

Pairing VT8000 Series Room Controllers with ZigBee Sensors

Installation Guide and Procedure

Commercial and Hotel/Lodging HVAC Fan Coil Applications



Quick setup

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

PROCEDURE

1. Set **Permit Join** on your Room Controller (or networked MPM coordinator if used) to **On**.
2. Go to first unused **Zone** screen in **Wireless Ecosystem** section of Room Controller's interface.
3. Insert battery or remove pull tab (for contact sensors) to activate ZigBee sensor.
4. Verify sensor has joined network, and that on **Zone** screen the **Paired** field status reads **Yes**.
5. Set the **Set function to** parameter to the correct setting.
6. Set **Permit Join** on your Room Controller (or networked MPM coordinator if used) to **Off**.
7. Conditional to use of door or window contact sensors:
 - a) Go to first screen in **Configuration** section of interface.
 - b) For window sensor, set **UI16** to **Window**.
 - c) For door sensor, set **UI17** to **Door Dry**.
8. Physically install the sensor.

TROUBLESHOOTING

If the short procedure described here is insufficient or an MPM or Room Controller needs to be configured, refer to the full procedure described later in this document.

Overview

This procedure shows you how to pair an 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 a StruxureWare Lite Multi-Purpose Manager.

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

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

INSTALLATION STEPS

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

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

Bind Room Controller to MPM

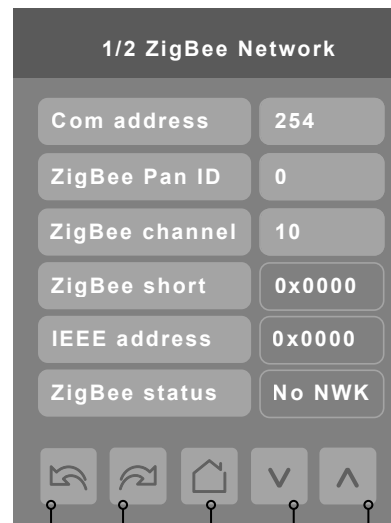
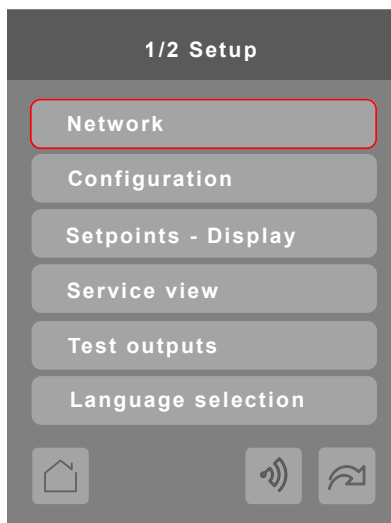
This procedure shows you how to bind a Room Controller to a MPM using Building Expert.

CONFIGURE VT8000 SERIES

1. In the center of the top of the screen, touch and hold this point for 3 seconds to enter setup mode.



2. Select **Network**.



Previous page Next page Back to Setup Change value

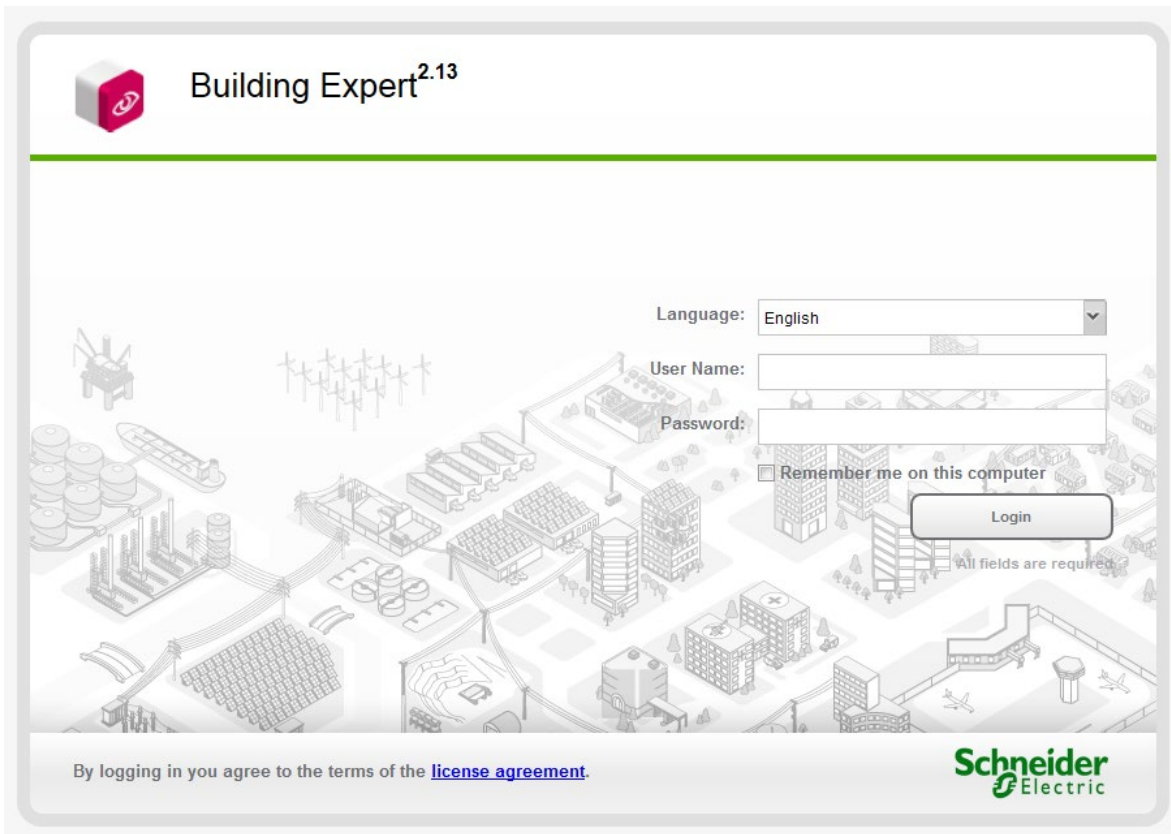
3. Select **COM address**.
 - Using the up/down arrow icons, enter the COM address value.
 - This should be unique to the device for networked installations.
4. Select **ZigBee pan. ID**.
 - Using the up/down arrows, enter the ZigBee pan. ID value.
 - This value should be 499 or less if the Room Controller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

