

## Motor 2 Library

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## 1 Hierarchical Index

### 1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

PinExtender

**Zmotor2** **2**

## 2 Data Structure Index

### 2.1 Data Structures

Here are the data structures with brief descriptions:

## Zmotor2

Class that stores state and functions for interacting with ZPCA9685 PWM chip

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## 3 File Index

### 3.1 File List

Here is a list of all files with brief descriptions:

[Zmotor2.cpp](#)

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[Zmotor2.h](#)

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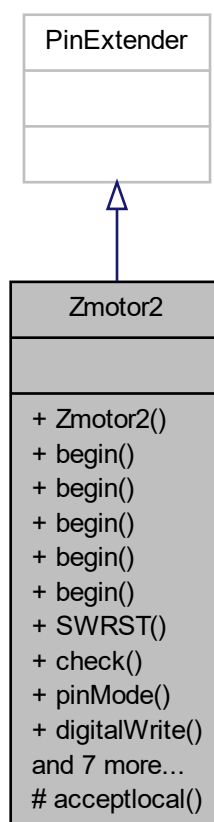
## 4 Data Structure Documentation

### 4.1 Zmotor2 Class Reference

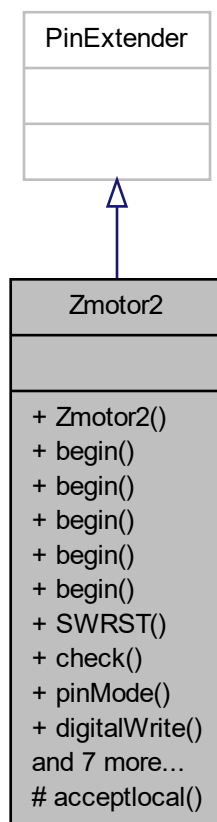
Class that stores state and functions for interacting with ZPCA9685 PWM chip.

```
#include <Zmotor2.h>
```

Inheritance diagram for Zmotor2:



Collaboration diagram for Zmotor2:



## Public Member Functions

- [Zmotor2](#) ()  
*Instantiates a new [Zmotor2](#) PWM driver chip with the I2C address on the Wire interface. On Due we use Wire1 since its the interface on the 'default' I2C pins.*
- void [begin](#) (TwoWire \*MyWire, uint8\_t addr1)  
*Setups the I2C interface and hardware.*
- void [begin](#) (TwoWire \*i2c, uint8\_t addr1, uint8\_t addrpwm)
- void [begin](#) (uint8\_t addr, uint8\_t addr2)
- void [begin](#) (uint8\_t addr)  
*Setups the I2C interface and hardware.*
- void [begin](#) (void)  
*Setups the I2C interface and hardware.*
- void [SWRST](#) (void)
- bool [check](#) ()
- void [pinMode](#) (uint32\_t p, uint8\_t d)
- void [digitalWrite](#) (uint32\_t p, uint8\_t d)
- uint8\_t [digitalRead](#) (uint32\_t p)
- void [analogWrite](#) (uint32\_t ulPin, uint32\_t ulValue)

- void `analogWriteResolution` (int res)
- uint32\_t `getPin` (uint32\_t ulPin)
- void `reset` (void)  
*Sends a reset command to the `Zmotor2` chip over I2C.*
- uint32\_t `analogRead` (uint32\_t pin)
- void `setPWMFreq` (float freq)  
*Sets the PWM frequency for the entire chip, up to ~1.6 KHz.*

#### Protected Member Functions

- bool `acceptlocal` (uint32\_t p)

#### 4.1.1 Detailed Description

Class that stores state and functions for interacting with ZPCA9685 PWM chip.

Definition at line 87 of file `Zmotor2.h`.

#### 4.1.2 Constructor & Destructor Documentation

##### 4.1.2.1 `Zmotor2()`

```
Zmotor2::Zmotor2 ( )
```

Instantiates a new `Zmotor2` PWM driver chip with the I2C address on the Wire interface. On Due we use Wire1 since its the interface on the 'default' I2C pins.

