Radio Thermostat

Design Specification

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Version 1.0

Constraint

My constraint is to create an Android App for the thermostat in addition to iPhone App.

Design Approach

- The purpose of this document is to describe each screen of the thermotat, iPhone app and Android app

- The document is divided into three sections each describing Physical thermostat interface, iPhone app interface and Android app interface. For each section, the screens illustrated pictorially and described in detail.

Mobile Platform

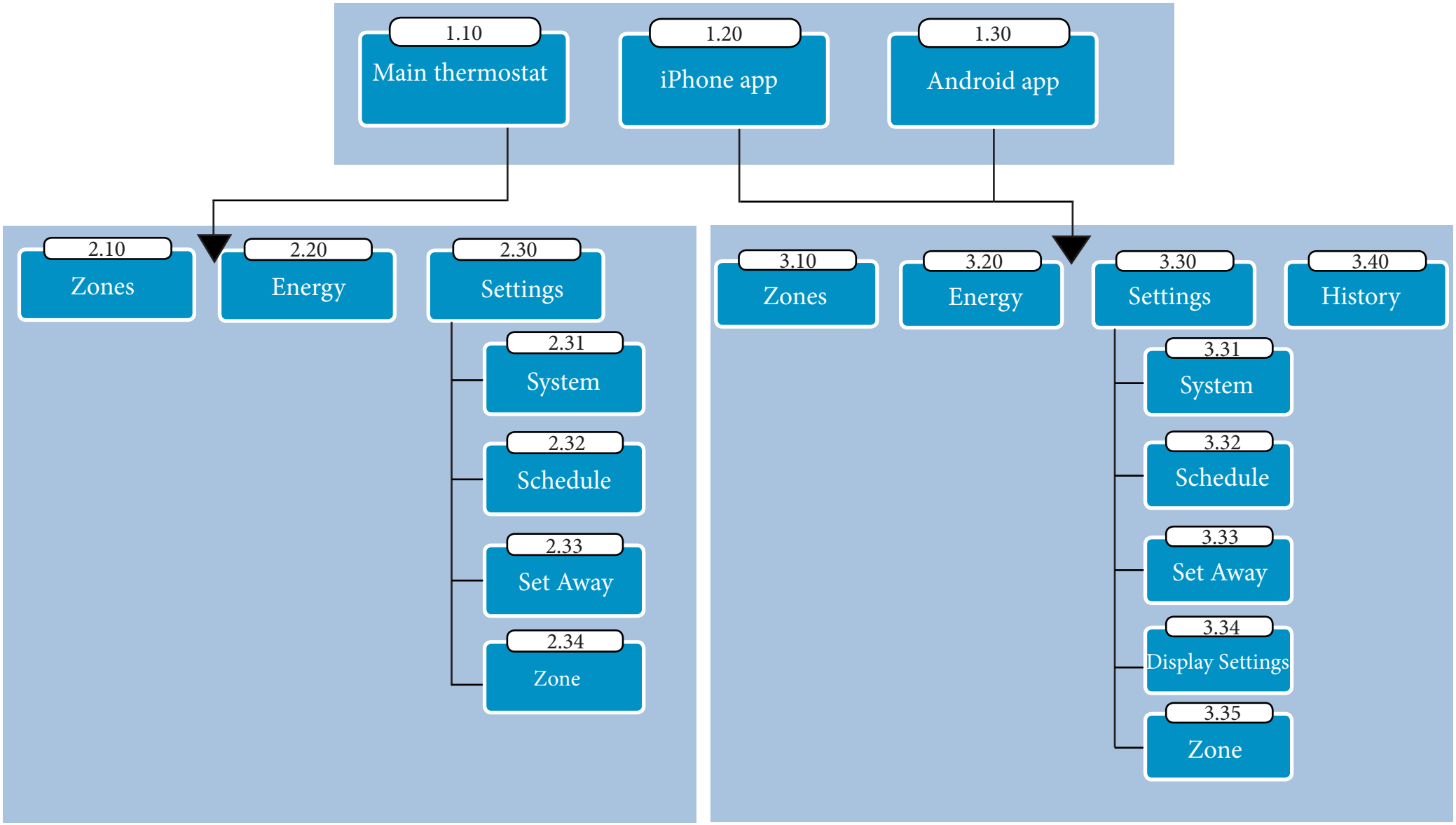
- iPhone app design specifications uses standards from iOS human interface guidelines to create the app.
- Android app design specifications uses Icecream Sandwich (ICS) OS human interface guidelines

Physical Product

- Physical product consists of 6 buttons out of which 2 buttons are used for the most frequent tasks. The thermostat screen background is black in color as black saves more power. The product will also have an inbuilt Wi-Fi that will connect to the apps.

Radio Thermostat
Radio Thermostat Company of America

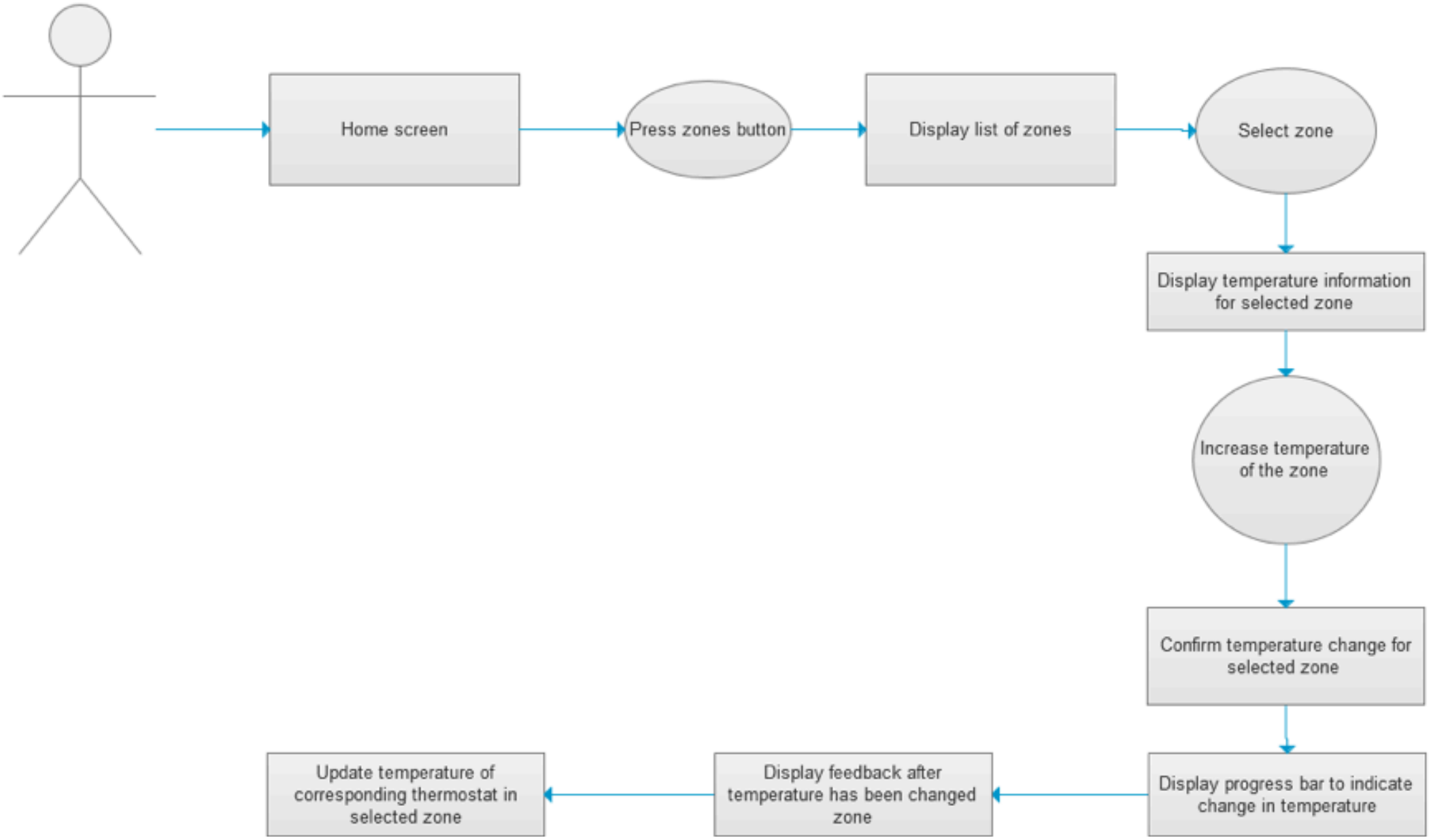
Application Map

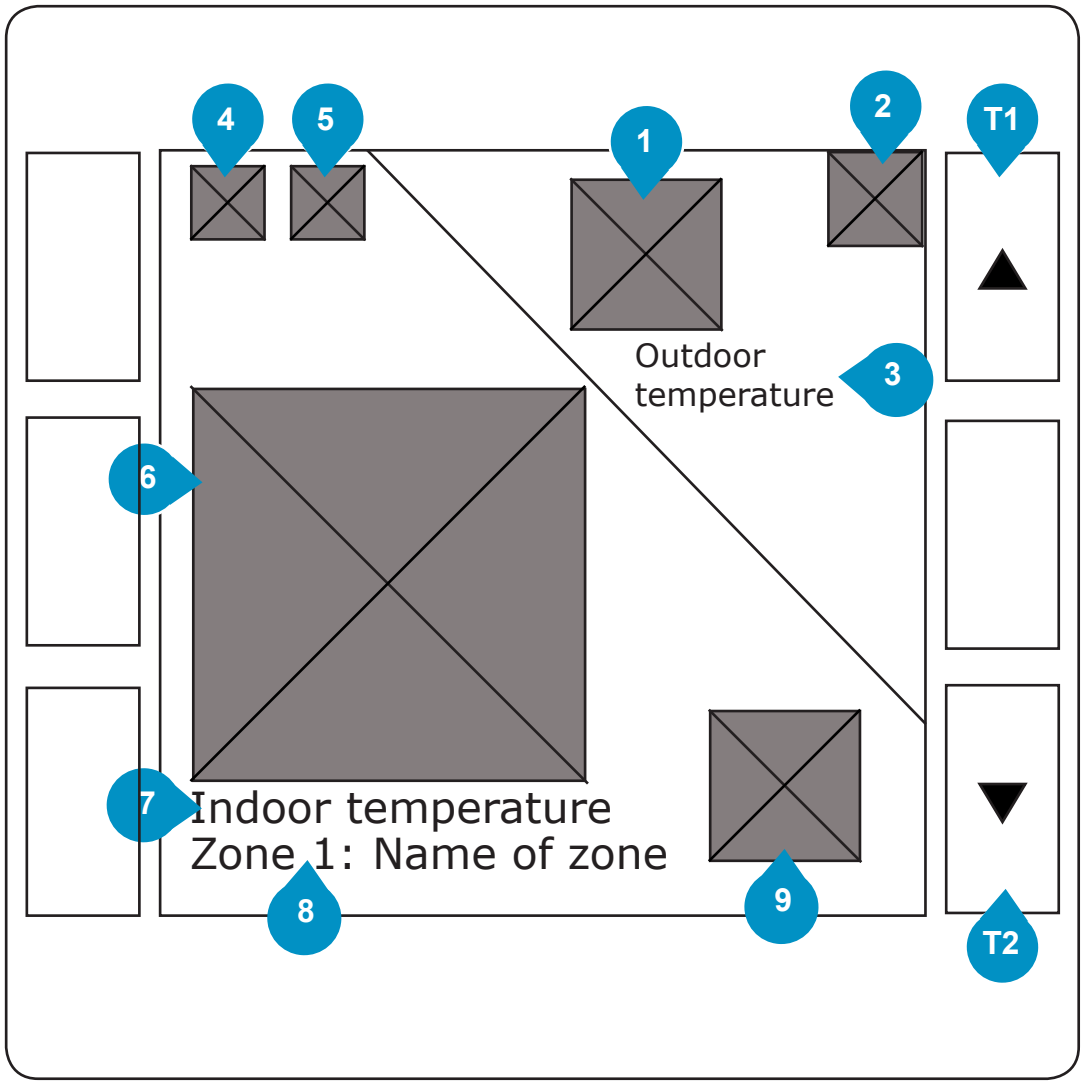


Physical UI for Main Thermostat

Zone Management

Task Flow


Home screen
Press zones button
Display list of zones
Select zone
Display temperature information for selected zone
Increase temperature of the zone
Confirm temperature change for selected zone
Display progress bar to indicate change in temperature
Display feedback after temperature has been changed zone
Update temperature of corresponding thermostat in selected zone



T1 Up arrow button

For the home screen, user can inrease the temperature with this button

T2 Down arrow button

For the home screen, user can decrease the temperature with this button

1. Outdoor temperature

Displays the current outdoor temperature. The thermostat will connect to wi-fi and update the temperature from weather forecast

2. Image for outside temperature

Displays the image represting outdoor temperature for e.g. image of sun for clear sky, clouds for cloudy sky, clouds with rain when it is raining outside etc.

3. Outdoor temperature label

Text to label outdoor temperature

4. Battery image

Displays an image to indicate battery power for the thermostat

5.Wifi image

Displays an image to indicate that the thermostat is connected to the wi-fi.

6. Indoor temperature

Displays the current indoor temperature of the room where the thermostat is deployed. User can change the temperature using T1 and T2 keys.

7. Indoor temperature label

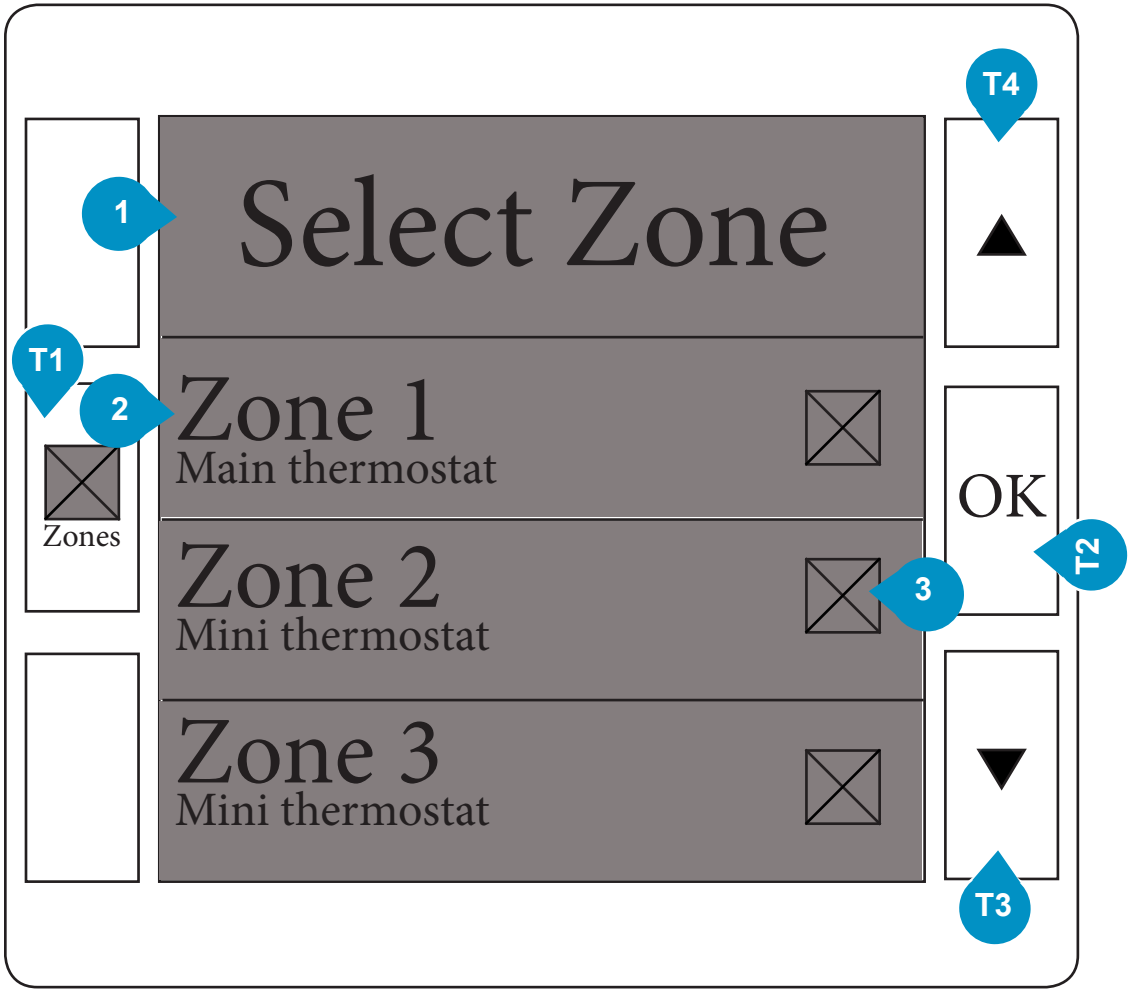
Text to indicate indoor temperature

8. Zone information

Displays the zone name for which the temperature is displayed in 6

9. Energy indicator

Displays a image with different colors indicating energy usage of the entire unit



1. Zone menu header

Header text displayed as the user enters the zone menu

2. Zone menu options

Each option of the menu consists of name of the zone configured by the user along with the type of the thermostat (main or mini)

3. Right arrow image

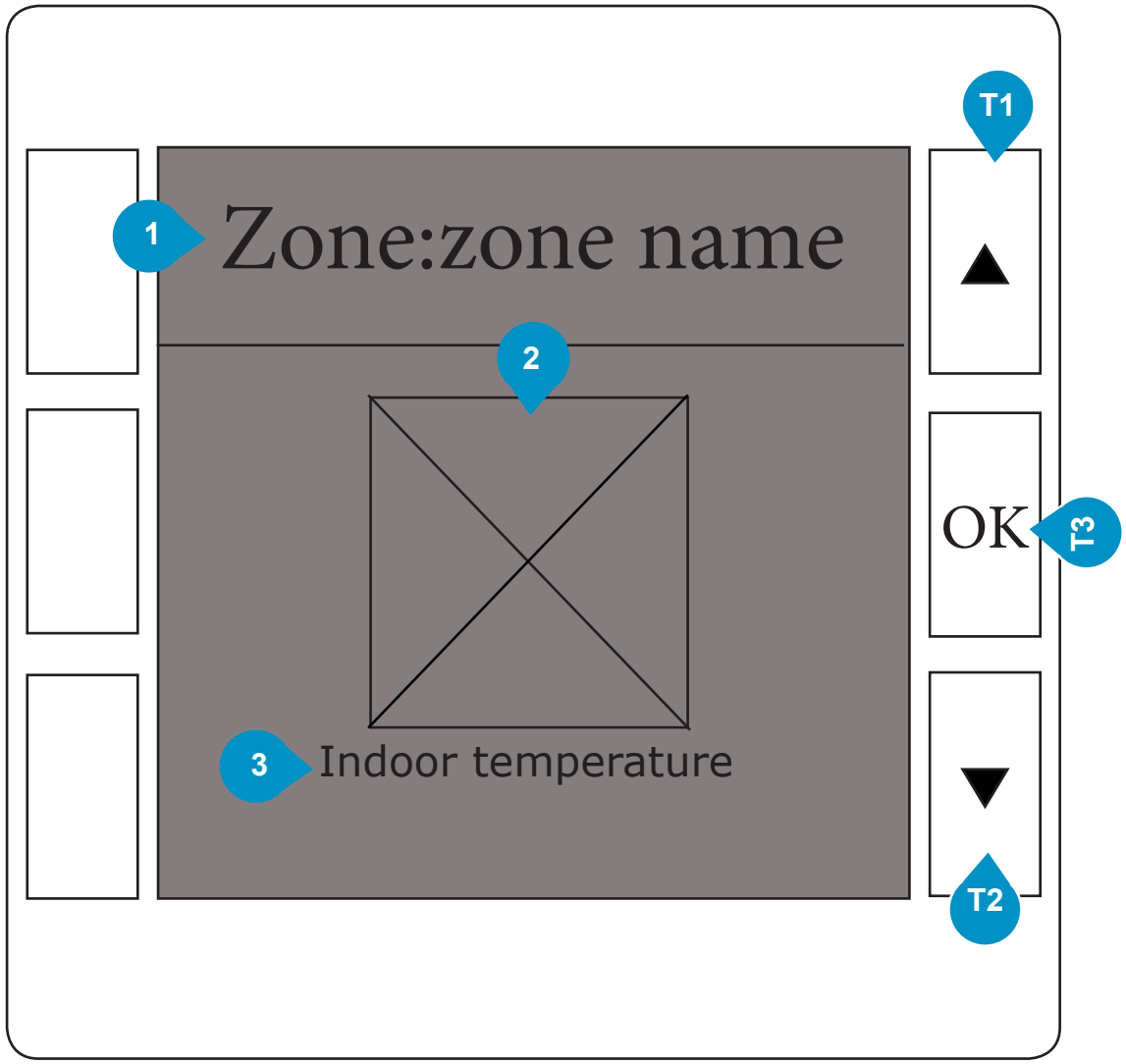
A right arrow image for each menu option for the zones

T1. Zones button

Users can access and change temperature for different zones through this button. This button will display all the available zones for the unit.

