

BPSim




BLOOD PRESSURE SIMULATOR



BPSim™

BPSIM USER GUIDE


KbPort™

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Pittsburgh, PA 15223
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support@kbport.com

THANK YOU FOR CHOOSING BPSIM™

BPSim™ is a high-fidelity manual blood pressure cuff simulator, providing a means for medical learners and healthcare professionals to achieve full competency in detecting and measuring blood pressure. This realistic sphygmomanometer can be used in conjunction with standardized patients and manikin simulators while still offering a highly-customizable and individualized experience. BPSim™ can be managed from both Android and iOS devices, and can be programmed for a wide range of blood pressure characteristics: hypo-tension, normal, pre-hypertension, hypertension (stages 1 & 2), and hypertensive crisis.

TECHNICAL FEATURES

- Works with Any Standard Stethoscope
- Realistic Analog Sphygmomanometer
- Programmable Systolic and Diastolic (mmHg) Settings
- Realistic Korotkoff Sounds
- Programmable Heart Rate
- Multiple Cuff Units Can Be Controlled by an Android or iOS Device
- Rechargeable Battery for 9 Hours of Usage



BENEFITS OF OWNERSHIP

- Teaches proper stethoscope placement
- Teaches proper stethoscope pressure
- Teaches precise pressure release
- Trains user in auscultatory focus and accuracy
- Standard KbPort™ parts warranty

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Regulatory Information

Federal Communication Commission Interference Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

SAR Information:

This wireless mobile and/or portable device has been shown to be compliant for localized specific absorption rate (SAR) for uncontrolled environment/general exposure limits specified in ANSI/IEEE Std. C95.1-1999 and has been tested in accordance with the measurement procedures specified in IEE 1528-203, OET Bulletin 65 Supp. C, RSS-102 and Safety Code 6

KbPort™

BPsim

This Class A Digital Apparatus Complies with Canadian ICES-003
Cet Appareil Numérique de la Class A est à la norme NMB-003 du Canada ICES-003

KbPort™

BPsim

This Class A Digital Apparatus Complies with Australian and New Zealand
Standard AS/NZS CISPR 11:2011

BPSIM™ SETUP

Thank you for choosing BPSim™. Before using your BPSim™ sphygmomanometer simulator for the first time, please install the KbPort™ BPSim™ application from the application store specific to your Android or iOS device. If you experience any difficulties during the setup or operation of your cuff, please contact us at support@kbport.com or 412/487.4663.



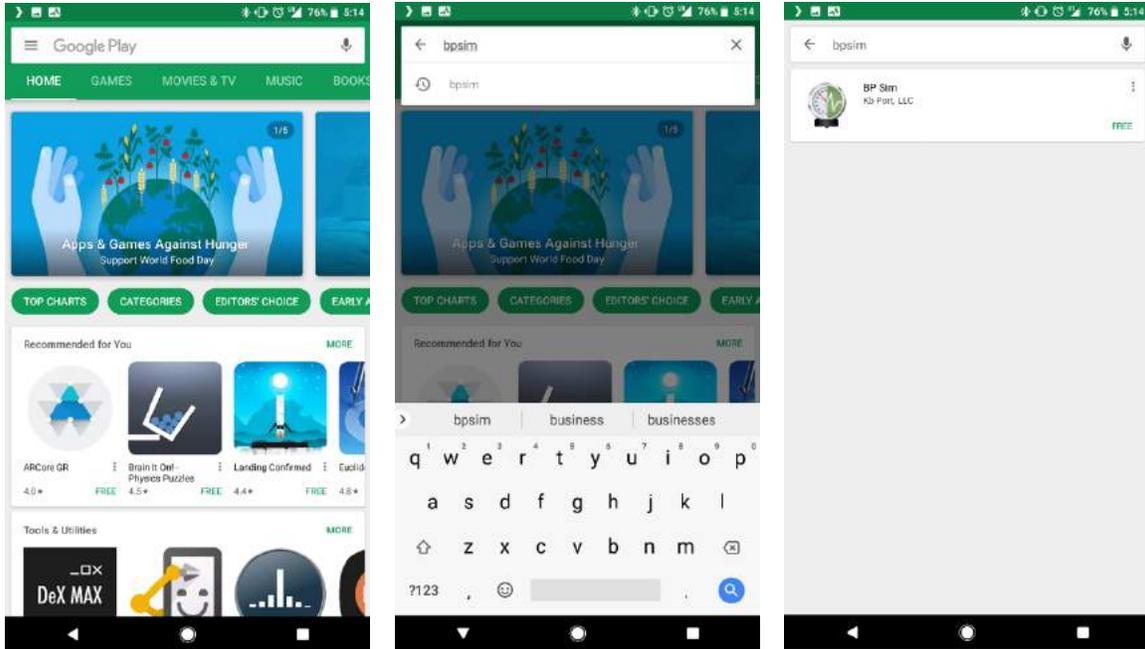
IMPORTANT: The BPSim™ application is supported on Android version 5.0 (Lollipop) and above, and iOS version 9.0 and above.

INSTALLATION – ANDROID

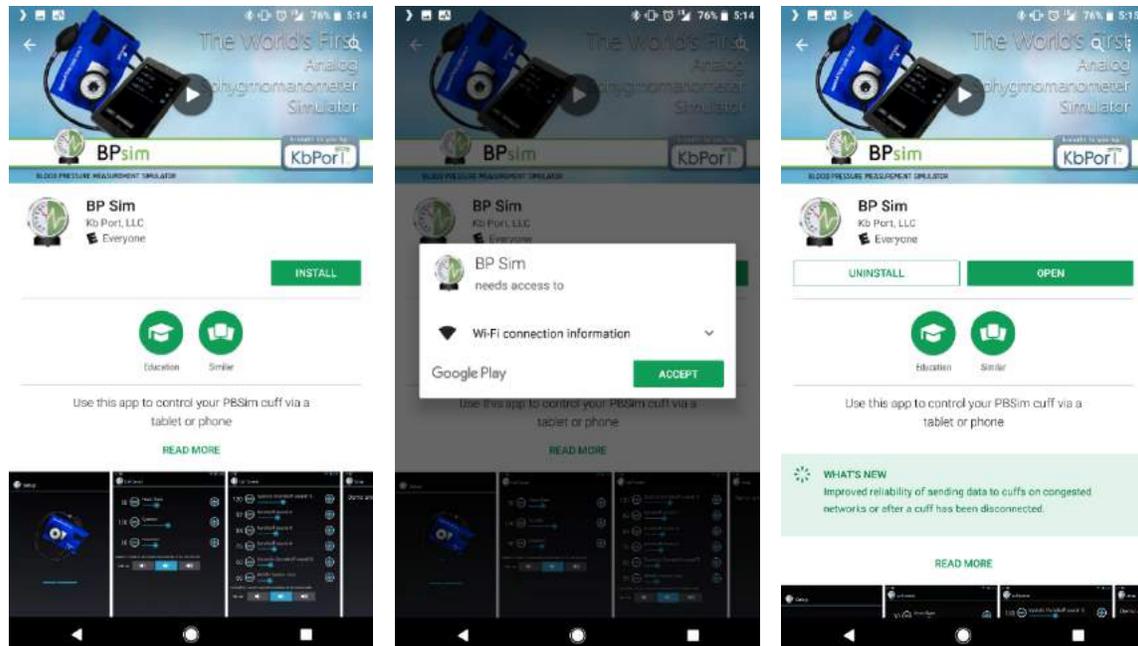
1. Locate the Google Play Store icon on your device. If not available on one of your home screens or the dock at the bottom of your screen, look for it in your list of installed applications.



2. Use the search bar at the top of the Google Play Store screen to search for “BP Sim” and look for the BPSim™ application (authored by “Kb Port, LLC”).

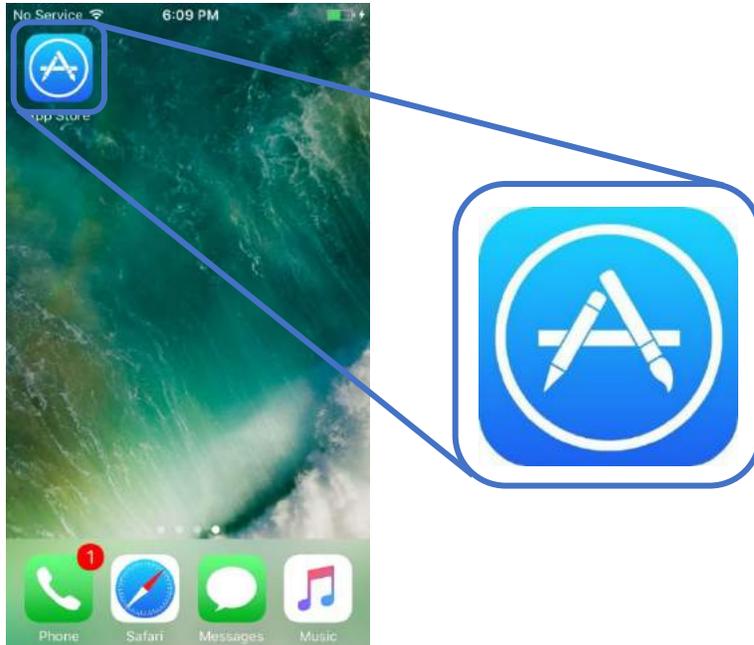


3. Tap on the application, then touch the [INSTALL] button to begin the download and installation process. Tap [ACCEPT] to acknowledge any required permissions.

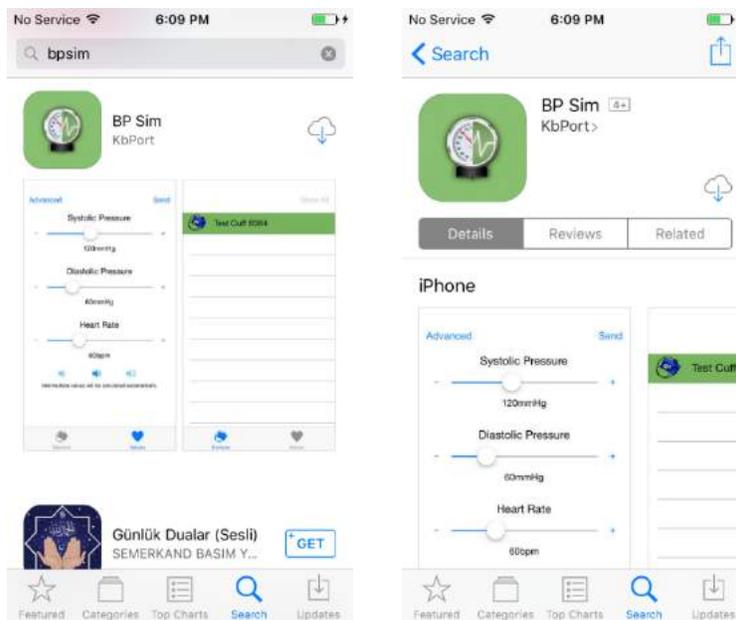


INSTALLATION – IOS

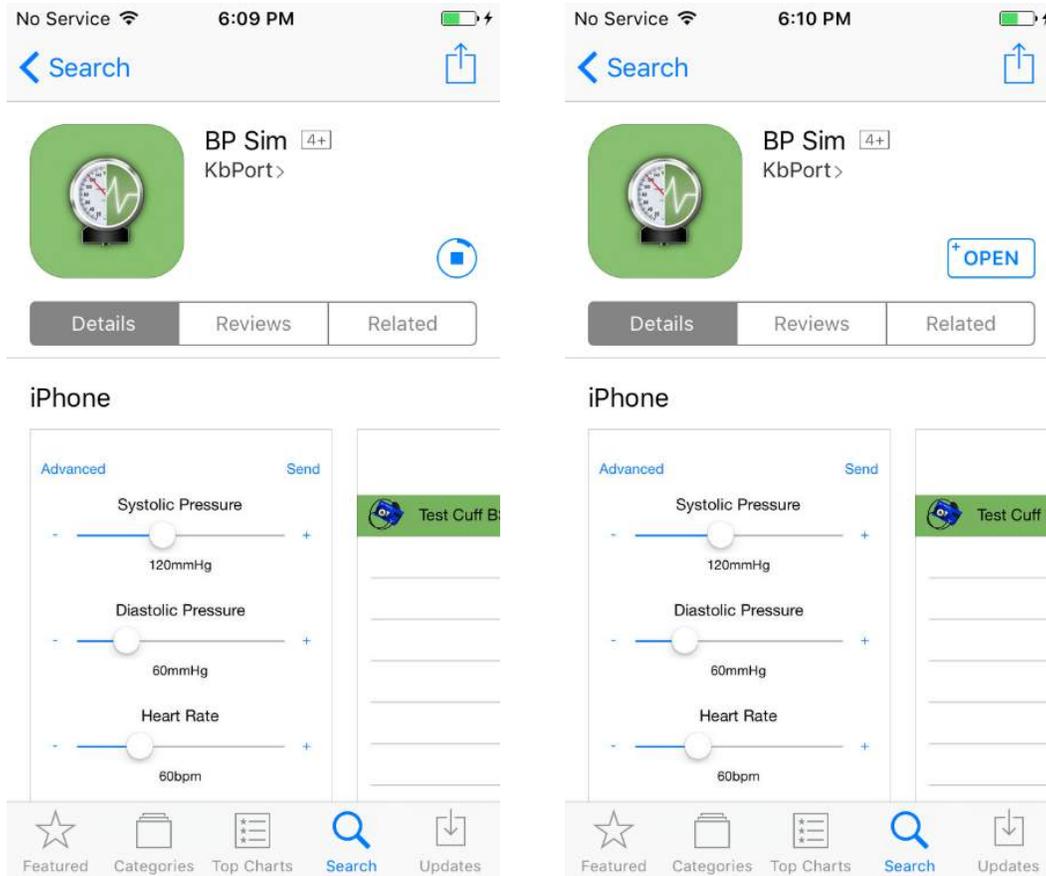
1. Locate the App Store icon on the home screen of your device.



2. Use the search bar at the top of the App Store screen to search for “BP Sim” and look for the BPSim™ application (authored by “Kb Port, LLC”).



3. Tap on the application, then touch the [GET] or cloud-shaped download button to begin the installation process. Accept any required permissions.



BPSIM™ DEVICE SETUP & CONFIGURATION

Now that you have installed the BPSim™ application onto your smartphone or tablet, you will need to configure your BPSim™ blood pressure cuff for the first time. The BPSim™ device can work in two distinct modes: “Access Point Network” mode (where a single cuff can be connected to and controlled by your iOS and Android device directly), and “Infrastructure Network” mode (where any number of cuffs can be controlled by connecting to a local Wi-Fi signal).



IMPORTANT: The battery pack needs to be charged for at least 8 hours before first use.



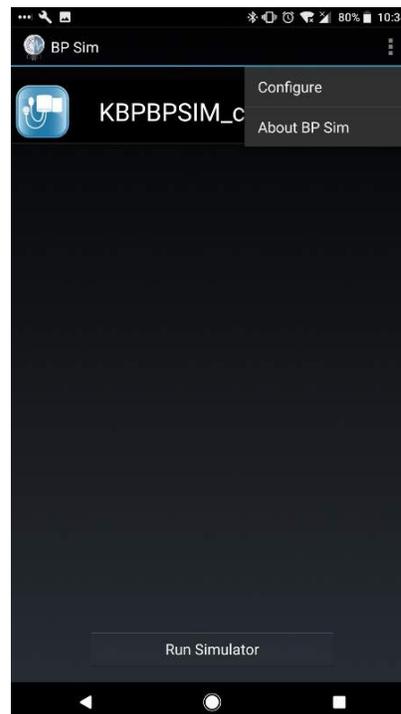
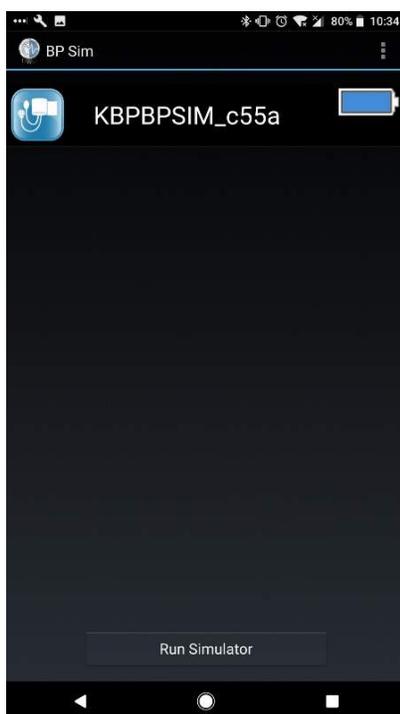
IMPORTANT: The charging cable must be removed from each BPSim™ cuff before use. Your BPSim™ devices will automatically power on once the charging cable has been disconnected.



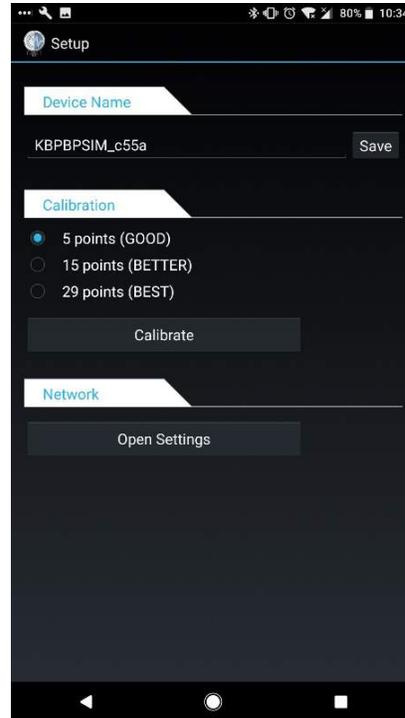
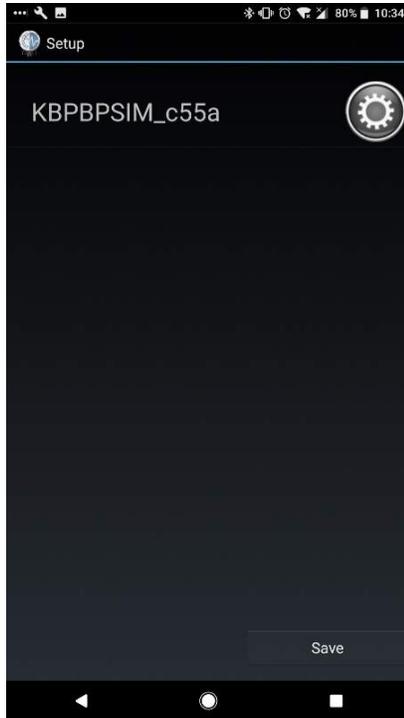
Note: If using an Android or iOS device capable of mobile data access, we recommend disabling this feature while using it with your BPSim™ cuff during initial setup and in Access Point mode.

First-Time Use – Android

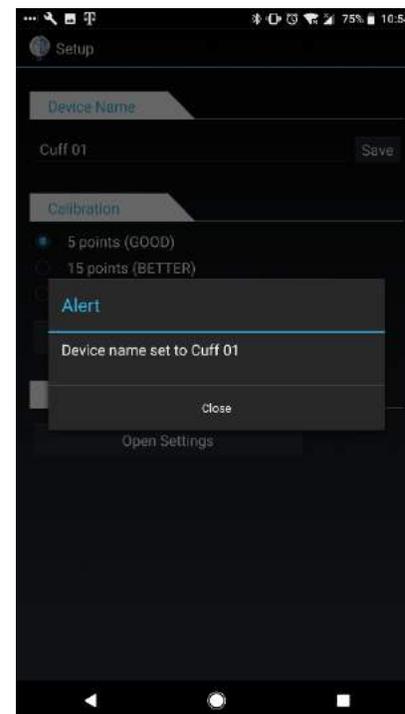
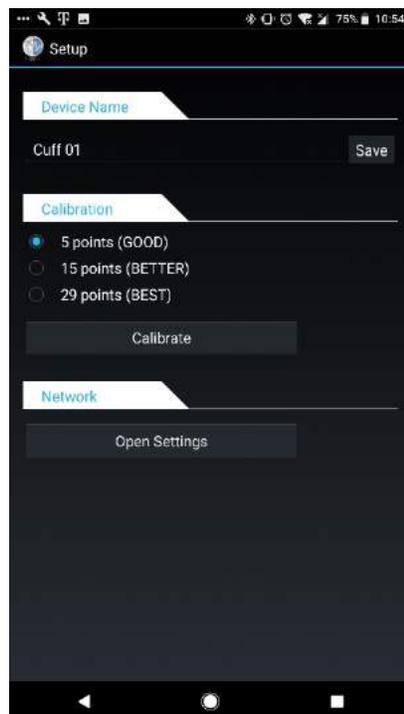
1. Remove the charging cable from the BPSim™ device to power it on.
2. Open your Wi-Fi settings on your Android device and search for available access points.
3. Identify and connect to the Wi-Fi SSID “KBPBPSIM_####”, where the # symbols represent a unique series of numbers and letters.
4. Once connected, open the BPSim™ app and touch the menu button located in the upper right-hand corner of the screen, then touch [Configure].



- There should be a single device listed in the application – click on the gear symbol located to the right of the BPSim™ cuff's current name to open the configuration menu.



- Enter a new name for the BPSim™ device, then tap [Save]. Enter the password for your BPSim™ device if prompted.





Note: BPSim™ devices can accept names and passwords up to 30 characters in length.



