# User Manual

(ZQS05 Version)

(For all the animation lasers operated by ZQS05)

**This user manual contains important information about the safe installation and use of this product. Please read and follow the instruction carefully and keep this manual in a safe place for future reference.**

# Professional Stage Lighting

## Getting Started

Thanks for choosing our product, please read and follow the user manual carefully and keep this manual in a safe place for future use.

## 1. Security warning

1、When the product is outputting a single laser beam, there must be no flammable substances within 10 meters.

2、Prohibited to expose the laser light to human skin or eyes, as it poses a risk of damaging human health.

3、Do not point your camera too close to the laser aperture, as it may burn out the camera!

4、The product is only intended for installation, operation and maintenance by qualified personnel.

5、Before installation, ensure that the voltage and frequency of power supply match the power requirement of the product.

6、It is essential that each product is correctly earthed and that electrical installation conforms to all relevant standards.

7、Make sure that the power-cord is never crimped or damaged by sharp edges. Never let the power-cord come into contact with other cables. Only handle the power-cord by the plug. Never pull out the plug by tugging the power-cord.

8、Do not attempt to dismantle and/or modify the product inner structure. Otherwise 2 years of warranty will get invalid.

9、There is no user serviceable parts inside the product, do not open the housing and never operate the product with the cover removed.

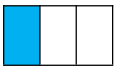
## 2. Specification

(This user manual is for all the animation lasers operated by FB4, as different models differ on power, scanner, size etc., so they are marked by blanks)

| | | | |
|---|---|---|---|
| **Product Name** | Animation laser | **Model No.** | |
| **Power** | | **Diode Brand** | Nichia (import from Japan) |
| **Light Source** | （R）：* W/638nm；（G）：* W/525nm；（B）：* W/450nm； | | |
| **Input Voltage** | 110/240V；50/60HZ | **Power Consumption** | |
| **Power Supply** | Mornsun / Mean Well brand | **DMX Channel** | 16/26CH |
| **Scanning Angle** | Max 60° | **Scanner** | |
| **Laser Show** | Text/graphic/animation/beam /LOGO/ customization | **Special Design** | Unique double-layer structure, with the optical path layer completely sealed |
| **Heat Dissipation** | High-speed air cooling (with built-in cooling fan system) | **IP Grade** | IP65 waterproof (Third-party quality inspection report) |
| **Working Temperature** | -40°C ~ 45°C- | **Diode Lifetime** | Over 20000 hours |
| **Net Weight** | | **Product Size** | |
| **Gross Weight** | | **Packing Size** | |
| **Self Protection** | When the laser beam is focused to the minimum point for a long time, it automatically light off. | | |
| **Analog Modulation** | 100k Analog. The power of the red, green and blue can be adjusted from 0 to 100. Adjust the power according to the show to optimize the alignment effect | | |
| **Control Mode** | ILDA mode: international standard 25 pins (with inbuilt FB4 or external FB4, use it when controlled by computer software)<br>DMX mode：XLR DMX512 (use it when controlled by console. If the laser has inbuilt FB4, a DMX sub-board must be installed)<br>Auto mode: voice control/auto-run/master-slave mode (use it with no controller. Voice control cannot be used if the laser has inbuilt FB4) | | |
| **Packing** | To prevent damage during transportation, professional flight case (shock-absorbing EPE foam + silent wheels) have been adopted for safety protection! | | |

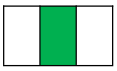
# 3. Hardware and interface

## 1.1 Indicator light

Power and TF card status indication：

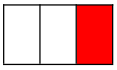
| | |
|---|---|
| Light off | No power |
| Slow flash | No TF card |
| Light on | TF card working |



Connect indication：

Under DMX mode

| | |
|---|---|
| Light off | No DMX sub-board |
| Slow flash | DMX sub-board working but no DMX signal |
| Light on | DMX working |



Laser light signal output

| | |
|---|---|
| Light off | No output |
| Light on | Output working |

## 1.2 Wire connection


1.POWER IN interface

| Pin | Name | Voltage |
|---|---|---|
| 1 | GND | 0 |
| 2 | VCC | +7V ~ +24V |

2. DMX IN interface

| Pin | Name | Voltage |
|---|---|---|
| 1 | GND | 0 |
| 2 | DMX RX | —— |
| 3 | DMX TX | —— |
| 4 | I2C SCL | —— |
| 5 | I2C SDA | —— |
| 6 | I2C INT | —— |
| 7 | VCC | 3.3V |


3.ILDA IN external program input

| Pin | Name | Voltage |
|---|---|---|
| 1 | GND | 0 |
| 2 | HAS | Grounded |
| 3 | EN | Grounded |
| 4 | GND | 0 |
| 5 | B IN | 0 ~ +5V |
| 6 | G IN | 0 ~ +5V |
| 7 | R IN | 0 ~ +5V |
| 8 | GND | 0 |
| 9 | YIN- | -5V ~ +5V |
| 10 | YIN+ | -5V ~ +5V |
| 11 | XIN- | -5V ~ +5V |
| 12 | XIN+ | -5V ~ +5V |

