

# AN11939

## QN908x Production Flash Programming

Rev 1.0 — June 2017

Application note

### Document information

Info	Content
<b>Keywords</b>	QN9080, QN9083, BLE, J-Link, Flash Programming
<b>Abstract</b>	This document describes the techniques for product programming the QN908x with J-Link interface.



## Revision history

Rev	Date	Description
1.0	06/2017	Public release.

## Contact information

For more information, see [www.nxp.com](http://www.nxp.com)

## 1. Introduction

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J-Link is an interface for downloading of application files, configuration files, and data into the target chip for the Bluetooth Low Energy application development or mass production based on the QN908x platform.

The J-Link interface is implemented on these pins:

- PA22 for SWCLK
- PA23 for SWDIO

## 2. J-Link download process

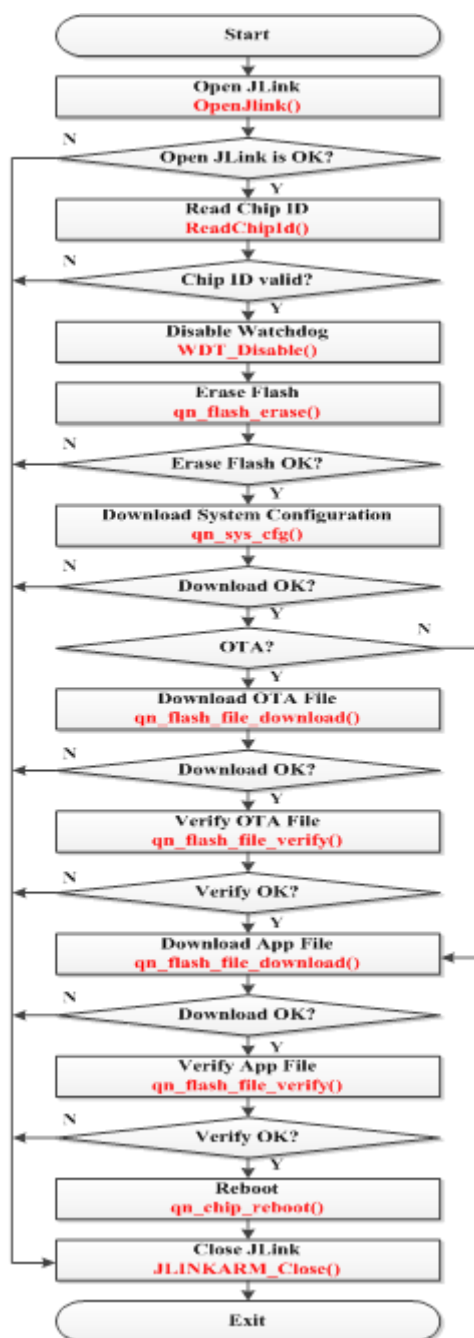


Fig 1. J-Link download process

Note: The red functions in [Fig 1](#) are included in the demo code and J-Link SDK.

J-Link SDK: [www.segger.com](http://www.segger.com)

3. Flash layout

The 512-KB flash is partitioned as shown in [Fig 2](#) and [Fig 3](#):

