlock Off. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized at the same time as the heat pump stage. Typically applies when the air handler heat pump coil is installed before the auxiliary heat (all electric systems). Interlock On. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized and the heat pump will be cut off. Typically applies when the air handler heat pump coil is installed after the auxiliary heat (add on systems). There is a 2 minute delay to restart the heat pump, when the auxiliary heat is shut down Off or On

NOTE: **For Heat Pump models:** When the outside air sensor is not connected or is shorted, the thermostat bypasses the heating/cooling lockouts and the low/high balance points. Also heat pump models, when set in Emergency system mode, bypass heating lockout and permits auxiliary heating whenever a heating demand occurs.

Table 17. Additional Configuration Parameters for Economizer Models

Configuration parameters	Significance Default value	Adjustments
Chngstpt	Changeover setpoint Default value = 55 F (13.0 C)	In *Cooling* mode. The outside air temperature value at which the cooling will be switched over from mechanical (compressor) to free cooling (economizer) **14 F to 70 F (-10.0 C to 21.0 C)**
min pos	Minimum position Default value = 0%	Outside air damper minimum position. Will be active only when fan is on (G terminal) and the internal or remote scheduling is in occupied mode. When internal or remote scheduling is in unoccupied mode and/or fan is off, minimum position will be set to 0% **0 to 100%** = 0 to 10 Vdc output range

Outside air percentage	**0%**	**5%**	**10%**	**15%**	**20%**	**25%**	**30%**
Setting for 0-10 Vdc Actuator	0%	5%	10%	15%	20%	25%	30%
Setting for 2-10 Vdc Actuator	0 to 20%	24%	28%	32%	36%	40%	44%

 |
C mech	Mechanical cooling allowed Default value = Off	In *Cooling* mode. Allows the operation of the mechanical cooling if the free cooling (economizer) cannot maintain the cooling setpoint. Off Typically applies when the MS (mixed air temperature sensor) is installed after the mechanical cooling refrigeration coils. In this case, mechanical cooling will never operate at the same time as free cooling. On Typically applies when the MS (mixed air temperature sensor) is installed before the mechanical cooling refrigeration coils in the mixing plenum. In this case, mechanical cooling is allowed when the free cooling (economizer operation) cannot maintain the cooling setpoint. **Off or On**
mix stpt	Mixed air setpoint Default value = 55 F (13.0 C)	Free cooling mixed air setpoint when economizer mode is enabled. **50 F to 90 F (10.0 C to 32.0 C)**
MS dis	Display mixed air temperature	**Economizer model only, only if sensor is installed.** Used as diagnostic/service help to troubleshoot and diagnose economizer operation.

Table 18. Troubleshooting Guide for all Models

Symptom	Possible Cause	Corrective Action
No display on the thermostat	Absent or incorrect supply voltage	Check power supply voltage between C and RC to be from 19-30 Vac Check for tripped fuse or circuit breaker
	Overloaded power transformer	Verify that the transformer used is powerful enough (enough VA's) to supply all controlled devices including the thermostat
Keyboard menu does not access all functions	Keyboard locked	Change configuration parameter LOCKOUT to value "0" to access all levels of the menu
Temperature setpoints revert to original value after a certain time period	Temporary setpoint option selected	The thermostat needs to be in Permanent setpoint mode for the new setpoint to be kept and memory and used all the time Go to the Set temperature menu. The last prompt is setpoint type. Set it to Permanent setpoint
Thermostat will not call for heating	Wrong mode selected	Select heating mode
	Thermostat in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the thermostat Occupied heating setpoint
	Anti-cycle delay active	Wait, the anti-cycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	Heating lockout attained	Mode is locked out based on outside air temperature Change configuration parameter H Lock to value 120 F (49 C) to by-pass lockout
	Wiring error	Start the Fan by forcing the Fan ON mode Put a jumper across terminals RH and W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC and RH
Thermostat will not call for cooling	Wrong mode selected	Select cooling mode
	Thermostat in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the thermostat Occupied cooling setpoint
	Anti-cycle delay active	Wait, the anti-cycling period will end and the equipment will start
	Cooling setpoint is satisfied	Lower the cooling setpoint
	Cooling lockout attained	Mode is locked out based on outside air temperature Change configuration parameter C Lock to value -40 F (-40 C) to by-pass lockout
	Wiring error	Start the Fan by forcing the Fan ON mode Put a jumper across terminals RC and Y1. The cooling should come ON. If it does not, verify wiring
The thermostat will not turn on the fan	Wrong mode selected	Start the Fan by forcing the Fan ON mode Put a jumper across terminals RC and G. The fan should come ON. If it does not, verify wiring
	Wiring error	
Digital display shows missing digits or erratic segments	Defective display	Replace thermostat