T2, T3, T4 Select button, Down arrow button, Up arrow button

User can browse through different zones in the zone menu and select using T2 button



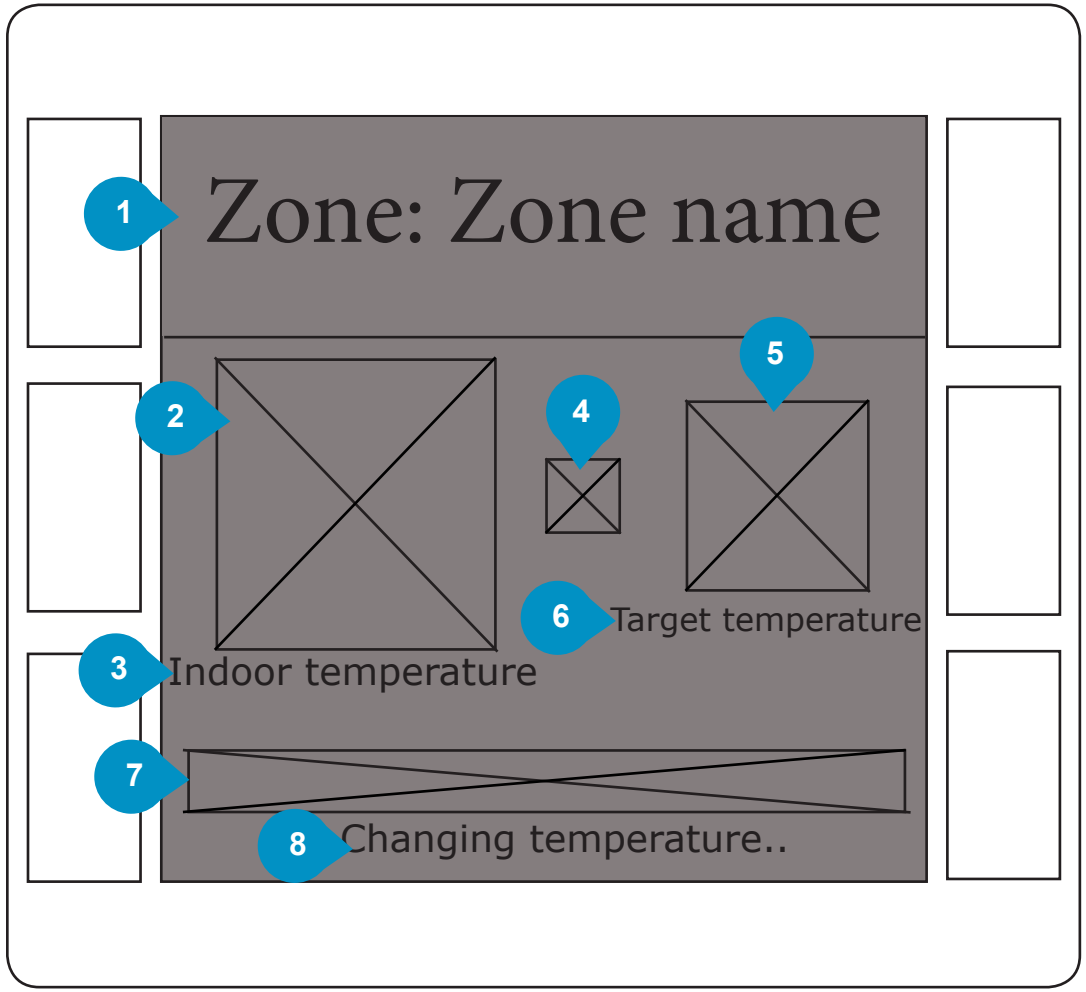
1. Zone screen header
The screen header displays the name of the zone

2. Zone temperature with image
This element displays information about the current temperature in the zone. It also has a background color which will change according to the temperature level. red color for 85F and above, yellowish-orange color for temperature between 65F to 84F and blue color for 64F and below

3. Text for indoor temperature
Indicates that the displayed temperature is indoor temperature for that zone

T1, T2 Up arrow button, down arrow button
For the home screen, user can change the temperature by increasing or decreasing the temperature with T1 and T2 button.

T3 Select button
Once the user changes the temperature with T1/T2 buttons, he/she can confirm the change with T3 button.



1. Zone menu header
Header text displayed for the selected zone

2. Current temperature for the zone
Displays the current temperature of the selected zone

3. Indoor temperature label
Text label for indoor temperature

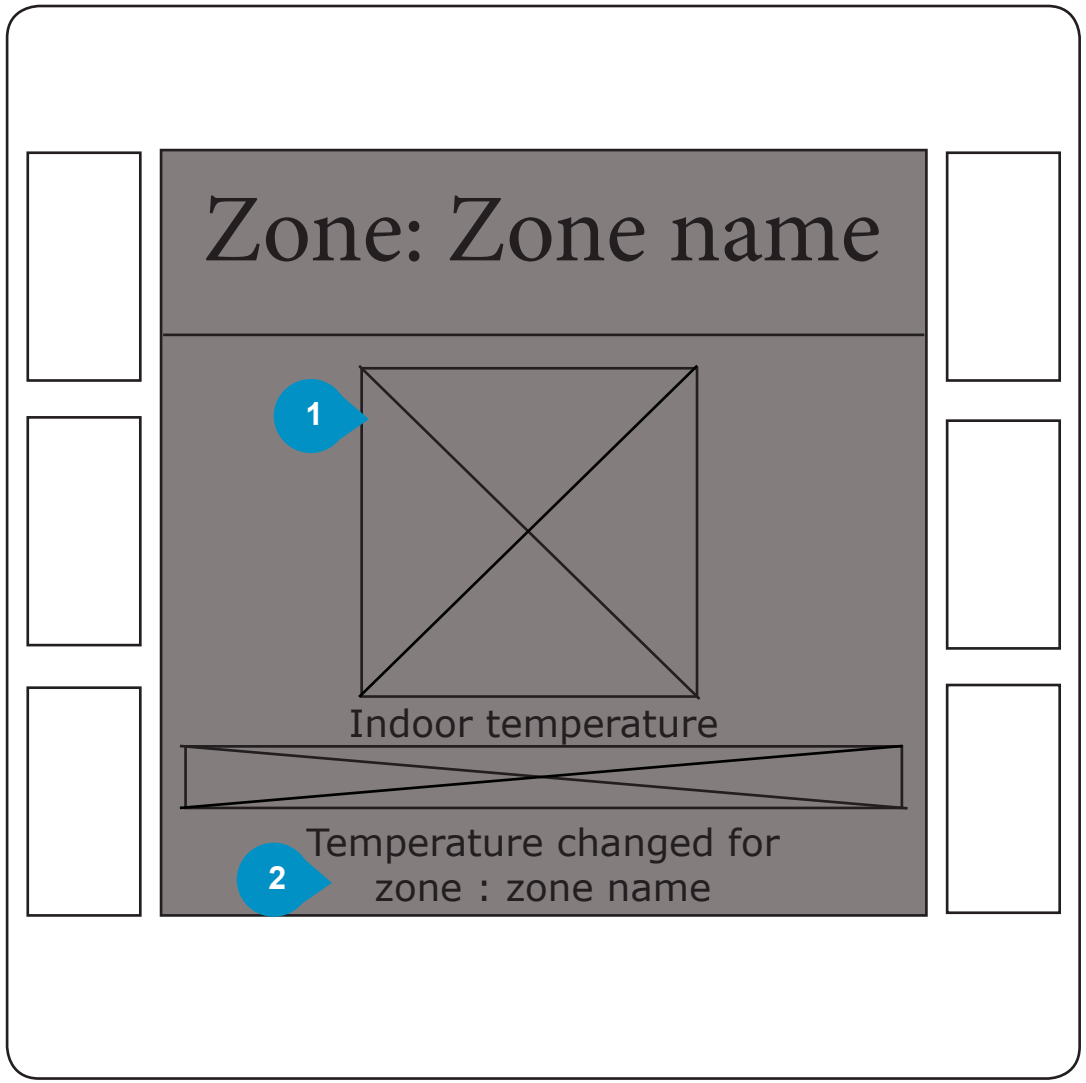
4. Arrow image
Right arrow image indicating that the current temperature for the zone is changing to the target temperature selected by the user

5. Target temperature
Displays the temperature selected by the user and which the thermostat is setting to, for that zone

6. Target temperature label
Text label for the target temperature

7. Animated loader
An animated loading image will be displayed when the indoor temperature is changed to target temperature for the zone. The animation will also display the % of time required to change the temperature

8. Temperature feedback
Text will display "changing temperature" until the temperature is changed.



1. Current temperature for the zone

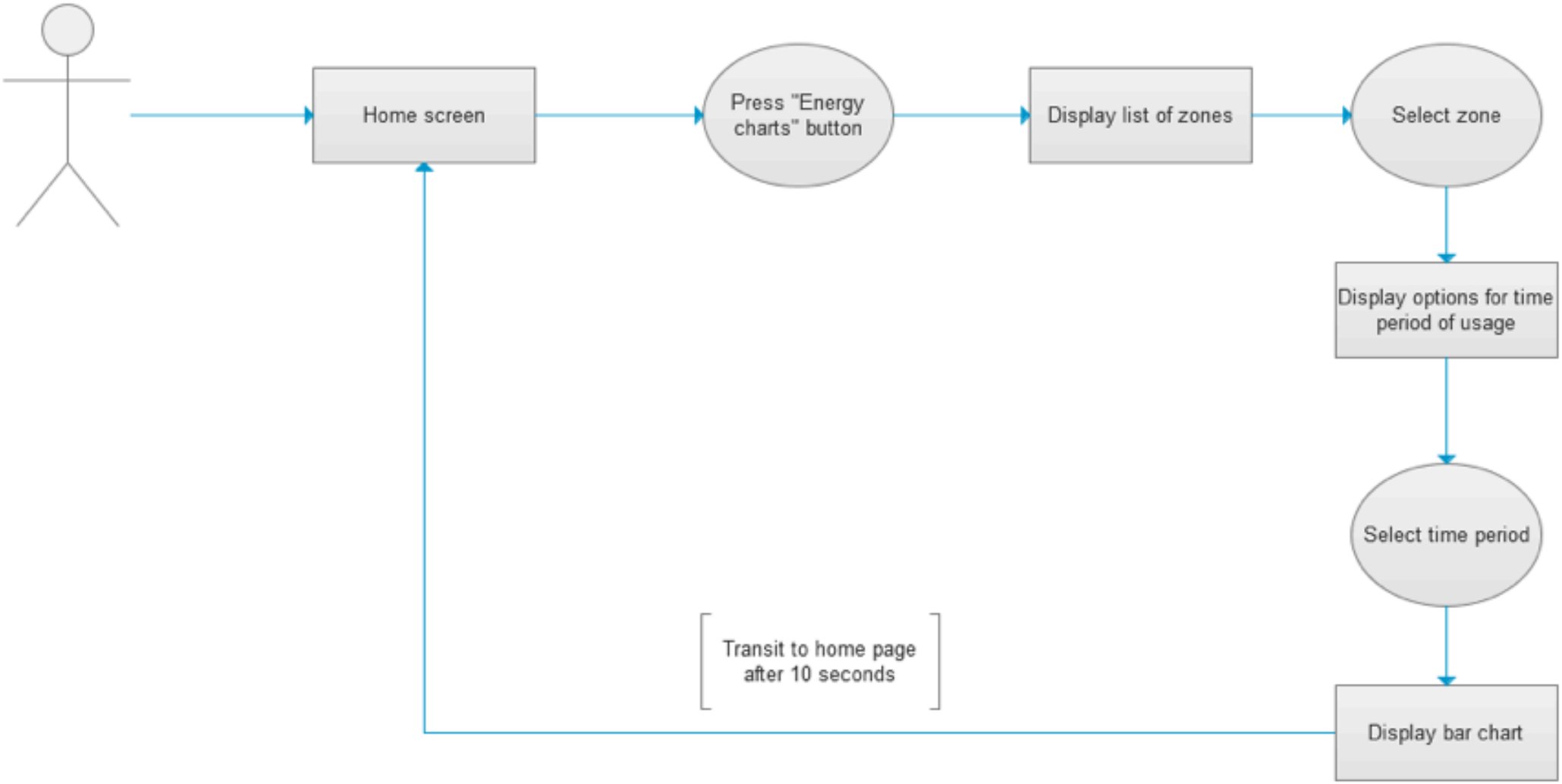
Displays the current changed temperature of the selected zone

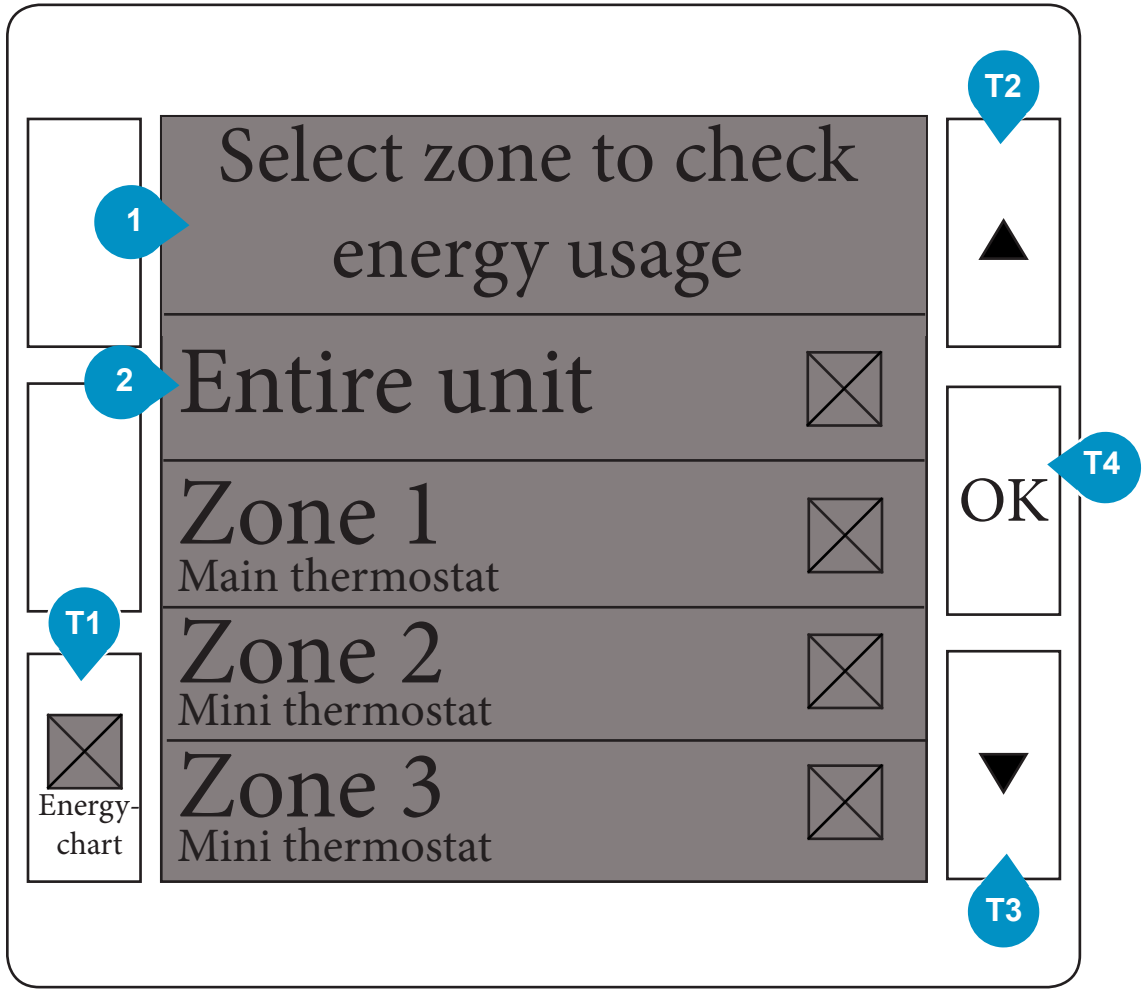
2. Feedback for temperatue change

Displays a feedback message indicating that the temperature has been changed and disappears after 10 seconds

Energy Management

Task Flow


Home screen
Press "Energy charts" button
Display list of zones
Select zone
Display options for time period of usage
Select time period
Display bar chart
Transit to home page after 10 seconds

