

ROBOMIGO

SOFTWARE ARCHITECTURE



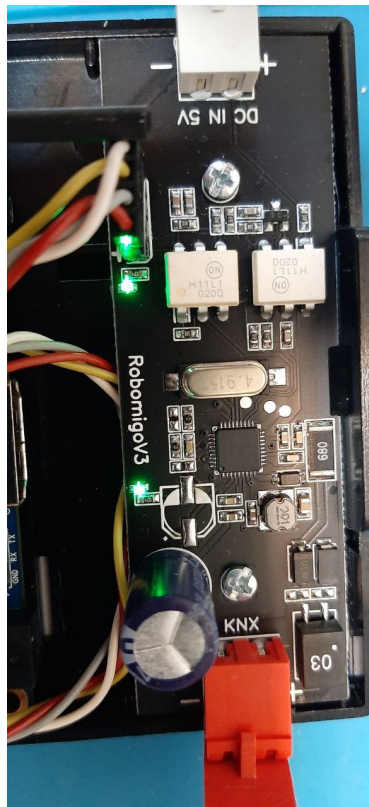
Table of Contents

ROBOMIGO SMART DEVICE	3
KNX IP INTERFACE	4
REMOTE VPN SERVER FOR REMOTE MAINTENANCE	6
HOW TO CONTROL THE IOT DEVICES	7
ADMIN PORTAL ON THE CLOUD	9
USER CONTROLS	9
ROBOMIGO DEVICE CONTROLS	9
GENERAL CONTROLS	9
APPLICATION INTERFACE CONTROLS	10
APPLICATION INTERFACES	12
TABLET and IPAD INTERFACES	12
MOBILE PHONE INTERFACES	16

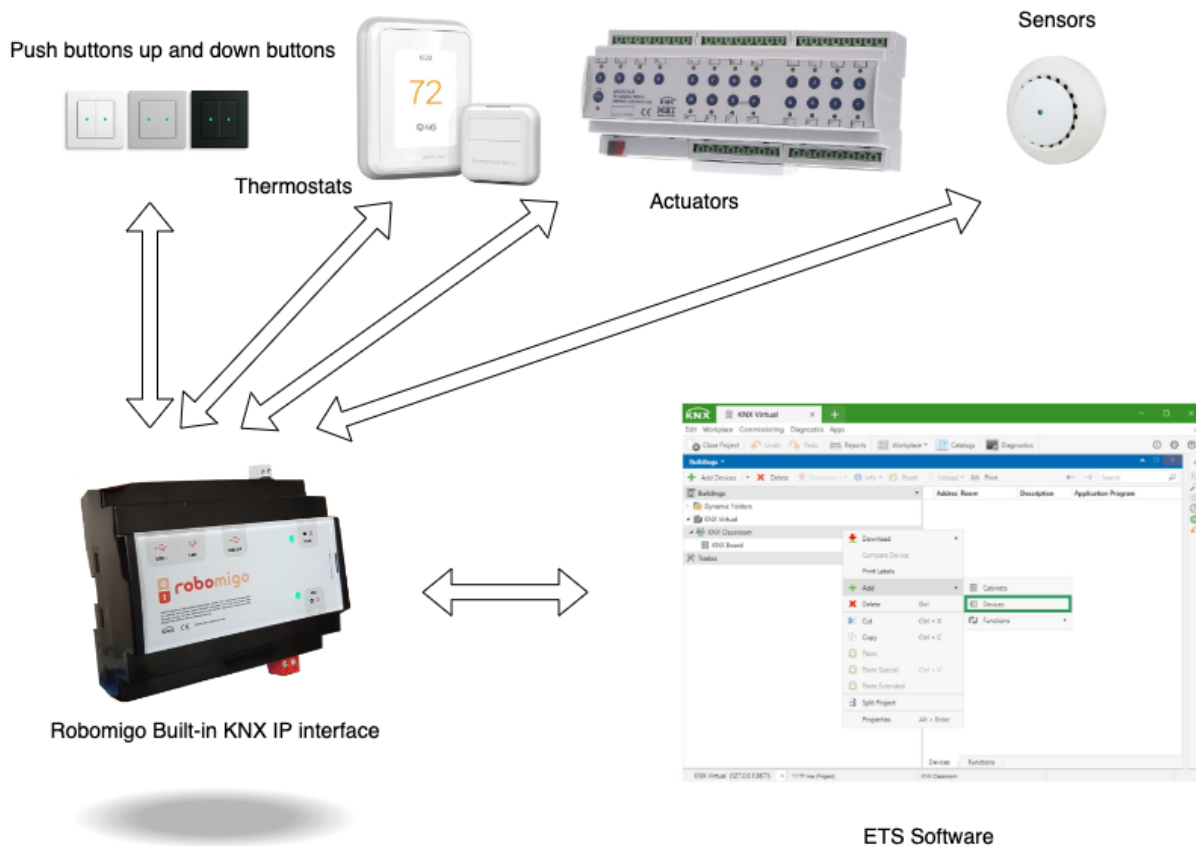
ROBOMIGO SMART DEVICE



Robomigo Smart Device runs on Armbian Linux operating system. It has a built-in KNX IP interface. You can connect the Robomigo device to the KNX wired network. The electronic circuit board of this interface is designed and manufactured by Robomigo. All the software within the device is developed by the Robomigo team and we are in control of all the source codes.



KNX IP INTERFACE



KNX is the leading global open building automation protocol which runs on dedicated 9600-baud wire as well as IP multicast.

ETS (Engineering Tool Software) SOFTWARE: It's a manufacturer independent configuration software tool to design and configure intelligent home and building control installations with the KNX system.

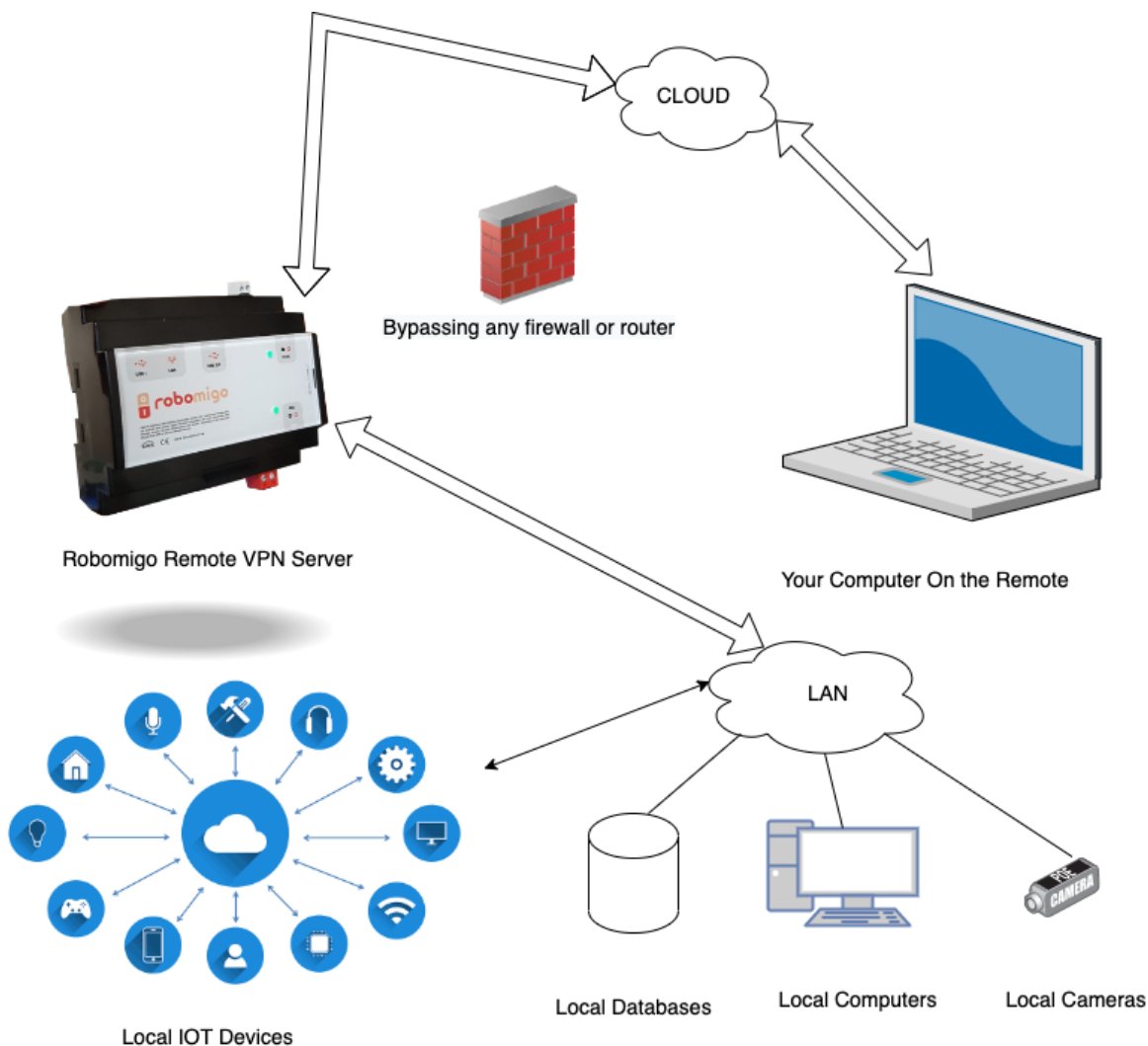
Robomigo device acts as a KNX IP interface right out of the box. If your computer is within the same network as your Robomigo device, then in your ETS software you will immediately see Robomigo as your KNX gateway. All the ETS programming functionality works instantly. That means if you connect your Robomigo device to the IOT network and connect it to the LAN, you can immediately start using the ETS Software. All product databases with certified products from all KNX manufacturers can be imported using Robomigo. Robomigo will acquire an IP address that it will use on your LAN and an IOT group address that it will use on your IOT network. Robomigo will manage all the packets from the LAN to the IOT network and vice versa. This interface is written in C++.

