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Winner Micro 联盛德微电子

Instructions for use of WM_W800_ parameter area

V1.2

WinnerMicro

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Document modification record

Version revision time	revision history	author review	
V0.1	2019/9/25 [C] Create document	Cuiyc	
V0.2	2020/7/8 Unified font	Cuiyc	
V1.0	2020/8/10 Upgrade version number	Cuiyc	
V1.1	2021/2/23 Update the size of the user area to be consistent with the SDK	Cuiyc	
V1.2	2021/5/13 Update the compiled scripts for user changes and adjust	Cuiyc	

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1 Introduction

1.1 Purpose of writing

This document is mainly used to explain the QFLASH layout in W800, the use of key parameter area and system parameter area and the User parameter area processing.

1.2 Intended audience

The applicable readers of this document include developers, testers, architects, etc.

1.3 Definition of terms

Ordinal	term/abbreviation	Description/Definition
1	QFLASH	Quad-SPI FLASH
2	SECBOOT	Second Bootÿrelative to ROM
3	ROM	Read-Only Memory

1.4 References

none

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2 QFLASH parameter area layout

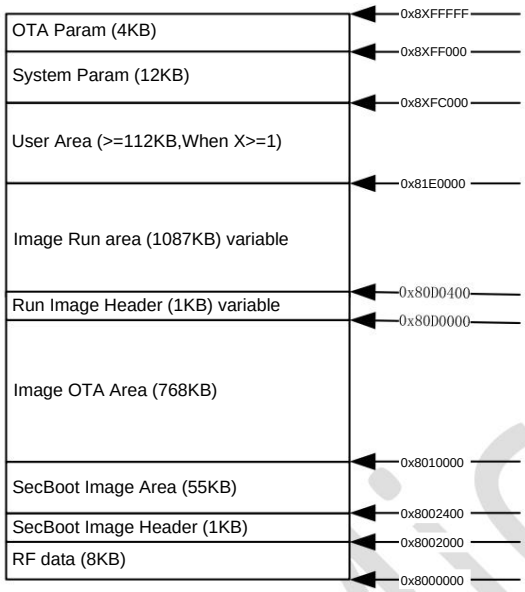


Figure 2-1

This document takes X=1 as an example, that is, the Flash capacity is 2MByte.

2.1 Physical layer parameter area

Address space: 0x8000000-0x8000FFF, 4KByte in total

Parameter content:

MAC address and RF parameters.

Parameter layout:

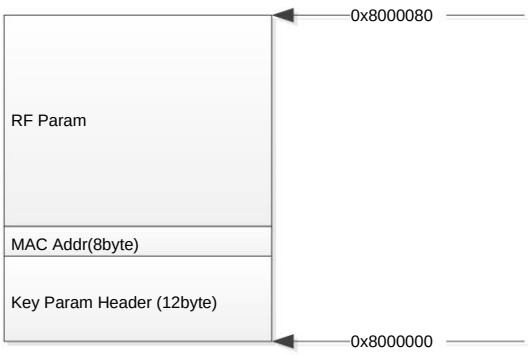


Figure 2-2

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2.2 User parameter area

Address space: 0x81E0000-0x81FBFFF, a total of 112KByte

Parameter content:

It is used when the user stores custom parameters.

Parameter layout:

Custom

2.3 System parameter area

Address space: 0x81FC000-0x81FEFFF, 12KByte in total

Parameter content:

Relevant parameters required for system operation

Parameter layout:

<table>
<tr><td colspan="2">MAGIC Number:4Byte</td></tr>
<tr><td>PARTITION_NUM:2Byte MODIFY_CNT:2Byte</td><td></td></tr>
<tr><td colspan="2">RESERVED:4Byte</td></tr>
<tr><td>RESERVED:2Byte</td><td>Length: 2Byte(whole
The size of the parameter, including CRC
value, determined by system parameters)</td></tr>
<tr><td colspan="2">Data Content (determined by system parameters)</td></tr>
<tr><td colspan="2">CRC Value: 4Byte (value of content before CRC)</td></tr>
</table>

1) System parameter area 1: 0x81FC000-0x81FCFFF

2) System parameter area 2: 0x81FD000-0x81FDFFF

3) System parameter area 3: 0x81FE000-0x81FEFFF

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3 Physical layer parameter area

3.1 Introduction to Physical Layer Parameters

The MAC address required for the W800 module to work, and the RF calibration parameters required for the Wi-Fi transceiver to work

3.2 Physical layer parameter writing stage

Write when W800 chip or module is produced

3.3 Use of physical layer parameters

When the W800 module starts, it will read the required parameters from the key parameter area for use.

