Jabra Perform JPBP SDK for Android

Doc Revision: 2.1.0
SDK Revision: 4.6.00
Release Date: Sep 20, 2023

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Introduction

This document is an introduction to the Jabra Perform BlueParrott (JPBP) SDK for Android that allows access to the Configurable Button on selected Jabra and BlueParrott headsets.

The Configurable Button on the headset has an initial factory setting that allows the user to mute the headset microphone. This Configurable Button can be accessed from a mobile application to program alternative functions.

The JPBP SDK enables developers to create apps that interact with this Configurable Button thus allowing the headset user to access functions of your application by pressing the Configurable Button.

SDK Purpose

The purpose of the JPBP SDK is to let you, a corporate or independent developer, develop applications that allow the end user to benefit from alternative functions for the Configurable Button found on a range of Jabra and BlueParrott headsets (see Appendix A).

Through use of the JPBP SDK you can access the Configurable Button. When your mobile application has been published the headset user may then control programmed activities within your mobile application directly from the headset via the Configurable Button.

Typical uses of the JPBP SDK include integration with:

- Push to Talk and Voice Messaging Applications, where recording is triggered by pressing the Configurable Button
- Voice Recognition and custom Voice Assistant applications, where the Voice Assistant is triggered by tapping the Configurable Button
- Other Enterprise Applications, where custom features can be triggered based on one or more button event

The Configurable Button can be configured to trigger up to five Button Events in your application:

- Press (for example to start a Push to Talk Call)
- Release (for example to end a Push to Talk Call)
- Single Tap (to invoke a voice recognition or other enterprise application)

- Double Tap
- Long Press

You may program each of these events for individual functions within your mobile application.

The SDK can also report changes in the proximity sensor on the headset (where available, not all headsets contain a proximity sensor).

The Configurable Button may also be programmed to a number of functions that do not result in events being sent to the application (e.g., Speed Dial).

You may limit your application to operating in the foreground only or you may wish to offer a smoother, more integrated experience for the headset user by extending your application to offer handling of button events even when your application is in the background.

SDK Scope

The JPBP SDK provides interfaces to the following functions in compatible headsets (see Appendix A):

- Setting the Configurable Button into 'SDK Mode', this will result in button events being sent to your application
- Event Handlers for Configurable Button events
- Configuring the Configurable Button to Speed Dial: Dials the specified phone number when the button is pressed
- Configuring the Configurable Button to Mute: Disables the microphone on the headset during a phone call. Pressing the Configurable Button again will un-mute the headset
- Setting the Configurable Button to “App Mode” with a specific App ID and App Name This allows another app using the SDK to receive button events, and if multiple apps are installed that make use of the Configurable Button, each can check if they are the currently configured app
- Setting the Configurable Button to a custom mode. Some headsets may offer features that can be accessed through the Configurable Button by configuring it to a custom mode. For more details on custom modes, contact your Jabra/BlueParrott representative
- Listening for Proximity change events (on supported headsets), when the user puts the headset on and off their head

The package includes the following development tools:

- SDK Library

- Example test application to show connectivity and connected device Configurable Button state
- Notes and reference documentation

Not in Scope

This document does not cover Android programming specifics, the developer should access the relevant sites for the development language.

Updates

The JPBP SDK will be updated from time to time, please check for updates at the following location: https://github.com/gna-sw

Supported Operating Systems

The current JPBP SDK for Android supports Android 6 and higher.

Getting Started

Including the SDK

Add the JPBP SDK to your project by importing the ‘blueparrottsdk-release.aar’ file into your project as a module.

Then add a dependency in your projects App Gradle file as follows

```
dependencies {
    compile(name: 'blueparrottsdk-release', ext: 'aar')
```

In addition the following will be required in the project build Gradle

```
repositories {
        flatDir {
```

```
            dirs 'libs'
        }
```

How the SDK Connects to the Headset

SDK Communication between the handset and headset is via Bluetooth and can be over one of three connection modes

- Auto
- Bluetooth Classic (BR/EDR)
- Bluetooth Low Energy (BLE).

(This SDK connection is separate to the normal connection between the handset and headset for audio/call handling which is handled automatically by the operating system) All headsets support SDK connection via BLE, and most but not all support the SDK connection over Bluetooth Classic.

