
Quadcopter controller module

User Guide

Rev 0

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1. Product overview

Quadcopter controlling module build on base of Arduino Pro Mini, 5V, 16MHz (Figure 1). Module pre-programmed with the base quadcopter control application. Programming is not required by the end user.

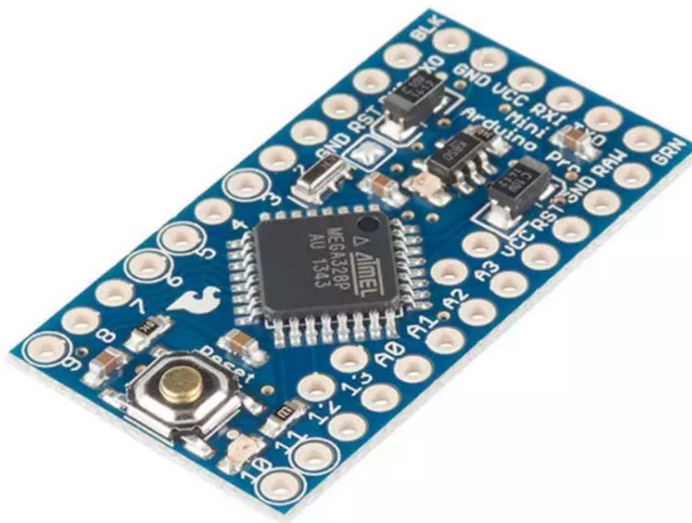


Figure 1. Arduino Pro Mini

2. Module Pin Out and Signal Description

Module pinout provided on Figure 2, and pinout signals description provided in the Table 1.

