

# **Detailed Design of Keypad Driver**

**Team X**

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## Introduction and functional overview:

This document specifies requirements for the module Keypad Driver. The Keypad driver is targeting 4\*4 Keypad Hardware.

The Keypad driver initializes the 4\*4 Keypad and gets data from the keypad

The behaviour of those services is synchronous.

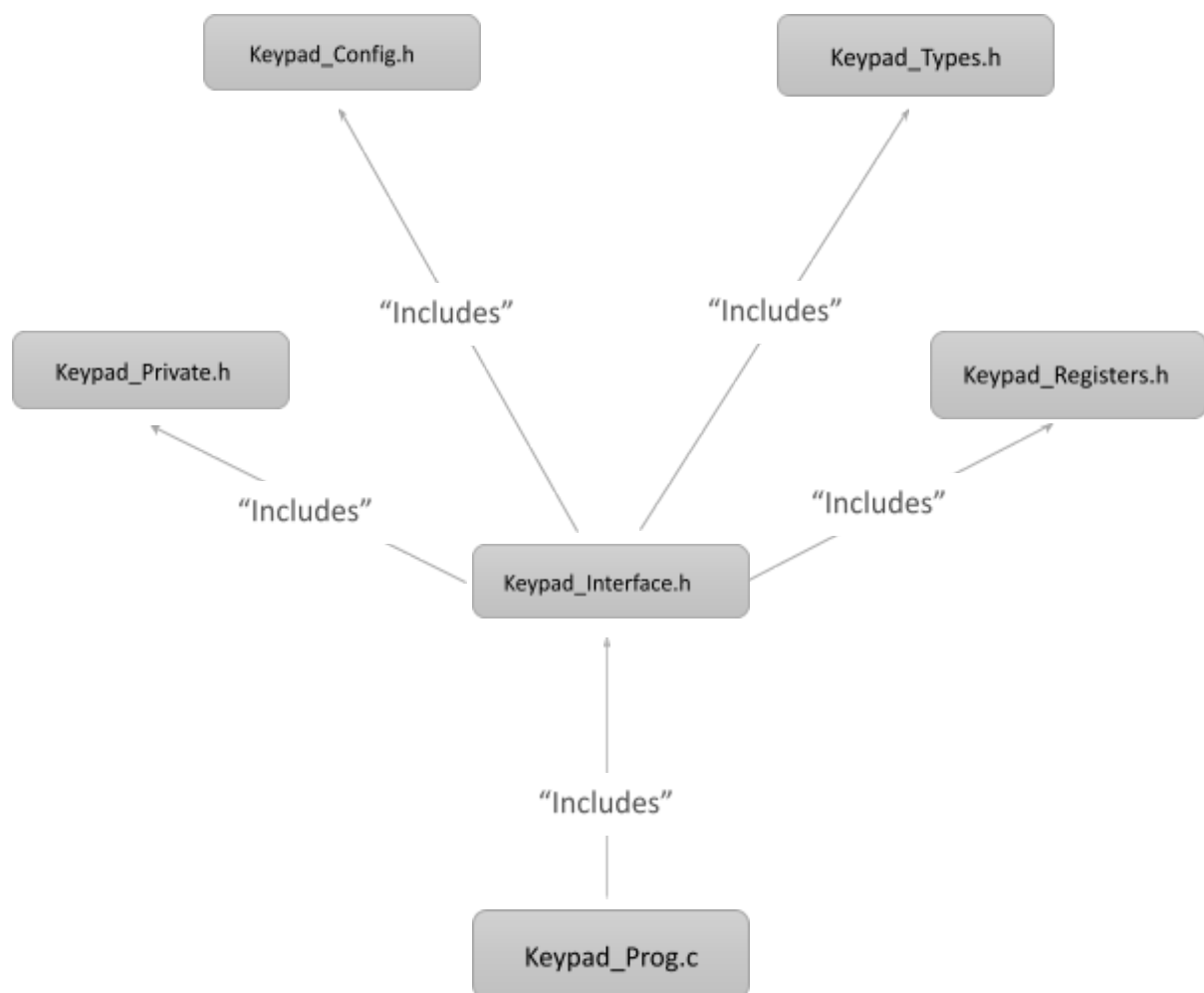
## Dependencies to other modules:

### DIO driver module

Keypad ports and pins are initialized and written on using the DIO driver module.

## File structure:

The Keypad module shall comply with the following file structure:



**Requirements traceability:**

Requirement	Description	Satisfied by
[SRS_Keypad_311]	The Keypad Driver shall support symbolic names for Keypad pins.	[DD_Keypad_311] [DD_Keypad_312] [DD_Keypad_313] [DD_Keypad_314] [DD_Keypad_315] [DD_Keypad_316] [DD_Keypad_317] [DD_Keypad_318] [DD_Keypad_319] [DD_Keypad_3110] [DD_Keypad_3111] [DD_Keypad_3112] [DD_Keypad_3113] [DD_Keypad_3114] [DD_Keypad_3115] [DD_Keypad_3116]
[SRS_Keypad_312]	The Keypad driver shall provide a service that initializes the Keypad.	[DD_Keypad_3117]
[SRS_Keypad_313]	The Keypad driver shall provide a service that gets value when the Button is pressed.	[DD_Keypad_3118]

