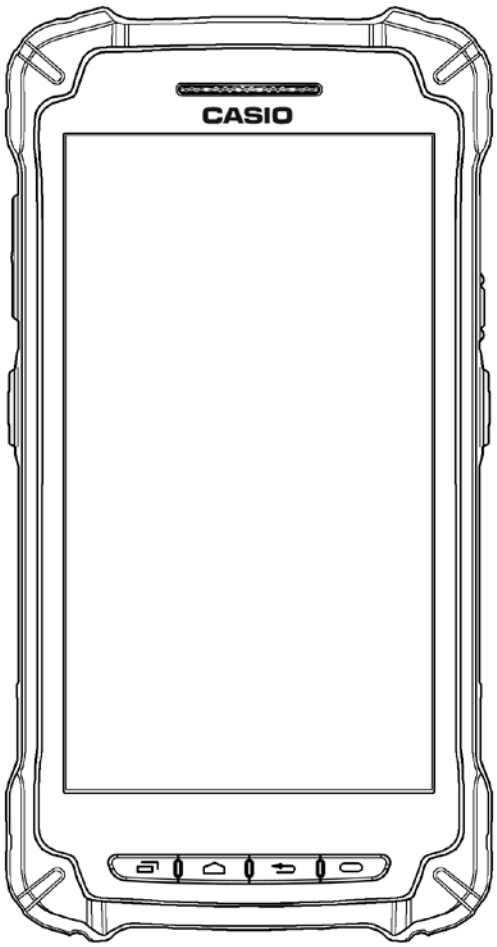
CASIO

IT-G400 Series

Android 6.0
Quick Start Guide

This document is a Development Guide Book for IT-G400 application developers.



Ver 1.05

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1. Overview

This document is a developement guide book writen for the IT-G400 application developers.

1.1 Notes of this development kit

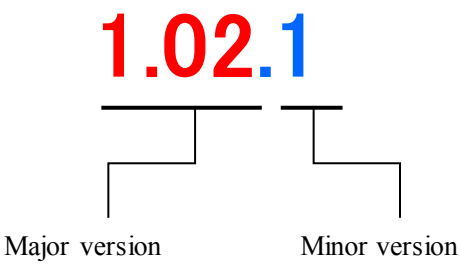
Notes for using this development kit are as follows.

- There is a dependency between the version of Android Studio and the version of the DeviceLibrary. For details, refer to "2.4 Required softwares (p.8)" in the Quick Start Guide (this document).

Please contact your distributor to get the latest version of development Kit.

1.2 Version of this development kit

The version number of this development kit consists of a combination of major version and minor version, as shown below.



The major number represents the version of DeviceLibrary(i.e. DeviceLibrary.aarAAR).
So, when a newer version of development kit is released, if it includes newer version of DeviceLibrary, its major version number is increased, and the minor version is returned to zero.
If changes other than DeviceLibrary (i.e. manuals, tools, etc.) are included, its minor version number is increased.

1.3 Structure of the development kit

The following figure shows the structure of this kit.

QuickStartGuide.pdf	Read this document first.
/MANUAL	/This folder contains manuals.
QuickStartGuide.pdf	Quick start guide
SoftwareManual.pdf	Software manual
DeviceLibraryManual.pdf	Device library manual
/SOFTWARE	/This folder contains softwares
/BDK	/Basic development kit
/CasioAndroidAddons	/Casio Addons for android
/bin	/Program's folder
CASIOAndroidAddons0100010005.apk	CasioAndroidAddons (binary)
/manual	/Manual's folder
CasioAndroidAdons.pdf	Casio Android Addons manual
/DeviceLibrary	/Device Library's folder
/javadoc	/javadoc's folder
index.html	javadoc index file
etc.	Other files.
/bin	/Program's folder
DeviceLibrary.aar	Device Library file (binary)
/samples	/Sample files's folder
KeyLibrarySample.zip	KeyLibrary samples
SymbolScan.zip	ScannerLibrary samples
RangeScan.zip	
InverseScan.zip	
CenteringWindowScan.zip	
TriggerScan.zip	
ImageCapture.zip	
/TOOLS	/Tools folder
/KittingTool	/KittingTool folder
/bin	/Program's folder
KitSettings0100010008.apk	Backup/Restore settings
KitDevice0100080008.apk	for Device setting
KitApp0100010001.apk	for Application setting
KitData.xls	Kitting scenario file
/manual	/Manual's folder
KittingToolManual.pdf	KittingTool manual
/OSUpdateService	/OSUpdateService folder
/bin	/Program's folder
OSUpdateService0100000000.apk	OS Update Service
/samples	/Sample files's folder
OSUpdateSample.zip	OS Update Sample

1.4 About manuals

The following is a list of manuals provided with this development kit.

Title	Contents
Quick start guide	This document
Software manual	Software specification of IT-G400
DeviceLibrary manual	Describing the specifications of the device library
CasioAndroidAddons manual	Describing the specifications of the CasioAndroidAddons.
KittingTool manual	Describing the specifications of the KittingTool.

2. Application development requirement

2.1 Needed programing knowledges

IT-G400 application can be developped using the following language.

- Java

And, also the knowledge about the followings are needed.

- Android OS
- Android allication development
- Android Studio
- Networks, etc.

2.2 Required hardware

Product name	Remarks
IT-G400	

2.3 Required system

[Windows]

- Microsoft® Windows® 7/8/10 (32- or 64-bit)
- 3 GB RAM minimum, 8 GB RAM recommended; plus 1 GB for the Android Emulator
- 2 GB of available disk space minimum,
- 4 GB Recommended (500 MB for IDE + 1.5 GB for Android SDK and emulator system image)
- 1280 x 800 minimum screen resolution
- For accelerated emulator: Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64), and Execute Disable (XD) Bit functionality

[Mac]

- Mac® OS X® 10.10 (Yosemite) or higher, up to 10.12 (macOS Sierra)
- 3 GB RAM minimum, 8 GB RAM recommended; plus 1 GB for the Android Emulator
- 2 GB of available disk space minimum,
- 4 GB Recommended (500 MB for IDE + 1.5 GB for Android SDK and emulator system image)
- 1280 x 800 minimum screen resolution

[Linux]

- GNOME or KDE desktop
- Tested on Ubuntu® 14.04 LTS, Trusty Tahr (64-bit distribution capable of running 32-bit applications)
- 64-bit distribution capable of running 32-bit applications
- GNU C Library (glibc) 2.19 or later
- 3 GB RAM minimum, 8 GB RAM recommended; plus 1 GB for the Android Emulator
- 2 GB of available disk space minimum,
- 4 GB Recommended (500 MB for IDE + 1.5 GB for Android SDK and emulator system image)
- 1280 x 800 minimum screen resolution
- For accelerated emulator: Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64), and Execute Disable (XD) Bit functionality, or AMD processor with support for AMD Virtualization™ (AMD-V™)

Caution! The explanation after the next chapter is all for Windows. If you are using Mac or Linux as a development environment, you are responsible for building the environment at your own risk.

2.4 Required softwares

In order to develop IT-G400 application programs, it needs the development environment of Android.

Development platform (Recommended)

Development language	Development platform (Recommended)
Java	Android Studio 2.3.2 or above Android SDK (API level 17 - 23) Google USB driver JDK7 or above

Caution !

The basic development kit was confirmed to work with the following Android Studio combination when it released.
When using the basic development kit please use the following combination or above. However, there is a possibility that something wrong with work if you use the latest unconfirmed Android Studio version.
If there is something wrong with work, please try with the confirmed below combination.

Android Studio	2.3.2	3.1.3
Gradle version (Android Studio)	3.3	4.4
Android Plugin Version (Android Studio)	2.3.2	3.1.3
development kit	1.04.0	1.04.0

Also, the basic development kit version 1.00, 1.01 can not be used with Android Studio 3.0 or above.
Please use the latest basic development kit when using Android Studio 3.0 or above.

You can get all released version of Android Studio from the following web site.
https://developer.android.com/studio/archive

3. Installing the development environment

Due to version upgrade of Android SDK, environment may not be installed by the following procedure. In that case, please refer to the procedure described on Google's website etc. and build the environment.

3.1 Installation steps of the development environment

The followings are the basic steps to install the development environment.

(1) Installing JDK

Before installing Android Studio, JDK (Java Development Kit) has to be installed.
Regarding JDK, refere “2.4 Required softwares (p.8)”.
Regarding JDK installation detail, refere “3.2Installing JDK (p.10)”.

(2) Installing Android Studio

Install Android Studio to your PC.
Regarding the requirement of Android Studio, refere “2.4 Required softwares (p.8)”.
Regarding Android Studio installation detail, refere “3.3 Installing Android Studio (p.13)”.

(3) Downloading of Android SDK/USB driver

Download Android SDK and USB driver from Google via Android Studio.
Android SDK will be installed automatically after downloading.
Regarding USB driver installation detail, refere “4.2 Installing USB driver (p.29)”.
Regarding the requirement of Android SDK, refere “2.4 Required softwares (p.8)”.

(4) Setting of PATH

Add the path to Android SDK to "PATH" of the system environment variable.
For the setting method, refer to "4.3 Settings for ADB （ Android Debug Bridge)(p.32)".

(4) Installing DeviceLibrary

Place the DeviceLibrary (AAR) to any where on your PC, and register it to the each of your projects via Android Studio.
Regarding DeviceLibrary installation, refere “3.5 Installing and Updating Device Library (p.17)”.

(6) Application development and debug

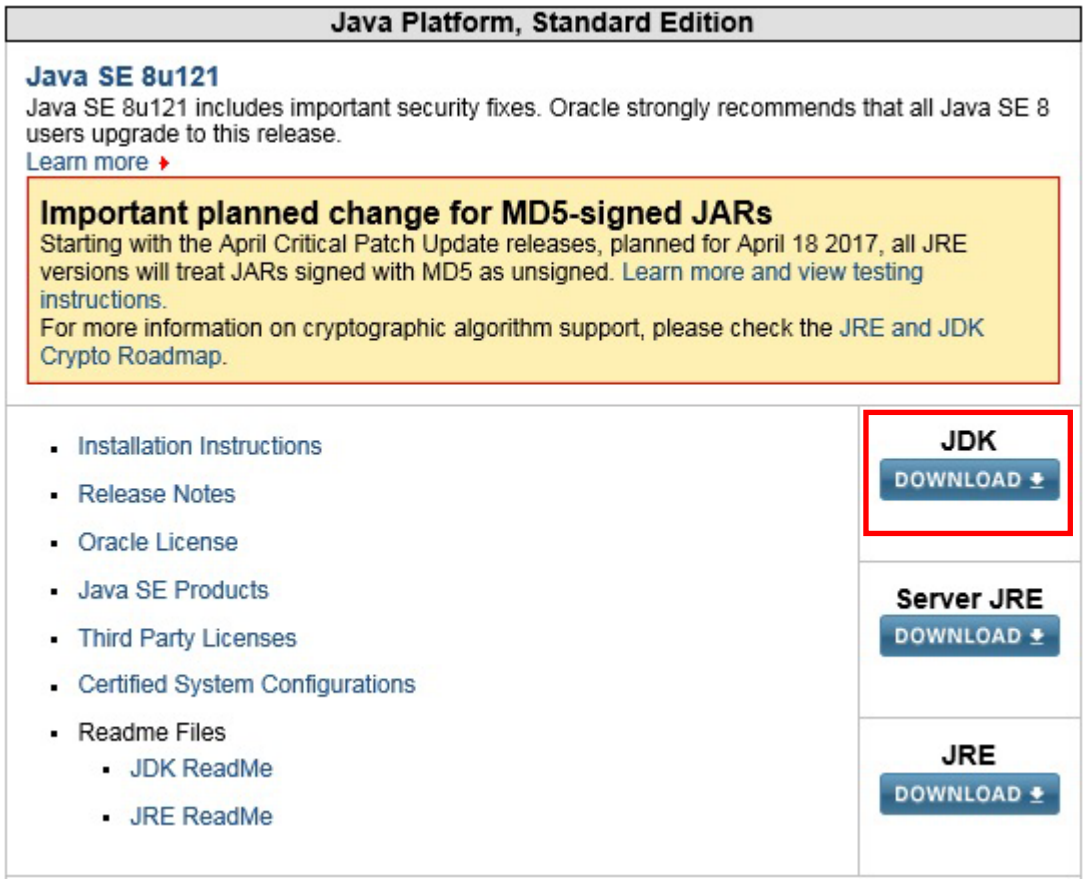
Use the installed Android Studio and SDK to develop the application.
For details on how to use the device library, refer to "Device Library Manual".
To debug the application, connect the PC and the IT-G400 via the ADB (Android Debug Bridge) interface. For details, see "4 Application development and debug (p.28) ".

3.2 Installing JDK

Java SE JDK can be downloaded from the Java site. Visit the site and download the Java SE JDK package corresponding to your Windows platform.

