TLE9893_2QTW62S_KEY_WRITE

About this document

Scope and purpose

The aim of this guide is to present the scope, the implementation, the algorithm and a demonstration of the **TLE9893_2QTW62S_KEY_WRITE** example code for the TLE989x Infineon Embedded Power ICs based on Arm® Cortex® M3. This example code can be found in the Keil µVision Pack Installer.

The full functionalities and characteristics of the embedded power devices are described in the datasheets and user's manual. Please refer to these documents for more detailed information. Furthermore, a low level (line-by-line) description of the code is not the aim of this document, although occasionally some codeblocks might be reported if necessary to the comprehension.

Note: *The following information is given as a hint for the implementation of the system only and shall not be regarded as a description or warranty of a certain functionality, condition or quality of the referred devices or presented software example.*

Intended audience

Design engineers, system engineers, embedded power designers

Table of contents

1 Introduction

Figure 1 shows the basic key write mechanism implemented and the user api call sequence.

UART tool (User) provides the Slot ID and Key version to the device. Upon executing the code, the new key will be successfully written into the requested key slot. Upon successful write LED P0.1 will be set to high.

Note: User keeps track of the slod ID and and the key version for each device. Key version for every key write operation must be greater than the previous key version for the device.

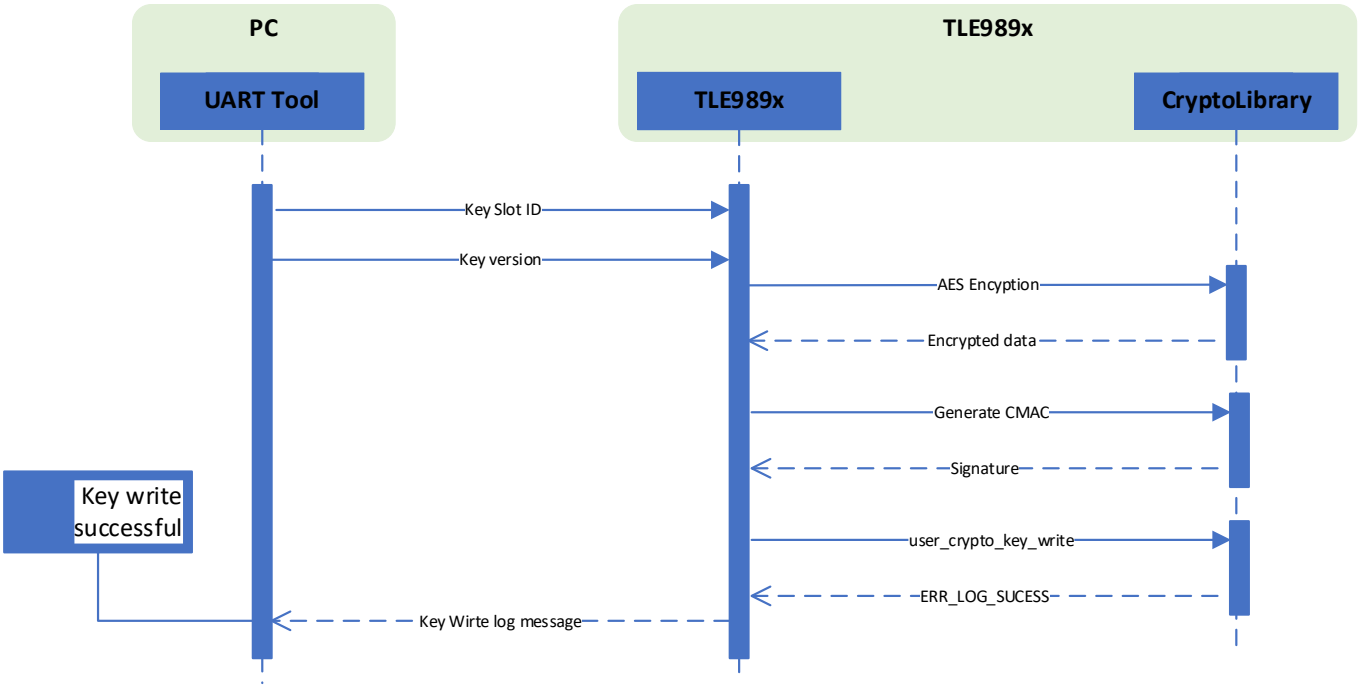

Figure 1 Key write mechanism

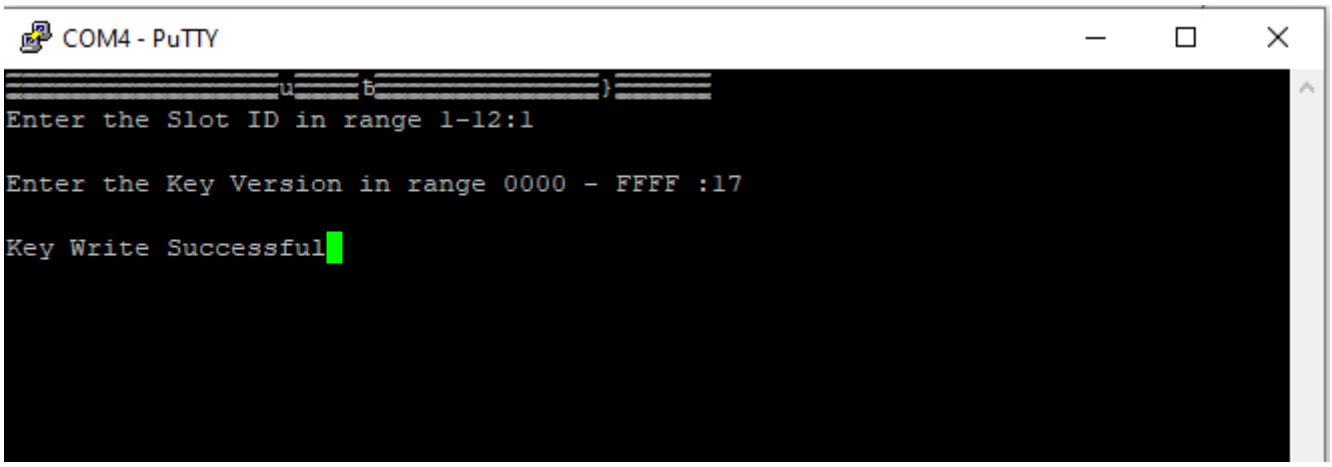

Figure 2 UART Output

Important Note:
User has to keep track of the slot id and key version for every device. Because for every key write key version must be greater than the previous one.

2 Hardware

This chapter shows how to run the TLE9893_2QTW62S_KEY_WRITE example with the TLE988x/TLE989x evaluation board. For this the project must be opened and compiled.

Figure 3 shows the TLE988x/TLE989x evaluation board. The application code must be loaded via a debugger (e.g. ULINK or J-Link) to the board. The board must be powered with 12V (red and black connections).

