

T7350

Commercial Programmable Thermostat

FOR SINGLE- OR MULTI-STAGE CONVENTIONAL/HEAT PUMP SYSTEMS

PRODUCT DATA



APPLICATION

The T7350 Commercial Programmable Thermostat controls 24 Vac commercial single zone heating, ventilating and air conditioning (HVAC) equipment. The T7350 consists of a thermostat and subbase. The thermostat includes the keypad and display for 7-day programming. The subbase includes equipment control connections. The subbase mounts on the wall and the thermostat mounts to the subbase.

FEATURES

- Typically used in buildings (including: restaurants, shopping malls, office buildings and banks) under 55,000 square feet.
- For single zone rooftop units, split systems, heat pumps or hot/chilled water systems.
- 7-day programming.
- Two Occupied and two Not Occupied periods per day.
- Thermostat Interface Module (TIM) connections to thermostat from PDA for advanced configuration, programming, keypad lockout, etc. changes can be made with thermostat mounted.
- Individual heat and cool setpoints available for Occupied and Not Occupied periods.
- P+I+D control minimizes temperature fluctuations.
- Recovery ramp control automatically optimizes equipment start times based on building load.
- Convenient overrides allow temporary setpoint changes.
- Keypad multi-level lockout available with all models.
- Remote sensor capability for temperature (including outdoor air and discharge air) and humidity sensors.
- Auxiliary subbase contact typically interface with a Honeywell Economizer System (for total rooftop control integration) or act as dehumidification output.
- Universal Versaguard™ Thermostat guards available.
- T7350H provides networking capability on LONWORKS® Bus using a Free Topology Transceiver (FTT).
- T7350H Conforms to LONMARK® Space Comfort Profile for rooftop applications.

continued

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FEATURES *(continued from page 1)*

Features Available via PDA Configuration

- 365 day clock with holiday programming.
- Automatic Daylight Saving Time adjustments.
- Selectable dehumidification limit control.
- Modulating output configuration.
- Occupancy input to control standby setpoint.
- Additional standby period used in low traffic areas.
- Sequential start option.
- Discharge air high/low limits.
- Selectable recovery ramp.
- Ambient lockout (with outdoor sensor).
- System monitoring.
- Application database with download and storing.

Features via Optional Network Model-H

- Communications on LonTalk® network.
- Network Tools (LONSPEC™, CARE) have ability to configure all PDA available features.
- T7350 Network data inputs including outdoor air temperature, Occupancy Sensor, Electric Demand Shed/Restore, room temperature and humidity.
- Use T7350H to time-schedule up to 119 network connected XL10 + XL15c devices.
- Time synchronization with a network master clock or the T7350H configured as the network master clock.
- Remote manual occupancy changes to the T7350 via Command Display (S7760)
- View and modify weekly schedules and holidays via Command Display (S7760)
- Remote changes to the T7350 occupancy override, schedules, fan operation (on auto), system mode (off, auto, heat, cool) and room temperature setpoints via Workstation
- Remote unoccupied bypass controlled from another device.
- Remote T7350 data and alarm monitoring via Command Display or Workstation.
- Network Manual Mode allows a remote user to turn on/off or modulate each output via a network connection.
- LONMARK® plugin software to facilitate third party configuration tools and workstations.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit might not exactly match listed specifications. This product is tested and calibrated under closely controlled conditions; minor performance differences can be expected if those conditions are changed.

Models: See Table 1.

Dimensions: See Fig. 1.

Finish (color): Trident White.

Batteries: No batteries required.

Table 1. T7350 Thermostat Features.

Model	Applications	Maximum Stages ^a		Features	Auxiliary Relay	LONWORKS® Capability?
		Heat	Cool			
T7350A	Conventional or Heat Pump	1 ^b	1 ^b		Yes	No
T7350B		2 ^b	2 ^b	Outdoor, Discharge Air Capability	Yes	
T7350D		3 (2) ^c	3 (4) ^c	Humidity, Occupancy, Outdoor, Discharge Air Capability	Yes	
T7350H1009					Isolated Normally Open	Yes
T7350H1017	Modulating	2 modulating, 2 ^b relay		Humidity, Occupancy, Outdoor, Discharge Air Capability, 4-20 mA output (2-10 Vdc with 500 ohm resistor)		Yes
T7350M					Yes	No

^a All models are down-selectable and can be configured to control fewer stages than the maximum allowed.

^b One extra stage (of either heat or cool) can be configured using the auxiliary relay.

^c Heat pump applications for these models have a maximum of two heat stages and two cool stages.

Mounting Means:

Mounts on subbase.

Subbase Mounts On:

Wall: Using two 5/8 in. long #6-32 screws (included).

Outlet Box: Using sheet metal screws.

Throttling Range for Modulating Outputs:

Automatically adjusts based on heat/cool stages. Manually adjustable with PDA.

Clock Accuracy (at 77°F [25°C]): ±1 min./month (30 days).

Minimum Stage Operation Time (fixed):

Minimum On

Heat: 1 minutes.

Cool: 3 minutes.

Minimum Off (Cool and Heat Pump): 1 minute.

Electrical Ratings:

Power: 24 Vac, 50/60 Hz.; 20 to 30 Vac, 50/60 Hz.

Input:

Temperature: 20K ohms.

Humidity: 0-10 Vdc.

Outdoor: 3000 PTC.

Discharge Air: 20K ohms.

Occupancy Sensor: Dry contact switching 30 Vdc at 1 mA.

All Relay Outputs (at 30 Vac):

Running: 1.5A maximum.

Inrush: 7.5A maximum.

Modulating Output: 4 to 20 mA with 510 ohm maximum terminating resistance.

System Current Draw (without load):

5 VA maximum at 30 Vac, 50/60 Hz.

NOTE: Relays are N.O. Single-Pole, Single-Throw (SPST).

Outdoor Sensor Wiring: Requires 18 gauge wire.

Humidity Ratings: 5% to 90% RH, noncondensing.

Emergency Heat Indication:

Display indicates when Emergency Heat is activated (Em).

Temperature:

Ratings:

Operating Ambient: 30°F to 110°F (-1°C to 43°C).

Shipping: -30°F to +150°F (-34°C to +66°C).

Display Accuracy: ±1°F (±1°C).

Setpoint:

Range:

Heating: 40°F to 90°F (4°C to 32°C).

Cooling: 45°F to 99°F (7°C to 37°C).

Deadband: 2°F (1°C).

Default Settings: See Table 2.

Loss of Power: The thermostat maintains programmed times and temperatures for the life of the product. Clock and day information is retained for a minimum of 48 hours.

NOTE: To achieve the 48-hour power-loss clock retention, the T7350 must be powered for at least 5 minutes.

Communicating Model T7350H:

Connection Terminals for the LONWORKS® Bus.

Network jack for quick access by personal computer based tools.

Communications service-pin pushbutton to simplify startup. LONMARK® Functional Profile: 8500_20 Space Comfort Controller.

LONMARK® SCC Object Type: 8504 Rooftop See Fig. 2.

LONMARK® Program Identifier: 80:00:0C:55:04:03:04:2E.

LONMARK® Application Interoperability: version 3.3

Honeywell LONMARK® Plug-In file downloads:

<http://plugin.ge51.honeywell.de/index.htm#>

PDA System Requirements:

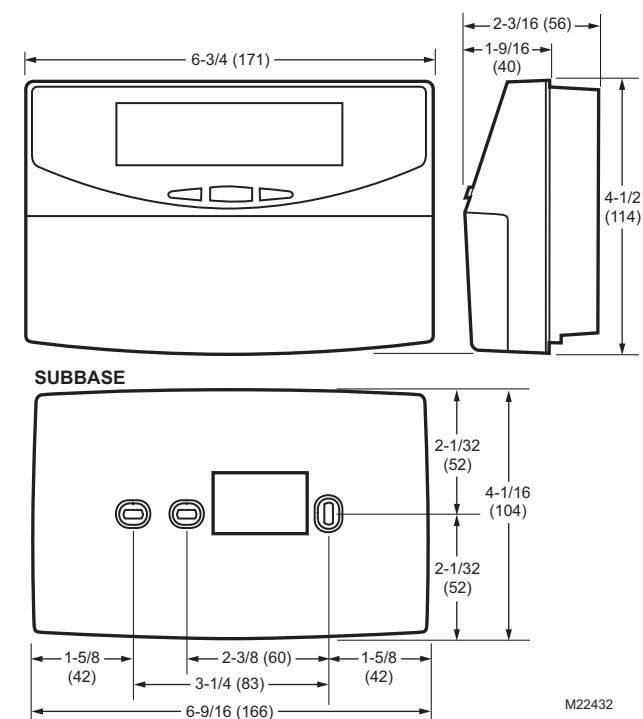
Palm OS: 3.5.x to 5.2.1
 Dynamic Heap: 256K bytes.
 Free RAM Space: 1000K bytes.
 Serial Communications: RS232.

Approvals:

European Community Mark (CE) Listed.
 UL 873 Recognized, NEC Class 2.
 FCC Part 15 subpart J Class A.
 cUL.

Table 2. Default Setpoints.

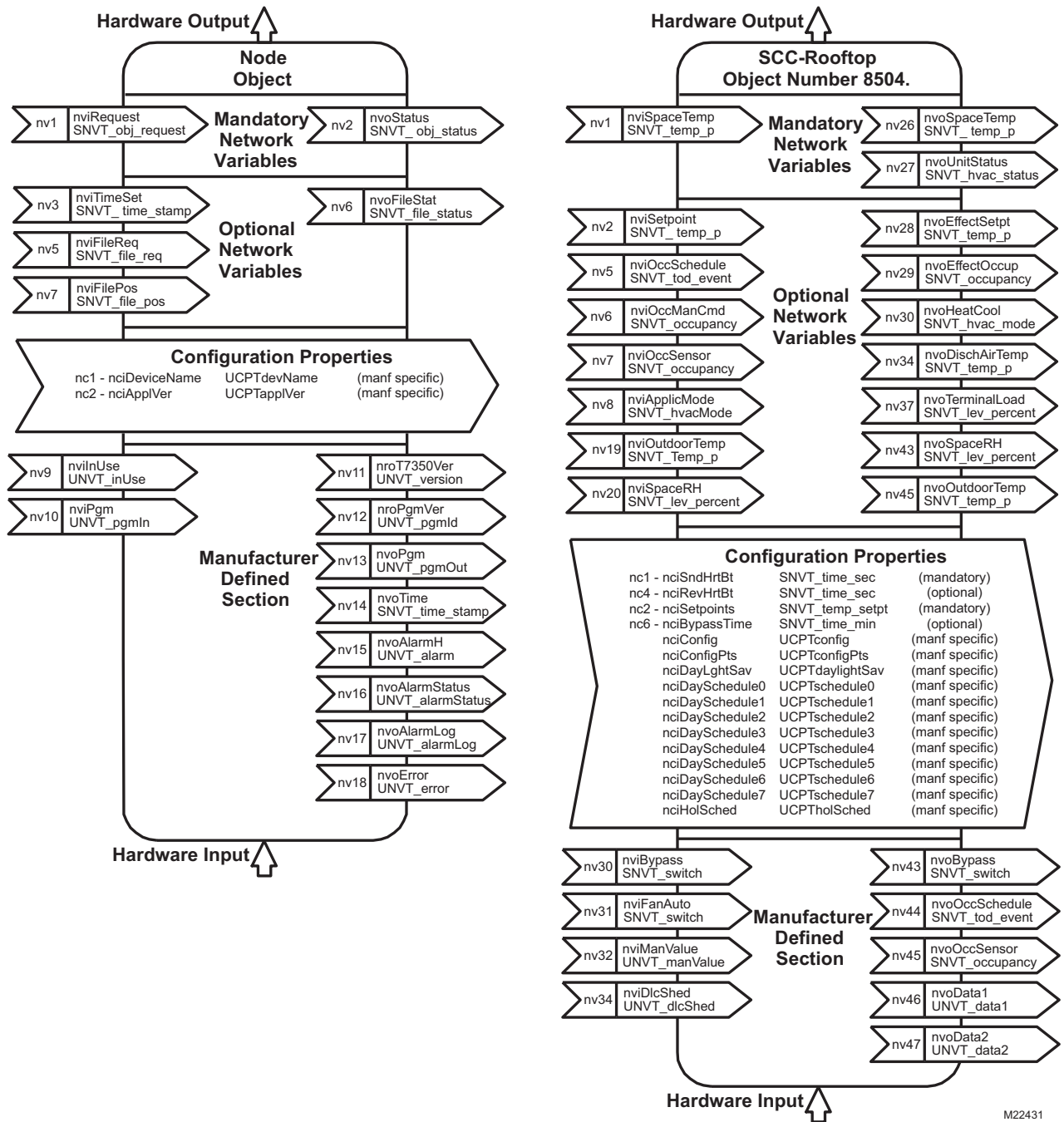
Control	Occupied	Not Occupied	Standby
Heating	70°F (21°C)	55°F (13°C)	67°F (19°C)
Cooling	75°F (24°C)	85°F (29°C)	78°F (26°C)



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Fig. 1. Dimensions of thermostat and subbase in in. (mm).**Accessories:**

Duct Discharge Air Sensors: C7041B (6 or 12 in.), C7041C (18 in.), C7041J (12 ft averaging), C7770A (8 in. probe).
 Outdoor Air Sensors: C7089A, C7170A, C7031G2014 (weatherproof).
 Temperature Sensors (Remote): C7772A, T7770A1006, T7770B1046, T7770C1044, T7770D1000, T7771.
 Economizer Logic Modules: W6210, W6215, W7210, W7212, W7215, W7459.
 Humidity Sensors: H7625, H7635.
 PDA Units: Palm™ V, M125, and i705 handhelds; TRGPro™ handheld; ZIRE™ 71 handheld; TUNGSTEN™ T handheld.
 Others:
 209541B FTT network termination module.
 209651A Vertical Mounting Hardware Wallplate Adapter (Trident white).
 50000083-001 Thermostat Interface Module (TIM).
 50000452-001 Troubleshooting Cable.
 AK3797 Single pair network cable plenum rated, U.L. Type CMP.
 AK3798 Single pair network cable, U.L. Type CMR.
 AK3799 Double pair network cable plenum rated, U.L. Type CMP.
 Q7740A FTT network 2-way repeater.
 Q7740B FTT network 4-way repeater.
 TG511, TG512 Universal Versaguard™ Thermostat guards.



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Fig. 2. T7350H LONMARK® Space Comfort Controller Rooftop Object (8504) with Node Object.

INSTALLATION

When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check ratings given in instructions and on the product to ensure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

CAUTION

Electrical Shock or Equipment Damage Hazard.
Can shock individuals or short equipment circuitry.

Disconnect power supply before installation.

IMPORTANT

All wiring must agree with applicable codes, ordinances and regulations.



MERCURY NOTICE

If this control is replacing a control that contains mercury in a sealed tube, do not place your old control in the trash. Dispose of properly.

Contact your local waste management authority for instructions regarding recycling and the proper disposal of an old control. If you have questions, call Honeywell Customer Care Center at 1-800-468-1502.

Location

Do not install the thermostat where it can be affected by:

- drafts, or dead spots behind doors and in corners.
- hot or cold air from ducts.
- radiant heat from sun or appliances.
- concealed pipes and chimneys.
- unheated (uncooled) areas such as an outside wall behind the thermostat.

Subbase

WHEN USED TO SENSE ROOM TEMPERATURE

Install the thermostat about 5 ft (1.5m) above the floor in an area with good air circulation at average temperature. (See Fig. 3.)

WHEN NOT USED TO SENSE ROOM TEMPERATURE

When using the remote-mounted temperature (and humidity) sensor(s) to sense ambient conditions, install the thermostat in an area that is accessible for setting and adjusting the temperature and settings.



CAUTION

Equipment Damage Hazard.

Can damage the TIM connection beyond repair.

Disconnect the TIM cable prior to opening or closing the thermostat cover.

NOTE: Allow sufficient clearance below the thermostat to plug in the TIM cable.

Install the remote-mounted sensor(s) about 5 ft (1.5m) above the floor in an area with good air circulation at average temperature. (See Fig. 3.)

