Naza for **Multi-Rotor**

User Manual

V 1.4

Warning & Disclaimer

Naza is an excellent autopilot system offering tremendous flight features for low altitude multi-rotor working in restricted space compared to normal helicopter. It is not a toy when installed in multi-rotors of any size. Please respect the AMA's National Model Aircraft Safety Code. Despite our efforts in making the controller to operate in the safest manner when the main power battery is connected, such as: disabling MC signal to ESCs when USB is connected; disabling throttle input and stick command when throttle stick is not at the lowest position, we strongly recommend customers to remove all propellers, use power supply from R/C system or flight pack battery, and keep children away during system calibration and parameter setup. Dajiang Innovation Technology Co. Ltd. assumes no liability for damage(s) or injuries incurred directly or indirectly from the use of this product. Please strictly follow these steps to mount and connect Naza on your multi-rotor, as well as to install the assistant software on your computer.

Product Profile

DJI Naza for multi-motors is an autopilot system designed for serious multi-rotor enthusiasts providing excellent self-leveling and altitude holding, which completely takes the stress out of flying RC multi-rotors for both professional and hobby applications. Naza can be installed in a variety of models from quad-rotor to hexa-rotor.

Naza Control Modes		
	Atti. Mode	**Manual Mode**
Command Stick Meaning	Maximum rudder angular velocity is 200 °/s	
	Multi attitude control; Stick center position for 0˚ attitude, its endpoint is 45˚. Has height lock.	Maximum pitch and roll angular velocity is 150 °/s, no angle limitation. No height lock.
Command Linearity	YES	
Stick Released	No position holding, only attitude stabilizing.	NOT Recommend
Altitude Lock	Maintain the altitude best above 1 meter from ground.	NO
Safety	Low voltage protection and auto level Fail-safe	Depends on experience.
Maneuverability	High agility, high stability	High agility

In Box

Main Controller (MC) ×1

The Main Controller (MC) is the brain of the system, it communicates with ESC and RC transmitter to carry out autopilot functionality. It has a built-in Inertial Measurement Unit (IMU) consists of one 3-axis accelerometer, one 3-axis gyroscope and a barometer for sensing the attitude and altitude.

Versatile Unit (VU) ×1

Specially designed for Naza. It solves the high power consumption problem of multi-rotor system, supply and monitor power for Naza and other electronic devices. It also has a LED to indicate different states of Naza and a USB interface for configuration and firmware upgrade.

USB Cable ×1

This cable is used to configure MC and upgrade firmware.

3-PIN Servo Cable ×8

Cables used to connect the MC and the receiver.

3M Gummed Paper ×4

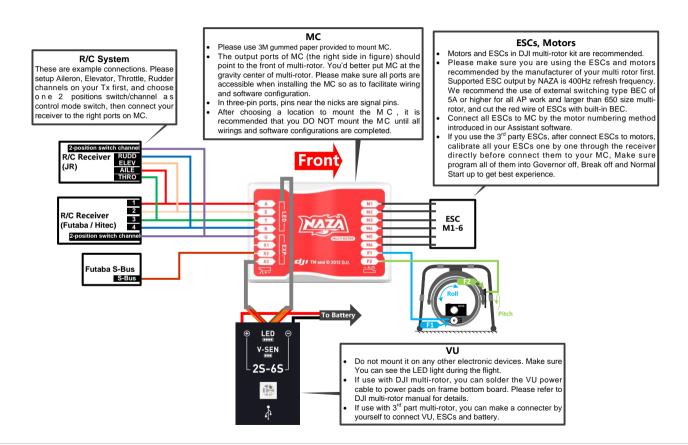For fixing Naza components on multi-rotor's frame.

