POSITIONING

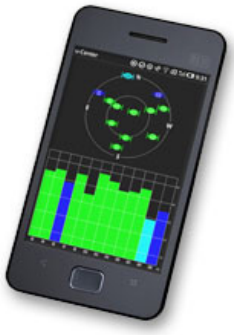
u-center Android

GNSS Evaluation Application

User Guide

Abstract

This document provides useful information to efficiently use the u-center evaluation software for Android. This tool has been specifically developed for evaluating u-blox GNSS receiver performance on Android platforms.



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Objective Specification	Document contains target values. Revised and supplementary data will be published later.
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This document applies to the following products:

Name
u-blox 6 GPS receiver products
u-blox 7 GNSS receiver products
u-blox M8 GNSS receiver products

Preface

Overview

u-center Android is the u-blox GNSS evaluation application expressly designed for assessing GNSS receiver performance on Android platforms such as smart phones and tablets. The software can be installed from Google play at the following link:

https://play.google.com/store/apps/details?id=com.ublox.ucenter

u-center Android is designed to:

- Run performance tests on u-blox GNSS receivers on Android platforms
- Visualize the location data and GNSS status published by the Android framework
- Test the added performance provided by u-blox' free Multiple GNSS Assistance (Online and Offline) service.
- Record log files for subsequent analysis and debugging using the standard u-center evaluation tool.

This User Guide provides a comprehensive description of the software, maximizing the ability of the end user to exploit its features.

u-blox GNSS solutions for Android

To integrate u-blox GNSS receivers in Android based devices, customers require the following:

- ✓ Kernel drivers
- ✓ u-blox Android GNSS driver
- ✓ u-center for Android

For the kernel drivers, the standard Linux drivers already work well on Android; the source code is therefore already available from Linux.

The u-blox Android GNSS driver handles the data coming from the hardware by means of kernel drivers, formats them properly, and sends them to the Android GNSS location provider. A-GNSS is also part of this implementation. For more information about the Android GNSS driver, please contact u-blox' sales channels.

The application described in this document – u-center Android – is positioned at the very top level of the Android framework. It interfaces with the application framework, and takes data from the Android GNSS location provider.

Using this guide

This User Guide assumes that the user has basic competence on Android operating systems and knowledge about GNSS receivers.

Questions

If you have any questions about using this app, please:

- Read this manual carefully.
- Read the questions and answers on our FAQ database on the homepage
- Contact our information service on the homepage http://www.u-blox.com

Technical Support

Worldwide Web

Our website (www.u-blox.com) is a rich pool of information. Product information, technical documents and helpful FAQ can be accessed 24h a day.

By E-mail

If you have technical problems or cannot find the required information in the provided documents, contact the closest Technical Support office. To ensure that we process your request as soon as possible, use our service pool email addresses rather than personal staff email addresses. Contact details are at the end of the document.

Helpful Information when Contacting Technical Support

When contacting Technical Support, please have the following information ready:

- Receiver type (e.g. NEO-7N-0-000) and firmware version (e.g. ROM1.0)
- Receiver configuration
- Clear description of your question or the problem together with a u-center logfile
- A short description of the application
- Your complete contact details

Contents

1 Features

The u-center Android GNSS evaluation app provides system integrators and users with a tool for evaluating, performing tests, and debugging GNSS receivers on Android platforms.

u-center Android allows the users to easily interface with u-blox receivers and provides several features for analyzing these products.

The main features are:

- Presentation of all the information collected during receiver operation (e.g. coordinates, altitude, speed, GNSS time, satellite tracking)
- Ability to evaluate performance (e.g. accuracy, tracking) and create case studies by recording log files.
- Views of satellite constellation, heading, clock, altimeter, speedometer, GNSS and satellite information views with real time cockpit instruments
- Ability to trigger a restart (cold start / warm start) of the receiver
- Supports Multiple GNSS Assistance (Online and Offline)
- Ability to customize the application with several preferences (described later)

2 Getting started

2.1 Format of the displayed values

2.1.1 Latitude and longitude

Latitude and longitude are displayed in the following format: degrees/minutes/seconds, degrees/minutes, and degrees (with fraction in decimal), and are referred to the datum selected into the GNSS receiver (WGS-84).

