Make sure the pilot is well-trained in operating UAVs before going on mission.
**TIANNONG M6E-1 Structure Picture**

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Item</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fuselage</td>
<td>7</td>
<td>Intelligent Battery</td>
</tr>
<tr>
<td>2</td>
<td>Clockwise Arm with LED</td>
<td>8</td>
<td>Landing Gear</td>
</tr>
<tr>
<td>3</td>
<td>Counter Clockwise Arm with LED</td>
<td>9</td>
<td>Camera Module</td>
</tr>
<tr>
<td>4</td>
<td>Clockwise Arm</td>
<td>10</td>
<td>Arm Joint(Fuselage)</td>
</tr>
<tr>
<td>5</td>
<td>Counter Clockwise Arm</td>
<td>11</td>
<td>Propeller (clockwise)</td>
</tr>
<tr>
<td>6</td>
<td>Water Tank</td>
<td>12</td>
<td>Propeller (Counter clockwise)</td>
</tr>
</tbody>
</table>
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1. Use Instruction

1.1 Safety Instruction

- The product is not suitable for the ones who are less than eighteen or who do not have full capacity for civil conduct.
- The product have bigger fuselage size, high speed rotary and strong flight dynamics. At runtime have a certain dangerousness. Not in accordance with the requirement operation and usage will cause to potential danger and hurt.
- When using this product, please keep away from airport, railroad, high speed road, high buildings, electric wire and other dangerous environments.
- When using this product, please keep away from mobile phone base stations, high power transmitting equipment, and other high electromagnetic interference environments.
- When using this product, please keep away from army and kinds of manned craft flight area.
- Don’t use this product in rain, thunder, sandstorm, fog snow, high wind, and low temperature and other bad environments.
- When flying in more than three kilometers. Environmental factors can lead to flight performance degradation, please care of using it.
- When operating this product fly in low sky. Please always keep UAV and people & animals in a safe distance of ten meters
- When using this product in desert area, please keep UAV within the range of operator’s eyes
- Don’t hover or fly over the crowd, Don’t be delight in scaring others.
- When it is close to the crowd, please land this UAV as soon as possible and guide people to keep and avoid potential accident.
- Don’t operate it in the area of children playing.
- If not in the extreme necessary condition, please do not power off when flying in the air.
• You can not fly it you are in drinking, tied, drugs, physical, discomfort, etc.

• Please inspect it before using very time, including but not limited to parts of fastness, organism and propeller of cracks, and abrasion, battery, the effectiveness of light. When error happens, please stop using immediately and replace the corresponding parts.

• Abnormal working state of the UAV maybe happen accidentally, don’t open the propellers and forcibly fly with wrong.

• Do not try to prevent the moving parts while working.

1.2 Pesticide Usage

• All pesticides are poisonous. Please be careful and work strictly according to the safety instructions of pesticides.

• When dispensing, please use clear water. If not, will cause jams mesh of impurities. If it is blocked, please clear it before reuse

• When dispensing, please note that liquid sparks and the pesticide residue in fuselage will be harmful to human body.

• When dispensing, please pay more attention and use protective tools, and do not let body directly touch with the pesticides; After pesticide spraying, please clear your skin, copter and remote control.

• When using pesticide, there will be interaction between different pesticides, user should clear cartridge or keep a certain interval time.

• Spraying shall be carried out in windless sunny day, don’t spray under high temperature at noon. While breezing, the operator should be standing above the wind and spraying; do not work when wind is four.

• When spaying, if you feel uncomfortable, headache or dizzy, please leave the site at once and rest. If once severe symptoms occur, immediately be sent to hospital.

• Pesticide effect and the solution concentration, spray rate, copter high from crops, wind direction, wind speed and so on are close related. When using pesticide should consider the above factors, to achieve the best effect. Please make sure that do not damage the human beings and animals and surroundings during the process of
sprayings.

- When using pesticide, do not pollute river and drinking water

### 1.3 Inspection

- Before flying, ensure the battery is enough
- Ensure all the parts are installed firmly, and all the screws are tight as required.
- Ensure all the wires are correctly linked.
- Ensure all parts go well. If it is broken or aging, please replace timely.
- Before flying, carefully check the propellers installation direction, rotation direction, control and others.
- Ensure all the propellers are fine, no any scratch and tightly installed.
- Ensure the sprayer is fluent without any clogging and work normally.

### 1.4 Environment

- While flying, please ensure the drone away from the crowds, dangerous goods, high buildings, high-voltage wires and others. Please fly the drone in a dedicated space.
- Please ensure the drone fly within the operator’s eyesight.
- The drone working temperature is between 0°C-40°C.
- Ensure the drone fly within the permit of local law and regulations.
- To fly the drone safely as required, please fly it within in the height of 50 meters. If it has local flying height limit within 50 meters, please make sure obey the related regulations.

### 1.5 Operation

- Please ensure the multi-rotor drone flying height is within 8 meters, except the special requirements.
- Before remote control calibration, hardware update, parameter setup, please remove the propellers and avoid the potential moving suddenly.
- Remove the battery if it does not fly, to avoid flying it when touching the remote control once.
- Please remove the batteries once landing. Do not move the drone when it is in power.
- Do not touch the joy stick mistakenly, and prevent start the drone.
• When it is powered, please stand in the safe distance of above 10 meters.
• Ensure the propellers completely stop and power off.
• Please switch it to the manual operation mode when errors happen. When the manual operation mode does not work, please press the emergency button. Please keep away from the crowd.
• When the battery is damaged, please ensure it is stored in the disposal area and avoid spontaneous combustion. In order to protect environment, please don’t throw batteries randomly. And consult the maker about the proper disposal method.
• During the flight, don’t fly overload and do not cause any potential dangers.
• When low battery is warning, please return as soon as possible.
• Ensure that the remote control and battery is enough, to ensure that firmware has been updated to the latest version.
• Ensure flying sites outside of the restricted areas and is proper for flight.
• Please make sure do not fly or operate the drone when you are drunk or with medicine limitation.
• Be familiar with the remote control operation & each flight mode, and ensure you know how to operate the control condition.
• User shall know and obey all the law and regulations in flying location.