4.RGB OUT color output

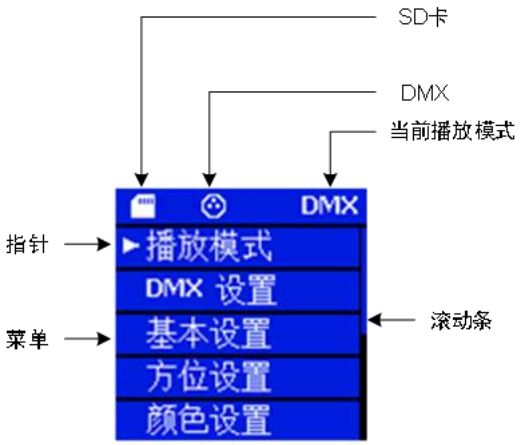
| Pin | Name | Voltage |
|---|---|---|
| 1 | Red | 0 ~ +5V |
| 2 | Green | 0 ~ +5V |
| 3 | Blue | 0 ~ +5V |
| 4 | —— | —— |
| 5 | —— | —— |
| 6 | —— | —— |
| 7 | Shutter | 0/3.3V |
| 8 | GND | 0 |

5.GS OUT

| Pin | Name | Voltage |
|---|---|---|
| 1 | Y+ | -5V ~ +5V |
| 2 | Y- | -5V ~ +5V |
| 3 | GND | 0 |
| 4 | GND | 0 |
| 5 | X- | -5V ~ +5V |
| 6 | X+ | -5V ~ +5V |

# 4. Menu

## 2.1 Display description：




## 2.2 Home directory：


| Menu | Description | Default |
|---|---|---|
| 【Operation Mode】 | Select the operation mode, 【DMX512】、【ILDA】、【ZLDA】、【TEST】and so on | |
| 【XXX Setting】 | Setting of the selected operation mode | |
| 【Master Setting】 | Master setting of the system | |
| 【Geo Correction】 | Correction of the geography | |
| 【Color Setting】 | Setting of the color | |
| 【Language】 | 【中文】Simplified Chinese<br>【en】English | 【中文】 |
| 【Device Info】 | Info of the device version etc. | |
| 【Exit Menu】 | Save the settings and backlight off | |

## 2.3 Operation Mode selection：


| Menu | Description | Default |
|---|---|---|
| 【DMX512】 | DMX512 mode, program comes from TF card, corresponding to ZLDA format files under dmx\ directory. | × |
| 【ILDA Play】 | ILDA mode, program comes from TF card, corresponding to ILDA format files under ilda\ directory. | × |
| 【ZLDA Play】 | ZLDA mode, program comes from TF card, corresponding to ZLDA format files under zlda\ directory. | × |
| 【TEST Play】 | TEST mode, program comes from TF card, corresponding to ZLDA format files under test\ directory. | × |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 2.4 DMX Setup：


| Menu | Description | Default |
|---|---|---|
| 【Start Addr】 | DMX data start address 1~500 | 1 |
| 【Timeout】 | Unit: second. If no DMX data received within this time, the DMX will be disconnected and output be off. | 3 |
| 【Profile】 | 【V3】Compatible with FB3 format control commands.<br>【CH26】26 channel format control commands.<br>【V4】Compatible with FB4 format control commands | V3 |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 2.5 ILDA Setup：


| Menu | Description | Default |
|---|---|---|
| 【Play Mode】 | 【cue】Play the single cue, corresponding to ILDA format files under ilda\cue directory.<br>【list】Play the list cues, corresponding to ILDA format files under ilda\list\001~999\ directory | cue |
| 【File Index】 | The cues being played, 001~999。<br>Under play mode 【cue】, corresponding to 001.ild~999.ild under ilda\cue directory.<br>Under play mode【list】， corresponding to files under ilda\list\001~999\ directory | 001 |
| 【End Action】 | 【list】 After the file is played to the end, replay from the beginning.<br>【off】 After the file is played to the end, turn off the laser output. | list |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 2.6 ZLDA Setup：


| Menu | Description | Default |
|---|---|---|
| 【Play Mode】 | 【cue】Play the single cue, corresponding to ZLDA format files under ilda\cue directory.<br>【list】Play the list cues, corresponding to ZLDA format files under ilda\list\001~999\ directory. | cue |
| 【File Index】 | The cues being played, 001~999。<br>Under play mode【cue】, corresponding to 001.ild~999.ild under zlda\cue directory.<br>Under play mode【list】， corresponding to files under zlda\list\001~999\ directory | 001 |

| | | |
|---|---|---|
| 【End Action】 | 【list】 After the file is played to the end, replay from the beginning.<br>【off】 After the file is played to the end, turn off the laser output. | list |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 2.7 TEST Setup：

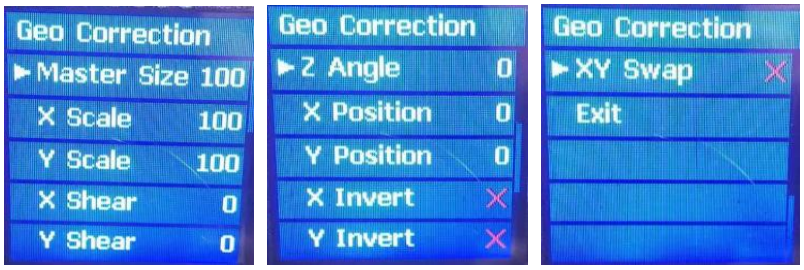

| Menu | Description | Default |
|---|---|---|
| 【Output】 | Turn on and off the laser output | × |
| 【File Index】 | The cues being played, 001~999, corresponding to 001.zld~999.zld under test\ directory | 001 |
| 【Master Size】 | 0~100% | 50 |
| 【Brightness】 | 0~100% | 100 |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 2.8 Master Setting:


