

# ***Lightstat Installation and Operation Manual***

## ***TG Series Thermostats for Heat/Cool Applications***

24 Volt A.C. Power Robbing, Temperature Limiting Thermostat with  
Optional Automatic Temperature Setback  
No Common Wire Needed.

Read instructions carefully before attempting to install, operate or service the Lightstat electronic setback thermostat. Failure to comply with instructions could result in personal injury and/or property damage. Retain instructions for future reference.

### ***Description***

The Lightstat thermostat saves energy and operating costs by using Owner specified factory limited temperature ranges which prevent excessive use of heating or cooling equipment. These limits cannot be changed by the user. The unit requires no batteries and no programming or reset in the event of a power failure. Optionally, the Lightstat thermostat can set back the temperature based on light level in the space. A dark space is considered unoccupied and will turn the heating and cooling setpoints back for better savings.

Thermostats described are available in Heat/Cool (TGHC) and Heat Pump (TGHP) models.



### ***Specifications***

Construction.....Electronic (solid state)  
Electrical Requirements.....24-30 VAC  
Anti-Cycle Time Delay.....45 seconds ON and OFF  
Switching Current.....0.2 to 1.0 AMP (max) per output  
Heating Temperature control range (typical).....55°F to 78°F (on models with heating)  
Cooling Temperature control range (typical).....85°F to 70°F (on models with cooling)  
Operating temperature differential minimum 0.5°F  
Dimensions 3.6"W x 5.0"H x 1.3"D  
Weight 8.0 oz  
Function switches: Cool/Off/Heat & Fan On/Auto

**Warning:**

Read these instructions carefully! Failure to follow them could cause damage to the product or cause a hazardous condition.

**General Safety Information:**

Do not use this product on circuits exceeding 30 VAC. Higher voltage will damage this control and could cause electrical shock or personal injury.

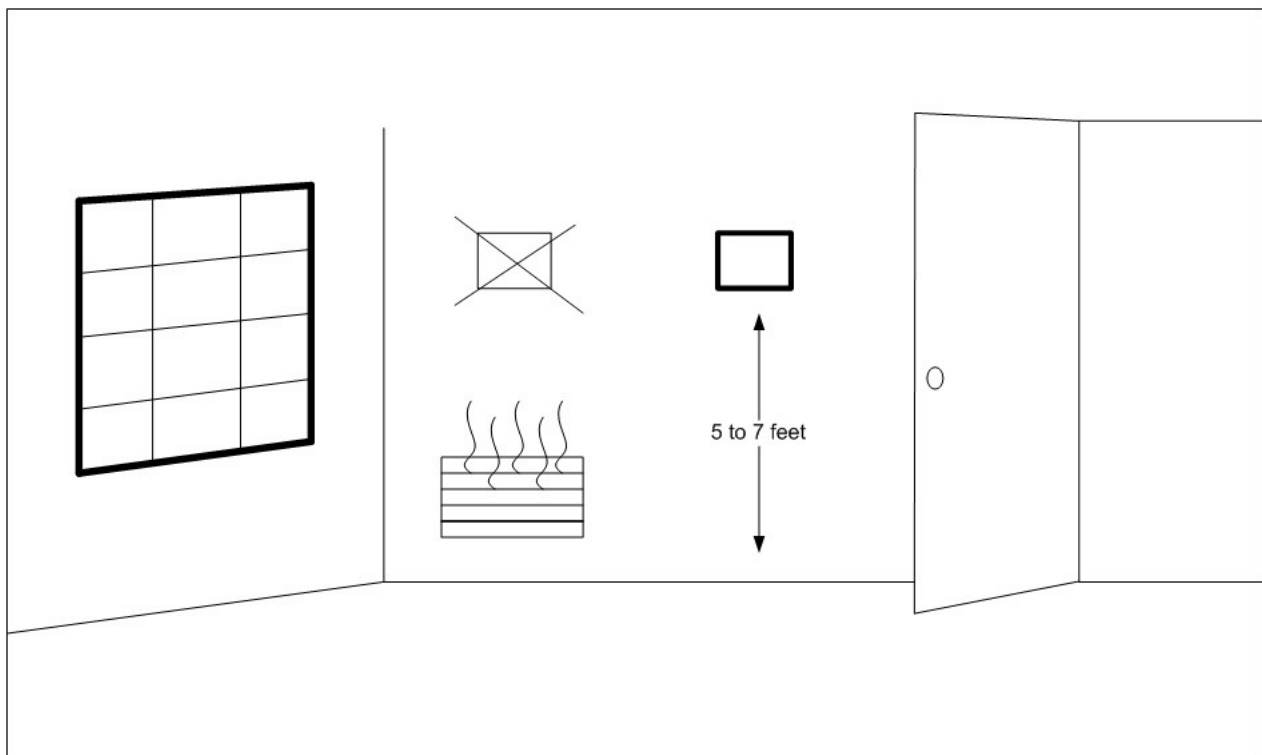
1. Installer must be a trained, experienced service technician familiar with the system this product will control.
2. Disconnect all power before beginning installation to prevent electrical shock or equipment damage.
3. Control voltage and current ratings must fall within the range outlined in “specifications.”
4. Verify that the relay load does not exceed 1 amp. Excessive load will damage the solid state switch.