2.1.2 Time

Time is displayed with reference to UTC time.

2.1.3 Elevation

Elevation is displayed as HAE (Height above WGS-84-Ellipsoid).

2.2 Installing u-center on an Android based device

In order to install u-center on an Android smart phone or tablet, install the software from Google play (https://play.google.com/store/apps/details?id=com.ublox.ucenter).

After correct installation on your mobile device, a red u-center icon appears in the collection of apps on your device.

Figure 1: u-center icon on the home page

3 u-center Android screens

3.1 Satellite location and signal strength

3.1.1 Screen information

In this screen you can check the number of satellites currently acquired and their relative signal strength.

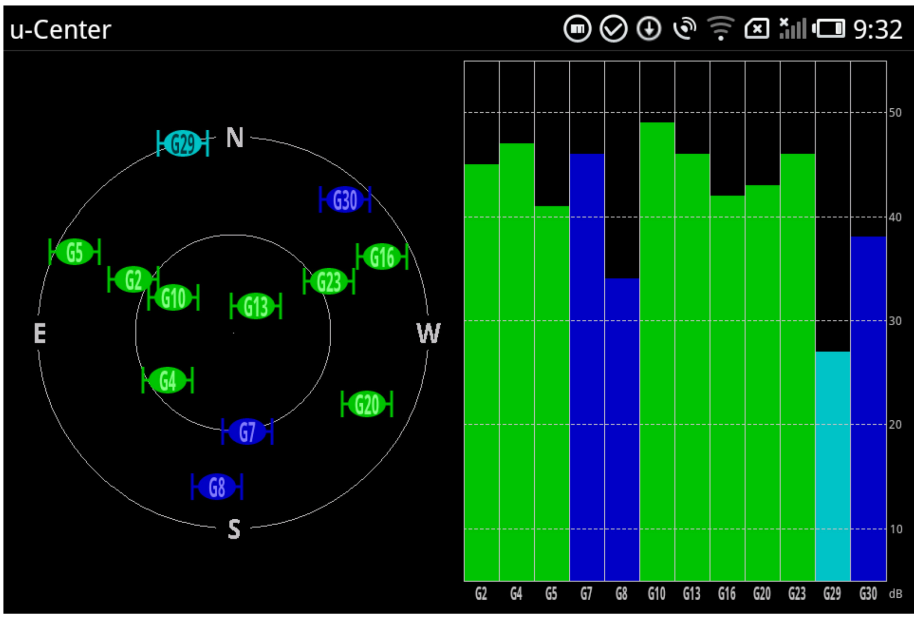

Figure 2: Satellite location in the sky and relative signal strength

At the left side of this screen, the distribution of the satellites in the sky is shown. They are arranged according to the cardinal points, with a lower distance from the diagram center representing a higher inclination with respect to the observer.

On the right-hand side of this screen, the signal strength of each satellite (in dBHz) is shown.

The satellites shown in green are those the receiver is using for position calculation. Satellites shown in blue are those whose signals are available but not for use in calculating position. Cyan satellites are those whose signals are available for use in navigation but are not currently being used. Finally, red satellites are those whose signals are not available. The color-coding is summarized in Figure 4:

	Color	Meaning
	Green	Satellite used in navigation
	Cyan	Satellite signal available for use in navigation
	Blue	Satellite signal available, but not for use in navigation
	Red	Satellite signal not available

Figure 3 Satellite color coding

3.1.2 Tips

In this screen you can:

- ✓ Double-tap on either diagram to zoom them to full screen view
- ✓ Rotate the mobile device in order to change the orientation

3.2 PVT information

3.2.1 Screen information

In this screen you can see a summary of the main satellite and sensor data information in a cockpit-like interface.

The application also integrates with other sensors and can show such information as the digital compass heading.

This screen includes the following information:

- ✓ **Heading info:** gives the heading determined by the GNSS receiver.
- ✓ **Altitude**: shows the GNSS altitude above WGS-84-Ellipsoid (HAE altitude) in meters or in ft.
- ✓ **Speed**: provides the current speed in km/h, m/s, or mph.
- ✓ **Time**: the UTC time is shown.