| Menu | Description | Default |
|---|---|---|
| 【Scan Rate】 | Number of points per second of the laser output, unit: K, range: 5~40K. | 20 |
| 【Color Shift】 | The number of points that color lag coordinates, unit: point, range: 0~15 | 0 |
| 【Rescan】 | After the playing source is disconnected, the duration before the program is closed, unit: millisecond, range: 100~999ms | 999 |
| 【Each Play T】 | The minimum time each program plays, unit: second, range: 1~20s | 2 |
| 【TurnOffTime】 | After no operation on the interface, the time of turning off,unit: second, range: 5~60s, 60s indicates that the screen is always on | 30 |
| 【Animate Mode】 | 1——play via point, 2——play via frame | 1 |
| 【Animate Rate】 | Valid for play via point, 1: full rate, 2: 1/2 rate, 3: 1/3 rate | 1 |

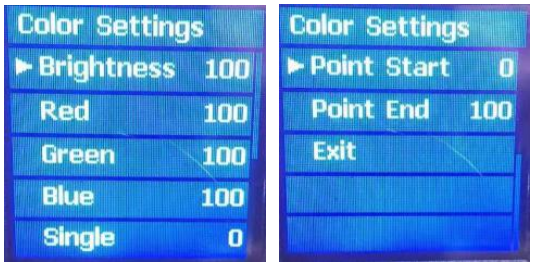
| | | |
|---|---|---|
| 【Targer FPS】 | Valid for play via frame, frames played per second, unit: frame, range: 1~40 | 10 |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 2.9 Geo Correction:




| Menu | Description | Default |
|---|---|---|
| 【Master Size】 | 0~100% | 50 |
| 【X Scale】 | 0~100% | 100 |
| 【Y Scale】 | 0~100% | 100 |
| 【X Shear】 | -100~100% | 0 |
| 【Y shear】 | -100~100% | 0 |
| 【Z Angle】 | 0~359 | 0 |
| 【X Position】 | -100~100% | 0 |
| 【Y Position】 | -100~100% | 0 |
| 【X Invert】 | 0\|1 | × |
| 【Y Invert】 | 0\|1 | × |
| 【XY Swap】 | 0\|1 | × |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

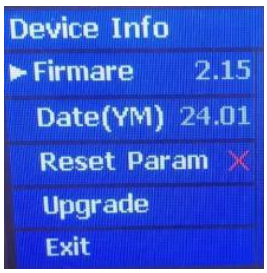
## 2.10 Color Setting:




| Menu | Description | Default |
|---|---|---|
| 【Brightness】 | 0~100% | 100 |
| 【Red】 | 0~100% | 100 |
| 【Green】 | 0~100% | 100 |
| 【Blue】 | 0~100% | 100 |

| | | |
|---|---|---|
| 【Point Start】 | 0~100% | 0 |
| 【Point End】 | 0~100% | 100 |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

### 2.11 Device Info:




| Menu | Description | Default |
|---|---|---|
| 【Firmware】 | X.XX indicates the major version. subversion | —— |
| 【Date(YM)】 | XX.XX indicates the firmware year. month | —— |
| 【Reset Param】 | Parameters are restored to factory Settings | |
| 【Upgrade】 | Click to upgrade firmware | |
| 【Exit】 | Exit the current menu and return to the upper menu. | |

## 5. DMX512 Operation

### 3.1 V3 version

16 channel list（base 255）：

| Channel | Value | Description | Width |
|---|---|---|---|
| 1 | 0-255 DMX Mode | 0-31 light off<br>33-95 the former 4 channels<br>97-159 the former 8 channels<br>161-232 the former 12 channels<br>225-255 the former 16 channels | 8 Bit |
| 2 | 0-255 Page Index<br>(total 9 pages) | 0-15 page 1<br>17-31 page 2<br>33-47 page 3<br>49-63 page 4<br>65-79 page 5<br>81-95 page 6<br>97-111 page 7<br>113-127 page 8<br>129-255 page 9 | 8 Bit |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 0-255 | Cue Index<br>(total 48 cues) | 0-32<br>33-35<br>37-39<br>.. - ..<br>221-223<br>225-255 | light off<br>cue 1<br>cue 2<br>..<br>cue 48<br>—— | 8 Bit |
| 4 | 0-255 | Rate | 0-15<br>17-31<br>33-255 | default rate<br>pause<br>25% ~ 200% | 8 Bit |
| 5 | 0-255 | brightness | 0% ~ 100% | | 8 Bit |
| 6 | 0-255 | Size | 0% ~ 100% | | 8 Bit |
| 7 | 0-255 | X scale | -100% ~ 100% | | 8 Bit |
| 8 | 0-255 | Y scale | -100% ~ 100% | | 8 Bit |
| 9 | 0-255 | Z angle | 0~360 degrees | | 8 Bit |
| 10 | 0-255 | X position | 0 = left, 128 = middle, 255 = right | | 8 Bit |
| 11 | 0-255 | Y position | 0 = top, 128 = middle, 255 = bottom | | 8 Bit |
| 12 | 0-255 | points visible | 0 ~ 100% | | 8 Bit |
| 13 | 0-255 | scan rate | 0-31<br>33-223<br>225-255 | default scan rate<br>6K ~ 29K<br>30K | 8 Bit |
| 14 | 0-255 | reserved | | | 8 Bit |
| 15 | 0-255 | color list | 0-31<br>33-223<br>225-255 | original color<br>color list<br>white | 8 Bit |
| 16 | 0-255 | reserved | Reserved | | 8 Bit |

