

2-DOF gimbal

1. Learning objectives

Drive 2-DOF gimbal.

2. Hardware connection

The servos used in this case are 180 and 270

MSPM0G3507 connected to servo pins

PA17 connected to 180-degree servo

PA18 connected to 270-degree servo

All modules connected together must share a common ground

3. Program description

- bsp_servo.h

```
#ifndef __BSP_SERVO_H_
#define __BSP_SERVO_H_

#include "ti_msp_dl_config.h"

void Set_Servo270_Angle(unsigned int angle);
void Set_Servo_Angle(unsigned int angle);
unsigned int Get_Servo_Angle(void);
unsigned int Get_Servo_Angle270(void);

#endif
```

Define four servo control functions.

- bsp_servo.c

```
/*
 * *****
 * Function name: Set_Servo270_Angle
 * Function description: Set 270 degree servo
 * Function parameter: angle = angle to be set, range 0-270
 * Function return: None
 * 函数名称: Set_Servo270_Angle
 * 函数说明: 设置270度舵机
 * 函数形参: angle=要设置的角度, 范围0-270
 * 函数返回: 无
 * *****
 */
void Set_Servo270_Angle(unsigned int angle)
{
    uint32_t period = 400;

    if(angle > 270)
```

```

{
    angle = 270; // 限制角度在0到270度之间 Limit the angle to between 0 and
270 degrees
}

Servo_Angle270 = angle;

// 计算pwm占空比 Calculate pwm duty cycle
// 0.5ms对应的计数 = 10    0.5ms corresponding count = 10
// 2.5ms对应的计数 = 50    Count corresponding to 2.5ms = 50
float min_count = 10.0f;
float max_count = 50.0f;
float range = max_count - min_count;
float ServoAngle = min_count + (((float)angle / 270.0f) * range);

DL_TimerG_setCaptureCompareValue(PWM_Servo_INST, (unsigned int)(ServoAngle
+ 0.5f), GPIO_PWM_Servo_C1_IDX);
}

unsigned int Get_Servo_Angle270(void)
{
    return Servo_Angle270;
}

```

Set_Servo270_Angle is used to set the angle of the servo motor, and Get_Servo_Angle270 is used to obtain the current angle of the servo motor.

Note: The project source code must be placed in the SDK path for compilation,

For example, the path: D:\TI\M0_SDK\mspm0_sdk_1_30_00_03\1.TB6612

新加卷 (D:) > TI > M0_SDK > mspm0_sdk_1_30_00_03				
名称	修改日期	类型	大小	
1.TB6612	2024/7/22 18:59	文件夹		
2.AT8236	2024/7/22 19:47	文件夹		
3.Encoder	2024/7/23 10:36	文件夹		
4.Servo	2024/7/23 11:13	文件夹		
docs	2024/7/23 10:33	文件夹		
examples	2024/7/23 10:34	文件夹		
kernel	2024/7/23 10:37	文件夹		
source	2024/7/23 10:33	文件夹		
tools	2024/7/23 10:33	文件夹		
imports.mak	2024/1/25 11:45	MAK 文件	2 KB	
known_issues_FAQ.html	2024/1/25 11:42	Microsoft Edge ...	67 KB	
license_mspm0_sdk_1_30_00_03.txt	2024/1/25 11:42	文本文档	33 KB	
manifest_mspm0_sdk_1_30_00_03.html	2024/1/25 11:42	Microsoft Edge ...	113 KB	
mspm0sdk_1_30_00_03.log	2024/7/23 10:42	文本文档	5,237 KB	
release_notes_mspm0_sdk_1_30_00_0...	2024/1/25 11:42	Microsoft Edge ...	108 KB	
uninstall.dat	2024/7/23 10:39	DAT 文件	344 KB	
uninstall.exe	2024/7/23 10:39	应用程序	6,048 KB	