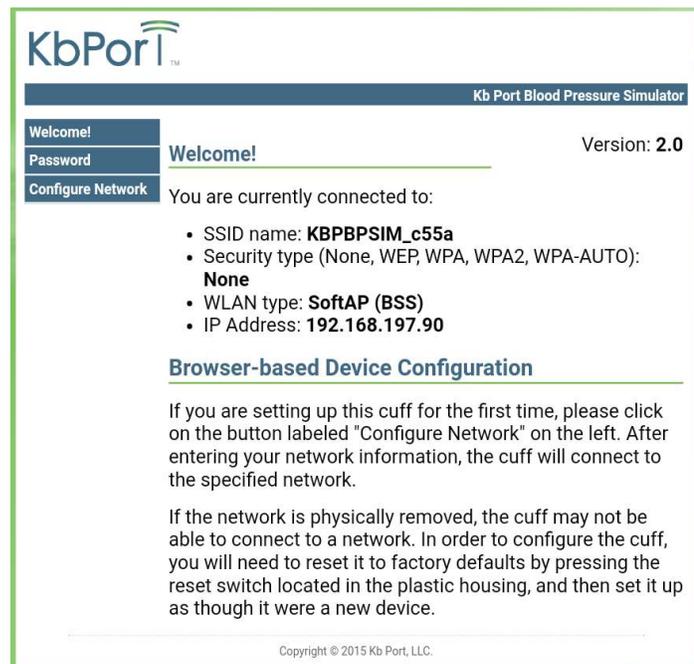
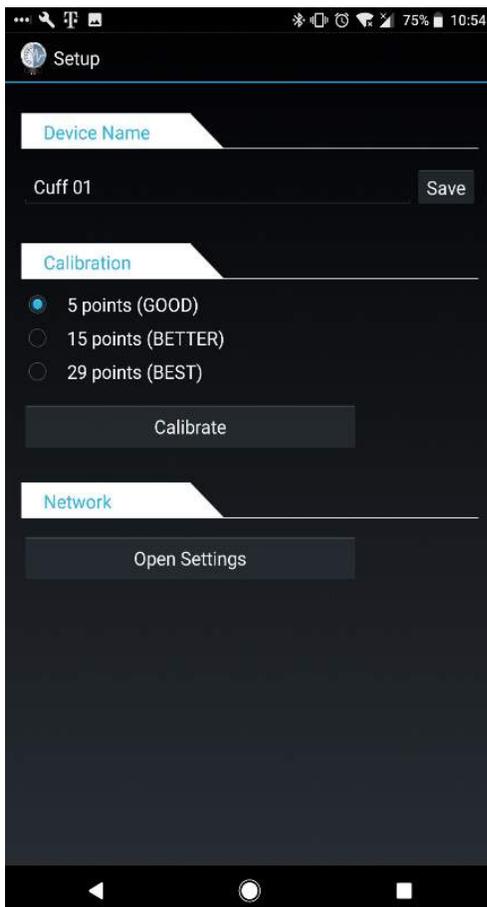
IMPORTANT: The default credentials for your BPSim™ cuff are:

Username: admin

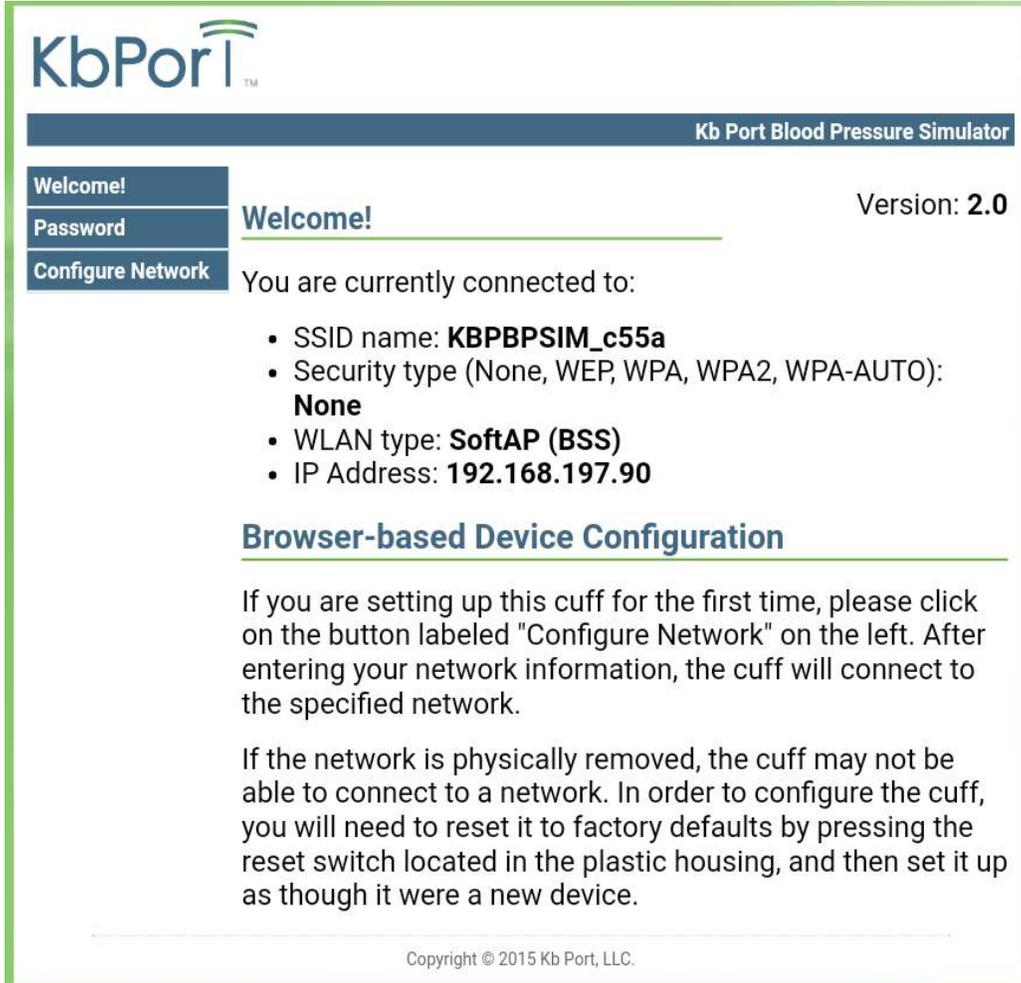
Password: kbsimulation

Hardware resetting your BPSim™ cuff (as described on page 57) will restore these values.

- At the bottom of the screen, tap [Open Settings]. This will open a web page in your default browser. If prompted, type in the username and password for the BPSim™ device. The web page should display information such as the device's IP Address, the SSID of the current network, etc.



- Click [Password] on the left-hand side of the web page. Type in the current password, followed by a new password, then the new password again. When ready, tap [Save] below.



KbPort™

Kb Port Blood Pressure Simulator

Welcome! Version: **2.0**

Password

Welcome!

Configure Network You are currently connected to:

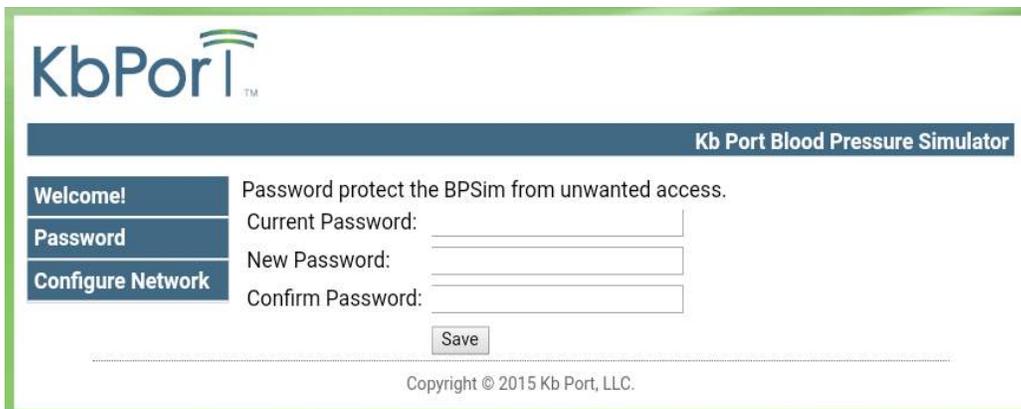
- SSID name: **KBPBPSIM_c55a**
- Security type (None, WEP, WPA, WPA2, WPA-AUTO): **None**
- WLAN type: **SoftAP (BSS)**
- IP Address: **192.168.197.90**

Browser-based Device Configuration

If you are setting up this cuff for the first time, please click on the button labeled "Configure Network" on the left. After entering your network information, the cuff will connect to the specified network.

If the network is physically removed, the cuff may not be able to connect to a network. In order to configure the cuff, you will need to reset it to factory defaults by pressing the reset switch located in the plastic housing, and then set it up as though it were a new device.

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KbPort™

Kb Port Blood Pressure Simulator

Welcome! Password protect the BPSim from unwanted access.

Password Current Password:

New Password:

Configure Network Confirm Password:

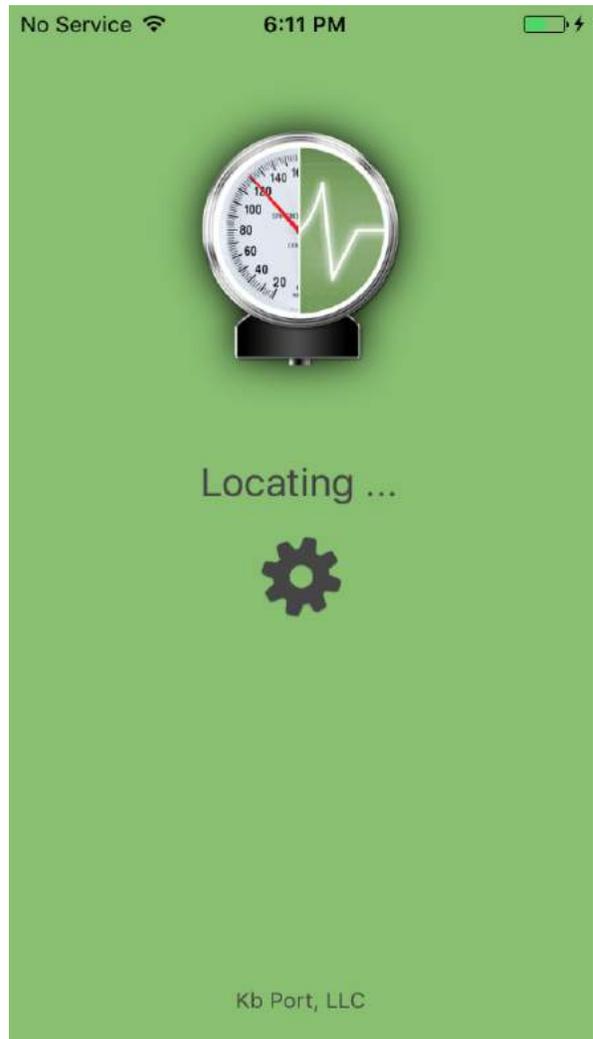
Copyright © 2015 Kb Port, LLC.

First-Time Use – iOS

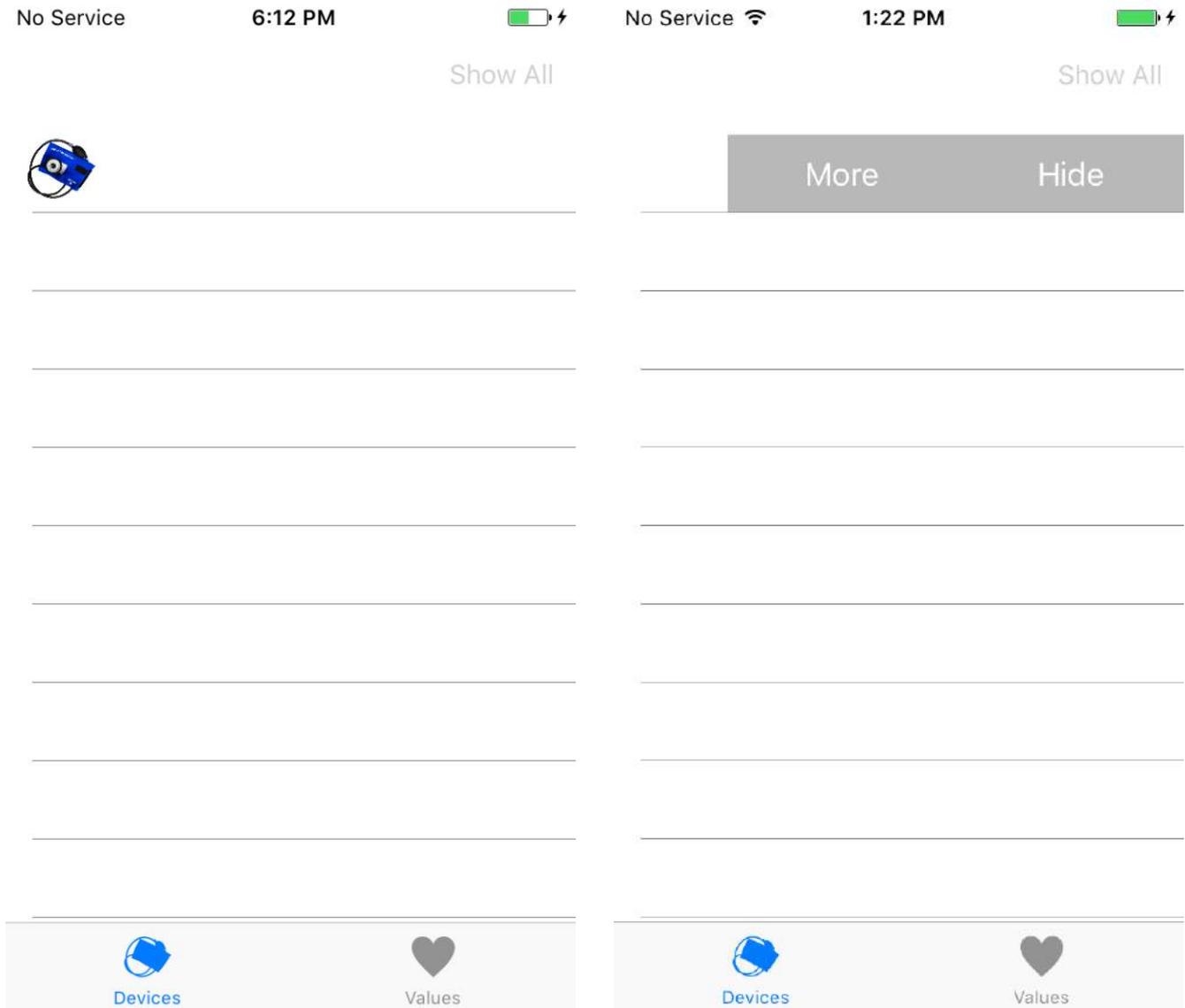


Note: In the iOS version of the BPSim™ app, new BPSim™ devices have no name by default.

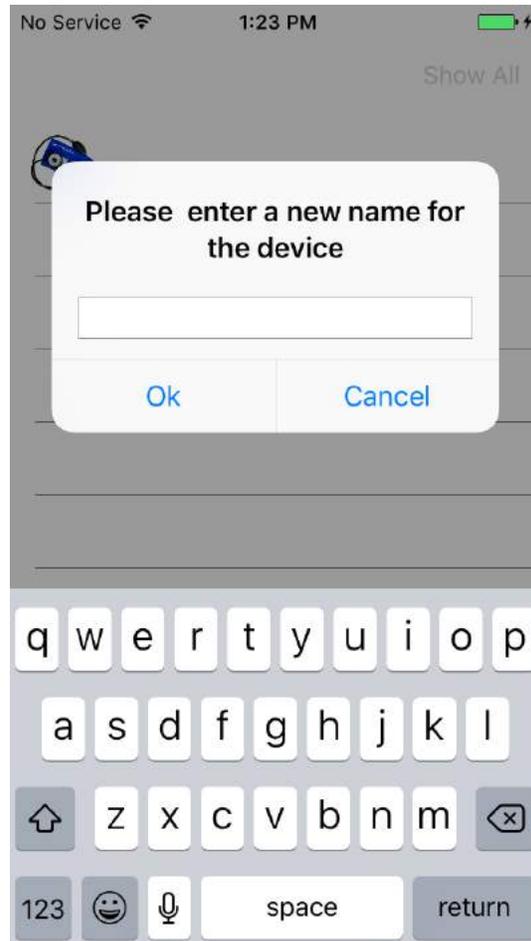
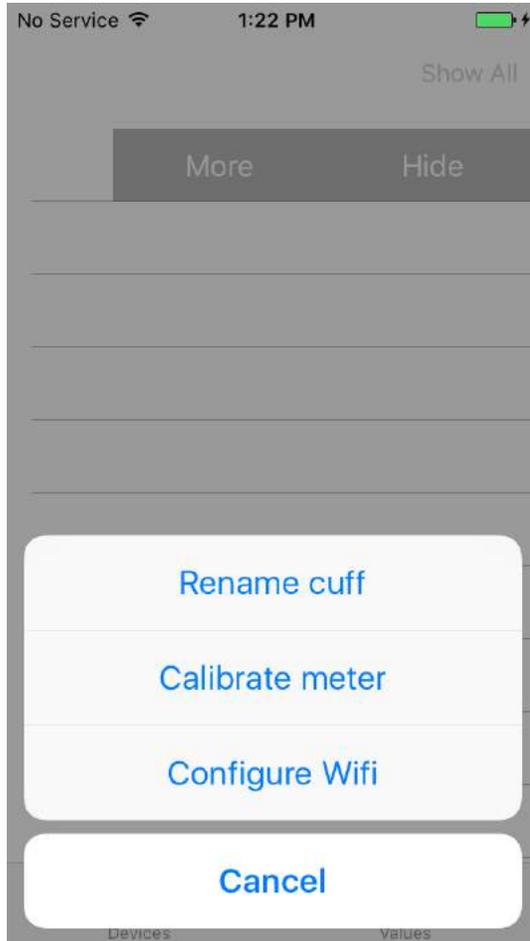
1. Remove the charging cable from the BPSim™ device to power it on.
2. Open your Wi-Fi settings on your iOS device and search for available access points.
3. Identify and connect to the Wi-Fi SSID “KBPBPSIM_####”, where the # symbols represent a unique series of numbers and letters.
4. Once connected, open the BPSim™ app.



5. There should be a single device listed in the application – swipe left on the BPSim™ cuff's current name to open the configuration menu.



6. Tap on [More], then [Rename cuff]. Enter a new name for the BPSim™ device, then tap [Ok]. Enter the password for your BPSim™ device if prompted.



Note: BPSim™ devices can accept names and passwords up to 30 characters in length.



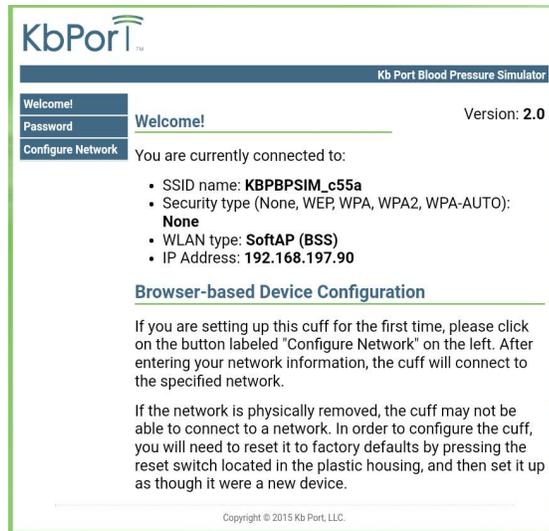
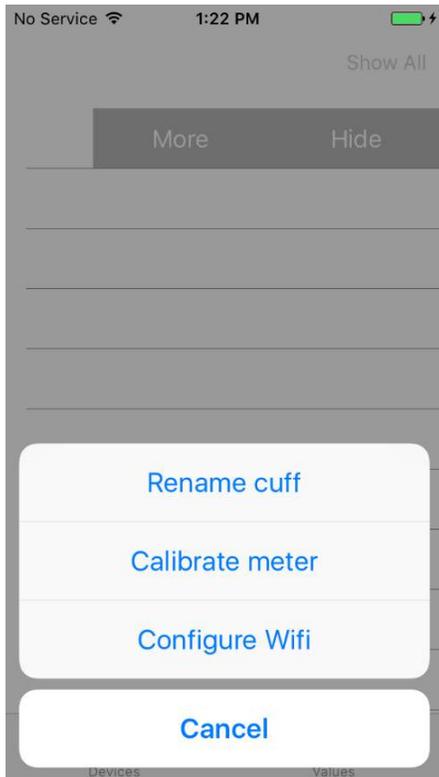
IMPORTANT: The default credentials for your BPSim™ cuff are:

Username: admin

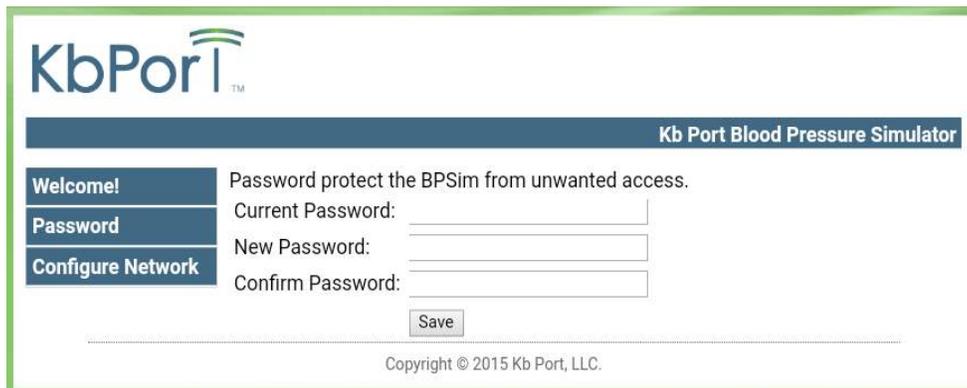
Password: kbsimulation

Hardware resetting your BPSim™ cuff (as described on page 57) will restore these values.

- The device name should now display the new name as entered. Swipe left on the BPSim™ cuff's current name to open the configuration menu again.
- Tap [More], then tap [Configure Wifi]. This will open a web page in your default browser. If prompted, type in the username and password for the BPSim™ device. The web page should display information such as the device's IP Address, the SSID of the current network, etc.



