

# Android 2.3 r18 for BIP-6000 Release Notes

This software is built on Linux kernel 2.6.35 and Android 2.3.7 (AOSP). This is a full release of Android 2.3 (AOSP) for the BIP-6000. Please see the Change Log at the end of this document for further detail.

Note that release r15 or higher is required for any BIP-6000Max model with Broadcom WiFi and/or u-blox GPS. This may include any BIP-6000Max device manufactured after July 2013. Devices with the older AR6002 WiFi and SiRFStar III GPS are still supported by releases r15 and higher. Please see the supplemental “BIP-6000 Android 2.3 r15 Upgrade Notes” for more details on upgrading devices from r13.

## Android Installation via ISO image

- You must already have Android installed on your BIP-6000 in order to be able to install this Android release. Please contact SDG Systems if you have a Windows Mobile BIP-6000.
- Burn the r18.iso file to a CD and boot a computer from the CD.
- Reboot your BIP-6000 into reflashing mode by pressing the up arrow key three times during device boot, before the red bar has reached the edge of the screen.
- Plug the BIP-6000 into its cradle, and plug the cradle into the computer via USB. Be sure the AC adapter is plugged into the cradle.
- The device will automatically reflash itself, and when complete it will reboot into Android.

## Over-The-Air (OTA) Update

The r18 release is available as an OTA update from r15, r15a, r16, and r17, and can be applied by navigating to Settings -> About phone -> Check for updates. Due to significant changes in the way WiFi connections are handled r15 was not available as an OTA upgrade from r10-r13. Users who wish to upgrade from r13 must do so manually by applying the r15 update.zip file, or by reflashing using the ISO image. The ISO image must also be used to upgrade from any beta or rc build, or releases prior to r6.

## Android Software

**At this time, we do not have the Android Market / Play application.**

Our Android is based on the Android Open Source Project (AOSP) which does not include support for Google Play. We have found that many of our customers do not want Google Play on the rugged device, so they can control what apps are installed. Users have the following options, and perhaps more, for installing applications.

- Alternative markets like the Amazon App Store, GetJar, or SlideME can be installed to provide functionality that is similar to Google Play.
- Customers can also install applications using the “adb” command from the Android SDK ('adb install <application.apk>'), or use the [Android Central Side Load Wonder](#)

application on Windows.

- Customers can copy an APK file to an SD card, then use the OI File Manager application to open and install the APK from the device itself.
- Customers can browse to an APK in the web browser to install it.

Many applications found in the Market/Play may also be found for download at sites like

<http://www.androidfreeware.org/>, <http://www.aproov.com/>, or <http://freewarelovers.org/android/>.

## General

- Use of the camera requires a SD card. Please insert a SD card if you plan to use the camera.
- To use the GPS, you must turn on Location Services: Settings → Security & Location → Enable GPS satellites. It is enabled by default.
- To use 802.11 wireless networking and/or Bluetooth, you must configure and enable it: Settings → Wireless & networks.
- GSM data services should automatically connect to your cellular network. If not, you must configure an APN for your provider: Settings → Wireless & networks → Mobile networks → Access Point Names (Menu → Add).
- Busybox is installed along with symlinks to its applets in /bin and /sbin.
- The /system partition is mounted in read-only mode by default.
- Barcode scanning is enabled in this build. Use Settings → Data collection to enable the barcode scanner.
- Without a working battery installed the behavior of the BIP-6000 is undefined. Install a battery even if using the device in a charging cradle.

## ADB

The USB vendor ID in Android 2.3 has changed, so some extra steps are required to allow “adb” to see the device.

### Windows

Install the SDG Bluebird USB driver using the Android SDK Manager:

1. Start the Android SDK manager (simply run “android” if it’s in your path).
2. Click the Tools menu and choose “Manage Add-on Sites...”.
3. Click the “New...” button then enter  
“https://sdgsystems.com/android/repository/addon.xml”, then click “OK” then “Close”.
4. Click the Packages menu and choose “Reload”. You should see the “SDG Bluebird USB driver package”. Check the box next to the package and then click “Install Packages...”.
5. Run the following from a command prompt:

```
echo 0x1aca >> "%USERPROFILE%\android\adb_usb.ini"
```