Physical layer parameters have a backup mechanism.

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4 System parameter area

4.1 System parameter introduction

System parameters refer to the parameters of networking, interface configuration, mode configuration, etc. required for the operation of the W800 module, specifically as Down:

1) Wi-Fi related (SSID, BSSID, KEY, channel list, power saving flag, speed setting, area code, work model)

2) IP information (static IP, DHCP enabling information, NTP server, DNS server)

3) Interface configuration (UART configuration)

4) BT parameters

5) Other parameters (WEB)

4.2 Use of system parameters

4.2.1 Initialization phase

The system parameter area has a backup mechanism, and the content of which parameter area is used is determined by the CRC and MODIFY_CNT check value. The content is used as a parameter when the system is running. The specific mechanism is:

1) When the CRC in the parameter area is correct, select the current parameter to be used according to MODIFY_CNT

2) If only one CRC in the parameter area is correct, select the parameter area with the correct CRC as the current parameter, and the other The parameter area is updated to the value of the current parameter area

3) If the CRC in the parameter area is not correct, first try to restore the parameters. If it is incorrect, the default parameter value will be used as the runtime parameter, and at the same time, the content of the updated parameter area will be the default parameter.

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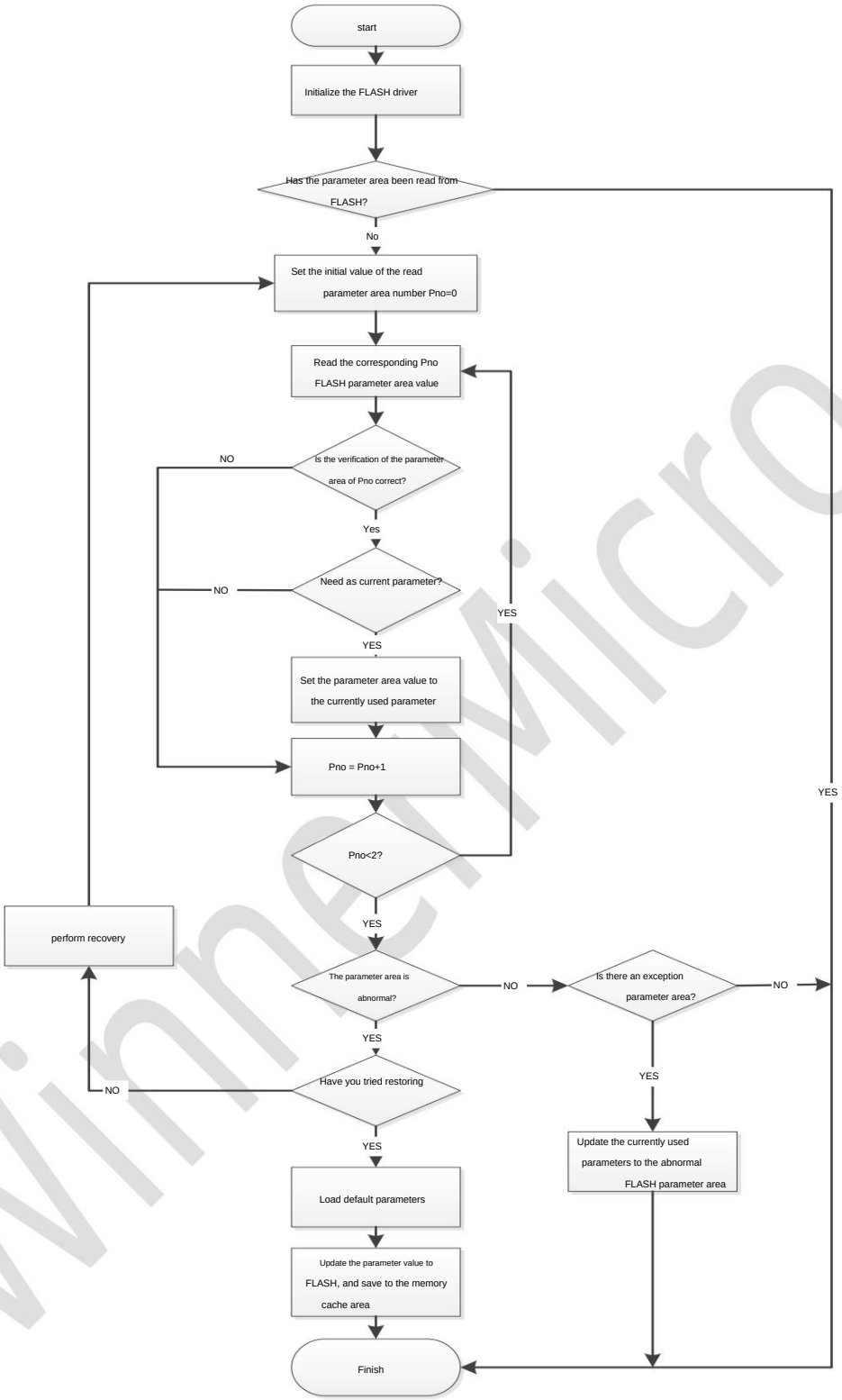


