Mazzy Star Drone User Manual

Date: 2021-05-10

1. Product profiles

Introduction

The Mazzy Star Drone is designed for drone light show, featuring a full-colour RGB LED, intelligent flight mode and high precision positioning system. It equips with RTK GPS positioning system and multiple control channels communication system to ensure a stable and safe formation flight.
Mazzy Star Drone has full size propeller guard and only 0.46kg armed weight. It flies at a maximum time of 18 minutes. For the revolutionary design, Mazzy Star Drone significantly reduce safety risks compared to other drones on the market.

Feature Highlights

- Compact, durable and light airframe, full size propeller guard
- Only 0.46kg armed weight, up to 18-min flight time
- Full-colour RGB LED in high brightness, up to 640LM
- Ground control software with Realtime 3D video preview
- High precision RTK GPS
- 915MHz /868MHz/2.4GHz, 3km Long Range Control
- WIFI transmit, 2.4G
- Radio transmit, Remote Control, 2.4G
- Intelligent flight controller "Vimdrones GCS" with efficient drone dashboard, enables flexible configuration and development
- Drone light show design ecosystem "Vimdrones Designer" —Blender

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Ready To Fly List

- Mazzy Star Drone (include the package)
- Mazzy Star Drone Battery
- Mazzy Star Drone Battery Charger
- Vimdrones Drone Light Show System
    - 1 Vimdrones Smart RTK Base
    - 1 Wifi Router & Charging Cable
    - 1 Spektrum Transmitter
    - 1 Tripod
    - 1 Antenna
    - 1 Feeder
    - 1 PoE power supply
    - 3 Network Cables
- Vimdrones Drone Light Show Designer Software
- Vimdrones Ground Station Software

Download Vimdornes Drone Light Show System.pdf

Other Additional Equipment

- May need 220V power supply from mobile power bank
- Some of the Power Strips
- A set of foldable desk and chair (would be very good)

