

NanoWii User Manual_v01

1. Introduction

The NanoWii was designed to control small to medium large multicopter.

It contains a microcontroller unit, a 3-axis gyroscope and a 3-axis ACC.

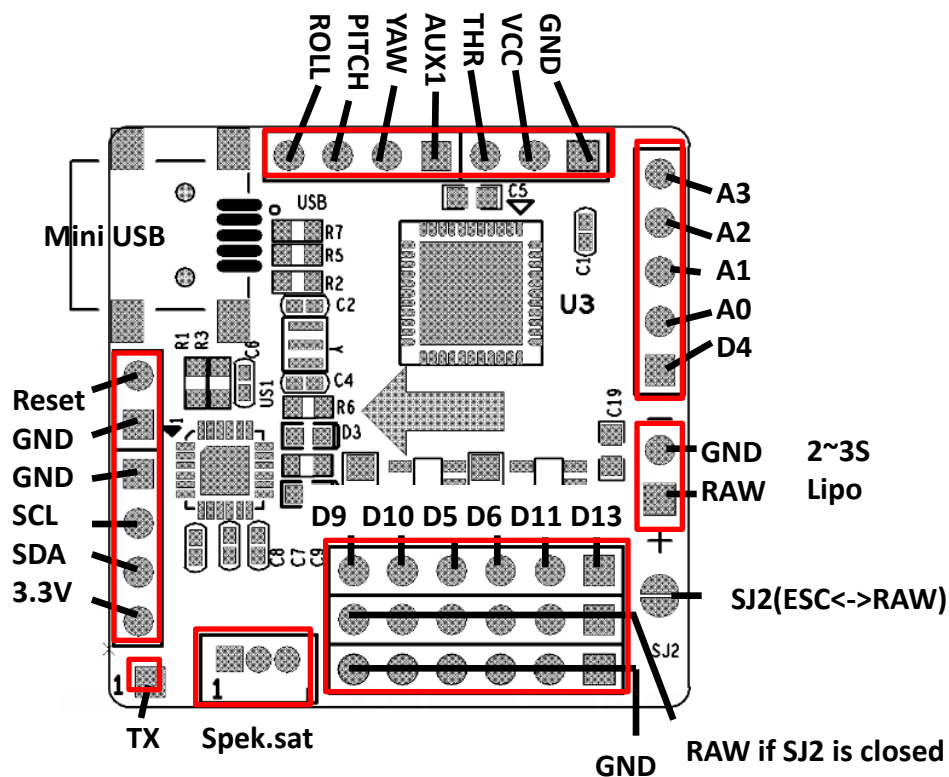
Without additional sensors it is possible to fly in acro and stable mode.

Acro = like normal RC helicopters

Stable = like coaxial helicopters (it always returns to a horizontal position)

The used microcontroller unit (Atmega32u4) has 6 high resolution PWM (ESC signal)

Outputs, a USB Port (no need for a FTDI adaptor) and is able to read the signals of various RX types. Gyro and ACC are combined in the MPU-6050.



2. Choose a power source

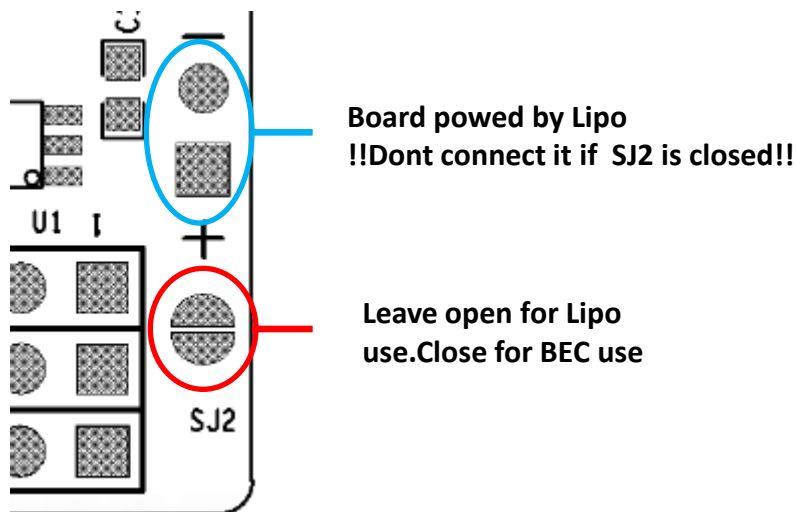
There are 3 ways to power the NanoWii Board

1. Default. The board is powered by a Lipo battery on the specific Pins (see Image)
In this case there are no ESC BEC's needed

2. Power supply by a ESC BEC or just a BEC. To use it like this you will need to solder the jumper2 (SJ2) (see Image)

ATTENTION ! If jumper 2 is soldered, dont connect a LipoBattery directly to the Board!