LOGIN TO MPM

Smart StruxureWare Building Expert requires an ESR version of Firefox. You can download it at: <http://www.mozilla.org/en-US/firefox/organizations/all.html>

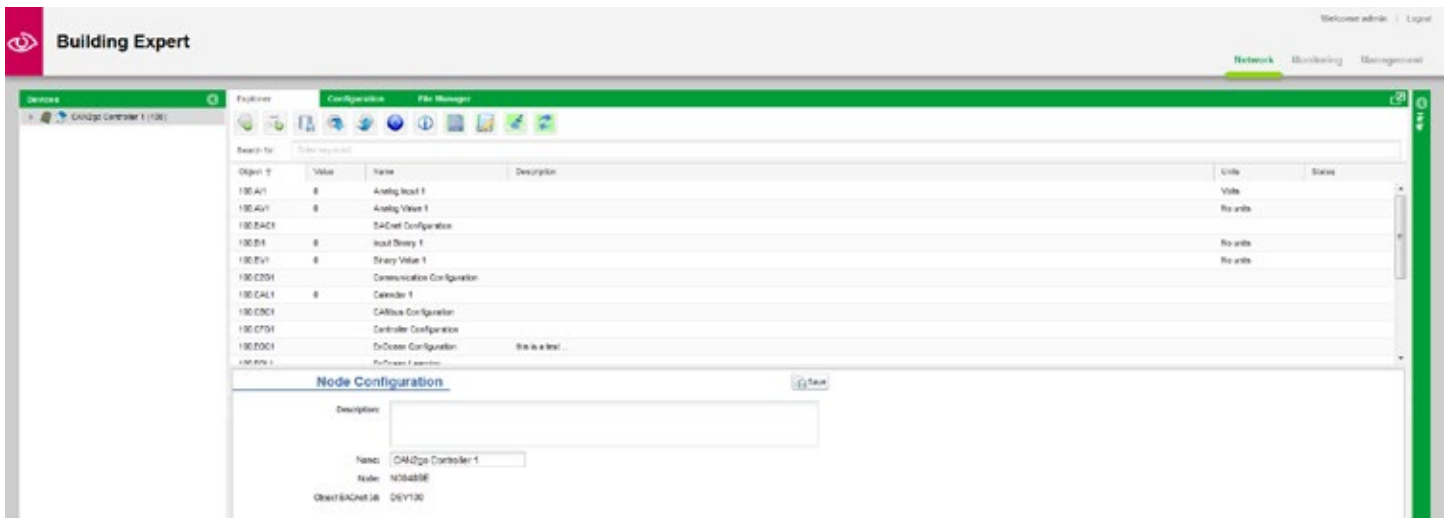
Note the instructions in this guide assume that Building Expert 2.13 or later is installed. If you are using an earlier version, update Building Expert before attempting the procedures described in this guide.

1. Type the default address in the address bar (10.50.80.3 for MPM-GW and MPM-UN, 10.50.80.4 for MPM-VA).
2. Verify Building Expert login page shows.



3. Select **Language** (default English).
4. Enter **User name** (default 'admin').
5. Enter **Password** (default 'admin').
6. Click on **Login**.

Building Expert loads to the default page.