If multiple remote sensors are required, they must be arranged in a temperature averaging network consisting of four or nine sensors. (See Fig. 4 and 6.)

NOTE: Only T7770 models with neither setpoint adjustment nor bypass can be used for temperature averaging.

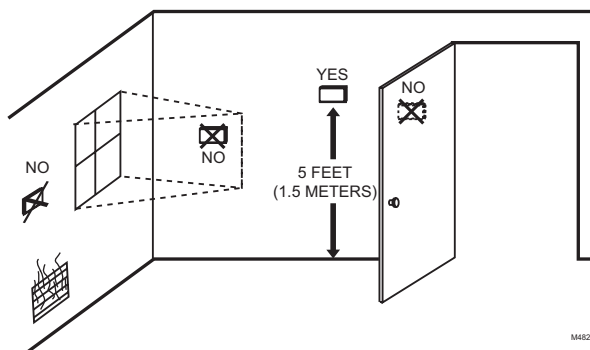


Fig. 3. Typical location of thermostat or remote-mounted sensor.

IMPORTANT

To avoid electrical interference, which can cause erratic performances, keep wiring runs as short as possible and do not run thermostat wires adjacent to the line voltage electrical distribution systems. Use shielded cable (Belden type 8762 or equivalent for 2-wire). The cable shield must be grounded only at the controlled equipment case.

Mounting Subbase

The subbase mounts horizontally or vertically.

IMPORTANT

- When using the internal temperature sensor, the device must be mounted horizontally (with the LCD facing upwards). Precise leveling is not needed.
- When using remote sensors, thermostat mounting orientation does not matter.

Wall mounting (using standard drywall screws) is standard. Mounting to a 2 in. by 4 in. wiring box can be accomplished:

- for a horizontal box, no extra hardware is required.
- for a vertical box, part 209651A is required.

- Mount to European standard wall box (having 60,3 mm between mounting screws in a horizontal line) with or without adaptive hardware.

1. Position and level the subbase.

NOTE: A level wallplate is only for appearance. The thermostat functions properly when not level.

2. Use a pencil to mark the mounting holes. (See Fig. 7.)
3. Remove the subbase from the wall and drill two 3/16 in. holes in the wall (if drywall) as marked. For firmer material such as plaster or wood, drill two 7/32 in. holes.
4. Gently tap anchors (provided) into the drilled holes until flush with the wall.
5. Position the subbase over the holes, pulling wires through the wiring opening.
6. Loosely insert the mounting screws into the holes.
7. Tighten mounting screws.

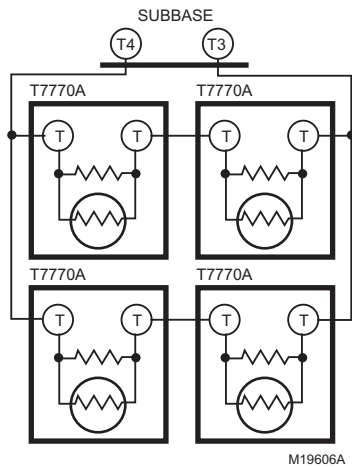
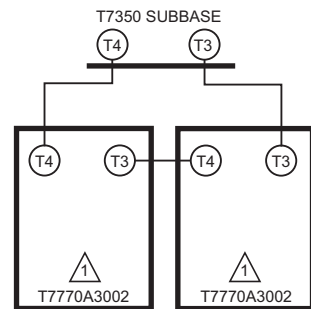


Fig. 4. Four T7770A Sensors providing a temperature averaging network for T7350 Thermostat.



1 THE T7771A3002 IS A 10K OHM SENSOR.
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Fig. 5. Two T7770A3002 Sensors providing a temperature averaging network for T7350 Thermostat.

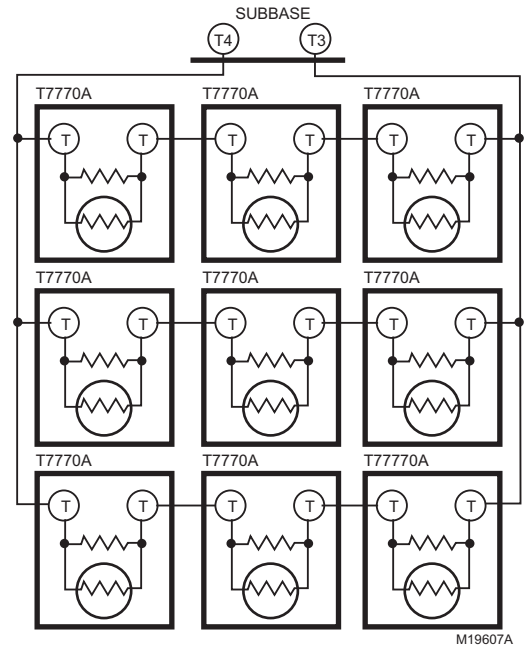


Fig. 6. Nine T7770A Sensors providing a temperature averaging network for T7350 Thermostat.

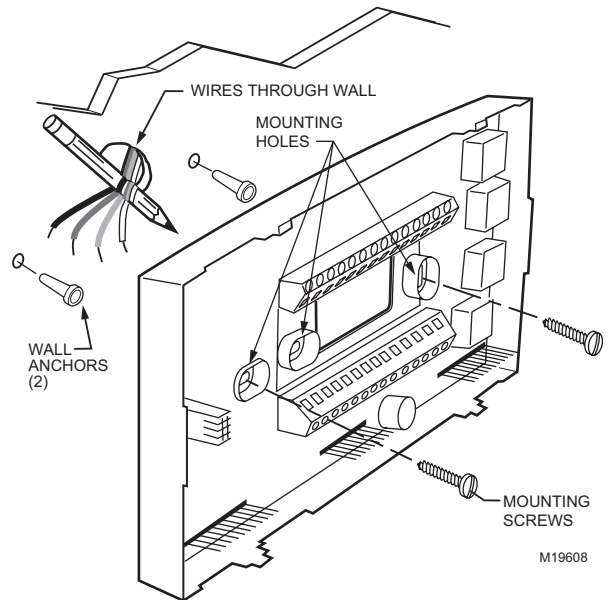


Fig. 7. Mounting the subbase.

Wiring

CAUTION

Electrical Shock or Equipment Damage Hazard.
Can shock individuals or short equipment circuitry.

Disconnect power supply before installation.

IMPORTANT

All wiring must comply with local electrical codes and ordinances.

NOTE: Maximum (and recommended) wire size is 18-gauge. Do not use wire smaller than 22-gauge.

Follow equipment manufacturer wiring instructions when available. Refer to the Wiring Diagram section for typical hookups. A letter code is located near each terminal for identification. Refer to Tables 3 through 8 for terminal designations.

1. Loosen subbase terminal screws and connect system wires.
2. Securely tighten each terminal screw.
3. Push excess wire back into the hole in the wall.
4. Plug the hole with nonflammable insulation to prevent drafts from affecting the thermostat.

Table 3. T7350A Subbase for Single-stage Heat, Single-stage Cool Systems.

Terminal		Description
Conventional	Heat Pump	
RC ^a	RC ^a	24 VAC Cooling transformer.
RH ^a	RH ^a	24 VAC Heating transformer.
X	X	Common.
G	G	Fan relay.
aux	aux	Conventional: Auxiliary relay or 2nd Stage of heating or cooling relay. Heat Pump: Auxiliary relay or 1st Stage auxiliary heat relay.
W1	O/B	Conventional: Stage 1 heating relay. Heat Pump: Changeover relay for heating (B) or cooling (O) ^b .
Y1	Y1	Conventional: Stage 1 cooling relay. Heat Pump: Stage 1 compressor relay.

^a Factory jumper between RC and RH for systems with one transformer.

^b For changeover functional details, see Operation section.

Table 4. T7350B Subbase for Two-stage Heat, Two-stage Cool Systems.

Terminal		Description
Conventional	Heat Pump	
RC ^a	RC ^a	24 VAC Cooling transformer.
RH ^a	RH ^a	24 VAC Heating transformer.
X	X	Common.
aux	aux	Conventional: Auxiliary relay or 3rd stage of heating or cooling. Heat Pump: Auxiliary relay or 2nd stage auxiliary.
W1	O/B	Conventional: Stage 1 heating relay. Heat Pump: Changeover relay for heating (B) or cooling (O) ^b .
W2	W1	Conventional: Stage 2 heating relay. Heat Pump: 1st Stage auxiliary heat relay.
Y1	Y1	Conventional: Stage 1 cooling relay. Heat Pump: Stage 1 compressor relay.
Y2	Y2	Conventional: Stage 2 cooling relay. Heat Pump: Stage 2 compressor relay.
AS	AS	Discharge Air Sensor connection. (1)
AS	AS	Discharge Air Sensor connection. (2)
OS	OS	Outdoor Air Sensor connection. (1)
OS	OS	Outdoor Air Sensor connection. (2)
G	G	Fan relay.
T3	T3	T7770 Remote Sensor connection (3).
T4	T4	T7770 Remote Sensor connection (4).
T5	T5	T7770 Remote Sensor connection (5).
T6	T6	T7770 Remote Sensor connection (6).
T7	T7	T7770 Remote Sensor connection (7).

^a Factory jumper between RC and RH for systems with one transformer.

^b For changeover functional details, see Operation section.

Table 5. T7350D Subbase for Three-stage Heat, Three-stage Cool Systems.

Terminal		Description
Conventional	Heat Pump	
RC ^a	RC ^a	24 VAC Cooling transformer.
RH ^a	RH ^a	24 VAC Heating transformer.
X	X	Common.
aux	aux	Auxiliary relay.
W1	O/B	Conventional: Stage 1 heating relay. Heat Pump: Changeover relay for heating (B) or cooling (O) ^b .
W2	W1	Conventional: Stage 2 heating relay. Heat Pump: 1st Stage auxiliary heat relay.
Y1	Y1	Conventional: Stage 1 cooling relay. Heat Pump: Stage 1 compressor relay.
Y2	Y2	Conventional: Stage 2 cooling relay. Heat Pump: Stage 2 compressor relay.
AS	AS	Discharge Air Sensor connection. (1)
AS	AS	Discharge Air Sensor connection. (2)
OS	OS	Outdoor Air Sensor connection. (1)
OS	OS	Outdoor Air Sensor connection. (2)
G	G	Fan relay.
T3	T3	T7770 Remote Sensor connection (3).
T4	T4	T7770 Remote Sensor connection (4).
T5	T5	T7770 Remote Sensor connection (5).
T6	T6	T7770 Remote Sensor connection (6).
T7	T7	T7770 Remote Sensor connection (7).
W3	W2	Conventional: Stage 3 heat or stage 4 cool relay. Heat Pump: 2nd Stage auxiliary heat relay.
Y3	—	Conventional: Stage 3 cooling relay.
HS	HS	Humidity Sensor connection (signal: 0-10 Vdc).
HC	HC	Humidity Sensor connection (common).
HP	HP	Humidity Sensor connection (power).
M	M	Motion Sensor connection (1).
M	M	Motion Sensor connection (2).

^a Factory jumper between RC and RH for systems with one transformer.

^b For changeover functional details, see Operation section.

Table 6. T7350H Subbase for Three-stage Heat, Three-stage Cool Systems with Network Communications

Terminal		Description
Conventional	Heat Pump	
RC ^a	RC ^a	24 VAC Cooling transformer.
RH ^a	RH ^a	24 VAC Heating transformer.
X	X	Common.
aux ^b	aux ^b	Auxiliary relay connection (normally open).
aux ^b	aux ^b	Auxiliary relay connection (common).
W1	O/B	Conventional: Stage 1 heating relay. Heat Pump: Changeover relay for heating (B) or cooling (O) ^c .
W2	W1	Conventional: Stage 2 heating relay. Heat Pump: 1st Stage auxiliary heat relay.
Y1	Y1	Conventional: Stage 1 cooling relay. Heat Pump: Stage 1 compressor relay.
Y2	Y2	Conventional: Stage 2 cooling relay. Heat Pump: Stage 2 compressor relay.
AS	AS	Discharge Air Sensor connection. (1)
AS	AS	Discharge Air Sensor connection. (2)
OS	OS	Outdoor Air Sensor connection. (1)
OS	OS	Outdoor Air Sensor connection. (2)
G	G	Fan relay.
T3	T3	T7770 Remote Sensor connection (3).
T4	T4	T7770 Remote Sensor connection (4).
T5	T5	T7770 Remote Sensor connection (5).
T6	T6	T7770 Remote Sensor connection (6).
T7	T7	T7770 Remote Sensor connection (7).
W3	W2	Conventional: Stage 3 heat or stage 4 cool relay. Heat Pump: 2nd Stage auxiliary heat relay.
Y3	—	Conventional: Stage 3 cooling relay.
HS	HS	Humidity Sensor connection (signal: 0-10 Vdc).
HC	HC	Humidity Sensor connection (common).
HP	HP	Humidity Sensor connection (power).
M	M	Motion Sensor connection (1).
M	M	Motion Sensor connection (2).
ebus	ebus	LONWORKS® Bus (1)
ebus	ebus	LONWORKS® Bus (2)

^a Factory jumper between RC and RH for systems with one transformer.

^b Floating auxiliary contact (not connected to transformer hot or common).

^c For changeover functional details, see Operation section.

Table 7. T7350H SubBase for Modulating Systems with Network Communications.

Terminal		Description
Conventional	Heat Pump	
RC ^a	—	24 VAC Cooling transformer.
RH ^a	—	24 VAC Heating transformer.
X	—	Common.
aux ^b	aux ^b	Auxiliary relay connection (normally open).
aux ^b	aux ^b	Auxiliary relay connection (common).
W1	—	Stage 1 heating relay.
Y1	—	Stage 1 cooling relay.
MX	—	Modulating common.
MH	—	Modulating heating signal (4-20 mA).
MC	—	Modulating cooling signal (4-20 mA).
AS	—	Discharge Air Sensor connection. (1)
AS	—	Discharge Air Sensor connection. (2)
OS	—	Outdoor Air Sensor connection. (1)
OS	—	Outdoor Air Sensor connection. (2)
G	—	Fan relay.
T3	—	T7770 Remote Sensor connection (3).
T4	—	T7770 Remote Sensor connection (4).
T5	—	T7770 Remote Sensor connection (5).
T6	—	T7770 Remote Sensor connection (6).
T7	—	T7770 Remote Sensor connection (7).
HS	—	Humidity Sensor connection (signal: 0-10 Vdc).
HC	—	Humidity Sensor connection (common).
HP	—	Humidity Sensor connection (power).
M	—	Motion Sensor connection (1).
M	—	Motion Sensor connection (2).
ebus	ebus	LONWORKS® Bus (1)
ebus	ebus	LONWORKS® Bus (2)

^a Factory jumper between RC and RH for systems with one transformer.

^b Floating auxiliary contact (not connected to transformer hot or common).

Table 8. T7350M Subbase for Modulating Systems.

Terminal		Description
Conventional	Heat Pump	
RC ^a	—	24 VAC Cooling transformer.
RH ^a	—	24 VAC Heating transformer.
X	—	Common.
aux	—	Auxiliary relay or 2nd stage of heating or cooling.
W1	—	Stage 1 heating relay.
Y1	—	Stage 1 cooling relay.
MX	—	Modulating common.
MH	—	Modulating heating signal (4-20 mA).
MC	—	Modulating cooling signal (4-20 mA).
AS	—	Discharge Air Sensor connection. (1)
AS	—	Discharge Air Sensor connection. (2)
OS	—	Outdoor Air Sensor connection. (1)
OS	—	Outdoor Air Sensor connection. (2)
G	—	Fan relay.
T3	—	T7770 Remote Sensor connection (3).
T4	—	T7770 Remote Sensor connection (4).
T5	—	T7770 Remote Sensor connection (5).
T6	—	T7770 Remote Sensor connection (6).
T7	—	T7770 Remote Sensor connection (7).
HS	—	Humidity Sensor connection (signal: 0-10 Vdc).
HC	—	Humidity Sensor connection (common).
HP	—	Humidity Sensor connection (power).
M	—	Motion Sensor connection (1).
M	—	Motion Sensor connection (2).

^a Factory jumper between RC and RH for systems with one transformer.

