Hub User Guide

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1. Overview

Your PassivLiving Hub along with associated devices should be professionally installed and commissioned. No further action is required and your system will be ready to control your heating. This guide provides information if you wish to integrate your heating system into other Z-Wave® networks or add new Z-Wave devices to this network. You can even replace your existing Z-Wave devices used for heating with other compatible Z-Wave devices - although the system may not function in exactly the same way.

2. Controlling your heating system

Guidance for controlling your heating system is available in the “Getting started with PassivLiving HEAT” section of your Installation & getting started guide. More detailed help is available online at; http://plhelp.passivsystems.com/advanced-heating/

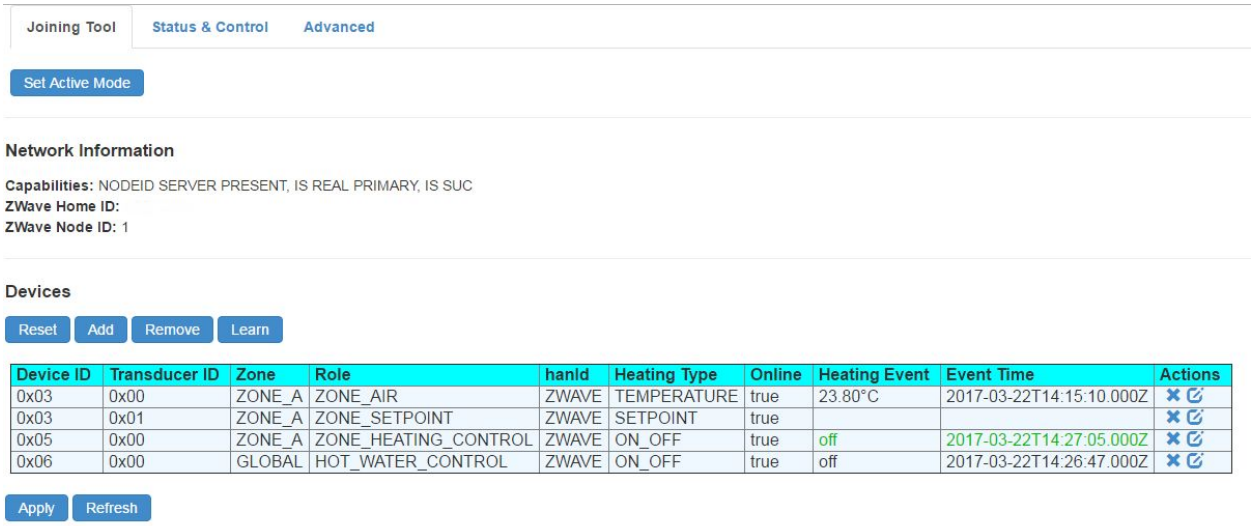
The heating system only supports one Zone/Group, such that the entire house is controlled via a single temperature setpoint. You can control your heating (temperature setpoint) either through the thermostat, portal or via mobile apps. Details on how to log into the heating control portal are available at;
http://plhelp.passivsystems.com/accessing-passivliving/passivliving-logging-in/

The PassivLiving App is available via the Google play or iTunes stores.

3. Hub Z-Wave Configuration Portal

You can make changes to the Z-Wave network, such as adding or removing devices by using the Hub Z-Wave Configuration Portal.
To access the Hub Z-Wave Configuration Portal please follow these instructions:

1. On a PC/laptop connected to the same LAN network (and subnetwork) as the Hub open up a web browser.
2. Enter the URL http://passivhub.local/portal in the browser.
3. If this is unsuccessful find the IP address of the HUB from the router and use that instead, e.g., http://192.168.1.3/portal.



= remove failed node

= Set role & zone.

The portal has three control tabs: “Joining Tool”, “Status & Control”, and “Advanced”. Their purpose shall be explained in subsequent sections.

