VSNW-XX (R/WH) VEKIN Switch Normal Wi-Fi

Setup Guide

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Works with
Apple HomeKit

WORKS WITH
amazon alexa

works with the
Google Assistant

1   Introduction

1.1   Background

This document provides guidelines to set up the VEKIN switch normal Wi-Fi (VSNW-XX) series switches with a touch interface, Wi-Fi connectivity and power measurement functionalities. This series also supports Apple HomeKit, Amazon Alexa, Google Assistant, MQTT and a customizable Android Application.

The document is updated with added features and builds on version 1.0 of the Setup Guide and Client Requirements.

1.2   Version Updates

- Updated maximum load power specifications

- Updated power measurement tolerance

- Corrected terminology

- Added setup instructions for iOS Device Support (Apple HomeKit)

- Added setup instructions for Android Device Support (Amazon Alexa/Google Assistant)

- Added setup instructions for MQTT control

- Updated pictures

- Updated model number

1.3   Switch Specifications

The specification of the switch is set out in Table 1.

Table 1: Switch Specifications

System parameters	Proposed design
Number of Channels	1-, 2- and 3-Gang versions (See Table 2)
Total Power	≤ 600W (Per Gang)
Operating Voltage Range	110 - 265V_{AC}
Frequency	50/60Hz
Surge Protection	Up to1.5kV

| Wireless	Wi-Fi 2.4GHz
Wireless Standard	IEEE 802.11 b/g/n
Touch UI	1, 2 and 3 Button versions
Power Measurement	Total Load Up to 5% Accuracy
Application Programme Interface	Apple HomeKit
	Amazon Alexa
	Google Assistant
	MQTT Protocol
Backlighting	Dimmable (Logo and Touch UI)
System Wiring	Live, Neutral and L+ for each gang
Power Failure Memory Feature	Yes
Load Type	Multiple (Light, Extractor Fans, etc.)

The switch is proposed as three variants, 1-, 2- and 3-gang. The maximum power output of the switch is 1800W, resulting in the following ratings per variant:

Table 2: Power Ratings per Variant (@230VAC)

System parameters	1 Gang (VSNW-XX-1)	2 Gang (VSNW-XX-2)	3 Gang (VSNW-XX-3)	Unit
Power per Gang	600	600	600	W
Current per Gang	2.6	2.6	2.6	A

2 Switch Connection

The switch should be wired as shown below. Both LIVE and NEUTRAL connections are required at the switch to operate. The **load** is connected between the **L1, L2 or L3** and **N** terminals.
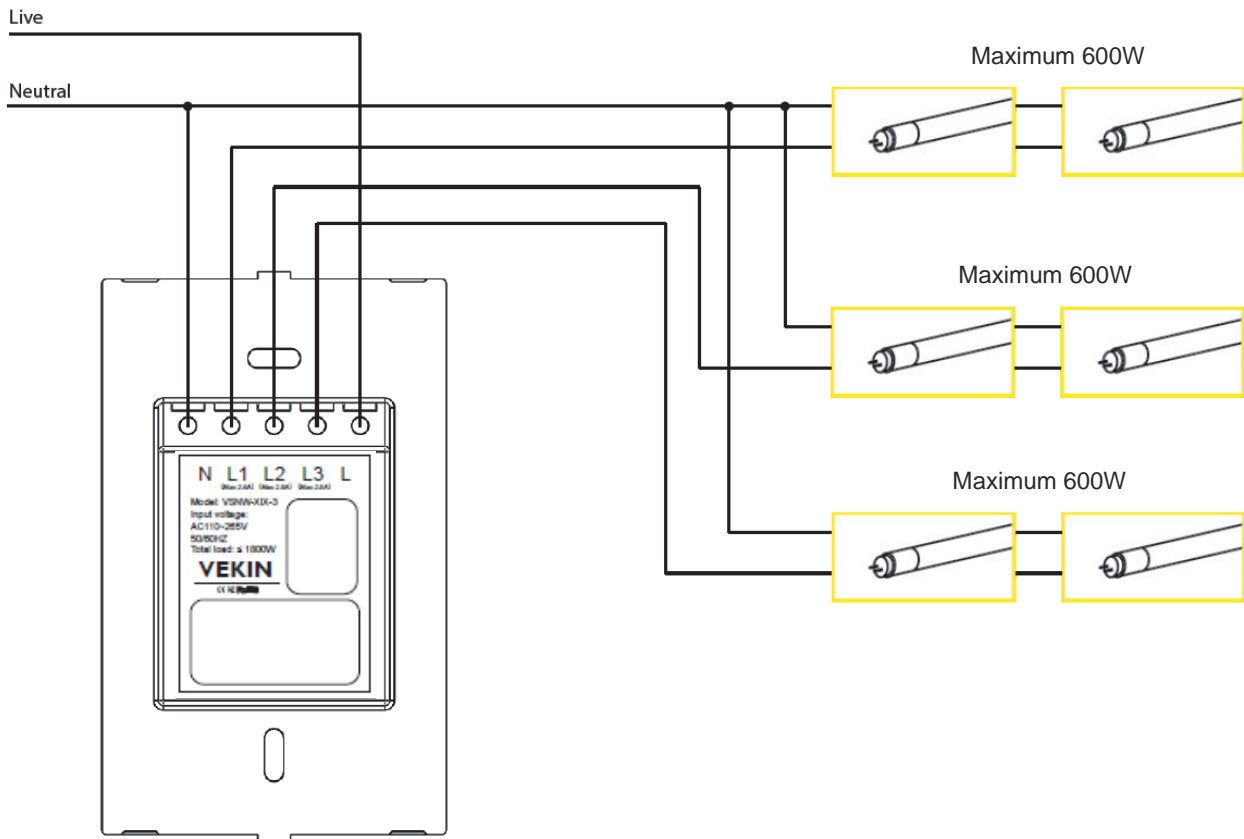
Figure 1: Hardware Connection Diagram

