In order to program the SPIFI flash, the flashloader has to be placed in to the RAM and execute from there.

The entire procedure can be described as follows:

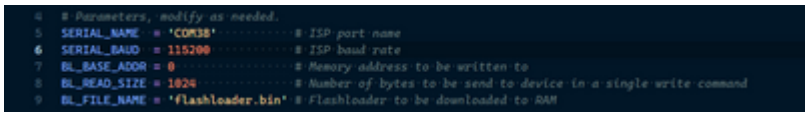
1. Put the device into ISP mode
2. Synchronize USART ISP interface
3. Write the content of flashloader.bin to SRAMX (0x0000_0000)
4. Use Go command to start the execution of the flashloader
5. Communicate with the flashloader using blhost

For step 2-4, please refer to the attached archive, which contains a simple python script to download and execute the flashloader using the ISP commands. **Please also note this script is for reference only and comes without waranty, thus should not be used in production.**

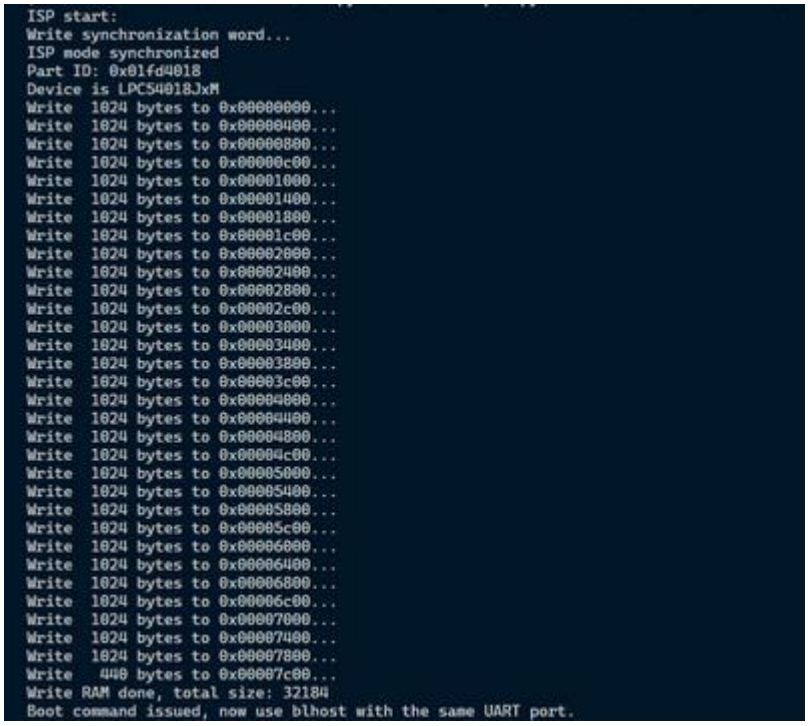
In order to use the script, the following steps should be performed:

1. Extract the contents of the archive to a directory
2. Prepare Python3 environment
3. Open a command line window, navigate to the extracted directory, and execute: **pip install -r requirements.txt**
4. Connect the board's ISP UART to the computer and put the device into ISP mode
5. Modify the connection parameters located in **pyisp.py**, such as port and baud rate (see below).
6. In the same directory, execute: **python pyisp.py**

Parameter settings:



If everything has been set up correctly, the following output can be observed in the commandline window:



The flashloader should be running by now, and with blhost, we can communicate with the flashloader.

The source code of the flashloader can be obtained from SDK **bootloader_examples/flashloader**

Please refer to **"Getting Started with LPC540xx/LPC54S0xx Flashloader User's Guide"** for further configuration of the SPIFI flash. Note the connection mode should be UART instead of USB:

```
$ blhost -p COM38 -- list-memory
Ping responded in 1 attempt(s)
Inject command 'list-memory'
Internal Flash:
  No Internal Flash available
Internal RAM:
  Region 0: 0x00000000 - 0x0002ffff; Total size: 192 KB
  Region 1: 0x20000000 - 0x2000ffff; Total size: 64 KB
  Region 2: 0x20010000 - 0x20017fff; Total size: 32 KB
  Region 3: 0x20018000 - 0x2001ffff; Total size: 32 KB
  Region 4: 0x20020000 - 0x20027fff; Total size: 32 KB
```

```
$ blhost -p COM38 -- get-property 12
Ping responded in 1 attempt(s)
Inject command 'get-property'
Response status = 0 (0x0) Success.
Response word 1 = 0 (0x0)
Response word 2 = 0 (0x0)
Response word 3 = 536870912 (0x20000000)
Response word 4 = 536916659 (0x2000b2b3)
Reserved Regions =
        Region0: 0x20000000-0x2000B2B3 (44.676 KB)
```

The SPIFI configuration word should be placed outside of the reserved region:

```
$ blhost -p COM38 -- fill-memory 0x2000C000 4 0xC0000004
Ping responded in 1 attempt(s)
Inject command 'fill-memory'
Successful generic response to command 'fill-memory'
Response status = 0 (0x0) Success.
```

```
$ blhost -p COM38 -- configure-memory 0xa 0x2000C000
Ping responded in 1 attempt(s)
Inject command 'configure-memory'
Successful generic response to command 'configure-memory'
Response status = 0 (0x0) Success.
```

```
$ blhost -p COM38 -- get-property 25 0xa
Ping responded in 1 attempt(s)
Inject command 'get-property'
Response status = 0 (0x0) Success.
Response word 1 = 15 (0xf)
Response word 2 = 268435456 (0x10000000)
Response word 3 = 4096 (0x1000)
Response word 4 = 256 (0x100)
Response word 5 = 4096 (0x1000)
Response word 6 = 0 (0x0)
UNKNOWN Attributes: Start Address = 0x10000000  Total Size = 4 MB  Page Size = 256 bytes  Sector Size = 4 KB
```

Then the user should be able to erase or program the external flash memory:

```
$ blhost -p COM38 -t 100000 -- flash-erase-region 0x10000000 0x100000
Ping responded in 1 attempt(s)
Inject command 'flash-erase-region'
Successful generic response to command 'flash-erase-region'
Response status = 0 (0x0) Success.
```

Please feel free to contact me if anything unclear about the tool or the ISP procedure.