Pairing VT8000 Series Room Controllers with ZigBee Sensors

Integration Guide

VICONICS
Beyond Comfort

Quick Setup

The quick set-up assumes all back-end configuration of the stand alone Room Controller acting as coordinator or the Multi-Purpose Manager (MPM) coordinator for the ZigBee network has already been completed. It also assumes the User is familiar with the **Permit Join** function and the **Wireless Ecosystem** screen functions.

1. Set **Permit Join** on Room Controller (or networked MPM coordinator if used) to **On**.
2. Go to first unused **Zone** screen in **Wireless Ecosystem** menu of Room Controller interface.
   IMPORTANT: the Room Controller attempts to pair itself with a sensor when you enter any Zone in the **Wireless Ecosystem** menu. If for any reason you exit from any Zone in the **Wireless Ecosystem** menu, you must wait 30 - 60 seconds before attempting to enter the **Wireless Ecosystem** menu screens again. The Room Controller cannot pair itself with a sensor if you access the **Wireless Ecosystem** menu screens without waiting for the necessary amount of time to pass.
3. Insert battery or remove pull tab (for contact sensors) to activate ZigBee sensor.
4. Click pairing button 10 times to allow sensor to pair with Room Controller.
   NOTE: keep sensor to left side of Room Controller when performing this step.
   NOTE: if sensor was already paired at an earlier date, removing the battery and inserting back into the sensor again performs the same action as clicking the pairing button 10 times.
5. Verify sensor has joined network and **Paired** field status shows **Yes** on **Zone** screen.
6. Set the **Set function to** parameter to correct setting.
   NOTE: if pairing multiple sensors, navigate to subsequent Zone page in Room Controller menu and repeat steps 3 - 6.
7. Set **Permit Join** on Room Controller (or networked MPM coordinator if used) to **Off**.
8. In Configuration screen 1/10, ensure UI16 and UI17 are set to **Door dry, Window, or Motion** to ensure correct operation.
   NOTE: UI17 is used for either Window or Motion sensors. Both sensors can not be used at the same time.
9. Physically install sensor.

TROUBLESHOOTING

Refer to full procedure described later in this document if the Quick Setup is insufficient, or, if an MPM or Room Controller must be configured.

Overview

This procedure shows how to pair a VT8000 Series Room Controller with one of the following ZigBee Sensors:

- Ceiling Mounted Sensor
- Door/Window Mounted Sensor
- Motion Sensor

The ZigBee Sensors can be paired with a stand-alone Room Controller, or with a Room Controller as part of a network. However, when pairing a ZigBee Sensor with a Room Controller on a network, the Room Controller must first be bound to MPM using Smart StruxureWare Building Expert.

You can pair up to 10 ZigBee Sensors per Room Controller. Each MPM can connect wirelessly with up to 30 ZigBee enabled devices.

SETTINGS

You must correctly set the following parameters to successfully pair a ZigBee Sensor with a Room Controller:

- PAN ID to value less than 499 if Room Controller is bound to an MPM.
- PAN ID to value greater than or equal to 500 if Room Controller is stand-alone.
- PAN ID parameter in Building Expert set to same value as Room Controller.
- Permit join set to ON in Building Expert and Room Controller. Then set to OFF in Building Expert and Room Controller after successful pairing.

INSTALLATION STEPS

Perform the following steps in order to successfully pair the ZigBee Sensor to the Room Controller:

1. Bind Room Controller to MPM.
2. Set parameters for MPM.
3. Set Permit Join to On in Room Controller and MPM.
4. Pair Sensor with Room Controller.
5. Install Sensor at selected location.

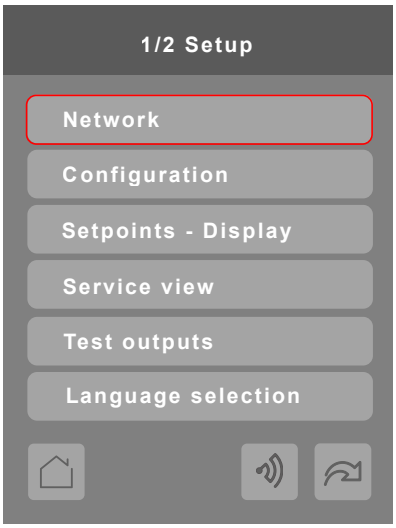
Bind Room Controller to MPM

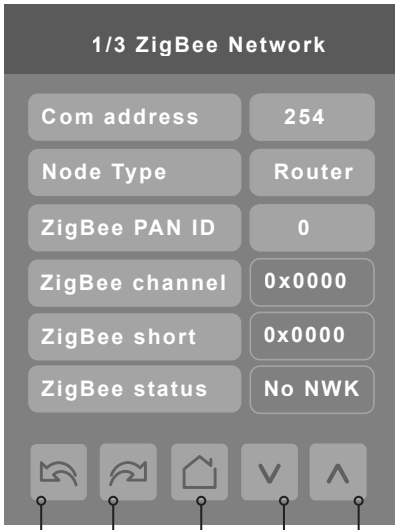
This procedure shows how to bind a Room Controller to an MPM using Building Expert.

