Prototype III App Requirements for Upwork Project

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Android and iOS App Development for Bluetooth SOC CC2541-Q1

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- App Name: MyGreenHouse

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App Browsing

App Icon (will provide AI or PSD files)

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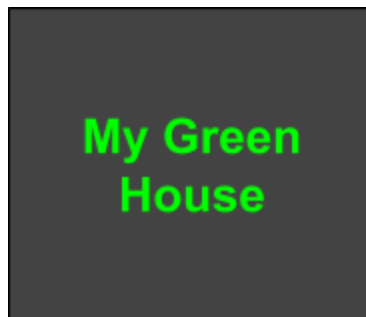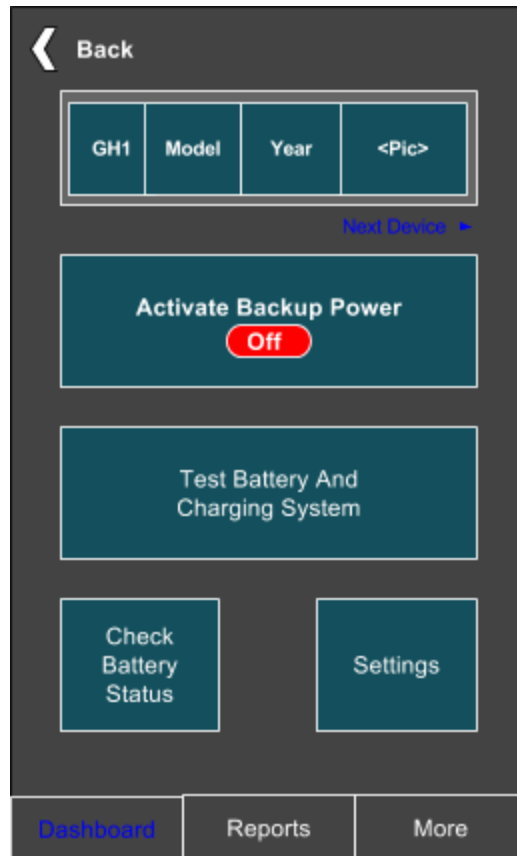
As soon as the app is opened, a description window should open for two seconds and then it should take the user to the Dashboard screen.

Brief App Highlight Screen

Placeholder for next phase of development. In current phase the screen should be developed but will have dummy Graphics and Description.

<Graphics1>

Greenhouse Management

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Dashboard

Dashboard Browsing for Multiple Devices

User should be able to swipe the top portion termed as 'device navigation section' of the app to navigate to the next device if additional device has been added.

Navigating to the next device can also be done by clicking on the Next Device button

For clarity of understanding the top portion ('device navigation section') mentioned above is shown below

When any of the button on the dashboard section is tapped, it should bring up information or send information/command to the relevant device displayed in the 'device navigation section'.

For clarity of understanding the dashboard section mentioned above is shown below.
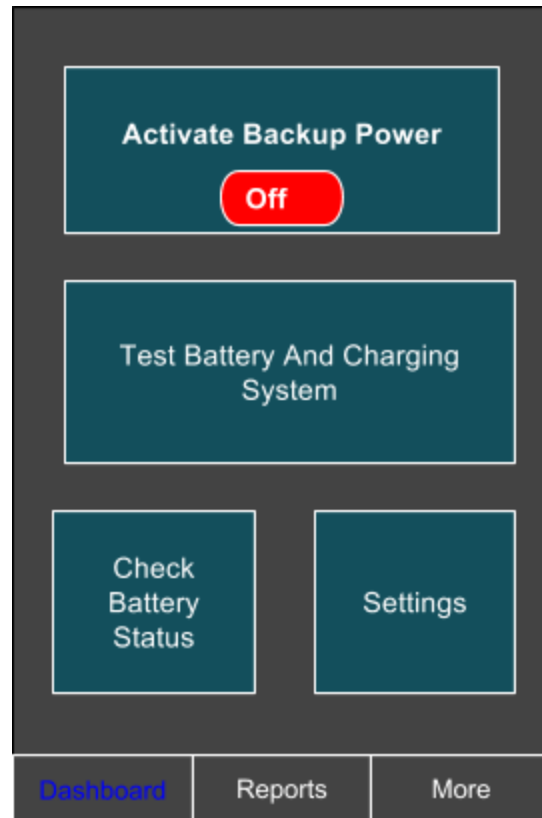
For example, if the device navigation section shows device information as GH1-Model-Year and the 'Activate Backup Power' button is tapped, the backup power of ONLY device GH1-Model-Year should be activated even if multiple devices are paired with the app.

