building controls

EnergyCenter
BY AUTANI

User Manual

autaniNet/EnOcean Bridge

Autani, LLC
autaniNet/EnOcean Bridge
Model # - 1000159-01
DOM 10/05/2015

EnOcean Bridge

EnergyCenter
BY AUTANI

FC (ETL) LISTED

Table of Contents

1.   Introduction

The **EnOcean Bridge** acts as a communication bridge between the Autani System and EnOcean devices for the following applications.
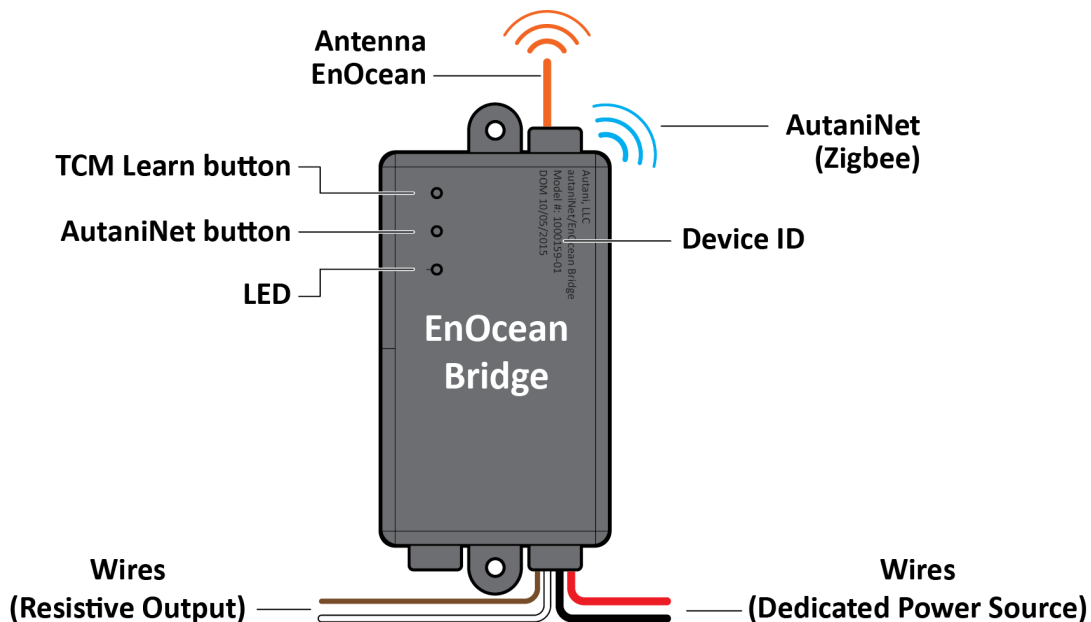
1.1.   HVAC Application

In general, the **EnOcean Bridge** will receive temperature readings from multiple remote sensors and provide an average temperature reading to the thermostat. Based on the average readings from the **EnOcean Bridge**, the thermostat would trigger the HVAC system to maintain the temperature of an area. If the system has a single remote sensor, there is no averaging, and the bridge would transmit only the single remote sensor data to the thermostat.

Parallel to the above bridging process, the **EnOcean Bridge** will also allow the devices to be connected to the Autani Manager's EnergyCenter® Software, via the autaniNet wireless network. The software can commission the remote sensors and also generate reports for all the devices.
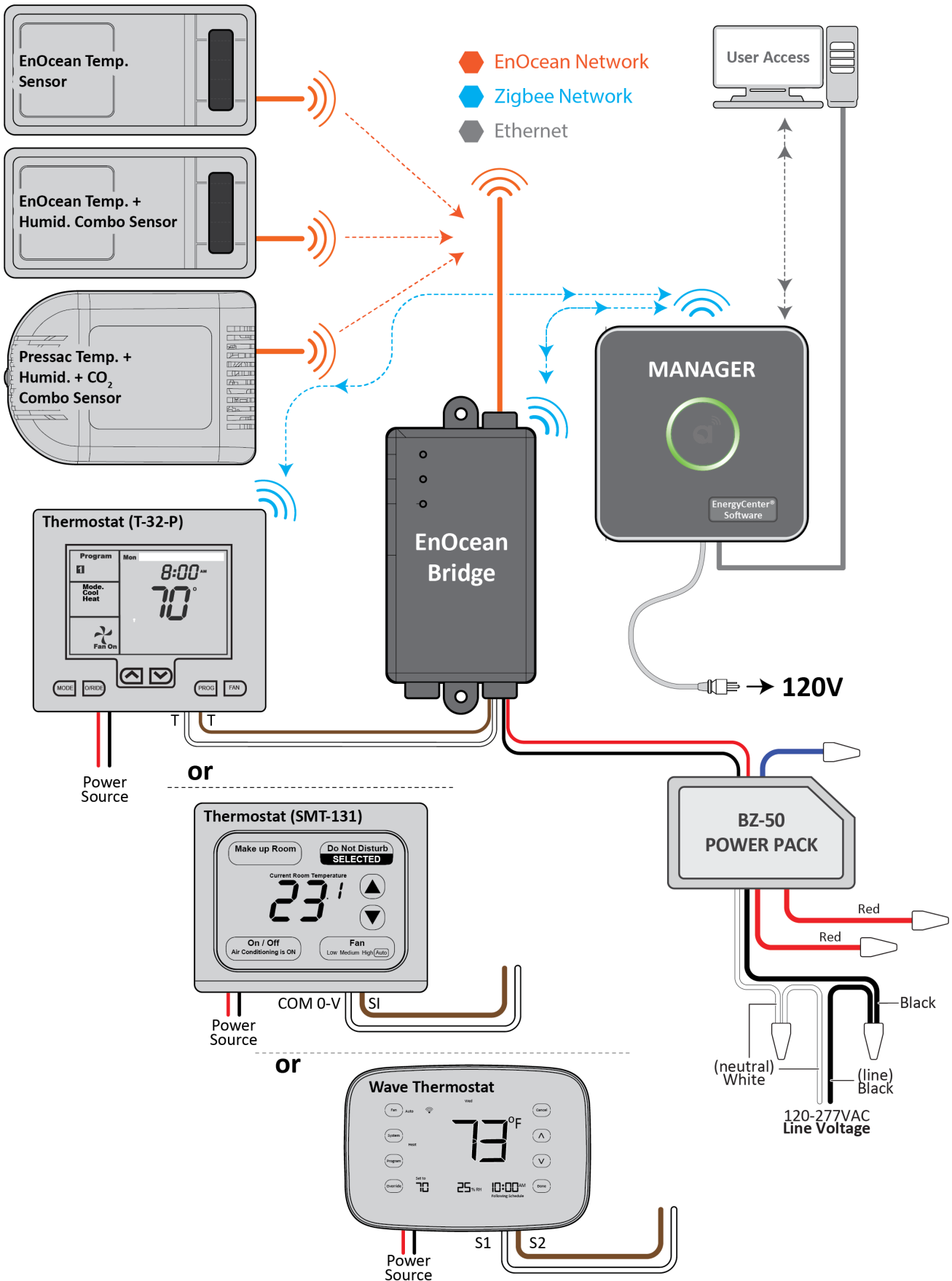
1.2.   General Pass-through Application

Another major functionality of the **EnOcean Bridge** is the General Pass-through feature in the absence of a thermostat. The sensor readings received by the **EnOcean Bridge** are directly transmitted to the Autani Manager's EnergyCenter® Software, via the autaniNet wireless network. The pass-through application can also be used with other select EnOcean sensors that Autani has certified capability with.
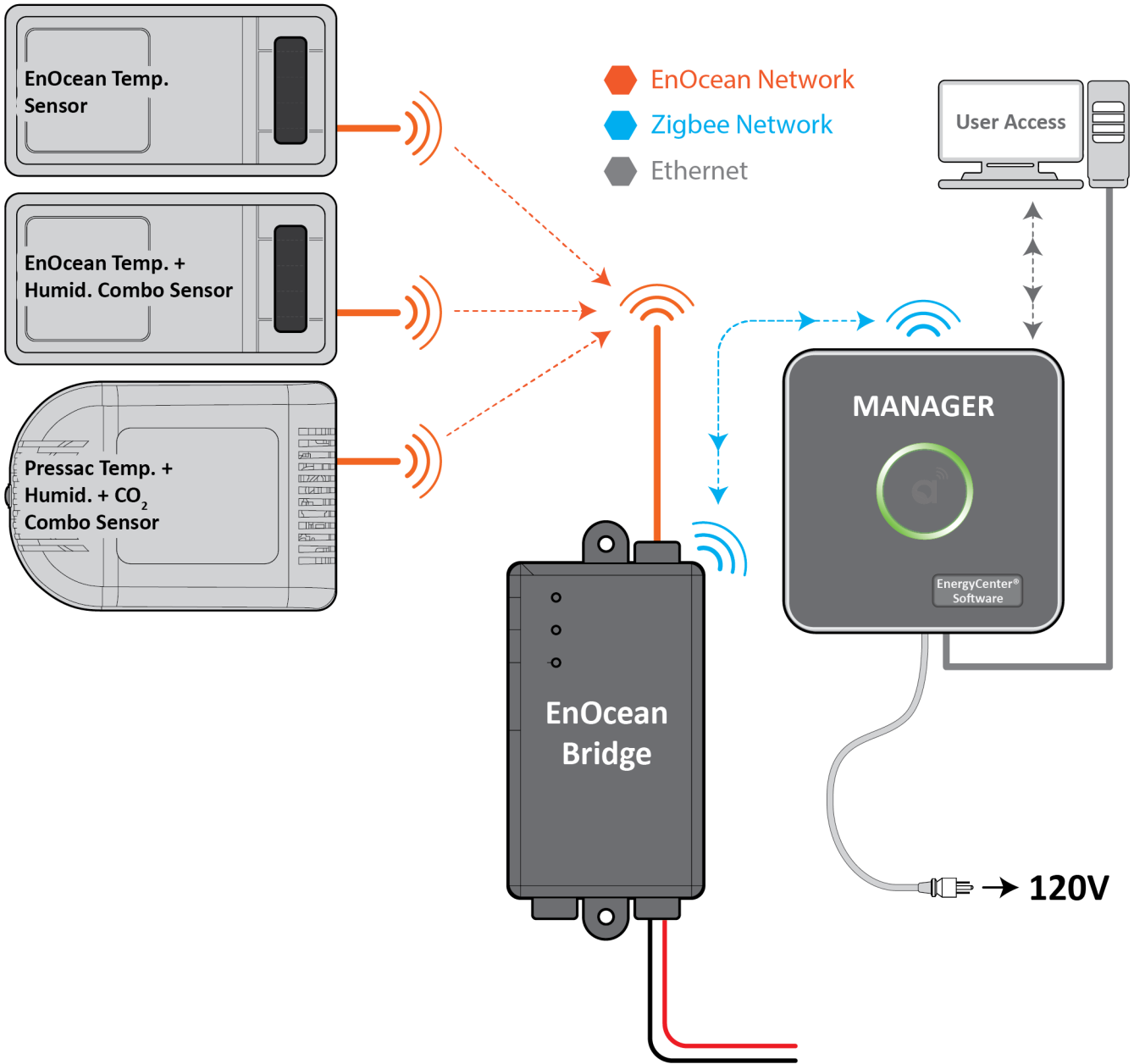

❑   The **EnOcean Bridge** can locally pair with remote temperature sensors, or they can be remotely commissioned through **EnergyCenter®** Software.

❑   The **EnOcean Bridge** can locally pair with the following **SENSORS** inside **HVAC Application**; it also supports other types of EnOcean devices (like motion or contact sensors) within the **Pass-through Application**.

