

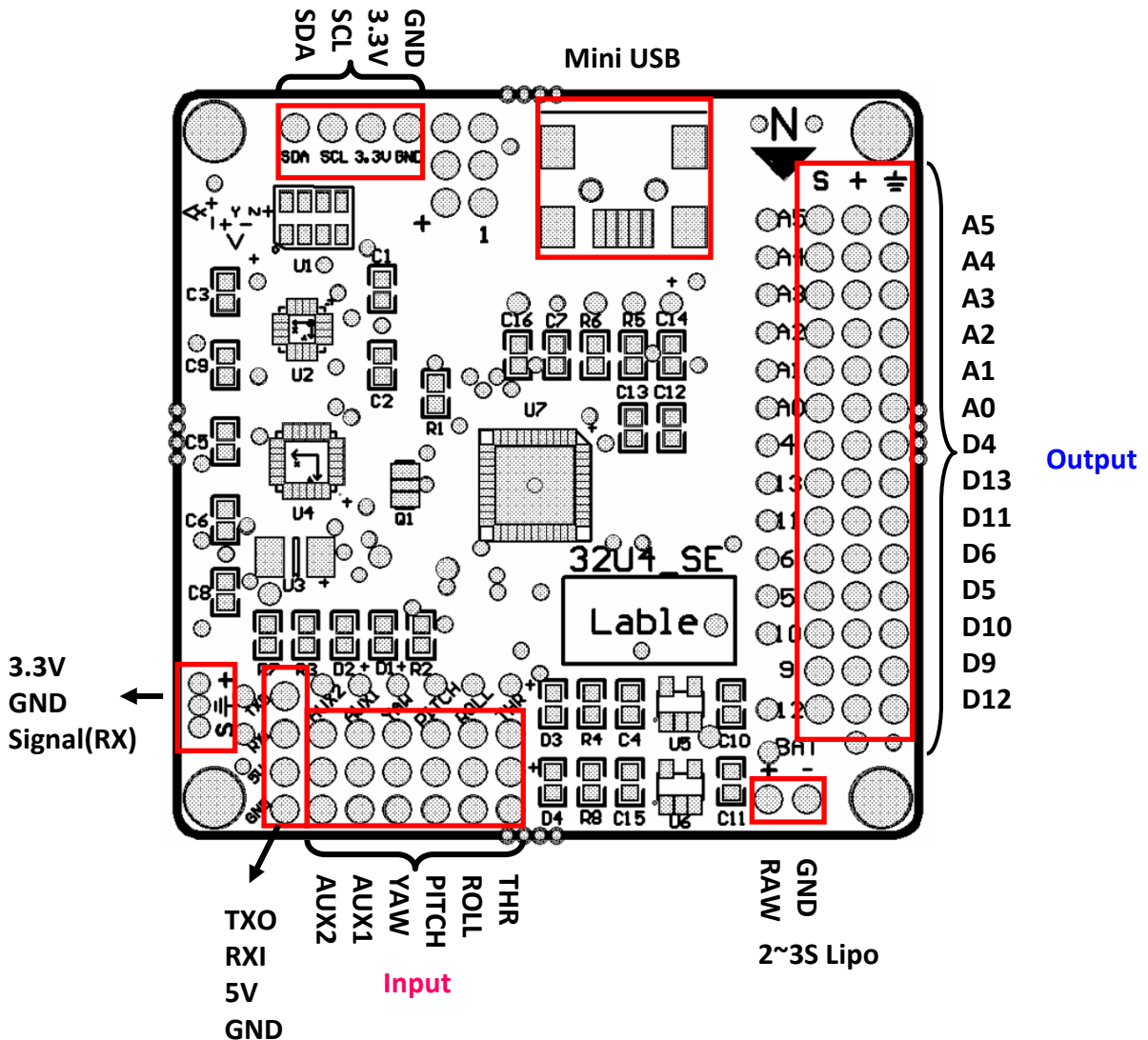
Multiwii_32U4_SE Manual

Rev01

1. Introduction

The Multiwii_32U4_SE is an All-In-One Flight-Controller (FC), usable for all sizes of Multirotor helicopters. It is equipped with a microcontroller, a 3-axis gyroscope (GYRO), a 3-axis accelerometer (ACC), a 3-axis magnetometer (MAG) and a barometer (BARO).. The FC was developed for use with the multiWii-software (www.multiwii.com) from Alexandre Debus – aka. AlexInParis – and it supports all flight conditions.