Dashboard Buttons

Activate Backup Power

Upon tap on the 'Activate Backup Power' button, the device should be requested to turn Port P1_1 High for 90 seconds to complete the connection. At the end of 90 seconds since connection, the Port P1_1 should be turned Low for indefinite time. The device should also provide the 'Connection_On' Feedback.
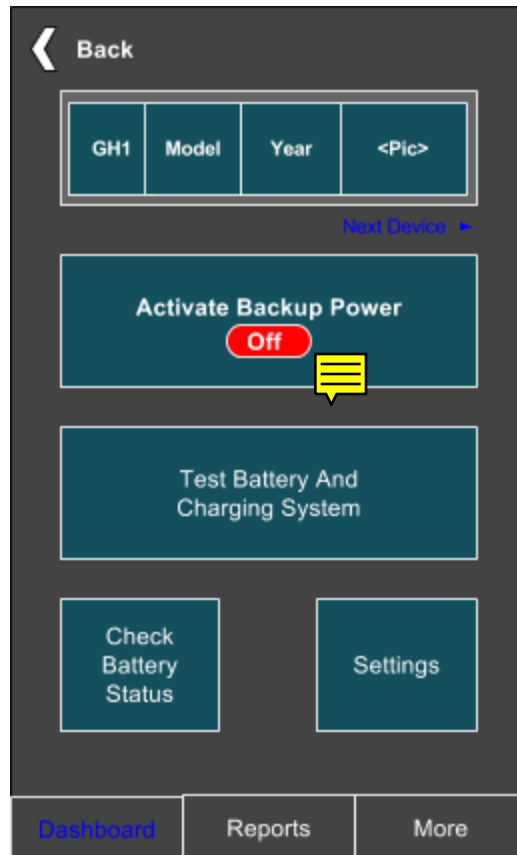
If 'Connection_On' feedback is received as 0 (False) from the paired device about successful backup power connection, change the Activate Backup Power to show 'Off' status and show message.

Backup Power Not Activated
Please Try Again

_____
OK

Upon clicking Ok button the message should disappear. The user is expected to tap on the 'Activate Backup Power' button again.

If 'Connection_On' feedback is received as 1 (True) from the paired device about successful backup power connection, change the Activate Backup Power to show 'On' status and proceed to the Backup Power screen.

| GH1 | Model | Year | <Pic> |

Next Device ▶

Activate Backup Power

On

Test Battery And Charging System

Check
Battery
Status

Settings

| Dashboard | Reports | More |

<Flashing message and voice prompt:"Battery Boost In Progress. Please Wait to Start Heater">
<Wait time is 30 seconds from the beginning of the connection>
<Reverse Countdown of wait time in seconds should be displayed>
<Progressing Green Bar should also be displayed. The bar may progress at an interval of 5 seconds>

