

CASIO[®]

DT-X400 Series

Android 8.1 Quick Start Guide

This document is a Development Guide Book for DT-X400 application developers.



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1. Overview

This document is a development guidebook written for the DT-X400 application developers.

1.1 Notes of this development kit

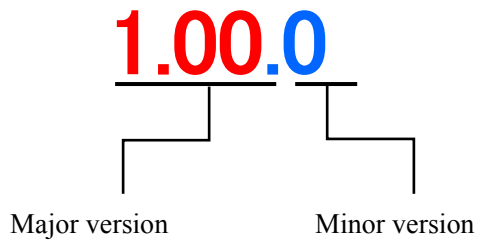
Notes for using this development kit are as follows.

- There is a dependency between the version of Android Studio and the version of the DeviceLibrary. For details, refer to "2.4 Required software (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.aar).

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.

Folder / File	Description
QuickStartGuide.Ink	Read this document first.
/MANUAL	/This folder contains manuals.
QuickStartGuide.pdf	Quick start guide
SoftwareManual.pdf	Software manual
DeviceLibraryManual.pdf	Device library manual
HardwareManual.pdf	Hardware manual
/SOFTWARE	/This folder contains softwares
/BDK	/Basic development kit
/CasioAndroidAddons	/Casio Addons for android
/bin	/Program's folder
CASIOAndroidAddons0100020012.apk	CasioAndroidAddons (binary)
/manual	/Manual's folder
CasioAndroidAddonsManual.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 file's folder
KeyLibrarySample.zip	KeyLibrary samples
SymbolScan.zip	ScannerLibrary samples
RangeScan.zip	
InverseScan.zip	
CenteringWindowScan.zip	
TriggerScan.zip	
ImageCapture.zip	
/TOOLS	/Tools folder
/SupportTools	SupportTool folder
/manual	/Manual's folder
KittingManual.pdf	Kitting manual
FLDroidManual.pdf	FLDroid manual
/bin	/Program's folder
KitData.xls	Kitting scenario file
/OSUpdateService	/OSUpdateService folder
/bin	/Program's folder
OSUpdateService0100010004.apk	OS Update Service
/samples	/Sample file'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 DT-X400
DeviceLibrary manual	Describing the specifications of the device library
CasioAndroidAddons manual	Describing the specifications of the CasioAndroidAddons.
Kitting manual	Describing the specifications of the Kitting.
FLDroid manual	Describing the specifications of the FLDroid.

2. Application development requirement

2.1 Needed programming knowledges

DT-X400 application can be developed using the following language.

- Java

And, also the knowledge about the followings are needed.

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

2.2 Required hardware

Product name	Remarks
DT-X400	

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 10.13 (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® 18.04 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™)

Note!

The explanation after the next chapter is all for Windows (64bit). 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 software

In order to develop DT-X400 application programs, it needs the development environment of Android.

Development platform (Recommended)

Development language	Development platform (Recommended)
Java	Android Studio 3.0 or above Android SDK (API level 26 - 27) Google USB driver JDK7 or above(Bundled with Android Studio)

Note!

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.

Software	Version
Android Studio	3.2.1
Gradle version (Android Studio)	4.6
Android Plugin Version (Android Studio)	3.2.4
Development Kit	2.05.1

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 Android Studio

Install Android Studio to your PC.

Regarding the requirement of Android Studio, refer "2.4 Required software (p.8)".

Regarding Android Studio installation detail, refer "3.2 Installing Android Studio (p.10)".

(2) 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, refer "4.2 Installing USB driver (p.30)".

Regarding the requirement of Android SDK, refer "2.4 Required software (p.8)".

(3) Setting PATH

Add the path to Android SDK to "PATH" of the system environment variable.

For the setting method, refer to "4.3 Settings ADB (Android Debug Bridge) (p.34)".

(4) Installing DeviceLibrary

Place the DeviceLibrary (AAR) to anywhere on your PC, and register it to the each of your projects via Android Studio.

Regarding DeviceLibrary installation, refer "3.4 Import and Updating Device Library (p.18)".

(5) 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 DT-X400 via the ADB (Android Debug Bridge) interface.

For details, see "4 Application development and debug (p.29)".

3.2 Installing Android Studio

Android Studio can be downloaded from Android site of Google.

<https://developer.android.com/studio/>

androidstudio

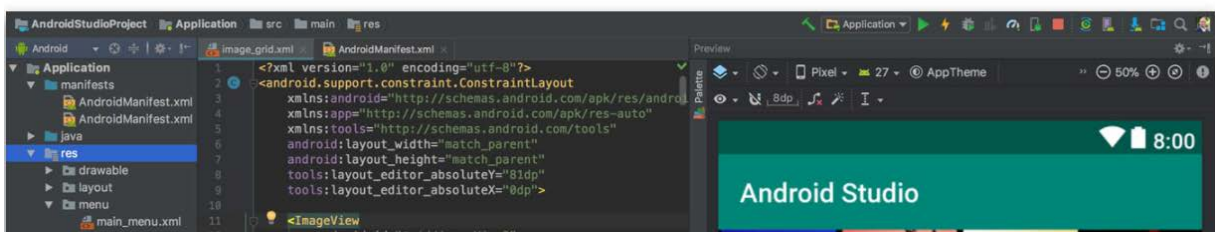
Android Studio provides the fastest tools for building apps on every type of Android device.

DOWNLOAD ANDROID STUDIO

3.1.4 for Windows 64-bit (790 MB)

DOWNLOAD OPTIONS

RELEASE NOTES



Agree to the "Terms of Conditions", then start downloading.

Download Android Studio

Before downloading, you must agree to the following terms and conditions.

Terms and Conditions

This is the Android Software Development Kit License Agreement

1. Introduction

1.1 The Android Software Development Kit (referred to in the License Agreement as the "SDK" and specifically including the Android system files, packaged APIs, and Google APIs add-ons) is licensed to you subject to the terms of the License Agreement. The License Agreement forms a legally binding contract between you and Google in relation to your use of the SDK.

1.2 "Android" means the Android software stack for devices, as made available under the Android Open Source Project, which is located at the following URL: <http://source.android.com/>, as updated from time to time.

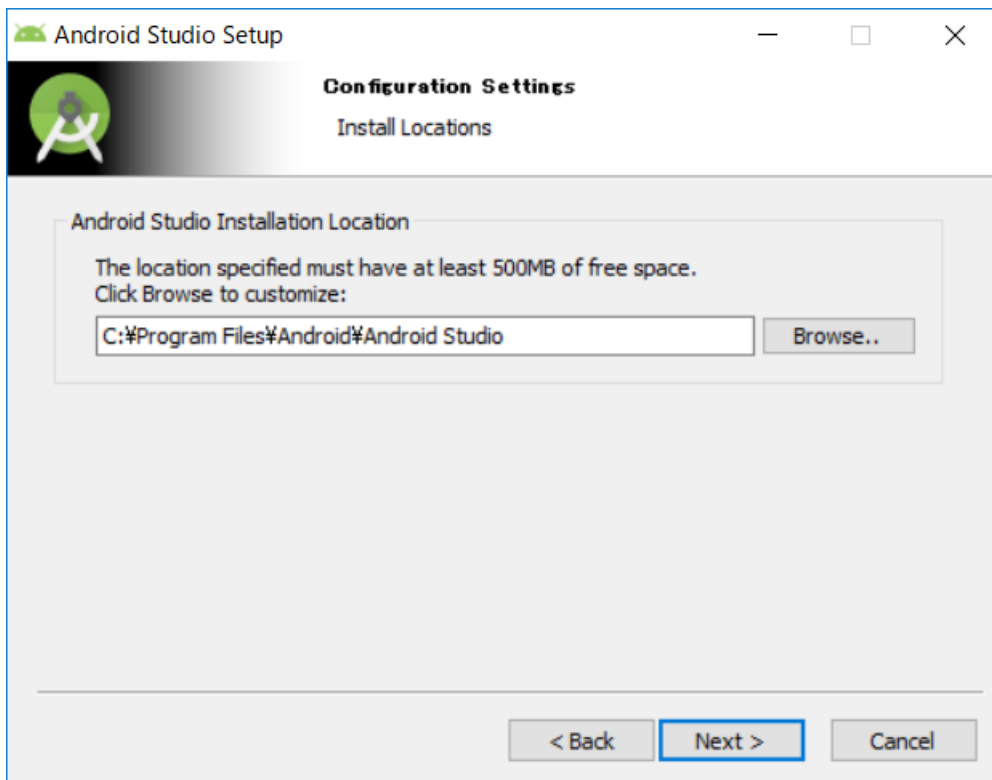
1.3 A "compatible implementation" means any Android device that (i) complies with the Android Compatibility Definition document, which can be found at the Android compatibility website

I have read and agree with the above terms and conditions

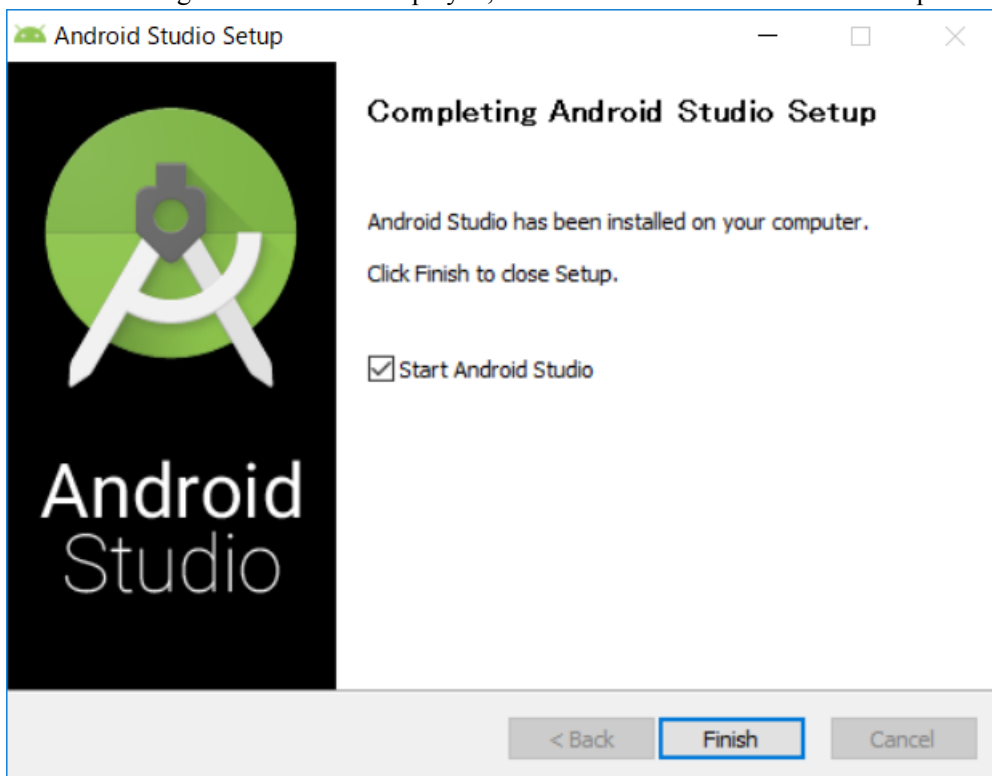
DOWNLOAD ANDROID STUDIO FOR WINDOWS

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

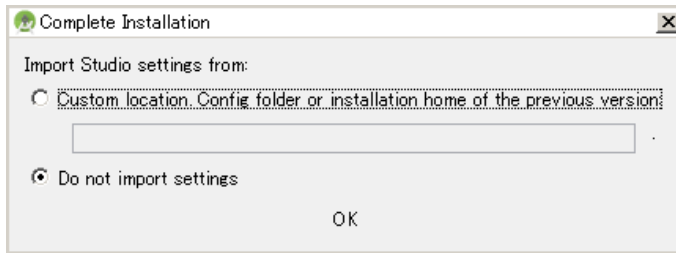
During installation, you will be prompted to specify the installation destination by the dialog below. Follow the instructions to proceed the installation.



