

RockPi-S

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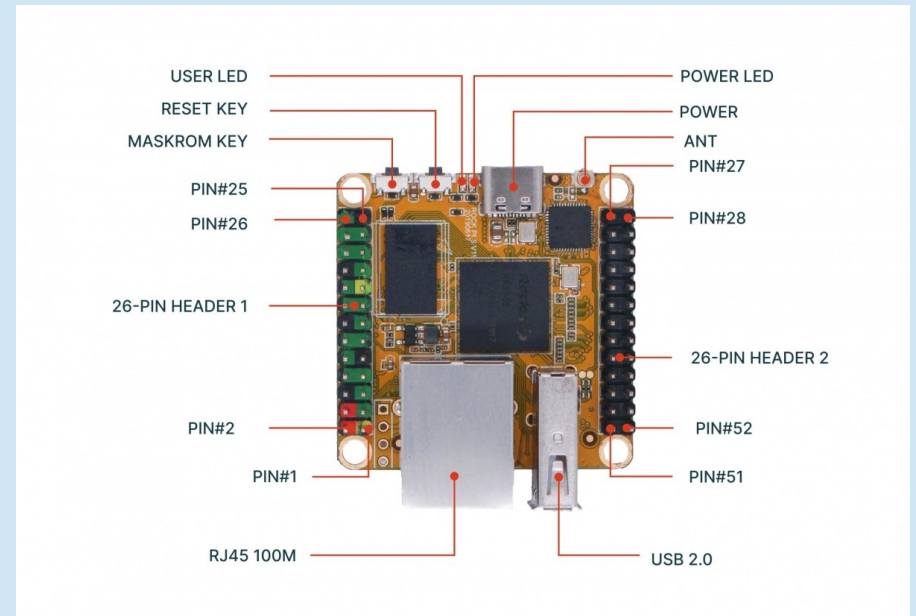
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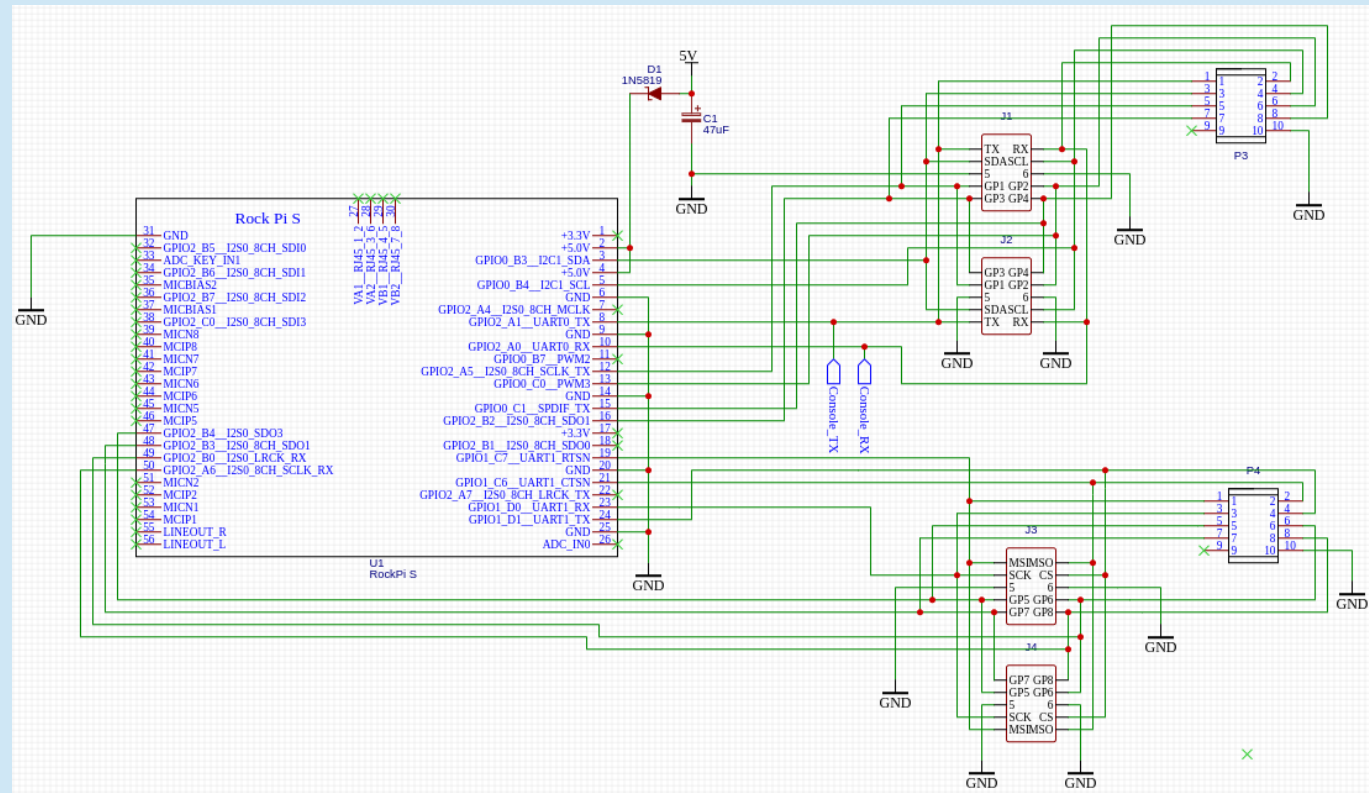
Hardware Overview