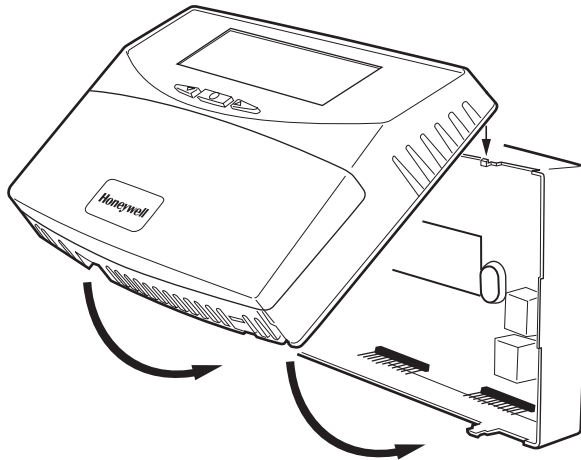
Mounting Thermostat on Subbase (Fig. 8)

With the subbase installed, mount the thermostat:

1. Engage the tabs at the top of the thermostat and subbase.
2. Swing the thermostat down.
3. Press the lower edge of the case to latch.

NOTE: To remove the thermostat from the wall, first pull out at the bottom of the thermostat; then remove the top.

A. ENGAGE TABS AT TOP OF THERMOSTAT AND SUBBASE OR WALLPLATE.



B. PRESS LOWER EDGE OF CASE TO LATCH.

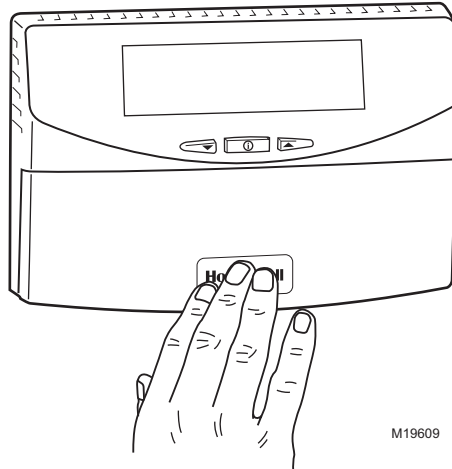


Fig. 8. Mounting thermostat on subbase.

SETTINGS

Using Thermostat Keys

The thermostat keys are used to:

- set current time and day,
- program times and setpoints for heating and cooling,
- override the program temperatures,
- display present setting,
- set system and fan operation,
- perform simple configuration.

NOTE: See Fig. 9 for keypad information.

Setting Temperature

Refer to Table 2 for the default temperature setpoints. See Programming section for complete instructions on changing the setpoints.

Setting System and Fan

System default setting is Auto. Fan default setting is On.

NOTE: Use *System* and *Fan* keys to change settings.

System Settings

- Auto: Thermostat automatically changes between heating and cooling based on indoor temperature.
- Cool: Thermostat controls only cooling.
- Off: Heating, cooling, and fan are all off.
- Heat: Thermostat controls only heating.
- Em Heat: Auxiliary heat serves as first stage. Compressor stages are locked off.

Fan Settings

- On: See Table 9.
- Auto: Fan always cycles with call for heating or cooling.
 - Conventional: The equipment (i.e. plenum switch) controls fan operation in heat mode. The thermostat controls fan operation in cool mode.
 - Electric Heat: The thermostat controls fan operation in both heat and cool modes.

NOTES: Fan operation can extend (delay Off) after the heating/cooling turns off:

- Heating choices are 0 or 90 seconds.
- Cooling choices are 0 or 40 seconds.

Table 9. Fan On Control Logic.

Occupancy		Call for Heat/Cool	
Scheduled	Sensor Signal	Yes	No
Occupied	Occupied	On	On
Occupied	Standby	On	Off ^a
Standby	—	On	On
Not Occupied	—	On	Off ^a

^a In heat mode, when set for conventional heat, the equipment (i.e. plenum switch) could power the fan despite the T7350.

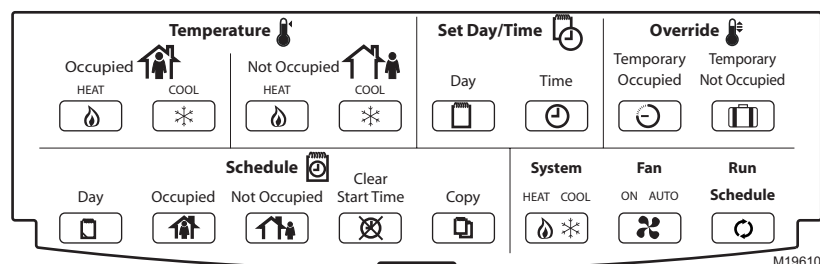


Fig. 9. Thermostat key locations.

INSTALLER SETUP

For most applications, the thermostat factory settings do not need to be changed. Review the factory settings in Table 10.

NOTE: When power is first applied to the thermostat, the display will show all segments (see Fig. 10).

Table 10. Keypad Configurable Installer Setup Options^a.

Configuration Option	Factory Default	Description
Degree temperature display	DEG F	Temperature display: °F or °C
Remote room temperature sensor	LOC SEN	LOC: Use Local temperature sensor. REM: Use Remote temperature sensor.
Clock format	12HRCLK	12HR: 12-hour clock format 24HR: 24-hour clock format
Keypad lockout level	KYLCK 0	Keypad lockout enable/disable through special keypad sequence. 0: No lockout. 1: Lockout all keys except Temporary Occupied, Temporary Not Occupied, ▲, ▼ and ⓘ ^b . 2: Lockout all keys except ⓘ ^b .
Conventional / heat pump selection	CONV	CONV: Conventional equipment. HT PUMP: Heat Pump.
Heat Pump Reversing Valve ^c	RVON HT	RVON HT: Heat pump, energize O/B on call for heat. RVON CL: Heat pump, energize O/B on call for cool.
Configuration Variables (C1,C2,C3,C4,C5,C6,C7,C8)	^d	Hexadecimal configuration code values. The code defines only Installer Configuration. It sets neither Parameters (gains and setpoints) nor Schedules.

^a With the exception of Temporary Not Occupied, functions not keypad configurable require a Palm OS® Configuration Tool.

^b Lockouts do not allow adjustments on dehumidification high limit. Special keypresses are never locked out.

^c Displays only when heat pump is selected.

^d Values vary depending on the model.

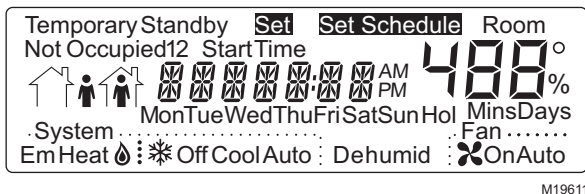


Fig. 10. LCD display of all segments.

Setup Using Keypad

The installer uses the Installer Setup to customize the thermostat to specific systems. (See Table 10.) The table includes all the configuration options available. For basic setup functions, the thermostat can be configured using the keypad.

NOTE: The T7350 has serial communications to facilitate use of an installer configuration tool. More advanced features are available using this tool. (See the Appendix for details.)

A combination of key presses are required to use the Installer Setup feature:

1. To enter the Installer Setup, press and hold both the *Run Schedule* and the *Copy* keys until DEG F (or DEG C) displays.
2. To advance to the next Setup item, press ⓘ.

NOTE: Pressing Run/Copy again while in this mode displays the T7350 firmware version number.

3. To return to a Setup item, cycle through the options.
4. To change a setting, use the up ▲ or down ▼ key.
5. To exit the Installer Setup, press *Run Schedule*.
6. The display prompts SAV CFG (save configuration).
 - a. If you want to save the new configuration, use the up ▲ or down ▼ key to change NO to YES before pressing *Run Schedule*.
 - b. If you want the configuration to remain as it was before starting this change, ensure the display indicates SAV CFG NO and press *Run Schedule*.

NOTE: Installer Setup is automatically exited after five minutes with no key pressed. Upon this automatic exit, all changes are lost.

Setting Keypad Lockout

Proper keypad sequences activate the lockout features. To change the keypad lockout state:

1. Enter the Installer Setup: press and hold both the *Run Schedule* and the *Copy* keys until DEG F (or DEG C) displays.
2. Press ⓘ until KYLCK displays.
3. Use the up ▲ or down ▼ key to change the setting. Options are:
 - 0: No lockout.
 - 1: Lockout all keys except Temporary Occupied, Temporary Not Occupied, up ▲, down ▼ and ⓘ.
 - 2: Lockout all keys except ⓘ.

NOTES:

- Options 1 and 2 do not allow adjustments on dehumidification high limit.
- No options lockout special keypresses. See the Special Functions section for details.

4. Once the proper option is chosen, exit Installer Setup by pressing *Run Schedule*.
5. The display prompts SAV CFG (save configuration). If you want to save it, use the up ▲ or down ▼ key to change NO to YES before pressing *Run Schedule* again.

Configuration



CAUTION

Possible Equipment Damage.

Fan must be running when system is operating.

Heat pump and electric heat systems must be configured correctly to prevent equipment damage caused by the system running without the fan.

Limited configuration can be done with the keypad. In order to determine the proper codes to use for the Configuration Variables (CnfgID), a PDA is required:

1. Open the PDA Config Tool Application.
2. Select the desired configuration.
3. On the summary screen, tap CnfgID.
4. The PDA determines the proper CnfgID.
5. Make note of the values.
6. Press both Copy and Run Schedule.
7. Tap ⓘ until C1 appears on the right end of the display.
8. Adjust each variable to match the PDA indication:
 - a. Hold down the up ▲ or down ▼ key to adjust the value quickly.
 - b. Tap the up ▲ or down ▼ key for fine control.
9. Press ⓘ to switch to another variable.
10. Return to step 8 and repeat the process until all digits are set properly.
11. To exit the Installer Setup, press *Run Schedule*.
12. The display prompts SAV CFG (save configuration).
 - a. If you want to save the new configuration, use the up ▲ or down ▼ key to change NO to YES before pressing *Run Schedule*.
 - b. If you want the configuration to remain as it was before starting this change, ensure the display indicates SAV CFG NO and press *Run Schedule*.

IMPORTANT

1. Review the settings to confirm that they are correct for the system.
2. Press *Run Schedule* to exit the Installer Setup.
3. The thermostat prompts you to save configuration changes. Default is NO.
4. Be sure to set the current day and time immediately.

Special Functions

Restore Factory Configuration (Run/Clear)

IMPORTANT

This operation erases the current configuration and restores the factory defaults for all configuration, parameters, setpoints and schedules. To regain the old requires device reconfiguration.

1. Press both *Run Schedule* and *Clear Start Time*.
2. The display gives the option to restore the FAC CFG.

- a. To restore the factory defaults, press up ▲ or down ▼ until the display indicates YES.
 - b. To cancel this option, ensure display indicates NO.
3. Press *Run Schedule*.

Get Factory Schedule (Info/Clear)

Performing this operation reverts the schedules to the factory defaults:

1. Press both *Info* and *Clear Start Time*.
2. The display gives the option to restore the FAC SCH.
 - a. To restore the factory schedule, press up ▲ or down ▼ until the display indicates YES.
 - b. To cancel this option, ensure display indicates NO.
3. Press *Run Schedule*.

Test Mode (Occupied/Not Occupied/Schedule Day)



CAUTION

Possible Equipment Damage.

Equipment damage can result if compressor is cycled too quickly.

The minimum off time for compressors is bypassed during Test Mode. Equipment damage can occur if the compressor is cycled too quickly.

Use the Test Mode to check the thermostat configurations and operation. To start the system test:

1. Press *Schedule Day, Occupied and Not Occupied* simultaneously.
2. The display gives the option to TEST.
 - a. To enter test mode, press up ▲ or down ▼ until the display indicates IN TEST.
 - b. To cancel this option, ensure the display indicates NO TEST.
3. Press *Run Schedule*.

NOTES:

- To verify whether or not the system test is still active, repeat the above process.
- The system test times out after ten minutes with no key pressed.

Save User Schedule (Info/Copy)

Performing this operation saves the current schedule (including holidays) to memory, overwriting the old saved schedule:
























1. Press both *Info* and *Copy*.
2. The display gives the option to SAV SHD.
 - a. To save the current schedule, press up ▲ or down ▼ until the display indicates YES.
 - b. To cancel this option, ensure display indicates NO.
3. Press *Run Schedule*.

Get User Schedule (Info/Run)

Getting the user schedule restores the schedule (including holidays) from saved memory, overwriting the schedule currently in use:

1. Press both *Run Schedule* and *Info*.
2. The display gives the option to GET SHD.
 - a. To retrieve the saved schedule, press up ▲ or down ▼ until the display indicates YES.
 - b. To cancel this option, ensure display indicates NO.
3. Press *Run Schedule*.

Table 11. T7350 Key Function Summary.

Grouping	Button	Definition
Information	Down Arrow 	Lowers setpoint, day, or time. When setting times or temperatures, hold key down to continuously decrease value. Also can make temporary change in temperature setpoint.
	Information 	Obtains information (where humidity “high-limit” can be set), cycles through setup options.
	Up Arrow 	Raises setpoint, day, or time. When setting times or temperatures, hold key down to continuously increase value. Also can make temporary change in temperature setpoint.
Temperature 	Occupied Heat 	Sets Occupied Heat setpoint.
	Occupied Cool 	Sets Occupied Cool setpoint.
	Not Occupied Heat 	Sets Not Occupied Heat setpoint.
	Not Occupied Cool 	Sets Not Occupied Cool setpoint.
Set 	Day 	Sets day of week. Tapping key with 'Set Value' segment on increases current day (same effect as <i>Up Arrow</i> key).
	Time 	Sets time. Tapping key with “Set Value” segment on increases time in one hour increments.
Override 	Temporary Occupied 	Temporary occupied setting for length of time defined by installer. User can modify setpoints.
	Temporary Not Occupied 	Sets holiday length. User selects number of days (“0”-“99”), or “---” for continuous override.
Schedule 	Day 	Selects day schedule to modify. (Used also with copy key.)
	Occupied 	Selects occupied event start times for specified day. Repeatedly press this key to toggle between two occupied events.
	Not Occupied 	Selects not occupied event start times for specified day. Repeatedly press this key to toggle between two not occupied events.
	Clear Start Time 	Clears start time for specified period and day.
	Copy 	Copies schedule from one day to another.
	System 	Selects System Mode. Toggles through Em Heat, Heat, Off, Cool, and Auto modes.
	Fan 	Selects fan operation mode. Toggles between On and Auto. ^a
	Run Schedule 	Resumes running schedule. Cancels Temporary (Not) Occupied action, and/or Temporary setpoint changes.

^a Fan On: Continuous fan operation (occupied and standby). During not occupied periods, fan cycles with call for heat or cool.
Fan Auto: Fan cycles with call for heat or cool during all periods. (See Fan Settings section for more details.)

NOTE: The display returns to the default screen after pressing Run Schedule (or after a period of time without keypress):
ten seconds: when returning from temporary setpoint changes, info screen, temp occ, and temp not occ.
one minute: when returning from setting clock/day.
ten minutes: when returning from System Checkout.
five minutes: when returning from all other modes.

PROGRAMMING

The thermostat operates at the Occupied temperature setting until the thermostat is programmed. Table 12 shows the default temperature settings. (The program has four):

- Occupied heat.
- Occupied cool.
- Not Occupied heat.
- Not Occupied cool.

Table 12. Occupied and Not Occupied Default Temperature Settings.

Control	Occupied	Not Occupied
Heating	70°F (21°C)	55°F (13°C)
Cooling	75°F (24°C)	85°F (29°C)

The thermostat can be set for two Occupied and two Not Occupied times for each day of the week (28 independent time settings). Programming Holidays provides a total of 32 independent time settings.

The Temporary Occupied key provides quick temporary temperature changes for increased occupant comfort. The Temporary Not Occupied key provides energy efficient operation for extended periods of time.

IMPORTANT

- *Programming the thermostat with the keypad requires 24 Vac (turn on system power).*
- *Keyboard lockout must be disabled.*

NOTE: Before starting the program procedure, use Table 13 to organize the program schedule.

Table 13. Occupied and Not Occupied Period Start Times.