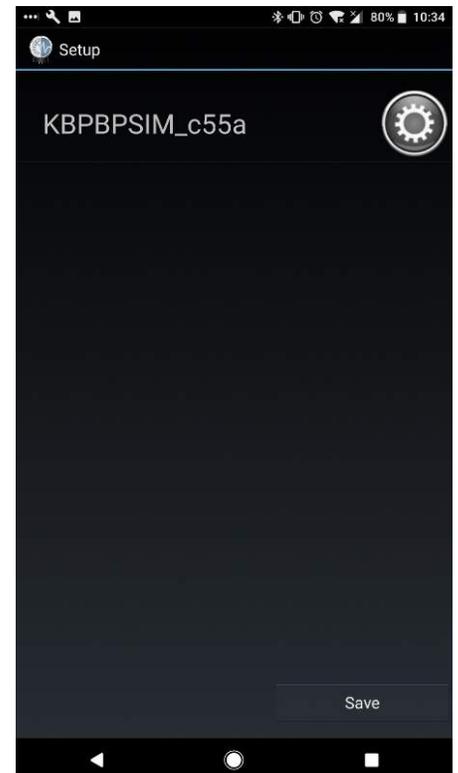
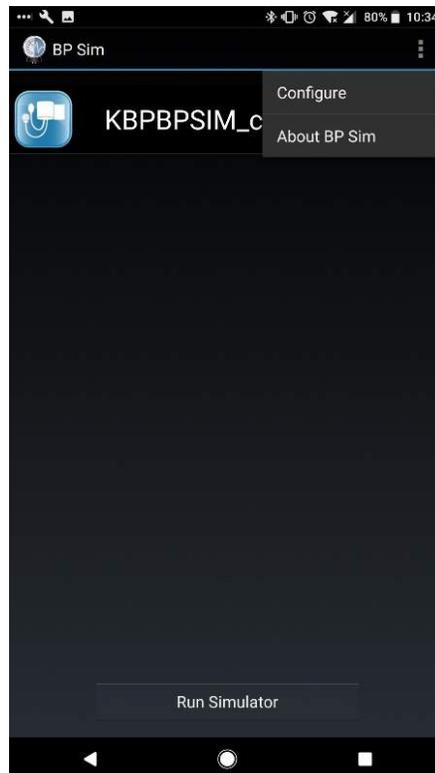
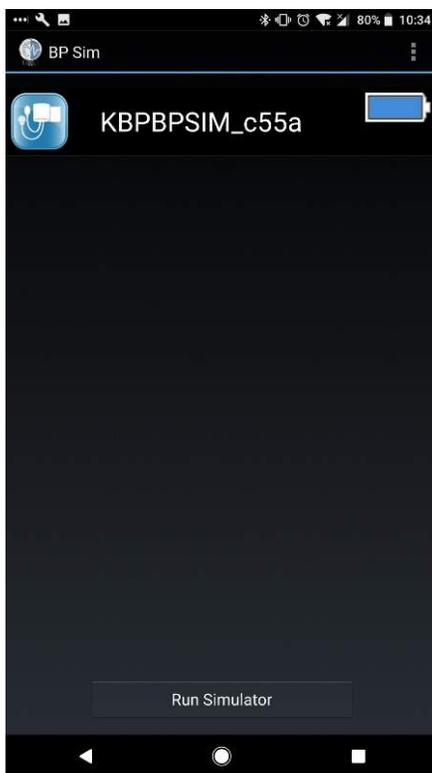
- Click [Password] on the left-hand side on the web page. Then, type in the current password, followed by a new password, then the new password again. When ready, tap [Save] below.



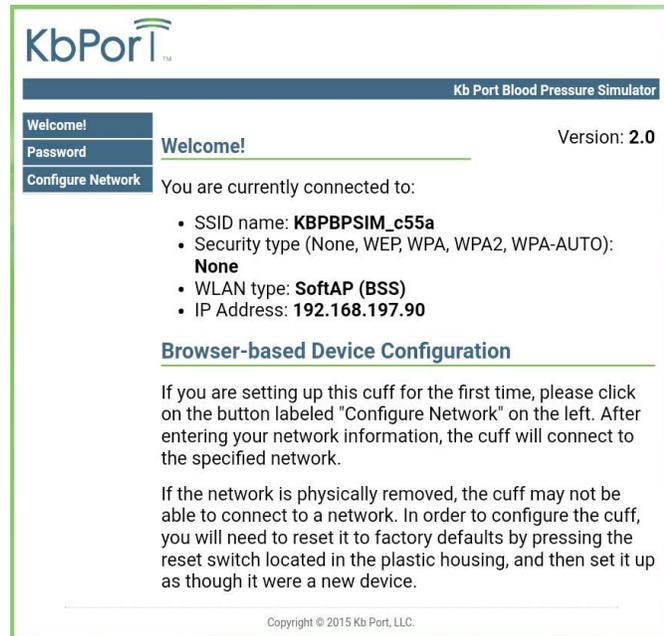
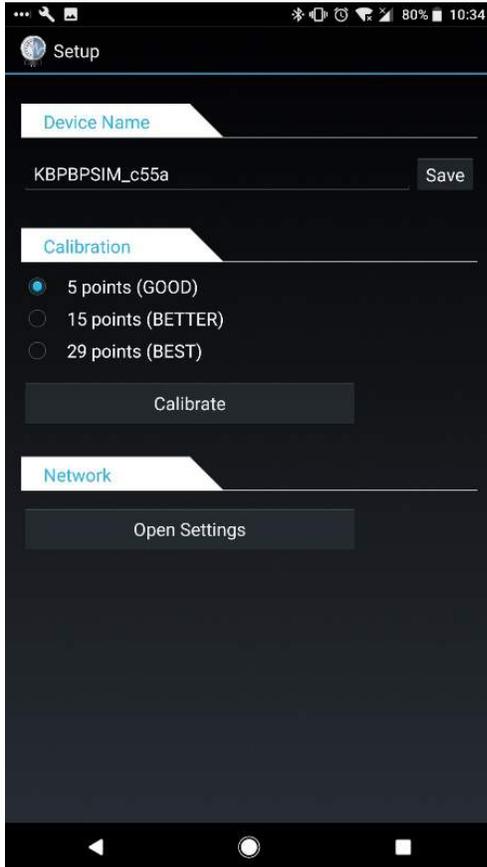
Wi-Fi Setup (Access Point Network) – Android

If you need to control just one BPSim™ unit, setting up the cuff in “Access Point Network” mode will enable it to broadcast its own Wi-Fi network. Once connected to the signal, this will allow your Android device to control the BPSim™ cuff directly through the app.

1. Ensure that your Android device is either connected directly to the BPSim™ cuff’s Access Point Network, or to the same Infrastructure Network as the BPSim™ device.
2. Once connected, open the BPSim™ app and touch the menu button located in the upper right-hand corner of the screen, then touch [Configure].
3. Click on the gear icon next to the name of the BPSim™ you would like to configure.



- At the bottom of the screen, tap [Open Settings]. This will open a web page in your default browser. If prompted, type in the username and password for the BPSim™ device. The web page should display information such as the device's IP Address, the SSID of the current network, etc.



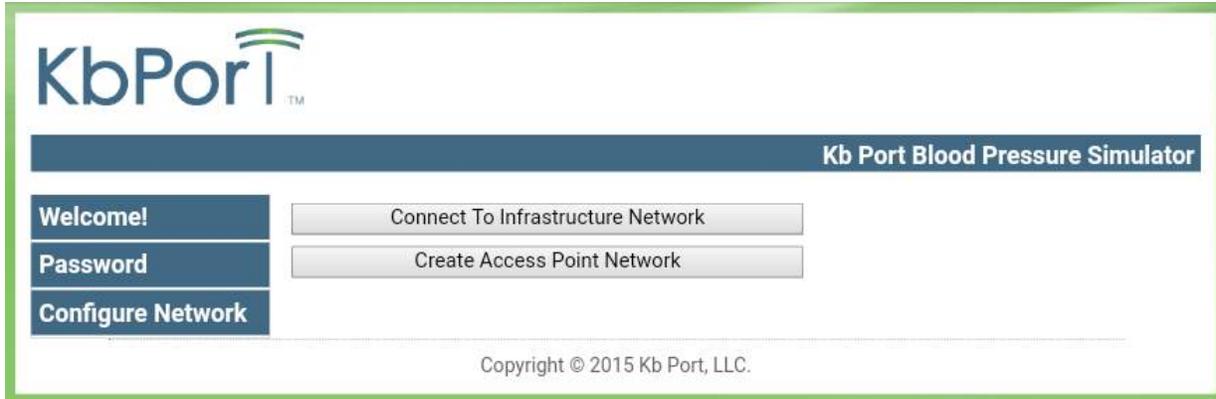
IMPORTANT: The default credentials for your BPSim™ cuff are:

Username: admin

Password: kbsimulation

Hardware resetting your BPSim™ cuff (as described on page 57) will restore these values.

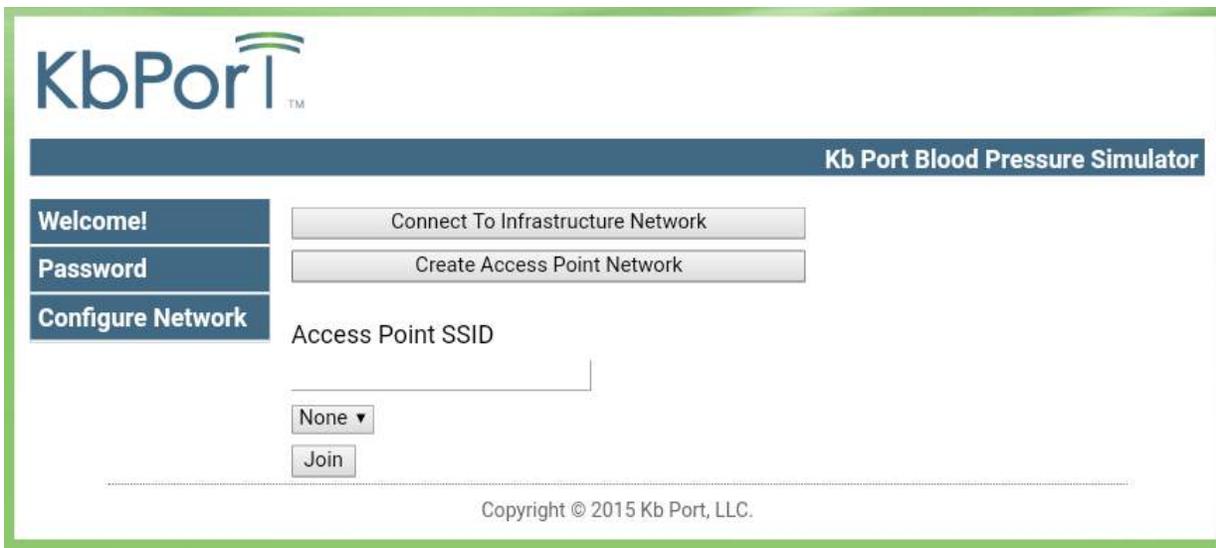
5. Click [Configure Network] on the left-hand side of the web page, then tap [Create Access Point Network].



6. In the Access Point SSID field, type in a name for the new Access Point Network and click on [Join].
7. Open the Android device's Wi-Fi settings and connect to the newly created Access Point Network.



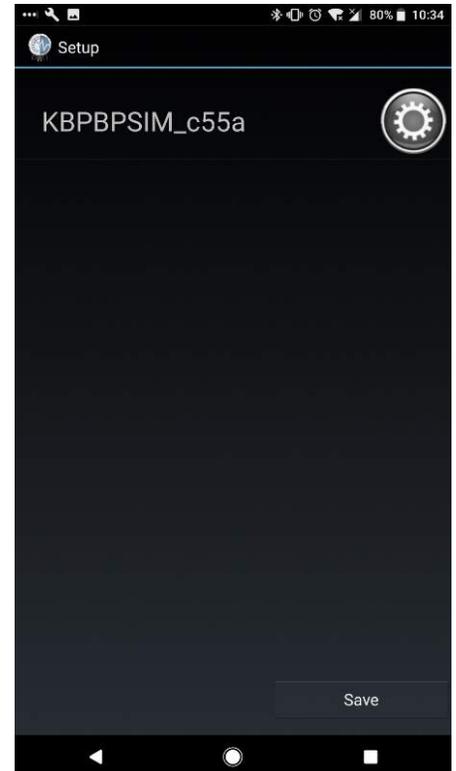
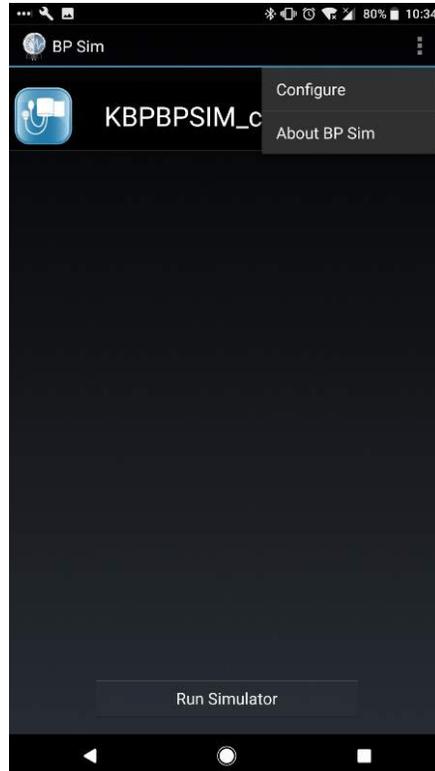
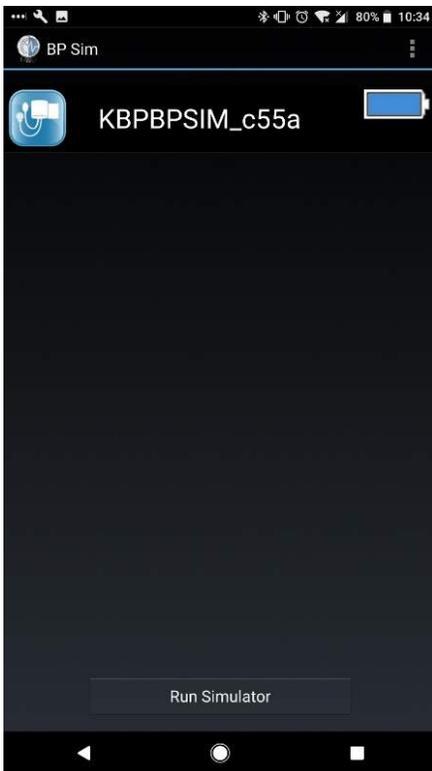
Note: An SSID can be a maximum of 32 characters in length.



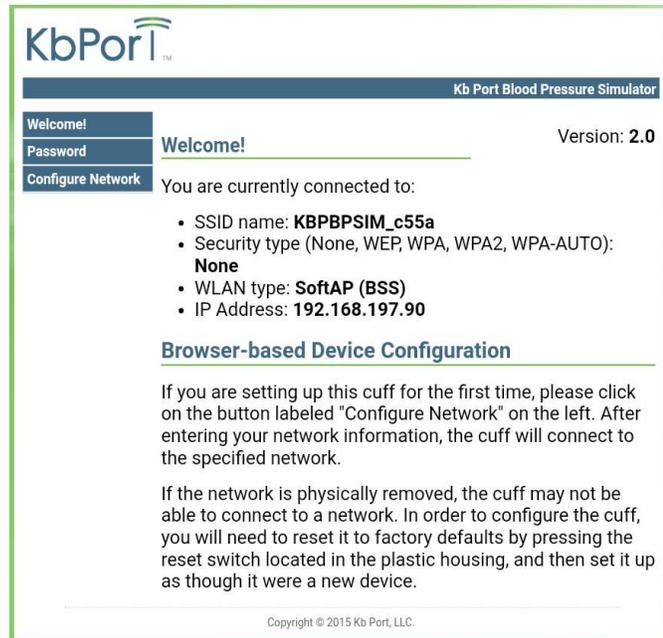
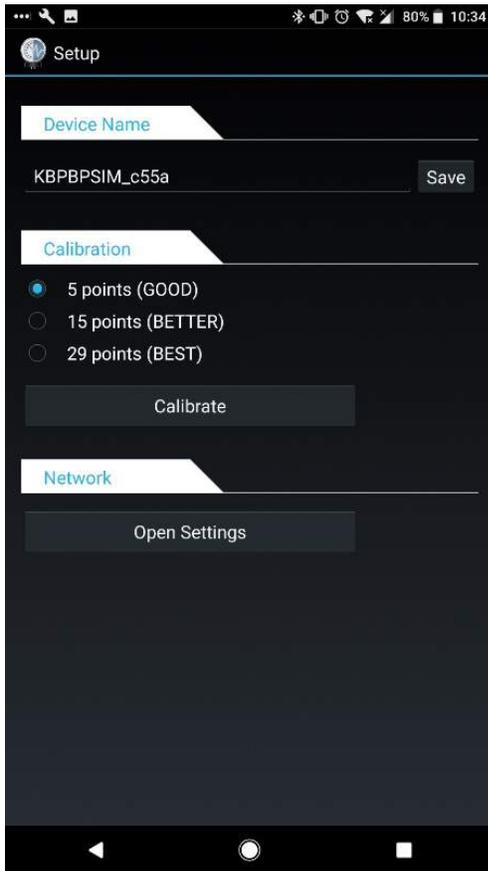
Wi-Fi Setup (Infrastructure Network) – Android

If you need to control more than one BPSim™ unit simultaneously, setting up the cuff in “Infrastructure Network” mode will enable it to connect to an existing Wi-Fi network. Once connected to the same signal, this will allow your Android device to control multiple BPSim™ cuffs over the network.

1. Ensure that your Android device is either connected directly to the BPSim™ cuff’s Access Point Network, or to the same Infrastructure Network as the BPSim™ device.
2. Once connected, open the BPSim™ app and touch the menu button located in the upper right-hand corner of the screen, then touch [Configure].
3. Click on the gear icon next to the name of the BPSim™ you would like to configure.



- At the bottom of the screen, tap [Open Settings]. This will open a web page in your default browser. If prompted, type in the username and password for the BPSim™ device. The web page should display information such as the device's IP Address, the SSID of the current network, etc.



IMPORTANT: The default credentials for your BPSim™ cuff are:

Username: admin

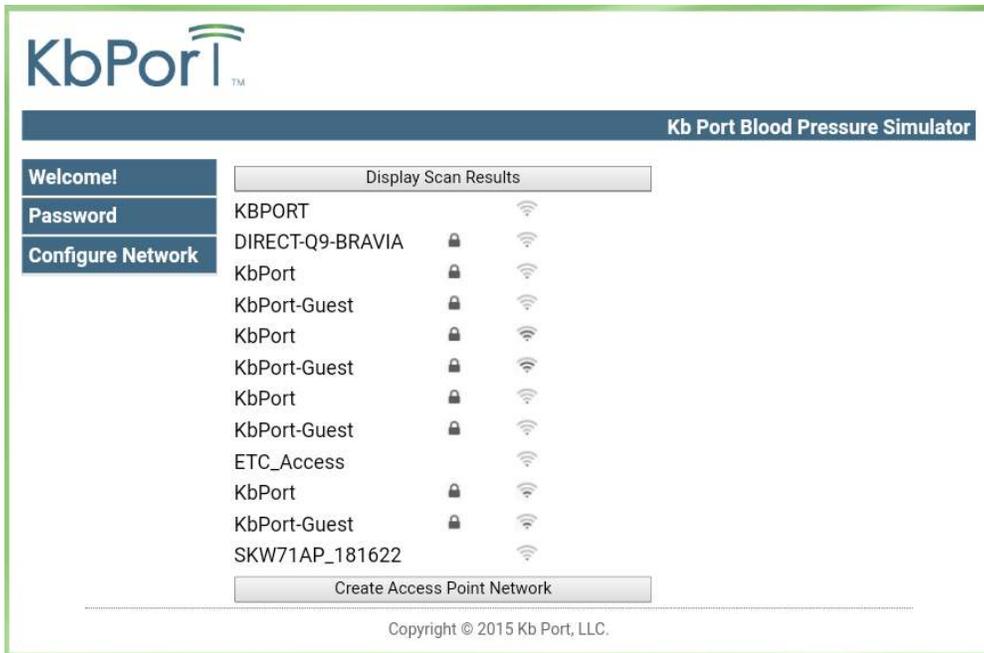
Password: kbsimulation

Hardware resetting your BPSim™ cuff (as described on page 57) will restore these values.

- Click [Configure Network] on the left-hand side of the web page, then tap [Connect To Infrastructure Network].



- The BPSim™ cuff will scan for all available Wi-Fi Networks in the area and display them on the screen alongside their security status (lock symbols mean a password is required) and their signal strength.
- Tap on the name of an access point, and enter the password for the network if prompted.



- Open your Android device's Wi-Fi settings and connect to the same Infrastructure Network as the BPSim™ cuff.



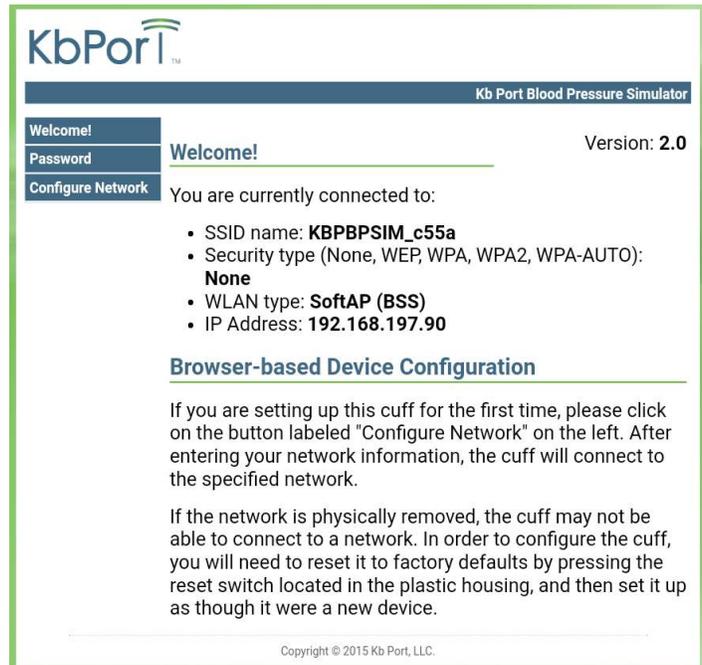
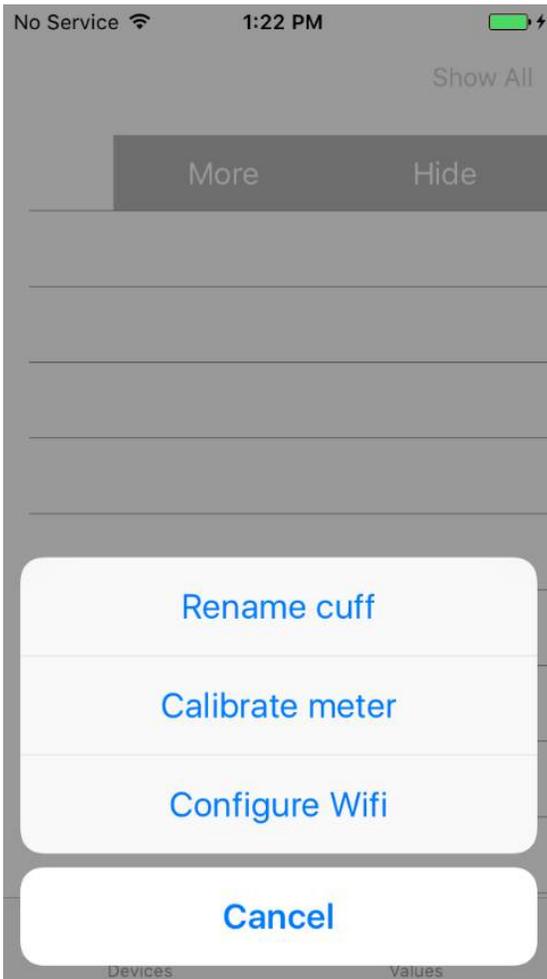
IMPORTANT: Incorrectly entering the password for the Infrastructure Network will cause the BPSim™ to become inaccessible. If this occurs, hardware reset the BPSim™ device (as described on page 57) and repeat the initial setup instructions.

