Smart curtains

Global design document

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| **File Name** | GDD “Global design document” |
| **Status** | Draft |
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History

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| --- | --- | --- |
| **Version** | **Date** | **Author** |
| 1.0 | 3/2/2019 | Mina Maurice |
| 1.1 | 4/2/2019 | Mina Maurice |
| **Description** | | |
| This file defines the electronic hardware and the main hierarchy of the software  Layered architecture . | | |

**Hardware components diagram**

AVR

motor

driver

motor

driver

motor

driver

LED 3

LED 2

LED 1

1. AVR microcontroller
2. LEDs
3. LED 1
4. LED 2
5. LED 3
6. Motors

1.motor 1

2. motor 2

3. motor 3

1. 3 Motor drivers

**layered architecture**

layered architecture diagram:

library

Application

Curtains management system

HAL

LED

Push button

Motor

MCAL

DIO

Components:

1. DIO: implements the functionality of input/output peripheral of AVR.
2. Motor: implements the control done on a DC motor
3. Push button: implements the push button functionality
4. LED : implements

Components of MCAL:

1. DIO

|  |  |  |
| --- | --- | --- |
| API | Set\_pinDirection(Copy\_DioPinNB,Copy\_DioPinMode) | |
| API\_ID | API\_001 | |
| Desc | This API determine the direction of the pin (“output”, “input”) | |
| Input | Copy\_DioPinNB  Range: 0:31 | Copy\_DioPinMode  Range: 0:1 |
| Output | Error\_Level  Range: 0:1 | |
| Covers |  | |

|  |  |  |
| --- | --- | --- |
| API | u8Set\_Pin\_value(Copy\_PINNB , Copy\_PIN\_Value) | |
| API\_ID | API\_002 | |
| Desc | This API determine the output value of the desired pin | |
| Input | Copy\_PINNB  Range: 0:31 | Copy\_PIN\_Value  Range: 0:1 |
| Output | Error\_Level  Range: 0:1 | |
| Covers |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| API | Error\_level=Get\_Pin\_Value (Copy\_PinNB,Copy\_PointerValue) | | |
| API\_ID | API\_003 | | |
| Desc | This API get the Pin value of the desired pin | | |
| Input | **Copy\_PinNB,Copy**  Range: 0:31 | | **Copy\_PointerValue**  Range: 0:1 |
| Output | Error\_Level  Range: 0:1 | **Copy\_PointerValue**  Range: 0:1 | |
| Covers |  | | |

HAL:

1. Motor driver :

|  |  |  |  |
| --- | --- | --- | --- |
| API | Error\_level =Motor\_stop(Copy\_MotorNb) | | |
| API\_ID | API\_004 | | |
| Desc | This API get force the running motor to stop | | |
| Input | Copy\_MotorNb  Range: 0:16 | |  |
| Output | Error\_Level  Range: 0:1 |  | |
| Covers |  | | |

|  |  |  |  |
| --- | --- | --- | --- |
| API | Error\_level =Motor\_UP(Copy\_MotorNb) | | |
| API\_ID | API\_005 | | |
| Desc | This API make the motor rotate clock wise direction | | |
| Input | Copy\_MotorNb  Range: 0:16 | |  |
| Output | Error\_Level  Range: 0:1 |  | |
| Covers |  | | |

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| --- | --- | --- | --- |
| API | Error\_level =MotorDown(Copy\_MotorNb) | | |
| API\_ID | API\_006 | | |
| Desc | This API make the motor rotate anti-clock wise direction | | |
| Input | Copy\_MotorNb  Range: 0:16 | |  |
| Output | Error\_Level  Range: 0:1 |  | |
| Covers |  | | |

1. Push\_Button

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| --- | --- | --- | --- |
| API | Error\_Level=Debouncing(Copy\_PinNb, Copy\_TimeMilles) | | |
| API\_ID | API\_007 | | |
| Desc | This API get force the running motor to stop | | |
| Input | Copy\_PinNb  Range : 0:31 | | Copy\_Time­Milles  Range : 0:500 |
| Output | Error\_Level  Range: 0:1 |  | |
| Covers |  | | |

1. Led

|  |  |  |  |
| --- | --- | --- | --- |
| API | Error\_level =LedOn(Copy\_LedNb) | | |
| API\_ID | API\_008 | | |
| Desc | This API turn the led on | | |
| Input | Copy\_LedNb  Range: 0:32 | |  |
| Output | Error\_Level  Range: 0:1 |  | |
| Covers |  | | |

|  |  |  |  |
| --- | --- | --- | --- |
| API | Error\_level =LedOff(Copy\_LedNb) | | |
| API\_ID | API\_009 | | |
| Desc | This API turn off the led | | |
| Input | Copy\_MotorNb  Range: 0:32 | |  |
| Output | Error\_Level  Range: 0:1 |  | |
| Covers |  | | |