

Test Result Report “SWT21 lab kit”

Revision History

| Date | Version | Description | Author | Customer |
|--------------|---------|------------------------------------------------------------------------|----------------------------------|----------------|
| 01/July/2021 | 1.0 | Created Test Result Report for CAN subsystem in "SWT21 lab kit" device | Maria Markova Jan Abrahamsson | Joachim Lublin |
| 02/July/2021 | 1.1 | Added results | Maria Markova Jan Abrahamsson | Joachim Lublin |
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Summary

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1. Introduction

1.1. Document overview

This document is the software test report of the SWT21 Labkit software development project. It contains the results of tests, which were executed during the testing by the Test Plan.

Testing was be based on these core features:

1. "SWT21 lab kit" sends information to CAN bus.
2. "SWT21 lab kit" receives information from CAN bus.

1.2. Project References

| # | Document identifier | Document title |
|-----|------------------------------------------------------------------------|--------------------------|
| D01 | Description of device operation | User manual |
| D02 | Test Plan | Test plan "SWT21 labkit" |
| S01 | Source code | swt21_fw/src/can.c |
| D03 | Specification of unit tests | Unit test-specification |
| B01 | Scope of test cases, bug reports, meetings summary and teams decisions | Testing backlog |

2. Overview of Tests Results

2.1. Test log

The SWT21 labkit software (version 1.1) was tested on the test PC Windows 10 and Macbook Pro iOS 4.4 located in Sweden, from the 28/06/2021 to the 01/07/2021. The tests of the test plan were executed.

Testers where:

- Muhammad Obaid Ullah Khan
- Jan Abrahamsson
- Maria Markova

2.2. Rationale for decision

After executing a test, the decision is defined according to the following rules:

| | |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OK | The test sheet is set to "OK" state when all steps are in "OK" state. The real result is compliant to the expected result. |
| NOK | The test sheet is set to "NOK" state when all steps of the test are set to "NOK" state or when the result of a step differs from the expected result. |
| Partial OK | The test sheet is set to "Partial OK" state when at least one step of the test is set to "NOK" state or when the result of a step is partially compliant to the expected result. |
| NOT RUN | Default state of a test sheet not yet executed. |
| NOT COMPLETED | The test sheet is set to "Not Completed" state when at least one step of the test is set "Not Run" state. |

3. Detailed Tests Results

For each executed test, this document contains:

- ❖ Test identification;
- ❖ Test title;
- ❖ Test decision;

A * containing additional information or problems encountered during execution and differences with the test procedure.

| ID | Test procedure | Test Conditions | Date | Author | Decision |
|-------|------------------------------------------|---------------------------------------|------------|------------------------------------------------------------------|------------|
| S01 | Review of the test plan | | 28/06/2021 | Muhammad Obaid Ullah Khan Jan Abrahamsson Maria Markova | OK |
| MS1 | Hardware layout | Labkit | 28/06/2021 | Muhammad Obaid Ullah Khan | OK |
| MS2 | Link check | Github | 28/06/2021 | Muhammad Obaid Ullah Khan | OK |
| MS3 | Wire check | Labkit | 28/06/2021 | Muhammad Obaid Ullah Khan | OK |
| MS4 | Source code check | User Manual Source code | 28/06/2021 | Muhammad Obaid Ullah Khan | OK |
| MB1 | Boot | Windows 10 Labkit 1.1. Python 3 | 29/06/2021 | Jan Abrahamsson | Partial OK |
| MB2 | Help check | Windows 10 Labkit 1.1. Python 3 | 29/06/2021 | Jan Abrahamsson | Partial OK |
| MC1 | CAN help | Windows 10 Labkit 1.1. Python 3 | 29/06/2021 | Jan Abrahamsson | OK |
| MC2 | CAN rx | Windows 10 Labkit 1.1. Python 3 | 29/06/2021 | Jan Abrahamsson | OK |
| MC3.1 | CAN send closed | Windows 10 Labkit 1.1. Python 3 | 29/06/2021 | Jan Abrahamsson | OK |
| MC3.2 | CAN send open | Windows 10 Labkit 1.1. Python 3 | 29/06/2021 | Jan Abrahamsson | OK |
| MCC1 | CAN help (Compatibility testing Mac iOS) | iOS 4.4 Labkit 1.1. Python 3 | 30/06/2021 | Maria Markova | OK |
| MCC2 | CAN rx (Compatibility testing Mac iOS) | iOS 4.4 Labkit 1.1. Python 3 | 30/06/2021 | Maria Markova | OK |

| | | | | | |
|--------|-------------------------------------------------|-------------------------------------------------|------------|-----------------|-----------|
| MCC3.1 | CAN send closed (Compatibility testing Mac iOS) | iOS 4.4 Labkit 1.1. Python 3 | 30/06/2021 | Maria Markova | OK |
| MCC3.2 | CAN send open (Compatibility testing Mac iOS) | iOS 4.4 Labkit 1.1. Python 3 | 30/06/2021 | Maria Markova | OK |
| ML1 | LED help | Windows 10 Labkit 1.1. Python 3 | 30/06/2021 | Jan Abrahamsson | NOK |
| ML2 | LED on/off | Windows 10 Labkit 1.1. Python 3 | 30/06/2021 | Jan Abrahamsson | OK |
| ML3 | LED blink | Windows 10 Labkit 1.1. Python 3 | 30/06/2021 | Jan Abrahamsson | OK |
| U01 | test_parse_message | Windows 10 Labkit 1.1. Python 3 Cygwin | 30/06/2021 | Maria Markova | OK |
| U02 | test_parse_message_re mote | Windows 10 Labkit 1.1. Python 3 Cygwin | 30/06/2021 | Maria Markova | OK |
| U03 | test_transmit | Windows 10 Labkit 1.1. Python 3 Cygwin | 30/06/2021 | Maria Markova | OK |
| U04 | Testing code without the device labkit | Windows 10 Python 3 Cygwin | 30/06/2021 | Maria Markova | NOT RUN* |
| S00 | config | | 29/06/2021 | Maria Markova | NOT RUN** |

* The source code showed that it is impossible to create effective unit testing for components without the device.

**It was not tested because it was decided not to include it in the test cases due to the test schedule. It is not entirely clear what this function is supposed to do in the source code, more information from the customer is needed.

4. Evaluation

Our team tested the functionality of the sub-system of the SWT21 labkit device with firmware version 1.1. During the design of test cases, we found that writing test cases without the device (testing the code) is not cost-effective due to the associated functions.

Therefore, we focused on functional manual testing and unit tests with the device.

During execution of the Test Plan, the CAN sub-system was tested. The tests showed a satisfactory result. We also conducted additional testing of the LED component in case this component will be used in the CAN sub-system in the future. But since the LED component was not listed as a requirement for testing in the plan, it did not impact the end evaluation.

We found minor deviations that will need to be retested after fix. We recommend creating a pool of automated unit tests in order to reduce the time for manual testing.

5. Summary of Activities

| Overall progress of the QA cycle(On time, delayed, Stopped) | On time |
|-------------------------------------------------------------|---------|
| Total number of test cases | 22 |
| Number of testers | 3 |
| Test cycle duration | 3 days |
| | |
| Number of test cases planned | 22 |
| Number of test cases executed | 21 |
| Number of partial successful test cases (Partial OK) | 2 |
| Number of test cases failed (NOK) | 1 |
| | |
| Percentage of successful test cases (OK) | 85% |
| Percentage of partial successful test cases (Partial OK) | 9% |
| Defects percentage (NOK) | 4% |