4. Managing your Z-Wave Network

This product can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.
The PassivLiving Hub is a security enabled Z-Wave Plus product that is able to use encrypted Z-Wave Plus messages to communicate to other security enabled Z-Wave Plus products. (The Hub supports Z-Wave Plus security scheme “S0”).

Before you can manage your Z-Wave network, ensure you are viewing the “Joining Tool” tab within the Hub Z-Wave Configuration Portal, and deactivate your Hub to make changes.- see 4.1. Activating / deactivating your Hub

4.1. Activating / deactivating your Hub

When your heating system is running normally, your Hub will be “active” and controlling your heating. Your installer will have activated your Hub and it will remain active unless you deactivate it.

Within the “Joining Tool” tab of the Hub Z-Wave Configuration Portal, you can make changes to your Z-Wave network. To make the changes you must first suspend the heating application by

moving the Hub to an “inactive” state by pressing the “Set Inactive Mode” button on the “Joining Tool” tab.. After you have made the changes, you should change back to active mode by pressing the “Set Active Mode” button. Once activated it can take up to 5 minutes before the Hub has gathered temperature information and can start controlling your system.

Note: If you forget to move your Hub back into active mode, both the PassivLiving Portal (Web UI) and the PassivLiving mobile App will not function.

4.2. Hub Heating Roles and Zones

In order to control your heating, your Hub needs to know which devices serve which purpose from a heating perspective. The purpose is set by selecting the role and zone. A device only supports certain types of roles - and this is indicated by the “Type”. You must have all roles and zones correctly set for your heating to function properly. It is important to note that some devices can provide multiple roles at the same time - for example a relay device might contain two relays which could be used to control both heating (eg relay 1) and hot water (eg relay 2). Key roles and zones that are used are shown in the two tables below

Different kit configurations have different roles and zones.

For heating you should have the following configuration:

Zone	Role	hanId	Heating Type
ZONE_A	ZONE_AIR	ZWAVE	TEMPERATURE
ZONE_A	ZONE_SETPOINT	ZWAVE	SETPOINT
ZONE_A	ZONE_HEATING_CONTROL	ZWAVE	ON_OFF

For heating and hot water control you should have the following configuration:

Zone	Role	hanId	Heating Type
ZONE_A	ZONE_AIR	ZWAVE	TEMPERATURE
ZONE_A	ZONE_SETPOINT	ZWAVE	SETPOINT
ZONE_A	ZONE_HEATING_CONTROL	ZWAVE	ON_OFF
GLOBAL	HOT_WATER_CONTROL	ZWAVE	ON_OFF

Note: It is important to set the correct role against the correct type.
Role descriptions:

- ZONE_AIR is an air temperature sensor; Type must be “TEMPERATURE”.
- ZONE_SETPOINT is a user interface that can display and set the current setpoint; Type must be “SETPOINT”.
- ZONE_HEATING_CONTROL controls your boiler heating; Type must be “ON_OFF”.
- HOT_WATER_CONTROL controls your hot water; Type must be “ON_OFF”.

Other roles should not be used unless guided by PassivSystems support.

Note: The Heating Type TEMPERATURE will be offered for any Z-Wave device that supports the COMMAND_CLASS_MULTILEVEL_SENSOR even if the device does not support temperature readings. Therefore it is important that a temperature device is used when selecting the heating role ZONE_AIR.

To change roles, please ensure you are viewing the “Joining Tool” tab, deactivate your Hub, click on the icon:  , select the new role then select apply.

4.3. Adding devices

To add a device to the Hub, the Hub must be deactivated and placed into add mode (sometimes called Inclusion) and the new device should be placed into join or learn mode. You can add Z-Wave devices from other manufacturers to your Hub. You can also add devices that are not related to heating - which means that the Hub can act as a repeater for them. For instance a light device and dimmer switch could both be added to the Hub’s network and share their routing capabilities.

