# OpenSDA

Serial and Debug Adapter (OpenSDA)

- Open-standard serial and debug adapter
- provides a bridge between your computer and the embedded target processor
- consists of a circuit featuring a Kinetis® K2x microcontroller with an integrated USB controller
- on the software side, it implements a mass storage device bootloader which offers a quick and easy way to load OpenSDA applications such as
  - flash programmers,
  - run-control debug interfaces,
  - serial to USB converters

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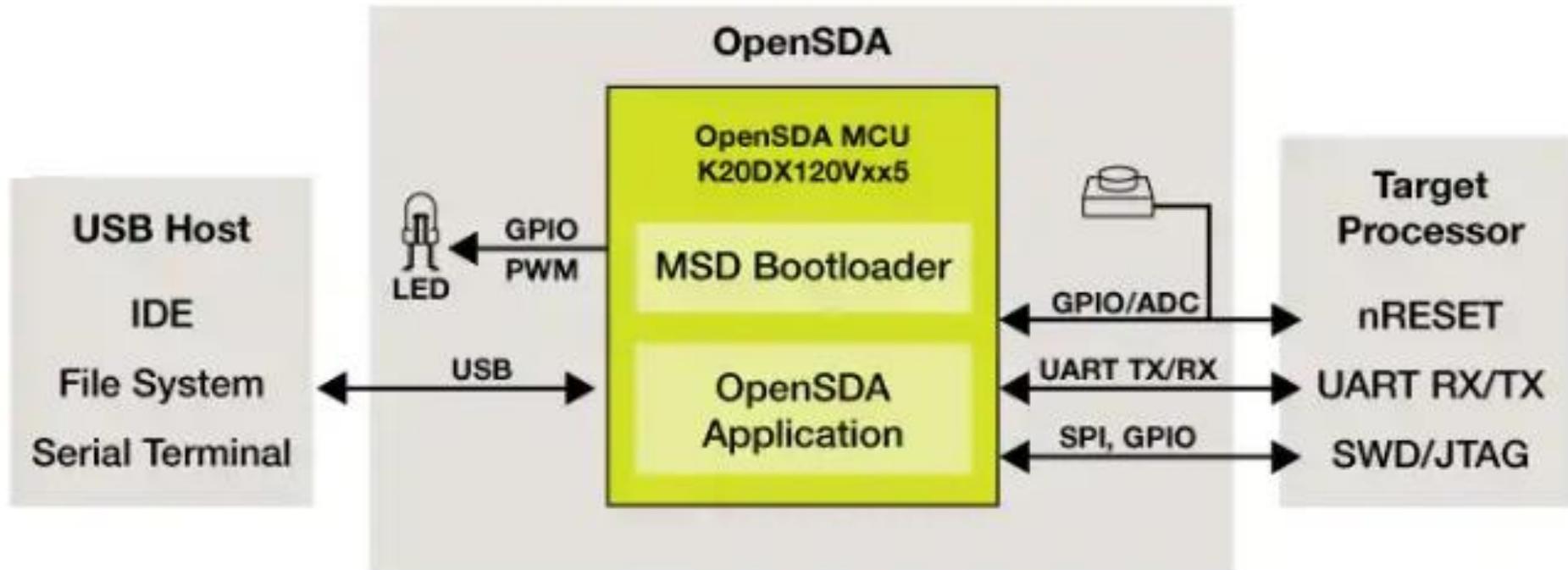
MSD bootloader

- Mass storage device (MSD) USB bootloader
- the device with this bootloader is connected to a host computer, and the bootloader enumerates it as a new drive
- advantages:
  - it does not require a driver to be installed on the host
  - it does not require an application to run on the host
- a firmware image file can then be copied onto the drive and the device reprograms itself.

Features

- Debugging, flash programming, and serial communication over a single USB connection between a host and an embedded target processor
- *DAPLink* is the new and improved implementation of mbed bootloader and standard debugging interface

- Comparison table of different OpenSDA versions:

Version	Bootloader	Default Debugging Interface	Flash Programming	Virtual Serial Port	Source code available
OpenSDAv1	P&E Micro	P&E Micro	.sda/.s19/.srec	Yes	No, proprietary
OpenSDAv2	Arm/mbed	CMSIS-DAP	.bin	Yes	Yes, open source
OpenSDAv2.1	Arm/mbed	CMSIS-DAP	.bin	Yes	Yes, open source
OpenSDAv2.2	mbed DAPLink	DAPLink	.bin, .hex	Yes	Yes, open source

If it is necessary to reload the firmware

- While holding down the small button between the USB connectors, plug the Freedom board into the usual USB connector

- the board will appear as a disk called BOOTLOADER

- in Windows, copy

  MSD-DEBUG-FRDM-KL25Z-Pemicro_v118.SDA

  onto it

- unplug, plug again

- the board will appear in Windows as a disk called FRDM-KL25Z, where you can copy the .bin files

- Windows may complain for some missing drivers:

  install (possibly with no board connected)

  PEDrivers_install.exe

In order to change the firmware…

- E.g., the *OpenSDA DAPLink rev0242* is needed for
  - Keil uVision (see later)
- repeat the previous steps using
  K20dx_frdmkl25z_if_crc.bin
- the board will appear in Windows as a disk called DAPLINK

- Windows may complain for some missing drivers:
  install (possibly with no board connected)
  mbedWinSerial_16466.exe