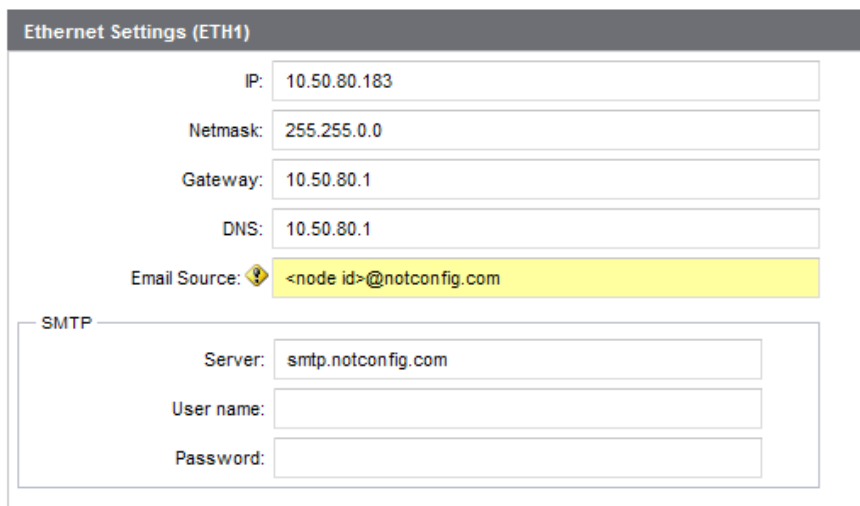


CONFIGURE MANAGER

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. Toggle **Enable**.
4. In **Ethernet Settings (ETH1)**, set **IP**, **Netmask**, **Gateway**, **DNS**, and **Email Source** with the appropriate addresses for your network.



5. Click on **Devices** window, and select your MPM. Then scroll down the main **Explorer** tab window and select **ZigBee Configuration**.

OR

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

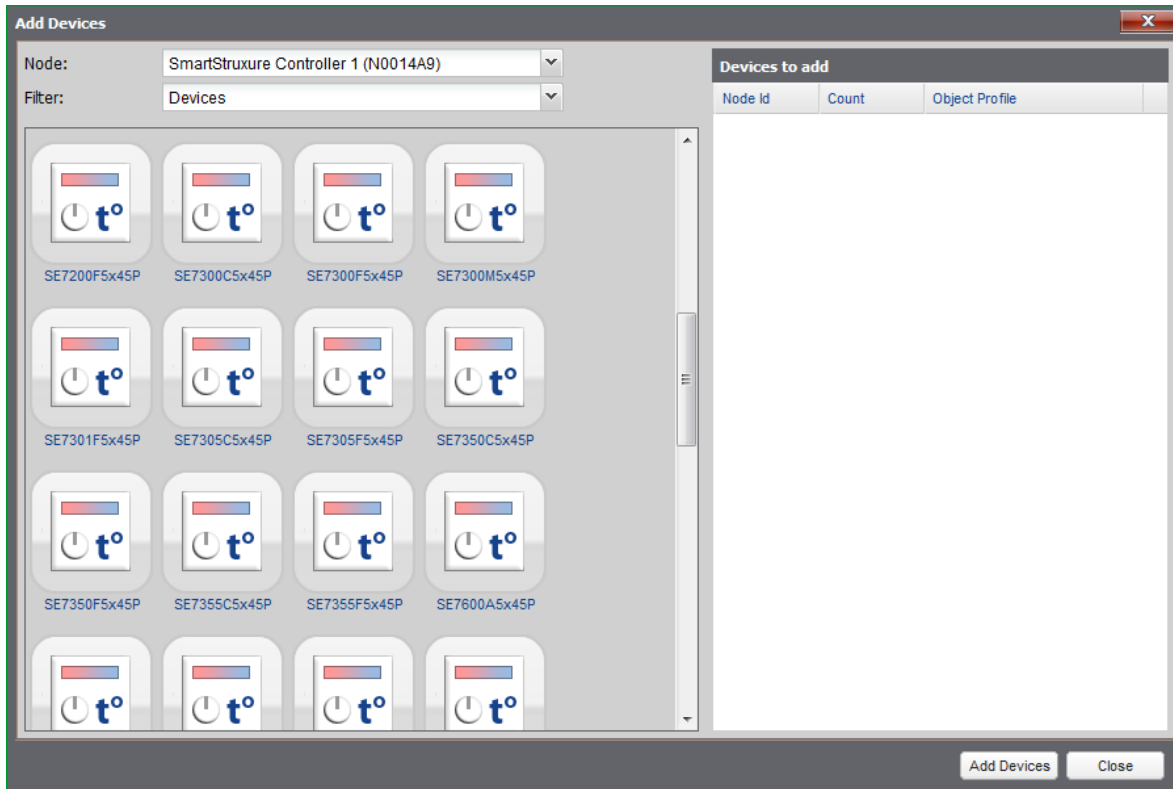
- Click on the **Edit Settings** toggle. A warning message will appear, click on **OK** to continue.

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

- Set **Channel** to a value between **11 - 25** matching the channel value set on the Room Controller
- Set **PAN ID (dec)** to a value matching the **pan. ID** value set on the Room Controller.
- Set **Stack Profile** to **2 - ZigBee_Pro**.
- Set **Security Profile** to **Home Automation**
- Click **Save**.