This can be transparent to the developer, although in certain circumstances you may wish to force the SDK to connect over a Bluetooth Classic connection. On some Android versions this is more stable, and also requires fewer permissions, making it easier to integrate into Enterprise Applications.

You may choose to force the SDK to connect via Bluetooth Classic, BLE, or allow it to automatically select the protocol using the Auto option, which will attempt to connect via Bluetooth Classic first, and if that fails will attempt to connect over BLE.

Permissions

Enable Bluetooth

The JPBP SDK manages the Bluetooth connection but you must manage the enabling of Bluetooth in your code. An approach to this is to alert the application user if Bluetooth is not available and ask the user to turn Bluetooth on in their handset settings, you must then provide another opportunity to connect.

Manifest Permissions

For Bluetooth Classic Connections you need the following permissions:

```
<!-- Request legacy Bluetooth permissions on older devices. -->
<uses-permission android:name="android.permission.BLUETOOTH"
android:maxSdkVersion="30" />
```

```
<uses-permission android:name="android.permission.BLUETOOTH_ADMIN"
android:maxSdkVersion="30" />

<!-- Needed to connect on Android 12+ for any bluetooth connection -->
<uses-permission android:name="android.permission.BLUETOOTH_CONNECT" />
```

For BLE Connections, you need the following permissions in your manifest:

```
<!-- Legacy permissions to scan over BLE prior to Android 12 -->
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"
/>
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />

<!-- Needed only if your app looks for and connects over Bluetooth low
Energy on Android 12+ -->
<uses-permission android:name="android.permission.BLUETOOTH_SCAN"
android:usesPermissionFlags="neverForLocation" />
```

Runtime Permission Prompts

For many permissions, you will need to prompt the user to grant access in your application at runtime. The following permissions require runtime permissions. For an example of how to code these permission requests, see the source code for the Demonstration App.

```
"android.permission.BLUETOOTH_CONNECT"
"android.permission.ACCESS_COARSE_LOCATION"
"android.permission.ACCESS_FINE_LOCATION"
"android.permission.BLUETOOTH_SCAN"
```

Connect to the Configurable Button

The JPBP SDK connect() method creates a connection from your application to the headset.

As described above, there are a number of methods to connect depending on the headset being used. Auto attempts to connect via Bluetooth Classic first and if that fails will attempt to connect over BLE. The connect() method takes one of the following parameters.

CONNECT_METHOD_AUTO	Attempts to connect to SDK via Bluetooth Classic connection.If this fails will attempt connection over BLE
CONNECT_METHOD_CLASSIC	Attempts to connect to SDK via Bluetooth Classic connection
CONNECT_METHOD_BLE	Attempts to connect to SDK via BLE connection

```
import com.blueparrott.blueparrottsdk.BPSdk;
import com.blueparrott.blueparrottsdk.BPHeadset;

BPHeadset headset;

    // Get a handle to the Configurable Button on the headset
    headset = BPSdk.getBPHeadset(this);

    if (!headset.connected()) {
                Log.d(TAG, "Connecting");
                headset.connect(CONNECT_METHOD_AUTO);
                   // perform your own code
    }
```

Listen for Connection Events

Through the JPBP SDK your app can get a handle to the Configurable Button on the headset, you can then add a Headset Listener.

The Headset Listener allows your application to listen for the stages associated with establishing a connection to the Configurable Button through the methods

- onConnect - when the SDK has successfully connected over bluetooth
- onConnectFailure - when the SDK has failed to connect

- onConnectProgress - an event to monitor the steps in making the connection
- onValuesRead - after the sdk has connected it reads some headset values (firmware version etc.) and these are now available to read

Connected

When your app is successfully connected to the Configurable Button a connected event is triggered.

```
...
      //override method in IBPHeadsetListener
      @Override
      public void onConnect() {
          Log.d("Connected");
          //place your code here
      }

      @Override
      public void onValuesRead(){
          Log.d(TAG,"headset values are available to use");
          // can now read appname, firmware version etc.
      }
```