Back

| GH1 | Model | Year | \<Pic\> |

Next Device ►

Activate Backup Power

On

Battery Boost In Progress
Please Wait To Start Heater

25

Dashboard | Reports | More

<At the end of wait time message and voice prompt: Please Start Your Heater Now>

<At start of the heater the screen should close or if the user closes the app/goes back to home screen, this screen should not have any issue reopening>
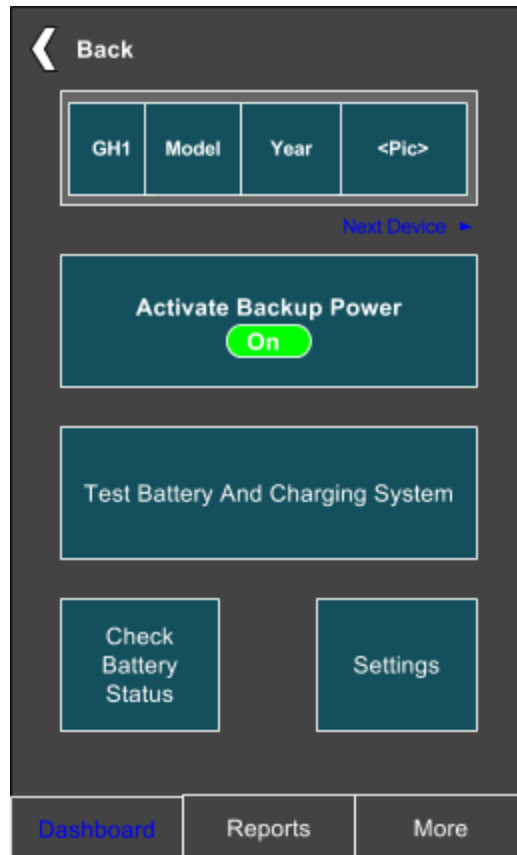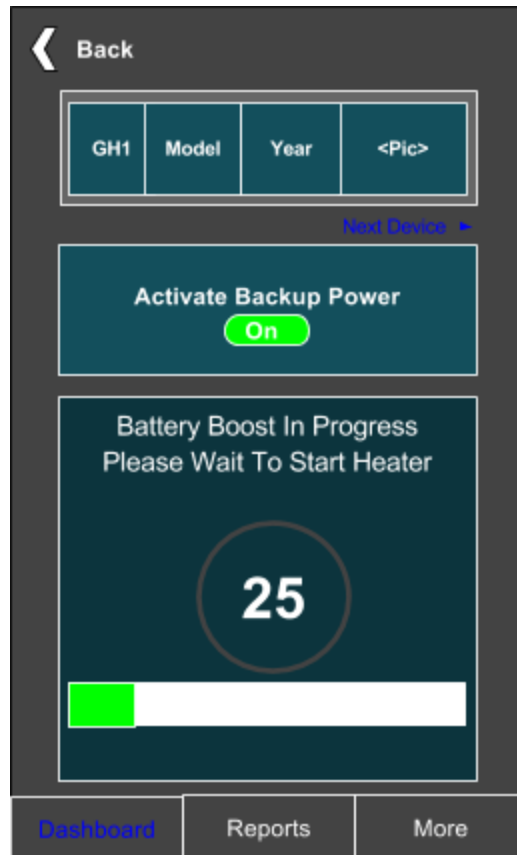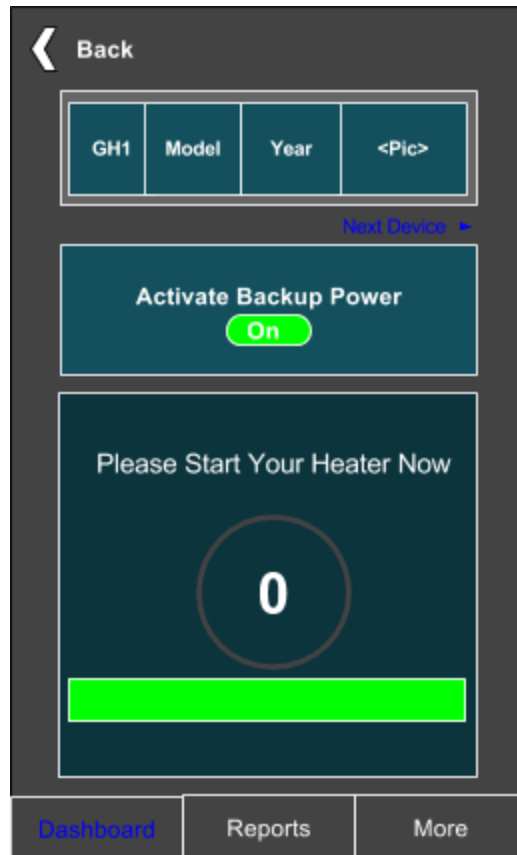
<At any time after the Backup Power Connection has been established and the user navigate away from the screen or closes the screen, DO NOT disconnect the Backup Power immediately. The Backup Power Connection should still end at the end of 90 seconds since connection.>

Exception Scenario 1 - Pairing is Lost

If pairing is lost display the message:

Device Not Paired
Please Follow More>Add Device
And Retry
_____
OK

Upon clicking Ok button the message should disappear. The user is expected to go to the More tab to complete the pairing.

If no feedback is received from the paired device about successful connection or connection failure in 20 seconds, display the message:

Connection Could Not Be Completed
_____
RETRY   EXIT

If warning code W00 is received from device, freezing conditions exists, show warning message:

WARNING:
Freezing Conditions Detected
Unsafe To Proceed
Do You Still Want To Continue?
_____
YES   NO

Clicking on 'Yes' button should make the message window disappear and inform the device to continue with normal 'Activate Backup Power' procedure.

If warning code W01 is received from device, the Pack temperature is above 100 Centigrade. Notify the user: Device Too Hot . Please Retry After 5 Minutes.

