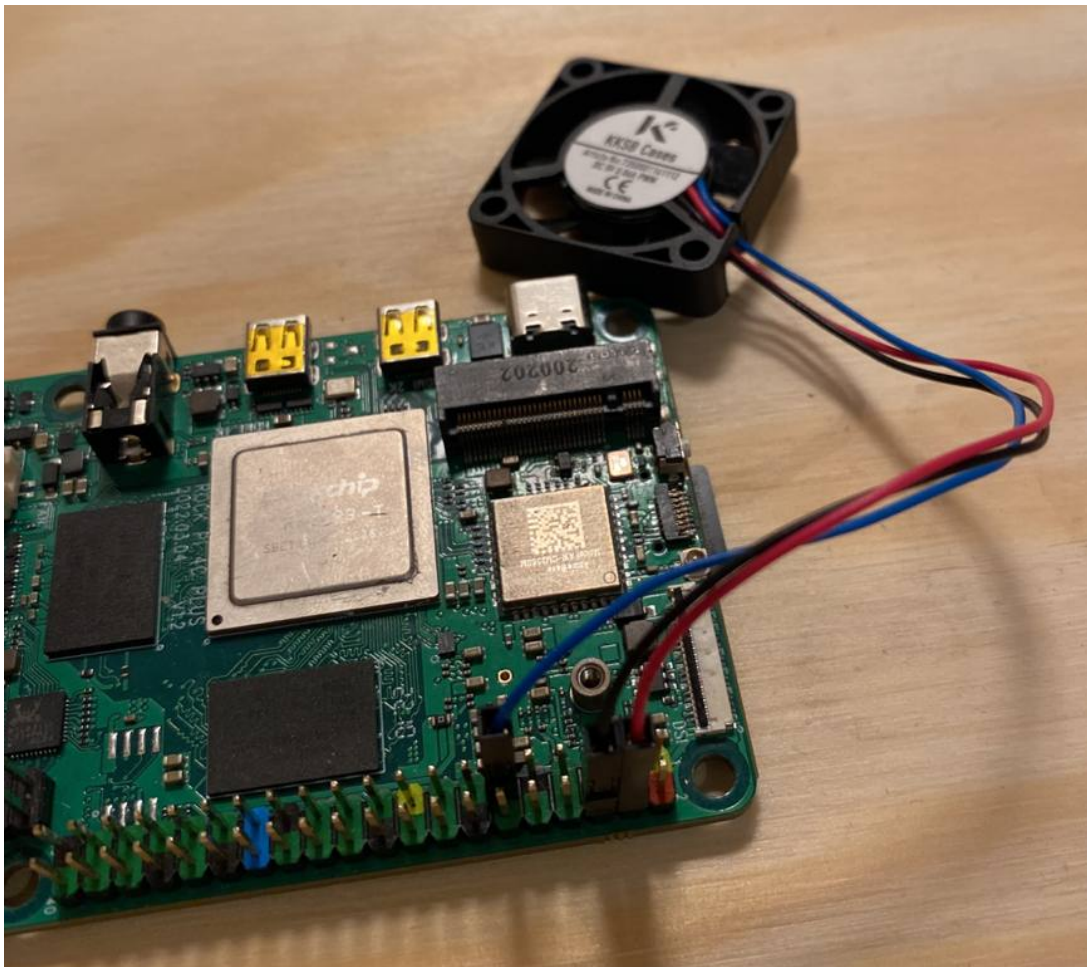
Temperature controlled KKSB PWM fan on Rock 4 C+ Android

In this KKSB Fan wiring guide, we are taking Rock 4 C+ GPIO as an example running the Official Android 11 OS. But you can use this fan and instruction with other RockPis as well with smaller tweaks.

Connection diagram

The KKSB 30mm 5V PWM Fan has 3 wires. Red for 5V, Black for GND and Blue for the PWM signal.

Function	Pin#	Pin#	Function
+3.3V	1	2	+5.0V
I2C7_SDA	3	4	+5.0V
I2C7_SCL	5	6	GND
SPI2_CLK	7	8	UART2_TXD
GND	9	10	UART2_RXD
PWM0	11	12	I2S1_SCLK
PWM1	13	14	GND
SPDIF_TX	15	16	
+3.3V	17	18	
SPI1_TXD	19	20	GND
SPI1_RXD	21	22	
SPI1_CLK	23	24	SPI1_CSn
GND	25	26	ADC_IN0
I2C2_SDA	27	28	I2C2_CLK
SPI2_TXD	29	30	GND
SPI2_RXD	31	32	SPDIF_TX
SPI2_CSn	33	34	GND
I2S1_LRCK_TX	35	36	I2S1_LRCK_RX
	37	38	I2S1_SDI
GND	39	40	I2S1_SDO