3 Wireless Control Setup

3.1 Initial Startup

Each switch is pre-loaded with software and set up to function out of the box. If the client provided the operating mode during production, the switch will automatically boot into the preferred mode when powered up for the first time. If not, the switch will not attempt to connect to a Wi-Fi network on initial power up and requires set up for wireless control by using Apple HomeKit, Amazon Alexa, Google Assistant and/or MQTT.

The following section summarizes the network configuration options for wireless control.

3.1 Entering Network Setup

A local webserver will automatically be activated when the switch is reset by either a MQTT command or touch buttons. The switch will make a Wi-Fi access point to which the installer can connect to by using a mobile device or computer directly. A browser can then be used to enter the unique IP address and enter the webserver hosted by the switch. This will allow the installer to enter/update the operation mode, network setup and MQTT information. The following steps describe the process to set up the network settings on the switch from a reset state.

1. **Get the switch in a reset state**:

VSNW-XX-1 (1-gang):

- From a state where the touch button is blue (load switched off), **press and hold the button for more than 30 seconds (do not release during the 30s)**.

Figure 2: Hold down the button (>30s) to enter network configuration mode

VSNW-XX-2 (2-gang):

- From a state where both touch buttons are blue (loads switched off), **press and hold the two buttons simultaneously for more than 15 seconds**.


Figure 3: Hold down the two buttons (>15s) to enter network configuration mode

VSWN-XX-R-3 (3-gang):

- From a state where all touch buttons are blue (loads switched off), **press and hold all three buttons simultaneously for more than 15 seconds**.

Figure 4: Hold down all three buttons (>15s) to enter network configuration mode

The unit will enter network configuration mode and the touch buttons will remain dark blue in color. The *VEKIN* logo will also start to flash slowly (breathing effect). The unit will now activate a mobile access point/ Wi-Fi network. Please note that the switch will still be fully functional in network configuration mode.

2. **Connect to the Wi-Fi Access Point**:

- Connect to the specific switch using a mobile phone or computer. The Wi-Fi access point created by the switch is named after each unit's unique ID/MAC number.

    o Hotspot Name: *VSNW-Y-X-xxxxxxxxxxxx*

        ▪ *Y: Production year in roman numerals (XX = 2020)*

        ▪ *X: Number of gangs (1, 2 or 3)*

        ▪ *x: 12-digit ID/MAC number (Hexadecimal format)*

    o Password: *setupsys*
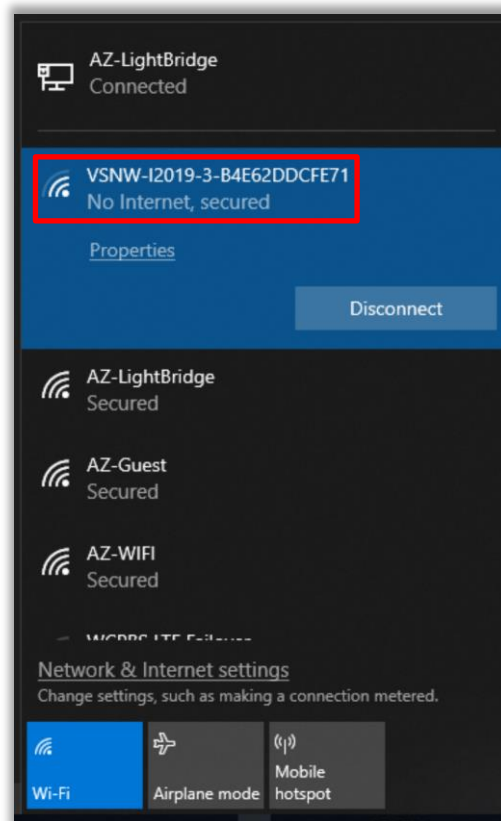
Figure 5: Connect to VSNW-Y-X-xxxxxxxxxxxx Wi-Fi Access Point

3. **Open the Webserver**:

- Open a browser on the device connected to the Wi-Fi access point and enter the necessary configuration settings and network information.

   o **Fixed IP address: http://192.168.1.1/**

Figure 6: Switch network setup in browser

- **Select the required Switch Wireless Control Setting:**
    o *iOS (Apple HomeKit), Android (VEKIN App (Smart Life), Amazon Alexa, Google Assistant) mode* – Default mode, allowing the switch to be controlled by both iOS and Android mobile devices.
    o *MQTT Broker Control and Android (VEKIN App, Amazon Alexa, Google Assistant) mode* – Select this mode if MQTT and Android mobile device control is required.
    o *MQTT Broker Control* mode – Select this mode if the switch will only be controlled by a MQTT broker.

- Enter Wi-Fi/MQTT Network Settings (Only required for MQTT broker control)

- o Only the SSID and Password is required for the network settings. The IP address and Gateway will be obtained automatically.

- o All MQTT information is required.