By accessing the admin portal on the cloud you can set the IOT group address range that the Robomigo device will be working on. For example; you can set IOT group address for the Robomigo device to be 0.0.240:10

From the admin portal on the cloud, you can also set Robomigo device LAN IP.

After you have finished configuring physical IOT devices using Robomigo, you can shut down the KNX IP Interface from the Robomigo admin portal on the cloud during the normal operation of the property. Most of the KNX visualization servers do not have a built-in KNX IP Interface and they need to be connected to the KNX IP interface all the time during their normal operation and that poses a security threat, which Robomigo does not have.

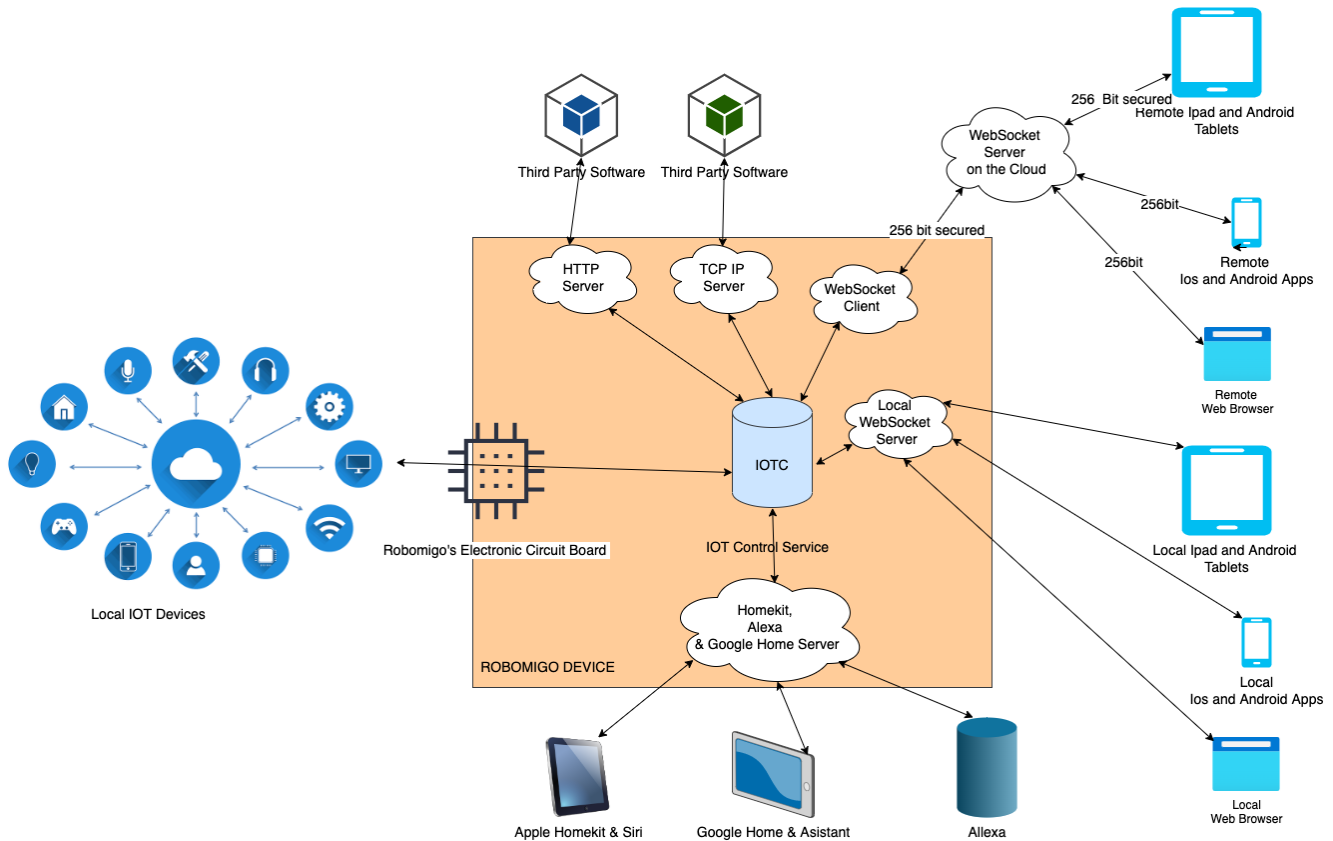
REMOTE VPN SERVER FOR REMOTE MAINTENANCE



Robomigo device has an optional built-in VPN server that tunnels through a cloud that you specify. This functionality can be turned on or off from the admin portal on the cloud. This functionality can also be disabled totally without affecting anything else. This function has a very comprehensive purpose and nature. It is not just for using ETS programming or doing local firmware updates from remote, it is for the maintenance of everything. It is secure and uncomplicated to connect to the local system remotely. Desired changes and system maintenance can be carried out quickly and individually, from anywhere in the world.

The Remote Access acts as a VPN server with the integrated VPN feature. This allows you to work in the remote network without needing to make complicated router or firewall settings. You can still have the local network even if the modem, firewall or router changes. For this, you need OpenVPN software on your computer.

HOW TO CONTROL THE IOT DEVICES



Robomigo device has the following services to control the IOT network.

IOT Control Service (IOTC): This is the central service in the Robomigo device. This service is for real time monitoring and controlling of the IOT devices in the IOT network. This service works in the group address topology of the KNX Protocol. The IOTC notifies other communicating services (Web socket client, Web Socket Server, Homekit, Alexa & Google Home Server, TCP IP server and the HTTP server) if there is a change in the value of any of the groups in the IOT network. And these other communicating services tell the IOTC to set new values for the IOT devices. The IOTC is written in C to be as fast as possible.

Web socket client: The websocket client is a bridge between the IOTC of the Robomigo device and the websocket server on the cloud. If there is a change of a value of any IOT devices, the IOTC notifies the Web Socket Client which is connected to the web socket server on the cloud, which communicates with Android apps, IOS apps, Mac apps, web browsers, etc. All the connection is 256 bit secure end to end (From IOTC to the cloud and from the cloud to the connecting device and vice versa.)

Local Web socket server:

The local websocket server is a bridge between the IOTC of the Robomigo device and the devices on the local network such as Android apps, IOS apps, Mac apps, web browsers. If there is no internet or if the communicating device is in the local network, the internet is not

used and these apps communicate directly with the web socket server for real time status updates and for setting new values to the devices.

