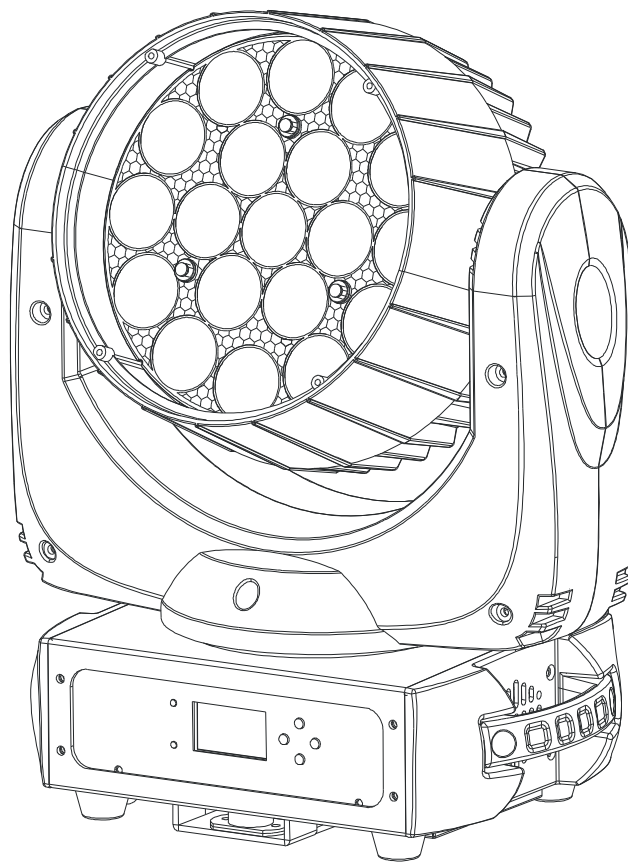# DIALighting
IW19-10 ZOOM

User Manual

Please read the instruction carefully before use

TABLE OF CONTENTS

1. Safety Instructions

⚠️

> **Please read the instruction carefully which includes important information about the installation, usage and maintenance.**

WARNING

Please keep this User Manual for future consultation. If you sell the unit to another user, be sure that they also receive this instruction booklet.

•

Unpack and check carefully there is no transportation damage before using the unit.

- Before operating, ensure that the voltage and frequency of power supply match the power requirements of the unit.

- It's important to ground the yellow/green conductor to earth in order to avoid electric shock.

- The unit is for indoor use only. Use only in a dry location.

- The unit must be installed in a location with adequate ventilation, at least 50cm from adjacent surfaces. Be sure that no ventilation slots are blocked.

- Disconnect main power before replacement or servicing.

- Make sure there are no flammable materials close to the unit while operating as it is fire hazard.

- Use safety cables when fixing this unit. DO NOT handle the unit by its head only, always carry by its base.

- Maximum ambient temperature is Ta: 40 degrees C. DO NOT operate it where the temperature is higher than this.

- Unit surface temperature may reach up to 75 degrees C. DO NOT touch the housing with bare-hands during its operation. Turn off the power and allow about 15 minutes for the unit to cool down before replacing or serving.

- In the event of a serious operating problem, stop using the unit immediately. Never try to repair the unit by yourself. Repairs carried out by unskilled people can lead to damage or malfunction. Please contact the nearest authorized technical assistance center. Always use the same type spare parts.

-

DO NOT touch any wire during operation as high voltage may cause electric shock.

Warning:

-

To prevent or reduce the risk of electrical shock or fire, do not expose the unit to rain or moisture.

-

The housing and lenses must be replaced if they are visibly damaged.

Caution:

There are no user serviceable parts inside the unit. Do not open the housing or attempt any repairs yourself. In the unlikely event your unit may require service, please contact your nearest dealer.

Installation:

The fixture should be mounted via its Omega Quick Release Clamp bracket. Always ensure that the unit is firmly fixed to avoid vibration and slipping while operating and make sure that the structure to which you are attaching the unit is secure and is able to support a weight of 10 times of the fixtures weight. Always use a safety cable that can hold 12 times of the weight of the fixture when installing.