- o Enter 0 in the SSID and Broker areas for standalone usage or leave in iOS/Android control mode. (No Wi-Fi connectivity)

- The installer can use the *Test Switch Outputs* section to toggle the outputs of the switch during installation.

- Select to erase previous iOS/Android pairing settings (Only applicable for corresponding wireless control mode)

  - o Take note that previous iOS/Android pairing settings will only be erased after the switch has rebooted into the selected wireless control mode.

- Press *send* after all the areas are filled in.

4. The switch will automatically store the preferred settings in memory and boot into the new wireless control mode.

- The switch is ready and online once all the touch buttons are blue.

- It will send subscription topics information to the MQTT broker to confirm successful connection (MQTT mode selected).

- The switch will be ready to connect to iOS and Android devices if not paired before or automatically connect to the previous paired devices.

5. Once the switch is configured, use the guidelines below to set up mobile phones.

3.2 iOS Device Control Setup

To connect the switch to your Apple Home cellphone application, please follow the steps below:

1. Connect your iOS device to some 2.4GHz Access Point (Wi-Fi network).

2. Make sure the switch is powered up.

3. Get the switch into a reset state by erasing the previously paired device. Following the instructions below for each of the variants:

VSNW-XX-1 (1-gang)

- o Press and hold the **touch button for longer than 15 seconds (but less than 30 seconds)** to erase the previously paired iOS device. The backlighting will turn cyan and back to blue when reset successfully. Take note that if the button is touched for longer than 30 seconds, the switch will enter the configuration mode.

Figure 7: Hold down the button (>15s, release before 30s) to erase the previously paired iOS device

VSNW-XX-2 (2-gang)

o Press and hold the **left touch button for longer than 15 seconds** to erase the previously paired iOS device. The backlighting will turn cyan and back to blue when reset successfully.

Figure 8: Hold down the left button (>15s) to erase the previously paired iOS device

VSNW-XX-3 (3-gang)

o Press and hold the **left and middle touch buttons for longer than 15 seconds** to erase the previously paired iOS device. The backlighting will turn cyan and back to blue when reset successfully.

**Figure 9: Hold down the left and middle button (>15s) to erase the previously paired iOS device**

4. Create a "Home" using the Home app on the iOS device.

5. Select "Add Accessory" option.

6. Scan the QR code located on the back of the switch.

7. Alternatively, select the "Don't Have a Code or Can't Scan?" option at the bottom, select the "VSNW-Y-X" accessory and manually enter the pairing code (also visible on the back of the switch).

8. The iOS will then provision the accessory (using WAC2) so that it joins the Wi-Fi network and pair with it using the provided HomeKit code.

9. After the process completes, you can give a User-Friendly name to the accessory and assign it to any room if required.

3.3 Android Device Control Setup

To connect the switch to your android (operating system) mobile phone, please follow the steps below:

1. Connect your iOS device to some 2.4GHz Access Point (Wi-Fi network).

2. Download the Smart Life Application from the Google Play store:

   https://play.google.com/store/apps/details?id=com.tuya.smartlife

3. Create a new account or sign in with your login details on the Smart Life App.

4. Once logged in, get the switch into a reset state by erasing the previously paired device. Following the instructions below for each of the variants:

   VSNW-XX-1 (1-gang)

   o Press and hold the **touch button for longer than 15 seconds (but less than 30 seconds)** to erase the previously paired android device. The backlighting will turn

cyan and back to blue when reset successfully. Take note that if the button is touched for longer than 30 seconds, the switch will enter the configuration mode.
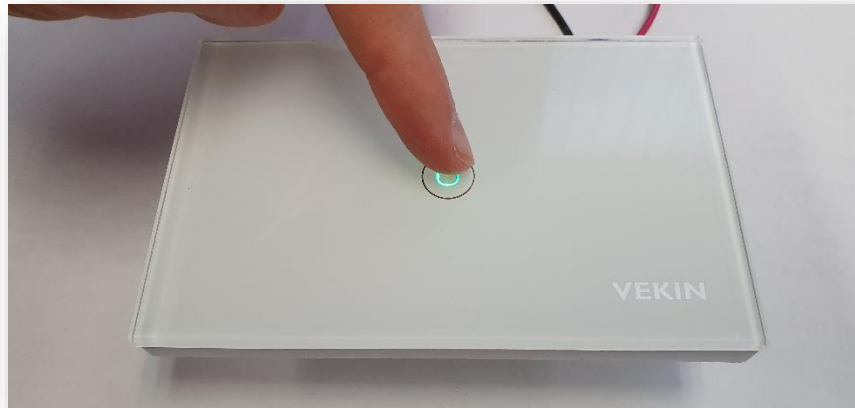
Figure 10: Hold down the button (>15s, release before 30s) to erase the previously paired android device

VSNW-XX-2 (2-gang)

o Press and hold the **right touch button for longer than 15 seconds** to erase the previously paired android device. The backlighting will turn cyan and back to blue when reset successfully.

Figure 11: Hold down the right button (>15s) to erase the previously paired android device

VSNW-XX-3 (3-gang)

o Press and hold the **middle and right touch buttons for longer than 15 seconds** to erase the previously paired android device. The backlighting will turn cyan and back to blue when reset successfully.