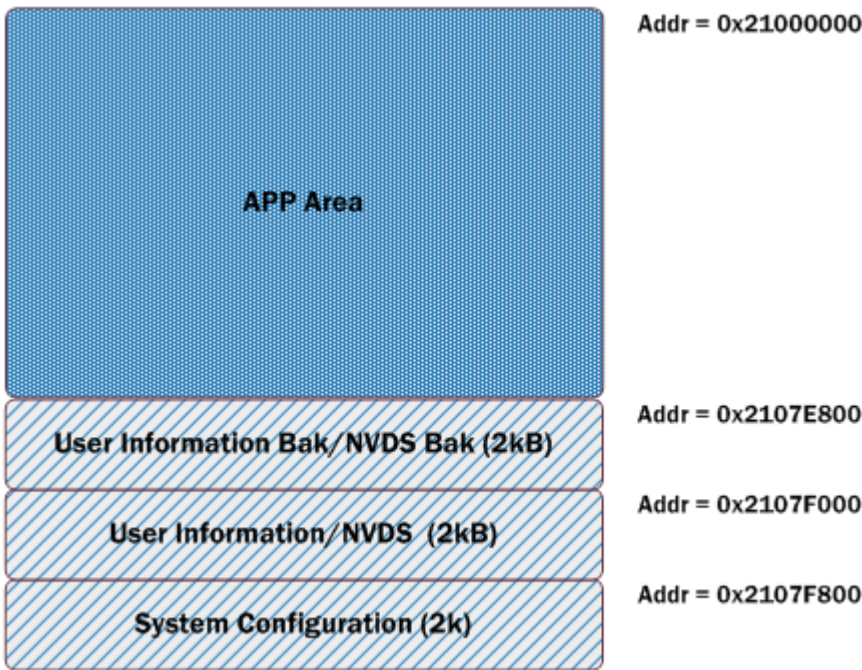


Fig 2. Flash space without OTA

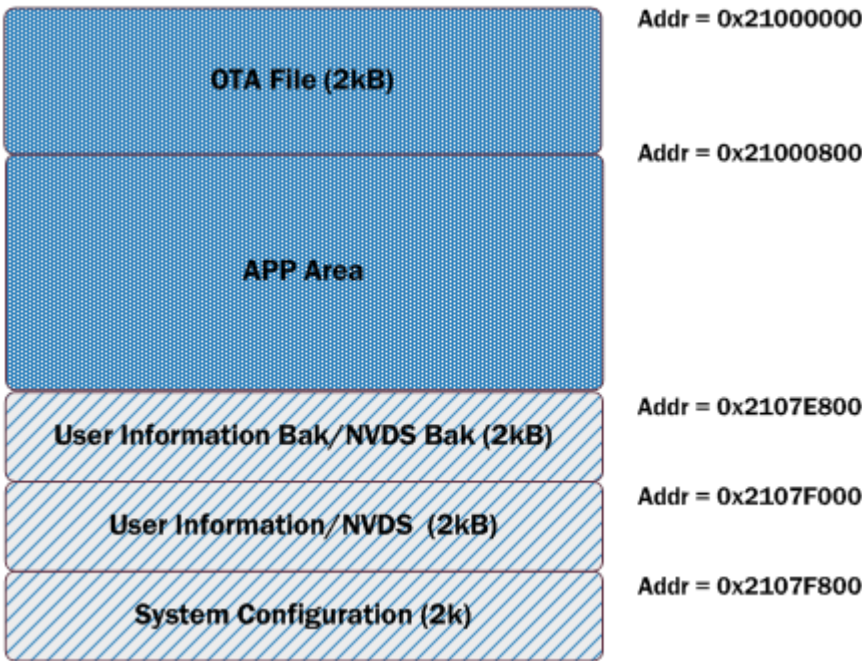


Fig 3. Flash space with OTA

## 4. Example code

### 4.1 Read chip Id

```
unsigned int ReadChipId(void)
{
    U32 chip_id;

    JLINKARM_ReadMemHW(0x40000108, 4, &chip_id); // QN908X.UM 2.5.10 Chip ID
    register

    return chip_id;
}
```

### 4.2 Disable watchdog

```
void WDT_Disable()
{
    // Disable watchdog timer
    U32 dis_wdt;
    dis_wdt = 0x1ACCE551;
    JLINKARM_WriteMemHW(0x40001020, 4, &dis_wdt);
    dis_wdt = 0x0;
    JLINKARM_WriteMemHW(0x40001008, 4, &dis_wdt);
    dis_wdt = 0x0;
    JLINKARM_WriteMemHW(0x40001020, 4, &dis_wdt);
}
```

### 4.3 Erase flash

```
BOOL qn_flash_erase(void)
{
    U32 data;

    data = 0x40000000;
    JLINKARM_WriteMemHW(0x40000010, 4, &data); // System clock source and divider
    register
    data = 0xffffffff;
    JLINKARM_WriteMemHW(0x4000000c, 4, &data); // Clock enable
    data = 0x0002001e;
    JLINKARM_WriteMemHW(0x4008100c, 4, &data); // TIME_CTRL 0x4001e

    data = 16000;
    JLINKARM_WriteMemHW(0x40081008, 4, &data); // erase time = 2ms, default =
    80ms

    // chip erase
    data = 0x0000503f;
    JLINKARM_WriteMemHW(0x40081010, 4, &data);
    data = 0x30000000;
    JLINKARM_WriteMemHW(0x40081004, 4, &data); //ERASE_CTRL
    data = 0xcale093f;
```

```
JLINKARM_WriteMemHW(0x400810a8 ,4, &data); // DEBUG_PASSWORD SWD erase
password = 0xCA1E093F

return TRUE;
}
```

#### 4.4 Download file

```
BOOL qn_flash_file_download(const char* sFileName, unsigned int Addr)
{
    JLINKARM_BeginDownload(0);
    JLINK_DownloadFile(sFileName,Addr);
    JLINKARM_EndDownload();

    return TRUE;
}
```

#### 4.5 Verify

```
BOOL qn_flash_file_verify(unsigned int Addr, unsigned int FileNumBytes, void*
FileData)
{
    // Read App File
    JLINKARM_ReadMem(Addr, FileNumBytes, rdFlashData);

    // Verify App
    if (memcmp(FileData, rdFlashData, FileNumBytes) != 0)
    {
        return FALSE;
    }

    return TRUE;
}
```

#### 4.6 Chip reboot

```
BOOL CswdDlg::qn_chip_reboot(void)
{
    U32 data;

    data = 0xfe5fffff;
    JLINKARM_WriteMemHW(0x40000000 ,4, &data); // bit 32 - write 1 to Reboot
entire system

    return TRUE;
}
```

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