An Atmel AVR 8-bit microcontroller (MCU), the ATMEGA32U4, is used on the 32U4_SE. This MCU has 6 high-resolution PWM (ESC signal) outputs, an on-chip USB interface (so, no need for a FTDI adapter) and the ability to read the signals of various RX types.



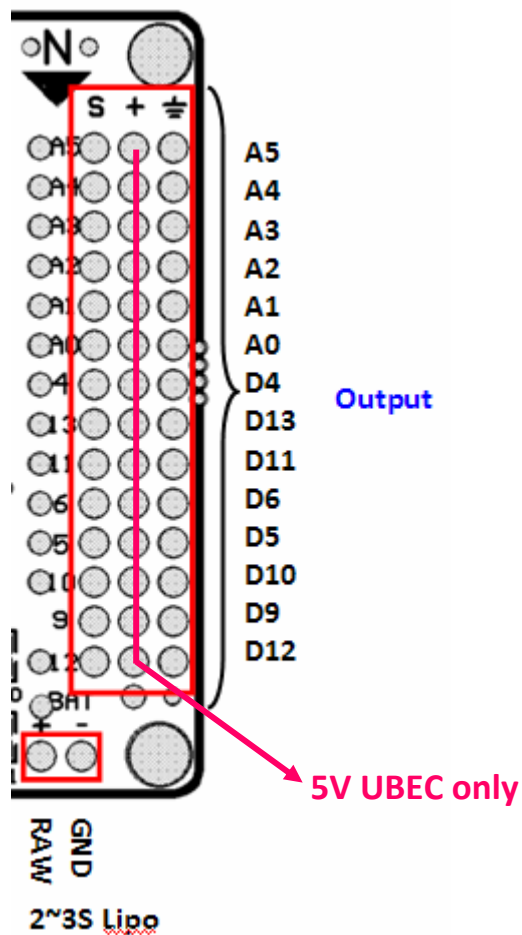
2. Power Supply

Your MultiWii_32U4_SE has two power supplies:

- 5V UBEC, connected to output
- LiPo, connected to LiPo 2S-3S

The outputs were always supplied via an ESC BEC or an external UBEC!

Attention: Use the 32U4_SE with 2-3S LiPos only!