Figure 12: Hold down the middle and right button (>15s) to erase the previously paired android device

5. Once the *VEKIN* logo starts to blink rapidly, go back to the Smart Life App and click on "Add Device".
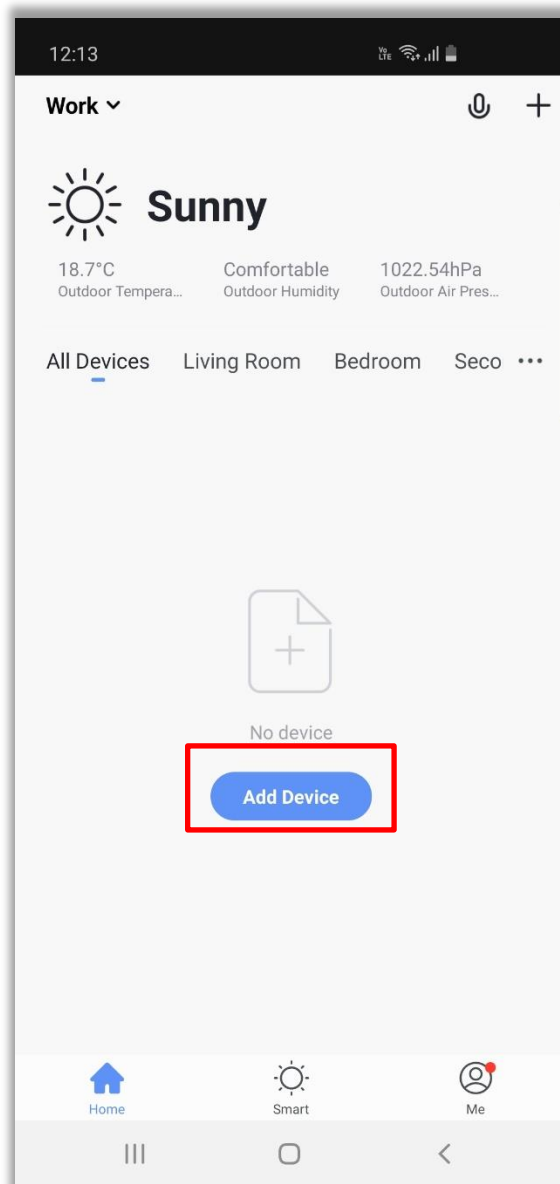
Figure 13: Add a new device in the Smart Life App

6. Under *Electrical Engineering Devices* and the *Add Manually* tab, select the **Switch** appliance as shown in Figure 14.
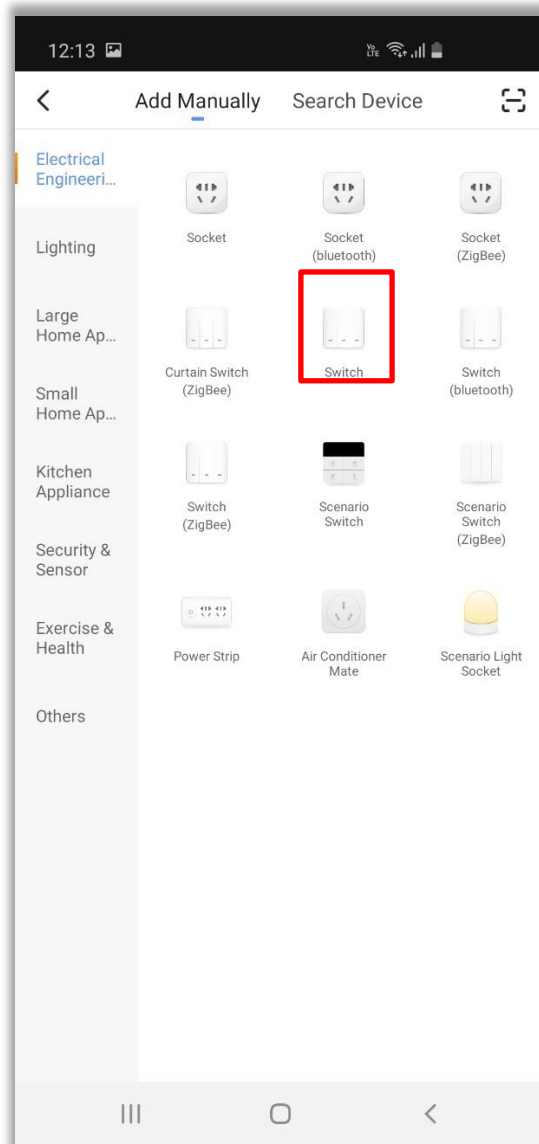
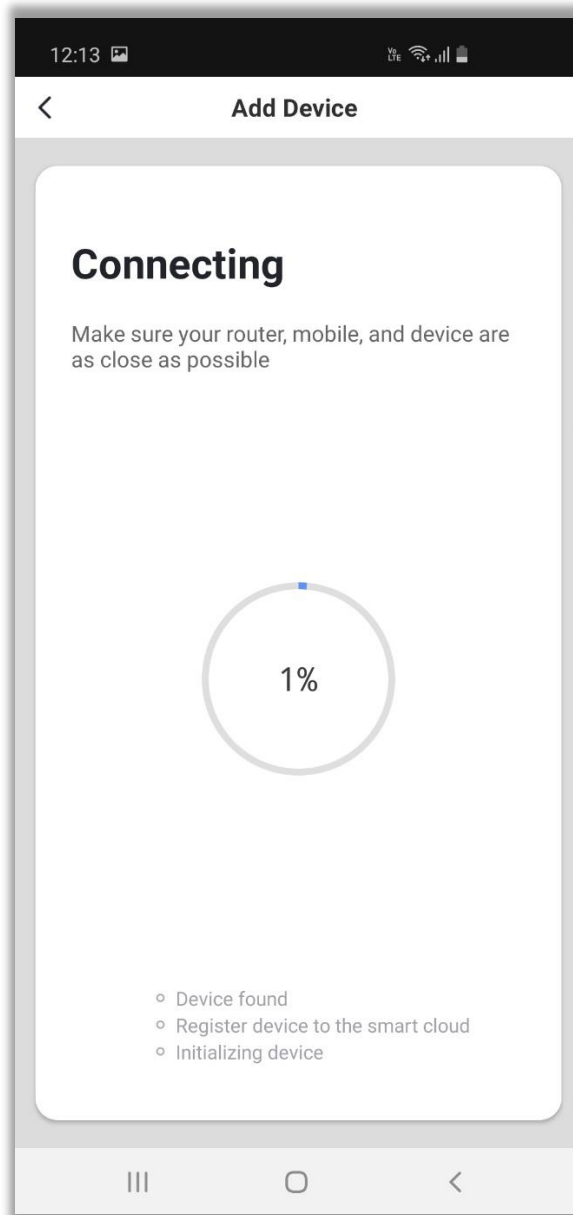**Figure 14: Select the Switch appliance in the Smart Life App**