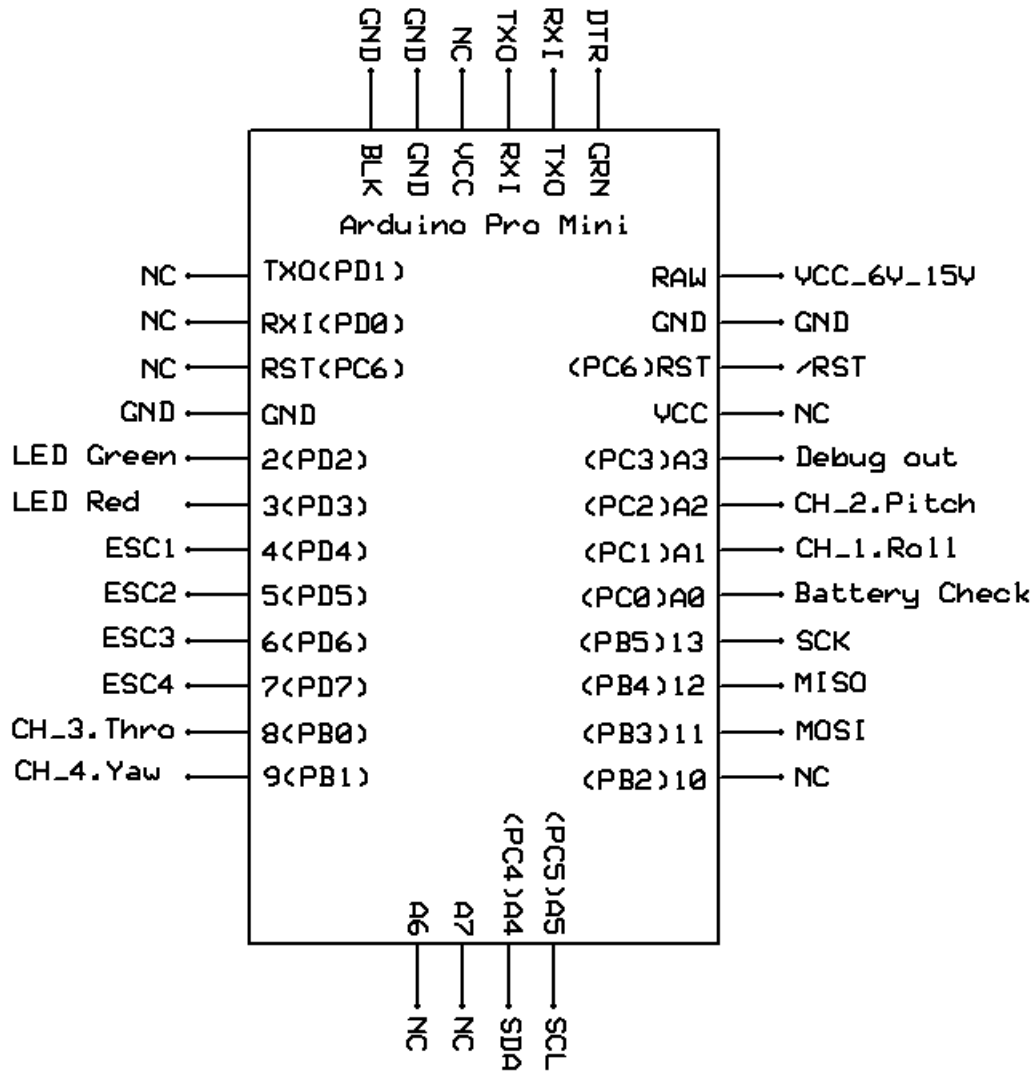


Figure 2. Module pinout (top view)

Table 1. Module pinout signals description

Signal Name	Signal Description	Signal Direction
LED Green	Indication of correct functioning. Could be other color as well.	out
LED Red	Indication of error, warnings. Could be other color as well.	out
ESC1	PWM signal to ESC of Motor #1.	out
ESC2	PWM signal to ESC of Motor #2.	out
ESC3	PWM signal to ESC of Motor #3.	out
ESC4	PWM signal to ESC of Motor #4.	out
Roll Ch1	Roll signal from Remote controller.	in
Pitch Ch2	Pitch signal from Remote controller.	in
Throttle Ch3	Throttle signal from Remote controller.	in
Yaw Ch4	Yaw signal from Remote controller.	in
MOSI	SPI MOSI for ISCP.	out
MISO	SPI MISO for ISCP.	in
SCK	SPI clock for ISCP	out
Battery Check	Battery voltage monitoring input.	in
/RST	Active low reset output.	out
Debug out	Debug signal output.	out
VCC_6V_15V	6VDC-15VDC voltage input	in
GND	Common connection	-
NC	No Connection.	-

3. Implementation

Figure 3 shows a connection diagram of the module.

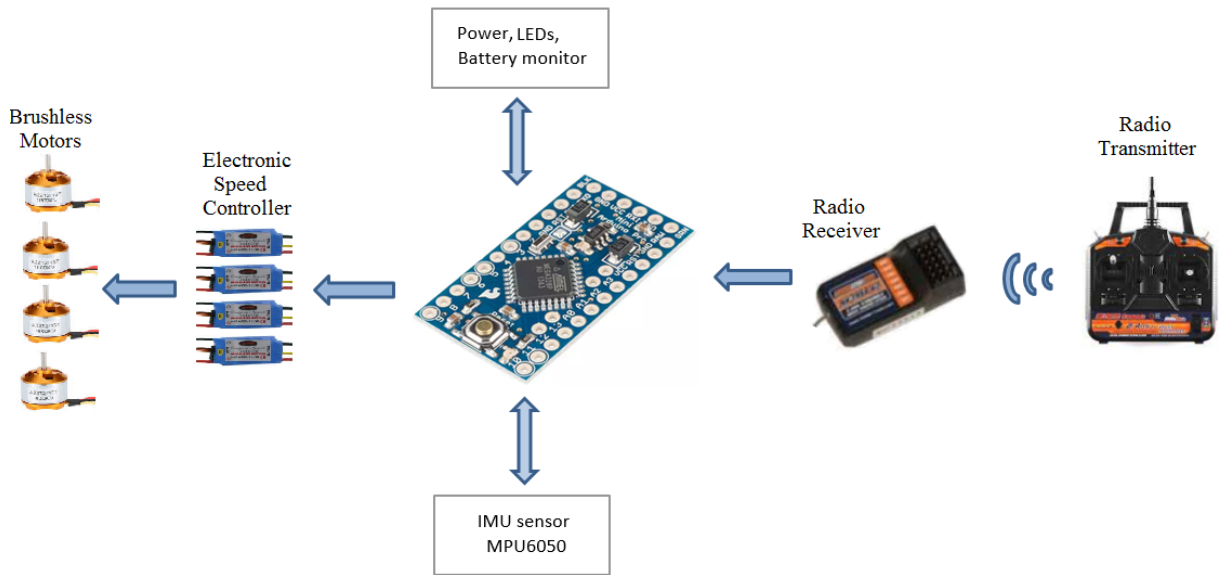


Figure 3. Connection diagram of quadcopter controller module

3.1. RC receiver interface

Follow Figure 2.