#### Parameters

<i>addr</i>	The 7-bit I2C address to locate this chip, default is 0x40
-------------	--

Definition at line 30 of file `Zmotor2.cpp`.

#### 4.1.3 Member Function Documentation

##### 4.1.3.1 `acceptlocal()`

```
bool Zmotor2::acceptlocal (
    uint32_t p ) [protected]
```

Definition at line 96 of file `Zmotor2.cpp`.

#### 4.1.3.2 analogRead()

```
uint32_t Zmotor2::analogRead (
    uint32_t pin )
```

Definition at line 174 of file Zmotor2.cpp.

#### 4.1.3.3 analogWrite()

```
void Zmotor2::analogWrite (
    uint32_t ulPin,
    uint32_t ulValue )
```

Definition at line 142 of file Zmotor2.cpp.

#### 4.1.3.4 analogWriteResolution()

```
void Zmotor2::analogWriteResolution (
    int res )
```

Definition at line 135 of file Zmotor2.cpp.

#### 4.1.3.5 begin() [1/5]

```
void Zmotor2::begin (
    TwoWire * MyWire,
    uint8_t addr1 )
```

Setups the I2C interface and hardware.

Definition at line 40 of file Zmotor2.cpp.

References `begin()`, `MCP23017_ADDR_BASE`, and `PCA9685_ADDR_BASE`.

Here is the call graph for this function:



#### 4.1.3.6 `begin()` [2/5]

```
void Zmotor2::begin (
    TwoWire * i2c,
    uint8_t  addrIo,
    uint8_t  addrpwm )
```

Definition at line 44 of file Zmotor2.cpp.

#### 4.1.3.7 `begin()` [3/5]

```
void Zmotor2::begin (
    uint8_t  addr,
    uint8_t  addr2 )
```

#### 4.1.3.8 `begin()` [4/5]

```
void Zmotor2::begin (
    uint8_t  addr )
```

Setups the I2C interface and hardware.

Definition at line 57 of file Zmotor2.cpp.

References `begin()`.

Here is the call graph for this function:



#### 4.1.3.9 begin() [5/5]

```
void Zmotor2::begin (
    void )
```

Setups the I2C interface and hardware.

Definition at line 67 of file Zmotor2.cpp.

Referenced by begin().

Here is the caller graph for this function:



#### 4.1.3.10 check()

```
bool Zmotor2::check ( )
```

#### 4.1.3.11 digitalRead()

```
uint8_t Zmotor2::digitalRead (
    uint32_t ulPin )
```

dummy function

Definition at line 109 of file Zmotor2.cpp.

#### 4.1.3.12 digitalWrite()

```
void Zmotor2::digitalWrite (
    uint32_t p,
    uint8_t d )
```

Definition at line 178 of file Zmotor2.cpp.



**4.1.3.13 getPin()**

```
uint32_t Zmotor2::getPin (
    uint32_t ulPin )
```

Definition at line 155 of file Zmotor2.cpp.

References MCP23017\_ADDR\_BASE, and PCA9685\_ADDR\_BASE.

**4.1.3.14 pinMode()**

```
void Zmotor2::pinMode (
    uint32_t ulPin,
    uint8_t mode )
```

Sets the pin mode to either INPUT or OUTPUT but for all, and input doesn't exist

Definition at line 123 of file Zmotor2.cpp.

**4.1.3.15 reset()**

```
void Zmotor2::reset (
    void )
```

Sends a reset command to the [Zmotor2](#) chip over I2C.

Definition at line 80 of file Zmotor2.cpp.

**4.1.3.16 setPWMFreq()**

```
void Zmotor2::setPWMFreq (
    float freq )
```

Sets the PWM frequency for the entire chip, up to ~1.6 KHz.