Connection Failure

If the connection attempt fails the onConnectFailure method is called with an error Code which can be handled in your code.

```
//Method from class : com.blueparrott.blueparrottsdk.BPHeadsetListener
@Override
public void onConnectFailure(int errorCode) {
      //handle the connection failure here
      //this may include instruction "Retry or turn headset off then on"
}
```

Reason Code	Value	Meaning
UPDATE_ANDROID	1	Android OS 4.4 or greater required for Classic Connection
BLUETOOTH_NOT_AVAILABLE	2	Bluetooth is not turned on
ALREADY_CONNECTED	3	Parrott Button is already connected
ALREADY_CONNECTING	4	Another connection attempt is already under way
NO_HEADSET_CONNECTED	5	There is no Bluetooth headset connected
HEADSET_NOT_SUPPORTED	6	Headset may not support Configurable Button
UPDATE_YOUR_FIRMWARE	7	Firmware on the headset is not offering Configurable Button Service. Firmware may be too old
UPDATE_YOUR_SDK_APP	8	This SDK/App is too old to connect to the firmware version on headset
HEADSET_DISCONNECTED	9	Headset Bluetooth Classic connection disconnected during BLE connection attempt
TIMEOUT	10	Unknown error, connection attempt has timed out
BLE_REQUIRES_LOLLIPOP	11	Android OS 5.0/Lollipop or greater required for BLE Connection

Through the JPBP SDK your app can get a handle to the Configurable Button on the headset, you can then add a Headset Listener.

Connection Progress

You may retrieve the status of progress during the connection process, as connection may take time it is advisable to keep your user informed of progress.

```
//Method from class : com.blueparrott.blueparrottsdk.BPHeadsetListener
@Override
public void onConnectProgress(int progressCode) {
      Log.d(TAG, "Progress Code:"+progressCode);
      Log.d(TAG,getStatusDescription(progressCode));
}
```

Status	Value	Meaning
WAITING_TO_CONNECT	0	Connection attempt will commence shortly
STARTED	1	Connection attempt has started
FOUND_CLASSIC_HEADSET	2	A Bluetooth headset has been found
REUSING_CONNECTION	3	Another app is connected over BLE, attempting to reuse connection
BLE_SCANNING_	4	Scanning for BLE services
FOUND_BP_SERVICE	5	The Configurable Button service has been found
CONNECTING_TO_BLE	6	Attempting to connect to the Configurable Button service over BLE
READING_HEADSET_VALUES	7	BLE connection established, reading settings from headset

USING_BT_CLASSIC	8	Connection being made using Bluetooth Classic

Setting the Configurable Button SDK Mode

Once connected to the Configurable Button the next step is to enable the Configurable Button in order to send events from the Configurable Button on the headset to your application on the handset. It is possible to check to see if the Configurable Button has been enabled previously and if not you may proceed to enable it.

If required by your program you may also disable the Configurable Button SDK this would reset the Configurable Button to the factory setting of a mute button.

```
//enable headset SDK mode - enable your app to receive button events
if (!headset.sdkModeEnabled()) {
      logStatus("Enabling SDK...");
      headset.enableSDKMode();
}

//disable headsetSDKMode - put button back to mute mode
if (headset.sdkModeEnabled()) {
    headset.disableSDKMode();
    //do something...
}
```

enableSDKMode Method

Signature:
enableSDKMode()
enableSDKMode(String appName)

Description:
There are now two methods to enable SDK mode in the SDK: enableSDKMode() and enableSDKMode(String appName). The new method allows the app to set the App Name while still putting the headset into SDK mode. This can allow the current app to know if it was the last app to put the headset into SDK mode.

Callbacks:
Results in a call to onModeUpdate() or onModeUpdateFailure()

setMuteMode Method

Signature:
setMuteMode()

Description:
This sets the headset into the default Mute mode.

Callbacks:
Results in a call to onModeUpdate() or onModeUpdateFailure()

setCustomMode Method

Signature:
setCustomMode(Integer mode)

Description:
This sets the headset into a custom mode.

Callbacks:
Results in a call to onModeUpdate() or onModeUpdateFailure()

Discussion:
The mode can be set to one of several preset modes, or a custom integer more can be set (if supported by the headset). For more details on custom modes, contact your Jabra/BlueParrott representative.

