

Wireless Home Automation Retrofit for 2 BHK Apartment [using Gateway (Hub)]

WIRELESS AUTOMATION : 'WITH' GATEWAY vs. 'WITHOUT'

Wireless Home Automation is often a retrofit, i.e. for homes with existing switches not being replaced. It comes in 2 different varieties

1. 'WITH GATEWAY (HUB)' VERSION (used in this case study)

- There is only 1 WiFi connection between the WiFi router and the Gateway.
- The Gateway connects to all other automation devices (nodes, sensors) using RF* (not WiFi)
- The Gateway behaves just like a smart phone or computer, connecting to the router

2. 'WITHOUT GATEWAY(HUB)' or 'WiFi NODE' VERSION (shown in a separate case study)

- Each node in this case connects to the WiFi router directly, like a smart phone/computer.
- This increases the number of connections (and bandwidth) to and from the router
- BuildTrack does not offer Sensors in this version, only Nodes that actuate electrical devices.

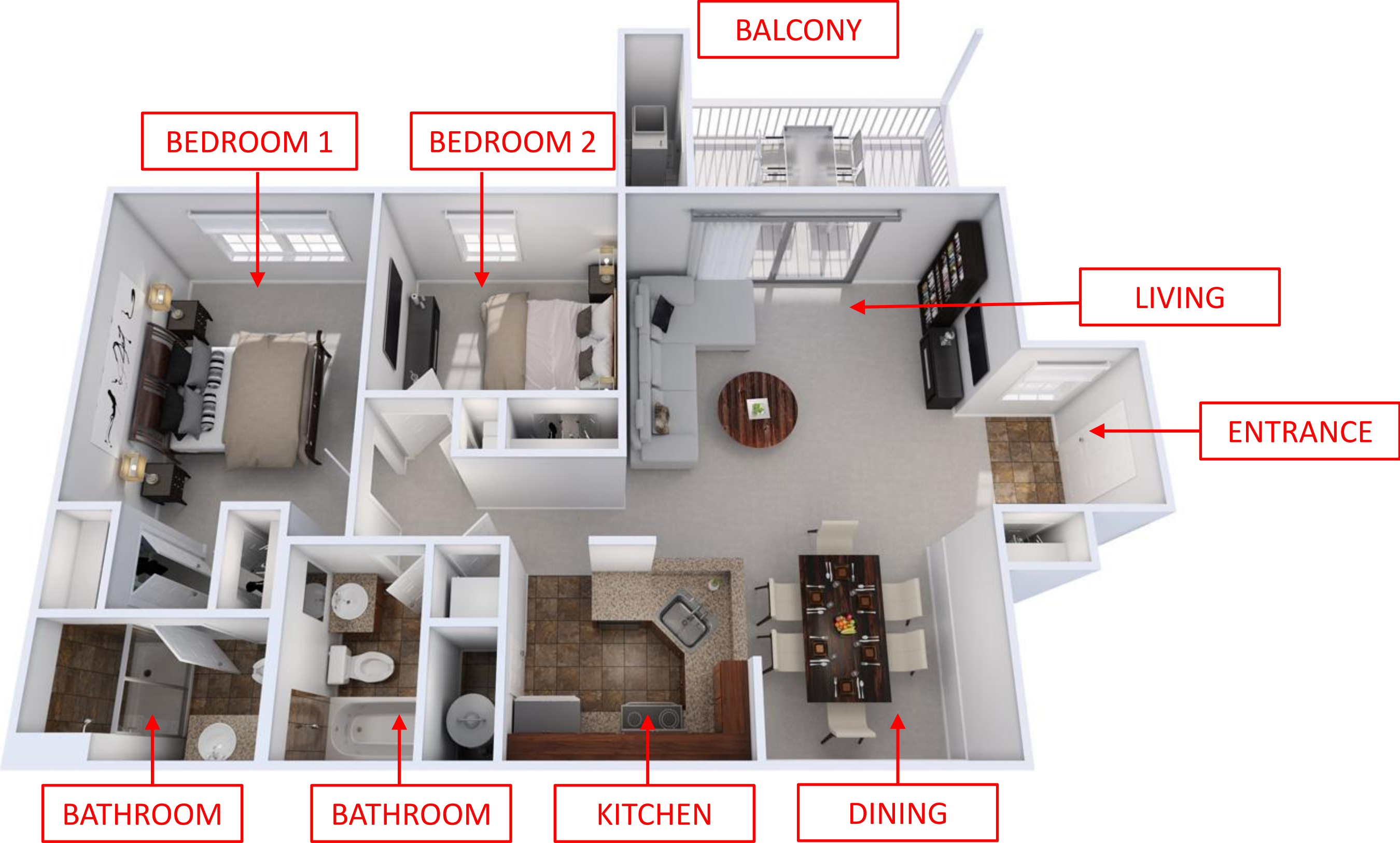
* "RF" is Radio Frequency that is Sub-GHz that does not interfere with the 2.4GHz or 5GHz spectrum that is typically used by routers, or home wireless phones or zigbee devices.

WHY THIS CUSTOMER CHOSE 'WITH GATEWAY(HUB)' OPTION

- Customer did not want too many devices (nodes) connecting to the WiFi router, as they might hinder phones and computers already connecting to it.
- They were concerned that if their router had to be relocated in the home, it could impact the reception at some of the switches.
- They were concerned that if their neighbours above or below them used more powerful routers then the distribution of their own router signals might be impacted
- They wanted to use gas sensor and smoke sensor (in the Kitchen), door intrusion sensor (for main door), and panic buttons (in bedroom) that are only possible with Gateway option offered by BuildTrack (our RF* allows long-battery life)

* "RF" is Radio Frequency that is Sub-GHz that does not interfere with the 2.4GHz or 5GHz spectrum that is typically used by routers, or home wireless phones or zigbee devices. Also allows longer battery life for sensors.