The equipment must be installed by professionals. It must be installed in a place where is out of the reach of people and no one can pass by or under it.

## 2. Technical Specifications

◇ Extremely small, fast and powerful LED moving beam.

◇ DMX Channels: 14 channels mode

◇ Operation modes: DMX512

◇ Blue LCD display for easy navigation

◇ Perfect for stage, theatre, TV studio, rental and discotheques

- **Input Voltage:**   AC 100V~240V, 50/60Hz

- **Power Consumption:**   245W

- **Power Cable Daisy Chain:** 11 Fixture Max. (230V, 50Hz)

5 Fixture Max. (130V, 60Hz)

- **Beam Angel:**   10° ~ 60°

- **LED Source:**   19 × 10W RGBW LED

- **Weight:**   9.2Kgs

- **Dimension:**   325 × 188 × 395mm

188

325

335

395
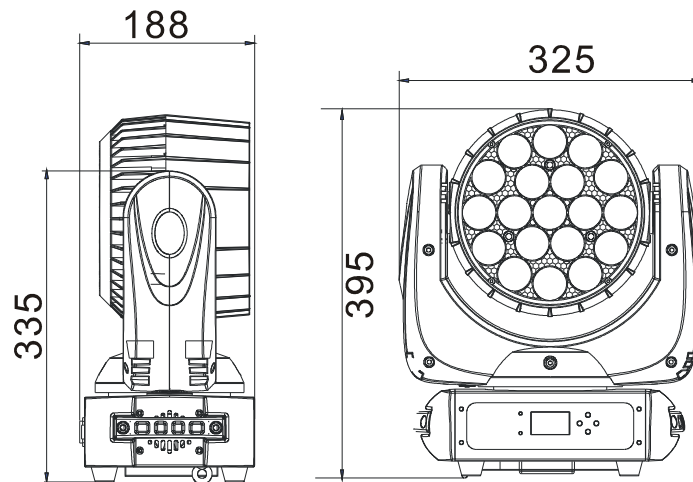
3. How To Set The Unit
3.1 Control Panel

3 2 1   4

5 6 7 8 9 10 11
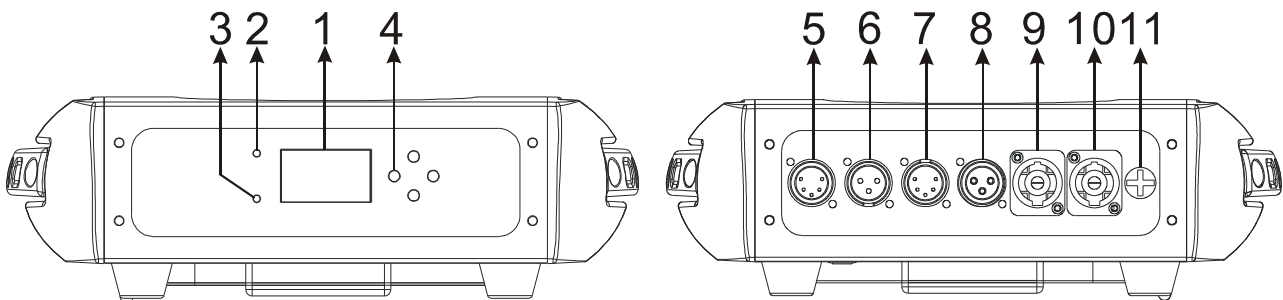
1. Display:

Shows the various menus and the selected functions

LED:

2. POWER	ON	Power On
3. DMX	ON	DMX input present

4. Button:

MENU	To select the programming functions
▼ DOWN	To go backward in the selected functions
▲ UP	To go forward in the selected functions