  ☐   EnOcean Temperature Sensor (Model: EEP: A5-02-05).
  ☐   EnOcean Temperature + Humidity Combo Sensor (Model: EEP: A5-04-01).
  ☐   Pressac Temperature + Humidity + CO_2 Combo Sensor (Model: EEP: A5-09-04).

  NOTE: Each **EnOcean Bridge** can map up to ten remote sensors within a range of 80 - 100 ft LOS.

❑   The **EnOcean Bridge** supports any thermostat with a 10k ohm type 2 thermistor. This Quick Start Guide describes the connection with following thermostats:

  ☐   Autani SMT-131.
  ☐   Autani T-32-P.
  ☐   Autani WAVE

2.   System Overview
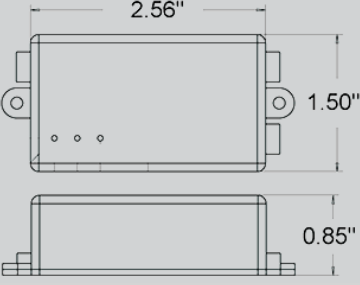
HVAC Applications.......|Autani Applications...............................

EnOcean Temp. Sensor

EnOcean Temp. + Humid. Combo Sensor

Pressac Temp. + Humid. + CO_2 Combo Sensor

⬡ EnOcean Network
⬡ Zigbee Network
⬡ Ethernet

User Access

MANAGER

EnergyCenter®
Software

EnOcean Bridge

→ **120V**

Thermostat (T-32-P)

Program   Mon
1
8:00 AM
Mode.
Cool
Heat
70°
Fan On

MODE O/RIDE ︿ ﹀ PROG FAN

T   T

Power
Source

or

Thermostat (SMT-131)

Make up Room   Do Not Disturb
SELECTED

Current Room Temperature

23¹ ▲
▼

On / Off   Fan
Air Conditioning is ON   Low Medium High Auto

COM 0-V   SI

Power
Source

or

Wave Thermostat

Fan Auto 📶   Wed   Cancel
System   Heat   73°F   ∧
Program   ∨
Override Set to 25% RH 10:00AM Done
          70   Following Schedule

S1   S2

Power
Source

BZ-50 POWER PACK

Red
Red

Black

(neutral)
White

(line)
Black

120-277VAC
Line Voltage

Passthrough Applications....|**Autani** Applications.....................

EnOcean Temp. Sensor

EnOcean Temp. + Humid. Combo Sensor

Pressac Temp. + Humid. + CO$_2$ Combo Sensor

⬡ EnOcean Network
⬡ Zigbee Network
⬡ Ethernet

User Access

MANAGER

EnergyCenter®
Software

EnOcean Bridge

120V

3. Specifications

3.1. EnOcean Bridge

Electrical
Input Voltage: 12-24V AC/DC

Environmental
Operating Temperature: 0° to 60°C
Storage Temperature: -25° to 80°C

Range
autaniNet: Approx. 600' LOS transmit/receive
EnOcean: Approx. 80-100' LOS transmit/receive
(See individual devices)

Radio Network (autaniNet)
IEEE 802.15.4-2003 2.4GHz ISM

Radio Network (EnOcean)
EnOcean 902 MHz

Regulatory Approvals
Module 1:
FCC ID: V8NWAT1000153 and SZVSTM300U
IC: 7737A-WAT1000153 and 5713A-STM300U
Module 2:
FCC ID: SZV-STM300U and SZVSTM300U
IC: 5713A-STM300U and 5713A-STM300U

Ordering Information
SKU: A06-01-0440-01
Description: autaniNet/EnOcean Bridge

Physical
Dimensions (HxWxD): 2.56 x 1.5 x 0.85 in

2.56"
1.50"
0.85"

3.2. EnOcean Temperature Sensor

Power supply: Solar cell

Antenna: Whip or helix antenna

Frequency
868.3 MHz (STM 33x) / 902.875 MHz (STM 33xU)

Radiated output power
STM 330 / 331: max. 6.4 dBm / 5 dBm (EIRP)
331U and STM 333U: typ 92 dBµV/m / 99 dBµV/m

Data rate / Modulation type
125kBit/s / ASK (868.3MHz) / FSK (902.875MHz)

Start-up time with empty energy storage
typ. <2.5 min @ 400 lux, 25 °C

Initial operation time in darkness @25°C[1]
Typ. 4 days, if energy storage fully charged wake-up every 100 s, transmission every 1000 s on average.

Input Channels
Internal: temperature sensor, LRN button
External via 20 pin connector: occupancy button, set point dial, HSM 100

Temperature sensor
Measurement range 0-40 °C, resolution 0.16 K
Accuracy typ. ±0.5 K between 17 °C and 27 °C, typ. ±1 K between 0 °C and 40°C

Transmission indicator: 1x LED

EnOcean Equipment profiles
Configurable EEPs: A5-02-05, A5-02-30, A5-10-05, A5-10-03 and with HSM 100: A5-04-01, A5-10-10, A5-10-12

Module dimensions
43 x 16 x 8 mm

Operating temperature[1]
-20 up to +60 °C

Radio approvals
STM 330 (max. radiated power +6.4dBm whip): RED (EU)
STM 331 (max. radiated power+5 dBm helix) : RED (EU)
STM 331U, 332U and STM 333U: FCC (US) / ISED (CA)

3.3. EnOcean Temperature + Humidity Combo Sensor

Power Supply: Solar cell

Antenna: Whip or helix antenna

Frequency
868.3 MHz (STM 33x) / 902.875 MHz (STM 33xU)

Radiated output power
STM 330 / 331: max. 6.4 dBm / 5 dBm (EIRP)
331U and STM 333U: typ 92 dBµV/m / 99 dBµV/m

Data rate / Modulation type
125kBit/s / ASK (868.3MHz) / FSK (902.875MHz)

Start-up time with empty energy storage
typ. <2.5 min @ 400 lux, 25 °C

Initial operation time in darkness @25°C[1]
Typ. 4 days, if energy storage fully charged wake-up every 100 s, transmission every 1000 s on average

Input Channels
Internal: temperature sensor, LRN button
External via 20 pin connector: occupancy button, set point dial, HSM 100

Temperature sensor
Measurement range 0-40 °C, resolution 0.16 K
Accuracy typ. ±0.5 K between 17 °C and 27 °C, typ. ±1 K between 0 °C and 40°C

Transmission indicator: 1x LED

EnOcean Equipment profiles
Configurable EEPs: A5-02-05, A5-02-30, A5-10-05, A5-10-03 and with HSM 100: A5-04-01, A5-10-10, A5-10-12

Module dimensions
43 x 16 x 8 mm

Operating temperature[1]
-20 up to +60 °C

Radio approvals
STM 330 (max. radiated power +6.4dBm whip): RED (EU)
STM 331 (max. radiated power+5 dBm helix) : RED (EU)
STM 331U, 332U and STM 333U: FCC (US) / ISED (CA)

3.4. Pressac Temperature + Humidity + CO₂ Combo Sensor

Measurement Range
CO_2 0 to 2550 PPM
Temperature 0 °C to +51 °C
Humidity 0 to 100% RH

Accuracy
CO_2 +/- 125PPM
Temperature +/- 0.5 °C
Humidity +/- 5% RH

Sampling Rate
Can be fixed to 15 minutes or can dynamically adjust between 5 and 15 minutes dependent on power source and light conditions

Repeater : No

Telegram
4BS

Environment
IP2X

Battery* Back Up
3.6v A size non rechargeable Lithium

Enclosure Material
ABS

Calibration
Manual or auto recalibrates every 8 days

Solar
Amorphous Silicon Solar Cells

Operating Temperature Range
-5 °C to +60 °C

Storage Temperature Range
-20 °C to +55 °C

Sensor Response Time
Telegram transmission is within 2 seconds of measurement.

Dimensions: 115 x 80 x 35 mm approx.

EEP : A5-09-04

[1]*Full performance is achieved after several days of operation (up to two weeks) at a good illumination level. Performance degrades over life time, especially if energy storage is exposed to higher temperatures. Each 10 K drop in temperatures doubles the expected life span.*
Battery life dependant on ambient light conditions.

4. Mounting the EnOcean Bridge

1. Mount the **EnOcean Bridge** in a convenient location at a desired distance from the ground, and within a range of 80-100 ft to the remote sensors.
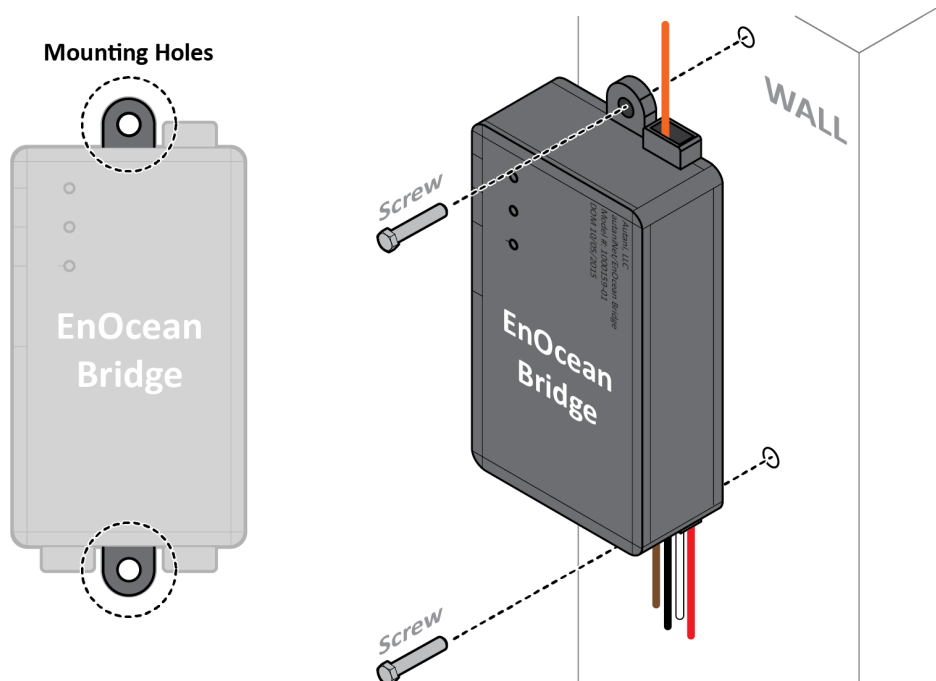
2. There are two mounting holes provided on the **EnOcean Bridge**. Locate a place to mount the **EnOcean Bridge**, mark the holes to be drilled, and drill two holes on the wall.

3. Place and align the **EnOcean Bridge** mounting holes with the holes on wall. Insert screws on both ends of the Bridge and torque tighten the screws.

5. Connecting EnOcean Bridge to Thermostat

CAUTION: Ensure the thermostat is not connected to the main line or power source (24VDC).

1. If the thermostat is already mounted to a wall, unmount the thermostat to proceed. (Please refer to the **Installation Manual of respective thermostat**.)

