Component Design Document

For

DIO Driver

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Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| Sara Rashwan | 17th April 2018 | Create the template | 1.0 |
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|  |  |  |  |
|  |  |  |  |

# *1. Introduction*

## Objective

DIO Driver is a driver to deal with the input output ports in the microcontroller support twp functions ,DIO\_writePin to write 0 or 1 to micro controller’s pins, And DIO\_ReadPin to read 0 or 1 from micro controller’s pins.

## Context Diagram

DIO

DIO\_WritePin

DIO\_ReadPin

Init

# ***External*** *Interface*

## STD\_types.h

### Types

|  |  |
| --- | --- |
| Type | Description |
| 1. u8 | unsigned char |
| 2. u16 | unsigned short int |
| 3. u32 | unsigned long int |

# *Static Design*

## Files

### Used Files

|  |  |
| --- | --- |
| FILE NAME | Description |
| DIO.h | The file in which there are the prototype of functions. |
| DIO\_cfg.h | The file in which there are the configurable types and macroes. |
| DIO .c | The file in which there are the functions of the driver. |
| DIO\_ cfg .c | The file in which there are the constant types used in the DIO.c and defined in DIO\_cfg.h |

### Files Inclusion

DIO.h

DIO.C

Registers.h

DIO\_cfg.h

DIO\_cfg.c

STD\_types.h

## Types

|  |  |
| --- | --- |
| Req ID | DIO\_001 |
| Covers |  |
| Name | DIO\_pinName |
| Type | Enumeration |
| Range | Contains the pin names of the used micro controller from PA0 to PA7 , from PB0 to PB7 , from PC0 to PC7 and from PD0 to PD7. |
| Description | Contains the pin names of the used micro controller. |

|  |  |
| --- | --- |
| Req ID | DIO\_002 |
| Covers |  |
| Name | DIO\_mode\_t |
| Type | Enumeration |
| Range | Contains the modes of the micro controller pin whether it were Input with internal pull up , input without internal pull up or Output. |
| Description | Contains the modes of the micro controller pin . |

|  |  |
| --- | --- |
| Req ID | DIO\_003 |
| Covers |  |
| Name | DIO\_cfg\_t |
| Type | Struct. |
| Range | Struct of the types DIO\_pinName and DIO\_mode\_t . |
| Description | Struct of the types used in the system. |

## Symbol Define

There are not any defines required from the user .

## Const

There are not any constants in this component .

## Interface (Services)

|  |  |  |
| --- | --- | --- |
| Req ID | DIO\_001 | |
| Covers |  | |
| Name/protoTypes | DIO\_WritePin | |
| Service ID | Function | |
| Re-entrant / Non re- entrant | Re-entrant | |
| Synchronous/Asynchronous | Asynchronous | |
| Return Value | void | There is not any return from this function |
| Input parameter | value | Parameter from the u8 type that will be wrote in the pin |
| Output parameter | Pin Name | Parameter from the Dio\_pinName\_t type. This parameter will be applied some operations on it. |
| Input /Output Parameter | None | There is not any output parameter. |

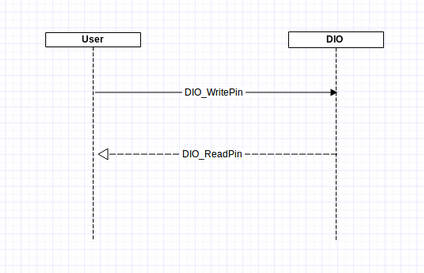
|  |  |  |
| --- | --- | --- |
| Req ID | DIO\_002 | |
| Covers |  | |
| Name/protoTypes | DIO\_ReadPin | |
| Service ID | Function | |
| Re-entrant / Non re- entrant | Re-entrant | |
| Synchronous/Asynchronous | Asynchronous | |
| Return Value | u8 | This function return the wroten value on the micro controller pin . |
| Input parameter | None | There is not any input parameter. |
| Output parameter | Pin Name | Parameter from the Dio\_pinName\_t type.This parameter will be applied some operations upon it. |
| Input /Output Parameter | None | There is not any output parameter. |

# *Dynamic Design*

## Mode Management

There is not any mode management draw for this component.

## Sequence Diagram



# *5.**Shared Resources*

## Analysis

### There are not any sharable resources in this component .

## Protection

### None.

# *Configuration Parameters*

## Pre-compile time

None .

## Link time

### Configuration of Dio\_pinName\_t and Dio\_cfg\_t .

## Post-build

None .

# *Configuration Constrains*

When we change the micro controller it is a must to change the Dio\_pinName\_t because we have 32 pins in the atmega controller in its 4 ports .

# *Integration Constrains*

calling Init() and make all the configurations .

# *History*

**Appendix A: Glossary**