px4 bootloader flash地址 0x08000000 ~ 0x08004000

user firmware flash起始地址 0x08004000

固件更新软件: QGroundControl/MissionPlanner

更新方式, 在固件更新页面中检测到USB插入, 选择用户自定义的bin文件

FMU   主控MCU: STM32F427VIT6, 晶振25M, 主频180MHz

px4io 副控MCU: STM32F100C8T6, 管理所有RC输入和IO输出

外部接口:

TELEM_1: [UART2] (TRX(PD5 PD6) CRTS(PD3 PD4))

TELEM_2: [UART3] (TRX(PD8 PD9) CRTS(PD11 PD12))

GPS: [UART4] (TRX(PA0, PA1) CANTRX [CAN2] (PB6, PB12))

SERIAL4/5: [UART7+UART8] (UART7 TRX(PE7, PE8), UART8(PE0, PE1))

SPI: [SPI4] SCK(PE2), NSS(PE4), MISO(PE5), MOSI(PE6)

I2C: [I2C1] SCL(PB8), SDA(PB9)

USB: [OTG-FS] DM(PA11) DP(PA12)

CAN: [CAN1] TX(D1) RX(D0)

ADC 3.3V: G [ADC1] (PC3) [ADC2] (PC4) V

ADC 6.6V: PC5

SWITCH: G PB5 PB13(LED) V -> 副控

BUZZER: PA15

SPKT/DSM: [USART1] RX(PA10) -> 副控

TF: [SDIO] D0(PC8) D1(PC9) D2(PC10) D3(PC11) CMD(PD2) CK(PC12)

FMU和IO(主控与副控链接)

USART6 PC6(FMUtoIO) PC7(IOtoFMU)

显示模组:

RGB(TCA62724驱动): [I2C2] SCL(PB10) SDA(PB11)

LED(FMU): PE12(low active)

传感器组 [SPI1]:

MPU6000 SCK(PA5) MISO(PA6) MOSI(PA7) CS(PC2) MPU_DRDY(INT)(D15)

LSM303D SCK(PA5) MISO(PA6) MOSI(PA7) CS(PC15) ACC_DRDY(B4) MAG_DRDY(B1)

L3GD201R SCK(PA5) MISO(PA6) MOSI(PA7) CS(PC13) GYRO_DRDY(INT)(B0)

MS5611 SCK(PA5) MISO(PA6) MOSI(PA7) CS(PD7)

存储器 [SPI2]:

FM25V01A SCK(PB13) MISO(PB14) MOSI(PB15) CS(PD10)

输入输出口:

FMU副输出:

CH1 CH2 CH3 CH4 CH5 CH6

E14 E13 E11 E9 D13 D14

IO主输出 -> 接入副控:

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8

A0 A1 B8 B9 A6 A7 B0 B1

SBUS/RC输入输出 (接SN74LVC2G240DCUR反相器) -> 接入副控:
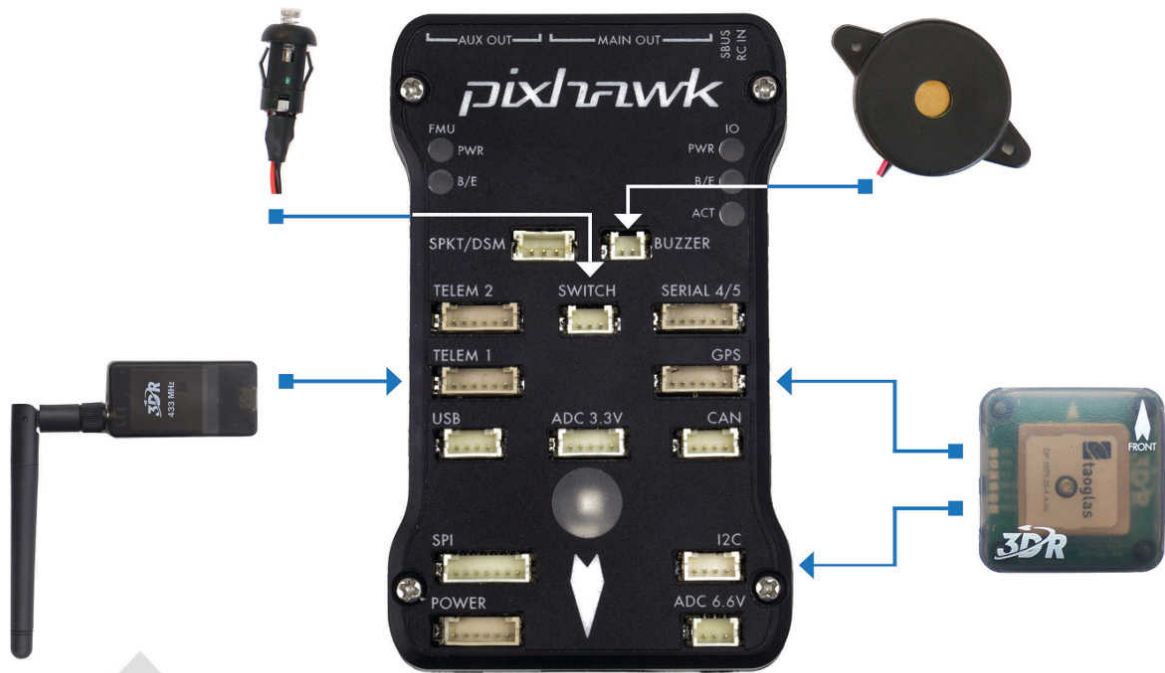
SBUS_INPUT: PB11