2. Locate the release slot on the bottom of the thermostat. Insert a small coin or a flat screwdriver and gently twist to open the sensor housing upside.
NOTE: Handle the sensor housing gently, not to stress the LCD or bend the terminal connector pins.
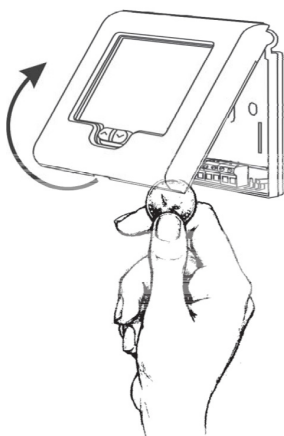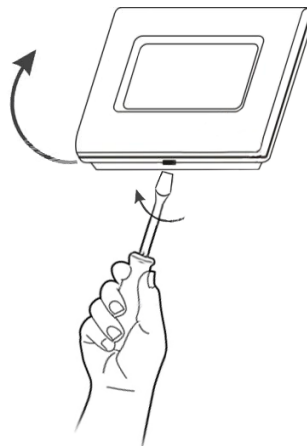
Thermostat: T-32-P	Thermostat: SMT-131	Wave Thermostat
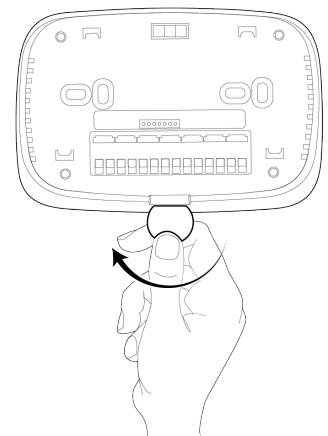
NOTE: After each connection detailed in below procedure, ensure the terminal connections are secure by fastening a screw into the terminals. DO NOT over tighten.

3. Except for the antenna, insert all the wires from the **EnOcean Bridge** into the large hole provided on the Base Plate of Thermostat. (**NOTE**: INSERT THE WIRES FROM THE BACKSIDE OF THE BASE PLATE).
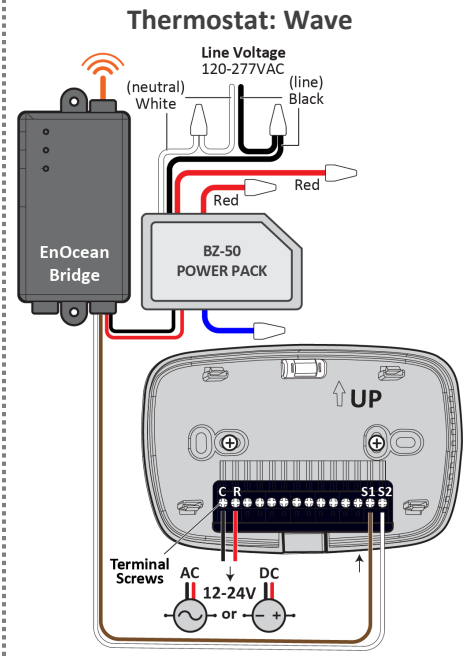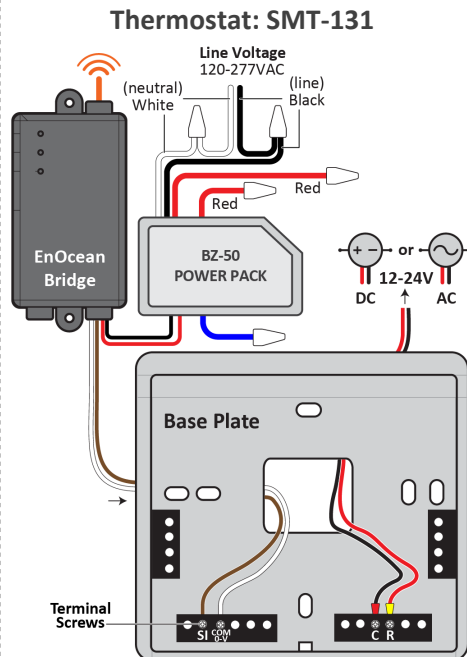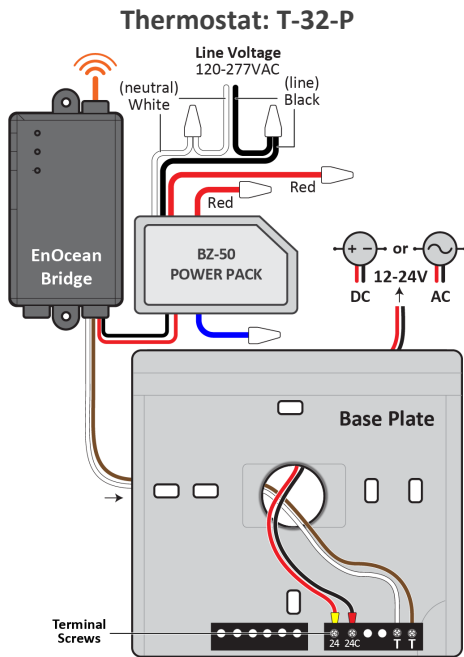
Thermostat: T-32-P	Thermostat: SMT-131	Thermostat: Wave

4. Connect the Red and Black wires of **EnOcean Bridge** to the Power Pack.

5. Ensure the **Power Pack** is connected to a Power Source (120-277VAC).

6. Connect the White wire from **EnOcean Bridge** to the first TT terminal of the thermostat.

7. Connect the Brown wire from **EnOcean Bridge** to the second TT terminal of the thermostat.

4. Connect the Red and Black wires of **EnOcean Bridge** to the Power Pack.

5. Ensure the **Power Pack** is connected to a Power Source (120-277VAC).

6. Connect the White wire from **EnOcean Bridge** to the **COM 0-V** terminal of the thermostat.

7. Connect the Brown wire from **EnOcean Bridge** to the **SI** terminal of the thermostat.

4. Connect the Red and Black wires of **EnOcean Bridge** to the Power Pack.

5. Ensure the **Power Pack** is connected to a Power Source (120-277VAC).

6. Connect the White wire from **EnOcean Bridge** to the **S2** terminal of the thermostat.

7. Connect the Brown wire from **EnOcean Bridge** to the **S1** terminal of the thermostat.

8. Connect the HVAC and others wires to thermostat. (Please refer to the **Installation Manual of respective thermostat**.)

9. Mount the thermostat to the wall. (Please refer to the **Installation Manual of respective Thermostat**.)

10. Gently close the sensor housing onto the base plate of Thermostat and proceed to section *Connect EnOcean Bridge to Remote Sensors* of this guide to pair with remote sensors.

5.1.   Mounting the Thermostats

This Quick Start Guide will not cover mounting instructions for the thermostat. For instructions on thermostat installation, please refer to the **installation manual of respective thermostat** on the Autani web portal.

> **NOTE:** The brown and white Resistive Output wires MUST be shielded from the 24V wire run, using dedicated conduit and shielding as needed. Failure to do so will cause an incorrect temperature reading into the thermostat from the remote sensors.

6. Connect EnOcean Bridge to Remote Sensors

The **EnOcean Bridge** can pair with the sensors locally or be commissioned remotely through the EnergyCenter® software.

6.1. Pairing Locally

1. Put the **EnOcean Bridge** into Learning Mode
   a. Insert a pin into the TCM-LRN (learn) button.
   b. Press and hold the TCM-LRN button until the Green LED turns on (after about 2-3 seconds).
   c. Release the button. The LED will turn Amber.
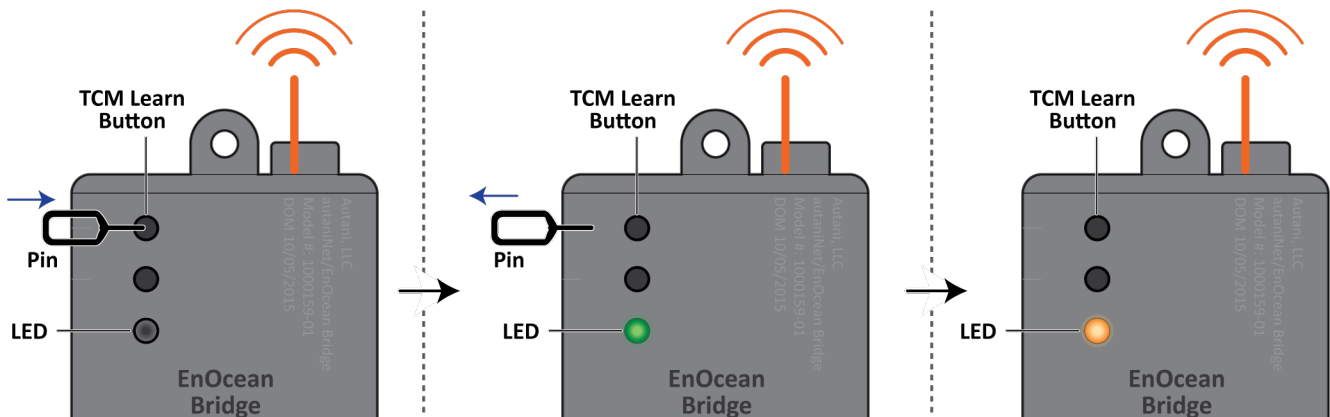
2. Pair the EnOcean Temperature Sensor to the **EnOcean Bridge**

   NOTE: Pair the sensor within 30 seconds. The 30 second timer resets when a new device is mapped.

   WARNING: Handle the sensor housing gently while dismantling the sensor to avoid damaging internal parts.