1.6 Compass Calibration Requirements
• Compass has to be calibrated before using the first time. If else, it cannot work and will affect flying safety. Calibration tips:
• Please do not calibrate it in the place close to the high-magnetic field or big metal materials, such as high-voltage, magnet, parking lot, concrete iron building, etc.
• When calibrating, please do not bring the magnetic materials, such keys and cellphone.
• If it is calibrated indoor, please do not re-calibrate it outdoor. It prevents that the two magnet differences cause the potential flying data errors.
• Magnetic field location is different, please make sure re-calibrate when it changes to the place from the previous one.
2. Product Introduction

TIANNONG M6E-X, the multi-rotor UAV, is the most economic integrated solution for all the agriculture spraying services. This UAV is waterproof and easy to repair, long-time flight with high-strength & light fuselage material. The big power brushless motor guarantees the sensitiveness and flexibility. The Lipo batteries guarantee the power supply and easy to repair and maintain. Various spraying tests proves the best performances of this UAV.

2.1 TIANNONG M6E-X Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (without battery)</td>
<td>9.5KG</td>
</tr>
<tr>
<td>Max Pitch Angle</td>
<td>≤35°</td>
</tr>
<tr>
<td>Standard Takeoff Weight</td>
<td>24KG</td>
</tr>
<tr>
<td>Best Spraying Speed</td>
<td>4–6m/s</td>
</tr>
<tr>
<td>Max Takeoff Weight</td>
<td>25KG</td>
</tr>
<tr>
<td>Max Spaying Speed</td>
<td>10m/s</td>
</tr>
<tr>
<td>Max Thrust-weight Ratio</td>
<td>2.25(Flying weight 24Kg)</td>
</tr>
<tr>
<td>Working Time</td>
<td>6–12min/flight</td>
</tr>
<tr>
<td>Battery</td>
<td>TTA Intelligent Battery(12S)</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Max Power</td>
<td>12000W</td>
</tr>
<tr>
<td>Hovering Power</td>
<td>3150W</td>
</tr>
<tr>
<td>Hovering Time</td>
<td>Empty flight ≥22min</td>
</tr>
<tr>
<td></td>
<td>Full flight ≥10min</td>
</tr>
<tr>
<td>Hovering Accuracy</td>
<td>Horizontal ±0.5m</td>
</tr>
<tr>
<td></td>
<td>Vertical ±0.5m</td>
</tr>
<tr>
<td>Spraying Height</td>
<td>2--4m</td>
</tr>
<tr>
<td>Max rotation angle</td>
<td>360°</td>
</tr>
</tbody>
</table>

### 2.2 TIANNONG M6E-X Agriculture UAV Specification

<table>
<thead>
<tr>
<th>Frame</th>
<th>Diagonal Wheelbase</th>
<th>1290mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arm Length</td>
<td>435mm</td>
</tr>
<tr>
<td></td>
<td>Unfolded Height</td>
<td>465mm</td>
</tr>
<tr>
<td></td>
<td>Folded Height</td>
<td>601mm</td>
</tr>
<tr>
<td></td>
<td>Folded Width</td>
<td>400mm</td>
</tr>
<tr>
<td></td>
<td>Sprayer Distance</td>
<td>1290mm</td>
</tr>
<tr>
<td>Motor</td>
<td>Motor Model</td>
<td>TTA6215</td>
</tr>
<tr>
<td></td>
<td>Stator Size</td>
<td>62mm</td>
</tr>
<tr>
<td></td>
<td>KV</td>
<td>160KV</td>
</tr>
<tr>
<td></td>
<td>Max Thrust</td>
<td>9KG</td>
</tr>
<tr>
<td></td>
<td>Max Power</td>
<td>2000W</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>325g</td>
</tr>
<tr>
<td>Power System</td>
<td>Max Continuous Working Current</td>
<td>50A</td>
</tr>
<tr>
<td></td>
<td>Max Peek Current(3s)</td>
<td>100A</td>
</tr>
<tr>
<td></td>
<td>Max Voltage</td>
<td>14S</td>
</tr>
<tr>
<td></td>
<td>Working Voltage</td>
<td>12S(44--50.4v)</td>
</tr>
<tr>
<td></td>
<td>Working Pulse Width</td>
<td>1000--2000us</td>
</tr>
<tr>
<td></td>
<td>Compatible Signal Frequency</td>
<td>50--400Hz</td>
</tr>
<tr>
<td></td>
<td>Drive PWM frequency</td>
<td>400Hz</td>
</tr>
<tr>
<td>Foldable Propellers</td>
<td>Material</td>
<td>High strength engineering plastic</td>
</tr>
<tr>
<td></td>
<td>Diameter /Screw pitch</td>
<td>2388 (L=585mm)</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>95g</td>
</tr>
<tr>
<td>Battery</td>
<td>Capacity</td>
<td>14000MAh</td>
</tr>
</tbody>
</table>
Spraying System

<table>
<thead>
<tr>
<th>Tank</th>
<th>Rated Payload</th>
<th>10KG prevail over 10L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>Pressure Type (Sector&amp;Cone)</td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td>6 pcs</td>
<td></td>
</tr>
<tr>
<td>Sprayer Diameter</td>
<td>0.5-1.5mm</td>
<td></td>
</tr>
<tr>
<td>Spraying Speed</td>
<td>4-6m/s</td>
<td></td>
</tr>
<tr>
<td>Spraying Volume</td>
<td>1.6--2.2L/min</td>
<td></td>
</tr>
<tr>
<td>Spraying Width</td>
<td>4-6m (up to height)</td>
<td></td>
</tr>
<tr>
<td>Spraying Droplet Diameter</td>
<td>80--200μm (adjustable)</td>
<td></td>
</tr>
</tbody>
</table>

Remote Controller

<table>
<thead>
<tr>
<th>Remote Controller</th>
<th>Model No.</th>
<th>R4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Frequency</td>
<td>2.4Ghz</td>
<td></td>
</tr>
<tr>
<td>Endurance</td>
<td>10h</td>
<td></td>
</tr>
<tr>
<td>Effective Signal Distance</td>
<td>1.2KM</td>
<td></td>
</tr>
<tr>
<td>Battery capacity</td>
<td>3.7V，4000mAh</td>
<td></td>
</tr>
<tr>
<td>Charging type</td>
<td>DC，5V 2A</td>
<td></td>
</tr>
<tr>
<td>Charging time</td>
<td>5-10h</td>
<td></td>
</tr>
<tr>
<td>Working Environment Temperature</td>
<td>0–40C°</td>
<td></td>
</tr>
<tr>
<td>Best Storage Temperature</td>
<td>10–25C°</td>
<td></td>
</tr>
<tr>
<td>Best Charging temperature</td>
<td>10–25C°</td>
<td></td>
</tr>
</tbody>
</table>

2.3 Preparation Before Takeoff

2.3.1 Installation of the Fuselage
Marking on the corresponding position of the fuselage and water tank kit as the Figure1-2. *(TTA label is the head direction, tank lid is the tail direction)*

1) Put the fuselage bottom upward as the Figure1.