WARNING:
Device Too Hot
Please Retry After 5 Minutes
_____
OK

Exception Scenario 5 - Main battery voltage below 10 Volts

If warning code W02 is received from device, Main battery voltage is below 10000 mV,
indicating a very low battery or no battery, the user should be notified before proceeding.

CAUTION:
Battery Not Present Or Below Charging Level
Do You Still Want To Proceed?
_____
YES   NO

Clicking on 'Yes' button should make the message window disappear and continue with normal
'Activate Backup Power' procedure.

Exception Scenario 6 - Pack Temperature Rose above 120 C

Warning code W03 received from device. This means Pack was disconnect immediately as the
temperature of the Pack rose above 120 Centigrade.
Notify the user: "Booster Disconnected. Device Too Hot. Please Retry After 5 Minutes."

WARNING:
Booster Disconnected
Device Too Hot
Please Retry After 5 Minutes

_____
OK

Change the 'Activate Backup Power' button to show 'Off' status.

Exception Scenario 7 - Disconnected due to Charging Voltage

Warning code W04 received from device. This means Main battery voltage is 13300 millivolts or
more.
Notify the user: Charging Voltage Detected. Booster Connection Aborted to Avoid Booster
Damage.

Charging Voltage Detected
Booster Connection Aborted To Avoid Booster Damage
_____
OK

Disconnect Backup Power

<At any time after the Backup Power Connection has been established by the device, if user requests disconnecting the Backup Power by tapping on the 'Activate Backup Power' button, the request should be sent to the device as 'Disconnect Backup Power Interrupt' to disconnect the Backup Power immediately by turning Port P1_1 Low for indefinite time.
Change the 'Activate Backup Power' button to show 'Off' status.
>

Check Battery Status

Show message:

Please Turn Off All Accessories
Then Proceed
_____
OK

Upon user clicking on Ok message should disappear and send the 'Charge Battery Status'.
Receive following values sent by the device:

Battery State of Charge: High/Medium/Low

<If Main Battery Voltage above 12400 millivolts then High.
If Main Battery Voltage between 12200 and 12400 millivolts then Medium.
If Main Battery Voltage below 12200 millivolts then Low
>

Battery State of Health: Good/Weak/Bad (based on last known state of health)

Current Battery Voltage: 12.6 Volts (In App convert the value from millivolts to volts to display to the user.)

Main Volt

Test Battery and Charging System
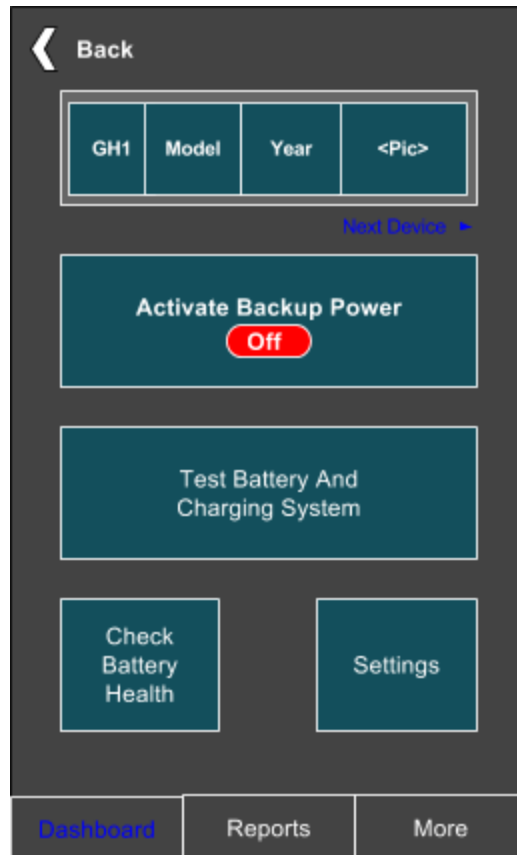
After 'Test Battery and Charging System' button is tapped, the device should go into load test mode (Test Battery and Charging System Interrupt) and provide Load_Test_Mode feedback to the app that the device is in load test mode.

As soon as the app gets the feedback following message should be displayed else show 'Retry' message.

Start and Run Heater for At Least 2 Minutes
Then Tap OK

_____
OK

After the user clicks on the Ok show following clickable message:

Get Test Results

After user clicks on the 'Get Test Results', send request to the device to come out of the Load_Test_Mode and send the test results to the App.