### Linux / Mac OS X

No driver is necessary for Linux and Mac OS X, but it is necessary to run the following command from a terminal:

```
echo 0x1aca >> ~/.android/adb_usb.ini
```

Linux may require additional steps as described here:

<http://developer.android.com/tools/device.html>

## Keypad Notes

- Volume is controlled by Mode+Up and Mode+Down (both keys together). Mode is the key with the square graphic.
- Qwerty keypad Android keys - F1=Menu, F2=Menu, F3=Home, F4=Back
- Numeric keypad Android keys - F1=Menu, F2=Menu, F3=Home, F4=Back, F5=Search

## Data Collection

### *Barcode Scanner*

- The 1D scanner is activated using the yellow scan buttons or pistol grip trigger (on equipped models) and is supported with a keyboard wedge mode and the much faster Android Intent API. Supported symbologies are UPC-A, UPC-E, EAN-8, EAN-13, EAN-128, Code 39, Code 93, Code 128, ITF (Interleaved 2of5). The 1D scanner can be accessed via a custom Android Intent. Please contact [support@sdgsystems.com](mailto:support@sdgsystems.com) for example code which can be used in your application(s).
- The 2D barcode scanner is activated using the yellow scan buttons or pistol grip trigger (on equipped models) and is supported with a keyboard wedge mode and the much faster Android Intent API. The 2D scanner supports Australian Post, Aztec Code, Aztec Mesas, British Post, Canadian Post, Codabar, Codablock F, Code 11, Code 39, Code 49, Code 93 and 93i, Code 128, Data Matrix, EAN-8, EAN-13, EAN-UCC Composite, Interleaved 2 of 5, ISBT 128, Japanese Post, KIX (Netherlands) Post, MaxiCode, MicroPDF417, MSI, OCR, 5:53, PDF417, Planet Code, Postnet, QR Code, RSS-14, RSS Limited, RSS Expanded, Straight 2 of 5 IATA, TCIF Linked code 39, UPC-A.
- A special version of zxing's BarcodeScanner app is included that will scan via the rear camera.
- Prefix/suffix options for the keyboard wedge can be configured via Settings → Data Collection → Keyboard wedge settings.
- Note that keyboard wedge should be disabled if using the barcode scanning API.
- For units equipped with 2D barcode scanners **only**, the following commands may be used to set whether EAN-8 and EAN-13 check digits are transmitted.

```
adb root
adb shell setprop persist.sys.ean8check 1 //or 0 for off
adb shell setprop persist.sys.ean13check 1 //or 0 for off
```

Scanning must be disabled and re-enabled before these settings take effect. By default,

check digits for both EAN-8 and EAN-13 will be transmitted.

- The above commands have no effect on units equipped with 1D scanners. If check digit transmission is not desired, it is recommended to use the Android Intent API to receive barcode data and to remove the check digit from the received payload.
- For units equipped with 1D laser barcode scanners **only**, the following command may be used to disable the appending of “J1” to EAN128 barcode:

```
adb root
adb shell setprop persist.sys.bc1d.ean128_suffix 0
```

## **RFID**

RFID is implemented using the Android 2.3 NFC package. By default it operates in keyboard wedge mode, but Tag mode can be enabled in Settings → Data Collection → NFC Settings. Note that Tag mode must be enabled in order to use the NFC programming interface. In Tag mode, scanned tags are broadcast as NDEFMessage broadcast intents with a non-encoded byte payload of the tag memory or Tag ID if no memory capability is present in the tag. The ‘Tag’ application in packages/apps/Tag in the Android source tree is a good example of how to receive and parse NDEFMessage tags.

Low Frequency (LF), High Frequency(HF) and Ultra-High Frequency(UHF) RFID readers are supported. Units equipped with a UHF reader, will display an additional UHF menu under NFC Settings. This menu provides the following options:

UHF → Location - Specify your location so that the RFID reader can set its frequency to the appropriate legal band for your geography

UHF → Power Gain - Adjust power gain to make the reader more or less sensitive.

UHF → User Memory Read Size - Specify the number of two-byte blocks to read from user memory. For ISO-18000-6C tags (also known as EPC Class 1 Generation 2), this is the amount of data that will be read from “memory bank 3” on the Tag. If a value of 0 is specified, the reader will attempt to read the entire contents of memory from bank 3. The default value for this setting is 4. (See note below.)

