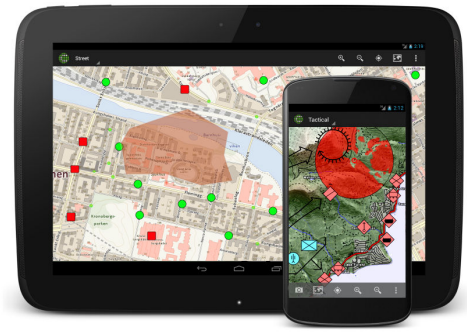
carmenta
geospatial innovations



Introducing Carmenta Engine for Android™

We are proud to be able to give Android software developers access to the tools and components they need to add map support in mission critical mobile applications.

Carmenta Engine is well known for its high performance maps and around the clock reliability. Systems based on Carmenta Engine are in use all over the world in mission critical defence and security applications.

This proven technology is now available for Android application development. As a result, software developers no longer have to compromise on functionality just because their applications are targeting tablets, smartphones, vehicle mounted displays or other Android based systems.

Carmenta Engine for Android in a Nutshell

Carmenta Engine for Android is the full, feature-rich Carmenta Engine GIS solution in a version suitable for the Android operating system. It uses the same code base as the desktop version of the solution but comes with a full Android API, including ready-made Activity and View classes which makes it straightforward to integrate into Android applications.

Since Carmenta Engine for Android uses the same configuration file format as the desktop versions of Carmenta Engine, both Windows and Linux developers can use the desktop versions of the efficient Carmenta Engine configuration tools – Carmenta Studio and Carmenta Explorer – to prepare the map data and set up visualization and data processing steps. This greatly reduces both development and map preparation time.

Key Benefits

- **High performance.** Thanks to the highly optimized C++ core and hardware accelerated map rendering pipeline, applications using Carmenta Engine for Android are both responsive and battery efficient.

- **Efficient use of resources.** The modular design of Carmenta Engine ensures that the Android version has a low memory footprint and very fast start-up time.

- **Offline or online maps.** By using Carmenta Engine, developers gain full flexibility to how their Android applications read maps. It is possible to build everything from always-connected systems which retrieve maps from OGC compliant servers, such as Carmenta Server, to disconnected systems which are preloaded with battery efficient map packages. You can read more about this below.

Getting Started with Carmenta Engine for Android Development

We have tried to make it as easy as possible to get started, both for experienced Android developers who are new to Carmenta Engine and for experienced Carmenta Engine developers who are new to Android development.

The SDK documentation contains a new tutorial called "Hello World Android Application". It walks you through all the steps that are required to get started – including downloading the necessary Android Development Tools.

The Carmenta Engine for Android SDK package also includes a sample application that comes with full source code.

Preparing Maps for Use on Android

As is the case when developing any sort of geospatial application, an important design consideration is how you will supply background maps and other geographical data to your Android application.

The section below describes three different ways to read maps in a Carmenta Engine for Android application. It is of course possible to create an application which uses a combination of these approaches to read the maps.

Read the Maps in Their Native Format

Just like the desktop version of Carmenta Engine, the Android version can read geographical data directly from a large number of industry-standard formats. In some scenarios, e.g. when you want to add new data sets directly to the devices out in the field, this functionality is very useful.

Below is a typical workflow when using maps in their native format:

- Use Carmenta Engine on your desktop system – either Windows or Linux – to create a map configuration file which reads the data. Preview the map in Carmenta Explorer to ensure that it works correctly.

- Simply copy the data and the map configuration file to your device. (If you want, you can include the configuration file and/or the data as resources in your application APK.)

Note that using the desktop tools to prepare the configuration file is optional – you can also use our Android API to construct the map configuration.

Pre-Generate Optimized Map Packages

Carmenta Engine 5.4 introduces a new and efficient map packaging mechanism. Map packages are easily generated from any Carmenta Engine map configuration file using the Carmenta Explorer application.

