

# Fork Lift Pin Assignment

## 1 Jason's Car with Fan

### 1.1 Motor

1. TIM3→CCR4  $\Rightarrow$  PE5 (FL) (C) (PWM)
  - Prescale = 170-1
  - ARR = 10000-1
2. TIM2→CCR1  $\Rightarrow$  (RL) (D) (PWM)
  - Prescale = 170-1
  - ARR = 10000-1
3. TIM2→CCR1  $\Rightarrow$  (FR) (B) (PWM)
  - Prescale = 170-1
  - ARR = 10000-1
4. TIM2→CCR2  $\Rightarrow$  (RR) (A) (PWM)
  - Prescale = 170-1
  - ARR = 10000-1

### 1.2 Encoder

1. TIM1  $\Rightarrow$  FL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
2. TIM5  $\Rightarrow$  RL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
3. TIM8  $\Rightarrow$  FR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
4. TIM4  $\Rightarrow$  RR encoder (TIMER)

- Prescale = 1-1
- ARR = 65535

### **1.3 External TB6612 Module (for right motor)**

1. EN\_L  $\Rightarrow$  3.3V / 5V (shorted)
2. C\_IN1  $\Rightarrow$  PB0 (GPIO)
  - GPIO Output
  - Pull Down
3. C\_IN2  $\Rightarrow$  PE6 (GPIO)
  - GPIO Output
  - Pull Down
4. D\_IN1  $\Rightarrow$  PD7 (GPIO)
  - GPIO Output
  - Pull Down
5. D\_IN2  $\Rightarrow$  PB3 (GPIO)
  - GPIO Output
  - Pull Down

### **1.4 External TB6612 Module (for left motor)**

1. EN\_R  $\Rightarrow$  3.3V / 5V (shorted)
2. A\_IN1  $\Rightarrow$  PA15 (GPIO)
  - GPIO Output
  - Pull Down
3. A\_IN2  $\Rightarrow$  PB7 (GPIO)
  - GPIO Output
  - Pull Down
4. B\_IN1  $\Rightarrow$  PD2 (GPIO)
  - GPIO Output
  - Pull Down
5. B\_IN2  $\Rightarrow$  PC12 (GPIO)
  - GPIO Output
  - Pull Down

## 1.5 Fan

1. TIM3→CCR3 ⇒ PE4 (PWM)
  - Prescale = 170-1
  - ARR = 10000-1

## 1.6 Hiwonder Board

1. UART4\_TX ⇒ PC10 (UART)
  - 9600 Bits/s
2. UART4\_RX ⇒ PC11 (UART)
  - 9600 Bits/s

## 1.7 Remote Controller

1. UART1\_TX ⇒ PC4 (UART)
  - 115200 Bits/s
2. UART1\_RX ⇒ PC5 (UART)
  - 115200 Bits/s

# 2 Jason's Car without Fan

## 2.1 Motor

1. TIM3→CCR4 ⇒ PE5 (FL) (C) (PWM)
  - Prescale = 1-1
  - ARR = 16800-1
2. TIM2→CCR4 ⇒ PD6 (RL) (D) (PWM)
  - Prescale = 1-1
  - ARR = 16800-1
3. TIM3→CCR2 ⇒ PE3 (FR) (B) (PWM)
  - Prescale = 1-1
  - ARR = 16800-1
4. TIM3→CCR1 ⇒ PE2 (RR) (A) (PWM)
  - Prescale = 1-1
  - ARR = 16800-1

## **2.2 Encoder**

1. TIM1  $\Rightarrow$  FL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
2. TIM5  $\Rightarrow$  RL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
3. TIM8  $\Rightarrow$  FR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
4. TIM4  $\Rightarrow$  RR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535

## **2.3 External TB6612 Module (for right motor)**

1. EN\_L  $\Rightarrow$  3.3V / 5V (shorted)
2. C\_IN1  $\Rightarrow$  PB0 (GPIO)
  - GPIO Output
  - Pull Down
3. C\_IN2  $\Rightarrow$  PE6 (GPIO)
  - GPIO Output
  - Pull Down
4. D\_IN1  $\Rightarrow$  PD7 (GPIO)
  - GPIO Output
  - Pull Down
5. D\_IN2  $\Rightarrow$  PB3 (GPIO)
  - GPIO Output
  - Pull Down

## **2.4 External TB6612 Module (for left motor)**

1. EN\_R  $\Rightarrow$  3.3V / 5V (shorted)
2. A\_IN1  $\Rightarrow$  PA15 (GPIO)
  - GPIO Output

- Pull Down
- 3. A\_IN2  $\Rightarrow$  PB7 (GPIO)
  - GPIO Output
  - Pull Down
- 4. B\_IN1  $\Rightarrow$  PD2 (GPIO)
  - GPIO Output
  - Pull Down
- 5. B\_IN2  $\Rightarrow$  PC12 (GPIO)
  - GPIO Output
  - Pull Down

## **2.5 Hiwonder Board**

1. UART4\_TX  $\Rightarrow$  PC10 (UART)
  - 9600 Bits/s
2. UART4\_RX  $\Rightarrow$  PC11 (UART)
  - 9600 Bits/s

## **2.6 Remote Controller**

1. UART1\_TX  $\Rightarrow$  PC4 (UART)
  - 115200 Bits/s
2. UART1\_RX  $\Rightarrow$  PC5 (UART)
  - 115200 Bits/s

# **3 Tommy's Car**

## **3.1 Motor**

1. TIM3 $\rightarrow$ CCR4  $\Rightarrow$  PE5 (FL) (C) (PWM)
  - Prescale = 1-1
  - ARR = 65535
2. TIM2 $\rightarrow$ CCR4  $\Rightarrow$  PA3 (RL) (D) (PWM)
  - Prescale = 1-1
  - ARR = 65535
3. TIM3 $\rightarrow$ CCR1  $\Rightarrow$  PE2 (FR) (B) (PWM)
  - Prescale = 1-1