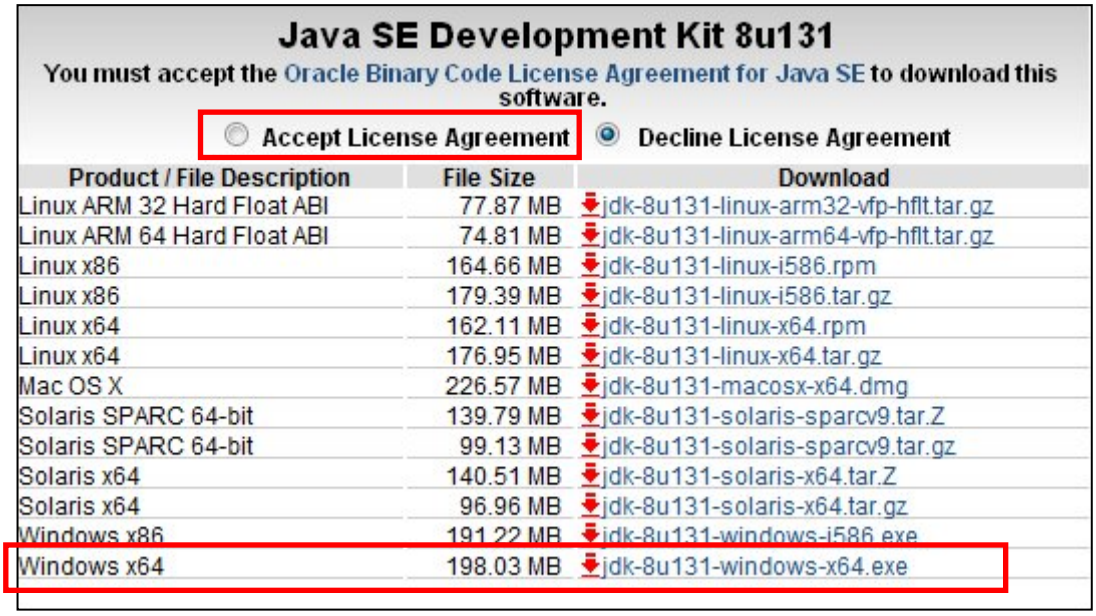
http://www.oracle.com/technetwork/java/javase/downloads/index.html

The URL and contents of the Java site may differ from the contents described in this document due to the update of the site. When downloading the JDK, please access the Java site via the search engine etc. and follow the description of the site.



In the following example, "jdk-8u121-windows-i586.exe" (64 bit) is downloaded.
For the 32 bit Windows, 32 bit version of JDK must be needed.

※ Because JDK is frequently updated, it's better to install the latest version at that time.



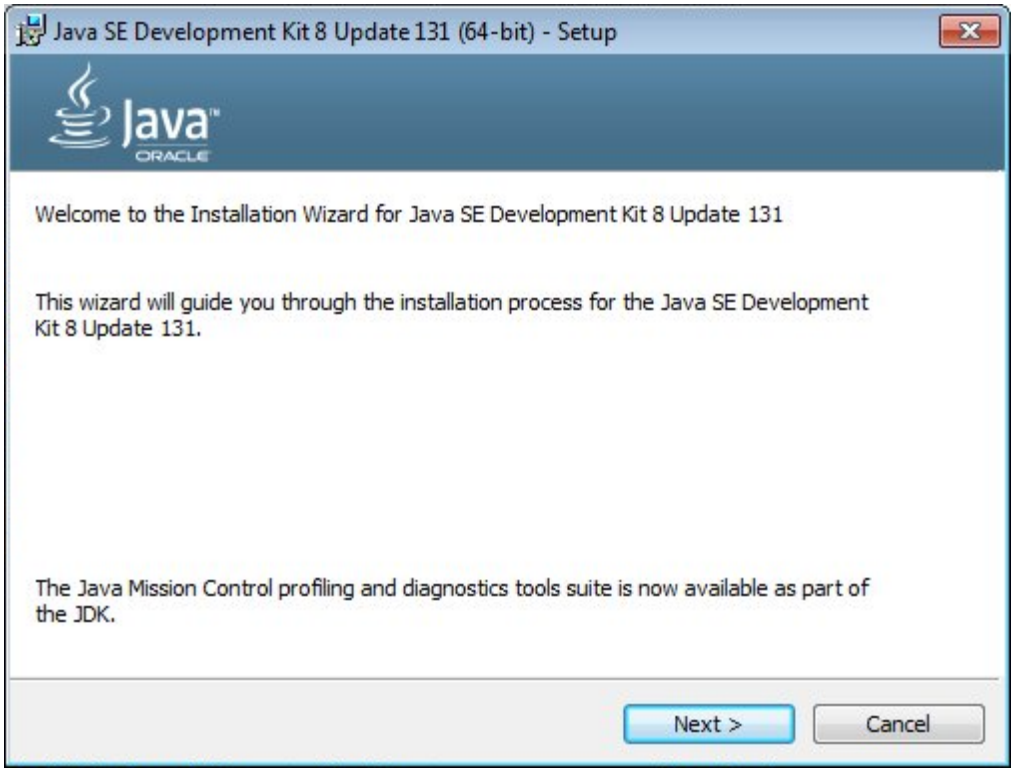
Java SE Development Kit 8u131

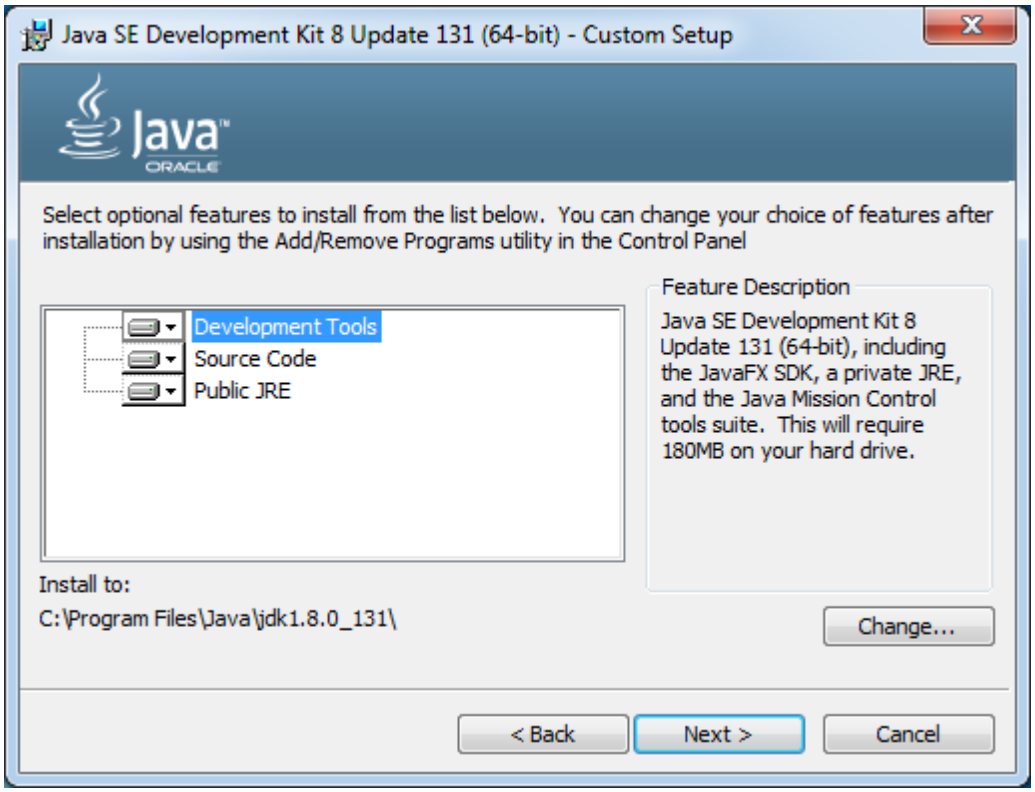
You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

Accept License Agreement Decline License Agreement

Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	77.87 MB	jdk-8u131-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	74.81 MB	jdk-8u131-linux-arm64-vfp-hflt.tar.gz
Linux x86	164.66 MB	jdk-8u131-linux-i586.rpm
Linux x86	179.39 MB	jdk-8u131-linux-i586.tar.gz
Linux x64	162.11 MB	jdk-8u131-linux-x64.rpm
Linux x64	176.95 MB	jdk-8u131-linux-x64.tar.gz
Mac OS X	226.57 MB	jdk-8u131-macosx-x64.dmg
Solaris SPARC 64-bit	139.79 MB	jdk-8u131-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	99.13 MB	jdk-8u131-solaris-sparcv9.tar.gz
Solaris x64	140.51 MB	jdk-8u131-solaris-x64.tar.Z
Solaris x64	96.96 MB	jdk-8u131-solaris-x64.tar.gz
Windows x86	191.22 MB	jdk-8u131-windows-i586.exe
Windows x64	198.03 MB	jdk-8u131-windows-x64.exe

Execute the downloaded file with administrator privileges. Basically, it is not needed to change the value from default.

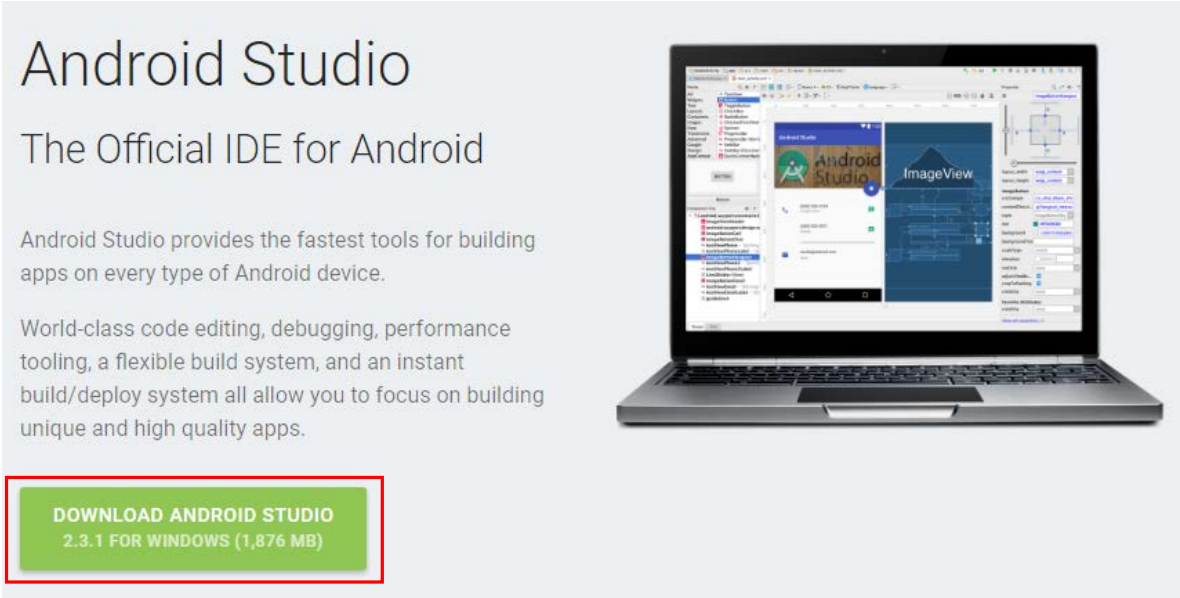



Java SE Development Kit 8 Update 131 (64-bit) - Custom Setup
Java
ORACLE
Select optional features to install from the list below. You can change your choice of features after installation by using the Add/Remove Programs utility in the Control Panel
Development Tools
Source Code
Public JRE
Feature Description
Java SE Development Kit 8 Update 131 (64-bit), including the JavaFX SDK, a private JRE, and the Java Mission Control tools suite. This will require 180MB on your hard drive.
Install to:
C:\Program Files\Java\jdk1.8.0_131\
Change...
< Back
Next >
Cancel

