



## Naze 32 Revision 6 Flight Controller Guide

naze32

unmannedtech1 Alex (Unmanned Tech)

Jan '16

The **Naze 32** Rev 6 board has made some nice layout revisions such as finally having the USB board mounted on the side for easy access on your miniquad at last!

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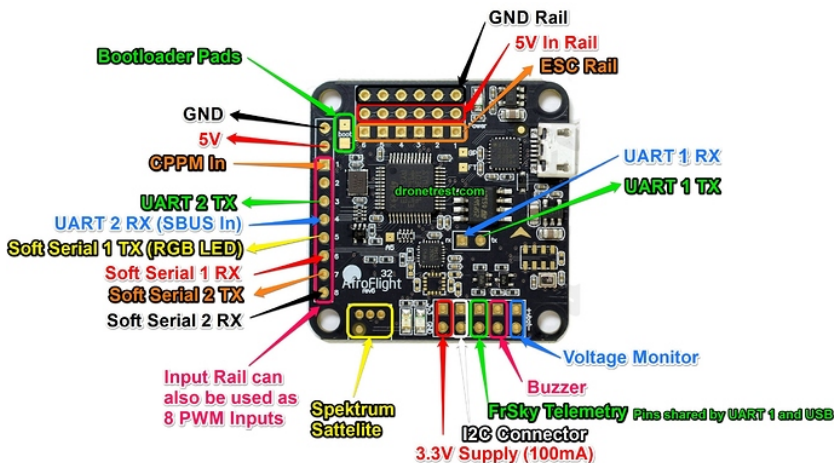
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### Whats new in Revision 6?

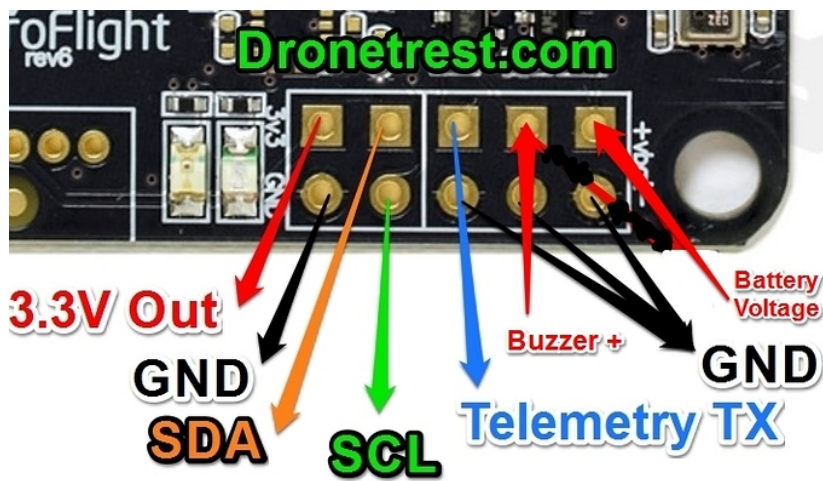
- USB port has been moved to the right of the board so you don't need to mount the board sideways anymore!
- IMU sensors upgraded to MPU 6500 (Rev 5 uses older MPU 6050)
- Receiver connectors are no longer solder pads but common pin hole headers style. This means that you no longer need to directly solder your receiver wires to the flight controller. Also older revisions had issues of pads delaminating when board got too hot.
- Fully pin compatible with Rev 5 boards for accessories such as OSD.
- Integrated SBUS inverter, now you can connect your Frsky SBUS receivers directly with no extra inverter!
- Dedicated Spectrum Satellite port.
- Additional Flash memory so you can use blackbox recording directly. With the Acro version you get 2Mb (16Mbit) and the Full version you get 16Mb (128Mbit). To learn more check our guide on [Naze 32 versions](#).