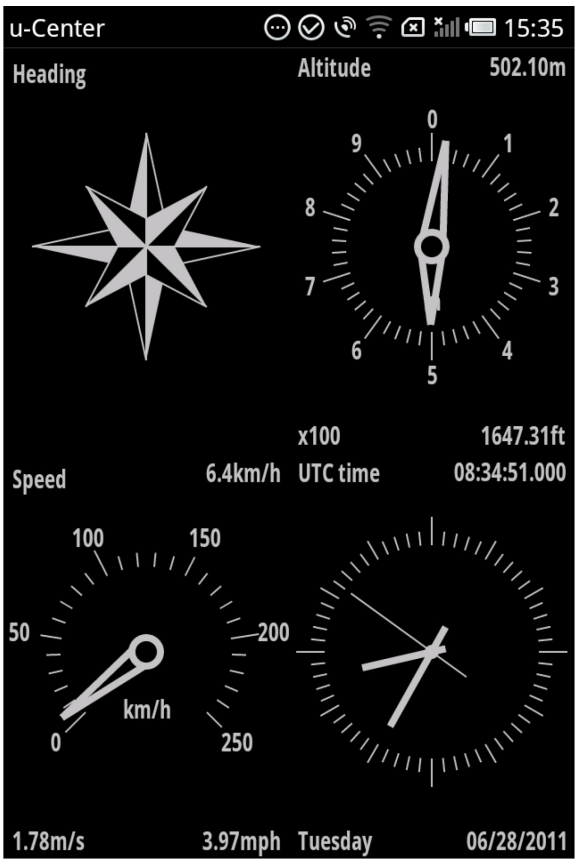

Figure 4 Satellite information cockpit view

3.2.2 Tips

In this screen you can:

- ✓ Double-tap on either diagram to zoom them to full screen view
- ✓ Rotate the mobile device in order to change the orientation

3.3 World map view

3.3.1 Screen information

This screen shows a comprehensive world map with current location shown by the green crosshairs.
The 2D position is given in latitude and longitude coordinates in three different formats:

- ✓ Degrees/minutes/seconds
- ✓ Degrees/minutes
- ✓ Degrees (with fractions in decimal)

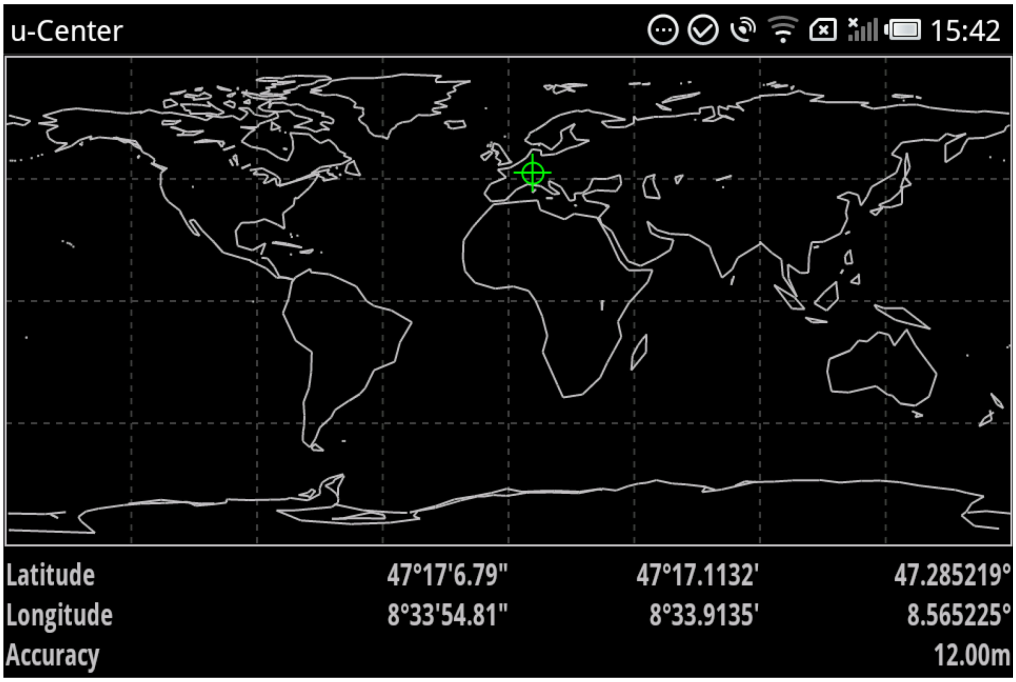

Figure 5 World map view

Information about the measurement accuracy (in meters) is provided as well

3.3.2 Tips

In this screen you can:

- ✓ Rotate the mobile device to change the orientation

3.4 Google Map view

3.4.1 Screen information

This screen is only available on devices supporting the Google Maps API.