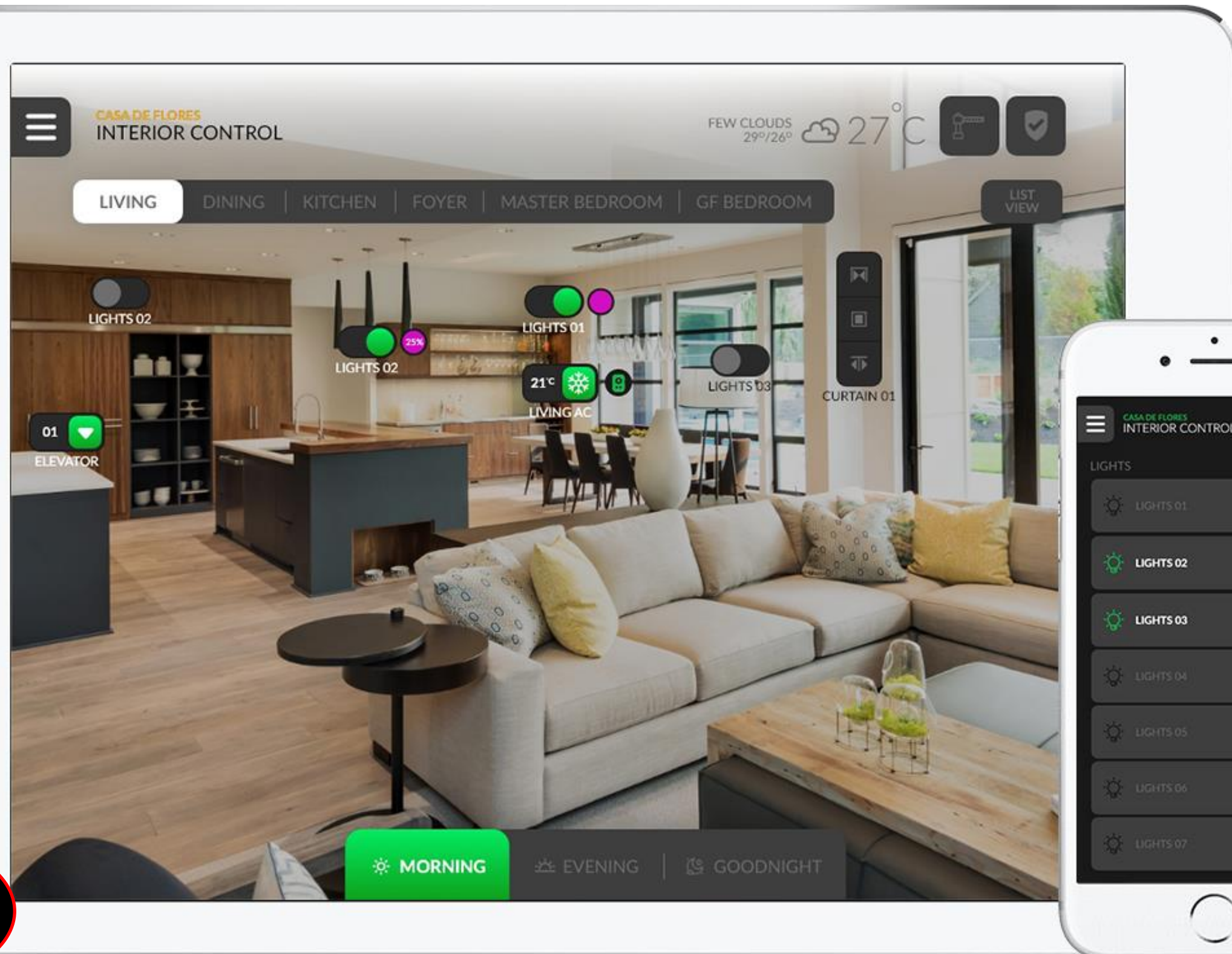
THE APARTMENT ROOMS



SMART AUTOMATION USER INTERFACES



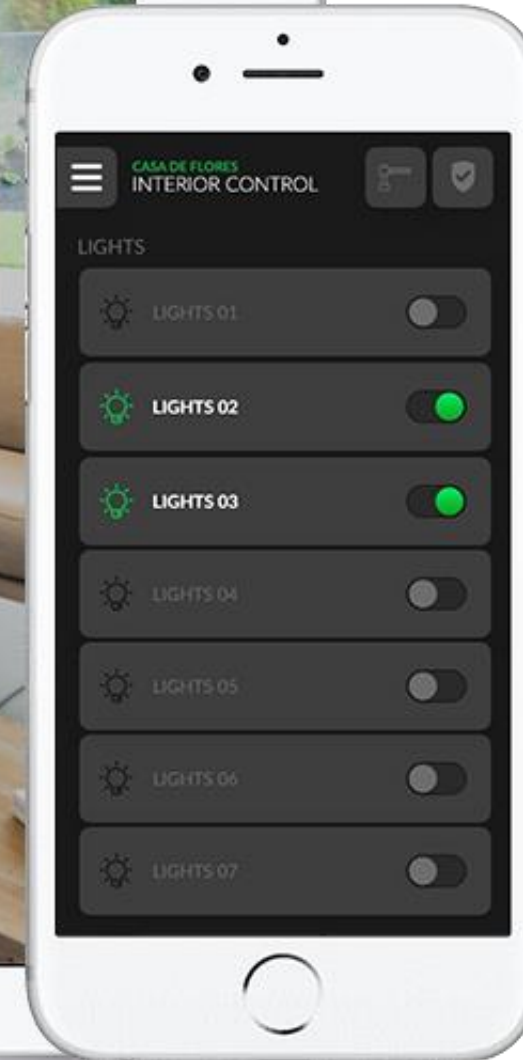
SMART APP



360deg view



BUILDTRACK REMOTE



VOICE ASSISTANT

AUTOMATION FEATURES MOST USED BY APP, VOICE or REMOTE

- Turning electrical devices ON/OFF – lights, fans, AC, TV, STB, Water Heater
- Dimming Lights
- Changing Fan speed
- Changing AC temperature setting & fan speed
- Changing TV Channels on STB
- Moving curtains open or closed
- Creating ‘Profiles’ that allow a combination of devices to be operated by a single button on the Smart App – like ‘All ON’, ‘All OFF’, ‘Movie Time’, ‘Good Night’
- Creating schedules for automatic operation of individual switches or complete profiles, (e.g. curtain opening in AM and closing in PM)

SWITCHES IN RETROFIT AUTOMATION : 'IN SYNC' option

All switches existing in the home were typical toggle switches. The 'IN SYNC' option for automation retains the ability of these switches to reflect the ON/OFF position as traditionally used, when the switch is physically operated.

- If Smart App/Voice is used to turn the Load ON, when the switch is physically in the OFF position, then to turn OFF the load using the physical switch the user has to first toggle the switch to the ON position and then the OFF position.
- If the Smart App/Voice is used to turn the Load OFF, when the switch is physically in the ON position, then, to turn the load back ON using the physical switch the user will have to first put it in the OFF position and then the ON position.

This IN SYNC option was deployed in this case-study.

This is a unique feature of BuildTrack's technology that is most liked by families

SWITCHES IN RETROFIT AUTOMATION : 'TOGGLE' option

The alternative to the 'IN SYNC' option is called the 'TOGGLE' option

- In this option each toggle of the switch changes the load condition between ON/OFF. The original “toggle” switch is now acting like a “touch” switch in its behavior. Each touch operates the load.
- The conventional ON/OFF positions of the switch have no meaning and so users would have to get used to this new way of operation.
- Users can use the switch interchangeably with the App/Voice

This option was not used in the current case study

CURTAINS / DIMMERS/ FANS IN RETROFIT AUTOMATION

- Since no switches were present for curtain control and during automation the curtain motors were added. The option to move curtains was only via Smart App or Voice. (Also, to provide power to the curtain motor, wiring is needed)
- Since only a toggle switch allow for the lights to be ON/OFF, it cannot be used to dim the lights. Hence, the dimming option is only possible via Smart App, Voice Control or Remote
- The Fan already has a regulator for speed control, so when the fan switch is in the ON position, the speed can only be controlled via the physical regulator. If it is in the OFF position, then the Smart App or Voice can be used to turn the fan ON/OFF and control its speed

