



Project Linus

PRD Kickoff Deck
06/03/22

inovelli®



Overview

Project Overview

Currently our Z-Wave switches are the best in their market. ZigBee offers an opportunity to go after a 10x larger market with the same advanced, proprietary features.

Posted by u/HomeAuto87 1 year ago

Smart Switches for Philips Hue

QUESTION

I need some help in understanding the options for Smart Switches for use with Philips Hue bulbs. I am running Home Assistant with Z-Wave in my house.

My requirements are:

1. Have the switch always pass power to the light fixture
2. Pressing the switch should have no effect on the power, as I'll be able to use Home Assistant to control the Hue Bulbs in that fixture

I'm reading a lot about the Lutron Casetas and the new Inovelli since both do not require a neutral wire. Are either of these an option to fit my needs? Should I be looking at something else?

Thanks in advance!

18 Comments Give Award Share Save Hide Report 74% Upvoted

Posted by u/Wings1412 2 years ago

Hue bulbs + Physical switches

Please forgive my ignorance, I'm sure this has been asked a million times, but I can't find a straight answer.

I really like some of the features of Philips Hue lighting, but I really hate that you can't control it with the physical switches. I have spent some time looking and found that I can get smart light switched (TP-Link have peaked my interest), but I can't find if I can synchronize these with the Philips Hue bulbs.

I don't like the weird fake switches Philips have for Hue Lighting, and I want to maintain physical switch incase my phone dies and voice isn't working for one reason or another.

13 Comments Give Award Share Save Hide Report 67% Upvoted

Posted by u/TLMS 1 year ago

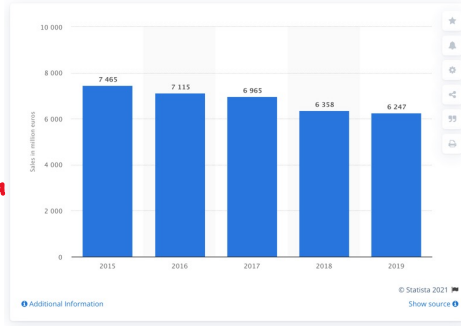
In Wall Smart Switches W/ Philips Hue?

I am currently using mostly Philips Hue lightbulbs around my house. However I have not been able to find a solution for light switches. In Wall Smart light switches cut power to my lights, rather than just set them to "off". The problem is I cant use the wireless ones as I will still have the regular light switches on my wall. I want it so that the only light switches on my wall are smart ones that work properly with my philips hue lights.

Is there a solution to this?

19 Comments Give Award Share Save Hide Report 88% Upvoted

Technology & Telecommunications - Consumer Electronics
Total sales of Signify (Philips Lighting) from 2015 to 2019
(in million euros)



Philips #1 problem is that they do not offer a hardwired smart switch and currently do not have ambitions to develop one. This is a huge request from people who have Hue smart bulbs and where we currently fill the gap with Z-Wave. We can do the same thing with ZigBee. Signify (Philips) sold over 6.2B Euros in 2019 and are the leader in smart bulbs in the US¹.

Connected Home Over IP (CHIP) Participating Companies



CHIP (now Matter) is underway in development and the companies involved do not have a wide selection around light switches. This is a huge gap in the market which we can exploit using ZigBee to start and then changing over the firmware once CHIP officially launches.



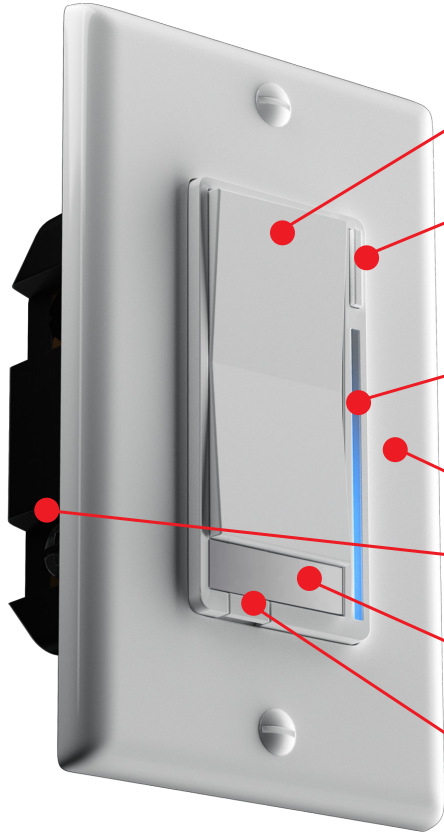
1. <https://www.statista.com/statistics/705981/annual-sales-of-philips-lighting-segment-of-the-philips-group/>

Hardware Requirements



Look & Feel

The look and feel should be identical to our [2-1 Zigbee Switch](#) - which is distinct to our brand.



