

TLE9255W

Configuration of the Selective Wake function

About this document

Scope and purpose

This document is a guidance for the following use cases:

- Initialization of the selective wake function after power up of the TLE9255W
- The TLE9255W shall enter the Sleep Mode (Selective wake function is enabled)

This document is an extension of the TLE9255w datasheet (TLE9255W-DS-v01_03-EN.pdf)

Intended audience

This documented is created for Software Developer who write software driver for the TLE9255W

Table of contents

About this document	1
Table of contents	1
1 Initialization of the selective wake function after power up of the TLE9255W	2
2 Sequence for entering the Sleep Mode if selective wake function is activated	3
3 Selective Wake Configuration Error	4
4 Error Frame Counter	5
5 System Error (SysErr)	6
Revision history	7

1 Initialization of the selective wake function after power up of the TLE9255W

After power up the TLE9255W is in the Stand-by Mode. The following configuration sequence for the selective wake function shall be done in the stand-by mode. To confirm the configuration, the flag CFG_VAL has to be set by the microcontroller at the end of the sequence.

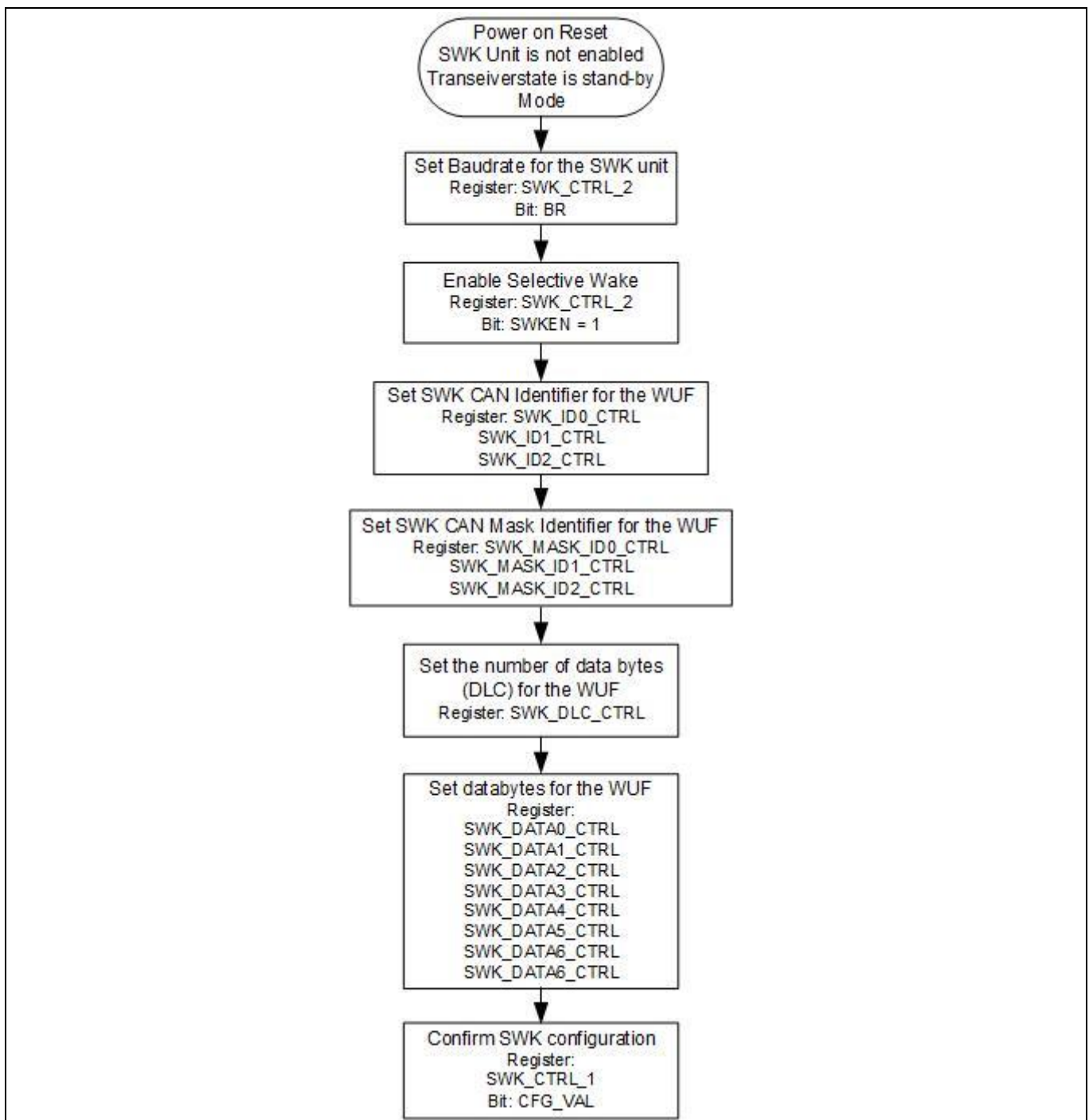


Figure 1 Initialization sequence after power up of the TLE9255W

2 Sequence for entering the Sleep Mode if selective wake function is activated

The following sequence shall be executed if the TLE9255W shall enter the Sleep Mode (selective wake function is enabled).