SMART AUTOMATION SYSTEM COMPONENTS



Wireless Point Node for existing switches

4 Types were used

1. ON/OFF
2. Dimming (by phase-cut option)
3. Fan Speed
4. High Capacity (water heater)



Smoke sensor



Alarm



Wireless Gateway



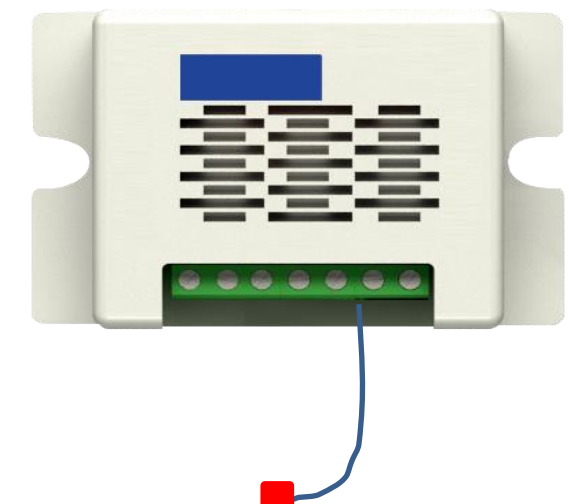
Wireless Panic Button



Gas Leak sensor



Door Contact Sensor

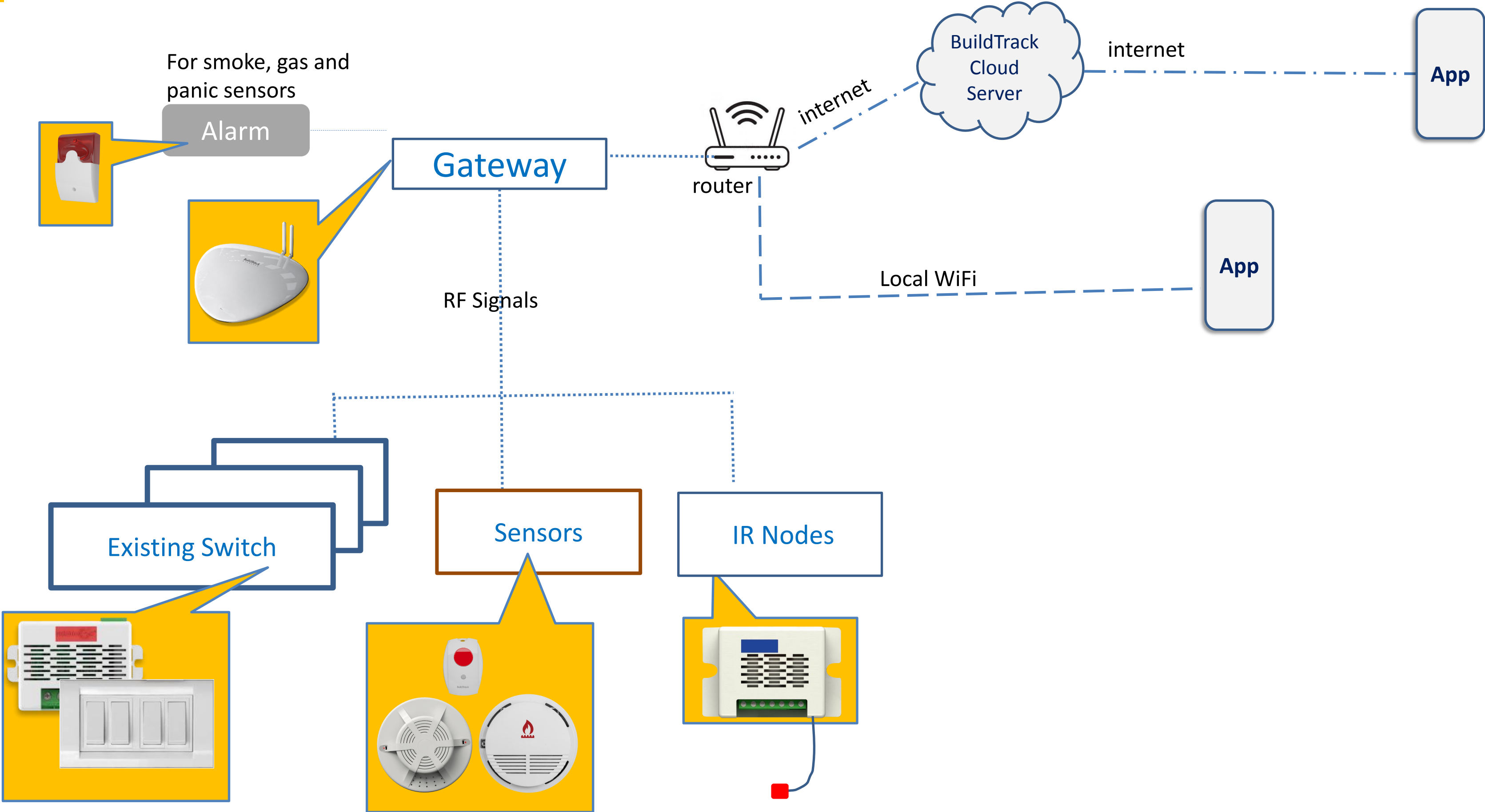


IR node

BUILDTRACK SYSTEM OVERVIEW

- A Wireless Home Automation System comprises of wireless nodes, sensors and a wireless gateway.
- BuildTrack Nodes sits behind and connects to any standard module switch in order to control the electrical load connected to the switch. The node can communicate with the BuildTrack Gateway or Remote Control to receive control signals and to send status signals.
- The node can communicate radio frequency (RF) communication with the Wireless Gateway across the home.
- Usually, 1 BuildTrack Wireless Gateway can manage the nodes and sensors throughout the home, but it depends on the layout of walls in the home.
- The BuildTrack Gateway communicates via Wifi with the router in the home
- The users can use the BuildTrack Smart App on mobile/Tab or Voice Assistants to operate lights, fans, TV, STB and Curtains or to initiate 'Profiles'

SYSTEM ARCHITECTURE



CONVERSIONS TO SMART AUTOMATION

In this apartment, only some Switch Panels were Automated, but not all. They are described below. Also, some items (e.g. Curtain Control, sensors) which were not present earlier were added.

ENTRANCE

Converted to Smart Automation:

- 1 Switch panel with
 - 1 Light

LIVING AREA

Converted to Smart Automation

- 1 Switch Panel with
 - 1 Fan switch w/ regulator
 - 2 Lights
 - 1 Cove Light Dimmer
- 1 AC control (both power ON/OFF and IR control)
- 1 TV and STB control (IR control only)

Additions for Smart Automation

- 1 Curtain motor for control (app/voice only – no switches)

DINING AREA

Converted to Smart Automation

- 1 Switch Panel with
 - 1 light
 - 1 Cove light Dimmer
- 1 AC control (both power ON/OFF and IR control)

KITCHEN

Converted to Smart Automation

- 1 Existing Switch panel for
 - Light Switch
 - Exhaust Fan

Additions for Smart Automation

- Added sensors
 - 1 Gas Sensor
 - 1 Smoke Sensor

BEDROOMS (2)

Converted to Smart Automation

- 1 Switch Panel with
 - 1 light (2-way, with sister switch in bedside panel)
 - 1 fan switch w/ regulator
- 1 AC control by SA (both power ON/OFF and IR control)

Additions for Smart Automation

- Panic button for bedside w/ Alarm device placed in living room (with gateway)

Items not Automated

- Bedside panel with reading lamp was not automated.

BATHROOMS (2)

Converted to Smart Automation

- 1 switch panel for water heater (high capacity)
- 1 wired motion sensor to the light switch

BALCONY

- 1 Switch panel for
 - Light Switch

Items not Automated across these rooms

- There were multiple switch + socket combos i either in isolation or part of above panels that were not part of Automation