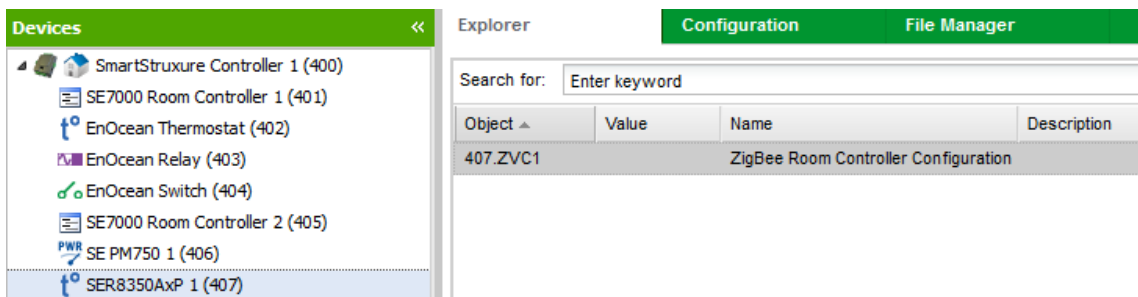
ADD DEVICE

1. In the **Explorer** tab of Building Expert, click the **Add Device** button. A new window opens.



2. Select the device you want to add.

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



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

Set Parameters for MPM

BIND AND CONFIGURE ZIGBEE PRO ONLINE FOR VT8000 SERIES

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

Object ↑	Value	Name	Description	Units	Status
102.AV9	4	System mode	1 = Off, 2 = Auto, 3 = Cool, 4 = Heat	No units	
102.AV10	16.5	Unocc. heat.	Unoccupied Heat Setpoint	Degrees Celsius	
102.AV11	1	Effective occ.	1 = Occupied; 2 = Unoccupied; 3 = Override; 4 = Stan...	No units	
102.AV12	50	Room temp.	Room Temperature	Degrees Celsius	
102.AV13	22.5	Occ. cool.	Occupied Cool Setpoint	Degrees Celsius	
102.ZVC1		ZigBee Room Controller Config.			0

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

ZigBee Room Controller Configuration Save Bind

Description:

Name: Model: SE8350U

Extended Node ID (hex): COM Address: 249

Short Node ID (hex): 9181 Temperature Display: Mode:

Application Version: 3

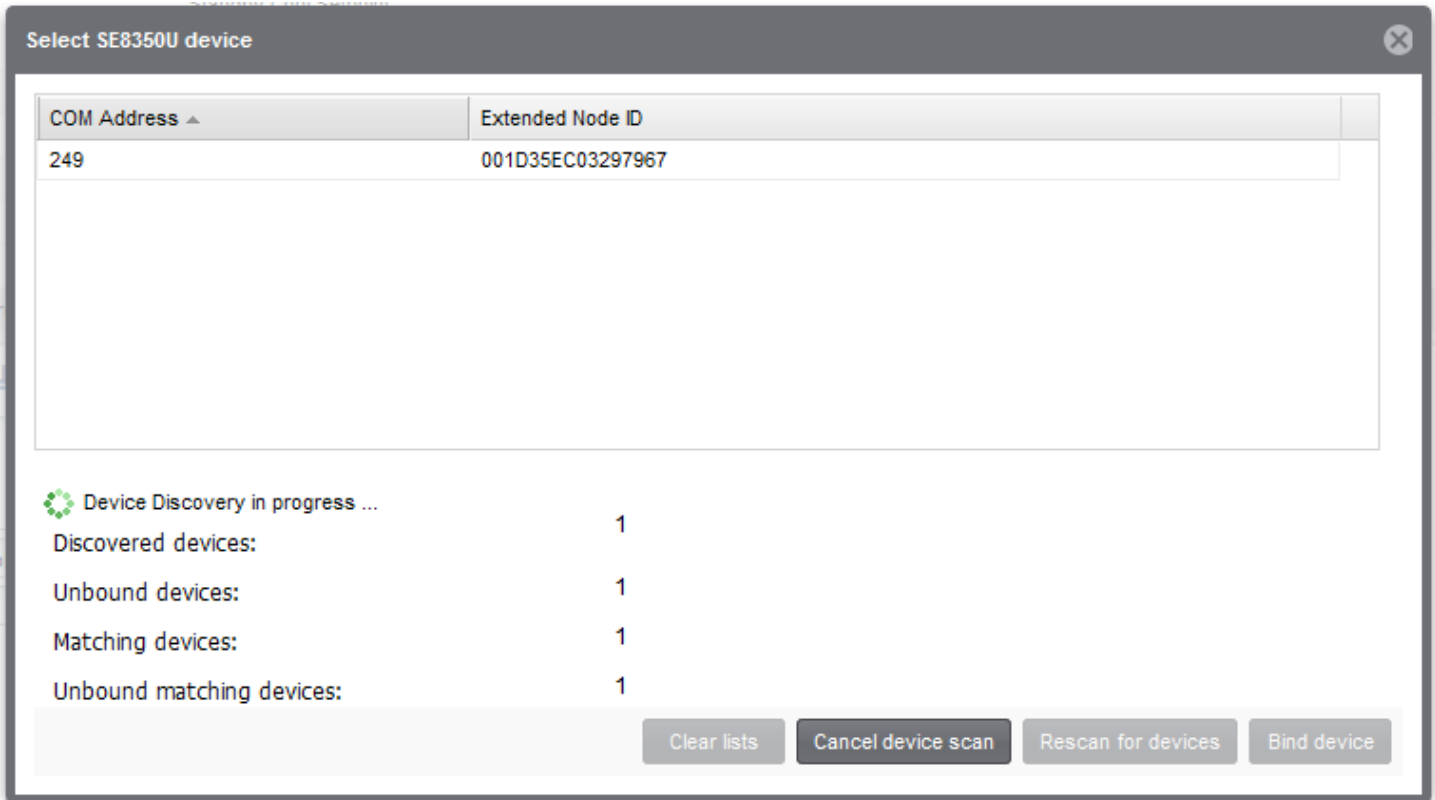
Status: Online

Last Communication: 2014-08-04 16:55:43

Points and COVs: Points left (48) COVs left (40)

Device data points	Auto	Controller object	COV
Auto Mode Enable	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Auto Mode Fan Function	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>

- Click **Bind**. A new window opens and Building Expert searches for the **Com Address** and **Extended Node ID** for your device.
- In the **Select device** window, select the device you want to bind with your MPM.



- Click **Bind device**. Building Expert adds the device's **Extended Node ID** and **COM Address** information to the selected Room Controller in the device list.

ASSIGN DEVICE DATA POINTS

1. In the **Object** field of the **Explorer** tab, click **ZigBee Room Controller Configuration**.
2. Click on the checkboxes for any device data points that you want to monitor in Building Expert. A maximum of 50 data points can be selected. Use the **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	<input checked="" type="checkbox"/>	BV2	<input type="checkbox"/>
Airflow Level	<input checked="" type="checkbox"/>	AV12	<input type="checkbox"/>
Analog Output Heat Demand	<input checked="" type="checkbox"/>	AV13	<input type="checkbox"/>
Anti Short Cycle Timer	<input checked="" type="checkbox"/>	AV14	<input type="checkbox"/>
BO 1 Auxiliary Output Status	<input checked="" type="checkbox"/>	BV3	<input type="checkbox"/>
BO 1 Auxiliary Output Config	<input checked="" type="checkbox"/>	AV15	<input type="checkbox"/>
Calibrate Outside Temp. Sensor	<input checked="" type="checkbox"/>	AV16	<input type="checkbox"/>
Calibrate Temperature Sensor	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Changeover Setpoint	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Chinese	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
CO2 Alarm	<input checked="" type="checkbox"/>	BV4	<input type="checkbox"/>
CO2 Level	<input checked="" type="checkbox"/>	AV17	<input type="checkbox"/>
Cool Lockout	<input checked="" type="checkbox"/>	AV18	<input type="checkbox"/>
Cooling CPH	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Cooling Demand Limit	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>

3. Click on **Unassign all** to clear all selected data points and restart.
4. In the **COV** field, select the checkbox for the **Wireless Zone Battery** and **Wireless Zone Status** for any Zones that you intend to use to pair sensors (see next section) so that they will be updated automatically to the MPM whenever the Room Controller has a change in the current values. This can take 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	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Window Alarm	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Window Contact Installed	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Window Contact Status	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 1 Battery	<input checked="" type="checkbox"/>	AV14	<input type="checkbox"/>
Wireless Zone 1 Status	<input checked="" type="checkbox"/>	AV15	<input type="checkbox"/>
Wireless Zone 10 Battery	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 10 Status	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 2 Battery	<input checked="" type="checkbox"/>	AV16	<input type="checkbox"/>
Wireless Zone 2 Status	<input checked="" type="checkbox"/>	AV17	<input type="checkbox"/>
Wireless Zone 3 Battery	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 3 Status	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 4 Battery	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 4 Status	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>
Wireless Zone 5 Battery	<input type="checkbox"/>	Unassigned	<input type="checkbox"/>

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

For more information on which points to select and what they represent in terms of Room Controller functionality, refer to the **VTR8300/VT8300 Series BACnet Integration** guide, or the **VT8600 Series BACnet Integration** guide.

Set Permit Join and Pair ZigBee Sensor(s)

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

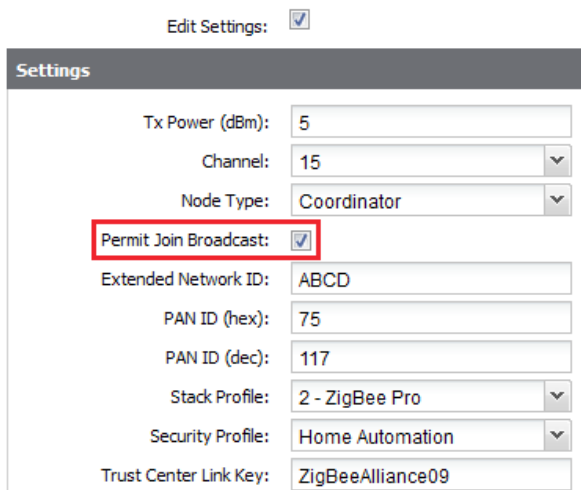
PERMIT JOIN

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

- For Room Controllers, this is on the second ZigBee settings screen, or on the first Wireless Ecosystem Zone screen.