Interpret the test results as follows:

<mark>Battery State of Health: Good/Weak/Bad</mark>

Regardless of CCA if Load_Volt <= 9000 then Battery State of Health is BAD

Load_Volt (Millivolts)	CCA	Battery State of Health
9200 or above	<=200	GOOD
9400 or above	200< CCA <=400	GOOD
9800 or above	400< CCA <=600	GOOD
10400 or above	600< CCA <=800	GOOD
10900 or above	800< CCA <=1000	GOOD
9000 <Load_Volt<9200	<=200	WEAK
9000 <Load_Volt<9400	200< CCA <=400	WEAK
9000 <Load_Volt<9800	400< CCA <=600	WEAK
9000 <Load_Volt<10400	600< CCA <=800	WEAK
9000 <Load_Volt<10900	800< CCA <=1000	WEAK

<mark>Temperature Compensation?</mark>

Charging System Health:

Load_Volt, Load_Time, Charge_Volt, Charge_Time and Temp

Normal (13800 mV to 15000 mV)
Overcharging (More than 15000 mV)
Undercharging (Less than 13800 mV)

```
Back        Battery And Charging
                System Health

  ┌──────┬───────┬──────┬────────┐
  │ GH1  │ Model │ Year │ <Pic>  │
  └──────┴───────┴──────┴────────┘
                        Next Device ►

  ┌────────────────────────────────┐
  │ Battery State Of Health         │
  │ GOOD                            │
  │ Test Time: 10 Dec 2016 8:30 AM  │
  └────────────────────────────────┘

  ┌────────────────────────────────┐
  │ Battery Load Voltage            │
  │ 10.1 VOLTS                      │
  │ Test Time: 10 Dec 2016 8:30 AM  │
  └────────────────────────────────┘

  ┌────────────────────────────────┐
  │ Charging System Health          │
  │ OVERCHARGING                    │
  │ Test Time: 10 Dec 2016 8:30 AM  │
  └────────────────────────────────┘

  ┌────────────────────────────────┐
  │ Charging Voltage                │
  │ 16 VOLTS                        │
  │ Test Time: 10 Dec 2016 8:30 AM  │
  └────────────────────────────────┘

  Dashboard    Reports      More
```

****
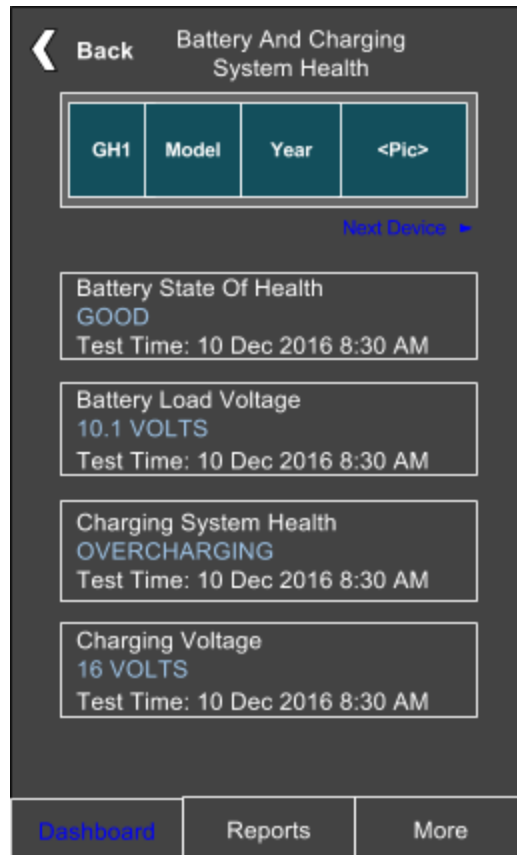
Settings

<Settings are by device>

Battery CCA: <User selectable value from 100 to 1200 in increments of 5. By default CCA should be 550>

Notify Me When
- Battery Health Weak Or Bad
- Low Booster Level - Phase II
- Main Battery level below safe cranking for more than 2 minutes - Phase II
- Booster Malfunction - Phase II (Nice to have)
- Parasitic Draw on Main Battery - Phase II (Nice to have)
- Alternator Overcharging - Phase II (Nice to have)
- Alternator Undercharging - Phase II (Nice to have)

Notification is by Device. Include Device Name in the Notification.

Device Time
HH:MM:SS AM/PM
<Sync Up Now> button
Upon tap of 'Sync Up Now' button, update the device time from the App time.