### Naze 32 Revision 6 Pinout

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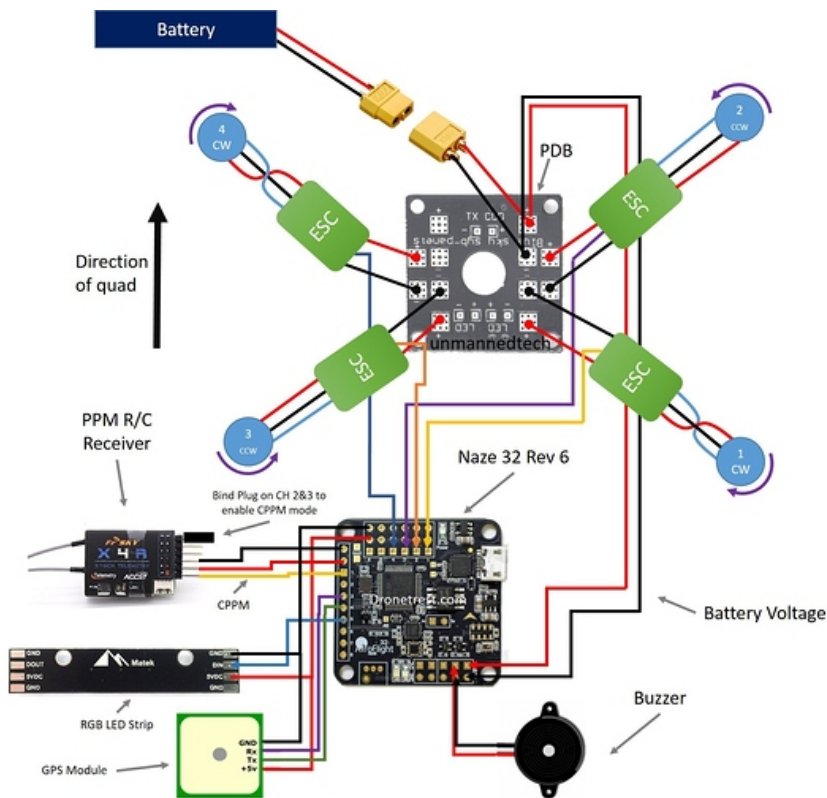


Here is a closeup of the auxiliary connectors on the Naze 32 board which include an extra 3.3V output at 100mA, a I2C connector, the buzzer connector, and battery voltage monitor pins. One thing to note is that the Frsky Telemetry pins are shared by the UART 1 TX, which is in turn shared by the USB. So if your board is connected to your PC via USB you cannot use the UART 1 ports.



## Typical Naze32 Connection diagram

The diagram below shows a fairly common setup on a FPV racing quadcopter using a CPM receiver, optional GPS module, and an RGB LED bar.



## Flashing Cleanflight onto Naze 32 Rev 6

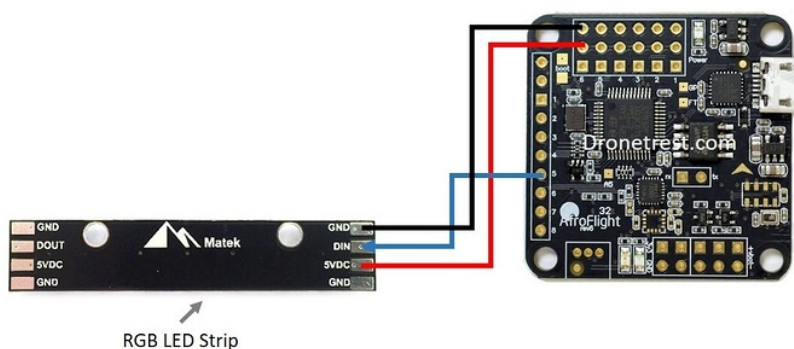
Contrary to many forums it is definitely possible to load and run cleanflight easily on the Rev 6 Naze 32 boards that we sell. Once the board is connected to your PC the drivers should install automatically. Then launch the [cleanflight GUI](#) and write the latest firmware version to your board as shown below.



## Connecting a RGB LED strip

Adding an **RGB LED strip** to your Naze 32 is one of the coolest features for FPV flying. Not only does it let you see your quadcopter easily, but you can also add smart features to your LED, so when you are turning left, the Left LED's can flash. When you slow down the lights can glow bright red, just like a car brake lights.

Depending on your RGB LED strip power requirements you might need to connect it directly your battery, or BEC. In the diagram below the LED strip runs on 5V so we can power it directly from the ESC rail. The control signal plugs into RC 5 on your naze32.



Once connected you will need to configure the RGB LED strip in clenaflight. Here is a great video showing you how to do this.

## Using integrated Black-box Recording to SPI dataflash

Since the revision 6 of the naze32 boards include a built in blackbox recorder, it is very easy to get this working. Rather than re-writing everything here is a great video by Roberto Correia showing the process of enabling the blackbox via cleanflight CLI and how to view the logs after a flight.

## Naze 32 Soft Serial

Since the Naze32 only has two hardware UART ports, of which one of them is used by USB. So this introduces some issues if you want to use a bunch of accessories with your Naze32. Fortunately you have the option of using softserial which emulates an extra two UART ports on RC pins 5,6,7,8. However if you enable soft serial you will not be able to

use those ports for other things such as RC 5 for your LED bar. My suggestion is to use a CPPM receiver so that you can use the dedicated spare UART2 port for something like GPS.