## API specification:

### Imported types:

#### 1- [DD\_Keypad\_311]

Module	Imported Type
DIO module: DIO_Types.h	E_DioPort E_dioPin

### Type definitions:

#### 1- [DD\_Keypad\_312]

Name:	KEYPAD_ROWS_PORT
Type	E_DioPort
Range:	0...<number of ports>
Description:	Port ID that contains Keypad rows pins
Covered requirements:	[SRS_Keypad_311]

#### 2- [DD\_Keypad\_313]

Name:	KEYPAD_COLUMNS_PORT
Type	E_DioPort
Range:	0...<number of ports>
Description:	Port ID that contains Keypad columns pins
Covered requirements:	[SRS_Keypad_311]

#### 3- [DD\_Keypad\_314]

Name:	KEYPAD_ROW0_PIN5
Type	E_DioPin
Range:	0...<number of pins>
Description:	Keypad row0 pin number
Covered requirements:	[SRS_Keypad_311]

#### 4- [DD\_Keypad\_315]

Name:	KEYPAD_ROW1
Type	E_DioPin
Range:	0...<number of ports>
Description:	Keypad row1 pin number
Covered requirements:	[SRS_Keypad_311]

## 5- [DD\_Keypad\_316]

<b>Name:</b>	KEYPAD_ROW2
<b>Type</b>	E_DioPin
<b>Range:</b>	0...<number of ports>
<b>Description:</b>	Keypad row2 pin number
<b>Covered requirements:</b>	[SRS_Keypad_311]

## 6- [DD\_Keypad\_317]

<b>Name:</b>	KEYPAD_ROW3
<b>Type</b>	E_DioPin
<b>Range:</b>	0...<number of ports>
<b>Description:</b>	Keypad row3 pin number
<b>Covered requirements:</b>	[SRS_Keypad_311]

## 7- [DD\_Keypad\_318]

<b>Name:</b>	KEYPAD_COLUMN0
<b>Type</b>	E_DioPin
<b>Range:</b>	0...<number of pins>
<b>Description:</b>	Keypad columns 0 pin number
<b>Covered requirements:</b>	[SRS_Keypad_311]

## 8- [DD\_Keypad\_319]

<b>Name:</b>	KEYPAD_COLUMN1
<b>Type</b>	E_DioPin
<b>Range:</b>	0...<number of pins>
<b>Description:</b>	Keypad columns 1 pin number
<b>Covered requirements:</b>	[SRS_Keypad_311]

## 9- [DD\_Keypad\_3110]

<b>Name:</b>	KEYPAD_COLUMN2
<b>Type</b>	E_DioPin
<b>Range:</b>	0...<number of pins>
<b>Description:</b>	Keypad columns 2 pin number
<b>Covered requirements:</b>	[SRS_Keypad_311]

## 10- DD\_Keypad\_3111]

<b>Name:</b>	NO_ROWS
<b>Type</b>	unsigned character
<b>Range:</b>	4

<b>Description:</b>	number of rows in keypad
<b>Covered requirements:</b>	[SRS_Keypad_311]

**11- [DD\_Keypad\_3112]**

<b>Name:</b>	KEYPAD_COLUMN3
<b>Type</b>	E_DioPin
<b>Range:</b>	0...<number of pins>
<b>Description:</b>	Keypad columns 3 pin number
<b>Covered requirements:</b>	[SRS_Keypad_311]

**12- [DD\_Keypad\_3113]**

<b>Name:</b>	NO_COLS
<b>Type</b>	unsigned character
<b>Range:</b>	4
<b>Description:</b>	number of columns in keypad
<b>Covered requirements:</b>	[SRS_Keypad_311]

**13- [DD\_Keypad\_3114]**

<b>Name:</b>	KEYS_VALUES
<b>Type</b>	character 2D array
<b>Range:</b>	'1' -> '#'
<b>Description:</b>	define the value of these keys
<b>Covered requirements:</b>	[SRS_Keypad_111]

**14- [DD\_Keypad\_3115]**

<b>Name:</b>	KEYPAD4X3
<b>Type</b>	none
<b>Range:</b>	none
<b>Description:</b>	define when used keypad 4*3
<b>Covered requirements:</b>	[SRS_Keypad_111]

**15- [DD\_Keypad\_3116]**

<b>Name:</b>	keypad_keys
<b>Type</b>	u8PinValu 2D array
<b>Range:</b>	the values of the keys
<b>Description:</b>	take the value of the keys
<b>Covered requirements:</b>	[SRS_Keypad_311]

## Function definitions:

### 1- [DD\_Keypad\_3117]

<b>Service name:</b>	Keypad get the value
<b>Syntax:</b>	u8PinValue HAL_KPD_getKey(void)
<b>Sync/Async:</b>	Synchronous
<b>Re-entrancy:</b>	Re-entrant
<b>Parameters (in):</b>	
<b>Parameters (out):</b>	return the values of the keys
<b>Parameters (inout):</b>	none
<b>Return type:</b>	u8PinValue
<b>Description:</b>	Function that returns the values of the keypad.
<b>Covered requirements:</b>	[SRS_Keypad_313]

### 2- [DD\_Keypad\_3118]

<b>Service name:</b>	Keypad initialization
<b>Syntax:</b>	E_ErrorType HAL_KPD_init(void)
<b>Sync/Async:</b>	Synchronous
<b>Re-entrancy:</b>	Re-entrant
<b>Parameters (in):</b>	none
<b>Parameters (out):</b>	none
<b>Parameters (inout):</b>	none
<b>Return type:</b>	E_ErrorType
<b>Description:</b>	Function that initializes the Keypad
<b>Covered requirements:</b>	[SRS_Keypad_312]