BlueSky Group

User Manual

Version 1.0

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Introduction

The purpose of this document is to present the functions and capabilities of the BlueSky Mobile Engine Downloader application. The application is built for Android operating systems and is built to emulate aircraft data viewing tools of the past. Some of the key features are:
- Downloading of flight data any time or place
- Dramatic decrease of the data download process via Bluetooth
- Viewing of flight data instantly

In the following sections are all the necessary details to Install and run the application on any Android. Our goal as a team is to provide our client with a useful product that illustrates the capabilities of mobile downloading.

Installation

As part of the final delivery of the application the team has provided our client with a link to the teams Github and a downloadable Android Packet Kit (APK). The source code can be accessed and downloaded from the Git but for an easier installation the APK comes ready to run on any Android device. The steps to install the APK are as follows:

Install From Your PC:

1. Since our application is not available on the Google Play store or other application vendors you will need to enable the installation of third party apps on your device
   a. Go to *Menu -> Settings -> Security* and check *Unknown Sources*
2. From here you will want to download the APK to your computer and connect your device to it
   a. You may be prompted if you want to simply charge your device or connect it as a *Media Device* select this option
3. Now you can access your devices directory from your home computer and place it in a folder of your choosing
4. Finally open your device and navigate to where you stored the APK, tap it and the select *Install*

Install From Your Android Device:

1. Enable the installation of third party apps by going to *Menu -> Settings -> Security* and check *Unknown Sources*
2. Open your browser and download the APK
3. Once it's downloaded navigate to the *Downloads* folder, tap the APK and select *Install*

Install Packages for Bluetooth in Linux:

1. Ensure pip is installed (sudo apt install python-pip)
2. Ensure python distutils are installed (sudo apt-get install python-dev)
3. Ensure BlueZ is installed (sudo apt install bluez)
4. Ensure libbluetooth-dev is installed (sudo apt-get install libbluetooth-dev)
5. Install PyBluez (pip install pybluez)
6. Edit the file using "sudo gedit /etc/systemd/system/dbus-org.bluez.service" and append "-C" to the line ending in "bluetoothd".
7. Reboot run the command "sudo sdptool add SP"

Configuration and Daily Use

To use the Python Bluetooth script:
1. Ensure that the yaml file "test.yaml" is located in the same directory as the Python file.
2. Run the Python script using "sudo python fileTransfer.py"

To download flight data and view it in the application follow these steps:
1. Ensure the Bluetooth python script is running using the steps above
2. Tap on the application icon to start it on your device
   a. If prompted to enable bluetooth on the application select *Accept*
3. Navigate to the connections page
   a. Identify the desired bluetooth microcontroller containing the flight data
   b. Tap its name to connect
   c. Tap the *Home* button to return to the menu
4. Click on the *Summary* page to view the flight data summary
5. Click on the *Faults* page to view a list of faults that may have occurred
6. Click on the *Events page* to see a timeline of a triggered event within the system
7. Click on the *Exceedances* page to see a list of exceedances that may have occurred
   a. Select the individual Exceedance to view additional information

Maintenance
In order to make sure that this software is running at peak performance over the coming years there are a few things that may need to be done in order to ensure that smooth running. The current version of the application currently works with supported versions of android. As more versions of android become available on the market the application will need to be updated to the specifics of those versions. This includes but is not limited to adding different application permissions, modifying how the application stores data, and making sure the Bluetooth library is up to date and using the most current version of Bluetooth. Another thing that may have to be done is clearing the applications cache.

As of right now there is no way in the application to go in and clear our old data that is not being accessed anymore; however, this data can still be cleared out by using the android devices settings. In order to do this the user must go into their settings, then find the applications tab. After that you navigate through the menu until you find the application. Then you simply just hit the button that says "clear cache". Doing this will erase all of the past datasets that are being stored by the application, so depending on if it is a security issue to keep these on the phone the data could be cleared after every time it is done being used or it can be cleared after every couple of flights.

Troubleshooting
- Trouble finding a device to pair with
  - Make sure that both devices Bluetooth are on
  - Make sure that both devices are set to "discoverable" / "visible"
  - Try and pair the devices outside of the application
  - Turn both devices on and off again
  - If problem persists after these steps refer to the maintenance section of this document as your android device may be out of date
- Trouble transferring data
  - Check above troubleshooting and ensure that devices are forming a bluetooth connection with each other
  - If the data is corrupted or malformed reconnect devices and try the transfer again
  - If data is still not being sent check that it is not corrupted on the side of the device that is sending the data
- Trouble with the application as a whole
  - Check and make sure you have the most current build of the app
  - Close and restart the application through the device that it is on
  - Go into settings --> applications --> find the application --> force close and then clear the cache
  - Turn device off and on

Conclusion
From all of us here at BlueSky group we hope that this product will be able to help effectively demonstrate that this concept of having a wireless engine downloader is possible. It is out hope that we have saved Honeywell significant time and money by developing this prototype for them, and that this user manual clearly outlines how the application is intended to be used. We hope that this effort is continued by professional teams, and we would have not been more happy to help with such an amazing project.
With best wishes from your BlueSky developers: Brandon Samz, Joseph Griffith, Corban Stevens, Robert McIntosh