Figure 5-1

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4.2.2 Parameter usage phase

1) Parameter acquisition

In addition to being stored in the two areas of QFLASH, the system parameter area will also be backed up in memory during initialization

One copy is convenient for runtime use and prevents frequent access to QFLASH.

2) Parameter writing

(1) When the system is started, the first initialization or the parameter area is damaged, the parameter area will be written

(2) During operation, the system parameters are updated, and the parameter area will be written

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5 User parameter area

5.1 User parameters

W800 users expect to store custom parameters or operation logs.

5.2 User Area Usage

5.2.1 Operation of user parameter area

The W800 SDK will add an operation mechanism for the user parameter area to ensure that the user only uses the corresponding

This can be done for addresses (relative to USER_ADDR_START).

5.2.2 Adjustment rules in the user parameter area

The default QFLASH layout of W800 can provide users with an area of 240KByte. However, the current W800

The user parameter area setting is designed based on the largest possible code area.

5.2.2.1 Adjustment rules in the user parameter area:

1) Based on the used runtime space determined by w800.img compiled by the user

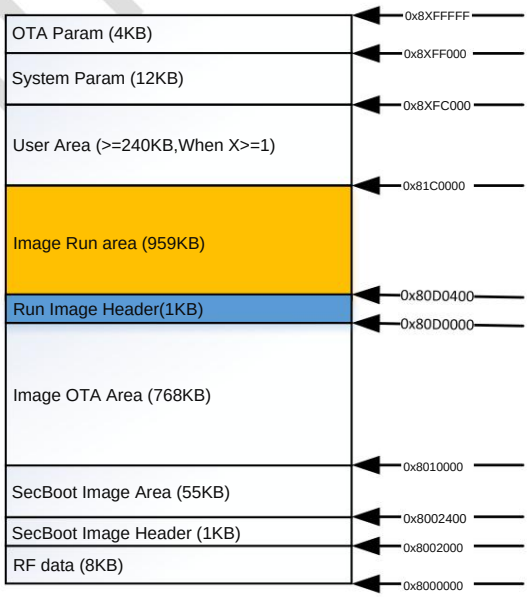


Figure 5-1

2) Determine the upgrade area space used according to the compression ratio of w800.img

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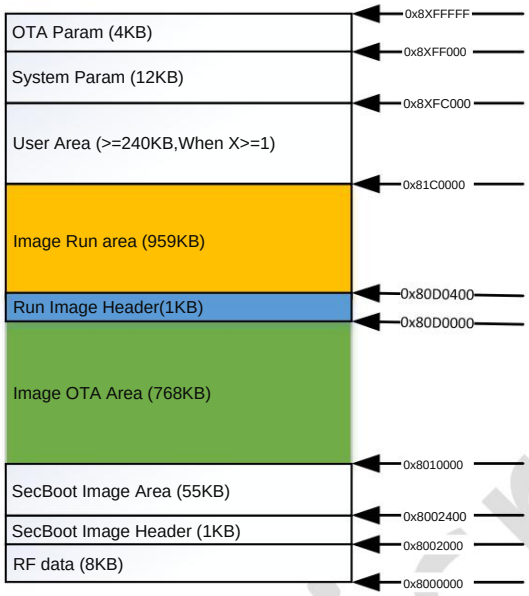


Figure 5-2

3) According to the size of **w800.img, it is divided according to the BLOCK (64Kbyte) interval of QFLASH by rounding up (need to focus on).**

4) Re-determine the start address of user space according to the division result of IMAGE.