Contents

Matters Need Attention

For safety reasons, please pay serious attention to all following items:

1. **Please disconnect ESCs and battery or remove all propellers during configuration and system setup!**

2. **Do not mount the MC upside-down.**

3. **You have to reboot MC and redo the Tx calibration after you change the RC system.**

4. **In Tx Calibration of assistant software:**
   - **Throttle: Slide left is craft down, slide right is craft up;**
   - **Rudder: Slide left is nose left, slide right is nose right;**
   - **Elevator: Slide left is craft back, slide right is craft front;**
   - **Aileron: Slide left is craft left, slide right is craft right.**

5. **Make sure switch on the transmitter first, then power on multi-rotor before takeoff! Power off multi-rotor first, then switch off the transmitter after landing!**

6. **If you open the gimbal control in assistant software during the configuration, please note that there is output from F1 and F2 ports. Now you should not connect these ports to ESCs which is wired with propellers and motors.**

7. **Do NOT set the failed-safe position of throttle under 10% of endpoint.**

8. **Throttle stick position should always be higher than 10% from cut-throttle during the flight!**

9. **Low voltage protections are NOT fun! You should land your multi-rotor ASAP in any level of protection to prevent your multi-rotor from crash or other harmful consequences!**

10. **By using Immediately mode to stop motors, in any control mode, once motors start and throttle stick is over 10%, motors will stop immediately when throttle stick is back under 10% again. In this case, if you push the throttle stick over 10% in 5 seconds after motors stop, motors will re-start, Combination Stick Command (CSC) is no need. If you don't push throttle stick after motors start in three seconds, motors will stop automatically.**

11. **By using Intelligent mode to stop motors, motors will start or stop immediately when you execute CSC. During normal flight, only pull throttle stick under 10% will not stop motors in any control mode. You have to execute CSC to re-start motors if they stop during the flight.**

12. **Red light blinking indicates battery voltage is low, please land ASAP.**

13. **Do NOT move any command sticks during system start and self-check! Please contact us if the last four green blinks are abnormal.**

Assembly

R/C System

These are example connections. Please setup Aileron, Elevator, Throttle, Rudder channels on your Tx first, and choose o n e 2 positions switch/channel a s control mode switch, then connect your receiver to the right ports on MC.

MC

- Please use 3M gummed paper provided to mount MC.
- The output ports of MC (the right side in figure) should point to the front of multi-rotor. You'd better put MC at the gravity center of multi-rotor. Please make sure all ports are accessible when installing the MC so as to facilitate wiring and software configuration.
- In three-pin ports, pins near the nicks are signal pins.
- After choosing a location to mount the M C , it is recommended that you DO NOT mount the M C until all wirings and software configurations are completed.

ESCs, Motors

- Motors and ESCs in DJI multi-rotor kit are recommended.
- Please make sure you are using the ESCs and motors recommended by the manufacturer of your multi rotor first. Supported ESC output by NAZA is 400Hz refresh frequency. We recommend the use of external switching type BEC of 5A or higher for all AP work and larger than 650 size multi-rotor, and cut the red wire of ESCs with built-in BEC.
- Connect all ESCs to MC by the motor numbering method introduced in our Assistant software.
- If you use the 3rd party ESCs, after connect ESCs to motors, calibrate all your ESCs one by one through the receiver directly before connect them to your MC, Make sure program all of them into Governor off, Break off and Normal Start up to get best experience.

Front

2-position switch channel

R/C Receiver (JR)
RUDD
ELEV
AILE
THRO

R/C Receiver (Futaba / Hitec)
1
2
3
4
2-position switch channel

Futaba S-Bus
S-Bus

A
E
T
R
U
X1
X2
X3

M1
M2
M3
M4
M5
M6
F1
F2

ESC M1-6

Roll

F2

Pitch

F1

To Battery

LED
V-SEN
2S-6S

VU

- Do not mount it on any other electronic devices. Make sure You can see the LED light during the flight.
- If use with DJI multi-rotor, you can solder the VU power cable to power pads on frame bottom board. Please refer to DJI multi-rotor manual for details.
- If use with 3rd part multi-rotor, you can make a connecter by yourself to connect VU, ESCs and battery.

Assistant Software

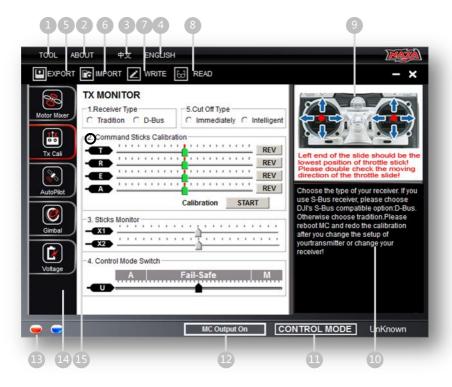## Software and Driver Installation

STEP1: Please download assistant software and driver from our website. Then decompress;

STEP2: Connect MC and PC via USB cable, power on MC;

STEP3: If operating system tries to install driver automatically, cancel it;

STEP4: Open folder DJI_USB_Driver, follow the *Driver Installation Manual* strictly to finish installation;

GUI

1. **TOOL**
   - ➔ **Firmware upgrade**: update your firmware from server, keep your autopilot system up-to-date.
   - ➔ **Disable All Knob**
   - ➔ **Check for Updates**: Check out the latest versions of assistant software and firmware. If necessary, you can follow the links displayed to find the download page.