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Aircraft Diagram

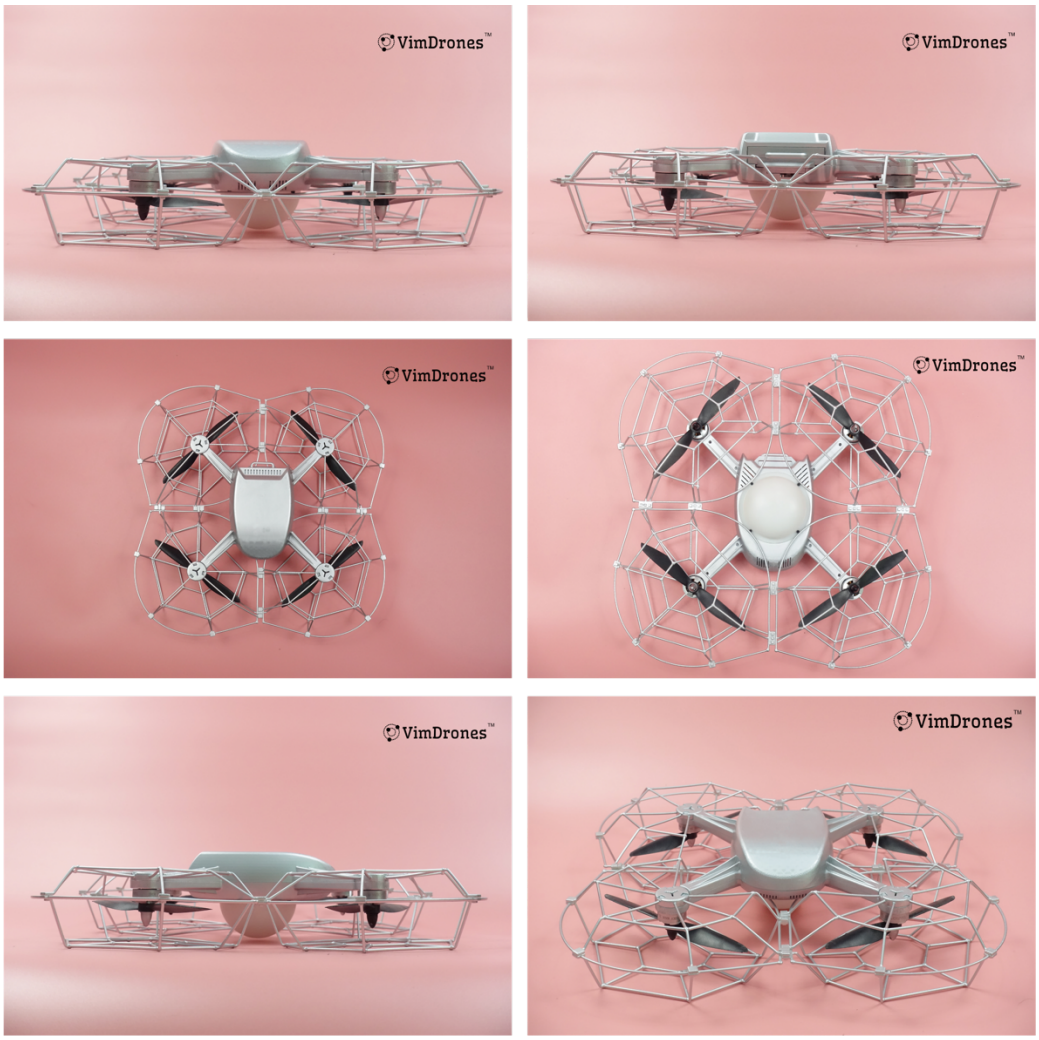


Figure 1. Aircraft Diagram

Technical Specifications

Drone Specs	Details
Airframe	Compact, durable and light airframe, full size propeller guard
Weight	460± g with 2S 3000mAh battery
Body Dimension	340*340*80 mm
Motor and Prop	2300 kV brushless motors; 6-inch carbon fiber propeller
Max Hover Time	18mins
Wind Resistibility	< 7 m/s
Positioning System	RTK GPS (GPS+GLONASS+Beidou), 2 cm precision with RTK fixed
Battery	LiPo2S, 7.6V, 3000-mAh
Remote Control	6-channel 2.4G radio remote controller (1km distance, optional)
Ground Antenna	915MHz/868MHz/2.4GHz 1000 mW, communication range 3km
Drone Antenna	915MHz/868MHz/2.4GHz 20 mW, communication range, 2km
LED	Integrated full-color RGB LED, 4W
Charger	high-power 2S LiPo battery balance charger; 10 charging holes; Input: AC100~240V 50/60Hz,3A(Max); Output: DC8.7 V 1.5A 10 groups
Accessory	Foam box 1 (420*420*148mm)

2. Battery

Figure 2. Battery

The battery package is shown in Fig.2, including 2s-3000mAh LiPo battery and its charger. The dimension of one battery is 105*63.5*14.5mm. Its capacity is 3000 mAh and the rated voltage is 8.7V.

Battery Charging and Discharging

At normal charging mode, in constant current stage, the battery is charged in 0.2C until voltage reaches 8.7V, when constant voltage stage starts. Whole charging ends after 3.5 hours or when charging current is less than 60mA(0.02C).

At fast charging mode, the charging current is 1C until voltage reaches at 8.7V. The whole process is up to 3 hours or ends when charging current is less than 60mA(0.02C)

While discharging, the fully charged battery is discharged at 0.2C current rate to voltage 6.0V

Usage Warning

- Do not disassemble, crush and incinerate, drop or leave high pressure on the battery.
- Do not short circuit the battery
- Do not expose the battery to temperatures above 45 degrees or below 0 degrees

Storage Instruction

- Keep the environment dry and clean
- Ensure the battery at a storage voltage (7.08-7.62V) if not in use for a long time. If voltage is above or below that level, please charge or discharge battery
- Battery must be fully charged and discharged routinely every three months. After battery is fully discharged, recharge the battery to 50% capacity