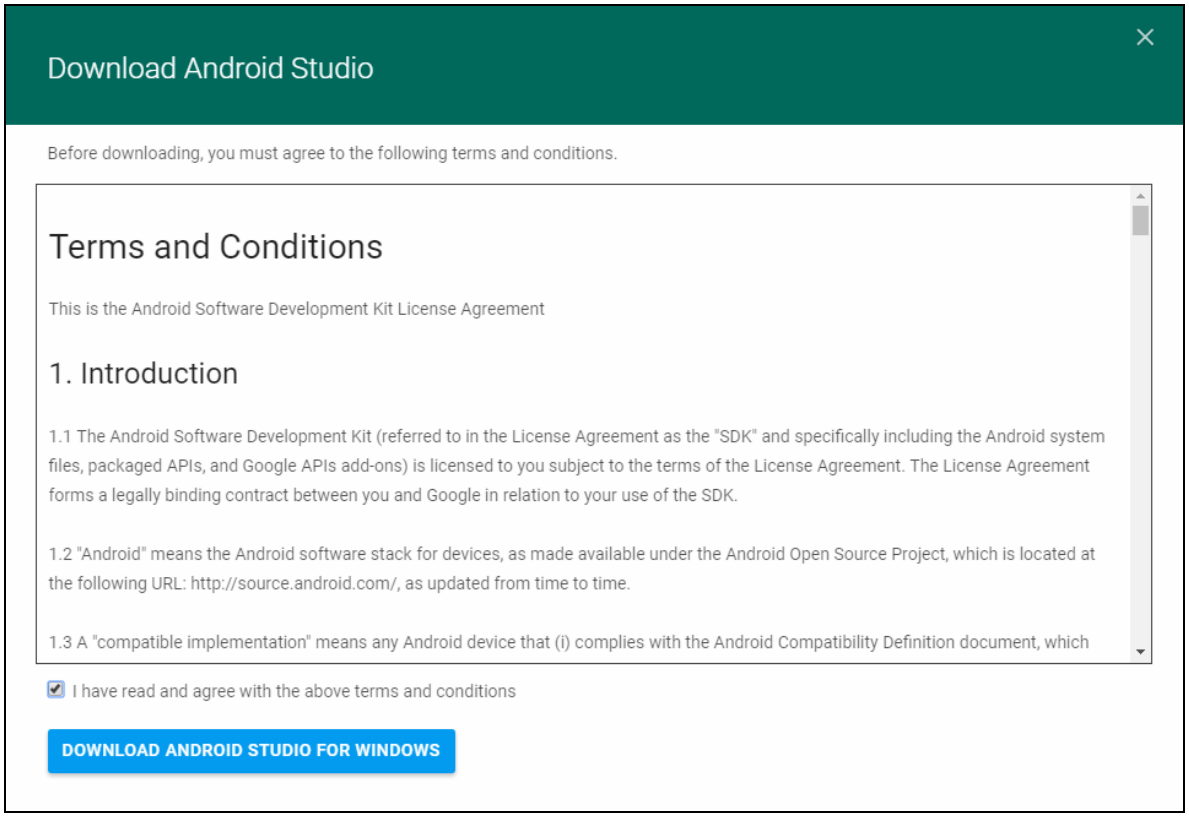
Java SE Development Kit 8 Update 131 (64-bit) - Complete
Java
ORACLE
Java SE Development Kit 8 Update 131 (64-bit) Successfully Installed
Click Next Steps to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK.
Next Steps
Close

3.3 Installing Android Studio

Android Studio can be downloaded from Android site of Google.
http://developer.android.com/sdk/index.html

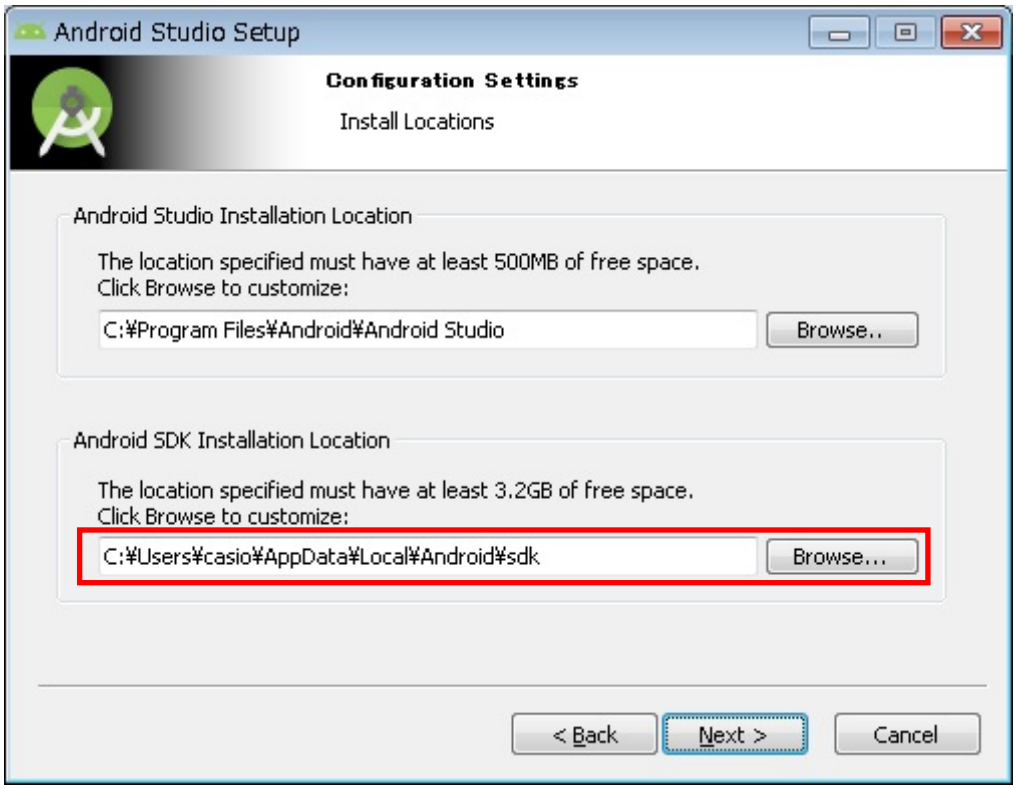


Agree to the “Terms of Conditions”, then start downloading.



Once executing the downloaded file, follow the instructions to proceed the installation.

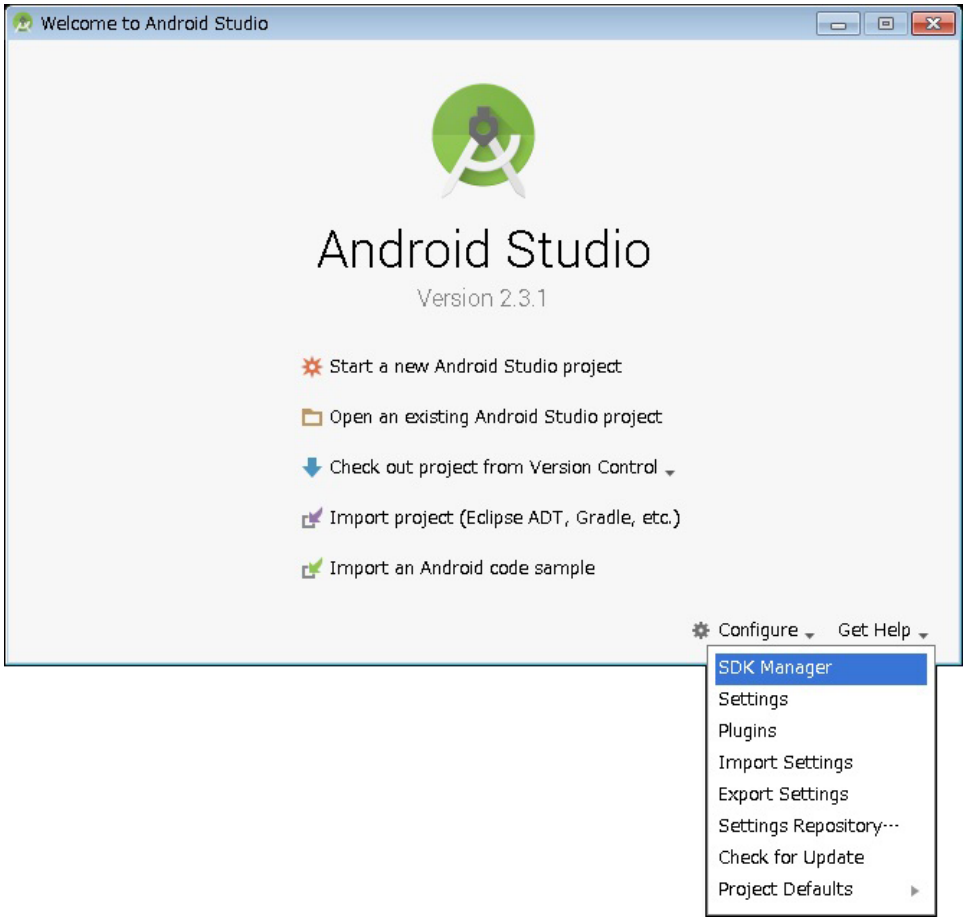
During installation, you will be prompted to specify the installation destination by the dialog below. The "Android SDK Installation Location" on the figure below is also necessary when installing the USB driver, it's better to take a note.



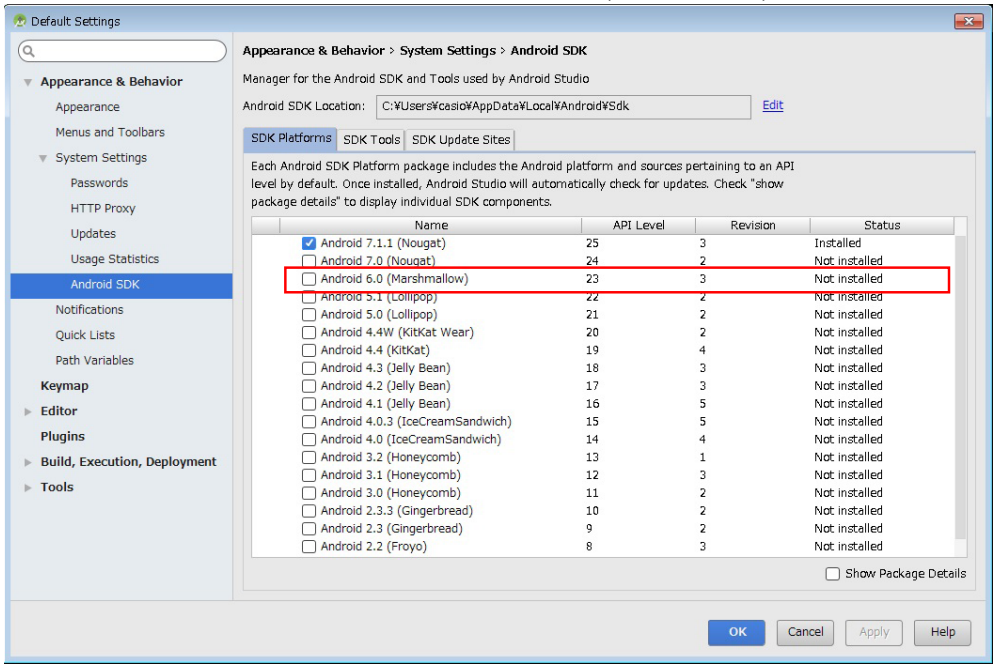
When the dialog shown below is displayed, installation of Android Studio is completed.

3.4 Downloading Android SDK and USB driver

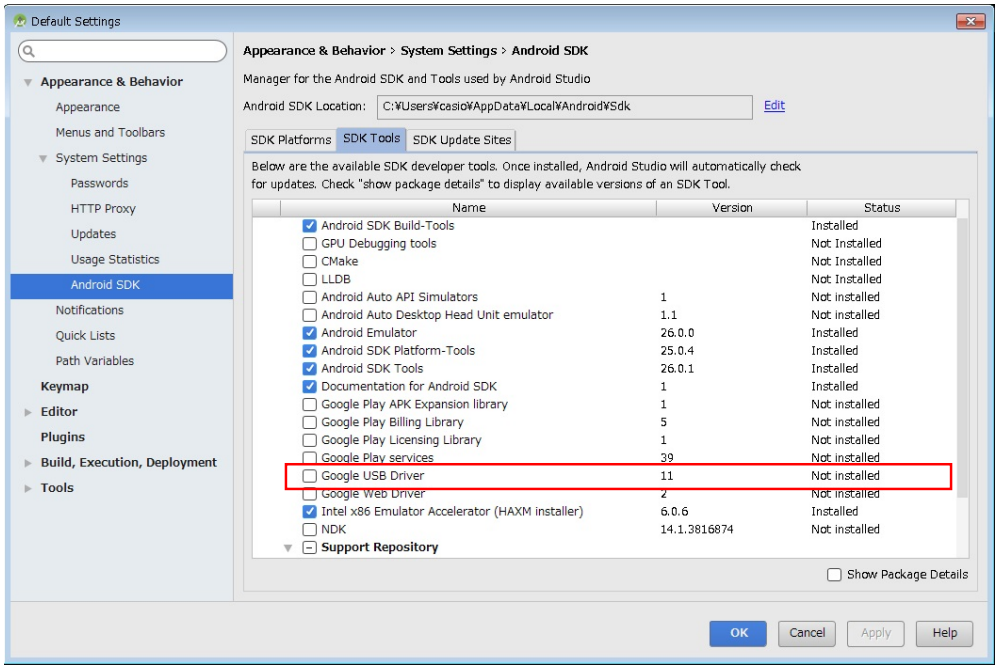
Launch Android Studio, and chose "SDK Manager" from Configure tab.



