



# Technical manual

## Ecobee4

### GETTING STARTED

#### Welcome

Thank you for supporting ecobee, the Smart Thermostat that provides your customers with freedom and flexibility in managing their home environment. The ecobee Smart Thermostat has been designed in partnership with HVAC contractors to ensure the installation process is simple and efficient. This step-by-step Installation Manual will walk you through all aspects of the installation. To ensure an on-going service relationship with your customers, please register all of your ecobee Smart Thermostats in your Contractor Portal.

The ecobee Team

Technical support

Our technical support team is available to answer your

questions at 1.877-9-ecobee (1.877.932.6233), or via

email at [support@ecobee.com](mailto:support@ecobee.com)



## Before You Begin

This product is intended to be installed by trained service professionals

This manual explains the procedures for installing the ecobee Smart Thermostat. Please read it carefully before

beginning the installation.

For information on how to operate the ecobee Smart Thermostat, please see the ecobee User's Manual.

The ecobee Smart Thermostat consists of two parts (see images below):

1. A Smart Thermostat to be mounted on the homeowner's wall.
2. An Equipment Interface Module This should be mounted in the homeowner's utility room and connects to the heating, cooling and ventilation equipment.

*Caution: Disconnect electric power to the system before installing this product. Failure to do so could result in electric shock and/or equipment damage. All wiring must conform to your local electrical code. Mercury Notice: This product does not contain mercury.*

*If you are replacing a product that does contain mercury please contact your local waste-management authority for disposal instructions. Do not discard the old product in the regular trash.*

## HVAC System Compatibility information

ecobee is designed to operate low-voltage heating and cooling systems. It is not designed for use with line voltage or millivolt heating and cooling systems. Ecobee supports control of up to four heating stages and two cooling stages. It also supports control of humidifiers, dehumidifiers, heat-recovery ventilators and energy-recovery ventilators.

### Equipment Description

Gas/Oil/Electric heating (up to three stages) Yes  
Heat pump with auxiliary heat (up to four stages) Yes  
Geothermal Heat Pump Yes  
Duel fuel systems Yes  
Standard electric cooling (up to two stages) Yes  
Boilers Yes  
Central humidifier Yes  
Central dehumidifier Yes  
Heat Recovery Ventilator (HRV) Yes  
Energy Recovery Ventilator (ERV) Yes  
Sensors with dry contact outputs Yes

## Approvals

This product was designed and built in accordance to RoHS directive 2002/95/EC and contains no hazardous substances as defined by this directive. Optional Power supply meets EPA C.E.C Level IV and E.C CoC No Load power Consumption requirements. It is also safety approved to UL/cUL standards.

## FCC Compliance Statement

This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is Encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna  
Increase the separation between the equipment and receiver  
Connect the equipment to an outlet on a different circuit from the receiver  
Consult the dealer or an experienced radio/TV contractor for help.  
Warning: Changes or modifications not expressly approved by ecobee Inc. could void the user's authority to operate the equipment.

To satisfy FCC/IC RF exposure safety requirements, a separation distance of 20 cm or more should be maintained between this device and persons. To ensure compliance, operation at closer than this distance is not allowed.



## Specifications

Temperature ranges  
Heat: 45 – 79°F (7 – 26°C)  
Cool: 58 – 92°F (14 – 33°C)  
Display: 40 – 100°F (5 – 37°C)  
Sensitivity: +/- 1°F (0.5°C)  
Equipment Interface Operating: -40o to 160oF (-40o to 70oC)  
Thermostat Operating: 32o to 130oF (0o to 55oC)  
Humidity Range  
Humidify: 20 to 50% R.H  
Dehumidify: 30 to 60% R.H  
Display: 0 - 90% R.H  
Sensitivity: +/- 2% R.H.  
Operating: 5 – 95% R.H non-condensing  
Dimensions  
Thermostat: 5.5"W x 3.25"H x 1"D (139.5mm H x 82.5mm W x 25mm D)  
Equipment Interface: 4.6"W x 10"H x 1.3"D (118mm W x 254mm H x 32mm D)  
Power  
AC Transformer - 24 VAC - 3VA Minimum (*not included*)  
Battery – CR2032 – 3V lithium coin cell (*included*)

### Wiring Specifications

Refer to this table to determine maximum wire lengths allowed:

#### Smart Thermostat to Equipment Interface

18 AWG 20 AWG 22 AWG  
1250ft/380m 790ft/240m 500ft/150m

#### Equipment Interface to heating/air equipment

18 AWG 20 AWG 22 AWG  
128ft/39m 80ft/24m 50ft/15m

### Configuring the Smart Thermostat

Configuring the Installer Settings  
Installer Settings let you configure the settings related to the various devices (such as a furnace, air conditioner, humidifier, dehumidifier or ventilator) that are connected to the Equipment Interface.