1. Access the Hub configuration portal (see 3. Hub Z-Wave Configuration Portal)
2. Within the “Joining Tool” tab, deactivate your Hub (see 4.1. Activating / deactivating your Hub)
3. Press the “Add” button on the portal. This will put the Hub into add mode for 60 seconds.
4. Follow the manufacturer's instructions for adding the Z-Wave device
5. If successful a new device should show up in the portal.
6. If the device is capable of providing heating functionality (eg thermostat) then you will have the opportunity to select a role if you wish (see 4.2. Hub Heating Roles and Zones.). If the device cannot be used for heating, it will be listed as “UNKNOWN_GENERIC_DEVICE_TYPE” - which indicates it is an additional Z-Wave ecosystem device.
7. If you are not making further changes to devices - you can re-activate your Hub.

4.4. Removing devices

To remove a device from the Hub, the Hub must be placed into remove mode (sometimes called Exclusion) and the new device should be placed into join or learn mode.

1. Access the Hub configuration portal (see 3. Hub Z-Wave Configuration Portal)
2. Within the “Joining Tool” tab, deactivate your Hub (see 4.1. Activating / deactivating your Hub)
3. Press the “Remove” button on the portal. This will put the Hub into remove mode for 60 seconds.
4. Follow the manufacturer's instructions for removing the Z-Wave device
5. If successful the device should be removed from the portal.
6. If you are not making further changes to devices - you can re-activate your Hub.

Note: If you have removed a device that is important to your heating, your Hub may not be able to control your heating. Please refer to 4.8. Pre-installed devices and also 4.2. Hub Heating Roles and Zones.

4.5. Manual termination of Add Mode and Remove Mode

Under normal circumstances the duration for add mode (insertion mode) and also remove mode (exclusion mode) is 60 seconds. However, it is possible to manually terminate these modes sooner if so required. These steps assume that the Hub is already in add or remove mode.

1. Access the Hub configuration portal (see 3. Hub Z-Wave Configuration Portal)
2. Select the “Advanced” tab.
3. Select “DELETE Request” from the “GET Request” dropdown.
4. Select “/v/1/hans/zwave/management” from the “Choose REST path” dropdown.
5. Press the “Send Request” button.

4.6. Status & Control features

Within the “Status & Control” tab all devices connected to the Z-Wave network are listed. This view may include devices that are unrelated to heating control.

The table provides individual device status details, including the applicable Home Control Group and Role if the device is known. If a device has multiple Z-Wave endpoints (ie is a multichannel device), then all endpoints will be listed. The table indicates if the device has joined securely using the Z-Wave S0 encryption. The table also provides an ability to provide Basic Control, indicated by the play/on and stop/off buttons on the right side of the table. If a device receives a Basic Control message (on or off), the exact behaviour of the device is manufacturer dependant and is not defined here.

If the device supports reporting of status information to the lifeline group for the following items, then the last report will be visible on the status screen;

- Temperature

- Thermostat mode
- Binary switch
- Meter energy
- Meter power
- Thermostat setpoint

Note: Heating control devices used by the Hub will also be listed within the "Status & Control" tab. If a user selects the play/on or stop/off buttons it will override the Hub control and prevent reliable control of the heating.

Note: The Mobile Apps associated with the Hub heating system do NOT include individual device information. They are specifically designed to configure the heating system Setpoint and Schedule, which the Hub uses to control the appropriate heating devices e.g. Thermostat or Boiler.

4.7. Advanced Z-Wave features

Many (but not all) of the advanced features can be accessed via the "Advanced" tab and requires that you select the specific URI request and API - and sometimes requires associated body text.

1. Access the Hub configuration portal (see 3. Hub Z-Wave Configuration Portal)
2. Select the "Advanced" tab.
3. Press the "GET Request" dropdown to select the type of the request, e.g., GET, PUT, POST, DELETE.
4. Press the "Choose REST path" dropdown to select the path of the REST call or enter the REST path directly in the adjacent dialog box.
5. Optionally enter data in the area next to the "Choose REST path" button.
6. Press the "Send Request" button.

4.7.1. Sending NIF (Node Information frame)

A short button press of the button at the back of the Hub will cause the Hub to broadcast a Z-Wave NIF message.