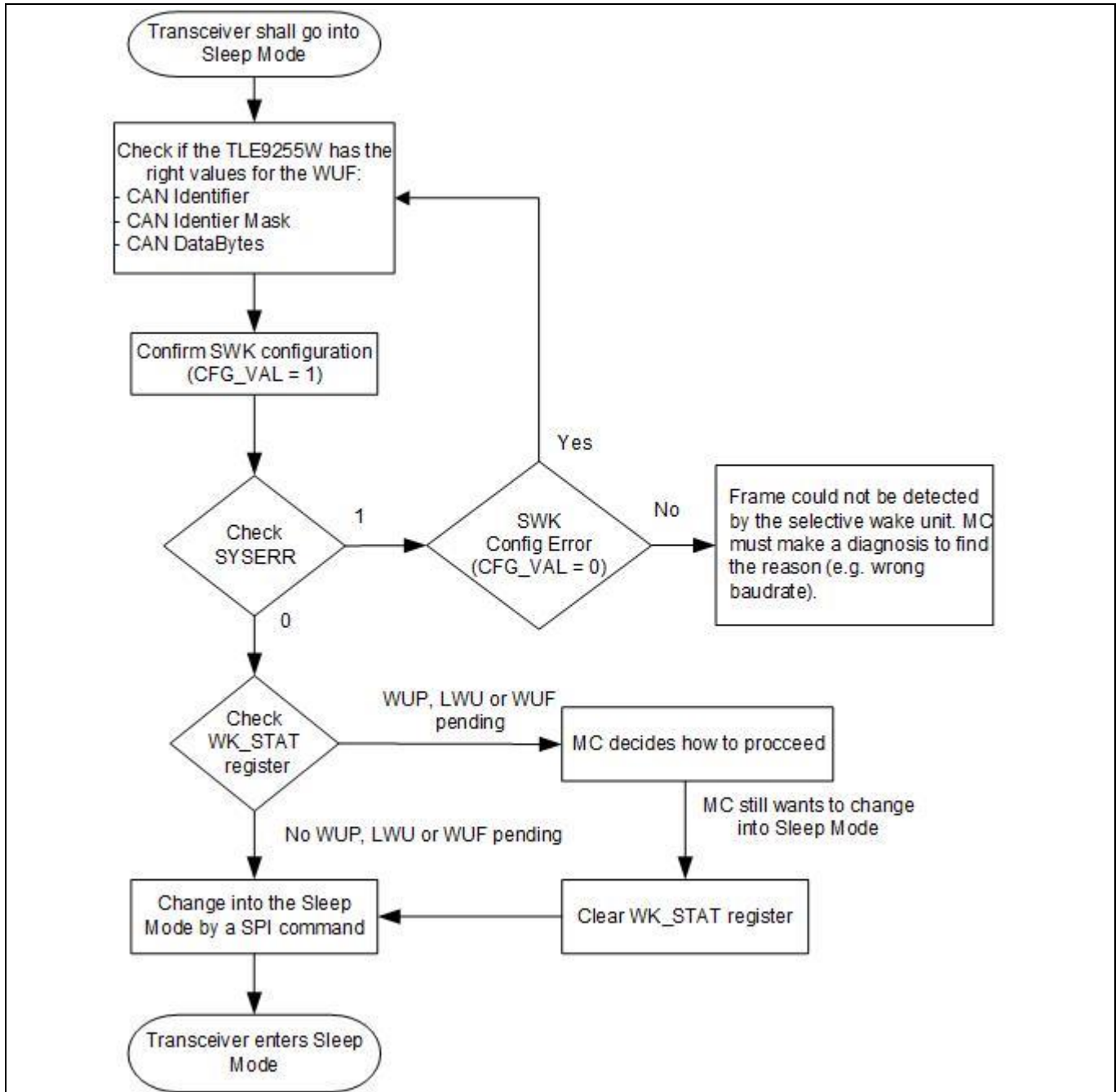


Figure 2 Sequence for entering the Sleep Mode if the selective wake function I activated

3 Selective Wake Configuration Error

After the microcontroller has confirmed the configuration (CFG_VAL = 1), writing the following registers generates a selective wake configuration error:

- Baud rate control register (SWK_CTRL_2)
- Identifier control registers (SWK_ID3_CTRL, SWK_ID2_CTRL, SWK_ID1_CTRL and SWK_ID0_CTRL)
- Mask identifier control registers (SWK_MASK_ID3_CTRL, SWK_MASK_ID2_CTRL, SWK_MASK_ID1_CTRL and SWK_MASK_ID0_CTRL)
- Data Length control register (SWK_DLC_CTRL)
- Data control registers (SWK_DATA7_CTRL, SWK_DATA6_CTRL, SWK_DATA5_CTRL, SWK_DATA4_CTRL, SWK_DATA3_CTRL, SWK_DATA2_CTRL, SWK_DATA1_CTRL and SWK_DATA0_CTRL)

The following sequence shows a selective wake configuration error.