   a. Use a 1/16" Allen Wrench to access the Learning Button by removing the screws from the bottom of the sensor housing. Slightly open the bottom of the sensor housing and then slide it up to disconnect it from the top of the base plate.
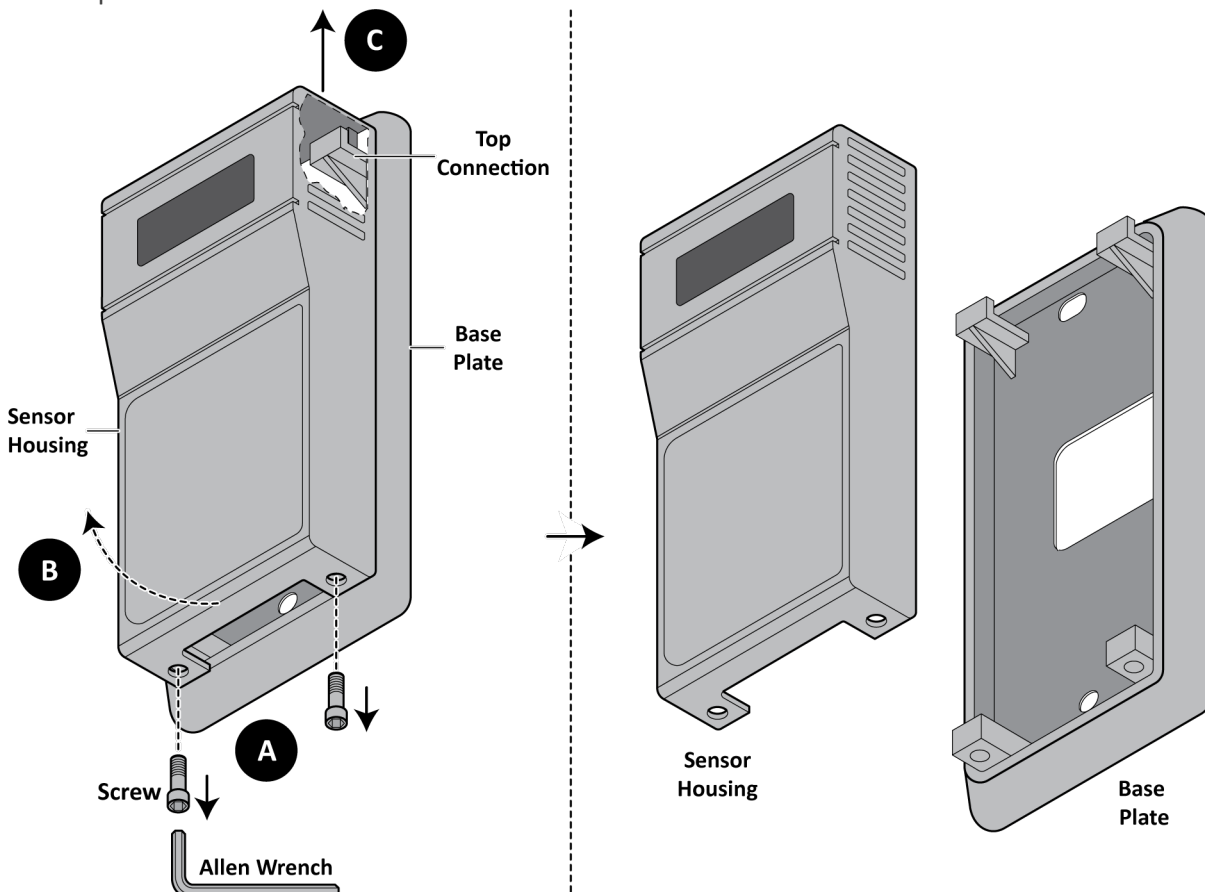
b. Press the Learn Button on the sensor housing. If a message is sent, the Red LED will flash on the sensor. If the Bridge has received the message, its LED will briefly turn Green.
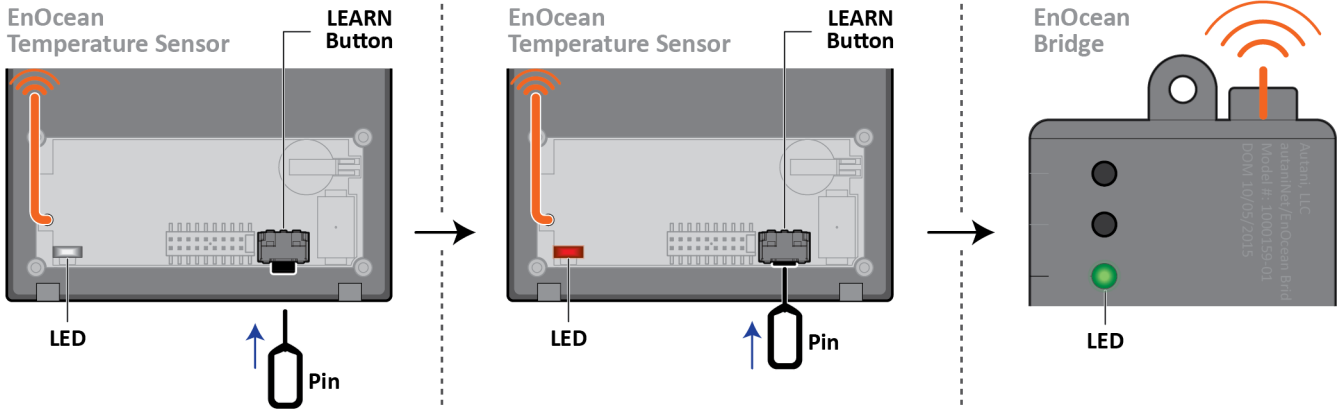
3. Pair the EnOcean Temp + Humidity Combo Sensor to the **EnOcean Bridge**

    a. Repeat step 2. **NOTE:** Pair the sensor within 30 seconds. The 30 second timer resets when a new device is mapped.
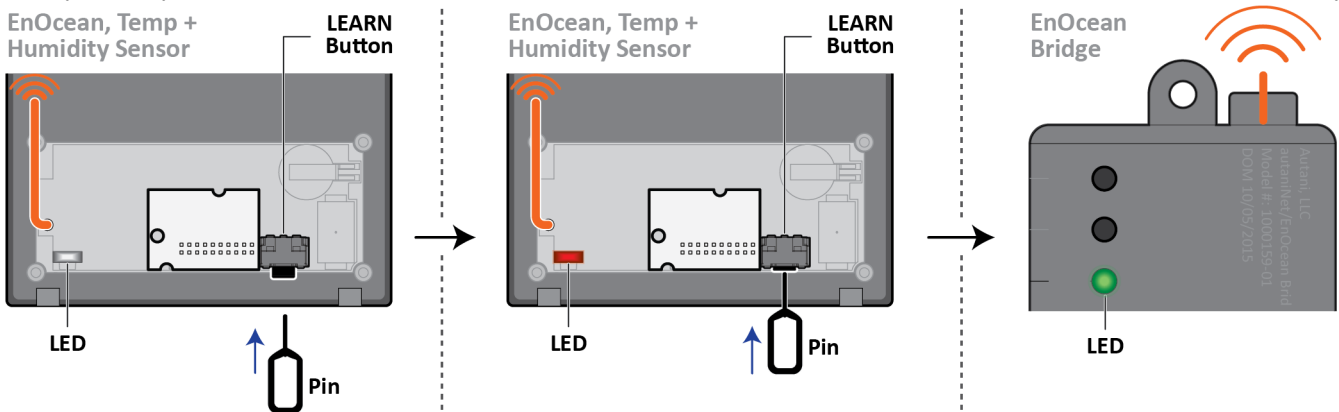
4. Pair the Pressac Temp + Humidity + CO_2 Combo Sensor to the **EnOcean Bridge**

    NOTE: Pair the sensor within 30 seconds. The 30 second timer resets when a new device is mapped.

    WARNING: Handle the sensor housing gently while dismantling the sensor to avoid damaging internal parts.

    a. Use a Philips screwdriver to access the Learning Button by removing the screws from the bottom of the sensor housing. Slightly open the top of the sensor housing and disconnect it from the base plate.

b. Press the Learn Button on the sensor housing. If a message is sent, the Red LED will flash on the sensor. If the Bridge has received the message, its LED will briefly turn Green.

Pressac Temperature + Humidity + CO² Sensor   **Pressac Temperature + Humidity + CO² Sensor**   **EnOcean Bridge**
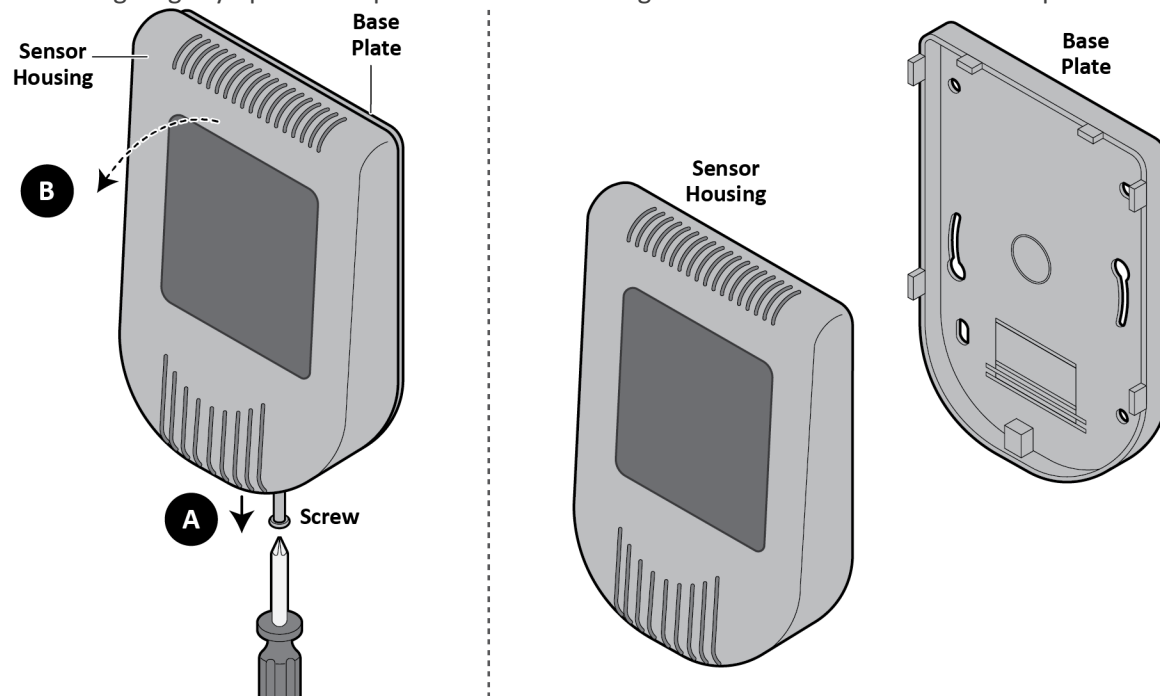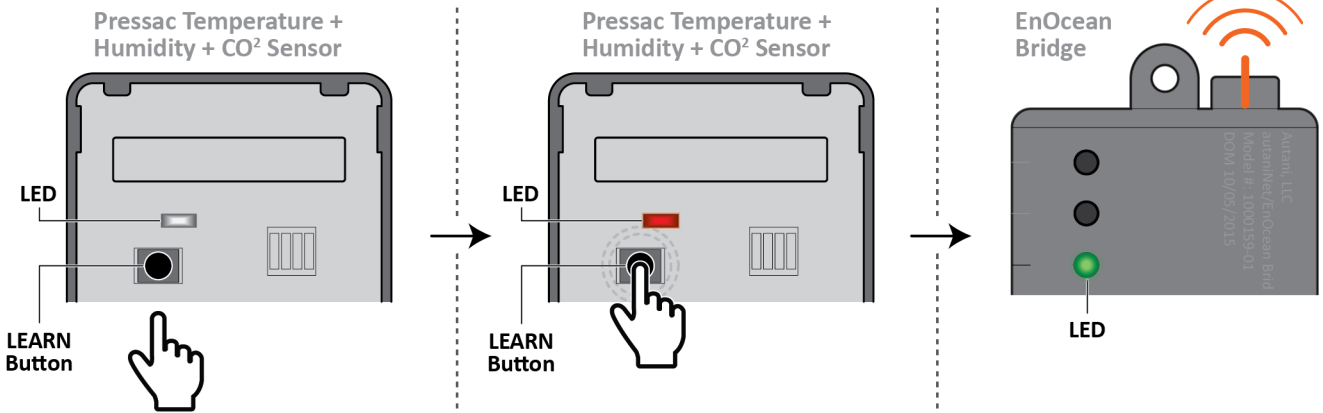
NOTE: Wait at least 30 seconds for learn mode to exit.

5. Verify sensors were paired (when the **EnOcean Bridge** is not in Learn Mode)

a. Press the Learn Button on the sensor.

b. The **EnOcean Bridge** LED should briefly turn solid green.

NOTE: If the **EnOcean Bridge** was already connected to autaniNet before the local binding, then the user must 'Rediscover' the **EnOcean Bridge** before the local bindings will show from the Bridges GUI within EnergyCenter®.