5) Adjust the macro definition of W800 SDK according to the newly divided space to determine the starting address of the new user space

```
/**FLASH MAP**/

/**Flash Base Address */
#define FLASH_BASE_ADDR                 (0x8000000UL)

/**Upgrade image area*/
#define CODE_UPD_START_ADDR             (0x8010000UL)

/**Run-time image header area*/
#define CODE_RUN_START_ADDR             (0x80D0000UL)

/**Area can be used by User*/
#define USER_ADDR_START                 (0x81C0000UL)
```

6) After adjusting the user space, you also need to update the configuration file and link file

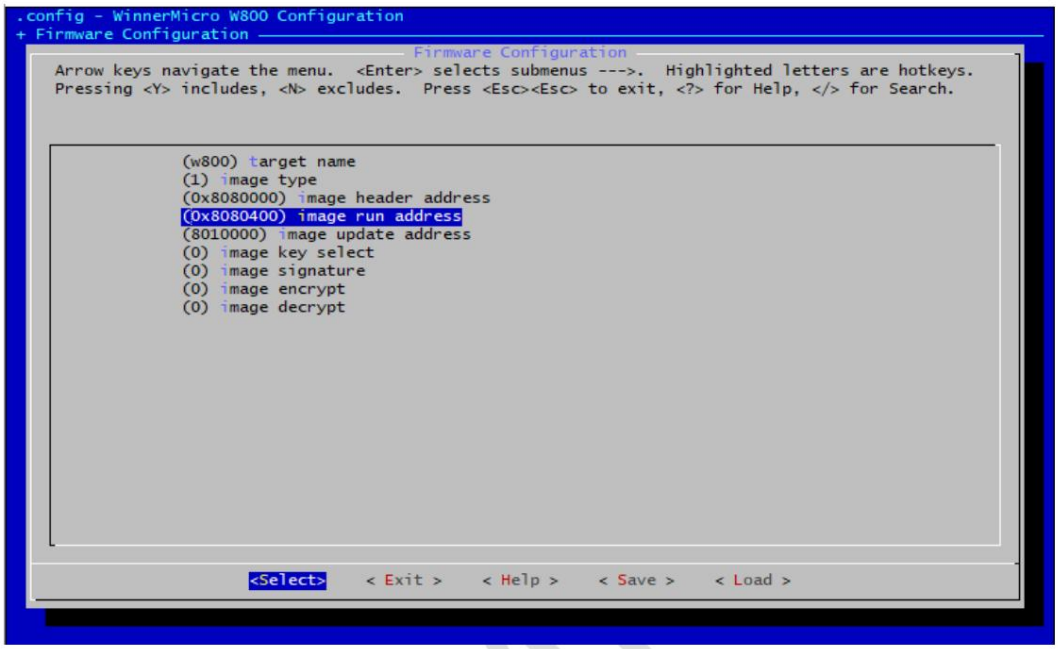
Configuration file tweaks:

(1) **For users who use linux or cygwin to compile with commands, the file needs to be adjusted:**

ÿ Use make menuconfig to enter the interface to adjust Image Headeraddress and

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The location of the Image run header address (as shown below)



ÿ If you don't want to use the above interface, you can directly modify the .config in the tools\w800 directory

The following two values are in the file:

CONFIG_W800_IMAGE_HEADER=8080000

CONFIG_W800_RUN_ADDRESS=8080400

(2) For users **who use the CDK** project, you need to modify: tools\w800\utilities

The values of the two variables in aft_build_project.sh:

run_img_header=8080000

run_img_pos=8080400

Linked file adjustments:

Modify gcc_csky.ld under the ld\w800 directory, and modify the ORIGIN value of I-SRAM (as follows):

I-SRAM : ORIGIN = 0x08080400 , LENGTH = 0x120000 /* I-SRAM */

7) Re-make to compile and burn the w800.fls file. After the module is started, the user parameter area becomes the new set value.

Notice:

If the customer uses the SDK before version V1.00.02, it is necessary to update the related version of V1.00.02

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Only after modification can it be used.

5.2.2.2 Examples

If the size of the user compiled IMAGE is

W800.imgÿ560KByte

compressed img: 400KByte

Take the size of IMAGE up to an integer multiple of 64KByte (important), then

Running area space: 576KByte

Upgrade area space: 448KByte

The configuration steps are as follows:

1) The user's new space is shown in the yellow part of the figure

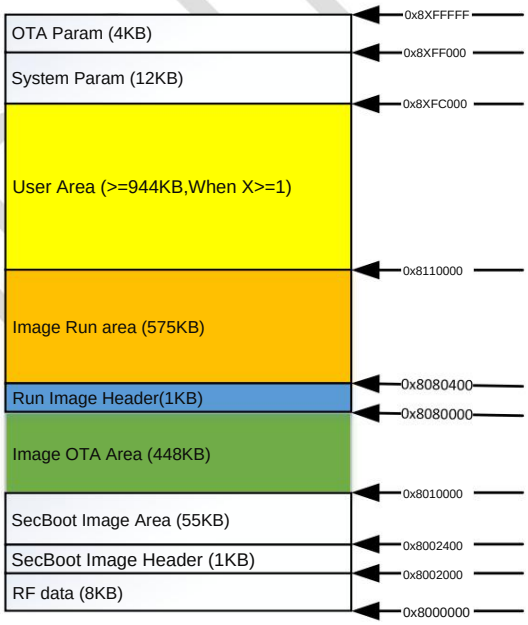


Figure 6-3

2) The new code space is adjusted to:

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```
/**Flash Base Address */
#define FLASH_BASE_ADDR                 (0x8000000UL)

/**Upgrade image area*/
#define CODE_UPD_START_ADDR             (0x8010000UL)

/**Run-time image header area*/
#define CODE_RUN_START_ADDR             (0x8080000UL)

/**Area can be used by User*/
#define USER_ADDR_START                 (0x8110000UL)
```

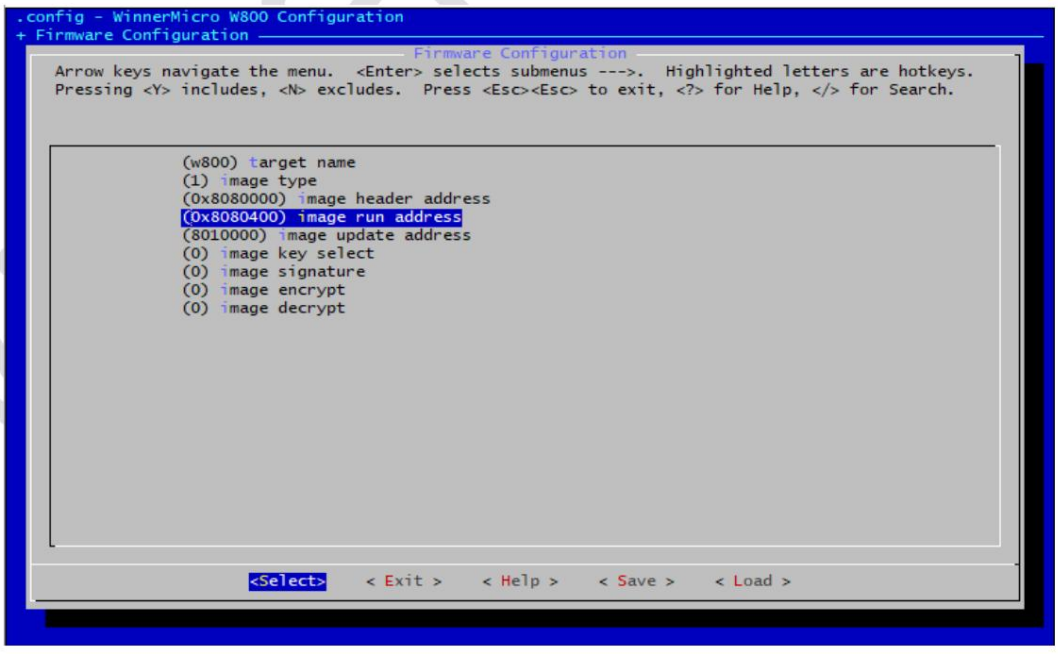
3) After adjusting the user space, you also need to update the configuration file and link file

Configuration file tweaks:

(3) For users who use linux or cygwin to compile with commands, the file needs to be adjusted:

ÿ Use make menuconfig to enter the interface to adjust Image Headeraddress and

The location of the Image run header address



ÿ If you don't want to use the above interface, you can directly modify the .config in the tools\w800 directory

The following two values are in the file:

CONFIG_W800_IMAGE_HEADER=8080000

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CONFIG_W800_RUN_ADDRESS=8080400

(4) For CDK users, you need to modify: aft_build_project.sh under tools\w800\utilities

The values of the two variables in:

run_img_header=8080000

run_img_pos=8080400

Linked file adjustments:

Modify gcc_csky.ld under the ld\w800 directory, and modify the ORIGIN value of I-SRAM (as follows):

I-SRAM : ORIGIN = 0x08080400 , LENGTH = 0x120000 /* I-SRAM */

4) Re-make to compile and burn the w800.fls file. After the module is started, the user parameter area becomes the new set value.

illustrate:

If the customer uses the SDK before version V1.00.02, it is necessary to update the related version of V1.00.02

Only after modification can it be used.

5.2.3 Double backup mechanism of user parameter area

If the user parameter area will record key information, it is recommended that the user implement a dual backup mechanism, the main area and the backup area are based on 4Kbyte

Interval division.

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