AUTOSAR Software Requirement Specification (SRS) For ADC Driver

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1. Introduction

1.1 Purpose

The purpose of this document is to specify the functional and non-functional requirements for the AUTOSAR-compliant implementation of the ADC code. This document outlines the software behavior and interfaces in accordance with AUTOSAR standards.

1.2 Scope

This SRS document covers the ADC code, including the initialization of the ADC module and the reading of ADC values. The code must adhere to AUTOSAR specifications.

2. Functional Requirements

2.1 Initialization of ADC Module (ADC1_init_mine Function)

FR 2.1.1

The `ADC1_init_mine` function shall initialize the ADC module for operation with a prescaler of 128.

FR 2.1.2

The ADC configuration shall include setting the reference and adjusting it as required.

FR 2.1.3

The function shall return `ADC_OK` on successful initialization.

Service name:	ADC Initialization
Syntax:	Std_ReturnType ADC1_init_mine(void);
Sync/Async:	Synchronous
Re-entrancy:	Re-entrant
Parameters (in):	A pointer to a `ADCConfig` structure
Parameters (out):	none
Parameters (inout):	none
Return type:	`ADCStatus` (either `ADC_OK` or `ADC_ERROR`)
Description:	Initializes the ADC with adjusting its prescaler.

2.2 Reading ADC Value (ADC_Read_mine Function)

FR 2.2.1

The `ADC_Read_mine` function shall read the ADC value from the specified channel.

FR 2.2.2

The function shall set the ADC channel and start the conversion.

FR 2.2.3

The function shall wait for the conversion to complete before reading the ADC value.

FR 2.2.4

The ADC value shall be stored in the `ret_val` as a 16-bit value.

FR 2.2.5

The function shall return `ADC_OK` on successful ADC value reading.

Service name:	ADC Get_read
Syntax:	Std_ReturnType ADC_Read_mine(const ADCConfig* config);
Sync/Async:	Synchronous
Re-entrancy:	Re-entrant
Parameters (in):	A pointer to a `ADCConfig` structure
Parameters (out):	none
Parameters (inout):	none
Return type:	`ADCStatus` (either `ADC_OK` or `ADC_ERROR`)
Description:	Retrieves the read measured by the sensors

3. Non-Functional Requirements (Qualities)

- NFR 3.1

The code shall meet safety standards suitable for its application.

NFR 3.2

The code shall perform efficiently and meet specified performance criteria.

4. Interfaces

4.1 Input Interfaces

The `ADC1_init_mine` function shall accept no input parameters.

The `ADC_Read_mine` function shall accept an `ADCConfig` structure as input, which includes the ADC channel and a pointer to store the ADC value.

4.2 Output Interfaces

The `ADC1_init_mine` function shall return a `Std_ReturnType` indicating the initialization status.

The `ADC_Read_mine` function shall return a `Std_ReturnType` indicating the reading status.

5. Constraints

5.1 Safety Requirements

The code is initially intended for non-safety-relevant systems. Safety requirements are assigned medium priority.

5.2 Performance Requirements

Performance requirements shall align with project-specific criteria.

8. Conclusion

This AUTOSAR SRS document outlines the requirements for the AUTOSAR-compliant implementation of the ADC code.