**Parameters**

<i>freq</i>	Floating point frequency that we will attempt to match
-------------	--

Definition at line 91 of file Zmotor2.cpp.

**4.1.3.17 SWRST()**

```
void Zmotor2::SWRST (
    void )
```

The documentation for this class was generated from the following files:

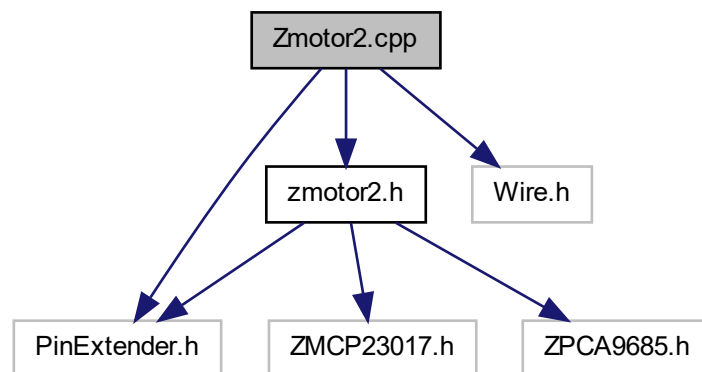
- [Zmotor2.h](#)
- [Zmotor2.cpp](#)

## 5 File Documentation

### 5.1 Zmotor2.cpp File Reference

```
#include "zmotor2.h"  
#include <Wire.h>  
#include "PinExtender.h"
```

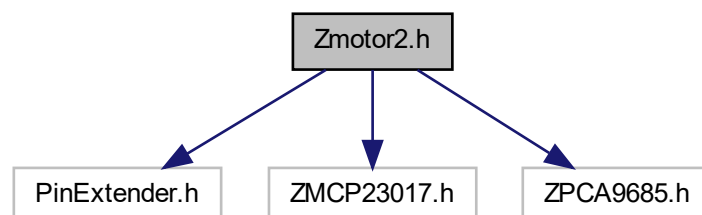
Include dependency graph for Zmotor2.cpp:



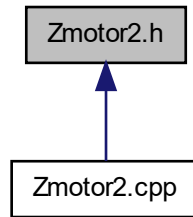
### 5.2 Zmotor2.h File Reference

```
#include "PinExtender.h"  
#include <ZMCP23017.h>  
#include <ZPCA9685.h>
```

Include dependency graph for Zmotor2.h:



This graph shows which files directly or indirectly include this file:



### Data Structures

- class [Zmotor2](#)

*Class that stores state and functions for interacting with ZPCA9685 PWM chip.*

### Macros

- `#define MCP23017_ADDR_BASE 0x20`
- `#define PCA9685_ADDR_BASE 0x40`
- `#define MOTOR2_IO_0 (MCP23017_GPA7 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_1 (MCP23017_GPA6 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_2 (MCP23017_GPA5 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_3 (MCP23017_GPA4 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_4 (MCP23017_GPA3 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_5 (MCP23017_GPA2 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_6 (MCP23017_GPA1 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_7 (MCP23017_GPA0 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_8 (MCP23017_GPB7 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_9 (MCP23017_GPB6 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_10 (MCP23017_GPB5 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_11 (MCP23017_GPB4 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_12 (MCP23017_GPB3 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_13 (MCP23017_GPB2 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_14 (MCP23017_GPB1 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_15 (MCP23017_GPB0 | MCP23017_ADDR_BASE<<16)`
- `#define MOTOR2_IO_A MOTOR2_IO_10`
- `#define MOTOR2_IO_B MOTOR2_IO_11`
- `#define MOTOR2_IO_C MOTOR2_IO_12`
- `#define MOTOR2_IO_D MOTOR2_IO_13`
- `#define MOTOR2_IO_E MOTOR2_IO_14`
- `#define MOTOR2_IO_F MOTOR2_IO_15`
- `#define MOTOR2_PWM_0 (PCA9685_LED15 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_1 (PCA9685_LED14 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_2 (PCA9685_LED13 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_3 (PCA9685_LED12 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_4 (PCA9685_LED11 | PCA9685_ADDR_BASE<<16)`

