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\*@brief for TLSR chips

\* @date May 06, 2021

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**Patch for Flash driver and low voltage detection: used for “telink\_private\_mesh\_sdk” SDK version V1.R and prior.**

Note: if you are developing based on V1.R, please update to V1.S for all patch. Other versions, in order to update patch, you need to do the following things:

# Patch Release Note

**Features**

* Support ZBit flash.
* Improve the efficiency of ota when using ZBit flash.
* Calibrate the flash vref according to the reading value from flash.
* add low voltage detection function: if low voltage is detected, the chip will enter sleep state. for more details, please refer to the codes of 'BATT\_CHECK\_ENABLE'.

**BUG FIXS**

* N/A

**BREAKING CHANGES**

* Flash::Modify some Flash API usage for compitible.
* void flash\_read\_mid(unsigned char\* mid) change to unsigned int flash\_read\_mid(void),the mid from 3byte change to 4byte.
* The API of flash\_read\_status、flash\_write\_status not provide to external use,you need use the API in the directory of flash depend on mid(eg:flash\_write\_status\_midxxxxxx).
* •The first argument of API int flash\_read\_mid\_uid\_with\_check( unsigned int \*flash\_mid ,unsigned char \*flash\_uid),flash\_mid need 4byte space.The second argument need 16byte,has two case,8byte or 16byte,if the flash only has 8byte uid,flash\_uid[8:15] will be clear to zero.
* The API of flash\_lock,flash\_unlock will be instead of flash\_lock\_midxxxxxx and flash\_unlock\_midxxxxxx.

**Features**

* 支持ZBit flash。
* 根据校准值校准Flash电压。
* 当使用ZBit Flash时提升OTA效率。
* 增加低电压检测功能：如果检测到低电压，芯片进入休眠状态。具体请参考BATT\_CHECK\_ENABLE对应的代码。

**Bug fixs**

* N/A

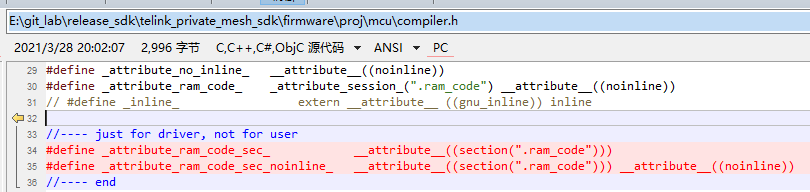
**BREAKING CHANGES**

* Flash:为兼容不同的Flash型号，Flash驱动结构做了调整，修改了部分Flash接口调用方式。
* void flash\_read\_mid(unsigned char\* mid) 改为 unsigned int flash\_read\_mid(void),mid由3byte改为4byte,最高byte用于区分mid相同但是功能存在差异的flash。 \*为兼容不同型号的Flash,flash\_read\_status、flash\_write\_status不提供给外部使用，需要使用对应接口时，需要根据mid去选择flash目录下的接口(例如：flash\_write\_status\_midxxxxxx)。
* 接口int flash\_read\_mid\_uid\_with\_check( unsigned int \*flash\_mid ,unsigned char \*flash\_uid)的第一个参数flash\_mid需要4个字节空间，第二个参数需要16byte空间， 现有flash的uid有两种情况，一种16byte，一种8byte，如果是8byte，flash\_uid[8:15]会被清零。

接口flash\_lock、flash\_unlock由flash\_lock\_midxxxxxx和flash\_unlock\_midxxxxxx替代。

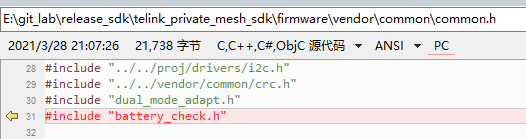
# Update flash driver

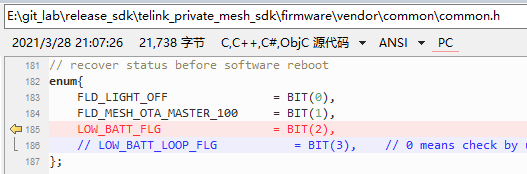
1. replace file " **\proj\drivers\flash.c** , **flash.h**"
2. add folder "**\proj\drivers\flash**" to path "\**proj\drivers\**”
3. add "**\proj\drivers\flash\_mesh\_extend.c**" to path "\**proj\drivers\**”
4. update file " **\proj\mcu\ compiler.h**" to add define of “\_attribute\_ram\_code\_sec\_” and “\_attribute\_ram\_code\_sec\_noinline\_”



# Add low voltage detection function

1. replace file " **\proj\drivers\ adc\_8258.c, adc\_8258.h**, **adc\_8278.c, adc\_8278.h**"
2. add " \vendor\common\battery\_check.c, battery\_check.h, battery\_check\_827x.c" to path "\**vendor\common\**”
3. update "\**vendor\common\common.h**” to add “#include "battery\_check.h"” and “LOW\_BATT\_FLG”