2) Install the fuselage and the water tank kit according to the mark 1-3, 2-4. It will be completed like Figure3.

3) Marking on the corresponding position of the 6 landing gears as Figure 4.

4) Slip the landing gear gently into the fillister mark 7. of fuselage as the "Mounting Direction" arrow of Figure5. Make the bulge mark 5. stuck into the fillister mark 8 and the part mark 6 get into the fillister mark 9 as the "Limit Direction" arrow to complete the installation.
5) The rest 5 landing gears should be installed as above. It will be completed like Figure 6.

2.3.2 Arm Installation

Make all the arms ready: 1 clockwise(CW) arm with LED, 1 counter clockwise(CCW) arm with LED, 2 CW arms and 2 CCW arms. Totally 6 arms.
Label M2 same as copter frame

Motor rotation direction as the cover

M2 CW arm assembly

Label M3 same as the copter frame

rotation direction same as motor

M3 CCW arm assembly with LED
Arm label same as the copter’s M4

Same as the motor rotation direction, CW

M4 CW arm assembly

Same as the label of copters label, M5

Same as the motor rotation direction, CCW

M5 CCW arm assembly
Same as the copter’s motor rotation

M6 CW arm assembly with LED

Arm M2 same as the copter’s M2

Copter’s M3 same as the copter’s M3

Copter’s M4 same as the copter’s M4

Copter’s M6 same as the copter’s M6

Copter’s M5 same as the copter’s M5

Head direction as the arrow

Arm M1 same as the copter’s M1

Arm and copter installation figure
1) Arm M1-M6 should be matched with copter’s.

2) Match the arm’s MT60 female connector with copter’s MT60 male connector, see figure 8.

3) Match 6mm inner hole of arm clamp with copter’s main part 6mm inner hole, see figure 9.

4) Install the M5*49 plug screw from the hexagon side of the 6mm hole on fuselage arm joint, see figure 10.

5) Lock the plug screw with a M5 nut from the other side, the bolt end should same as the nut, that means lock works, as Figure 11

5) Install the rest 5 arms as above, it will be completed like Figure 12.

6) Fix the camera module on the heading position as Figure 13.
Attention:

1) The difference between CCW arm and CW arm is different rotation direction of the propellers which produce lift force. There is a mark arrow on every motor holder to help differentiate. CCW arrow means CCW arm, you need to install the CCW propeller, otherwise it will be CW arm which you need to install the CW propeller.

2) There is a indicate arrow on the Dome which shows the heading direction.

3) According to the Figure 7, install CCW arm on M1 and M5, install CW arms on M2 and M4, install CCW Arm with LED on M3, install CW Arm with LED on M6.

4) Arm could only fold down instead of up during the installation, arm should be in an horizontal level with ESC

2.3.3 Spraying Tube Installation

1) First, insert the Φ8 spraying tube into the three-way connector as Figure 14-1. Second, go through the spraying tube from the tube holder as Figure 14-2. And then insert the other side of the spraying tube into the one-way connector at the nozzle place as Figure 14-4. Install the other spraying tube the same way.

2) It will be completed like Figure 14-3.
2.3.4 Intelligent Battery Installation

1) Push the Intelligent battery into the water tank as Figure 15-1, due to interference fit, it will be installed well when the battery wear pad stuck into the position Mark 3 in the Figure 15-2. It will be completed like Figure 15-3.

2) The battery will be completely installed like Figure 15-4.
3. Intelligent Battery Instruction

3.1 Key Function

Short press 1S to check the battery real-time electricity.

**Attention:**

The battery need to be power on when charge and discharge, the charge port will be opened when the battery power on and be closed when the battery power off.

3.2 Electricity Inspection

When the battery is off, you can check the real-time electricity with a short press.

```
[Power] [LED1] [LED2] [LED3] [LED4] [red] [orange] [white] [ON] [flash] [OFF]
```

**Attention:**

Electricity indicate light represents both the quantity of electricity when charge and discharge and also the life of the battery.

**Battery Indicate Light**

<table>
<thead>
<tr>
<th>Indicator LED1-LED4</th>
<th>Battery Electricity</th>
<th>Green LED1</th>
<th>Green</th>
<th>Green LED3</th>
<th>Green LED4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%-12%</td>
<td>Flash</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>13%-24%</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>25%-37%</td>
<td>ON</td>
<td>Flash</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>38%-49%</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>50%-62%</td>
<td>ON</td>
<td>ON</td>
<td>Flash</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>63%-74%</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>75%-87%</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>Flash</td>
<td>OFF</td>
</tr>
<tr>
<td>88%-100%</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>
3.3 Charging

1) Electric indicator will flash in cycle and displays the current electric quantity.

2) It means the intelligent battery has been fully when electric indicator is OFF. Please take down the charger and charging has been finished.

3) The charging temperature of intelligent battery is 10℃ to 40℃, it's forbidden to charge above 45℃ or less than 5℃.

4) Please do not charge the battery without people.

5) Forbid to charge with the output connector and forbid to use the battery power when charging.

**Attention:** Please disconnect the discharging cable before charging.

<table>
<thead>
<tr>
<th>Indicator LED1-LED4</th>
<th>Battery</th>
<th>Green</th>
<th>Green</th>
<th>Green LED3</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%-25%</td>
<td>Flash</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>26%-50%</td>
<td>Flash</td>
<td>Flash</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>51%-75%</td>
<td>Flash</td>
<td>Flash</td>
<td>Flash</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>76%-99%</td>
<td>Flash</td>
<td>Flash</td>
<td>Flash</td>
<td>Flash</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

3.3.1 Charging Protection Function

1) The best charging current for intelligent battery is 0.5C, 20A is maximum supported, large charging current will not benefit to prolong battery lifetime, it's forbidden to charge higher than charging current.

2) If there is abnormal (short circuit of charging end) during charging status, charging will be interrupted automatically in order to ensure not damage to battery cell.

3) It will benefit to battery lifetime to set highest protection voltage of each cell according to different charging current.