16 channel list（base 100）

| Channel | Value | | Description | | Width |
|---|---|---|---|---|---|
| 1 | 0-100 | DMX Mode | 0-12 | Light off | 8 Bit |
| | | | 13-37 | The former 4 channels | |
| | | | 39-62 | The former 8 channels | |
| | | | 64-90 | The former 12 channels | |
| | | | 92-100 | The former 16 channels | |
| 2 | 0-100 | Page Index<br>(total 9 pages) | 0-5 | Page 1 | 8 Bit |
| | | | 7-12 | Page 2 | |
| | | | 13-18 | Page 3 | |
| | | | 20-24 | Page 4 | |
| | | | 26-30 | Page 5 | |
| | | | 32-36 | Page 6 | |
| | | | 38-43 | Page 7 | |
| | | | 45-49 | Page 8 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 51-100 | | Page 9 | | |
| 3 | 0-100 | Cue Index<br>(total 48 cues) | 0-12 | Light off | 51 | Cue 25 | 8 Bit |
| | | | 13 | Cue 1 | 52 | Cue 26 | |
| | | | 15 | Cue 2 | 54 | Cue 27 | |
| | | | 16 | Cue 3 | 56 | Cue 28 | |
| | | | 18 | Cue 4 | 57 | Cue 29 | |
| | | | 20 | Cue 5 | 59 | Cue 30 | |
| | | | 21 | Cue 6 | 60 | Cue 31 | |
| | | | 23 | Cue 7 | 62 | Cue 32 | |
| | | | 24 | Cue 8 | 63 | Cue 33 | |
| | | | 26 | Cue 9 | 65 | Cue 34 | |
| | | | 27 | Cue 10 | 67 | Cue 35 | |
| | | | 29 | Cue 11 | 68 | Cue 36 | |
| | | | 30 | Cue 12 | 70 | Cue 37 | |
| | | | 32 | Cue 13 | 71 | Cue 38 | |
| | | | 34 | Cue 14 | 73 | Cue 39 | |
| | | | 35 | Cue 15 | 74 | Cue 40 | |
| | | | 37 | Cue 16 | 76 | Cue 41 | |
| | | | 38 | Cue 17 | 78 | Cue 42 | |
| | | | 40 | Cue 18 | 79 | Cue 43 | |
| | | | 41 | Cue 19 | 81 | Cue 44 | |
| | | | 43 | Cue 20 | 82 | Cue 45 | |
| | | | 45 | Cue 22 | 84 | Cue 46 | |
| | | | 46 | Cue 22 | 85 | Cue 47 | |
| | | | 48 | Cue 23 | 87 | Cue 48 | |
| | | | 49 | Cue 24 | 225-255 | —— | |
| 4 | 0-100 | Rate | 0-5 | | default rate | | 8 Bit |
| | | | 7-12 | | pause | | |
| | | | 13-100 | | 25% ~ 200% | | |
| 5 | 0-100 | brightness | 0% ~ 100% | | | | 8 Bit |
| 6 | 0-100 | size | 0% ~ 100% | | | | 8 Bit |
| 7 | 0-100 | X scale | -100% ~ 100% | | | | 8 Bit |
| 8 | 0-100 | Y scale | -100% ~ 100% | | | | 8 Bit |
| 9 | 0-100 | Z angle | 0~360 degrees | | | | 8 Bit |
| 10 | 0-100 | X position | 0 = left, 50 = middle, 100 = right | | | | 8 Bit |
| 11 | 0-100 | Y position | 0 = top, 50 = middle, 100 = bottom | | | | 8 Bit |
| 12 | 0-100 | points visible | 0 ~ 100% | | | | 8 Bit |
| 13 | 0-100 | scan rate | 0-12 | | default scan rate | | 8 Bit |
| | | | 13-87 | | 6K ~ 29K | | |
| | | | 89-100 | | 30K | | |
| 14 | 0-100 | reserved | | | | | 8 Bit |
| 15 | 0-100 | color list | 0-12 | | original color | | 8 Bit |
| | | | 13-87 | | color list | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | 89-100 | white | |
| 16 | 0-100 | reserved | Reserved | | 8 Bit |

## 3.2 V4 Version (base 255)

The 39 channel mode is as follows:

1. Put ZQS05 in Setup Mode (please note there is a two-second delay before the "Set Mode" is initialized). Now limit the area where the laser may be projected.

2. Put ZQS05 in Play Mode for actual performance, with ability to play programs.

During Set Mode, channel 14 - 39 will ignore DMX/ART-NET changes.