Table 19. Troubleshooting Guide for Heat Pump Models

Symptom	Possible Cause	Corrective Action
Auxiliary heat does not operate	Wrong mode selected	Select emergency heat mode
	Thermostat in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the thermostat Occupied heating setpoint
	Anti-cycle delay active	Wait, the anti-cycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	High Balance point attained	Mode is locked out based on outside air temperature Change configuration parameter High BP to value 90 F (32 C) to by-pass lockout
	Heating lockout attained	Mode is locked out based on outside air temperature Change configuration parameter H Lock to value 120 F (49 C) to by-pass lockout
	Wiring error	Start the Fan by forcing the Fan ON mode Put a jumper across terminals RH and W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC and RH
Heat pump does not operate in heating mode	Wrong mode selected	Select heating mode
	Thermostat in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the thermostat Occupied heating setpoint
	Anti-cycle delay active	Wait, the anti-cycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	Low Balance point attained	Mode is locked out based on outside air temperature Change configuration parameter Low BP to value -12 F (-24 C) to by-pass lockout
	Heating lockout attained	Mode is locked out based on outside air temperature Change configuration parameter H Lock to value 120 F (49 C) to by-pass lockout
	Wiring error	Start the Fan by forcing the Fan ON mode Put a jumper across terminals RH and W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC and RH
	Wrong reversing valve configuration	Wrong selection of parameter Re Valve Select O will energize the valve in cooling operation. Valve is normally heat. Select B will energize the valve in heating operation. Valve is normally cool.

SPECIFICATIONS

Network Protocol: Models available in BACnet MS/TP or ZigBee wireless mesh

WEBs-AX Controllers: Compatible with WEB-2xx, WEB-6xx, and WEB-7xx

Platform:
WEB-2xx and WEB-6xx - WEBStation-AX 3.0 or later
WEB-7xx - WEBStation-AX 3.5 or later

Thermostat power requirements:
19-30 Vac 50 or 60 Hz; 2 VA (RC and C) Class 2
RC to RH jumper 2.0 Amps 48 VA maximum

Operating conditions:
32 F to 122 F (0 C to 50 C)
0% to 95% R.H. non-condensing

Storage conditions:
-22 F to 122 F (-30 C to 50 C)
0% to 95% R.H. non-condensing

Sensor: 10 K NTC thermistor onboard

Resolution: ± 0.2 F (± 0.1 C)

Control accuracy: ± 0.9 F (± 0.5 C) @ 70 F (21 C) typical calibrated

Occupied and unoccupied setpoint range cooling: 54 F to 100 F (12.0 to 37.5 C)

Occupied and unoccupied setpoint range heating: 40 F to 90 F (4.5 C to 32 C)

Room and outdoor air temperature range: -40 F to 122 F (-40 C to 50 C)

Proportional band for room temperature control: Factory set, heating and cooling at 2.0 F (1.1 C)

Digital inputs: Relay dry contact only across C terminal to DI1 or DI2

Contact output rating:
Each relay output: (Y1, Y2, G, W1, W2 and AU)
30 Vac, 1 Amp maximum
30 Vac, 3 Amp in-rush

Economizer analog output rating: 0 to 10 Vdc into 2KΩ resistance min.

Economizer analog output accuracy: ± 3% typical

Wire gauge: 18 gauge maximum, 22 gauge recommended

Dimensions: see Fig. 12.

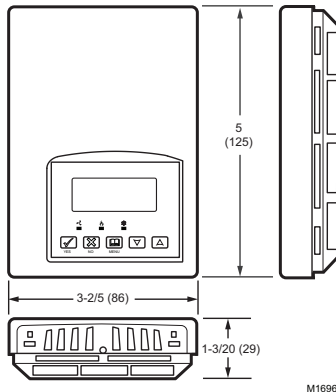**Approximate shipping weight:** 0.75 lb (0.34 kg)

Fig. 12. Thermostat dimensions in inches (mm)

Agency Approvals all models:
UL: UL 873 (US) and **CSA** C22.2 No. 24 (Canada), File E27734 with CCN XAPX (US) and XAPX7 (Canada)
Industry Canada: ICES-003 (Canada)
FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)
CE: EMC Directive 89/336/EEC (Europe Union)
C-Tick: EN55022:2006, IEC 61326-1:2005

Agency Approvals wireless models
FCC: Compliant to: Part 15, Subpart C
   This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Agency Approvals on BACnet models
BTL

IMPORTANT

   All TB7600 series controls are for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verifications prior to shipment to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user/installer/electrical system designer to incorporate safety devices (such as relays, flow switch, thermal protections, etc.) and/or alarm system to protect the entire system against such catastrophic failures. Tampering of the devices or miss application of the device will void warranty.

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