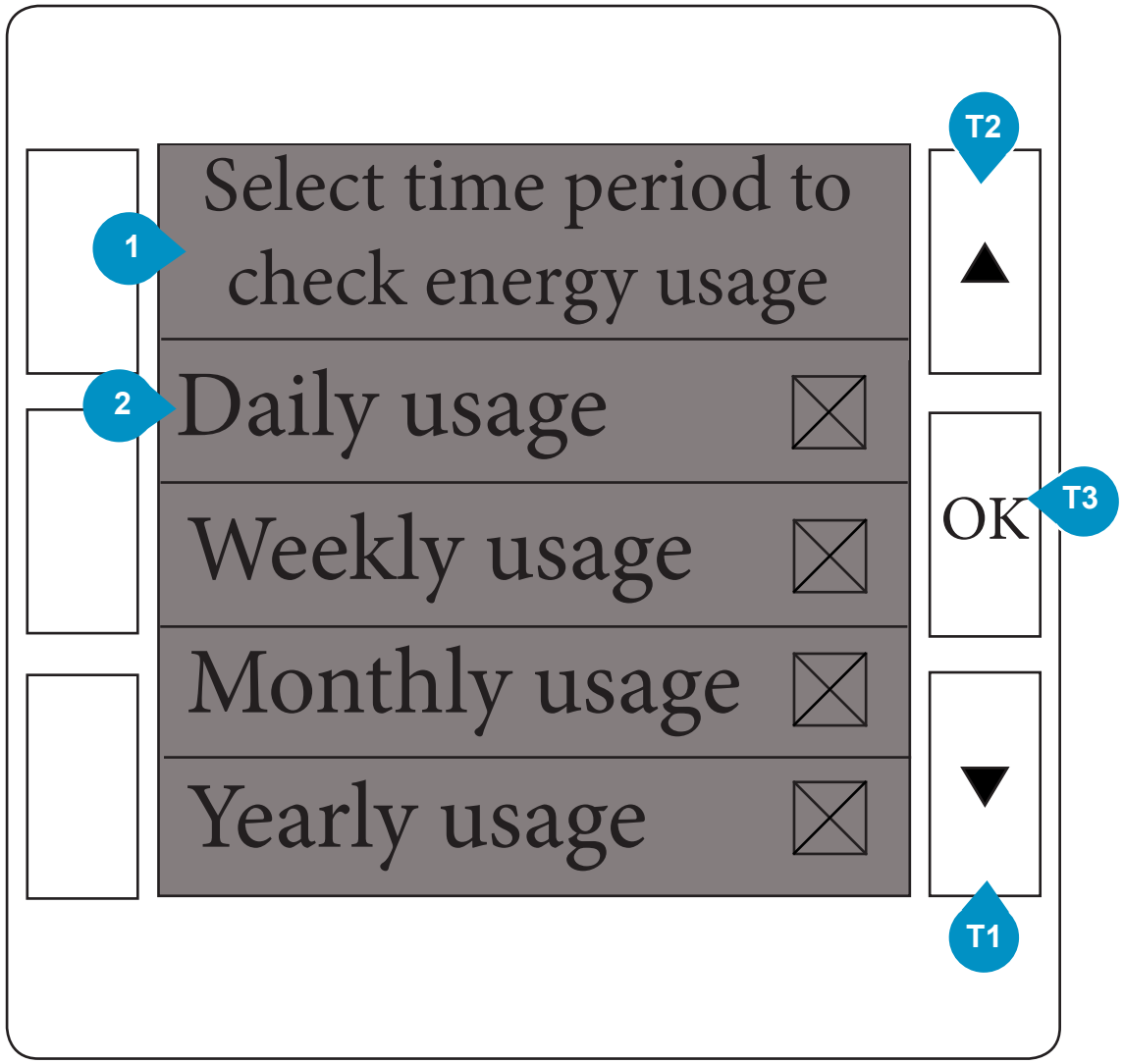


1. Energy usage menu header
Header text displayed to track energy usage

2. Menu options for energy usage
Displays options to check zonewise energy usage and energy usage of the entire unit

T1. Energy chart button
Users can track zonewise energy usage through these option. They can check daily. weekly, monthly and yearly energy usage

T2, T3, T4 Select button, Down arrow button, Up arrow button
User can browse through different options ofr energy usage using these buttons



1. Energy usage header

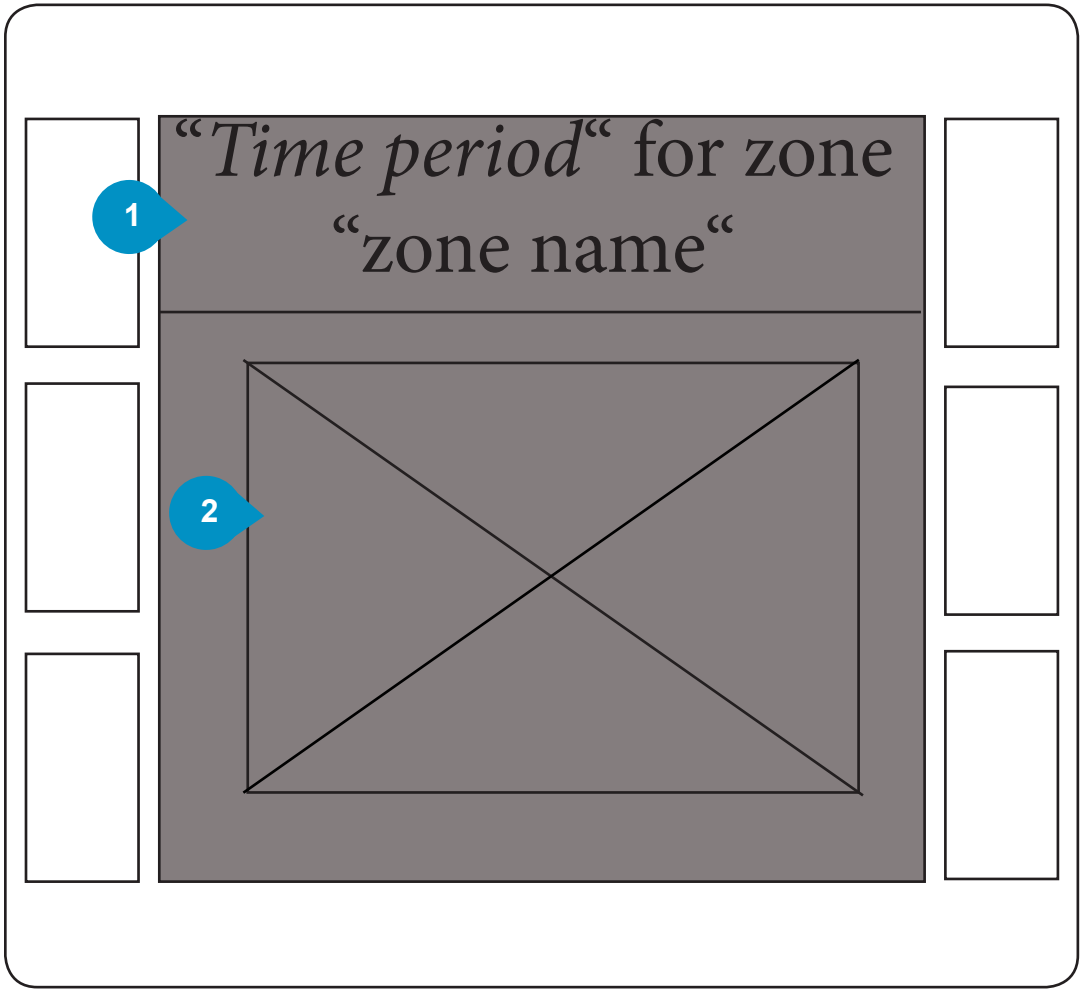
Displays information to select time period to track energy usage

2. Energy chart options

Displays options to check energy usage across different time periods.

T1,T2, T3 Select button, Down arrow button, Up arrow button

User can browse through different options of energy usage using these buttons



1. Energy usage graph header

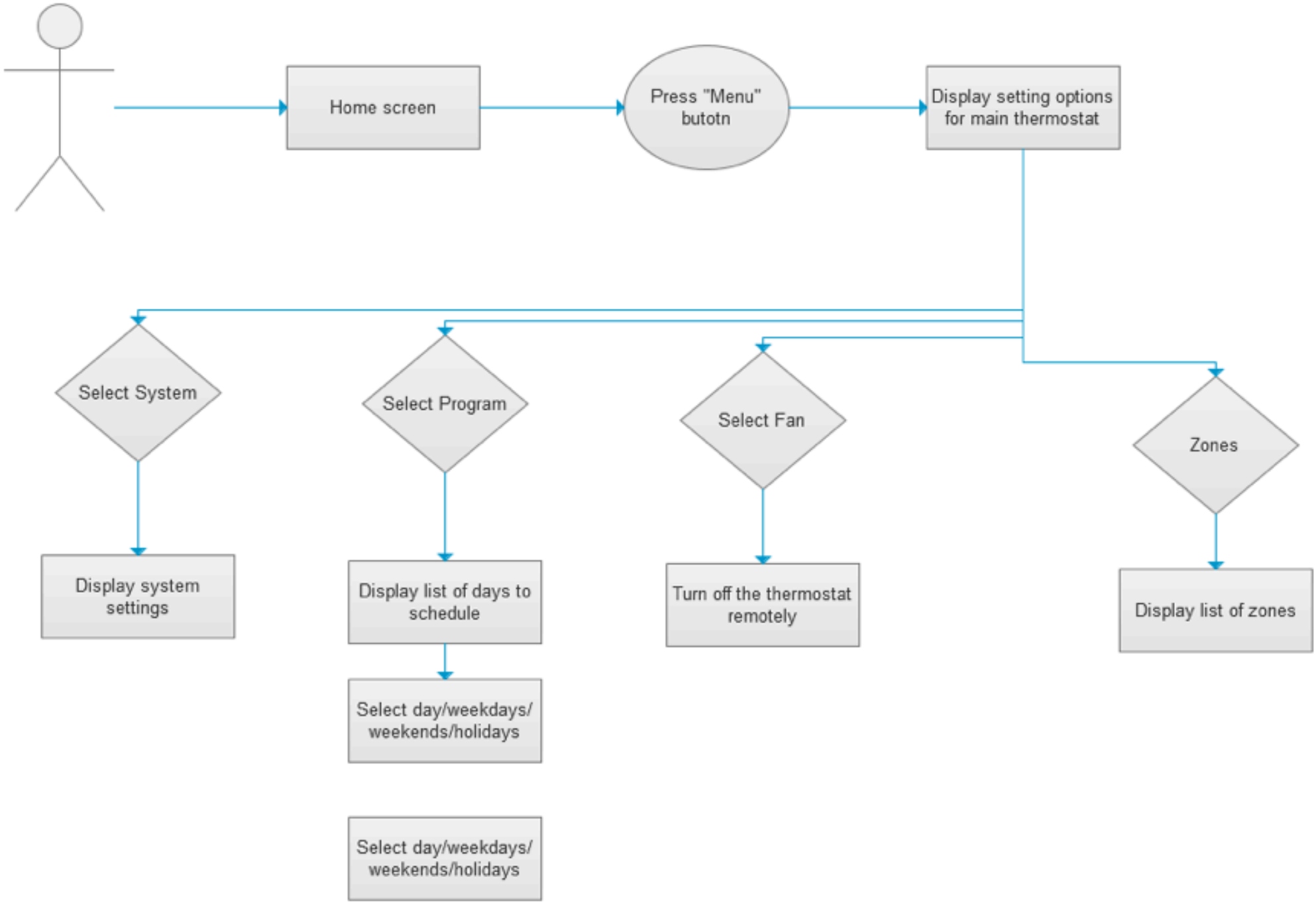
Displays information about the zone and the time period for which graph is displayed

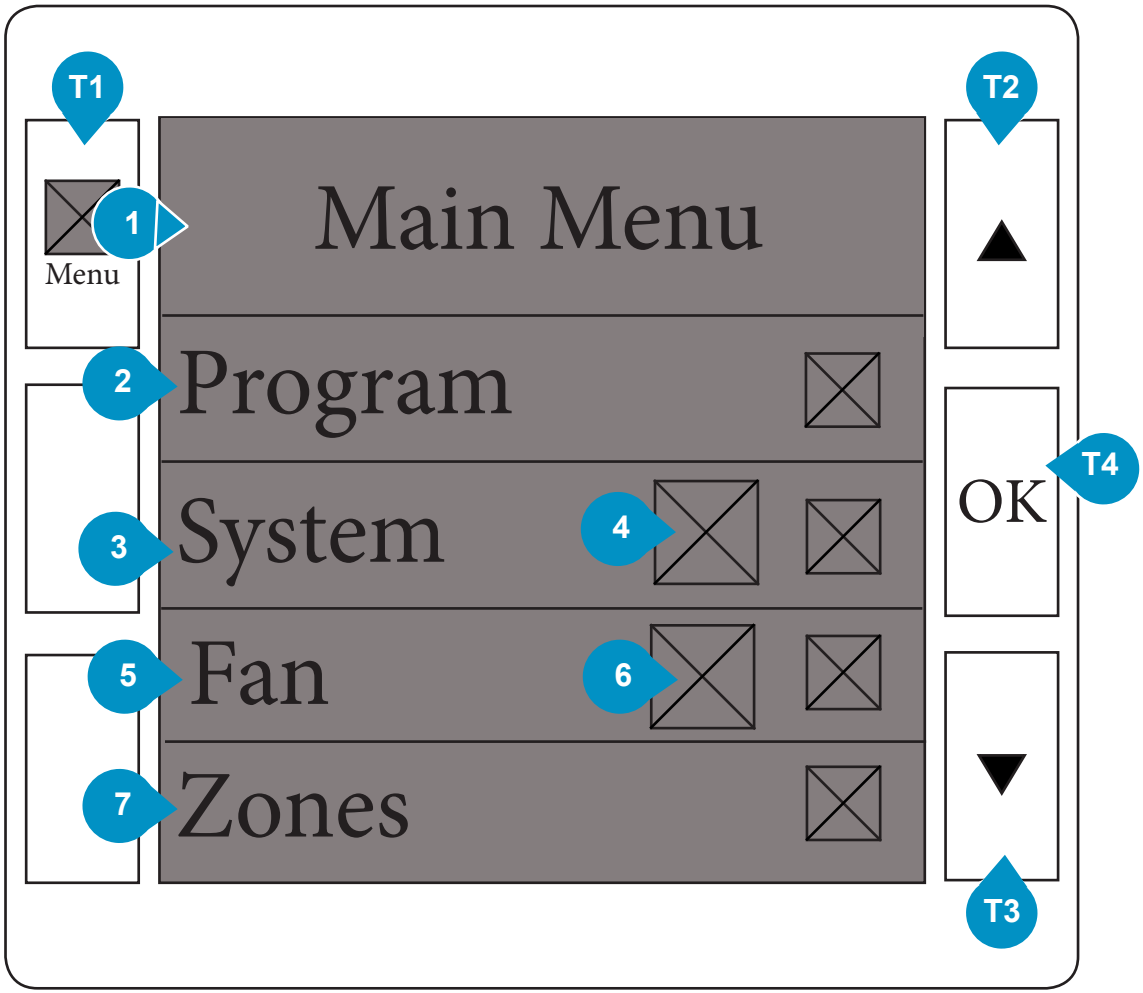
2. Graph

Dynamically generated bar chart that displays the energy usage in kilo watts per power unit.

Thermostat Settings

Task Flow


Home screen
Press "Menu" butotn
Display setting options for main thermostat
Select System
Select Program
Select Fan
Zones
Display system settings
Display list of days to schedule
Turn off the thermostat remotely
Display list of zones
Select day/weekdays/ weekends/holidays
Select day/weekdays/ weekends/holidays



T1 Menu button
This button displays a list of options supported by the main thermostat.

T2,T3, T4 Up arrow button, Down arrow button, Select button
User can browse through different options of menu using these buttons

1. Main menu header
Displays text to indicate menu header

2. Menu option - Program
This option enables the user to schedule the thermostat

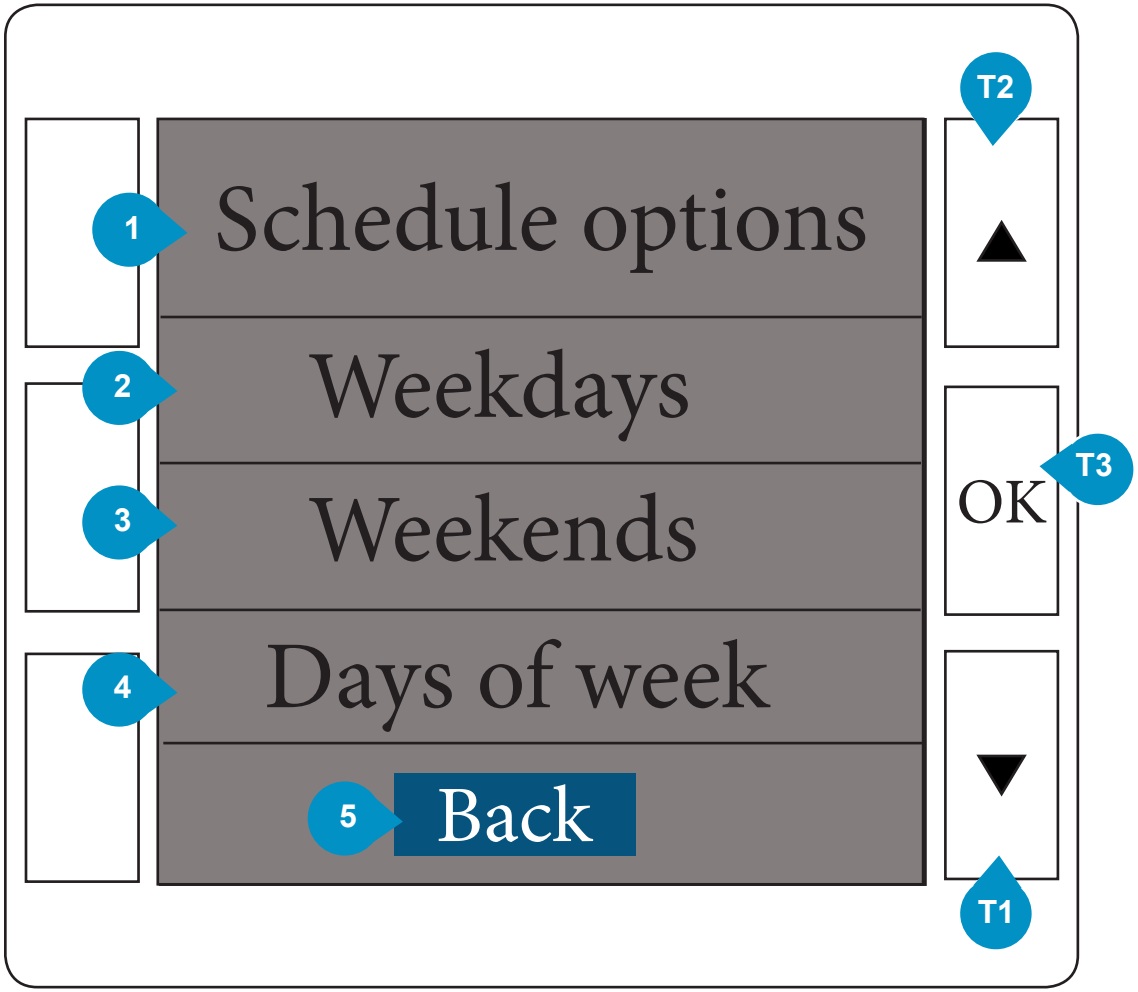
3. Menu option - System
This option provides a feedback about the status of the system i.e. heat, cool or off.