4D

ENTER	To confirm the selected functions

5. DMX input:

DMX512 link, use 5-pin XLR cable to link the unit and DMX controller

6. DMX input:

DMX512 link, use 3-pin XLR cable to link the unit and DMX controller

7. DMX output:

DMX512 link, use 5-pin XLR cable to link the next unit

8. DMX output:

DMX512 link, use 3-pin XLR cable to link the next unit

9. Mains input:

Connects to power supply

10. Mains output:

Connects to next fixture

11. Fuse (T 6.3A)**:**

Protects the unit from over-voltage or short circuit

3.2 Main Function

To select any of the given functions, press the **MENU** button until the required function is showing on the display. Select the function by pressing the **ENTER** button and the display will blink. Use the **DOWN/UP** buttons to change the mode. Once the required mode has been selected, press the **ENTER** button to setup, to go back to the functions without any change press the **MENU** button again. Press and hold the **MENU** button for about one second or wait for one minute to exit the menu mode.

The main functions are shown overleaf:

```
                                                              ┌──────────┐
                                              ┌─────────────┐ │   001    │
                              ┌──────────────┐│ DMX  Address├─┤          │
               ┌─────────────┐│ DMX Functions││             │ │   512    │
               │             ││              │└─────────────┘ └──────────┘
               │             ││              ││
               │             ││              ││ View DMX Value│
               │             ││              │└──────────────┘
               │             │
               │             │                               ┌──────┐
               │             │                ┌─────────────┐│  No  │
               │             │                │ Pan Inverse ├┤      │
               │             │                │             ││ Yes  │
               │             │                └─────────────┘└──────┘
               │             │                               ┌──────┐
               │             │                ┌─────────────┐│  No  │
               │             │                │ Tilt Inverse├┤      │
               │             │                │             ││ Yes  │
               │             │                └─────────────┘└──────┘
               │             │                               ┌──────┐
               │             │                ┌─────────────┐│  No  │
               │             │                │ P/T Feedback├┤      │
               │             │                │             ││ Yes  │
               │             │                └─────────────┘└──────┘
               │             │                               ┌──────┐
               │             │                ┌─────────────┐│  No  │
               │             │                │Bl.o. P/T Mov├┤      │
               │             │                │             ││ Yes  │
               │Fixture Sett.│                └─────────────┘└──────┘
               │             │                               ┌──────┐
               │             │                ┌─────────────┐│ Red  │
               │             │                │White Balance├┤ Green│
               │             │                │             ││ Blue │
               │             │                └─────────────┘└──────┘
               │             │                               ┌──────┐
               │             │                ┌─────────────┐│ Auto │
               │             │                │Cooling Mode ├┤      │
               │             │                │             ││ Low  │
               │             │                └─────────────┘└──────┘
               │             │                               ┌───────────┐
               │             │                ┌─────────────┐│  Linear   │
               │             │                │Dimmer Curve ├┤Square Law │
               │             │                │             ││Inverse Squ│
               │             │                └─────────────┘│ S-curve   │
               │             │                               └───────────┘
               │             │                               ┌──────┐
 ┌──────┐      │             │                ┌─────────────┐│ Fast │
 │ MENU ├──────┤             │                │Dimmer Speed ├┤      │
 └──────┘      │             │                │             ││Smooth│
               │             │                └─────────────┘└──────┘
```

Menu Tree (page 6D)

MENU

- **DMX Functions**
  - DMX Address → 001 … 512
  - View DMX Value

- **Fixture Settings**
  - Pan Inverse → No / Yes
  - Tilt Inverse → No / Yes
  - P/T Feedback → No / Yes
  - Bl.o. P/T Moving → No / Yes
  - White Balance → Red / Green / Blue
  - Cooling Mode → Auto / Low
  - Dimmer Curve → Linear / Square Law / Inverse Squ. / S-curve
  - Dimmer Speed → Fast / Smooth

- **Display Setting**
  - Display Inverse → No / Yes
  - Backlight Auto Off → No / Yes
  - Backlight Intensity → 1~10
  - Temperature Unit → ℃ / ℉
  - Display Warning → No / Yes

- **Fixture Test**
  - Auto Test
  - Manual Test

- **Fixture Information**
  - Fixture use time
  - Lamp On time → Exit / Reset Time
  - Fireware Version

- **Reset Functions**
  - Pan /Tilt
  - Zoom → No / Yes
  - All

- **Special Functions**
  - Fixture Maintenance → Interval / Remain Time
  - Factory Settings → No

6D

DMX Functions

Enter MENU mode, select **DMX Functions**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **DMX Address** or **View DMX Value**.