**Thermostat Placement:**

Mount your thermostat vertically about 5 feet above the floor in an area that has good air circulation at average room temperature. Be sure to locate the thermostat where it will be exposed to lights that are normally on when the room is occupied.

Locate the thermostat away from:

- Outside walls and drafts
- Doors, windows, and direct sunlight
- Supply air ducts, radiators and convectors
- Appliances that produce heat or cool air



**Warning: Do not use this thermostat on circuits exceeding 30 volts AC.**

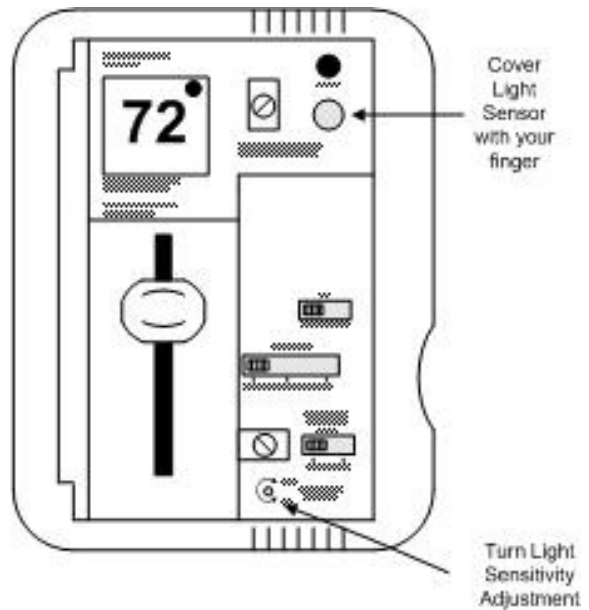
**Installation:**

1. Check the equipment ratings on the system this thermostat will control, to make sure the thermostat is appropriate for the application.
2. Check the system voltage and verify it is between 24 and 30 VAC.
3. Turn the sytem power OFF before you begin the installation procedure.
4. Note the color of the wires and the terminals they are connected to. Some thermostats may have to be removed from the wall to determine wiring connections.
5. Remove the old thermostat from the wall, making sure the wires do not fall back into the wall.
6. Make sure the thermostat switch is in the OFF position.  
**NOTE: TGHP thermostats may have power even while switch is in the OFF position. (if the display can be read with the switch in the off position, the thermostat has power)**
7. Set DIP switches (see page 7).
8. Attach the wires as shown in the model specific wiring diagrams (see page 6).
9. Attach the thermostat to the wall using the hardware supplied. Note: The thermostat does not have to be level in order to operate properly, but it should be level for good appearance.
10. Turn the system power ON and the thermostat switch to the ON position as desired.

**Note:** Your Lightstat may come from the factory with fixed light sensitivity. This means that under normal lighting, the thermostat will heat/cool your space to the comfort slide setting. Under low light conditions, the thermostat will set the temperature back. A green setback light turns ON, indicating the thermostat is in the Setback mode.