4. System image
An image displaying pictorially, the status of the system. A flaming image for heat, a blue colored image for cool and gray colored image for off

5. Menu option - Fan
This option provides feedback about the status of the Fan i.e. on/off

6. Fan image
An image indicating pictorially whether the Fan system is on/off

7. Menu option - zones
User can access other settings about thermostats from other zones through these option



1. Schedule header
Header text displayed for schedule options

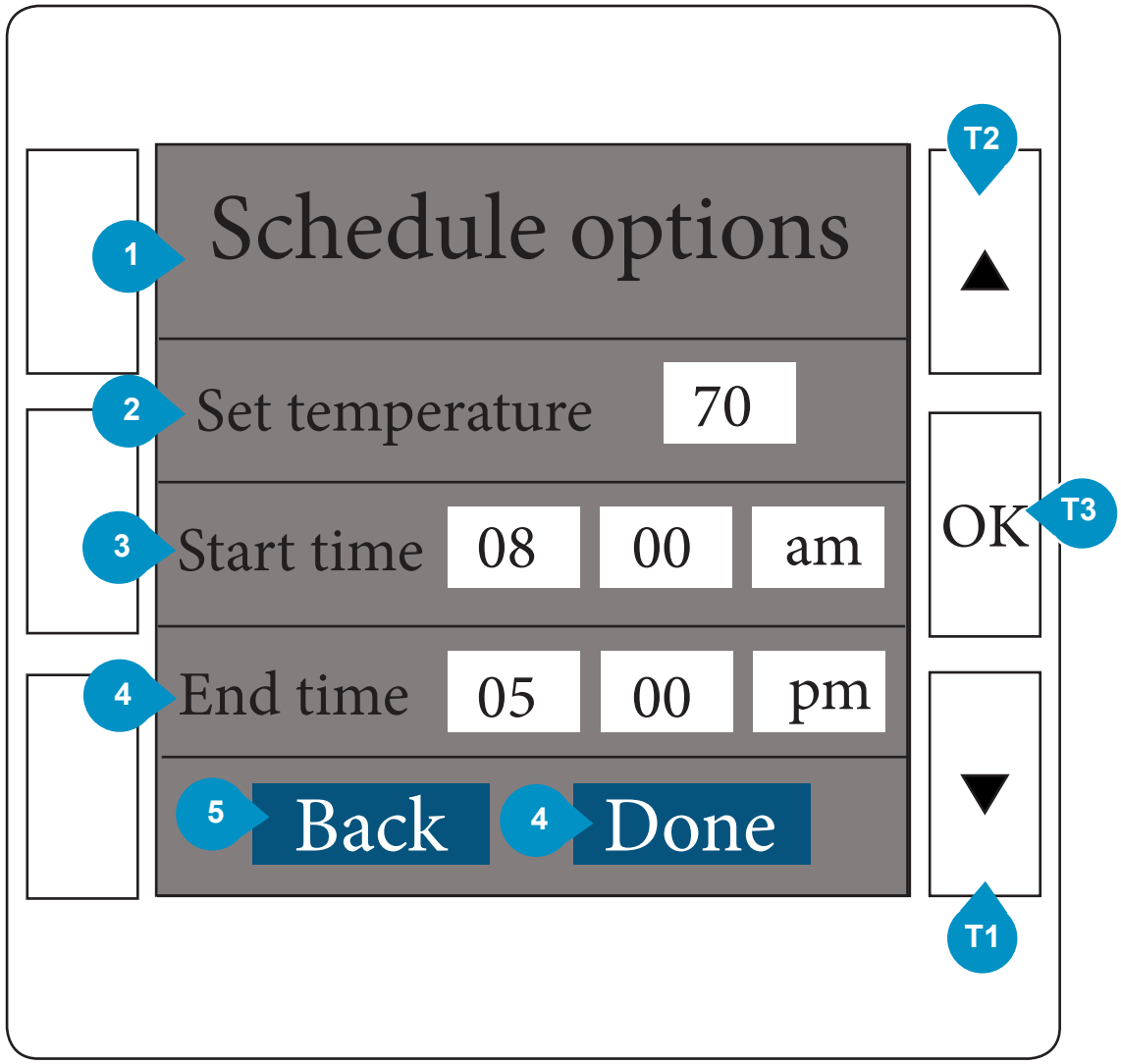
2. Schedule options - Weekdays
This option enables the user to schedule 5 weekdays of the week simultaneously for the same time

3. Schedule option - weekend
This option enables the user to schedule the thermostat for 2 days of the week-end.

4. Schedule option - Days
This option enables the users to sched-ule all 7 days of week at different times

5. Back option
As the schedule process is long, the back option allows the user to go back one screen

T1,T2, T3 Down arrow, up arrow and select button
User can browse through different schedule options



1. Schedule options header
Text header to schedule the thermostat

2. Set temperature
This option allows the user to set the temperature to schedule the thermostat

3. Start time
Enables the user to enter a start time with hours and minutes of the day. User can browse through these options using T1, T2 and T3 keys.

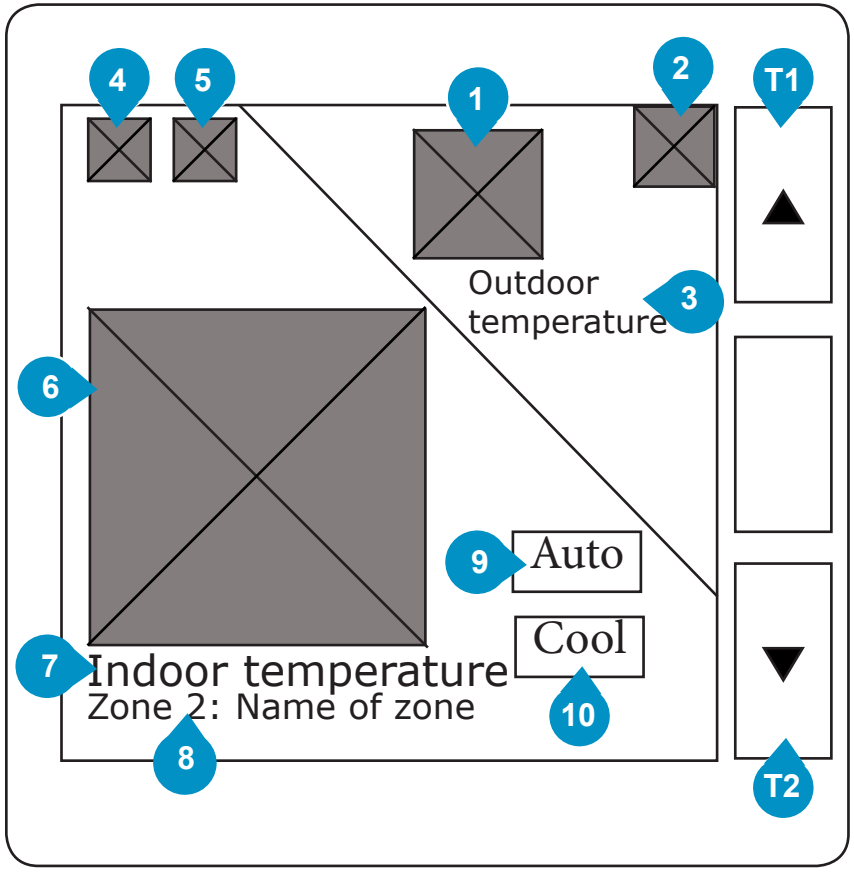
4. End time
Enables the user to enter a end time with hours and minutes of the day. User can browse through these options using T1, T2 and T3 keys.

5. Back
Allows the user to go back one screen

6. Done
This option displays a feecback message indicating completion of the schedule task and transits back to the home screen.

T1,T2, T3 Down arrow, up arrow and select button
User can browse through different schedule options with these buttons

Physical UI for Mini Thermostat



1. Outdoor temperature

Displays the current outdoor temperature. The thermostat will connect to wi-fi and update the temperature from weather forecast

2. Image for outside temperature

Displays the image represting outdoor temperature for e.g. image of sun for clear sky, clouds for cloudy sky, clouds with rain when it is raining outside etc.

3. Outdoor temperature label

Text to label outdoor temperature

4. Battery image

Displays an image to indicate battery power for the thermostat

5.Wifi image

Displays an image to indicate that the thermostat is connected to the wi-fi.

6. Indoor temperature

Displays the current indoor temperature of the room where the thermostat is deployed. User can change the temperature using T1 and T2 keys.

7. Indoor temperature label

Text to indicate indoor temperature

8. Zone information

Displays the zone name for which the temperature is displayed in 6

9. Fan

Displays the status of the Fan for the mini thermostat

10. Heat/Cool System

Displays the status of the system for the mini thermostat

T1 Up arrow button

For the home screen, user can inrease the temperature with this button

T2 Down arrow button

For the home screen, user can decrease the temperature with this button

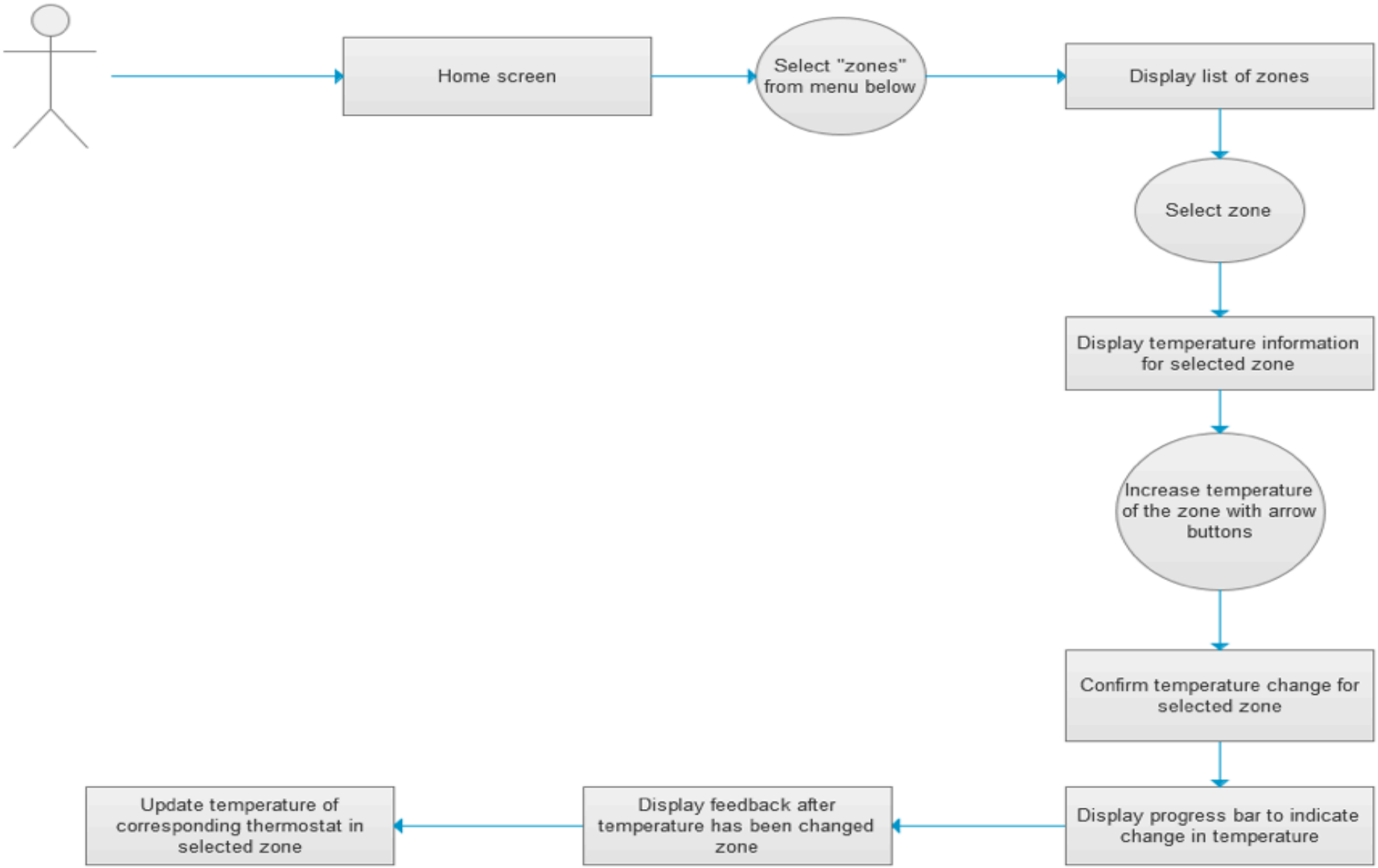
Radio Thermostat

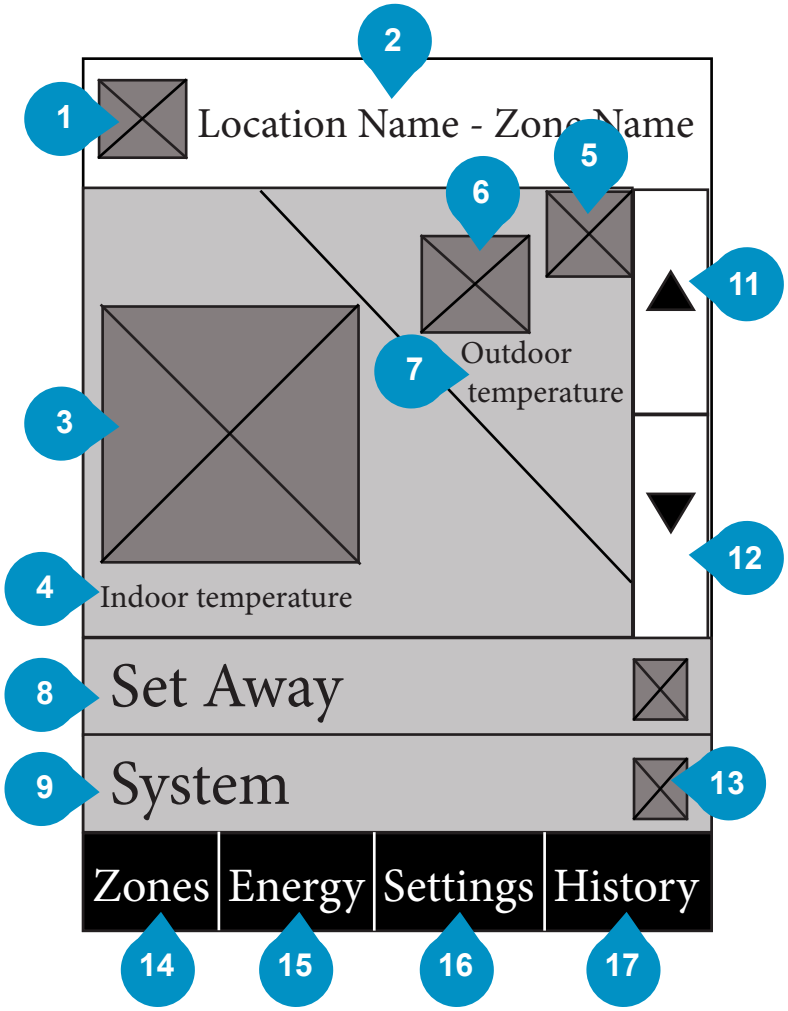
Radio Thermostat Company of America

iPhone App Interface

Zone Management

Task Flow


Home screen
Select "zones" from menu below
Display list of zones
Select zone
Display temperature information for selected zone
Increase temperature of the zone with arrow buttons
Confirm temperature change for selected zone
Display progress bar to indicate change in temperature
Display feedback after temperature has been changed zone
Update temperature of corresponding thermostat in selected zone



1. Location image
An image for the type of location where the thermostat setting is displayed

2. Home screen header
Header text with the location name and name of the zone where the main thermostat is displayed

3. Indoor temperature
Displays current indoor temperature of the main thermostat

4. Label for indoor temperature
Label to indicate the indoor temperature for main thermostat

5. Weather image
The app updates the temperature image from weather forecast.

6. Outdoor temperature
Displays the temperature updated from the the weather forecast.

7. Label for outdoor temperature
Label to indicate the outdoor temperature

8. Set Away
Users can turn off the thermostat remotely by using this option.

9. System
User can access the the system settings of the main thermostat directly from here or can access from the settings tab

11. Up arrow button
This button will allow the user to increase the temperature for the main thermostat

12. Down arrow button
This button will allow the user to decrease the temperature for the main thermostat

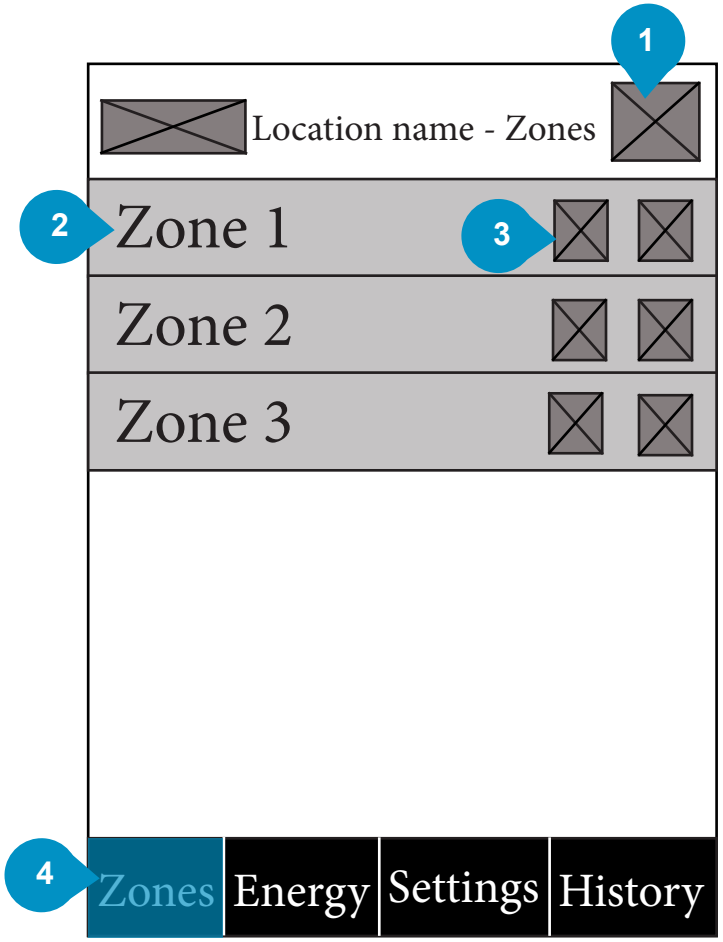
13. Right arrow image
Right arrow image

14. Menu option - zones
Displays list of all the zones configured for the current thermostat system

15. Menu option - Energy
Displays a bar chart that will show a zone wise energy usage across different time periods.

16. Menu option - Settings
Displays options to configure and program the main thermostat.

17. Menu option - History
Displays a log of all the changes made for the entire thermosat system. It stores data upto a week.

