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