1. update to add define of “BATT\_CHECK\_ENABLE” and IO setting into

firmware/vendor/light\_8258/light.h,

firmware/vendor/light\_8278/light.h

firmware/vendor/light\_gateway/light\_gateway\_8258.h

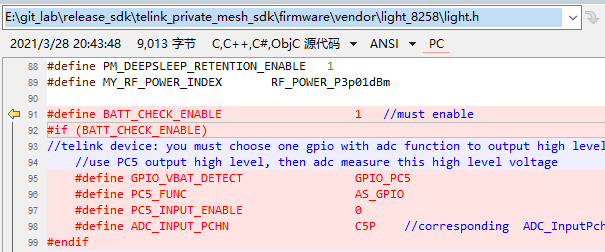
firmware/vendor/light\_gateway/light\_gateway\_8278.h

firmware/vendor/light\_lpn/light\_lpn\_8258.h

firmware/vendor/light\_lpn/light\_lpn\_8278.h

firmware/vendor/light\_switch/light\_switch\_8258.h

firmware/vendor/light\_switch/light\_switch\_8278.h



1. update to add function calling of “app\_battery\_power\_check\_and\_sleep\_handle(1);” in all main\_loop(), and “app\_battery\_power\_check\_and\_sleep\_handle(0);” at the first of all user\_init(). Include:

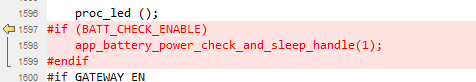
firmware/vendor/light\_8258/main\_light.c

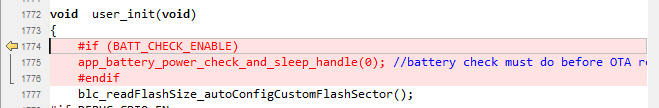
firmware/vendor/light\_8278/main\_light.c

firmware/vendor/light\_gateway/main\_light.c

firmware/vendor/light\_lpn/light\_lpn.c

firmware/vendor/light\_switch/light\_switch.c



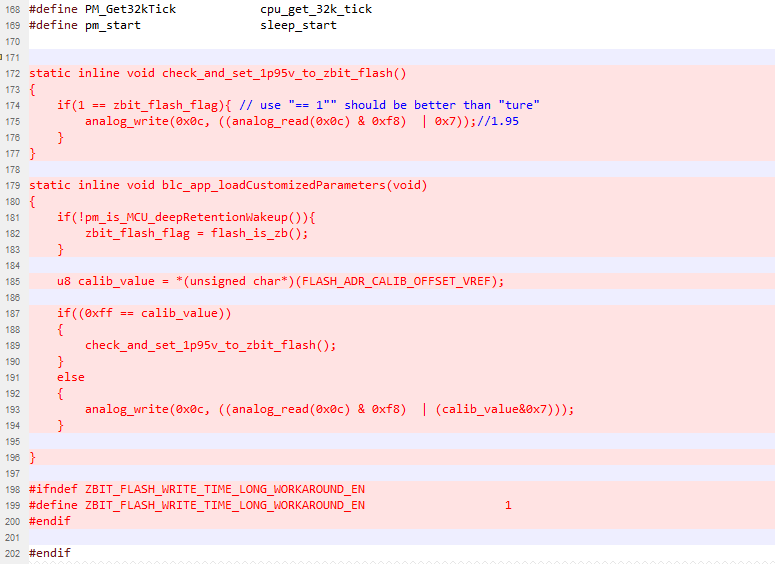


1. <EN> If customer has already used the ADC function before, if it is to detect the power supply voltage, you can combining the detection with BATT\_CHECK\_ENABLE; if it is the ADC detection of other functions, you need to reinitialize the ADC to read, and then set “adc\_hw\_initialized = 0;” to inform the function “app\_battery\_power\_check()” to run ADC initialization again. Otherwise, the ADC detection will be error.

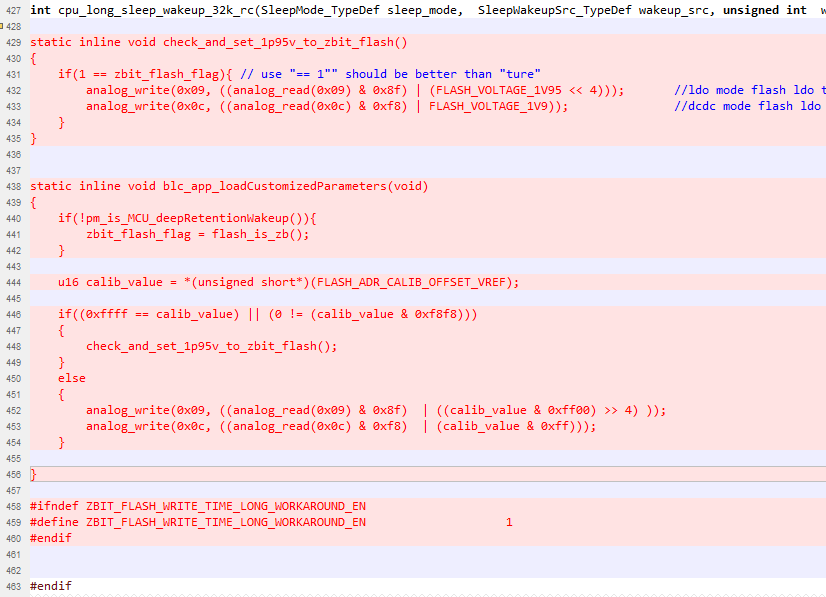
<CN>假如客户之前已经有使用了 ADC 功能，如果是检测电源电压的话，可以考虑和 BATT\_CHECK\_ENABLE 合并检测；如果是其它功能的ADC 检测，则需要重新初始化 ADC 才能读取，然后 设置 adc\_hw\_initialized = 0；让 BATT\_CHECK\_ENABLE 对应的ADC 检测函数(app\_battery\_power\_check())读取ADC时，先执行 ADC 的初始化。否则ADC检测异常。