2. **ABOUT**
   - ➔ **Info**: Information regarding your product
   - ➔ **Error Code**

3. **中文**: Chinese interface.

4. **ENGLISH**: English interface.

5. **EXPORT**: Export configure data.

6. **IMPORT**: Import vertion compatible configure data.

7. **WRITE**: Write data of the current page to your MC. The parameter or the title of which will turn red and bold when modified, make sure you click the **Write** button or press **Enter** to update your system. Optional parameters will be written to MC directly after modification.

8. **READ**: read parameters from MC for current page.

9. Graphic guidance

10. Text guidance

11. **CONTROL MODE**: Control mode indication.

12. **MC Output On** Indicates there are outputs to ESCs; when communication is built up between MC and assistant software via USB cable, **MC Output Off** appears, it indicates no output to motors, then you can configure your multi-rotor with assistant software more safely!

13. Red light: MC↔PC has been disconnected.

    Green light: MC↔PC has been connected.

    Blue light: MC↔PC communication.

14. Here you can find all the configuration contents in Configuration chapter

15. Configuration step.

Notices:

- Please power the MC first, then connect your MC to a internet enabled computer by the USB cable before you open the assistant software.
- You have to register at the first time you use the assistant software.
- It will auto detect software version when you open the assistant software and prompt **Check for Updates** window if your version is not the latest one:
- Do not disconnect MC and PC when you are using the assistant software..

Firmware Upgrade

Please strictly follow the procedure for firmware upgrade, otherwise autopilot might not work properly:

STEP1: Make sure your computer is connected to the Internet.

STEP2: Please close all the other applications during the firmware upgrade, including anti-virus software and firewall.

STEP3: Make sure the power supply is securely connected. DO NOT un-plug the power supply until firmware upgrade has finished.

STEP4: Connect MC to PC with micro-USB cable, DO NOT break connection until firmware upgrade is finished.

STEP5: Run Software and wait for connection.

STEP6: Select TOOL→ Firmware Upgrade.

STEP7: Server will check your current firmware version, and get the latest firmware prepared for the unit.

STEP8: If there is a firmware version more up-to-date than your current version, you will be able to click the Upgrade button.

STEP9: Wait until Assistant software reads finished.

STEP10: Click OK and power cycle the unit after at least 5 seconds.

Your unit is up-to-date now.

Notices:

● After firmware upgrade, please re-configure by Assistant software.

● If it is notified that the network or server is busy, please try again later with above procedures.

● If firmware upgrade failed, MC will enter waiting for firmware upgrade status automatically, please try again with the above procedures.

Product Info & Upgrade

You can check the MC product version via ABOUT → Info:

●Software　　　　　　　●Firmware　　　　　　　●Loader　　　　　　　●Hardware ID
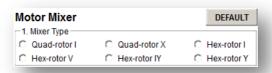
S/N is a 32 digits authorization code for unit function activations. We had already filled in the authorization code for your unit after manufacture. You might be asking to fill in the new S/N in the future if you brought new function upgrades. Fill-in the S/N and then click Write button. If you filled in an invalid S/N over 30 times, your MC will be locked and you have to contact our customer support.

Configuration

1 Motor Mixer

STEP1: Mixer Type

Set your transmitter into ACROBATIC mode. Then select the right mixer type according to your multi-rotor.
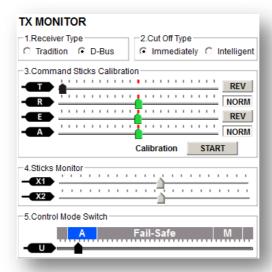
Tips:

- We support six types of multi-rotors. Refer to *Multi-Rotors Supperted* in Appendix:

Notices:

- Do NOT follow instruction from 3rd party multi-rotor manufacturer! Make sure the rotation direction of each motor is the same as the way up figure shows. If not, switch any of two wire connetcions of the incorrect motor to change its rotation direction.

