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Remote Sensor Module: EB-RSM-01

1 Introduction

The purpose of this product is to provide contractors the ability to connect additional sensors to the ecobee Smart and/or EMS thermostats. This product will support off-the-shelf, hardwired sensors that are already readily available through the HVAC distribution channel.

This additional hardware will give the ecobee Smart and EMS system them ability to detect the temperature, humidity and CO2 in specific areas and act according to various programmable options.

2 Use Cases

2.1 Alternate Room temperature/humidity monitoring

There are cases where the location of the thermostat within the home or office is not ideal. Either the home or business owner does not want the thermostat in an open space, or it cannot be easily installed in the space that best represents the current temperature or humidity. With this product a sensor can be installed in the desired location and the thermostat can be configured to use the temperature registered by the selected sensor as the “current temp” and/or “current humidity”. The product will function as normal but will use this remote sensor as the current temperature

2.2 Room temperature/humidity averaging

Similar to 2.1, it may be desired to take an overall average of several rooms and use that as the current temperature or humidity. In the case of temperature the contractor would install up to 4 sensors in various locations and configure the thermostat to take a simple average of some or all of the sensors (including the one in the IDT). This average will be the used as the “current temp”.

For humidity up to 2 remote sensors and the one within the IDT could be used to produce an average “current humidity” reading.

2.3 HVAC system monitoring

In this use case the contractor would like to monitor the HVAC system discharge air temperature and/or return air temperature to ensure the system is operating within required parameters. Alerts would be sent if preprogrammed thresholds are reached. In the case of EMS thermostats, sensor input actions could also be programmed. This will allow the contractor to automatically program

the equipment connected to the EI to shutdown, reduce the set point, turn on a relay etc when the threshold is reached.

2.4 Refrigerator/Freezer monitoring

In light commercial applications, it may be desirable to monitor, locally and remotely, the temperature of the refrigerators and/or freezes to ensure they are operating within specifications. Alerts would be sent if preprogrammed thresholds are reached. In the case of EMS thermostats, the system could be programmed to activate an accessory relay to turn on or off the equipment being controlled, or some other control device.

2.5 Outdoor temperature sensing

In this use case, a remote temperature sensor can be used to replace the internet weather feed as a means to detect the outdoor temperature only. The temperature registered by this sensor would be used for the control algorithms that require outdoor temperature. Internet weather would still be provided for display on the IDT and web portal. This feature would be used in applications where the associated weather feed does not accurately represent the temperature where the equipment is located. If multiple sensors are configured as outdoor temp sensor, then the average of the valid sensors is used. If the outdoor sensor is providing invalid values then the internet feed is used instead.

2.6 Compute B Value

If a user is configuring a new sensor model but doesn't know the B Value for the sensor then they will be able to compute the B Value based on entering a Resistance in ohms for the sensor at 70degF.

2.7 Ventilation Fan

In this use case, a remote temperature sensor can be used to control an attic fan by switching on an EI accessory relay to activate it.

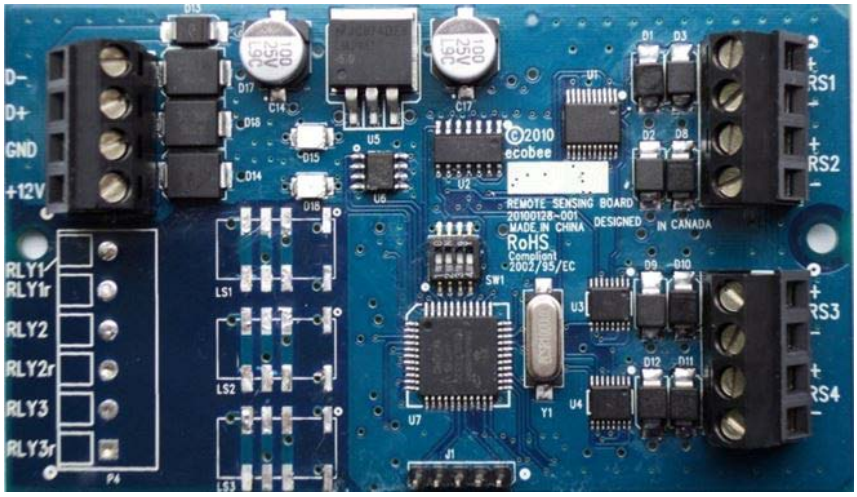
2.8 Demand control ventilation (EMS only)

In this scenario, a CO2 sensor would be used to determine at which point a ventilation system should be activated. The contractor would program a trigger point for this sensor and the desired action. Typical action would be to activate a relay (that in turn activates a ventilation/fan system)

3 Hardware Overview

- 4 sensor inputs capable of supporting dry contacts, or thermistors
- 2 of the 4 can be configured to support 0-10Vdc sensors
- No calibration of Remote Sensors required.
- Max distance of Thermistor to Sensing board is 250ft.
- Remote Temperature reading accuracy +/-1.0 F (0.5C).
- Each Sensor terminal is ESD protected with MOV.
- Interface to Remote Sensing board is the ecobee 4 wire interface, +12VDC, Gnd, D+ and D-.
- Max distance between Remote Sensing board and EI is 1000ft.
- Thermistor Sensor to be of variety 10K @25C +/-1%
- Sensor excitation Voltage = 5.0VDC
- Sensor Operating and measuring Temperature -30C to 80C
- Two wire interface using 18 gauge preferred, 22-24 gauge OK.
- Sensors connected to input #1 and #2 can support temp and dry contact only
- Sensors connected to input #3 and #4 can support temp, dry contact, humidity or CO2