- Linux based microcontroller
- USD instead of disk
- Most of common interfaces



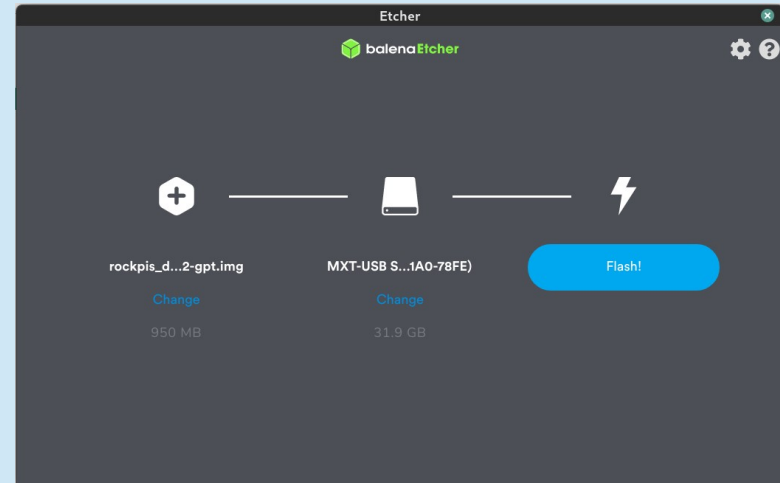
Development board

- UART = UART0
- I2C = I2C1
- SPI = SPI2
- GP1 = GPIO2_A5
- GP2 = GPIO0_C0
- GP3 = GPIO2_B2
- GP4 = GPIO0_C1
- GP5 = GPIO2_B4
- GP6 = GPIO2_B0
- GP7 = GPIO2_B3
- GP8 = GPIO2_A6



Download and Flash Debian Image

- Etcher - flash application
 - <https://etcher.balena.io/#download-etcher>
 - balenaEtcher-1.18.11-x64.AppImage
- Debian Image
 - <https://wiki.radxa.com/RockpiS/downloads>
 - https://is.muni.cz/auth/el/fi/podzim2023/PV284/um/lab_examples/rockpi/



Connection to RockPI

- adb shell
- Debian: apt-get install adb
- Windows:
 - https://wiki.radxa.com/Rock/windows_adb
 - <https://www.getdroidtips.com/how-to-install-adb-and-fastboot-on-windows/>
- ip add – get ip address
- Putty / ssh
 - Username rock, password rock

RockPi S pinout

GPIO number	Func4	Func3	Func2	Func1	Pin#	Pin#	Func1	Func2	Func3	Func4	GPIO [Collapse] number
				+3.3V	1	2	+5.0V				
11			I2C1_SDA	GPIO0_B3	3	4	+5.0V				
12			I2C1_SCL	GPIO0_B4	5	6	GND				
68		PDM_CLK_M_M2	I2S0_8CH_MCLK	GPIO2_A4	7	8	GPIO2_A1	UART0_TX	SPI0_MOSI		65
				GND	9	10	GPIO2_A0	UART0_RX	SPI0_MISO		64
15		I2C3_SDA_M0	PWM2	GPIO0_B7	11	12	GPIO2_A5	I2S0_8CH_SCLK_TX			69
16		I2C3_SCL_M0	PWM3	GPIO0_C0	13	14	GND				
17			SPDIF_TX	GPIO0_C1	15	16	GPIO2_B2	I2S0_8CH_SDO1			74
				+3.3V	17	18	GPIO2_B1	I2S0_8CH_SDO0			73
55	SPI2_MOSI	UART2_TX_M0	UART1_RTSN	GPIO1_C7	19	20	GND				
54	SPI2_MISO	UART2_RX_M0	UART1_CTSN	GPIO1_C6	21	22	GPIO2_A7	I2S0_8CH_LRCK_TX			71
56	SPI2_CLK	I2C0_SDA	UART1_RX	GPIO1_D0	23	24	GPIO1_D1	UART1_TX	I2C0_SCL	SPI2_CSN0	57
				GND	25	26	ADC_IN0				