Homekit, Alexa & Google Home Server (Voice Server):

Homekit, Alexa & Google Home Server is a bridge between the IOTC in the Robomigo device and the Apple Homekit, Google Home and Alexa. This server gets voice commands from Siri on Iphones and Ipads, Google Assistant on Android Devices and Alexa on Alexa devices and sends them the IOTC. Realtime or time based updates from the IOTC are sent to the mobile devices, tablets, Ipods, Alexa devices etc. The voice server can be controlled from the admin portal on the cloud.

TCP IP server:

TCP IP server is a bridge between the third party automation devices and applications and the IOT network that Robomigo can control. For example, American multinational automation company, Crestron, uses the Robomigo device to connect its own devices to KNX's IOT network via the TCP IP server of Robomigo. One third party application or device can send commands to the TCP/IP server through a specified port to set values in the IOT network. TCP/IP Server gets real time updates from the IOTC and sends these updates to the connected devices. The TCP/IP server can be controlled from the admin portal on the cloud and it can be stopped or started from the admin portal remotely.

Http Server:

The http server is a bridge between the third party automation devices and applications and the IOT network that Robomigo can control. HTTP requests are sent to the HTTP server which connects to the IOTC and sets values of the IOT devices and gets their values as well.

ADMIN PORTAL ON THE CLOUD

Admin Portal on the Cloud is written in PHP and Mysql. The admin portal is for controlling all the devices in a property. On the admin portal, each device can be accessed, programmed and maintained separately. Admin Portal can either be on a remote cloud or on premise.

USER CONTROL

There are 4 user groups on the admin portal: Super Admin, Admin, Device Admin, App User.

Super Admin: The Super Admin has access to all Robomigo devices in the property and can add new admins and can assign new Robomigo devices to the admin. The super admin can manage the access rights of all the user groups.

Admin: The admin has access to only the Robomigo devices that super admin has let him control. The admin can add different device admins to different Robomigo devices.

Device Admin: The Device Admin can only control one device that the admin lets him control.

App User: The App User can not access the admin portal. The App user can control the IOT devices via the IOS app or the Android app or via accessing the user interface from a web browser.

ROBOMIGO DEVICE CONTROL

GENERAL CONTROLS:

From the admin portal, all Robomigo devices in the property can be managed individually. You can control the following features:

Voice Control Configuration: You can manage the voice control configuration that Apple Homekit and Google Home Assistant will use.

Restart the Robomigo Device:

Get General System Information: Get the CPU temperature and system uptime.

Send the Device Data to the Robomigo Device: After you have added all the devices in the IOT network, you can send their data to the Robomigo device.

Firewall: You can manage the firewall on the Robomigo Device.

KNX Interface IP addressing: You can give your Robomigo Device a new IOT group address that it will use on the IOT network.

LAN and WAN Address Control and Setup: You can check the IP address of your Robomigo device and make changes to it. You can set the IP address to be static or dynamic. You can manage the network configuration of the Robomigo Device.

Siri Management: You can manage Apple's Siri from the portal.

TCP / IP Server Management: You can control and enable or disable the TCP/IP server for third party devices and apps.

Remote VPN Server Control: You can control and enable or disable Remote VPN Server. You can download the secure VPN key file to use it with the openvpn client.

Check for Robomigo Device Updates: Robomigo device updates are automatic, but you can manually check for new updates and check the Update Logs.

Manual IOT Testing: You can manually send any data to manually test the IOT devices that the Robomigo device is connected to. For example, you can send 1 to 0/0/3 to turn on the light. Or you can manually check the current value of 0/0/3.

APPLICATION INTERFACE CONTROLS:

From the admin portal, you can control what the app users will see when they download the app from the AppStore or Google Play or when they access the local user portal.

Adding New Rooms: If the Robomigo device is in an IOT network with more than one room, you define the rooms first and select their corresponding icons. Living room, kitchen, etc.

Adding New Devices: You add new devices from the admin portal on the cloud. You select among the different device types like push button, vertical blinds or shutters, horizontal blinds or shutters, thermometer, slider for dimmable devices, value reading sensor, rgb lamp, etc.

Then you select the icons that will be used on the app interface. Then you add the device to a room or to the main screen.

Mode Creation: You create scenarios like cinema, relaxation, in-room, out-of-the room etc. As many as you like. And you define which IOT device does what in each mode. You can choose to make the modes visible or invisible on the user interface.

Conditional Responses: Here you define what will happen on what condition.

For example, you can define "if the heat sensor's value is above a specific value, activate the invisible fire mode." And for the invisible fire mode, you might have it defined to turn on guiding lights to the fire escape and shutdown the elevators, activate the sprinklers, etc.

For example, you can define to turn off irrigation/watering if it has been raining above a specific level.

You can also define the case that if there's a specific sensor value, the user will get a voice notification. For example, you can say that if the smoke detector's value is above a certain level, the interface users will get a voice notification.

Time Based Responses: Here you can control the time frequency based events. You can repeat a visible or an invisible mode every minute, every hour, every week, every 2 weeks, every month or every year, starting at a time and ending at a certain time.

Adding News: If the Robomigo device is connected to the internet, you can add RSS feeds to be displayed on the user's interface. For example, you can add BBC, CNN, Bloomberg, etc. RSS feeds. These different news will be displayed on the user's interface.

Adding Traffic Information: If the Robomigo device is connected to the internet, you can add displaying live traffic information between as many two points as you wish, on the user's interface.

Like traffic information from the hotel to a museum.

Traffic information from the hotel to a busy city center, etc.

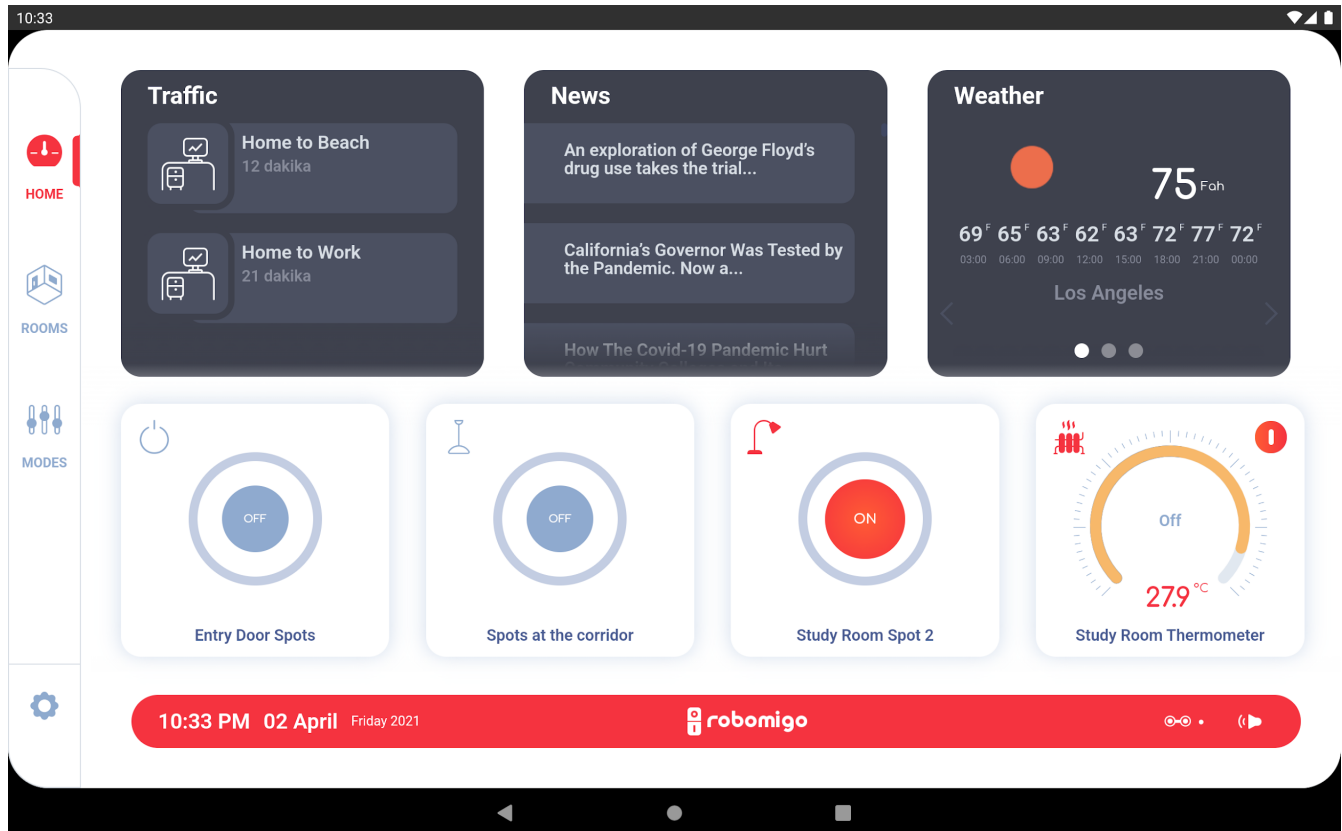
Adding Weather Information: If the Robomigo device is connected to the internet, you can add weather information for major cities on the user's interface.