CONFIGURE VT8000 SERIES

1. Touch and hold screen for 3 seconds to enter setup mode.

2. Select **Network.**





Previous page | Next page | Back to Setup | Change value

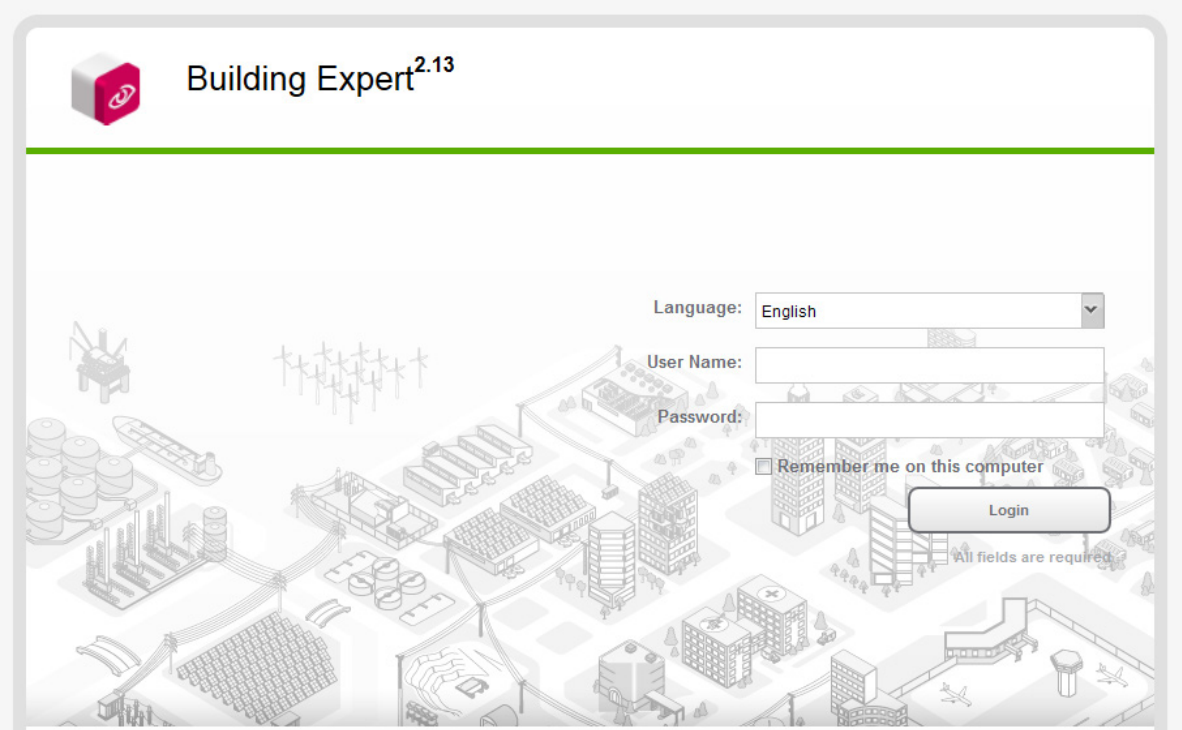
3. Select **COM address**.
   - Using up/down arrow icons, enter COM address value.
     NOTE: this should be unique to the device for networked installations.
4. Select **ZigBee pan. ID**.
   - Using up/down arrows, enter ZigBee pan. ID value.
     NOTE: this value must be 499 or less if the Room Controller is part of a network of Room Controllers, and 500 or greater if Room Controller is stand-alone.
5. Select **ZigBee channel**.
6. Using up/down arrows, enter Channel number.
7. Select B**ack to Setup** icon.

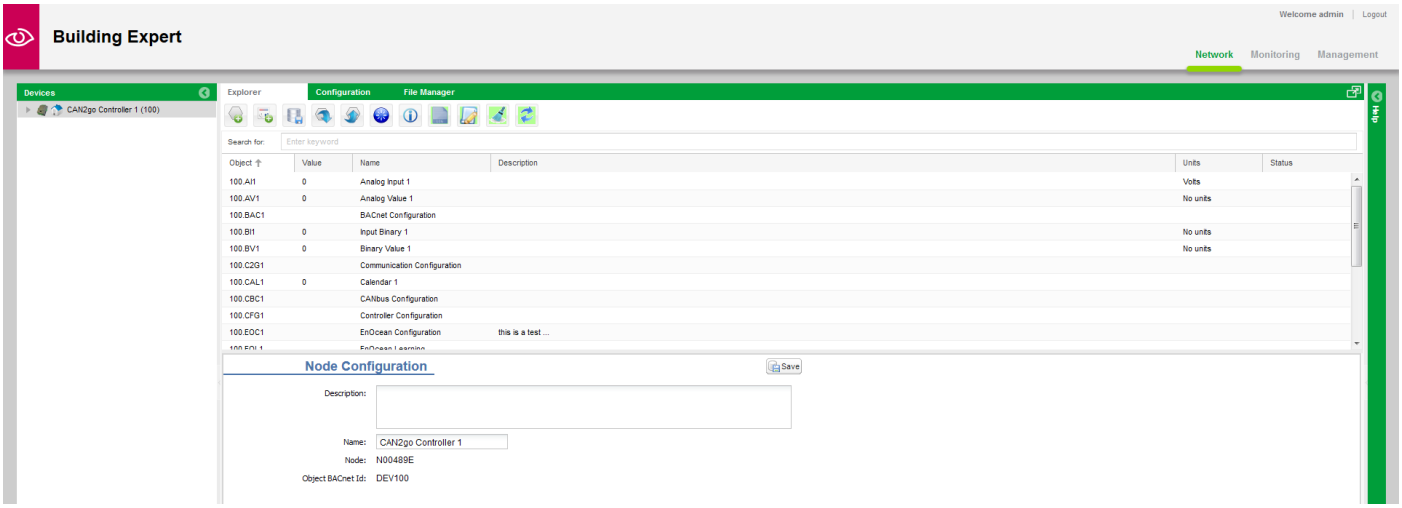
LOGIN TO MPM

Smart StruxureWare Building Expert requires ESR version of Firefox.

The instructions in this guide assume Building Expert 2.13 or later is installed. If you are using an earlier version, update Building Expert before attempting the procedures described in this guide.

1. Type default address in address bar (10.50.80.3 for MPM-GW and MPM-UN, 10.50.80.4 for MPM-VA).
2. Building Expert splash page shows:
3. Select **Language** (default English).
4. Enter **User name** (default 'admin').
5. Enter **Password** (default 'admin')
6. Click **Login**. Building Expert loads to default page.