Tuning /boot/uEnv.txt

- `fdtfile=rockchip/rk3308-rock-pi-s.dtb`
- `overlays=rk3308-console-on-uart0 rk3308-i2c0
rk3308-i2c1 rk3308-i2c3-m0`
- `console=ttyS0,9600n8`
- `rootuuid=37055840-4ec4-444f-979b-9e47ee4bd848`

Dealing with GPIO

- Direct work with GPIO possible but uncomfortable:
 - `cd /sys/class/gpio`
 - `echo X > export`
 - $X = 32 * \text{Gpio_num} + 8 * \text{Gpio_gate} + \text{Gpio_pin}$
 - Gpio_gate A=0, B=1, ...
- `cd gpioX`
- `echo out > direction`
- `echo 1 > value`

Install libraries

- <https://wiki.radxa.com/RockpiS/dev/libmraa>
- `apt-get update -- fix-missing`
- `apt-get upgrade`
- `apt-get install libmraa`
- `apt-get install -y build-essential`

libmraa

- mraa-gpio list
- A test with push-button application:
- mraa-gpio set 12 0
- 12 = GP-1 GPIO2_A5 (LED pin in the hardware description)
- 0 = pin's value

```
root@rockpi5:/# mraa-gpio list
01          3V3:
02          5V:
03      I2C_SDA: GPIO I2C
04          5V:
05      I2C_SCL: GPIO I2C
06          GND:
07 I2S0_8CH_MC: GPIO
08      UART0_TX: GPIO UART
09          GND:
10      UART0_RX: GPIO UART
11 PWM2,I2C3_S: GPIO I2C PWM
12 I2S0_8CH_SC: GPIO
13 PWM3,I2C3_S: GPIO I2C PWM
14          GND:
15      SPDIF_TX: GPIO
16 I2S0_8CH_SD: GPIO
17          3V3:
18 I2S0_8CH_SD: GPIO
19 UART1_RTSM, : GPIO SPI  UART
20          GND:
21 UART1_CTSN, : GPIO SPI  UART
22 I2S0_8CH_LR: GPIO
23 UART1_RX,I2: GPIO I2C  SPI  UART
24 UART1_TX,I2: GPIO I2C  SPI  UART
25          GND:
26      ADC_IN0: AIO
27          GND:
28 I2S0_8CH_SD: GPIO
29 ADC_KEY_IN1: AIO
30 I2S0_8CH_SD: GPIO
31      MICBIAS2:
32 I2S0_8CH_SD: GPIO
33      MICBIAS1:
34 I2S0_8CH_SD: GPIO
35      MICN8:
36      MCIP8:
37      MICN7:
38      MCIP7:
39 UART3_TX, I: GPIO I2C  SPI  UART
40 UART3_RX, I: GPIO I2C  SPI  UART
41      SPI1_CLK: GPIO SPI
42      SPI1_MISO: GPIO SPI
43 I2S0_8CH_SD: GPIO
44 I2S0_8CH_SD: GPIO
45 I2S0_8CH_LR: GPIO
46 I2S0_8CH_SC: GPIO
47      MICN2:
48      MICIP2:
49      MICN1:
50      MCIP1:
51      LINEOUT_R:
52      LINEOUT_L:
```

libmraa

- `cp -av /usr/local/share/mraa/examples/c /home/rock/mraa-examples`
- `cd /home/rock/mraa-examples`
- Compiling - example:
- `rock@rockpis:~/mraa-examples$ gcc -o test-spi test-spi.c -lmraa`

libmraa - examples

- All materials can be found on GIT FI after logging in with your faculty account.
- https://gitlab.fi.muni.cz/iot-courses/pv284/-/tree/main/Labs/Lab6-rock-pi?ref_type=heads<https://is.muni.cz/auth/go/acxh39>

**Now it is the time for
your own experiments!**