Day	Occupied Period 1	Not Occupied Period 1	Occupied Period 2	Not Occupied Period 2
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				
Holiday ^a				

^a Only applies to holidays programmed with 365-day calendar

NOTE: 12:00 PM is Noon, and 12:00 AM is Midnight.

Setting Current Day/Time

This can be done using the keypad or a PDA interface.

IMPORTANT

- *Once you set the day/time once, you should not need to set it again. As a result, once a PDA sets the day using calendar mode (MM/DD/YYYY), keypad changes to the day are not allowed.*

NOTES: To allow keypad day changes, use a PDA as follows:

1. Go to the "Set Clock" function.
2. Change the "Date Mode" from "MM/DD/YYYY" to "Day of Week".
3. Press Set.

When using the keypad to change the day/time:

1. Press *Set Day* until the current day is displayed.

NOTE: Sun = Sunday, Mon = Monday, Tue = Tuesday, Wed = Wednesday, Thu = Thursday, Fri = Friday, Sat = Saturday.

2. Press *Set Time*.
3. Press up ▲ or down ▼ until the current time is displayed.

NOTE: Tapping *Set Time* changes the time in one hour increments.

4. Press *Run Schedule*.

Setting Schedule Times

Use the PDA or the keys in the "Schedule" area of the keypad for this procedure.

1. Press *Occupied*.

NOTE: Anytime a start time is not required, press *Clear Start Time*.

2. Press *Day* until the desired day is displayed.
3. Press *Occupied* or *Not Occupied* until the proper period is displayed.
4. Press up ▲ or down ▼ until the desired start time is displayed.
5. Repeat steps 3 and 4 for a given day.
6. Repeat steps 2 through 5 until finished.

Program Holidays

IMPORTANT

- *Holidays must be first programmed with a PDA.*
- *Day-of-Week mode forces the T7350 to ignore holidays.*

With holidays set, holiday schedule times can be changed using the keypad:

1. Use the *Schedule Day* key to select "Hol" for Holiday schedule times.
2. Press *Occupied* or *Not Occupied* to switch to the proper time period within the holiday.

3. Press up ▲ or down ▼ until the desired time is displayed.
4. Press *Run Schedule*.

IMPORTANT

- Invalid holidays are ignored.
- Valid holidays require valid: month, day and duration.
- Holidays such as the fifth Tuesday of a month with only four Tuesdays are also invalid.

Copying a Day

Use the PDA or almost exclusively keys in the “Schedule” area of the keypad for this procedure:

1. Press *Occupied*.
2. Press *Day* to select the day to be copied.
3. Press *Copy*.
4. Press *Copy* again. The following day is automatically selected. (For example: If the day to be copied is Monday, Tuesday will automatically be selected.)
5. If necessary, press *Day* until the day to receive the copy is displayed.

NOTE: To cancel the copy press *Run Schedule* before step 6.

6. Press *Copy*.

NOTE: DONE displays for two seconds then the program display reappears.

7. Repeat steps 2 through 6 for all the days desired.
8. Press *Run Schedule*.

Clearing Program Start Times

1. Press *Occupied* or *Not Occupied* until the start period to be cleared is displayed.
2. Press *Day* until desired day is displayed.
3. Press *Clear Start Time*.
4. Repeat steps 1 through 3 for all the start times to be cleared.
5. Press *Run Schedule*.

Temperature Setpoints

Setpoint Limits

The setpoint temperature range is 40°F to 90°F (4°C to 32°C) for heating and 45°F to 99°F (7°C to 37°C) for cooling.

NOTES: The ranges mentioned can be limited based upon setpoints and stops:

1. The greater of the Minimum Heat Stop and the Not Occupied Heat setpoints determines the lowest setting to which the occupied heat setpoint can be adjusted:
°F: $\text{Stop/NotOcc} \leq \text{OccHeat} \leq (\text{OccCool} - 2)$
°C: $\text{Stop/NotOcc} \leq \text{OccHeat} \leq (\text{OccCool} - 1)$
2. The lesser of the Maximum Cool Stop and Not Occupied Cool setpoints determines the highest setting to which the occupied cool setpoint can be adjusted:
°F: $\text{Stop/NotOcc} \geq \text{OccCool} \geq (\text{OccHeat} + 2)$
°C: $\text{Stop/NotOcc} \geq \text{OccCool} \geq (\text{OccHeat} + 1)$

3. The Maximum Occupied Heat Setpoint is limited by Occupied Cool Setpoint – 2°F (1°C).
4. The Minimum Occupied Cool Setpoint is limited by the Occupied Heat Setpoint + 2°F (1°C).

Programming Temperature Setpoints

1. Press *Occupied Heat*.
2. Press up ▲ or down ▼ until the desired temperature is displayed.
3. Press *Occupied Cool*.
4. Press up ▲ or down ▼ until the desired temperature is displayed.
5. Press *Not Occupied Heat*.
6. Press up ▲ or down ▼ until the desired temperature is displayed.
7. Press *Not Occupied Cool*.
8. Press up ▲ or down ▼ until the desired temperature is displayed.
9. Press *Run Schedule*.

Temperature Setpoint Overrides

IMPORTANT

- The setup determines the duration of Occupied overrides.
- Default duration is three hours.

NOTE: To cancel the Override and immediately return to the program, press *Run Schedule*.

T7770 Setpoint Knob

A T7770 setpoint knob can remotely adjust the T7350 setpoint. Adjustment can be made with the sensor in override.

NOTES:

- During override, only occupied and standby heat setpoints, and cool setpoints are adjusted.
- The maximum adjustment is ±5°F.
- With a disconnected or failed T7770, or a T7350 not set for remote+setpoint, offset is zero.

T7771 Setpoint Button

A T7770 setpoint button can remotely adjust the T7350 setpoint. Adjustment can be made with the sensor in override.

NOTES:

- During override, only occupied and standby heat setpoints, and cool setpoints are adjusted.
- The maximum adjustment is ±3°F.
- With a disconnected or failed T7771, or a T7350 not set for remote+setpoint, offset is zero.

Changing Temperature Setpoint Until Next Program Period

This is a simple change to perform even with the door closed:

1. Press up ▲ or down ▼ until the desired temperature is displayed.

NOTE: If done while in Standby or Not Occupied mode, Temporary Occupied override engages

2. The temporary temperature appears for approximately ten seconds, then the room temperature is displayed.

Using Temporary Occupied Override

The Temporary Occupied Override can be used when the T7350 is in Not Occupied or Standby mode. It switches to the Occupied mode for a fixed number of hours.

1. To use the default occupied override, press *Temporary Occupied*.

NOTE: The default temperature setting is the Occupied setpoint.

2. To select a temperature setting other than the default, press up ▲ or down ▼ until the desired temperature offset is displayed (range is 0°F to 3°F).

NOTE: This offset can be restricted by the limits detailed in the Setpoint Limits section.

Using Temporary Not Occupied Override

The Temporary Not Occupied Override fixes the device to operate in Not Occupied mode for a number of days (between 1 and 99) without changing programming saved in memory.

NOTES:

- If the number of days is set to zero, no temporary change takes effect.
- If the number of days is set just below zero, the display for days is "---" (an indefinite override).
- To turn off this override, you must press *Run Schedule*.

1. Press *Temporary Not Occupied*.
2. Press up ▲ or down ▼ to change the duration of the Not Occupied period (in days).

NOTE: The default temperature setting is the Not Occupied setpoint.

3. Press ⓘ to display the default setpoint.

NOTE: The only way to change this setpoint is to change the Not Occupied setpoint.

OPERATION

Startup Operation

Upon initial thermostat powerup, a startup and initialization program begins. This startup occurs only on initial powerup. After total loss of power for an extended period, the current time and day can be lost (requiring reset). However, the thermostat retains the user program.

NOTE: With no program set, the thermostat controls to the Occupied default setpoints of 70°F (21°C) for heat and 75°F (24°C) for cool.

T7350 Relay Logic

All T7350 model thermostats contain four switching relays. In conventional applications, the relays control first stage cooling, first stage heating, fan, and auxiliary. In heat pump applications, the relays control the heat pump compressor, changeover, fan, and emergency heat.

NOTE: Models T7350B,D, T7350H1009 have subbases with more relays to accommodate extra stages.

Logic with Modulating Outputs (T7350H1017, M, only)

The specific relay logic depends on whether or not staging is employed. See Table 14.

NOTE: The modulating outputs always provide a signal.

Table 14. T7350 Modulating Relay Logic Exceptions.

Modulating Output ^a	Stages	Relay Action	
		Heat/ Cool	Fan
On (1 to 100 percent)	0	On	Output reaches 10%: On Output falls below 5%: Off
	1 or 2	Staged Cycling	On/Off matches equipment stage operation
Off (0 percent)	0,1, or 2	Off	Off

^a See Table 15 for modulating output signal details.

To display the status of the modulating outputs:

1. Cycle through information displays using the info key.
2. The device displays a percentage value for each output:
 - a. MODHEAT on one screen.
 - b. MODCOOL on another screen.

Table 15. Modulating Output Signal.

Action	0 percent	100 percent
Direct	4 mA	20 mA
Reverse	20 mA	4 mA

O/B Terminal for Heat or Cool Changeover

The O/B terminal controls heat pump changeover. The default operation is for the terminal to be powered when calling for heat (or while the most recent call was for heat). This corresponds to a typical O terminal.

NOTE: The O/B terminal can be configured to operate as a typical B terminal (powered on call for cool).

Emergency Heat (select T7350 Thermostats only)

With the system set for *Em Heat*, auxiliary heat serves as stage one; compressor stages are locked off. The fan cycles with the auxiliary heat.

Equipment Protection

As part of the operational sequence, the T7350 microprocessor incorporates cycle rate, and minimum on and off times for all heating and cooling stages. This extends equipment life as it prevents rapid cycling of equipment.

NOTE: Minimum on and off times are fixed.

Cycle Rates

The thermostat control algorithm maintains the temperature by cycling stages of heating or cooling to meet setpoint. Cycle rates, in cycles per hour (cph) are set using a PDA.

NOTE: Defaults are: heat: 6cph, cool: 3cph.

P+I+D Control

The T7350 microprocessor-based control requires that the user understands temperature control and thermostat performance. A conventional electromechanical or electronic thermostat does not control temperature precisely at setpoint. Typically, there is an offset (droop) in the control point as the system load changes. This is a phenomenon that most people in the industry know and accept.

IMPORTANT

- *P+I+D (Loop Tuning) parameters are optimized for proper operation of a vast majority of HVAC systems. Only when completely certain of necessary and proper changes should you alter these values.*
- *Improper changes result in poor system performance and equipment problems such as compressor short cycling. Other problems include wide swings in space temperature and excessive overdriving of modulating outputs.*

All adjustments to Loop Tuning parameters should be gradual. After each change, allow the system to stabilize to accurately observe the effects of the change. Then, as needed, make further refinements until the system operates as desired.

If adjustment of PID parameters is required, use the following:

NOTE: In the items that follow, the term “error” refers to the difference between the measured space temperature and the current actual space temperature setpoint:

- The **Throttling Range (TR)**, also called Proportional Gain, determines the impact of the error on the output signal. Decreasing TR amplifies the error effect; that is, for a given error, smaller TR causes higher output signal.
- The **Integral Time (IT)**, also called Integral Gain, determines the impact of the error-over-time on the output

signal. Error-over-time has two components making up its value: amount of time the error exists; and size of the error. The higher the IT, the slower the control response. In other words, a decrease in IT causes a more rapid change to the output signal.

- The **Derivative Time (DT)**, also called Derivative Gain, determines the impact of the error rate on the output signal. The error rate is how fast the error value changes. It can also be the direction the space temperature is going, either toward or away from the setpoint, and its speed—rapid or slow. A decrease in DT causes, for a given error rate, a greater effect on output signal.

Recovery Ramping Logic

The T7350 incorporates a ramping feature that gradually changes the space setpoints. During recovery operation, the setpoint changes at a rate in degrees per hour depending on the outdoor air temperature. If there is no outdoor air temperature sensor available, the minimum ramp rate is used.

When recovering in heating, the control point raises gradually, maximizing the use of the more economical first stage heat to bring the sensed temperature to the desired comfort setpoint. This minimizes using the typically more expensive later stage(s) of heat.

NOTE: See Fig. 11 for a pictorial representation of the heat ramp rate determination.

Recovery Ramping for Conventional Systems

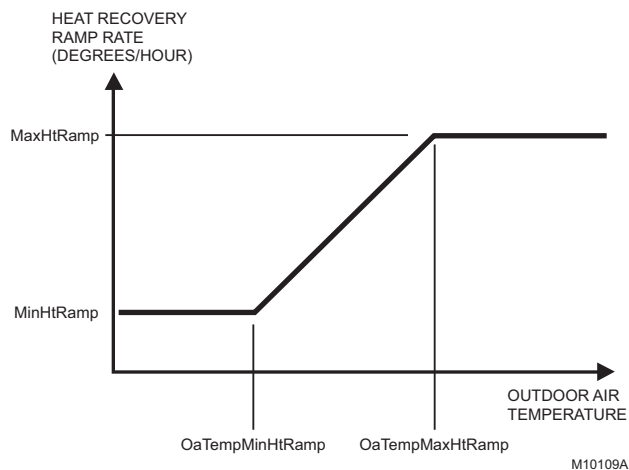


Fig. 11. Heat setpoint ramping for conventional systems.

NOTES:

- Recovery ramping applies between scheduled heat or cool setpoint changes from not occupied to standby and not occupied to occupied.
- Other setpoint changes use a setpoint step change.

Recovery Ramping for Heat Pump Systems

During recovery with heat pump equipment, the heating setpoint is split into a heat pump setpoint for compressors, and two auxiliary heat setpoints for the auxiliary heat stages. (See Fig. 12 for the various setpoints.)

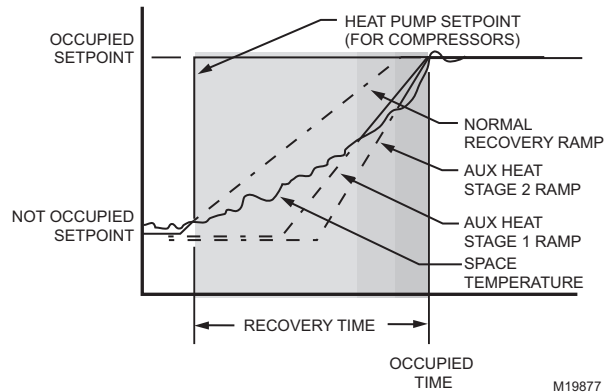


Fig. 12. Heat setpoint ramping for heat pump systems.

Heat pump ramping for heating proceeds as follows:

1. The heat pump setpoint begins to ramp until the room temperature and the compressor ramp intersect.
 2. At this point, the heat pump setpoint performs a step change to the Occupied (or Standby) setpoint and all auxiliary heat stages are disabled.
- NOTE: The heat pump setpoint remains here for the rest of the Not Occupied period.
3. The stage one auxiliary heat ramp is calculated based on a steeper slope starting 1°F below the not occupied setpoint.
 4. When the room temperature intersects this auxiliary heat ramp, the first stage of auxiliary heat is enabled.
 5. The stage two auxiliary heat ramp is calculated based on an even steeper slope starting 2°F below the not occupied setpoint.
 6. When the room temperature intersects this auxiliary heat ramp, the second stage of auxiliary heat is enabled.

During the cool recovery period, the setpoint changes at a rate in degrees per hour relative to the outdoor air temperature. If there is no outdoor air temperature sensor available, the minimum ramp rate is used.

See Fig. 13 for the various setpoints.

NOTE: For cooling, the same method is used in both conventional and heat pump systems.

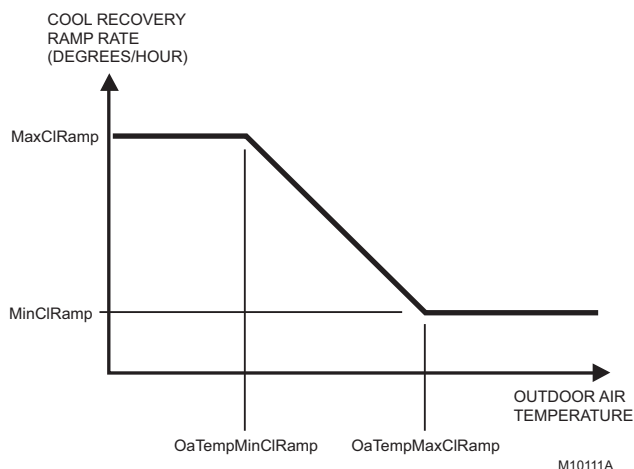


Fig. 13. Setpoint ramping parameters with ramp rate calculation.