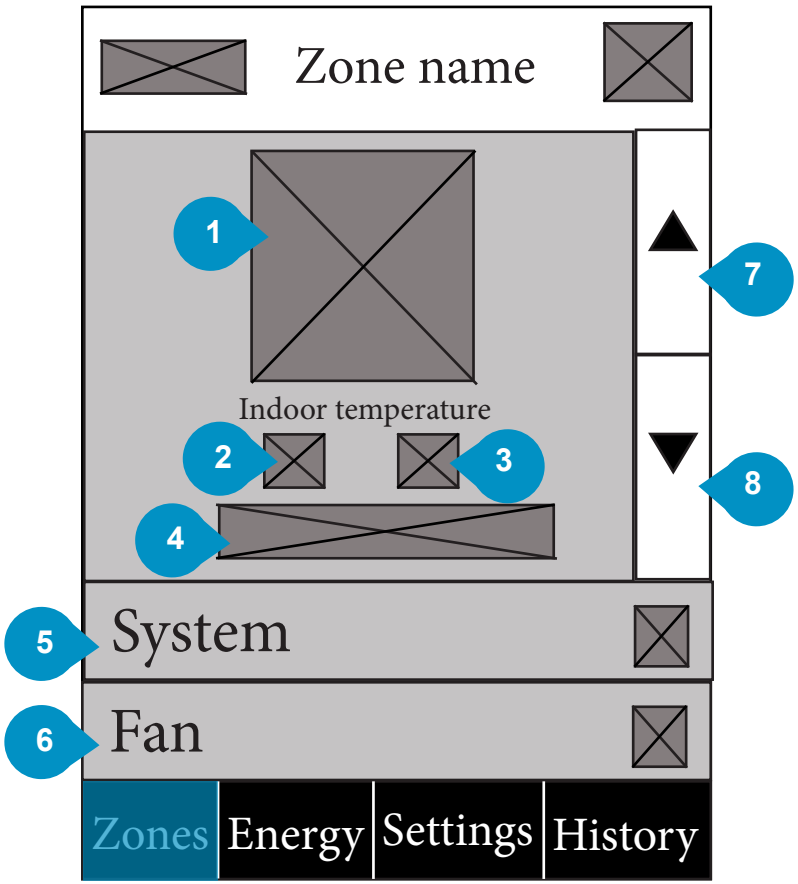


1. Home button
Navigates the user to the home screen

2. Menu items
Displays a list of all zone names configured by the user

3. Zone temperature
Displays a highlight of the indoor temperature of the corresponding zone

4. Active menu
Highlight the menu item indicating its active state



1. Zone temperature
Displays the indoor temperature of the selected zone

2. Cancel action image
As the user changes the temperature with the up and the down arrow buttons, the app asks the user's confirmation in the form of 'ok' and 'cancel' images. This image has a red cross indicating canel option

3. OK action image
Displays a green check mark indicating OK option

4. Animated image
Displays a progress bar indicating the precentage of time needed to change the temperature in the zone.

5. System
Displays a list of options for the thermostat system in the current zone and are similar to those of main thermostat.

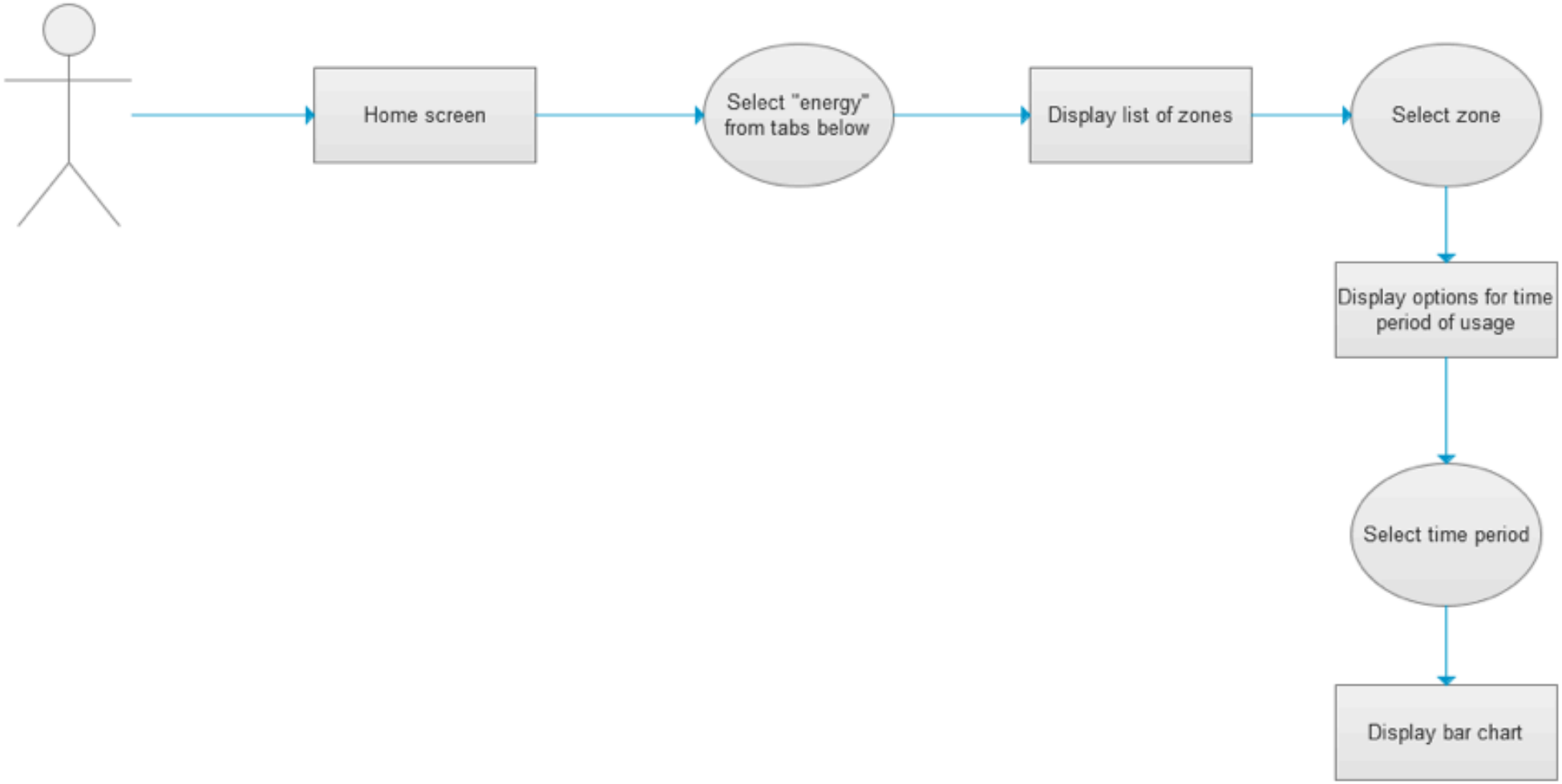
6. Fan
Displays a slider switch similar to iPhone's slider to turn the fan on/off.

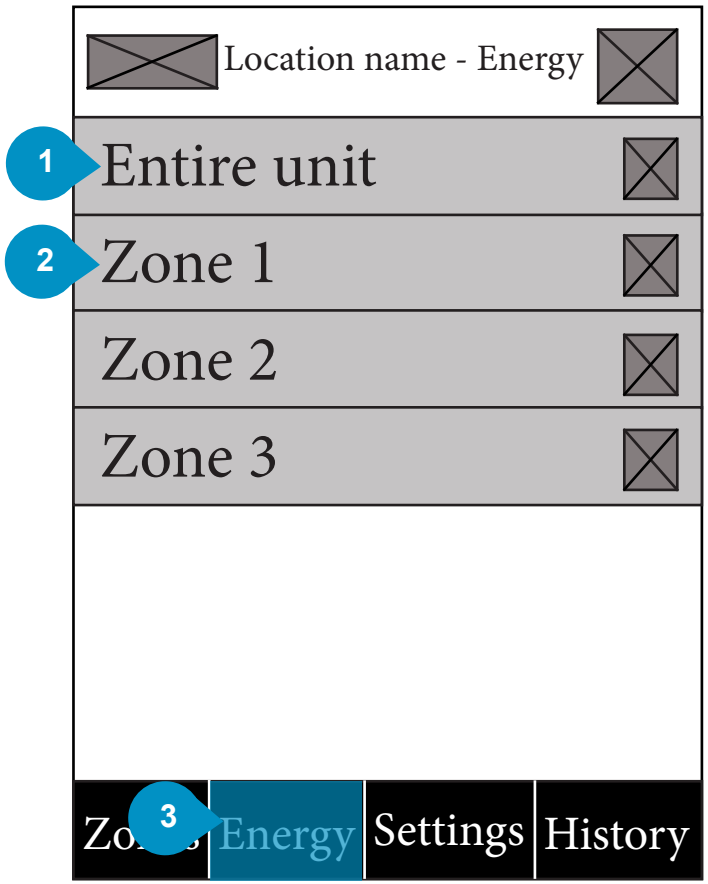
7. Up arrow button
User can increase the temperature of the zone with this button.

8. Down arrow button
User can decrease the temperature of the zone with this button.

Energy Management

Task Flow


Home screen
Select "energy" from tabs below
Display list of zones
Select zone
Display options for time period of usage
Select time period
Display bar chart



1. Menu option - entire unit

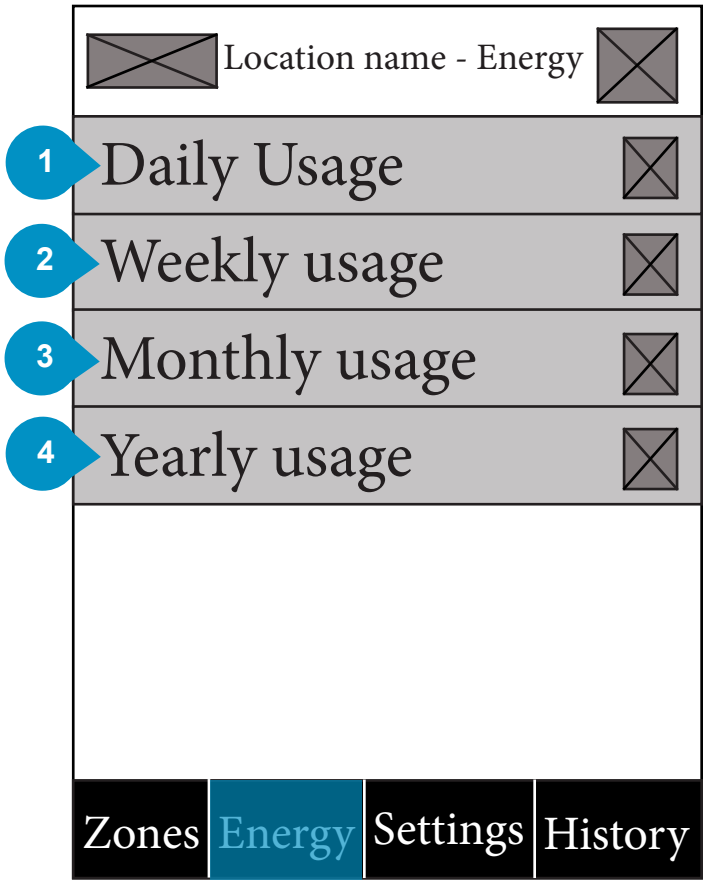
This option displays the energy usage of all the zones in the unit across different time periods

2. Menu option - zone name

This option displays the zonewise energy usage across different time periods.

3. Highlight 'Energy' tab

As the user selects the Energy tab, it is highlighted to indicate the active tab

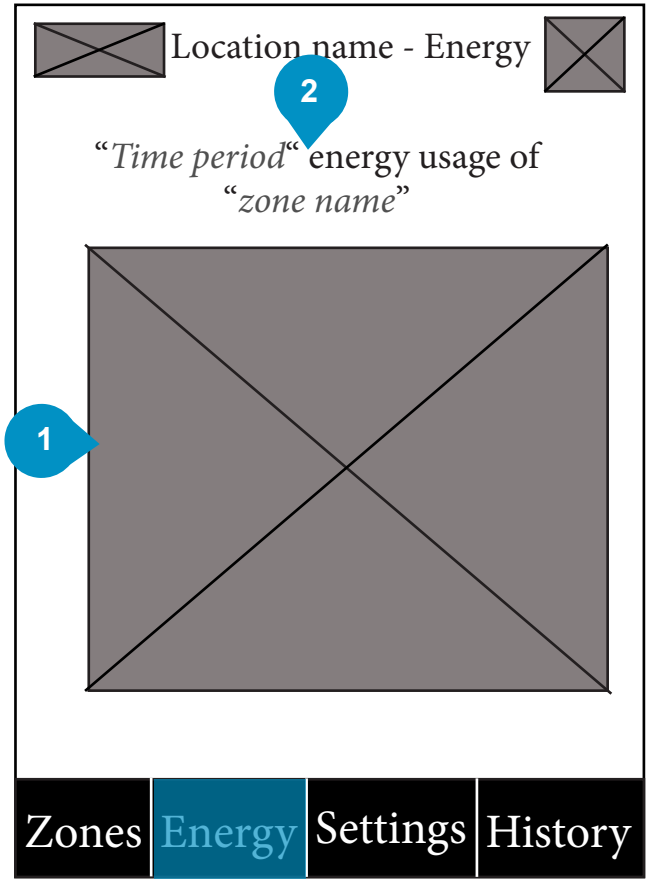


1. Menu option - daily usage
Displays hourly consumption of energy in terms of kilo watts per unit

2. Menu option - weekly usage
Displays consumption of energy in terms of kilo watts per unit by days of week

3. Menu option - Monthly usage
Displays consumption of energy in terms of kilo watts per unit by months of the year

4. Menu option - Yearly usage
Displays consumption of energy in terms of kilo watts per unit by months of the year

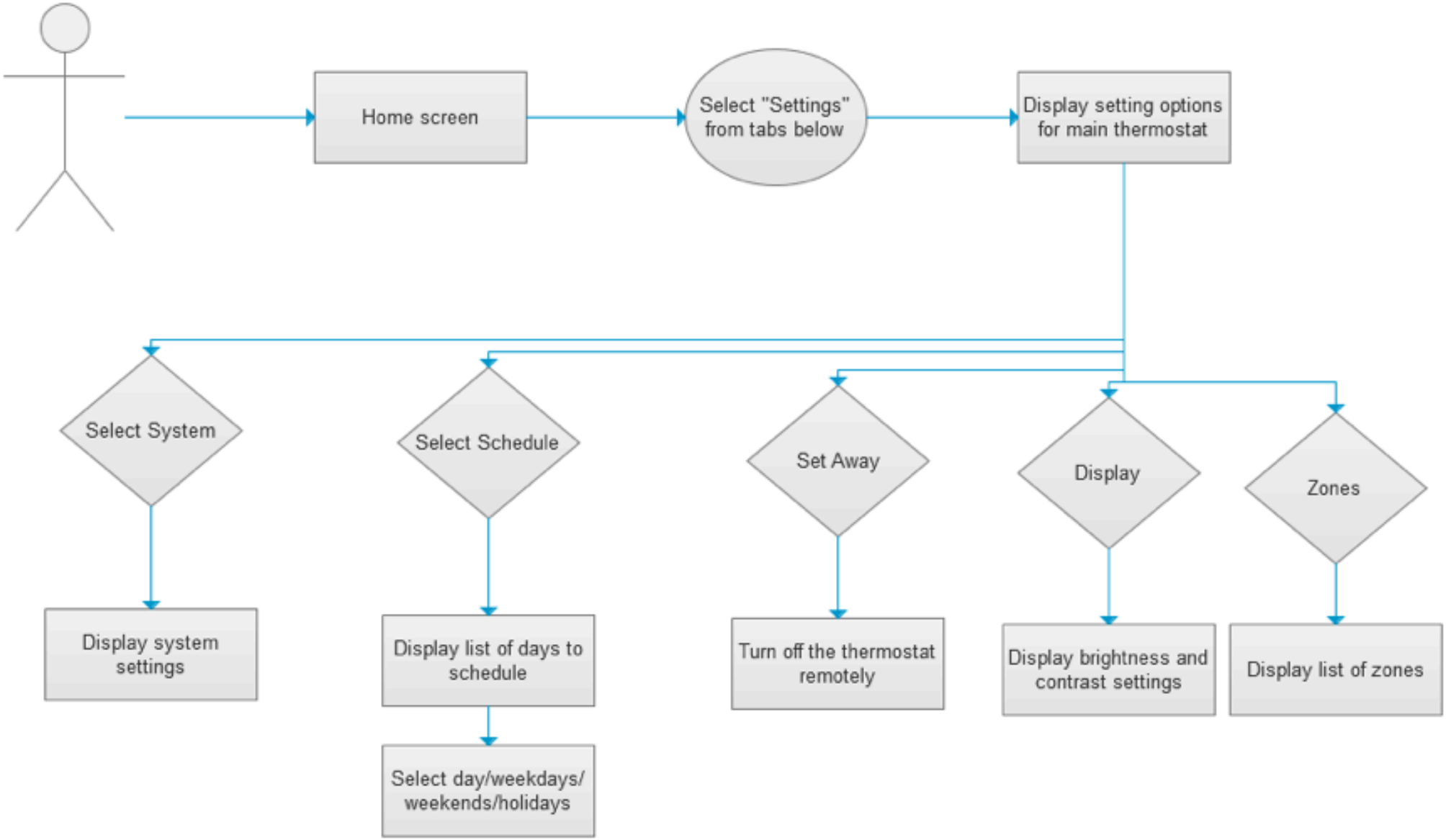


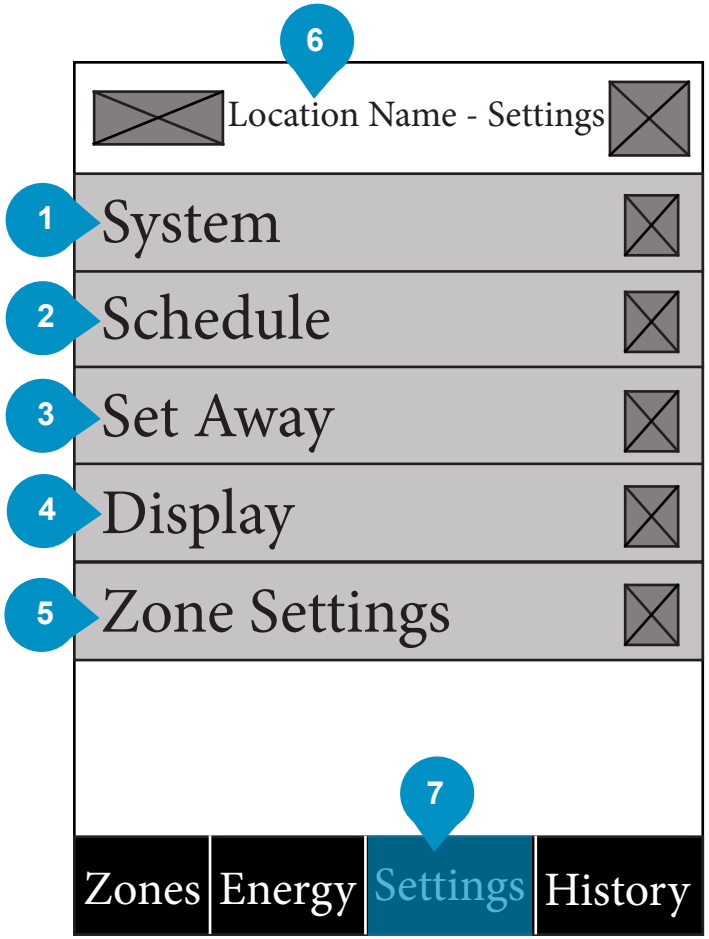
1. Bar chart
Displays energy usage in the form of bar chart.