- A device can be rediscovered from **Settings** > **Device Setup** > **View Wireless Network** accordingly.
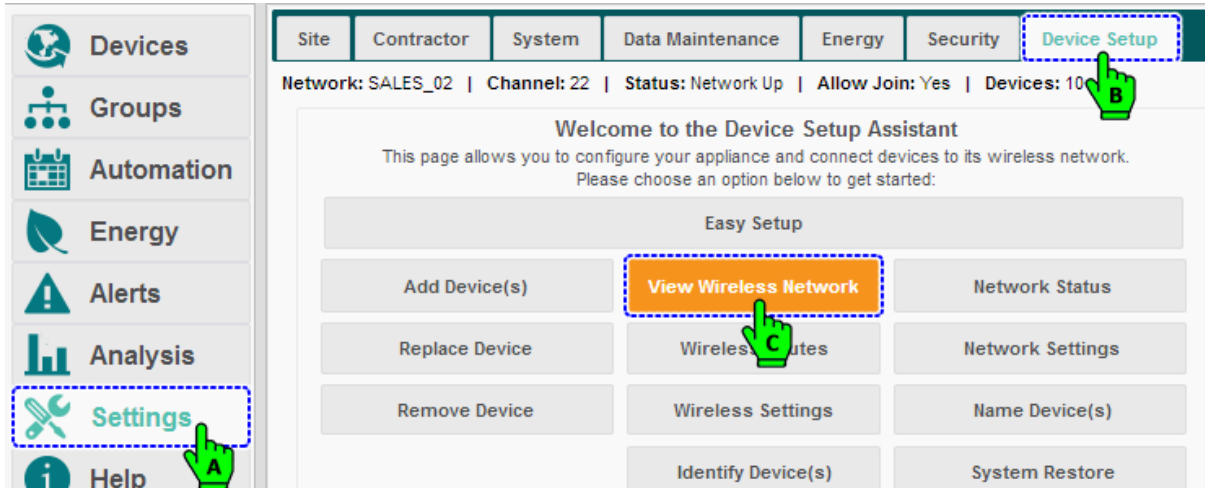
- Select the **Bridge** and click on **Rediscover** button.
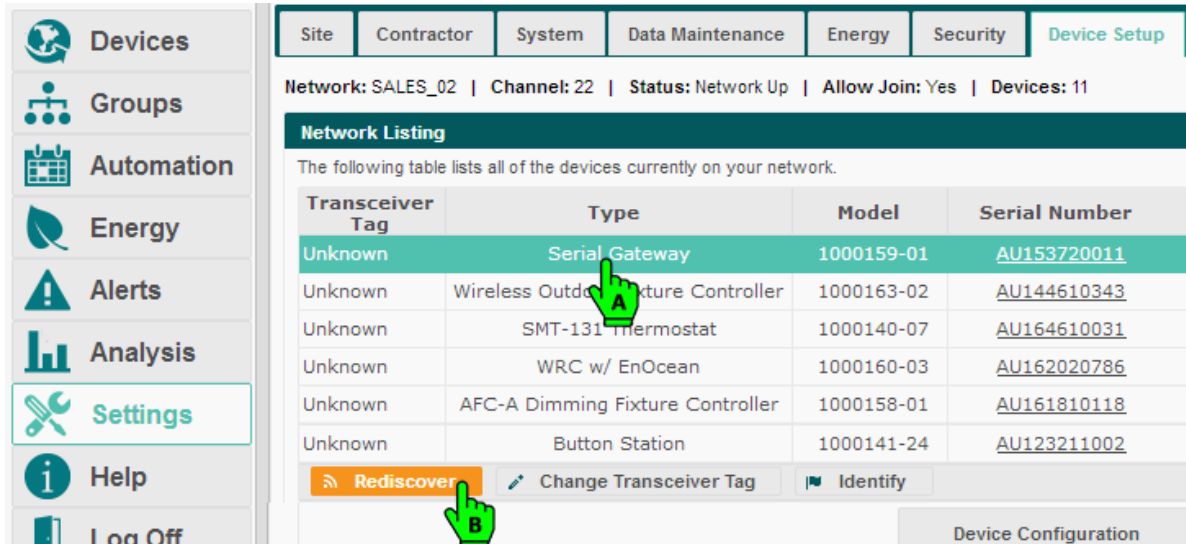
6.2. Commissioning Remotely

The **EnOcean Bridge** and the remote sensors can also be paired and commissioned through the Autani Manager's EnergyCenter® Software.

1. Login to the Autani web portal using the credentials provided.

2. By default the browser will load the **Device** page with the **Dashboard** data. (For more information on the User Interface, please refer to the **Help section of EnergyCenter®**.)

6.2.1. Commissioning EnOcean Bridge

1. To add the **EnOcean Bridge**, click **Settings** > **Device Setup** > **Add Device(s)**.

   NOTE: If the **Add Device(s)** button is not available, proceed with the **Easy Setup** wizard.

2. The **Add Device(s)** page loads. Select the **EnOcean Bridge** from the list of devices and click **Next**.

    NOTE: The system may need a moment to search for and list nearby devices.

3. Review the selected device and click **Next**.
4. The last screen confirms the addition of an **EnOcean Bridge** to the system. Click **Finish** to complete the process.

5. The **EnOcean Bridge** is now available inside the **Devices** section under **Extender** Tab.

6. To commission the remote sensors, click **Devices** and then click the **Extender** tab, select the **EnOcean Bridge – AU165210838** from the list, and click **Setup**.
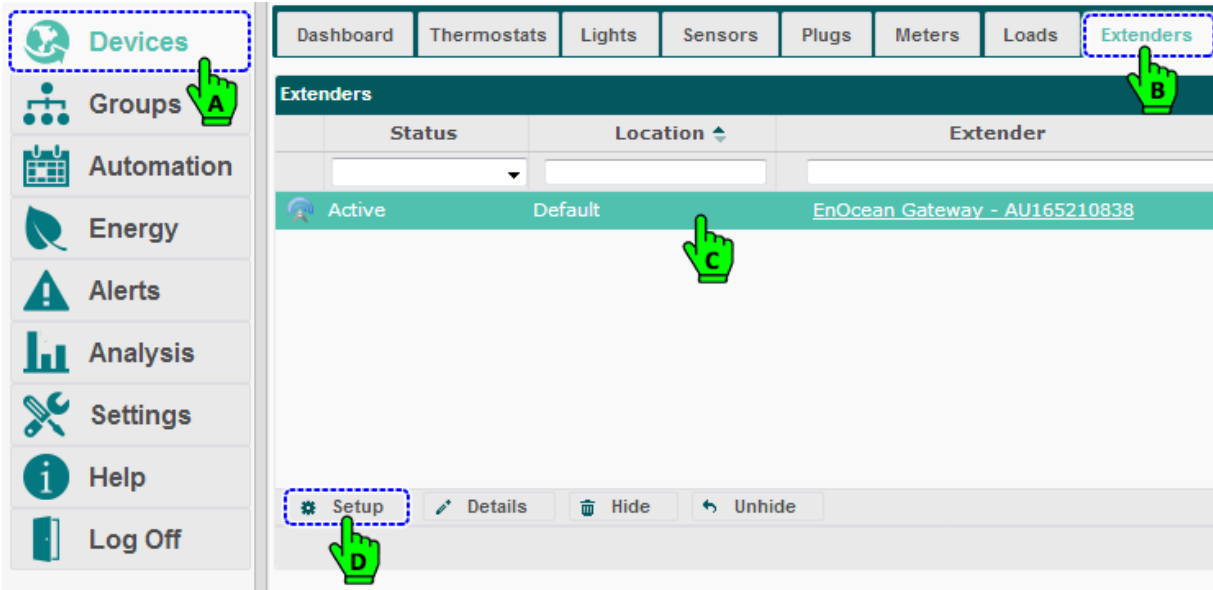
7. The **Setup Extender** pop-up menu appears containing **General** and **Sensors** tabs. The **General** tab is selected by default and contains three options for the Pass-through feature of **EnOcean Bridge**. Here the user can choose to limit the amount of EnOcean messages sent to Autani Manager.

8. Select the option **All - all EnOcean messages are forwarded**... to forward all the messages. Click **Save**.
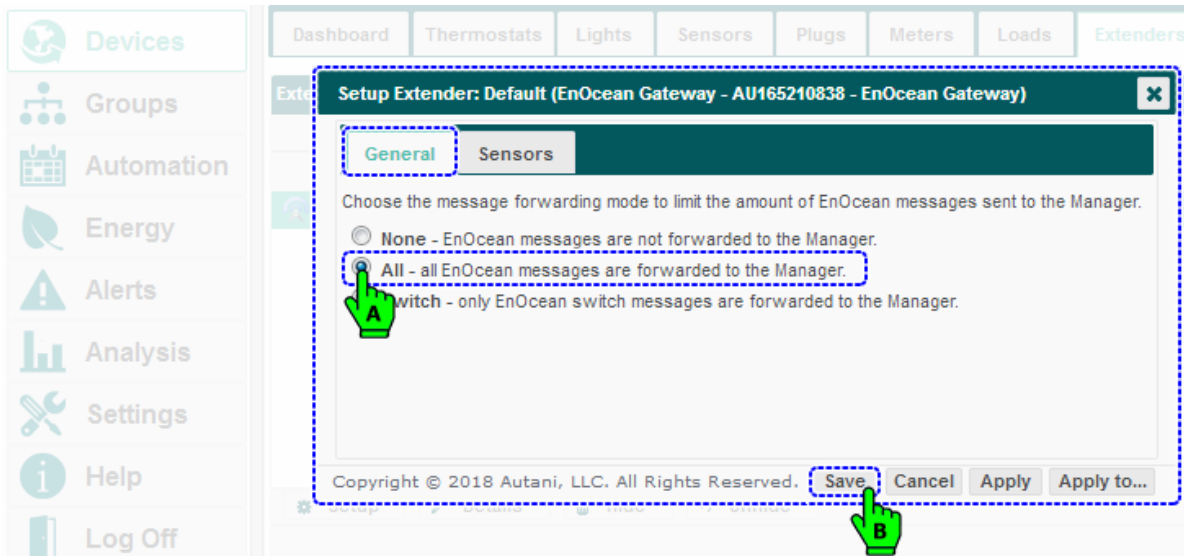
6.2.2. Commissioning Remote Sensors

1. Click on the **Sensors** tab, which will allow the user to commission the sensors. The tab should have already listed the sensors added during Learning Mode, or the user can add them directly to the list and set the type of sensing.
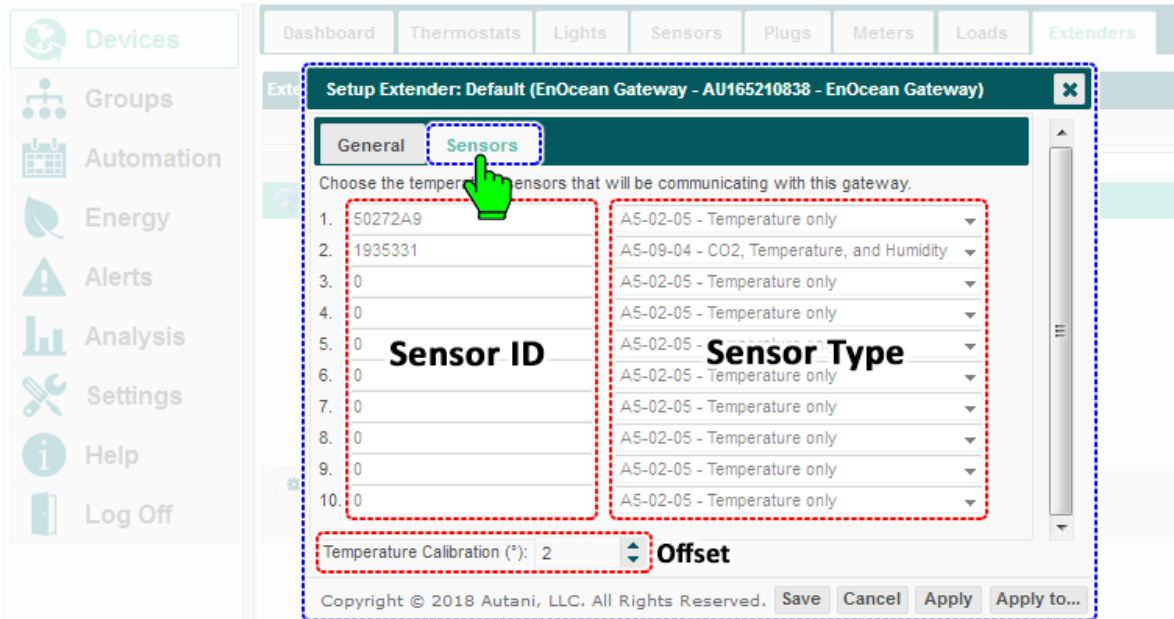
- ☐ There are two columns inside the Sensor tab, one for **Sensor ID** and another for **Sensor Type**.
- ☐ **NOTE**: There is also a feature to **calibrate** the averaged temperature if the averages are not inline. This can be done by providing the **offset** to the average by few degrees; this offset is stored inside the **EnOcean Bridge**.