NOTE: The setpoint used during the cool recovery period is similar to the heat mode in Fig. 11, except the slope of the line reverses for cooling.

Advantages:

- Comfort setting is achieved at the programmed time and maintained regardless of weather conditions; occupants are comfortable.
- Drafts from low-temperature discharge air are minimized during Occupied periods.
- Use of the more economical first stage of heat is maximized during recovery, minimizing use of the expensive later heat stage(s).
- Comfort and energy savings can be achieved in both heating and cooling.
- Heat cycling reduced, extending equipment life.

Auxiliary Relay

The auxiliary relay can be used with a variety of controls:

- Time-of-day (TOD).
- Economizer minimum position control.
- Dehumidification (see Dehumidification section).

Relay for Time-Of-Day (Table 16)

Time-of-day (TOD) is the Auxiliary Relay default configuration. TOD logic operates strictly according to programming:

- Occupied: Relay contacts closed.
- Not Occupied: Relay contacts open.
- Standby (Scheduled): Relay contacts closed.

Relay for Economizers

Mechanical cooling is often used with outside temperatures in the 50°F (10°C) to 60°F (16°C) range and humidity below 50 percent. In central and northern climates, hundreds of hours

fall into this temperature category. By permitting 80 to 100 percent outside air into the system, mechanical cooling may not be needed at all, particularly during Spring and Fall.

Economizers take advantage of outside air. The typical economizer consists of an outside air damper, motor, outdoor air changeover control and a minimum position potentiometer. The motor controls the dampers. Suitability of the outside air for cooling is determined by the outdoor air changeover control. The potentiometer adjusts the minimum position of the economizer dampers, which provide a minimum amount of fresh air for ventilation.

The economizer reduces compressor run time, thereby saving energy and extending compressor life. The drawback to using the economizer is that during the Not Occupied period, if there is no call for cool or outdoor air is not suitable for free cooling, the economizer is controlled to minimum position. This position allows some percentage of outdoor air to enter the building, regardless of air suitability. The situation can cause the heating or cooling to run more often than when only suitable air is permitted to enter the building.

The T7350 can take advantage of an economizer by closing the auxiliary relay contacts to control the economizer minimum position potentiometer. (See Table 16 for details.)

- Powered: Allows normal economizer operation.
- Unpowered: Disables the economizer minimum position. The lack of power causes the economizer to drive dampers fully closed instead of staying at minimum open position. This reduces the possibility of unsuitable outdoor air entering the building, which lowers the internal load on the HVAC system and saves additional energy.

Table 16. Auxiliary Relay Logic (Economizer and TOD).

Occupancy		Call for Cool ^a	Auxiliary Contacts	
Scheduled	Sensor Signal		Economizer	TOD
—	Occupied	—	Closed ^b	Closed
Occupied	Standby	Yes	Closed	Open
Occupied	Standby	No	Open	Open
Standby	Standby	—	Closed ^b	Closed
—	Not Occupied	Yes	Closed	Open
—	Not Occupied	No	Open	Open

^a Unless otherwise noted, Economizer logic ignores calls for heat. TOD logic always observes calls for heat.

^b With fan set to AUTO and call for neither heat nor cool, the relay is open in order to disable damper minimum position.

Other Uses for the Auxiliary Relay

Examples of other uses of the auxiliary relay are hot water heaters, lighting, or baseboard heat. The additional loads are connected to the auxiliary relay contacts on the subbase. The contacts are rated for 1.5A at 30 Vac, but can be adapted to higher current applications using an external relay. (See Fig. 14 through 16.)

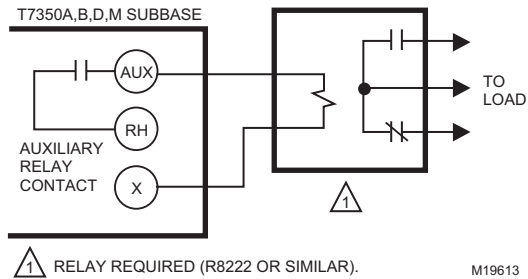


Fig. 14. Using T7350A,B,D,M models with an external relay (with loads greater than 1.5A).

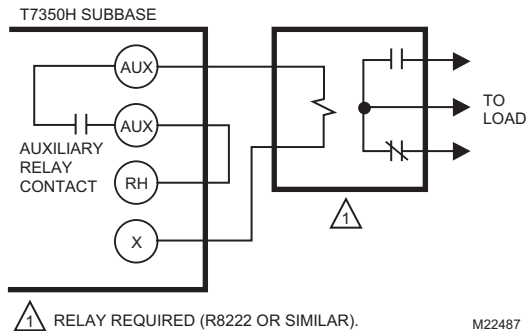


Fig. 15. Using T7350H models with an external relay powered from thermostat transformer.

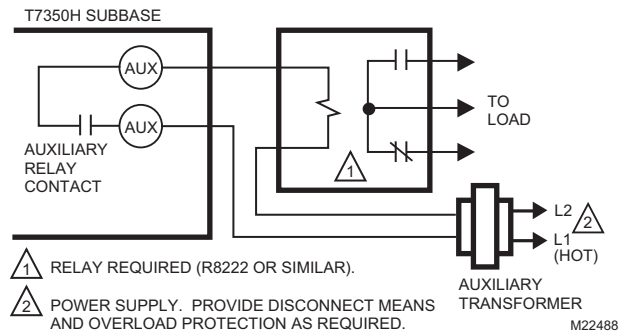


Fig. 16. Using T7350H models with an external relay powered from an auxiliary transformer.

Default Auxiliary Relay Operations (T7350D, T7350H1009 only)

Unless configured as a stage of heating or cooling, terminals W2, W3, and Y3 operate for specific auxiliary functions. Each output takes on different auxiliary functions depending on configuration for Conventional or Heat Pump operation. See Table 17 for details.

NOTE: The default functions cannot be modified. They are limited to firmware version 1.3.0 or higher.

Table 17. Default Auxiliary Relay Operations.

Heat Pump or Conventional	Contact Not Used as Heat or Cool Stage	Contact Configuration of Contact Not Used as Stage			
Heat Pump	Y3 not	Simple Dehumidification ^a	Simple Dehumidification ^a	Time of Day	Time of Day
	W2 not aux heat	Economizer	Time of Day	Economizer	Economizer
Conventional	W3 not	Simple Dehumidification ^a	Simple Dehumidification ^a	Simple Dehumidification ^a	Time of Day
	Y3 not (W3 not)	Economizer	Time of Day	Time of Day	Economizer
	Y3 not (W3 used)	Simple Dehumidification ^a	Simple Dehumidification ^a	Simple Dehumidification ^a	Time of Day
Auxiliary Contact Configuration ^b :		Time of Day	Economizer	Hot Gas Bypass Dehumidification	Simple Dehumidification ^a

^a Simple dehumidification uses a normally closed contact. The relay is closed when humidity is below the high limit. When the humidity is above the high limit, the contact is open.

^b The PDA configuration tool output screen displays available Auxiliary Relay functions based on this configuration.

Dehumidification (T7350D,M,H only)

There are five methods through which the T7350 can control for dehumidification. Three of them modify the control algorithm, thus providing limited dehumidification through cooling. The other two use the auxiliary output to control another device.

IMPORTANT

Configurable only with a PDA or a network tool such as LONSPEC™ or CARE.

NOTE: The dehumidification high limit can be set within the range of 10 to 90 percent relative humidity.

Control Through Cooling

Configure using some combination of the following:

- Minimum On.
- Reheat.
- Reset.

NOTES:

- These methods operate only during cooling.
- Selecting both Reheat and Reset can cause frequent setpoint adjustments. This selection is not recommended.

MIN ON TIME

Dehumidifies by increasing the compressor minimum on time (normally 3 minutes) by a programmable amount. This is useful with oversized systems in that it forces the coils to cool to a point where dehumidification can occur.

NOTES:

- Can force wider temperature swings by cooling when setpoint control does not require it.
- The minimum on time can be set within the range of 5 to 15 minutes.
- Hysteresis and a minimum timer are used to ensure this behavior does not change with every equipment cycle.

REHEAT

Dehumidifies by operating cooling during typical off time. The T7350 maintains the proper setpoint by running the heat at the same time.

IMPORTANT

At times during Reheat dehumidification, the T7350 operates heating and the cooling simultaneously. This is normal.

NOTES:

- The heat stage never energizes during Reheat if more than one cool stage is on.
- Reheat mode cannot occur during heating.
- The T7350H1017, T7350M do not support the Reheat method.

RESET TEMP SETPT

The room temperature set point resets to a specified number of degrees below the actual set point when room relative humidity (rh) rises above humidity high limit.

Though this may not technically reduce rh, it reduces the dew point to provide the customer with a sense of comfort due to a lower temperature setting in the room.

As long as rh stays above humidity high limit, this set point is maintained.

NOTE: Hysteresis and a minimum timer prevent the set point from short interval alternation (between standard and reset set points).

Options Utilizing Auxiliary Output

There are two dehumidification options that utilize the auxiliary output. They are:

- Simple Dehumidification.
- Hot Gas Bypass Dehumidification.

SIMPLE DEHUMID(IFICATION)

The auxiliary output:

- Energizes when rh rises above humidity high limit.
- De-energizes when rh drops below humidity high limit.

NOTES:

- Hysteresis and a minimum timer prevent short cycling of this output.
- Unlike Dehumid Hot Gas BP the relay remains energized during calls for multiple cooling stages.

DEHUMID HOT GAS BP

The auxiliary output operates as shown in Table 18.

Table 18. Hot Gas Bypass Dehumidification Logic.

Humidity	Cooling Stages Active	Auxiliary Output
High	more than one	De-energized
High	one or less	Energized
Low	more than one	De-energized
Low	one or less	De-energized

Auxiliary output during call for multiple cooling stages for two reasons:

1. This method assumes that the cooling provides dehumidification.
2. Multiple cooling stages probably provide necessary dehumidification.

NOTE: Hysteresis and a minimum timer prevent short cycling of this output.

TROUBLESHOOTING GUIDE (TABLE 19)

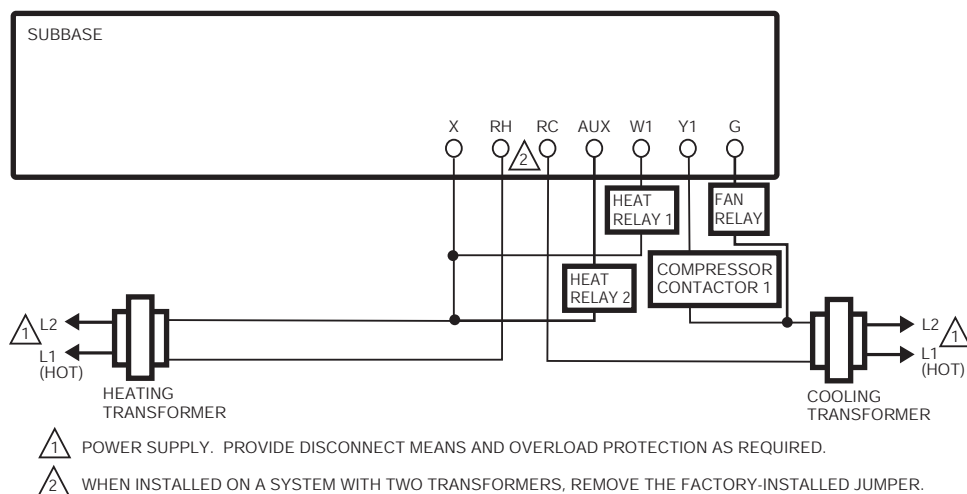
Table 19. Troubleshooting Information.

Symptom	Possible Cause	Action
Display will not come on.	Thermostat is not being powered.	Check that X terminal is connected to the system transformer. Check for 24 Vac between X and RH or RC terminals. If missing 24 Vac: <ul style="list-style-type: none"> • Check if circuit breaker is tripped; if so, reset circuit breaker. • Check if system fuse is blown; if so, replace fuse. • Check if the HVAC equipment power switch is in the Off position; if so, set to the On position. • Check wiring between thermostat and HVAC equipment. Replace broken wires and tighten loose connections. If 24 Vac is present, proceed with troubleshooting.
Temperature display is incorrect.	Room temperature display has been recalibrated.	Use PDA configuration software to recalibrate as desired.
	Thermostat is configured for °F or °C display.	Press both <i>Run Schedule</i> and <i>Copy</i> , then reconfigure the display.
	Bad thermostat location.	Relocate the thermostat.
	Display shows three dashes and a degree sign (all systems shut down).	T7350 is set for remote sensing and sensor is missing or circuit is either open or shorted.
Temperature settings will not change. (Example: Cannot set heating higher or cooling lower.)	Upper or lower temperature limits were reached.	Check the temperature setpoints: <ul style="list-style-type: none"> • Heating limits are 40 to 90°F (7 to 31°C) • Cooling limits are 45 to 99°F (9 to 37°C)
	Occupied setpoint temperature range stops were configured.	Using a PDA, check setpoint stops. If necessary, reconfigure the stop(s).
	Keypad is locked. When a locked key is pressed, LOCKED appears momentarily on the LCD.	<ul style="list-style-type: none"> • Use PDA (Set, Display) to unlock keypad. • Press both <i>Run Schedule</i> and <i>Copy</i>, then change keypad lock level.
Room temperature is out of control.	Remote temperature sensing is not working.	Check all remote sensors.
Heat will not come on.	No power to the thermostat.	Check that X terminal is connected to the system transformer. Check for 24 Vac between X and RH terminals. If missing 24 Vac: <ul style="list-style-type: none"> • Check if circuit breaker is tripped; if so, reset circuit breaker. • Check if system fuse is blown; if so, replace fuse. • Check if the HVAC equipment power switch is in the Off position; if so, set to the On position. • Check wiring between thermostat and HVAC equipment. Replace broken wires and tighten loose connections. If 24 Vac is present, proceed with troubleshooting.
	Thermostat minimum off time is activated.	<ul style="list-style-type: none"> • Wait up to five minutes for the system to respond. • Use PDA to configure heating response.
	System selection is set to Off or Cool.	Set system selection to Heat or Auto.
	DAT high limit has been reached, or OAT lockout is engaged.	<ul style="list-style-type: none"> • If the setpoints are correct, do nothing. • Use PDA (Heating Config) to adjust or disable DAT high limit and/or OAT lockout. • Check HVAC equipment to ensure proper operation.

Table 19. Troubleshooting Information. (Continued)

Symptom	Possible Cause	Action
Cooling will not come on.	No power to the thermostat.	Check that X terminal is connected to the system transformer. Check for 24 Vac between X and RC terminals. If missing 24 Vac: <ul style="list-style-type: none"> Check if circuit breaker is tripped; if so, reset circuit breaker. Check if system fuse is blown; if so, replace fuse. Check if the HVAC equipment power switch is in the Off position; if so, set to the On position. Check wiring between thermostat and HVAC equipment. Replace broken wires and tighten loose connections. If 24 Vac is present, proceed with troubleshooting.
	Thermostat minimum off time is activated.	<ul style="list-style-type: none"> Wait up to five minutes for the system to respond. Use PDA to configure cooling response.
	System selection is set to Off or Heat.	Set system selection to Cool or Auto.
	DAT low limit has been reached, or OAT lockout is engaged.	<ul style="list-style-type: none"> If the setpoints are correct, do nothing. Use PDA (Cooling Config) to adjust or disable DAT low limit and/or OAT lockout. Check HVAC equipment to ensure proper operation.
System indicator (flame: heat, snowflake: cool) is displayed, but no warm or cool air is coming from the registers.	The call for heat or cool is not yet given.	Check if any stage indicators (dots next to the system indicator) are displayed. With no display of stage indicators, no call for cool/heat via relay is yet given. For T7350M models <i>only</i> : Check the information screens. MODHEAT or MODCOOL percentages of zero and 100 indicate an extreme signal from the given terminal. See Table 15 for details.
	Conventional heating equipment turns the fan on only after the furnace has warmed to a setpoint.	Wait one minute after seeing the on indicator and then check the registers.
	Heating or cooling equipment is not operating.	Verify operation of heating or cooling equipment in Test Mode.