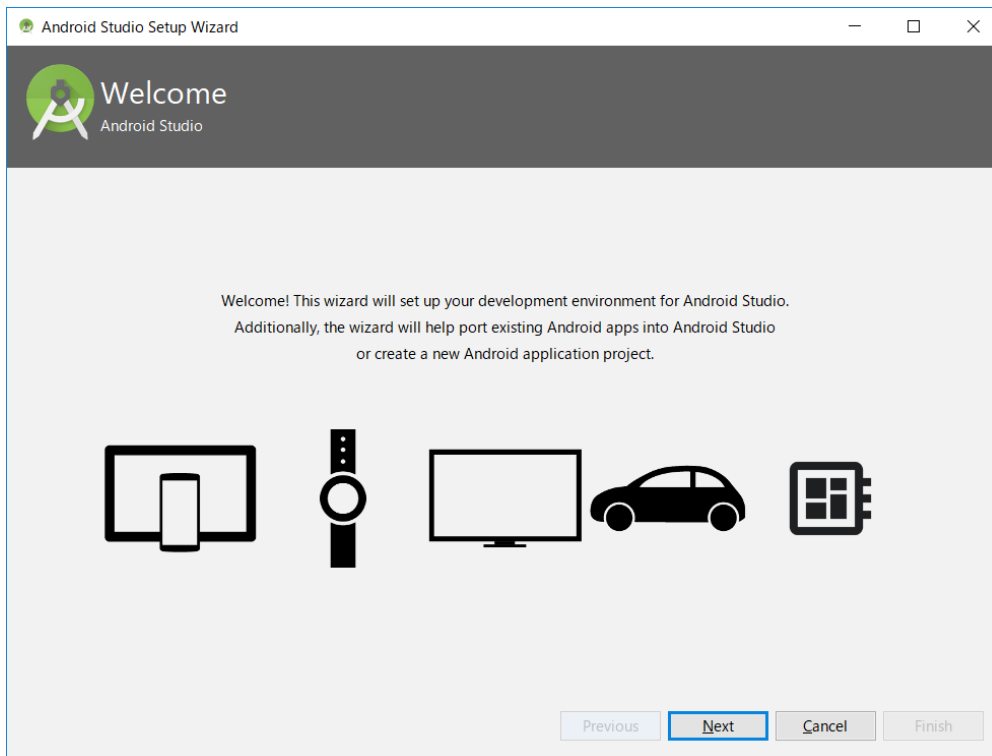
When the dialog shown below is displayed, installation of Android Studio is completed.



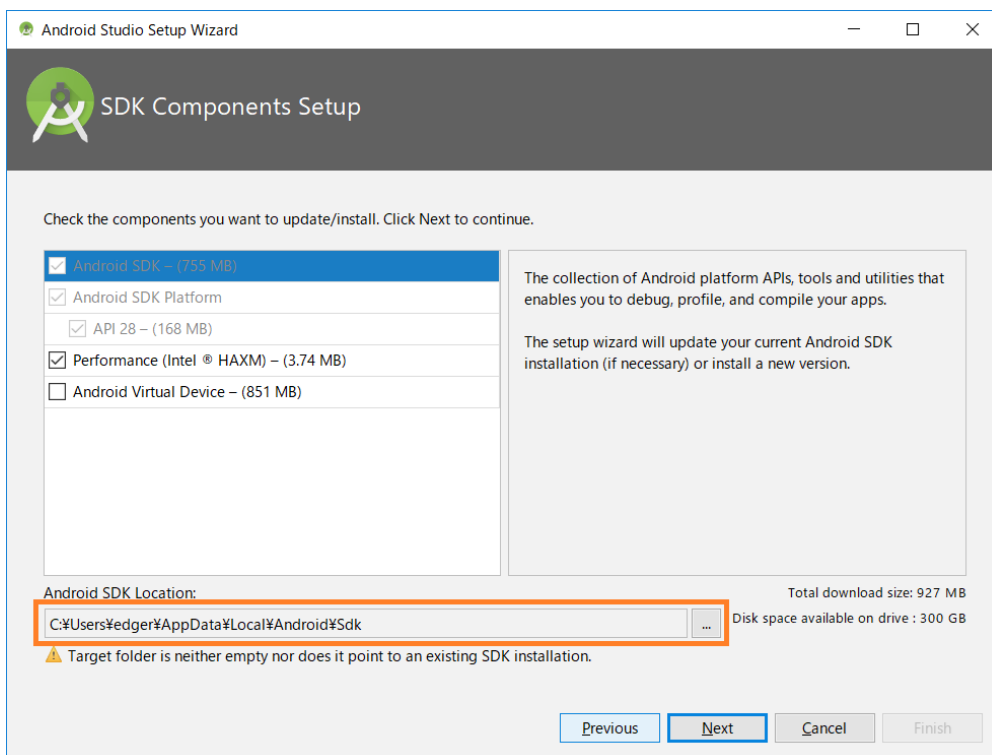
Next, select whether to use the previous setting or not. If you do not want to use the previous setting, please select Do not import settings.



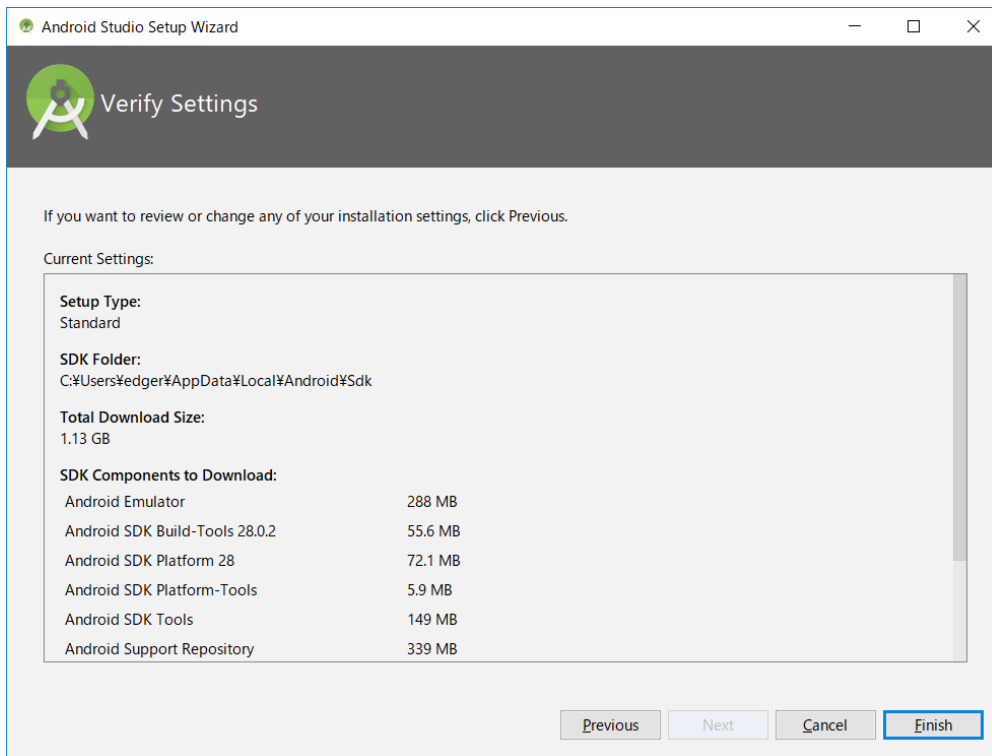
The Setup Wizard will start, so follow the instructions.



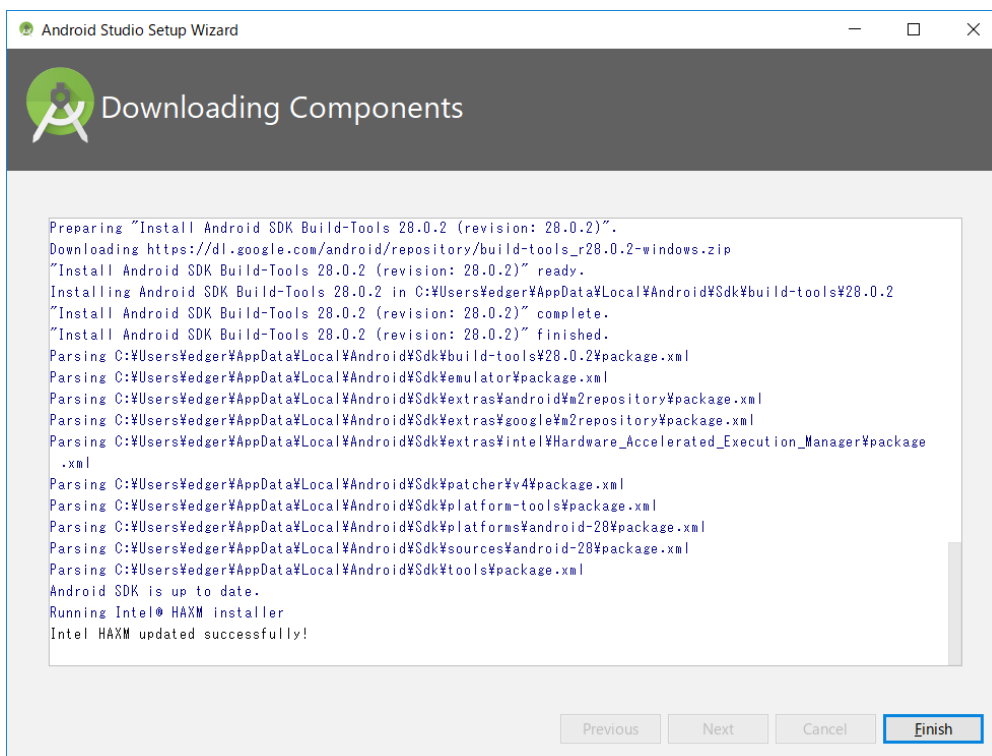
During installation, you will be prompted to specify the installation destination by the dialog below. The "Android SDK Installation Location" on the figure below is also necessary when installing the USB driver, it's better to take a note.



This is the end of the Setup Wizard. If you do not have any problem after confirming "Finish".



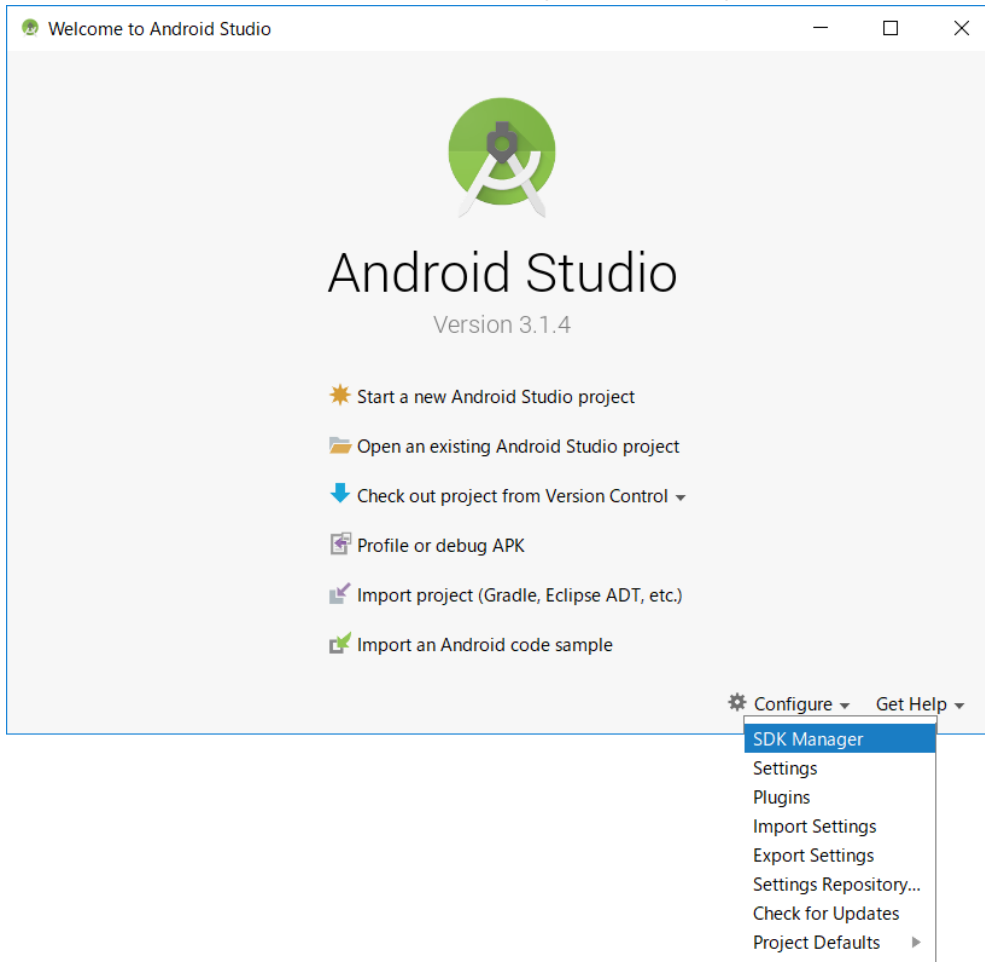
Downloading Components begins.