2. To commission another sensor, locate the next available empty list, and place the cursor inside the ID field, and key in the **Sensor ID**. Select the type of sensor from the drop down list. Click **Save** followed by **Apply** button.
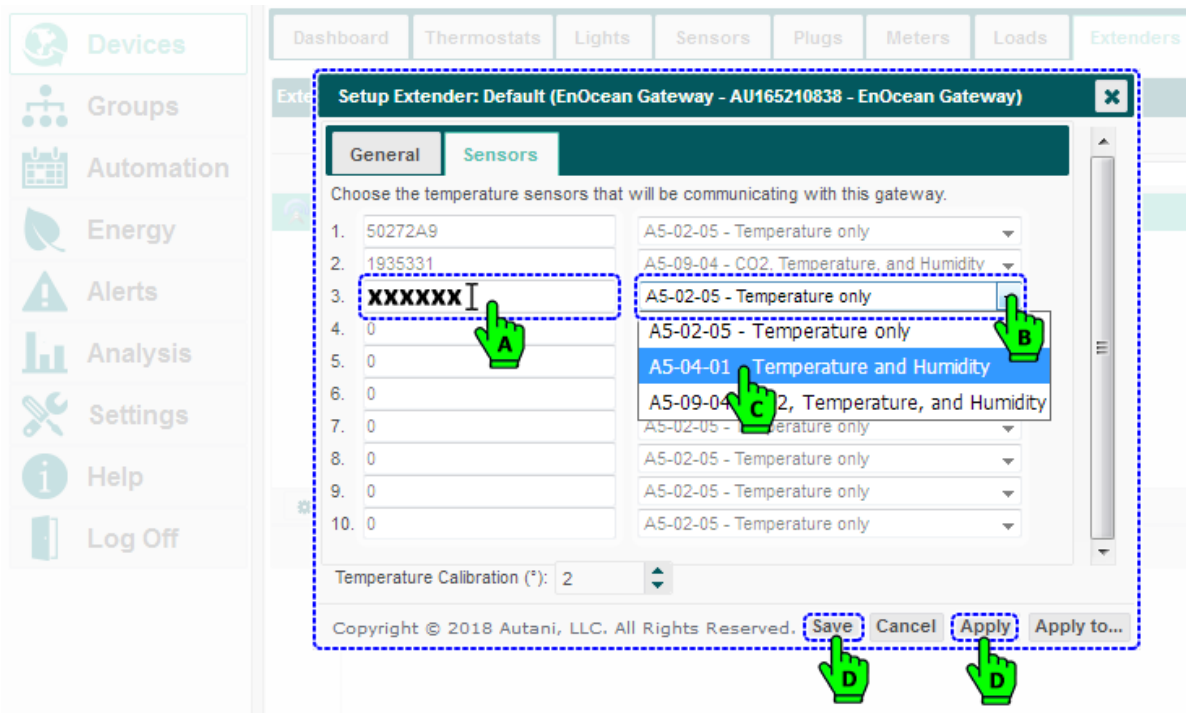
3. Start adding the sensors to the EnergyCenter® system. Click **Settings** > **Device Setup** > **EnOcean Device Management.**

4. The **EnOcean Device Management** page, lists all the EnOcean devices within the range of **EnOcean Bridge**.

5. Search/find a **Temp Sensor** in the list using Serial Number/Address. Select the desired sensor and click on **Set Device Type** to set the type of sensor.

   NOTE: The user can skip setting the device type if the sensor is already set with a device type while pairing locally, or if it is set inside the Sensor tab.
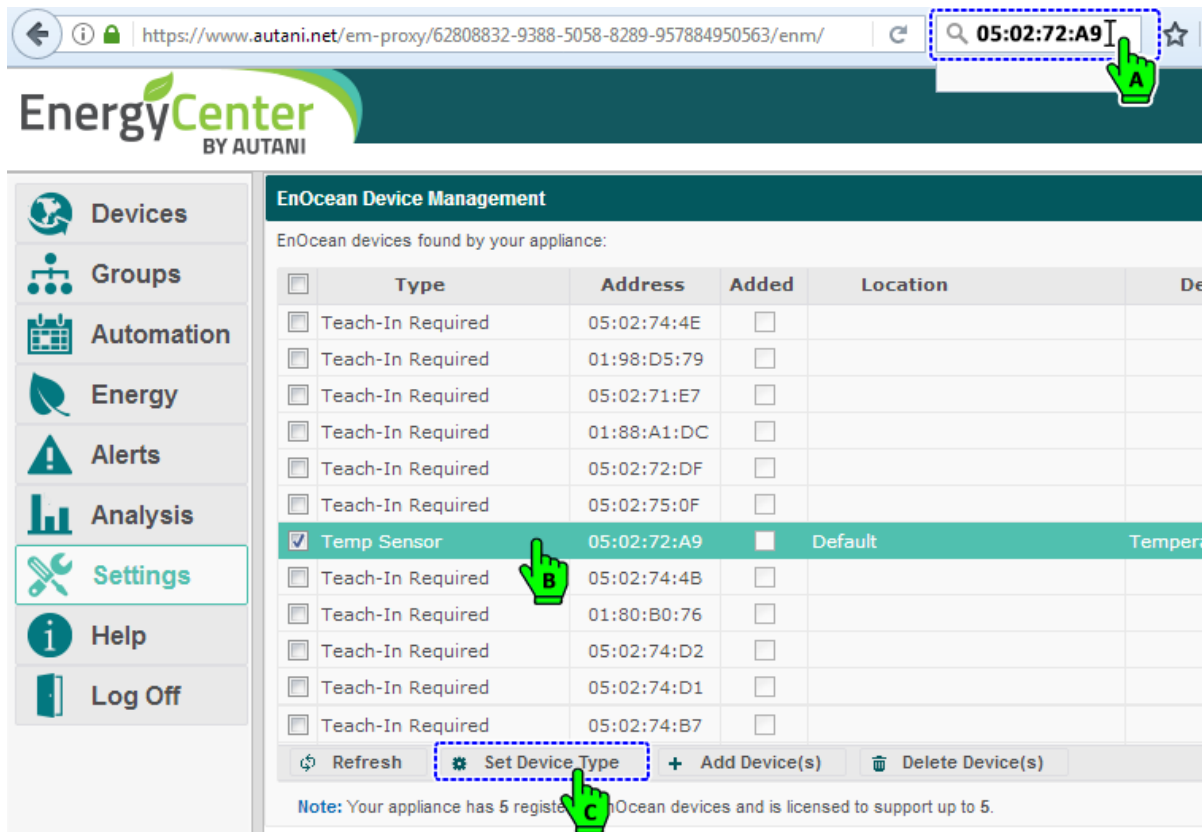
6. The **Set Device Type** pop-up menu appears; select the **Temp Sensor - A5-02-05** from the drop down list and click **Set** button to set the device type.
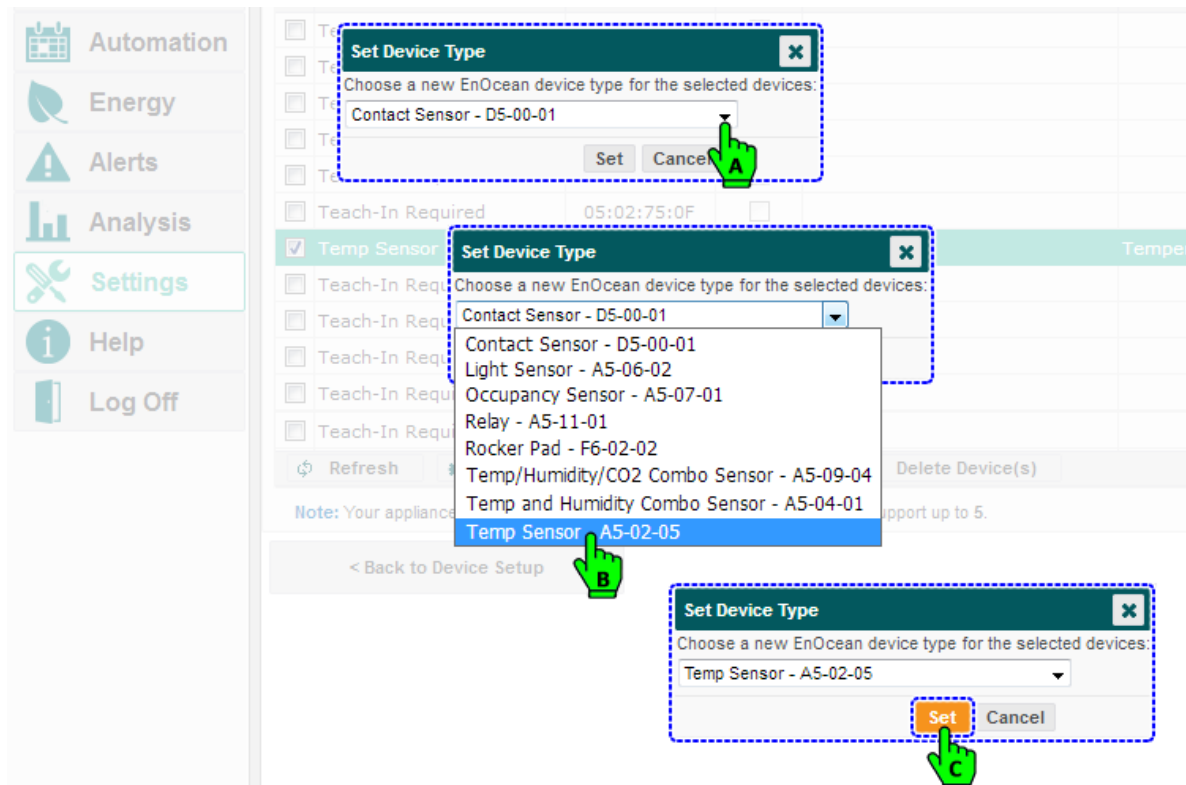
7. With the Temp Sensor still selected, click **Add Device(s)** button to add the Temp Sensor to EnergyCenter® System. **NOTE**: If the sensor is added, the check box in the **Added** column should be in checked state, or else click the **Refresh** button for the checked state to appear, confirming the addition of sensor to the system.

8. Repeat steps 5-7 to add **Temp + Humidity Sensor** to the system. Ensure the device type is set to **Temp and Humidity Combo Sensor - A5-04-01**.

☑ Temp/Humidity Combo Sensor	01:9F:F9:14	☑	Conference Room

9. Repeat steps 5-7 to add **Temp + Humidity + CO$_2$ Sensor** to the System. Ensure the device type is set to **Temp/Humidity/CO$_2$ Combo Sensor - A5-09-04**.

☑ Temp/Humidity/CO2 Combo Sensor	01:93:53:31	☑	Default

10. The Sensors added to the system should soon start reporting their values inside the **Sensors** tab.

11. Along with the temperature values, other values like humidity, CO$_2$, illuminance, etc., are also reported by respective sensors. These values are further utilized by EnergyCenter® software to generate reports as needed. This is one of the important features of pass-through application.