UHF → Include Bank 2 Contents - If set, the contents of memory bank 2 (Tag ID memory) will be included in the memory contents returned on a tag read.

UHF → Size of Bank 2 to Read - Specify the number of two-byte blocks to read bank 2 memory when the UHF → Include Bank 2 Contents flag is set. If a value of 0 is specified, the reader will attempt to read the entire contents of memory from bank 2. The default value for this setting is 2. (See note below)

Note: The settings UHF → User Memory Read Size and UHF → Size of Bank 2 to Read currently default to a non-zero value in order to work around a known problem where the UHF reader fails to respond to tag reads with a zero length. (See “Known Problems, Fixes In

Progress” for more information.)

## Known Problems, Fixes in Progress

- We are not supporting video capture at this time.
- Video playback may fail for some types of video.
- SMS messages sent to the device while the device is sleeping may be delayed.
- First ring for incoming phone call may be lost if the device is suspended.
- Ethernet may not connect if the ethernet cable is plugged into the cradle after the device is placed in it.
- WiFi may not resume automatically after the device wakes from suspend. If the WiFi fails to connect to the network, turn WiFi off, then back on. The power control widget is a useful way to toggle the WiFi power.
- To read tag memory from ISO-18000-6C RFID tag (also known as EPC Class 1 Generation 2), you must specify how many two-byte words to read from the tag. According to the EPC tag data standards, supplying a length of zero should return the entire contents of the requested memory bank. However, at present the UHF reader does not respond when a length of zero is specified. To work around this issue, UHF → User Memory Read Size is set to a default value of 4, and the UHF → Size of Bank 2 is set to set to a default value of 2. You can adjust these settings to read the amount of data you require from your tags. (See RFID section above for more information on these settings.) SDG is actively pursuing a resolution to issue with the vendor.

## Changelog

Changes in r18:

- Add support for a newer camera chip (MT9T112) seen in newer BIP-6000s.
- Fix a problem where the modem would fail to work on some newer BIP-6000 boards.

Changes in r17:

- Wired headsets are now supported. Levels are tuned for the Pidion headset.
- Improved mic levels in phone calls.
- Eliminated most audio pops.
- PL2303-based serial USB dongles are now supported.
- A new system property `persist.sys.bc1d.ean128_suffix` has been added to control whether the “JC1” suffix is appended to EAN128 barcodes scanned by the 1D laser scanner.
- Fixed a bug that could result in wifi failing to enable.
- Fixed a bug where portrait applications would be momentarily rotated to landscape and then back to portrait when a barcode scan was triggered.
- Enabled a kernel feature that helps some Google Play apps to run, such as YouTube and Copilot.
- Fixed a hang on boot that affected BIP-6000-AC models.

#### Changes in r16:

- Fixed a bug that may prevent the device from establishing a cellular data connection.
- Cellular signal strength is now more accurately reported.
- IMEI, IMEI SV, and Baseband version are now displayed correctly.

#### Changes in r15:

- Support for new Broadcom WiFi/Bluetooth chipset, including SoftAP mode, with a couple of caveats:
  - If the device suspends while WiFi tethering is enabled, tethering will fail. Either keep the device from sleeping, or toggle tethering off and back on.
  - WiFi tethering will fail to start if regular WiFi is already enabled, so turn off WiFi before enabling WiFi tethering.
- Greatly improved WiFi roaming support on devices with AR6002 WiFi
- Support for new u-blox GPS, including A-GPS support. If the BIP-6000 has a data connection (WiFi or cell), it can speed up time to first fix dramatically.
- VPNs are now supported
- USB tethering is now supported
- Improved reliability of GSM modem data connections
- Removed support for WiFi networks with hidden SSIDs
- Bluetooth headsets no longer emit intermittent bursts of noise

#### Changes in r13:

- Device now correctly honors Wi-fi sleep policies, but will not enter deep sleep if Wi-fi sleep policy requires that Wi-fi remains active
- Improved camera autofocus behavior

#### Changes in r12:

- Support for new NAND flash in some BIP-6000 models

#### Changes in r11:

- Support for EAN-8 and EAN-13 check digit transmission configuration on devices equipped with 2D barcode scanners