- For MPMs, **Permit Join** is one of the ZigBee settings accessible as described previously.

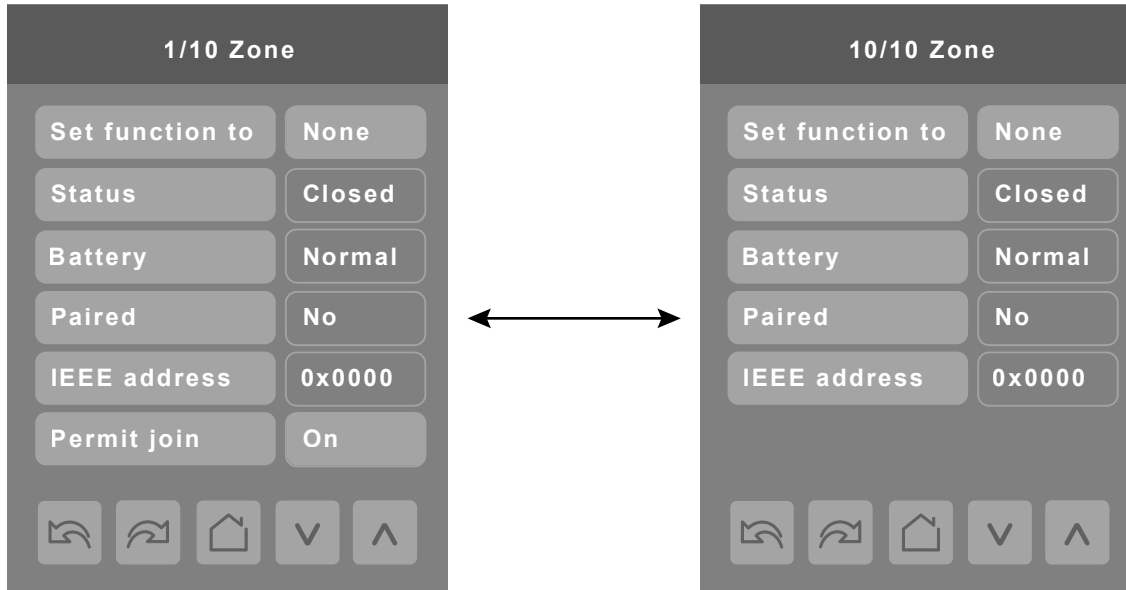


PAIR ZIGBEE SENSOR(S) WITH ROOM CONTROLLER

For a full description of how to install a ZigBee sensor, refer to the appropriate **Installation Guide** for the ZigBee sensor you are trying to pair with your Room Controller.

Navigate to the Wireless Ecosystem screen on your Room Controller.

1. Go to the first Zone screen that is not already paired with a ZigBee sensor.



2. Hold the ZigBee sensor in close proximity to the Room Controller, and then click the button on the ZigBee sensor (Consult the installation guide for your ZigBee sensor in order to determine the locations of the button and LED for your sensor).
3. Assuming all the preceding steps have been completed correctly, the LED on the ZigBee sensor will flash several times, in the following sequences:
 1. ●●● YRY Searching for Network
 2. ●●● YGY Device Being Configured
 3. ●●● GGG Device Joined
4. If there is a problem with the pairing, the following sequence will be displayed:
 1. ●●● RRR Device Failed to Join
5. For any other sequence of LED flashes, consult the installation guide for your ZigBee sensor to determine what the issue is and how to correct it.



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 only one Room Controller at a time is being bound with a ZigBee sensor.**

When **Permit Join** is set to **On** on an MPM, all Room Controllers bound to it will 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. For this reason, make sure you 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 - WINDOW AND DOOR SENSORS

For window and door contact sensors, additional configuration is necessary for the Room Controller sequences to function appropriately.

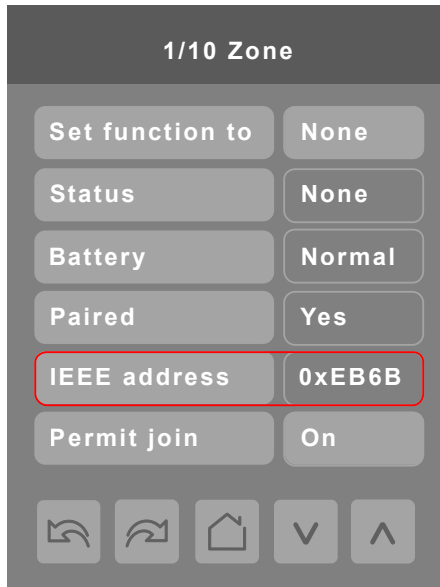
1. Go to the first page of the **Configuration** settings in the Room Controller interface.
2. If a ZigBee wireless window contact sensor has been paired with the Room Controller, select **UI16** and make sure the function is set to **Window**.
3. If a ZigBee wireless door contact sensor has been paired with the Room Controller, select **UI17** and make sure the function is set to **Door Dry**.