12. Click **Devices** and then click **Sensors** tab; all the sensors added to the system will report their values in **Value** column.
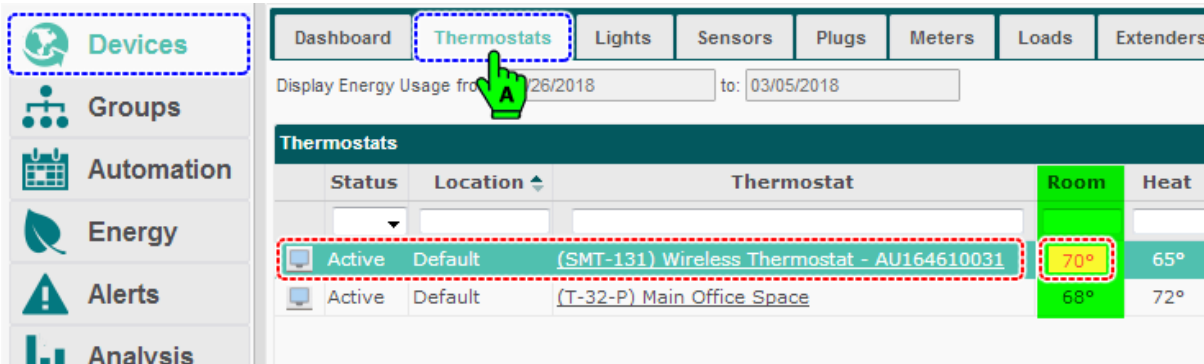
6.2.3. Commissioning Thermostats

1. The temperature readings from the sensors are averaged, which can be verified against the thermostat value. Click on the **Thermostat** tab and verify the average temperature displayed in the respective thermostat.

2. If the **EnOcean Bridge** is connected to a **SMT-131 Thermostat**, the remote sensor inside the **Thermostat Configuration** is set to **Data Only (use on-board sensors)** by default. This need to be changed to **Remote** Sensor.

3. Select the **SMT-131 Thermostat** from the list of thermostats, and click the **Setup** button.
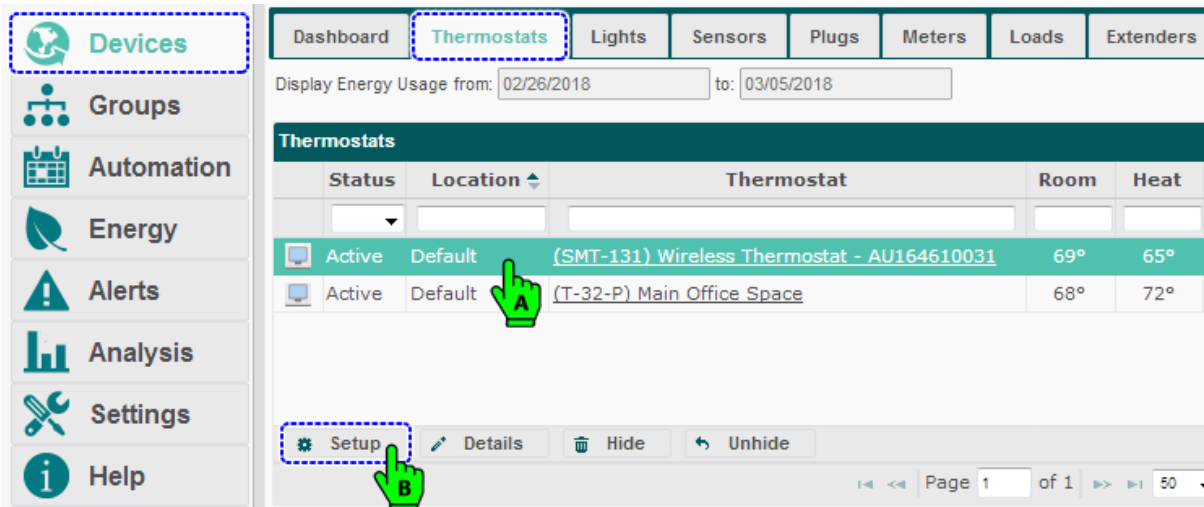
4. The **Setup Thermostat** pop-up menu appears. Click the **Thermostat Configuration** tab and set Remote Sensor to **Remote**. Click **Save**.
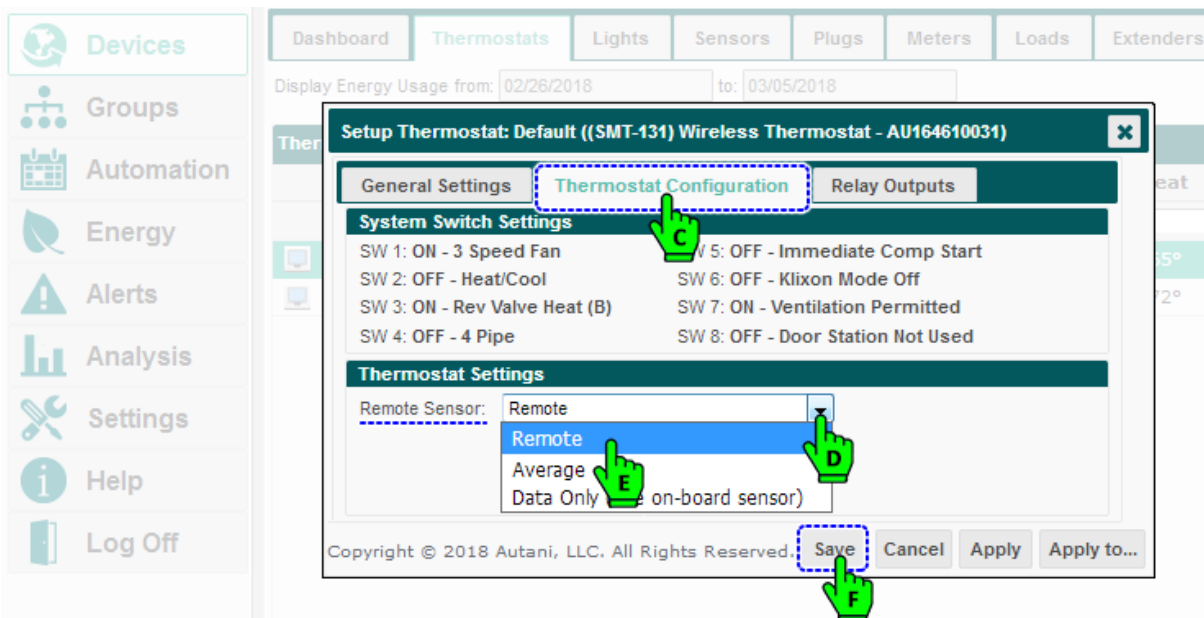
5. If the **EnOcean Bridge** is connected to a **T-32-P Thermostat**, the remote sensor inside the **Thermostat Configuration** is set to **Indoor Sensor** by default. If it is not, change it to **Indoor Sensor**.

6. Select the **T-32-P Thermostat** from the list of thermostats, and click the **Setup** button.
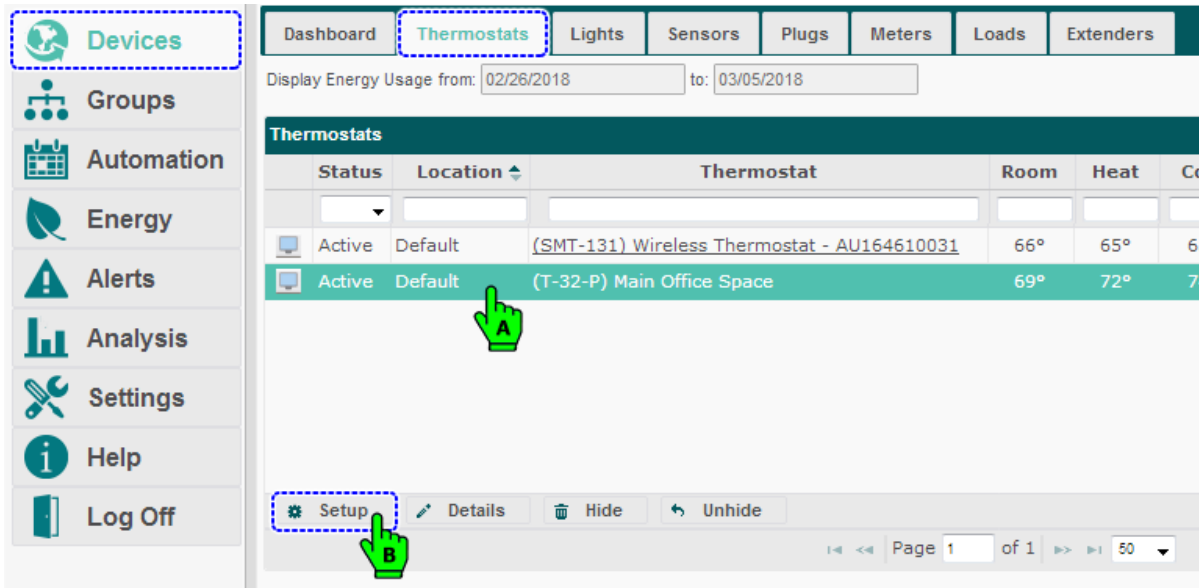
7. The **Setup Thermostat** pop-up menu appears. Click the **Thermostat Configuration** tab and set Remote Sensor to **Indoor Sensor** from the drop-down list. Click **Save**.

7.   Mounting the EnOcean Remote Sensors

The below procedures are common to both the **EnOcean Temperature Sensor** and **Temperature + Humidity Combo Sensor**.
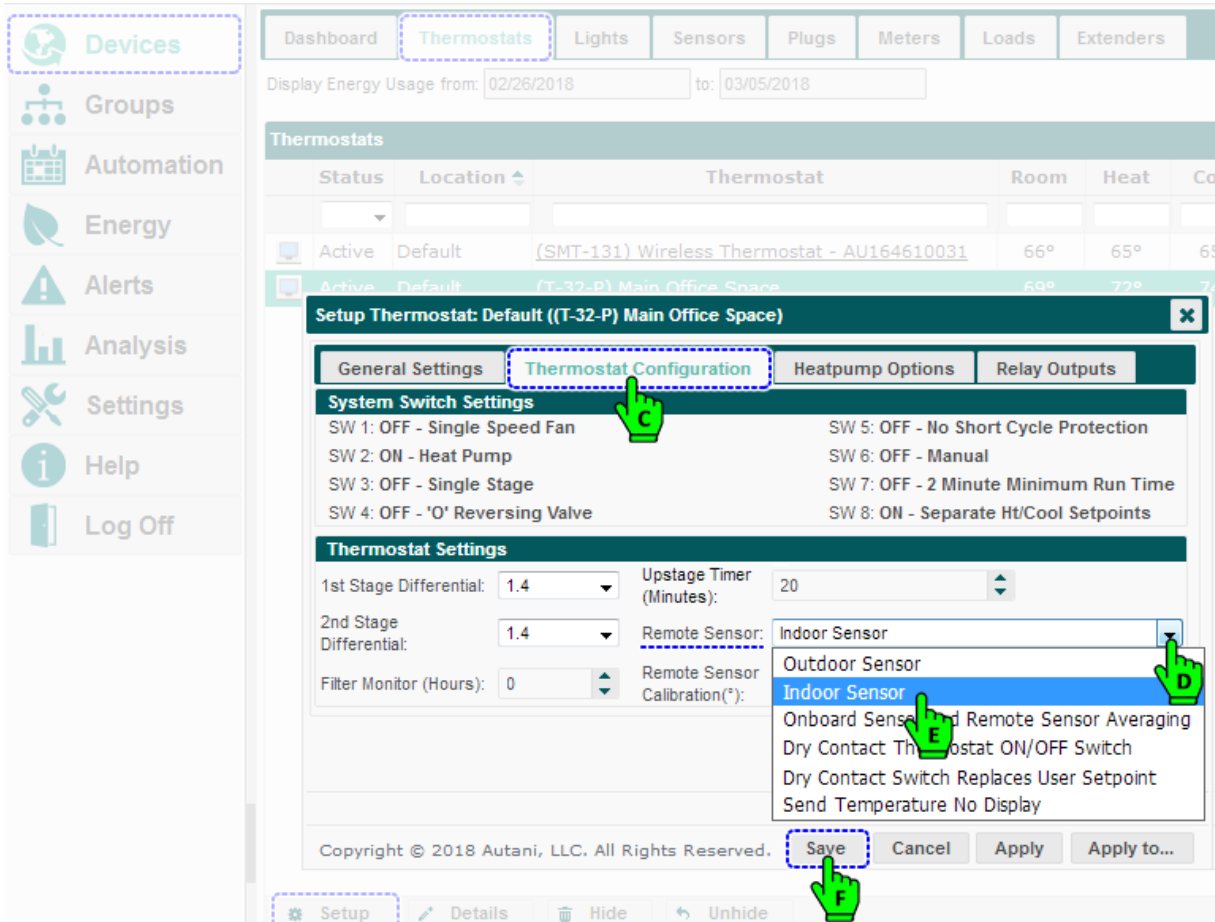
☐   The EnOcean remote sensors should be wall mounted in a convenient location at a desired distance from the ground and within a range of 80-100ft from the **EnOcean Bridge**.