SBUS_OUTPUT: PB10

SBUS_OUTPUT_EN: PB4

PPM_INPUT: PA8

RSSI_IN: PA5 PA12

pixhawk 2.4.8 基本器件接线图

(Required) Connect the buzzer and safety switch.

AUX OUT — MAIN OUT — SBUS RC IN

pixhawk

FMU
PWR
B/E

IO
PWR
B/E
ACT

SPKT/DSM   BUZZER

TELEM 2   SWITCH   SERIAL 4/5

TELEM 1   GPS

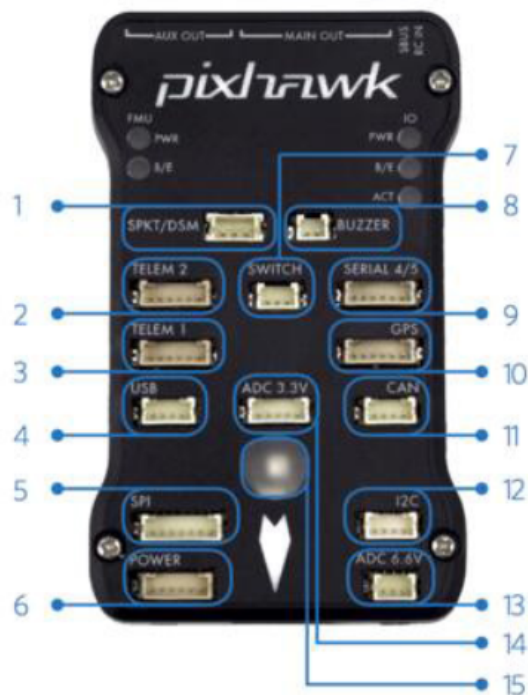USB   ADC 3.3V   CAN

SPI   I2C

POWER   ADC 6.6V

(Optional) Connect a 3DR Radio to Pixhawk's Telem port using the 6-wire cable provided with your 3DR Radio Kit to receive data and communicate with the autopilot in flight.

(Required) Connect a 3DR GPS+Compass to provide the autopilot with positioning data during flight. This kit includes a 6-wire cable to connect the GPS ports. Connect the MAG to the I2C port using the 4-wire cable provided with the 3DR GPS+Compass.