4.7.2. Sending Basic Set On/Off to Hub

The Hub does not support receiving basic set on/off commands. Any Z-Wave basic set message sent to the Hub is ignored.

4.7.3. Sending Basic Set On/Off to a device

Please refer to section 4.6 Status & Control for controlling a device with Basic Set on/off. Note: The exact behaviour of the device is manufacturer dependant and not defined here.

4.7.4. Adding the Hub to a different network

Learn mode allows the Hub to join another Z-Wave network. However, if the hub is joined to another Z-Wave network, it cannot access battery powered devices. As your heating system uses a thermostat which is battery powered, you will NOT be able to control heating. There are two solutions to this problem:

A. Do not join the Hub to another Z-Wave network, but join the heating devices to the Hub Z-Wave network directly. Please refer to section 4.3 Adding Devices.

B. Replace the battery powered thermostat with a mains powered thermostat. It is recommended to first join your mains powered heating devices (boiler controller and thermostat) to the new network before joining the Hub. This will allow the Hub to discover the devices again via controller replication. Before attempting to add the Hub to the new network, please ensure that no devices are joined to the existing Hub network - you should remove them all or reset the Hub. The Hub will not adopt learn mode if one or more devices are already added in the the Hub's own Z-Wave network. To remove these devices from the Hub network, refer to the section 4.4. Removing devices.
   To add the Hub to a different network follow these steps:
   1. Put the new network's controller into add mode (please refer to the user guide for your Z-Wave network controller)
   2. Press the "Learn" button on the "Joining Tool" tab in the configuration portal.

   Once your Hub has joined the new network - devices already in that network will be visible in the portal. Any devices that can be used for heating will offer the option to select roles (see 4.2. Hub Heating Roles and Zones).

4.7.5. Removing the Hub from a different network

The process for removing a Hub from a different network is similar to adding the Hub - except that the network controller is put into remove mode rather than add mode. Please refer to the steps in 4.7.4. Adding the Hub to a different network but use "remove" rather than "add" in solution B step 1.

4.7.6. Copy network information to the Hub

Copying network information is called "Replication". When the Hub is added to a different network, initially the Hub will receive network information. However if new devices are subsequently joined to the network, the Hub may not see them until the network information is copied to the Hub. The procedure for copying network information to the Hub is similar to joining the Hub to a network - i.e. the network controller that is sending the controller information is put into Add mode and the Hub is put into Learn mode:

1. Put the new network's controller into add mode (please refer to the user guide for your Z-Wave network controller)
2. Press the "Learn" button on the "Joining Tool" tab in the configuration portal.

4.7.7. Copy network information to another controller.

Copying network information is called "Replication". When a controller is added to the Hubs network, a "replication" is automatically performed whereby network and protocol information is shared with the new controller. If further new devices are subsequently added to the network, the previously joined controller may not be aware of these devices. Network information can be sent to the controller by putting the Hub into add mode and putting the other controller into learn mode (please refer to user instructions for the controller):

1. From the configuration portal press the "Add" button. This will put the Hub into add mode for 60 seconds.
2. Follow the manufacturer's instructions for adding the Z-Wave device or initiating a replication receive.
3. If successful, the controller will now receive updated network information.

4.7.8. Factory reset Hub

You can reset the Hubs Z-Wave network by pressing the reset button in the configuration portal. This will remove all devices from your network and your heating will not function. After reset it may take a few seconds before the Local Portal gets updated. If this controller is the primary controller for your network, resetting it will result in the nodes in your network being orphaned and it will be necessary after the reset to exclude and re-include all of the nodes in the network. If this controller is being used as a secondary controller in the network, use this procedure to reset this controller only in the event that the network primary controller is missing or otherwise inoperable. You can add back in your default devices and configure them by referring to the sections 4.8. Pre-installed devices, 4.3. Adding devices, 4.2. Hub Heating Roles and Zones and 4.1. Activating / deactivating your Hub.