- `#define MOTOR2_PWM_5 (PCA9685_LED10 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_6 (PCA9685_LED9 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_7 (PCA9685_LED8 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_8 (PCA9685_LED7 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_9 (PCA9685_LED6 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_10 (PCA9685_LED5 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_11 (PCA9685_LED4 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_12 (PCA9685_LED3 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_13 (PCA9685_LED2 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_14 (PCA9685_LED1 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_15 (PCA9685_LED0 | PCA9685_ADDR_BASE<<16)`
- `#define MOTOR2_PWM_A MOTOR2_PWM_10`
- `#define MOTOR2_PWM_B MOTOR2_PWM_11`
- `#define MOTOR2_PWM_C MOTOR2_PWM_12`
- `#define MOTOR2_PWM_D MOTOR2_PWM_13`
- `#define MOTOR2_PWM_E MOTOR2_PWM_14`
- `#define MOTOR2_PWM_F MOTOR2_PWM_15`

### 5.2.1 Macro Definition Documentation

#### 5.2.1.1 MCP23017\_ADDR\_BASE

```
#define MCP23017_ADDR_BASE 0x20
```

Definition at line 27 of file Zmotor2.h.

Referenced by Zmotor2::begin(), and Zmotor2::getPin().

#### 5.2.1.2 MOTOR2\_IO\_0

```
#define MOTOR2_IO_0 (MCP23017_GPA7 | MCP23017_ADDR_BASE<<16)
```

Definition at line 29 of file Zmotor2.h.

#### 5.2.1.3 MOTOR2\_IO\_1

```
#define MOTOR2_IO_1 (MCP23017_GPA6 | MCP23017_ADDR_BASE<<16)
```

Definition at line 30 of file Zmotor2.h.

#### 5.2.1.4 MOTOR2\_IO\_10

```
#define MOTOR2_IO_10 (MCP23017_GPB5 | MCP23017_ADDR_BASE<<16)
```

Definition at line 40 of file Zmotor2.h.

#### 5.2.1.5 MOTOR2\_IO\_11

```
#define MOTOR2_IO_11 (MCP23017_GPB4 | MCP23017_ADDR_BASE<<16)
```

Definition at line 41 of file Zmotor2.h.

#### 5.2.1.6 MOTOR2\_IO\_12

```
#define MOTOR2_IO_12 (MCP23017_GPB3 | MCP23017_ADDR_BASE<<16)
```

Definition at line 42 of file Zmotor2.h.

#### 5.2.1.7 MOTOR2\_IO\_13

```
#define MOTOR2_IO_13 (MCP23017_GPB2 | MCP23017_ADDR_BASE<<16)
```

Definition at line 43 of file Zmotor2.h.

#### 5.2.1.8 MOTOR2\_IO\_14

```
#define MOTOR2_IO_14 (MCP23017_GPB1 | MCP23017_ADDR_BASE<<16)
```

Definition at line 44 of file Zmotor2.h.

#### 5.2.1.9 MOTOR2\_IO\_15

```
#define MOTOR2_IO_15 (MCP23017_GPB0 | MCP23017_ADDR_BASE<<16)
```

Definition at line 45 of file Zmotor2.h.

#### 5.2.1.10 MOTOR2\_IO\_2

```
#define MOTOR2_IO_2 (MCP23017_GPA5 | MCP23017_ADDR_BASE<<16)
```

Definition at line 31 of file Zmotor2.h.

#### 5.2.1.11 MOTOR2\_IO\_3

```
#define MOTOR2_IO_3 (MCP23017_GPA4 | MCP23017_ADDR_BASE<<16)
```

Definition at line 32 of file Zmotor2.h.