## Connecting a SBUS receiver

Is it possible to connect a SBUS receiver (such as the **X4R-SB**) directly to the Naze32 Rev 6 flight controller, but by doing so you will be using the UART2 ports and will not be able to use UART2 for other things such as GPS. However I would suggest you try to rather use a CPPM receiver (X4R-SB can be used in CPPM mode) as this will keep the UART ports free on your NAZE 32.

## Connecting FrSky Telemetry

With the older D series receiver (like the D4R) connecting telemetry is fairly simple by connecting the green wire from your D4R to the telemetry pin on the flight controller.

## Connecting Smart Port Telemetry

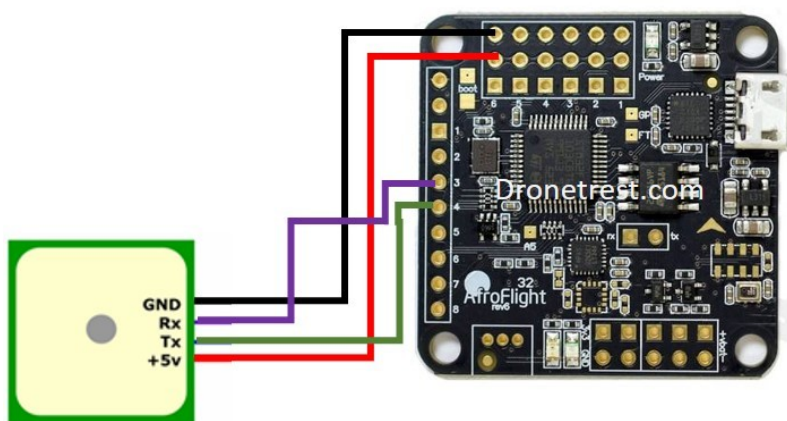
When it comes to the newer X-series FRsky receivers, telemetry connection is a little more tricky. To use this you will need to use the softserial feature on cleanflight. Doing so means that RC pins 5,6,7,8 will be used so you cannot use your RGB LED bar in addition to the smart port telemetry. For full details check our our guide on how to setup smart port telemetry on your flight controller.

### Smart Port Telemetry on Naze 32

Using FrSky smart port telemetry on Naze 32 flight controllers is a little tricky to get working due to the limited number of UART ports available on the naze 32 flight controller with F1 processors. Using other naze 32 compatible flight controllers with F3 processors such as DoDo F3 make things abit easier. However if you do have a naze32 and want to use your X-series receiver (such as X4R) with telemetry here is what you need to do. There are two options, the first one which is better is t...

## Connecting a GPS Module

If you are using a 10DOF or Full Naze 32 board then you can add a GPS module to use extra flight modes. Connecting it to the UART 2 ports is fairly easy and straight forward as shown in the image below. You will need to power the GPS module from the ESC rail.



Once connected you need to enable it within the cleanflight GUI. The important thing is to make sure the baud rate is set correctly within cleanflight to match the baud rate on your GPS module. If you are not sure you can play around

with the various baud rate settings until one of them works. However most modules run on 57600.

Ports DOCUMENTATION FOR 1.11.8

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.  
Note: Do NOT disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you do.

Identifier	Data	Logging	Telemetry	RX	GPS
UART1	<input checked="" type="checkbox"/> MSP 115200 ▼	<input type="checkbox"/> Blackbox 115200 ▼	Disabled ▼ AUTO ▼	<input type="checkbox"/> Serial RX	<input type="checkbox"/> 57600 ▼
UART2	<input type="checkbox"/> MSP 115200 ▼	<input type="checkbox"/> Blackbox 115200 ▼	Disabled ▼ AUTO ▼	<input type="checkbox"/> Serial RX	<input checked="" type="checkbox"/> 57600 ▼

**Enable GPS on UART2 and set appropriate BAUD**

Save and Reboot

Once the serial port is configured, you will need to set the GPS settings in the configuration tab.

GPS

Note: Remember to configure a Serial Port (via Ports tab) when using GPS feature.