**Attention:**

Restart should be done after any protection to ensure the abnormal has been eliminated and protection has been effective.
# 4. Charger Station Introduction

## 4.1 Production Parameters

### Standard Charging Station

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>100-120V-18A 60Hz</td>
</tr>
<tr>
<td></td>
<td>180-240V~16A 50Hz</td>
</tr>
<tr>
<td>Output</td>
<td>Max50.4V Max30.0A</td>
</tr>
<tr>
<td>Output Power</td>
<td>100-120V, Max 750Wx2CH</td>
</tr>
<tr>
<td></td>
<td>180-240V, Max 1200Wx2CH</td>
</tr>
<tr>
<td>Battery</td>
<td>LiPo, Intelligent battery</td>
</tr>
<tr>
<td>Battery Cells</td>
<td>12S</td>
</tr>
<tr>
<td>Charging Channel No.</td>
<td>2 channels (Optional: 10-channel double-charging manager station)</td>
</tr>
<tr>
<td>Input Protection</td>
<td>Over-current</td>
</tr>
<tr>
<td>Output Protection</td>
<td>Over-voltage, under-voltage, short circuit, over-temperature, open circuit, reversed polarity</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>5-45°C</td>
</tr>
<tr>
<td>Dimension</td>
<td>325x190x280.5mm</td>
</tr>
<tr>
<td>Weight</td>
<td>8.27kg</td>
</tr>
</tbody>
</table>

### Charging Manager

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand</td>
<td>TTA</td>
</tr>
<tr>
<td>Output current</td>
<td>Max.30.0A</td>
</tr>
<tr>
<td>Battery type</td>
<td>LiPo</td>
</tr>
<tr>
<td>Battery Cells</td>
<td>12S</td>
</tr>
<tr>
<td>Channel</td>
<td>5 channels/set</td>
</tr>
<tr>
<td>Input Protection</td>
<td>Over-current</td>
</tr>
<tr>
<td>Output Protection</td>
<td>Over-voltage, under-voltage, short circuit, over-temperature, open circuit, reversed polarity</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>5-45°C</td>
</tr>
<tr>
<td>Dimension</td>
<td>320x121x30.4mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.35kg</td>
</tr>
</tbody>
</table>
4.2 Wiring diagram

Charging Manager

① Indicator lamp  ② XT90 output port  ③ Balance port
④ Power input port  ⑤ Master voltage port

Charging Station

<table>
<thead>
<tr>
<th>①</th>
<th>Master switch</th>
<th>⑥</th>
<th>Current switch</th>
<th>⑪</th>
<th>Storage button</th>
</tr>
</thead>
<tbody>
<tr>
<td>②</td>
<td>Air intake</td>
<td>⑦</td>
<td>Micro-USB update port</td>
<td>⑫</td>
<td>Handle</td>
</tr>
<tr>
<td>③</td>
<td>Brand</td>
<td>⑧</td>
<td>LCD monitor</td>
<td>⑬</td>
<td>Cooling fan</td>
</tr>
<tr>
<td>④</td>
<td>Charge port</td>
<td>⑨</td>
<td>LED</td>
<td>⑭</td>
<td>AC input port</td>
</tr>
<tr>
<td>⑤</td>
<td>Master Voltage</td>
<td>⑩</td>
<td>Charging button</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1) Connect the charging station and charging manager by inserting the XT port and balance port. Fix their connection with 4 screws.

2) Insert the port of power cable into the input port of charging station first. Then connect a AC power, 100~240V, 50/60HZ.

3) Connection of M6E-X 12S intelligent battery

Remark:

1) Before connecting, check the ports and cable of battery to avoid breakage and
2) Must connect according to the negative and positive pole label, when using banana plug.

3) To avoid short circuit, user must connect the banana plug and link box first, then connect battery, when user want to charge it. Meanwhile, user must disconnect the battery first, then disconnect the link box and charging station.

4.3 Indicator Lamp Instruction

<table>
<thead>
<tr>
<th>Indicator Lamp Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>——</td>
<td>Green Flash</td>
</tr>
<tr>
<td>———</td>
<td>Red Constant</td>
</tr>
<tr>
<td>———</td>
<td>Green Constant</td>
</tr>
<tr>
<td>———</td>
<td>Green &amp; red flash alternately</td>
</tr>
<tr>
<td>——</td>
<td>Orange flash</td>
</tr>
</tbody>
</table>

Add battery while working, total voltage detected is correct, but balance port status is unknown (standby).

4.4 Operation Instruction

1) Start and Self-inspection

Check all connections to confirm their condition first. Press the maser power switch of charger to power on. LCD monitor and LED will turn on, meanwhile the buzzer will turn on. After buzzer ring completely, it means the charger has finished the power-on and self-inspection procedure.

2) Working Mode

The charger has 2 modes, charging & storage for user to chose according to the requests. When charging manager was plugged, charger will recognized it and switch to constant working mode automatically. Charging station will work constantly assisted with charging manager, after operations once being executed.

Charging mode: Battery will be charging rapidly in this mode.

Storage mode: The battery is suggested to be maintained every 15 days when no
use for long time. Battery needs to be maintained in storage mode when the
endurance declines apparently or the voltage difference between each battery cell
beyond 50mv. In storage mode, charger will try to balance the voltage of each battery
cell to 3.84--3.86 by charging, discharging and balancing in small current.

**Constant working mode:** Charging station will recognize and switch to constant
working mode after the charging manager is plugged.

3) **Working Mode Settings**

Chose the proper position of current switch to set the working mode according to
battery capacity and user requirement.

4) **Charging Introduction**

Long press the charging button for 2 second to enter into charging mode, or it will
start charging automatically after 10 seconds without any operations.

1. Red lamp on constantly: In charging status, monitor display real-time
   charging status dates.

2. Green lamp on constantly: Charging completely

3. Press any buttons: Stop charging

Cautions: Charging station will execute some actions, such as stopping, inspection,
switching channels, automatically in constant working mode. Users don’t need to do any
actions to disturb the procedure. The charger will recharge battery if user just press Stop
button once but do nothing for 30 seconds then.

5) **Maintain**

Long-press the Storage button to enter into Maintainance mode.

1. Red lamp on constantly: Maintaining battery, and monitor will display
   real-time maintaining specify status.

2. Green lamp on constantly: Maintaining completely.

3. Press any button: Stop charging

4.5 **Interface Instruction**

1. Charging station Interface
Beijing TT Aviation Technology Co., Ltd.  
Add: No.1 TTA Building, Niantou Industrial Park, Changping District, Beijing, China

Channel NO. will display while charging battery. If not, it won’t display.