2. Information
Displays energy usage in the form of bar chart.

Thermostat Settings

Task Flow


Home screen
Select "Settings" from tabs below
Display setting options for main thermostat
Select System
Select Schedule
Set Away
Display
Zones
Display system settings
Display list of days to schedule
Select day/weekdays/ weekends/holidays
Turn off the thermostat remotely
Display brightness and contrast settings
Display list of zones



1. Menu option - System
This option provides the user with option regarding the system settings of the main thermostat

2. Menu option - Schedule
This option enables the user to schedule the main thermostat for different temperatures on different days.

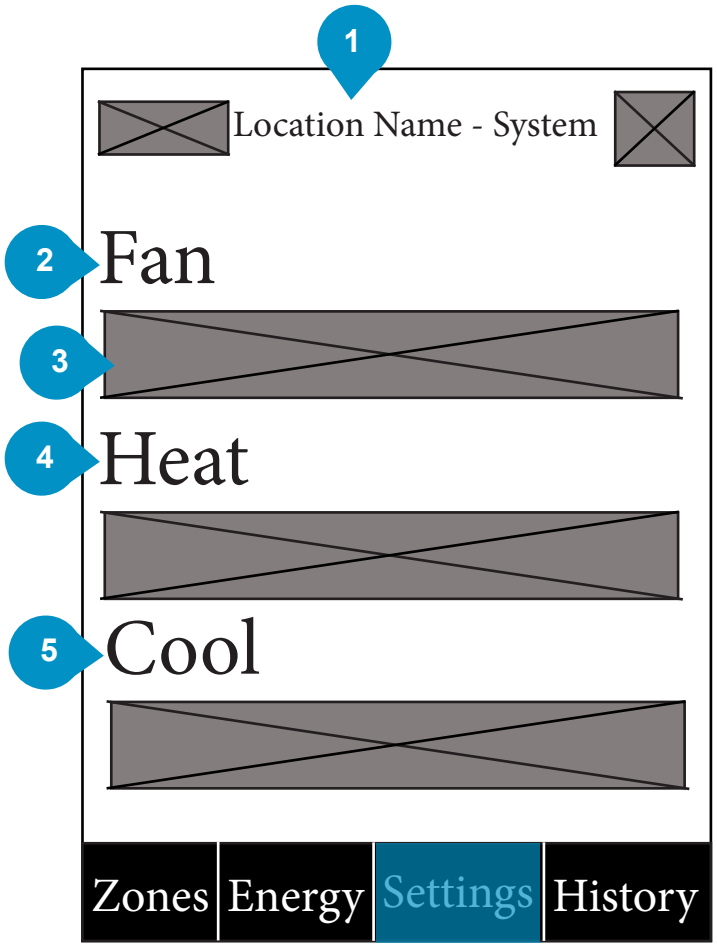
3. Menu option - Set Away
This option enables the user to turn off the thermostat remotely.

4. Menu option - Display
User can change the brightness and contrats settings of the thermostat remotely through this option

5. Menu option - zone settings
This option enables the user modify thermostat settings for different zones

6. Header
Displays text of the location name along with the tab name

7. Tab option
Highlight the current tab option with a blue overlay



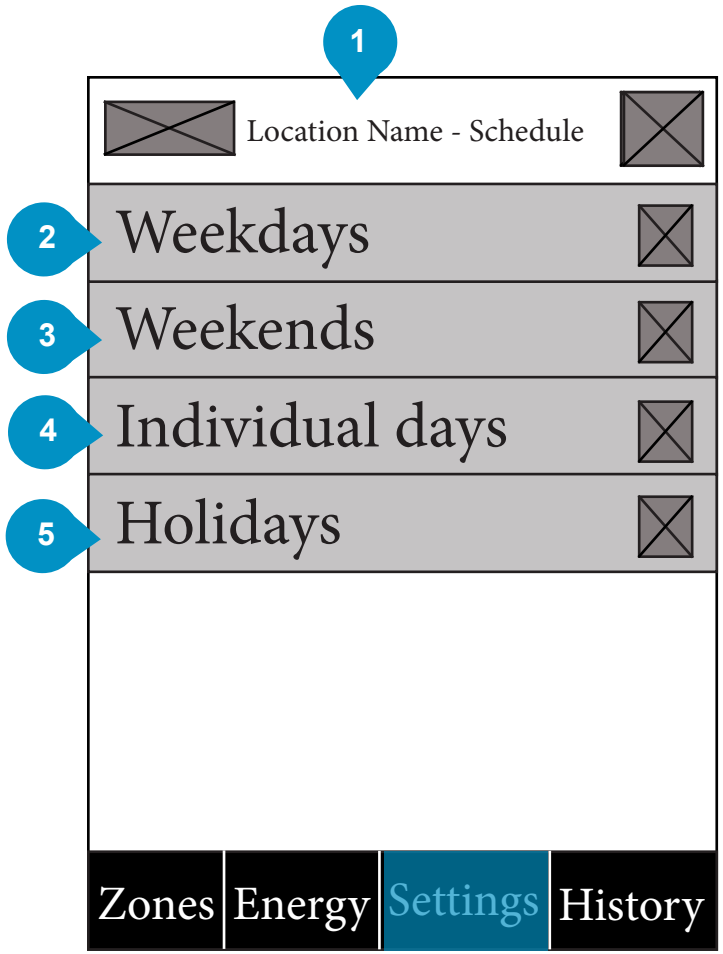
1. System Header
Header text displayed for system options

2. Fan
Fan option for main thermostat

3. Slider
Slider control to turn the Fan on/off

4. Heat
Heat option for the main thermostat

5. Cool
To turn the cooling system on or off using the slider.



1.Schedule header

Displays text to indicate schedule header.

2. Weekdays

Enables the user to schedule for all five days of week simultaneously.

3. Weekends

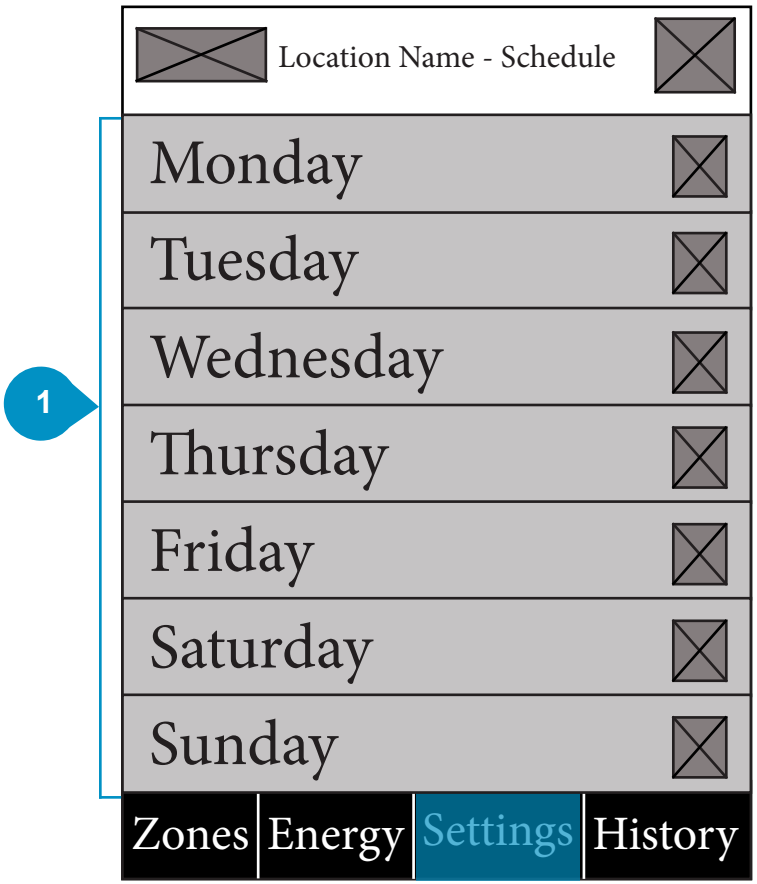
Enables the user to schedule for saturday and sunday simultaneously

4. Days

Enables the user to schedule different days of the week at differnet times with different tempertures

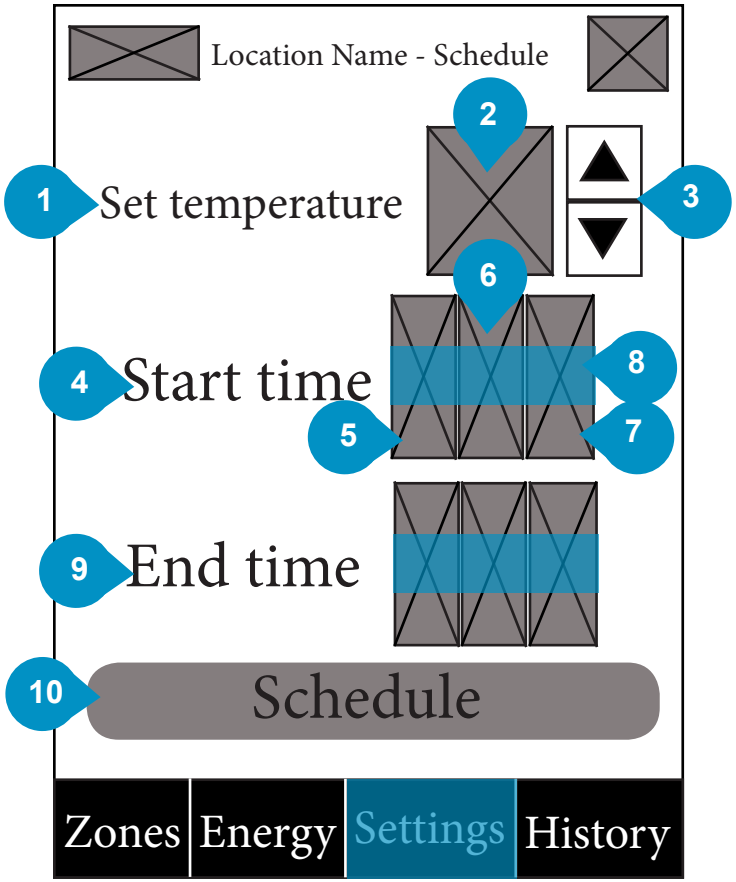
3. Weekends

Allows the user to configure holiday schedule for the thermostat



1. Schedule header

List of all seven days to allow the user to schedule different days at different temperatures.



1. Set temperature

Label displayed to set temperature for scheduling

2. Temperature, 3 Up and down arrow buttons

User can set the temperature of the thermostat to schedule with the use of up and down arrow buttons

4. Start time label

Label displayed to set start time of the day for the scheduled temperature

5. Set hour

Mobi-scroll control used to set hour of the day. The options for the digits displayed would be between 01 to 12

6. Set minute

Mobi-scroll control used to set minutes of the hour. The options for the digits displayed would be between 00 to 59

7. am/pm

Mobi-scroll control used to set part of the day (day or night). The options for the text displayed would be am or pm.

8. Highlight Mobi scroll

A blue overlay used to highlight the selection made by the user

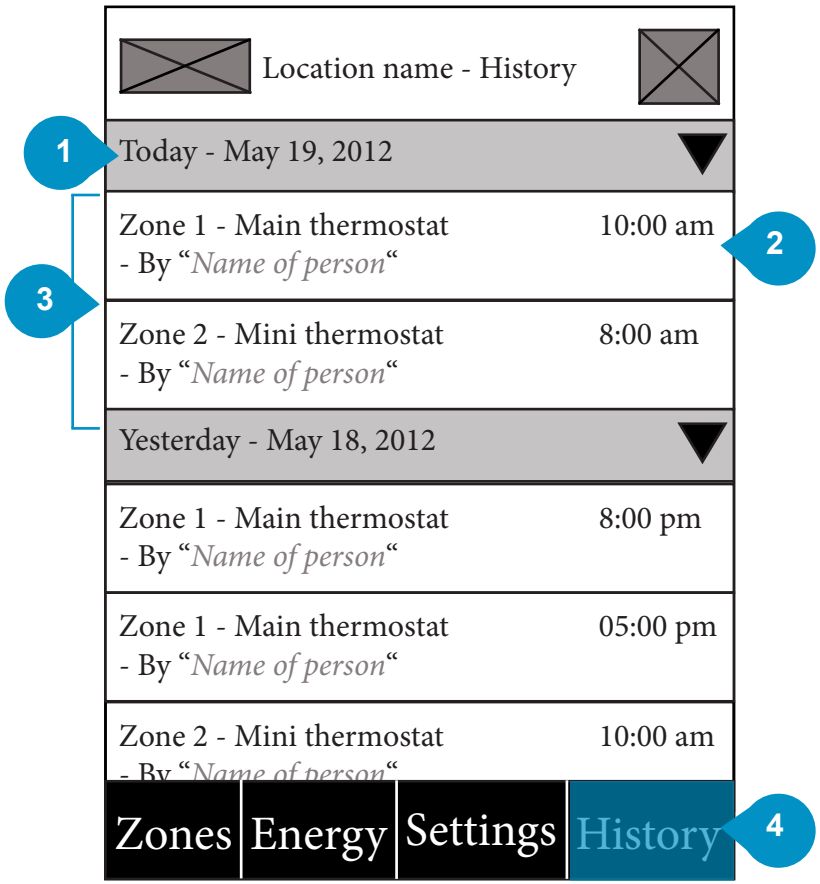
9. End time

Label displayed to set the end time of the day for the scheduled temperature

10. Schedule button

Button used to confirm the scheduling changes made to the schedule.

Access History



1. History header
Section header displayed to indicate the time period for the log details

2. Log entry
Each log entry displays information about the access made to any thermostat within the unit. Each entry displays the zone name where the thermostat was accessed, type of thermostat (main or mini), name of the person who accessed the thermostat and time when it was accessed.

3. Entry log section
All logs are divided according to the time of access and displayed in different sections. The app can save logs upto a week