- ARR = 65535
- 4. TIM2 → CCR3 ⇒ PD7 (RR) (A) (PWM)
  - Prescale = 1-1
  - ARR = 65535

### **3.2 Encoder**

1. TIM1 ⇒ FL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
2. TIM5 ⇒ RL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
3. TIM8 ⇒ FR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
4. TIM4 ⇒ RR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535

### **3.3 External TB6612 Module (for right motor)**

1. EN\_L ⇒ 3.3V / 5V (shorted)
2. C\_IN1 ⇒ PE3 (GPIO)
  - GPIO Output
  - Pull Down
3. C\_IN2 ⇒ PE4 (GPIO)
  - GPIO Output
  - Pull Down
4. D\_IN1 ⇒ PE6 (GPIO)
  - GPIO Output
  - Pull Down
5. D\_IN2 ⇒ PC13 (GPIO)
  - GPIO Output
  - Pull Down

### **3.4 External TB6612 Module (for left motor)**

1. EN\_R  $\Rightarrow$  3.3V / 5V (shorted)
2. A\_IN1  $\Rightarrow$  PA8 (GPIO)
  - GPIO Output
  - Pull Down
3. A\_IN2  $\Rightarrow$  PA9 (GPIO)
  - GPIO Output
  - Pull Down
4. B\_IN1  $\Rightarrow$  PA10 (GPIO)
  - GPIO Output
  - Pull Down
5. B\_IN2  $\Rightarrow$  PA11 (GPIO)
  - GPIO Output
  - Pull Down

### **3.5 Linear Actuator**

1. LINEAR\_ACT\_1\_1  $\Rightarrow$  PD2 (GPIO)
  - GPIO Output
  - Pull Down
2. LINEAR\_ACT\_1\_2  $\Rightarrow$  PD4 (GPIO)
  - GPIO Output
  - Pull Down
3. LINEAR\_ACT\_2\_1  $\Rightarrow$  PD6 (GPIO)
  - GPIO Output
  - Pull Down
4. LINEAR\_ACT\_2\_2  $\Rightarrow$  PD1 (GPIO)
  - GPIO Output
  - Pull Down

### **3.6 Remote Controller**

1. UART1\_TX  $\Rightarrow$  PC4 (UART)
  - 115200 Bits/s
2. UART1\_RX  $\Rightarrow$  PC5 (UART)

- 115200 Bits/s

## 4 Kitty's Car

### 4.1 Motor

1. TIM3→CCR2 ⇒ PE3 (FL) (PWM)
  - Prescale = 15-1
  - ARR = 65535-1
2. TIM2→CCR1 ⇒ PD3 (RL) (PWM)
  - Prescale = 15-1
  - ARR = 65535-1
3. TIM3→CCR1 ⇒ PE2 (FR) (PWM)
  - Prescale = 15-1
  - ARR = 65535-1
4. TIM2→CCR2 ⇒ PD4 (RR) (PWM)
  - Prescale = 15-1
  - ARR = 65535-1

### 4.2 Encoder

1. TIM1 ⇒ FL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
2. TIM5 ⇒ RL encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
3. TIM8 ⇒ FR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535
4. TIM4 ⇒ RR encoder (TIMER)
  - Prescale = 1-1
  - ARR = 65535



### **4.3 TB6612 (for left motor)**

1. MOTOR\_LEFT\_ENABLE  $\Rightarrow$  PC3 (GPIO)
  - GPIO Output
  - Pull Down
2. MOTOR\_FL\_IN1  $\Rightarrow$  PA5 (GPIO)
  - GPIO Output
  - Pull Down
3. MOTOR\_FL\_IN2  $\Rightarrow$  PA4 (GPIO)
  - GPIO Output
  - Pull Down
4. MOTOR\_RL\_IN1  $\Rightarrow$  PA6 (GPIO)
  - GPIO Output
  - Pull Down
5. MOTOR\_RL\_IN2  $\Rightarrow$  PA7 (GPIO)
  - GPIO Output
  - Pull Down

### **4.4 TB6612 (for right motor)**

1. MOTOR\_RIGHT\_ENABLE  $\Rightarrow$  PD15 (GPIO)
  - GPIO Output
  - Pull Down
2. MOTOR\_FR\_IN1  $\Rightarrow$  PA10 (GPIO)
  - GPIO Output
  - Pull Down
3. MOTOR\_FR\_IN2  $\Rightarrow$  PA11 (GPIO)
  - GPIO Output
  - Pull Down
4. MOTOR\_RR\_IN1  $\Rightarrow$  PA9 (GPIO)
  - GPIO Output
  - Pull Down
5. MOTOR\_RR\_IN2  $\Rightarrow$  PA8 (GPIO)
  - GPIO Output
  - Pull Down

#### **4.5 Stepper Motor**

1. TIM3→CCR4 ⇒ PE5 (PWM)
  - Prescale = 1-1
  - ARR = 65535
2. STEPPER\_DIR\_GPIO\_Port ⇒ PE4 (GPIO)
  - GPIO Output
  - Pull Down

#### **4.6 Servo Motor**

1. TIM2→CCR4 ⇒ PD6 (Big Wheel's Servo) (PWM)
  - Prescale = 1-1
  - ARR = 65535

#### **4.7 Remote Controller**

1. UART1\_TX ⇒ PC4 (UART)
  - 115200 Bits/s
2. UART1\_RX ⇒ PC5 (UART)
  - 115200 Bits/s