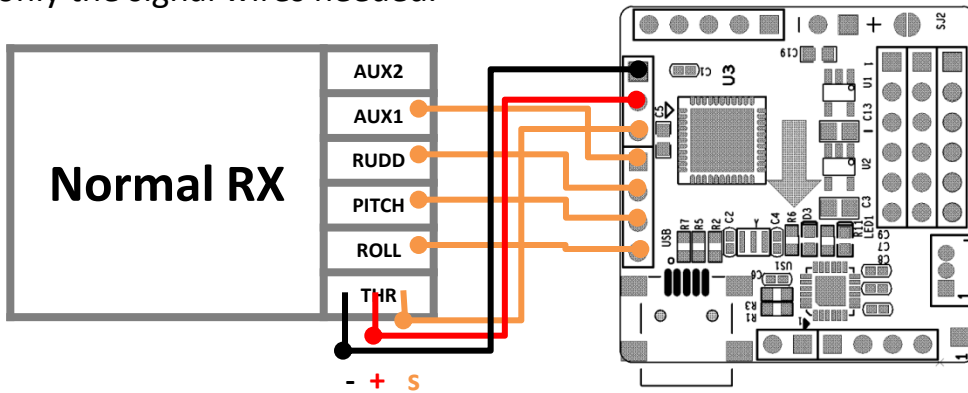
3. Supplied by VCC. If your RX is already powered by 5 - 5,5v You can power the board by the VCC pin of your RX (Throttle connector). Please leave Jumper 2 (SJ2) open in this case.



3. Connect a RX

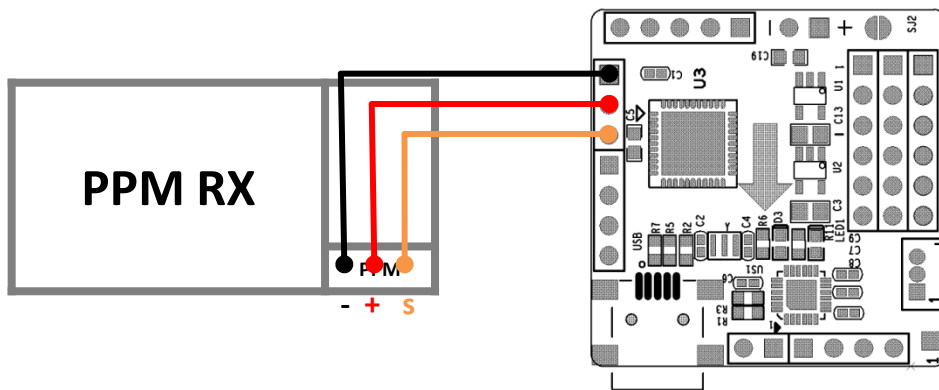
Normal RX

You can use every standard RX from 4-5 Channels. 5 channel are recommended. Only for the Throttle pin are all wires connected (signal,+,-). For the other channels are only the signal wires needed.