Display status: Charging / Storage/Standby/Error

Real-time Charge/ Maintain current

Real-time Charge/ Maintain cvoltage

<table>
<thead>
<tr>
<th>0%</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Icon interval will flash to indicate the current capacity of battery while charging or maintaining.
- Voltage of each battery cell
- Charging / Maintaining time
- The capacity unit will turn to Ah while capacity over 999mAh (10000mAh will be displayed to 10Ah)

2. Error & Warning

When using the charger incorrectly or meet any problems, charger will display some errors as below:

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1: 0.000 0.000 0.000 0.000 0.000 | Over-voltage Battery voltage too high!
| 5: 0.000 0.000 0.000 0.000 0.000 | Over-voltage Battery voltage too high!
| 9: 0.000 0.000 0.000 0.000 0.000 | Over-voltage Battery voltage too high!
| 1: 0.000 0.000 0.000 0.000 0.000 | Over-voltage Battery voltage too high!
| 5: 0.000 0.000 0.000 0.000 0.000 | Over-voltage Battery voltage too high!
| 9: 0.000 0.000 0.000 0.000 0.000 | Over-voltage Battery voltage too high!

- Disconnection of output or balance cable
- Battery over-voltage!
- Battery under-voltage!
- Voltage differences between cells too big!
- Cells voltage differences too big, balance failed!
- Power failure: Fan failure detected!
- Charger overheat! Confirm a good ventilation!
- Discharge short-circuit or overload!
- Safety timer arrives at the set time!
- Module offline, check the connection!
- Over-low Battery temperature detected!
- Over-high temperature detected!
- Power failure: Overheat protection, stop charging!
- Power failure: Overheat protection, stop charging!
- AC input under-voltage detected!
- Power failure: Overheat protection, stop charging!
- Communication timeout!
- Communication break, battery offline!

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4.6 Operation Instruction

1) When power on 220V, leave power switch in the position OFF means input power is shut off, charger does not work.

2) When power on 220V, leave power switch in the position POWER, input power has been open, battery figure L0 on the screen is lightened, inner fan begin to rotate and charging channel close at the same time.

3) How to charge: Turn on the battery by a short press and a long press according to the instruction 3.1 first, then connect XT 60 input connector and balance connector separately, progress bar of battery type signal flash, electric quantity indicator displays red, inner fan and outside fan run together, it means the state of charging.

4) During charging, charging or abnormal status will be stopped if start button has been pressed.

5) If charging status is displayed not good after charging, please do not disconnect battery without urgent use, thus battery life will be prolonged.

6) Battery will discharged by charger for full charge storage, discharging will be stopped when single cell voltage lower than 3.85V or total voltage lower than 46.2V, but balance current will not be stopped until battery balanced or disconnected. Please do not disconnect battery to avoid total voltage less than 46.2V but storage status has been reminded if battery is not balanced, and it will costs long time.

Safety Warning:

1) Charger will not work normally or be damaged for too high or too low input voltage.

2) 12S(50.4V) LiPo battery is suitable to this product, correct battery should be chosen.

3) Please take care of charging status when charger connecting, stop operation for any abnormal phenomenon.

4) Be sure charger is far away dust, moisture, rain, heat source, direct sunlight, vibration and some other unsuitable environment.

5) Battery and charger must be placed on uninflammable, insulated surface.

6) Please follow the strict instructions.
5. App Setting of Copter

5.1 Software Configuration

1. Please install the GCS software.

2. After GCS installation, the label will be appeared as figure 5-1.

   TTA-M6E-X support Android 4.0 or above

3. Open GCS, enter into the start page.

4. Enter into the main page, see figure 5-2.

   Figure 5-1

   Figure 5-2

5.2 Parameters Adjustment

   - Sensitivity should not be changed by common user, the unnecessary loss should be taken by user for authorized changing.
   - Remote controller could not unlock before parameters adjustment.
   - Exit could only be done when all of the parameters adjustment should be done and confirmed. Copter could only fly by restarting after parameters adjustment.

Parameters could be adjusted when copter connected, the steps are as followings:

1) Open the OTG function from cellphone SETTINGS---SYSTEM---OTG (the default is Off thus it should be opened every time), see figure 5-2-1.
2) Bluetooth connection

Open the bluetooth function in cellphone. Set the connect type of APP on Bluetooth mode.
Connect the bluetooth of remote controller. Remote controller Bluetooth name: T12_***, password:1234

3) After connection, app will be as followings, see figure 5-4
4) Click label at up right corner to enter into parameters adjustment.

5.2.1 Remote Controller Calibration In GCS

Two kinds of calibration ways:

① Calibration In GCS. To keep synchronization with the Info of flight controller

② RC Hardware Calibration. To calibrate the channels of RC itself. (more details at chapter 6.3)

Remote controller calibration: click the button READ to get the data, see the following
1) Start to calibrate: connect copter with GCS, click RC CHANNEL, move the stick to maximum and minimum position 4 to 5 times.

2) Stop calibration: click Finish after calibration. Then check the channel status.

3) Normal or reverse setting of remote controller is set to check whether it’s right or wrong.

5.2.2 IMU Calibration

Leave the copter in a horizontal position, click the button ACCELEROMETER, LED will flash in red, green, yellow alternately. LED green means successful calibration, data will be stored by restart.

5.2.3 Compass Calibration

▼ Situations when need calibration

1) Everytime you transport the drone to another place, the compass have to be calibrated.

2) If you fly in the mountain, every time you move from one hill to the other one, do the compass calibration.

3) Everytime you get new drone or a repaired drone, do the compass calibration.

4) Once you find that the drone cannot stay when it's hover in GPS (it might be moving like
a cycle), do the calibration.

▼ Calibration order

Two kinds of method of compass calibration:

1) Click the button COMPASS to enter into calibration status.

2) Switch switch E back and forth more than 4 times to enter into calibration status.

▼ Calibration Step

1) Confirm GCS communication well, compass installation correct and copter outside.

2) Clicking calibration, yellow LED of copter is on, hold and keep copter rotating clockwise and slowly, leave copter head to the ground when green led is on, rotate copter clockwise and slowly till LED flash in red,green and yellow alternately.

3) After vertical calibration, calibration mode will be exited automatically and LED will flash normally if successful. LED will keep red for 3 seconds. If fails, user need to calibrate again.

4) Please power again after successful calibration.

Attention:

1) Compass should be done after changing flying area.

2) Calibration should be done in outdoor,wild and far away from high tension line tower which is easy influenced by magnetic interference.