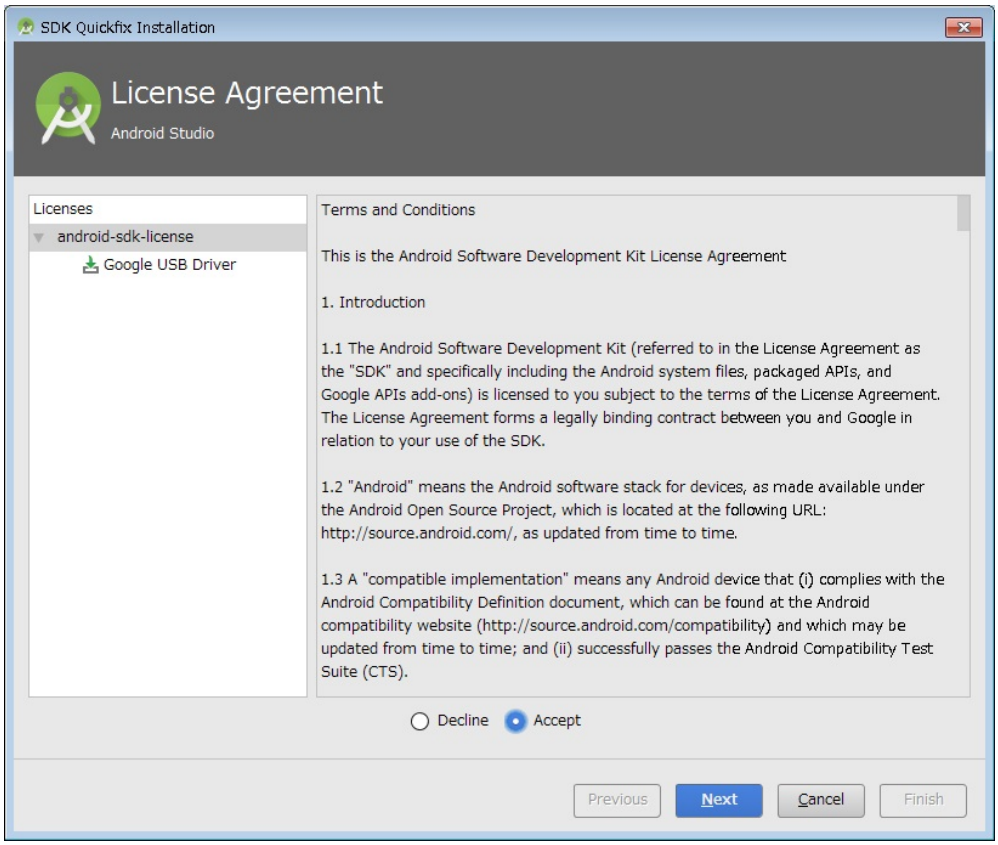
Select “SDK Platform” tab, then check "Android 6.0 (API Level 23)".



Then, select “SDK Tools” tab and check "Google USB Driver".



Once agree to the “License Agreement”, then press “OK” to start installation.



The downloaded files are stored under "Android SDK Installation Location" that you noted in "3.3 Installing Android Studio (p.13) ".

The USB driver is stored in "extras¥google¥usb_driver" under "Android SDK Installation Location".

3.5 Installing and Updating Device Library (AAR)

This chapter explains how to register the device library and its help file to Android Studio project.

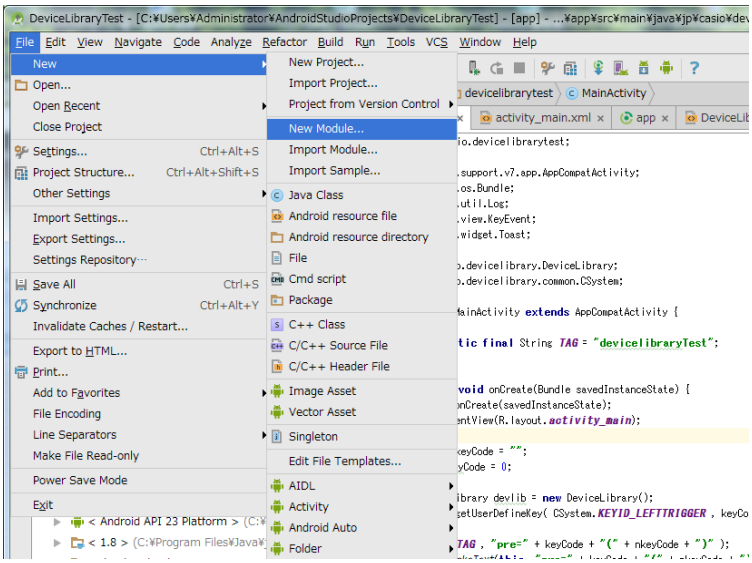
3.5.1 Preparations

Device Library (AAR) and its help files (Javadoc) are needed to be registered to the each project via Android Studio. Therefore, the method described here is necessary every time when creating new project that uses the device library.

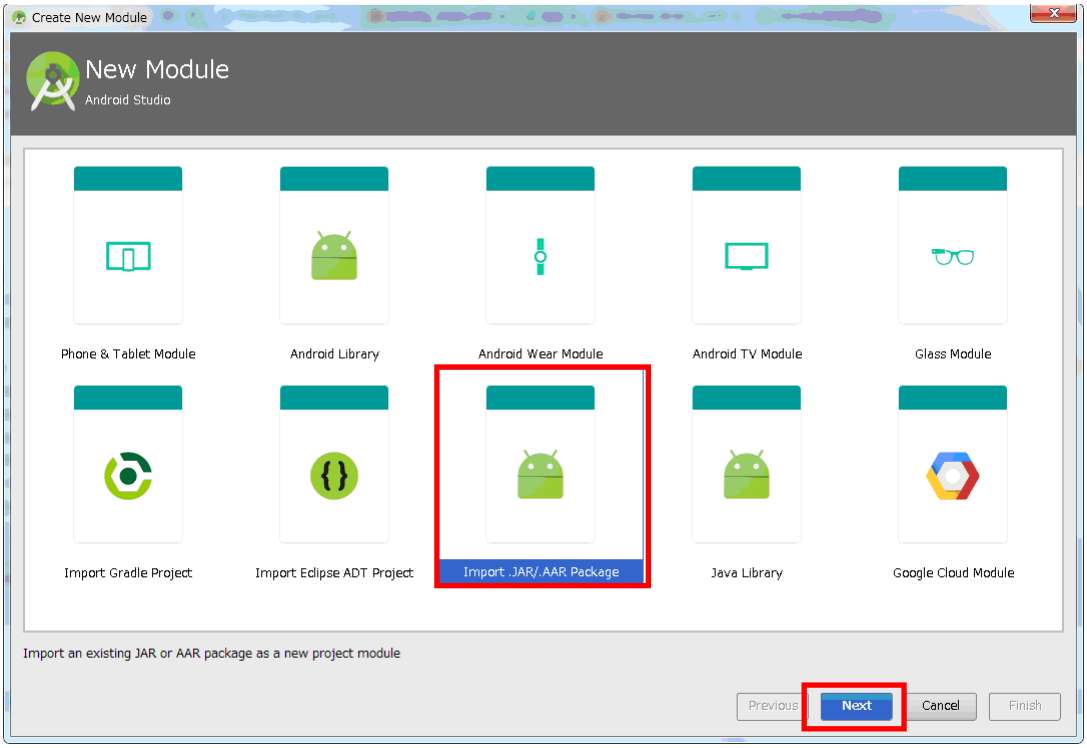
The following chapter explains the procedure for registering the device library and its help files to the project. It is better to copy the DeviceLibrary and its help files from the IT-G400 Basic Development Kit to the local folder beforehand.

3.5.2 Registering DeviceLibrary (AAR)

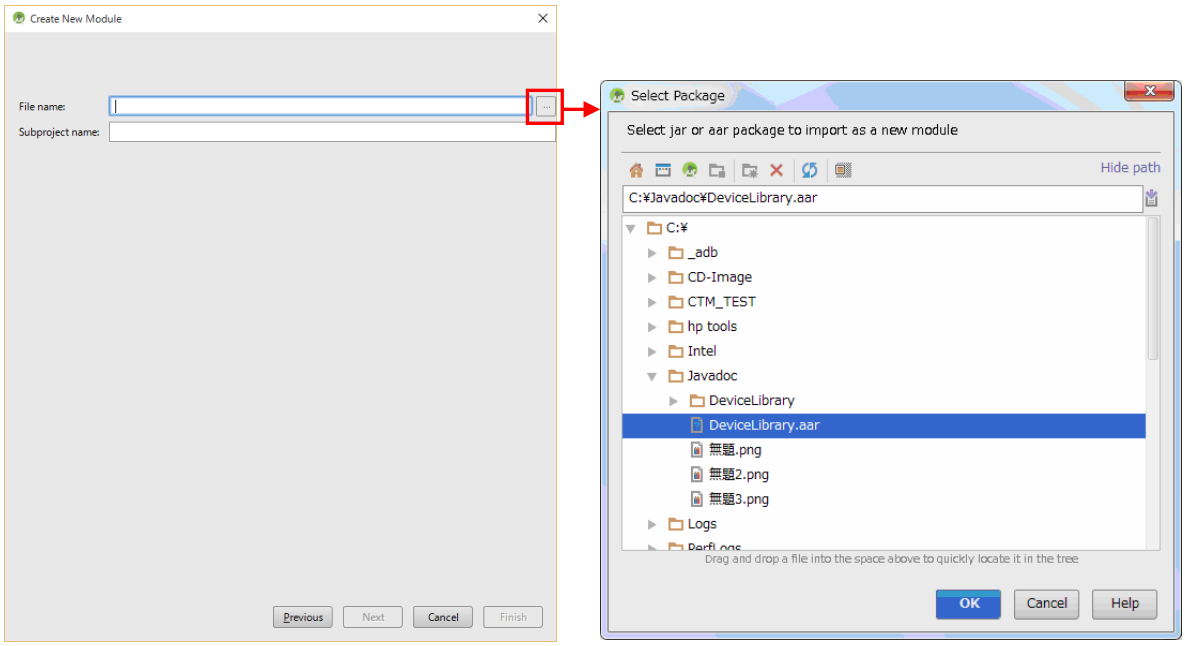
Once open the project from the Android Studio, open the "New Module" dialog with [File] → [New] → New Module.



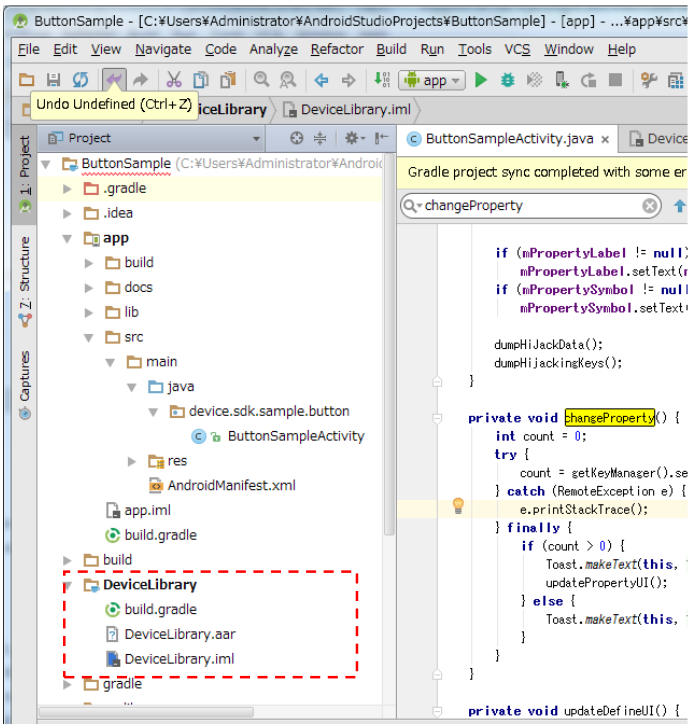
On the dialog shown below, select "Import .JAR/.AAR Package" and proceed with "Next".



Press the [...] of "File name" and select the DeviceLibrary (AAR) you copied beforehand.



By the above, the registration of the device library to the project was completed. You can see that the AAR file name has been added to the Android Studio Project tree.