3. Battery Charger

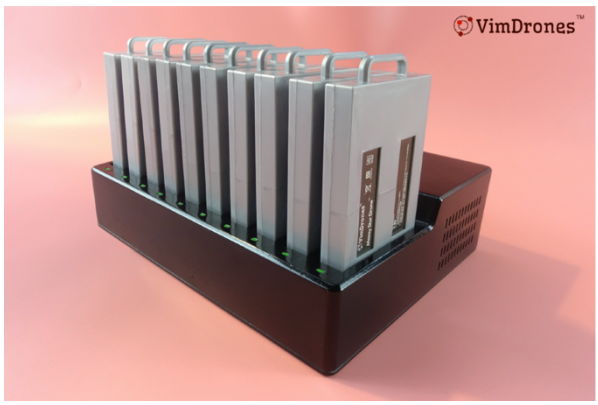


Figure 3. Battery Charging Package

- 2S Li-ion HV Battery Charger, 8.7V/1.5A*10Channel
- Input: AC100~240V 50/60Hz 3A(Max)
- Output: DC8.7V/1.5A*10Channel

Instruction

- Connecting battery with charger, making sure the positive of battery connecting with the positive of charger, the negative of battery connecting with the negative of charger.
- Plug charger in DC power outlet, LED turns to RED, the charging is starting.
- The charging finish once LED turns to GREEN. After charging, make sure unplug charger from DC power outlet.
- Disconnecting battery with charger.
    - Note: battery may become hot after charging.

Usage Warning

- Don't short circuit charger
- Use the charger to charge correct battery
- Don't cover charger and battery during charging
- Don't charge battery unattended

4. Drone Light Show System

Figure 4. RTK Base with Antenna

As shown in Fig.4, the RTK base is integrated with long range radio communication system and computing unit integrated. It is connected through WIFI/Ethernet network.

The drone light show system includes a Controlling PC with Vimdrones GCS and Designer, RTK base, WIFI router, Remote Control and Mazzy Star Drone. The schematic diagram of the drone light show flight communication system is shown in Figure 5.