# Calibrate flash vref by reading value from flash, improve the efficiency of OTA when using ZBit flash

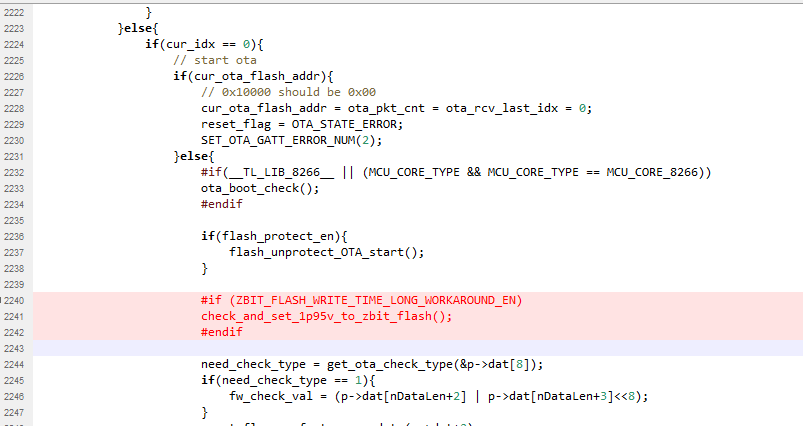
1. replace " \proj\_lib\pm\_8258.h" for V1.R, or update this file to add codes in red.



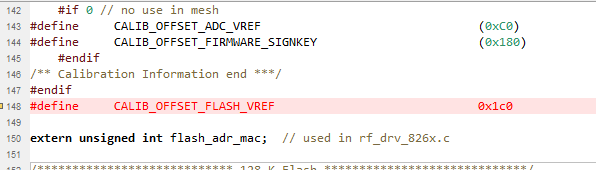
1. replace " \proj\_lib\pm\_8278.h" for V1.R, or update this file to add codes in red.

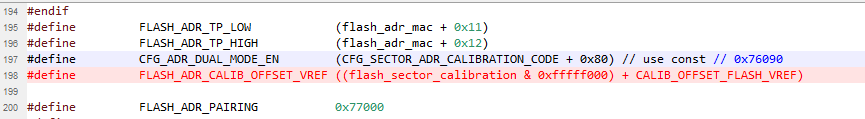


1. update the function “rf\_link\_slave\_data\_ota\_save()” in file “\vendor\common\common.c” to add the codes in red.

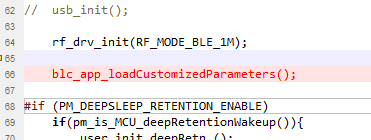


1. update file “\vendor\common\user\_config.h” to add the codes in red.

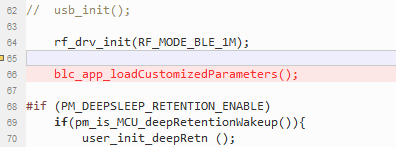




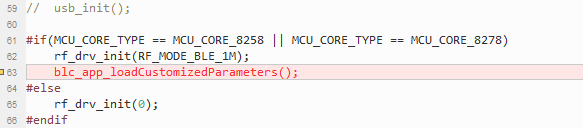
1. update the function “main()” in file “\vendor\light\_8258\main.c” to add the codes in red.



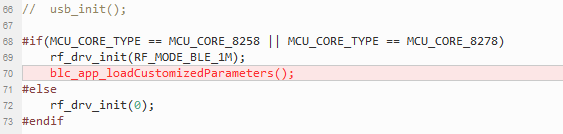
1. update the function “main()” in file “\vendor\light\_8278\main.c” to add the codes in red.



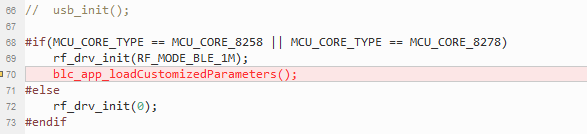
1. update the function “main()” in file “\vendor\light\_gateway\main.c” to add the codes in red.



1. update the function “main()” in file “\vendor\light\_lpn\main.c” to add the codes in red.



1. update the function “main()” in file “\vendor\light\_switch\main.c” to add the codes in red.



1. <EN>if customer has added your own OTA process, you need to call check\_and\_set\_1p95v\_to\_zbit\_flash() when OTA start. as shown below:

<CN>假如客户有增加了自己的OTA 流程，需要在 OTA start 的时候，调用check\_and\_set\_1p95v\_to\_zbit\_flash();如下图：

