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# Kneron KL720 USB Dongle Specification

2021 July

## Revision History:

version	Description	date
0.1	Initial version	2021/07/22
0.2	Specification update	2021/07/29

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## KL720 USB Dongle Specification

### Product Outline



Online Store : [KNEO \(kneroncloud.com\)](https://kneroncloud.com)

### Hardware Feature List

Item	KL720-USB Dongle	
Maker	Board Maker	
Part Number	KP72B340A-D1003	
Chipset	KL720B3421B 	
Board size	70x25 mm	
Power	USB TYPE C	USB3, max 500mA
Boot	SPI NAND	1Gb
Data transfer interface	USB3 device	
Connective Interface	USB Type C	
LED	<ul style="list-style-type: none"> <li>Light – system power on</li> <li>Blink – system activity</li> </ul>	
Embedded memory	128MB	
Support operating system	<ul style="list-style-type: none"> <li>Windows @ 64bit</li> <li>Linux @ 64bit</li> <li>Raspberry Pi</li> </ul>	
Support AI model	<ul style="list-style-type: none"> <li>Yolov5s</li> <li>Customization model</li> </ul>	
Support AI framework	Caffé, Keras, Tensorflow, TensorflowLite, Pytorch, ONNX	
Working Temperature	0 °C ~ 40°C	
Storage Temperature	0 °C ~ 70°C	
Certification	CE/FCC	
Package	<ul style="list-style-type: none"> <li>USB Dongle</li> <li>TYPE-C cable, support auto swap</li> </ul>	

## Installation Guide

### Environment Setup

#### Linux

Before building code, some build tools and packages must be set up for the first time.

- Install **libusb-1.0.0-dev**, **cmake**, and **build-essential**.

- `sudo apt install libusb-1.0-0-dev`
- `sudo apt install cmake`
- `sudo apt install build-essential`

#### Windows(MINGW64\MSYS)

#### WinUSB installation

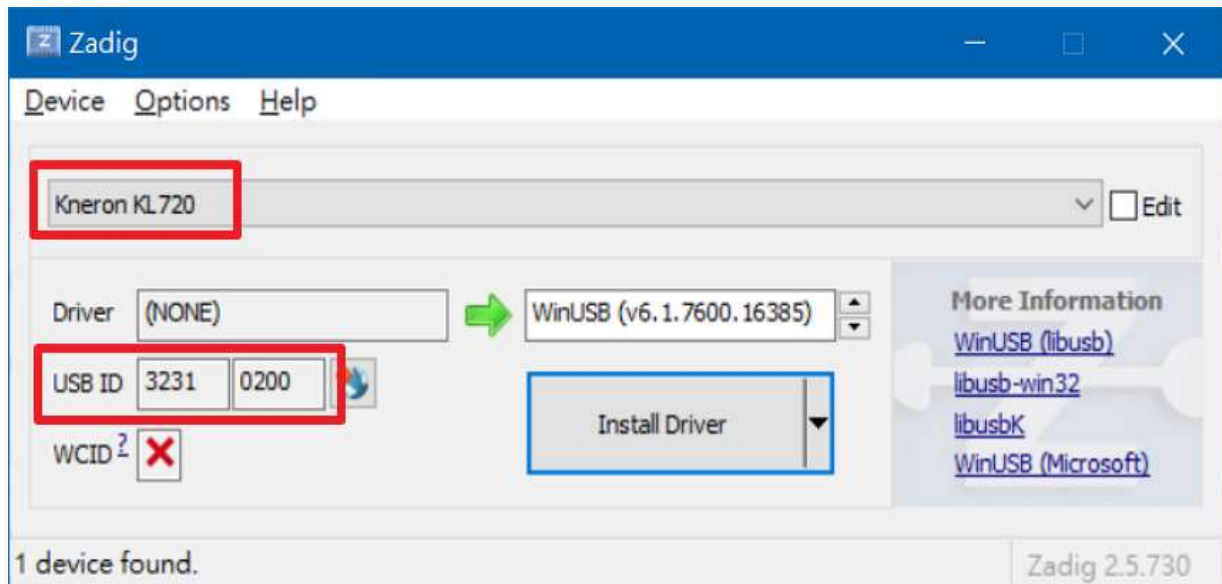
You will need administrator's rights to perform the installation.

When a Kneron device is connected to a Windows PC for the very first time, Windows might report that it failed to find a USB driver automatically.

This section explains how-to install the driver manually.

The instruction is valid for Windows 10 version only.

1. Download **Zadig** application from [zadig.akeo.ie](http://zadig.akeo.ie) appropriate for Windows 10.
2. Connect Kneron device to your PC.
3. Run the Zadig application. The application should detect device as "**Kneron KL720**" with USB ID "**3231/0200**" and the screen should look like that:



Make sure that the **Driver** field, has **WinUSB** option selected.

4. Click "Install Driver" button.

When installation process is finished, "**Kneron KL720**" can be found in Windows Device Manager under **Universal Serial Bus Devices** tree node.

## Environment, gcc, etc.

- Install git for windows SDK (MUST BE!)

Get [git for windows SDK \(MUST BE!\)](#) installed.

- Install **libusb**, **cmake**.

- `pacman -S mingw-w64-x86_64-libusb`
- `pacman --needed -S mingw-w64-x86_64-cmake`

- Install opencv\_3.4

- Get [opencv 3.4.1, mingw-w64-x86\\_64-opencv-3.4.1-1-any.pkg.tar.xz.zip](#)
- Unzip mingw-w64-x86\_64-opencv-3.4.1-1-any.pkg.tar.xz.zip to **mingw-w64-x86\_64-opencv-3.4.1-1-any.pkg.tar.xz**.
- Install mingw-w64-x86\_64-opencv-3.4.1-1-any.pkg.tar.xz:

```
pacman -U mingw-w64-x86_64-opencv-3.4.1-1-any.pkg.tar.xz
```

Make sure you enter the directory of opencv xz file in msys command line

- Add **mingw64\bin** to PATH variable in Environment Variable
  - Right-clicking This PC and going to Properties.
  - Clicking on the Advanced system settings in the menu on the left.
  - Clicking on the Environment Variables button on the bottom right.
  - In the System variables section, selecting the Path variable and clicking on Edit. The next screen will show all the directories that are currently a part of the PATH variable.
  - Assume **git for windows SDK** is installed in **C:\git-sdk-64\mingw64**
  - Clicking on New and entering **C:\git-sdk-64\mingw64\bin** directory.

## AI Model ZOO

[GitHub - kneron/ONNX\\_Convertor: ONNX converter and optimizer scripts for Kneron hardware.](#)

### **ONNX Convertors Introduction**

This project includes converters and optimizers in Python3 that are used to generate and optimize ONNX models for Kneron Toolchain. The current using onnx version is 1.6.0 which is under operator set version 11.

Note that the generated onnx is **especially optimized for Kneron Toolchain**, which may not be the best solution for general purpose ONNX usage, though in most cases, math optimal solutions are good for the toolchain. For example, the ONNX to ONNX optimizer has an option on add a do-nothing BatchNormalization node on the skip branch. This seems not optimal from the math perspective. However, for the Kneron Toolchain, adding such a layer can improve its quantization process.

**Please go to register the Kneron website in order to get detailed development support.**

- [v1.3.0 - Document Center \(kneron.com\)](#)
- [KNEO \(kneroncloud.com\)](#)