

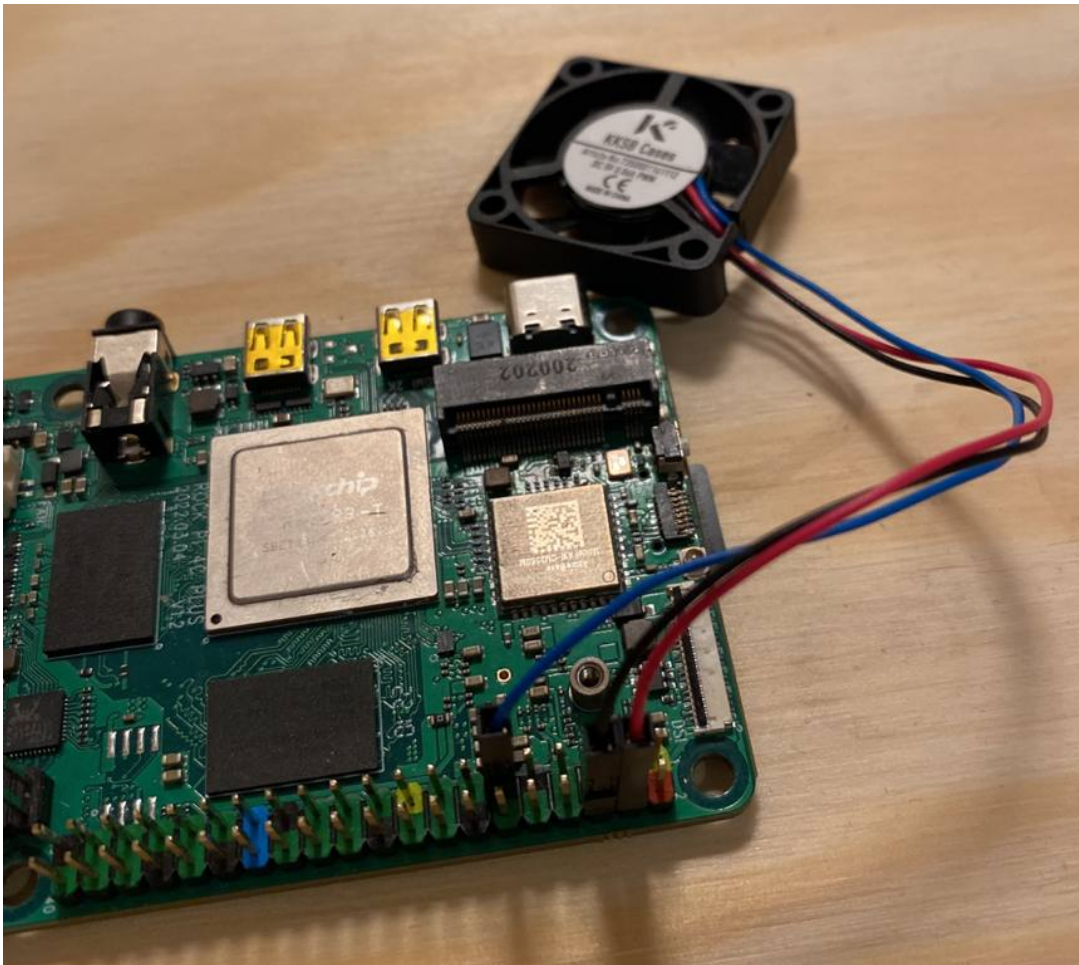
## Temperature controlled KKSB PWM fan on Rock 4 C Plus Debian

In this KKSB Fan wiring guide, we are taking Rock 4 C Plus GPIO as an example running the Official Debian 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_CS <sub>n</sub>
GND	25	26	ADC_IN0
I2C2_SDA	27	28	I2C2_CLK
SPI2_TXD	29	30	GND
SPI2_RXD	31	32	SPDIF_TX
SPI2_CS <sub>n</sub>	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

## Enable PWM

In Radxa Official Debian release for RockPi 4 C Plus libmraa is already installed, for other OSes follow the guide for that release on how to enable GPIO and install libmraa.

First open `/boot/hw_intfc.conf` to enable PWM.

Copy this text and paste into a terminal:

```
sudo nano /boot/hw_intfc.conf
```

Change `pwm0=off` to `on` and `pwm1=off` to `on`

```
# Hardware Interface Config
# For more details, check
https://wiki.radxa.com/Rockpi4/hardware/devtree\_overlays.
# Set "on" to enable the optional hardware interfaces while set "off"
to disable

intfc:pwm0=on
intfc:pwm1=on
intfc:uart2=off
intfc:uart4=off
intfc:spi1=off
intfc:spi2=off
intfc:i2c2=off
intfc:i2c6=off
intfc:i2c7=off
```

ctrl+x to save.

Reboot for it to take effect

## Python script

To create the script, copy this text and paste into a terminal:

```
nano fan.py
```

Copy and paste this script into the nano editor, pay close attention to the indents. Python is sensitive to indentation so everything after *while True* needs to have the same amount of whitespaces before it.

```
import mraa
import time

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

# Initialize PWM
fan = mraa.Pwm(11) # 11 for PWM0, 13 for PWM1
fan.period_us(700)
fan.enable(True)

# Main loop
while True:
    # Read Temperature
    file = open("/sys/class/thermal/thermal_zone0/temp")
    cpu = float(file.read()) / 1000

    # Control fan speed
    # Each "elif" can be copied for more granular control
    if cpu < LEVEL1:
        fan.write(1) # The pin is inverted so a 1 means off and a 0
means full speed
    elif cpu < LEVEL2:
        fan.write(0.5) # Half speed
    else:
        fan.write(0) # Full speed
    time.sleep(LOOP_TIME)
```

ctrl+x to save.

Test script:

Copy this text and paste into a terminal:

```
sudo python fan.py
```

sudo is required to access PWM

ctrl+c to stop script

## Autostart script

Create a systemd script to autostart the script at startup  
Copy this text and paste into a terminal:

```
sudo nano /etc/systemd/system/fan.service
```

Copy and paste this text into the nano editor:

```
[Unit]
Description=Fan control service
After=multi-user.target

[Service]
Type=simple
Restart=always
ExecStart=/usr/bin/python3 /home/<username>/fan.py

[Install]
WantedBy=multi-user.target
```

Replace <username> with your username ( **rock** as standard )

ctrl+x to save.

Reload the systemd daemon

```
sudo systemctl daemon-reload
```

Enable fan.service so it doesn't stop after a restart

Copy this text and paste into a terminal:

```
sudo systemctl enable test.service
```

Start the service

Copy this text and paste into a terminal:

```
sudo systemctl start test.service
```

Now the fan.py is up and running every time the system boots.