Units:
METRIC/IMPERIAL
(Default should be IMPERIAL)

If IMPERIAL is selected, all the temperature display on App should be in Celsius (°C) wherever used.
If METRIC is selected, all the temperature display on App should be in Fahrenheit (°F) wherever used.
Celsius to Fahrenheit conversion:
°F = (°C*9/5)+32

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Reports (tab at the bottom)

Other than 'Data Log' button other buttons are placeholders for next phase of development.

****
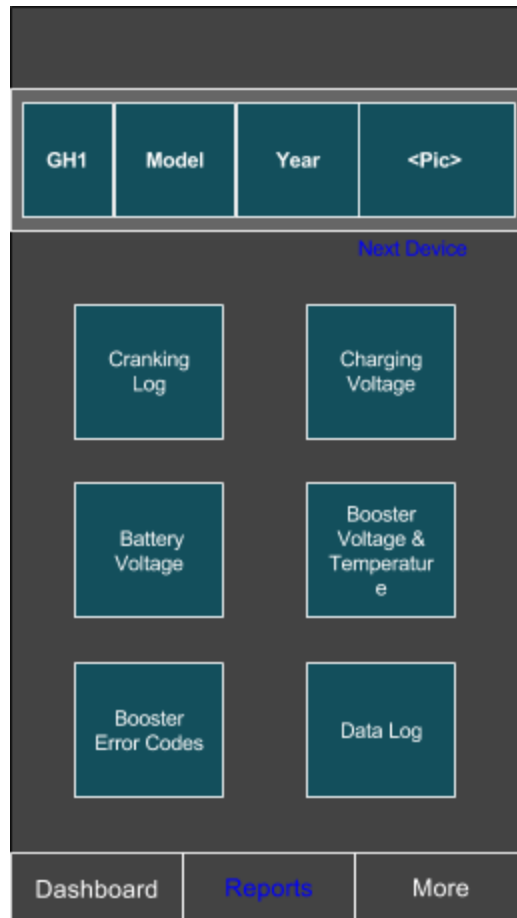
Cranking Log

Add in II phase of development.

****

Charging Voltage

Add in II phase of development.

****

Battery Voltage

Add in II phase of development.

****

Booster Voltage & Temperature

Add in II phase of development.

****

Booster Error Codes

Add in II phase of development.

****

Data Log

ADC values from 'Data Log' will be removed from the next phase of development.