**Adjusting (optional) light sensor:**

1. Open the thermostat cover and locate the green setback light at the upper right of the thermostat and the light sensor below it.
2. Cover the light sensor with your finger. The green setback light should turn ON after 3 seconds, indicating the thermostat is in Setback mode. Remove your finger and the green light should turn OFF indicating the thermostat is in Day mode.
3. The Light Sensitivity knob located at the lower right of the thermostat controls the amount of light necessary to keep the thermostat in the Day mode.
4. Turn the knob full clockwise (towards bright) to put the thermostat in the Setback mode. The green light should be on after 3 seconds.
5. Now slowly turn the knob counterclockwise (towards dim) until the green setback light just goes out.
6. Close the thermostat cover. Cover the light sensor and verify the green light turns on. Remove the covering over the sensor and verify the green setback light turns off. If it does not turn off, slightly adjust the light sensitivity knob clockwise and re-verify operation. Your thermostat is now adjusted to your current light level.



### **Adjusting (optional) night setback setting:**

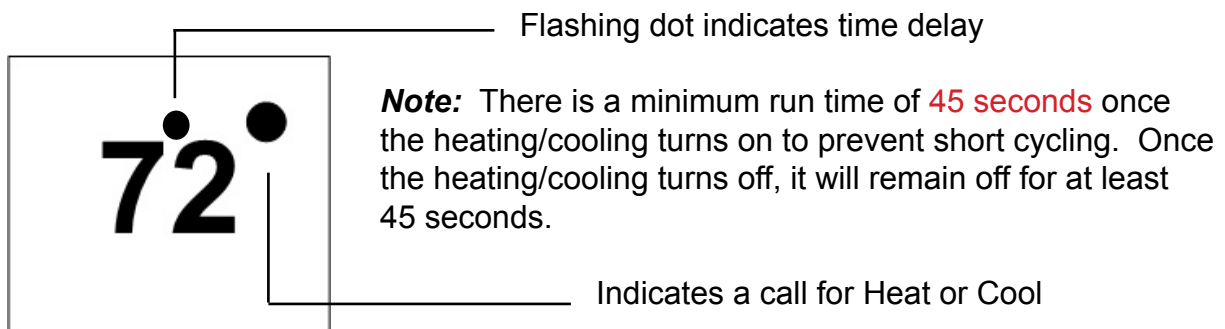
Your Lightstat may come from the factory with a fixed night setback. That means when your Lightstat thermostat is in the Setback mode, it will automatically set the heating/cooling back a predetermined number of degrees from the comfort slide setting. If your model has setback options, there will be a night setback switch on the back or in the lower right hand corner of the thermostat. Choosing less setback may be more comfortable, but will offer less energy conservation and savings. See page 11 for more detail on DIP switch settings and setback features.

**Note:** When the green setback light goes on, the display will briefly flash showing the night setback temperature. When the green setback light turns off, the display will flash showing the comfort slide setting temperature.

Some thermostats may be equipped with a “slide sensitive” setback. (refer to model specific features to know if your thermostat has this functionality). If the temperature slide is not moved for an amount of time specified by the customer (and preprogrammed at the factory), then the thermostat is in setback. To bring the thermostat out of setback, simply move the temperature slide.

**Note:** Typically, moving the temperature slide will show the current thermostat setpoint. For slide sensitive setback models, the setback setpoint cannot be viewed on the display because touching the slide will bring the thermostat out of setback.

### **Adjusting the temperature setting:**



**Note:** Any time the comfort slide is moved, the display will illuminate and the flashing number indicates the current setpoint temperature.

1. Make sure the system power is ON.
2. Move the thermostat power switch to the ON position.
3. Adjust the comfort slide either up or down until the flashing number reaches the desired setting.
4. Once you have stopped moving the comfort slide the display will change from a flashing display to a steady display. A steady display indicates actual room temperature.
5. A steady dot in the upper right corner of the display will indicate if heating/cooling system is ON.

### **Basic Operation:**

- Steady temperature display indicates actual room temperature.
- Set temperature with comfort slide.
- Display will illuminate briefly when temperature slide is moved.
- Flashing display indicates comfort slide setting.
- Solid dot in upper right corner of display indicates a call for heat or cool.
- Flashing dot in middle of display indicates that a time delay is in effect.
- Temperature range and setbacks are programmed at the factory.
- Night setback is automatic when there is a drop in the room light level.
- Setback mode is indicated by a green light.

Check the inside cover for your model's temperature range and setback.