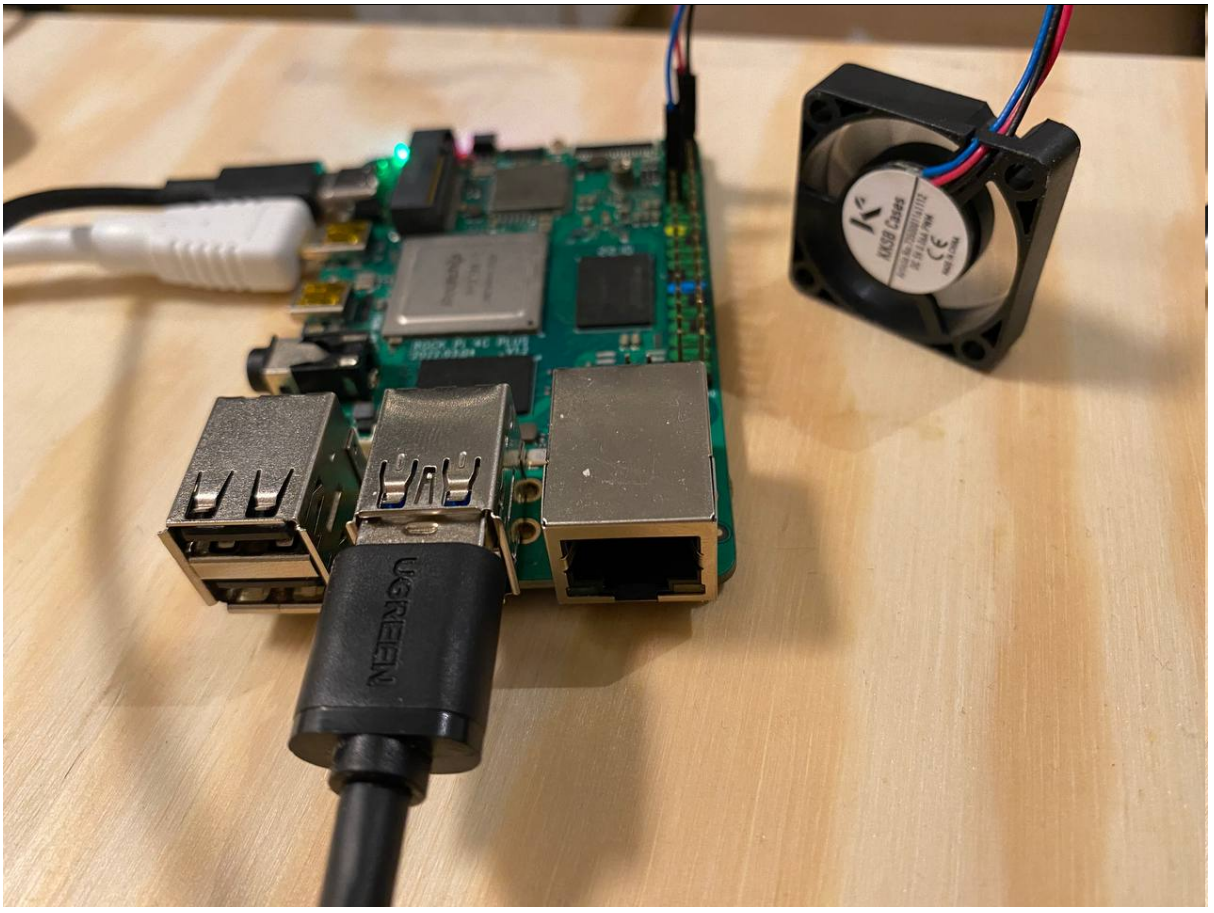


Connect Red to pin 4
Connect Black to pin 6
Connect Blue to pin 11

Connect with ADB (Android Debug Bridge) (OPTIONAL)

We will use ADB to transfer the fan control script and install the script runner, but there are many other ways to do it on Android itself.

1. Install adb on a PC and enable USB debugging in Rock 4 C Plus settings. Follow this excellent guide on how to get it up and running: https://www.xda-developers.com/install-adb-windows-macos-linux/
2. Connect with a USB A male to USB A male cable between your PC to the top USB 3.0 port on the Rock 4 C+:



3. Test if the device is recognised by running "*adb devices"* in a terminal, a list of connected devices should be shown.

Shell script

This script will run indefinitely measuring the temperature and react by changing the PWM duty cycle to the fan. Feel free to change the LEVEL to temperature limits that suit you.

Create a file on your PC named *“fan.sh”* with the following code inside it. Save the file.