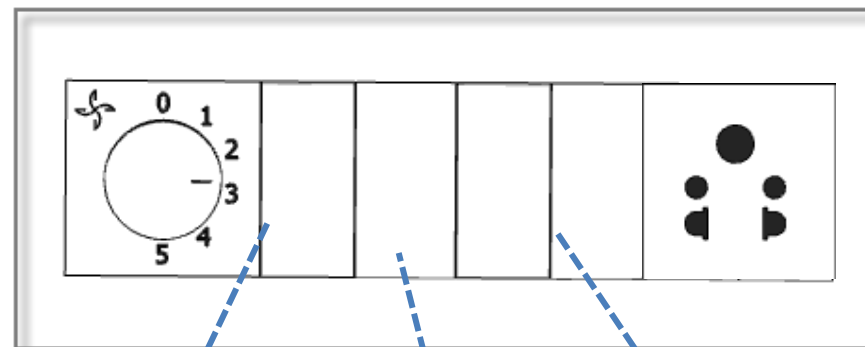
LIVING AREA : AUTOMATION PLACEMENT

LIVING AREA

1 Fan w/
speed
regulator

1 cove
light

2 Lights



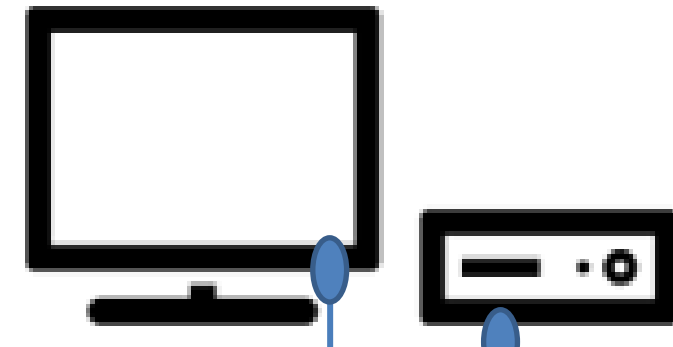
Node for fan
on/off and
speed control



Dimmer
node for
cove light

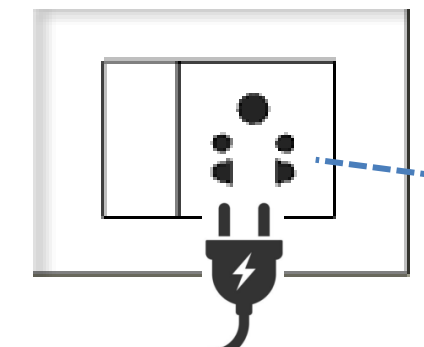


2 point
node for
on/off

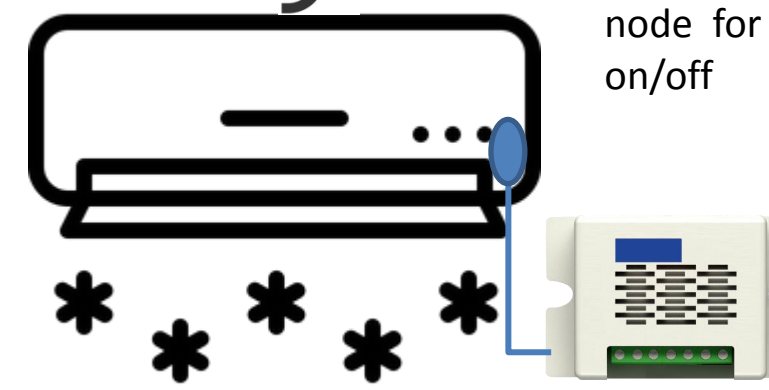


IR node

1 plug socket ON/OFF

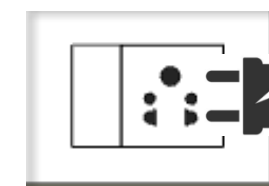


1 point
node for
on/off



IR node

Curtain Motor *



* New power wire had to be
drawn to the curtain for this

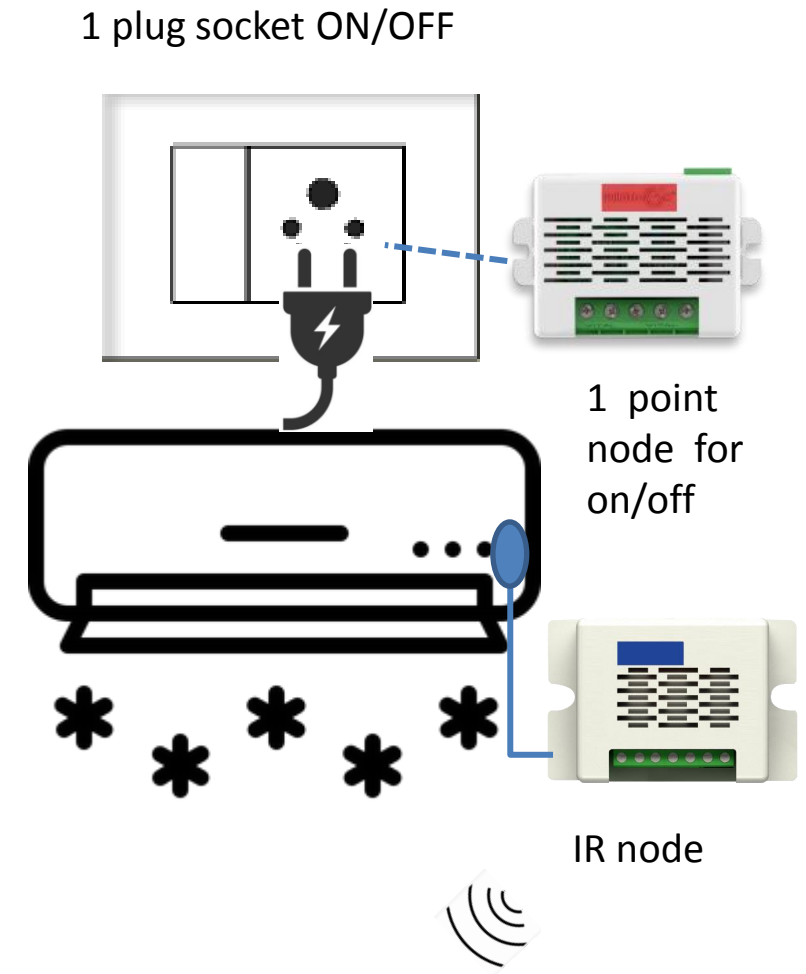
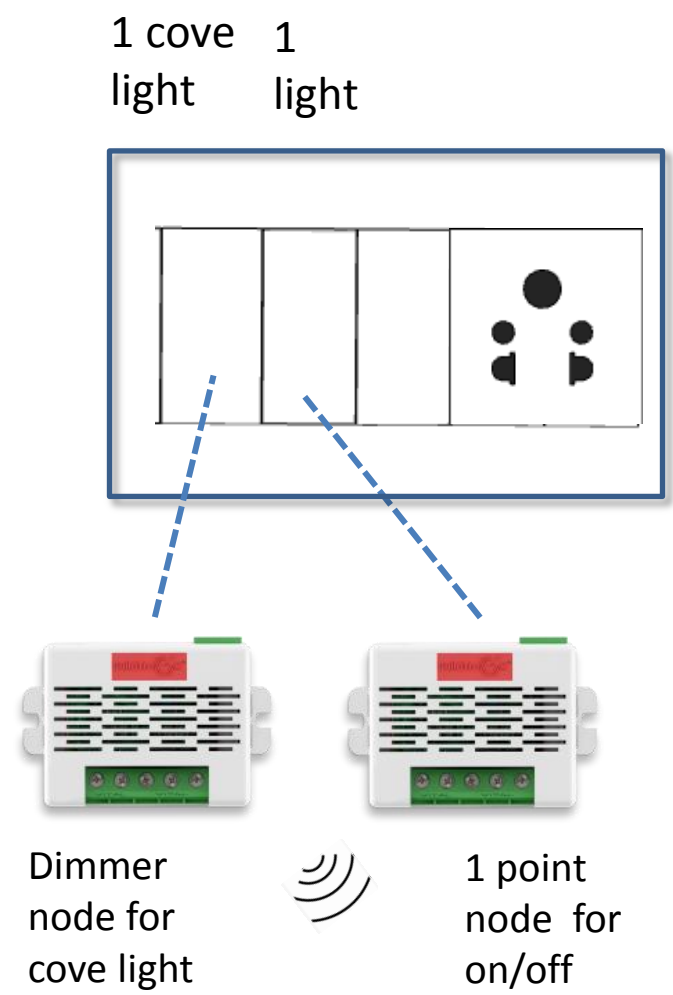