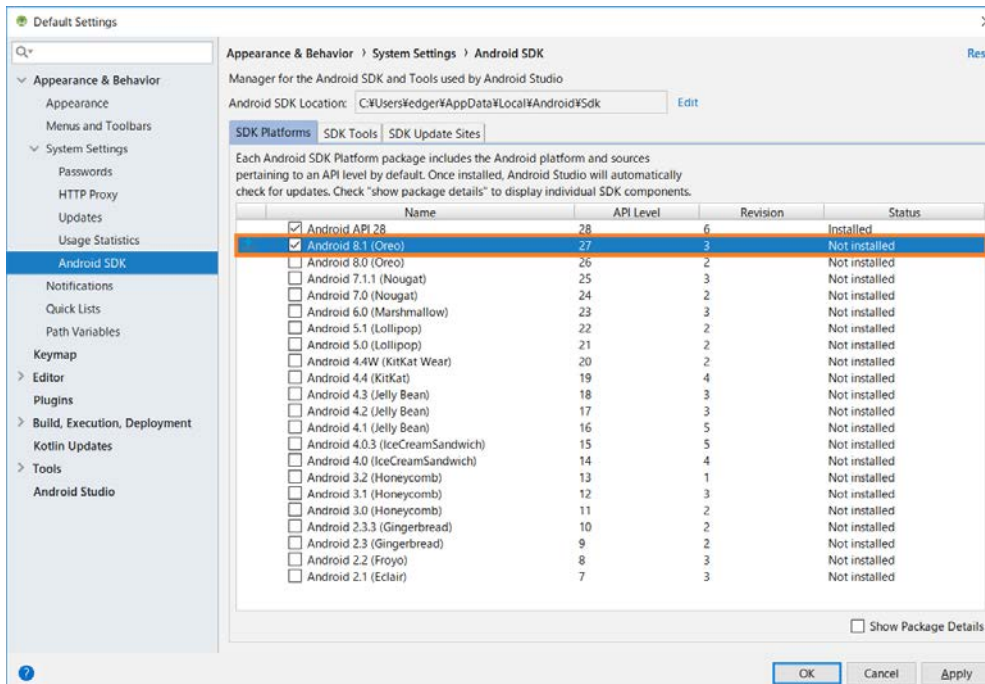
When you finish, AndroidStudio will start up.

3.3 Downloading Android SDK and USB driver

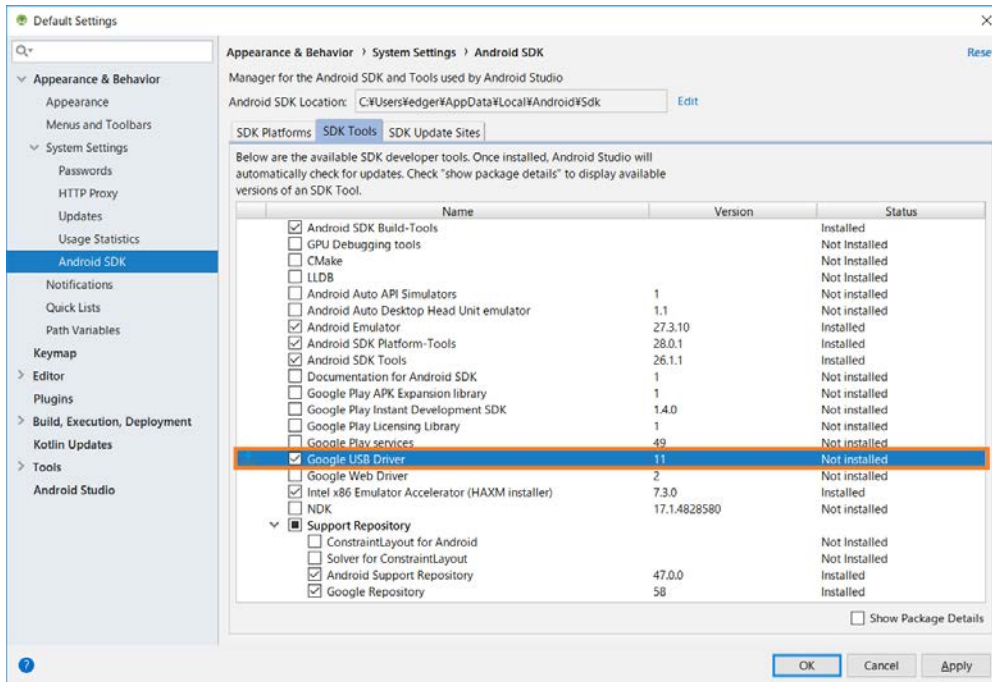
Launch Android Studio, and chose "SDK Manager" from Configure tab.



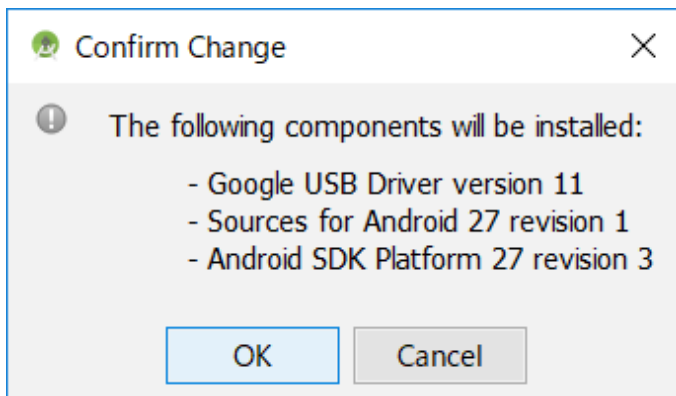
Select "SDK Platform" tab, then check "Android 8.1 (API Level 27)".



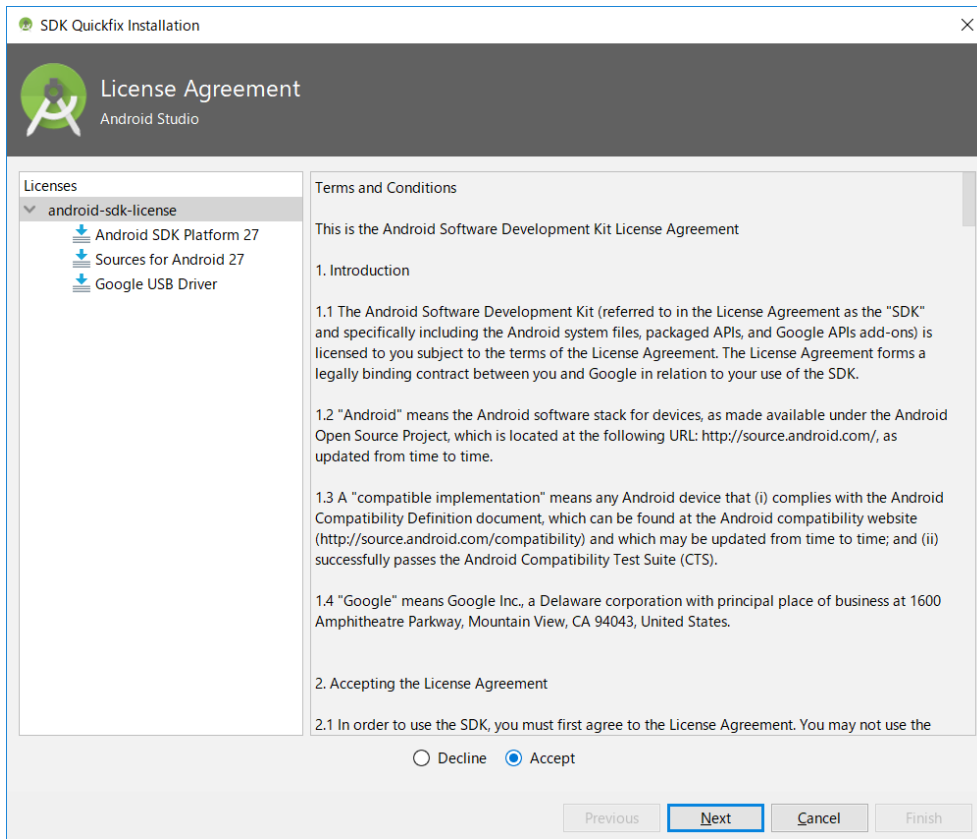
Then, select "SDK Tools" tab and check "Google USB Driver".



When you press "OK" the following dialog will be displayed, please press "OK".



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 "3.2 Installing Android Studio (p.10)".

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

3.4 Inport and Updating Device Library (AAR)

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

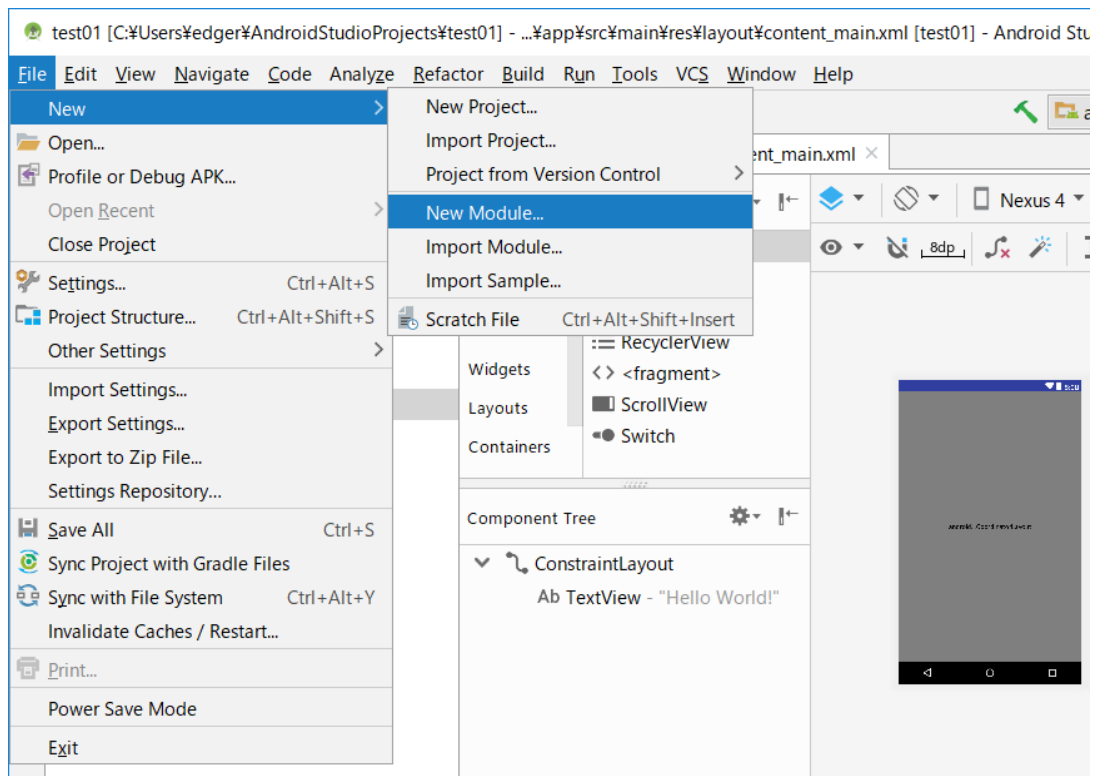
3.4.1 Preparations

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.