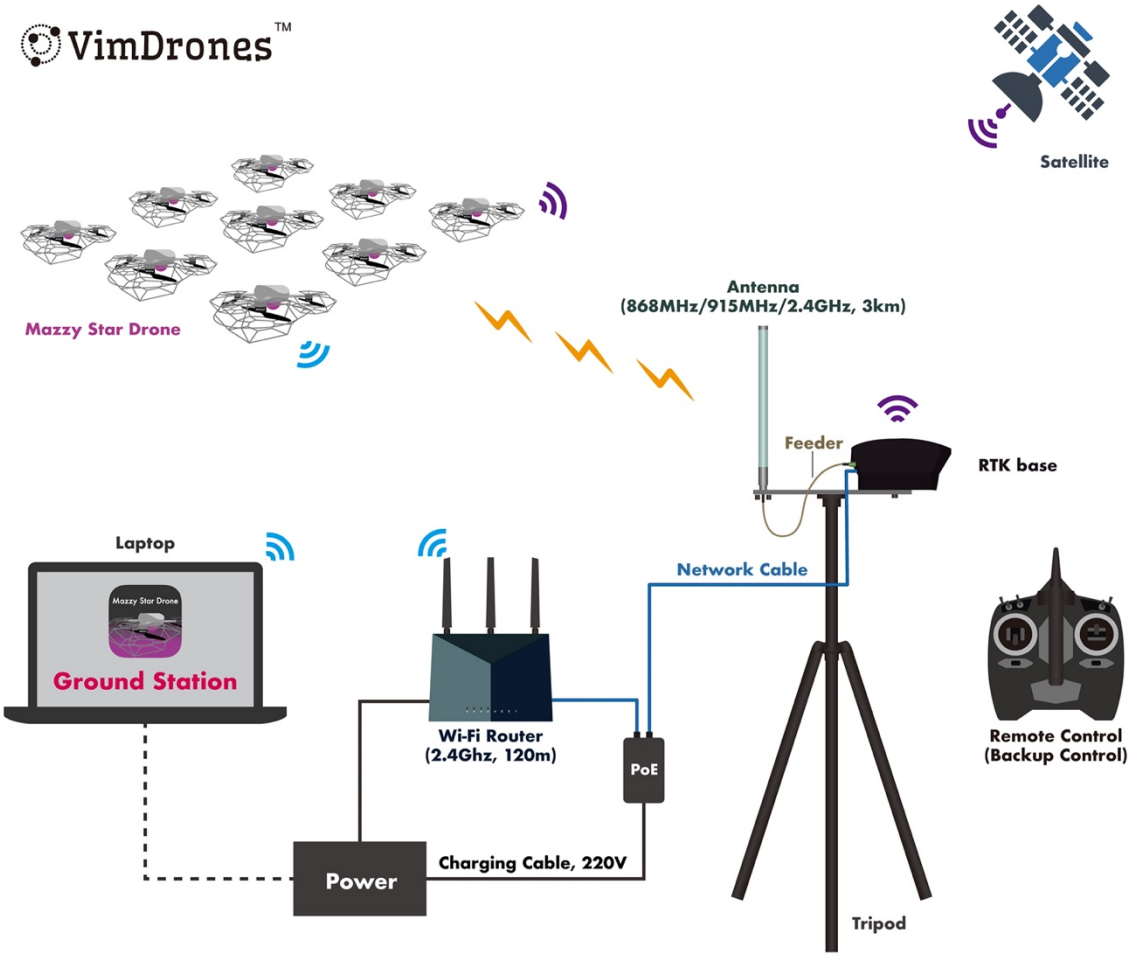


Figure 5. Drone Light Show Flight Communication Diagram

5. Pre-Flight Setup Procedure

Battery preparation

- Please prepare a sufficient number of batteries（more than the number of drones）
- Please charge the battery fully（according to the flight time, the voltage is at less 8.2V）

Drone preparation

- Please check the number the drones
- Please check the airframe of the drones, especially for the propeller guard, propeller and the motor

Flight Path preparation

- Use Vimdrones Designer to design the Flight path, save the .blend file and export the data
- Usage Warming
    - Do not let the drone collide when design the Flight path. The distance between drones should need more than 2m
    - Do not let the drone exceed the speed limit when design the Flight path. Max Vertical Ascent Speed (Up To) is 5m/s, Max Vertical Descent Speed (Up To) is 3m/s, Max Horizontal Speed (Up To) is 4m/s. It is recommended that the flying speed of the drone is about 2m/s on average
    - Do not let the drone beyond the fence when design the Flight path

6. Pre-Flight Setup Procedure

- Power the WIFI router, connect the WIFI router and PoE power supply with a network cable
- Place the tripod, setup the RTK Base and the antenna, use the Feeder to connect the RTK Base and the antenna
- Connect the RTK Base to PoE power supply with a network cable (so the WIFI router can communicate with the RTK base)
- Power the RTK Base through the PoE power supply
- Power the radio transmitter
- Place and locate drones, the distance between each drone no less than 2 m,