In this view you can navigate through the maps provided by the Google Maps service, and track your position on it. The yellow cross indicates current location, while the green crosses provide a trace of previous points.

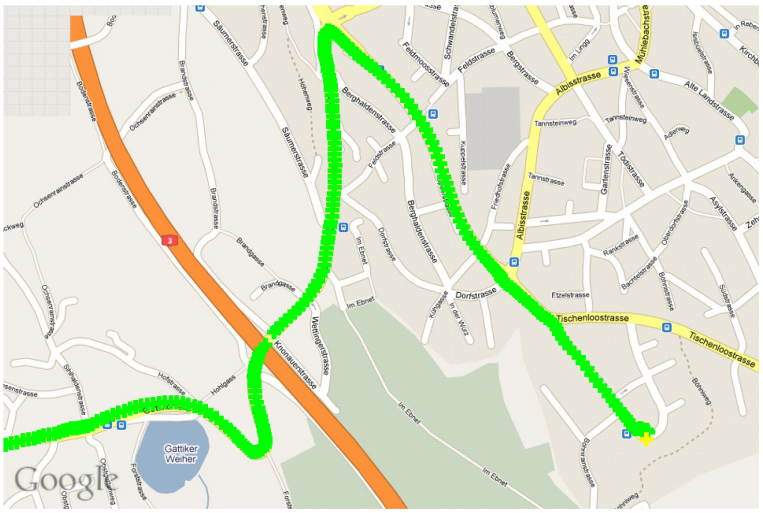

Figure 6 Google Map view

3.4.2 Tips

In this screen you can:

- ✓ Rotate the mobile device in order to change the orientation
- ✓ Swipe the map in order to navigate through it[1]
- ✓ Pinch to zoom

[1] When swiping through the map a fast motion can change the screen.

3.5 NMEA messages screen and GNSS information

3.5.1 Screen information

In these screens you can check the NMEA messages from the receiver and basic information from each satellite (e.g. azimuth, elevation, status). With these screens it is also possible to see the 3D position solution (latitude, longitude and altitude) plus speed, bearing (speed vector heading) UTC time and accuracy.