3) Keep horizontal and vertical during the slow calibration.

4) Clockwise is the only direction.
5.2.4 Flying Parameters Adjustment

Click the button READ to obtain the current flying parameters, click button SAVE to save the parameters.

The default number of back landing height is 20 meters, AB swath is 4 meters, route speed is 5m/s.

5.2.5 Low Voltage Protection
5.2.5.1 Low Voltage Protection Settings

Five voltage protection options for user to select: Close(close the protection), return(auto home landing), Hang(hovering), Land(auto landing), Hang-Land(hovering and then landing). User could choose the one suitable. **The default is Return(Home landing).**

5.2.5.2 Alarm Voltage Settings

Settings of first alarm and second alarm. It’s recommended to 43.6V for the first alarm and 43.1V for second alarm.

LED will flash yellow triple when get to the first alarm level; LED will flash rapidly when get to the second alarm level, copter will react as the low voltage settings, such as return to home or landing.

5.2.5.3 Voltage Calibration Settings

Flight controller voltage sensor need to be calibrated if flight controller voltage sensor result is different from real voltage. Real battery voltage should be filled in measured voltage, flight controller voltage will be calibrated by clicking save. **It's unnecessary to set by user as calibration has been done before delivery.**

5.2.5.4 Low Liquid Protection
When liquid is nearly out, the following reaction could be set: Off (Close the protection), Return (auto home landing), Hovering, Hovering & landing. The default is Off, which means only LED flash as alarm. **We suggest you to set it on Return option.**

### 5.2.5.5 Spraying Mode

The drone has 2 spraying modes: Combination & Manual mode.

Combination mode: Spraying rate will follow flying speed. Faster speed, bigger flow rate.

Manual mode: Spraying always work under the biggest flow rate when in this mode.

Combination control of the pump, max flow rate match to max flying speed. The maximum default combination number is 6m/s, minimum default combination number is 0.2m/s.

### 5.2.6 Fail-Safe

When lost RC signals, aircraft will enter into Fail-Safe status and execute the set Fail-Safe action. The default set is “**Automatic return**” which means Return To Home automatically. Besides, “Lost Comms Continue Path” is used to set whether drone will continue the mission after lost-control during a mission flight. If it is open, drone won’t execute Fail-Safe action until its mission has been completed. The default setting is **Close**.
5.2.7 Map & Coordinates Offset

Open About interface, choose map type, choose Google map. Voice alarm could be opened to prompt the real-time information, such as voltage, GPS, operation etc. It is suggested to open “coordinates” function if position deviation is obvious.

5.3 Route Establish

Four Automatic Operation modes: Map Point, Dot Equipment, Drone Point, Phone Dot.

Map Point mode: Dot on a built-in map to plan route.

Dot Equipment: Use a Dot Equipment to make boundary points.

Drone Point: Drive drone to mark boundary points.

Phone Dot: Use Phone to mark boundary points.

5.3.1 Start Route Establish

1. Click to enter into route interface.
2. Click **new** to name the block and then select point making type.
5.3.2 Map point

1) Select *Map Point*.

2) Click *adding area* and click the boundary point on map to set the working area. Obstacles could be added by clicking *add obstacles*.

5.3.3 Drone Point

1) Select *Drone Point*

2) Click *adding area* to set working area. Obstacles could be added by clicking *add obstacles*.
3) Fly drone to the first boundary point, Click “Common” to make the first boundary point. Then the second, third, fourth...

5.3.4 Route Making

Click “Create” to confirm the chosen area and enter into “Adjust Route” interface.

**Swath:** Distance between 2 spraying routes

**Obstacle gap:** Distance around the obstacle

**Target gap:** Distance between working area and boundary
Offset: Translation of working area

Save: Save the task

After editing completed, click Save to save the task.

5.3.5 Executing Mission

1) Click Task to enter into Task Management interface. Click “Send Mission” to upload the task.

Two Mission Task Modes: Block and Edge.

Block mode: Drone will only fly along the route.

Edge mode: Drone will automatically fly along the boundary line after finishing the route.
3) Click 🚀 to take off from GCS or remote controller, click start task to execute the route.
Rudder and Throttle could be operated during flying, obstacles could also be avoided by moving the Aileron stick.
6. Remote Controller

- Charger output more than 5V should not be used.
- Remote controller charging current should be not more than 2A.
- Any damaged, smoking or abnormal heating charger should not be used.
- Charging should not be continued in condition of smoking, smelly, weeping.
- Charging should not be in the area of baby playing.
- Charging should not at temperature more than 60°C.

2.4G 3db Antenna

6.1 Function Description

<table>
<thead>
<tr>
<th>Channel</th>
<th>Top</th>
<th>Middle</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>E: Flying mode</td>
<td>Attitude mode</td>
<td>GPS mode</td>
<td>AB mode</td>
</tr>
<tr>
<td>F: AB recording</td>
<td>/</td>
<td>Recording Point A</td>
<td>Recording Point B</td>
</tr>
<tr>
<td>Y3: Flow rate</td>
<td>Higher</td>
<td>/</td>
<td>Lower</td>
</tr>
<tr>
<td>D: Home landing</td>
<td>OFF</td>
<td>/</td>
<td>ON</td>
</tr>
<tr>
<td>Channel</td>
<td>Left</td>
<td>Middle</td>
<td>Right</td>
</tr>
<tr>
<td>G: Pump mode</td>
<td>OFF</td>
<td>Combination</td>
<td>Manual</td>
</tr>
<tr>
<td>H: Terrain following</td>
<td>ON</td>
<td>/</td>
<td>OFF</td>
</tr>
</tbody>
</table>
6.2 Bind

◆ Power on the remote controller first. Power on drone for 1 second and cut off immediately, repeating this step for three times. Then power on the drone for the fourth time and keep the power connection. The drone will enter into binding mode automatically. Drone will bind the remote controller successfully with a voice prompt. Remote controller need to be calibrated after binding.

Remark: Binding remote controller can not be operated for more than one pair at the same time. Only one-to-one pairing is allowed.

6.3 RC Hardware Calibration

The following method is to calibrate the channels of RC itself.

1) keep pressing both button C and button D until switching on the power of Remote Control successfully.

2) After power on, give a long press on the button D until hearing continue beeping.

3) Start to do joystick calibrating:

4) Move the joysticks around in cycle and make sure they reach the max edge / corner.

5) Leave the joysticks back to center.

6) Move the switches up and down to calibrate the them.