3.2. ESC calibration

ESCs need to be calibrated before connecting to controller. For calibration could be used an Youtube video on <https://www.youtube.com/watch?v=HKJ2WKXbEEw>.

3.3. ESC interface

Follow Table 1.

3.4. IMU interface

Device designed to work with IMU sensor MPU6050 only.

Figure 3 shows a connection diagram of the device to the MPU6050.

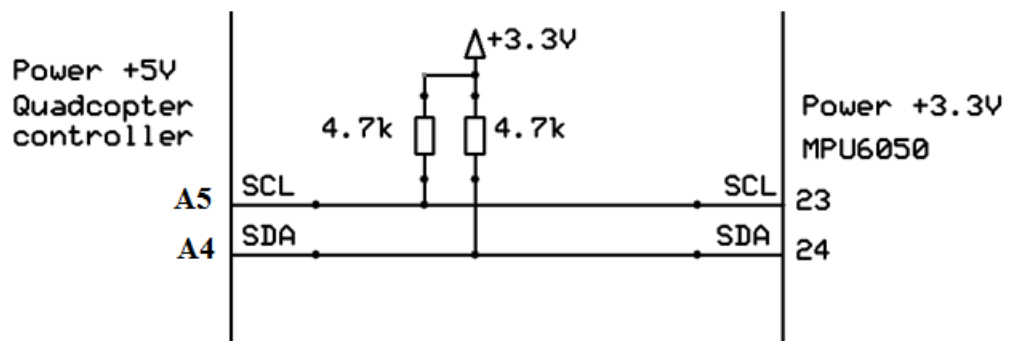


Figure 4. MPU6050 connection

3.5. Motors and MPU6050 orientation

Motors spinning direction and MPU6050 orientation should correspondent to Figure 5.