☒ GPS Configure port scenario first

UBLOX ▼ Protocol

Auto-detect ▼ Ground Assistance Type

0 ▼ Magnetometer Declination [deg]

**Setup GPS module in configuration tab**

## Naze 32 LED's and their meanings

Each naze 32 has three LED's on the board, one located close to the USB port to indicate if its powered or not. The other two are located next to the spektrum connector and are used to provide some details as to what is happening on your flight controller according to various flashing sequence:

- Red+Green + Blue on solid - device is in bootloader mode
- Green flashing - indicates the board is not armed (if you cant get your board to arm see below)
- Green on solid - the board is armed
- Green + Red on solid - board is armed and is in horizon / self level mode
- Red + Green flashing one after another - board is calibrating accelerometers / compass

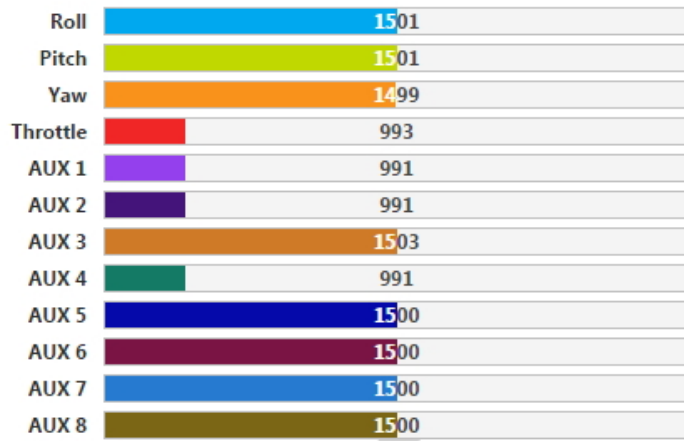
## I cant get my Naze32 to arm

It can be rather annoying to build and setup your quadcopter and when you arrive to go fly, it will not arm. So its always a good idea to check its working after setting it up before going out to fly. However from time to time it might not want to arm so here are a few common mistakes that prevent your Naze 32 flight controller from arming.

### Make sure your radio is setup correctly

When you are setting up your cleanflight board, make sure that your radio settings are correct. This means to make sure the channels are correctly assigned and not reversed (when you move the throttle stick upwards you see the throttle channel moving upwards on cleanflight). Also make sure the range is between 1000-2000, if not you will need to change either the settings on your radio, or use the cleanflight command line as discussed [here](#)





### Make sure you have performed sensor calibration?

If you have not yet calibrated your accelerometers, and compass (only on 10DOF boards) on your board. An easy way to do this is to make sure your multirotor is on a level surface, with battery connected. Then on your R/C controller move the sticks to the appropriate positions as shown in the image below for the Gyro and ACC calibration:

### Mode 2 Stick Functions

Arm		In-flight Calibration Controls	
Disarm		Trim Acc Left	
Profile 1		Trim Acc Right	
Profile 2		Trim Acc Forwards	
Profile 3		Trim Acc Backwards	
Calibrate Gyro		Disable LCD Page Cycling	
Calibrate Acc		Enable LCD Page Cycling	
Calibrate Compass		Save Setting	

### Check your throttle failsafe

A common error is the PWM failsafe value that is set on cleanflight. Cleanflight has a failsafe to turn off the motors and disarm if it loses connection to your R/C controller. However sometimes this might be higher than your actual radio throttle idle value, so the failsafe would activate (requiring you to restart your board before it will allow you to arm again). So you will either need to change the throttle idle value on your radio, or change the value within cleanflight. But please make sure that you do set a failsafe and have configured this on your R/C receiver as you don't want your drone to fly away accidentally.

[🔗 Flip 32+ \(Naze 32\) Flight Controller Guide](#)

[🔗 Frsky XSR - the best miniquad RX?](#)

[🔗 Seriously Pro SPracing F3 Mini](#)







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**unmannedtech1** Alex (Unmanned Tech)

**May '16**

With most blheli ESC it actually doesn't matter as you can just switch the direction with software anyways. I actually cant remember the last time I paid attention to the motor to ESC wiring 😄

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[mlpfw](#)

May '16

Alex

Yes, I know you can use BLHeli to change it but not everyone has an ESC with BLHeli bootloader/firmware.

I had a friend that followed your diagram few days ago and got it wrong. Don't forget that a lot of new guys are the ones that actually look at tutorials like this.

Take it for what it is worth.

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[unmannedtech1](#) Alex (Unmanned Tech)

May '16

[@mlpfw](#) Thats a very good point, and I did not notice that the diagram was wrong until you pointed it out so I have fixed it now 😊

When I was writing this guide it was rather late at night and I used our diagram from our [ZMR250 build guide](#) which has the correct ESC wiring on it, and for some odd reason I switched it around. So thanks again for pointing that out!

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[mr1drone2many](#)

May '16

thanks so much ! I have the taranis with the 8XR with the rev6 board. How to i get the telemetry info back to the controller thanks !

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[unmannedtech1](#) Alex (Unmanned Tech)

May '16

Check out our [smart port telemetry guide](#) which will tell you how to do it.