During Play Mode, channel 2 - 13 will ignore DMX/ART-NET changes.

| Channel | Value | Description | Width |
|---|---|---|---|
| 1 | 0-255 play mode | 0-150 light off<br>150-190 setup mode<br>200-240 play mode<br>240-255 light off | 8 Bit |
| 2 | 0-255 max brightness | set the max brightness (0 ~ 100%) | 8 Bit |
| 3 | 0--255 test graphic | (1= test cue 1, 255 = test 255) | 8 Bit |
| 4,5 | 0-65535 X scale | set the max width (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 6,7 | 0-65535 Y scale | set the max height (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 8,9 | 0-65535 X position | set the horizontal position (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 10,11 | 0-65535 Y position | set the vertical position (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 12,13 | 0-65535 Z angle | set the rotation angle (0~ 360°) | 16 Bit |
| 14 | 0-255 page index | 1 = page 1, ... 255 = page 255 | 8 Bit |
| 15 | 0-255 cue index | 1 = cue 1, ... 255 = cue 255 | 8 Bit |
| 16 | 0-255 play rate | (0 = original rate, 1 – 255 = 1% ~ 255%) | 8 Bit |
| 17 | 0-255 brightness | (0 ~ 100%) | 8 Bit |
| 18,19 | 0-65535 size | (0 ~ 100%) | 16 Bit |
| 20,21 | 0-65535 X scale | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 22,23 | 0-65535 Y scale | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 24,25 | 0-65535 Z angle | rotation angle(0~ 360°) | 16 Bit |
| 26,27 | 0-65535 Z rotation | rotation rate -60 ~ 60 Rpm ( 0 = initial position, 1 ~ 32767 = -100% ~ -1% rotation rate, 32768 = stay still without rotation, 32769 ~ 65535 = 1% ~ 100% rotation rate) | |
| 28,29 | 0-65535 X position | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 30,31 | 0-65535 Y position | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 32 | 0-255 scan rate | (5k ~ 30K) | 8 Bit |
| 33 | 0-255 red brightness | (0 ~ 100%) | 8 Bit |
| 34 | 0-255 green brightness | (0 ~ 100%) | 8 Bit |
| 35 | 0-255 blue brightness | (0 ~ 100%) | 8 Bit |
| 36 | 0-255 RGB change color | (0 = initial color, 1-255 = 0 ~ 100% change color) | 8 Bit |

| | | | |
|---|---|---|---|
| 37 | 0-255 initial display point | (0 ~ 100%) | 8 Bit |
| 38 | 0-255 end display point | (0 ~ 100%) | 8 Bit |
| 39 | 0-255 strobe | 0 = strobe off<br>1-255 = 1 to 20 Hz | 8 Bit |

**（base 100）**

| Channel | Value | | Description | |
|---|---|---|---|---|
| 1 | 0-100 | play mode | 0-58 | light off |
| | | | 60-70 | setup mode |
| | | | 80-90 | play mode |
| | | | 95-100 | light off |
| 2 | 0-100 | max brightness | set the max brightness (0 ~ 100%) | |
| 3 | 0—100.0 | test graphic | (0.4= test cue 1, 0.8 = test cue 2, 100 = test cue 255) | |
| 4-5 | 0-100.0 | X scale | set the max width (-100 ~ 100%, 50 = 0 scale) | |
| 6-7 | 0-100.0 | Y scale | set the max height (-100 ~ 100%, 50 = 0 scale) | |
| 8-9 | 0-100.0 | X position | set the horizontal position (-100 ~ 100%, 50.0 = middle) | |
| 10-11 | 0-100.0 | Y position | set the vertical position (-100 ~ 100%, 50.0 = middle) | |
| 12-13 | 0-100.0 | Z angle | set the rotation angle (0~ 360°) | |
| 14 | 0-100 | page index | 0.4 = page 1, 0.8 = page 2,... 100 = page 255 | |
| 15 | 0-100 | cue index | 0.4 = cue 1, 0.8 = cue 2... 100 = cue 255 | |
| 16 | 0-100 | play rate | (0 = original rate, 0.4 – 100.0 = 1% ~ 255%) | |
| 17 | 0-100 | brightness | (0 ~ 100%) | |
| 18-19 | 0-100.0 | size | (0 ~ 100%) | |
| 20-21 | 0-100.0 | X scale | (-100 ~ 100%, 0 = 0 scale) | |
| 22-23 | 0-100.0 | Y scale | (-100 ~ 100%, 0 = 0 scale) | |
| 24-25 | 0-100.0 | Z angle | rotation angle(0~ 360°) | |
| 26-27 | 0-100.0 | Z rotation | rotation rate -60 ~ 60 Rpm | |
| | | | 0 = initial position, 0.1 ~ 49.9 = -100% ~ -1% rotation rate | |
| | | | 50.0 = stay still without rotation | |
| | | | 50.1 ~ 100.0 = 1% ~ 100% rotation rate | |
| 28-29 | 0-100 | X position | (-100 ~ 100%, 50.0 = middle) | |
| 30-31 | 0-100 | Y position | (-100 ~ 100%, 50.0 = middle) | |
| 32 | 0-100 | scan rate | (5k ~ 30K) 50 = 17.5k, 60 = 20k, 80 = 25k, 100 = 30k | |
| 33 | 0-100 | red brightness | (0 ~ 100%) | |
| 34 | 0-100 | green brightness | (0 ~ 100%) | |
| 35 | 0-100 | blue brightness | (0 ~ 100%) | |

| | | | | |
|---|---|---|---|---|
| 36 | 0-100 | RGB change color | (0 = initial color, 0.4-100.0 = 0 ~ 100% change color) | |
| 37 | 0-100 | initial display point | (0 ~ 100%) | |
| 38 | 0-100 | end display point | (0 ~ 100%) | |
| 39 | 0-100 | strobe | 0 = strobe off | 0.4-100.0 = 1 to 20 Hz |