Wi-Fi Setup (Access Point Network) – iOS

If you need to control just one BPSim™ unit, setting up the cuff in “Access Point Network” mode will enable it to broadcast its own Wi-Fi network. Once connected to the signal, this will allow your iOS device to control the BPSim™ cuff directly through the app.

1. Ensure that your iOS device is either connected directly to the BPSim™ cuff’s Access Point Network, or to the same Infrastructure Network as the BPSim™ device.
2. Open the BPSim™ application and swipe left on the device you would like to configure.

3. Tap [More], then [Configure Wifi]. This will open a web page in your default browser. If prompted, type in the username and password for the BPSim™ device. The web page should display information such as the device's IP Address, the SSID of the current network, etc.



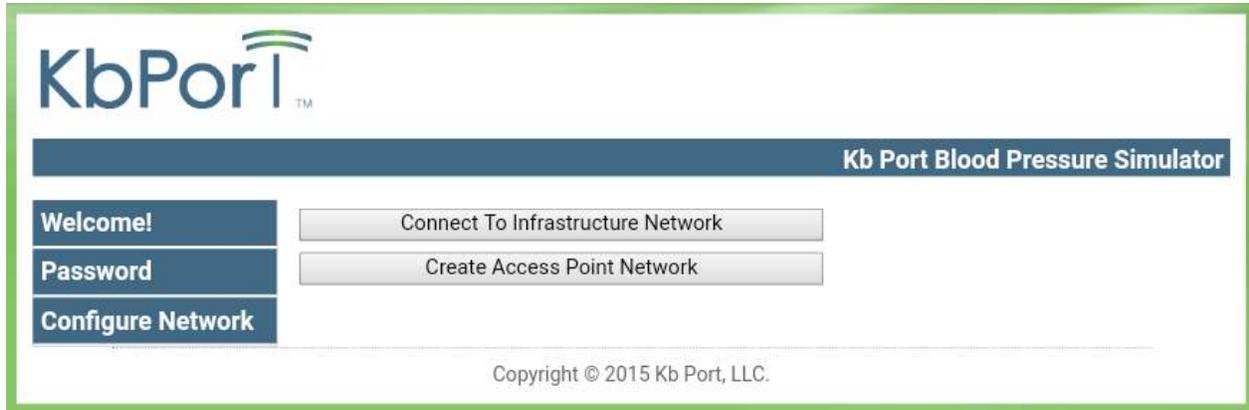
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Username: admin

Password: kbsimulation

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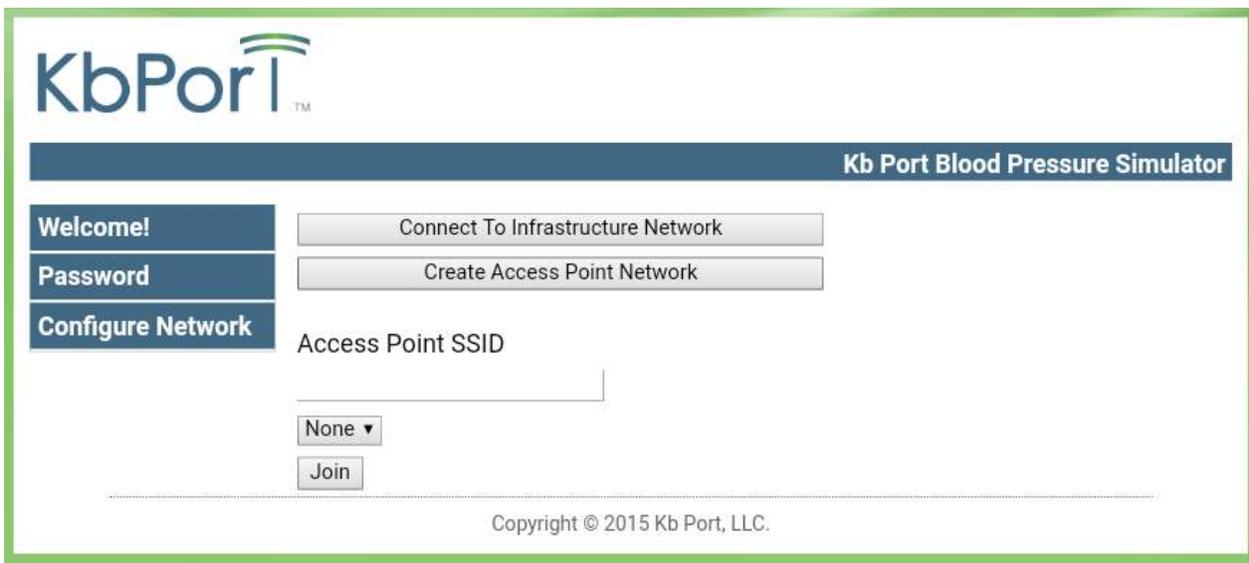
4. Click [Configure Network] on the left-hand side of the web page, then tap [Create Access Point Network].



5. In the Access Point SSID field, type in a name for the new Access Point Network and click on [Join].
6. Open the iOS device's Wi-Fi settings and connect to the newly created Access Point Network.



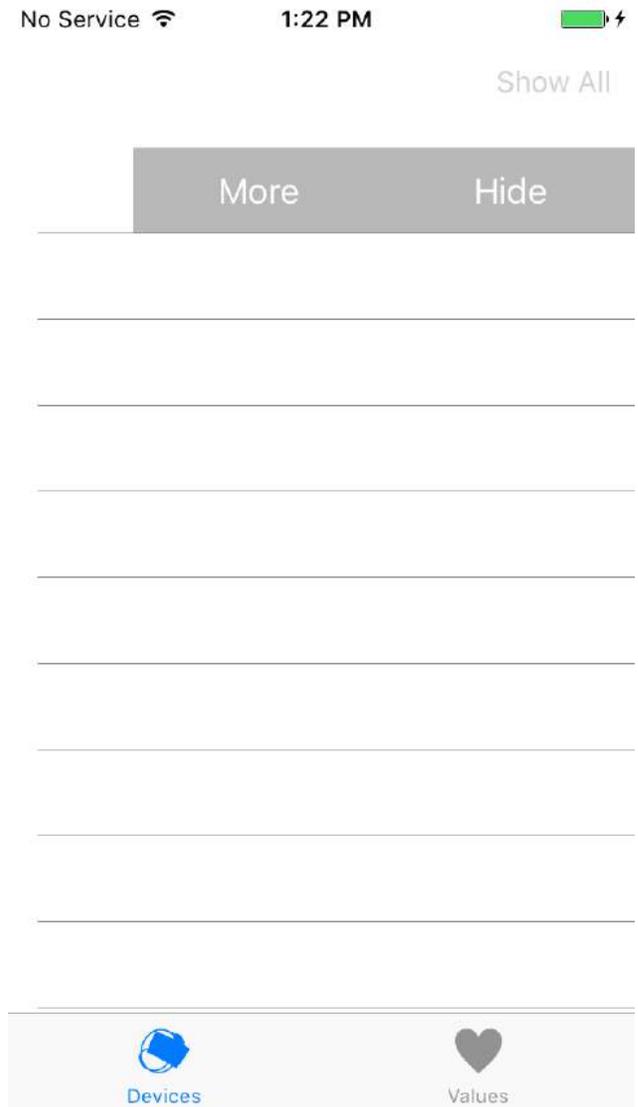
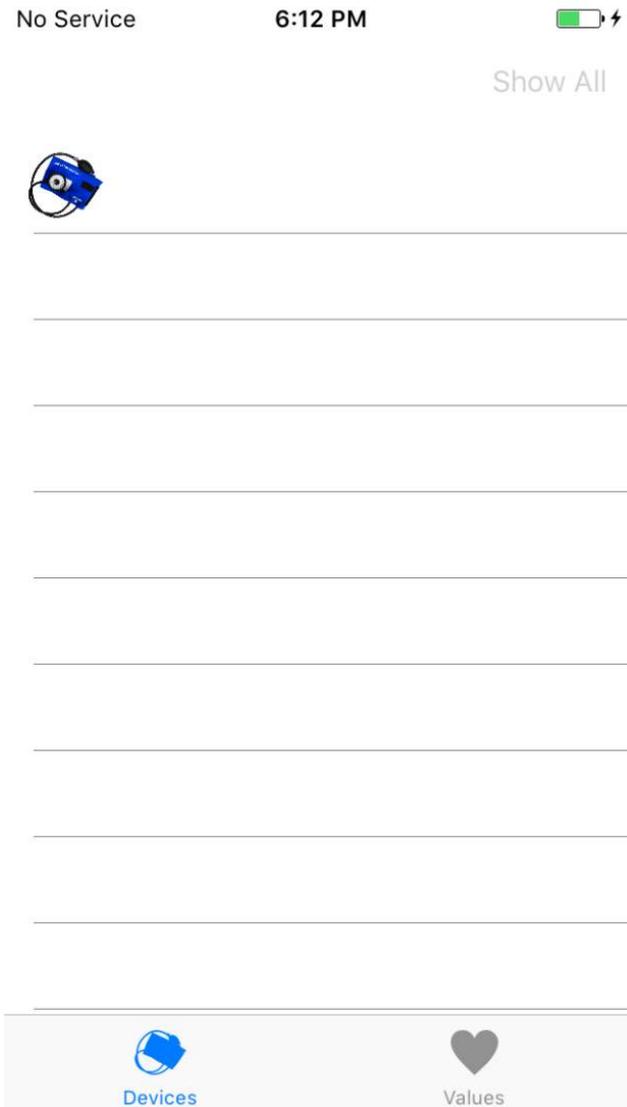
Note: An SSID can be a maximum of 32 characters in length.



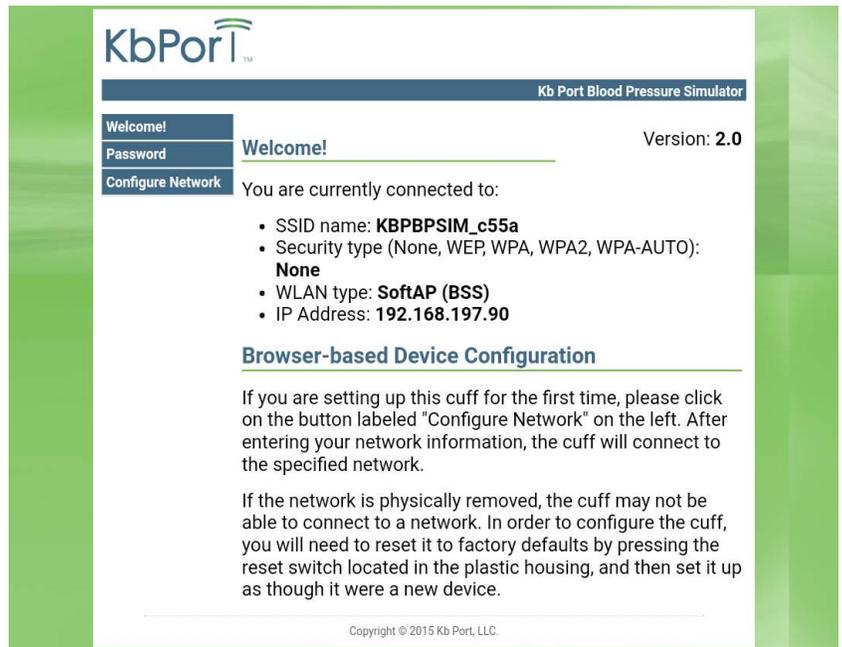
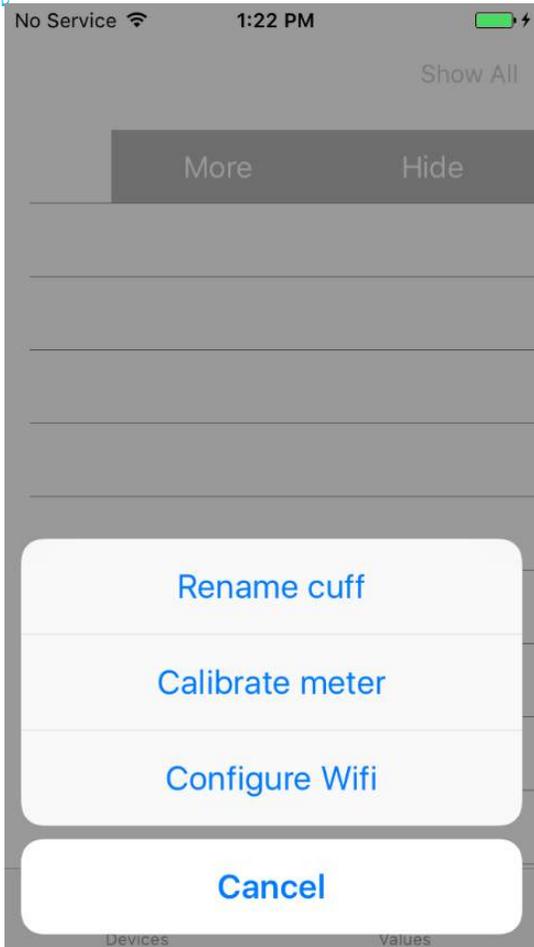
Wi-Fi Setup (Infrastructure Network) – iOS

If you need to control more than one BPSim™ unit simultaneously, setting up the cuff in “Infrastructure Network” mode will enable it to connect to an existing Wi-Fi network. Once connected to the same signal, this will allow your iOS device to control multiple BPSim™ cuffs over the network.

1. Ensure that your iOS device is either connected directly to the BPSim™ cuff’s Access Point Network, or to the same Infrastructure Network as the BPSim™ device.
2. Open the BPSim™ application and swipe left on the device you would like to configure.



3. Tap [More], then [Configure Wifi]. This will open a web page in your default browser. If prompted, type in the username and password for the BPSim™ device. The web page should display information such as the device's IP Address, the SSID of the current network, etc.



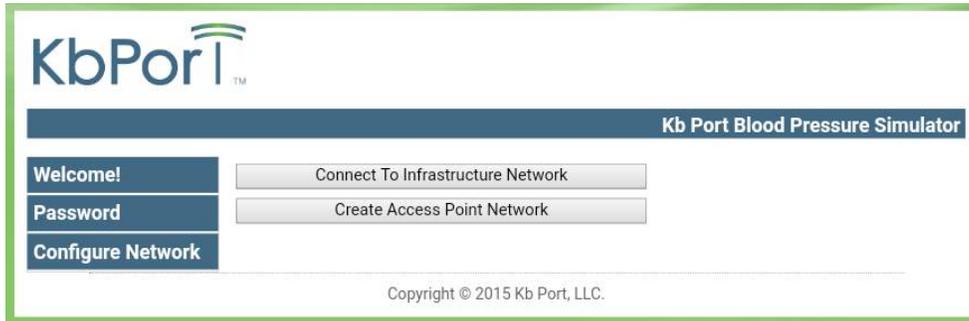
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Username: admin

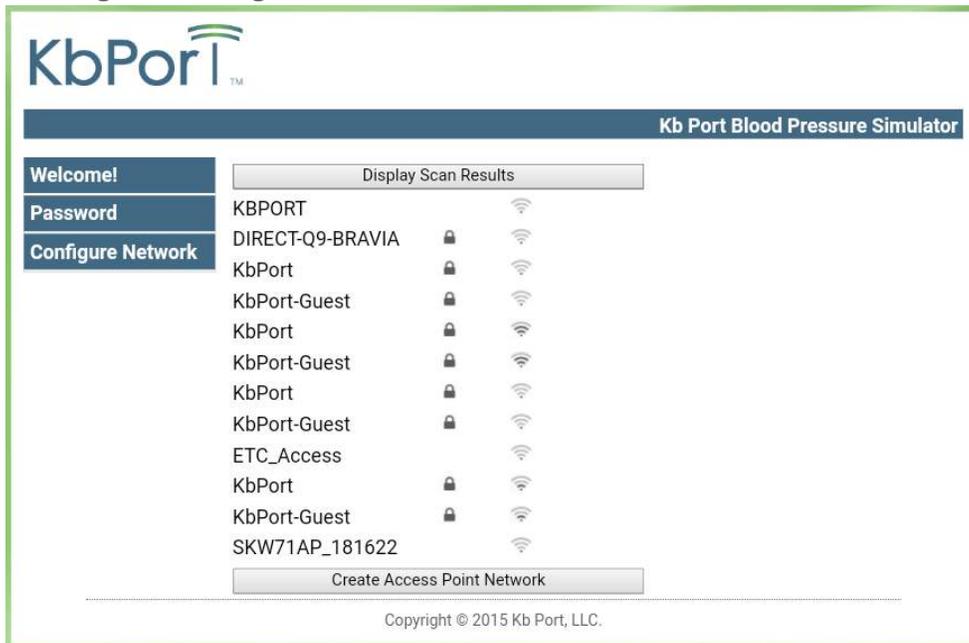
Password: kbsimulation

Hardware resetting your BPSim™ cuff (as described on page 57) will restore these values.

- Click [Configure Network] on the left-hand side of the web page, then tap [Connect To Infrastructure Network].



- The BPSim™ cuff will scan for all available Wi-Fi Networks in the area and display them on the screen alongside their security status (lock symbols mean a password is required) and their signal strength



- Tap on the name of an access point, and enter the password for the network if prompted.
- Open your iOS device's Wi-Fi settings and connect to the same Infrastructure Network as the BPSim™ cuff.

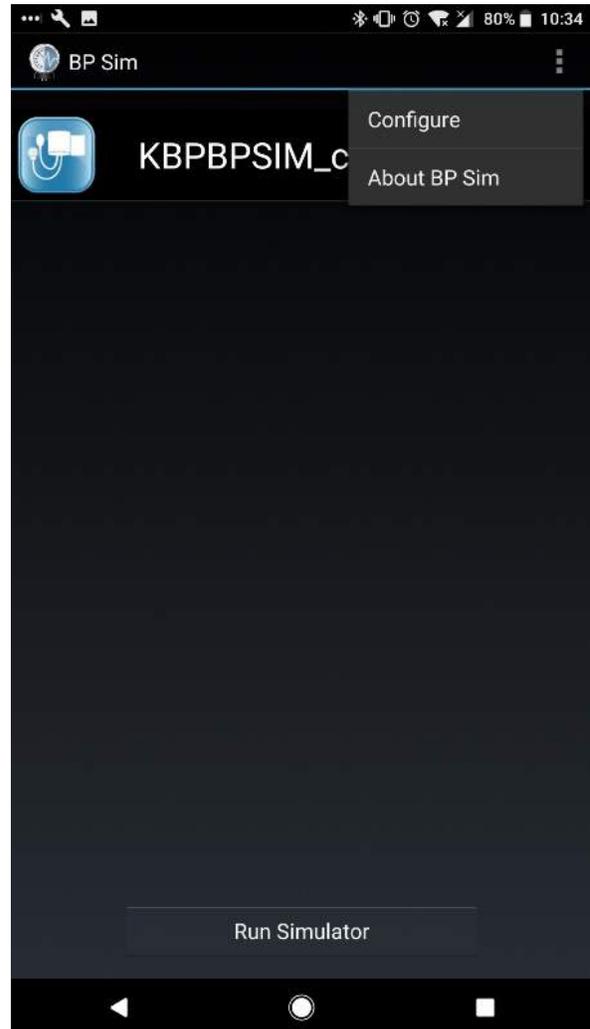
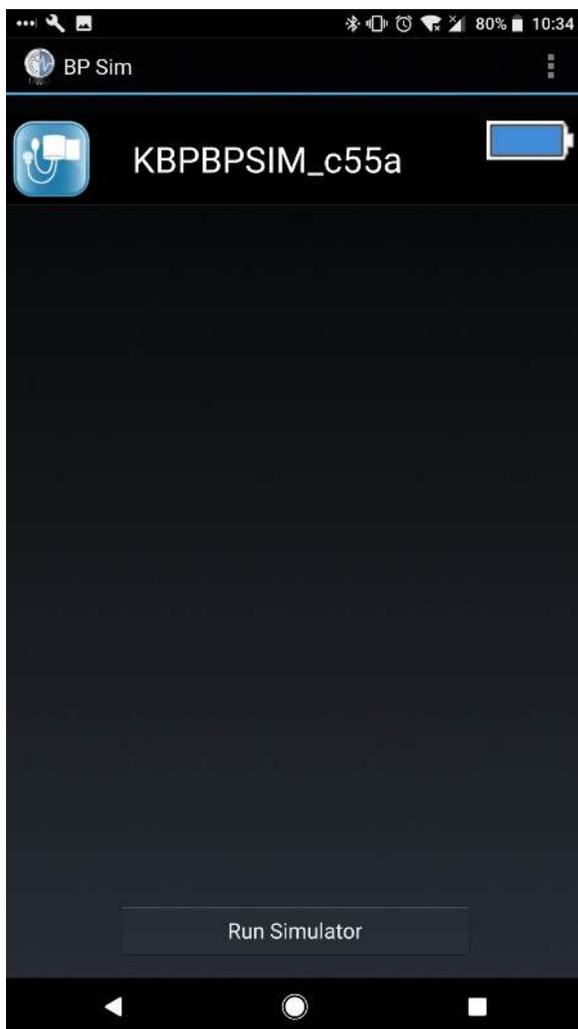


IMPORTANT: Incorrectly entering the password for the Infrastructure Network will cause the BPSim™ to become inaccessible. If this occurs, hardware reset the BPSim™ device (as described on page 57) and repeat the initial setup instructions.