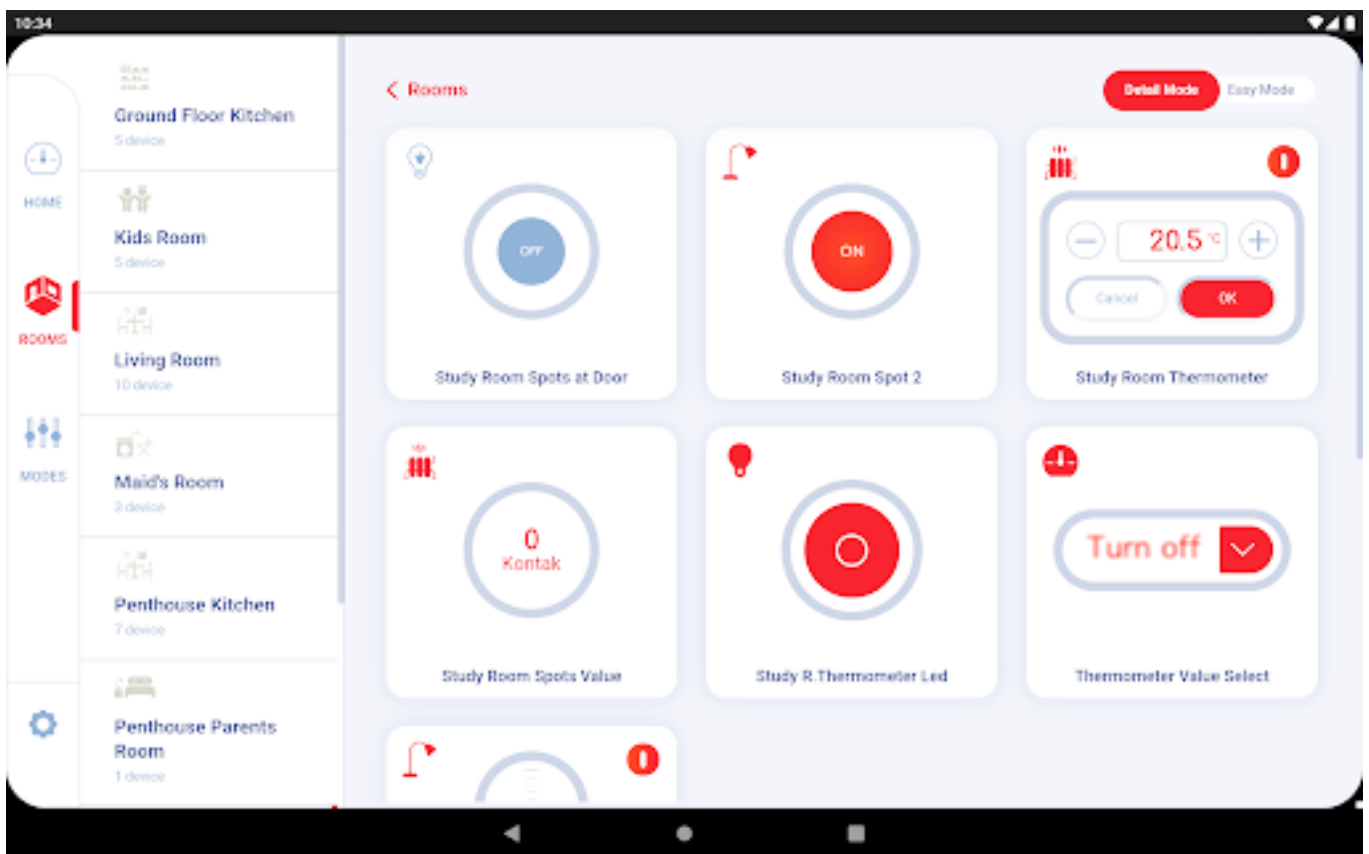
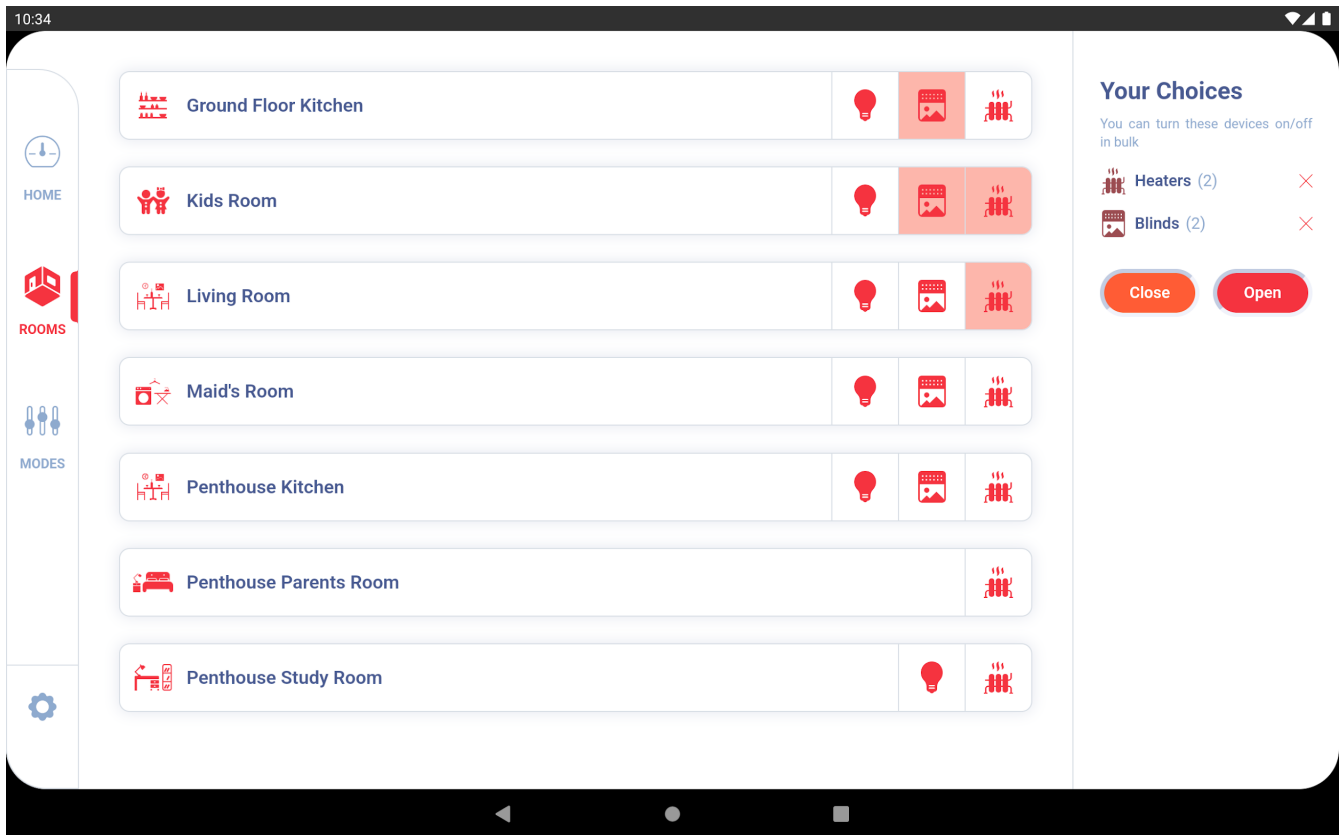
Application Interface Testing: You can use and test the application Interfaces.