## 3.2 26 Chanel list (base 255)

| Channel | Value | | Description | Width |
|---|---|---|---|---|
| 1 | 0-255 | page index | 0~3 light off<br>4~7 page 1<br>8~11 page 2<br>12~15 page 3<br>……<br>252~255 page 63 | 8 Bit |
| 2 | 0-255 | cue index | 0~3 light off<br>4~7 cue 1<br>8~11 cue 2<br>12~15 cue 3<br>……<br>252~255 cue 63 | 8 Bit |
| 3 | 0-255 | play rate | (0 = original rate, 1 – 255 = 1% ~ 255%) | 8 Bit |
| 4 | 0-255 | brightness | (0 ~ 100%) | 8 Bit |
| 5,6 | 0-65535 | size | (0 ~ 100%) | 16 Bit |
| 7,8 | 0-65535 | X scale | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 9,10 | 0-65535 | Y scale | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 11,12 | 0-65535 | Z angle | rotation angle (0~ 360°) | 16 Bit |
| 13,14 | 0-65535 | Z rotation | rotation rate -60 ~ 60 Rpm ( 0 = initial position, 1 ~ 32767 = -100% ~ -1% rotation rate, 32768 = stay still without rotation, 32769 ~ 65535 = 1% ~ 100% rotation rate) | |
| 15,16 | 0-65535 | X position | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 17,18 | 0-65535 | Y position | (-100 ~ 100%, 0 = 32768) | 16 Bit |
| 19 | 0-255 | scan rate | (5k ~ 30K) | 8 Bit |
| 20 | 0-255 | red brightness | (0 ~ 100%) | 8 Bit |
| 21 | 0-255 | green brightness | (0 ~ 100%) | 8 Bit |
| 22 | 0-255 | blue brightness | (0 ~ 100%) | 8 Bit |
| 23 | 0-255 | RGB change color | (0 = initial color, 1-255 = 0 ~ 100% change color) | 8 Bit |
| 24 | 0-255 | initial display point | (0 ~ 100%) | 8 Bit |
| 25 | 0-255 | end display point | (0 ~ 100%) | 8 Bit |
| 26 | 0-255 | strobe | 0 = strobe off<br>1-255 = 1 to 20 Hz | 8 Bit |

## 3.3 26 Chanel list (base 100)

| Channel | Value | | Description | | | |
|---|---|---|---|---|---|---|
| 1 | 0-100 | page index | page index | | | |
| | | | 1 | light off | 51 | Page 32 |
| | | | 2 | Page 1 | 52 | Page 33 |
| | | | 4 | Page 2 | 54 | Page 34 |
| | | | 5 | Page 3 | 55 | Page 35 |
| | | | 7 | Page 4 | 57 | Page 36 |
| | | | 8 | Page 5 | 59 | Page 37 |
| | | | 10 | Page 6 | 60 | Page 38 |
| | | | 11 | Page 7 | 62 | Page 39 |
| | | | 13 | Page 8 | 63 | Page 40 |
| | | | 15 | Page 9 | 65 | Page 41 |
| | | | 16 | Page 10 | 66 | Page 42 |
| | | | 18 | Page 11 | 68 | Page 43 |
| | | | 19 | Page 12 | 70 | Page 44 |
| | | | 21 | Page 13 | 71 | Page 45 |
| | | | 22 | Page 14 | 73 | Page 46 |
| | | | 24 | Page 15 | 74 | Page 47 |
| | | | 26 | Page 16 | 76 | Page 48 |
| | | | 27 | Page 17 | 77 | Page 49 |
| | | | 29 | Page 18 | 79 | Page 50 |
| | | | 30 | Page 19 | 80 | Page 51 |
| | | | 32 | Page 20 | 82 | Page 52 |
| | | | 33 | Page 21 | 84 | Page 53 |
| | | | 35 | Page 22 | 85 | Page 54 |
| | | | 37 | Page 23 | 87 | Page 55 |
| | | | 38 | Page 24 | 88 | Page 56 |
| | | | 40 | Page 25 | 90 | Page 57 |
| | | | 41 | Page 26 | 91 | Page 58 |
| | | | 43 | Page 27 | 93 | Page 59 |
| | | | 44 | Page 28 | 95 | Page 60 |
| | | | 46 | Page 29 | 96 | Page 61 |
| | | | 48 | Page 30 | 98 | Page 62 |
| | | | 49 | Page 31 | 99 | Page 63 |
| 2 | 0-100 | cue index | cue index | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 1 | light off | 51 | Cue 32 |
| | | | 2 | Cue 1 | 52 | Cue 33 |
| | | | 4 | Cue 2 | 54 | Cue 34 |
| | | | 5 | Cue 3 | 55 | Cue 35 |
| | | | 7 | Cue 4 | 57 | Cue 36 |
| | | | 8 | Cue 5 | 59 | Cue 37 |
| | | | 10 | Cue 6 | 60 | Cue 38 |
| | | | 11 | Cue 7 | 62 | Cue 39 |
| | | | 13 | Cue 8 | 63 | Cue 40 |
| | | | 15 | Cue 9 | 65 | Cue 41 |
| | | | 16 | Cue 10 | 66 | Cue 42 |
| | | | 18 | Cue 11 | 68 | Cue 43 |
| | | | 19 | Cue 12 | 70 | Cue 44 |
| | | | 21 | Cue 13 | 71 | Cue 45 |
| | | | 22 | Cue 14 | 73 | Cue 46 |
| | | | 24 | Cue 15 | 74 | Cue 47 |
| | | | 26 | Cue 16 | 76 | Cue 48 |
| | | | 27 | Cue 17 | 77 | Cue 49 |
| | | | 29 | Cue 18 | 79 | Cue 50 |
| | | | 30 | Cue 19 | 80 | Cue 51 |
| | | | 32 | Cue 20 | 82 | Cue 52 |
| | | | 33 | Cue 21 | 84 | Cue 53 |
| | | | 35 | Cue 22 | 85 | Cue 54 |
| | | | 37 | Cue 23 | 87 | Cue 55 |
| | | | 38 | Cue 24 | 88 | Cue 56 |
| | | | 40 | Cue 25 | 90 | Cue 57 |
| | | | 41 | Cue 26 | 91 | Cue 58 |
| | | | 43 | Cue 27 | 93 | Cue 59 |
| | | | 44 | Cue 28 | 95 | Cue 60 |
| | | | 46 | Cue 29 | 96 | Cue 61 |
| | | | 48 | Cue 30 | 98 | Cue 62 |
| | | | 49 | Cue 31 | 99 | Cue 63 |
| 3 | 0-100 | play rate | (0 = original rate, 0.4 – 100.0 = 1% ~ 255%) | | | |
| 4 | 0-100 | brightness | (0 ~ 100%) | | | |
| 5,6 | 0-100.0 | size | (0 ~ 100%) | | | |
| 7,8 | 0-100.0 | X scale | (-100 ~ 100%, 50.0 = 0 scale) | | | |
| 9,10 | 0-100.0 | Y scale | (-100 ~ 100%, 50.0 = 0 scale) | | | |
| 11,12 | 0-100.0 | Z angle | rotation angle (0~ 360°) | | | |
| 13,14 | 0-100.0 | Z rotation | rotation rate -60 ~ 60 Rpm | | | |