7. Confirm that the *VEKIN* logo is still blinking rapidly.
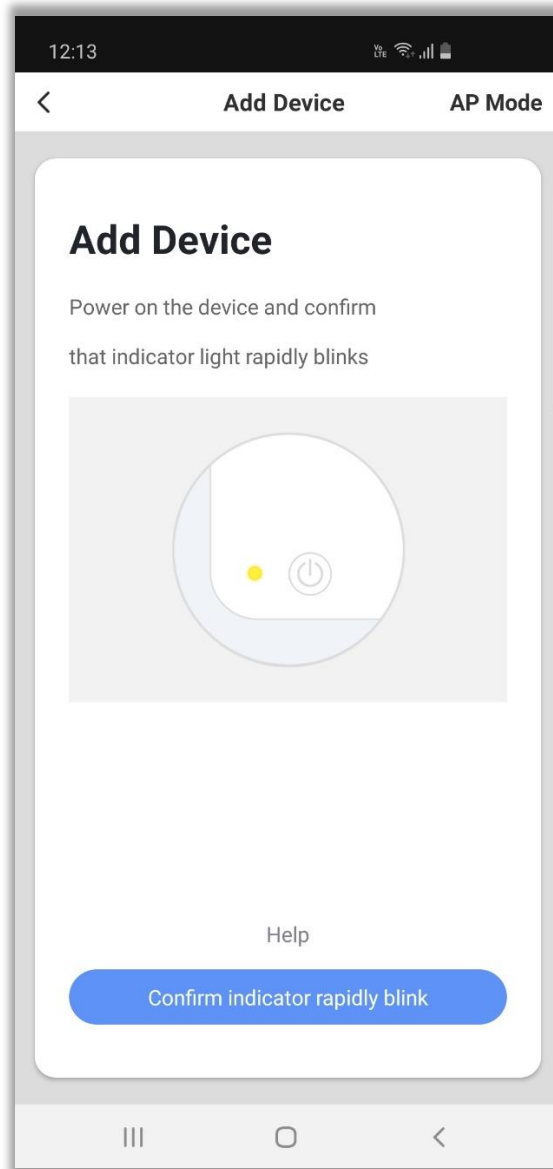
Figure 15: Confirm VEKIN logo blinks rapidly in the Smart Life App

8. The Smart Life will search for the switch and configure the network settings automatically.

Figure 16: Screen shown in Smart Life App during network configuration

9. Once the connection between the Smart Life App and the switch has successfully been established, the device will appear in the main window (Figure 13).

3.4 Amazon Alexa and Google Home Control

In order to control the switch with Amazon Alexa and Google Assistant, access should be given to the Smart Life App from both the 3rd party applications.

Follow the steps below to set up these applications:

1. Download the Amazon Alexa application from the Google Play store on the android device (with Smart Life App installed):

    https://play.google.com/store/apps/details?id=com.amazon.dee.app&hl=en

2. Create an account and configure your Amazon Echo by following the instructions provided with your Echo.

3. Once your Echo is configured, enable the Smart Life skill under the "Skills" tab in the Alexa App menu.
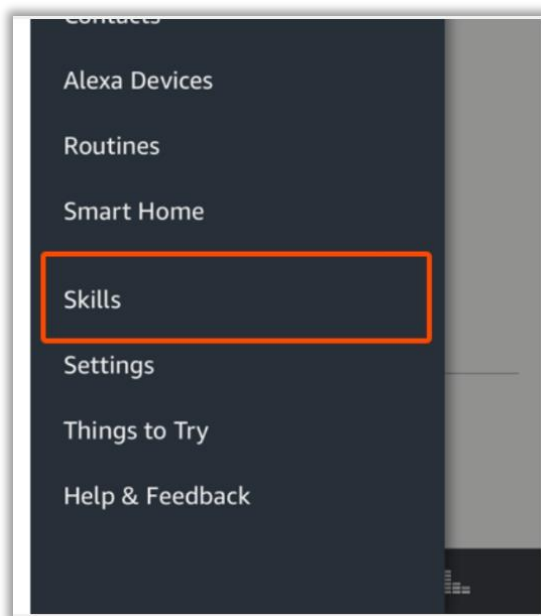
Figure 17: Select Skill Menu in Alexa App