#### Changes in r10:

- Support for BIP-6000-AF1 (1GB Flash support)
- Added ability to disable barcode beep
- Improvements in camera preview performance
- Added support for GS1/EAN-128 barcodes
- Fixed an issue that could result in an invalid ANDROID\_ID
- Devices with no serial number in flash memory will prompt user to enter the serial
- Fixed an issue that caused a connect/disconnect loop to occur with cellular data connections on devices with Cinterion PHS-8 modems
- Fixed an issue that could prevent a cellular data connection on devices with Cinterion PHS-8 modems

- Improved cellular data connection robustness when the connection is idle for extended periods of time on devices with Cinterion PHS-8 modems
- Fixed an issue that prevented the WiFi configuration file from loading on devices that were updated directly from r6 to r8/r9.
- Clock will fall back to NTP server if no date/time data is received from modem
- Canadian Atlantic time zone now properly reflects Daylight Savings
- Other minor bug fixes

#### Changes in r9:

- Fixed an issue that affected devices with both a 1D scanner and Cinterion PHS-8 modem

#### Changes in r8:

- Full support for the Cinterion PHS8-P modem.
- Bug fixes in prefix/suffix support.

#### Changes in r7:

- Fixed several UHF RFID issues: Added support for adjusting frequency spectrum based on geography for UHF RFID readers; fixed issue that prevented scanning tag memory. See the RFID heading under the Data Collection section for more information.
- Support has been added to the Data Collection Settings menu for setting the prefix and suffix to be used with the barcode scanner in keyboard wedge mode.
- Changes to telephony and emergency dialing for compliance with Australian A-Tick standards.
- Preliminary support for the Cinterion PHS8-P modem.

#### Changes in r6:

- Emergency calls can now be made even with no SIM card in the device
- Fixed an issue that under certain conditions would cause a long delay while the device was booting on devices equipped with a 2D scanner
- Added support for BIP-6000 models with a high-brightness flash
- Camera preview is now full-screen instead of windowed
- Added support for new camera module used in some models
- Fixed an issue that would cause the ADB connection to be lost shortly after the device boots or resumes from suspend
- Initial support for BIP-6000 MaxID (LF/UHF) and MaxGrip (pistol-grip) models is now included

#### Changes in r5:

- Fixed an issue that would cause the 2D scanner to stop working if the system time was adjusted backwards

#### Changes in r4:

- Enter key on numeric keypads now works as expected in all apps

- Support for BIP-6000 models with QVGA screens
- Minor 2D scanning enhancements
- Fixed an issue that would cause RFID to become unstable after suspend/resume
- New Bluebird wallpaper

#### Changes in r2:

- The enhanced decoder for 2D models is now included in r2. There is no longer a separate image just for 2D models.
- Added barcode scanning API for much faster performance than keyboard wedge mode, for both 1D and 2D scanners.
- Improved WiFi hidden SSID support.
- Fixed low in-call audio volume.
- Fixed occasional camera hangs.

#### Changes in r1/rhw1:

- New boot animation.
- A new product/image including the enhanced 2D decoder was created for BIP-6000 models with a 2D scanner, for licensing purposes.

#### Fixes and new features in rc3:

- Camera now works reliably after suspend/resume.
- Bluetooth now works after suspend/resume.

#### Fixes and new features in rc2:

- Enhanced 2D barcode decoder engine
- Reflashing from SD in sdgboot
- RFID keyboard wedge is now enabled by default
- Added GSM carrier PPP authentication
- Modified default homescreen widget layout
- New WiFi driver

#### Fixes and new features in rc1:

- System Info (serial, etc) is now stored in NAND flash
- Added support for BIP-6000 with High Brightness flash
- Boot screen now displays properly
- MMS messages should send and receive properly
- Default ringtone is no longer "Silent"
- RFID implemented through Android NFC package

#### Fixes and new features in beta2:

- RFID keyboard wedge implemented
- WiFi to GSM failover now works properly
- Improved reliability of DNS resolution



Fixes and new features in beta1:

- Touchscreen calibration runs on first boot.
- USB-Ethernet support.
- Aztec barcode scanning enabled.
- Recovery mode is now enabled (allows factory reset, OTA updates).
- Screen elements are slightly smaller to better fit home screen widgets.