WIRING DIAGRAMS (FIG. 17-25)



M19764A

Fig. 17. Typical hookup of T7350A in two-stage heat and one-stage cool conventional system with two transformers.

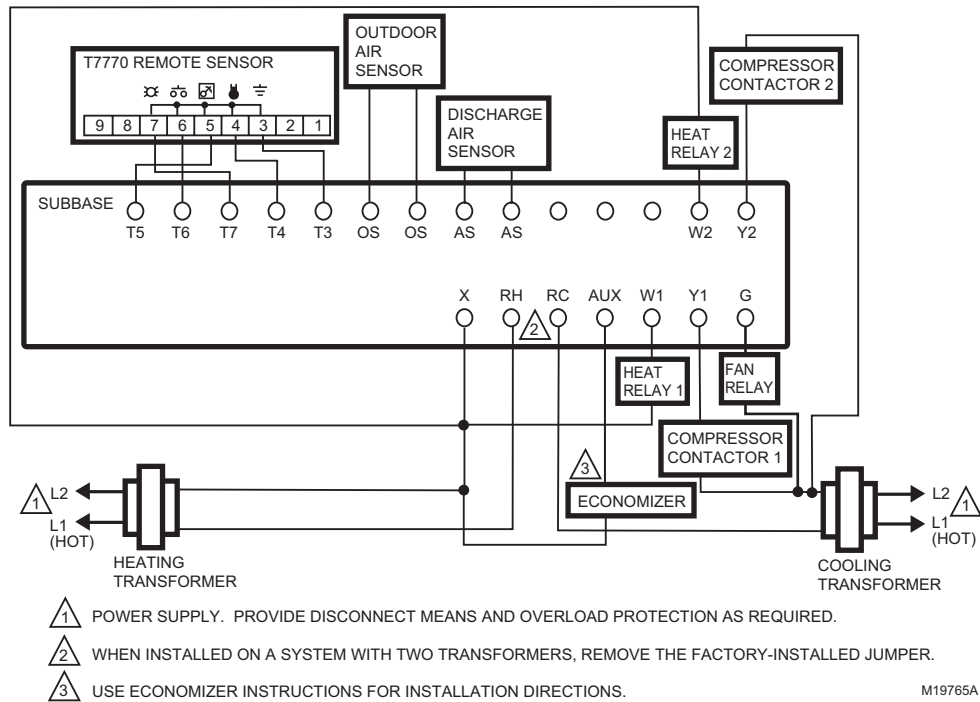


Fig. 18. Typical hookup of T7350B in two-stage heat and two-stage cool conventional system with two transformers.

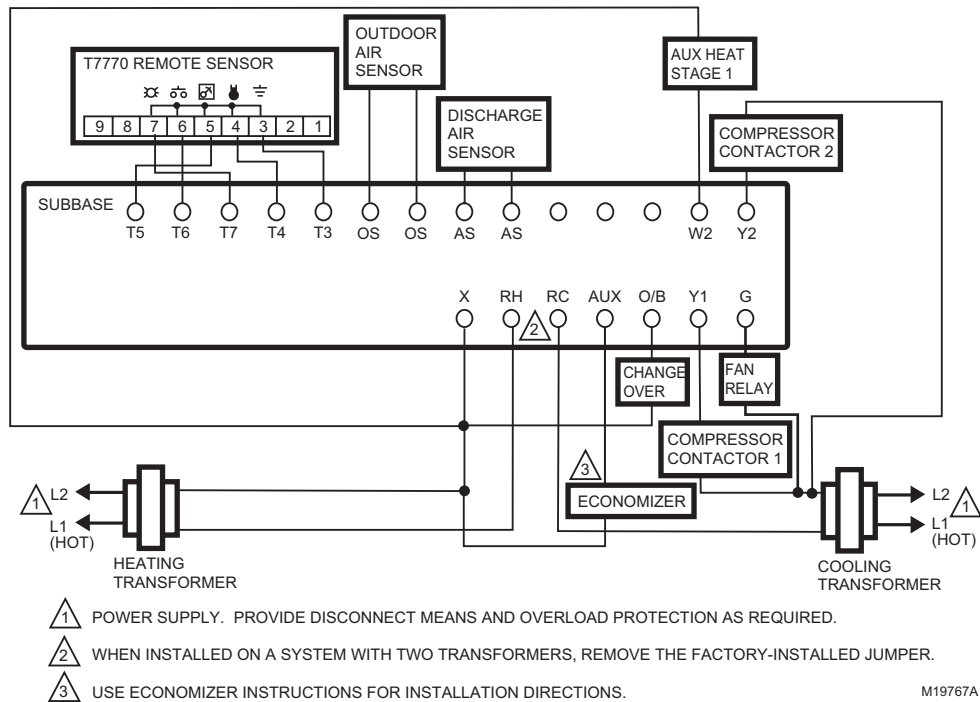
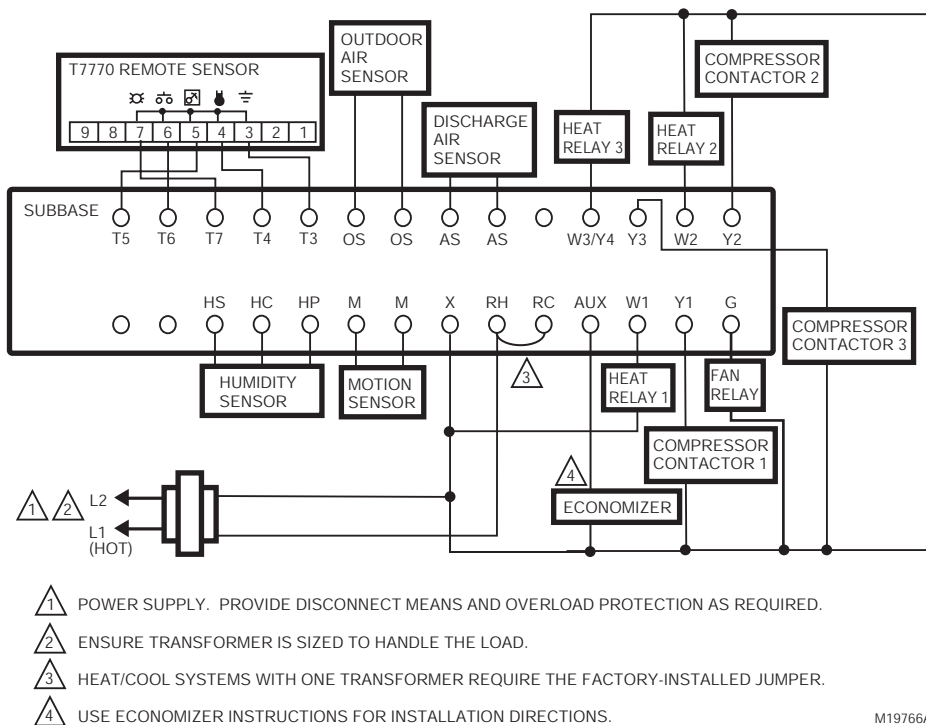
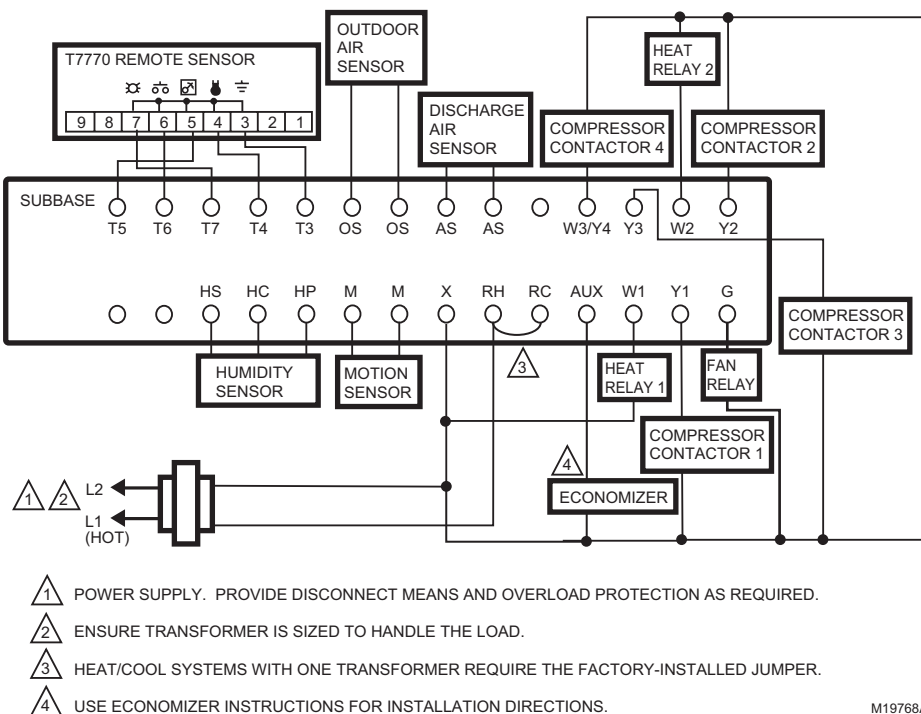


Fig. 19. Typical hookup of T7350B in three-stage heat and two-stage cool heat pump system with two transformers.



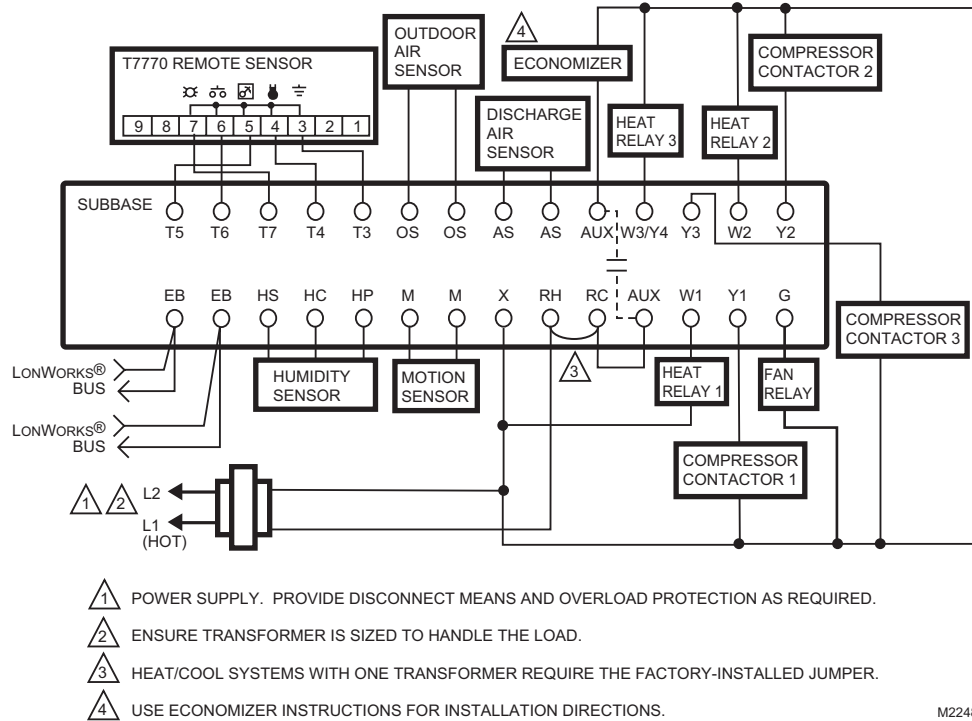
M19766A

Fig. 20. Typical hookup of T7350D in three-stage heat and three-stage cool conventional system with one transformer.



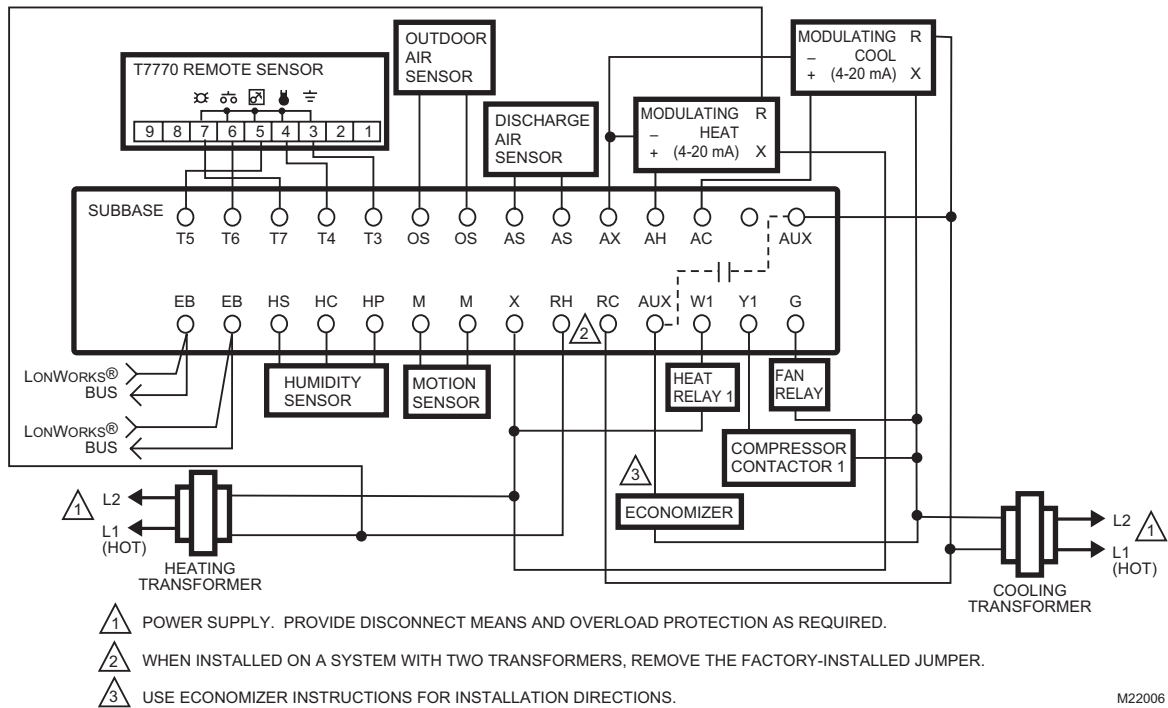
M19768A

Fig. 21. Typical hookup of T7350D in two-stage heat and four-stage cool conventional system.



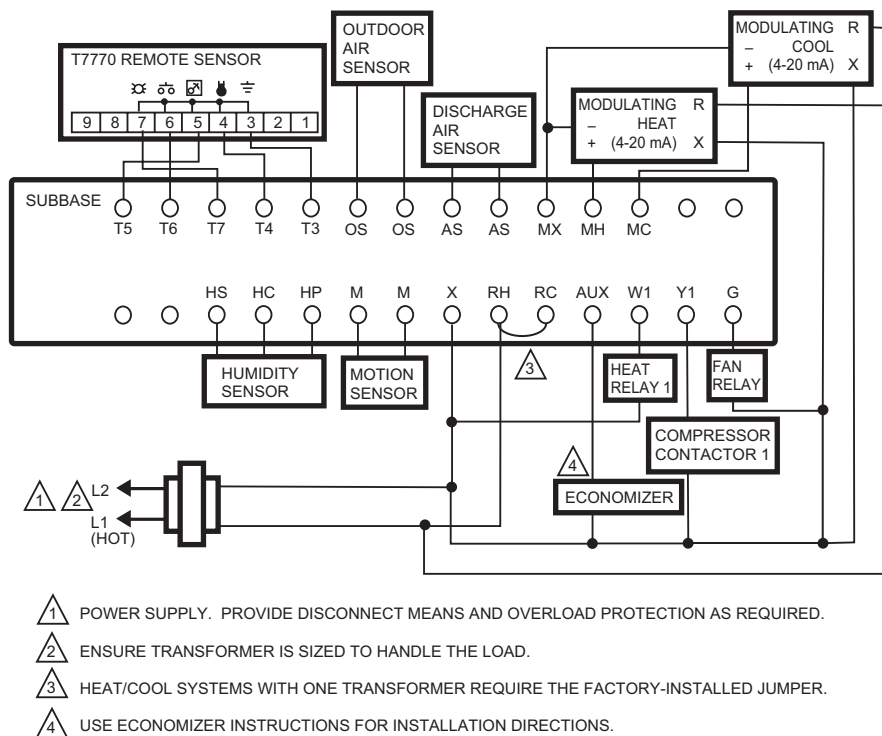
M22489

Fig. 22. Typical hookup of T7350H1009 in three-stage heat and three-stage cool conventional system with one transformer.