| | | | | |
|---|---|---|---|---|
| | | | 0 = initial position | |
| | | | 0.1 ~ 49.9 = -100% ~ -1% rotation rate | |
| | | | 50.0 = stay still without rotation | |
| | | | 50.1 ~ 100.0 = 1% ~ 100% rotation rate | |
| 15,16 | 0-100.0 | X position | (-100 ~ 100%, 50.0 = middle) | |
| 17,18 | 0-100.0 | Y position | (-100 ~ 100%, 50.0 = middle) | |
| 19 | 0-100 | scan rate | (5k ~ 30K) 50 = 17.5k, 60 = 20k, 80 = 25k, 100 = 30k | |
| 20 | 0-100 | red brightness | (0 ~ 100%) | |
| 21 | 0-100 | green brightness | (0 ~ 100%) | |
| 22 | 0-100 | blue brightness | (0 ~ 100%) | |
| 23 | 0-100 | RGB change color | (0 = initial color, 0.4 - 100.0 = 0 ~ 100% change color) | |
| 24 | 0-100 | initial display point | (0 ~ 100%) | |
| 25 | 0-100 | end display point | (0 ~ 100%) | |
| 26 | 0-100 | strobe | 0 = strobe off | 0.4-100.0 = 1 to 20 Hz |

# 5. TF card files structure

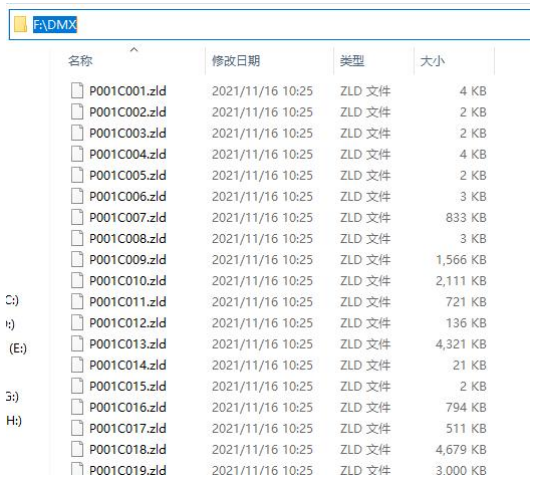
## 4.1 DMX file structure

DMX plays the files under DMX\ directory, the file names are included in P001C001.zld ~ P255C255.zld.. P=Page, C=Cue.

Using DMX 16 channel command Page index and Cue Index corresponding P001C001.zld ~ P009C048.zld, total 9*48=432 files are supported.

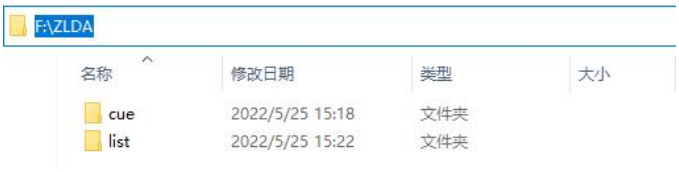
Using DMX 39 channel command Page index and Cue Index corresponding P001C001.zld ~ P255C255.zld, total 255*255=65025 files are supported.

During DMX playing, if the files corresponding to Pages and Cues are not found, the laser output will be off..