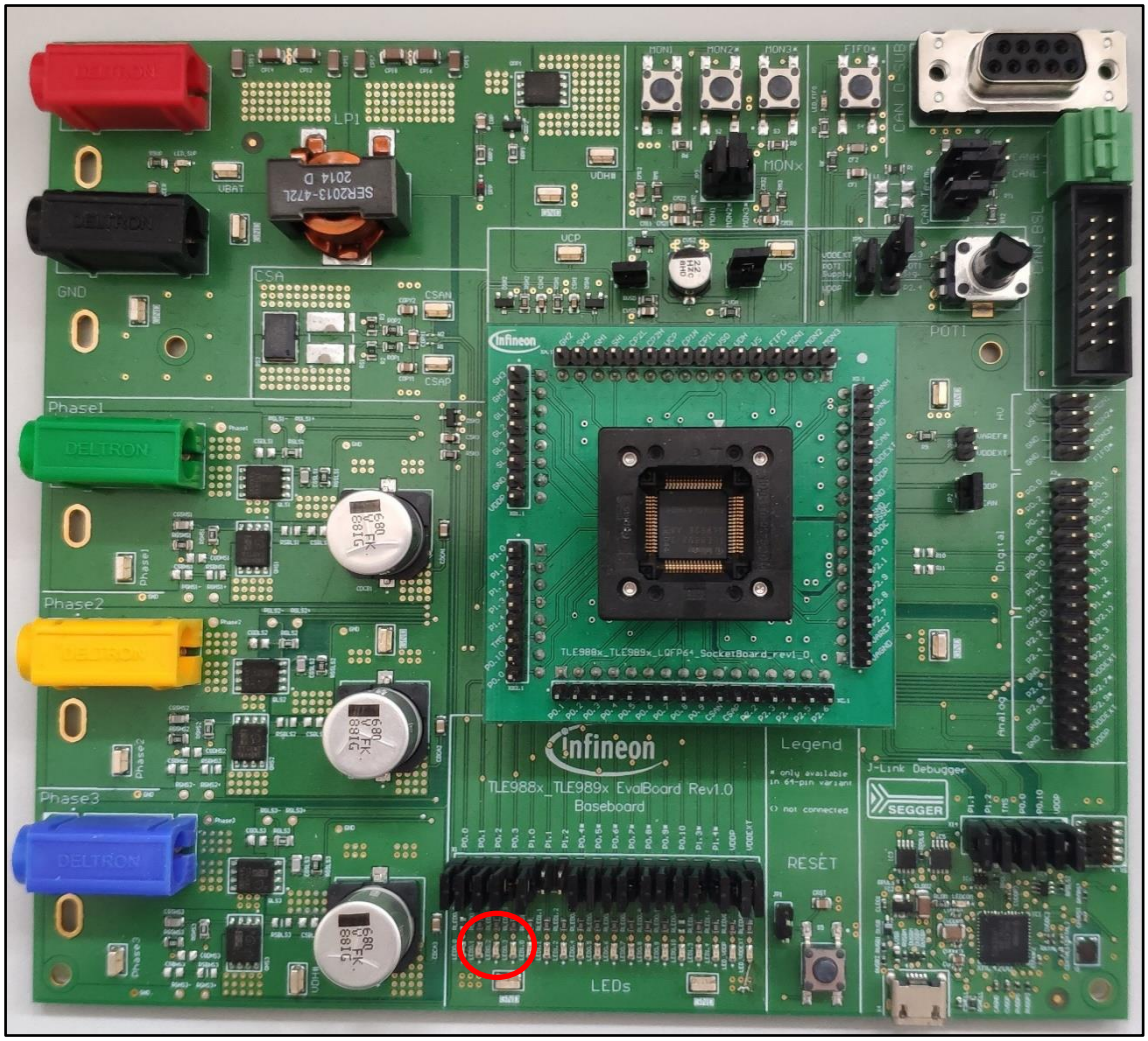

Figure 3 TLE989X evaluation board

A USB connection can be established to a local PC, which emulates a virtual COM port. The relevant COM device number can be identified via the Device Manager on Windows systems or the dmesg tool on Unix based operating systems.

In order to show the output on a command console, free tools like Putty or TeraTerm can be used. The UART1 in this example is configured with:

- a transmission baud rate of 115200,
- 8 data bits,
- 1 stop bit,
- no parity and no flow control.

3 Implementation

This chapter shows the process to follow to get a working secure access simple example.

3.1 Get the example via the Pack Installer for Keil

Open the Pack Installer within the Keil IDE.

Choose the appropriate device (here TLE9893_2QTW62S) on the left-hand side. On the right-hand side, select the tab Examples, where you can access the TLE98932QTW62S_KEY_WRITE example.

Clicking on “Copy” will copy the example on your computer and open it.