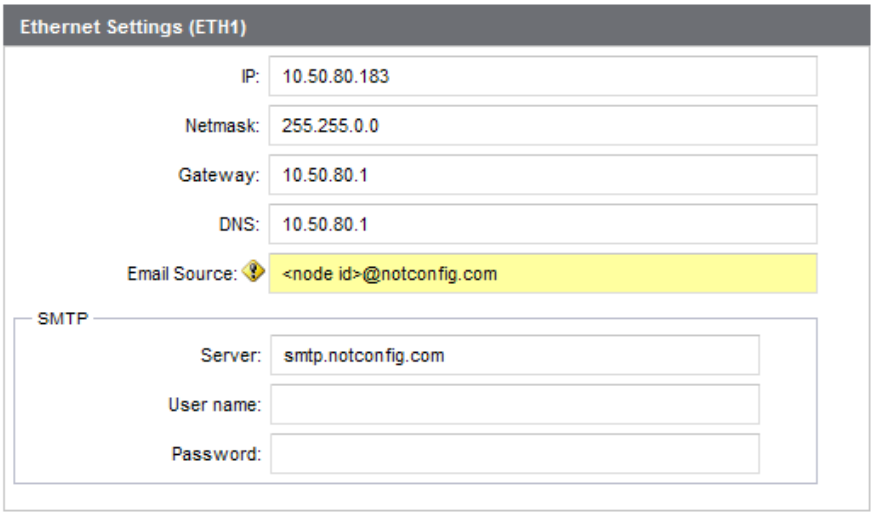


CONFIGURE MANAGER

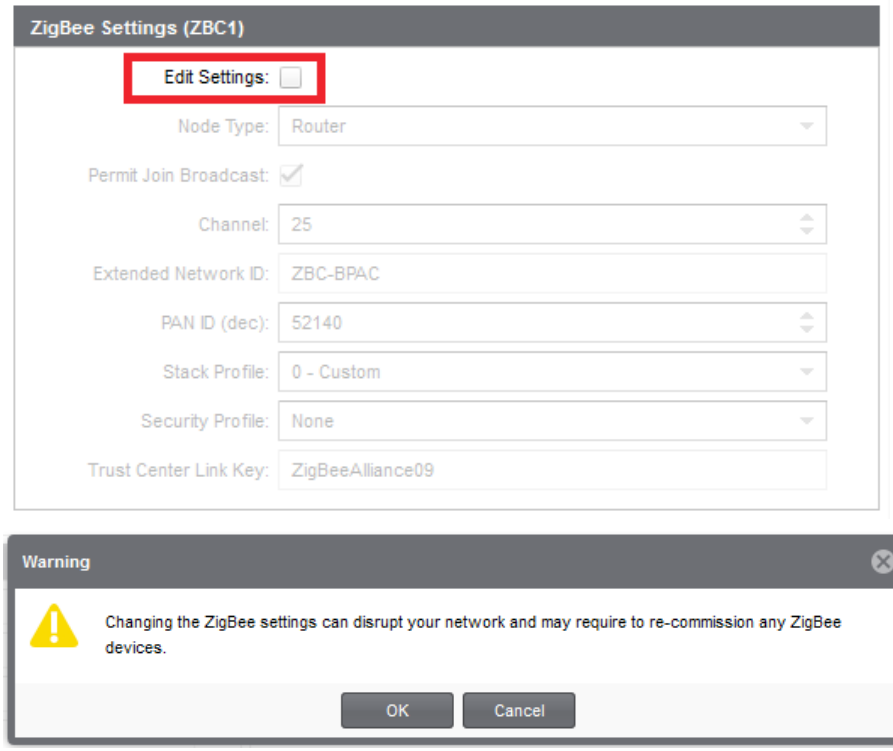
1. In Building Expert, click **Configuration** tab.
2. In **Controller Settings (CFG1)**, set **Adjust Time**, **Save Period**, **Time Zone Offset**, and **Enable DST** (if applicable).
3. Click **Enable** toggle.
4. In **Ethernet Settings** (ETH1), set **IP**, **Netmask**, **Gateway**, **DNS**, and **Email Source** with appropriate addresses for network.
5. Click **Devices** window and select MPM. Then scroll down main **Explorer** tab window and select **ZigBee Configuration.**

   OR

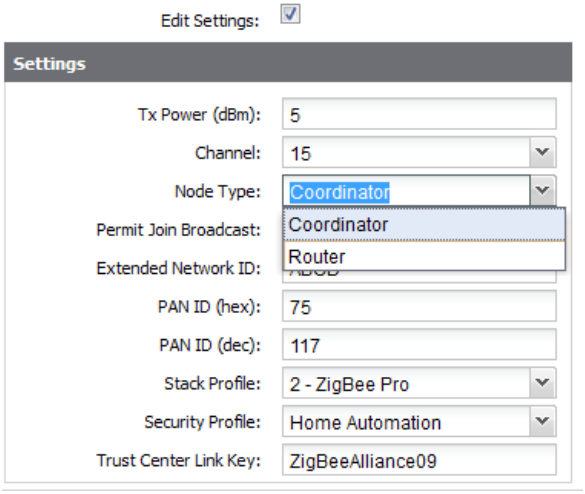
   Click **Configuration** tab of main window and go to **ZigBee Settings (ZBC1)** section.



6. Toggle **Edit Settings** (warning message shows) and click **OK** to continue.



7. Set **Node Type** as Coordinator or Router.



8. Set **Channel** to value between **11 - 25** matching Channel value set on Room Controller.

9. Set **Extended Network ID** to a unique value.
   NOTE: this value must be unique for each Room Controller. For example, in a Hotel, use the Hotel Room number as the unique ID value.