## 4.2 ZLDA files structure

ZLDA play has two types, one is 【cue】, the other is 【list】, corresponding to zlda\cue\ and zlda\list\ directories respectively.



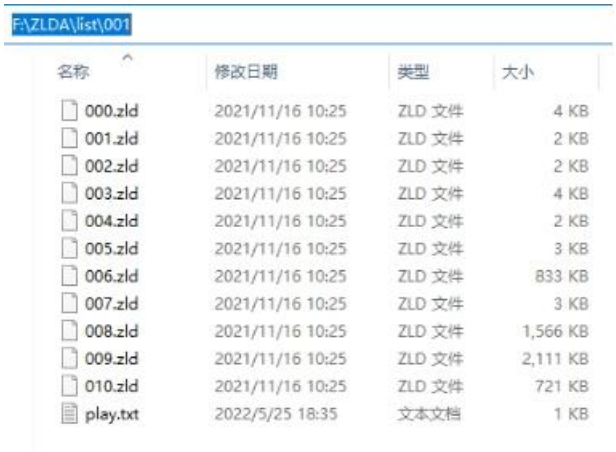

### 1. Cue mode

Under zlda\cue\ directory, file name 001.zld~999.zld, corresponding to the menu 【current file]】, total 999 files are supported. During ZLDA cue mode playing, if the corresponding files are not found, the laser output will be off.


### 2. List mode

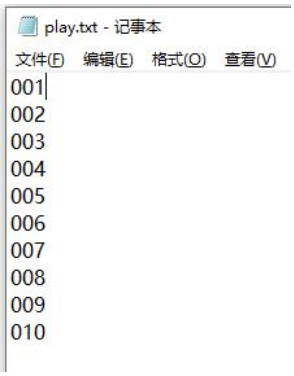
Under zlda\list\ directory, total 999 (001~999) directories can be built, each directory as a list, file name corresponds to menu of 【current file]】 selected.

Under zlda\list\001 directory, file names 001.zld~999.zld, A play.txt file is needed to indicate the order of playing.




The content of play.txt is as below, quantity and order of files can be customized. Files can also be reused. Each file name is required to occupy one line, no other content except 001~999 file names.

During ZLDA list mode playing, if the corresponding files are not found, the laser output will be off.



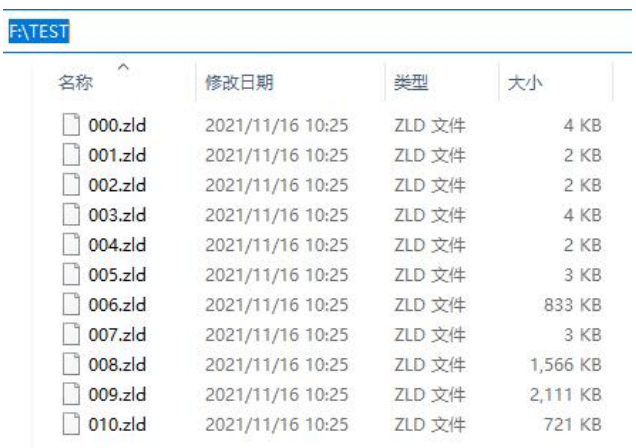

### 4.3 ILDA file structure

Similar to ZLDA mode， only the file format is *.ild.

### 4.4 TEST file structure

Under test\ directory, file name 001.zld~999.zld, corresponding to the menu 【current file]】, total 999 files are supported. Some files only for test can be put under this directory.

During Test mode playing, if the corresponding files are not found, the laser output will be off.



# 6. Upgrade

## 1. Prepare file

Put the upgrade file to the root directory of the TF card, the file name is ZQS05******.zqb. The file name prefix ZQS05 and extension.zqb are mandatory, otherwise the device can not identify the file.


## 2. Upgrade device

Insert the TF card, start the device, find Upgrade in the device information menu, and click to enter the upgrade interface. If the firmware is invalid, the upgrade interface can not be entered

Before upgrade, confirm the version information carefully and click OK. Do not have the power off during the upgrade. Otherwise the firmware will be lost.

## 7. Safety Instructions

**For safety reasons, please follow the following instructions:**

- Do not disassemble or alter the product.
- Do not drop flammable liquids, water and metals into the product.

**Avoid using the unit in the following situations：**

- The relative humidity is too high.
- oscillation or collision environment.

**Attention：**

- If you encounter serious difficulties in use, please stop immediately, and inquire agents or manufacturers for inspection.
- Do not disassemble the product, there are no repair parts inside.
- Please request inspection by qualified personnel.

## 9. Warranty

We offer 2-year warranty and lifetime maintenance service. Within 2 years, any damage caused by the product's own quality issues can be repaired for free. 2 years later, material cost will be charged for the maintenance or replacement of parts.
The software included in the products can be upgraded and function improved for free in future.

The following product damages or other reasons not caused by our product itself are not covered by our company's free repair service:

1. Wrong installation.
2. Voltage not matched.
3. Not following the user manual and make wrong operation.
4. Any repair or modification not authorized by our company.
5. The product lacks necessary maintenance.
6. The required working environment was not provided.
7. Product damage caused by the user's secondary transportation
8. System failures caused by viruses or other software which is not offered by our company's etc..
9. Force majeure factors such as natural disasters (lightning strikes, earthquakes, tsunamis, floods, etc.) and unexpected situations
10. The power supply for the product must be effectively grounded.