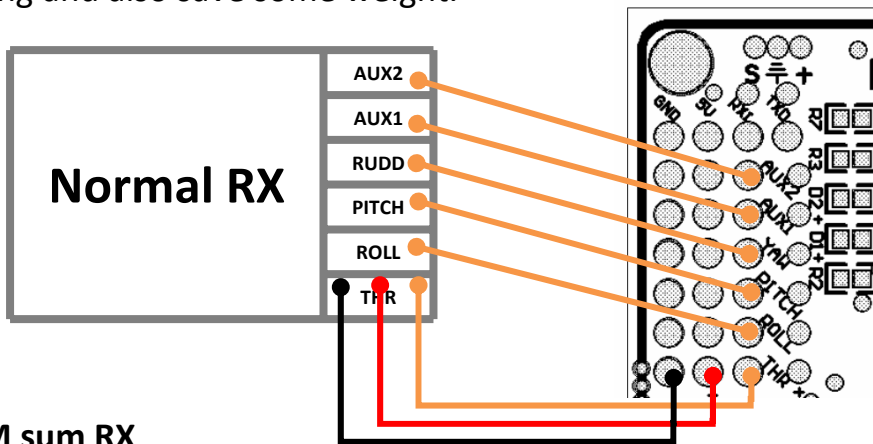


3. Connect a RX

Normal RX

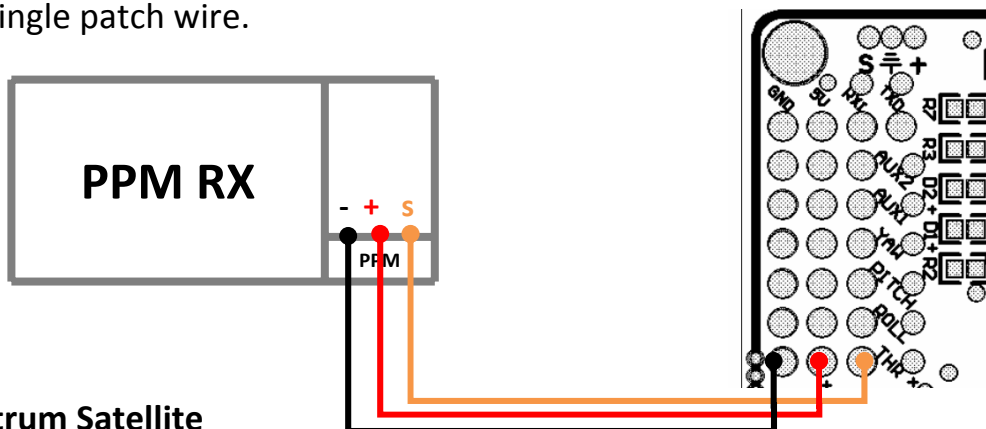
You can use a standard RX with 4 channels. Because of the sensors used and the Various flight modes available, a 6 channel RX is recommended .

You only need to connect all three wires for the throttle channel (signal and power (+/-)). For all other channels only the signal wires are needed. This will simplify your wiring and also save some weight.



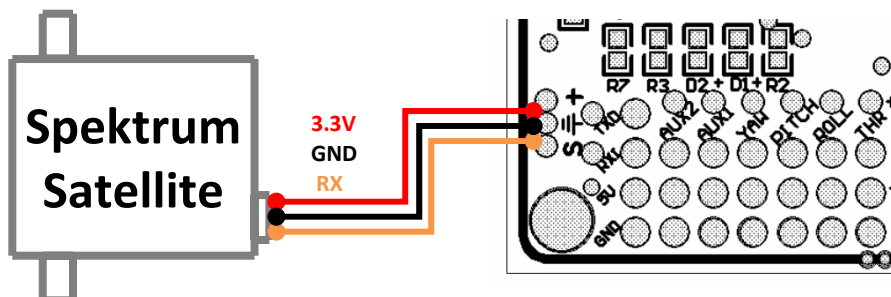
PPM sum RX

With a PPM sum RX you can use up to 8 channels (at the time of writing) with only one single patch wire.



Spektrum Satellite

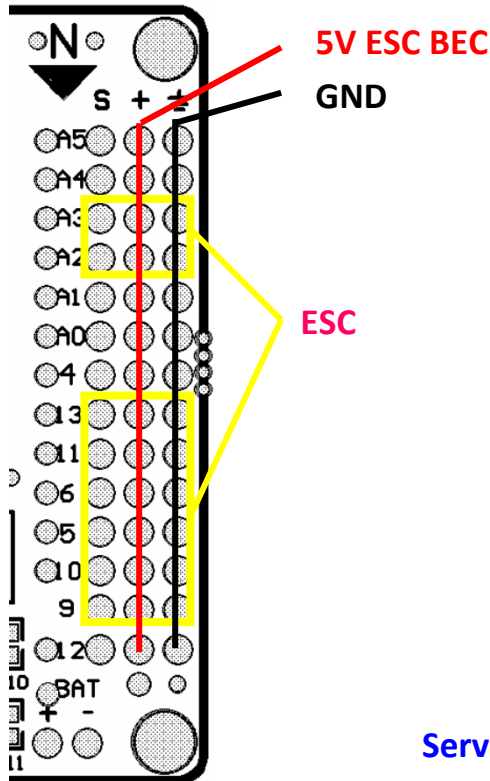
A Spektrum satellite receiver outputs all channels of the transmitter over a serial interface (UART). With the use of a Spektrum satellite you can use up to 8 channels (as with a PPM Sum receiver). In addition, it is quite small and lightweight.