Script:

```
#!/bin/sh

LEVEL1=35 # Turn off if temperature is under
LEVEL2=50 # Full speed if temperature is above
LOOP_TIME=10 # Seconds between temperature check

# Initialize PWM0 on pin 11 (change to 13 for PWM1)
mraa-pwm period 11 700
mraa-pwm enable 11

# Main loop
while true; do
    # Read Temperature
    cpu=$(cat /sys/class/thermal/thermal_zone0/temp)
    cpu=$(echo "$cpu / 1000" | bc -l)

    # Control fan speed
    # Each "elif" can be copied for more granular control
    if [ $(echo "$cpu < $LEVEL1" | bc -l) -eq 1 ]; then
        mraa-pwm percentage 11 1
    elif [ $(echo "$cpu < $LEVEL2" | bc -l) -eq 1 ]; then
        mraa-pwm percentage 11 0.5
    else
       mraa-pwm percentage 11 0
    fi
    sleep $LOOP_TIME
done
```

In a command window, navigate to the script directory and transfer the file to Rock 4 C+ by running:

```
adb push fan.sh /sdcard/Download/
```

This will transfer the file to */sdcard/Download/* folder on the Rock 4 C+. You could use other methods to transfer the file.

To test if the script works by writing the code below in a command window:

```
adb shell sh /sdcard/Download/fan.sh
```

And the fan should spin up.

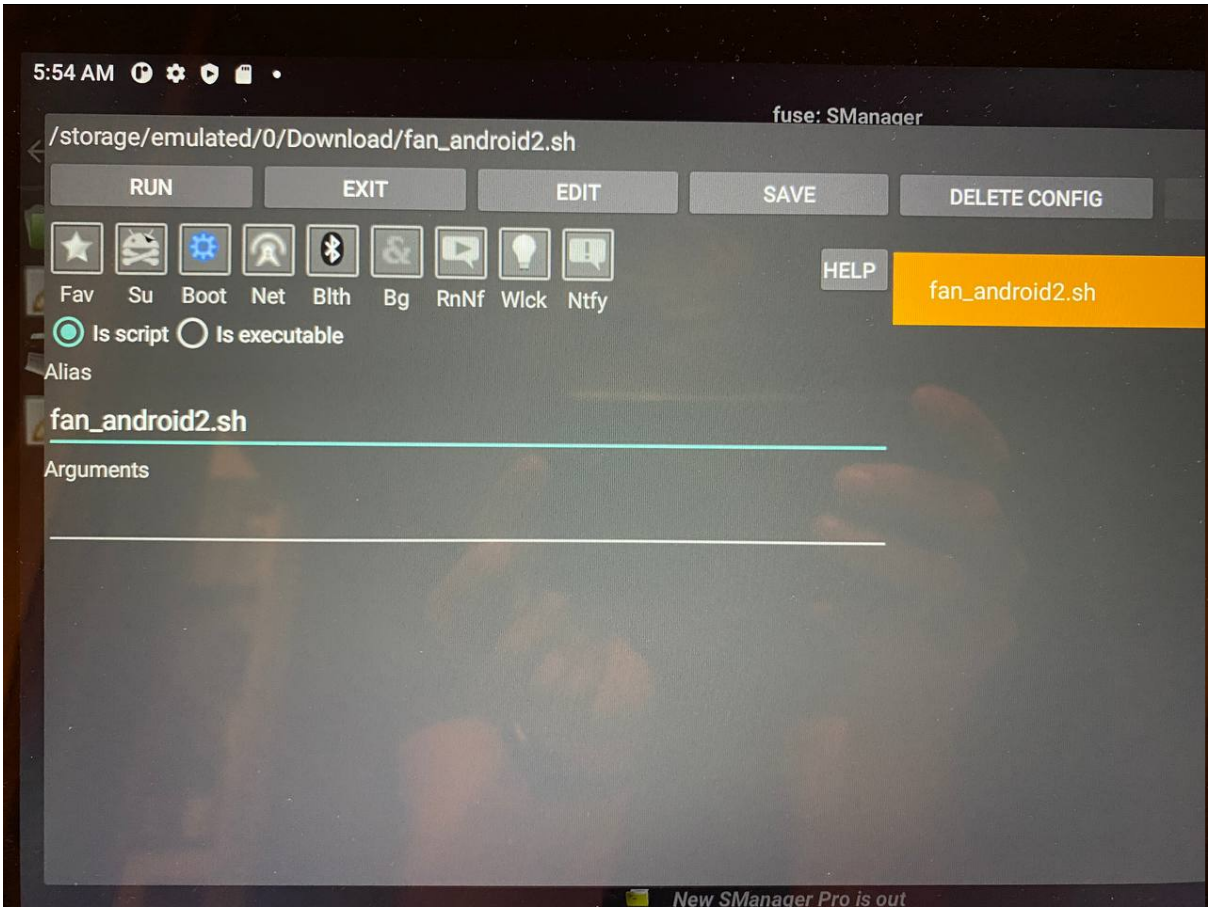
Autostart script

We will be using *SManager* to autostart the script: https://apkpure.com/script-manager-smanager/os.tools.scriptmanager or https://play.google.com/store/apps/details?id=os.tools.scriptmanager

To install *SManager* without Google Play(replace <package.apk> with the name of the SManager package you downloaded.

```
adb install <package.apk>
```

Navigate to the script and press the Boot icon so it turns blue to autostart the script on boot.



Press Save.

Turn off the Rock 4 C plus and start it again to test that the fan start