Using Flash Magic Program LPC

There are two ways to program LPC chips using Flash Magic, ISP mode and Single Wire Debug (SWD) mode. ISP mode support COM port, USB, CAN and Ethernet. SWD support LINK2(LPC1800/lpc4300) bridge and LPC11u35 bridge. This article use four demonstrations to show these programming methods.

Download Flash Magic tool from: https://www.flashmagictool.com/

Pay attention use the new version **Flash Magic v13.10** or later.

1. ISP mode

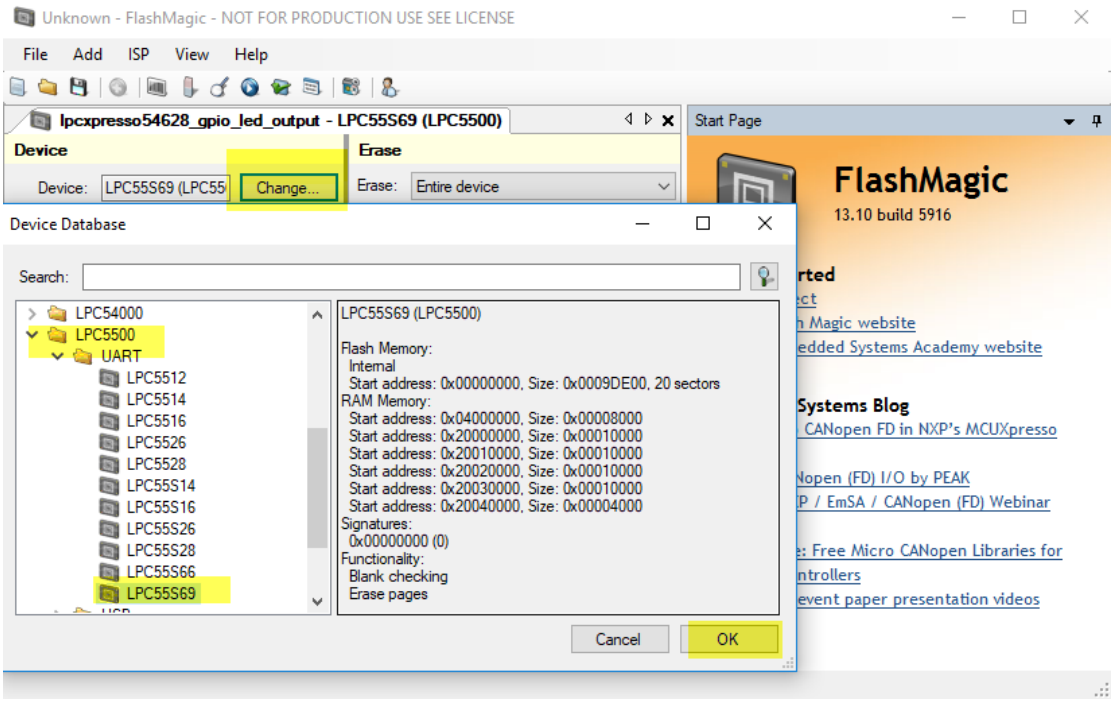
NXP Semiconductors produce a range of Microcontrollers that feature both on-chip Flash memory and the ability to be reprogrammed using In-System Programming technology. Flash Magic is Windows software from the Embedded Systems Academy that allows easy access to all the ISP features provided by the devices. So make chip enter ISP mode, then we can use Flash Magic program image.
This article mainly demonstrates using UART ISP mode and USB ISP mode, CAN ISP ant Ethernet are the same.

1.1UART ISP Mode Demonstration

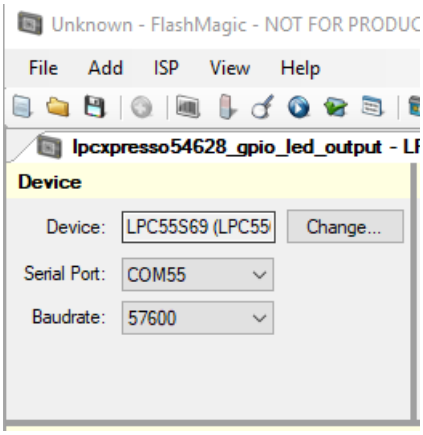
This section describes how to program lpc55s69 using UART, follow below steps:

1) Connect P6 on board with PC, press the ISP button (and keep it pressed) while reset the board(press and release RESET button). (Because the first valid probe message on UART, I2C, SPI or USB locks in that interface, and UART is connected to P6.).LPC55s69 enter UART ISP mode.