10. Set **PAN ID (dec)** to value matching **PAN ID** value set on Room Controller.

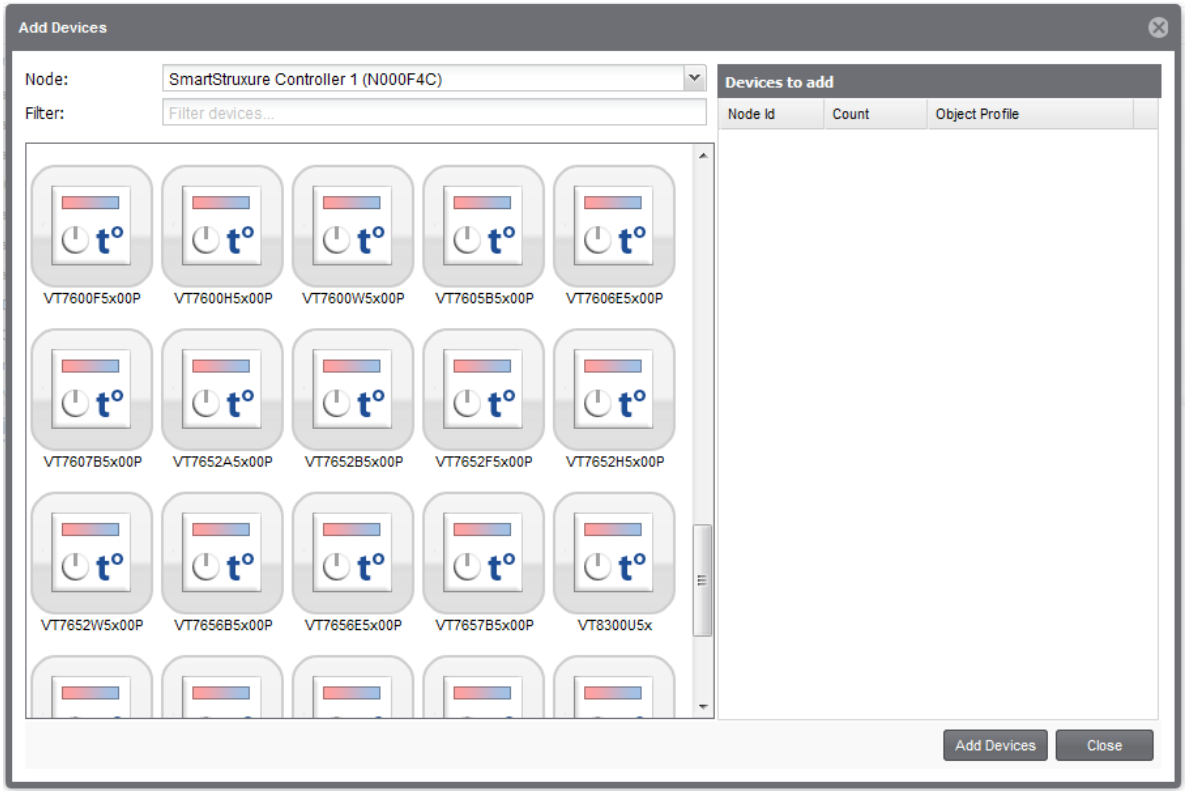
11. Set **Stack Profile** to **2 - ZigBee_Pro**.

12. Set **Security Profile** to **Home Automation**

13. Click **Save**.

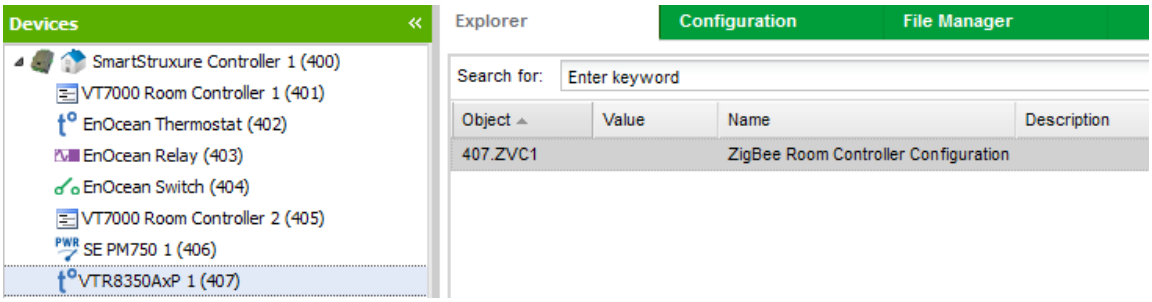
ADD DEVICE

1. In **Explorer** tab, click **Add Device**.



2. Select device to add.

   NOTE: device model selected from device list must be identical to model number of device.