- Make sure the type of propeller matches the rotation direction of the motor.

2 Tx Monitor

Notices: Make sure you have removed all propellers before this step!

STEP1: Receiver Type
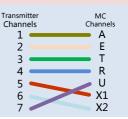
Choose the type of your receiver. If you use S-Bus receiver, please choose S-Bus compatible option: D-Bus.

Otherwise choose Tradition.

Notices:

Please reboot MC and redo the calibration after you change the setup of your transmitter or change your receiver!

Tips:
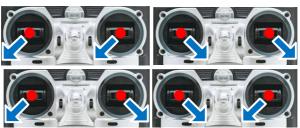
If you use S-Bus receiver, the communication of A, E, T, R, U, X1 and X2 channels are all through the D-Bus channel. Right figure shows the connection of default transmitter channels and MC channels in S-Bus receiver (Only first 8 channels of S-Bus receiver are used at the moment).

STEP2: Cut Off Type

Please read the introductions of start and stop motor in this step first, and then choose a cut off type.

1	**Start Motor**: Pushing throttle stick before takeoff will not start motors. You have to execute any one of following four Combination Stick Commands (CSC) to start motors:

2	**Stop Motor**: We provide two options to stop motors: Immediately, Intelligent.

- Immediately Mode: By using this mode, in any control mode, once motors start and throttle stick is over 10%, motors will stop immediately when throttle stick is back under 10% again. In this case, if you push the throttle stick over 10% in 5 seconds after motors stop, motors will re-start, CSC is no need. If you don't push throttle stick after motors start in three seconds, motors will stop automatically.

- Intelligent Mode: By using this mode, different control mode has different way of stopping motors. In Manual Mode, only executing CSC can stop motors. In Atti Mode, any one of following four cases will stop motors:

    a)	You don't push throttle stick after motors start in three seconds;

    b)	Executing CSC;

    c)	Throttle stick under 10%, and after landing 3 seconds.

    d)	The slope angle of multi-rotor is over 70°, and throttle stick under 10%.

Tips (Intelligent Mode):

- You have to execute CSC to start motors. Push throttle stick only will not start motors.
- In Atti. Mode, it has landing judgment, which will stop motors.
- Start motors in Atti. Mode, you have to execute CSC and then push throttle stick over 10% in 3 seconds, otherwise motors will stop after 3 seconds.
- During normal flight, only pull throttle stick under 10% will not stop motors in any control mode.
- For safety reason, when the slope angle of multi-rotor is over 70° during the flight in Atti. Mode (may be caused by collision, motor and ESC error or propeller broken down), and throttle stick is under 10%, motors will stop automatically.
- You can stop motors by executing CSC in any control mode.

Notices:

1.	All these two cut off types will work properly only if Tx calibration is correct.

2.	When Tx commands are valid under any control modes, motors will start or stop immediately when

you execute CSC. It has nothing to do with current throttle stick position. Please DO NOT executes CSC during flight without any reason.

3. If you choose Immediately mode, you should not pull throttle stick under 10% during flight, because that will stop motors. If you do it accidentally, you should push the throttle stick over 10% in 5 seconds to re-start motors.

4. If you choose Intelligent mode, throttle stick under 10% will trigger landing judgment in any control mode. In this judgment, pitch, roll and yaw controls are denied except throttle, but multi-rotor will still auto level.

5. In any control mode, DO NOT pull throttle stick under 10% during normal flight without any reason.

6. In failed-safe, CSC is denied by MC, motors will hold state.

STEP3: Command Sticks Calibration

Slides Moving Definition：

T : **Slide left is craft down, slide right is craft up;**

R : **Slide left is nose left, slide right is nose right;**

E : **Slide left is craft back, slide right is craft front;**

A : **Slide left is craft left, slide right is craft right.**

STEP1: Set endpoints of all channels to default values (100%) and set all trims and sub-trims of sticks to 0 on your transmitter first. Keep all curves' settings as default since the end-point of transmitter sticks will be recorded here.

STEP2: Click START button, and move all of the sticks throughout their complete range several times.

STEP3: After that, click FINISH button when you finished above procedures.