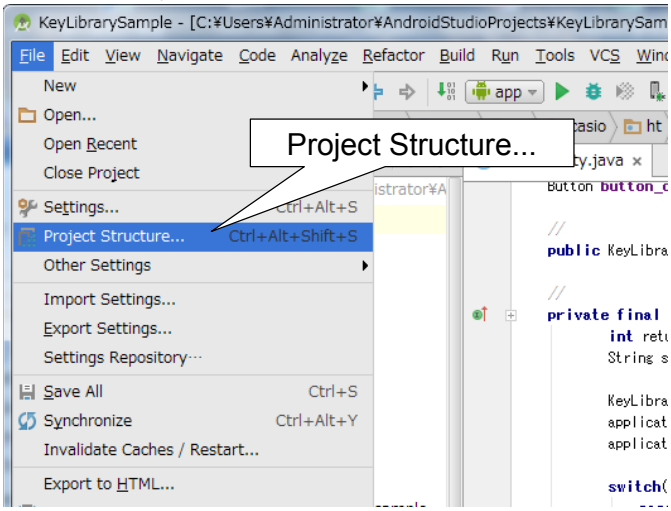

ButtonSample - [C:¥Users¥Administrator¥AndroidStudioProjects¥ButtonSample] - [app] - ...¥app¥src¥
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
Undo Undefined (Ctrl+Z)
DeviceLibrary.iml
Project
ButtonSample (C:¥Users¥Administrator¥Androi
.gradle
.idea
app
build
docs
lib
src
main
java
device.sdk.sample.button
ButtonSampleActivity
res
AndroidManifest.xml
app.iml
build.gradle
build
DeviceLibrary
build.gradle
DeviceLibrary.aar
DeviceLibrary.iml
gradle
ButtonSampleActivity.java
Gradle project sync completed with some er
changeProperty
if (mPropertyLabel != null)
mPropertyLabel.setText(
if (mPropertySymbol != null
mPropertySymbol.setText
dumpHiJackData();
dumpHijackingKeys();
}
private void changeProperty() {
int count = 0;
try {
count = getKeyManager().se
} catch (RemoteException e) {
e.printStackTrace();
} finally {
if (count > 0) {
Toast.makeText(this,
updatePropertyUI();
} else {
Toast.makeText(this,
}
}
}
private void updateDefineUI() {

3.5.3 Dependency check of DeviceLibrary (AAR)

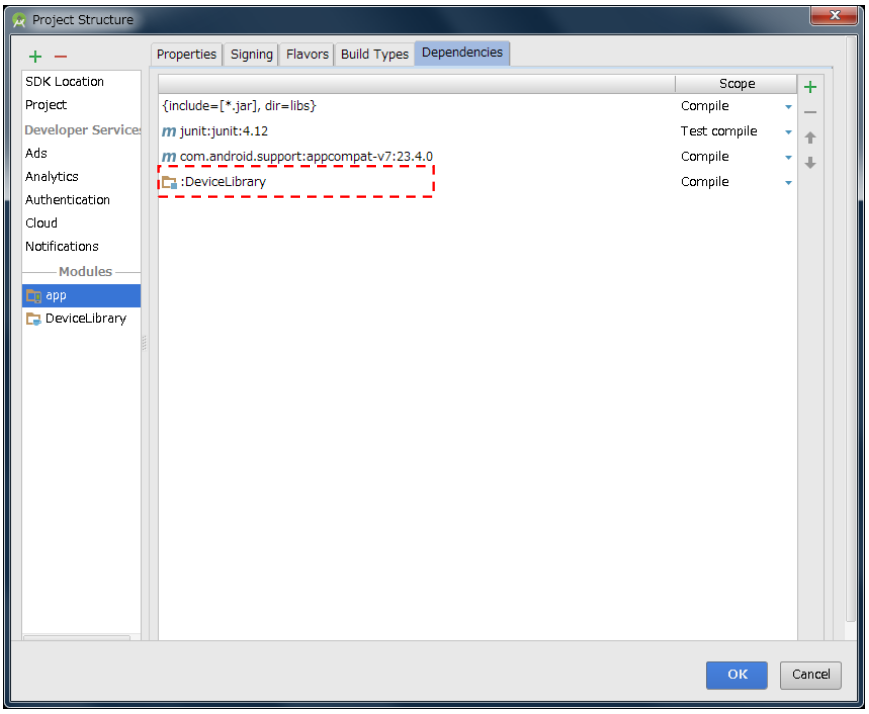
The registration of the device library was completed with "3.5.2 Registering DeviceLibrary (p.17)". However, somehow the dependency relationship of the DeviceLibrary to the project is not set correctly in some cases.

If the dependency is not set correctly, "3.5.4 Registering Help files (Javadoc) (p.23)" can not be done correctly, in that case follow the explanation in this section.

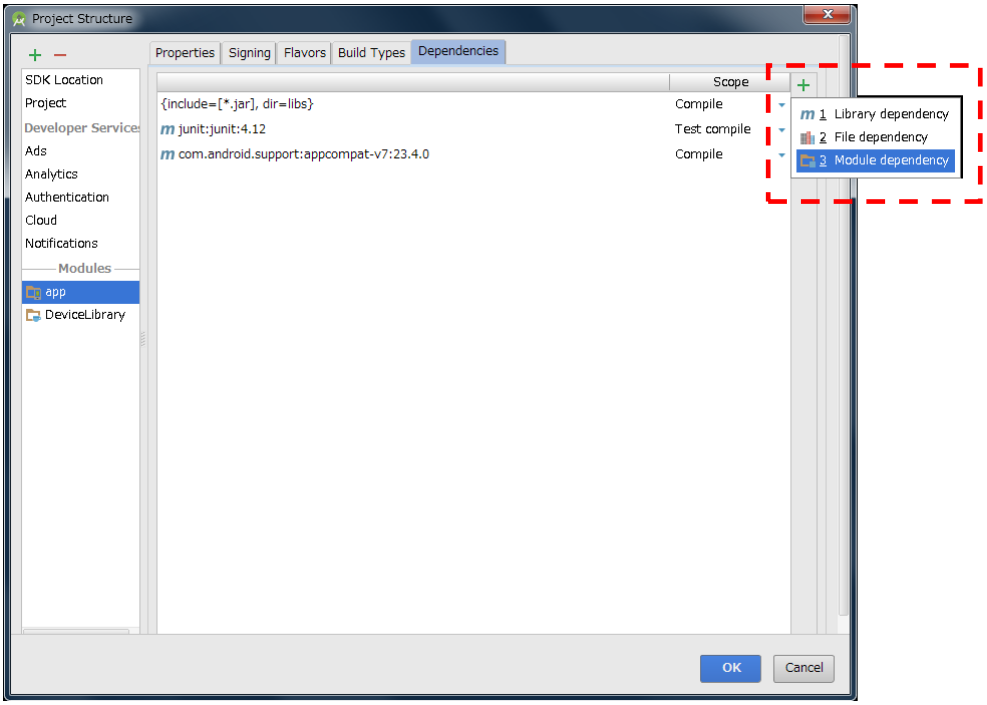
First, select "Project Structure ..." from File menu.



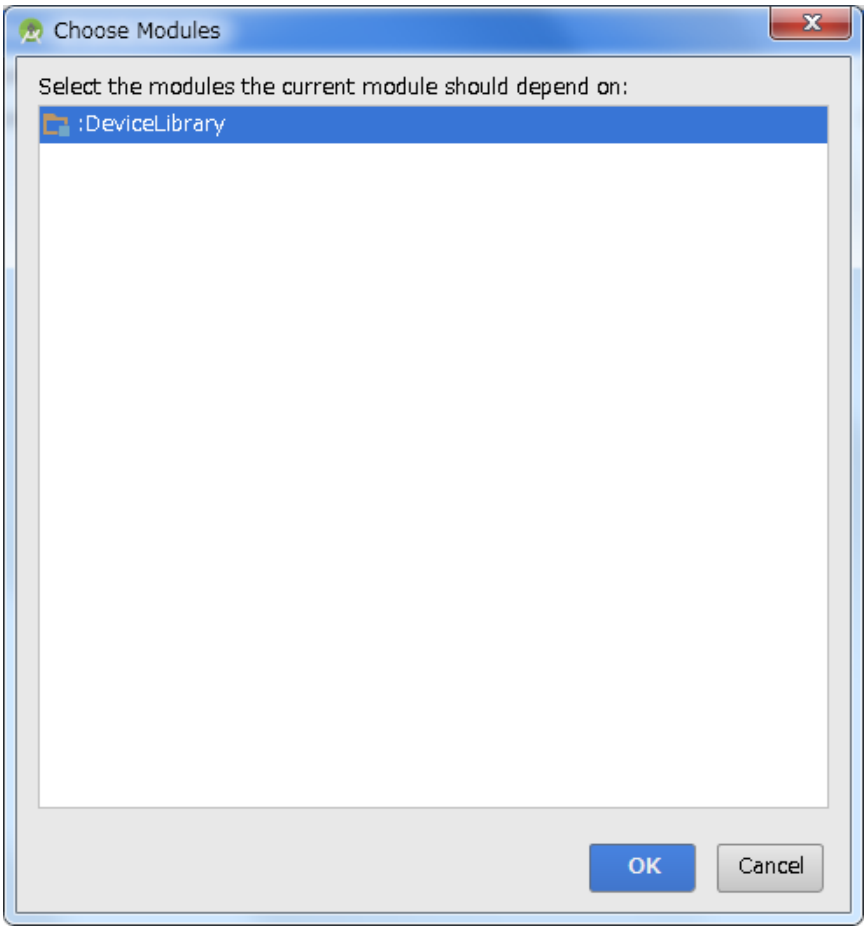
Open the "Dependencie" tab and check if "DeviceLibrary" (red frame in the figure below) exists. If it exists, subsequent operations are unnecessary.



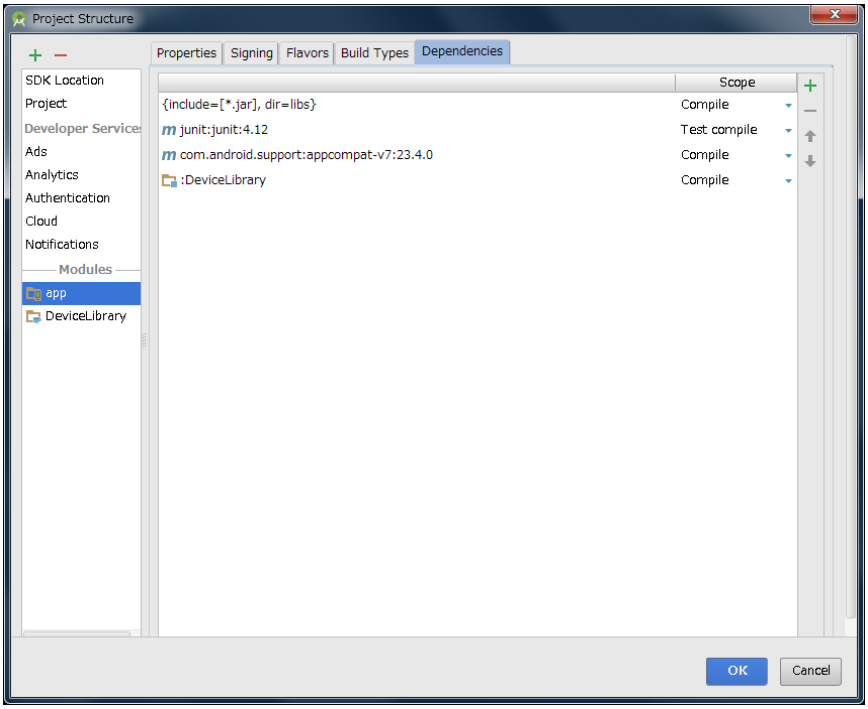
If it does not exist, tap "+ button" at right end and select "Module dependency".



Confirm that "DeviceLibrary" is displayed as shown below and tap "OK".



By the above, "DeviceLibrary" has been added to the tab of "Dependencies".


Project Structure
Properties
Signing
Flavors
Build Types
Dependencies
SDK Location
Project
Developer Services
Ads
Analytics
Authentication
Cloud
Notifications
Modules
app
DeviceLibrary
Scope
{include=[*.jar], dir=libs}
Compile
junit:junit:4.12
Test compile
com.android.support:appcompat-v7:23.4.0
Compile
:DeviceLibrary
Compile
OK
Cancel

3.5.4 Registering Help files (Javadoc)

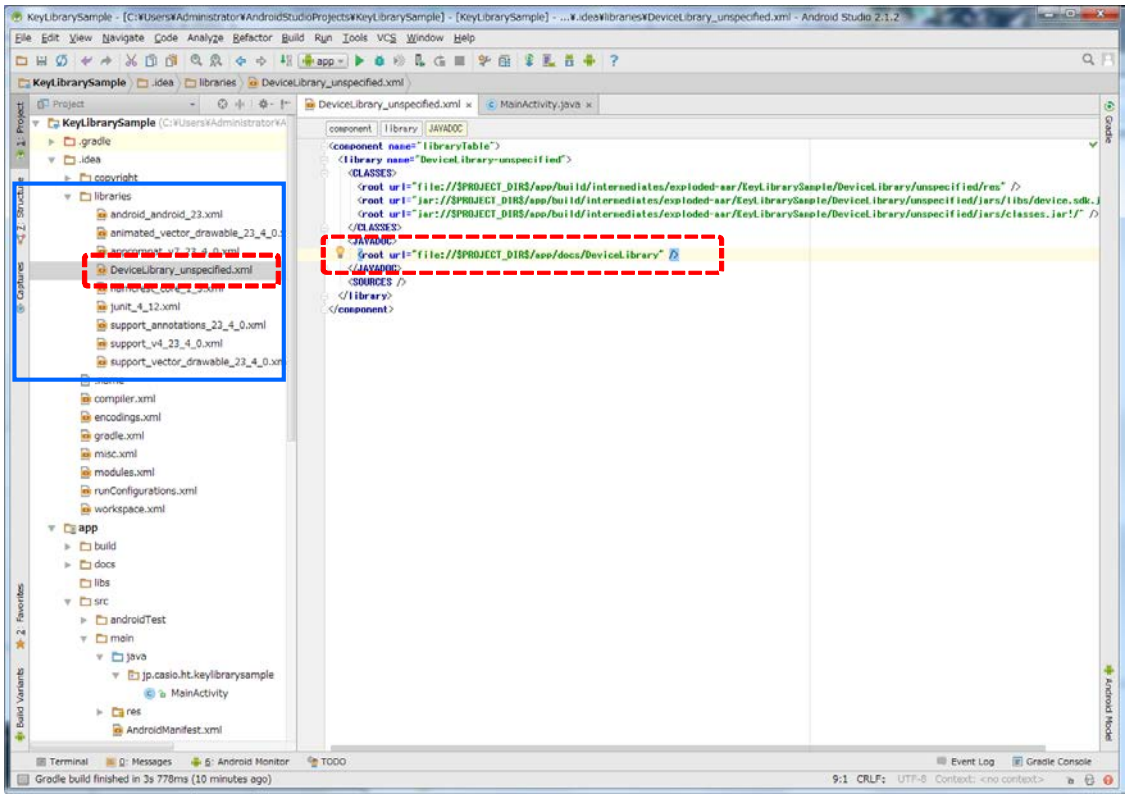
This section explains how to enable pop-up help (pops up help message when you move the cursor to the function name) of Device Library.