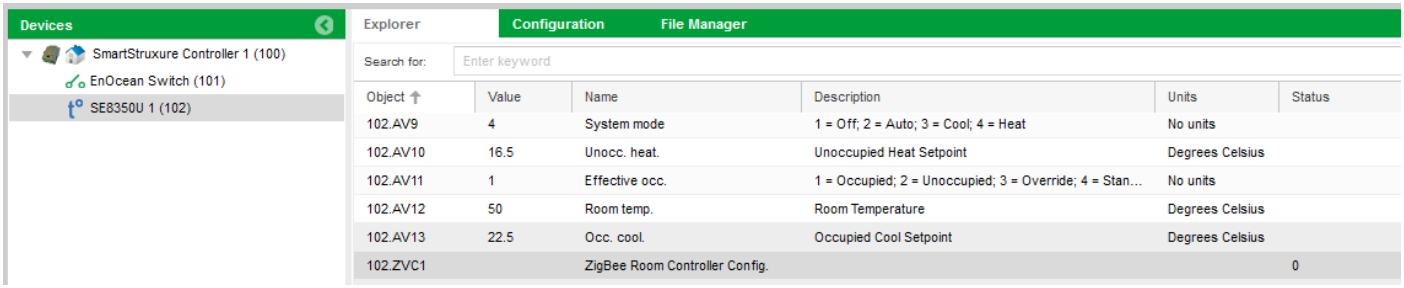


3. Click **Add Devices**. Building Expert automatically adds device to your Room Controller.

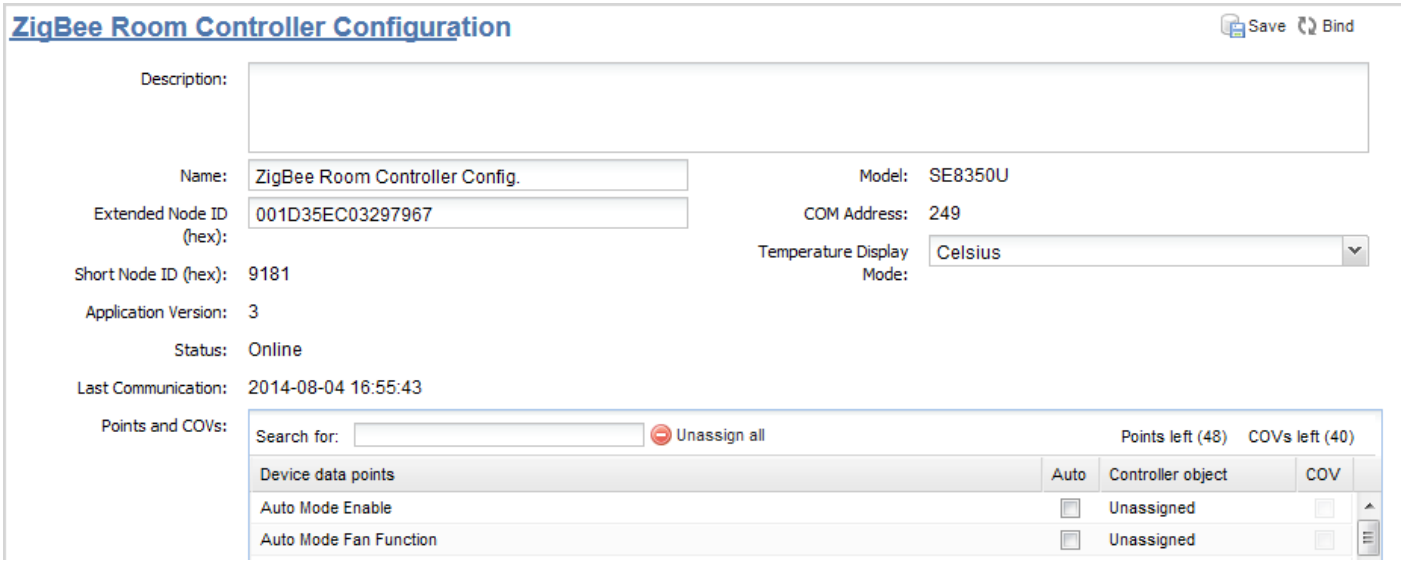
Set Parameters for MPM

BIND AND CONFIGURE ZIGBEE PRO ONLINE FOR VT8000 SERIES

1. In **Devices** pane, select newly added device.

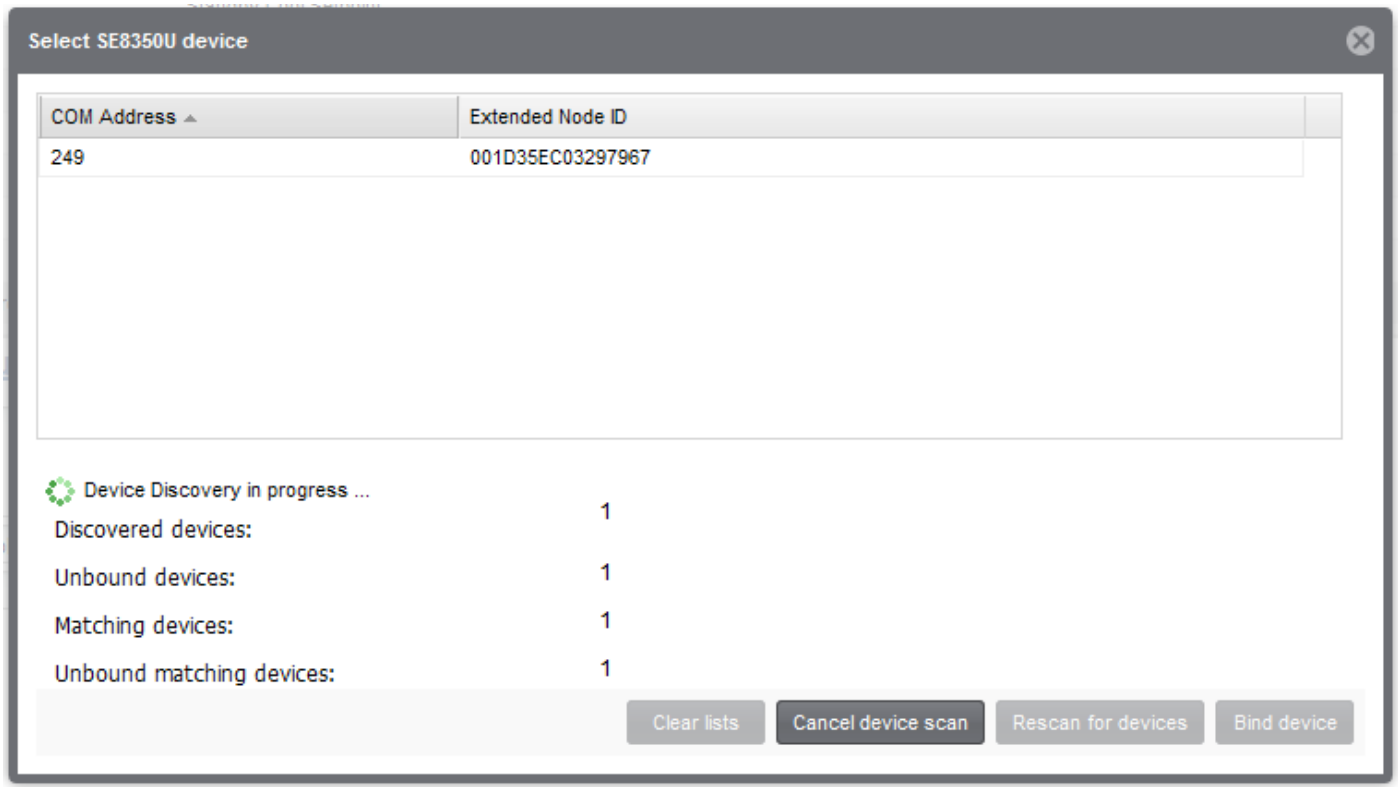


2. Navigate to **ZigBee Room Controller Configuration** on **Explorer** tab.



3. Click **Bind**. A new window opens and Building Expert searches for **Com Address** and **Extended Node ID** for device.