STEP4: If the moving direction of the slide is opposite to the *Slides Moving Definition*, click the reverse button REV/NORM beside.

Notices:

1. All slides should become 🟩 when all the sticks are in the middle positions. If slides cannot go back to center points (become 🟩), just click FINISH, then slides will be at center automatically. If still not, please reboot MC, and do not apply Tx command during the reboot.

2. CSC may not start motors If trims and sub-trims of sticks are not 0!

STEP4: Sticks Monitor

This step is optional. X1 and X2 is for remote gain tuning; X1 is also for gimbal pitch control. Setup the

channel on your RC correctly.

STEP5: Control Mode Switch

Whichever 2-position switch you have selected to use in the transmitter for control mode switching, connect the right channel on receiver to U port on MC. At each switch position, use end-point fine tuning on your transmitter, move the slider of channel U to A (Atti. Mode), M (Manual Mode) to turn the corresponding area blue respectively.

Tips:
- To move the slider is to adjust end-points of the channel selected.
- For 2-position switch, you should assign: Position-1 to Manual Mode; Position-2 to Atti. Mode; or reverse the assignment.

If your transmitter supports Fail-Safe, then move the slider to the range which reads Fail-Safe Mode to turn the area blue, set Fail-Safe output of receiver to input port-U. If you switch off your transmitter now, the U channel slide should move to Fail-Safe and turn the corresponding area to blue. Otherwise please reset the fail-safe. MC has built-in auto level Fail-Safe function. That means when the communication between MC and transmitter is disconnected, the outputs of all command sticks from MC will go to center point. If your transmitter has only 4 channels, then MC will work in Atti. Mode by default without Fail-Safe function.

Tips:
Please refer to your RC manual for the details of fail-safe setup.

Notices:
1. Do NOT set the fail-safe position of throttle under 10% endpoint.
2. MC would not execute Fail-Safe protection if you don't set it properly. You can verify the Fail-Safe settings by shutting down your transmitter, and then you can use the following method to check whether MC is already in Fail-Safe mode.
   - Check the Assistant Software status bar at the bottom side of the software interface. Control mode will change to Fail-Safe.
   - Check the LED indicator. Read the appendix in this manual for details. LED will give fast orange blinking if in fail-safe mode.
3. If your transmitter does not support Fail-Safe, the auto level Fail-Safe function will not work when the communication between MC and transmitter is disconnected.
4. Do not use 4-channel Futaba transmitter with S-Bus receiver, otherwise MC will work in Fail-Safe mode.

3 Autopilot

STEP1: Basic Parameters

Usually, the default parameters are ready to go. However, different multi-rotors have different gains because of different size, ESC, motor and propeller. If gain is too large, you will find the multi-rotor oscillating in the corresponding direction (About 5~10Hz). If too small, the multi-rotor will likely to be hard to control. So you can still setup the basic Gain of Pitch, Roll, Yaw and Vertical manually according to your multi-rotor to have a wonderful fly experience. We suggest you to change 10% to 15% of the parameter at a time.

To the gains of Pitch and Roll, if you release the Pitch or Roll stick after command stick, multi-rotor should be back to hovering state. If the reaction of multi-rotor in this procedure is too soft (large delay), please increase the basic gain slowly (10%-15% each time) until vibration emerges after you release the stick. Then decrease the gain a little until vibration just disappears. Now the gain is perfect, but the reaction of the attitude change is slow. You can follow the way introduced at the end of this section to tune the attitude gains.

The way of tuning the Yaw gain is the same as the way of adjusting the Tail Gyro. If you want fast stick reaction speed, increase the gain, otherwise decrease the gain. However, the spin of multi-rotor is produced by the counter torque force, and the magnitude of which is limited. Therefore, large gain will not produce tail vibration like helicopter, but severe reaction at the start or stop of motors, which will affect the stabilization of the other directions.

You use two methods to judge if the Vertical gain is good enough: 1) The multi-rotor can lock the altitude when the throttle stick is at center position; 2) The change of altitude is small during the flight along a route. You can increase the gain slowly (10% each time) until the vibration emerges along the vertical direction or the reaction of throttle stick is too sensitive, then decrease 20% of the gain. Now it is a suitable Vertical gain.