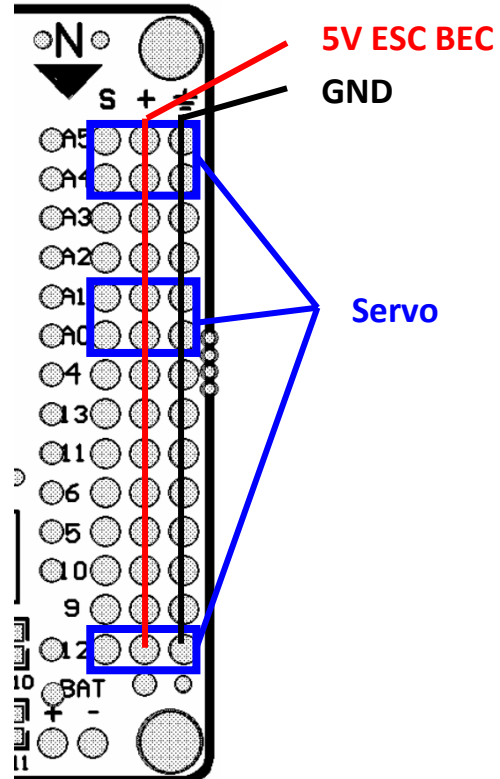
4. Connect the ESC's

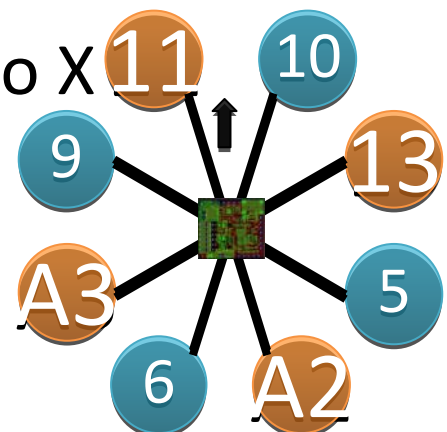
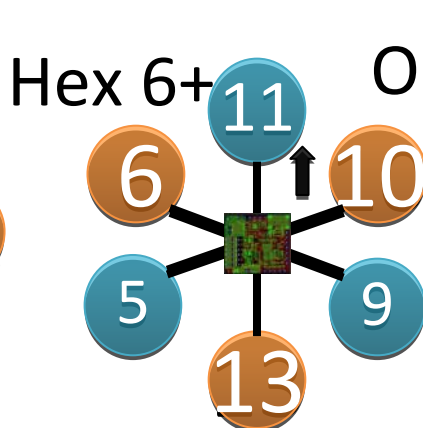
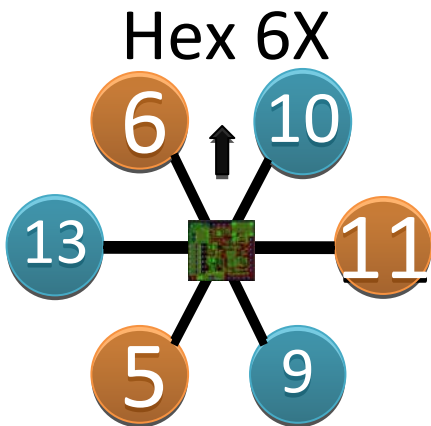
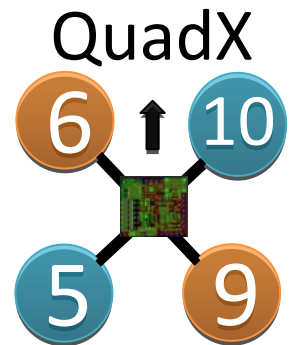
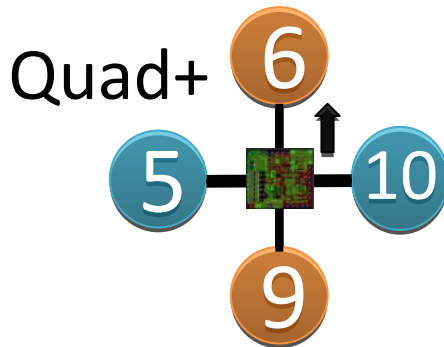
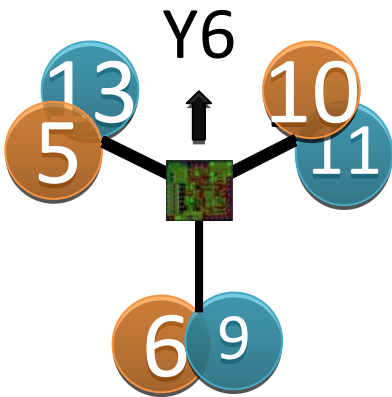
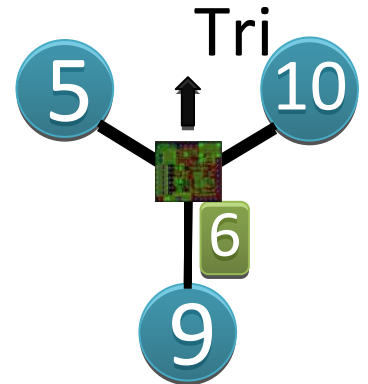
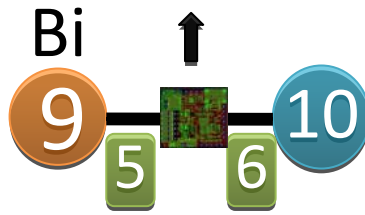
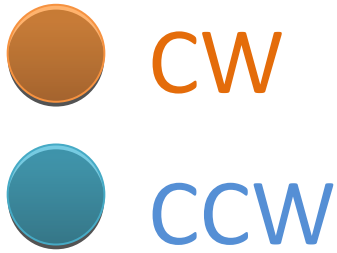
The MultiWii_32U4_SE was designed to provide up to 8 ESC connections plus up to 5 additional servos (maximum, but depends from the configuration and the on-board resources used!). The image shows the motors positions and spin directions.