4. In **Select device** window, select device to bind with MPM.



5. Click **Bind device**. Building Expert adds devices **Extended Node ID** and **COM Address** information to selected Room Controller.

ASSIGN DEVICE DATA POINTS

1. In **Object** field of **Explorer** tab, click **ZigBee Room Controller Configuration**.

2. Click on checkboxes for any device data points to monitor in Building Expert. A maximum of 60 data points can be selected. Use **Search for** text box to locate specific data points.

Points and COVs:

Search for: Unassign all Points left (40) COVs left (40)

Device data points	Auto	Controller object	COV
Air Alarm	☑	BV2	☐
Airflow Level	☑	AV12	☐
Analog Output Heat Demand	☑	AV13	☐
Anti Short Cycle Timer	☑	AV14	☐
BO 1 Auxilary Output Status	☑	BV3	☐
BO 1 Auxiliary Output Config	☑	AV15	☐
Calibrate Outside Temp. Sensor	☑	AV16	☐
Calibrate Temperature Sensor	☐	Unassigned	
Changeover Setpoint	☐	Unassigned	
Chinese	☐	Unassigned	
CO2 Alarm	☑	BV4	☐
CO2 Level	☑	AV17	☐
Cool Lockout	☑	AV18	☐
Cooling CPH	☐	Unassigned	
Cooling Demand Limit	☐	Unassigned	

3. Click **Unassign all** to clear all selected data points (if necessary).

4. In **COV** field, select checkbox for **Wireless Zone Battery** and **Wireless Zone Status** for any Zones intended for use to pair sensors (see next section).
   NOTE: data gets updated automatically to MPM whenever Room Controller has a change in current values. This can affect up to 20 COV data points.

Points and COVs:

Search for: Unassign all Points left (44) COVs left (40)

Device data points	Auto	Controller object	COV
User Password	☐	Unassigned	
Window Alarm	☐	Unassigned	
Window Contact Installed	☐	Unassigned	
Window Contact Status	☐	Unassigned	
Wireless Zone 1 Battery	☑	AV14	☐
Wireless Zone 1 Status	☑	AV15	☐
Wireless Zone 10 Battery	☐	Unassigned	
Wireless Zone 10 Status	☐	Unassigned	
Wireless Zone 2 Battery	☑	AV16	☐
Wireless Zone 2 Status	☑	AV17	☐
Wireless Zone 3 Battery	☐	Unassigned	
Wireless Zone 3 Status	☐	Unassigned	
Wireless Zone 4 Battery	☐	Unassigned	
Wireless Zone 4 Status	☐	Unassigned	
Wireless Zone 5 Battery	☐	Unassigned	

5. Select checkboxes for any other data set points to have updated to MPM automatically when Room Controller has a change in current values.
   NOTE: up to a maximum of 40 COV data points counting those used for ZigBee sensors in previous step.

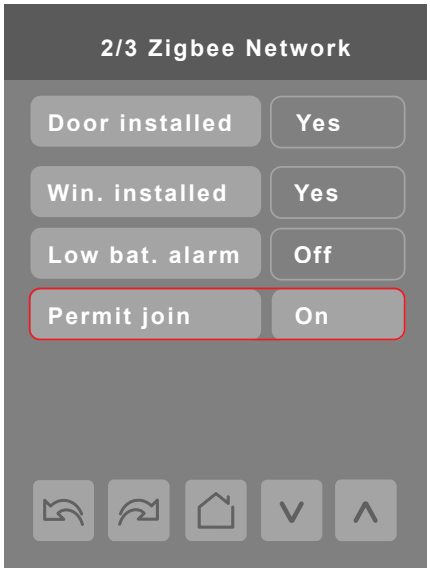
Set Permit Join and Pair ZigBee Sensor(s)

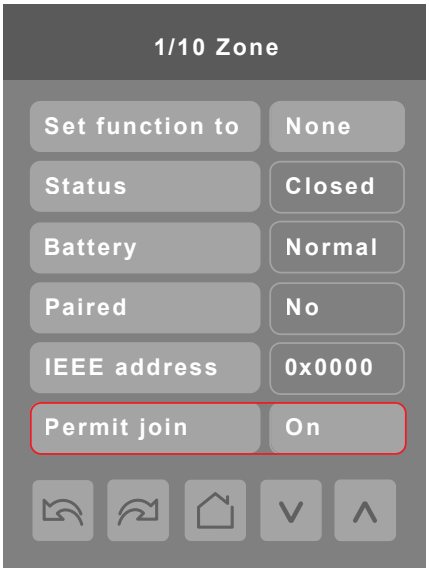
This procedure assumes the Room Controller is either stand-alone or is bound to an MPM acting as a coordinator. See Appendix A for information on how to pair a ZigBee sensor with a Room Controller bound to an MPM in a network including multiple MPMs.

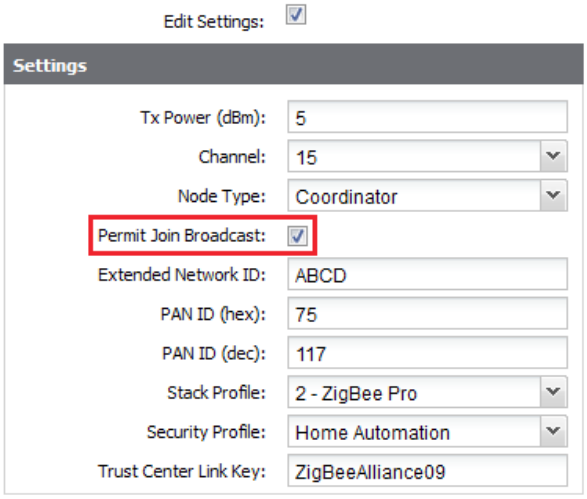
PERMIT JOIN

Ensure Room Controller (or MPM if used) has **Permit Join** parameter set to **On.**

- For Room Controllers: ZigBee settings screen 2/3, Wireless Ecosystem Zone screen 1/10.
- For MPMs, **Permit Join** is one of the ZigBee settings accessible as described previously.