4. Enter the Smart Life App account and password, then tap "Link Now" to link your Smart Life account to enable the Skill.
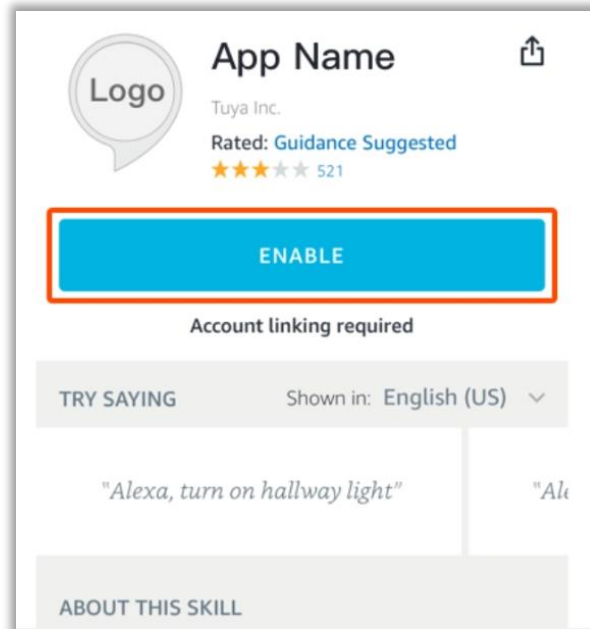
Figure 18: Enable Smart Life Skill in Alexa App

5. Once done, search for new devices in the main window. Your VSNW-Y-X switch should appear as 2, 3 or 4 devices, a switch for each gang and one main switch.

6. Please change the name of the device to an easily identifiable name so that it is easier for Alexa to switch on your lights. Names are usually in English.

7. Download the Google Home application from the Google Play store on the android device (with Smart Life App installed):

   https://play.google.com/store/apps/details?id=com.google.android.apps.chromecast.app&hl

8. Open the Google Home App on your phone to set up your Google Home device. You will be prompted to log in with your Google account. Follow the setup instructions received with your Google Home device.

9. Once your Google Home is successfully set up, on the main page of the Google Home App, tap the sidebar menu in the top left corner and select "Home Control".
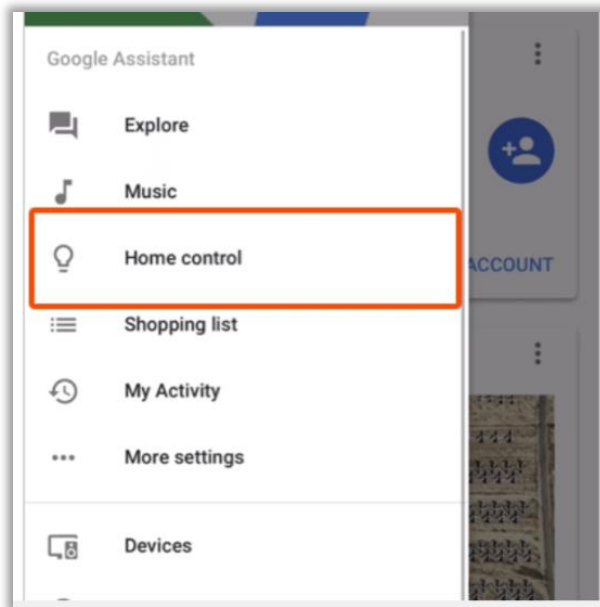
Figure 19: Select Home control in the sidebar menu

10. Then tap the plus sign in the lower right corner and search for "Smart Life".
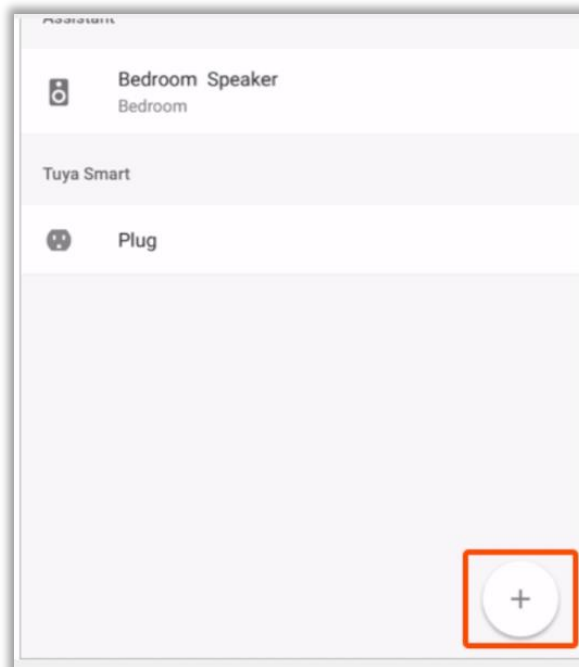
Figure 20: Link Google Home with Smart Life App

11. Find Smart Life on the list and open it, select the country where your Smart Life App account is located, enter your Smart Life App account and password, and tap "Link Now".

12. Choose the room where your device is located, the skill will appear on the Home Control Device list. The VSNW-Y-X switch will automatically appear in this area and is now ready to be used.

4 Operating the Switch

4.1 Touch User Interface

The touch buttons control each gang individually and acts as a physical user interface. These buttons will function even if the switch is not connected to a wireless network.