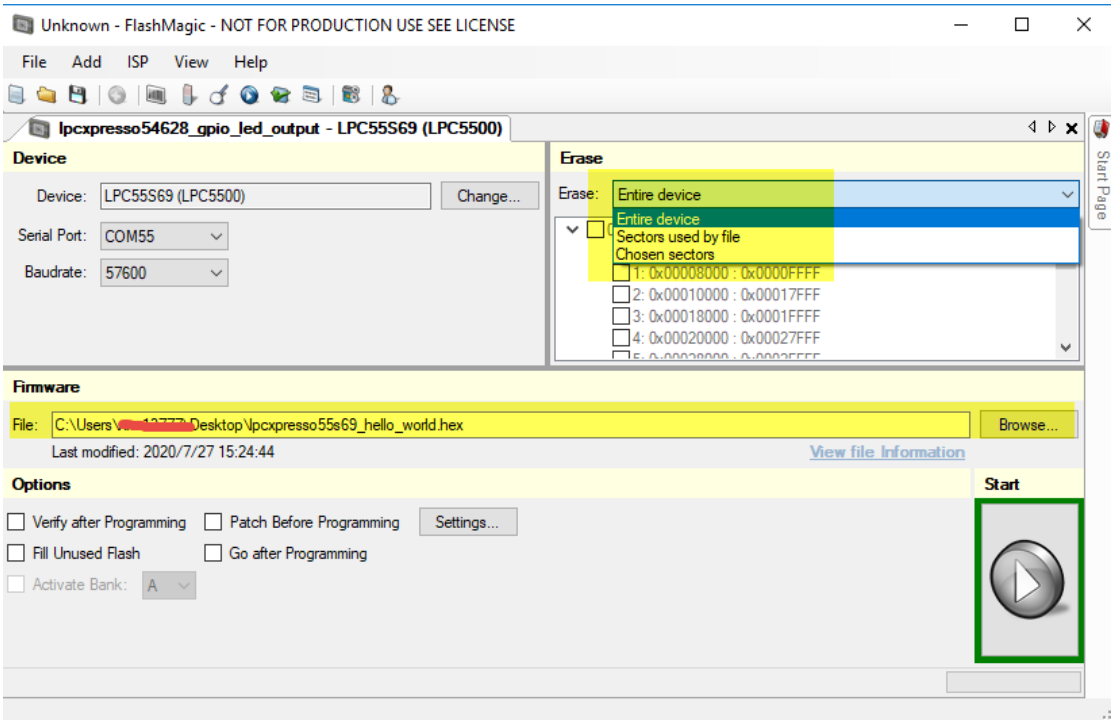
2) Open Flash Magic, choose LPC55S69 from Device.
Chang…->LPC5500->UART-> LPC55S69



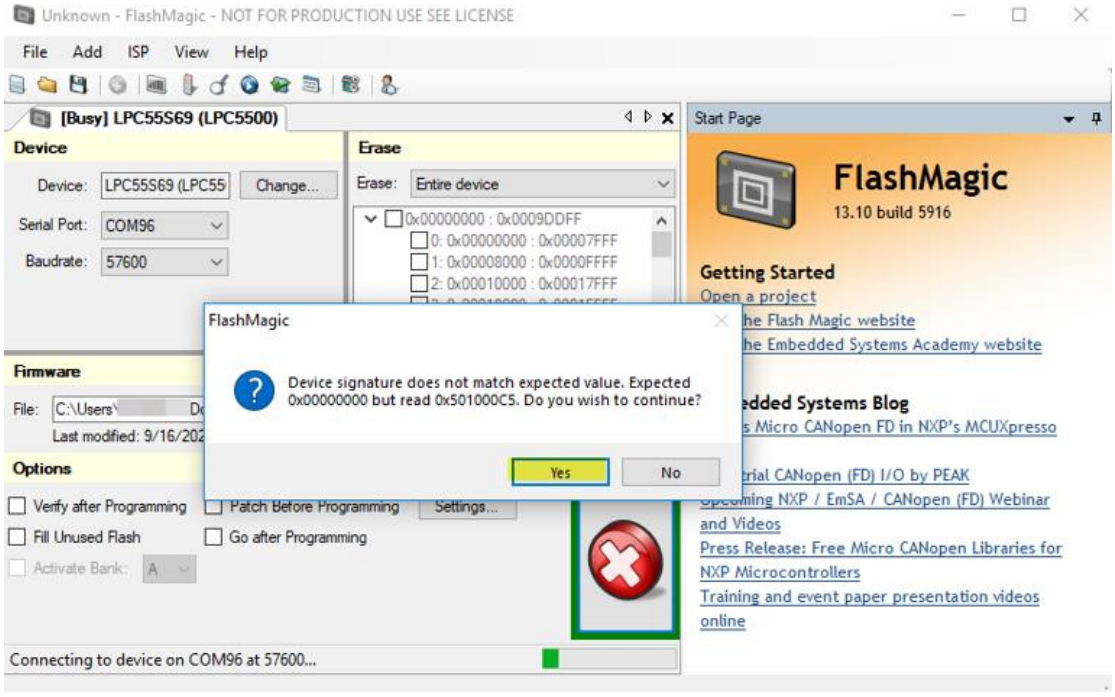
Click “OK”, the Serial port will show.



3) Import hex file you want to program to target from “Firmware” area, config erase options, there are some options you can choose refer to your own requirements.



4) Click “Start” button to program. You will see “Device signature does not match expected value. Expected…” dialog pop up, click yes to move on. Application can be downloaded to target Flash successfully.



1.2 USB ISP Mode Demonstration

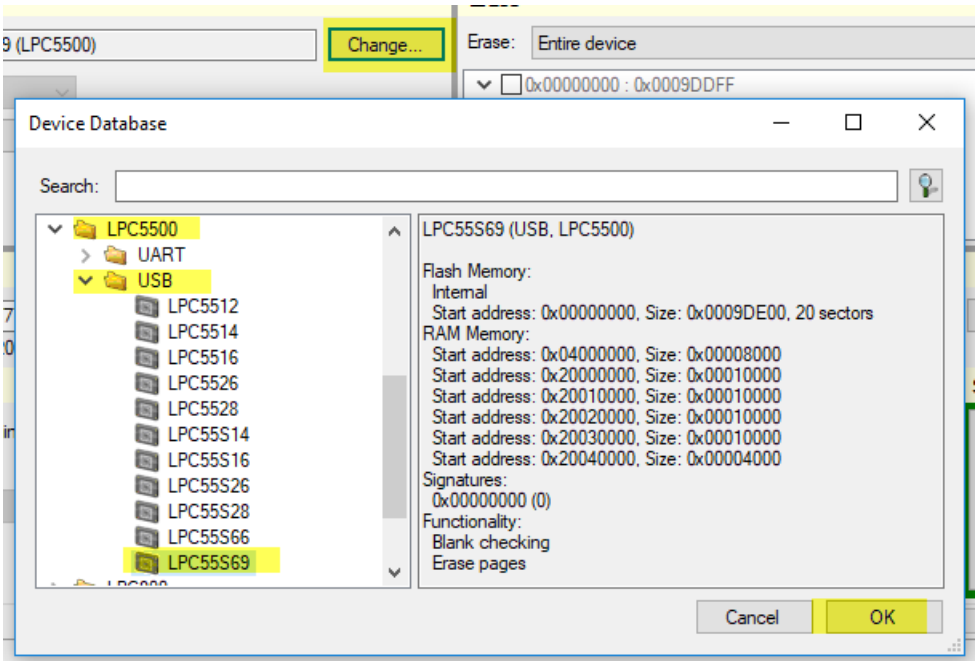
This section describes how to program lpc55s69 using USB, follow below steps:

1) Connect High Speed USB(P9) with PC, press the ISP button (and keep it

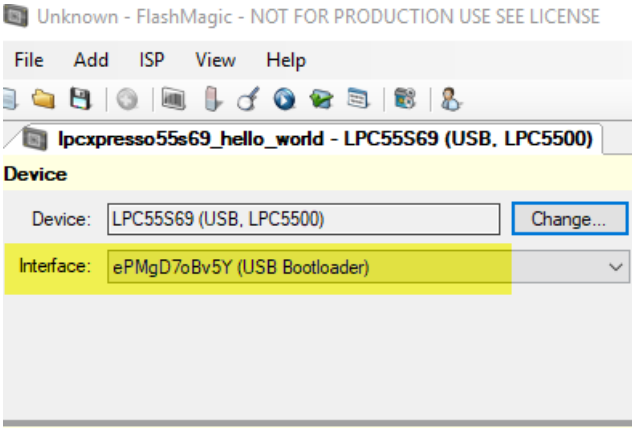
pressed) while reset the board(press and release RESET button). LPC55s69 enter USB ISP mode.

2) Open Flash Magic, choose LPC55S69 from Device.

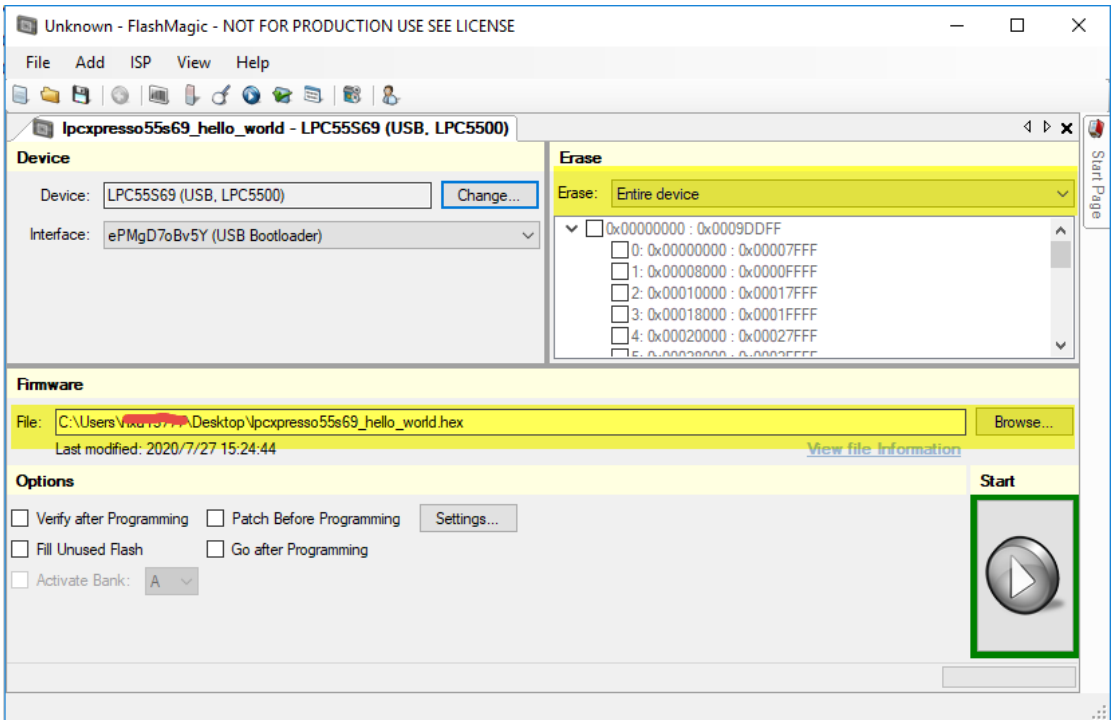
Chang…->LPC5500->USB-> LPC55S69



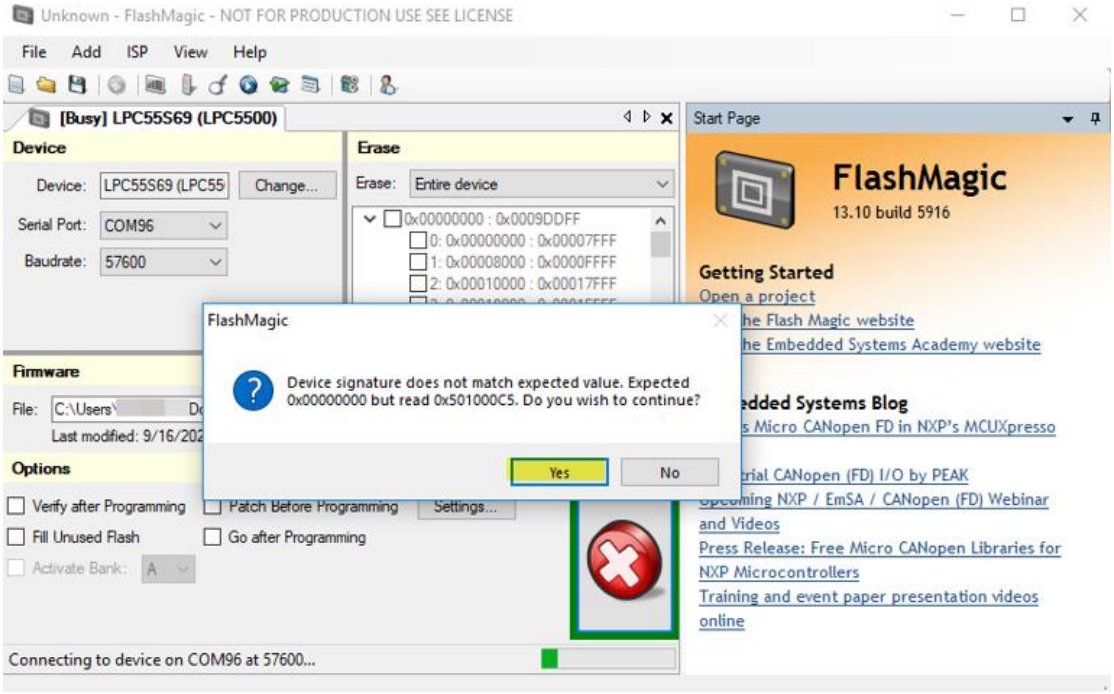
Click “OK”, “USB Bootloader” will show in Interface.



3) Import hex file you want to program to target from “Firmware” part, config erase options, there are some options you can choose refer to your own requirements.



4) Click “Start” button to program. You will see “Device signature does not match expected value. Expected…” dialog pop up, click yes to move on. Application can be downloaded to target Flash successfully.



2. Single Wire Debug(SWD) Mode

Flash Magic supports programming some NXP microcontrollers using SWD. In order to do this, a bridge must be used. The following bridges are currently supported.

2.1 SWD over Link2 Bridge

2.1.1 Introduction