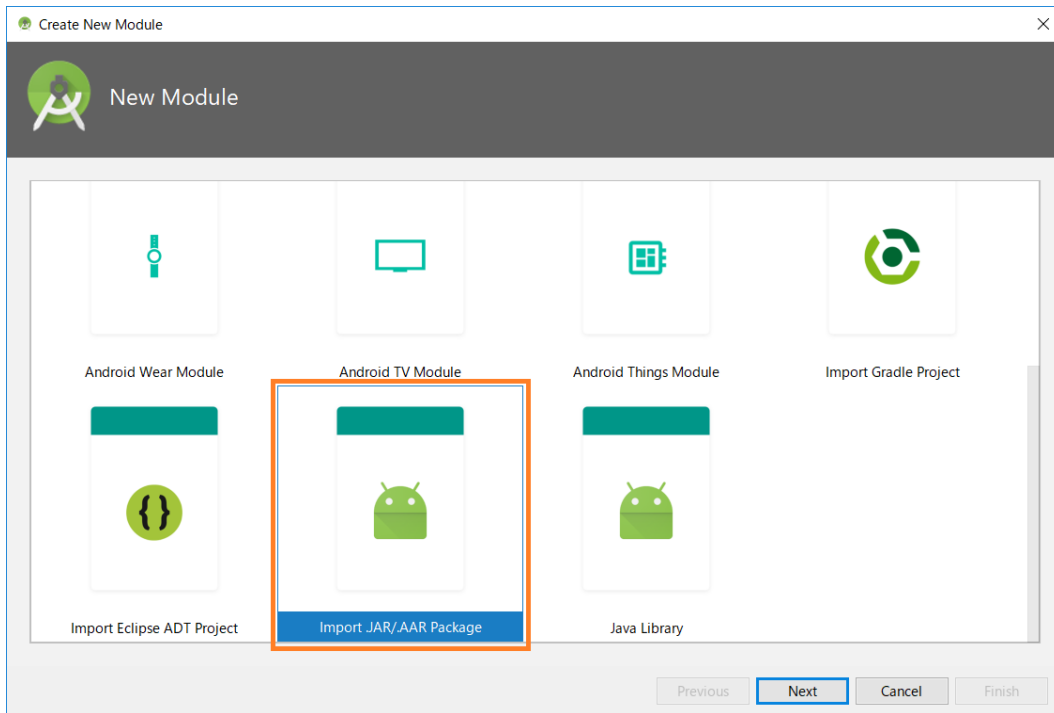
The following chapter explains the procedure for registering the device library and its help files to the project. It is better to copy the DeviceLibrary and its help files from the DT-X400 Basic Development Kit to the local folder beforehand.

3.4.2 Registering DeviceLibrary (AAR)

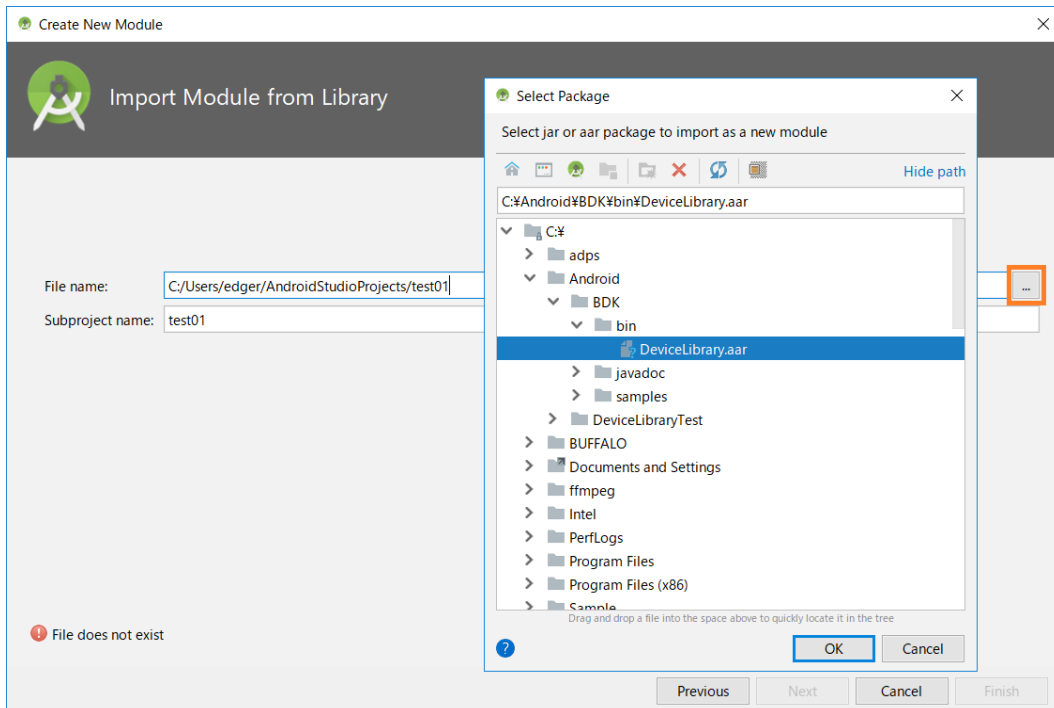
Once open the project from the Android Studio, open the "New Module" dialog with [File] → [New] → New Module.



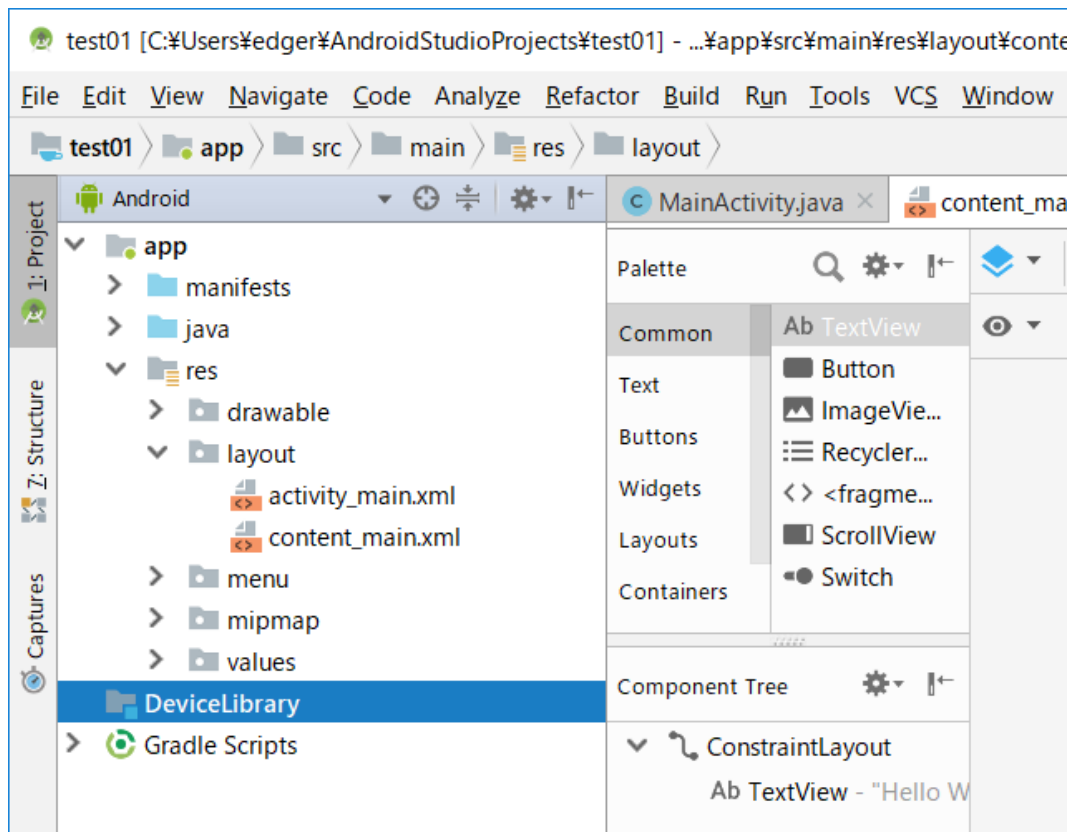
On the dialog shown below, select "Import .JAR/.AAR Package" and proceed with "Next".



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



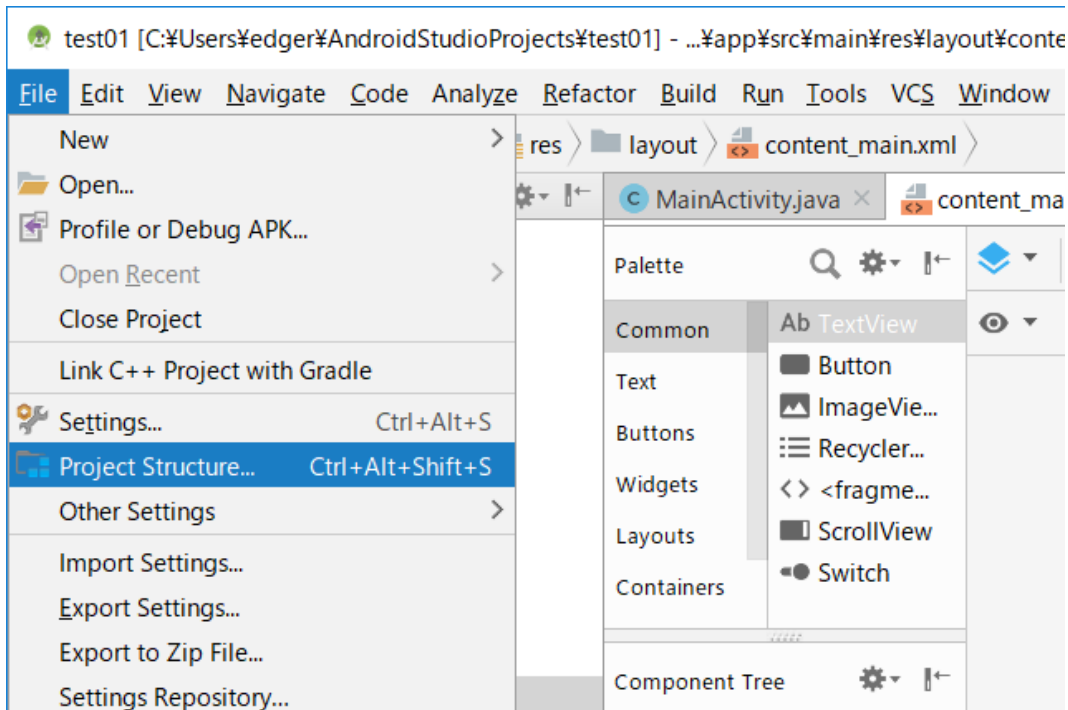
By the above, the registration of the device library to the project was completed. You can see that the AAR file name has been added to the Android Studio Project tree.



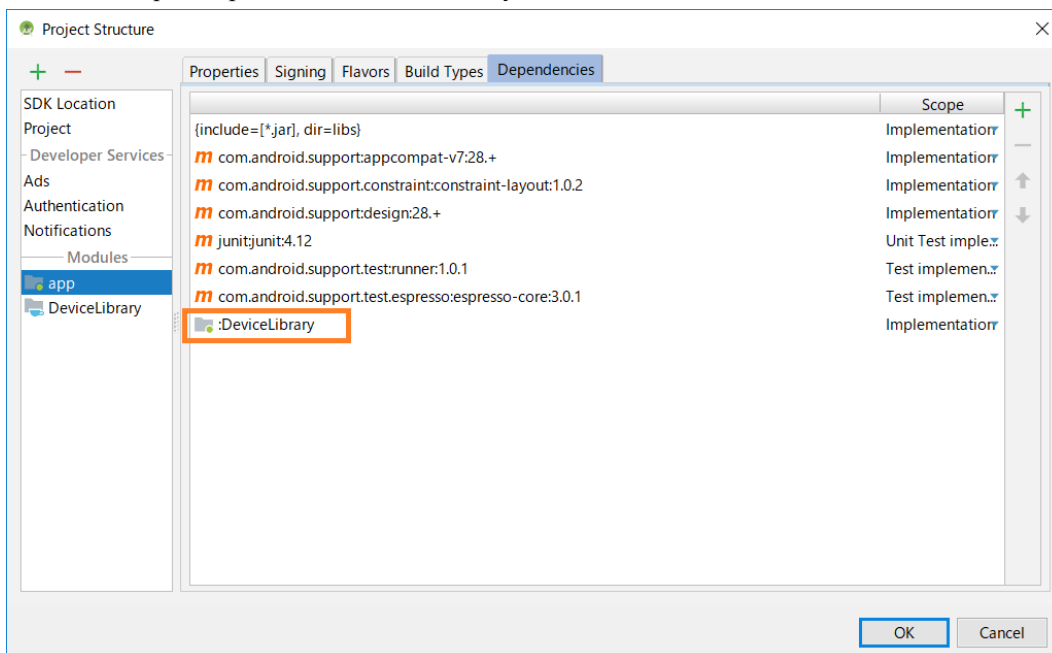
3.4.3 Dependency check of DeviceLibrary (AAR)

The registration of the device library was completed with "3.4.2 Registering DeviceLibrary (p.18)". However, somehow the dependency relationship of the DeviceLibrary to the project is not set correctly in some cases.