Move Node for
curtain open/
close

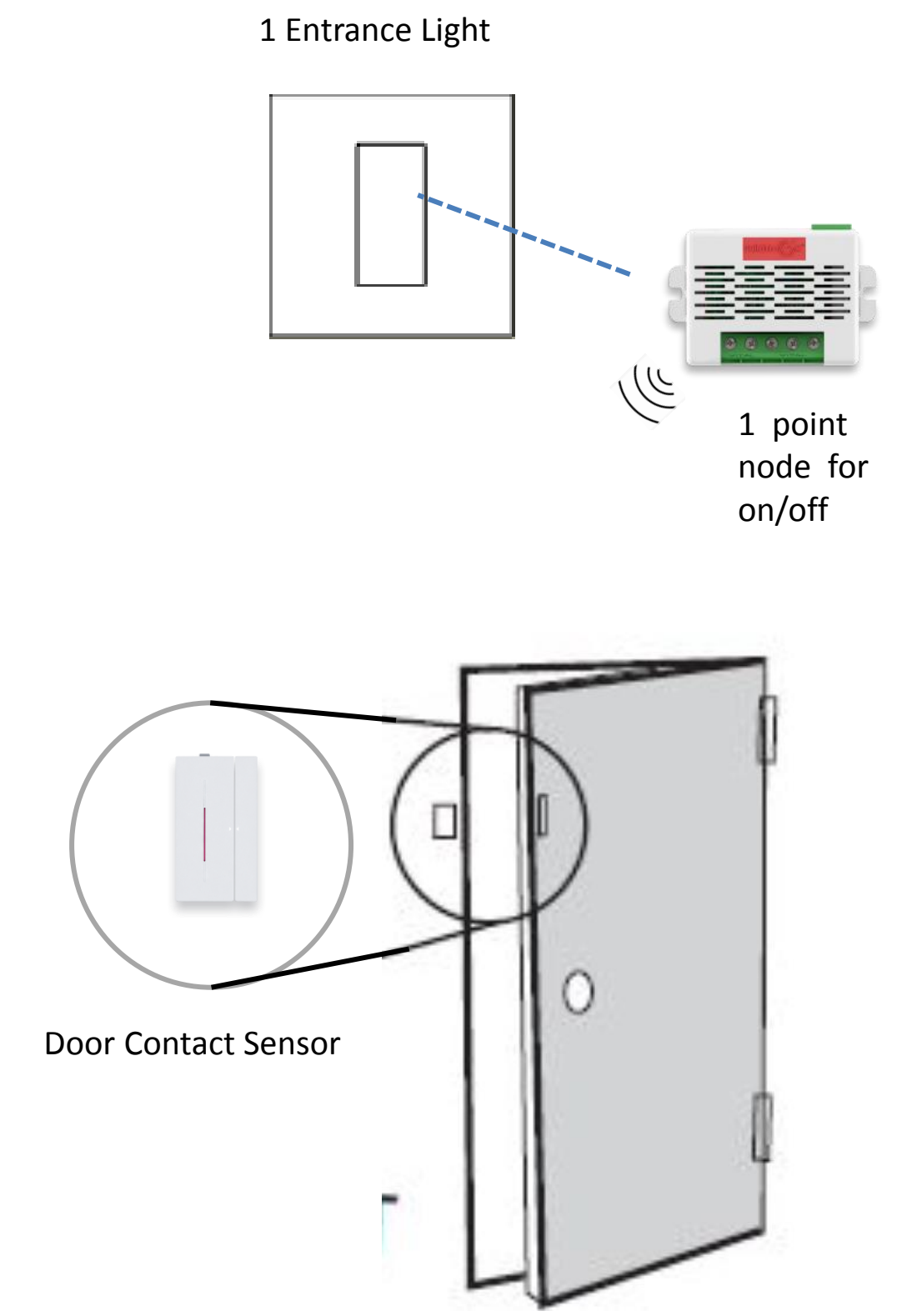


ENTRANCE & DINING AREA: AUTOMATION PLACEMENT

DINING AREA

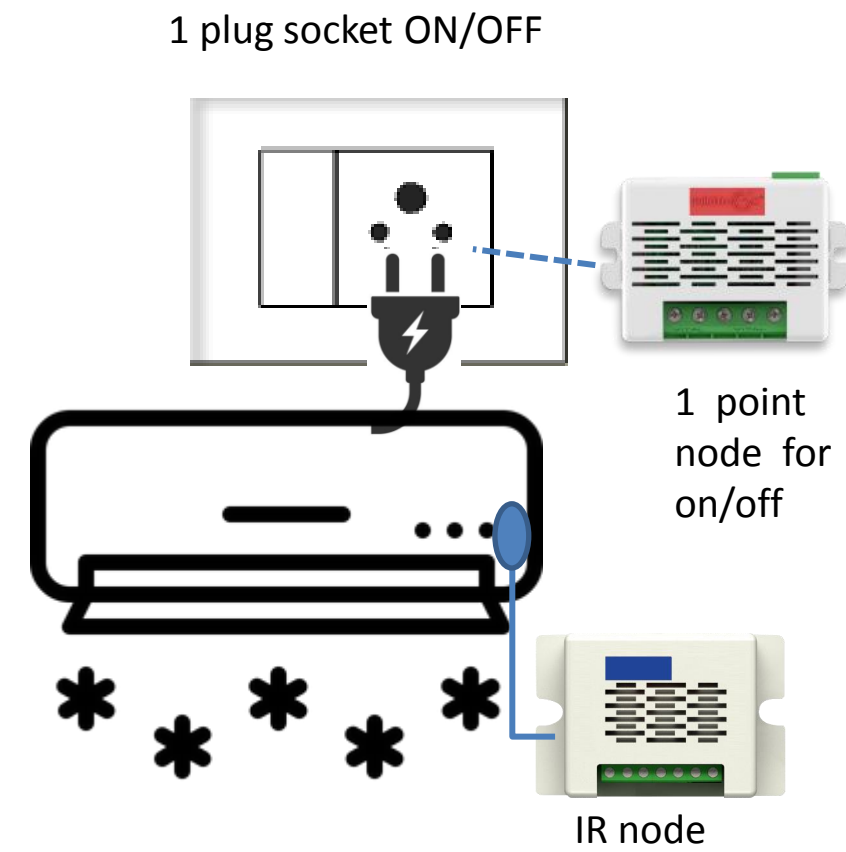
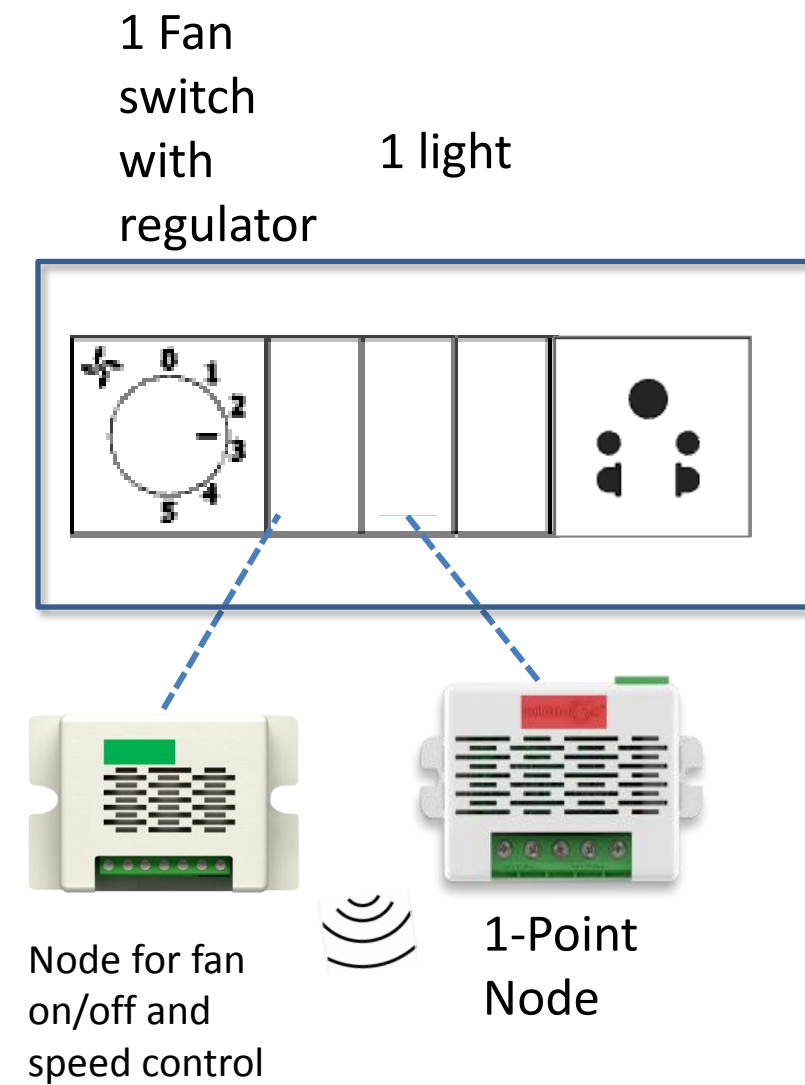