DMX Address

To select **DMX Address**, press the **ENTER** button to show the **DMX ADDRESS** on the display. Use the **UP/DOWN** button to adjust the address from **001** to **512**, press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

View DMX Value

To select **View DMX Value**, press the **ENTER** button to show the **VIEW DMX VALUE** on the display. Use the **UP/DOWN** button to view the DMX channel values. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Fixture Setting

Enter MENU mode, select **Fixture Setting**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Pan Inverse, Tile Inverse, P/T Feedback**, **BL.O. P/T Moving, White Balance, Cooling Mode**, **Dimmer Curve** or **Dimmer Speed**.

Pan Inverse

To select **Pan Inverse**, press the **ENTER** button to show the P**AN INVERSE** on the display. Use the **UP/DOWN** button to select **No** (normal) or **Yes** (pan inverse), press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

#### Tilt Inverse

To select **Tilt Inverse**, press the **ENTER** button to show the **TILT INVERSE** on the display. Use the **UP/DOWN** button to select **No** (normal) or **Yes** (tilt inverse), press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

P/T Feedback

To select **P/T Feedback**, press the **ENTER** button to show the **PAN/TILT FEEDBACK** on the display. Use the **UP/DOWN** button to select **No** (Pan or tilt's position will not feedback while out of step) or **Yes** (Feedback while pan/tilt out of step), press the **ENTER** button to setup. Press the

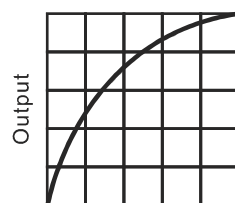**MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

BL.O. P/T Moving

To select **BL.O. P/T Moving**, press the **ENTER** button to show the **BLACKOUT WHILE PAN/TILT MOVING** on the display, use the **UP/DOWN** button to select **No** (normal while pan/tilt moving) or **Yes** (blackout while pan/tilt moving), press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

White Balance

To select **White Balance**, press the **ENTER** button to show the **WHITE BALANCE** on the display, use the **UP/DOWN** button to select **Red**, **Green** or **Blue**. Once selected, press the **ENTER** button to confirm, and use the **UP/DOWN** button to adjust the value from **125** to **255**, press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Cooling Mode

To select **Cooling Mode**, press the **ENTER** button to show the **COOLING MODE** on the display. Use the **UP/DOWN** button to select **Auto** (Normal) or **Low** (Low speed). Once selected, press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Dimmer Curve

To select **Dimmer Curve**, press the **ENTER** button to show the **DIMMER CURVE** on the display, use the **UP/DOWN** button to select **Linear**, **Square Law**, **Inverse Squ.** or **S-curve**. Once selected, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.
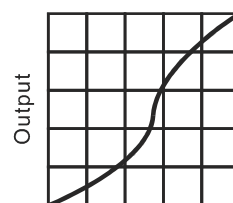
Dimmer Modes
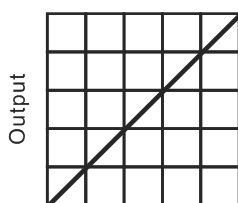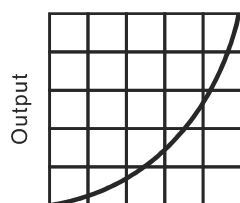
| Optically Linear | Square Law | Inverse Square Law | S-curve |

Linear: The increase in light intensity appears to be linear as DMX value is increased.