4.7.9. Remove failed device

1. From the main configuration portal select the remove failed node icon (✖) next to the device you want to remove
2. If the device has failed - it will be removed.

4.7.10. Replace failed device

1. Select the "Advanced" tab in the configuration portal.
2. Select "PUT Request" from the "GET Request" dropdown.
3. Select "/v/1/hans/zwave/management" from the "Choose REST path" dropdown.
4. Select the node id to remove and enter the appropriate JSON text, e.g.,

{ "operation":"REPLACE_FAILED_NODE", "nodeId":"0x2" } in the "PUT/POST Data" dialog box.

5. Ensure “Send JSON” is selected..
6. Press the “Send Request” button.
7. Follow the manufacturer's instructions for adding the Z-Wave device.
8. If successful a new device should show up in the portal.

4.8. Pre-installed devices

Your system comes preconfigured and ready to control your heating. If you remove your preconfigured devices - you will need to add devices with similar functionality - or add back the original devices if you wish to control your heating. If you have removed your default devices (eg by resetting the Z-Wave network), then you can add them back in by following these steps;

4.8.1. Hot water and heating boiler controller

1. If the bottom LED on the boiler controller is not flashing, put the Hub into remove mode (4.4. Removing devices) then press and hold the network (bottom) button on the boiler controller to ensure it is not part of a Z-Wave network.
2. Put the Hub into add mode (see 4.3. Adding devices)
3. Press and hold the network (bottom) button on the boiler controller until the lower LED stops flashing.
4. Observe that the new device is present in the configuration portal. Please set the correct role as per 4.2. Hub Heating Roles and Zones.

Full instructions for the hot water and heating boiler controller can be found at http://www.securemeters.com by searching for product SSR303.

4.8.2. Thermostat

1. Remove the thermostat from the wall and on the back set SW1 (first small slider switch) to the “on” position.
2. Ensure that the device is not part of a network by putting the Hub into remove mode (4.4. Removing devices) and rotate the dial on the thermostat so that “L” is displayed then press the dial once. “LP” will be displayed to indicate the device is now not part of a Z-Wave network.
3. Put the Hub into add mode (see 4.3. Adding devices)
4. Rotate the dial on the thermostat so that “L” is displayed then press the dial once. “LP” will be displayed to indicate the device is now joined to the Hub
5. Observe that the new device is present in the configuration portal. Please set the correct role as per 4.2. Hub Heating Roles and Zones.

Full instructions for the thermostat can be found at http://www.securemeters.com by searching for product HRT4-ZW.
Finally - you must activate your Hub again (see 4.1. Activating / deactivating your Hub).

4.9. Hub Power Supply Outage

If the Hub is power cycled or experiences a power outage, each device connected to the Hub will be interviewed again. For sleepy devices (typically battery powered) they will not present their full status in the Hub Z-Wave Configuration Portal until they have woken up, allowing the Hub to communicate fully with each of them.

4.10. Z-Wave association groups

Your PassivLiving Hub supports only the Z-Wave “lifeline” association group 1 as defined by the Z-Wave specifications. When devices join the Hub, they are automatically added to the lifeline group if they support it.

The hub can also provide lifeline reporting information if other controllers requested it - with a limit of up to 6 destination nodes. If the Hub is reset, it will notify lifeline group members of the reset.

No other association groups are supported by the Hub. Device reset locally is the only command sent via lifeline by hub.

5. Supported Z-Wave Command Classes

- COMMAND_CLASS_ZWAVEPLUS_INFO
- COMMAND_CLASS_ASSOCIATION
- COMMAND_CLASS_SECURITY (S0)
- COMMAND_CLASS_VERSION

- COMMAND_CLASS_CRC_16_ENCAP
- COMMAND_CLASS_MANUFACTURER_SPECIFIC
- COMMAND_CLASS_APPLICATION_STATUS
- COMMAND_CLASS_ASSOCIATION_GRP_INFO
- COMMAND_CLASS_DEVICE_RESET_LOCALLY
- COMMAND_CLASS_POWERLEVEL