ENTRANCE



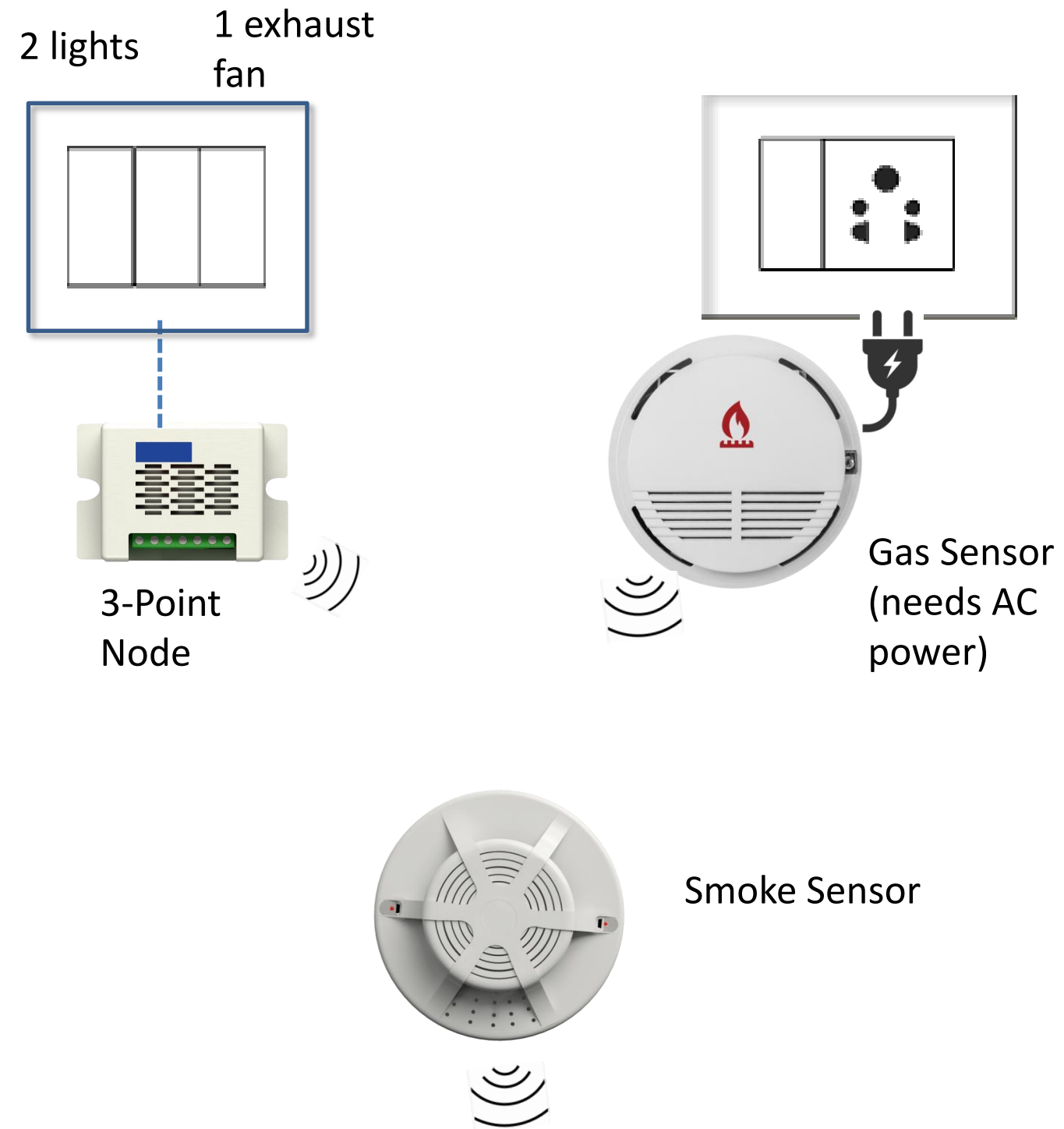
MASTER & KIDS BEDROOM (same format in all)