ESC connections



Servo connections



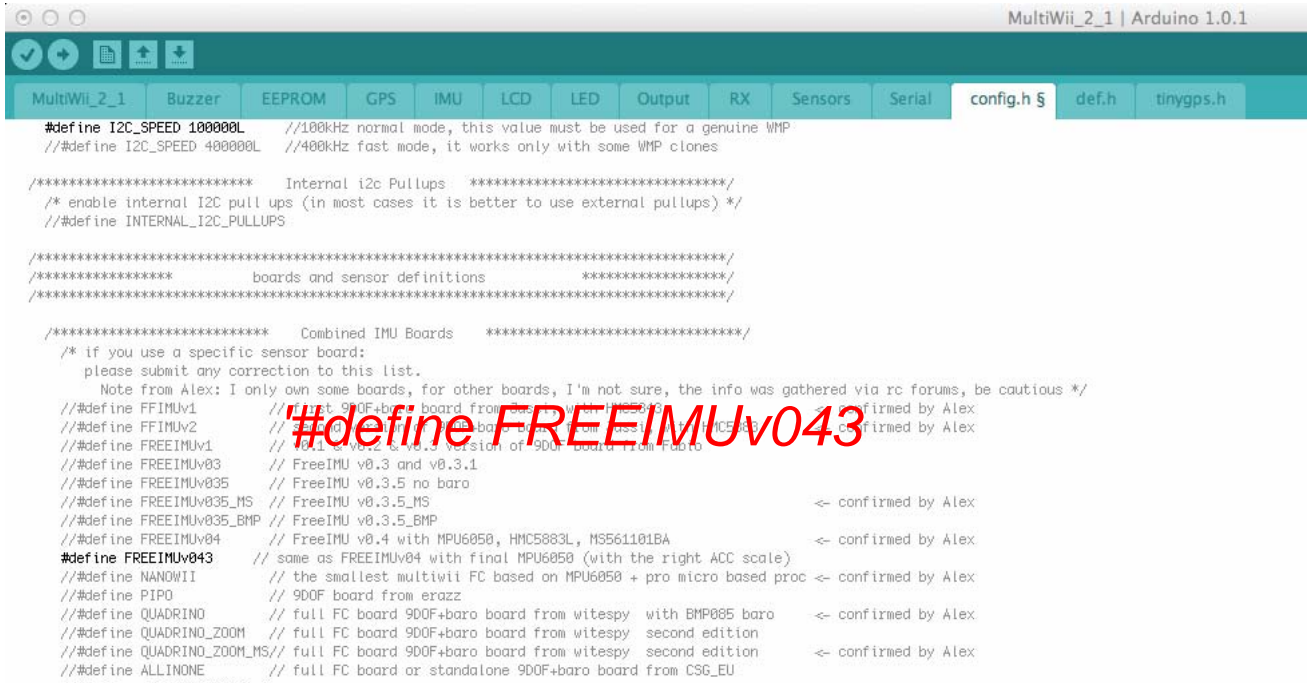
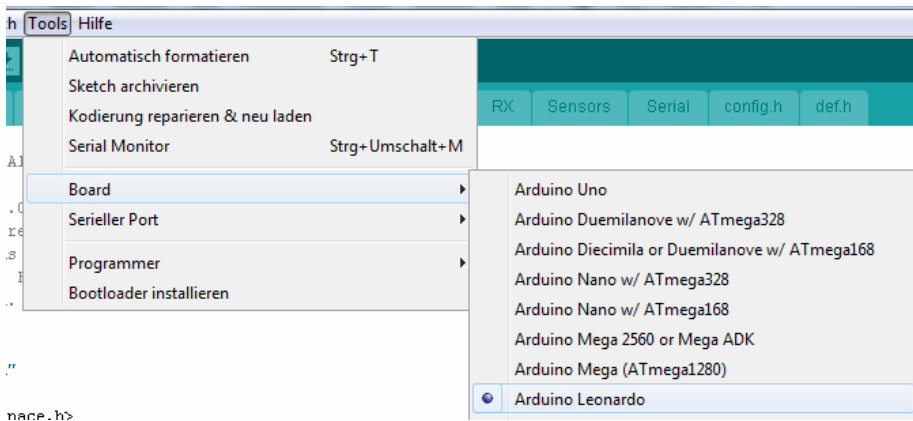


