DIO Driver for AVR Microcontrollers

Software Requirement Specification Document

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1. Introduction

This document describes the Software Requirement Specification (SRS) for a DIO (digital input/output) driver for AVR microcontrollers. The driver shall provide a simple and easy-to-use interface for controlling digital pins on AVR microcontrollers.

1. System Overview

The DIO driver shall provide the following features:

- The ability to initialize digital pins as inputs or outputs
- The ability to read the state of digital input pins or port
- The ability to write the state of digital output pins or port
- The ability to set and clear digital pins or ports on an interrupt basis

2. Specific Requirements

4.1 General Behaviour

4.1.1 Background

The DIO Driver abstracts the access to the microcontroller's hardware pins. Furthermore, it allows the grouping of those pins.

4.2 Requirements

the Dio SWS shall define functions allowing:

- Port
- Pin

-based read and write access to the internal general purpose I/O ports.

4.3 Technical requirements

- the driver shall be compatible with all AVR microcontrollers.
- The AVR DIO driver shall not buffer data when providing read and write services.

- The AVR DIO driver shall provide synchronous read/write/toggle services.

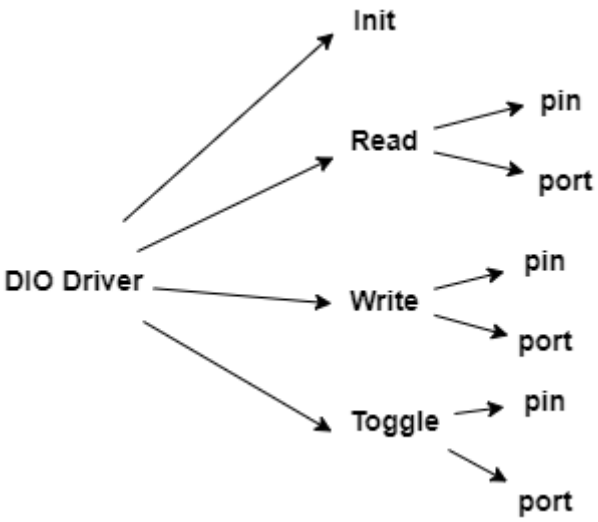

Figure 1: DIO Services

- The AVR DIO driver shall only use the STD_HIGH and STD_LOW values for the software level of pins.

- The AVR PORT module shall configure a DIO pin as input or output.

- It shall be possible to group several DIO pins by hardware in the AVR DIO driver to represent a DIO port.

- The AVR Dio module shall configure a DIO port as input or output.

4.4 non-technical 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 DIO 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.

5.File Structure

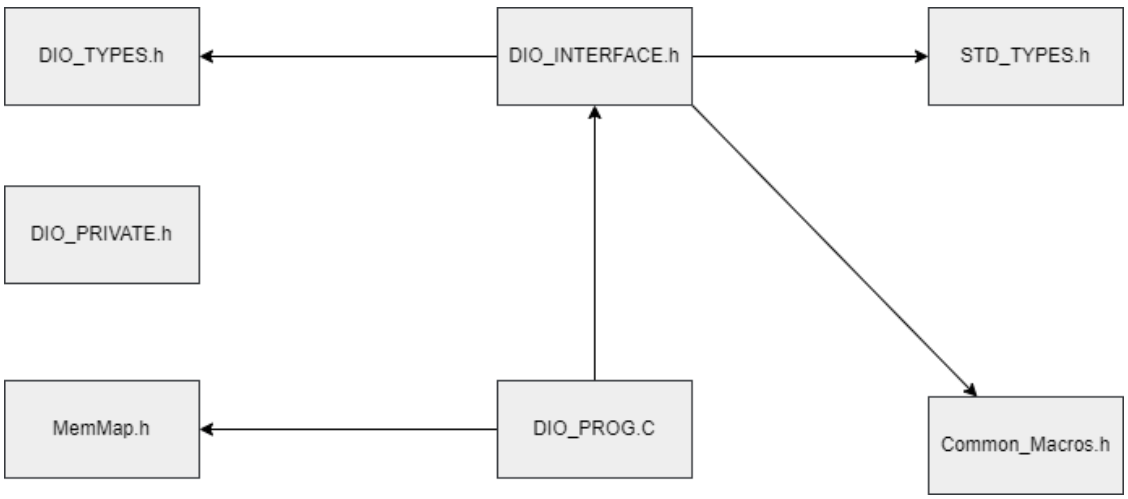

Figure 2: Include File Structure

6. Acceptance Criteria

The DIO 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

AVR Microcontroller Datasheets