7) Give a long press on the button D to end the RC calibrating state and the continue beeping will be stopped at the same time.

6.4 RC Connection & Device Helper.APP Introduction


2). Device Helper introduction.

ADJUST PARAMETERS ------- Adjusting channels, rudder value, fail-safe value.

OTHER OPTIONS ------- Selecting SBUS or PPM output mode of receiver, and telemetry baud rate.

HAND SETTINGS ------- Select hand mode, USA, Japan ect.

UPDATE DEVICE ------- Update firmware online

Connection mode ------- Bluetooth mode, SBUS receiver mode.
Cautions: Don’t do any adjustment, unless under professional introduction. Otherwise, any consequences caused are undertaken by its users.

6.5 Video Transmitter Introduction

1) Download and install FPV.APK into user’s phone. FPV.APK link: https://www.ttaviation.org/wp-content/uploads/2019/06/M4EM6E-1M6E-XM8A-Pro-2.45.APK_.zip

2) Open OTG function of cellphone to give permission of data transmission. Connect the phone and remoter controller with USB cable. Power on the drone.
3) Video will be displayed on the phone after user click the ‘OK’ option.

6.6 Hand Mode Settings Introduction

1) Connect user’s phone, remote controller and drone

2) Open Device Helper.APP, click HAND SETTINGS and select hand mode: USA or JPN.

3) Click “SAVE SETTINGS” to save.
6.7 Remote Controller Antenna

Remote controller antenna should straight up when it is stretched.

Caution: Incorrect directions as the two pictures below.
6.7 Flight Control

1) Pull control sticks to the bottom inside corners to unlock drone. Meanwhile, keep away from the drone to avoid any injuries.

2) Pull control sticks to the bottom outside corners to lock drone (only for emergency use). While flying, this operation can also stop motors immediately.

3) After unlocked, push the throttle above the neutral position to make the aircraft take off.

4) After unlocked, motor will be stopped and locked automatically if user do not push the throttle above the 10% position from neutral in 3 seconds.

5) After landing the aircraft, push the throttle down and hold for 3 seconds. The motors will be stopped.

Cautions:

1. It is suggested to take off in **GPS mode** if satellites is more than 14, no magnetic field interference and all parts of aircraft are in good condition.

2. Before take off, please check the **stick mode** and confirm the current settings is the mode you want. If not, never reset by yourself without the introduction of TTA after-sales engineer.

3. During autonomous mode or AB mode, missions can be **interrupted** by switching the flight mode manually. After that, operator can **fully control** the aircraft.

4. When drone executes protection action such as low-voltage protection and low-liquid protection, operator can **take over control** by switching the flight mode manually if needed.
7. Function Control

7.1 Flight Mode

<table>
<thead>
<tr>
<th>Flight mode</th>
<th>Instruction</th>
<th>Operate</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude mode</td>
<td>Horizontal stabilization, yaw locked, fixed altitude</td>
<td>By transmitter</td>
<td>GPS satellite enough, LED does not flash red</td>
</tr>
<tr>
<td>GPS mode</td>
<td>Fixed horizontal point, yaw locked, fixed altitude</td>
<td>Transmitter operation/empty tank reaction/others</td>
<td>GPS satellites enough, LED does not flash red</td>
</tr>
<tr>
<td>AB mode</td>
<td>Copter will fly and spray along with AB point</td>
<td>Record point A and B and switch to AB mode, choose left or right for roll</td>
<td>GPS satellites enough, LED does not flash red</td>
</tr>
<tr>
<td>Return mode</td>
<td>Copter will fly back home point automatically, flying back tail to home point and then descend slowly, it could be controlled after arriving on the top of home point except throttle</td>
<td>Press button Home continuously/empty tank reaction/low voltage reaction/reaction of losing transmitter signal</td>
<td>GPS satellites enough, LED does not flash red</td>
</tr>
</tbody>
</table>
AB mode is a more simple efficient mode with fault tolerance to operate. The working theory is above in the picture. Record the point A and B, the UAV will plan the flight line like this.

1. Operate Steps:
   1) Record the point A, switch the mode to GPS mode. Until the drone self-hovering steadily, switch F to "Point A memorized". After that, the LED flash yellow for 2 seconds. The controller have voice prompt.
   2) Record the point B, drive the drone to the position, **be sure it is at least 10 meters away from point A**. Until drone self-hovering steadily, switch F to "Point B memorized". After that, LED flash yellow for 2 seconds. The controller have voice prompt.
   3) Select the direction, switch E (Flight mode) to AB mode, move the roll joystick to select the roll direction. Move the joystick to the left limitation, the drone rolls to the left side, move the joystick to the right limitation, the drone rolls to the right side. While the drone doing AB point flight mode, the user can stop controlling the joystick. **Make sure the water is enough, the pump is under auto-controlled or manual-controlled.**
   4) AB Mode Correction
      ① Altitude correction: Control the flight altitude by the throttle joystick, "up" for the
drone to rise, the “down” for the drone to set;
② Correct the rudder to control the direction;
③ Adjust point A: while the drone moving from point B to Point A, push up the pitch stick to make point A 1m closer to point B, push down the pitch stick to make point A 1m away from point B.
④ Adjust point B: while the drone moving from point A to Point B, push down the pitch stick to make point B away from point A, push down the pitch stick to make point B 1m closer to point A.

5) Shut Down and Quit
① When set the “no pesticide” action to self-hovering or return, in AB mode this function still works.
② When set the “low battery” action to return, in AB mode this function still works.
③ After the spraying work is done, AB mode can be shut down by switching into altitude mode.

6) To return to the breakpoint, after broke the AB mode route automatically or manually.
Filling the pesticide in the tank and taking off, then switch SA (flight mode) to AB mode directly, the drone would return right to the breakpoint.

2. Delete Point A and B
Move stick F (AB recording) for 4-5 times rapidly, LED alternately flash red green and yellow, AB mode dates deleted. Without deleting last AB point dates, user cannot set new AB point.

3. Set the Interval Width
From the software->Flight parameters to set the spraying width and working speed

Attention:
1) Be sure to start AB mode within turning on the pump and agitation function working.
2) Be sure it is at least 10 meters away from point A to point B.
3) Every time recording point A and B, be sure to wait until the drone self-hovering steadily in GPS mode.
4) Without deleting last AB point, cannot set new AB point.
Appendix I  Key Parts Maintenance

1. Propellers

(1) Blades of propeller should keep intact. If there are any cracks or missing parts, the propeller should be replaced.