Square Law: Light intensity control is finer at low levels and coarser at high levels.

Inverse Square Law: Light intensity control is coarser at low levels and finger at high levels.

S-cure: Light intensity control is finger at low levels and high levels and coarser at medium levels.

Dimmer Speed

To select **Dimmer Speed**, press the **ENTER** button to show the **DIMMER SPEED** on the display. Use the **UP/DOWN** button to select **Fast** or **Smooth**. Once selected, press the **ENTER** button to setup. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Display Setting

Enter **MENU** mode, select **Display Setting**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Display Inverse, Backlight Auto Off, Backlight Intensity ,Temperature unit** or **Display Warning.**

Display Inverse

To select **Display Inverse**, press the **ENTER** button to show the **DISPLAY INVERSE** on the display. Use the **UP/DOWN** button to select **No** (normal) or **Yes** (display inverse). Once selected, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Backlight Auto Off

To select **Backlight Auto Off**, press the **ENTER** button to show the **BACKLIGHT AUTO OFF** on the display. Use the **UP/DOWN** button to select **No** (display always on) or **Yes** (display goes off one minute after exiting menu mode). Once selected, press the **ENTER** button to confirm and store. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Backlight Intensity

To select **Backlight Intensity**, press the **ENTER** button to show the **BACKLIGHT INTENSITY** on the display. Use the **UP/DOWN** button to adjust the intensity from **1** (dark) to **10** (bright). Once selected, press the **ENTER** button to setup and store. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Temperature Unit

To Select **Temperature Unit**, press the **ENTER** button to show the **TEMPERATURE UNIT** on the display. Use the **UP/DOWN** button to select **°C** or **°F**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Display Warning

To select **Display Warning**, press the **ENTER** button to show the **DISPLAY WARNING** on the display. Use the **UP/DOWN** button to select **No** (Normal) or **Yes** (display will show the error warning when the unit went wrong), press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle one minute to exit menu mode.

Fixture Test

Enter **MENU** mode, select **Fixture Test**, press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Auto Test** or **Manual Test**

Auto Test

To select **Auto Test**, press the **ENTER** button to show the **AUTO TEST** on the display. Press the **ENTER** button, the unit will run built-in programs to automatically test pan, tilt and zoom. Press the **MENU** button back to the last menu or exit menu mode after auto test.

Manual Test

To select **Manual Test**, press the **ENTER** button to show the **MANUAL TEST** on the display. Press the **ENTER** button, and then use the **UP/DOWN** button to select channel, and adjust the channel value. Once selected, press the **ENTER** button to setup, the fixture will run as the channel value indicates. Press the **MENU** button back to the last menu or exit menu mode let the unit idle one minute.

(All channels value will become 0 after exiting **Manual Test** menu)

Fixture Information

Enter MENU mode, select **Fixture Information**, press the ENTER button to confirm, use the UP/DOWN button to select **Fixture use time, Lamp On tme** or **Firmware Version.**

Fixture use time

To select **Fixture use time**, press the **ENTER** button to show the **FIXTURE USE TIME** on the

display. Press the **ENTER** button, the fixture working hours will show on the display. Press the **MENU** button to exit.

Lamp On time

To select **Lamp On time**, press the **ENTER** button to show the **LAMP ON TIME** on the display. Press the **ENTER** button to confirm, then use the **UP/DOWN** button to select **Exit** or **Reset Time**, press the **ENTER** button to store. Press the **MENU** button back to the last menu or exit menu mode let the unit idle one minute.

Firmware Version

To select **Firmware Version**, press the **ENTER** button to show the **FIRMWARE VERSION** on the display. Press the **ENTER** button and the fixture software version will show on the display. Press the **MENU** button to exit.