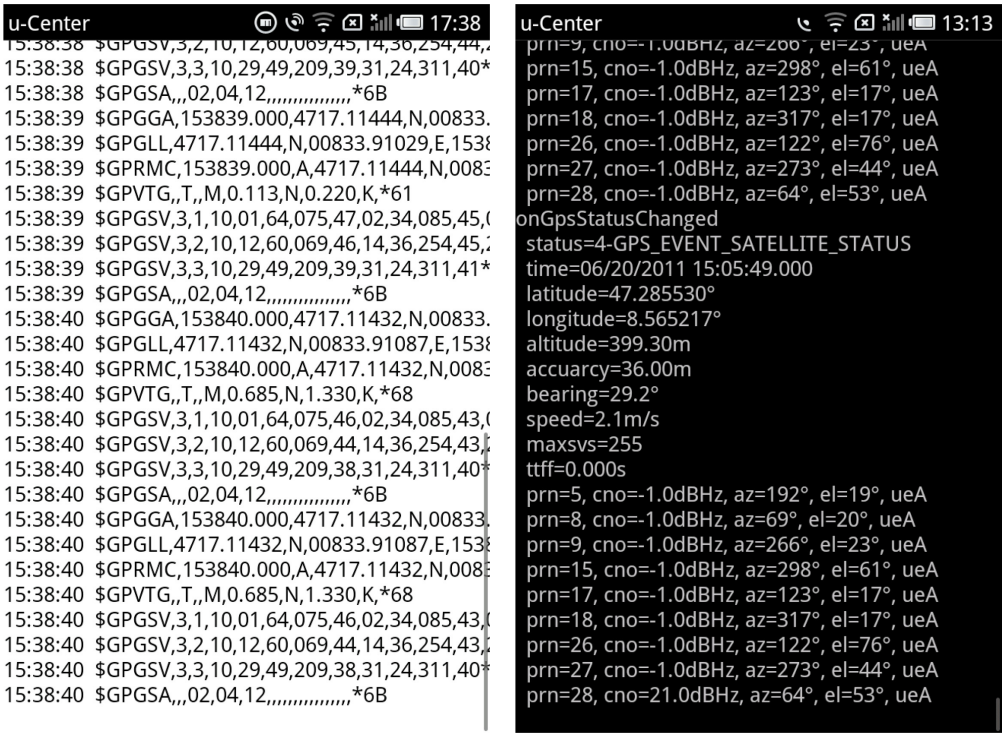

Figure 7 NMEA Message Console / Status information console

4 u-center Android features and usage

4.1 General information

The u-center Android application is based on a smart, user-friendly interface allowing users to perform several kinds of evaluations on u-blox receivers.

u-center Android exploits device sensors and the multi touch screen to allow users to swipe through the screens, pinch to zoom (for map screen only), and to enter landscape view by just rotating the device.

4.2 Preferences menu

The preferences menu allows the user to customize several program settings. This section provides an insight into it. Hereafter a short description of all the items is provided.

4.2.1 Location/GNSS

4.2.1.1 Location and security

This menu is a short cut to the standard "Location and Security" setting menu of the settings application. It allows you to:

- ✓ Enable the use of a wireless network for determining position by means of WLAN or mobile networks.
- ✓ Use the GNSS satellite signal. This must be enabled for u-center evaluations.

4.2.1.2 Preferred providers

This menu allows you to choose your preferred positioning information provider between

- ✓ Automatic
- ✓ GNSS
- ✓ Network
- ✓ Passive

Select "GNSS" to correctly use this app.

4.2.1.3 Minimum distance

This allows you to set the preferred minimum distance interval expressed in meters.

4.2.1.4 Minimum time

This allows you to set the preferred minimum time interval expressed in seconds.

4.2.2 UBX log files

4.2.2.1 Directory

This allows the user to select a folder for storing UBX Log Files.

4.2.2.2 NMEA

The checkbox allows the user to add NMEA strings to the log file.

4.2.2.3 System Information

This checkbox enables the dumping of system information as UBX-INF messages to the log file.

4.2.2.4 Location and SV status

This allows the conversion of location and satellite information to NMEA messages. Some third party receivers do not publish NMEA sentences to the Android framework. u-center Android can convert the location reports to NMEA messages to collect the information in a log file.

4.2.3 General preferences

These items are general custom preferences:

4.2.3.1 Keep screen on

This prevents the device screen from turning off while the application is running.

4.2.3.2 Active in background

This checkbox enables location in background

4.2.3.3 Full Screen

When activated, the application is in full screen mode

4.2.3.4 Hide splash screen

When activated this removes the u-blox splash screen at the application start up.

4.2.3.5 Send command

Using this menu it is possible to

- ✓ Initiate the application with a cold start
- ✓ Initiate the application with a warm start
- ✓ Force Time Inject (Time aiding from NTP server)
- ✓ Force XTRA Inject (Assist Now Offline)

4.2.3.6 About

This provides information on the program and its developer.

4.2.3.7 Exit

This allows the user to exit the program.

4.3 UBX Log File

The UBX log File menu allows the user to register a Log file. This file records all the information about satellite signal and performance during the test and allows the user or u-blox to perform offline tests using the standard u-center PC-based program.

Log files are saved in the folder selected in the preferences (see 4.2.2.1).

Use this feature when reporting issues to u-blox.

Related documents

[1] u-blox GNSS Android solution Product Summary, Docu. No UBX-15016573

[2] u-center User Guide, Docu. No UBX-13005250

All these documents are available on our homepage (http://www.u-blox.com).

☞ For regular updates to u-blox documentation and to receive product change notifications, please register on our homepage.

Revision history

Revision	Date	Name	Status / Comments
1	23-Jun-2011	asan	Initial Release (Last revision with previous docu number GPS-SW-11003)
R02	03-Jun-2015	smos	Terminology, language, and style update

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