(Required) Connect the 3DR Power Module to the Power port using the 6-wire cable to direct power from your lithium polymer (LiPo) battery to the autopilot.
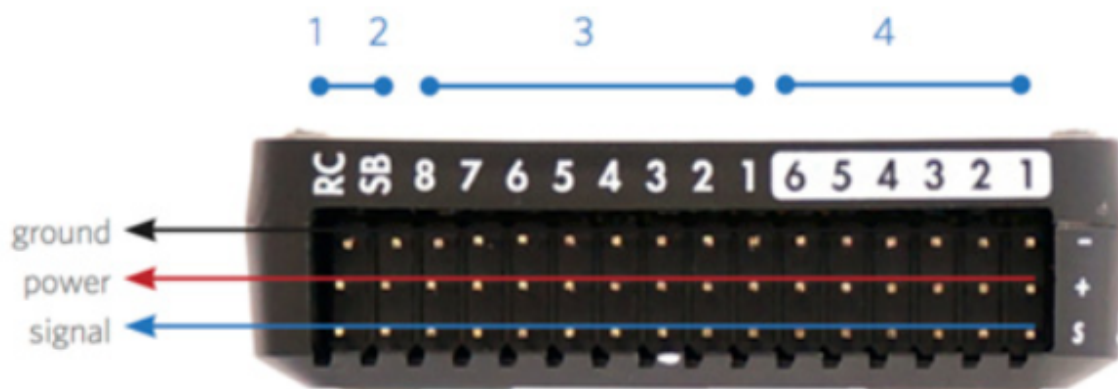
(Optional) The I2C splitter expands the I2C port to allow up to four additional peripherals to connect to Pixhawk. Use the 4-wire cable to connect the I2C splitter and add a compass module, external LED, digital airspeed sensor, or other peripherals to your vehicle.

1 Spektrum DSM 接收机专用接口
2 遥测：屏幕显示 OSD（TELEM2）
3 遥测：数传（TELEM1）
4 USB
5 SPI 总线（串行外设接口）
6 电源模块（接供电检测模块）
7 安全开关
8 蜂鸣器
9 串口
10 GPS 模块
11 CAN 总线
12 I²C 分路器或接指南针（罗盘）模块
13 模数转换器（ADC）6.6V
14 模数转换器（ADC）3.3V
15 LED 指示灯

1 接收机输入   2 S.BUS 输出   3 主输出   4 辅助输出

1 输入/输出重置按钮   2 SD 卡插槽   3 飞行管理重置按钮   4 Micro-USB 接口

TELEM1, TELEM2 ports

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	TX (OUT)	+3.3V
3 (blk)	RX (IN)	+3.3V
4 (blk)	CTS (IN)	+3.3V
5 (blk)	RTS (OUT)	+3.3V
6 (blk)	GND	GND

GPS port

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	TX (OUT)	+3.3V
3 (blk)	RX (IN)	+3.3V
4 (blk)	CAN2 TX	+3.3V
5 (blk)	CAN2 RX	+3.3V
6 (blk)	GND	GND

SERIAL 4/5 port - due to spa

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	TX (#4)	+3.3V
3 (blk)	RX (#4)	+3.3V
4 (blk)	TX (#5)	+3.3V
5 (blk)	RX (#5)	+3.3V
6 (blk)	GND	GND

SWITCH

Pin	Signal	Volt
1 (red)	VCC	+3.3V
2 (blk)	!IO_LED_SAFETY	GND
3 (blk)	SAFETY	GND

ADC 3.3V

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	ADC IN	up to +3.3V
3 (blk)	GND	GND
4 (blk)	ADC IN	up to +3.3V
5 (blk)	GND	GND

ADC 6.6V

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	ADC IN	up to +6.6V
3 (blk)	GND	GND

I2C

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	SCL	+3.3 (pullups)
3 (blk)	SDA	+3.3 (pullups)
4 (blk)	GND	GND

CAN

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	CAN_H	+12V
3 (blk)	CAN_L	+12V
4 (blk)	GND	GND

SPI

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	SPI_EXT_SCK	+3.3
3 (blk)	SPI_EXT_MISO	+3.3
4 (blk)	SPI_EXT_MOSI	+3.3
5 (blk)	!SPI_EXT_NSS	+3.3
6 (blk)	!GPIO_EXT	+3.3
7 (blk)	GND	GND

POWER

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	VCC	+5V
3 (blk)	CURRENT	+3.3V
4 (blk)	VOLTAGE	+3.3V
5 (blk)	GND	GND
6 (blk)	GND	GND

进入DFU模式:

Reset-Button

Shortcut with tweezer or wire

Pixhaw 2.4.8 China Stuff - pink version ;-)

Set into DFU - Mode

Preconditions:
* download Firmware. I use fmuv5.hex
* use an fw uploading program like Betaflight Configurator or dfu-util

1) Connect board via USB
2) shortcut above pins
3) press RESET button 1-2 secs and release button
4) check if e.g. BF-Configurator DFU-Mode is enabled
5) if (4)==TRUE:
    flash firmware to device
  else:
    repeat step 2,3,4 as long, as DFU-Mode is activated
6) after flashing new FW, go into APM Planner and try to connect