#### 5.2.1.12 MOTOR2\_IO\_4

```
#define MOTOR2_IO_4 (MCP23017_GPA3 | MCP23017_ADDR_BASE<<16)
```

Definition at line 33 of file Zmotor2.h.

#### 5.2.1.13 MOTOR2\_IO\_5

```
#define MOTOR2_IO_5 (MCP23017_GPA2 | MCP23017_ADDR_BASE<<16)
```

Definition at line 34 of file Zmotor2.h.

#### 5.2.1.14 MOTOR2\_IO\_6

```
#define MOTOR2_IO_6 (MCP23017_GPA1 | MCP23017_ADDR_BASE<<16)
```

Definition at line 35 of file Zmotor2.h.

#### 5.2.1.15 MOTOR2\_IO\_7

```
#define MOTOR2_IO_7 (MCP23017_GPA0 | MCP23017_ADDR_BASE<<16)
```

Definition at line 36 of file Zmotor2.h.

#### 5.2.1.16 MOTOR2\_IO\_8

```
#define MOTOR2_IO_8 (MCP23017_GPB7 | MCP23017_ADDR_BASE<<16)
```

Definition at line 38 of file Zmotor2.h.

#### 5.2.1.17 MOTOR2\_IO\_9

```
#define MOTOR2_IO_9 (MCP23017_GPB6 | MCP23017_ADDR_BASE<<16)
```

Definition at line 39 of file Zmotor2.h.

#### 5.2.1.18 MOTOR2\_IO\_A

```
#define MOTOR2_IO_A MOTOR2_IO_10
```

Definition at line 47 of file Zmotor2.h.

#### 5.2.1.19 MOTOR2\_IO\_B

```
#define MOTOR2_IO_B MOTOR2_IO_11
```

Definition at line 48 of file Zmotor2.h.

#### 5.2.1.20 MOTOR2\_IO\_C

```
#define MOTOR2_IO_C MOTOR2_IO_12
```

Definition at line 49 of file Zmotor2.h.

#### 5.2.1.21 MOTOR2\_IO\_D

```
#define MOTOR2_IO_D MOTOR2_IO_13
```

Definition at line 50 of file Zmotor2.h.

#### 5.2.1.22 MOTOR2\_IO\_E

```
#define MOTOR2_IO_E MOTOR2_IO_14
```

Definition at line 51 of file Zmotor2.h.

#### 5.2.1.23 MOTOR2\_IO\_F

```
#define MOTOR2_IO_F MOTOR2_IO_15
```

Definition at line 52 of file Zmotor2.h.

#### 5.2.1.24 MOTOR2\_PWM\_0

```
#define MOTOR2_PWM_0 (PCA9685_LED15 | PCA9685_ADDR_BASE<<16)
```

Definition at line 54 of file Zmotor2.h.

#### 5.2.1.25 MOTOR2\_PWM\_1

```
#define MOTOR2_PWM_1 (PCA9685_LED14 | PCA9685_ADDR_BASE<<16)
```

Definition at line 55 of file Zmotor2.h.

### 5.2.1.26 MOTOR2\_PWM\_10

```
#define MOTOR2_PWM_10 (PCA9685_LED5 | PCA9685_ADDR_BASE<<16)
```

Definition at line 65 of file Zmotor2.h.

### 5.2.1.27 MOTOR2\_PWM\_11

```
#define MOTOR2_PWM_11 (PCA9685_LED4 | PCA9685_ADDR_BASE<<16)
```

Definition at line 66 of file Zmotor2.h.

### 5.2.1.28 MOTOR2\_PWM\_12

```
#define MOTOR2_PWM_12 (PCA9685_LED3 | PCA9685_ADDR_BASE<<16)
```

Definition at line 67 of file Zmotor2.h.

### 5.2.1.29 MOTOR2\_PWM\_13

```
#define MOTOR2_PWM_13 (PCA9685_LED2 | PCA9685_ADDR_BASE<<16)
```

Definition at line 68 of file Zmotor2.h.