To prevent accidental modifications to these settings you can enable a 4-digit installer code. This code is pre-programmed to 3262 and can be enabled in the Thresholds option menu.

### Installation Wizard

The Installation Wizard takes you step-by-step through a series of choices regarding the HVAC equipment intended to be connected to the Equipment Interface.

Simply answer the questions accordingly and press Next to advance to the next screen. Once completed

you will be shown a diagram of the wiring connections that reflects the choices made during the wizard process. You can press Back to go back and make any changes. Once you are satisfied with the setup, press Done.

### Equipment

The equipment setting will allow you to manually configure the various devices that are connected to the Equipment Interface.

### Heat Pump

This section allows you to enable and configure up to a 2 stage heat pump. If a second stage is required you must configure an Accessory relay to control that stage Geothermal/Ground Source Heat pump If you select Yes, this tells the system a geothermal or ground source heat pump is being controlled. This helps the Thermostat determine optimum performance and default settings.

If you select NO, the system will optimize for an air-to-air heat pump. O/B Energize on Cool If you choose Yes, the reversing valve output (O/B terminal) will activate when there is a call for cooling. If you select No, the relay will energize when there is call for heat

**Min Cycle Off Time** Enables you to configure the compressor off time between cycles. This is adjustable from 240 - 900 Seconds.

**Min Outdoor Temp** Allows you to set the minimum outside air temperature at which the compressor will be disabled. This performs two functions: You can set it to prevent the compressor from going on when the outdoor temperature is too low, thus resulting in damage to the compressor. You can also set this value to determine when you want the auxiliary heat (if installed) to engage to help meet the set temperature. The temperature range is adjustable from 0°F (-17.8°C) - 65°F (18.3°C) or can be completely disabled. You will need an internet connection for this feature to operate properly.

### Allow Heat Pump/Auxiliary Heat to Run Simultaneously

If you select Yes and there is a source of auxiliary heat, it will turn on in addition to the heat pump. The heat pump will be energized for the first 30 minutes. If, after 30 minutes, the set point has not been met, the auxiliary heat will be energized to assist the heat pump in meeting the load. If you select no, the heat pump will be energized for up to 2 hours.



If after 2 hours the set point has not been met, the Thermostat will shutdown the heat pump and energize the auxiliary heat to meet the set point. This option should also be used for installation where the heat pump evaporator coil is downstream from the source of auxiliary heat.

### *Furnace (Auxiliary Heat)*

Allows you to enable and configure up to a 3-stage conventional heat source. If you have selected Heat pump as your primary source, this feature will allow you to configure the auxiliary heat connected to the system.

### *Furnace Type*

Allows you to configure the type of furnace connected. This allows the Smart Thermostat to optimize its algorithms based on the type of fuel and typical characteristics of the chosen system. Choose the option that best represents the type of heating system installed.

### *Heat Stages*

Allows you to configure up to 3 stages of heat. If you require a third stage, you must configure an accessory relay to control that stage.  
**Heat Fan Control** This option allows you to determine if the system fan is controlled by the system during heat cycles, or if the Thermostat is required to control the fan. Normally the HVAC system controls the fan during heat cycles.

### *Air Conditioner*

Allows you to enable and configure up to 2 stages of air conditioning. If you require a second stage, you must configure an accessory relay to control that stage.

### *Staging Method of Operation*

The ecobee Smart Thermostat uses a unique method for staging for multi-stage heating or cooling. It uses a combination of intelligent algorithms and past performance to determine when to activate the stages.

When there is a call for heat or cool, the system computes how long it would take for the system to reach the desired set point in stage 1, stage 2 or stage 3 accordingly. It will determine the highest stage at which a minimum of 10 minutes of run time is required. It will then automatically start the system at that stage (ie if it calculates that it will take 15 minutes at stage 2 but only 7 minutes at stage 3, the system will immediately turn on stage 2 to meet the set point). If the calculation indicates to start at stage 1, and it takes more than 10 minutes to reach the set point, it will automatically engage stage 2. If stage 2 runs for

more than 10 minute without reaching the set point it will activate stage 3. A minimum run time of 10 minutes is used to ensure that proper circulation throughout the system and that minimum cycle times are maintained. For heat pumps with auxiliary heat, the operation of the auxiliary heat will depend on the configuration of the Allow Heat

### *Pump/Auxiliary Heat to Run Simultaneously.*

### *Accessory relays*

Accessory relays are generic relays that can be configured to control the following;  
**Heat Stage 3** Select this option when the Thermostat is required to control a 3-stage conventional heating system. Connect the third stage (or W3) contact to this accessory relay.