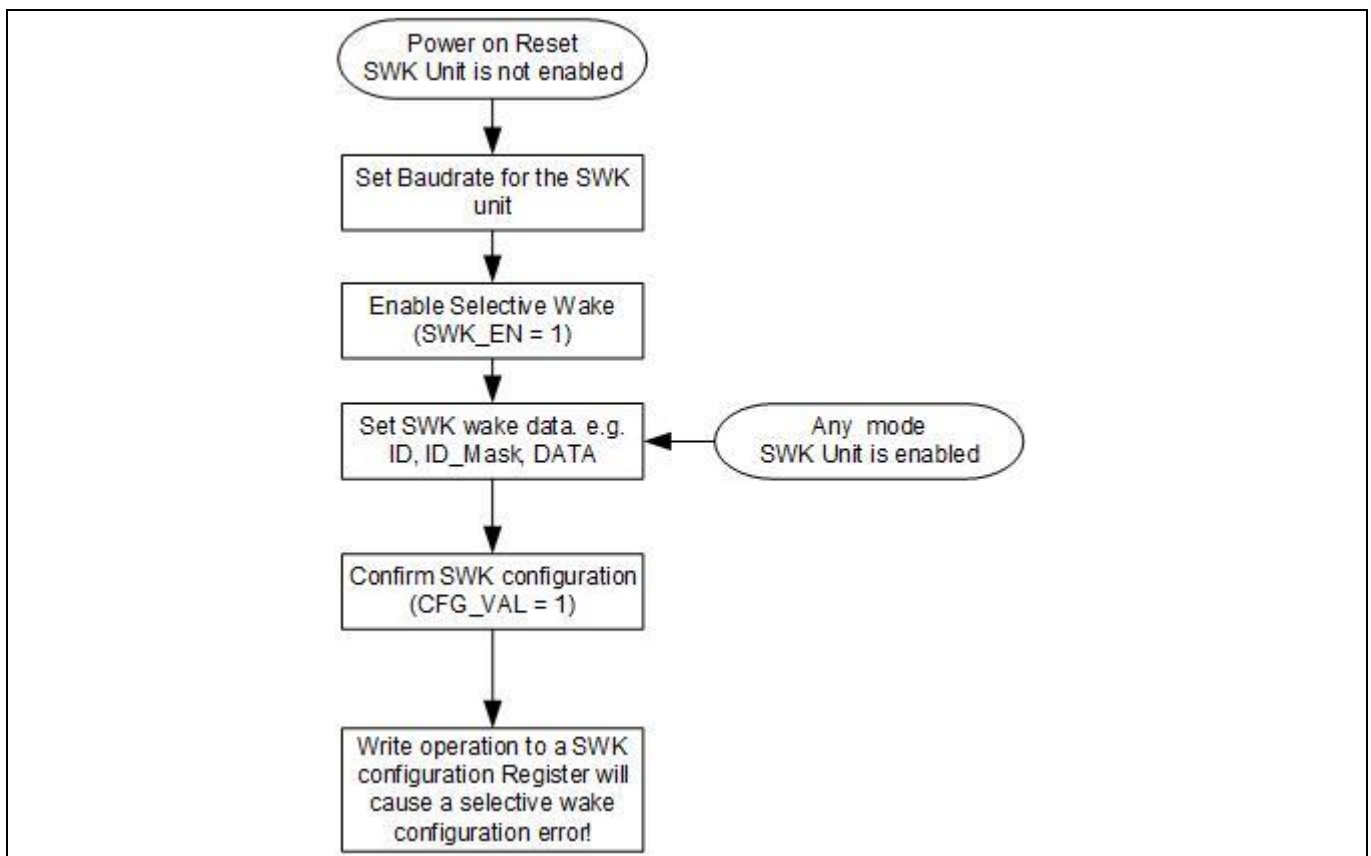


Figure 3 Selective wake configuration Error

4 Error Frame Counter

The error frame counter indicates, whether received classical CAN frames are valid. CAN FD frames are not evaluated and therefore CAN FD frame errors do not affect the frame error counter. If the selective wake unit detects a classical CAN frame error, then the frame error counter is increased by 1. If the selective wake unit detects a valid classical CAN frame, then the error counter is decreased by 1. The following types of errors cause invalid classical CAN Frames:

- Bit stuffing error
- CRC error
- CRC delimiter error

If the SPI bit SWK_EN = 1, then the frame error counter is active in any mode of operation. The error counter value can be read via SPI (register SWK_ECNT_STAT). Each time that the Selective Wake Unit is enabled (SWK_EN = 1) OR if the t_{silence} timer has expired, then the error counter is reset to zero.

5 System Error (SysErr)

The SysErr flag in the register SWK_STAT indicates an error condition in the selective wake unit of the TLE9255W. Only if the SPI bit SWK_EN = 1, then the SysErr flag is set. The SysErr flag does not prevent entering the Sleep Mode by an SPI command. However, the SysErr flag determines, whether the TLE9255W enters the Selective Wake Sub-Mode (SysErr = 0) or Sleep WUP Mode (SysErr = 1). The following sequence shows this scenario.