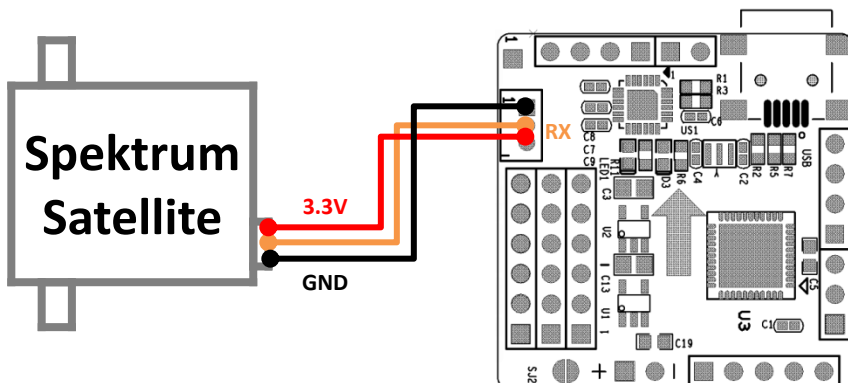
PPM sum RX

With a PPM sum RX you can use up to 8 channels with only one wire



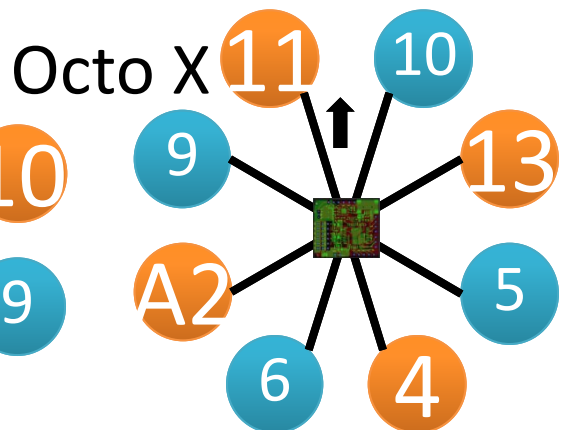
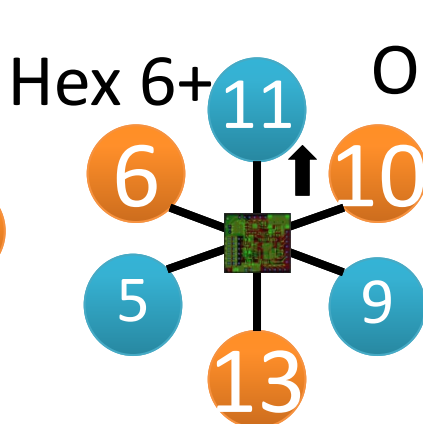
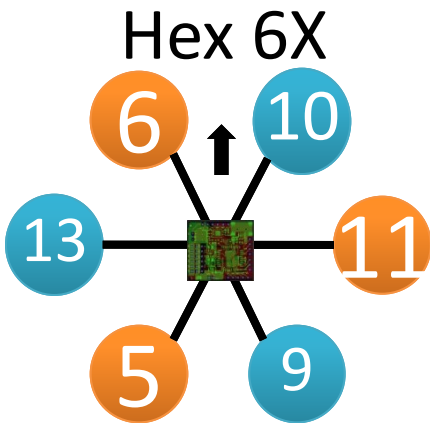
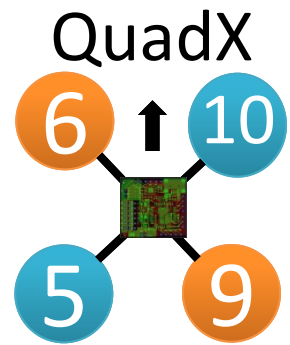
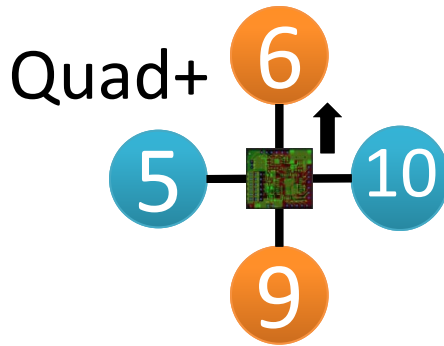
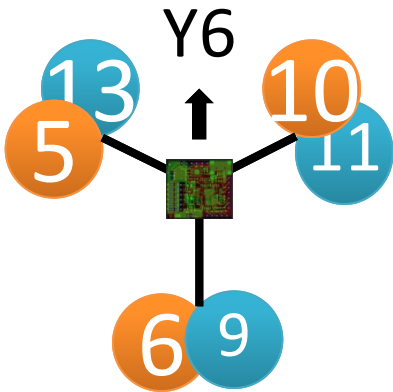
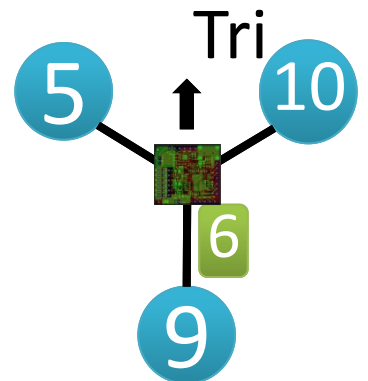
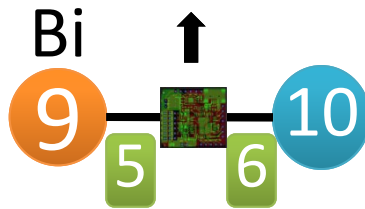
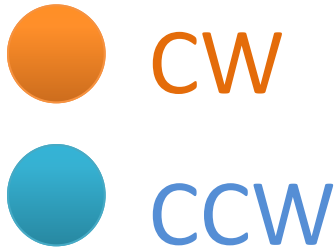
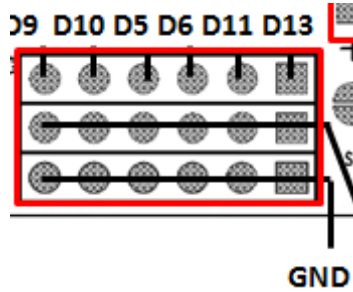
Spektrum Satellite

