PX2FMU – Flight Management Unit

QUICK START – HARDWARE VERSION 0.2 DEV

Description

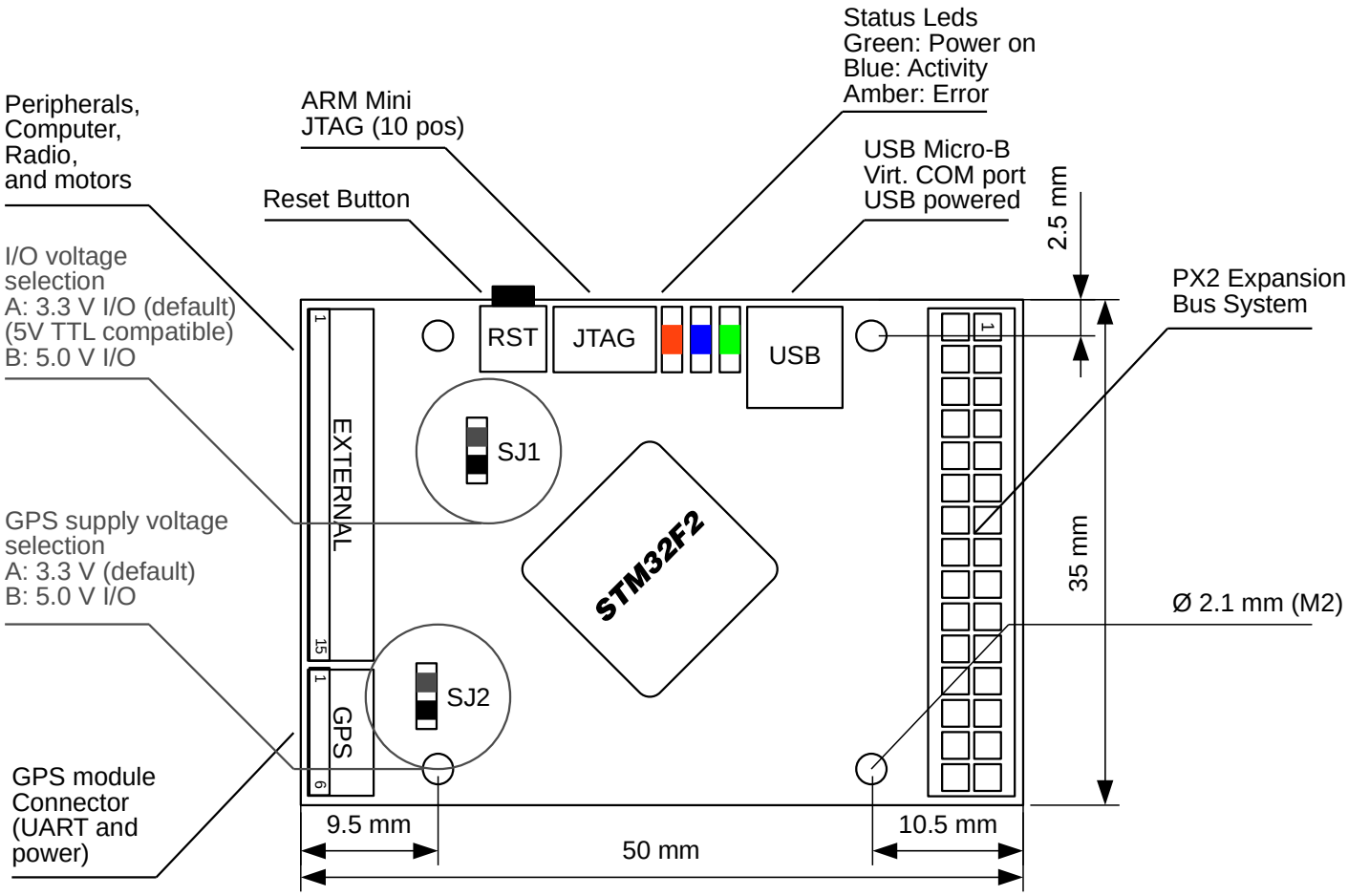
PX2FMU is an onboard management unit for micro air vehicles. It combines autopilot and inertial measurement unit and allows to control an aircraft using a single-board solution. The 30-pin expansion bus allows to combine it with other modules to provide additional I/O.

http://github.com/qgc/hardware

Features

- 120 Mhz Cortex-M3 CPU (128 KB RAM, 1 MB Flash)
- 50 mW power consumption
- 3D Gyro, ACC and Magnetometer (16 bit)
- Barometric pressure (16 bit)
- CAN/SPI/I2C/4x UART interfaces
- PX2 Expansion bus (PX2IO: Servo and solid state relay outputs)
- USB Serial Port (Virtual COM Port / VCP) USB Bootloader
- 50x35x6 mm (1.38x1.97x0.24“), 8g, 30x30 mm mounting holes
- 4.3-6 V wide supply input range (incl. USB power)
- Selectable 3.3 V or 5 V IO

Connectors, Jumpers and Dimensions



Pinout and absolute maximum Ratings

- Input: 4.3-6 V, 10 mA onboard use, max. 800 mA peripheral supply
- Output: 5 V/3.3 V, fuse-limited 500 mA EXT, 5 V/3.3 V, fuse-limited 200 mA GPS
- VDD_5V: 5 V input, VCC_3V3: 3.3 V output