- Insert the batteries to the drones, but not power the drones

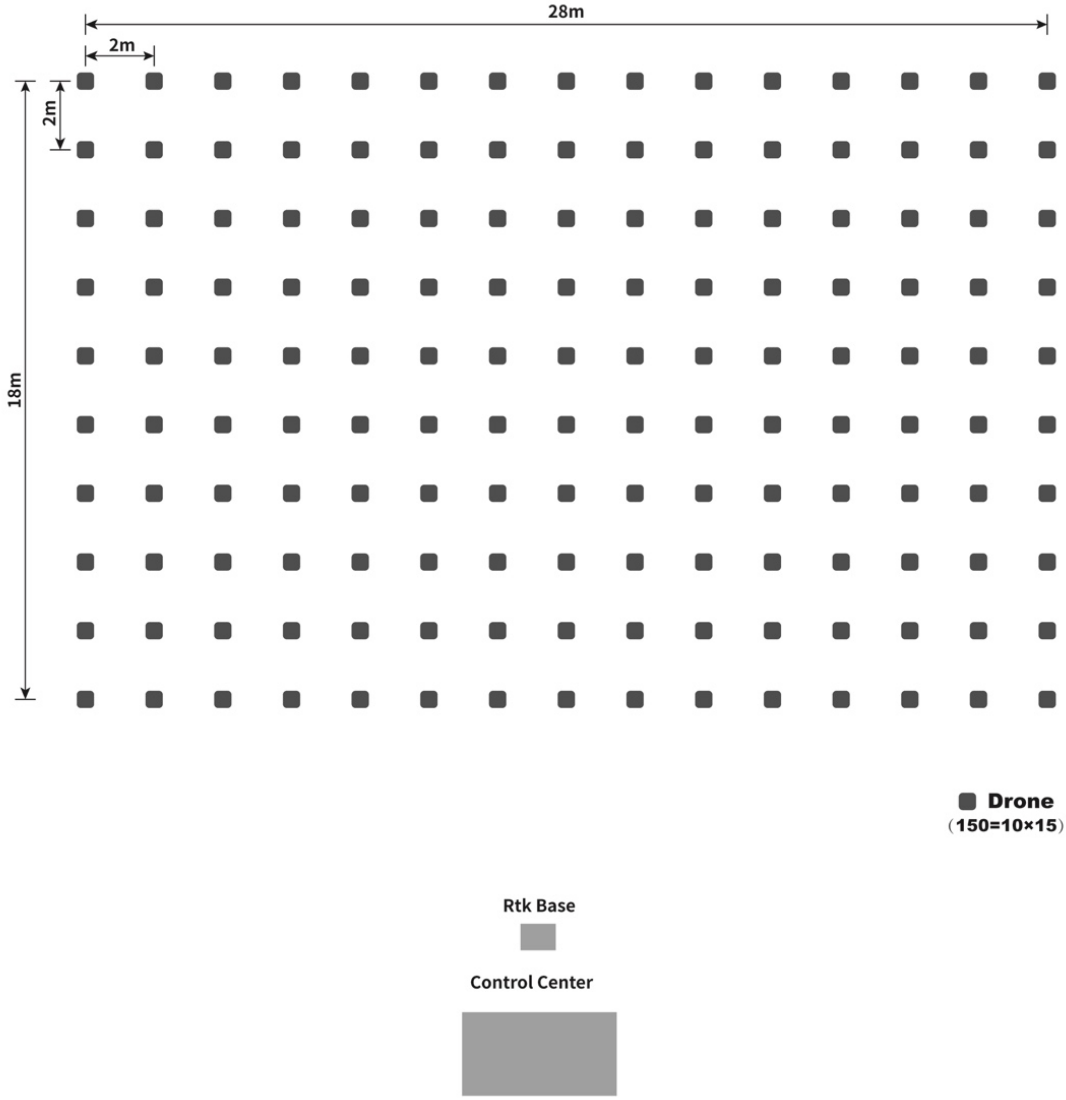


Figure 6. Drone Light Show Layout Diagram

Usage Warning:

- Do not have the show near people too close or over people' head
- Should have the show in an open space without high obstacles
- Should make sure of good order inside the venue without any interference or disruption when having the show

7. Flight Procedure

Run Vimdrones GCS on computer

1. When the RTK Base is enter, click Survey In button
2. Waiting for Survey In ready, Survey in(Success)
3. Click Open button, Select Design Project
4. Power on Mazzy Star Drones, red light
5. Mazzy Star Drone online, we can see the Drone Status on GCS
6. Drone Status Check Pass, yellow light
7. Click Upload button, upload trajectory Design to the drones, white light flashing
8. Select Drone 1, click Copy From Drone button, copy drone 1 location， green light
9. Click Set Home button, set home location to all drones
10. Click Takeoff button, start your Drone Light Show

8. Post-Flight Setup Procedure

- Unplug the batteries of the drones to the package (charge them for the next drone light show)
- Put the drones into the packages, then stack up the packages and tie them up with a buckle
- Pack up the Drone Light Show System into the package
- Pack up the remaining equipment

9. Remote Control

Figure 7. Remote Control Diagram

Usage Manual:

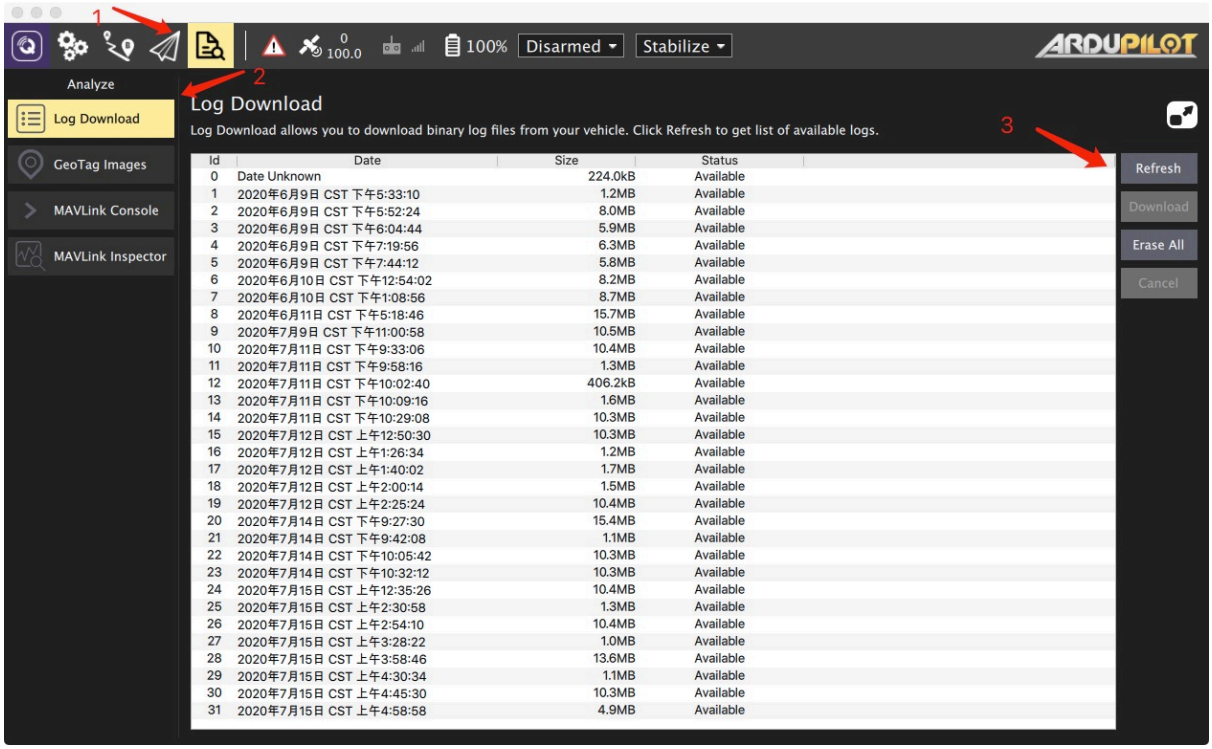
- DXe Transmitter Manual – Multilingual

Usage Warning:

- Do not arm the drone near people too close
- Do not arm the drone over people' head

10. Get Log

- Please download the QGC software.
- Open QGC, use a micro USB cable to connect the computer to the USB port on the right side of the drone. Click **LOG DOWNLOAD**. It may need to click **Refresh** button. Select the log and click **DOWNLOAD** button.



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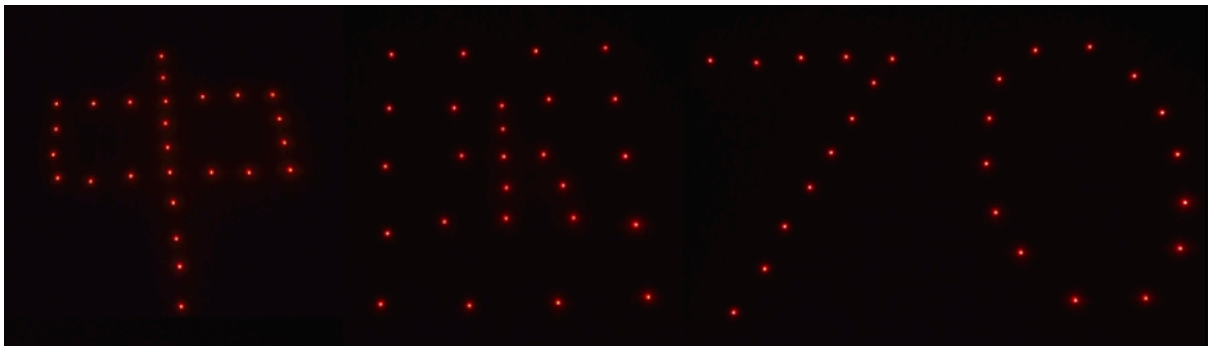
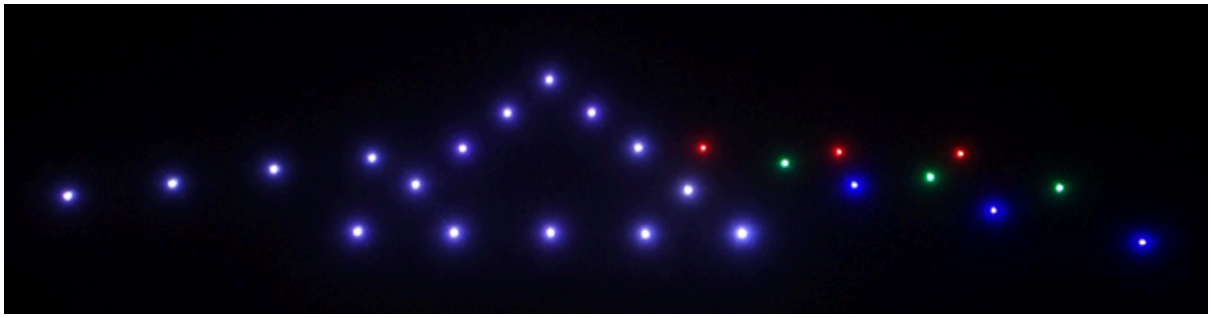
- Figure 8. Log Download Diagram