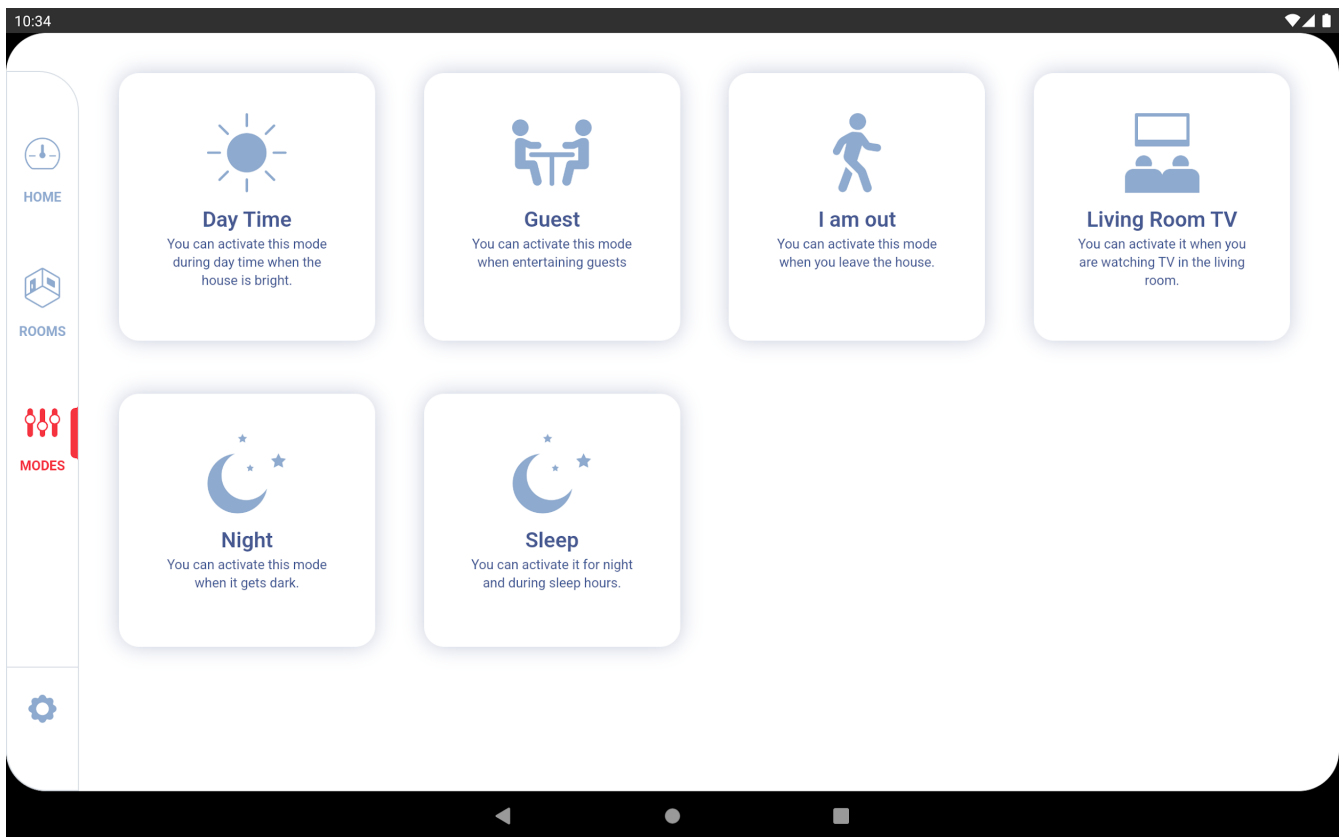
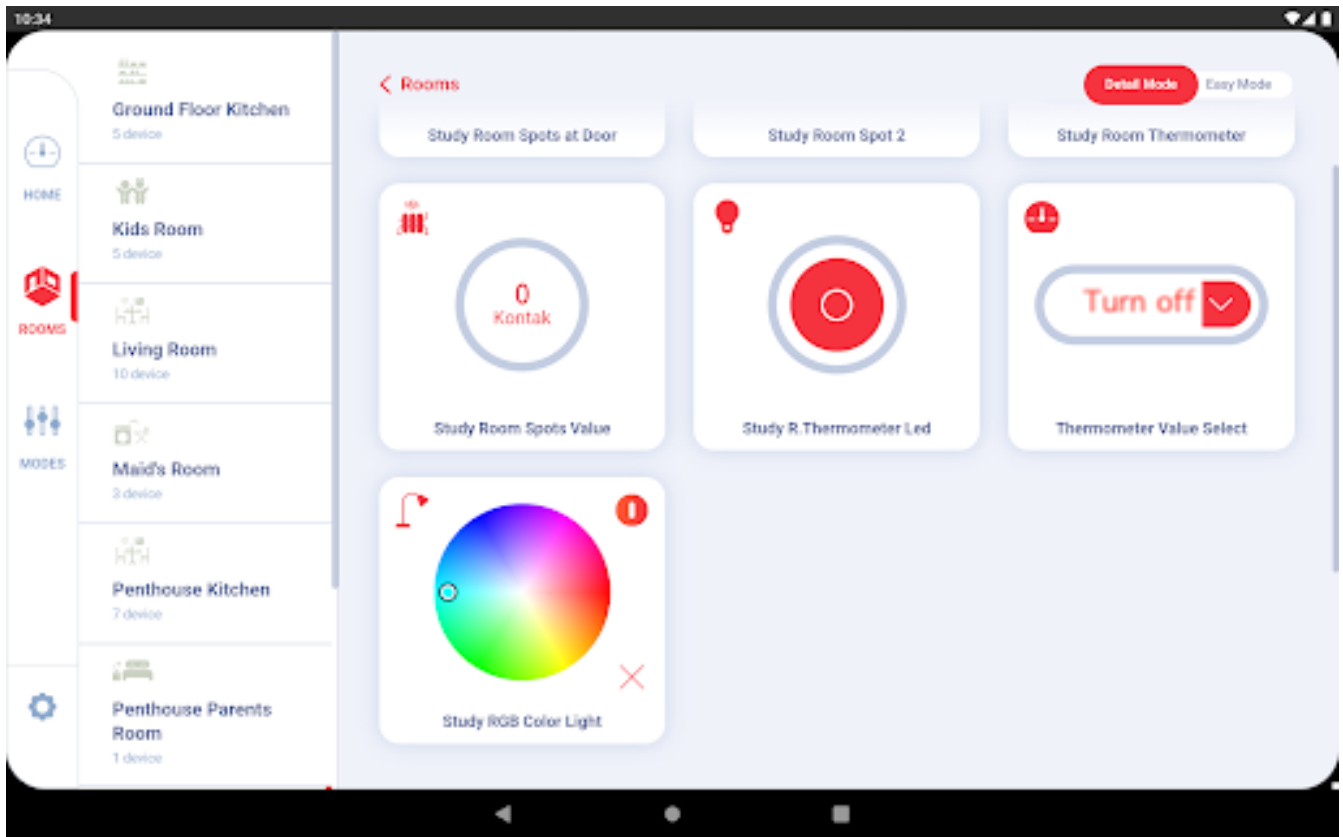
APPLICATION INTERFACES