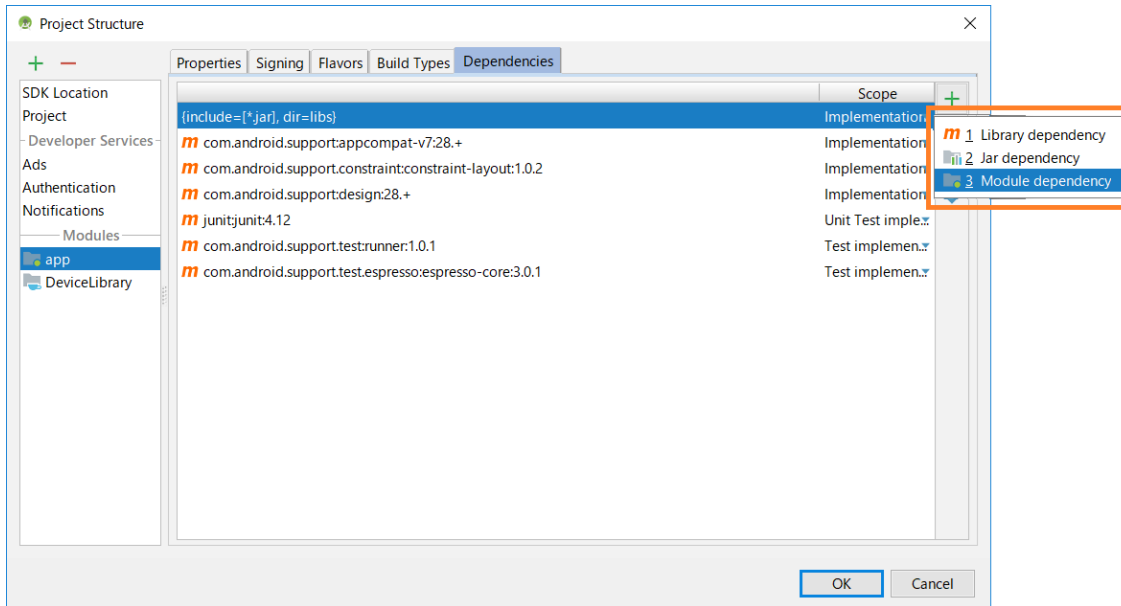
First, select "Project Structure ..." from File menu.



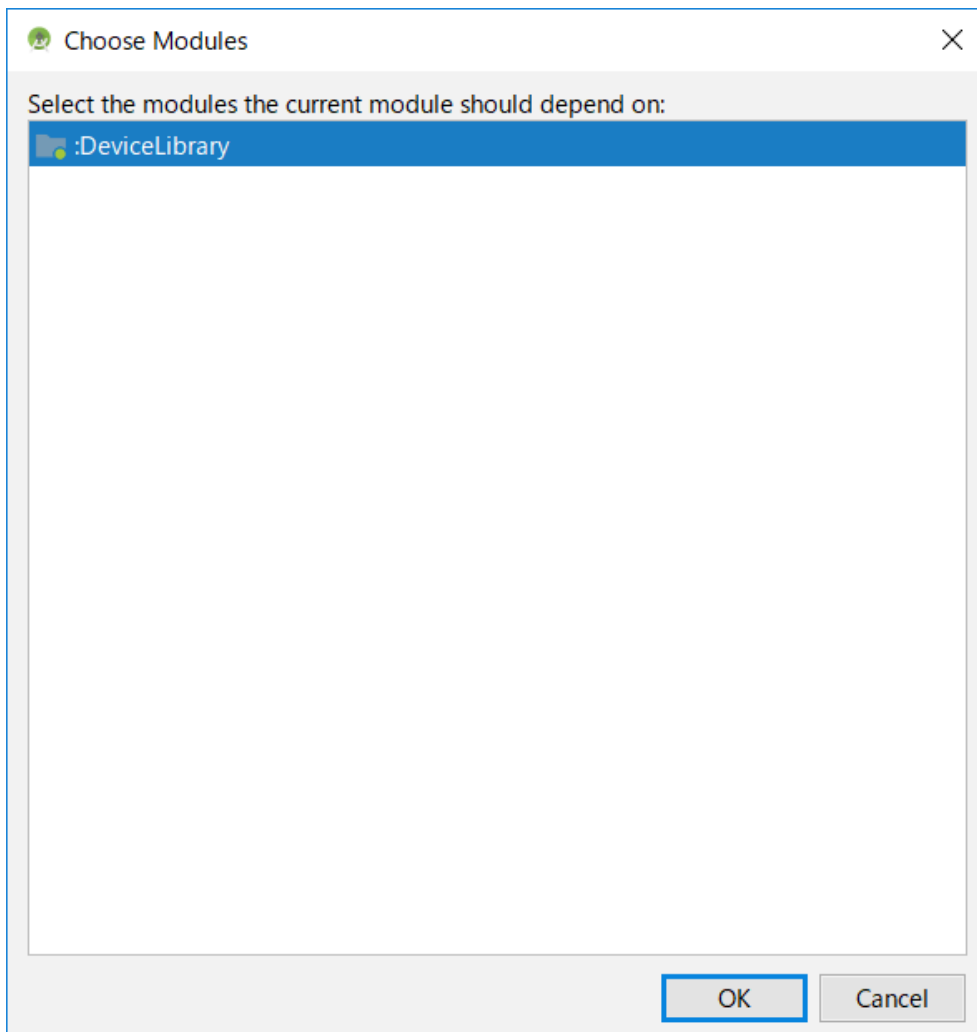
Open the "Dependencies" tab and check if "DeviceLibrary" (red frame in the figure below) exists. If it exists, subsequent operations are unnecessary.



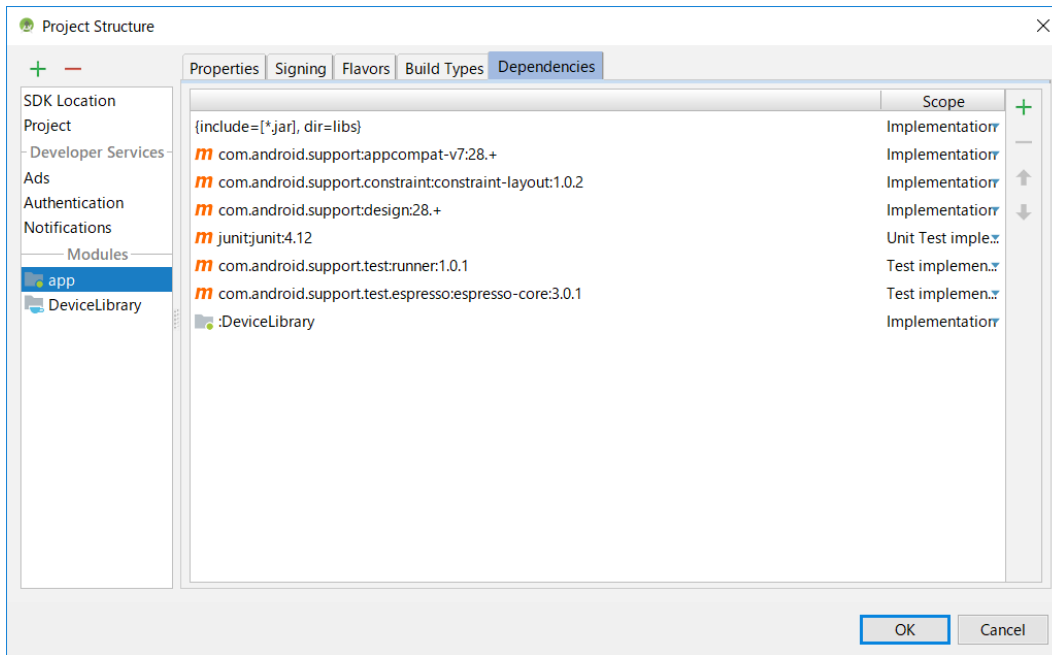
If it does not exist, press "+ button" at right end and select "Module dependency".



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



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



3.4.4 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.

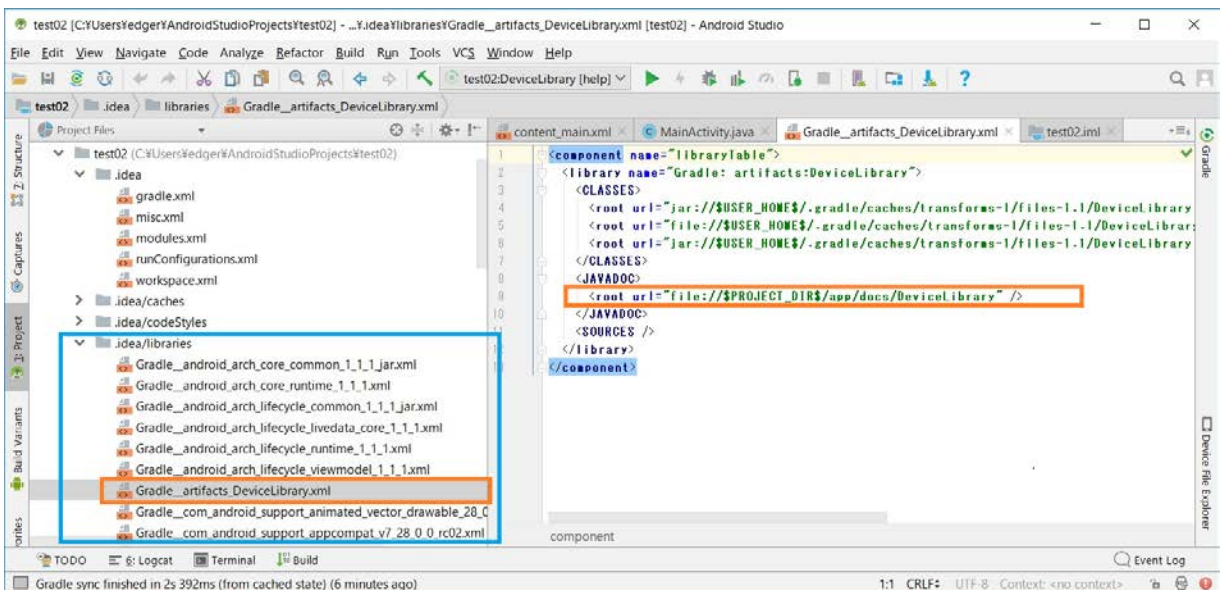
The Javadoc file can be placed anywhere as long as it can be referenced on the PC. It assumes that it is placed in the "app/docs/DeviceLibrary" folder here.

When registration of the device library is completed, a xml file (Gradle__artifacts_DeviceLibrary.xml) whose name is same as the library is automatically created under the ".Idea/library" 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>". (see note)

Note!

If a xml file is not created, restart Android Studio.