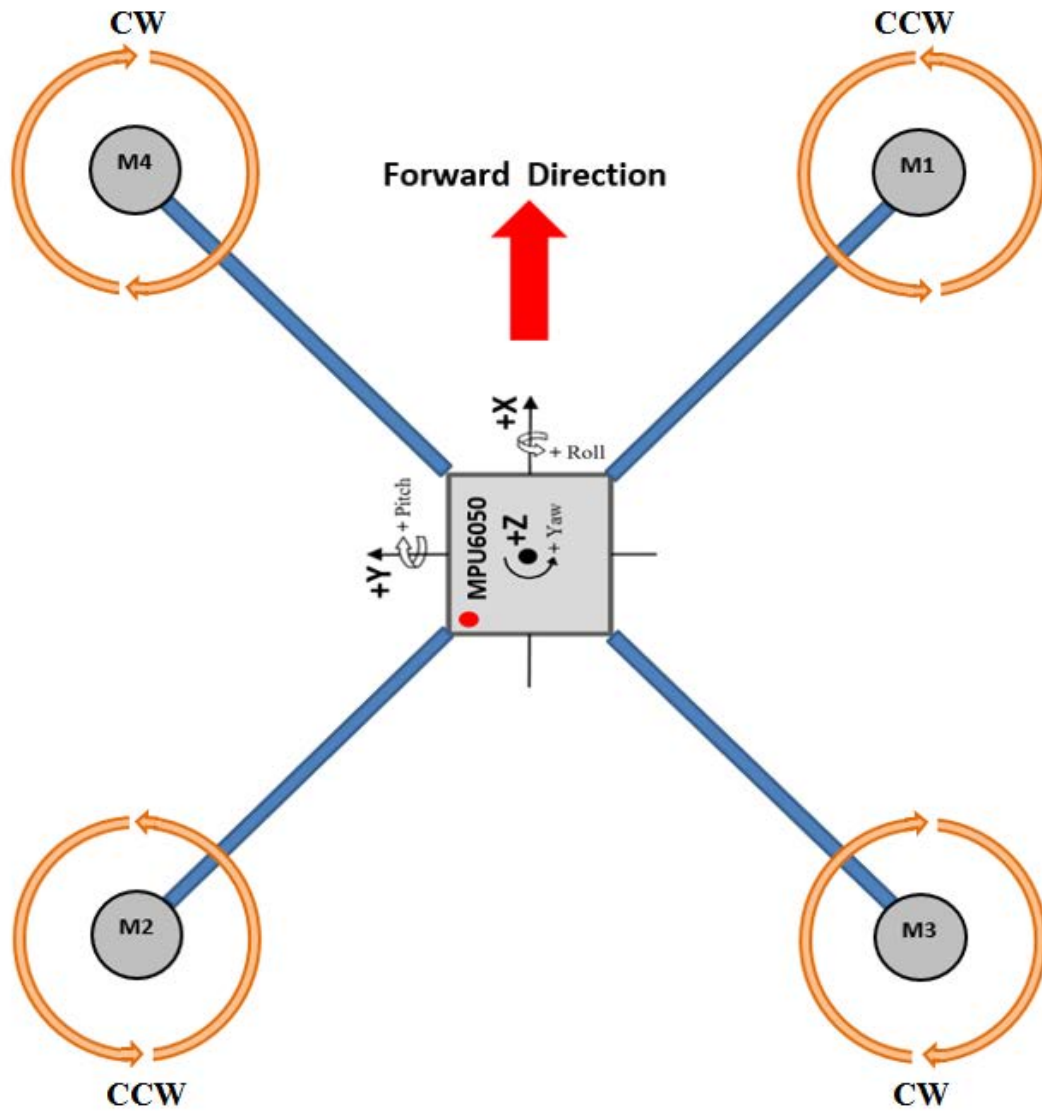


Figure 5. MPU6050 and Motors orientation

4. Evaluation board

Controller's Evaluation board schematics provided in Figure 6. Schematic drawing performed by the tool from the www.expresspcb.com.

