LED Drivers

Nti Team

Software Requirement Specification Document

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1. Scope of Document

This document specifies requirements on the module Interrupt Driver.

1.1 Constraints

First scope for specification of requirements on basic software modules is systems which are not safety relevant. For this reason safety requirements are assigned to medium priority.

2. Requirements Structure

Each module specific chapter contains a short functional description of the Basic Software Module. Requirements of the same kind within each chapter are grouped under the following headlines (where applicable):

Functional Requirements: -

- Configuration (which elements of the module need to be configurable).
- Initialization.
- Normal Operation.
- Shutdown Operation.
- Fault Operation.
- …….

Non-Functional Requirements:-

- Timing Requirements.
- Resource Usage.
- Usability.
- Output for other WPs (e.g. Description Templates, Tooling,...).
- …….

3. Functional Overview

The purpose of this document is to specify the requirements for a software driver for controlling LEDs on microcontrollers. The driver shall provide a simple and easy-to-use interface for controlling LEDs, including functions for initializing LEDs, turning LEDs on and off, and blinking LEDs.

Requirement Specification

5.1 Functional Requirements

- [LED_001] the driver shall be compatible with all microcontrollers.
- [LED_002] The LED driver shall not buffer data when providing on, off, toggle services.
- [LED_003] The LED driver shall provide synchronous on/off/toggle services.

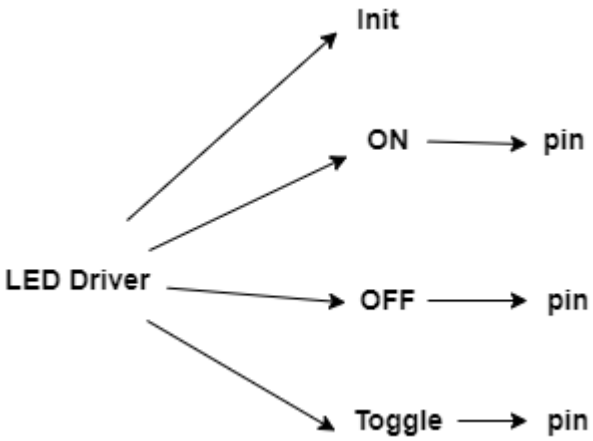

Figure 1: LED Services

5.2 Non-functional requirements

- The driver shall be easy to use and understand.
- The driver shall be well-documented.
- The driver shall be efficient and use minimal resources.
- The driver shall be reliable and robust.

- In addition to the above requirements, the Interrupt driver should also meet the following non-technical requirements.
- The driver should be open source and freely available to use.
- The driver should be actively maintained and supported by the community.
- The driver should be well-tested and documented.
- The driver should be compatible with a variety of development tools and environments.

4. State Machine

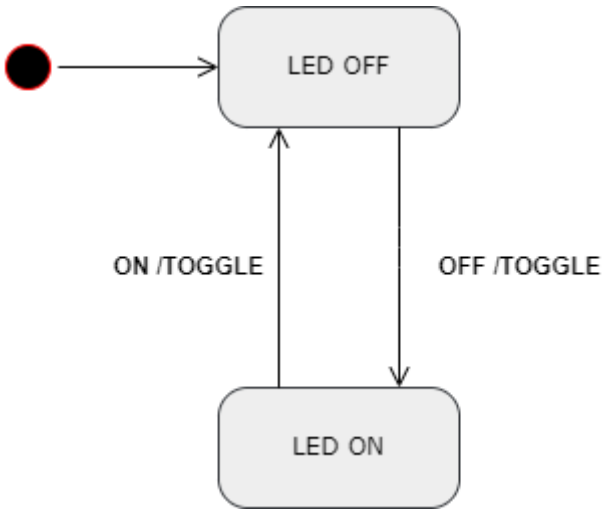

Figure 2: LED State Machine

5. Sequence diagram

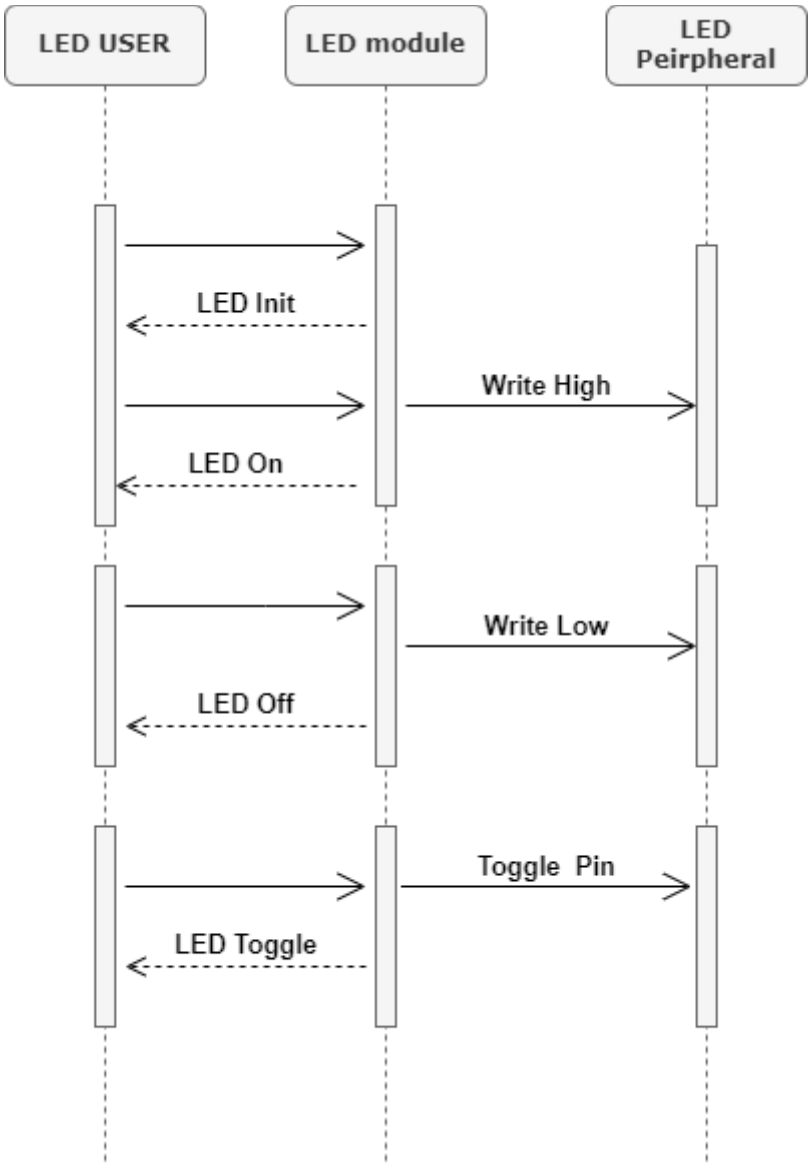

Figure 3: LED Sequences

6. Acceptance Criteria

The LED driver shall be accepted when it meets the following criteria:

– The driver shall compile and run without errors on all AVR microcontrollers.

- The driver shall pass all unit tests.
- The driver shall pass all integration tests.
- The driver shall pass all system tests.

7. References

1. Developers of NTI team.
2. AVR Microcontroller Datasheets.