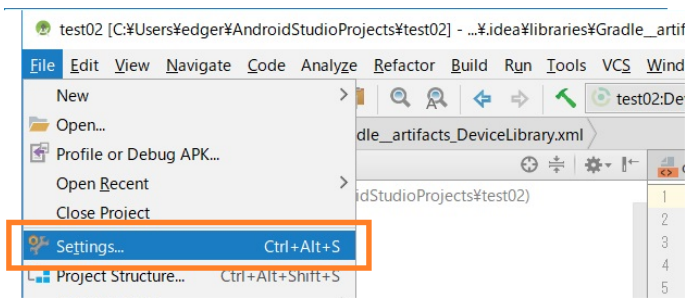
```
<JAVADOC>
<root url="file://$PROJECT_DIR$/app/docs/DeviceLibrary" />
</JAVADOC>
```



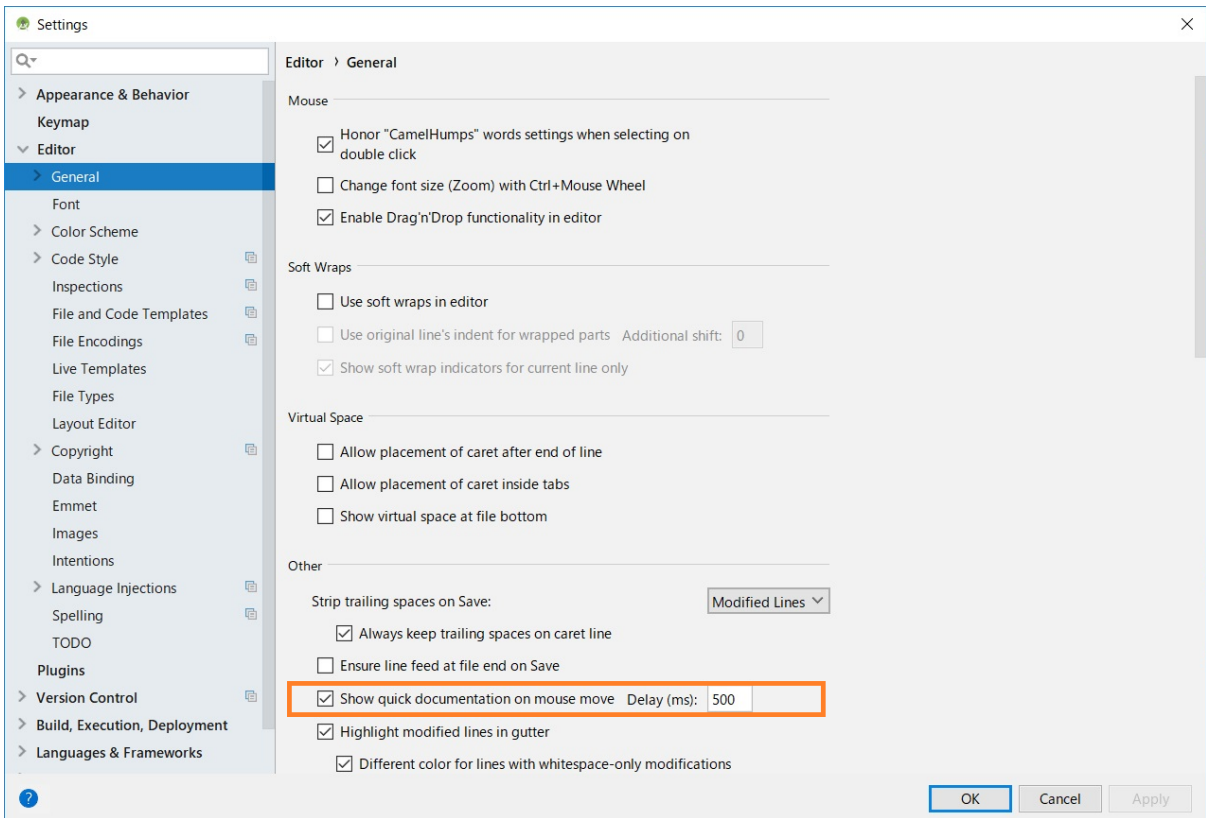
By the above, the registration of the help file was completed.

Next, enable "Quick documentation on mouse move" which is the function of Android Studio.

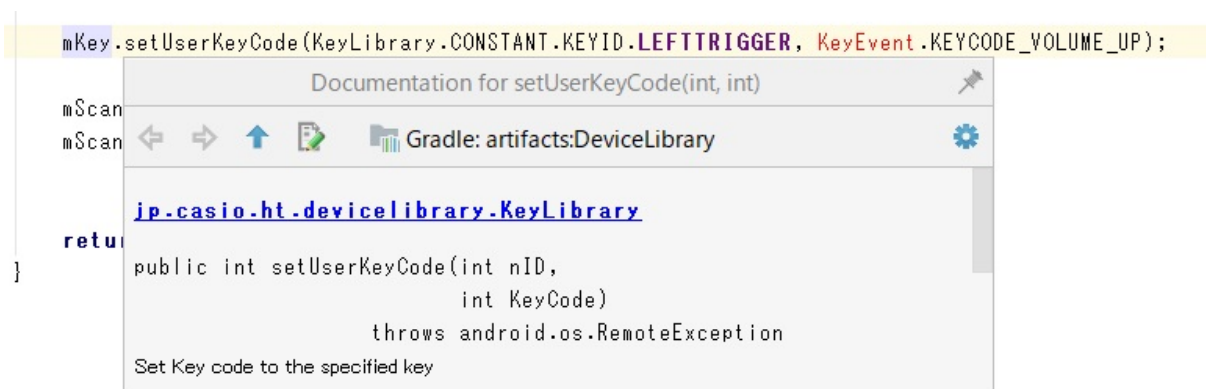
Select "Settings ..." from File menu of Android Studio.



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



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



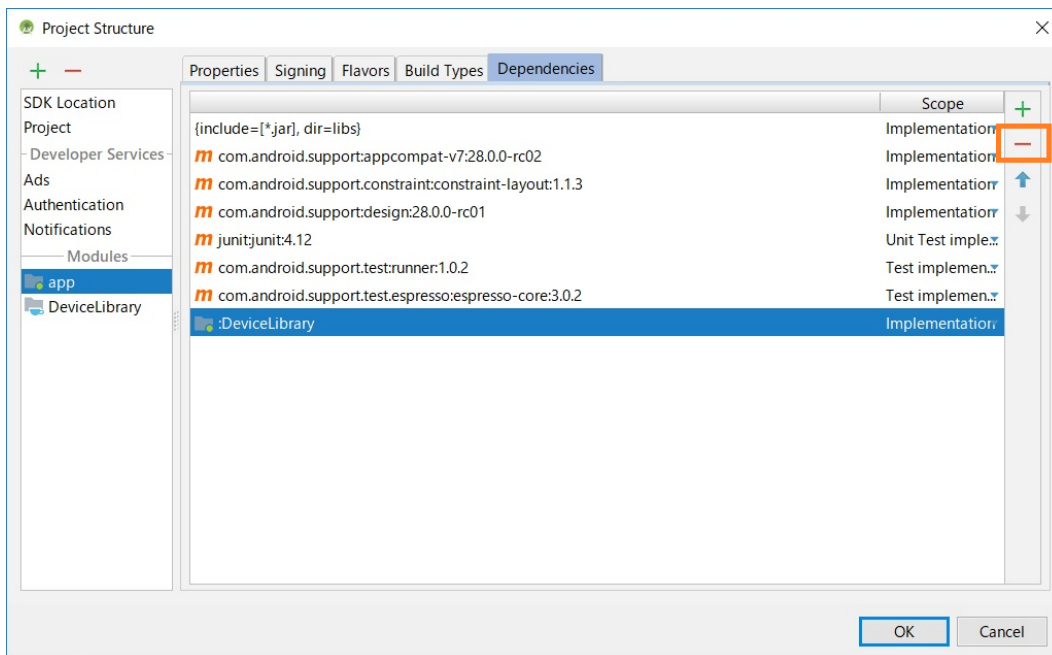
3.4.5 Updating of DeviceLibrary (AAR)

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.

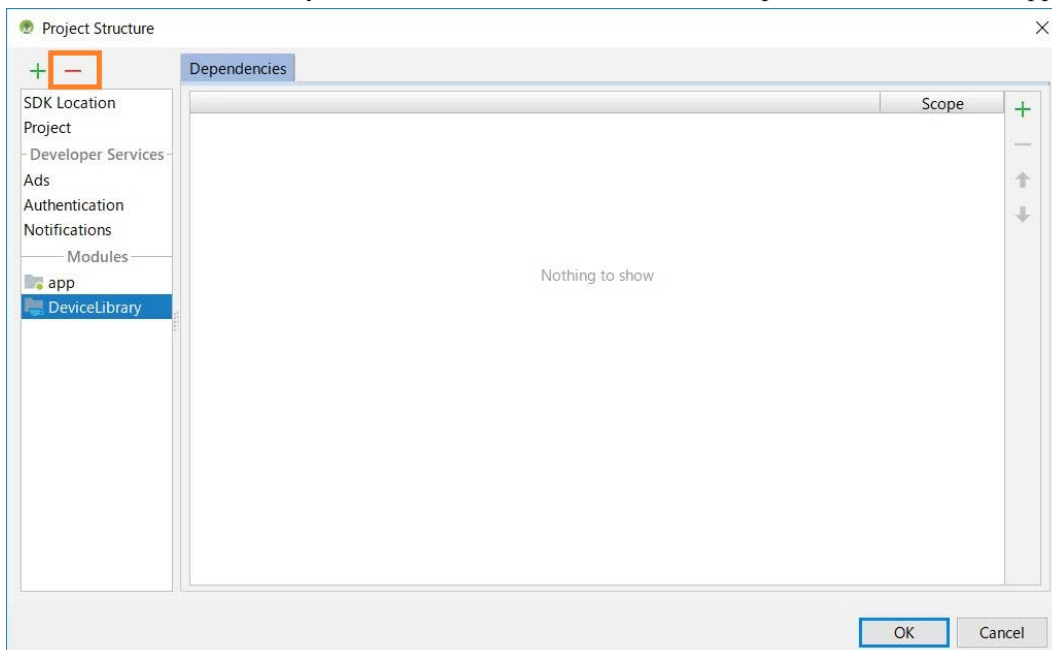
(1) Unassociate Library (AAR)

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.

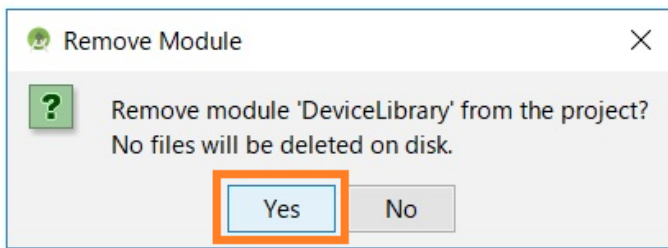


(2) Unregister Library (AAR)

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



A dialog to confirm deletion of DeviceLibrary appears, so press "Yes".



By the above, Device Library was unregistered. Follow "3.4 Import and Updating Device Library(p.18)" to register the new Device Library.

4. Application development and debug

In order to develop / debug applications using DT-X400, the following preparation is necessary.

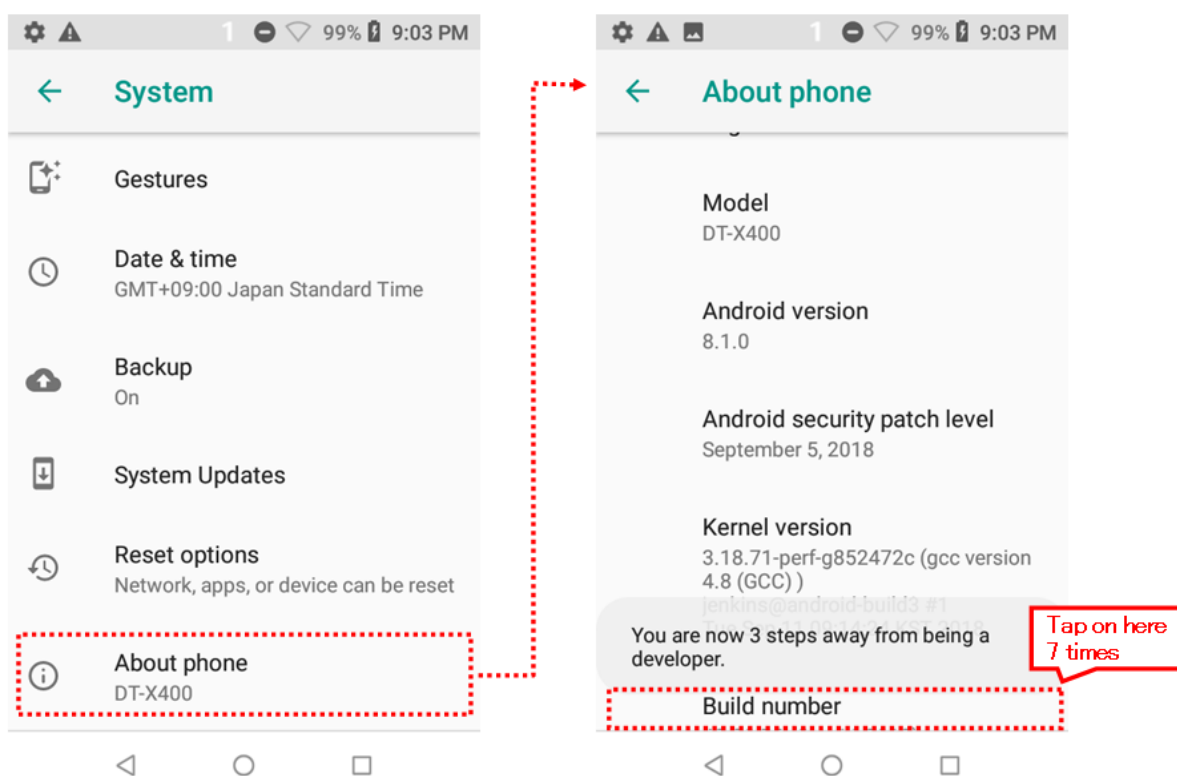
- (1) Enable USB debugging (ADB connection) of DT-X400.
- (2) Install DT-X400 USB driver to your PC.
- (3) Set PATH to the debug tools on your PC.