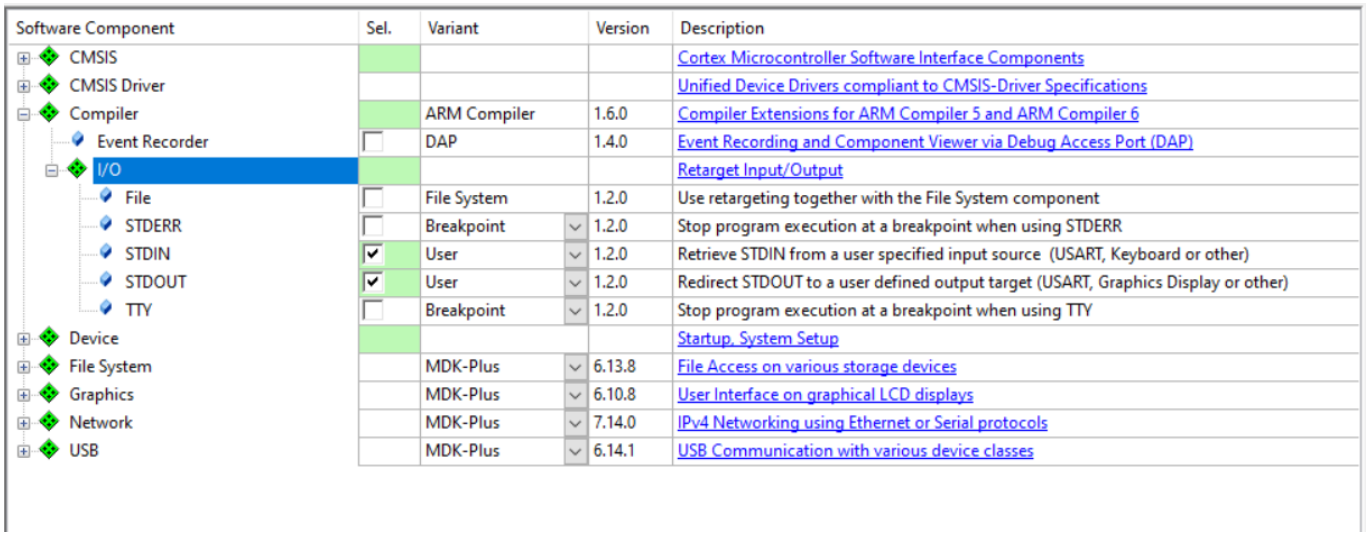

Figure 4 RTE settings for stdout and stdin

In order to redirect the stdout functions - the printf call in the example, adjust the runtime environment setting for the compiler within the Keil IDE. Select the option “User” under Compiler -> I/O -> STDOUT (see Figure 4).

In order to redirect the stdin functions - the stdin_getchar call in the example, adjust the runtime environment setting for the compiler within the Keil IDE. Select the option “User” under Compiler -> I/O -> STDIN (see Figure 4).

3.2 Configuration

In order to configure the UART module for the TLE9893_2QTW62S_SECURE_ACCESS_USING_AES example, select the UART tab. Enable the UART1 module. Next, select the 8-bit UART mode with variable baudrate. The baudrate is set to 115200 in the blue box Baudrate Generator Settings. This is one of the common speed settings for the UART. In the pink box Transmission Settings, select the pin P1.1. In the green box Reception Settings, select the pin P1.2 and set enable receiver of serial port radio box.