☐   The sensors should be mounted in a place where it can receive sufficient ambient or outside light to maintain the charge without having to use a battery.

CAUTION: Handle the sensor housing gently while mounting/unmounting the sensor to avoid damaging internal parts.

1.   Using a 1/16" Allen Wrench to remove the screws from the bottom of the sensor housing. Slightly open the bottom of the sensor housing and then slide it up to disconnect it from the top of the base plate.

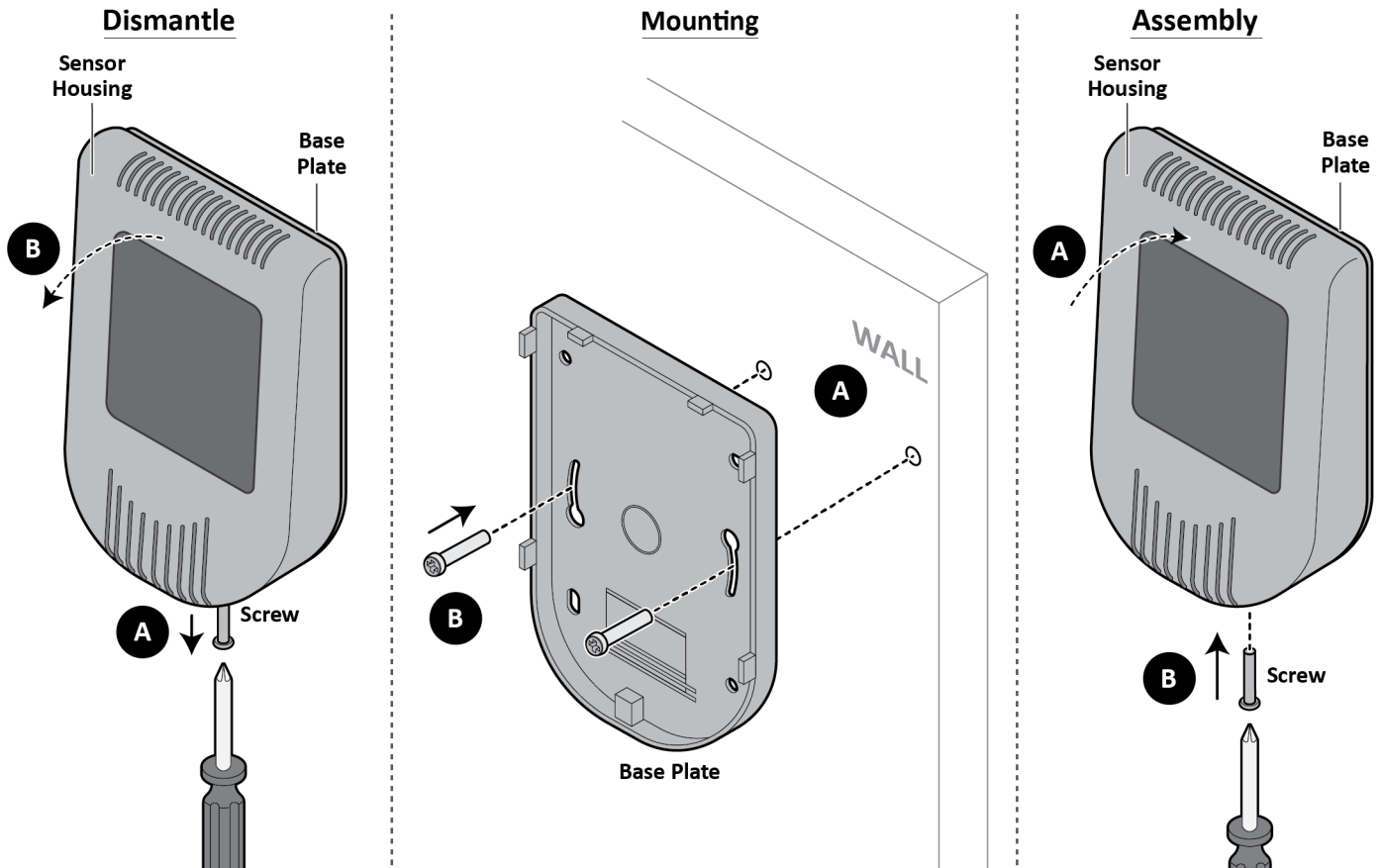

Dismantle	Mounting	Assembly
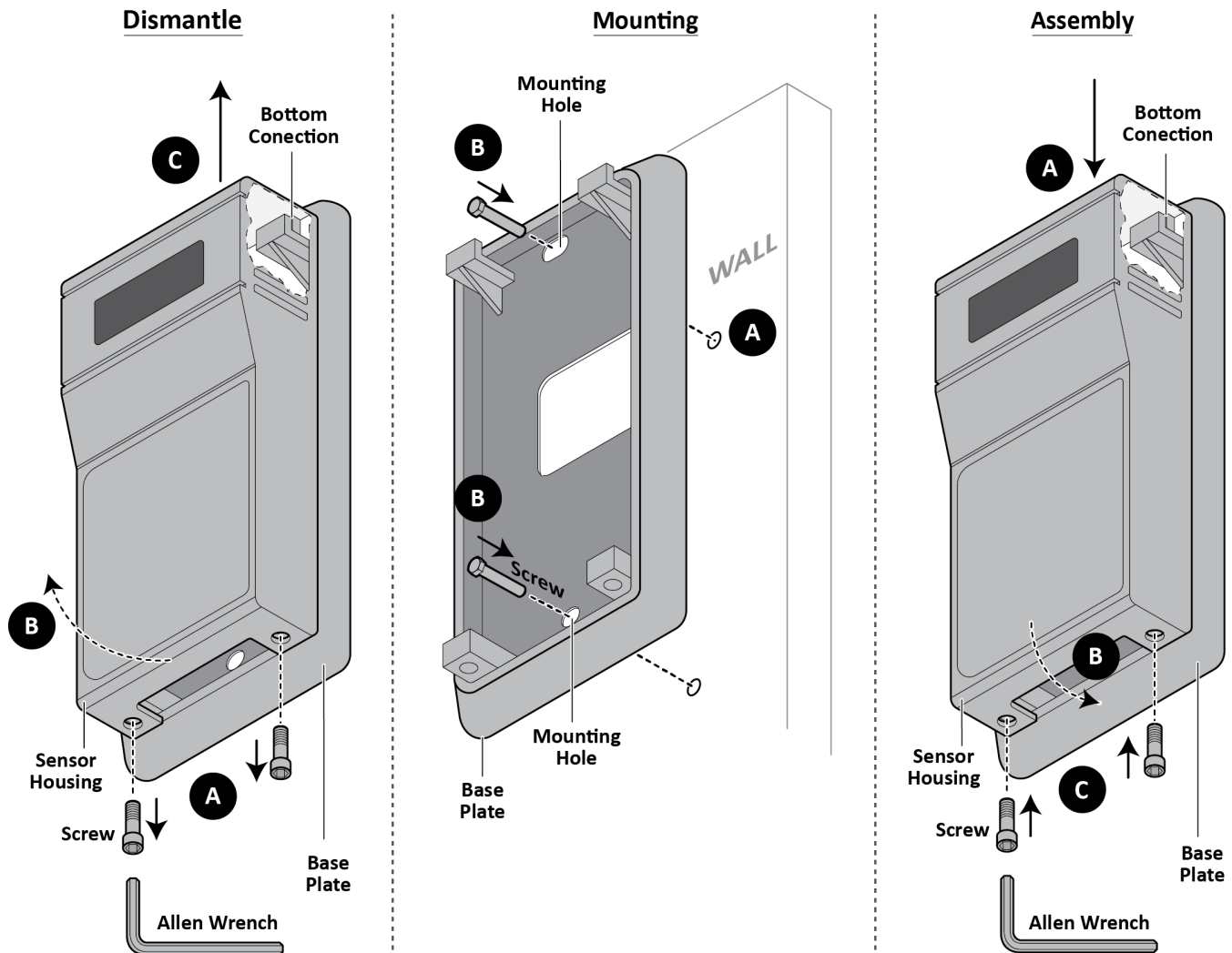
2.   The base plate has two mounting holes, one each on top and bottom. Place the base plate on the wall and mark the holes to drill. Remove the base plate and drill two holes in the marked locations.

3.   Place and hold the base plate on the wall, aligning the mounting holes with the holes made on the wall. Insert the screws through mounting holes and tighten.

4.   Locally pair the EnOcean sensors with **EnOcean Bridge**. (Please refer to the *Connect EnOcean Bridge to Remote Sensors* section.)

5.   Install the sensor housing onto the base plate. Start by inserting the groove on top of the sensor housing into the slot provided on the base plate, and then completely insert the bottom of the sensor housing into the base plate.

6.   Insert the screws at the bottom of the sensor housing and use a 1/16" Allen Wrench to tighten them.

8.   Mounting the Pressac Remote Sensor

☐ The Pressac remote sensors should be wall mounted in a convenient location at a desired distance from the ground and within a range of 80-100ft from the **EnOcean Bridge**.

☐ The sensors should be mounted in an area where the local CO_2 can be measured and they can receive sufficient ambient or outside light to maintain the charge without having to use a battery.

CAUTION: Handle the sensor housing gently while mounting/unmounting the sensor to avoid damaging internal parts.

1. Use a Philips screwdriver to remove the screws from the bottom of the sensor housing. Slightly open the top of the sensor housing and disconnect it from the base plate.

2. The base plate has two mounting holes. Place the base plate on the wall and mark the holes to drill. Remove the base plate and drill two holes in the marked locations.

3. Place and hold the base plate on the wall, aligning the mounting holes with the holes made on the wall. Insert the screws through mounting holes and tighten.

4. Locally pair the Pressac Sensor with **EnOcean Bridge**. (Please refer to the *Connect EnOcean Bridge to Remote Sensors* section.)

5. Install the sensor housing onto the base plate. Start by inserting the bottom of the sensor housing into the groove on the base plate, and then completely insert the top of the sensor housing into the top of the base plate.

6. Insert a screw into the bottom of the sensor housing to attach it to the base plate. Use a Philips screwdriver to tighten the screw.

9.   General Application

❑ When installing the **EnOcean Bridge** for non-HVAC applications, no connections need to be made to the thermostat.

❑ Supported pass-through devices/accessories: Contact Sensors, Light Sensors, Occupancy Sensors, and Rocker Pad.

❑ Supported devices are added and commissioned the same way as the remote sensors.

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