GH1	Model	Year	<Pic>

Next Device

Data Logging
Start

Retrieve Data

Erase Device Data

Erase App Data

Data Log Interval	4	ms

Dashboard	Reports	More

Data log should include the following:
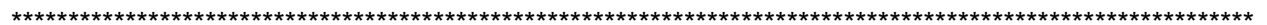
Time (Current_Timestamp),
Port #,
Port State (High/Low),
ADC Value (at Port),
Voltage (in Volts with upto 3 decimal positions. Convert from value obtained from Device),
Device Temperature (Temp0 - CC2541 Temperature Reading),
Booster Temperature (Temp1 - Reading from external temperature sensor)

```
┌─────────────────────────────────────┐
│ ❮ Back        Data Logging          │
├──────┬────────┬────────┬────────────┤
│      │        │        │            │
│ GH1  │ Model  │  Year  │   <Pic>    │
│      │        │        │            │
├──────┴────────┴────────┴────────────┤
│                        Next Device  │
│                                     │
│   Time: ,                           │
│   Port #: ,                         │
│   Port_State: ,                     │
│   ADC Value: ,                      │
│   Voltage: ,                        │
│   Device Temperature: ,             │
│   Booster Temperature: ,            │
│                                     │
│                                     │
│                                     │
├───────────┬──────────┬──────────────┤
│ Dashboard │ Reports  │    More      │
└───────────┴──────────┴──────────────┘
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More (tab at the bottom)

Placeholder for next phase of development.

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Add Device

This screen should show all devices which are advertising or paired.

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Devices

Initially when no device is paired, the screen may not show any paired device in the device list.
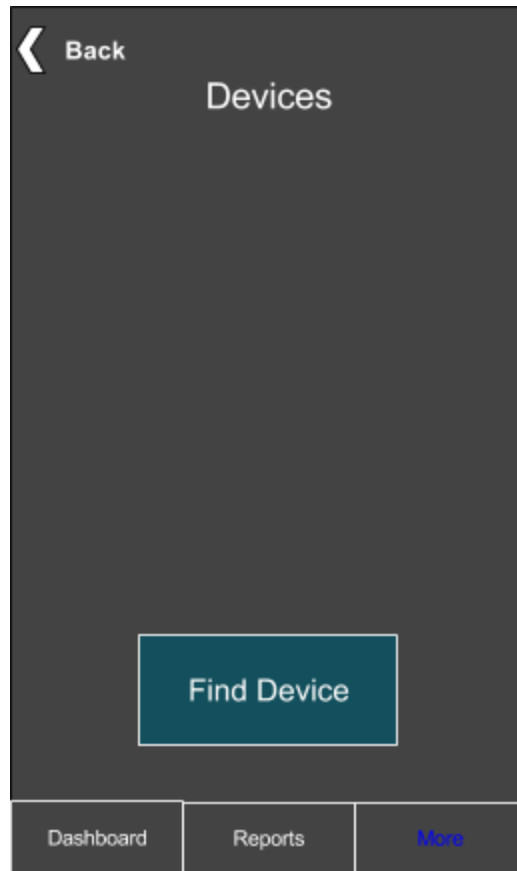
Find Device
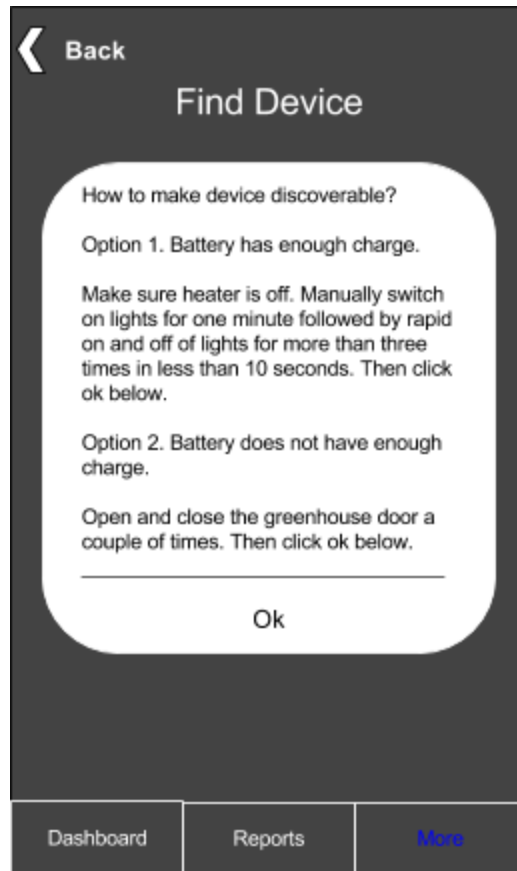
In next phase of development the Find Device instructions will also have video animation.

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Possible Scenarios

No Device Found

If no device is found in advertising mode, the message should be displayed

No Device Found. Please Make Sure the Device is Advertising.
Refer to User Manual for More Information.

_____
OK

Clicking on OK button should make the message window disappear.

If the advertising devices have already been paired and no new device is found in advertising mode, the message should be displayed

Message in case only one device in advertising mode, which is already paired is found.

<div align="center">

This Device is Already Paired
No New Device Found
_____
OK

</div>

Message in case more than one device in advertising mode, which are already paired are found.

<div align="center">

These Devices are Already Paired
No New Device Found
_____
OK

</div>

Clicking on OK button should make the message window disappear.

If a device is found in advertising mode and user selects the device to pair and if the device is already paired, the message should be displayed

<div align="center">

This Device is Already Paired
_____
OK

</div>

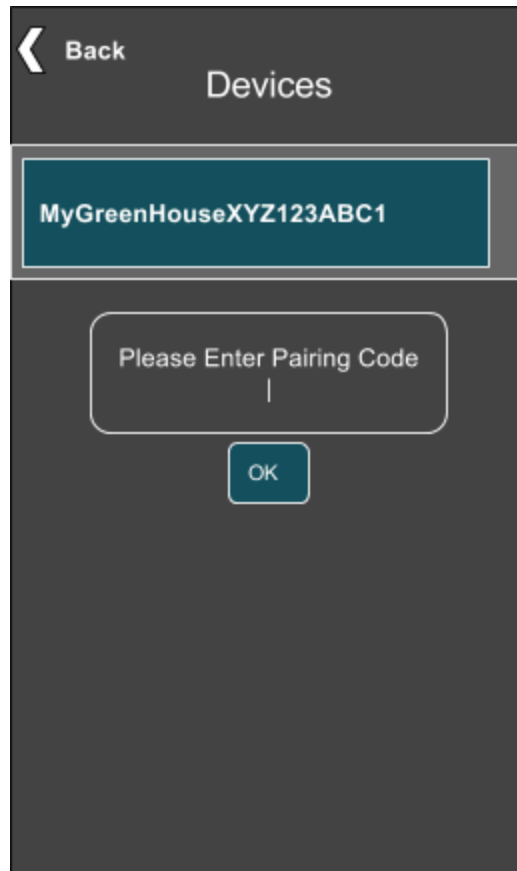Clicking on OK button should make the message window disappear.