Note that these functions are not interchangeable; only **UI16** can enable the window contact sensor functions for the Room Controller, and only **UI17** can enable the door contact functions for the Room Controller.

DISABLING PERMIT JOIN

- Once your ZigBee sensor has joined the network, verify that the last four digits of the IEEE address on the sensor match what shows on the Room Controller screen. More than one ZigBee sensor may have joined, so confirm that the correct type has joined for each zone that you use to pair a ZigBee sensor with the Room Controller.



- Once the sensor has been paired with the Room Controller, change the **Set function to** parameter to match the correct type of ZigBee sensor. The options are:

- None** Default setting, no sensor function specified.
- Door** Default behaviour is that if the door is opened, then closed, and the room controller does not detect motion for 15 seconds, then the Room Controller will switch to **Standby** setpoints.
- Window** Default behaviour is that triggering the sensor turns off the HVAC air compressor.
- Motion** Default behaviour is that triggering the sensor will switch the Room Controller to **Occupied** setpoints.
- Status** Use this setting to monitor the functioning of the sensor without allowing it to affect the Room Controller's settings.
- Remove** Select this setting to clear the sensor settings from this Zone.

if the incorrect function is configured, then either the **Paired** status will change to **Invalid** (when incorrectly setting motion<-->contact), or incorrect responses will be triggered in the Room Controller (example window<-->door); i.e. 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.

- After you have confirmed that you have successfully joined all the ZigBee sensors you need with your Room Controller, set the **Permit Join** setting on both the Room Controller and Building Expert to **Off**. This will prevent any other ZigBee sensors from accidentally joining your network.

