**Detailed Design of Button Driver**

**Team X**

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# Introduction and functional overview:

This document specifies detailed design of the module Button Driver.

The Button driver provides services for configuration, initializing the Button, reads the value on the button’s pin, and sets the state pull-up for the button.

The behavior of those services is synchronous.

# Dependencies to other modules:

#### DIO driver module

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

# File structure:

The Button module shall comply with the following file structure:





















# Requirements traceability:

| Requirement | Description | Satisfied by |
| --- | --- | --- |
| [SRS\_Button\_211] | The Button Driver shall support symbolic names for Button pin. | [DD\_Button\_211]  [DD\_Button\_212]  [DD\_Button\_213] |
| [SRS\_Button\_212] | The Button driver shall provide a service that initializes the Button | [DD\_Buttom\_214] |
| [SRS\_Button\_213] | The Button driver shall provide a service that reads the value of the button pin. | [DD\_Button\_215] |
| [SRS\_Button\_215] | The Button driver shall provide a service that makes the button pull up which button”s pin will be input and high. | [DD\_Button\_216] |

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# API specification:

## Imported types:

#### [DD\_Button\_211]

| Module | Imported Type |
| --- | --- |
| DIO module:  DIO\_Types.h | E\_DioPort  E\_dioPin |

## Type definitions:

#### [DD\_Button\_212]

| Name: | Button\_pin |
| --- | --- |
| Type | E\_DioPin |
| Range: | 0…<number of pins> |
| Description: | Button pin number |
| Covered requirements: | [SRS\_Button\_211] |

#### [DD\_Button\_213]

| Name: | Button\_port |
| --- | --- |
| Type | E\_DioPort |
| Range: | 0…<number of ports> |
| Description: | Port ID that contains Button pin |
| Covered requirements: | [SRS\_Button\_211] |

## Function definitions:

#### [DD\_Button\_214]

| Service name: | Button initialization |
| --- | --- |
| Syntax: | E\_ErrorType HAL\_BUTTON\_init( ) |
| Sync/Async: | Synchronous |
| Re-entrancy: | Re-entrant |
| Parameters (in): | none |
| Parameters (out): | none |
| Parameters (inout): | none |
| Return type: | E\_ErrorType |
| Description: | Function that initializes the button |
| Covered requirements: | [SRS\_button\_212] |

#### [DD\_Button\_215]

| Service name: | Read the button’s pin |
| --- | --- |
| Syntax: | E\_ErrorType HAL\_BUTTON\_read(u8PinValue \*btn\_state) |
| Sync/Async: | Synchronous |
| Re-entrancy: | Re-entrant |
| Parameters (in): | none |
| Parameters (out): | none |
| Parameters (inout): | \*btn\_state .. takes the value of the pin and return it. |
| Return type: | E\_ErrorType |
| Description: | Function that reads the value of the button pin. |
| Covered requirements: | [SRS\_button\_213] |

#### [DD\_Button\_216]

| Service name: | Pull up the button |
| --- | --- |
| Syntax: | E\_ErrorType HAL\_BUTTON\_set\_pullup() |
| Sync/Async: | Synchronous |
| Re-entrancy: | Re-entrant |
| Parameters (in): | none |
| Parameters (out): | none |
| Parameters (inout): | none |
| Return type: | E\_ErrorType |
| Description: | Function that makes the button state as pull up |
| Covered requirements: | [SRS\_Button\_214] |