Attitude gains determine the reaction speed of attitude from command stick, the bigger the value the quicker the reaction. Increase it for sharper and quicker leveling action after command stick released. Unstable shaking flying and the control feeling will be stiffness and rigid if the value is too high; and sluggish leveling action and slow braking if too small.
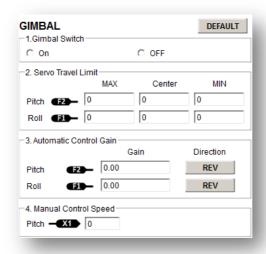
Notices:

- You must upgrade firmware first, then click Default button in first setup parameter.
- The vertical gain will NOT affect the manual mode.
- The final flight performance is decided by the autopilot parameters and all parts of multi-rotor (includes mechanical structure, motors, ESCs, propellers and battery). If these parts are not compatible, you cannot get good flight performance by adjusting the autopilot parameters. Therefore, if you have high requirement to flight performance, you'd better get a multi-rotor with good integration test.

Tips:

- If you are a fresh player, you can tune the basic parameters first as following:
    1. Increase the basic parameters 10% at a time so as to make your multi-rotor hover or light oscillate after small angular command input.
    2. Decrease the basic parameters until your multi-rotor can just hover, then decrease 10% more.
- Here you can make use of remote gain-tuning channels to tune the gains during the flight:
    1. Followed the instructions in *Assembly* R/C System section to connect and setup correctly;
    2. Choose the X1 or X2 channel in Remote Adjust for the gain you want to tune. One channel to one gain.
    3. The range of remote tuning is from half current value to twice current value.
- Usually the Pitch, Roll, Attitude Pitch and Attitude Roll Gains of hexa-rotor are high then quad-rotor.

4 Gimbal

STEP1: Gimbal Switch

If you use gimbal, please choose On here.

Notices:

If you open the gimbal control in assistant software during the configuration, please note that there are outputs from F1 and F2 ports. Now you should not connect these ports to ESCs which is wired with propellers and motors.

STEP2: Servo Travel Limit

Range: -1000 to+1000

MAX/MIN are servo travel limits; adjust them to avoid mechanical binding; Place your multi-rotor on level ground, adjust Center value of Pitch and Roll direction to make the camera mounting frame to your desired angle-to-ground.

STEP3: Automatic Control Gain

Range: 0 to 100

Adjust the reaction angle of automatic control. The initial value 100 is full angle. The bigger the gain, the

bigger the reaction angle. Click REV/NORM, and then you can reverse the feedback control directions.

STEP4: Manual Control Speed
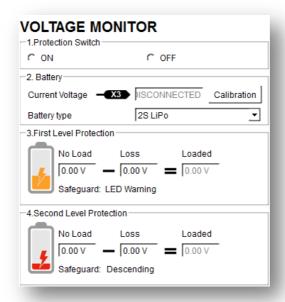
Range: 0 to 100

You should assign one of the knobs on your transmitter to X1 channel for controlling the Pitch direction (angle) of camera gimbal during flight first. Then adjust the reaction speed of pitch direction manual control; the initial value 100 is full speed.

Notices:

If parameter adjustment was enabled on channel X1, the gimbal manual control via channel X1 will still be on as well.

5 Voltage Monitoring

VOLTAGE MONITOR

1. Protection Switch
- ○ ON
- ○ OFF

2. Battery

Current Voltage — **X3** DISCONNECTED Calibration

Battery type 2S LiPo ▼

3. First Level Protection

No Load Loss Loaded

0.00 V — 0.00 V = 0.00 V

Safeguard: LED Warning

4. Second Level Protection

No Load Loss Loaded

0.00 V — 0.00 V = 0.00 V

Safeguard: Descending

STEP1: Protection Switch

In order to prevent your multi-rotor from crash or other harmful consequences caused by low battery voltage, we have designed two levels of low voltage protection. You can choose to not to use them, however we strongly recommend to open the protections here!

Notices:

- Make sure the connection between VU and MC (V-SEN to X3) is correct; otherwise the low voltage protection will not work properly.
- All two levels of protection have LED warning as default. All two levels of protection will blink red light ● ceaselessly.
- All two level protections will only have LED warning under Manual Mode, no any automatic actions.
- Low voltage protections are NOT fun! You should land your multi-rotor ASAP in any level of protection to prevent your multi-rotor from crash or other harmful consequences!