First, associate Javadoc which is the help file of Device Libraries to Device Library registered to Android Studio.

The Javadoc file can be placed anywhere as long as it can be referenced on the PC. It assumes that it is placed in the "docs/DeviceLibrary" folder here.

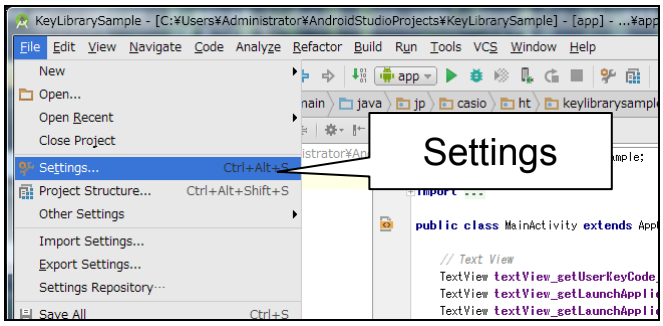
When registration of the device library is completed, a xml file whose name is same as the library is automatically created under the “". Idea" folder. At moment, the item "<JAVADOC>" in this xml file has not been set. Specify the location of the javadoc file (folder path with index.html) in this item "<JAVADOC>".

```
<JAVADOC>
<root url="file://$PROJECT_DIR$/app/docs/DeviceLibrary" />
</JAVADOC>
```

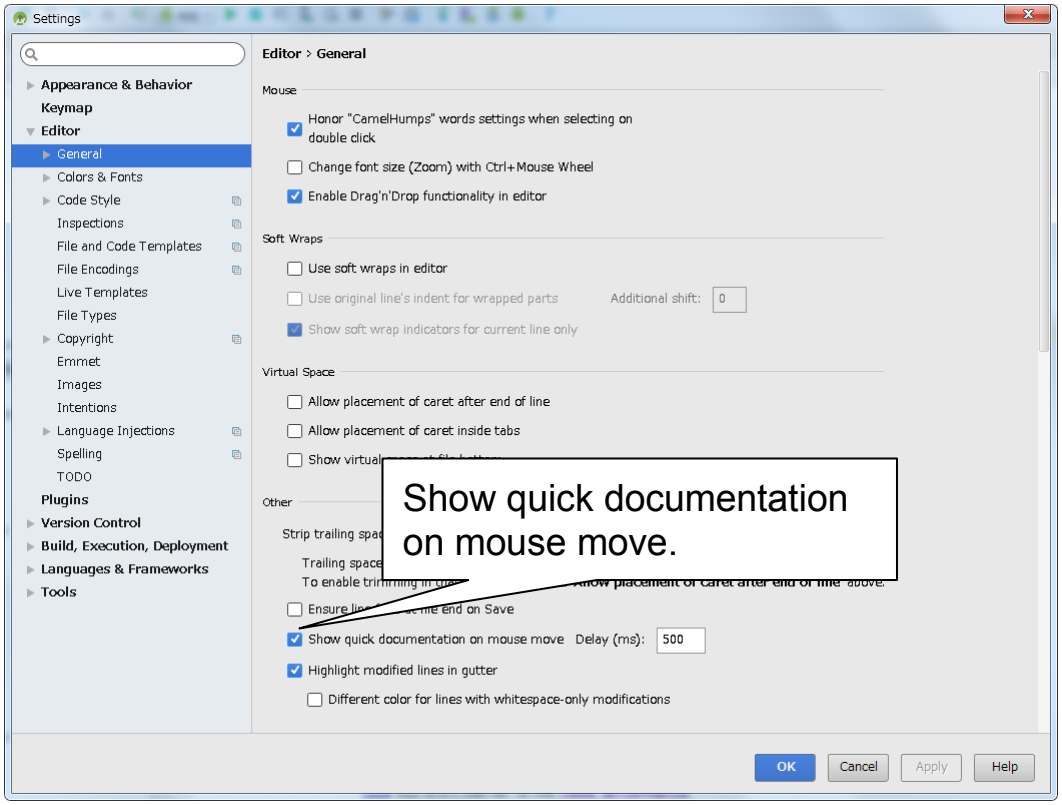


By the above, the registration of the help file was completed.
Next, enable "Quick documentation on mouse move" which is the function of Android Studio.

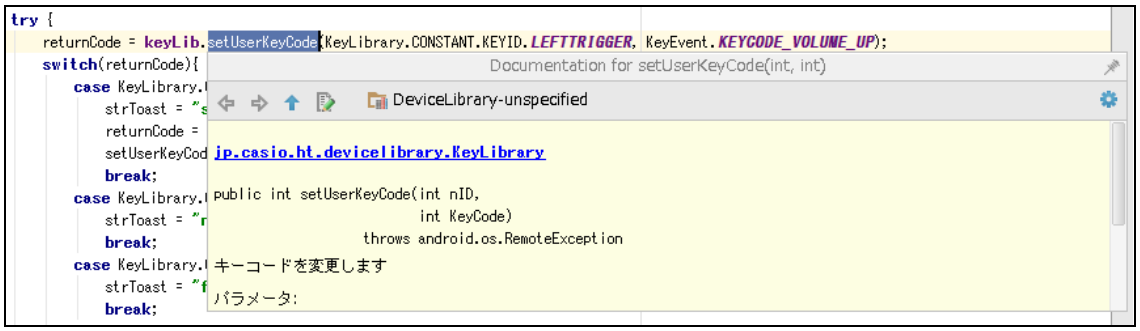
Select "Settings ..." from File menu of Android Studio.



Next, check a box of "Show quick documentation on mouse move".



Now, if you hover the mouse cursor over the function name, help of the function will be poped up.



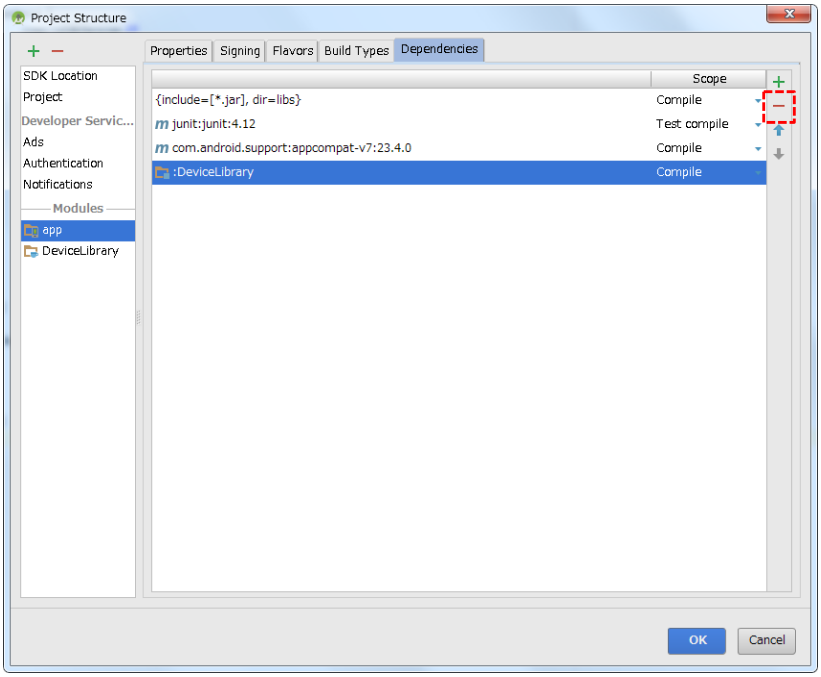
3.5.5 Updating of DeviceLibrary （ AAR ）

In order to update the device control library registered in the project of Android Studio (exchange to the new version), once you need to unregister (unassociate) them and register new one.

This section explains how to unregister (unassociate) them from the project.

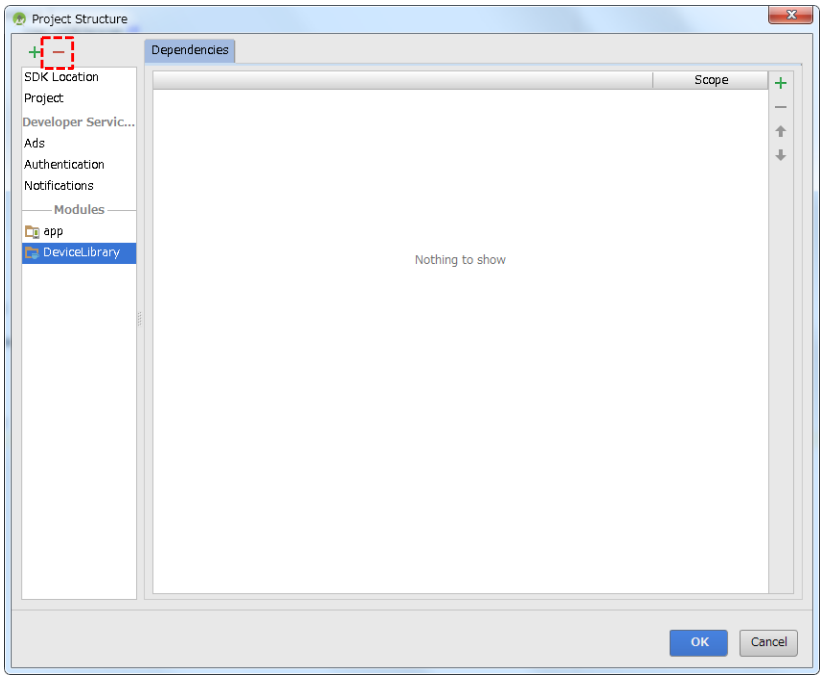
(1) Unassociate Library (AAR)

Open your project in Android Studio and select [File] -> [Project Structure ...]. Select "app" from "Modules" in the left frame and open the "Dependencies" tab. Select DeviceLibrary and press the right "-" button to cancel the association.

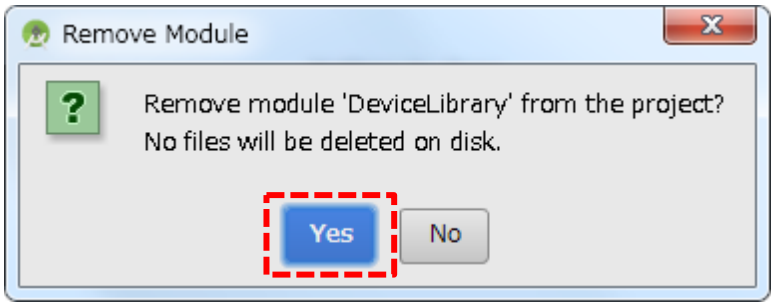


(2) Unregister Library (AAR)

Next, select "DeviceLibrary" from "Modules" in the left frame and tap "- button" in the upper left.