(2) Tightness of all the blades should be suitable and be similar. Replace the propeller gaskets/washer with new ones when blades cannot spin smoothly.

(3) Blades should be folded well and be held by the blade holder or belts after flight, and should be released and put straight before take off.

2. Motors

(1) Motors should be or be suggested to be replaced:

(2) Before the rotor clearance get loose or running after 3000 hours.

(3) The rotor movement get blocked.

3. ESC should be or be suggested to be replaced:

(1) When Esc output obviously different from other ones.

(2) Damaged in crash

4. Flight Controller should be or be suggested to be replaced:

(1) When IMU is not able to be calibrated to normal.

(2) When the I/O ports is not capable to communicate with other devices on drone as normal as before.
## Appendix II  Implication of Indicator Light

<table>
<thead>
<tr>
<th>Items</th>
<th>Indicator light</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flying Mode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gyro mode (stabilization,attitude)</td>
<td>Green light single flash</td>
<td>Low</td>
</tr>
<tr>
<td>GPS mode (angle,speed)</td>
<td>Green light double flash</td>
<td>Low</td>
</tr>
<tr>
<td>AB mode</td>
<td>Green light triple flash</td>
<td>Low</td>
</tr>
<tr>
<td><strong>GPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS unconnected/GPS receive no satellite</td>
<td>Red light triple flash</td>
<td>Low</td>
</tr>
<tr>
<td>GPS bad signal</td>
<td>Red light double flash</td>
<td>Low</td>
</tr>
<tr>
<td>GPS general signal</td>
<td>Red light single flash</td>
<td>Low</td>
</tr>
<tr>
<td>GPS Good signal</td>
<td>Red light off</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Low Voltage Warn(alarm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First alarm level</td>
<td>Yellow light triple flash</td>
<td>Low</td>
</tr>
<tr>
<td>Second alarm level</td>
<td>Yellow light quick flash</td>
<td>High</td>
</tr>
<tr>
<td><strong>Compass Calibration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal calibration</td>
<td>Yellow light constant light</td>
<td>Middle</td>
</tr>
<tr>
<td>Vertical calibration</td>
<td>Green light constant light</td>
<td>Middle</td>
</tr>
<tr>
<td>Calibration failed</td>
<td>Red light constant light</td>
<td>Middle</td>
</tr>
<tr>
<td>Calibration succeed</td>
<td>Red,green and yellow light alternating flash</td>
<td>Middle</td>
</tr>
<tr>
<td><strong>Accelerator Calibration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibrating</td>
<td>Red,green and yellow light alternating flash</td>
<td>Middle</td>
</tr>
<tr>
<td>Calibration succeed</td>
<td>Green light constant light</td>
<td>Middle</td>
</tr>
<tr>
<td><strong>Error</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote controller lose control</td>
<td>Red light quick flash</td>
<td>High</td>
</tr>
<tr>
<td>Compass interfered/error</td>
<td>Yellow and green light alternating flash</td>
<td>High</td>
</tr>
<tr>
<td>GPS lose satellite/error</td>
<td>Red and green light alternating flash</td>
<td>High</td>
</tr>
<tr>
<td>IMU over vibration/error</td>
<td>Red and yellow light alternating flash</td>
<td>High</td>
</tr>
<tr>
<td><strong>Other Situations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initialization of power on</td>
<td>Red,green and yellow light alternating flash</td>
<td>High</td>
</tr>
<tr>
<td>Unlock</td>
<td>Red,green and yellow light alternating flash</td>
<td>High</td>
</tr>
<tr>
<td>Unlock failed</td>
<td>Red light constant light</td>
<td>High</td>
</tr>
</tbody>
</table>
Appendix III  How to connect copter to PC GCS

1 Find the correct port from the copter and open the protection cover, see figure 1:

2 Find the computer connection cable from the attached bag, see figure 2:

3 One connect to computer, another end connect to copter. Waiting for a moment (It takes few minutes to install the driver for the first connection with a new computer)

4 Open PC GCS, select the language you need. Click the connection button, see figure 3:
Appendix Ⅳ  How to download log from PC GCS

1. Open the PC GCS, select Tool menu
2. Click Refresh button
3. Click Download button
4. Log is saved in the position as the orange word
Appendix V  How to upgrade the firmware

1. Download the upgrading tool from the following address:

2. Open the upgrading tool, see the following picture:

   ![Upgrading Tool Image]

   - Click the button open, select the correct firmware.
   - Click the button Auto Update, then the circular indicator will turn to be green. LED of copter usually is OFF during upgrading.
   - Waiting until the down left corner to 100%. The circular indicator will also turn to red and LED will flash red yellow green to self inspection. Waiting for a moment, the led will flash normally, then upgrading is finished.
   - Close the upgrading tool and disconnect the upgrade cable.
Disclaimer

1. To protect the legitimate rights and interests of users, please be sure to read our instruction attached carefully before using product. Be sure to understand your legitimate rights and interests, responsibilities and safety instructions; or it may cause property damage, safety accident and hidden personal safety problem. Beijing TTA reserves the right to update this document. Please be sure to in accordance with the instructions and safety instructions operating this product.

2. The users use this product directly or indirectly, any violation of the law, TTA company will not bear any responsibility.

3. This product is not suitable for under-18-year old and other who do not have full capacity for civil conduct, please avoid these people use this product. While using this product in public occasion please pay extra attention to operate.

4. Once you start using this product, deemed as you have read, recognized and accepted the product specification, disclaimer and terms and conditions of all safety instructions. It's user's commitment to their own behavior and therefore is responsible for all the consequences. Users promised to use this product only for legitimate purposes, and agree to these terms and any others policies or guidelines TTA company may develop.

5. In the process of using this product, please be sure to strictly obey the safety instructions included in this document but not limited in it. For violations of the safety information we have informed and cause any personal injury, accident, property damage, legal disputes, conflicts of adverse events, and all others relevant responsibilities, the loss should be borne by the users themselves, TTA company will not bear any responsibility.

6. In the following situations, we do not provide any technical support and security commitments:
   A) through informal agents or improper access to this product units or individuals;
   B) the unauthorized modification, debugging, and replacement parts products.
   C) warranty card, serial number, or flight data lost;
   D) due to personal error caused personal injury and property damage.

Please contact us in the following ways should you encounter any problems.

Beijing TT Aviation Technology Co., Ltd.
Emil: tta_techsupport@ttaviation.com