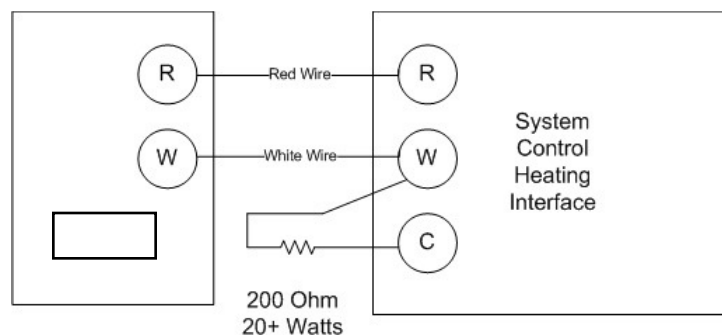
### **Application Notes:**

When connecting the TG series (power robbing) thermostats to a furnace control board or electronic ignition model, one of (3) potential issues may occur.

1. When not calling for heat, the furnace falsely starts its heating cycle.
2. When calling for heat, the furnace is "chattering" or does not complete its heat cycle.
3. The display goes blank at times.

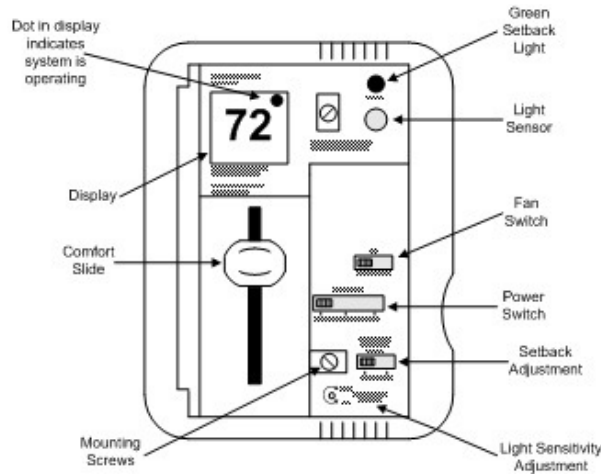
If the installation exhibits any of these issues, we recommend that you add a 200 ohm (minimum 20 watt) resistor from any output terminal to the C (common) terminal at the front of the furnace control board, ignition module, or zone control valve.

Below is a wiring diagram showing a resistor placed from the W (heating) terminal to C (Common). Other terminals may be used.



It is recommended that the resistor be mounted so that it is not touching anything and that there is adequate ventilation around it as it will normally get warm. A 200 Ohm, 20 Watt resistor is included with a metal lead from one end and a white wire whip from the other to allow flexibility during installation. The resistor has no polarity.

## Thermostat Layout



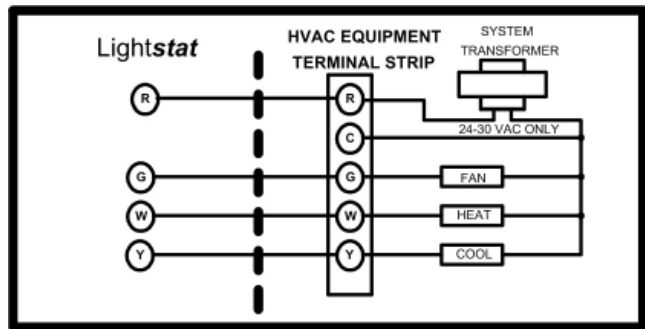
### TGHC Heating/Cooling Thermostat Specifications:

The TGHC is a single stage heat/cool thermostat.

This thermostat cannot be used on:

1. Millivolt systems (self generating systems that do not have a transformer or relay).
2. Two transformer systems using RC and RH wires.
3. Heat pump systems.
4. Line voltage (120 VAC) systems directly.

### TGHC Wiring Diagram



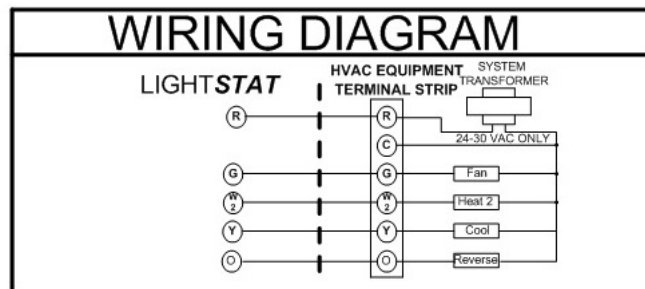
### TGHP Heat Pump Thermostat Specifications:

The TGHP is a single stage heat/cool thermostat for heat pump applications.