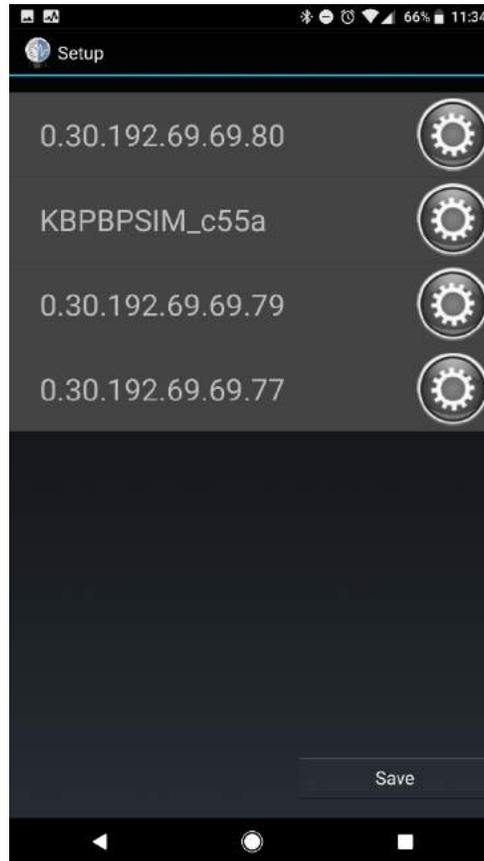
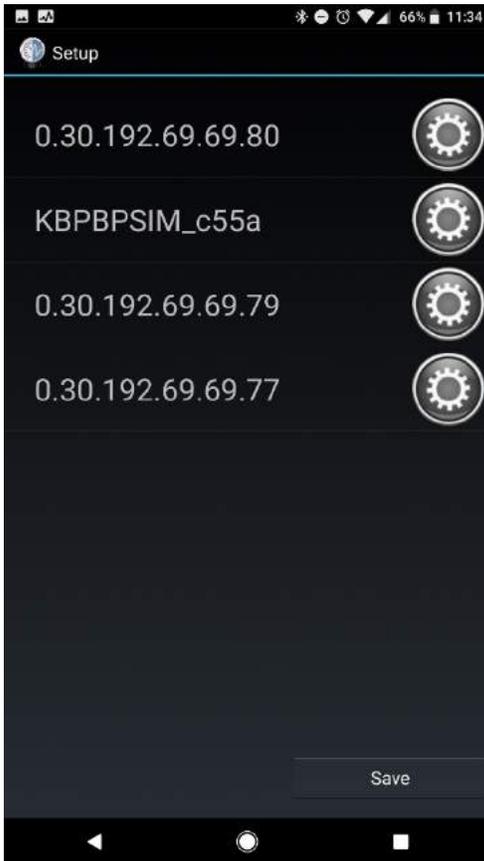
BPSIM™ APPLICATION SETUP & CONFIGURATION

Adding Devices to the App (Android Only)

1. Remove the power cord from all BPSim™ devices you intend to use to power them on.
2. Ensure your Android device is connected to the same network as the BPSim™ cuff.
3. Within the BPSim™ application, click the menu icon in the top-right corner, then [Configure]



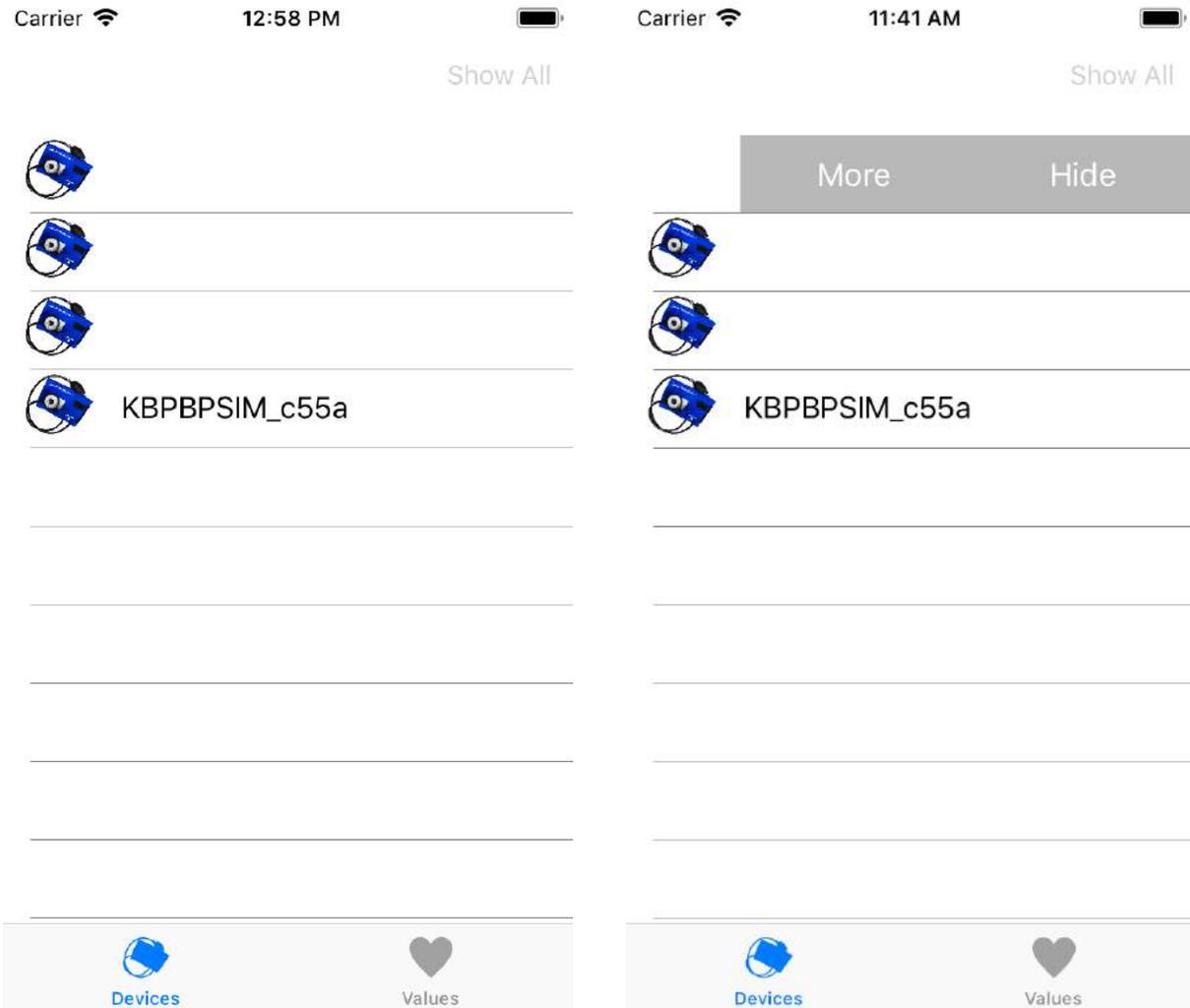
4. Tap on each BPSim™ cuff you would like to associate with the Android device – selected cuffs should turn a lighter shade of gray. Then, click [Save] at the bottom of the screen.
5. On the main menu, each connected BPSim™ device will be listed, displaying its name and current battery level.



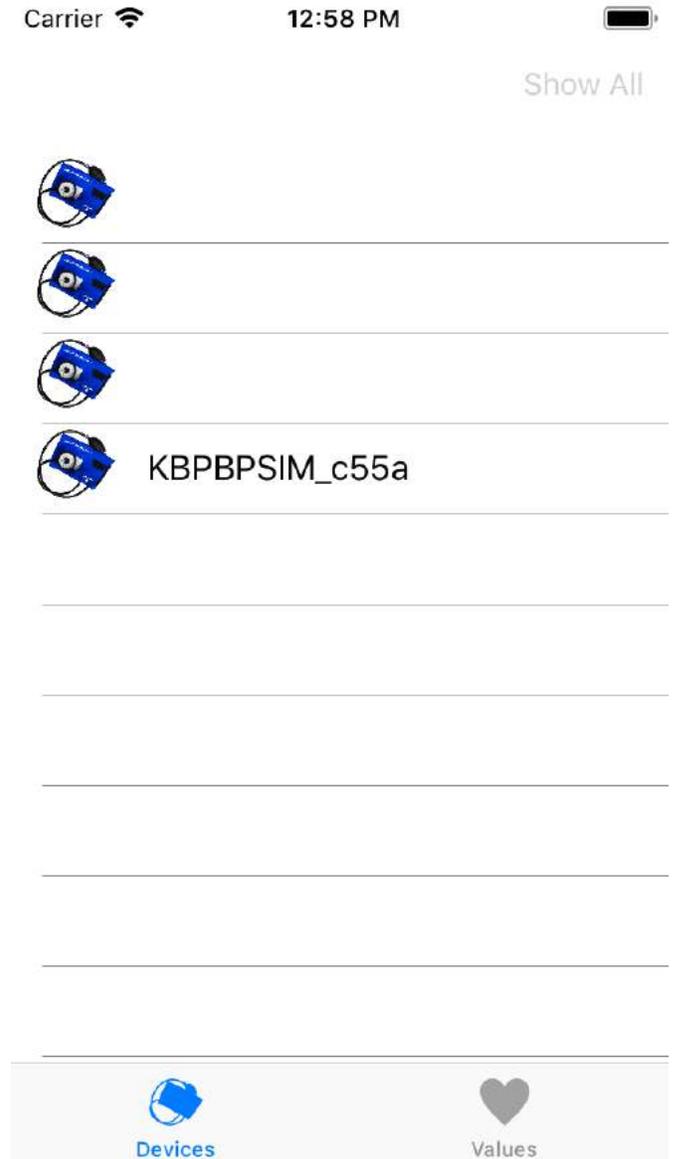
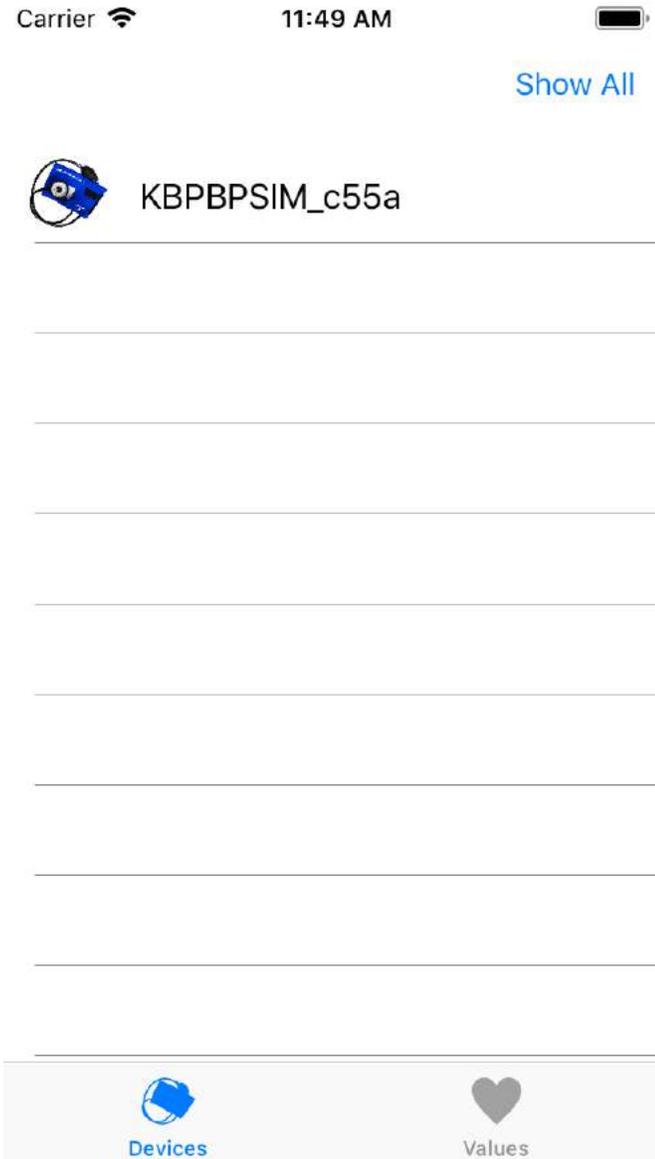
Note: A maximum of 5 devices can be saved to the Android version of the BPSim™ app at any given moment.

Hiding Devices in the App (iOS Only)

1. Remove the power cord from all BPSim™ devices you intend to use to power them on.
2. Ensure your iOS device is connected to the same network as the BPSim™ cuff.
3. Within the BPSim™ application, swipe left on whichever cuff you would like to hide from the list. Then, tap the [Hide] button.



4. Repeat for any additional BPSim™ devices.
5. To unhide all cuffs, click on [Show All] at the top of the screen.



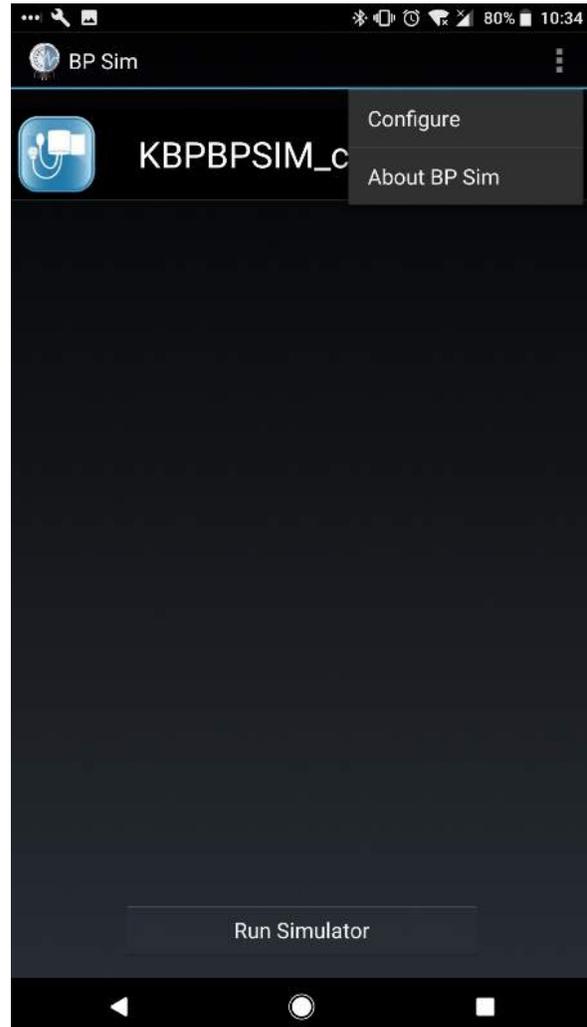
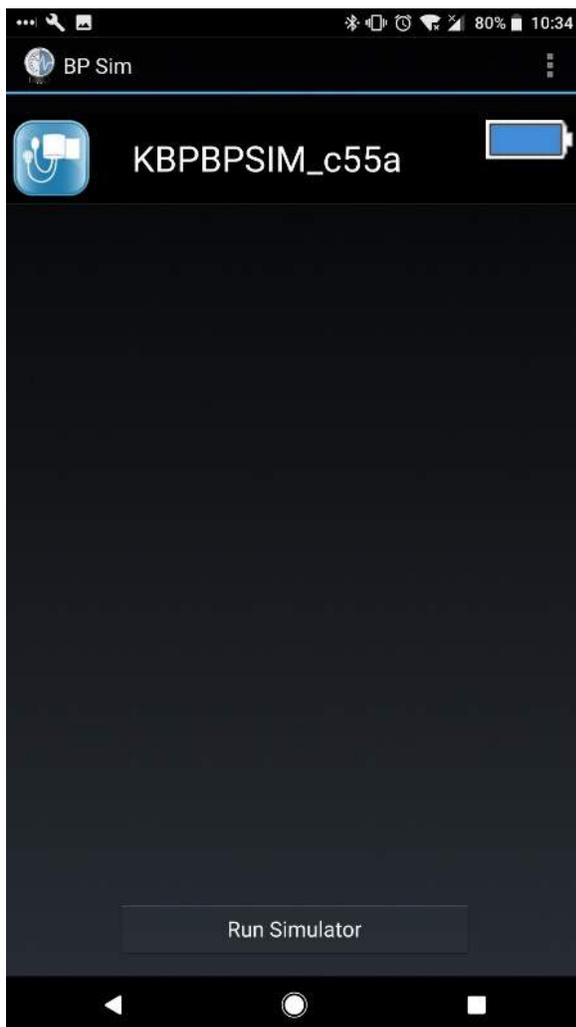
Note: Unlike the Android app, the iOS version of the BPSim™ app can control any number of BPSim™ devices.

Calibration - Android

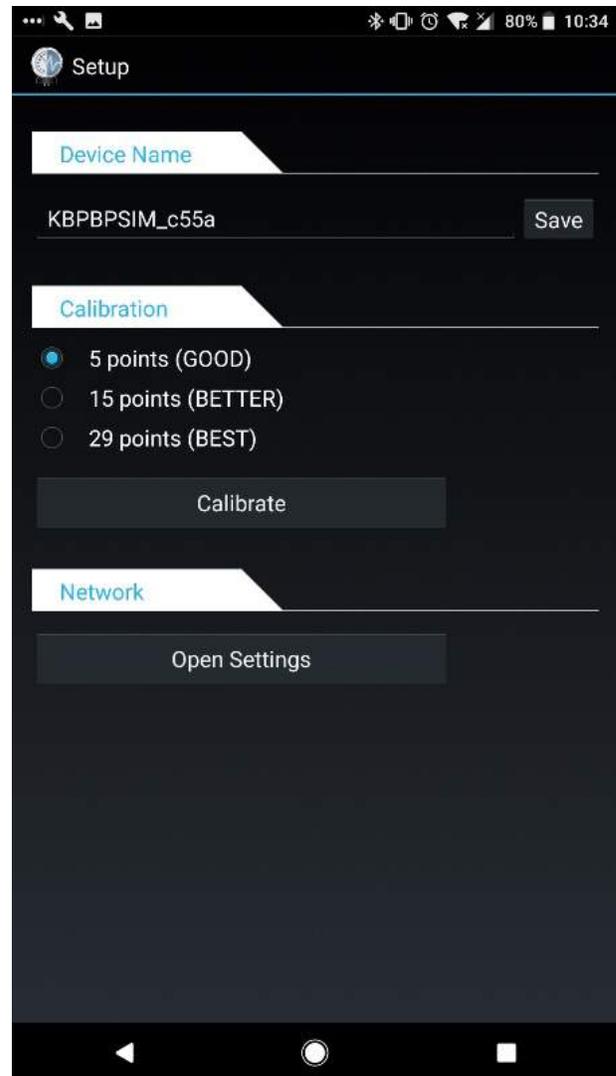
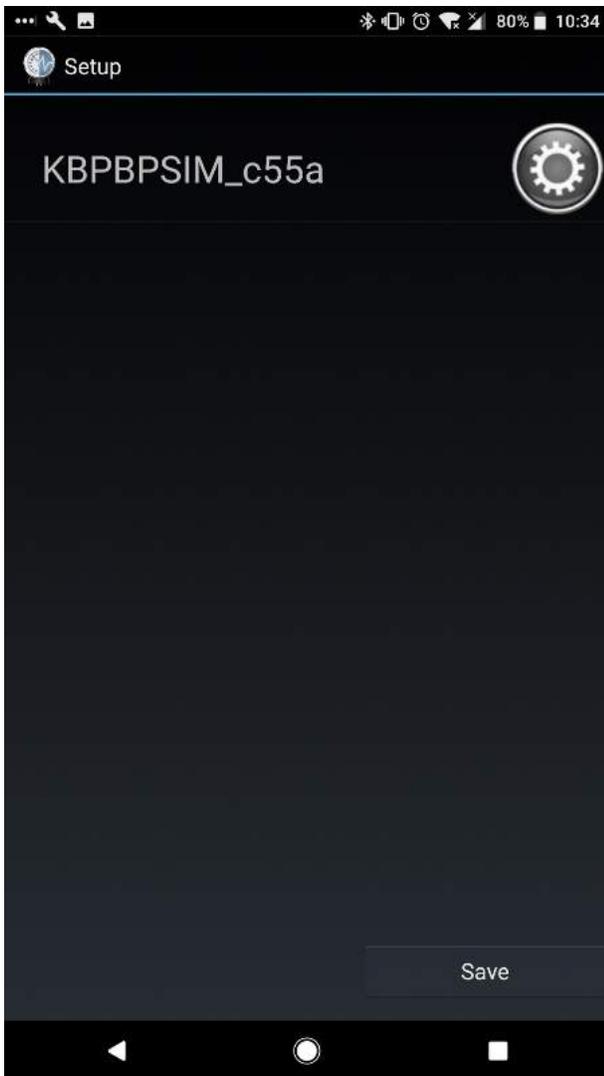


IMPORTANT: Calibrating each BPSim™ cuff is critical to proper function. BPSim™ devices will not work correctly if they are not calibrated before first use or after a hardware reset.

1. Use the Wi-Fi settings on your Android device to either connect to the BPSim™ cuff's Access Point directly, or join the same Infrastructure Network as the BPSim™ cuff.
2. Open the BPSim™ app and touch the menu button located in the top right-hand corner of the screen, then click on [Configure]



3. Tap the gear icon next to the BPSim™ device you would like to configure. Enter the password for the device if prompted.