With a Spektrum Satellite RX you can also use up to 8 channels. And it is quite small and lightweight. (the Satellite must be bind on a nother RX before you can use it)



4. Connect the ESC's

The NanoWii supports up to 6 ESC connections but its also possible to connect up to 8. this images show the motors positions and spindirection (see Image)



5. Copter installation

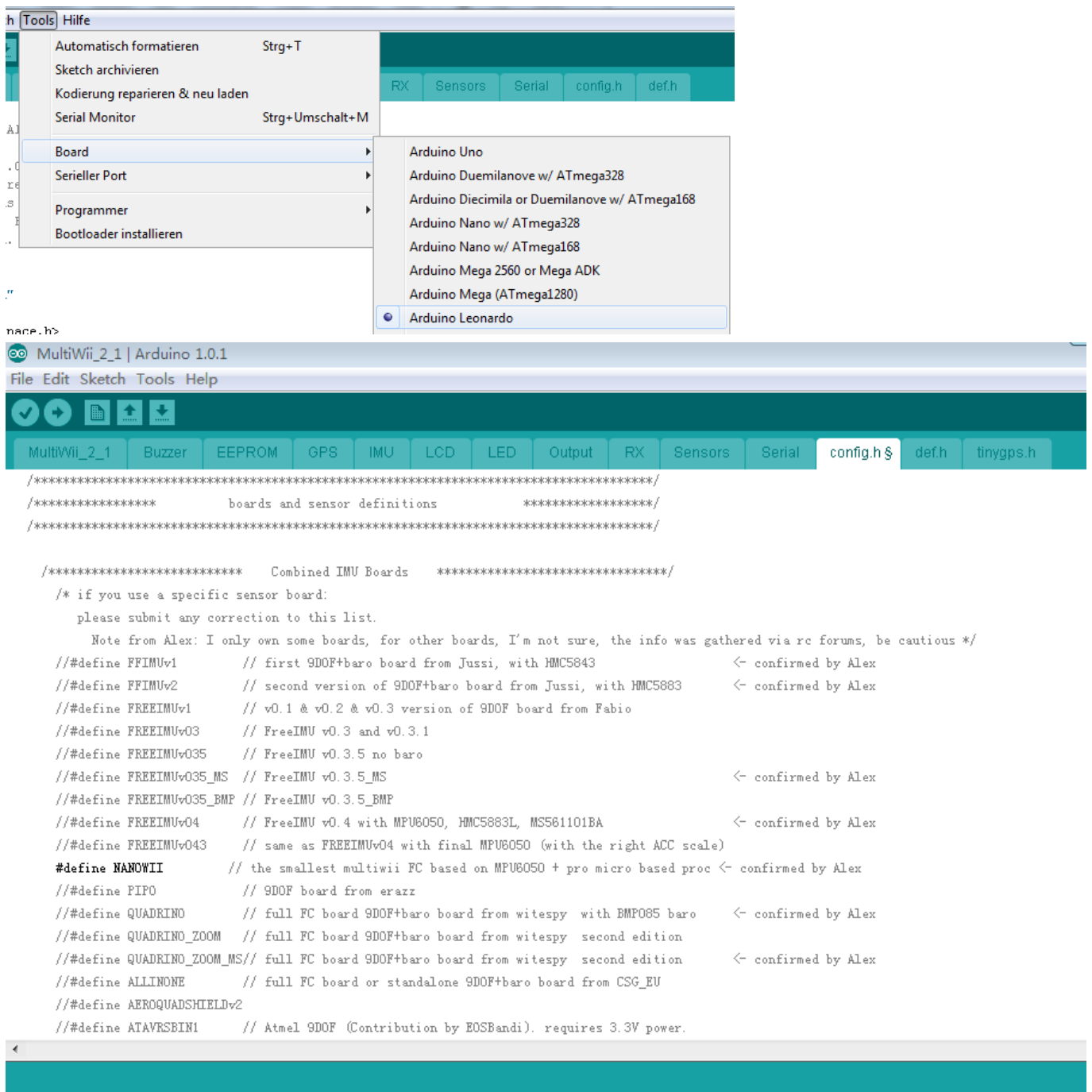
When installing the NanoWii it will be good to place it at the center of your copter with foam double sided tape