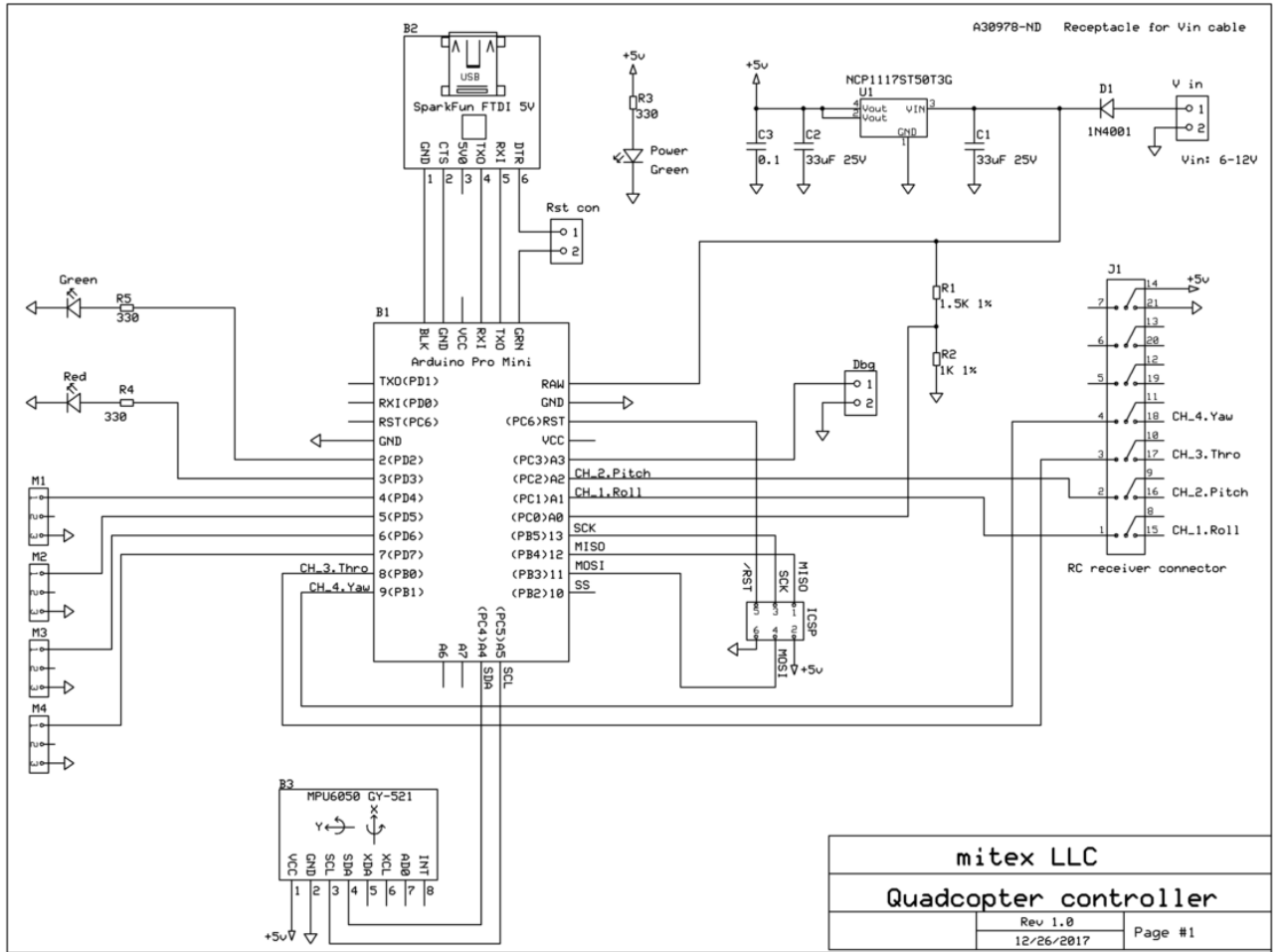


Figure 5. Quadcopter controller module schematics

Controller's Evaluation board pictures provided in Figure 6.

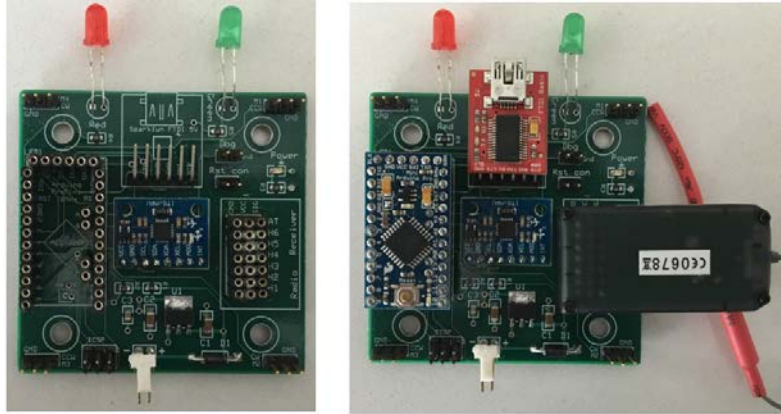


Figure 6. Quadcopter controller module board

Controller's Evaluation board picture on the Drone provided in Figure 7.



Figure 7. Quadcopter with the controller module

5. Revision history

Date	Revision	Description
02/03/18	1.0	Quadcopter controller module user guide

6. Disclaimer

We expressly disclaims any liability arising out of the application or use of the Quadcopter controller module. We reserve the right to make changes, at any time, to the Quadcopter controller module as deemed desirable in the sole discretion of ours. We assume no obligation to correct any errors contained herein or to advise you of any correction if such be made. We will not assume any liability for the accuracy or correctness of any engineering or technical support or assistance provided to you in connection with the Quadcopter controller module.

THE DESIGN IS PROVIDED "AS IS" WITH ALL FAULTS, AND THE ENTIRE RISK AS TO ITS FUNCTION AND IMPLEMENTATION IS WITH YOU. YOU ACKNOWLEDGE AND AGREE THAT YOU HAVE NOT RELIED ON ANY ORAL OR WRITTEN INFORMATION OR ADVICE, WHETHER GIVEN BY US, OR OUR AGENTS OR EMPLOYEES. WE MAKE NO OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, REGARDING THE DESIGN, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NONINFRINGEMENT OF THIRD-PARTY RIGHTS.

The Quadcopter controller module is not designed or intended for use in the development of on-line control equipment in hazardous environments requiring fail-safe controls, such as in the operation of nuclear facilities, aircraft navigation or communications systems, air traffic control, life support, or weapons systems ("High-Risk Applications"). We specifically disclaim any express or implied warranties of fitness for such High-Risk Applications. You represent that use of the Quadcopter controller module in such High-Risk Applications is fully at your risk.