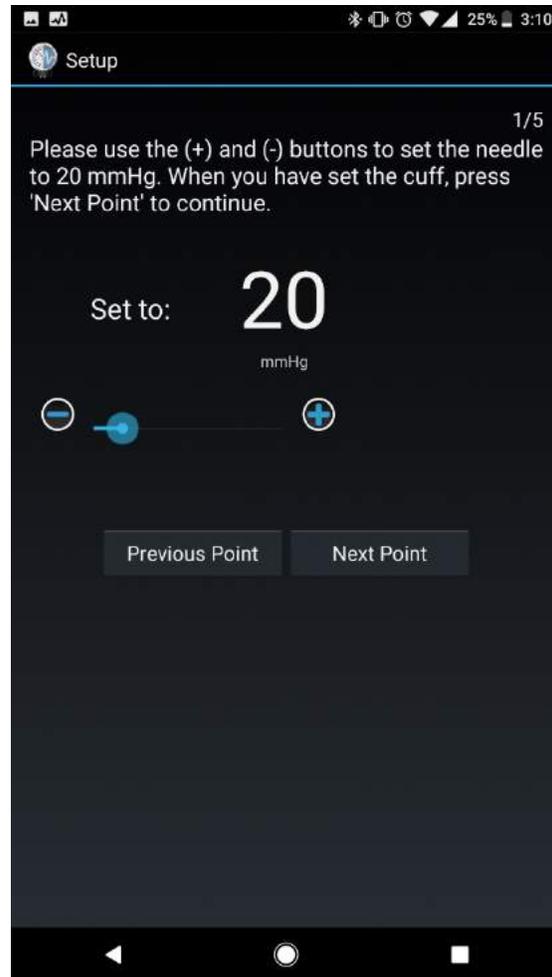
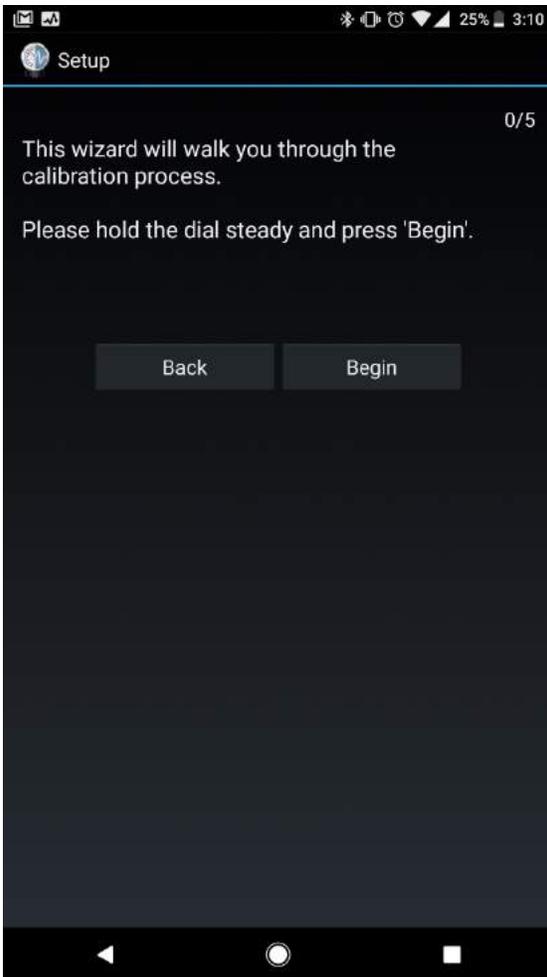


4. Choose a calibration level, then tap [Calibrate]. Use the password **kbsimulation** if asked.



IMPORTANT: For this specific instance, you will need to type in the default password for your BPSim™ device, not the new password if previously changed. Please use the password **kbsimulation** when prompted, otherwise the calibration process will fail.

5. For each number presented on the screen, tap on the [+] or [-] buttons to raise or lower the monometer needle on the BPSim™ cuff until it rests on the dial number shown.
6. Once the two numbers match, tap [Next] to proceed to the next calibration point and repeat until all calibration points have been set. Tap [Complete] when done.



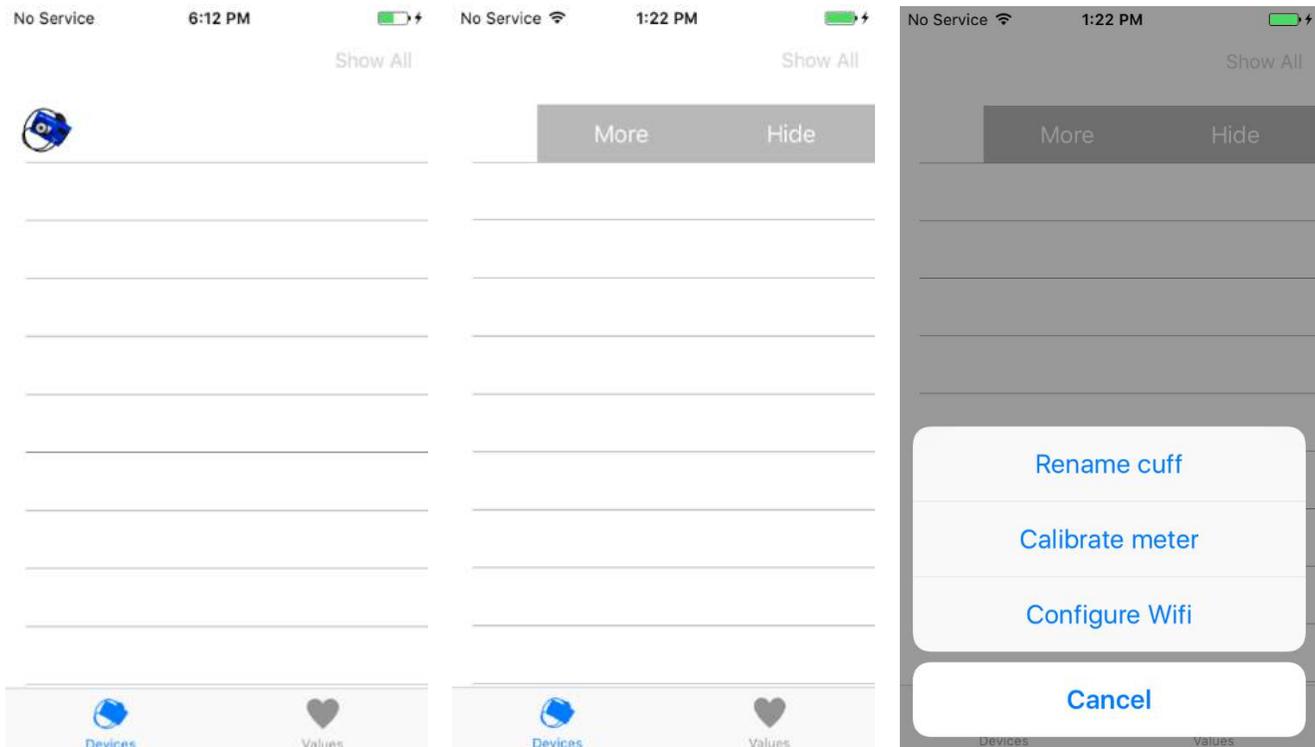
Note: The sphygmomanometer gauge behaves just like a real blood pressure cuff, so be sure keep the dial steady and away from sources of vibration – it may take a moment for the needle to settle on its final value.

Calibration – iOS



IMPORTANT: Calibrating each BPSim™ cuff is critical to proper function. BPSim™ devices will not work correctly if they are not calibrated before first use or after a hardware reset.

1. Use the Wi-Fi settings on your iOS device to either connect to the BPSim™ cuff's Access Point directly, or join the same Infrastructure Network as the BPSim™ cuff.
2. Open the BPSim™ app and swipe left on the BPSim™ device you would like to configure.
3. Tap [More], then tap [Calibrate meter]. Use the password **kbsimulation** if asked.



IMPORTANT: For this specific instance, you will need to type in the default password for your BPSim™ device, not the new password if previously changed. Please use the password kbsimulation when prompted, otherwise the calibration process will fail.

4. For each number presented on the screen, tap on the [+] or [-] buttons to raise or lower the monometer needle on the BPSim™ cuff until it rests on the dial number shown.
5. Once the two numbers match, tap [Next Point] to proceed to the next calibration point and repeat until all calibration points have been set.

No Service  1:24 PM 

Cancel

Calibrate



Please use the plus [+] and minus [-] buttons to move the needle on the cuff to the specified value below. When the needle has been accurately positioned, press 'Next Point' to calibrate the next point

- 20 mmHg +

Next Point

Previous

Carrier  4:04 PM 

Cancel

Calibrate



Please use the plus [+] and minus [-] buttons to move the needle on the cuff to the specified value below. When the needle has been accurately positioned, press 'Next Point' to calibrate the next point

- 300 mmHg +

Complete

Previous

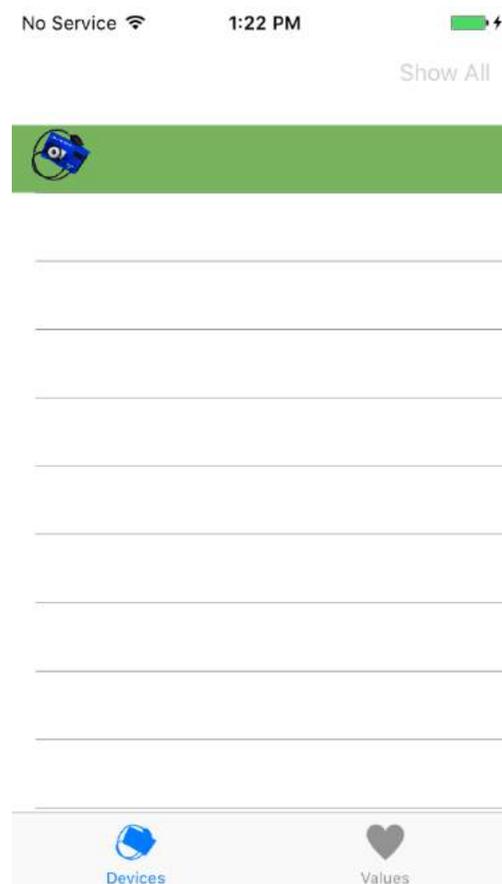
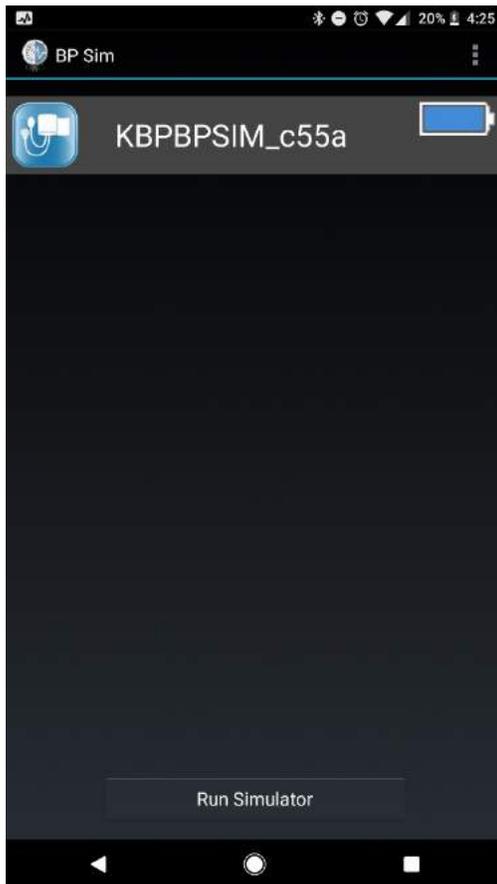


Note: The sphygmomanometer gauge behaves just like a real blood pressure cuff, so be sure keep the dial steady and away from sources of vibration – it may take a moment for the needle to settle on its final value.

BPSIM™ USAGE INSTRUCTIONS

GETTING STARTED

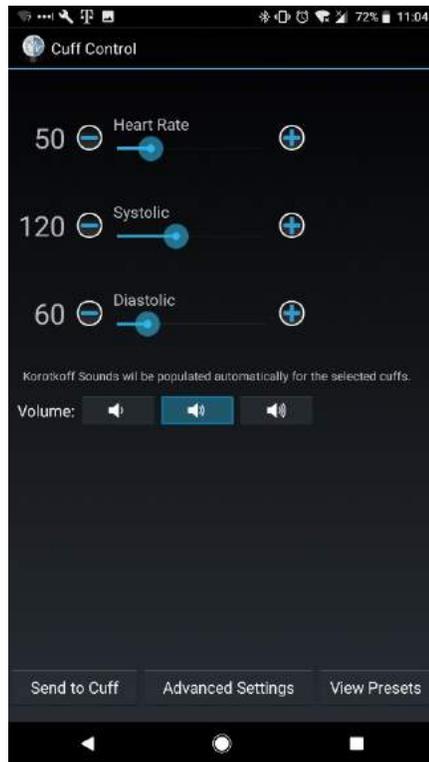
1. Remove the power cord from all BPSim™ devices you intend to use to power them on.
2. Use the Wi-Fi settings on your Android or iOS device to either connect to the BPSim™ cuff's Access Point directly, or join the same Infrastructure Network as the BPSim™ units.
3. Open the BPSim™ app and tap on each BPSim™ device or devices you would like to control – selected devices should either turn a lighter shade of gray (on Android) or green (on iOS).



4. Touch [Run Simulator] or [Values] at the bottom of the screen to continue.

BASIC SETTINGS

Within the “Cuff Control” menu in [Basic Settings] mode, there are three options available for configuring your BPSim™ units:



Heart Rate

This sets the pulses per minute of the needle and Korotkoff sounds emitted by the cuff just above and below the range between the Systolic and Diastolic blood pressure values.

Systolic Pressure

Represents the upper pressure threshold at which blood flow within the artery can first be heard. The 1st phase of Korotkoff sounds should begin right when the pressure gauge falls below this level.

Diastolic Pressure

Represents the lower pressure threshold at which blood flow within the artery can last be heard. The 4th phase of Korotkoff sounds should be audible immediately above this pressure level, and should completely disappear (the 5th Korotkoff phase) when the pressure gauge falls below this level.

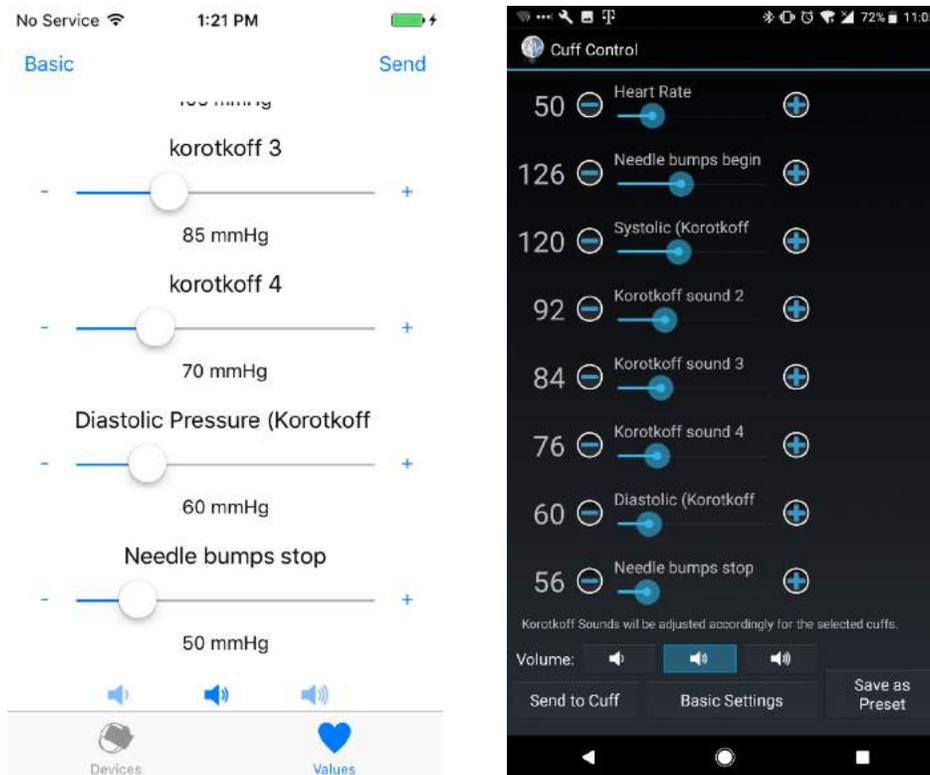
All three of these values can be adjusted by tapping on the [+] or [-] icons next to each parameter, or by sliding the corresponding dial in between them to either side.

There are also three different volume levels to choose from for blood flow/Korotkoff sounds. While the default (middle) setting will produce the most realistic audio response, you can choose whichever setting is most appropriate for the current situation by tapping on the matching icon.

Once the settings are properly configured, clicking on the [Send] or [Send to Cuff] button will propagate the values to each of the connected BPSim™ cuffs.

ADVANCED SETTINGS

If greater control over what threshold each Korotkoff is desired, tapping on the [Advanced] or [Advanced Settings] button on the “Cuff Control” screen will reveal several additional settings, including:



Needle Bumps Begin

The blood pressure value at which the heart rate pulses are first discernable.

Systolic Pressure (Korotkoff Phase 1)

Represents the upper pressure threshold at which blood flow within the artery can first be heard. The 1st phase of Korotkoff sounds should begin right when the pressure gauge falls below this level.

Korotkoff Phase 2

Characterized by the transition from the soft tapping sounds from Korotkoff sound 1 to a louder swishing sound.

Korotkoff Phase 3

Characterized by the transition from swishing to a louder “knocking” sound. It is similar in quality to Korotkoff sound 1 but crisper and more pronounced.

Korotkoff Phase 4

Characterized by the transition of sounds from the previous phase (Korotkoff sound 3) suddenly becoming muffled and airy in quality.

Diastolic Pressure (Korotkoff Phase 5)

Represents the lower pressure threshold at which blood flow within the artery can last be heard. The 4th phase of Korotkoff sounds should be audible immediately above this pressure level, and should completely disappear (the 5th Korotkoff phase) when the pressure gauge falls below this level.

Needle Bumps Stop

The blood pressure value at which the heart rate pulses are no longer noticeable.

Just like with [Basic Settings], all three of these values can be adjusted by tapping on the [+] or [-] icons next to each parameter, or by sliding the corresponding dial in between them to either side.

Also in common with [Basic Settings], there are also three different volume levels to choose from for blood flow/Korotkoff sounds. While the default (middle) setting will produce the most realistic audio response, you can

choose whichever setting is most appropriate for the current situation by tapping on the matching icon.

Once the settings are properly configured, clicking on the [Send to Cuff] button will propagate the values to each of the connected BPSim™ cuffs.

To switch back to [Basic Settings] mode, just tap the [Basic] or [Basic Settings] button.

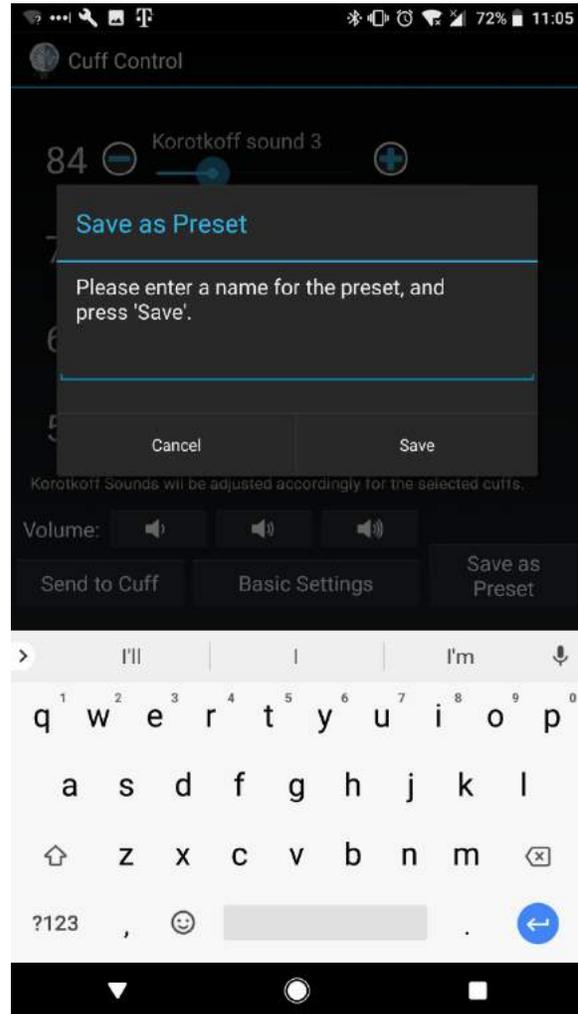
CREATING & USING PRESETS (ANDROID ONLY)

To make it easier to use common configurations, the BPSim™ application on Android operating systems can store, name, and recall pre-defined settings for quick deployment to any quantity of BPSim™ units.

Creating a Preset

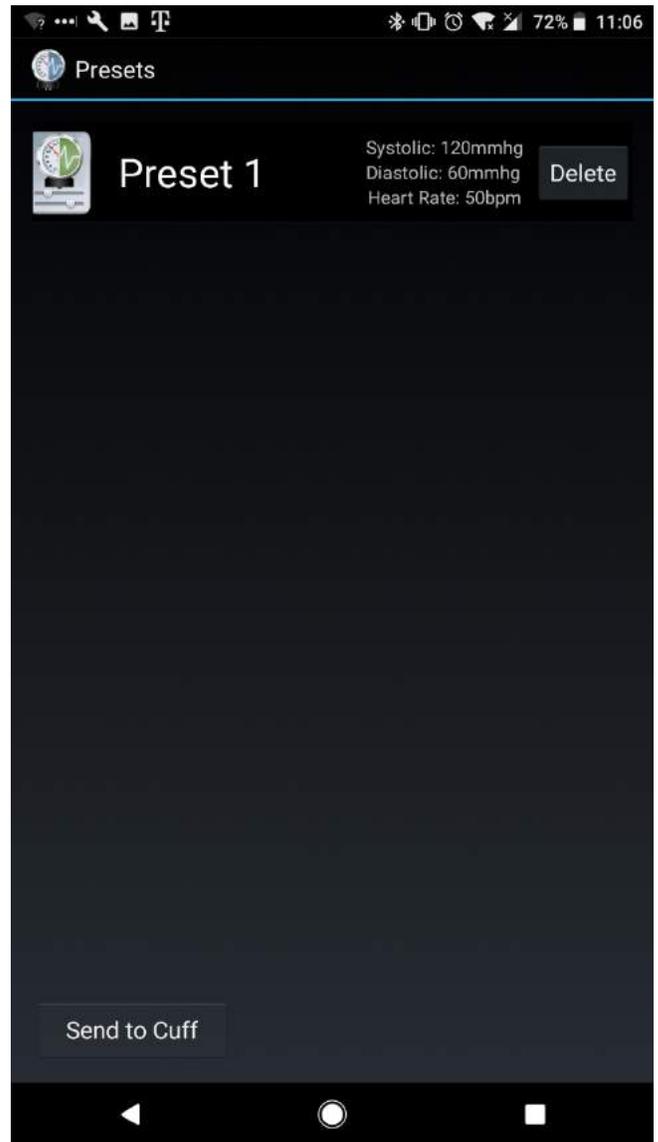
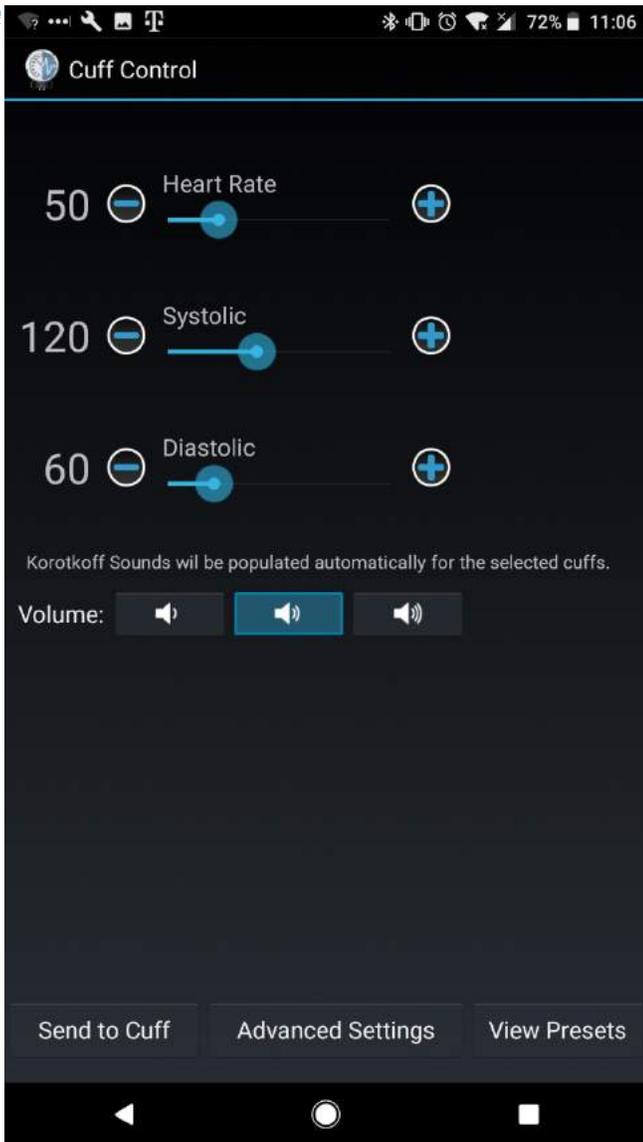
1. Within the “Cuff Control” menu, configure all the settings to the desired values.
2. If in the [Basic Settings] mode, tap the [Advanced Settings] button at the bottom of the screen.