5. Copter installation

When installing the MultiWii_32U4_SE it is best placed at the center of your multicopter.

6. MultiWii Firmware & upload

The MultiWii_32U4_SE is specially designed for the use with MultiWii The Leonardo is supported with the latest Arduino version. (1.0.1 or later). The 32U4_SE uses the same sensors (and axis orientation) as the popular FreeIMUv043. To activate the sensors you need to uncomment the '#define FREEIMUv043'.



```
MultiWii_2_1 | Arduino 1.0.1
MultiWii_2_1 | Buzzer | EEPROM | GPS | IMU | LCD | LED | Output | RX | Sensors | Serial | config.h § | def.h | tinygps.h

//#define TEENSY20

/*****
 * Settings for ProMicro, Leonardo and other Atmega32u4 Boards
 */

/***** pin Layout *****/
/* activate this for a better pinlayout if all pins can be used => not possible on ProMicro */
#define A32U4ALLPINS

/***** PWM Setup *****/
/* activate all 6 hardware PWM outputs Motor 5 = D11 and 6 = D13.
note: not possible on the sparkfun promicro (pin 11 & 13 are not broken out there)
if uclivted:
Motor 1-6 = 10-bit hardware PWM
Motor 7-8 = 8-bit Software PWM
Servos = 8-bit Software PWM
if deactivated:
Motor 1-4 = 10-bit hardware PWM
Motor 5-8 = 10-bit Software PWM
Servos = 10-bit Software PWM */
//#define HWPWM6

/***** Aux 2 Pin *****/
/* AUX2 pin on pin RX0 */
//#define RCAUX2PINRX0

/* aux2 pin on pin D17 (RXLED) */
//#define RCAUX2PIND17

/***** Buzzer Pin *****/
/* this moves the Buzzer pin from TX0 to D8 for use with ppm sum or spectrum sat. RX (not needed if A32U4ALLPINS is active) */
//#define D8BUZZER

/***** Promicro version related *****/
```

#define A32U4ALLPINS

To make use of the full potential of the 32U4_SE you need to uncomment the **'#define A32U4ALLPINS'**.

7. External sensors

You may connect any I2C sensor to the 32U4_SE that is supported by the software. But as GYRO, ACC, MAG and BARO were present on the 32U4_SE the only addition might be an external I2C GPS-module.

ATTENTION:

The external I2C bus of the 32U4_SE may only be used with 3.3V sensors!