## List of Alerts

Below is a complete list of alerts. Depending on your configuration, some of these may not apply to your system.

- Low Battery
- Furnace Air Filter
- Ventilator Filter
- UV Lamp
- Humidifier Filter
- Comms fault
- Low Temp. Alert
- High Temp Alert
- Low Humidity Alert
- High Humidity Alert
- Heat Not Responding
- Cool Not Responding
- Input 1
- Input 2
- Maintenance Reminder
- Auxiliary Heat Run Time
- Auxiliary Outdoor Temperature
- The battery in your Thermostat will need to be changed soon.
- Your furnace filter needs to be cleaned/changed.
- Your ventilator filter needs to be cleaned/changed.
- Your UV lamp needs to be changed.
- Your humidifier pad needs to be cleaned/changed.
- There is no communication between the Thermostat and the Equipment Interface module.
- The temperature in the home is too low.
- The temperature in the home is too high.
- The humidity in the home is too low.
- The Humidity in the home is too high.
- The system has failed to heat the home.
- The system has failed to cool the home.
- Used if this input is programmed to generate an alert.
- Used if this input is programmed to generate an alert.
- You are due for regular maintenance.
- Your auxiliary heat source is running too often.
- Your auxiliary heat source is running at higher than expected outdoor temperatures.





if the Product: was operated/stored in abnormal use or maintenance conditions;

### 3-Year Limited Warranty

ecobee warrants that for a period of three (3) years from the date of purchase by the consumer ("Customer"), the ecobee Smart Thermostat (excluding battery) (the "Product") shall be free of defects in materials and workmanship under normal use and service. During the warranty period, ecobee shall, at its option, repair or replace any defective Products, at no charge for labour or materials. Any replacement and/or repaired device are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. If the product is defective, call Customer Service at 1-877-9-ecobee. ecobee will make the determination whether a replacement product can be sent to you or whether the product should be returned to the following address: ecobee Customer Service, 477 Richmond Street West, #210, Toronto, ON M5V 3E7, Canada.

In the event of a failure of a Product, Customer may: (a) if Customer did not purchase the Product directly from ecobee, contact the third party contractor from whom the Product was purchased to obtain an equivalent replacement product, provided the contractor determines that the returned Product is defective and Customer is otherwise eligible to receive a replacement product; (b) contact ecobee directly for service assistance at 1-877-9-ecobee and ecobee will make the determination whether an advance equivalent replacement Product can be sent to Customer with return shipping supplies (in which case a hold shall be put on Customer's credit card for the value of the replacement Product until ecobee has received the defective Product). Product should be returned to the following address:

ecobee Customer Service, 477 Richmond Street West, #210, Toronto, ON M5V 3E7, Canada. If the returned Product is found by ecobee to be defective and Customer is otherwise eligible to receive a replacement product, no amount shall be charged to Customer's credit card; or (c) ship the defective Product directly to ecobee, in which case Customer shall contact ecobee directly at 1-877-9-ecobee, so ecobee can make the required shipping arrangements. Upon receipt of the defective Product, ecobee will ship an equivalent replacement product to Customer, provided the returned Product is found by ecobee to be defective and Customer is otherwise eligible to receive a replacement product.

### Warranty

This warranty does not cover removal or reinstallation costs and shall not apply if the damages were found to be caused by something other than defects in materials or workmanship, including without limitation,

authorizes was subject to abuse, neglect, electrical fault, improper handling, accident or acts of nature; was not installed by a licensed Heating Ventilating and Air Conditioning (HVAC) contractor; or was installed improperly.

ecobee's sole responsibility shall be to repair or replace the Product within the terms stated above.

### ECOBEE

SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND, INCLUDING ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING, DIRECTLY OR INDIRECTLY, FROM ANY BREACH OF ANY WARRANTY, EXPRESS OR IMPLIED, OR ANY OTHER FAILURE OF THIS PRODUCT.

Some US states and Canadian provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. in materials and workmanship is limited to repair and replacement as set forth in this warranty statement. All express and implied warranties for the product, including but not limited to any implied warranties and purpose, are limited to the three-year duration of this limited warranty. No warranties, whether express or implied, will apply after the limited warranty period has expired. Some US states and Canadian provinces do not allow limitations on how long an implied warranty lasts, so this limitation may not apply.

ecobee neither assumes responsibility for nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product. have other rights which vary from jurisdiction to jurisdiction.

If you have any questions regarding this warranty, please write ecobee Customer Service, 477 Richmond Street West, #210, Toronto, Ontario M5V 3E7, Canada.