cdfr2020BaseRoulanteRework

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Chapter 1

File Index

1.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 2

File Documentation

2.1 lowlevel/include/motor.h File Reference

This file is part of cdfr2020BaseRoulanteRework.

```
#include <libopencm3/stm32/timer.h>
#include "timer.h"
#include "gpio.h"
```

Macros

- #define PWM_PRESCALE (64)
- #define PWM_PERIOD (20000)
- #define **MOTOR_TIM_RCC** RCC_TIM3
- #define **MOTOR_TIM** TIM3
- #define **MOTOR_A_GPIO_RCC_EN** RCC_GPIOA
- #define **MOTOR_A_PORT_EN** GPIOA
- #define **MOTOR_A_PIN_EN** GPIO4
- #define **MOTOR_A_GPIO_RCC_DIR** RCC_GPIOA
- #define **MOTOR_A_PORT_DIR** GPIOA
- #define **MOTOR_A_PIN_DIR** GPIO3
- #define **MOTOR_A_AF** GPIO_AF2
- #define **MOTOR_A_OC_ID** TIM_OC2
- #define **MOTOR_A_OC_MODE** TIM_OCM_PWM1
- #define **MOTOR_A_INIT_DIR** 0
- #define **MOTOR_B_GPIO_RCC_EN** RCC_GPIOA
- #define **MOTOR_B_PORT_EN** GPIOA
- #define **MOTOR_B_PIN_EN** GPIO6
- #define **MOTOR_B_GPIO_RCC_DIR** RCC_GPIOA
- #define **MOTOR_B_PORT_DIR** GPIOA
- #define **MOTOR_B_PIN_DIR** GPIO7
- #define **MOTOR_B_AF** GPIO_AF2
- #define **MOTOR_B_OC_ID** TIM_OC1
- #define **MOTOR_B_OC_MODE** TIM_OCM_PWM1
- #define **MOTOR_B_INIT_DIR** 0

Enumerations

- enum motor_sel { **MOTOR_A**, **MOTOR_B** }

  enum of the two motors of the robot to choose which one will be piloted (with function motor_set)

Functions

- void motor_setup ()

  This function initialize the timers and GPIOs to pilot the propulsion motors in our setup by PWM + the GPIOs for the direction.
- void motor_set (enum motor_sel sel, int8_t value)

  This function pilot the sel (MOTOR_A or MOTOR_B) with a value between -100(backward full speed) and +100 (forward full speed)

2.1.1 Detailed Description

This file is part of cdfr2020BaseRoulanteRework.

This implements the functions required to pilot the propulsion motors of the robot

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2.1.2 Macro Definition Documentation

2.1.2.1 PWM_PERIOD

```
#define PWM_PERIOD (20000)
```

We need a 50 Hz period (1000 / 20ms = 50), thus divide 100000 by 50 = 20000 (us).

2.1.2.2 PWM_PRESCALE

```
#define PWM_PRESCALE (64)
```

Prescale 64000000 Hz system clock by 64 = 1000000 Hz.

2.1.3 Enumeration Type Documentation

2.1.3.1 motor_sel

```
enum motor_sel
```

enum of the two motors of the robot to choose which one will be piloted (with function motor_set)

2.1.4 Function Documentation

2.1.4.1 motor_set()

```
void motor_set (
            enum motor_sel sel,
            int8_t value )
```

This function pilot the sel (MOTOR_A or MOTOR_B) with a value between -100(backward full speed) and +100 (forward full speed)

Parameters

sel	The motor that will be piloted (eg MOTOR_A)
value	value is between -100 and +100, controls the speed and direction of the motor sel (eg +54)

2.1.4.2 motor_setup()

```
void motor_setup ( )
```

This function initialize the timers and GPIOs to pilot the propulsion motors in our setup by PWM + the GPIOs for the direction.

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