4. Tab option
Blue overlay used to highlight the current active tab (History).

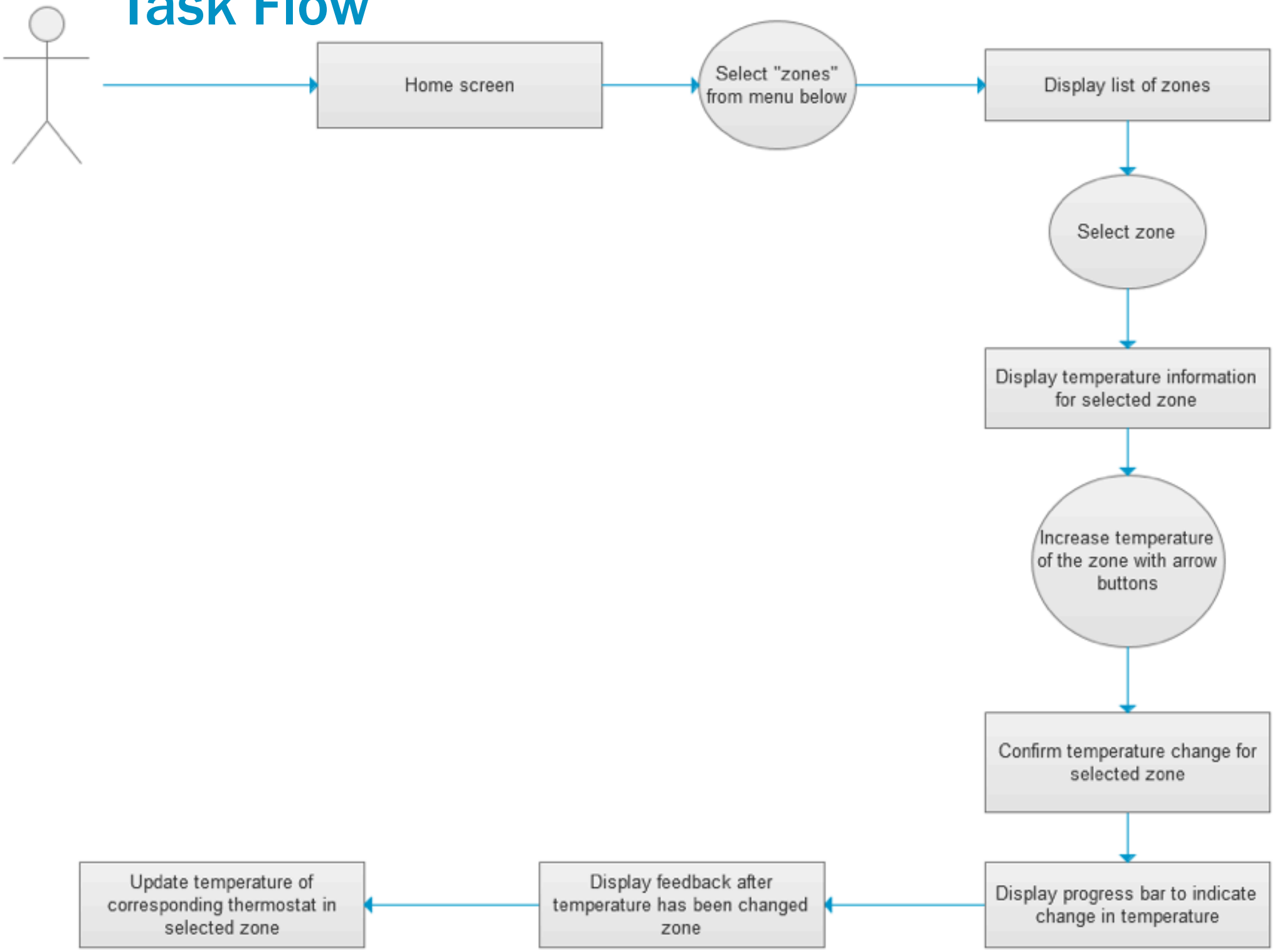
Radio Thermostat

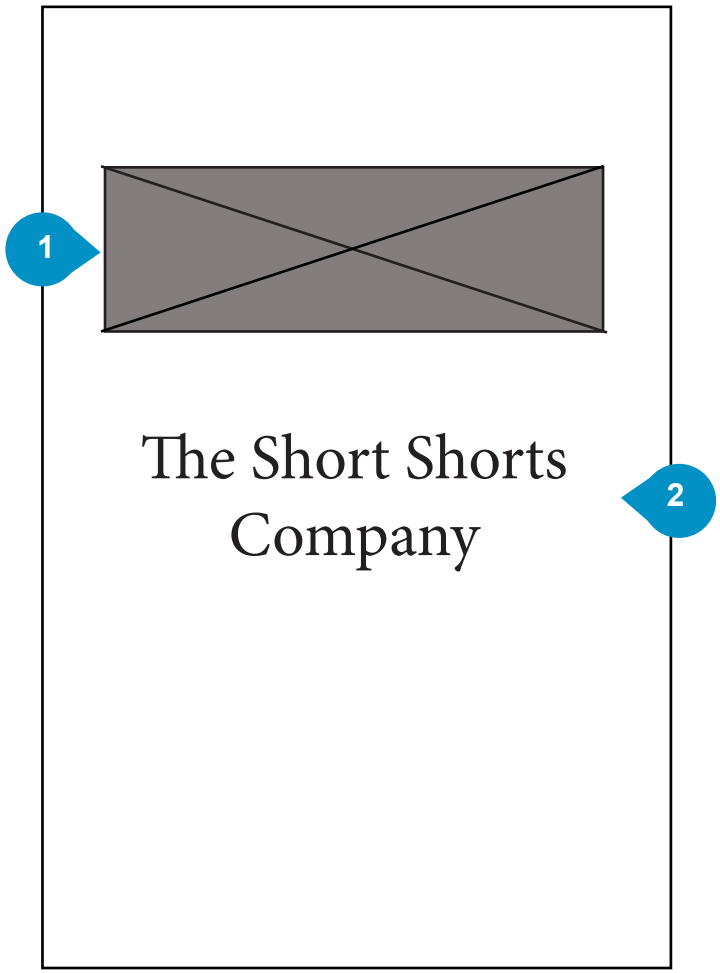
Radio Thermostat Company of America

Android App Interface

Zone Management

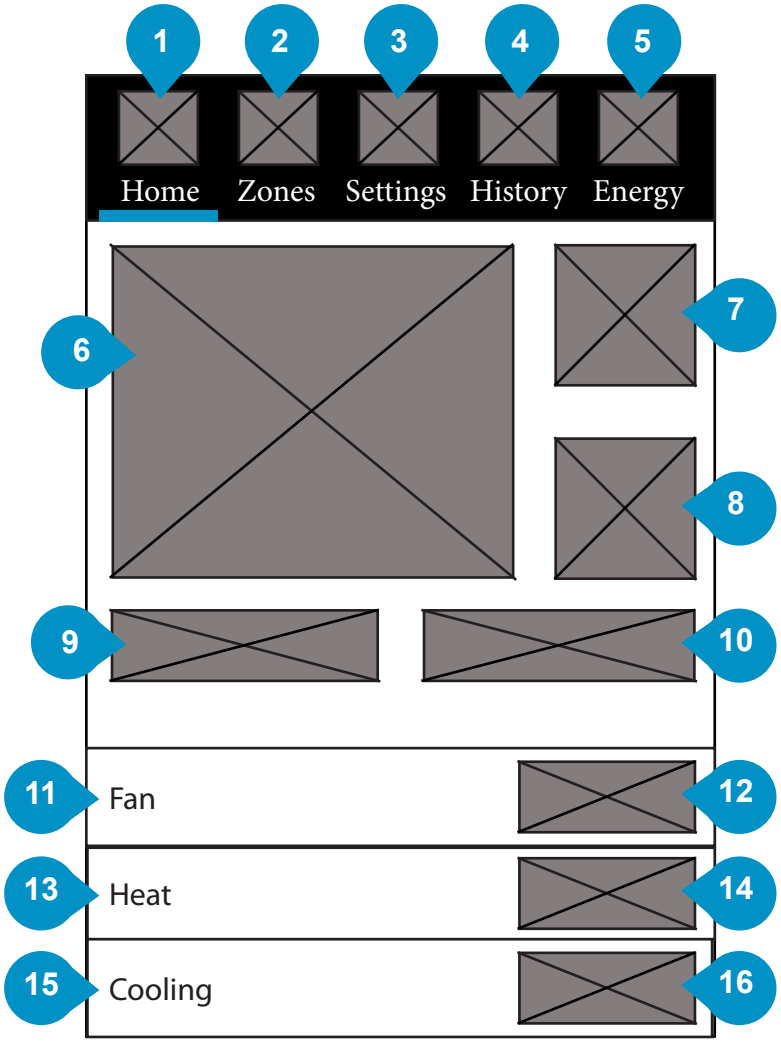
Task Flow


Home screen
Select "zones" from menu below
Display list of zones
Select zone
Display temperature information for selected zone
Increase temperature of the zone with arrow buttons
Confirm temperature change for selected zone
Display progress bar to indicate change in temperature
Display feedback after temperature has been changed zone
Update temperature of corresponding thermostat in selected zone



1. Company logo
Displays logo of radio thermostat

2. Client Name
Displays client name



1. Menu item - Home
Displays home icon along with text. Navigates user to the home screen. A blue underline highlights the active menu.

2. Menu item - Zones
Displays zone icon along with text. Navigates user to the zones screen and displays list of available zones

3. Menu item - Settings
Displays tool icon along with text. Displays system settings for the main thermostat.

4. Menu item - History
Displays history icon along with text. Stores and displays logs of thermostat access upto a week.

5. Menu item - Energy
Displays energy icon along with text. Displays energy usage for a given period of time.

6. Temperature
Displays current temperature of the main thermostat

7. Increase temperature
Button used to increase temperature for the main thermostat

8. Decrease temperature
Button used to decrease temperature for the main thermostat

9. Confirm option - Cancel
Image button displayed to cancel the change in temperature for the main thermostat

10. Confirm option - OK
Image button displayed to confirm the change in temperature for the main thermostat.

11. Fan
Option displayed to toggle the Fan funtion for the main thermostat

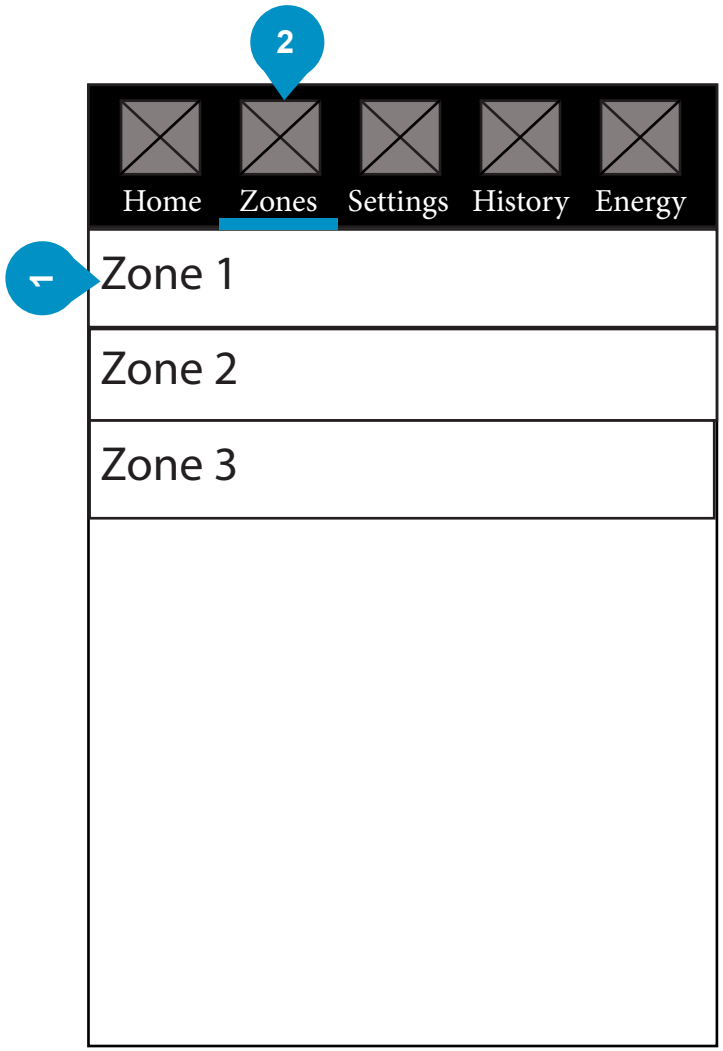
12. Fan Slider
A slider displayed to turn the fan on/off for the main thermostat

13. Heat
Option displayed to toggle the Heat funtion for the main thermostat

14. Heat slider
A slider displayed to turn the heat on/off for the main thermostat

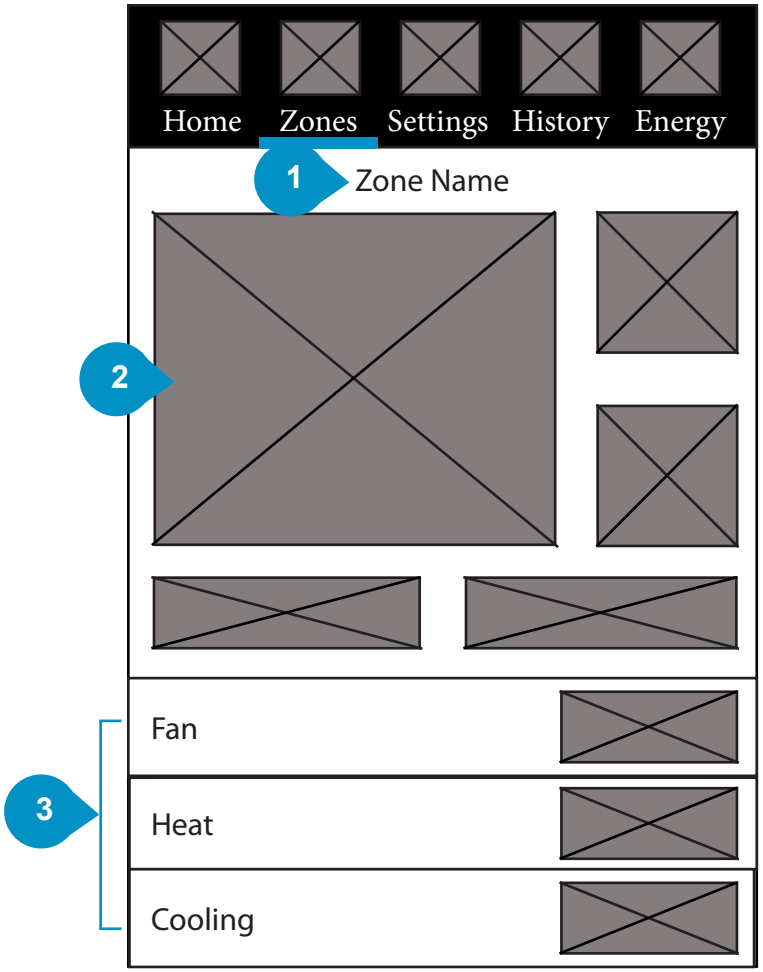
15. Cooling
Option displayed to toggle the cooling funtion for the main thermostat

16. Cooling slider
A slider displayed to turn the cool on/off for the main thermostat



1. Zone name
Displays a list of all zones pre-configured by the user

2. Zone menu
A blue underline for the zone option in the menu to indicate the active zone



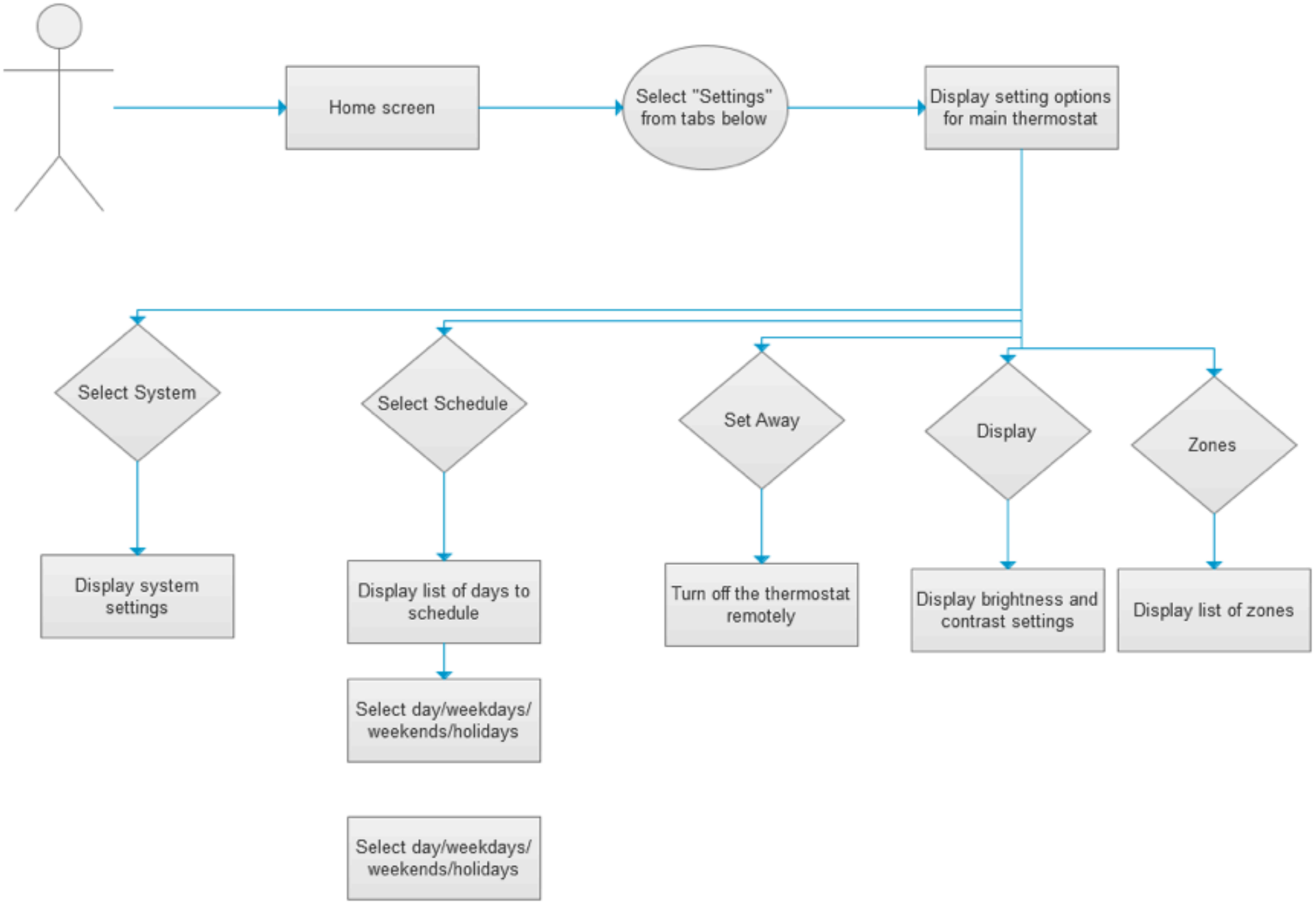
1. Zone header
Displays header text with the name of the selected zone.

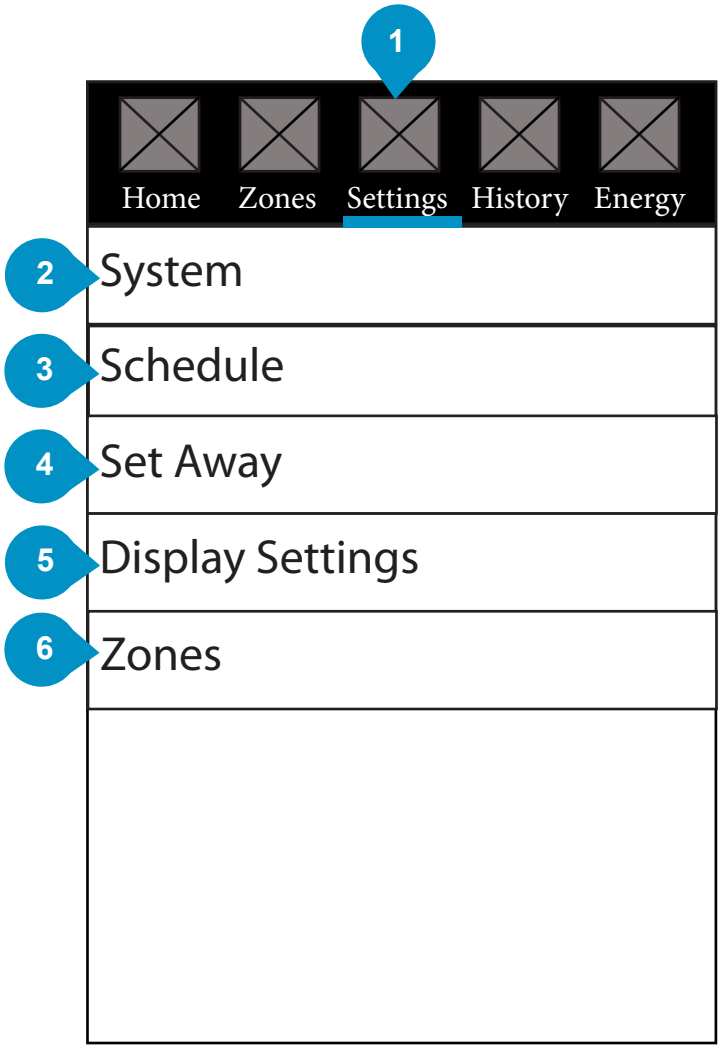
2. Zone temperature
Displays current indoor temperature for the selected zone.

3. Thermostat options
Displays current fan settings, heat settings and cooling settings for the thermostat in the selected zone

Thermostat Settings

Task Flow


Home screen
Select "Settings" from tabs below
Display setting options for main thermostat
Select System
Select Schedule
Set Away
Display
Zones
Display system settings
Display list of days to schedule
Turn off the thermostat remotely
Display brightness and contrast settings
Display list of zones
Select day/weekdays/ weekends/holidays
Select day/weekdays/ weekends/holidays



1. Menu item - Settings
Displays a list of options to configure the thermostat remotely

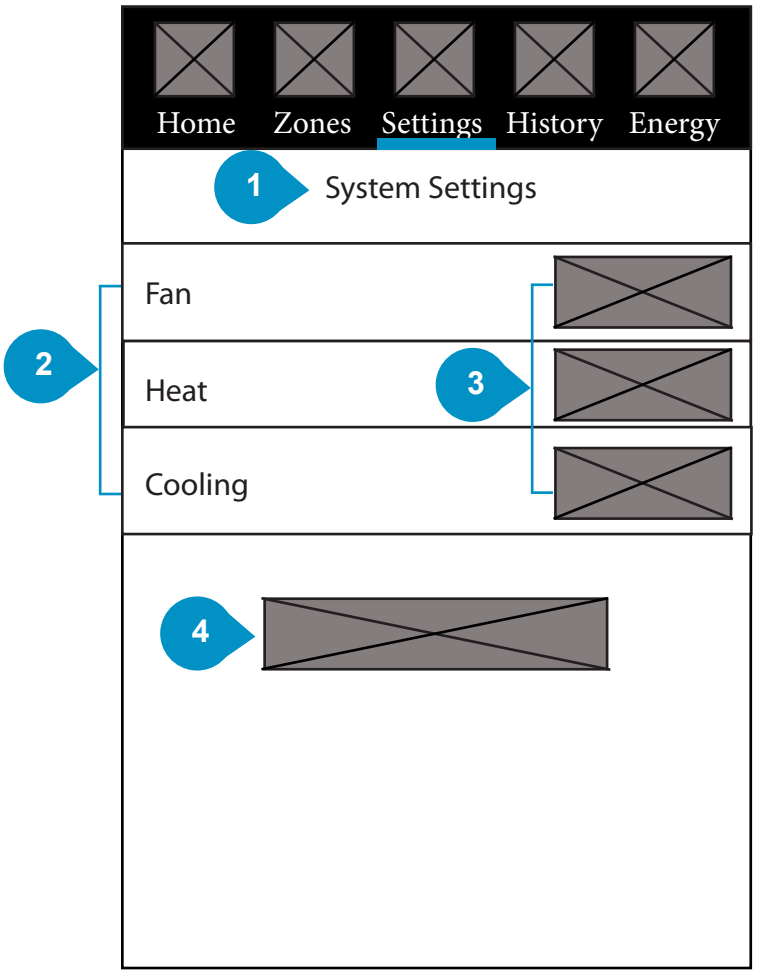
2. System
Displays a list of settings for the main thermostat which includes Fan settings, Heat settings and cooling settings.