STEP2: Battery

Power the MC by a battery and connect the MC with PC, current battery voltage will be displayed in this column. If the battery voltage displayed here is different from the voltage you measure from a voltmeter, you

have to calibrate. Click the Calibration, fill the voltage you have just measured in the Calibration column of the dialogue box, and then click Confirm.

Meanwhile we need you to choose the battery type you are using, so that MC can provide default warning voltages and ranges of warning voltages for you.

STEP3: First Level Protection

- No Load (No Load Voltage): Self-defining warning voltage. Needs your input.
- Loss (Line Loss Voltage): The battery voltage drop during the flight. Needs your input.
- Loaded (Loaded Voltage): The real-time battery voltage during the flight. This is the actual warning voltage monitored by MC. No needs your input, calculated by No Load and Loss.

Tips:

Voltages Magnitude Relation:

- No Load: First level > Second level.
- Loss: First level = Second level.
- Loaded: Calculated, First level > Second level.

Method of Acquiring Line Loss Voltage:

1 Make sure you can fly your multi-rotor normally with a fully charged battery.

2 Use a fully charged battery, switch on the low voltage protections in assistant software, and observe the current voltage. Fill a reasonable warning voltage in the No Load of first protection (We recommend to fill a voltage 1V lower than current voltage and higher than minimum battery voltage rating in). Fill 0V in Loss at the moment.

3 Fly the multi-rotor until the first level protection is triggered, and the ● is flashing. Now land your multi-rotor ASAP.

4 Connect the MC to PC, open the assistant and acquire new current voltage. The Loss (Line loss voltage) is the difference between the new current voltage and the first level No Load voltage you filled in.

Acquire the line loss voltage by the method introduced before first, and fill it in Loss . Then fill a reasonable warning voltage in the No Load .

STEP4: Second Level Protection

1   Fill the warning voltage and line loss voltage in No Load and Loss by the method introduced in previous step.

2   When the second level protection is triggered, LED warning will be on. Meanwhile the center point of throttle stick will move up slowly to 90% of endpoint, you should land ASAP to prevent your multi-rotor from crash or other harmful consequences!

3   When the center point is at 90% of endpoint, multi-rotor will still ascend slowly if you continue to pull the throttle stick, and the control of Pitch, Roll and Yaw are the same as before. Please land ASAP to prevent your multi-rotor from crash or other harmful consequences!

Flight

Before First Flight

Notices:

- Make sure you have assembled your multi-rotor correctly.

- Make sure you have done the configuration procedure correctly.

- Any of the following mistakes will leads to dangerous accident, double check all these items:

  - Rotation direction of motor is opposite;

  - Propeller installation mistake;

  - MC installation mistake;

  - Wrong connection between MC and ESC;

- In Atti Mode, throttle stick center position is for 0m/s along the vertical direction. You'd better keep throttle stick position higher than 10% from cut-throttle during the flight!

- Make sure switch on the transmitter first, then power on multi-rotor! (Power off multi-rotor first, then switch off the transmitter after landing!)

- Please do the test fly and gain tuning with Atti. Mode in the open air without heavy wind!

- In Atti Mode, after power on and before motors start, if 🟡 double blinks without move any stick, that means, you have moved any stick during system start up and check. Now you should reboot MC.

Test Fly

STEP1: Make sure your batteries are fully charged for your transmitter, MC and all the devices on your multi-rotor;

STEP2: Check all connections and wirings, and make sure they are in good condition;

STEP3: Switch on the transmitter first, then power on your multi-rotor!

STEP4: Slide the control mode switch on your transmitter, and make sure it is working properly. Check it with LED indicator to specify the current working mode for MC. See Appendix for details about LED indicator;

STEP5: Switch the system to Atti. Mode. **Use any safe method to do the following test:** Apply the throttle to 20% slowly and make sure all the motors are working, and then try to push your sticks lightly in Roll, Pitch and Yaw to feel if your multi-rotor moves to the corresponding direction. If not, go back to *Configuration Procedure* correct your settings.