Remote Sensor Module – PCB layout



Product Specifications

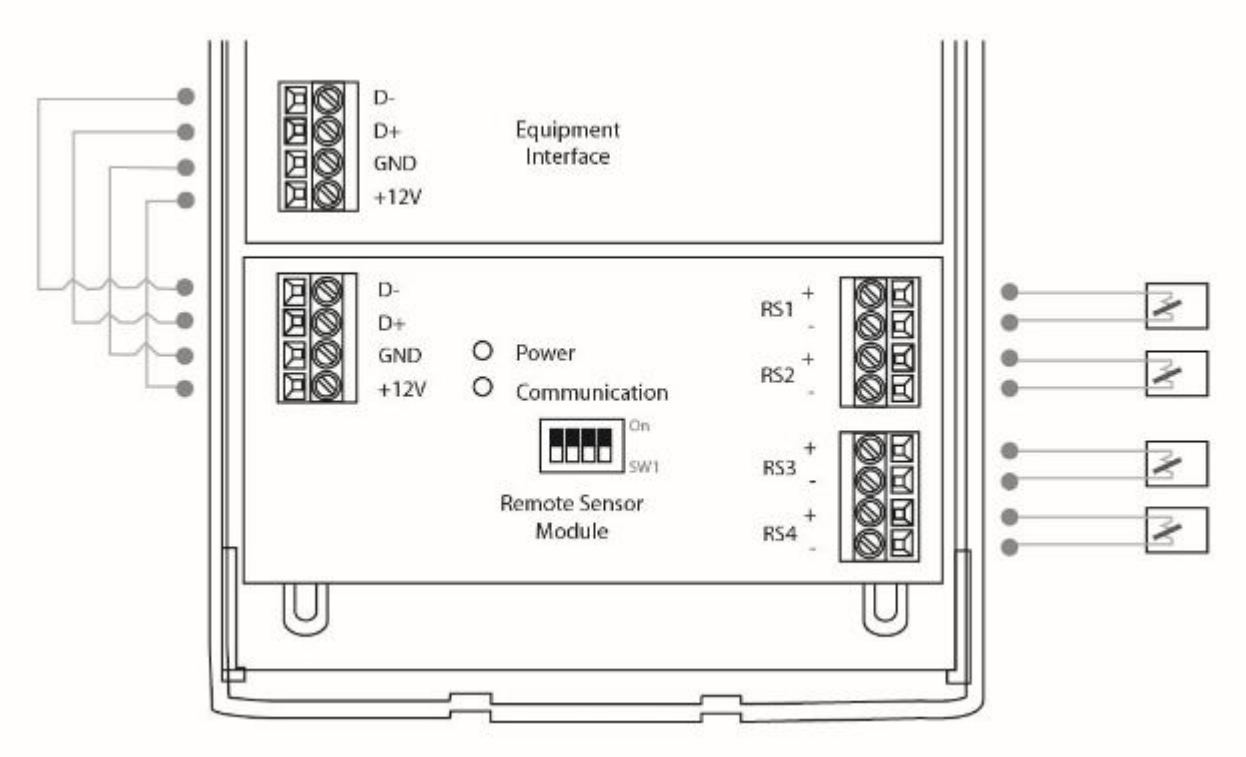
Environmental: For indoor use only

Temperature: -40°F to 160°F (-40°C to 70°C)

Humidity: 5-95% RH (non-condensing)

Dimensions 4.365“ L x 2.5” W x 0.75” H (111 mm L x 63.5 mm W x 19 mm H)

Remote Sensor Module to Equipment Interface Module – Basic connection layout



4 Sensor types

- Up to four 10K NTC resistive temperature sensors OR
- Up to four additional Dry contact inputs OR
- Up to two 0-10Vdc or 0-5Vdc analog sensors

4.1 Compatibility (preconfigured)

- HW C7189U indoor sensor
- HW C7089 outdoor sensor
- Tekmar D084 flush mount
- Tekmar D079 slab sensor
- Tekmar D076 indoor sensor
- JCI HT-6703 humidity sensor (0-10Vdc)
- JCI CD-W00 CO2 sensor (0-10Vdc)

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 Remote Sensor Module (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. 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, contact the supplier from whom the product was purchased to obtain an equivalent replacement product, provided the supplier determines that the returned Product is defective and the Customer is otherwise eligible to receive a replacement product; 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, if the product:

• was operated/stored in abnormal use or maintenance conditions;

• is repaired, modified or altered, unless ecobee expressly authorizes such repair, modification or alteration in writing;

• was subject to abuse, neglect, electrical fault, improper handling, accident or acts of nature;

• was installed improperly.

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