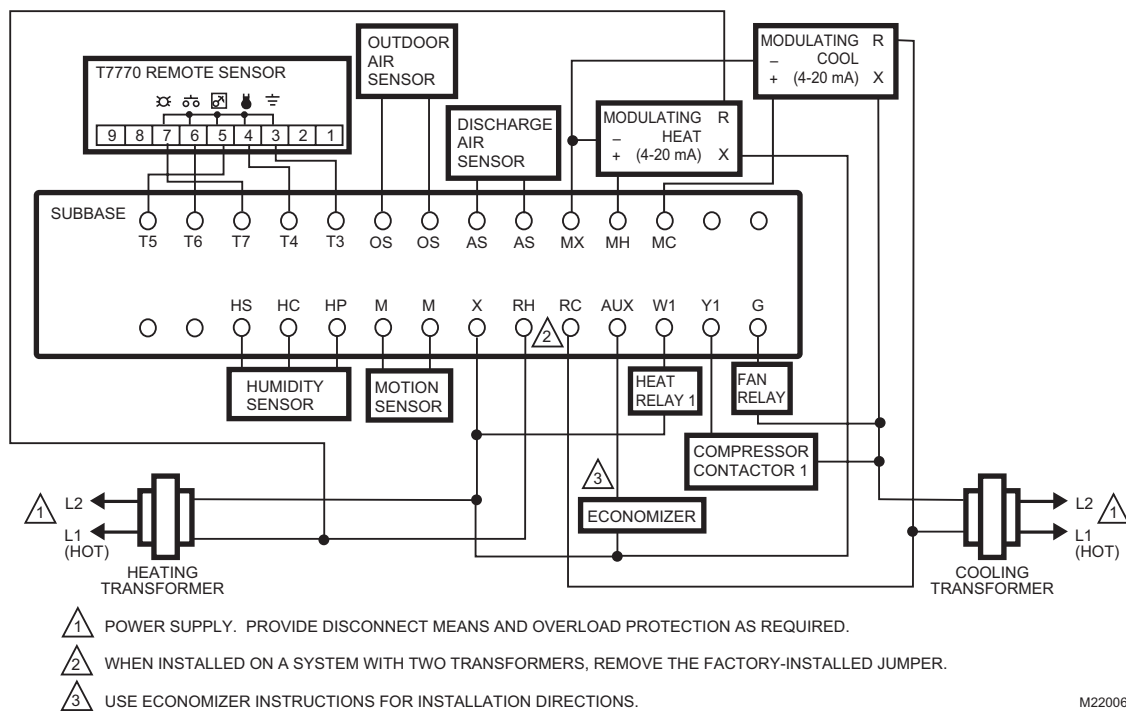
M22006

Fig. 23. Typical hookup of T7350H1017 for system with two independent heat stages (one modulating), two independent cool stages (one modulating), and two transformers.



M19769A

Fig. 24. Typical hookup of T7350M for system with two independent heat stages (one modulating), two independent cool stages (one modulating), and one transformer.



M22006

Fig. 25. Typical hookup of T7350M for system with two independent heat stages (one modulating), two independent cool stages (one modulating), and two transformers.

APPENDIX - PDA USAGE

See Table 20 for the advanced setup options available through a PDA.

NOTE: Upon initial thermostat power-up, wait at least 30 seconds before connecting the TIM.

Hardware Requirements

The Thermostat Configuration Tool has the following configuration:

- PDA hardware platform supporting application software.
- Serial Connection Cable with TIM. The interface plug connects to the thermostat socket.



CAUTION

Equipment Damage Hazard

Can damage the TIM connection beyond repair.

Disconnect the TIM cable prior to opening or closing the thermostat cover.

Setting Clock

It is best to set the clock before downloading anything else to the thermostat. Connect to the thermostat and set the clock. See Fig. 26.

NOTES:

- When setting the clock the first time, the PDA displays an incorrect *T7350 Clock* time, day, and date.
- Day-of-Week mode forces the T7350 to ignore holidays.

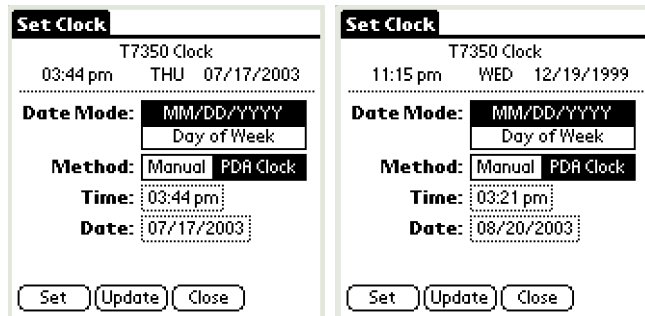


Fig. 26. Set Clock menu.

PDA Programming

The PDA Configuration Tool can perform a variety of tasks:

- Configure the thermostat.
- Calibrate the thermostat.
- Perform diagnostics.

NOTE: To install the configuration tool on a second PDA:

1. Power up both PDAs.
2. Execute the following command sequence from the source PDA: Menu, Beam, T7350, Beam.

Configuration

Whether the configuration is performed offline or while connected, the procedure is the same.

OFFLINE CONFIGURATION

While disconnected from the thermostat, you can arrange and save named configurations.

NOTE: The user can note the Configuration ID and manually set the code using the T7350 user interface.

CONNECT AND CONFIGURE

Connect to a thermostat and:

- configure device with existing named parameter arrangement,
- configure device by changing all parameters
- read the existing configuration parameter values and
 - change one or more configuration parameters
 - save new configuration file.

NOTE: The configuration tool verifies that the subbase supports the existing arrangement.

CONFIGURATION PROCEDURE

1. Enter the T7350 PDA application. (See Fig. 27.)
2. If disconnected, the only usable functions are:
 - a. New Config:
 - (1) Enter a name for the configuration.
 - (2) Tap New Config.
 - (3) Proceed to Select Existing Config(uration) section.
 - b. Select Existing Config: See below.

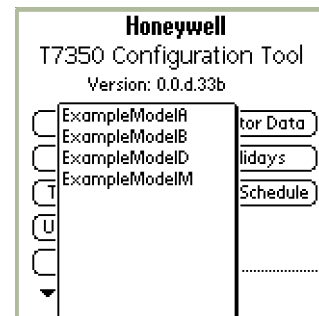


Fig. 27. PDA configuration tool main menu.

Select Existing Config(uration)

This function is used to select a programmed configuration when setting up/programming a T7350. This can be useful when you use any given configuration more than once.

NOTES:

- You can modify details of a given configuration prior to downloading it into any particular T7350.
- The PDA tool will notify you when a selected configuration requires more stages/features than the T7350 into which you are downloading it.
- Configuration screens will vary depending on the T7350 model selected.

To configure a T7350:

1. From the opening screen, tap Select Existing Config.
(See Fig. 28.)
2. Select the desired configuration.

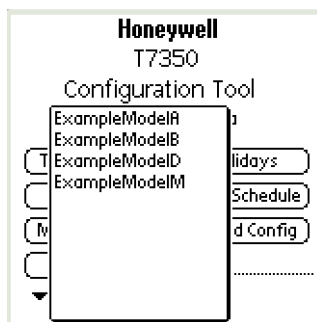


Fig. 28. Select Existing Config.

3. This brings up the Summary screen. From here, you can make changes using the:
 - a. Novice navigation screens (that appear), or
 - b. Advanced navigation screens, using the hidden menus. (These are designed for expert users.)
 - (1) Access to the Advanced Navigation mode is obtained using one of the following methods:
 - (a) Tap the lower left "Menu" silk screen icon.
 - (b) Tap the Title Tab of any screen.

RESULT: The Config Tool replaces the existing Screen Title Tab with the Advanced Navigation menu displayed across the top of the screen.
4. Tap "SaveAs" to save the changes under a new name.
5. The Summary screen facilitates changes to:
 - a. Description.
 - b. Model.
 - c. Control (Standard or Heat Pump).

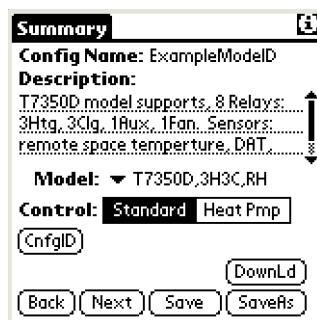


Fig. 29. Configuration Summary screen.

6. Make changes and tap "Next" to proceed to the Inputs screen.
7. The Inputs screen facilitates changes to:
 - a. RoomTemp(eration).
 - b. Room Rel(ative) Humidity.
 - c. Occ(upancy) Sensor.
 - d. Discharge Air Temp(eration).
 - e. Outdoor Air Temp(eration).

NOTE: Some selections only appear for the models that support them.

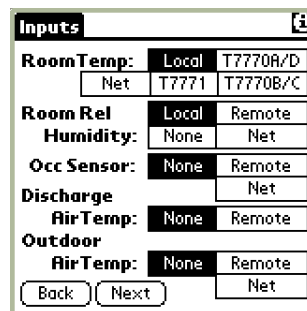


Fig. 30. Inputs screen.

8. Make changes and tap "Next".

NOTE: Novice navigation to the Dehumidification screen is controlled based on the T7350 model and configured room humidity sensor status. So, step 9 and Fig. 31 may not apply.

9. The Dehumidification screen facilitates changes to:
 - a. Room humidity high limit.
 - b. Dehumidification options.

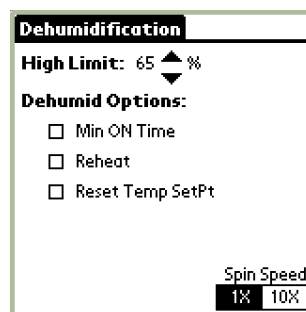


Fig. 31. Dehumidification screen.

10. Make changes and tap "Next" to proceed to the Cooling Config(uration) screen.
11. The Cooling Config screen facilitates changes to:
 - a. Number of Stages.
 - b. Cooling Response.
 - c. OAT Lockout and DAT Low Limit Setpoints (for some models).

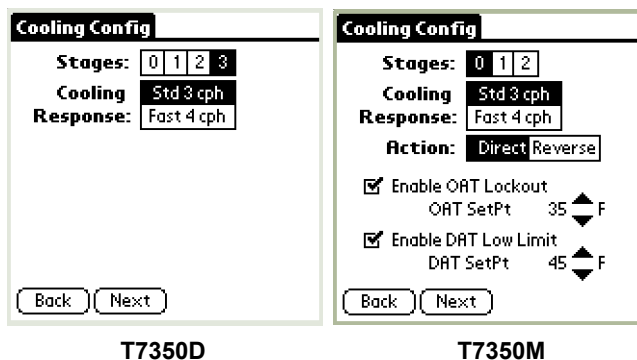


Fig. 32. Cooling Config(uration) screen.

12. Make changes and tap "Next" to proceed to the Heating Config(uration) screen.
13. The Heating Config(uration) screen facilitates changes to:
 - a. Number of Stages.
 - b. Heating Response.
 - c. OAT Lockout and DAT High Limit Setpoints (for some models).

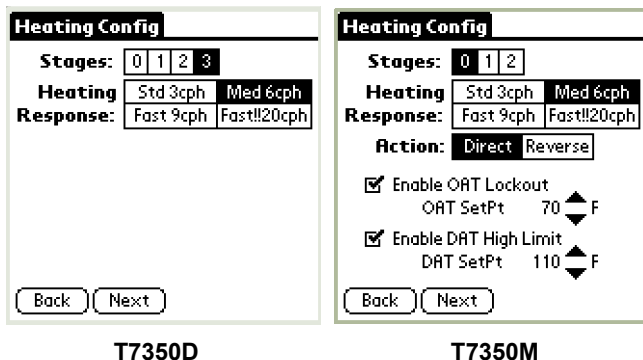


Fig. 33. Heating Config(uration) screen.

14. Make changes and tap "Next" to proceed to the Outputs screen.
15. The Outputs screen facilitates changes to output type(s).

NOTE: When configured with an extra stage of heat or cool (using the auxiliary stage) the Outputs screen shows nothing but this indication.

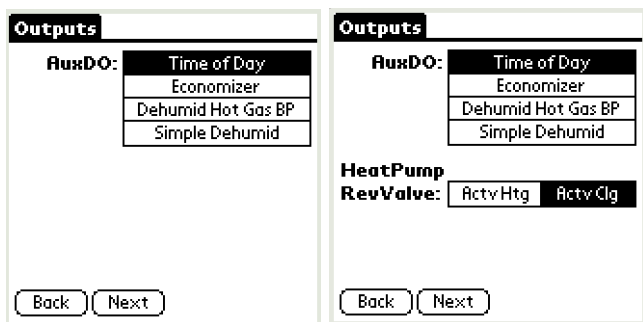


Fig. 34. Outputs screen.

16. Make changes and tap "Next" to proceed to the Fan screen.
17. The Fan screen facilitates changes to:
 - a. Fan Switch (On or Auto).
 - b. Fan Operation (Conventional or Electric Heat).
 - c. Heat and cool extended operation.

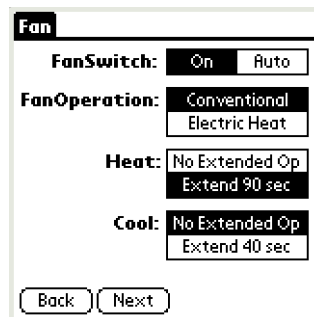


Fig. 35. Fan screen.

18. Make changes and tap "Next" to proceed to the Weekly Schedule screen.

NOTE: The only schedule days/times displayed are those in the program. It is possible to have as many as 4 event times per day for each day (including holiday) programmed into each set.

19. The Weekly Schedule screen facilitates changes to the program schedule:
 - a. Tap Modify. (See Fig. 37.)
 - b. Select a day to modify.
 - c. Make changes to:
 - (1) Mode (see Fig. 38).

NOTE: To remove a given event, change Mode to "None".

- (2) Time (see Fig. 39).
 - d. Repeat step c for all events until changes are complete for the given day.
- NOTE: To copy a day schedule, check the appropriate boxes, and click CopyDayTo. (See Fig. 40.)
- e. Tap OK.
 - f. Type in a name for the new schedule.
 - g. Tap SaveAs.

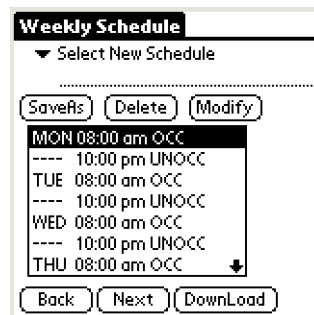


Fig. 36. Weekly Schedule screen.

Fig. 37. Weekly Schedule modification screen.

Fig. 38. Weekly Schedule Mode modification.

Fig. 39. Weekly Schedule Time modification.

Fig. 40. Weekly Schedule Mode CopyDayTo.

- Default setpoints.
- Occupied Setpoint stops.
- Temporary Override duration.

Fig. 41. SetPoints screen.

- Make changes and tap "Next" to return to the Summary screen.
- Tap "Save" to save changes under the existing name.
- Tap "DownLd" to download changes to a connected T7350.
- Tap "CnfgID" to have the device calculate configuration number(s).
- The configuration numbers represent the C numbers (C1.C2.C3.C4.C5.C6.C7.C8) that can be input using the T7350 keypad.

NOTE: The configuration numbers determine all but the schedule and setpoints.

