# AUTOSAR Software Requirement Specification (SRS) For Keypad 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 code responsible for initializing and retrieving keypress information from a custom keypad. This document will define the software behavior and interfaces in accordance with AUTOSAR standards.

1.2 Scope

This SRS document is limited to the ECU_KEYPAD_init and ECU_KEYPAD_Get_Key functions, outlining their behavior, input and output interfaces, and any constraints. The code is expected to be compliant with AUTOSAR specifications.

# 2. Functional Requirements

2.1 Initialization of Keypad (ECU_KEYPAD_init Function)

- FR 2.1.1: The ECU_KEYPAD_init function shall initialize the keypad by configuring pin directions and initial values as specified by AUTOSAR COM standards.

- FR 2.1.2: The initialization process shall not result in errors, ensuring a return status of KEYPAD_OK.

- FR 2.1.3: The initialization process shall be designed to handle potential errors and return KEYPAD_ERROR if encountered.

| Service name: | Keypad Initialization |
|---|---|
| **Syntax:** | KeypadStatus ECU_KEYPAD_init(keypad_t *keypad); |
| **Sync/Async:** | Synchronous |
| **Re-entrancy:** | Re-entrant |
| **Parameters (in):** | A pointer to a `keypad_t` structure |
| **Parameters (out):** | none |
| **Parameters (inout):** | none |
| **Return type:** | `KeypadStatus` (either `KEYPAD_OK` or `KEYPAD_ERROR`) |
| **Description:** | Initializes the keypad with custom column and row pins. |

2.2 Key Retrieval from Keypad (ECU_KEYPAD_Get_Key Function)

- FR 2.2.1: The ECU_KEYPAD_Get_Key function shall detect and return the key pressed on the keypad.

- FR 2.2.2: The function shall scan both rows and columns to identify the pressed key.

- FR 2.2.3: It shall set and verify pin values in accordance with AUTOSAR COM standards.

- FR 2.2.4: The function shall include a delay, possibly for debouncing purposes.

- FR 2.2.5: Errors encountered during the key retrieval process shall be handled, and KEYPAD_ERROR shall be returned if necessary.

| Service name: | Keypad Get_Key |
|---|---|
| **Syntax:** | KeypadStatus ECU_KEYPAD_Get_Key(keypad_t *keypad); |
| **Sync/Async:** | Synchronous |
| **Re-entrancy:** | Re-entrant |
| **Parameters (in):** | A pointer to a `keypad_t` structure |
| **Parameters (out):** | none |
| **Parameters (inout):** | none |
| **Return type:** | `KeypadStatus` (either `KEYPAD_OK` or `KEYPAD_ERROR`) |
| **Description:** | Retrieves the key pressed on the keypad |

# 3. Non-Functional Requirements (Qualities)

- NFR 3.1: Safety Requirements: The code shall meet safety standards suitable for its application.

- NFR 3.2: Performance Requirements: The code shall perform efficiently and meet specified performance criteria.

# 4. Interfaces

4.1 Input Interfaces

- The input interface for ECU_KEYPAD_init shall accept a pointer to a keypad_t structure.

4.2 Output Interfaces

- The output interface for ECU_KEYPAD_init shall return a KeypadStatus value.

- The output interface for ECU_KEYPAD_Get_Key shall return a KeypadStatus value and update the 'ret_val' variable in the keypad_t structure.

# 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 code responsible for keypad initialization and key retrieval. It ensures adherence to AUTOSAR standards and provides a reference for developers and stakeholders.