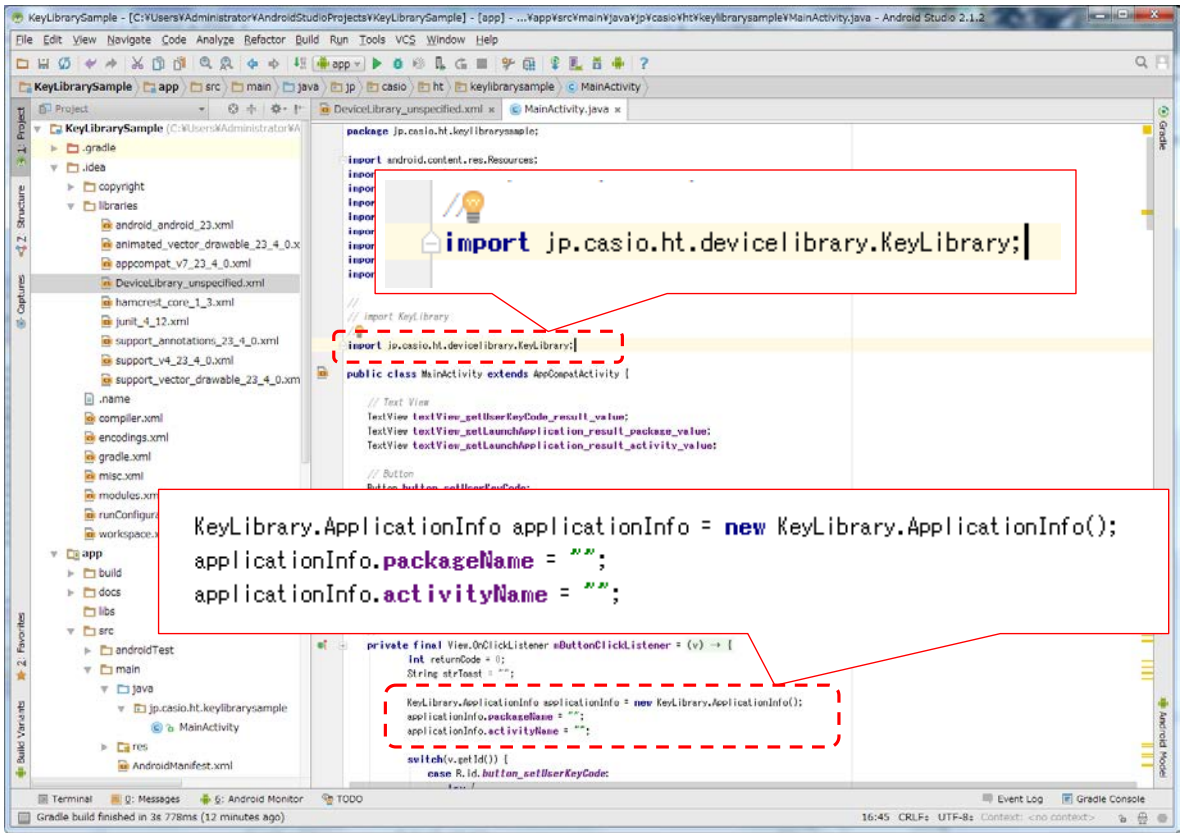
A dialog to confirm deletion of DeviceLibrary appears, so tap [Yes].



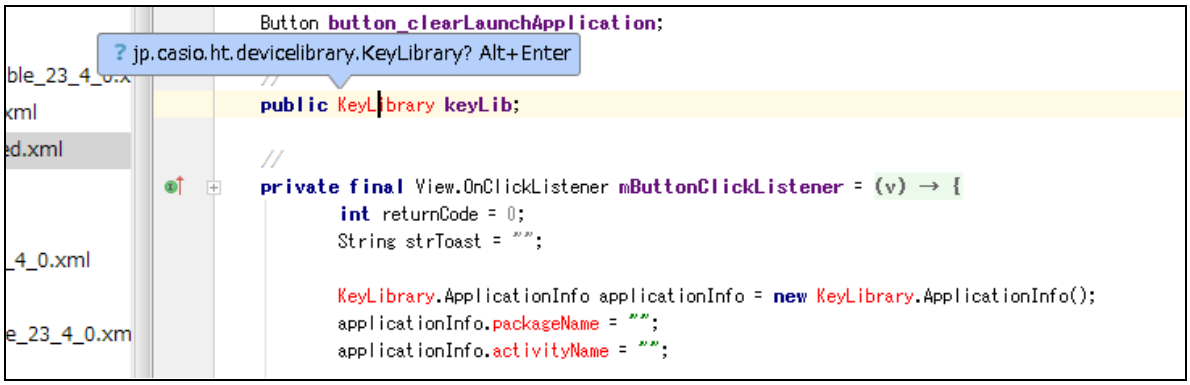
By the above, Device Library was unregistered. Follow "3.5Installing and Updating Device Library(p.17)" to register the new Device Library.

3.6 How to use the DeviceLibrary (AAR)

To use an AAR file, just like jar, it is needed to inport it in order to create class object.



If a class that has not been imported is used, popup message as shown below is comes.



4. Application development and debug

In order to develop / debug applications using IT-G400, the following preparation is necessary.

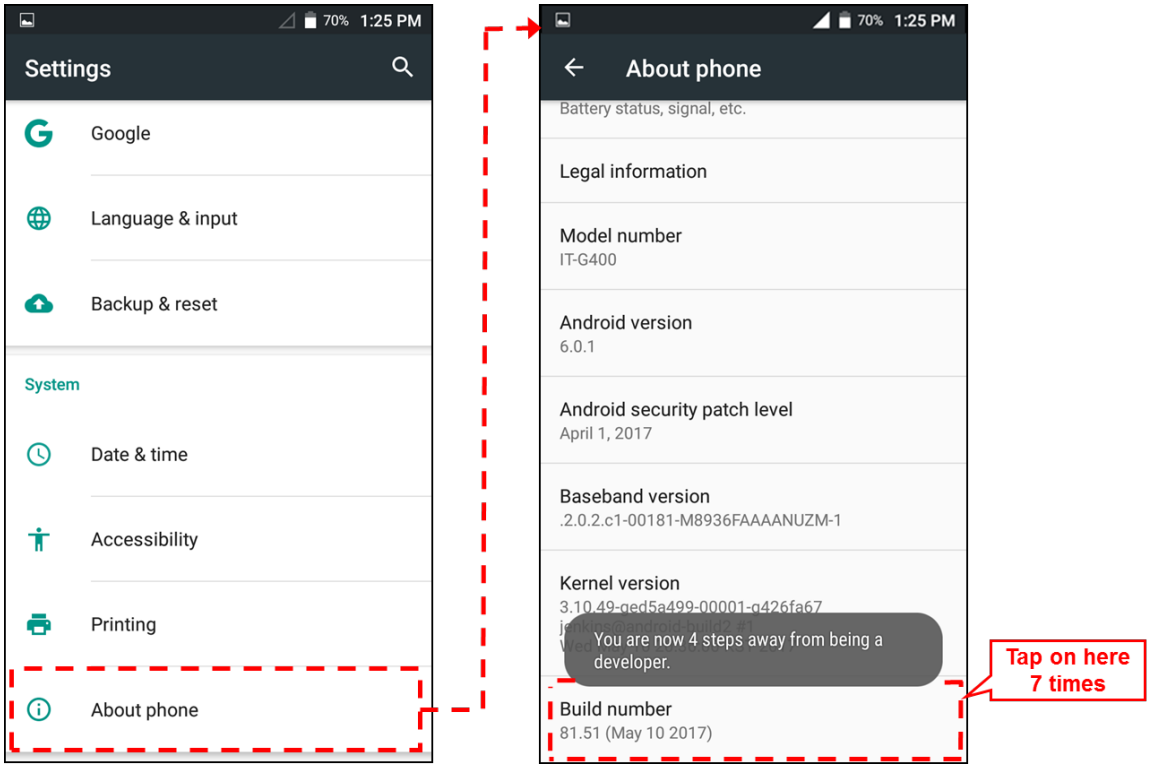
(1) Enable USB debugging (ADB connection) of IT-G400.
(2) Install IT-G400 USB driver to your PC.
(3) Set PATH to the debug tools on your PC.

These steps are described below.

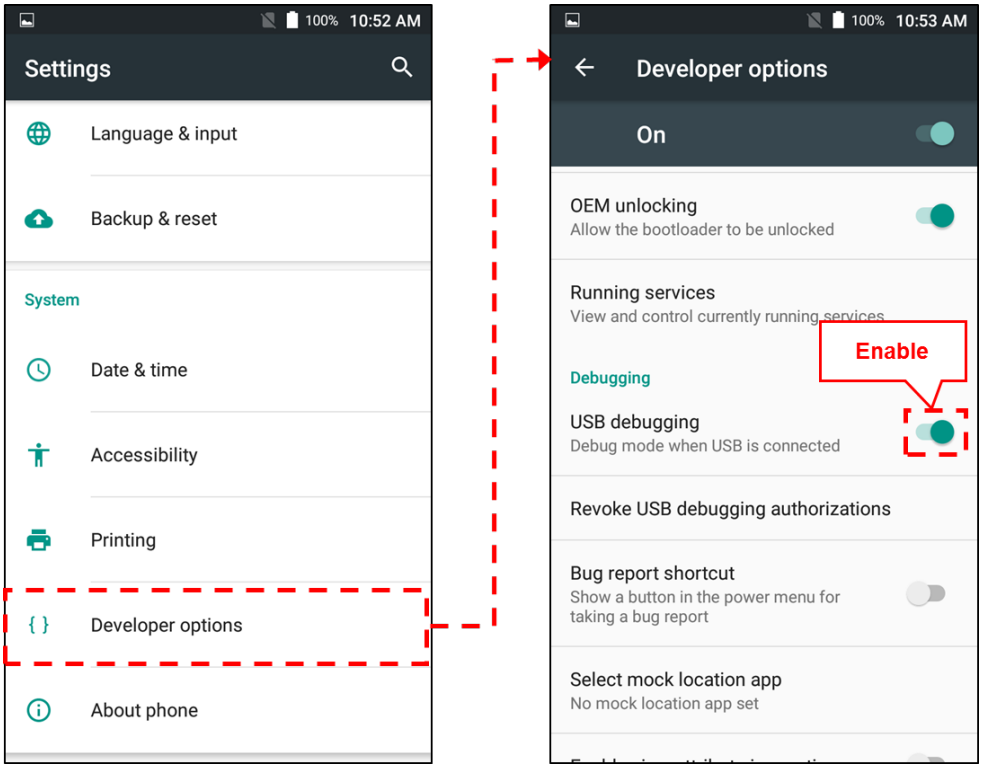
4.1 Enabling USB debugging

Since USB debugging is a function for developers, you first need to activate the Developer options by the following procedure.

Open [Settings] → [About phone] and tap "Build number" on the bottom line seven times, [Developer options] is added above [About phone].



Tap [Developer options] and enable "USB debugging" on the opened screen.

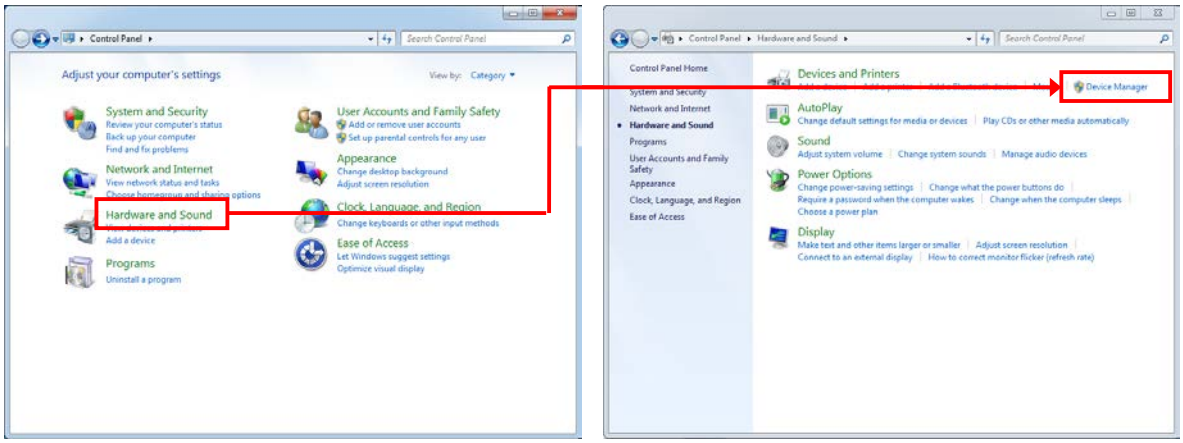


4.2 Installing USB driver

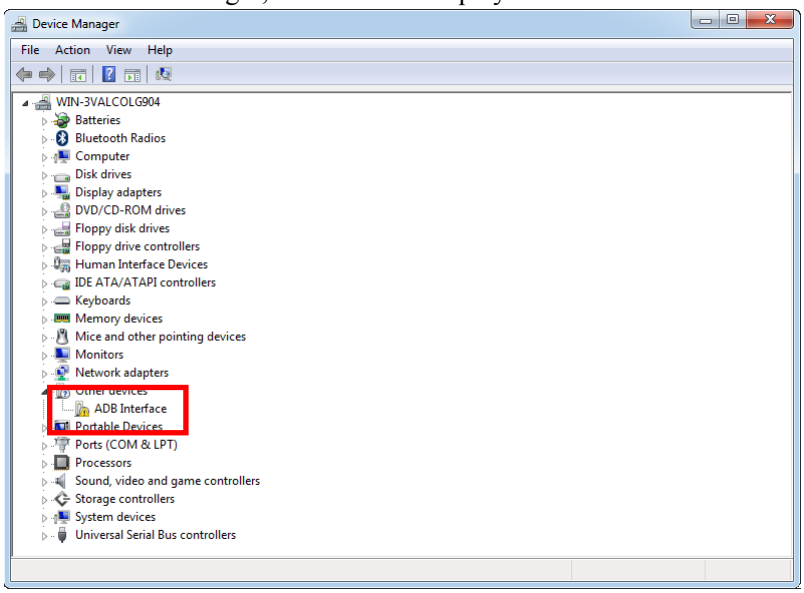
Install the USB driver for connecting the IT-G400 and PC with the ADB (Android Debug Bridge) protocol.