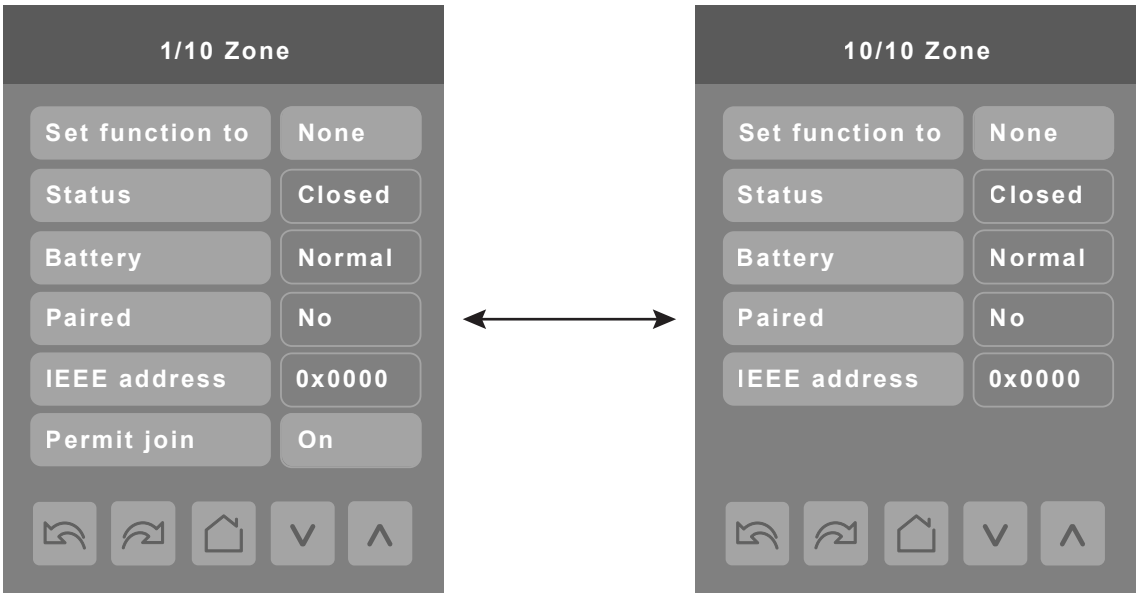




PAIR ZIGBEE SENSOR(S) WITH ROOM CONTROLLER

Navigate to the Wireless Ecosystem screen on your Room Controller before starting procedure.

1. Navigate to first Zone screen not already paired with any ZigBee sensor.



2. Hold ZigBee sensor in close proximity to Room Controller and click button on ZigBee sensor (consult installation guide for ZigBee sensor to determine locations of button and LED for sensor).

3. Ensure LED on ZigBee sensor flashes several times in the following sequences:

   1. YRY Searching for Network
   2. YGY Device Being Configured
   3. GGG Device Joined

4. The following sequence shows if there is a problem with pairing:

   RRR Device Failed to Join

5. For any other sequence of LED flashes, consult installation guide for ZigBee sensor to determine how to troubleshoot.

Restrictions and limitations

When pairing ZigBee sensors in a networked environment where multiple Room Controllers are bound to a single MPM, **it is necessary to make certain that one Room Controller at a time is being bound with a ZigBee sensor.**

When **Permit Join** is set to **On** for an MPM, all Room Controllers bound to it also have **Permit Join** set to **On**. A ZigBee sensor trying to pair with a Room Controller will pair with the first Room Controller in range that has an empty **Zone** screen open in the **Wireless Ecosystem** section of the interface.

If more than one Room Controller in range of the ZigBee sensor has an empty Zone screen open in the interface, the pairing may fail. The ZigBee sensor will always attempt to pair with the last Room Controller that became ready to pair by opening an empty Zone interface screen, whether or not that is the correct Room Controller the sensor is intended. For this reason, make sure to never have more than one Room Controller at a time with an empty Zone screen open in the interface ready to pair with a ZigBee sensor.

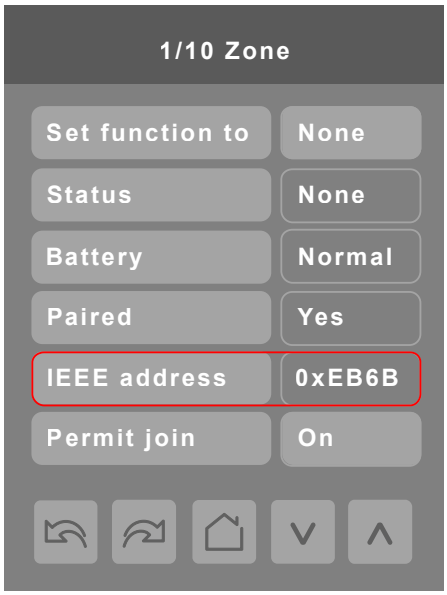
ADDITIONAL CONFIGURATION

Additional configuration is necessary for the Room Controller sequences to function correctly.

1. Navigate to first page of **Configuration** settings in Room Controller interface.
2. Set **UI16** to **Window** if Window sensor is used. Otherwise set to **Motion NO** or **Motion NC** if motion sensor is used.
3. Set **UI17** to **Door dry** if Door sensor is used.

DISABLING PERMIT JOIN

1. Once ZigBee sensor has joined network, verify last four digits of IEEE address on sensor match what shows on Room Controller screen. More than one ZigBee sensor may have joined. Confirm correct type has joined for each zone used to pair ZigBee sensor with Room Controller.



2. After sensor has paired with Room Controller, change **Set function to** parameter to match correct type of ZigBee sensor according to the following:

None	Default setting, no sensor function specified.
Door	Default behavior is if the door is opened and then closed, and the Room Controller does not detect motion for 15 seconds. In this state the Room Controller switches to **Standby**.
Window	Default behavior triggered the sensor and turns off the HVAC air compressor.
Motion	Default behavior triggers the sensor and switches the Room Controller to **Occupied** setpoints.
Status	Monitors functioning of the sensor without allowing it to affect the Room Controllers settings.
Remove	Clears the sensor settings from this Zone.

if the incorrect function is configured, then either the **Paired** status changes to **Invalid** (when incorrectly setting motion<-->contact), or incorrect responses get triggered in the Room Controller (example window<-->door). For example, the Room Controller can tell the difference between a contact sensor and a motion sensor, but it needs to be told if the contact is a window sensor or door sensor.