### 5.2.1.30 MOTOR2\_PWM\_14

```
#define MOTOR2_PWM_14 (PCA9685_LED1 | PCA9685_ADDR_BASE<<16)
```

Definition at line 69 of file Zmotor2.h.

### 5.2.1.31 MOTOR2\_PWM\_15

```
#define MOTOR2_PWM_15 (PCA9685_LED0 | PCA9685_ADDR_BASE<<16)
```

Definition at line 70 of file Zmotor2.h.

### 5.2.1.32 MOTOR2\_PWM\_2

```
#define MOTOR2_PWM_2 (PCA9685_LED13 | PCA9685_ADDR_BASE<<16)
```

Definition at line 56 of file Zmotor2.h.



#### 5.2.1.33 MOTOR2\_PWM\_3

```
#define MOTOR2_PWM_3 (PCA9685_LED12 | PCA9685_ADDR_BASE<<16)
```

Definition at line 57 of file Zmotor2.h.

#### 5.2.1.34 MOTOR2\_PWM\_4

```
#define MOTOR2_PWM_4 (PCA9685_LED11 | PCA9685_ADDR_BASE<<16)
```

Definition at line 58 of file Zmotor2.h.

#### 5.2.1.35 MOTOR2\_PWM\_5

```
#define MOTOR2_PWM_5 (PCA9685_LED10 | PCA9685_ADDR_BASE<<16)
```

Definition at line 59 of file Zmotor2.h.

#### 5.2.1.36 MOTOR2\_PWM\_6

```
#define MOTOR2_PWM_6 (PCA9685_LED9 | PCA9685_ADDR_BASE<<16)
```

Definition at line 60 of file Zmotor2.h.

#### 5.2.1.37 MOTOR2\_PWM\_7

```
#define MOTOR2_PWM_7 (PCA9685_LED8 | PCA9685_ADDR_BASE<<16)
```

Definition at line 61 of file Zmotor2.h.

#### 5.2.1.38 MOTOR2\_PWM\_8

```
#define MOTOR2_PWM_8 (PCA9685_LED7 | PCA9685_ADDR_BASE<<16)
```

Definition at line 63 of file Zmotor2.h.

#### 5.2.1.39 MOTOR2\_PWM\_9

```
#define MOTOR2_PWM_9 (PCA9685_LED6 | PCA9685_ADDR_BASE<<16)
```

Definition at line 64 of file Zmotor2.h.

#### 5.2.1.40 MOTOR2\_PWM\_A

```
#define MOTOR2_PWM_A MOTOR2_PWM_10
```

Definition at line 72 of file Zmotor2.h.

#### 5.2.1.41 MOTOR2\_PWM\_B

```
#define MOTOR2_PWM_B MOTOR2_PWM_11
```

Definition at line 73 of file Zmotor2.h.

#### 5.2.1.42 MOTOR2\_PWM\_C

```
#define MOTOR2_PWM_C MOTOR2_PWM_12
```

Definition at line 74 of file Zmotor2.h.

#### 5.2.1.43 MOTOR2\_PWM\_D

```
#define MOTOR2_PWM_D MOTOR2_PWM_13
```

Definition at line 75 of file Zmotor2.h.

#### 5.2.1.44 MOTOR2\_PWM\_E

```
#define MOTOR2_PWM_E MOTOR2_PWM_14
```

Definition at line 76 of file Zmotor2.h.

#### 5.2.1.45 MOTOR2\_PWM\_F

```
#define MOTOR2_PWM_F MOTOR2_PWM_15
```

Definition at line 77 of file Zmotor2.h.

#### 5.2.1.46 PCA9685\_ADDR\_BASE

```
#define PCA9685_ADDR_BASE 0x40
```

Definition at line 28 of file Zmotor2.h.

Referenced by Zmotor2::begin(), and Zmotor2::getPin().



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