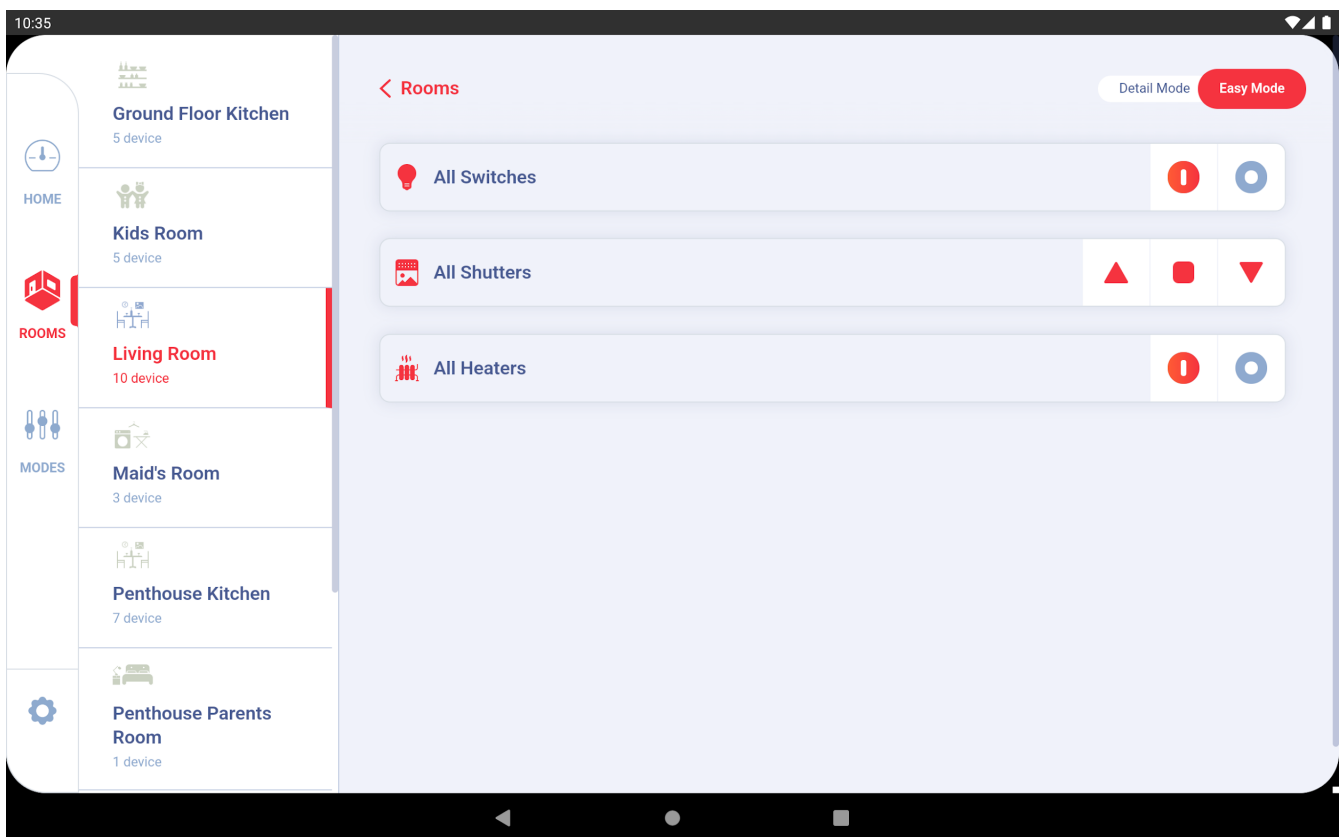
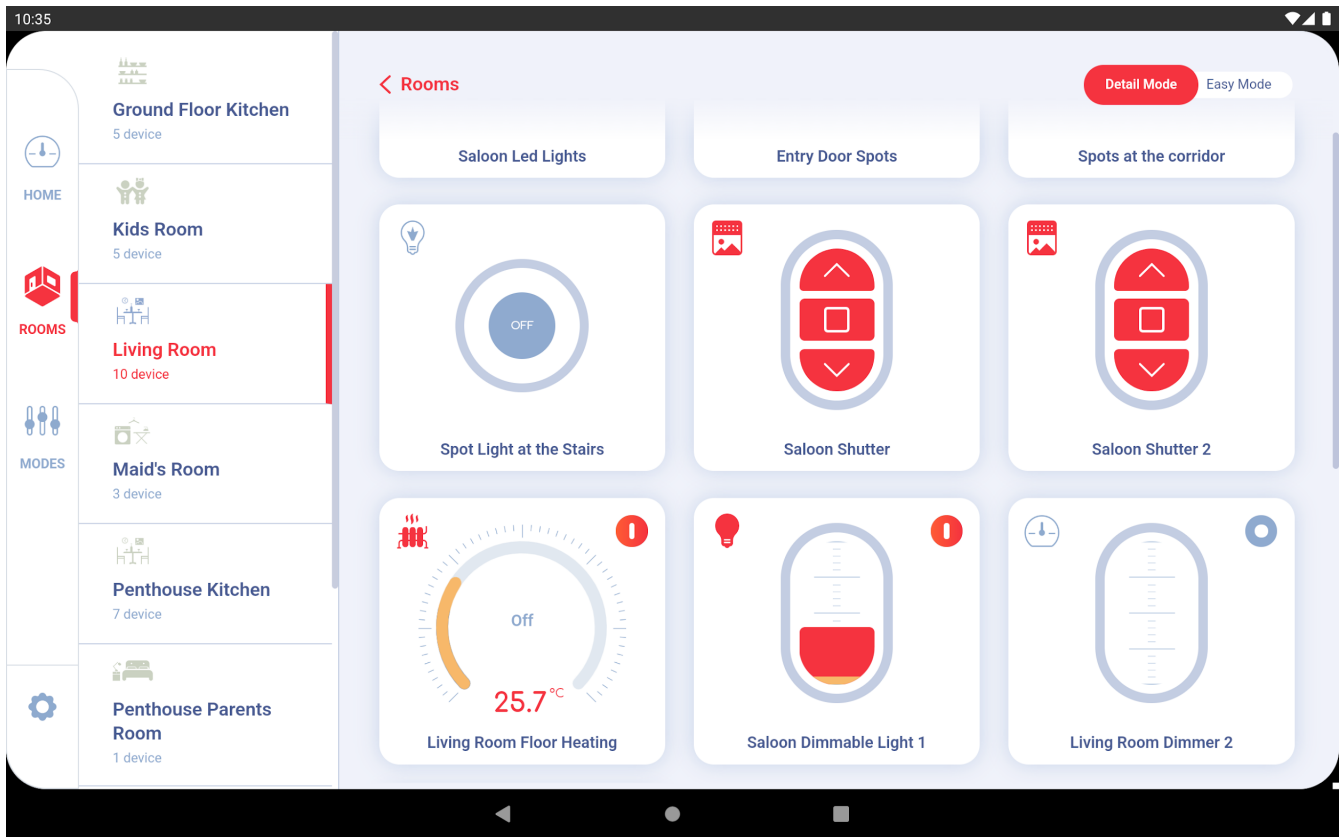
When you have finished building the application interfaces from the admin portal on the cloud, you can publish it to be usable on mobile phones, tablets and browsers.

Tablet and Ipad Interfaces





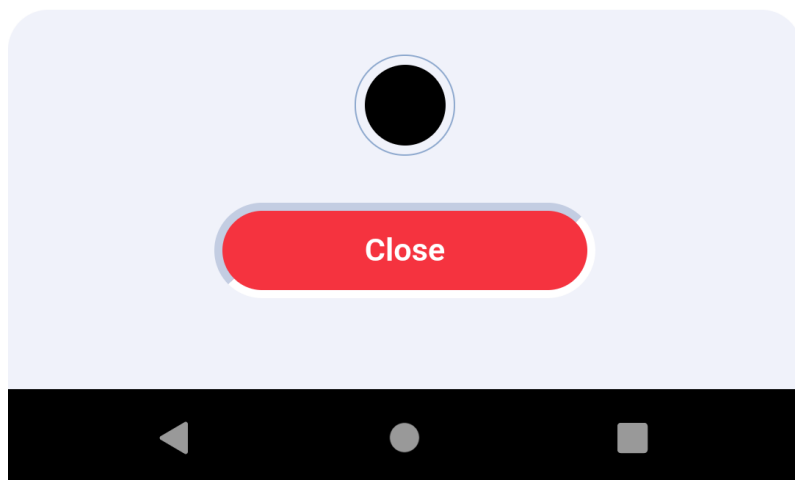
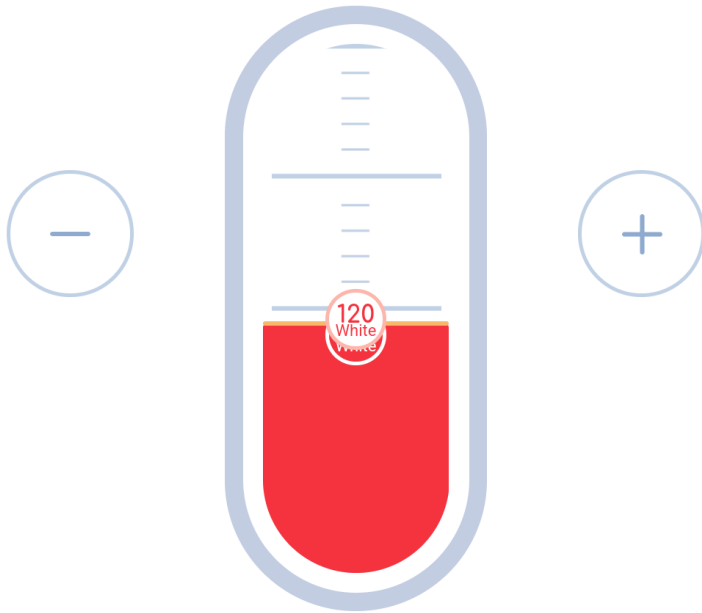