3. After confirming you have successfully joined all the ZigBee sensors needed with the Room Controller, set **Permit Join** setting on both the Room Controller and Building Expert to **Off**. This prevents any other ZigBee sensors from accidentally joining the network.

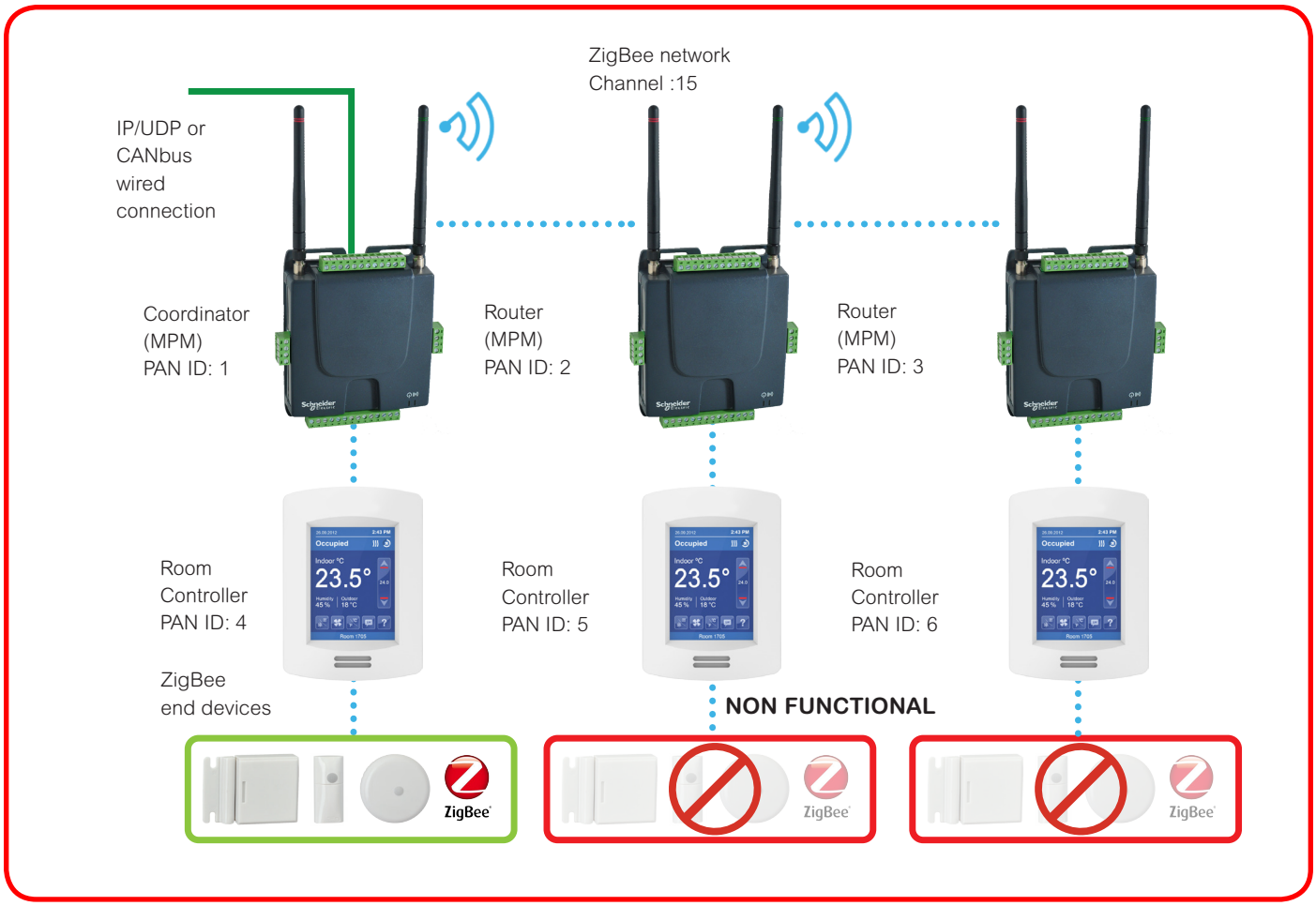
Once the pairing procedure is complete, proceed with the physical installation of the ZigBee sensor(s) according to the instructions in the **Installation Guide** appropriate to the model(s) of ZigBee sensor(s) being used.

Appendix A
Binding ZigBee Sensors to Room Controllers in Network with Multiple MPMs

When pairing a ZigBee sensor with a Room Controller that is part of a network involving multiple MPMs, **it is necessary for all of the MPMs to be networked using IP/Ethernet (UDP) or Canbus, and to be functioning as a coordinator for their local ZigBee network of Room Controllers.**

If a Room Controller is instead bound to an MPM acting as a router on a wireless network using ZigBee, the pairing procedure for the ZigBee sensors described in this document **will not work**. For this reason, it is **not recommended** to use the ZigBee wireless networking for MPMs feature at the same time that ZigBee wireless sensors are used.

Incorrect network set up for ZigBee sensors



To use the ZigBee wireless sensors in a network with multiple MPMs, the general network architecture **must** resemble the diagram shown below.

If the general design of your network installation with MPMs, Room Controllers, and ZigBee sensors **does not match** that shown in the diagram below, contact Support for more information.

Note: Make sure each MPM controlling a ZigBee network has a different PAN ID. If the MPMs do not have different PAN IDs, the sensors will be unable to distinguish which network with which they are supposed to communicate. This causes them to malfunction. All MPMs have the same default PAN ID, and therefore, it is essential to configure the value when using ZigBee sensors.

Correct network set up for ZigBee sensors

IP/UDP or CANbus wired connection

Correct network set up for ZigBee sensors