BEDROOM

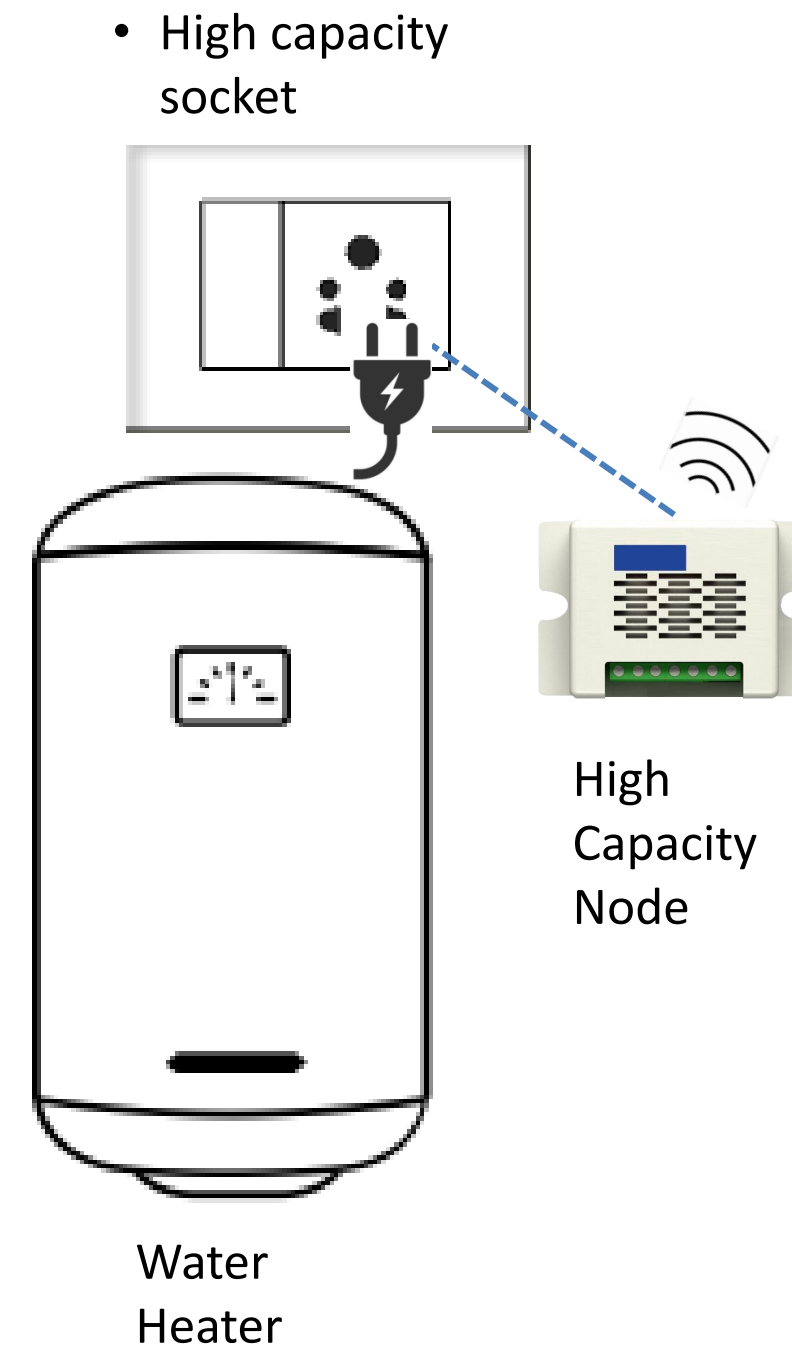


KITCHEN, BATHROOM & BALCONY

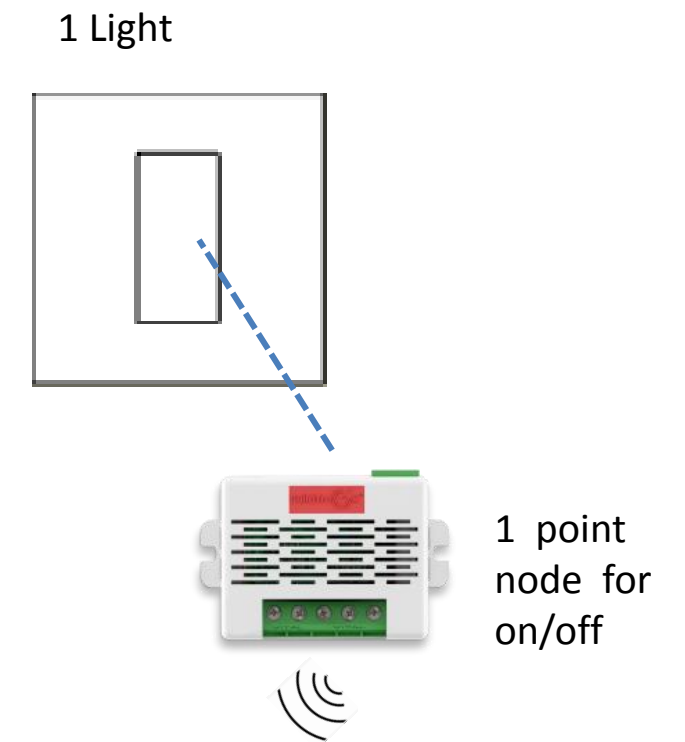
KITCHEN AREA



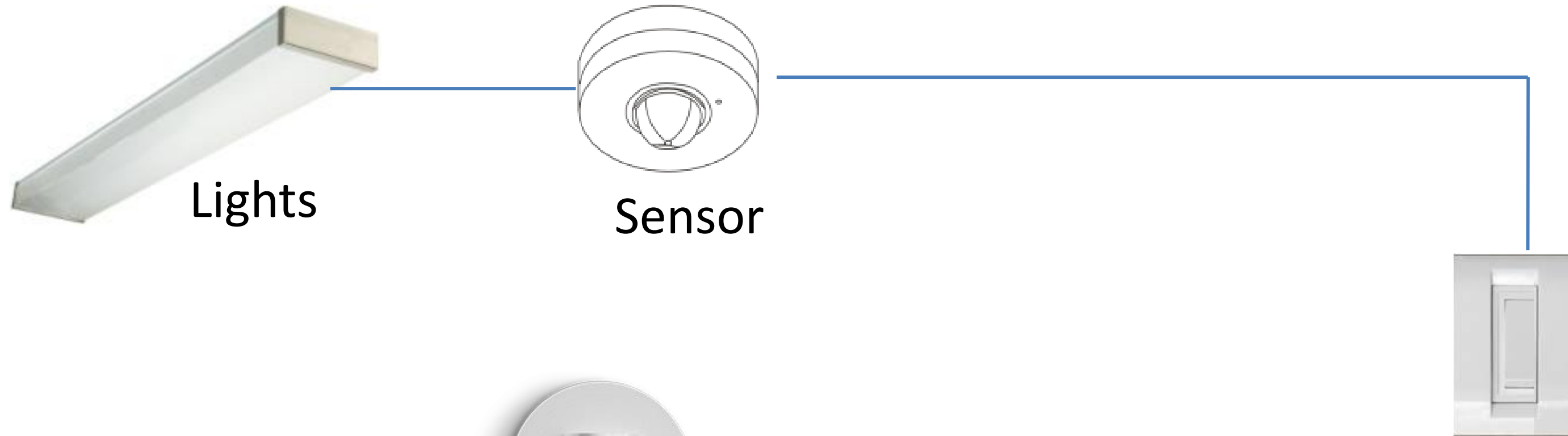
BATHROOM



BALCONY

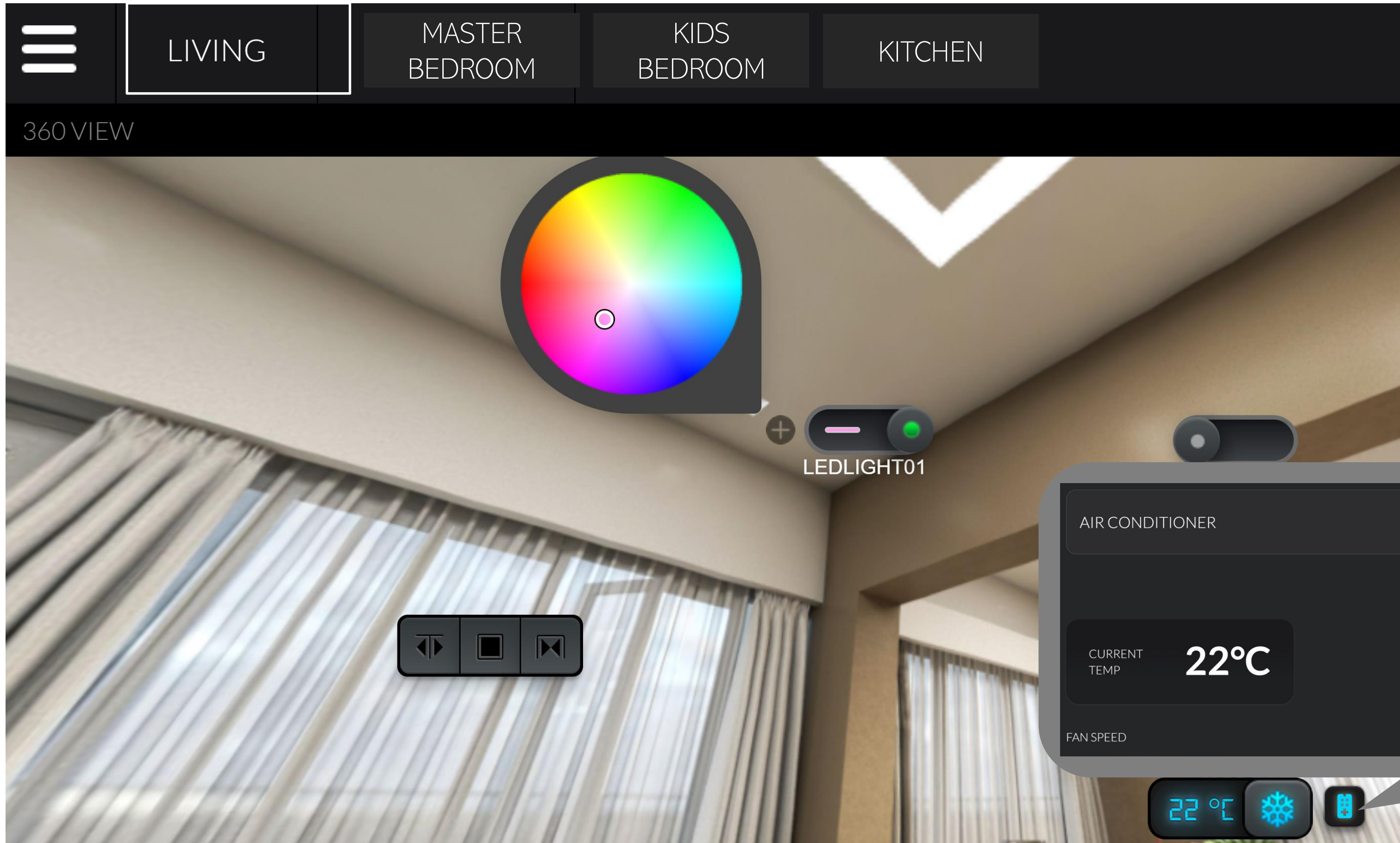


BATHROOMS – Standalone Sensors (not connected to App/Voice)