This thermostat cannot be used on:

1. Millivolt systems (self generating systems that do not have a transformer or relay).
2. Two transformer systems using RC and RH wires.
3. DC voltage systems.
4. Line voltage (120 VAC) systems directly.

### TGHP Wiring Diagram



### Warning:

**Never connect a common or neutral wire to the Lightstat. This will cause damage to the Lightstat.**

### **Setting the DIP switches:**

Your thermostat may have up to (7) configurable DIP switches depending on the features specified for your application. DIP switches may be configured in accordance with the following table.

For TGHC Models, switch positions 1 through 5 should be set. Positions 6 and 7 have no function.

<b>Position</b>	<b>Off (left position)</b>	<b>On (right position)</b>
1	Fahrenheit	Celsius
2	45 Second Lockon/lockoff Timers Active	45 Second Lockon/lockoff Timers Inactive
3	Lesser setback number	Greater setback number
4	Fan controlled by thermostat in heat mode.	Fan controlled by external device in heat mode.
5	Fan locked in auto when in setback.	Fan on allowed when in set- back.
6	No function on TGHC	No Function on TGHC
7	No Function on TGHC	No Function on TGHC

For TGHP Models, all switch positions (1 through 7) should be set accordingly.

<b>Position</b>	<b>Off (left position)</b>	<b>On (right position)</b>
1	G & Y remain energized w/ Call for W2	No G or Y with a Call for W2
2	45 Second Lockon/lockoff Timers Active	45 Second Lockon/lockoff Timers Inactive
3	Lesser setback number	Greater setback number
4	Fan controlled by thermostat in heat mode.	Fan controlled by external device in heat mode.
5	Fan locked in auto when in setback.	Fan on allowed when in set- back.
6	Backup Heat Operating Differential 1.5 ° F (0.8 ° C)	Backup Heat Operating Differential 3.0 ° F (1.7 ° C)
7	O output with cool	O output with heat

**Note:** If any DIP switch is changed during operation, the thermostat will reset and the new dipswitch setting(s) will be read.

## ***Troubleshooting your Lightstat thermostat:***

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
The digital display does not light up.	<ol style="list-style-type: none"> <li>1. No power to the stat or system equipment.</li> <li>2. Lightstat switch in OFF position.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the system low voltage power.</li> <li>2. Check the system ON/OFF switch.</li> <li>3. Check the circuit breaker.</li> </ol>
The display works but the heat does not come on.	The room temperature is above the factory programmed limit of the thermostat.	Check again when the room temperature falls below the factory programmed limit.
The display works but the cooling does not come on. (some stats are heating only and this would not apply).	The room temperature is below the factory programmed limit of the thermostat.	Check again when the room temperature goes above the factory programmed limit.
Setback indicator stays ON or OFF.	<ol style="list-style-type: none"> <li>1. Improper light sensor adjustment.</li> <li>2. Thermostat location is not optimal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust light sensor (optional)</li> <li>2. Move thermostat if necessary.</li> </ol> Review locations to avoid (page 2).
Fan runs continuously with thermostat system switch set to OFF.	Fan switch set to the ON position.	Move fan switch to the AUTO/OFF position.
Control relay on heating unit chatters.	Low voltage	



## **Warranty**

Lightstat Inc. warrants each product manufactured by it to be free from defects in workmanship under normal use and service; its obligation under this warranty, at its option, being limited to repair or replace the product if found defective, provided that it is removed by the installer and returned within (12) twelve months of purchase to the factory with transportation charges, if any, prepaid after first obtaining return authorization and shipping instructions from Lightstat Inc.

This warranty is expressly in lieu of other warranties expressed or implied including a warranty of merchantability and of all other obligations or liabilities on its part.

The company neither assumes nor authorizes any other person or organization, other than the seller, to assume for us any other liability in connection with this product. This warranty shall not apply to any product which has been subject to misuse, negligence, or accident, nor to any product which has not been operated in accordance with the printed instructions. The company shall not in any event be liable for any consequential damages, secondary charges, expenses of installing or disconnecting, injury or damage resulting from an alleged defect in the unit.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so that above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

**Manufactured by:  
Lightstat Inc.  
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**Made in the USA.**

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