Files necessary for installation are downloaded as described in "3.4 Downloading Android SDK and USB driver (p.15)".

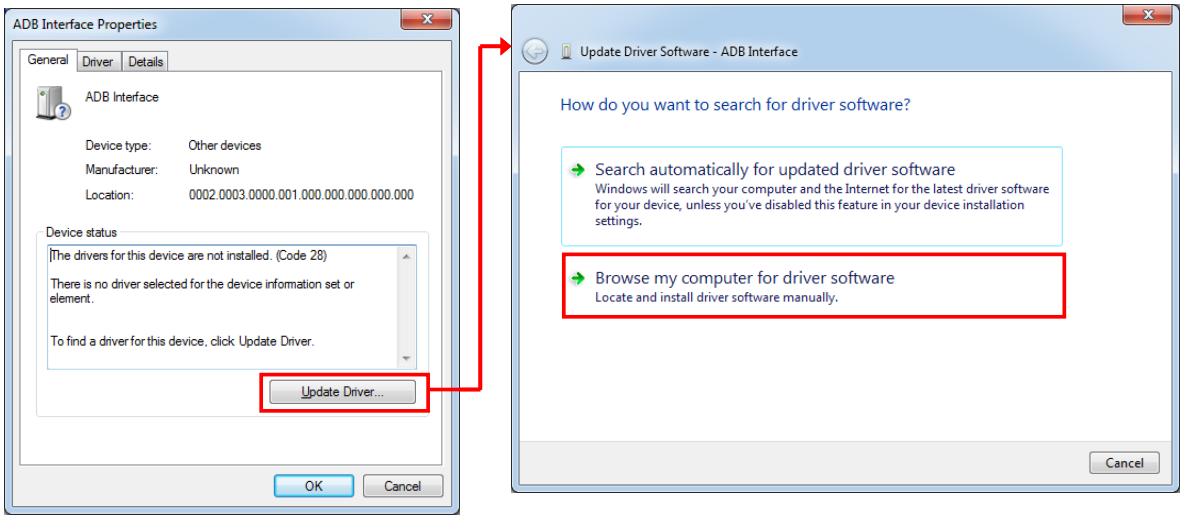
Connect the IT-G400 to a PC using a USB cable or a USB cradle. Then, open the Device Manager by [Control Panel] → [Hardware and Sound] → [Device Manager].



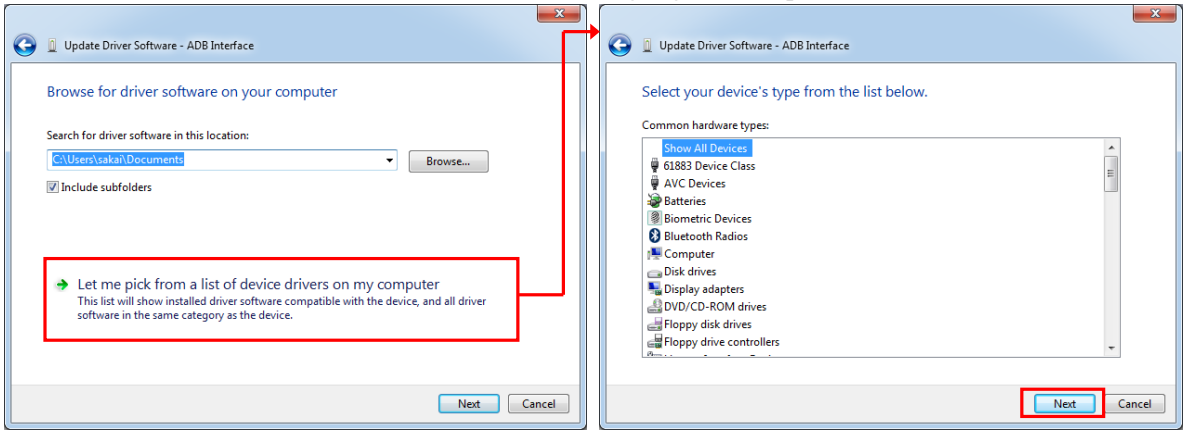
In the Device Manager, “Android” is displayed as an unknown device as shown below.



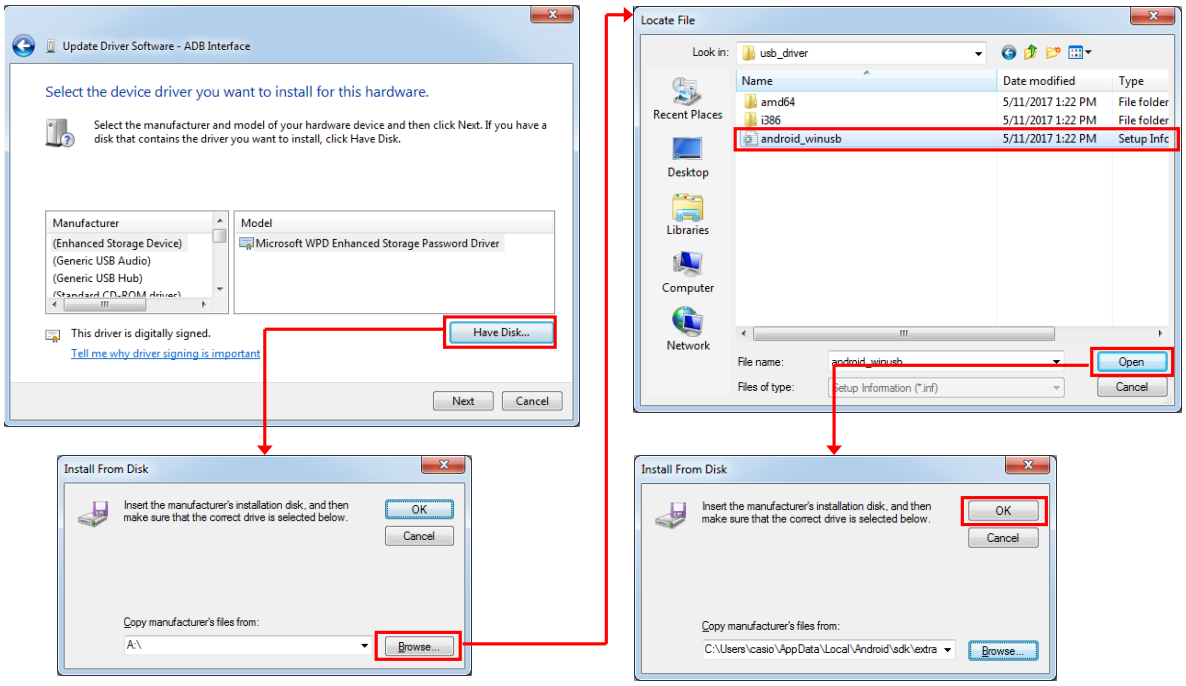
By right-click the red frame (“Android”) in the above figure, displays its properties, and press [Update Driver].



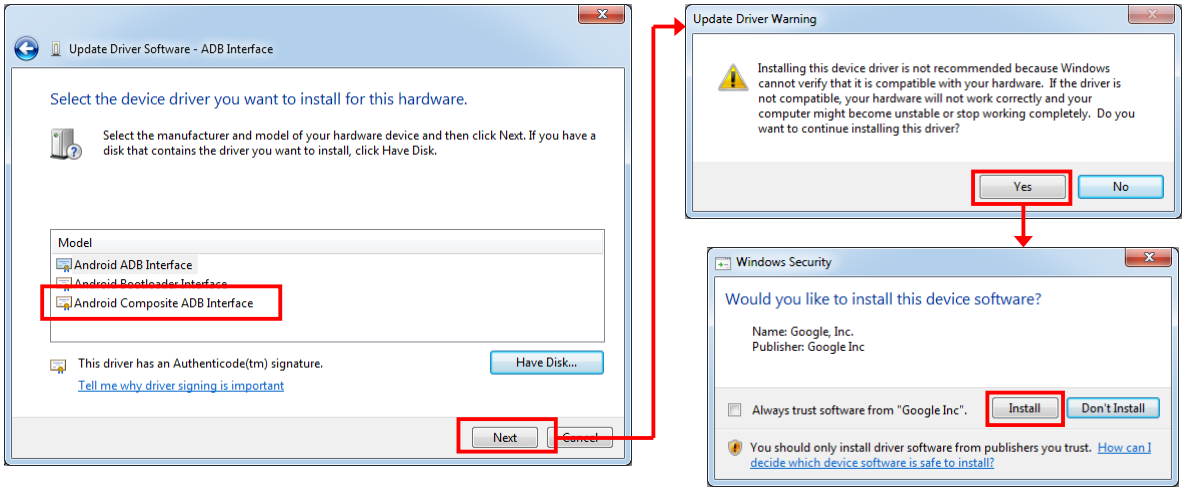
When the dialog below is displayed, press "Let me pick from a list of drivers on my computer " at the bottom. In the driver list, with "Show all devices" is highlighted and press [Next].



When you click [Hard Disk…] in the displayed dialog, a dialog box for specifying the location of the driver opens, so click [Browse…] to open the file dialog box.　In the file dialog box, search for “extras¥google¥usb_driver¥android_winusb.inf” under the “Android SDK Installation Location" that you took note in “3.4 Downloading Android SDK and USB driver (p.15)” and specify it.



The following driver selection screen will appear. Select "Android Composite ADB Interface" and press [Next].　Answer "Yes" to "Driver Update Warning" and press "Install" of "Windows Security" dialog.

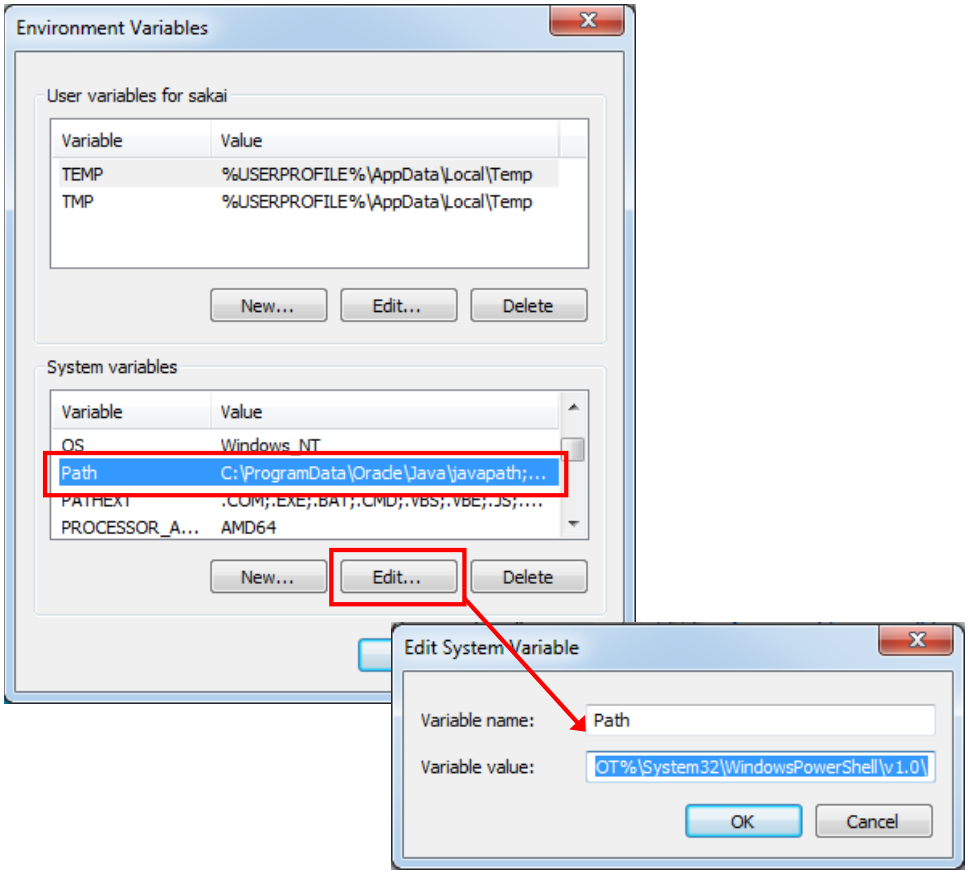


By the above, the installation of the USB driver for ADB protocol was completed.

4.3 Settings for ADB （ Android Debug Bridge ）

In order to use Android SDK tools such as adb from the command prompt, it is needed to add the path to Android SDK to the system environment variable.　Add the following two paths.

The "tools" folder under "Android SDK Installation Location" that you took note.
The "platform-tools" folder under "Android SDK Installation Location".



In the above example, the path to add is as follows.

C:¥Users¥casio¥AppData¥local¥Android¥sdk¥tools
C:¥Users¥casio¥AppData¥local¥Android¥sdk¥platform-tools