GPS

1	GND
2	VDD_GPS (3.3 or 5V)
3	USART6_RX
4	USART6_TX
5	GND
6	NOT CONNECTED (NC)

Mates: Housing: JST SH XXX, Contacts: JST SH "XXX", AWG XX

VDD_5V	1	2	VDD_5V		
GND	3	4	GND		
CAN2_RX	5	6	CAN2_TX		
USART1_RX_EXT	7	8	USART1_TX_EXT		
I2C3_SDA	9	10	I2C3_SCL		
SPI3_MOSI	11	12	SPI3_SCK		
SPI3_NSS	13	14	SPI3_MISO		
UART5_RX	15	16	UART5_TX		
I2C2_SDA	17	18	I2C2_SCL		
USART2_RTS	19	20	USART2_CTS		
USART2_RX	21	22	USART2_TX		
GPIO_EXT1	23	24	PPM_INPUT		
PC8	25	26	GPIO_EXT2		
ADC123_IN11	27	28	GND		
ADC123_IN13	29	30	ADC123_IN12		

Mates 2 mm header: 3M "951230-2520-AR-PR"

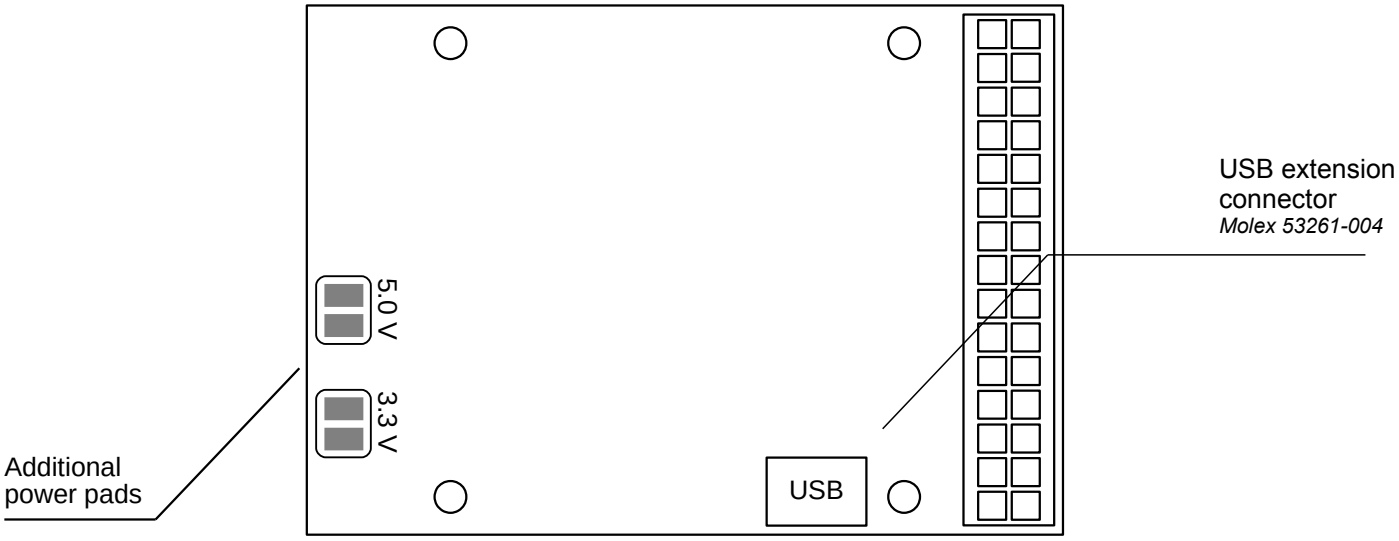
EXTERNAL

1	VDD_5V	2	VDD_5V
3	VDD_3V3	4	GND
5	I2C1_SCL	6	CAN2_TX
7	I2C1_SDA	8	USART1_TX_EXT
9	USART2_TX	10	I2C3_SCL
11	USART2_CTS	12	SPI3_SCK
13	USART2_RTS	14	SPI3_MISO
15	UART2_RX	16	UART5_TX
17	USART1_TX_EXT	18	I2C2_SCL
19	USART1_TX_EXT	20	USART2_CTS
21	PPM_INPUT (3-5V)	22	USART2_TX
23	GPIO_EXT2	24	PPM_INPUT
25	GPIO_EXT1	26	GPIO_EXT2
27	BATTERY_MONITOR (3-18V)	28	GND
29	GND	30	ADC123_IN12

Mates housing: Molex PicoBlade xxxxx-xxxx, contacts: xxxxx-xxx, AWG xx

Additional connectors (bottom side)

The footprints on the bottom side of the connector can be used by advanced users to interface additional boards or sensors.



Software Tools / Getting Started

Please follow the steps below to get started with PX2FMU.

- Download the QGroundControl GUI (Windows / Linux / Mac) from http://www.qgroundcontrol.org/downloads
- Install the application
- Connect PX2FMU with an USB-A to Micro USB-B cable to your computer (cellphone usb data cable type)
- Your operating system might display a message indicating that new hardware was found
- Start QGroundControl from your application menu
- Go to Communication > Add new Link
- Leave the default settings, except for these values:
  Baud rate: 115200 baud, data bits: 8 bits, stop bits: 1 bit, no parity, no hardware flow control
- QGroundControl will display the heartbeat of MAV001. The displayed attitude will change if you move PX2FMU.

Upgrading Firmware / Developing Custom Code

After the steps in the getting started guide have been completed, follow these instructions to upgrade your firmware:

- Start QgroundControl, select from the "Widget" menu the item "PX2 Firmware"
- In the PX2Firmware widget, click on "Check for Updates"
- Select the firmware revision to flash – usually the newest one at the top of the list, but the tool also allows to downgrade to older versions.

To develop custom code, please follow the developer instructions at: http://www.example.com/developers_guide

Contact, Copyleft and further Information

PX2FMU is an open hardware design, following the XXX open hardware license. You can do XXX with it. PX2FMU was created by XXX. The XXX project contributed XXX.

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Further information is available here:

- PX2FMU website
- Appropriate mailing list 1
- Appropriate community 1