This bridge uses the USB interface on a LPC1800 or LPC4300 to communicate with Flash Magic and SWD to communicate with the target device (LPCxpresso Link2 circuit design). A standalone LPC-Link2 board can also be used.

The LPC1800/LPC4300 must be configured to boot into USB DFU mode. The NXP LPC USB driver must be installed. The option to install this is part of the Flash Magic installer, and is optional. If you are unsure if it is installed re-run the Flash Magic installer and select the option to install it.

Flash Magic will automatically detect the hardware, program in the bridge code and start using it. Only one bridge can be connected to a PC at once. The bridge appears as a USB HID device.

To use this bridge choose it from the interface drop-down list in section 1 of the main window.
The LPC1800/LPC4300 must use a 12MHz crystal. If an LED is connected to pin P1[1] then it will flash at 500Hz when the bridge code is executing.

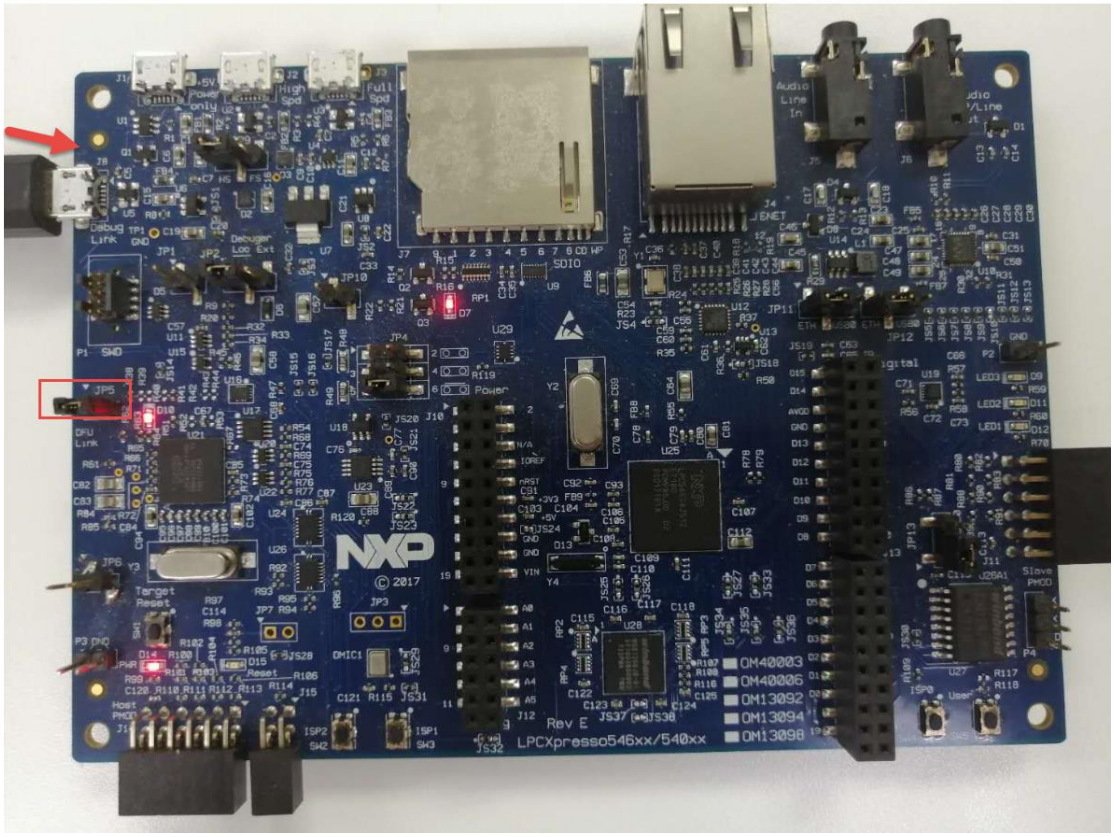
The following SWD connections are used:

LPC1800/LPC4300 Pin	Function	Notes
P1[5]	SWDIO Transmit Enable	When high SWDIO is driven by LPC1800/LPC4300. When low SWDIO is driven by target device.
P1[6]	SWDIO	SWD Signal
P1[17]	SWCLK	SWD Signal
P2[5]	/RESET	Connects to reset of target device
P2[6]	/RESET Enable	When high LPC1800/LPC4300 drives reset of target device using /RESET. When low target device reset is pulled high or under control of a reset button.

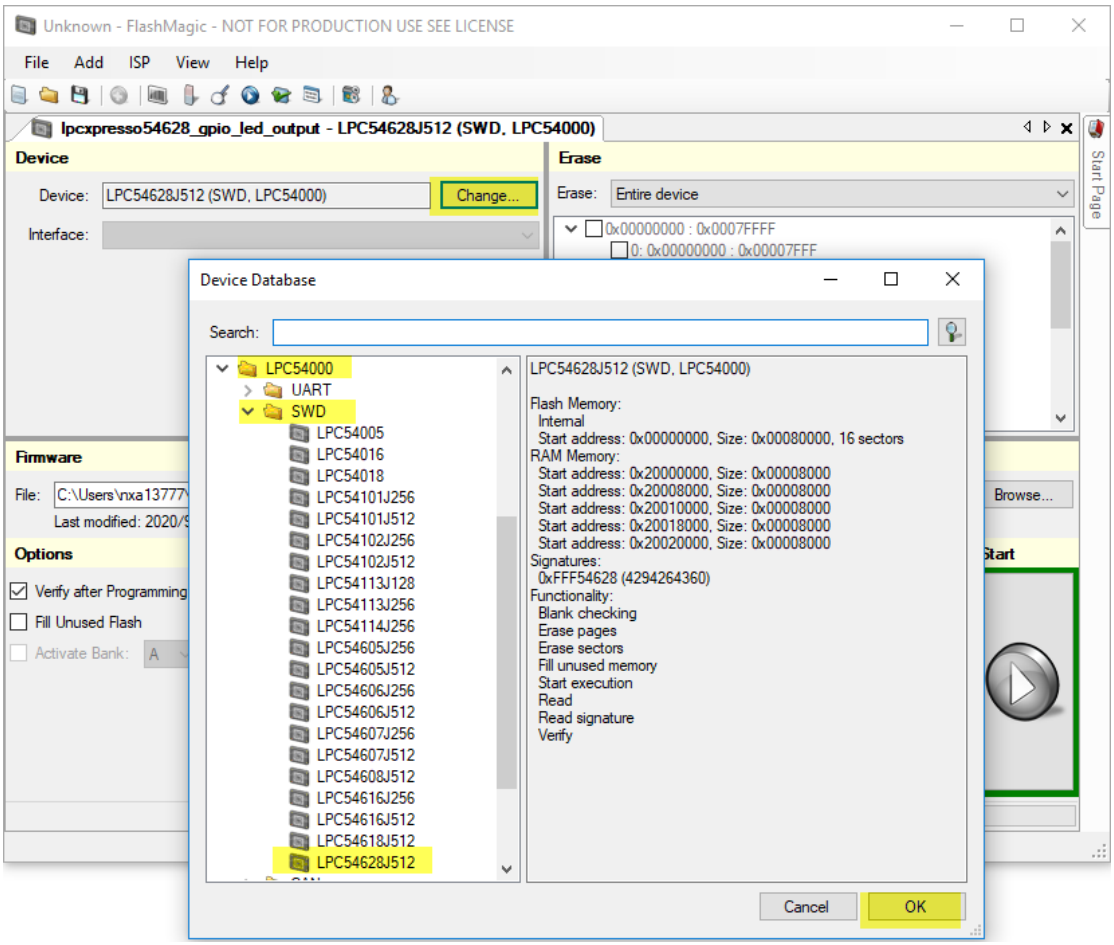
2.1.2 Demonstration

This section describes how to program lpc54628 using SWD. NXP LPCxpresso54628 board have integrated Link2 bridge(lpc4322), follow below steps:

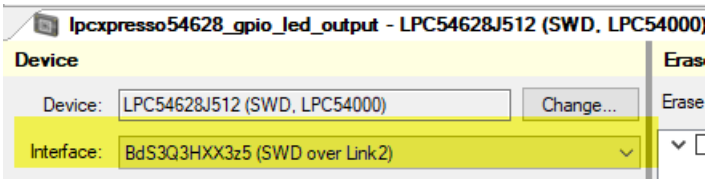
1) Install jumper JP5(DFU LINK) to force DUF mode, connect Debug Link interface(J8) with PC.