These steps are described below.

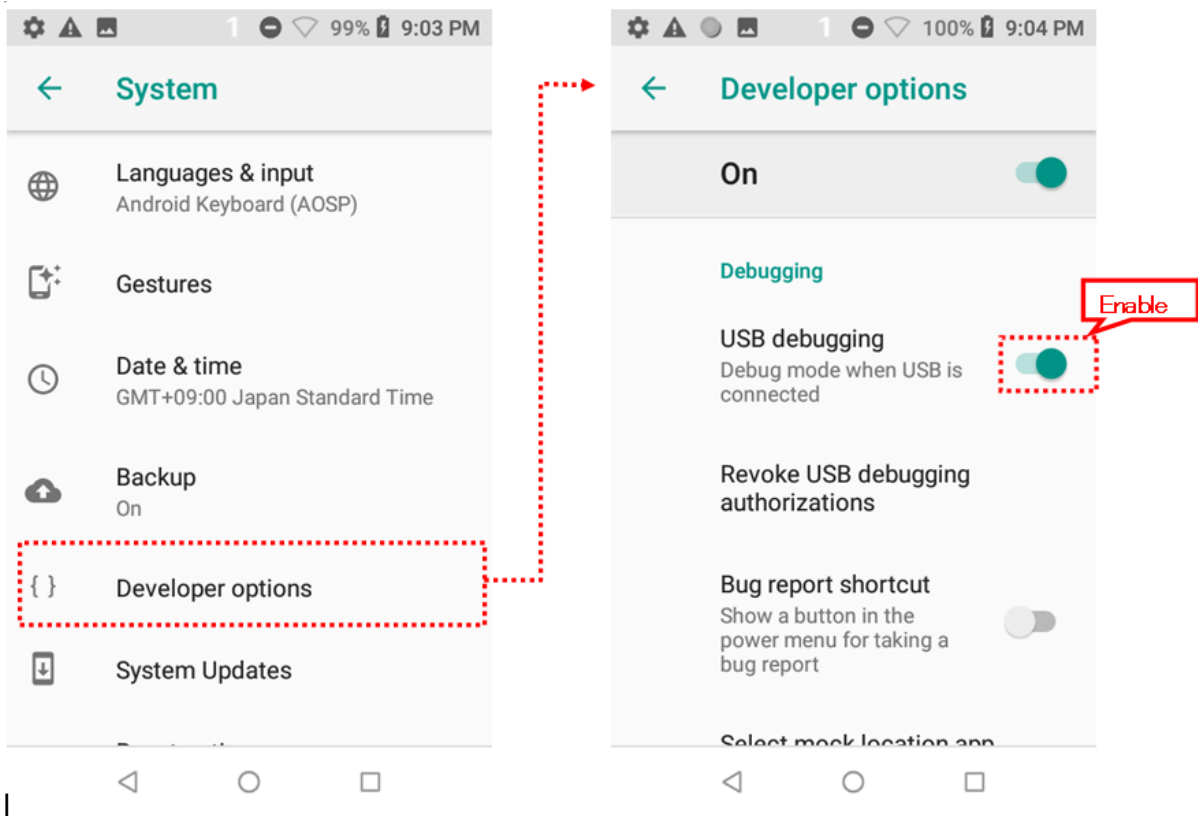
4.1 Enabling USB debugging

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.

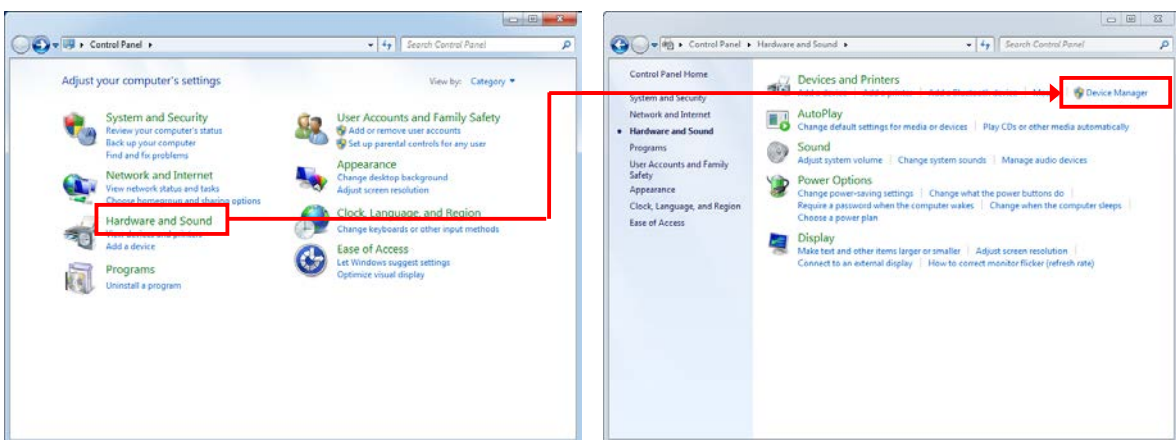


4.2 Installing USB driver

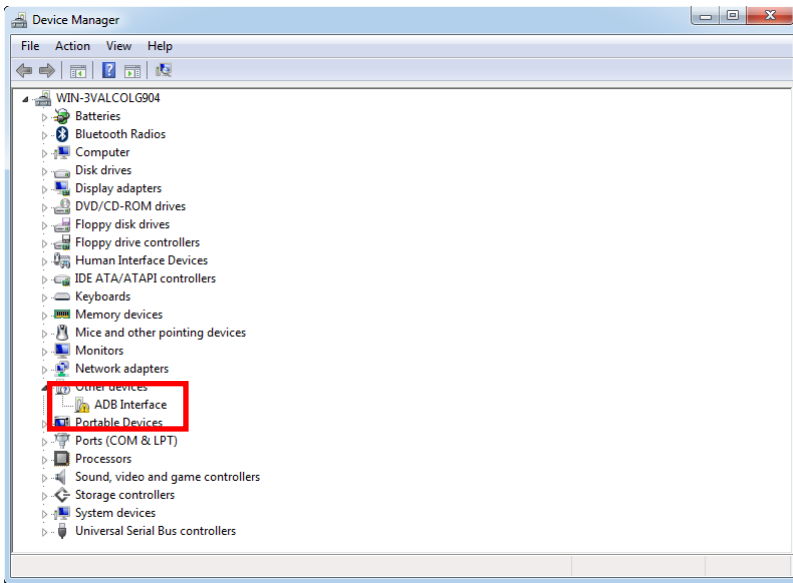
Install the USB driver for connecting the DT-X400 and PC with the ADB (Android Debug Bridge) protocol.

Files necessary for installation are downloaded as described in "3.3 Downloading Android SDK and USB driver (p.15)".

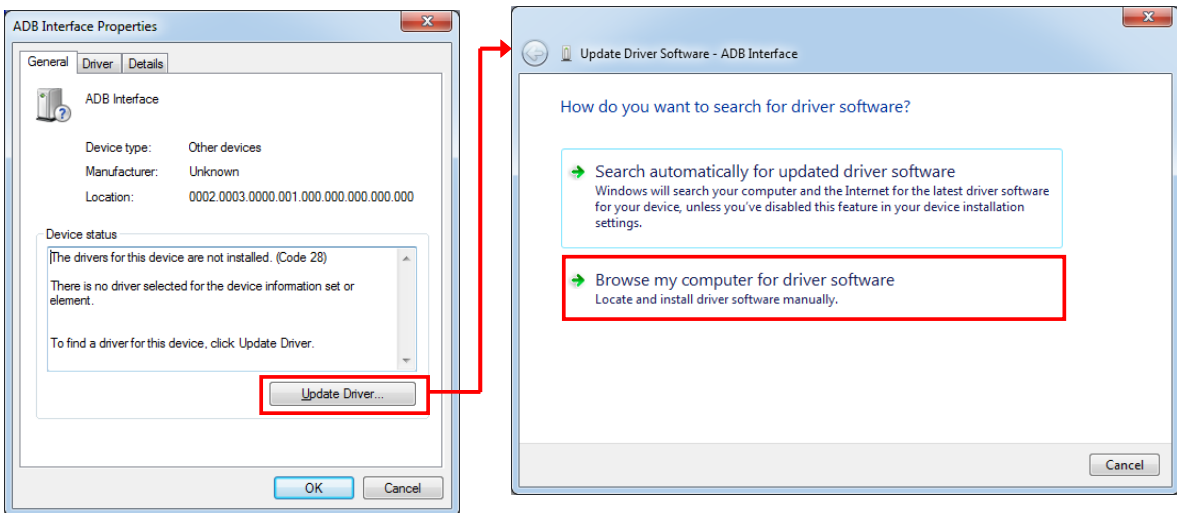
Connect the DT-X400 to a PC using a USB cable or a USB cradle. Then, open the Device Manager by [Control Panel] → [Hardware and Sound] → [Device Manager].



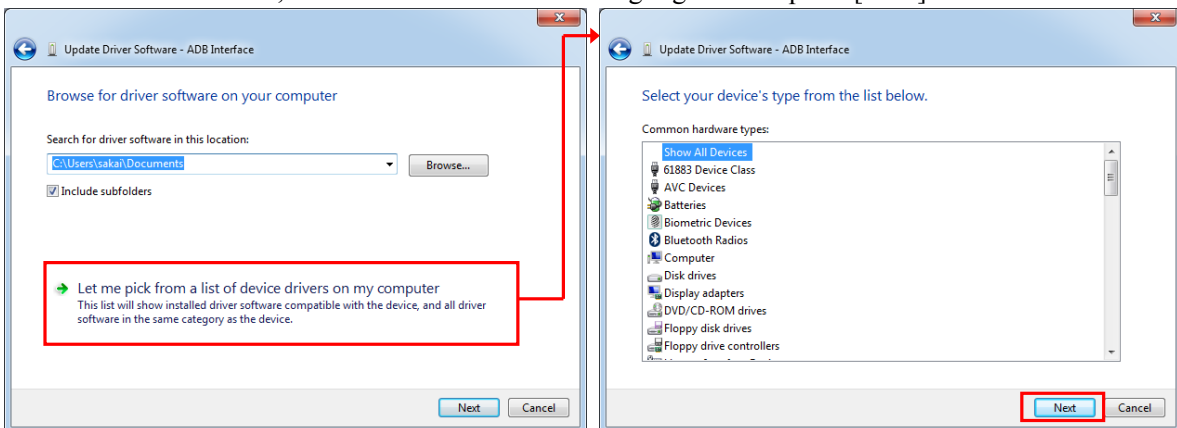
In the Device Manager, "ADB Interface" is displayed as an unknown device as shown below.



