

```
1 #include "motor.h"
2
3 /*
4      Note
5      * The PWM is handled by TIM4.
6      * In case of DC motor configuration:
7      * - the master clock for TIM4 is 1MHz
8      * - the counter counts up to 2000, result in 2ms of PWM period (500Hz)
9      * - the PWM pulse width data can to 0~1999, corresponding to 0~100% duty cycle
10 */
11 extern TIM_HandleTypeDef htim4;
12
13 /*
14      * Setup the driving power for 4 motors. p1~p4 data range is 0~1999, which equals
15      * to 0~100% duty cycle (for DC motor configuration)
16      */
17 void set_motor_pwm(MotorControlTypeDef *motor_pwm)
18 {
19     if (motor_pwm->motor1_pwm >= MOTOR_MAX_PWM_VALUE)
20         htim4.Instance->CCR1 = MOTOR_MAX_PWM_VALUE;
21     else if (motor_pwm->motor1_pwm <= MOTOR_MIN_PWM_VALUE)
22         htim4.Instance->CCR1 = MOTOR_MIN_PWM_VALUE;
23     else
24         htim4.Instance->CCR1 = motor_pwm->motor1_pwm;
25
26     if (motor_pwm->motor2_pwm >= MOTOR_MAX_PWM_VALUE)
27         htim4.Instance->CCR2 = MOTOR_MAX_PWM_VALUE;
28     else if (motor_pwm->motor2_pwm <= MOTOR_MIN_PWM_VALUE)
29         htim4.Instance->CCR2 = MOTOR_MIN_PWM_VALUE;
30     else
31         htim4.Instance->CCR2 = motor_pwm->motor2_pwm;
32
33     if (motor_pwm->motor3_pwm >= MOTOR_MAX_PWM_VALUE)
34         htim4.Instance->CCR3 = MOTOR_MAX_PWM_VALUE;
35     else if (motor_pwm->motor3_pwm <= MOTOR_MIN_PWM_VALUE)
36         htim4.Instance->CCR3 = MOTOR_MIN_PWM_VALUE;
37     else
38         htim4.Instance->CCR3 = motor_pwm->motor3_pwm;
39
40     if (motor_pwm->motor4_pwm >= MOTOR_MAX_PWM_VALUE)
41         htim4.Instance->CCR4 = MOTOR_MAX_PWM_VALUE;
42     else if (motor_pwm->motor4_pwm <= MOTOR_MIN_PWM_VALUE)
43         htim4.Instance->CCR4 = MOTOR_MIN_PWM_VALUE;
44     else
45         htim4.Instance->CCR4 = motor_pwm->motor4_pwm;
46 }
47
48 void set_motor_pwm_zero(MotorControlTypeDef *motor_pwm)
49 {
50
```

4つのモータへPWM信号を出力する関数

モータ No. 1: レジスタに値を書き込む。上下限界を超える場合は飽和させる。

モータ No. 2

モータ No. 3

モータ No. 4

4つ全てのモータを止めるためのPWMレジスタ値を設定する関数

```
51 motor_pwm->motor1_pwm = 0;
52 motor_pwm->motor2_pwm = 0;
53 motor_pwm->motor3_pwm = 0;
54 motor_pwm->motor4_pwm = 0;
55 }
56
57
```