With each touch, the connected load will either switch on or off. The backlighting for each touch button will light up green if the gang is switched on and will remain blue in color while the gang is switched off.

Figure 21: VSNW-XX-3 sample touch interface

Note that each gang is synchronized with the Home/Smart Life App on the iOS and Android devices. Each touch interaction will also reflect on the MQTT broker (if a wireless network is established and MQTT wireless mode selected).

4.2 HomeKit App Control

The switch will be visible in the Home app as four individual services. The Home app will automatically generate a service for each gang and display it as an on/off switch. The fourth service will be displayed as a light service in the Home app and can be used to control the backlighting of the switch.
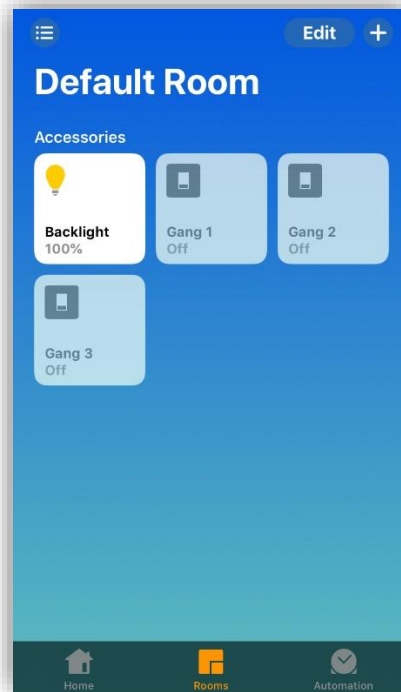
Figure 22: Switch services visible in the Home App (iOS) for VSNW-XX-3

Each service can be updated by clicking on the icons from the home screen. Additional services (such as backlight dimming) can be controlled by pressing and holding on the service icon. Figure 23 shows an example of the backlight additional service. The switch setting is accessible by clicking on the "Settings" icon in the additional service display.
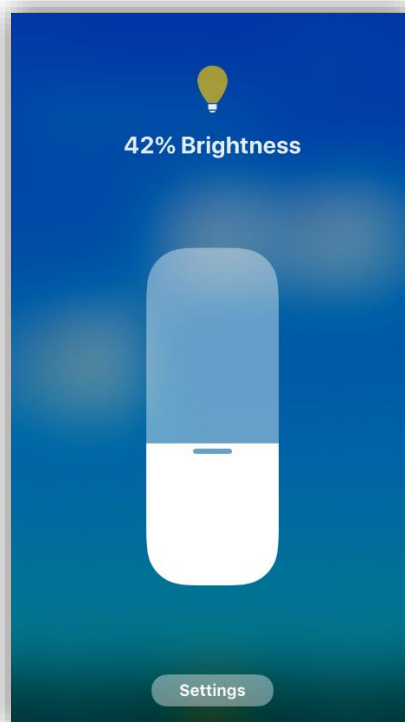

Figure 23: Additional service example in the Home App (iOS)

4.3 Smart Life App Control

The Smart Life App will display three on/off buttons for the individual gangs. An additional button allows all gangs to be switched on or off at once. The Smart Life App will also display real time power consumption data as current (mA), voltage (V) and power (W).

The individual switches and one main switch will be visible in both Amazon Alexa and Google Home/Assistant if configured correctly. Figure 24 shows an example of the VSNW-XX-3 switch in Amazon Alexa, while Figure 25 shows the Google Home integration.
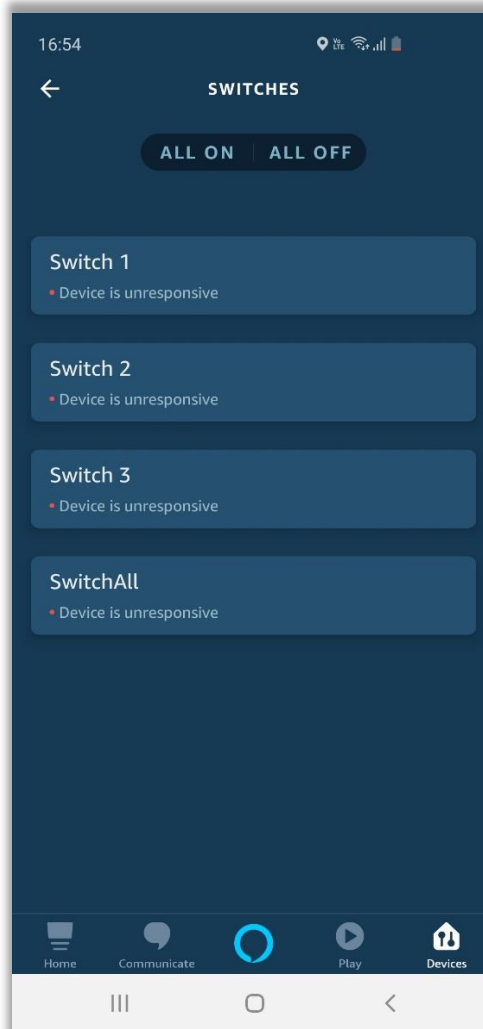
Figure 24: Switches visible in Amazon Alexa App for VSNW-XX-3
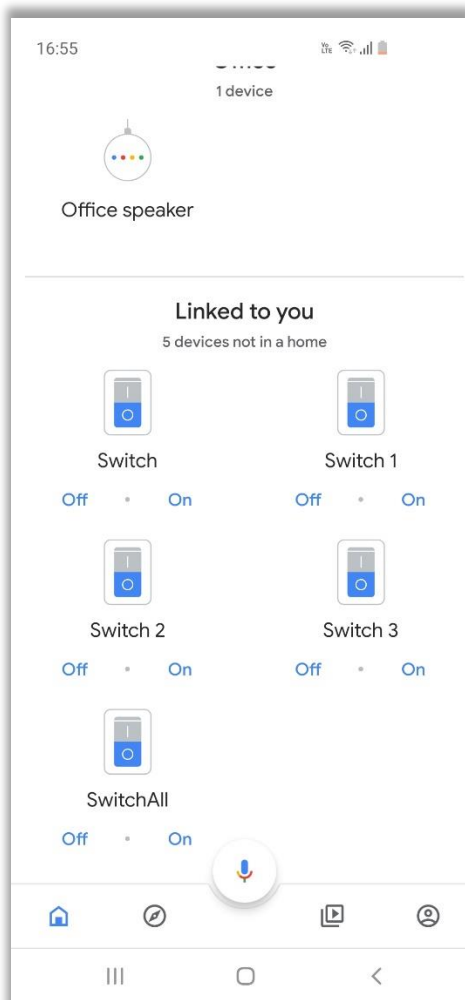
Figure 25: Switches visible in Google Home App for VSNW-XX-3