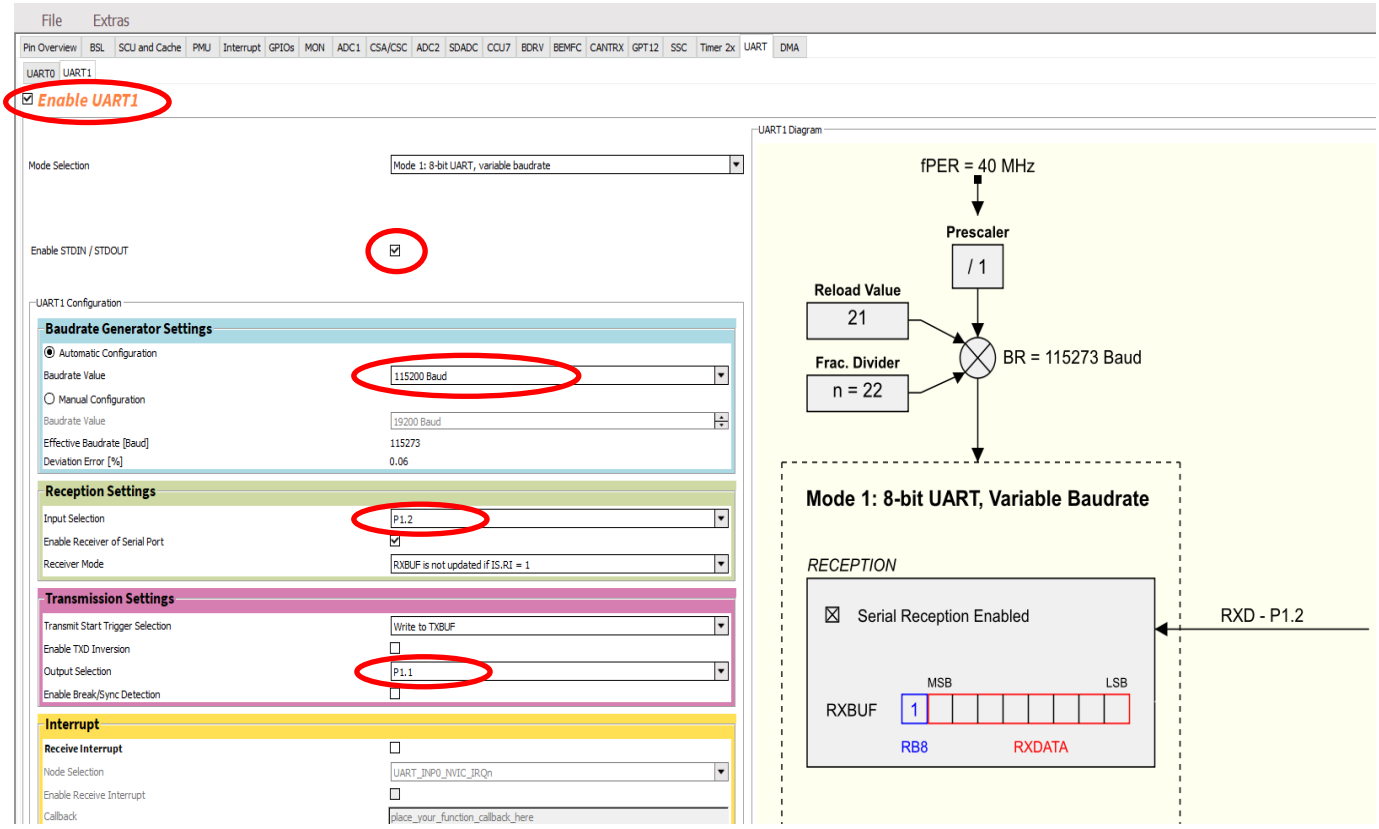

Figure 5 Config Wizard UART1 configuration

Figure 6 shows the LED configuration.

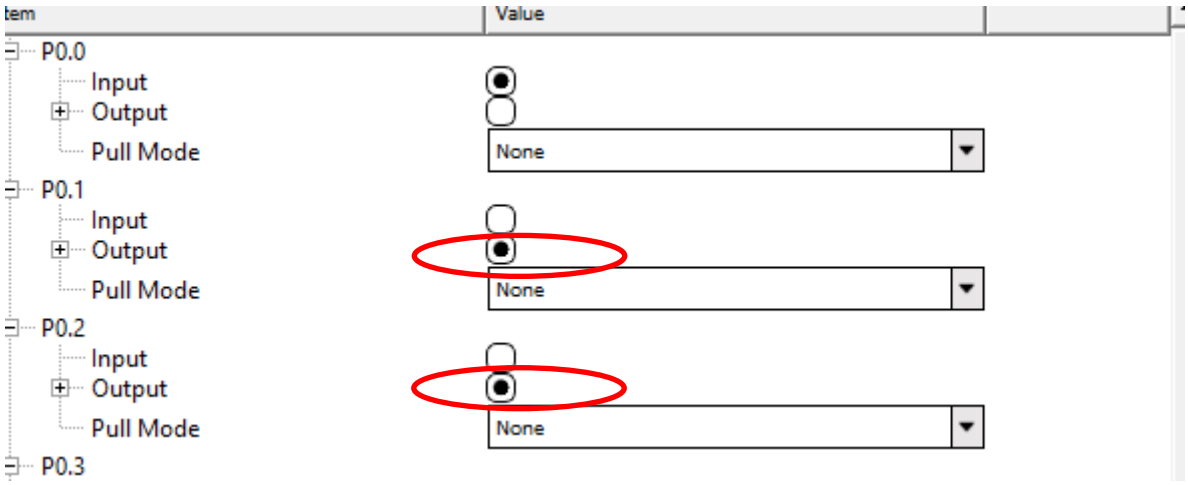

Figure 6 Config Wizard configuration for LEDs/GPIO

Finally, save your configuration to take these changes into account (File -> Save).

3.3 Key Write Example description

Step 1: Receive Slot ID and Key version via UART1, and configure them in key structure.

Step 2: Update the `u8_rawKey` buffer with new Key.

Step 3: Perform CBC mode AES encryption for the `user_key_t` structure data.

Step 4: Update the `user_key_write_t` structure with the key write parameters, and generate the CMAC signature.

Step 6: Call `user_crypto_key_write` API function which writes a cryptographic key.

References

See the code examples at **www.infineon.com**

Revision history

Document version	Date of release	Description of changes
1.0	2021-09-20	Initial version
1.1	2022-10-13	Editorial changes

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