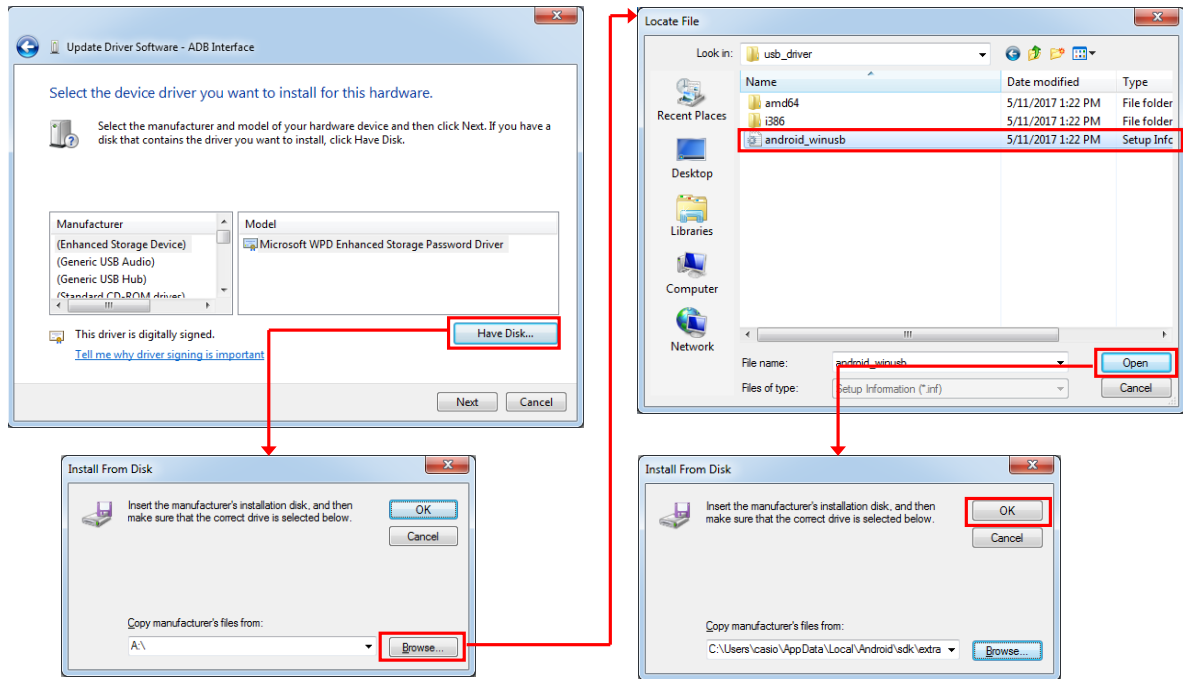
By right-click the red frame ("Android") in the above figure, displays its properties, and press [Update Driver].



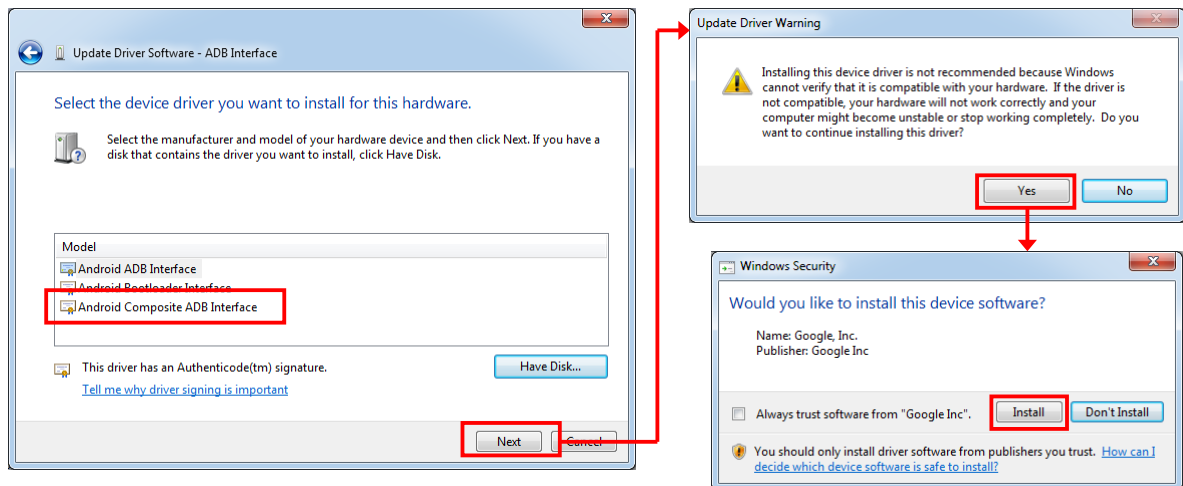
When the dialog below is displayed, press "Let me pick from a list of drivers on my computer " at the bottom. In the driver list, with "Show All Devices" is highlighted and press [Next].



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 "3.3 Downloading Android SDK and USB driver (p.15)" and specify it.

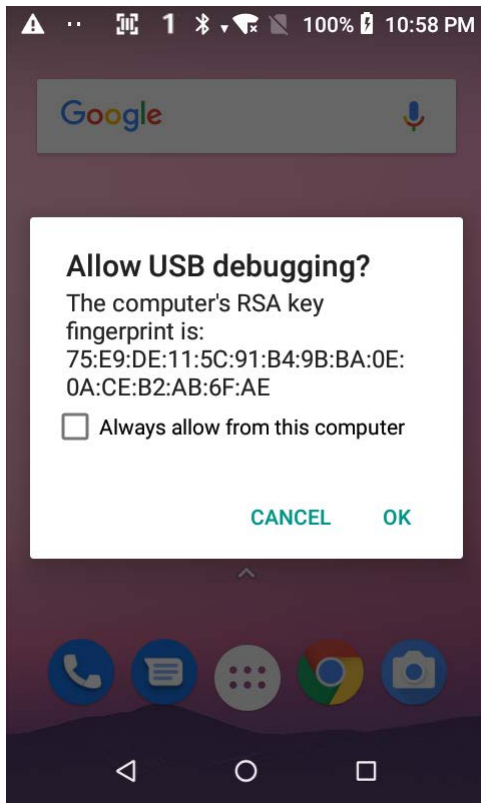


The following driver selection screen will appear. Select "Android Composite ADB Interface" and press [Next]. Answer "Yes" to "Driver Update Warning" and press "Install" of "Windows Security" dialog.



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

Press "OK" when the follow dialog is shown on DT-X400.

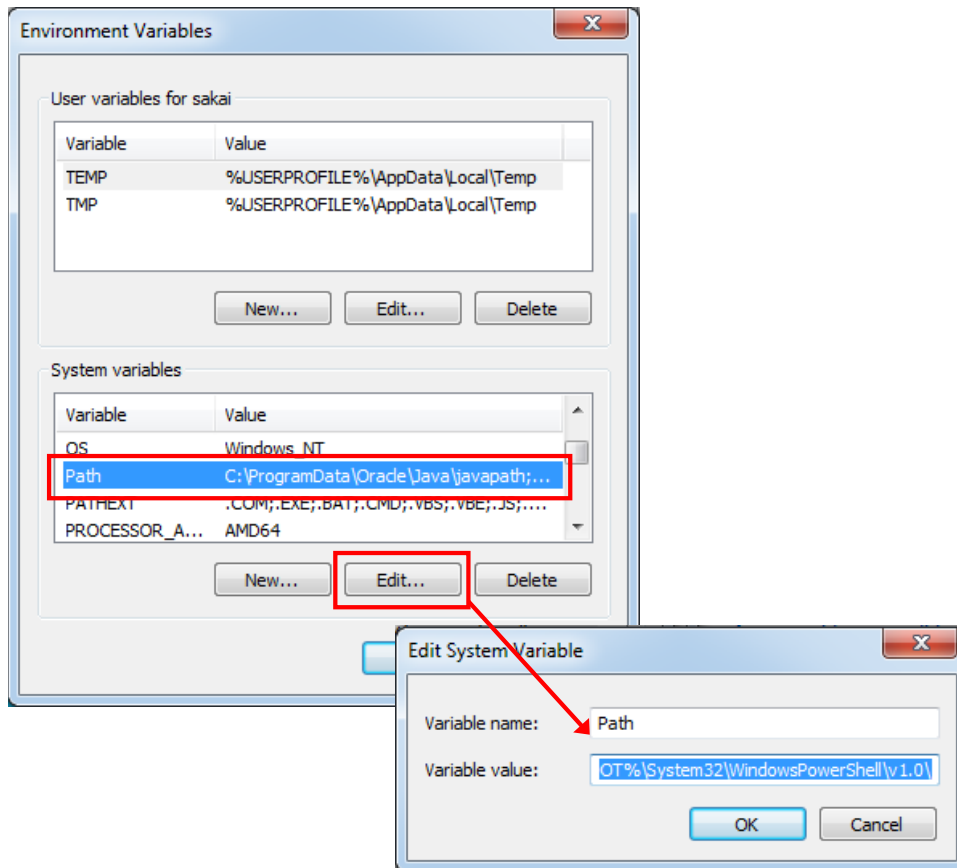


4.3 Settings ADB (Android Debug Bridge)

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".



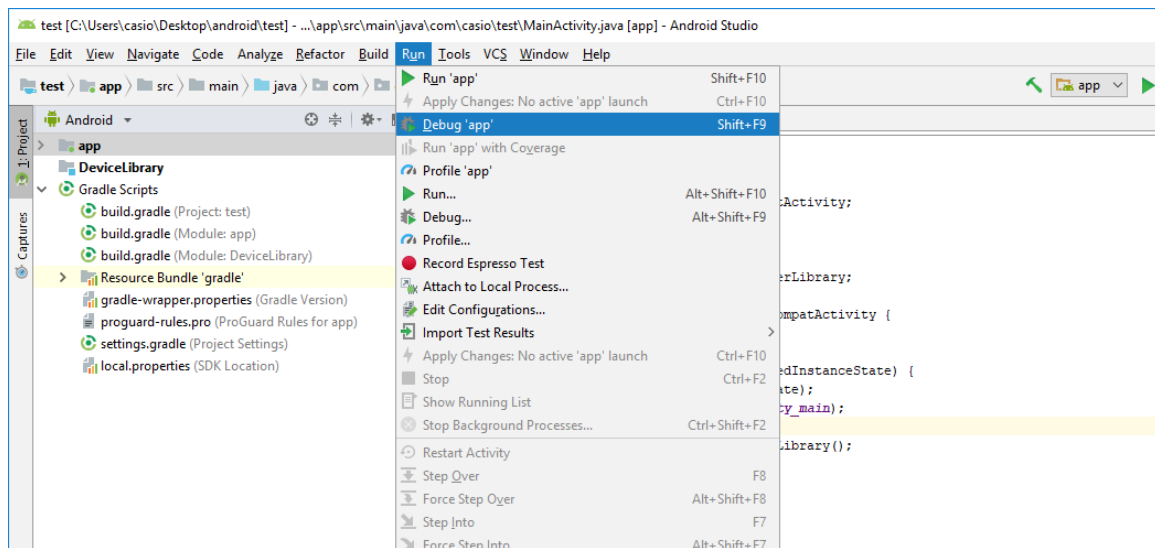
In the above example, the path to add is as follows.

C:\Users\casio\AppData\local\Android\sdk\tools

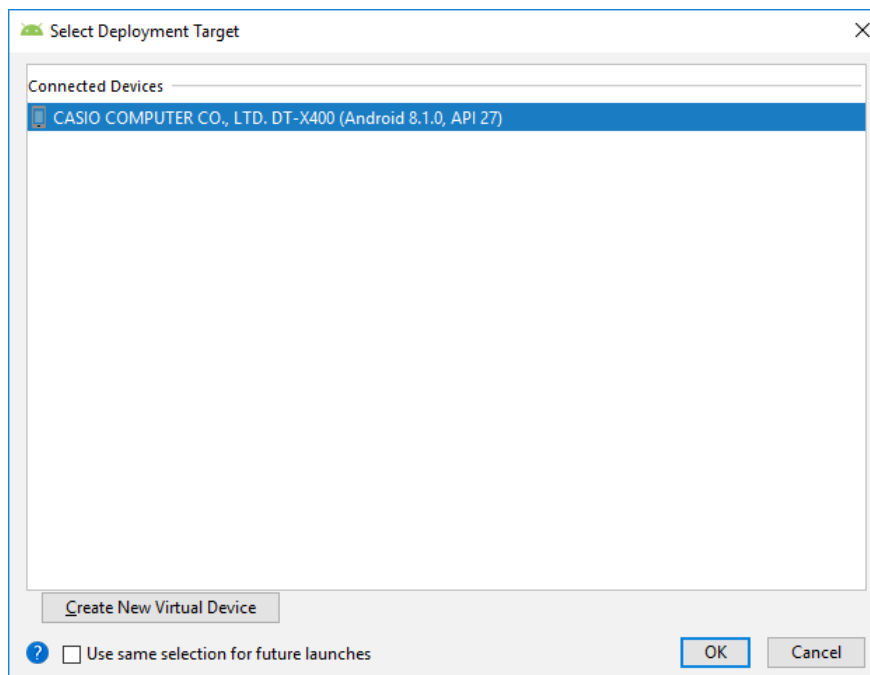
C:\Users\casio\AppData\local\Android\sdk\platform-tools

4.4 Debugging application

Select "Run" > "Debug 'app'" on Android Studio after you connected PC with DT-X400.



When the follow dialog is shown, select "CASIO COMPUTER CO., LTD. DT-X400 (Android 8.1.0, API 27)" from "Connected Devices" and press "OK".



Start to debug an application on DT-X400.