4.4 MQTT Command Structure

4.4.1 MQTT Topic and Message Definitions

The switch can be controlled by the following MQTT command structure:

MQTT Topic	MQTT Message
*VSNW **/** IDxxxxxxxxxxxx **/** Select*	*Command **=** Value **=** Signature*

where:

- *VSNW*: Classify type of device to communicate to (For future projects, controlling other types of devices such as air-conditioning systems).

- *IDxxxxxxxxxxxx*: Unique switch ID to communicate to, where xxxxxxxxxxxx is the 12-digit (6 bytes) device MAC address.

- *Select*: Select a switch channel/gang or group to modify.

- *Command*: Command byte to execute certain operations/tasks.

- *Value:* Value byte for the selected command.

- *Signature:* Data encryption message signature set together by using the unique ID of each device. (Not implemented)

The MQTT command structure has various options as listed below. The selection of variables described above exists for each switch and the broker/server has the freedom to communicate to individual or multiple units at the same time.

Table 3: MQTT Command Set

MQTT Topic		MQTT Message		Switch Actions	Default Values
IDxx…	*Select*	*Command*	*Value*		
ID552467 (Example ID)	CH1	PowerLevel (or P)	0-1	Switch Gang 1, 0: Off, 1: On	0: Off
		GroupSelect	0-2	0: No Group, 1: Group 1, 2: Global	0: No Group
	CH2	PowerLevel (or P)	0-1	Switch Gang 2, 0: Off, 1: On	0: Off
		GroupSelect	0-2	0: No Group, 1: Group 1, 2: Global	0: No Group
	CH3	PowerLevel (or P)	0-1	Switch Gang 3, 0: Off, 1: On	0: Off
		GroupSelect	0-2	0: No Group, 1: Group 1, 2: Global	0: No Group

	GROUP	PowerLevel (or P)	0-1	Switch Gang On/Off for group (Selected Switches)	0: Off
	CONFIG	Reboot	n/a	Reboot the master MCU of switch	Default values not re-loaded
		ResetMCU	n/a	Activates the switch configuration mode (webserver)	Default values not re-loaded
		PowerMemory	Enable/Disable	Enable or disable memory feature for power failure	Enable
		ResetAndroid	n/a	Reset Vekin APP, Amazon Alexa and Google Assistant Configuration	n/a
		ResetIOS	n/a	Reset Apple HomeKit Configuration	n/a
		BackLight	0-100	Adjust Brightness of LED Backlighting (%)	100%
	POW	Report	Enable/Disable	Enable or disable power consumption MQTT report	Enable
		SampleInterval	1-60	Adjust power consumption sampling and reporting interval (Seconds)	15s
		GetPower	n/a	Sends power (W) consumption of selected switch via MQTT	n/a
	VEK	Report	Enable/Disable	Enable or disable Vekin format reporting (Format: CH1_Level : CH2_Level : CH3_Level : Power)	Enable
		ReportInterval	1-250	Adjust the reporting interval of the Vekin format reporting	10s
GLOBAL	n/a	PowerLevel (or P)	0-1	Switch Gang On/Off for global (All switches selected on Global)	0: Off

	USA	**Asia**	**South Africa**
Physical Address	6507 Jester Blvd Bldg 5, suite 510G Austin TX 78750 USA	Rm1227, Glittery City Shennan Rd Futian District Shenzhen, 518033 China	1 Bergsig Avenue Paarl 7646 South Africa
Postal Address	6507 Jester Blvd Bldg 5, suite 510G Austin TX 78750 USA	Rm1227, Glittery City Shennan Rd Futian District Shenzhen, 518033 China	PO Box 3534 Paarl 7620 South Africa
Tel	+1 512 538 1995	+86 755 8303 5294 ext 808	+27 21 863 0033
Fax	+1 512 672 8442		+27 21 863 1512
Email	info@azoteq.com	info@azoteq.com	info@azoteq.com

Please visit www.azoteq.com for a list of distributors and worldwide representation.

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.