Preset modes are as follows:

Reason Code	Value	Meaning
BUTTON_MODE_UNKNOWN	-1	An unknown mode. This can be returned if the current mode has not been read yet.

BUTTON_MODE_MUTE	0	Mute on call mode. This is the default mode.
BUTTON_MODE_SPEEDDIAL	1	Speed dial a specific number.
BUTTON_MODE_PARTNER_APPLICATION	2	Compatible App or SDK Mode.

Listen for Configurable Button Mode Update

You can monitor the success of enabling the SDK using the mode update methods from the Headset Listener.

```
//Methods from class : com.blueparrott.blueparrottsdk.BPHeadsetListener

//Listen for success of SDK mode update
@Override
public void onModeUpdate() {
    logStatus("Mode Updated");
}
```

Listen for Configurable Button Mode Update Failure

```
//listen for failure of mode update
@Override
public void onModeUpdateFailure (int reasonCode) {
      logStatus("Mode Update Failed. Reason"
+getUpdateErrorDescription(reasonCode));
      //handle error
```

```
}
```

If mode update fails you may look for one of the following update errors to provide feedback to the user.

Reason Code	Value	Meaning
NOT_CONNECTED	1	BLE connection not available
WRITE_FAILED	2	Writing to headset over BLE failed
TIMEOUT	3	Operation timed out

Once you enable the SDK on the Configurable Button data can be sent over Bluetooth from the headset to your app for Configurable Button events.

You can then use Headset Listener to monitor the traffic from the headset.

Once enabled the SDK remains enabled on the headset until either your app disables the SDK or the user resets the headset.

Listening for Configurable Button Events

Once connected to the Configurable Button, with the button enabled to send events, the Headset Listener for the JPBP SDK may be used to monitor presses of the Configurable Button.

When the user clicks on the headset Configurable Button your app will receive an event and can react to the user's interactions.

The Headset Listener provides methods to allow your code to interact with the users headset Configurable Button clicks:

- Button Down - button has been pressed
- Button Up - button has been released

- Tap - single tap
- Double Tap
- Long Press

```
//Methods from class : com.blueparrott.blueparrottsdk.BPHeadsetListener
@Override
public void onButtonDown(int buttonId) {
    Log.d(TAG,"Button Down");
    //your code goes here
}

@Override
public void onButtonUp(int buttonId) {
    Log.d(TAG,"Button Up");
     //your code goes here
}

@Override
public void onTap(int buttonId) {
    Log.d(TAG,"Tap");
    //your code goes here
}

@Override
public void onDoubleTap(int buttonId) {
    Log.d(TAG,"DoubleTap");
    //your code goes here

@Override
public void onLongPress(int buttonId) {
    Log.d(TAG,"Long Press");
    //your code goes here
}
```

Listening for Proximity Events

Once connected to the Configurable Button, the JPBP SDK may be used to monitor changes in the proximity sensor on the headset.

Possible values for the proximity state are 0 (Off) and 1 (On).

```
// Methods from protocol: BPHeadsetListener

@Override
public void onProximityChange(int status) {
   Log.d(TAG,"Proximity Change ="+status);

}
```

Disconnecting from the Configurable Button

Now you have the ability to check if the Configurable Button is connected and you can disconnect the Configurable Button in your code if required.

```
    if (headset.connected()) {
               Log.d(TAG,"Disconnecting..");
               headset.disconnect();
     }
```

Listen for Disconnect

Using the Headset Listener you may listen for a disconnect event in your program and carry out any appropriate actions and housekeeping at this point.

```
public class BpSDKDemo extends AppCompatActivity implements
BPHeadsetListener {
      //add a BPHeadsetListener
    headset.addListener(this);
```

```
@Override
public void onDisconnect() {
    Log.d(TAG,"Disconnected");
     //tidy up here
}
```

Enterprise Values

On some compatible headsets, there may be one or more enterprise values which can relate to hardware-specific functions (e.g., the headset may be put into “warehouse mode” which could affect how pairing is managed). There are a number of properties, events and methods related to the enterprise values in the headset.

enterpriseValuesRead Property (Readonly)

Indicates whether the SDK has finished retrieving all enterprise values from the headset. After the app receives the `onConnect()` event, this will be FALSE. After the `onEnterpriseValuesRead()` event, this will return TRUE.

onEnterpriseValuesRead Event

This is called on the Headset Listener when the SDK has finished retrieving all enterprise values from the headset.

setConfigValue Method

Signature:
setConfigValue(Integer key, String value)

Description:
Sets the value for a specific enterprise key. Details for the keys applicable for a specific headset and the possible values are described below.

getConfigValue Method

Signature:
getConfigValue(Integer key)

Description:
Retrieves a specific enterprise key. Details for the keys applicable for a specific headset and the possible values are described below.