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

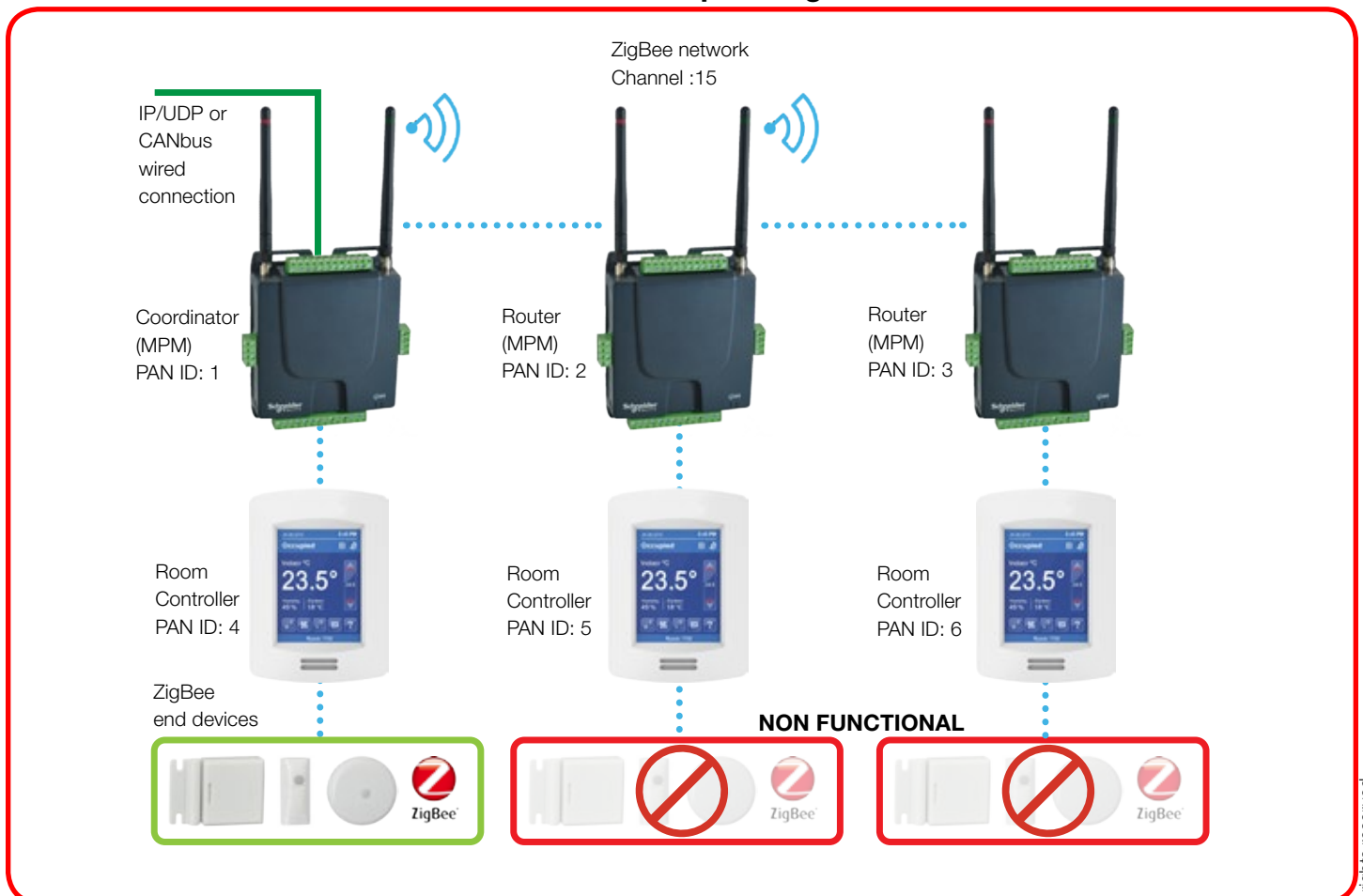
Appendix A

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 that involves multiple MPMs, **it is necessary for all of those 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

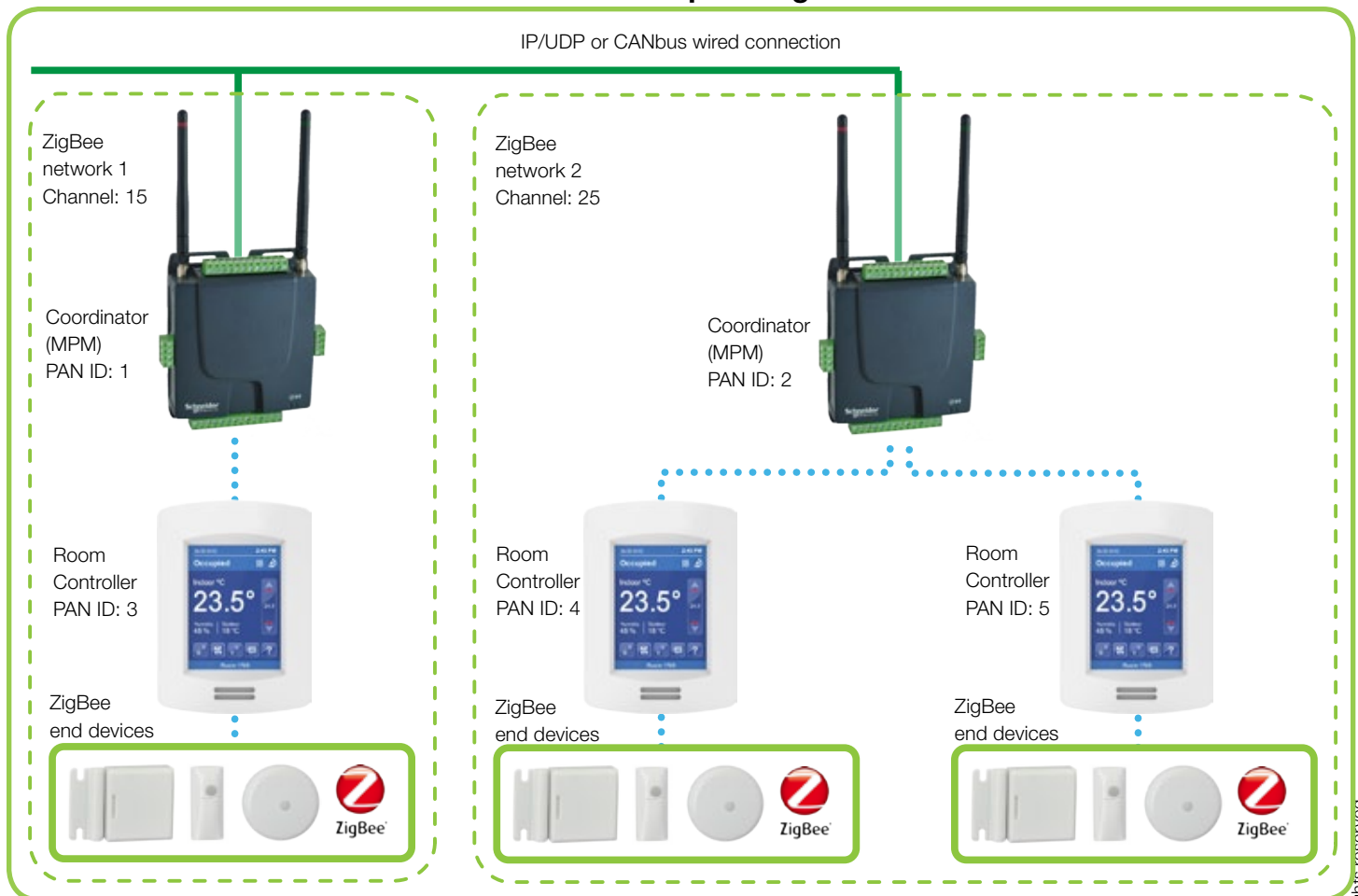


To use the ZigBee wireless sensors in a network with multiple MPMs, the general network architecture **must** resemble the diagram shown below.

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

Note: Make sure that 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, and this will cause them to malfunction. All MPMs have the same default PAN ID, so it is essential to configure the value when using ZigBee sensors.

Correct network set up for ZigBee sensors



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