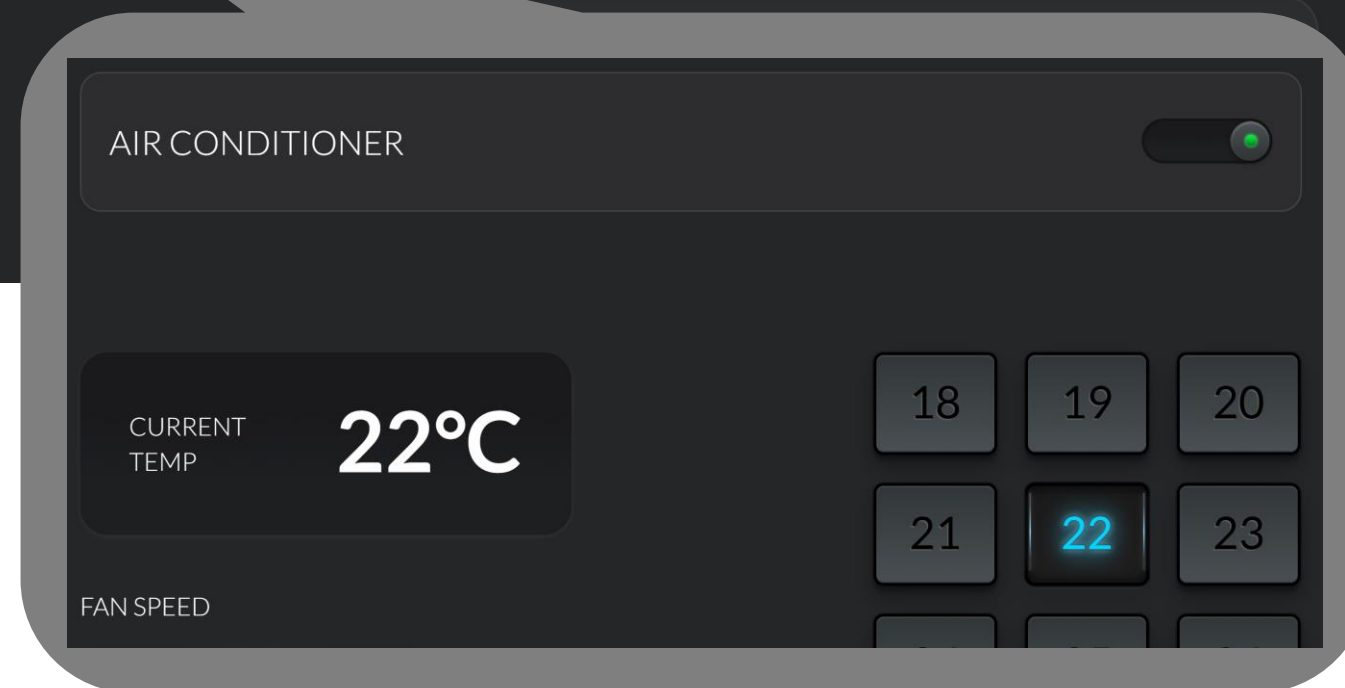
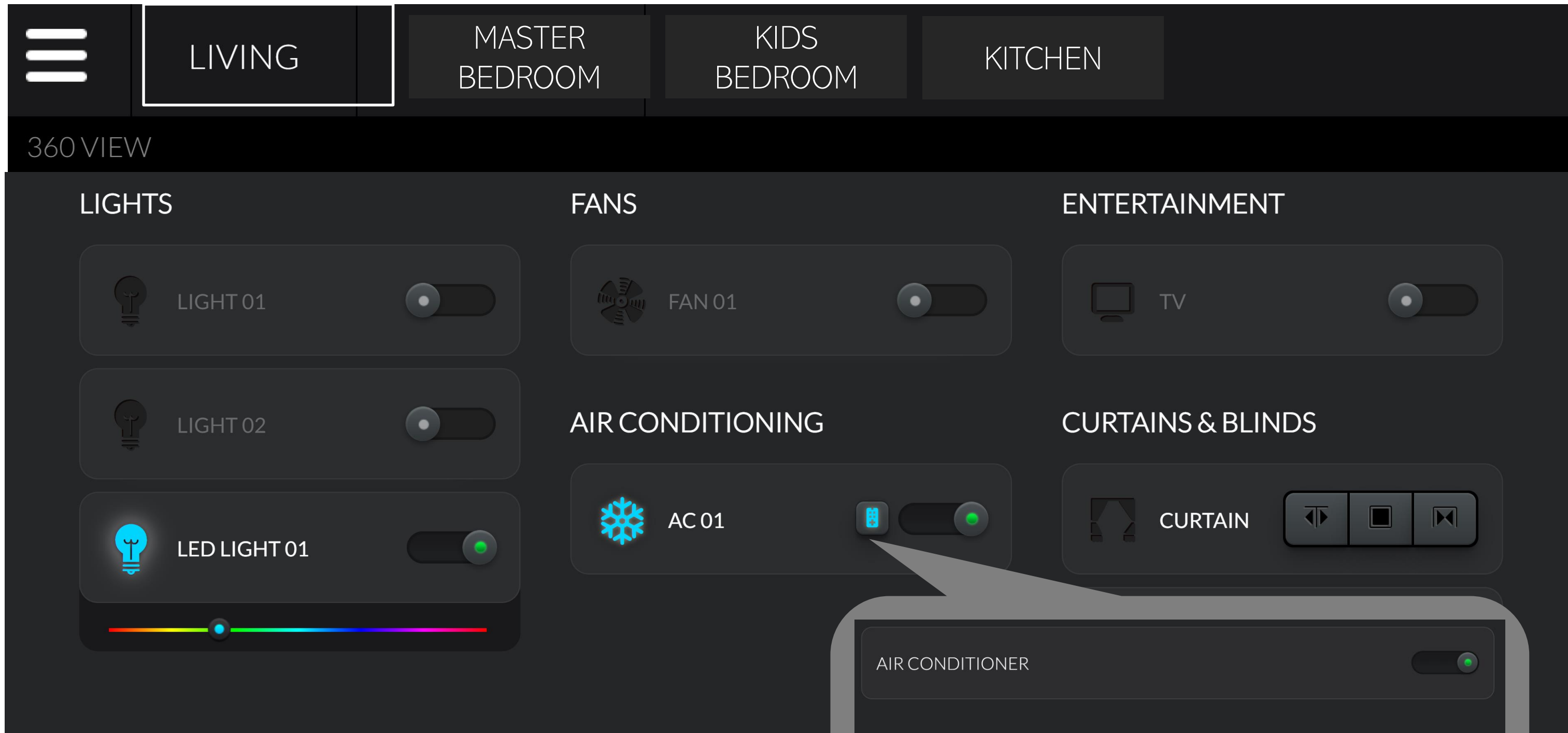


Standalone Sensor
Lighting Controls

SMART APP – 360deg view



SMART APP – List View



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T H A N K Y O U

Also see our Case Study on

WiFi Home Automation for 2BHK
[without Gateway/Hub]

Click [HERE](#) to experience our Smart App (demo version)

BuildTrack[®]