Returns:
Returns a string representing the value of the enterprise key.

getConfigValues Method

Signature:
getConfigValues()

Description:
Retrieves all enterprise keys from the headset. Details for the keys applicable for a specific headset and the possible values are described below.

Returns:
Returns a dictionary containing NSNumber representations of the keys and Strings for the values.

Configuration Key and Values

Only the keys and values described below should be set in an application.

Config Key	Description
1	Voice Control
2	General Headset configuration

3	Warehouse Features

The values that can be set for each key are detailed below.

Key 1 - Voice Control

This is an integer-type value, where specific bits can be set to change the behavior of the voice recognition feature built into the headset.

Bit	Description
4	Voice Trigger to Talk / Voice trigger will mimic the Configurable Button functions (B550-xt version 1.34 and higher)
5	'Hello Blue Parrott' now triggers phone command instead of 'Say a command' (B550-XT)
6	Disable the 'always listening' triggers
7	Disable 'answer or ignore' on incoming calls
8	Enable BPEC ("Blue Parrot End Call")
9	Disable voice prompts

Key 2 - General Headset Configuration

This is an integer-type value, where specific bits can be set to change some high-level behavior of the headset.

Bit	Description
1	Warehouse mode all modes on. If this is set then all Warehouse modes are enabled and it disregards configuration key 3
2	Kodiak AT commands. This key will enable Kodiak AT commands if there is no BLE connection.
4	Multifunction Button (MFB) / Configurable Button Switch Enable (M300 Only)
5	Parrott Button disconnection will cause the 'headset is disconnected' prompt to play
14	Reserved
15	Disable Proximity sensor (B550, B650, S650 only)

Key 3 - Warehouse Features

This is an integer-type value, where specific bits can be set to change different features that may be useful in a warehouse usage scenario.

Bit	Description
0	Overrides the headset friendly name to have the last 4 digits of the Bluetooth MAC address added
1	Enables the headset pairing list to be cleared every time the headset is put into pair mode

2	Disables the 'Cancel' or 'End Call' function of the MFB
3	Disables the 'Establish SLC[1]' event when the MFB is pressed – disabling this option will prevent headset from reconnect to handset device
4	Disables the 'Answer' event when the MFB is pressed
6	Receiver Soft Mute (B450, C300 only)
7	Enable Receiver Hard mute (B450, C300 only). **Note:** receiver mute must be enabled to enable hard mute
9	Version Disable - Removes version from friendly name
10	Enable CMFB (button events generated by MFB).

[1] HFP profile connection requires RFCOMM connection first and then a Service Level Connection (SLC) on top of RFCOMM. HFP profile is only considered fully connected when SLC is established

Example:

Assume we would like to enable the features to have the last 4 digits of the Bluetooth MAC address and also would like to disable the “Answer” event when the MFB is pressed. These keys relate to Key 3, and we need to set Bits 0 and 4 on the key.

In binary, the value to set Bit 0 is: 00000001

In binary, the value to set Bit 4 is: 00010000 (note that the first Bit is referred to as “Bit 0” and we count up from there moving to the left).

In order to set both bits, we just “OR” the values together, to get: 00010001.

To set this value on the key, we convert 00010001 to decimal: 17.

Now we can call the setConfigValue method, and pass it in the integer 3 for the ***key***, and the string “17” as the ***value***.