3. Schedule
Displays options to schedule the main thermostat

4. Set Away
User can turn off the main thermostat using this option.

5. Display Settings
Displays brightness and contrast settings for the main thermostat

6. Zones
Displays a list of zones configured by the user. A second way to navigate to zones

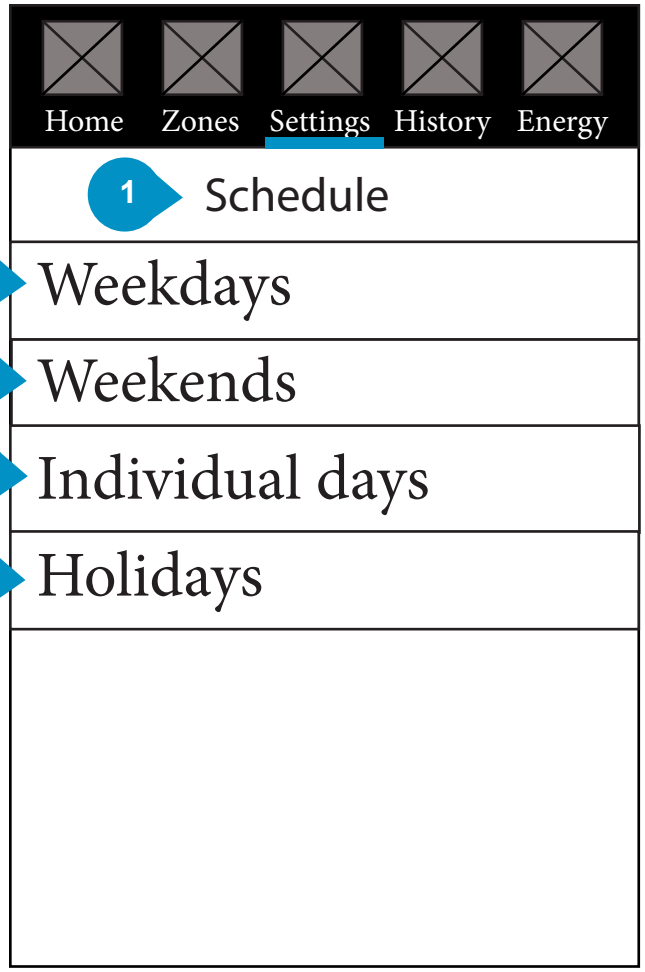


1. System settings header
Header text to indicate system settings

2. Thermostat options
Displays current fan settings, heat settings and cooling settings for the thermostat in the selected zone

3. Slider
Each setting is changed using a toggle on/ off switch.

4. Confirm button
Button to confirm the changed settings.



1.Schedule header

Displays text to indicate schedule header.

2. Weekdays

Enables the user to schedule for all five days of week simultaneously.

3. Weekends

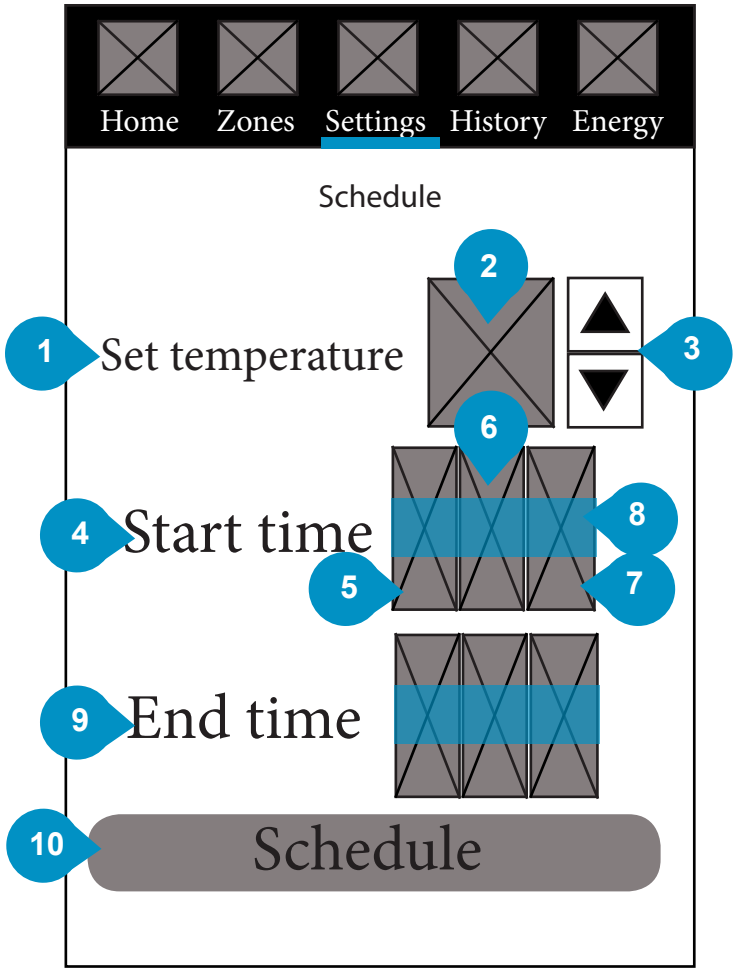
Enables the user to schedule for saturday and sunday simultaneously

4. Days

Enables the user to schedule different days of the week at differnet times with different tempertures

3. Weekends

Allows the user to configure holiday schedule for the thermostat



1. Set temperature

Label displayed to set temperature for scheduling

2. Temperature, 3 Up and down arrow buttons

User can set the temperature of the thermostat to schedule with the use of up and down arrow buttons

4. Start time label

Label displayed to set start time of the day for the scheduled temperature

5. Set hour

Mobi-scroll control used to set hour of the day. The options for the digits displayed would be between 01 to 12

6. Set minute

Mobi-scroll control used to set minutes of the hour. The options for the digits displayed would be between 00 to 59

7. am/pm

Mobi-scroll control used to set part of the day (day or night). The options for the text displayed would be am or pm.

8. Highlight Mobi scroll

A blue overlay used to highlight the selection made by the user

9. End time

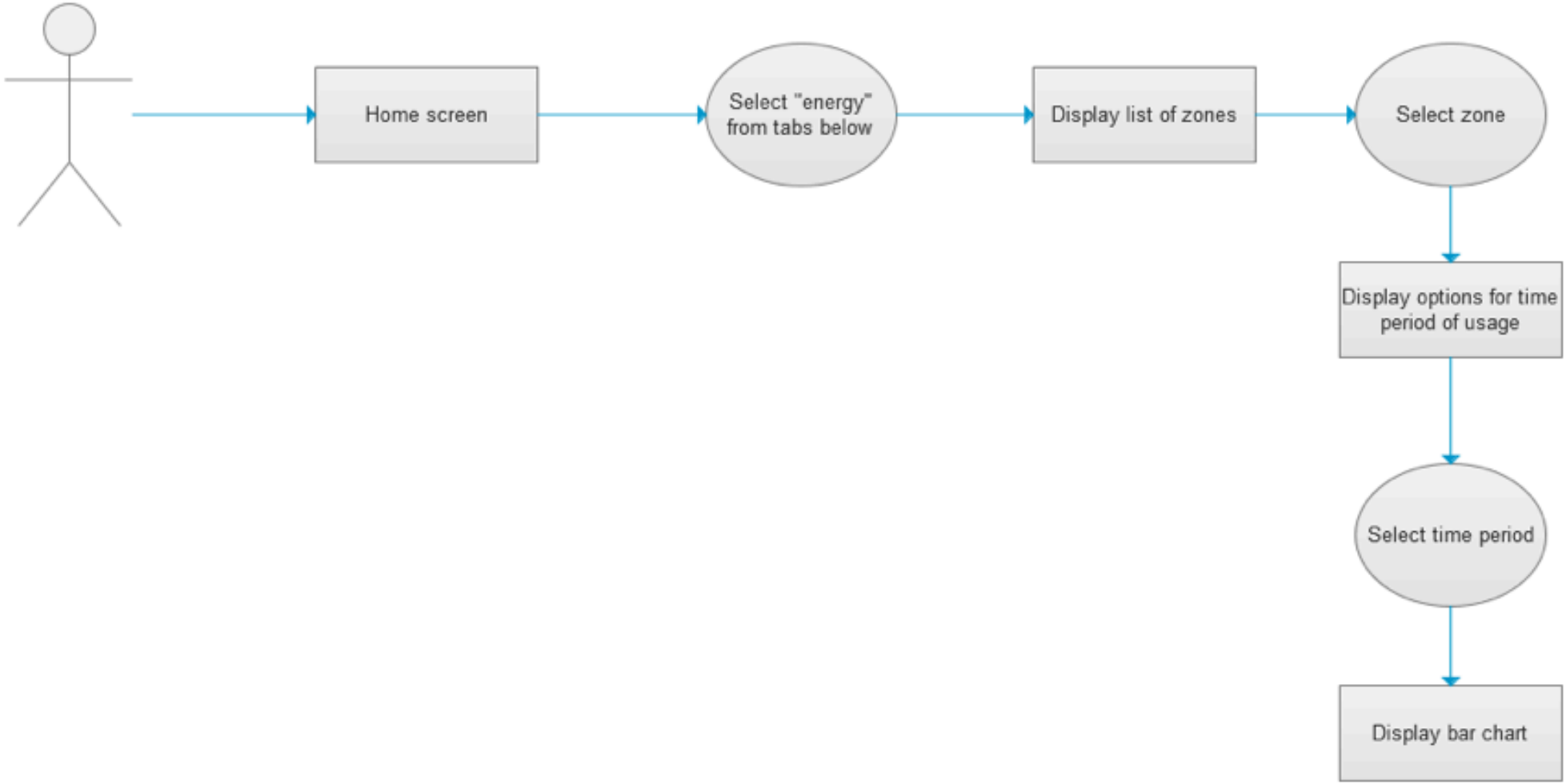
Label displayed to set the end time of the day for the scheduled temperature

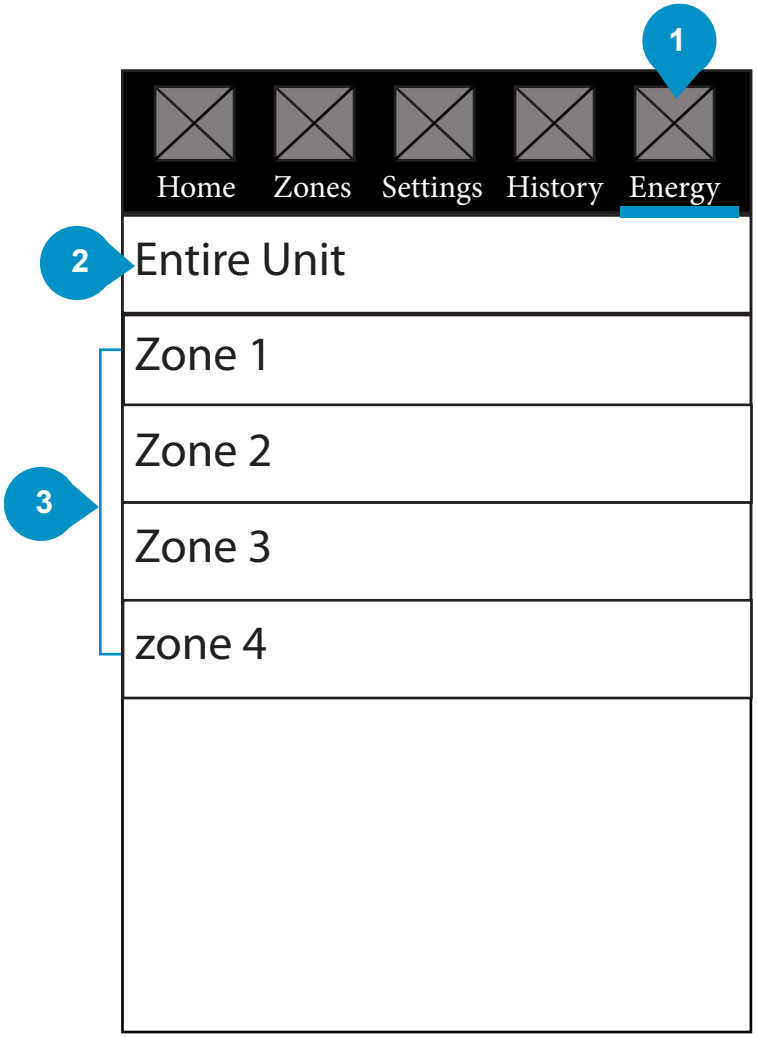
10. Schedule button

Button used to confirm the scheduling changes made to the schedule.

Energy Management

Task Flow

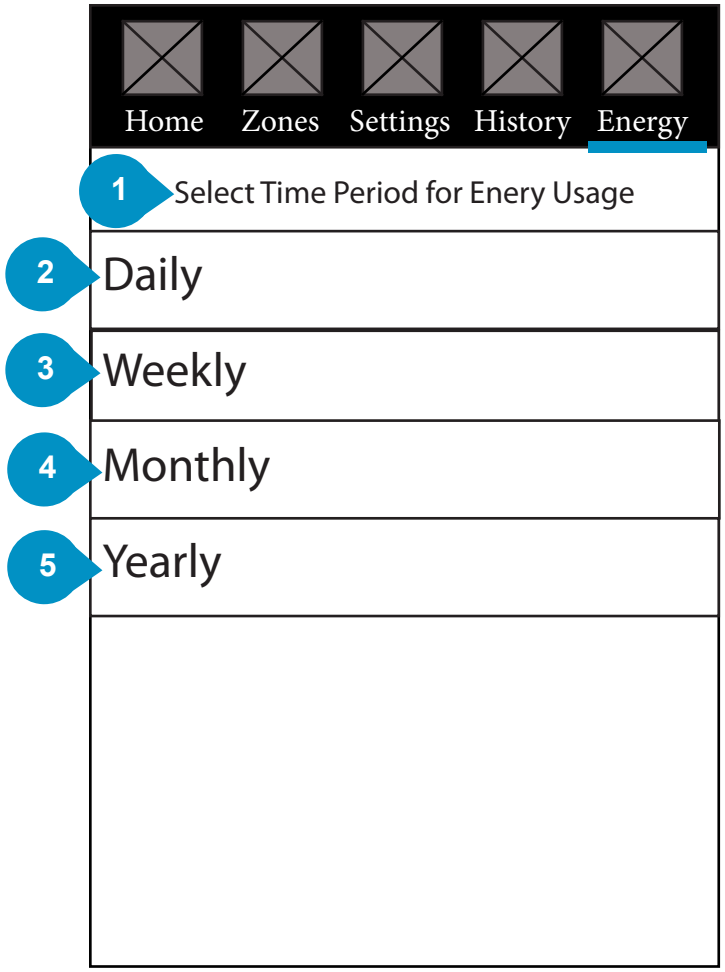

Home screen
Select "energy" from tabs below
Display list of zones
Select zone
Display options for time period of usage
Select time period
Display bar chart



1. Menu option - Energy
Highlights energy tab with underline as the user selects the tab

2. Entire unit
This option displays the energy usage of all the zones in the unit across different time periods

3. Zones
This option displays the zonewise energy usage across different time periods.



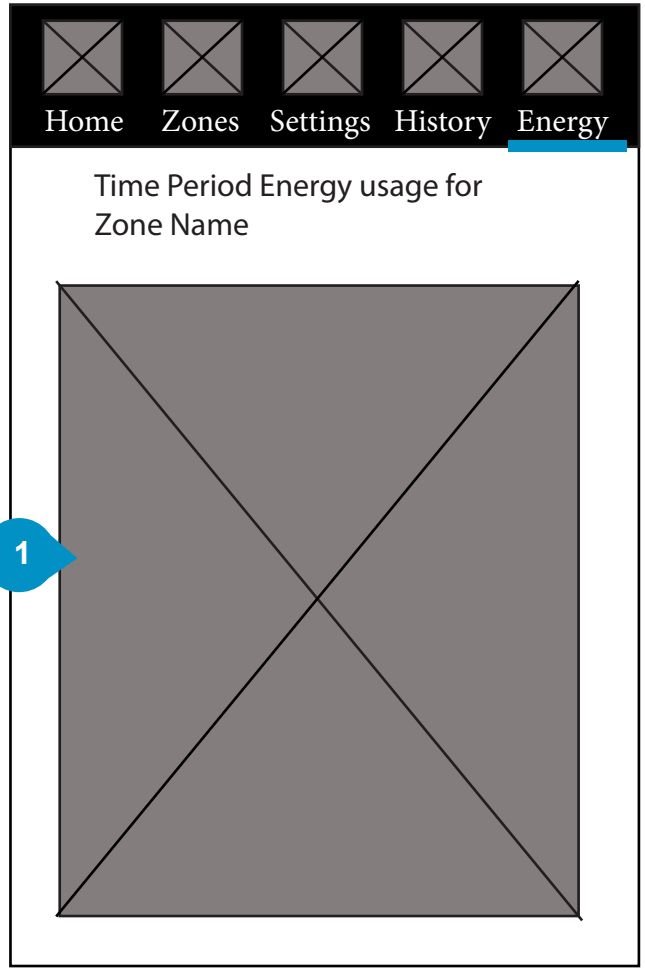
1. Energy usage header
Displays information to select time period to track energy usage

2. Menu option - daily usage
Displays hourly consumption of energy in terms of kilo watts per unit

3. Menu option - weekly usage
Displays consumption of energy in terms of kilo watts per unit by days of week

4. Menu option - Monthly usage
Displays consumption of energy in terms of kilo watts per unit by months of the year

5. Menu option - Yearly usage
Displays consumption of energy in terms of kilo watts per unit by months of the year



1. Bar chart

Bar chart showing the energy usage of the zone/unit in terms of kilo watts per unit.