6. MultiWii Firmware & upload

The NanoWii is specially designed for the use with MultiWii

Download the Latest version of it (The nanoWii is full supportet at the V2.1)

Open it with Arduino and select the NanoWii and the needed settings in the file config.h. If all settings are right, press the upload button.



The screenshot shows the Arduino IDE interface. The 'Tools' menu is open, and the 'Board' option is selected, displaying a list of boards. 'Arduino Leonardo' is selected. The main window shows the 'config.h' file with the following content:

```
h Tools: Hilfe
Automatisch formatieren Strg+T
Sketch archivieren
Kodierung reparieren & neu laden
Serial Monitor Strg+Umschalt+M
Board
  Arduino Uno
  Arduino Duemilanove w/ ATmega328
  Arduino Diecimila or Duemilanove w/ ATmega168
  Arduino Nano w/ ATmega328
  Arduino Nano w/ ATmega168
  Arduino Mega 2560 or Mega ADK
  Arduino Mega (ATmega1280)
   Arduino Leonardo
Seriemer Port
Programmer
Bootloader installieren

name.h>
MultiWii_2_1 | Arduino 1.0.1
File Edit Sketch Tools Help
MultiWii_2_1 Buzzer EEPROM GPS IMU LCD LED Output RX Sensors Serial config.h $ def.h tinygps.h
/*****
/***** boards and sensor definitions *****/
/*****

/***** Combined IMU Boards *****/
/* if you use a specific sensor board:
please submit any correction to this list.

Note from Alex: I only own some boards, for other boards, I'm not sure, the info was gathered via rc forums, be cautious */
#define FFIMUv1 // first 9DOF+baro board from Jussi, with HMC5843 <- confirmed by Alex
#define FFIMUv2 // second version of 9DOF+baro board from Jussi, with HMC5883 <- confirmed by Alex
#define FREEIMUv1 // v0.1 & v0.2 & v0.3 version of 9DOF board from Fabio
#define FREEIMUv03 // FreeIMU v0.3 and v0.3.1
#define FREEIMUv035 // FreeIMU v0.3.5 no baro
#define FREEIMUv035_MS // FreeIMU v0.3.5_MS <- confirmed by Alex
#define FREEIMUv035_BMP // FreeIMU v0.3.5_BMP
#define FREEIMUv04 // FreeIMU v0.4 with MPU6050, HMC5883L, MS561101BA <- confirmed by Alex
#define FREEIMUv043 // same as FREEIMUv04 with final MPU6050 (with the right ACC scale)
#define NANOWII // the smallest multiwii FC based on MPU6050 + pro micro based proc <- confirmed by Alex
#define PIPO // 9DOF board from erazz
#define QUADRINO // full FC board 9DOF+baro board from witespy with BMP085 baro <- confirmed by Alex
#define QUADRINO_ZOOM // full FC board 9DOF+baro board from witespy second edition
#define QUADRINO_ZOOM_MS // full FC board 9DOF+baro board from witespy second edition <- confirmed by Alex
#define ALLINONE // full FC board or standalone 9DOF+baro board from CSG_EU
#define AEROQUADSHIELDv2
#define ATAVRSBIN1 // Atmel 9DOF (Contribution by EOSBandi). requires 3.3V power.
```

7. External sensors

You may connect any I2C sensor to the NanoWii that is supported by the software. But as a Gyro and a ACC is already present, it is recommendable to connect this sensors:

- I2C Barometer (BMP085 or MS561101BA)
- I2C Magnetometer (HMC5843, HMC5883, AK8975 or MAG3110)
- I2C GPS

7. Lipo monitoring

To monitor the Lipo voltage you will need to connect two resistors to pin A3 and GND.