Other Configurable Button Functions

After the application has received the onValuesRead callback, the application can query the current state of the Configurable Button configuration.

getAppKey

The current App Key for the headset (if the headset is in BPButtonModeApp), as a String. If the headset is currently in SDK mode, this will return “sdk”. This can be set by an application, and then later queried to check if another app has configured the Configurable Button (and then possibly ignore button events).

getAppName

The current App Name for the headset (if the headset is in BPButtonModeApp), as a String. If the headset is currently in SDK mode, this will return “SDK” unless the app has set the App Name to something different.

getSpeedDialNumber

The number that will be dialed by the headset when the Configurable Button is pressed, if the headset is in BPButtonModeSpeedDial, as a String.

getFriendlyName

Returns the friendly name of the connected headset.

getModel

Returns the model of the connected headset as a hexadecimal string. See Appendix A for the list of headsets and their model numbers.

valuesRead()

Indicates whether the SDK has finished retrieving all values from the headset. After the app receives the `onConnect()` event, this will be FALSE. After the `onValuesRead()` event, this will return TRUE.

The SDK can also be used to set the mode of the headset, which can change the behavior of the Configurable Button or potentially change the headset function (e.g., using a Custom Mode could change whether the headset resets its pairing list on being connected to a power source).

Some of the methods that can affect the mode of the Configurable Button or headset are described below:

setAppMode

Signature:
setAppMode(String appKey, String appName, String partnerAppPackageName)

Description:
This sets the headset into App Mode with the given App ID and App Name.

Callbacks:
Results in a call to onModeUpdate() or onModeUpdateFailure()

setSpeedDialMode

Signature:
setSpeedDialMode(String phoneNumber)

Description:
This sets the headset into a Speed Dial mode with the given number.

Callbacks:
Results in a call to onModeUpdate() or onModeUpdateFailure()

setSendAnalytics

Signature:
setSendAnalytics(boolean useAnalytics)

Description:
A static method on the BPSdk class that determines whether the SDK will send anonymous usage statistics to Jabra/BlueParrott. This can be used during development to help troubleshoot issues and improve the SDK. The default value for this property is NO.

Callbacks:
None

getSendAnalytics Property

Returns the value previously set by setSendAnalytics

Support

Please report problems with this SDK through the public issue tracker on GitHub.

Legal

Note that by using JPBP SDK for Android, you accept our Developer Terms of Service.

Appendix A: Supported Headsets

The following is a list of devices which have a Configurable Button and are supported by the JPBP SDK.

BlueParrott Headsets

Headset	Model
M300-XT	0029
M300-XT SE	002d
B550-XT	0021
B650-XT/S650-XT	0028
B450-XT Classic	0008
B350-XT	0011
B450-XT	0025
C400-XT	0020
Reveal Pro	0012
S450-XT	1388
C300-XT	0022

Jabra Headsets

Headset	Model
Perform 45	2e45

Appendix B: Simple Sample Application

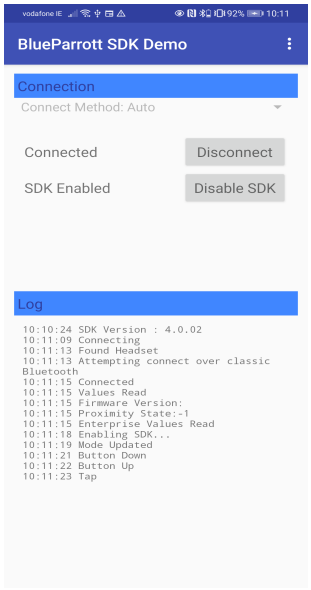
The ‘BlueParrottSDKDemo’ Application is a sample of a simple integration, allowing the developer to get up and running quickly while using the JPBP SDK.

The BPSDKSample application runs in the foreground only. It allows you to connect to and disconnect from the Configurable Button. You may enable and disable the SDK Mode on the Configurable Button. When the SDK is enabled the app gives feedback on the presses of the Configurable Button through the log and UI.

This simple demo includes the following features:

- Displays the version of the SDK being used in the app
- Connects to headset Configurable Button
- Enables JPBP SDK mode
- Utilizes Headset Listener recognising the Configurable Button clicks
- Recognises and logs Proximity events
- Disables JPBP SDK mode
- Disconnects from the headset Configurable Button
- Allows reading and setting of Enterprise config values

Below is a sample screen from the application:



Appendix C: Additional Sample Applications

The SDK package also includes demo app ‘BlueParrottSDKConnectSample’ which gives an example template for how to maintain a connection to the headset SDK in a Service, in order to support background event handling.