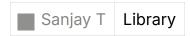
# **Servomotor library function**



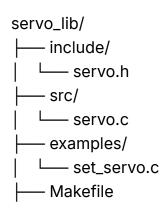
# Ruggedboard A5D2X PWM Servo Library — servo\_lib

# ✓ Step-by-Step: Create Your Own C Library for Servo Motor Control

We'll build a reusable C static library named servo\_lib to control a servo motor using PWM on Ruggedboard A5D2X.

Signal	PWM Path	Period	Duty Cycle Range
PWM0	/sys/class/pwm/pwmchip0/pwm0	20ms (20000000 ns)	1ms-2ms (1000000- 2000000 ns)

### 1. Folder Structure



2. include/servo.h

```
#ifndef SERVO_H
#define SERVO_H

void setup_pwm();
void set_servo_angle(int angle);

#endif
```

#### 3. src/servo.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <fcntl.h>
#include "servo.h"
#define PWM_CHIP "/sys/class/pwm/pwmchip0"
#define PWM_CHANNEL "0"
void setup_pwm() {
int fd;
fd = open(PWM_CHIP "/export", O_WRONLY);
if (fd >= 0) {
  write(fd, PWM_CHANNEL, strlen(PWM_CHANNEL));
  close(fd);
  usleep(100000);
}
fd = open(PWM_CHIP "/pwm0/period", O_WRONLY);
if (fd >= 0) {
  write(fd, "20000000", 8); // 20ms period
```

```
close(fd);
}
fd = open(PWM_CHIP "/pwm0/enable", O_WRONLY);
if (fd >= 0) {
  write(fd, "1", 1);
  close(fd);
}
}
void set_servo_angle(int angle) {
int duty_ns = 1000000 + (angle * 1000000 / 180);
char buffer[32];
snprintf(buffer, sizeof(buffer), "%d", duty_ns);
int fd = open(PWM_CHIP "/pwm0/duty_cycle", O_WRONLY);
if (fd >= 0) {
  write(fd, buffer, strlen(buffer));
  close(fd);
}
printf("Servo set to %d°\\n", angle);
```

## 4. examples/set\_servo.c — Sample Application

```
#include <unistd.h>
#include <stdio.h>
#include "servo.h"

int main() {
  setup_pwm();
  for (int i = 0; i <= 180; i += 45) {
     set_servo_angle(i);
}</pre>
```

```
sleep(1);
}
return 0;
}
```

4. Makefile for servo\_lib

```
CC? = ${CC}

CFLAGS = -Wall -linclude

LIB_SRC = src/servo.c

EXAMPLE_SRC = examples/set_servo.c

all: set_servo

set_servo:

$(CC) $(CFLAGS) $(LIB_SRC) $(EXAMPLE_SRC) -o set_servo

clean:
rm -f set_servo
```

## ✓ Usage Instructions

```
. /opt/poky-tiny/2.5.2/environment-setup-cortexa5hf-neon-poky-linux-muslea
make # Cross-compile set_servo for RuggedBoard
sudo cp set_servo /srv/tftp
//then
//in rugged board
tftp -r set_servo -g 192.168.1.15 //replace ur ipaddress of host machine
```

# On the RuggedBoard:

chmod +x ./set\_servo