STEP6: Push the throttle stick slowly in 3 seconds after executing CSC until all the rotors are working, and then take-off your multi-rotor gently
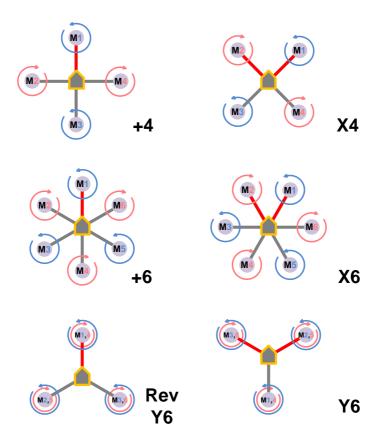
Tips:

After a successful test fly, the preparation before taking off can be simplified: Put your multi-rotor on the plane ground, turn on the transmitter first, power on multi-rotor, then you can take off in Atti. Mode .

Appendix

Multi-Rotors Supported

To coaxial propellers: Blue propeller is at Top; Red propeller is at Bottom. Otherwise all propellers are at top.

+4

X4

+6

X6

Rev Y6

Y6

Port Description

Main Controller

A	For roll control (left/right)	
E	For pitch control (front/back)	
T	For throttle control	
R	For rudder control	
U	For Control Mode Switch	
X1	For gimbal pitch control	Or for gain tuning
X2	For D-Bus (S-Bus compatible)	Or for gain tuning
X3	For voltage monitor (Connect with VU V-SEN port)	
M1	To #1 rotor	
M2	To #2 rotor	
M3	To #3 rotor	
M4	To #4 rotor	
M5	To #5 rotor	
M6	To #6 rotor	
F1	To gimbal roll servo	
F2	To gimbal pitch servo	
LED	LED port, for LED wire connection from Versatile Unit	
EXP.	Expansion port, for future upgrade and usage.	
	(In three-pin ports, pins near the nicks are signal pins.)	

Versatile Unit

V-SEN	V-SEN port: To MC X3 port, for monitoring battery voltage and supplying power
	• Orange wire (signal wire) output: ±3.3V
	• Red wire (power wire) output: 4A@5V
LED	LED wire, to MC LED port.
⇐	Micro-B USB port: PC connection for configuration and firmware upgrades.

Light Description

Main LED

Manual Mode	No light
Atti. Mode	🟡 🟡 🟡 🟡 🟡 🟡 🟡 🟡

Sparking indications of 🟡 is:

- Before motors start: **Single blink**, all sticks (except throttle stick) return to center; **Double blinks**, stick(s) (except throttle stick) not at center.

- After motors start and throttle stick is over 10% in 3 seconds: **Single blink**, all sticks return to center; **Double blinks**, stick(s) not at center.

Tx signal lost	🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡🟡
Low voltage / Other errors	🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴🔴
Connect to PC correctly	🟢━━━━━━━━━━━━━━━━━━🟢
System start and self-check	🔴🟢🟡🔴🟡🔴🟢🟡🟢🟢🟢🟢

Do NOT move any command sticks during this procedure! Please contact us if the last four green blinks are abnormal.

Specifications

General

Built-In Functions	• Two Modes Autopilot
	• Auto Level Fail-Safe
	• Low Voltage Protection
	• S-Bus Receiver Support
	• 2-axle Gimbal Support

Peripheral

Supported Multi-rotor	• Quad-rotor +4, X4;
	• Hexa-rotor +6, X6, Rev Y6, Y6.
Supported ESC output	400Hz refresh frequency.
Recommended Transmitter	PCM or 2.4GHz with minimum 4 channels.
Assistant Software System Requirement	Windows XP SP3; Windows 7

Electrical & Mechanical

Working Voltage Range	• MC: 4.8V ~ 5.5 V
	• VU: 7.2V ~ 26.0 V (recommend 2S ~ 6S LiPo)
Power Consumption	• MAX: 1.5W(0.3A@5V)
	• Normal: 0.6W(0.12A@5V)
Operating Temperature	-10°C ~ 50°C
Weight	• MC: 25g
	• VU: 20g
Dimensions	• MC: 45.5mm $\times$ 31.5mm $\times$ 18.5mm
	• VU: 32.2mm $\times$ 21.1mm $\times$ 7.7mm

Flight Performance (can be effected by mechanical performance and payloads)

Height Lock Accuracy	±0.2m
Max Yaw Angular Velocity	200 °/s
Max Tilt Angle	45 °
Max Ascent / Descent Speed	±6m/s

![DJI logo]

Naza for **Multi-Rotor**