3. Click [Save as Preset], then type in a descriptive name.



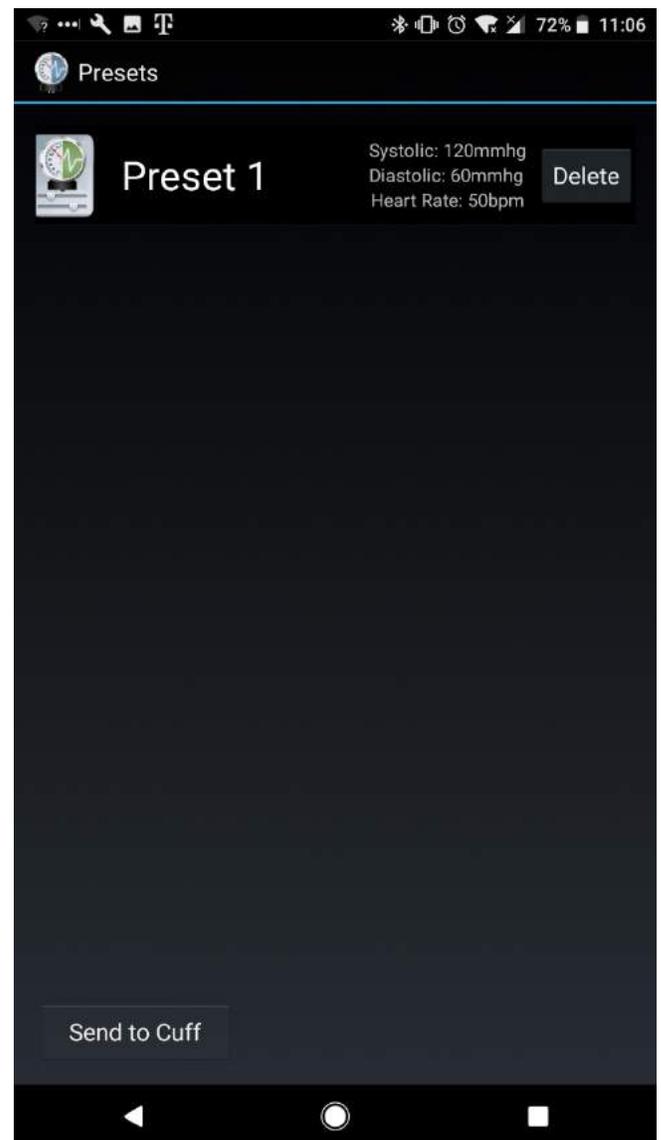
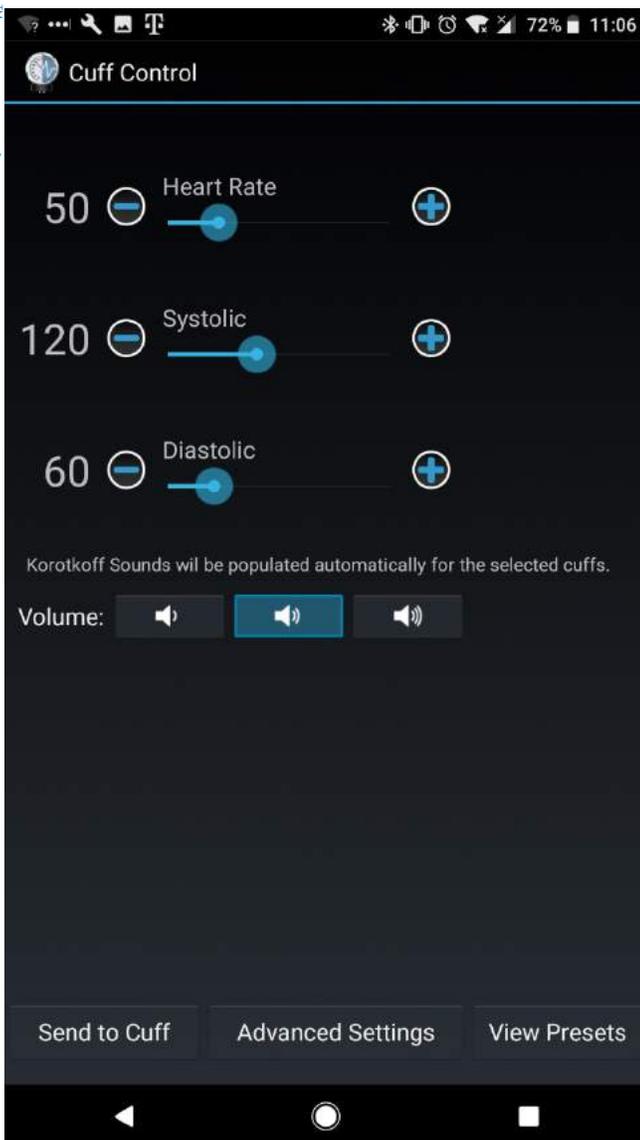
Deploying a Preset

1. Within the “Cuff Control” menu, confirm the app is in the [Basic Settings] mode. If not, tap the [Basic Settings] button at the bottom of the screen.
2. Click the [View Presets] button at the bottom of the screen.
3. Tap on whichever preset you would like to deploy, then tap on the [Send to Cuff] button at the bottom of the screen.



Deleting a Preset

1. Within the “Cuff Control” menu, check to see if it is in the [Basic Settings] mode. If not, tap the [Basic Settings] button at the bottom of the screen.
2. Click the [View Presets] button at the bottom of the screen.
3. Tap on the [Delete] button next to whichever preset you would like to remove.



GENERAL PROCEDURE

1. Remove the power cord from all BPSim™ cuffs you intend to use to power them on.
2. Ensure your iOS or Android device is connected to the same network as the BPSim™ cuff.
3. Within the BPSim™ app, tap on each device you would like to control.
4. Navigate to the “Cuff Control”, then set the desired values and tap on either [Send] or [Send to cuff].

5. Turn the air release valve counterclockwise to release any leftover pressure in the BPSim™ device. Then, turn the valve clockwise until the valve is sealed.
6. Secure each BPSim™ cuff to each manikin simulator, standardized patient, or participant, making sure to position the device so that the “Artery” label is positioned just above the *antecubital fossa*, or “crook” of the elbow. If desired, the pressure gauge can be stored in the loop of black fabric near the label.
7. Using a standard medical stethoscope, place the diaphragm-side of the chestpiece so that it sits against the skin, just below the “Artery” label on the cuff. The lip of the drum should be placed just slightly underneath the edge of the cuff and should gently rest on the surface of the skin for best performance.



IMPORTANT: Make sure that the diaphragm, or “drum”, portion of the stethoscope’s chestpiece is active, rather than the “bell.” If tapping lightly on the “drum” does not produce sound while listening through the stethoscope, try rotating the chestpiece until it snaps into its other position. The “drum” must be active to properly hear the simulator.



IMPORTANT: If the chestpiece is applied with too much pressure on the surface of the skin, the sound of blood flow will be inaudible. For the BPSim™ to work correctly, it is critical to use only minimal pressure to keep the drum of the chestpiece in place.

8. While listening through the stethoscope, raise the pressure of the cuff by squeezing the inflation bulb. The needle on the gauge will quickly rise, then begin to slowly fall depending on how open the air release valve is. If any blood flow noise can be heard, the pressure may be too low and must be raised by squeezing the inflation bulb until there is no perceptible noise.
9. As the needle begins to fall, notice when the needle begins to “pulse” – this is the patient’s heart rate.
10. Adjust the air release valve until the needle drops a single “tick” mark on the gauge per pulse. It will be far easier to determine the Systolic and Diastolic blood pressures this way.

11. Listen carefully through the stethoscope as the cuff pressure drops for the first audible occurrence of blood flow – this is the Systolic Pressure.
12. As the needle continues to fall, notice how the sound of the blood flow changes. Each change represents the transition through the various Korotkoff phases – there are five in total.
13. As the 4th Korotkoff sound tapers off and disappears, the moment the sound of blood flowing becomes inaudible marks the Diastolic Pressure and the transition into the 5th and final Korotkoff phase. The needle will stop pulsing soon after.
14. Release the rest of the air from the BPSim™ device and remove from the patient.
15. If done, attach the power cord to the BPSim™ cuff and store safely.

TROUBLESHOOTING & MAINTENANCE

COMMON PROBLEMS & RESOLUTIONS

Device sound is low or absent

- **Low volume setting** – The BPSim™ may be making sound, but is too low to hear. Try choosing a higher volume setting from the app.
- **Out of calibration** – The Korotkoff sounds may be out of sync with the pressure gauge. Run the calibration procedure from the app again.
- **Low or no charge** – Your BPSim™ may be low or out of charge, let it charge for approximately 8 hours and try again.

Pressure gauge needle does not move when pumped

- **Powered off or is in a bad state** – The cuff may not be receiving power or needs to be restarted. Plug the charging cord into the BPSim™ cuff for 1 minute, then disconnect and try again.
- **Air release valve is open** – The BPSim™ cuff works just like a real sphygmomanometer: if the air release valve is open while the inflation bulb is actuated, no pressure is built up in the cuff and the gauge will not register a pressure (this may be accompanied by a “hissing” or “whooshing” sound). Ensure the air release valve is closed before trying again.
- **Out of calibration** – The Korotkoff sounds may be out of sync with the pressure gauge. Run the calibration procedure from the app again.
- **Low or no charge** – Your BPSim™ may be low or out of charge, let it charge for approximately 8 hours and try again.

Pressure gauge needle does not move as expected or is inaccurate

- **Out of calibration** – The Korotkoff sounds may be out of sync with the pressure gauge. Run the calibration procedure from the app again.
- **Low or no charge** – Your BPSim™ may be low or out of charge, let it charge for approximately 8 hours and try again.

Unit does not appear in app or in Wi-Fi settings

- **Powered off or is in a bad state** – The cuff may not be receiving power or needs to be restarted. Plug the charging cord into the BPSim™ cuff for 1 minute, then disconnect and try again.

- **Low or no charge** – Your BPSim™ may be low or out of charge, let it charge for approximately 8 hours and try again.
- **Wi-Fi settings have changed or are misconfigured** – If the name or password of the Wi-Fi access point the BPSim™ unit is connected to has changed, or if the password stored in the BPSim™ unit does not match the actual Wi-Fi password, it will not show up in either the app or in your Wi-Fi settings. The only recourse is to hardware reset the device (as described on page 57) and reconfigure its settings.

Unit will not charge or the AC charger flashes in a red/green pattern

- **Hardware/charging error** – This can occur if the charging cable has been plugged into the BPSim™ device before being plugged into the wall. Disconnect the cable from the BPSim™ unit, plug the AC charger into the wall, then connect the power cord to the BPSim™ cuff.

Charger/cuff makes an electronic pulsating sound when plugged in

- **No action needed** – This is entirely normal while the BPSim™ cuff is charging. The charger for your BPSim™ unit uses a DC-DC peak detect charger, meaning that it tends to emit more noise when the battery is low. This noise will become quieter as the battery takes charge.

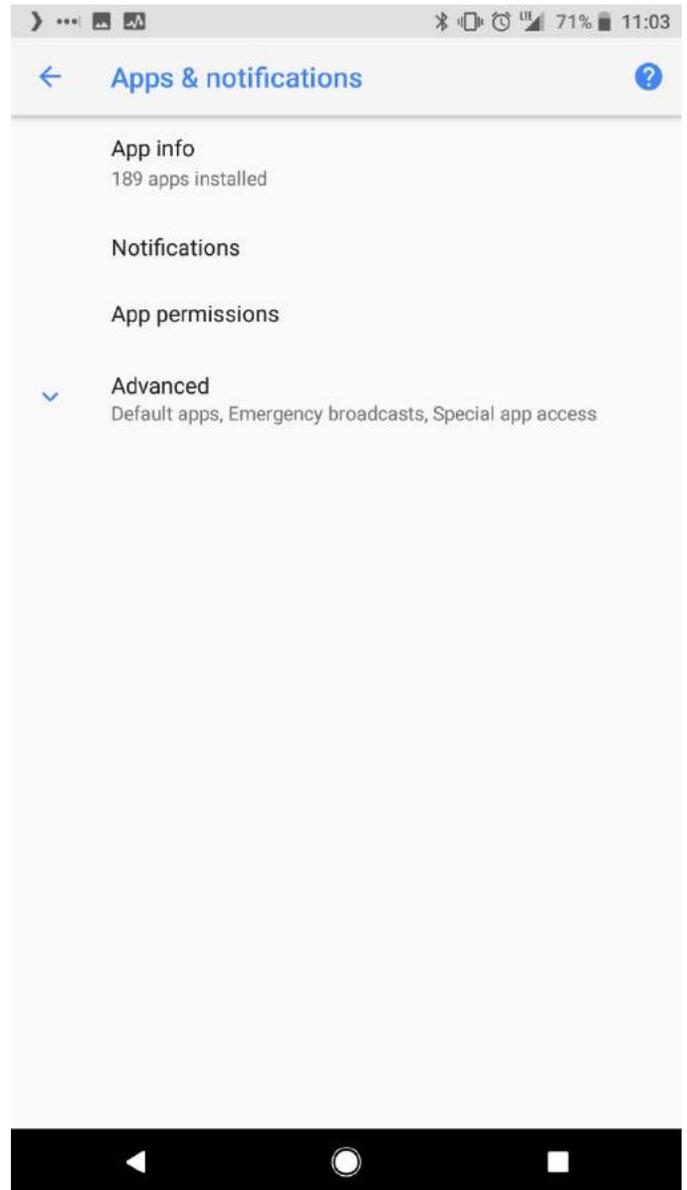
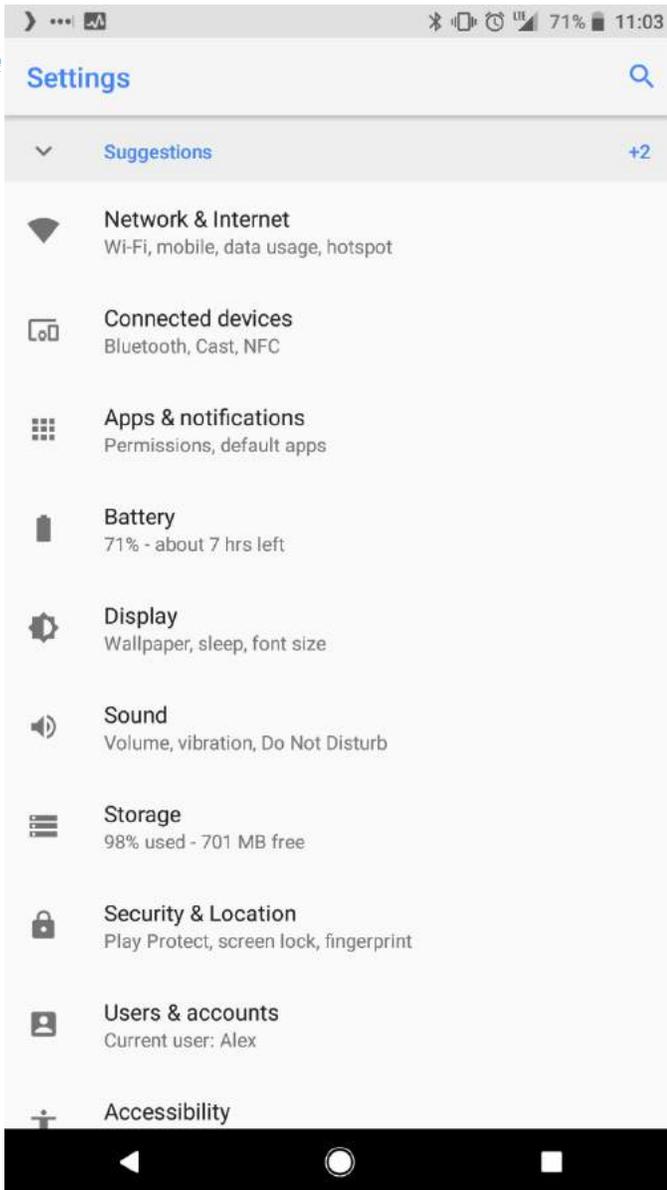
UNINSTALLING & RESETTING THE APP – ANDROID



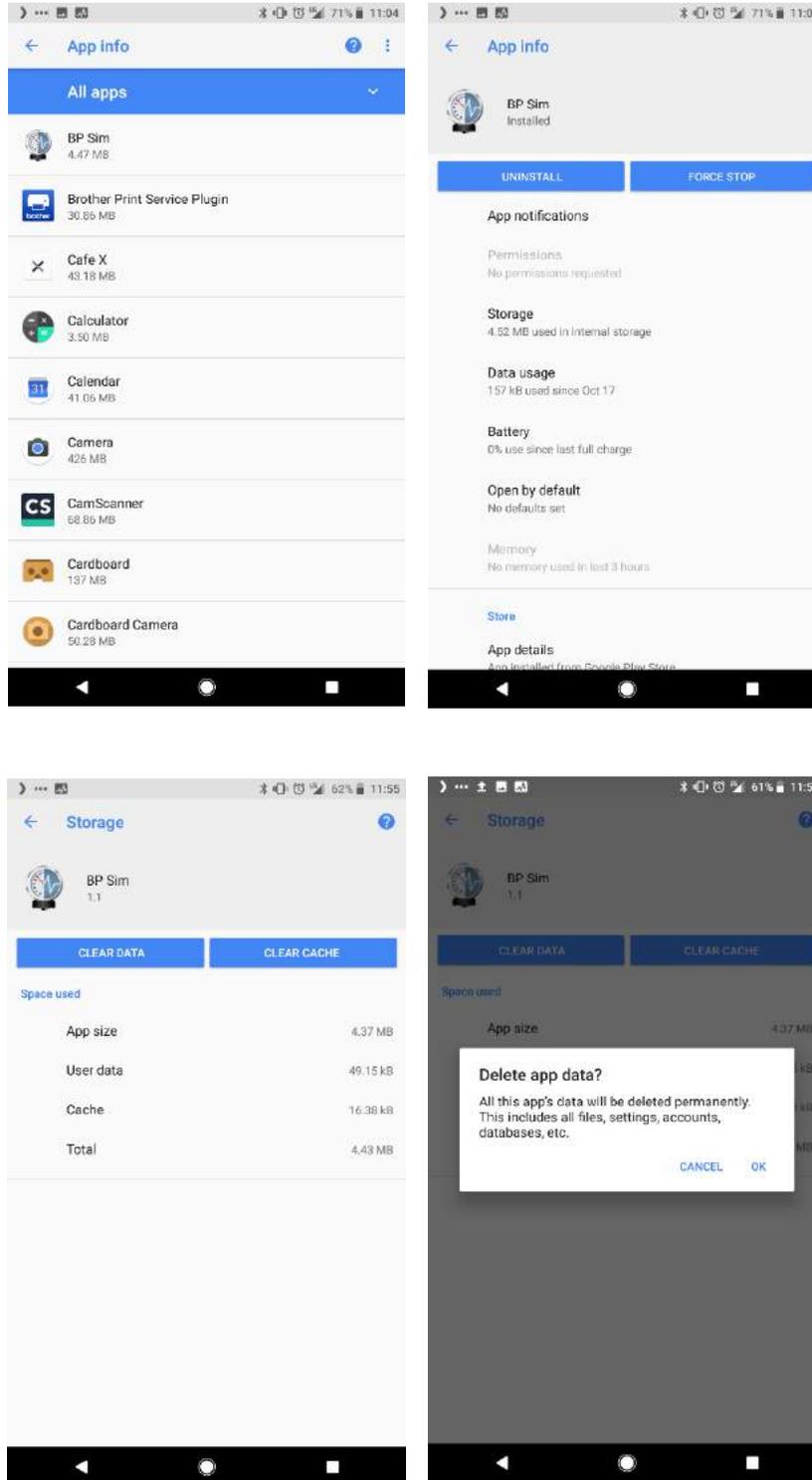
Note: All Android devices are different – these instructions are for an Android smartphone running the latest version of the OS (8.1 Oreo). These steps may vary slightly for your specific device.