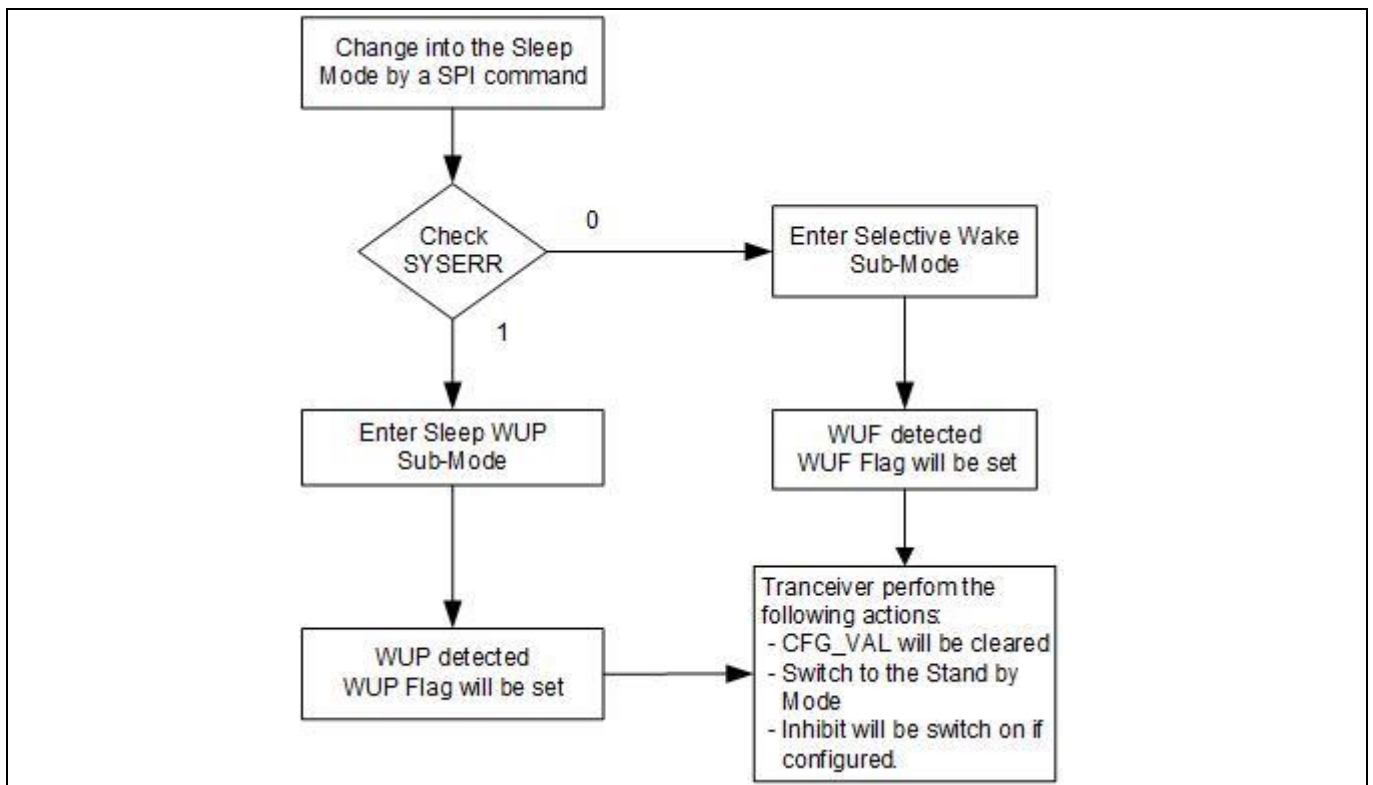


Figure 4 Sequence for entering the Sleep Mode if the selective wake function is activated

The SysErr flag is set under any of the following conditions:

- Selective wake configuration error is detected (see chapter 3).
- The frame error counter value is greater than 31 (see chapter 4).

Only if no configuration error (CFG_VAL = 1) exists AND if the error counter is less than 32, then the TLE9255W resets the SysErr flag.

Revision history

Document version	Date of release	Description of changes
1.0	17.07.2019	Initial Version

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