- To return to the Home Screen, tap the Menu icon (lower left hand corner silk screen) and tap Set / Home.

Fig. 42. Summary screen with configuration numbers.

Deleting Configurations

- Make certain you are in a configuration other than the one you plan to delete.
- Tap the Summary tab in the upper left corner.
- Select File / Delete.
- Select the configuration to delete.
- Tap DELETE.
- A prompt appears allowing you to cancel the deletion.
- To delete more configurations, return to step 4.
- When finished with deletions, tap DONE.

Weekly (Wkly) Schedule

This function is used to upload/modify/download schedule sets for programming a T7350. This can be useful if you want to change only schedule settings.

NOTE: The schedule can also be modified from within a given configuration.

Holidays

This function is used to upload/modify/download holiday sets for programming a T7350. This can be useful if you want to change only holiday settings. It is especially useful if you use any group of holidays more than once.

NOTE: The holidays can be modified from within a given configuration.

To create a new holiday group:

1. From the main menu, tap Holidays. (See Fig. 43.)

NOTE: The only holidays displayed are those contained in a program set. It is possible to have as many as 10 holidays programmed into each set.



Fig. 43. Holiday screen.

2. Tap Modify. (See Fig. 44.)

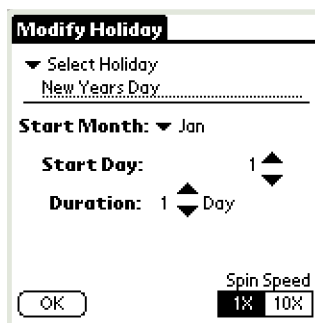


Fig. 44. Holiday modification screen.

3. Select a holiday slot to modify or create.
4. Make changes to:
 - a. Holiday title.
 - b. Start Month.

NOTE: To remove a given holiday, change the Start Month to "None" and tap "OK". The title will remain, but the holiday will not operate.

- c. Start Day.
- d. Duration.

NOTE: To remove all evidence of a given holiday, change Title to "Hol ##", Start Month and Start Day to "None", Duration to "0" and tap "OK".

- e. Spin Speed.

NOTE: Spin Speed determines the increment change (1X or 10X) for Start Day and Duration. The spin speed setting is local for each screen.

5. Repeat steps 2 through 4 until changes are complete for the given holiday set.
6. Type in a name for the new holiday set.
7. Tap SaveAs.
8. Repeat steps 2 through 8 for all desired holiday sets.
9. To return to the main menu, tap the Holiday screen OK.

Calibration

Connect to a thermostat and calibrate the temperature display.

Online Diagnostics

Connect to a thermostat and, using the "Monitor Data" function, read diagnostic information including:

- Thermostat firmware version.
- Thermostat hardware version.
- Subbase hardware version.
- Run time error messages.

Table 20. Thermostat Setup Options Through PDA.

Configuration Option	Factory Default ^a	PDA Tool	CnfgID	Description
Fan Operation	Conventional	X	X	Conventional: Applications where equipment controls fan operation in heat mode. Electric Heat: Applications where thermostat controls fan operation in heat mode. The thermostat always controls the fan in cool mode.
Extended Heat Fan	Extend 90 sec	X	X	No Extended Op: No extended fan operation after call for heat ends. Extend 90 sec: Fan operation extended 90 seconds after call for heat ends.
Extended Cool Fan	No Extended Op	X	X	No Extended Op: No extended fan operation after call for cool ends. Extend 40 sec: Fan operation extended 40 seconds after call for cool ends.
Control	Standard	X	X	Standard: Conventional equipment; Heat Pmp: Heat Pump.
HeatPump RevValve	ActvClg	X	X	ActvClg: Energize O/B on call for cool. ActvHtg: Energize O/B on call for heat.
Heat Output Stages	a	X	X	Stages of heat (conventional HVAC equipment). Set to zero for heat pump. Three heat stages not available if configured for four stages of cooling.
AuxStg	1	X	X	Auxiliary Heat Stages (for heat pump applications): Number of stages (0, 1, or 2).
Heating Response	6 cph	X	X	3 cph: Standard response for heating system; 6 cph: Medium response for heating system; 9 cph: Fast response for heating system; 20 cph: Super fast response for heating systems.
Heat Lockout	None	X	X	None: No outdoor air temperature (OAT) lockout for heat. Enable: Heat locked out when OAT is greater than Heat Lockout Setpoint.
Heat Lockout Setpoint	70 °F	X		Heat is locked out when OAT is greater than this setpoint. Range: -40 to 120 °F
Cool Output stages	a	X	X	Stages of cool (conventional), or number of compressor stages (heat pump).
Cooling Response	3 cph	X	X	3 cph: Standard response for cooling system. 4 cph: Fast response for cooling system. Cooling response applies to compressors in heat pump applications.
Cooling Lockout	None	X	X	None: No OAT lockout for cool. Enable: Cool locked out when OAT is less than Cool Lockout Setpoint.
Cool Lockout Setpoint	35°F	X		Cooling is locked out if the outdoor temperature is less than this setpoint. Range: -40 to 120 °F
Cooling Valve	Direct	X	X	Modulating Cooling Valve Action: Direct or Reverse. (T7350M only.)
Heating Valve	Direct	X	X	Modulating Heating Valve Action: Direct or Reverse. (T7350M only.)
Anticipator Authority Application	Htg	X	X	Htg: Authority applies to heating only. Htg&Clg: Authority applies to both heating and cooling. (Found in Loop Tuning.)
Anticipator Authority	4°F	X	X	Thermostat Anticipator Authority. Range: 2 to 15 °F.
Cooling TR	a	X		Cooling Throttling Range. Range: 1 to 30 °F. (Found in Loop Tuning.)
Cooling IT	a	X		Cooling Integral Time. Options: 0, 100 to 5000 sec. (0: disable.)
Cooling DT	0 sec	X		Cooling Derivative Time. Options: 0, 10 to 3000 sec. (0: disable.)
Heating TR	a	X		Heating Throttling Range. Range: 1 to 30 °F. (Found in Loop Tuning.)
Heating IT	a	X		Heating Integral Time. Options: 0, 100 to 5000 sec. (0: disable.)
Heating DT	0 sec	X		Heating Derivative Time. Options: 0, 10 to 3000 sec. (0: disable.)
Display Units	°F	X	X	Temperature Display: °F or °C.
Clock Format	AM/PM	X	X	AM/PM: 12-hour clock format. 24 hr: 24-hour clock format.
Temperature Display Calibration	No Change	X		No Change: Displayed temperature is actual room temperature. Can adjust to display up to 3°F (1.7°C) higher or down to 4°F (2.2°C) lower than room temperature.
TempOverride	3	X	X	Temporary Occupied Override duration. Range: 1 to 8 hours.

^a The Factory defaults listed here apply to all subbase models with the exceptions of the items listed in Table 21.

^b 12:00 Noon is the default start point when time is unknown.

^c Only Available if user selected one or more of following: Dehumidification Reset, Dehumidification Minimum On, or Dehumidification Reheat.

^d Config ID cannot handle Standby setpoints. Keypad users cannot set Occupied setpoints that violate Not Occupied setpoint relationship. The T7350 algorithm never allows the effective setpoint outside Not Occupied setpoints.

Table 20. Thermostat Setup Options Through PDA. (Continued)

Configuration Option	Factory Default ^a	PDA Tool	CnfgID	Description
RoomTemp	Local	X	X	Room Temperature Input Local: Use internal sensor; T7770A/D: Use remote sensor. T7770B/C: Use remote sensor with setpoint adjustment capability (requires PDA). T7771: Use remote sensor with setpoint adjustment capability (requires PDA); changes T7771 LED and bypass button operation: LED on means either occupied or bypass, pushing bypass can cancel bypass.
RoomRelHumidity	a	X	X	Room Relative Humidity Input. None: No humidity sensor; Local: Use internal humidity sensor; Remote: Use remote humidity sensor (0-10 Vdc signal).
Discharge AirTemp	None	X	X	Discharge Air Temperature Input. None: No discharge air sensor; or Remote: Remote discharge air sensor.
Outdoor AirTemp	None	X	X	Outdoor Air Temperature Input. None: No outdoor air sensor; or Remote: Remote outdoor air sensor.
OccSensor	0	X	X	None: No occupancy sensor; or Remote: Remote occupancy sensor.
AuxDO	Time of Day	X	X	Auxiliary Contact Operation: Time of Day, Economizer, Dehumid Hot Gas BP, or Simple Dehumid. Auxiliary contact not available if heat pump selected with T7350A.
Key Pad (Lockout)	Enable All	X	X	Keypad lockout enable/disable through special keypad sequence. Enable All (0): No lockout. SetPts & Ovrrd (1): Lockout all keys except: Temporary (Not) Occupied, ▲, ▼ and ⓘ. Info Only (2): Lockout all keys except ⓘ. The special keypress features are never locked out.
Recovery Heat RampMin	5°F/hr	X		Minimum heating recovery ramp rate. Range: 0 to 20°F/hr.
Recovery Heat RampMax	8°F/hr	X		Maximum heating recovery ramp rate. Range: 0 to 20°F/hr.
Recovery Cool RampMin	3°F/hr	X		Minimum cooling recovery ramp rate. Range: 0 to 20°F/hr.
Recovery Cool RampMax	6°F/hr	X		Maximum heating recovery ramp rate. Range: 0 to 20°F/hr.
Recovery Heat OAT@Min	0°F	X		Minimum heating outdoor air temperature. Range: -20 to 100°F.
Recovery Heat OAT@Max	40°F	X		Maximum heating outdoor air temperature. Range: -20 to 100°F.
Recovery Cool OAT@Min	90°F	X		Minimum cooling outdoor air temperature. Range: -20 to 100°F.
Recovery Cool OAT@Max	70°F	X		Maximum cooling outdoor air temperature. Range: -20 to 100°F.
Demand Limit Control Bump	3 °F	X		Demand limit control set point bump. Range: 0 to 10°F.
Power Failure Seq Start	0 (x10 sec)	X	X	Delays start of equipment (fan, heat, cool) after power restored to thermostat. Range: 0 to 150 seconds (in 10-second increments).
Enable DAT High Limit	None	X	X	None: No Discharge Air Temperature (DAT) high limit; Enable: Use DAT High Limit.
Enable DAT Low Limit	None	X	X	None: No Discharge Air Temperature (DAT) low limit; Enable: Use DAT Low Limit.
High Limit DAT Setpoint	110°F	X		Discharge Air Temperature High Limit Setpoint. Range: 65 to 140°F.
Low Limit DAT Setpoint	45°F	X		Discharge Air Temperature Low Limit Setpoint. Range: 35 to 60°F.
Dehumidification Min On	None	X	X	None: No Minimum On Time dehumidification; Enable: Dehumidification using Minimum On Time.
Dehumidification Min On Time	5	X		Minimum on time used with "Dehumidify Minimum On". Range: 5 to 15 minutes.
Dehumidification Reset Temp	None	X	X	None: No Reset dehumidification; Enable: Dehumidification using Reset.
Dehumidification Reset Temp Setpt	2 °F	X		Amount of reset used with "Dehumidify Reset". Range: 1 to 5 °F. Must be smaller than occupied zero energy band (ZEB) or standby ZEB.
Dehumidification Reheat	None	X	X	None: No Reheat dehumidification; Enable: Dehumidification using Reheat.

^a The Factory defaults listed here apply to all subbase models with the exceptions of the items listed in Table 21.

^b 12:00 Noon is the default start point when time is unknown.

^c Only Available if user selected one or more of following: Dehumidification Reset, Dehumidification Minimum On, or Dehumidification Reheat.

^d Config ID cannot handle Standby setpoints. Keypad users cannot set Occupied setpoints that violate Not Occupied setpoint relationship. The T7350 algorithm never allows the effective setpoint outside Not Occupied setpoints.

Table 20. Thermostat Setup Options Through PDA. (Continued)

Configuration Option	Factory Default ^a	PDA Tool	CnfgID	Description
Dehumidification High Limit	65%	X	X ^c	Dehumidification High Limit. Range: 10 to 90%.
Clock Year	1999	X		Range: 2000 to 2035.
Clock Month	12	X		1: January... 12: December.
Clock Day	Wed	X		Day of the Week: Sun, Mon, Tue, Wed, Thu, Fri, Sat
Clock Minutes	11:15 p.m. ^b	X	X	12:00 a.m.: Midnight (first minute of the day); 12:00 p.m.: Noon.
Holiday Month	0	X		Unprogrammed; January...December.
Holiday Day	0	X		Unprogrammed; 1; 2...31; LASTDAYOFMONTH...LAST_SAT
Holiday Duration	0 days	X		Duration of given Holiday (in days). Range: 0 to 99 days.
Delays	On	X	X	On: Delays (on relays, sequential start, etc.) are active. Off: Delays disabled (also called Test Mode).
System Switch	Auto	X	X	System settings: Auto; Cool; Off; Heat; Emergency Heat (valid if Heat Pump)
Fan Switch	On	X	X	Fan setting: On; Auto
Occupied Heat Setpt Stop	55°F	X		Occupied Minimum Heat Setpoint: Lowest the programmed occupied heating setpoint can be adjusted. Range: 40 to 90°F; Value \leq OccHt \leq OccCl - 2°F.
Occupied Cool Setpt Stop	85°F	X		Occupied Maximum Cool Setpoint: Highest the programmed occupied cooling setpoint can be adjusted. Range: 45 to 99°F. Value \geq OccCl \geq OccHt + 2°F.
Not Occupied Heat Setpoint	55°F	X	X	Not Occupied heating setpoint. Range: 40 to 90°F. UnoccHt \leq OccHt \leq OccCl - 2°F; UnoccHt \leq StdByHt \leq StdByCl - 2°F
Standby Heat Setpoint	67°F	X	d	Standby heating setpoint. Range: 40 to 90°F.
Occupied Heat Setpoint	70°F	X	X	Occupied heating setpoint. Range: 40 to 90°F.
Occupied Cool Setpoint	75°F	X	X	Occupied cooling setpoint. Range: 45 to 99°F.
Standby Cool Setpoint	78°F	X	d	Standby cooling setpoint. Range: 45 to 99°F.
Not Occupied Cool Setpoint	85°F	X	X	Not Occupied cooling setpoint. Range: 45 to 99°F. UnoccCl \geq OccCl \geq OccHt + 2°F; UnoccCl \geq StdByCl \geq StdByHt + 2°F.
Event 1 State	Occupied	X	X	Day Schedule is a structure of 8 days of 4 events each day. Defaults listed are for Monday through Friday. Saturday/Sunday/Holiday default to Unprogrammed (None / 12:00 a.m.). All Events can be set for: Standby or None. Only Events 1 and 3 can be set for Occupied. Only Events 2 and 4 can be set for Not Occupied. Note: The Config ID cannot set an event to Standby, but it can change the time.
Event 2 State	Not Occupied	X	X	
Event 3 State	None	X	X	
Event 4 State	None	X	X	
Event 1 Time	8:00 a.m.	X	X	Scheduled time for event change. 12:00 p.m.: Noon 12:00 a.m.: Midnight
Event 2 Time	10:00 p.m.	X	X	
Event 3 Time	12:00 a.m.	X	X	
Event 4 Time	(midnight)	X	X	

^a The Factory defaults listed here apply to all subbase models with the exceptions of the items listed in Table 21.

^b 12:00 Noon is the default start point when time is unknown.

^c Only Available if user selected one or more of following: Dehumidification Reset, Dehumidification Minimum On, or Dehumidification Reheat.

^d Config ID cannot handle Standby setpoints. Keypad users cannot set Occupied setpoints that violate Not Occupied setpoint relationship. The T7350 algorithm never allows the effective setpoint outside Not Occupied setpoints.

Table 21. Exceptions to Factory Defaults.

Configuration Option	T7350A	T7350B	T7350D T7350H1009	T7350M T7350H1017
Heat Output Stages	1	2	3	0
Cool Output Stages	1	2	3	0
Room Humidity Sensor	None	None	Local	Local
Heat Throttling Range	3	4	7	5
Cool Throttling Range	3	4	7	5
Heat Integral Time	3100	2500	1650	1250
Cool Integral Time	3100	2500	1650	1250

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