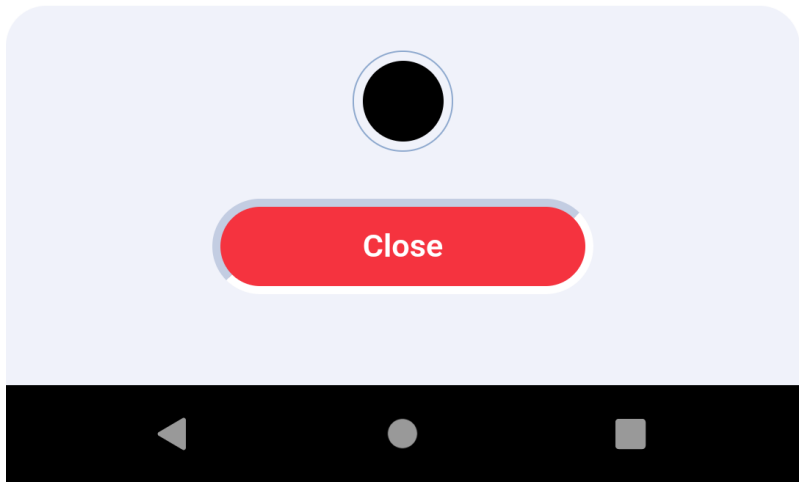
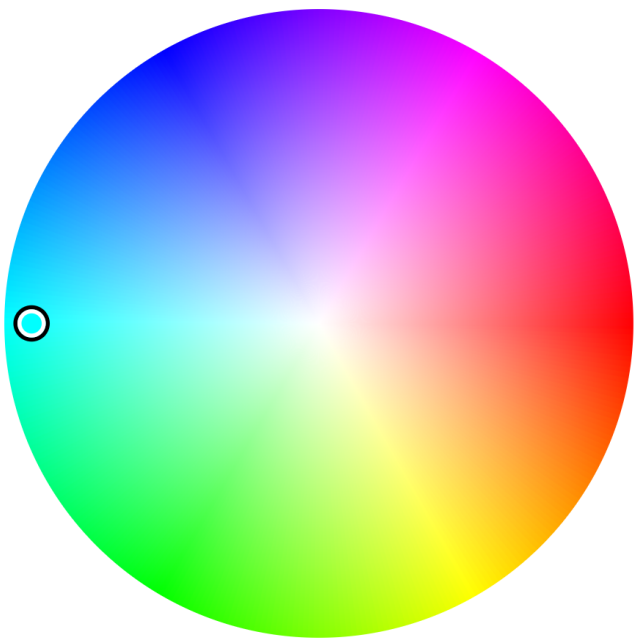
Mobile Phone Interfaces