If a device is found or more than one devices are found in advertising mode and user selects a device to pair and if the device is not already paired, the user should be prompted to enter the pairing code: 123456

Devices

MyGreenHouseXYZ123ABC1

If pairing cannot be completed, the user should get the message:

Pairing Could Not Be Completed

_____

RETRY   EXIT

Upon clicking on 'Retry', the message should disappear and pairing effort should be retried. If pairing cannot be completed, the user should get the above message again.

Upon clicking on 'Exit', the pairing effort should be aborted and message should disappear.

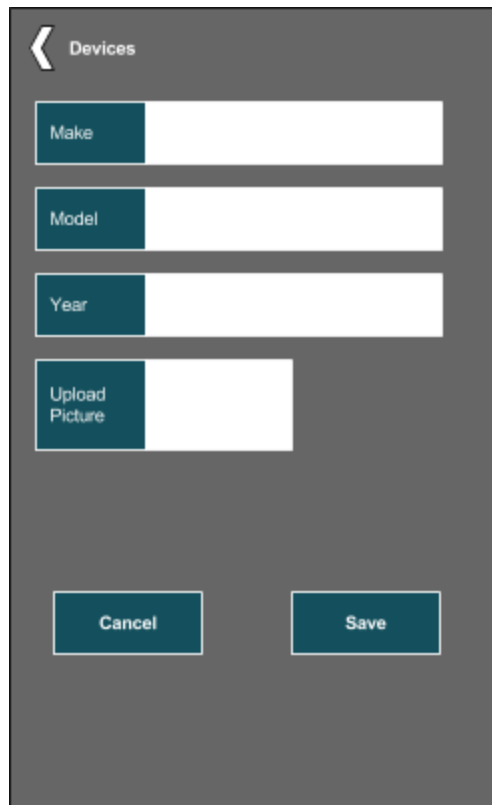After the pairing code verification and pairing completion, update Device time from the App time then the user should be asked to enter the following information:

Make: Mandatory information. Free text entry. 20 Character limit. (In the next phase of development this should be a list of values. The list will be periodically updated from an online server location. The lis will always have 'Other' as an option.)

Model: Mandatory information. Free text entry. 20 Character limit. (In the next phase of development this should be a list of values. The list will be periodically updated from an online server location. The lis will always have 'Other' as an option.)

Year: Mandatory information. Free text entry. 4 Character limit. (In the next phase of development this should be a list of values starting from 1950. The user should not be able to select a year more than one year from current year. For example if current year is 2017, the user should not be able to enter 2019 or any year after that. The user can still select year 2018 in this case.)

Picture: This is an optional field. The user should be able to upload a picture from a photos folder from smartphone.

<Question unrelated to app design: How to make sure that the user has paired with the right device?>

After a new device has been added the new device should be available in the list of devices in the 'Devices' screen.

The new device should be available in the 'Devices' screen.

Remove Device

Should be able to remove a device. Need suggestions on how to do this on the UI.

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Order Device

Add the Order Device screens in phase II development.

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See Demo

Demo Mode to See App Capabilities.
Add the Demo screens in phase II development.

****

User Manual

Add the User Manual in phase II development.

****

Contact Us

Add the Contact Us in phase II development.

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Suggest Improvements

Add the Suggest Improvements in phase II development.

****

Message when not connected to any device:

Not Connected To Device
Please Ensure Pairing With Device Is Complete
See Settings>Bluetooth For Pairing

_____

OK

Clicking on OK button should make the message window disappear.

****

App Update

App update procedure will be added in the next phase of development. This should be taken into account in the current phase of development.

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Misc

Charts and Graphs - phase II development.
Erasing saved data from App - phase II development.

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<div align="center">End of Requirement Document</div>
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