11. Case

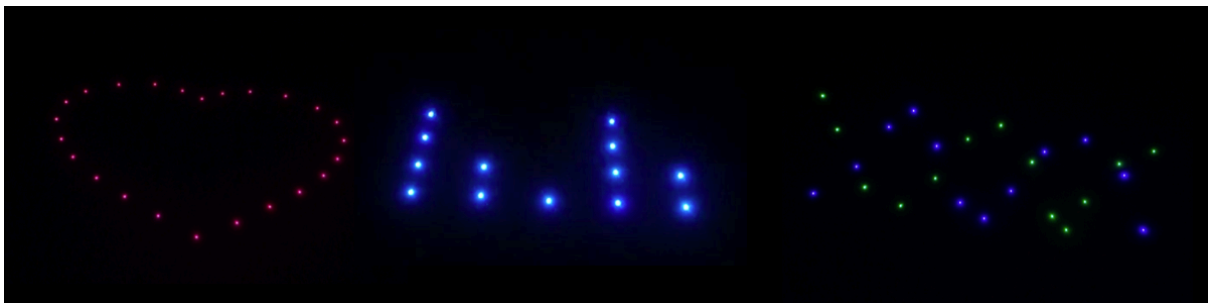
70th anniversary of China [YouTube link]



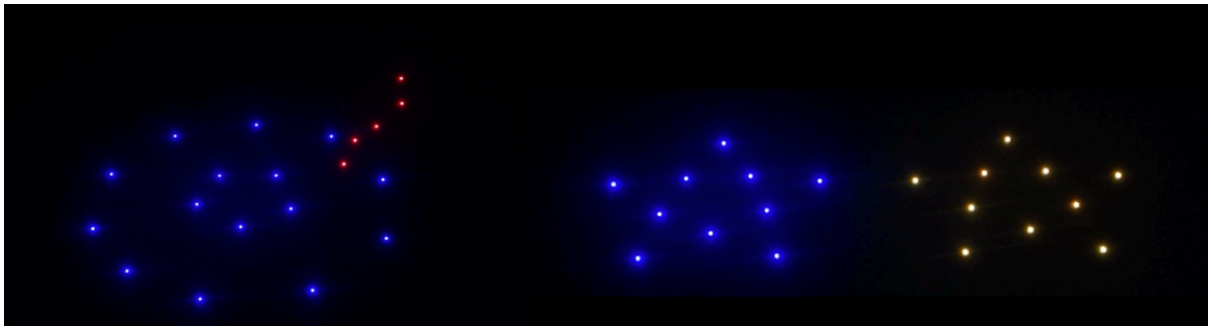
Any Colour You Like [YouTube link]



Musical Drone Light Show Propose YouTube link



Drone Light Show with DJ beats YouTube link



Drone Light Show | To The Sky with Batman YouTube link

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FCC STATEMENT :

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.