- **Responsive Paddle** - rests in a neutral state
(tap up = on // tap down = off & hold up = dim up // hold down = dim down)
- **Configuration / Favorites Button** - button should be used for configuration of the switch as well as scene control.
 - Should be able to be held (for configuration)
 - Should be able to be tapped (for scene control)
- **RGB LED Bar** - should measure the % of how much the switch is dimmed
 - LEDs should be RGB (artificial white included)
 - LEDs should also be able to be dimmed
- **Paddle & Faceplate Color** - color should match Lutron Claro wall-plate white
- **Slim Design** - See appendix (Section A) -- depth of switch should be as slim as possible so that it can fit into metal boxes.
- **Motion Sensor (and potentially Lux)** - motion detection either via PIR or mmWave with built in lux (if possible and based on costs)
- **Air Gap**
- **No heat-sink tabs** (if possible - See Section A in Appendix)

Features & Capabilities

These features allow us to be versatile in any installation setting and experience level and should take the intimidation away from installing a smart switch.



Features

Basically, this should follow the 2-1 Switch tooling but add in motion/lux capabilities.

- **ZigBee 3.0** - use the latest ZigBee chipset (MG21 or MG24 if possible) and compatible with SmartThings, Hubitat, Home Assistant & Amazon Echo Plus Gateways
- **3-Way / 4-Way Ready** - switch should auto-detect (see Appendix - Section B)
 - Should work with an auxiliary switch (like our 2-1)
 - Should work with an existing dumb switch
 - Should work with another smart switch (if wired to another smart switch, it should be able to detect this)
- **Power Monitoring** - switch should measure the power consumption
- **ZigBee Distance Estimator** - should be able to estimate the signal strength of the Z-Wave signal and notify via the LED bar (see Appendix - Section C)
- **Instant On** - when tapped 1x (and scenes aren't used), switch should turn the bulb on instantly (no delay)
 - Configurable delay in 100ms increments (see tech doc)
- **CFL & LED Compatibility** - minimum buzz and flickering
- **600W** - increase the wattage to 600 like GE's
- **Neutral & Non-Neutral Compatibility** - Switch should be able to work with a neutral wire or without a neutral wire
 - Should auto-detect which setting it's in (neutral/non-neutral, aux/dumb) and if it can't, then there should be a manual override.
- **Auto-Detect Line/Load** (and if possible other terminals)
 - No matter how customer wires it, the switch should be able to detect what's wired/where.
- **PIR or mmWave** - Prefer mmWave if possible (see Appendix D)
- **Lux Sensor** - detect light brightness (see Appendix E)

Firmware Requirements



Firmware Requirements

Here's where Inovelli shines and what sets us apart from the competition. It's important we nail this.



Features

Follow the 2-1 Switch firmware, but add in motion/lux parameters

- **On/Off or Dimmer** - switch should be able to be either an on/off or dimmer depending on what the user sets it as
- **ZigBee Scene Control** - multi-taps to activate various scenes
- **RGBW Bar Config** - bar should be able to change colors and dimmed to the customer's favorite level
- **Auto Timer** - switch should have a timer that shuts the switch off after a certain amount of time
- **Easy Config** - switch should be able to be configured via the config / favorite button.
 - There should be infinite customization via parameters in the firmware, but also set customizations for HUB's that do not allow parameter changes (ie: Wink)
- **Internal Relay Disable** - internal relay should be able to be disabled locally and via ZigBee
- **Minimum dim level / Maximum dim level**
- **Ramp rate configuration** - ability to change how fast/slow light turns on
- **Ramp rate & instant on/off separated**
- **Default Dim Level** - ability to set the default dim level
- **OTA Ready** - ability to update firmware via OTA
- **Zigbee Bindings** (Individual & Group)
- **Smart Bulb Mode**
- **PIR or mmWave zone settings and calibration**
- **Lux calibration** - ability to adjust lux reading if something is off



Other Info

Other Requirements

Customers expect these to have the following certifications and inserts.



Certifications

- ZigBee (Required)
- UL (Required)
- FCC (US) / IC (Canadian) – (Required)
- Friends of Hue (Optional)
- Works w/Alexa (Optional)

What's in the Box

- Instruction Manual (color)
- Wiring Insert
- Rewards Program Insert
- Warning sticker on side of switch
- Faceplate & screws (white – matches Lutron Claro)
- Switch + Paddle

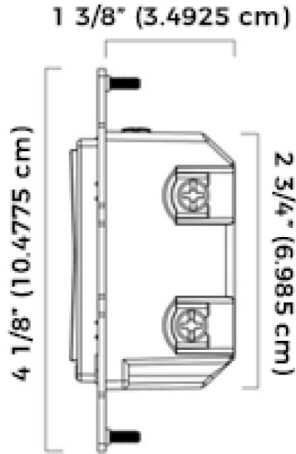


Appendix

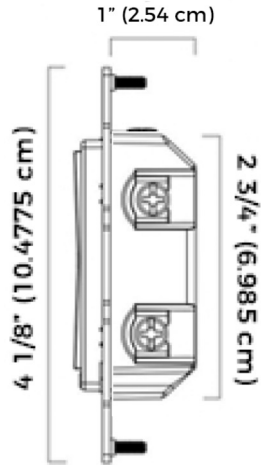
Section A – Slim Design & No Heat Sink Tabs

Smart switches are extremely thick and sometimes hard to fit into US gang-boxes, especially older gang-boxes that are metal.