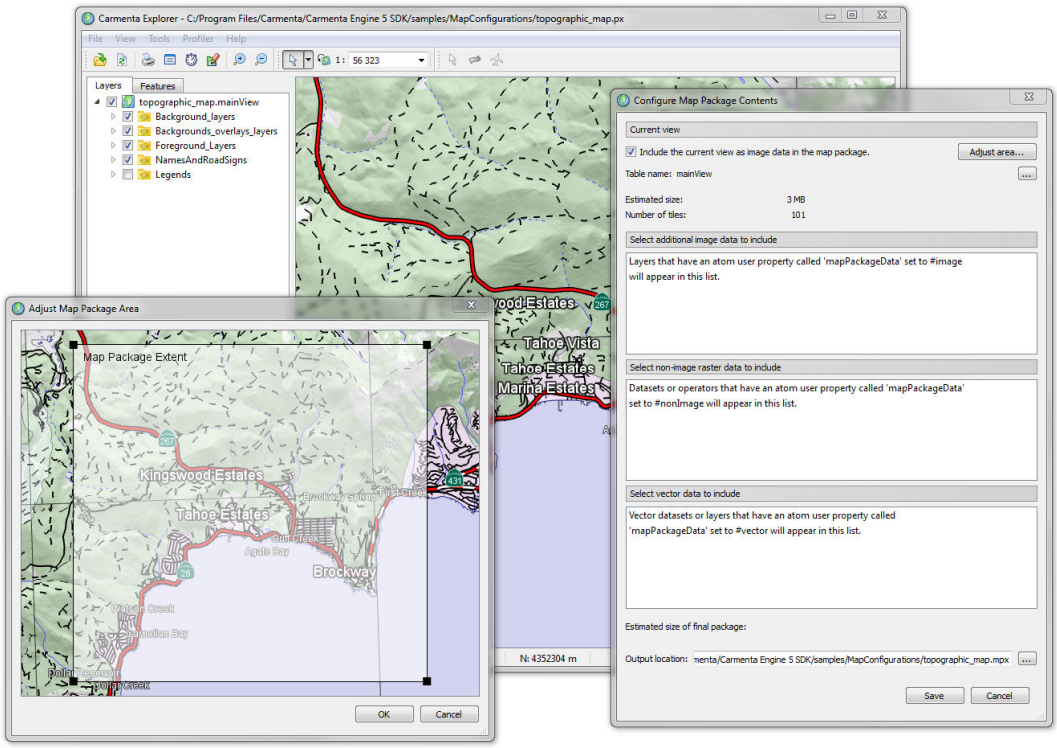


Image 1. Exporting a section of a map using Carmenta Explorer

These are the steps required to use the map package mechanism:

- Use Carmenta Engine on your desktop system – either Windows or Linux – to create a map configuration file which reads and visualizes the required data either from local files, geospatial databases or OGC compliant web services.

- Use the "Export to Map Package" functionality in Carmenta Explorer to generate a map package that covers your area of interest. Have a look at the Map Package Tutorial chapter in the documentation for more details.

- Copy the exported map package – a single, self-contained file – to the device. (If you want, you can also include the package as a resource in your application APK.)

- To connect to the package, either copy the auto generated map configuration file which reads the map package to the device, or simply initiate a MapPackageDataSet using our API.

Carmenta is committed to ensuring that our products implement open standards whenever possible. The map package structure is aligned with the current draft OGC GeoPackage specification.

Connect to OGC Compliant Web Services

If your application will be used in a setting where the Android device has a network connection, an easy way to provide background maps and other geographical data to the device is to connect to an OGC compliant web service.

- Use Carmenta Engine on your desktop system – either Windows or Linux – to create a map configuration file that connects to the desired services using components such as OgcWmsLayer, which reads maps from OGC Web Map Service interfaces and OgcWcsDataSet, which reads raster data from OGC Web Coverage Service interfaces.

- Copy the map configuration file to your device. (If you want, you can include it as a resource in your application APK.)

Note that using the desktop tools to prepare the configuration file is optional – you can also use our Android API to create the required classes programmatically.

Did you know that our product Carmenta Server has extensive support for OGC service interfaces and is configured using the same map configuration files as the desktop and Android versions of Carmenta Engine? It is the perfect choice for providing maps to your online Android application.

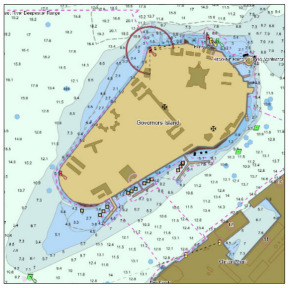
System Requirements

Carmenta Engine Android 5.4 supports Android devices that are using Android version 2.3.3, or above, and are equipped with an ARMv7 compatible CPU.

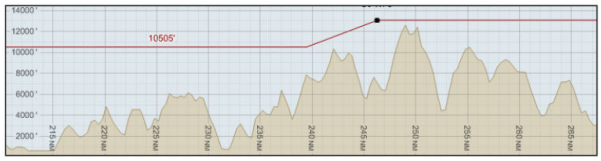
Extensions Available for the Android Version

In addition to the core functionality, Carmenta Engine for Android supports most of the extensions available in the desktop version:

- **The Tactical Extension** makes it possible to create, manage and visualize tactical symbols according to the MIL-STD-2525B and APP-6B standards.
- **The Nautical Extension** gives you the possibility to read and render nautical charts according to the IHO S57 and S52 standards.



- **The Vertical Profile Extension** provides functionality for generating vertical profiles, usually terrain profiles, along a route line.
- **The Visibility Analysis Extension** performs real time visibility-related calculations such as line of sight.



- **The ARINC 424 Extension** makes it possible to read aeronautical information in its native format.
- **The Military Geodata Formats Extension** reads military geographic data in CMRG (PCMap), DFAD and RPF (CADRG and CIB) formats.
- **The Terrain Vehicle Analysis Extension** performs calculation of terrain vehicle accessibility and speed in terrain.

More information about all these extensions can be found in the Carmenta Engine Extensions Product Sheet.

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