Resetting & Clearing App Data

1. Go to the device settings menu on your Android device.
2. Tap on [Apps & Notifications], then [App info].

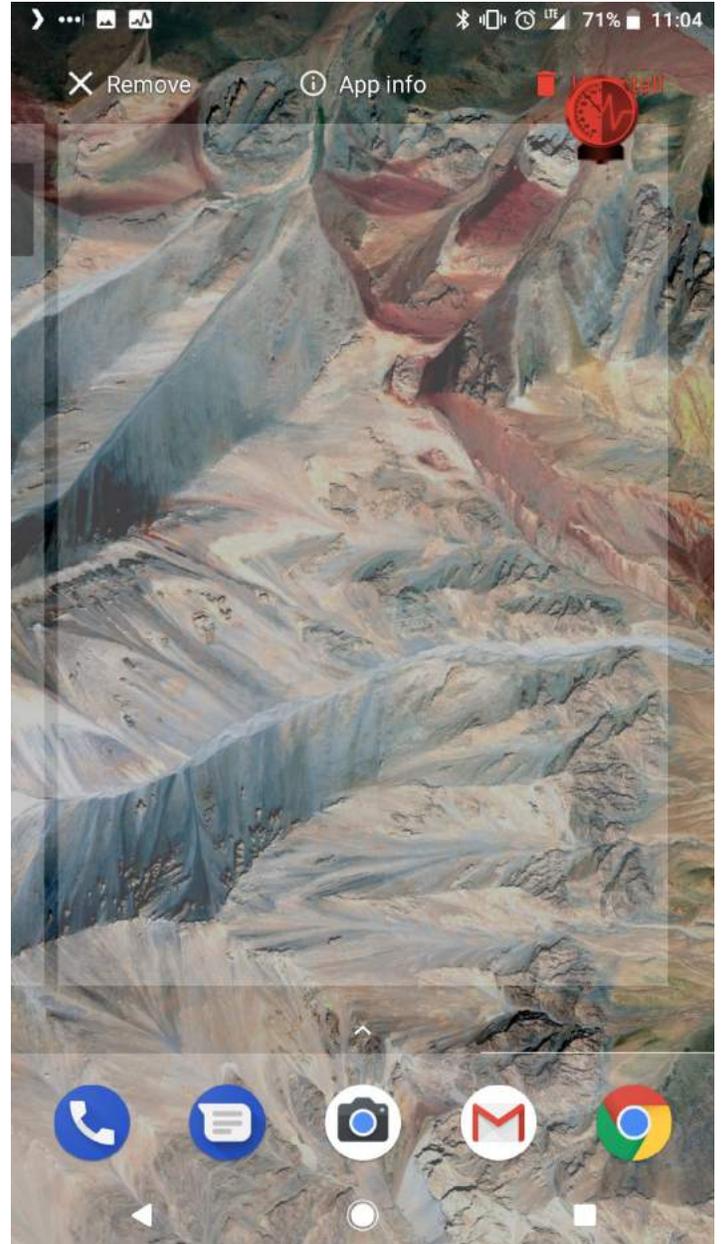


3. Within the list of applications, find and click on [BPSim™].
4. Tap on [Storage], then click on both [Clear Data] and [Clear Cache]. Tap [OK] to confirm on each if prompted.



Uninstall Method 1: Home Screen or App Drawer

1. Find the BPSim™ app on either your device's home screen or app drawer.
2. Touch and drag the icon to the upper right-hand corner of the screen, where the [Uninstall] icon should appear.
3. Let go of the icon and accept the uninstallation if prompted.

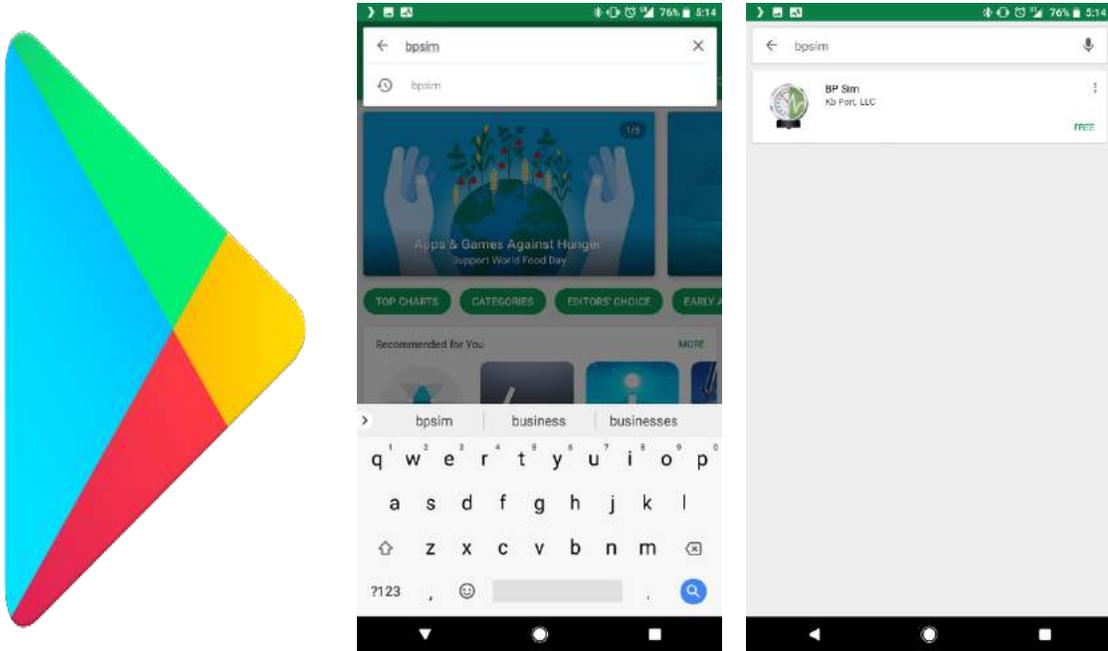


Uninstall Method 2: Google Play Store

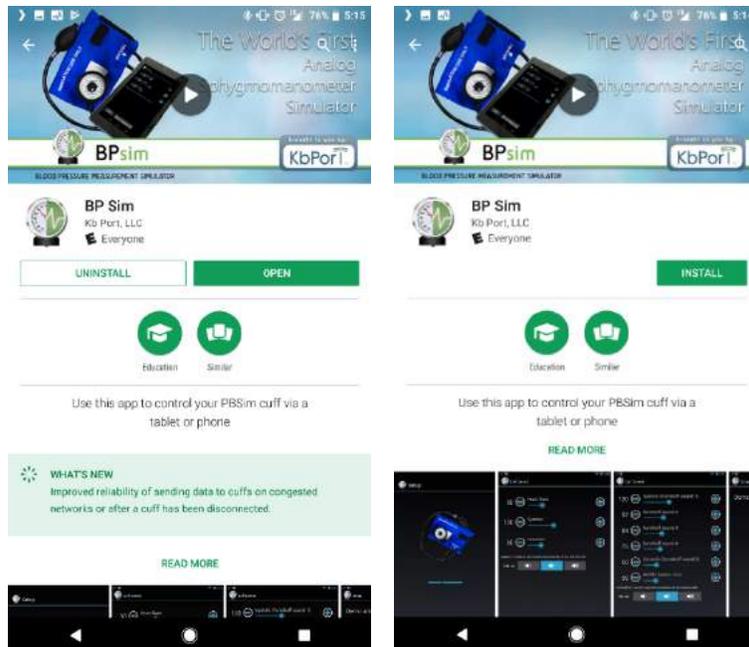
1. Locate the Google Play Store icon on your device. If not available on one of your home screens or the dock at the bottom of your screen, look for it in your list of installed applications.



- Use the search bar at the top of the Google Play Store screen to search for “BPSim” and look for the BPSim™ application (authored by “Kb Port, LLC”).

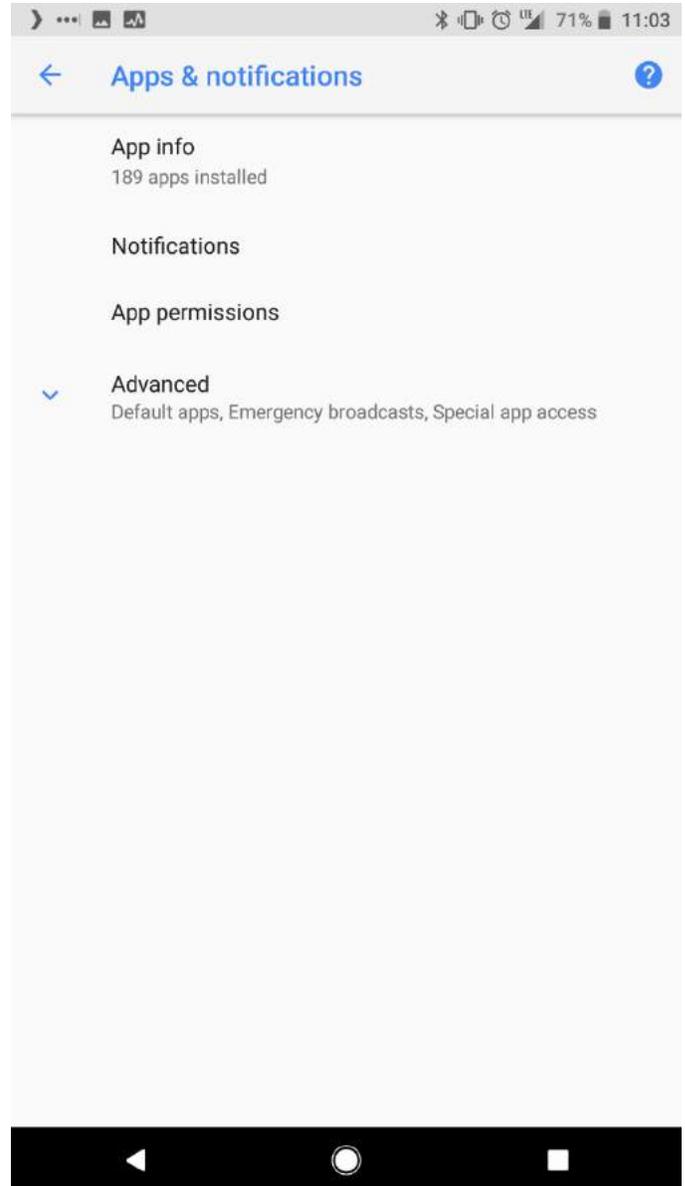
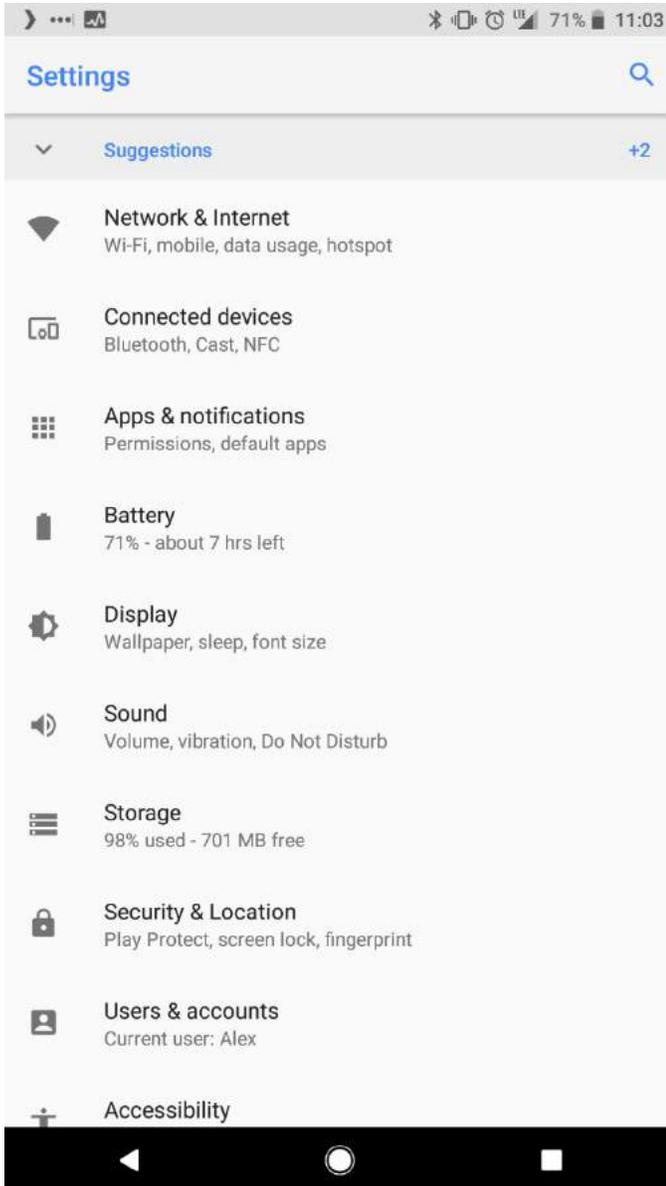


- Tap on the application, then touch the green [UNINSTALL] button to begin the download and installation process. Tap [ACCEPT] to any permissions that are required.

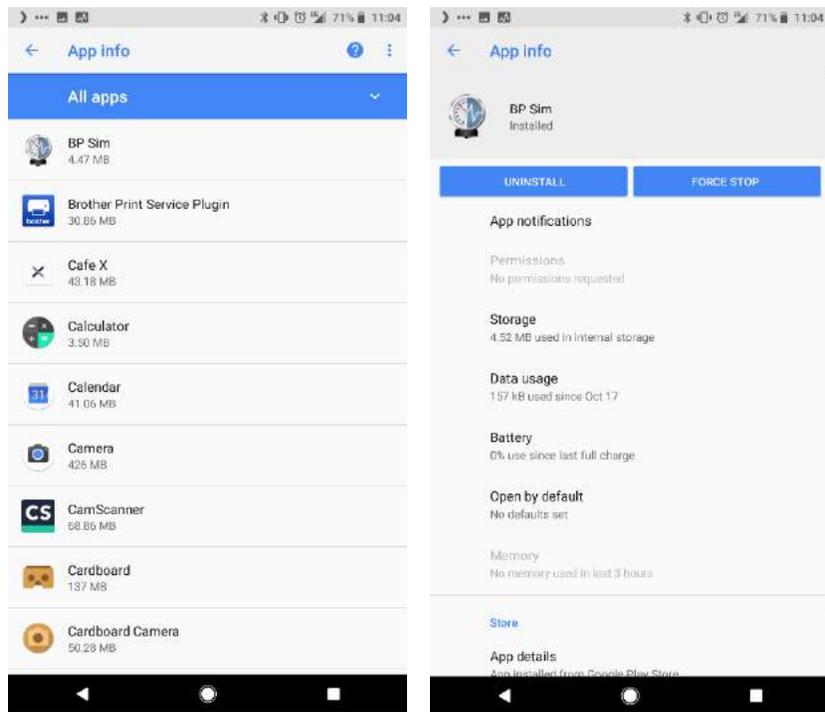


Uninstall Method 3: Application Settings

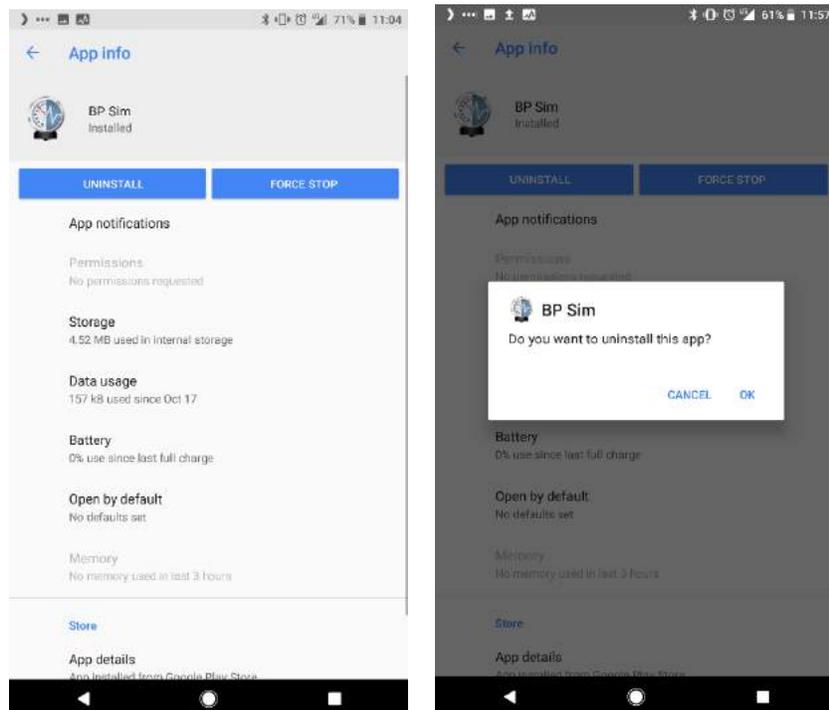
1. Go to the device settings menu on your Android device.
2. Tap on [Apps & Notifications], then [App info].



3. Within the list of applications, find and click on [BPSim™].

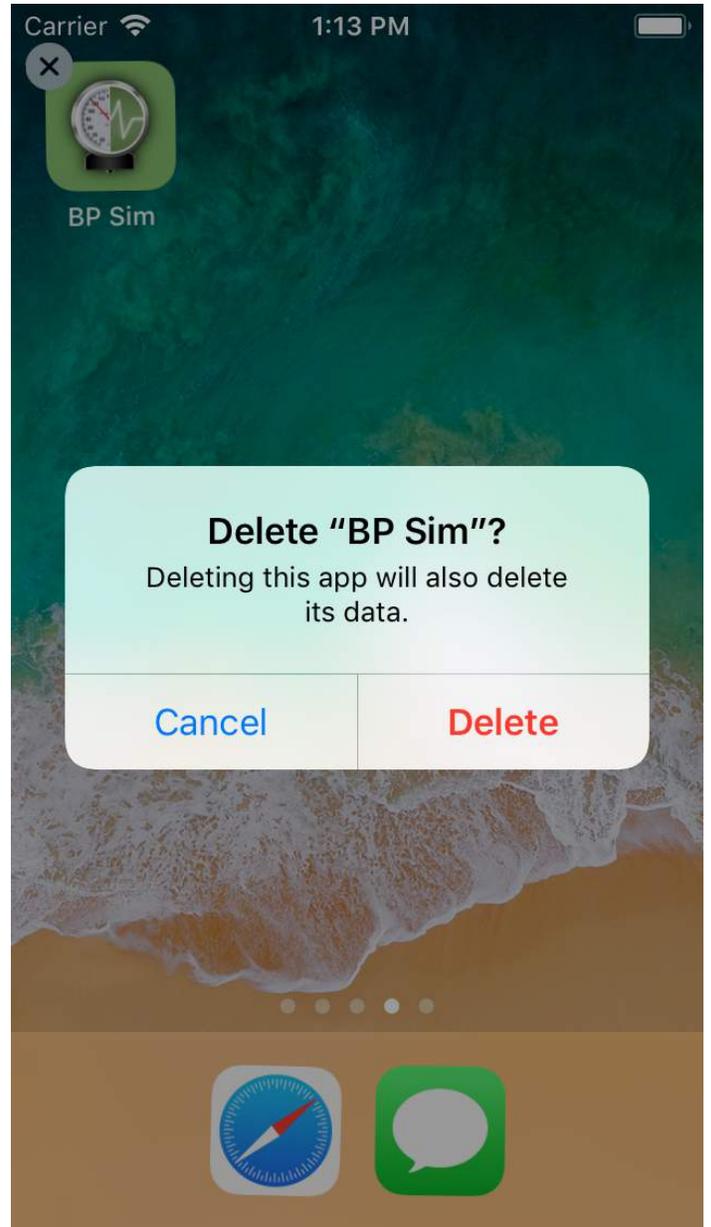
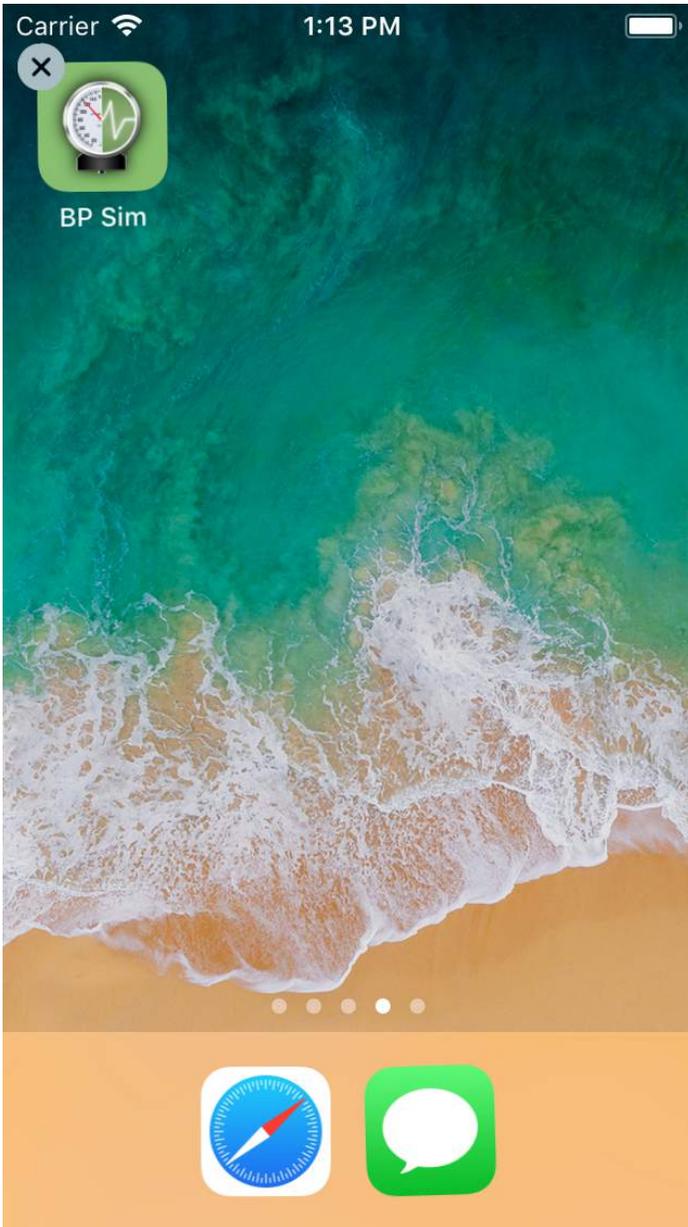


4. Tap on [Uninstall], then [OK] to accept.



UNINSTALLING & RESETTNG THE APP – IOS

1. Find the BPSim™ app on your iOS device's home screen.
2. Tap and hold on the BPSim™ app icon until small [x] appears on the upper left-hand corner of the icon.
3. Click on the [x] and confirm the uninstallation by tapping on [Delete].



HARDWARE RESETTING THE BPSIM™ DEVICE



IMPORTANT: This is a last resort. Performing a hardware reset on your BPSim™ device will reset all passwords, calibration, access point information, and Wi-Fi settings. After reset, you will have to perform all configuration steps from scratch. Only do this if absolutely necessary.

1. Open the bottom of the BPSim™ cuff and carefully remove the air bladders and simulator module from the canvas housing.
2. At the bottom of the simulator module, there is a small hole located towards the middle. Insert a small screwdriver or paper clip into the hole and hold for 15 seconds.
3. Carefully install the air bladders and simulator module back into the canvas housing.
4. Reconnect the BPSim™ device to power, wait 1 minute, then disconnect.
5. Connect your iOS or Android device to the BPSim™ unit's default access point and configure once again.