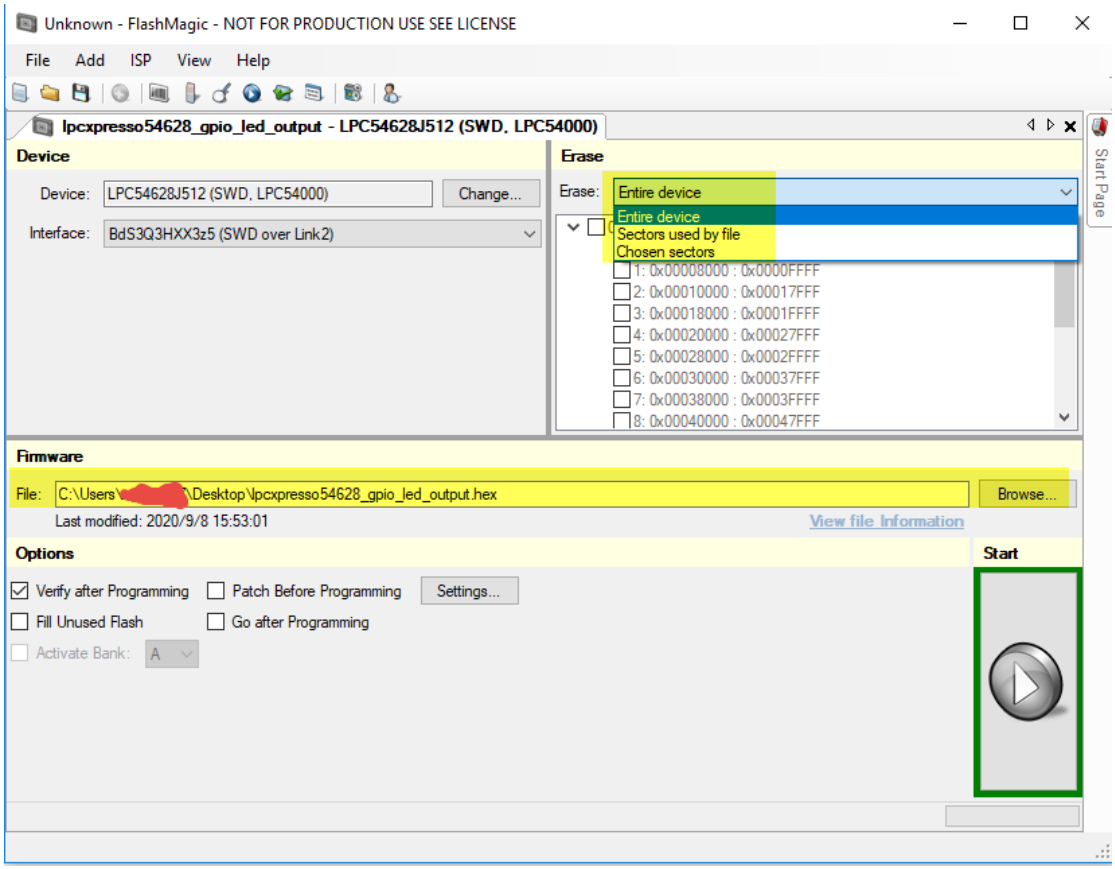
2) Open Flash Magic, choose LPC54628J512 from Device.
Chang…->LPC54000->SWD->LPC54628J512



Click “OK”, Interface will show the SWD over Link2 (Flash Magic detect the hardware Interface), if no, please check and reconnect your board.



3) Import hex file you want to program to target from “Firmware” part, config erase options, there are some options you can choose refer to your own requirements.



4) Click “Start” button to program.

2.2 SWD over LPC11U35

2.2.1 Introduction

This bridge uses the USB interface on a LPC11U30 to communicate with Flash Magic and SWD to communicate with the target device.

Before using this interface the LPC11U30 must be programmed with the bridge code. The easiest way to do that is using the mass-storage USB mode. The binary file can be found in the Interfaces subfolder in the Flash Magic installation.

Once programmed and running Flash Magic will automatically detect the hardware and start using it. Only one bridge can be connected to a PC at once. The bridge appears as a USB HID device.
To use this bridge choose it from the interface drop-down list in section 1 of the main window.
The LPC11U20/30 must use a 12MHz crystal. If an LED is connected to pin P0_20 then it will flash at 500Hz when the bridge code is executing.

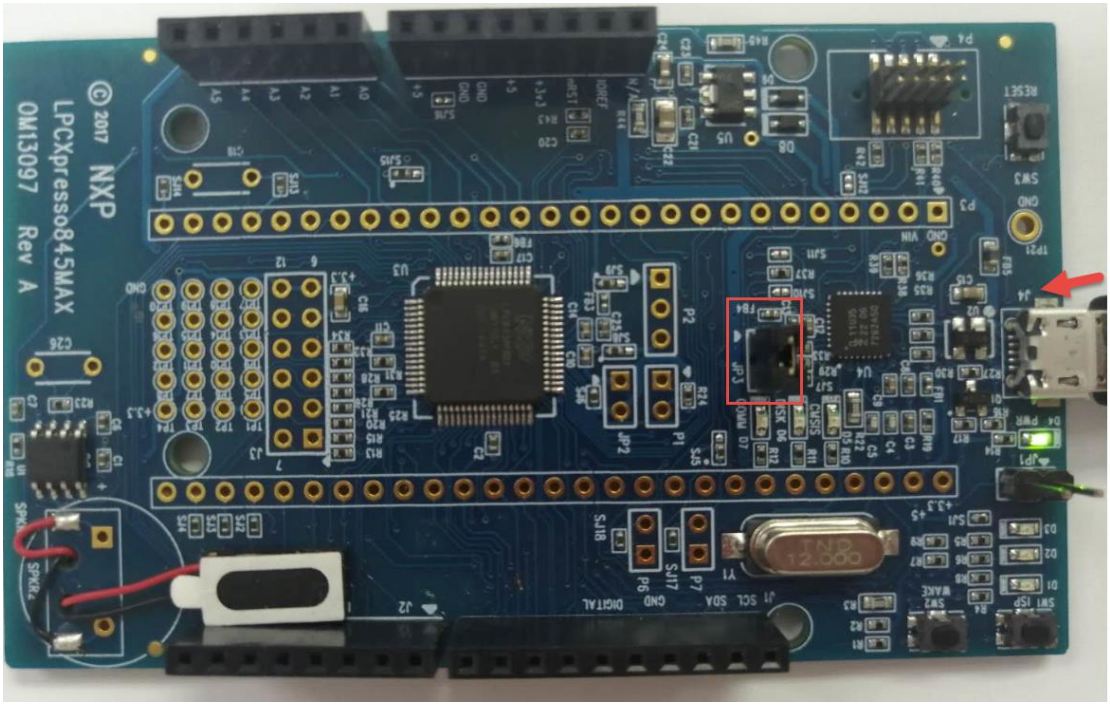
The following SWD connections are used:

LPC11U20/30 Pin	Function	Notes
P0_8	SWDIO	SWD Signal
P0_7	SWCLK	SWD Signal
P0_2	/RESET	Connects to reset of target device

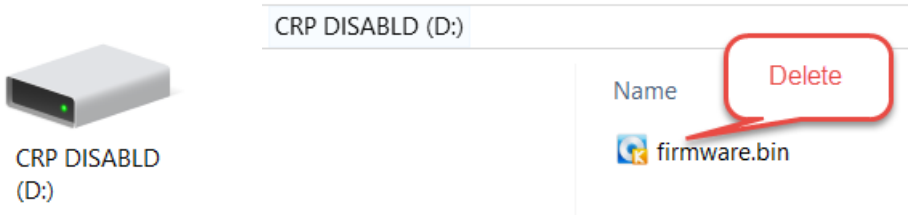
2.2.2 Demonstration

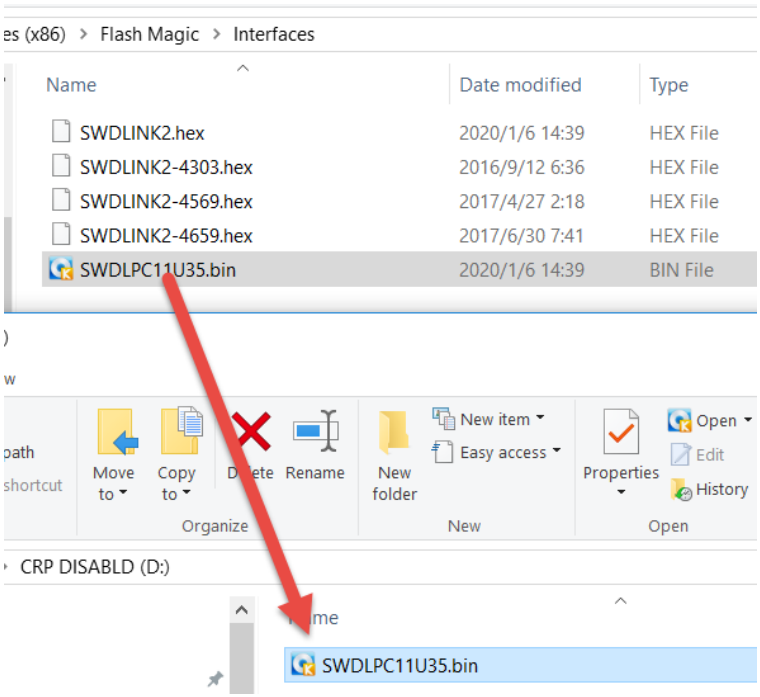
This section describes how to program lpc845 using SWD. NXP LPCxpresso845MAX board have integrated LPC11u35 bridge, follow below steps:

1) Install jumper JP3 to force mass-storage USB mode, connect Debug Link interface(J4) with PC.



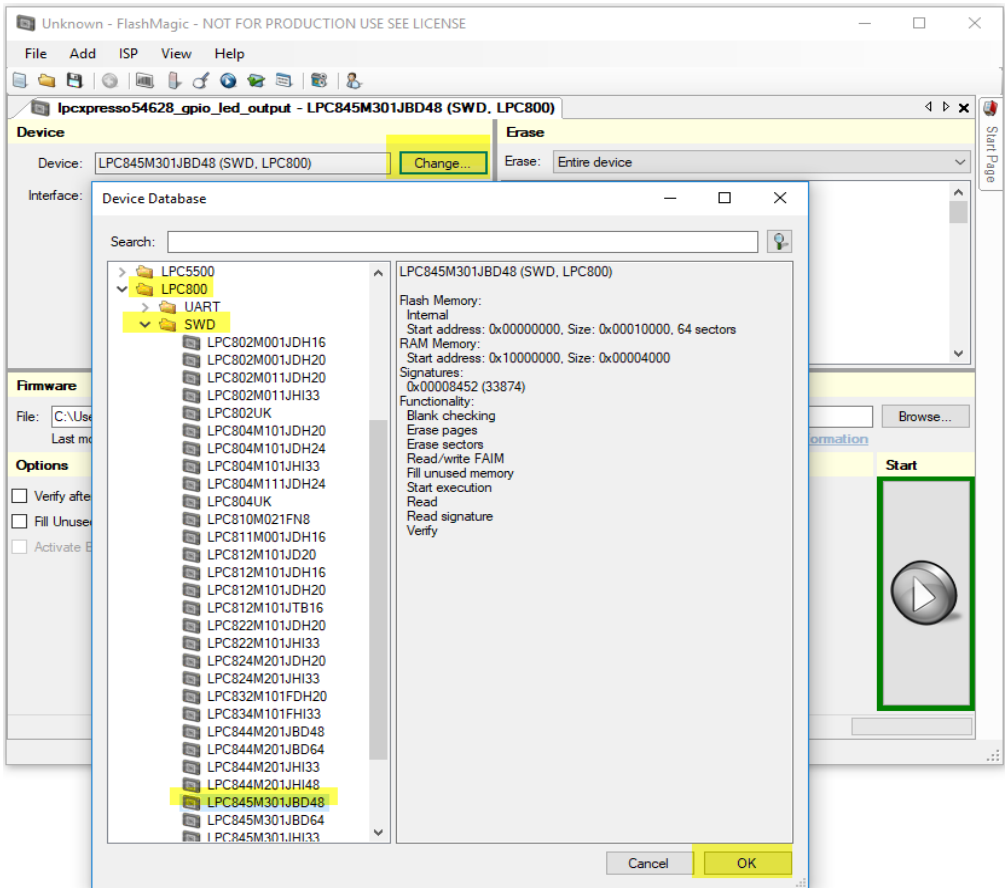
2) “CRP DISABLD” shows in PC, delete the “firmware.bin” inside it, and drag “SWDLPC11U35.bin”(under path Flash Magic\Interfaces) into it.