Current Depth



Ideal Depth



QUICKFIT™

20% smaller housing

No break-off tabs to remove

The screenshot shows the QUICKFIT logo at the top. Below it, two rows of images illustrate the product's benefits. The first row shows a white smart switch with a red arrow pointing to a smaller version of the same switch, labeled '20% smaller housing'. The second row shows a white smart switch with a red arrow pointing to a smaller version of the same switch, labeled 'No break-off tabs to remove'.

NOTE: Above screenshot taken from GE's new switches

Section B – Multi-Switch Setup

Oftentimes people will want various setups for their 3-Way (multi-switch) setups. Solving for all three is mandatory.



SMART & AUX SWITCH

Similar to GE's setup, where there is a smart switch (ie: GE #12722) and an aux switch (ie: GE #12723).



SMART & DUMB SWITCH

User can use a smart switch (Inovelli) and an existing, "dumb" switch such as this: <https://www.lowes.com/pd/Eaton-15-Amp-3-Way-White-Rocker-Light-Switch/1000050595>



SMART & SMART SWITCH

User should be able to use two Inovelli switches together (either On/Off or Dimmer) and the switch will detect this.

Section C – ZigBee Signal Indicator

Switches should indicate the ZigBee distance to let customers know if their switch is within range. If the switch LED turns green, it means that it's within range, if yellow = weak range, if red = not in range.



RED
Not in Range
of ZigBee
Signal



YELLOW
Poor Range
of ZigBee
Signal



GREEN
Within Range
of ZigBee
Signal

Section D – PIR vs mmWave

Smart home companies are now moving towards mmWave, which is a lot more accurate and flexible than PIR (can detect presence – important when you are sitting still in a room and you don't want your lights to turn off). However, we need to analyze what the costs are as well as limitations (mmWave devices in market have various flaws).



AQARA HUMAN PRESENCE SENSOR – FP1

This is the latest sensor from Xiaomi Aqara. There seems to be some issues with the detection time (about 4 seconds which is very slow) but the presence sensor works amazing.

Article: [Everything Smart Home](#)

Issues: [Reddit Thread \(4s Delay\)](#)



YouTube Review Video
(Click to view)

PIR

Strengths: Detects motion and less expensive than mmWave

Weaknesses: Does not detect presence which makes some automations fail (ie: you want your lights to turn off if no motion is detected in 10 min – if you're watching a movie, the PIR sensor will not detect you there and your lights will shut off even if you're in the room)

mmWave

Strengths: Detects motion and presence allowing more granularity over your motion automations (ie: If no motion OR presence in a room for 10 min, shut off light – you cannot do this with PIR)

Weaknesses: Possible processing time delay (walk into room and you want the light to come on once presence is detected – if it takes more than 1 second, it is very slow) and more expensive than PIR

Section E – Lux Reporting

Depending on costs, the sensor should also have a built-in lux reading. This will help with all sorts of automations including opening/closing blinds, and Circadian Rhythm (which a huge B2B opportunity is looking for and currently working on)



Circadian Rhythm Example

09:00AM - Lux Reports 0%, RGBW Bulbs - 2700K (Soft White)
10:00AM - Lux Reports 20%, RGBW Bulbs - 3000K (Soft White)
11:00AM - Lux Reports 40%, RGBW Bulbs - 4000K (Soft White)
12:00PM - Lux Reports 60%, RGBW Bulbs - 5000K (Cool White)
01:00PM - Lux Reports 80%, RGBW Bulbs - 6000K (Cool White)
02:00PM - Lux Reports 100%, RGBW Bulbs - 7000K (Cool White)
03:00PM - Lux Reports 80%, RGBW Bulbs - 6000K (Cool White)
04:00PM - Lux Reports 60%, RGBW Bulbs - 5000K (Cool White)
05:00PM - Lux Reports 40%, RGBW Bulbs - 4000K (Soft White)
06:00PM - Lux Reports 20%, RGBW Bulbs - 3000K (Soft White)
07:00PM - Lux Reports 0%, RGBW Bulbs - 2700K (Soft White)