RGB Led



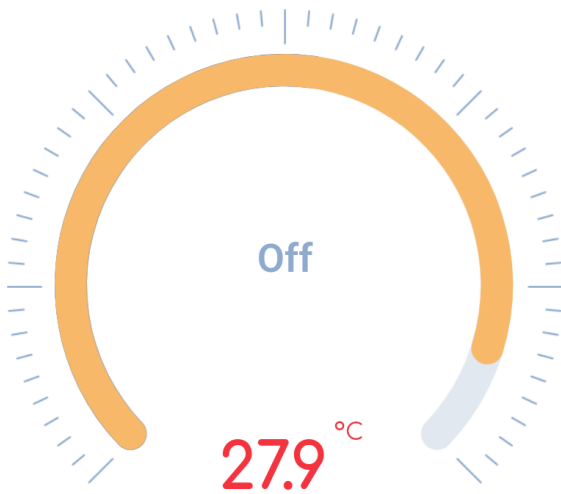
RGB Led



10:49

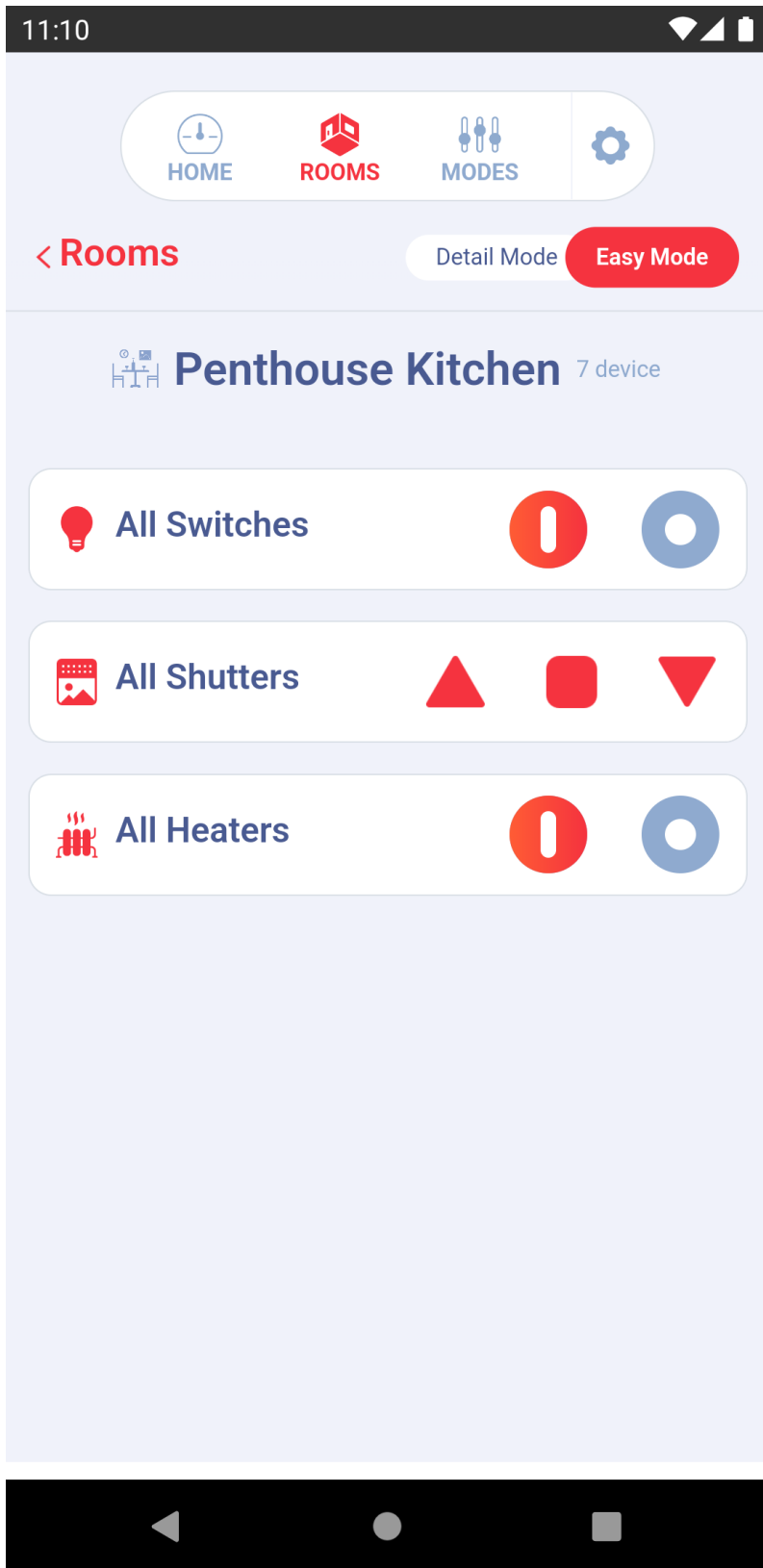


Study Room Thermometer

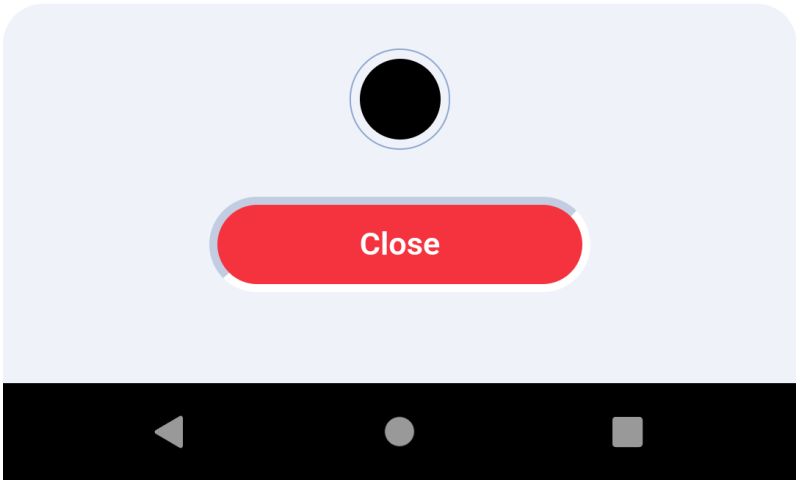
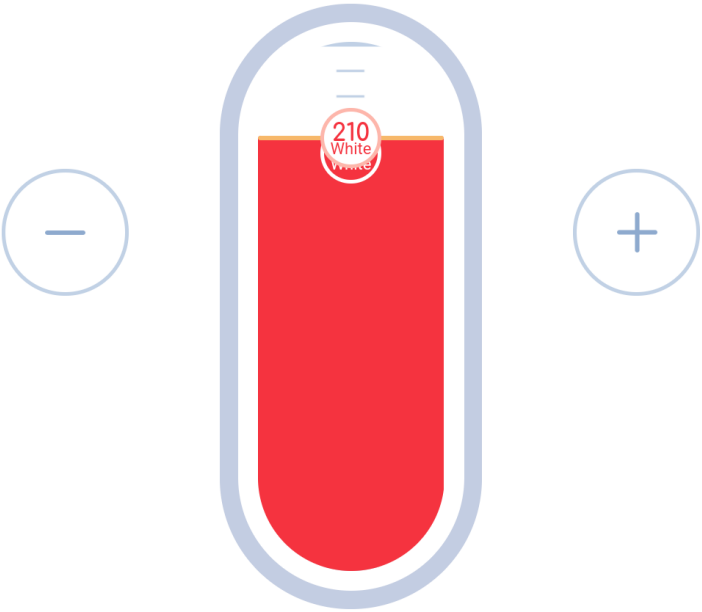


A control panel with a minus button, a temperature display showing 20.5 °C, a plus button, a Cancel button, and an OK button.

Control	Value
Minus	-
Temperature	20.5 °C
Plus	+
Cancel	Cancel
OK	OK



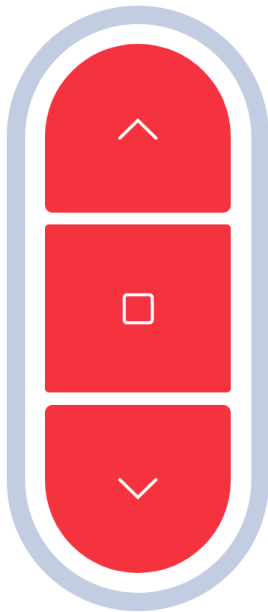
RGB Led



11:10

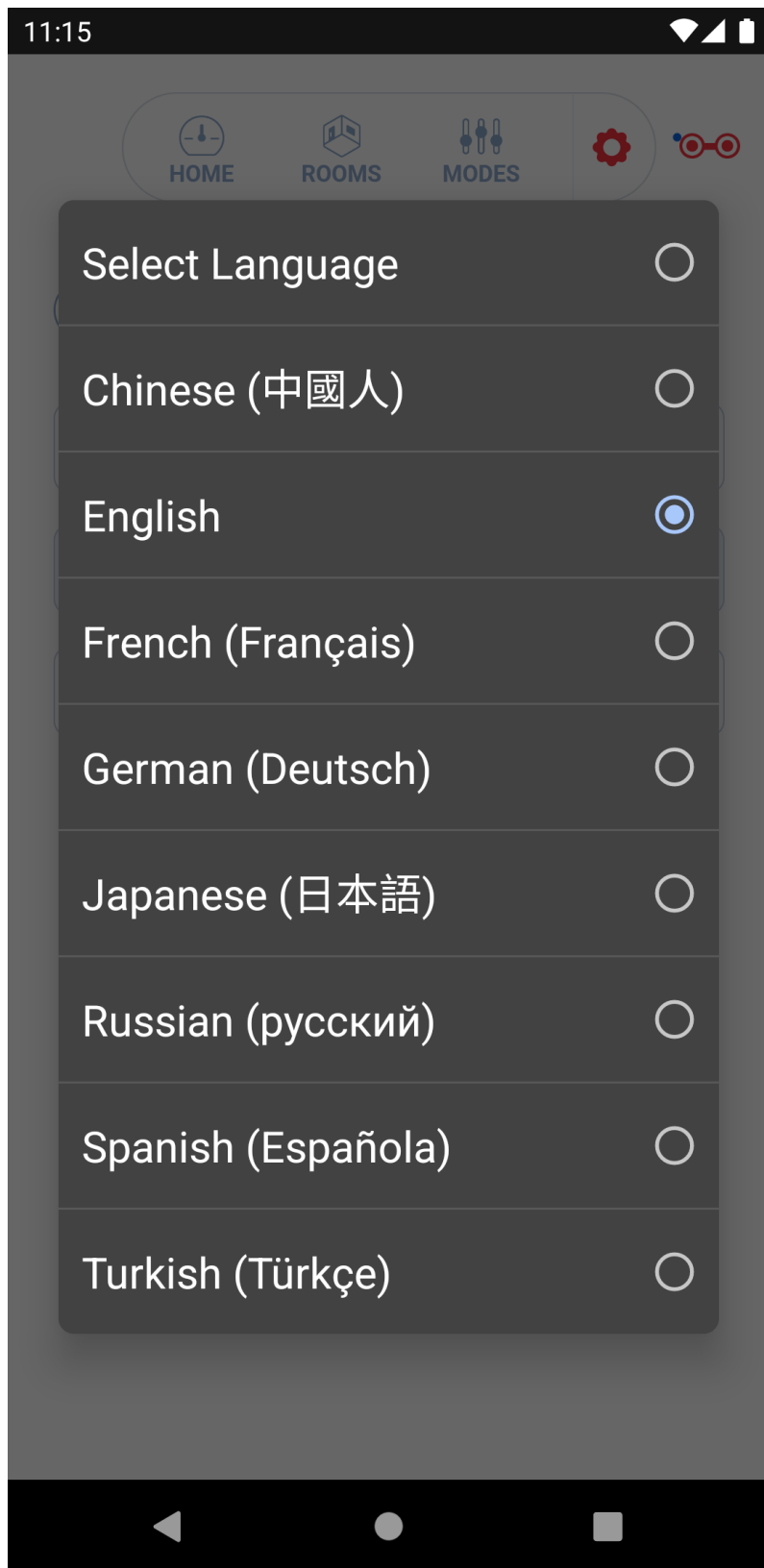


Penthouse Shutter Balcony



Close





Penthouse Blinds