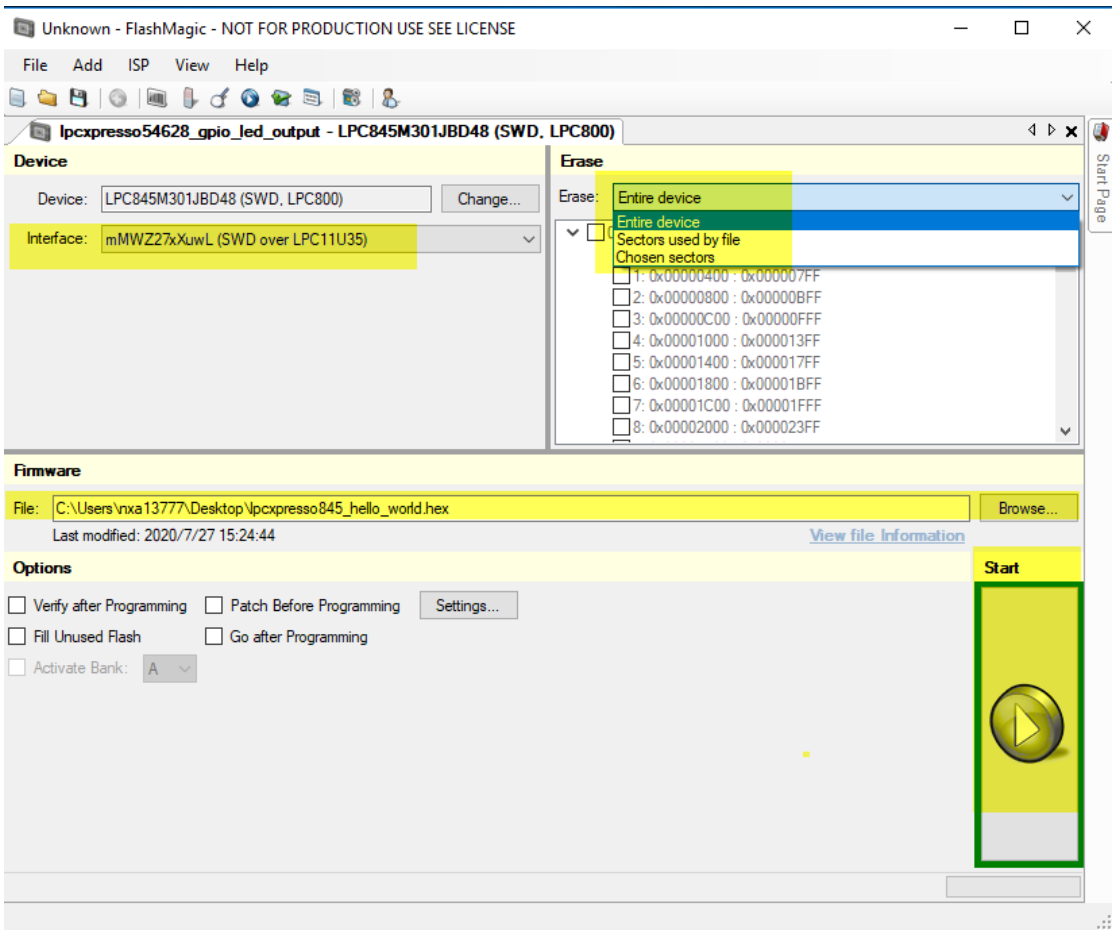


3) Remove jumper on JP3, reconnect board(J4) with PC.

4) Open Flash Magic, choose LPC845M301JBD48 from Device.
Chang…->LPC8000->SWD-> LPC845M301JBD48



Click “OK”, Interface will show the SWD over LPC11u35 (Flash Magic detect the hardware Interface), if no, please check and reconnect your board.



5) Click “Start” button to program.

2.2.3 Recover board

After the steps in 2.2.2(change the firmware in LPC11u35), it can’t be debug using IDE, if you want to debug, need recover firmware. Download firmware from NXP websites:
https://www.nxp.com/webapp/sps/download/preDownload.jsp
About changing firmware steps, please refer to steps1)-3) in section 2.2.2.

3. Reference

<Flash Magic Manual>