Reset Functions

Enter MENU mode, select **Reset Function**, press the ENTER button to confirm, use the **UP/DOWN** button to select **Pan/Tilt, Zoom** or **All.**

Pan/Tilt

To Select **Pan/Tilt**, press the **ENTER** button to show the **PAN/TILT** on the display. Use the **UP/DOWN** button to select **Yes** (the unit will run built-in program to reset pan and tilt to their home positions) or **No**, press the **ENTER** button to store. Press the **MENU** button to exit menu mode.

Zoom

To select **Zoom**, press the **ENTER** button to show the **ZOOM** on the display. Use the **UP/DOWN** button to select **Yes** (the unit will run built-in program to reset zoom to its home positions) or **No**, press the **ENTER** button to store. Press the **MENU** button to exit menu mode.

All

To select **All,** press the **ENTER** button to show the **ALL** on the display. Use the **UP/DOWN** button to select **Yes** (the unit will run built-in program to reset all motors to their home positions) or **No**, press **ENTER** button to store. Press **MENU** button to exit menu mode.

Special Functions

Enter MENU mode, select **Special Functions**, press the **ENTER** button to confirm, use the

UP/DOWN button to select **Fixture Maintenance** or **Factory Setting**.

Fixture Maintenance

To select **Fixture Maintenance**, press the **ENTER** button to show the **FIXTURE**

MAINTENANCE on the display. Use the UP/DOWN button to select **Interval** or **Remain Time**.

Interval

To select **Interval,** press the **ENTER** button to confirm, the interval time will be shown on the
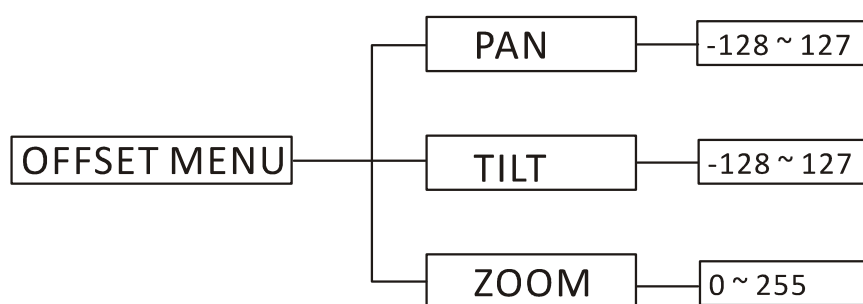
display. Press the **MENU** button to exit.

Remain Time

To select **Remain Time,** press the **ENTER** button to confirm, the remaining time will be shown

on the display. Press the **ENTER** button to confirm, use the **UP/DOWN** button to select **Exit** or

Reset time, press the **MENU** button to exit.

Factory Setting

To select **Factory Setting**, press the ENTER button to show the FACTORY SETTING on the

display. Press the **ENTER** button to confirm, use the **UP/DOWN** button to select **No** or **Yes** (the

fixture will reset to factory settings and exit menu mode).

3.3 Home Position Adjust

```
                    ┌──────────┐     ┌────────────┐
                ┌───│   PAN    │─────│ -128 ~ 127 │
                │   └──────────┘     └────────────┘
┌─────────────┐ │   ┌──────────┐     ┌────────────┐
│ OFFSET MENU │─┼───│   TILT   │─────│ -128 ~ 127 │
└─────────────┘ │   └──────────┘     └────────────┘
                │   ┌──────────┐     ┌────────────┐
                └───│   ZOOM   │─────│  0 ~ 255   │
                    └──────────┘     └────────────┘
```

In the main functions, hold the **ENTER** button for at least 3 seconds into offset mode, use the

DOWN/UP button up to select **Pan** Offset, **Tilt** Offset or **Zoom** Offset, and press the **ENTER** button

to confirm. Use the **DOWN/UP** button to adjust the home position of the Pan, Tilt or Zoom, Once

the position has been selected, press the **ENTER** button to setup, to go back to the functions

without any change press the **MENU** button again. Press and hold the **MENU** button about one

second or wait for about one minute to exit the menu mode.

4. Control By Universal DMX Controller
4.1 DMX 512 Connection
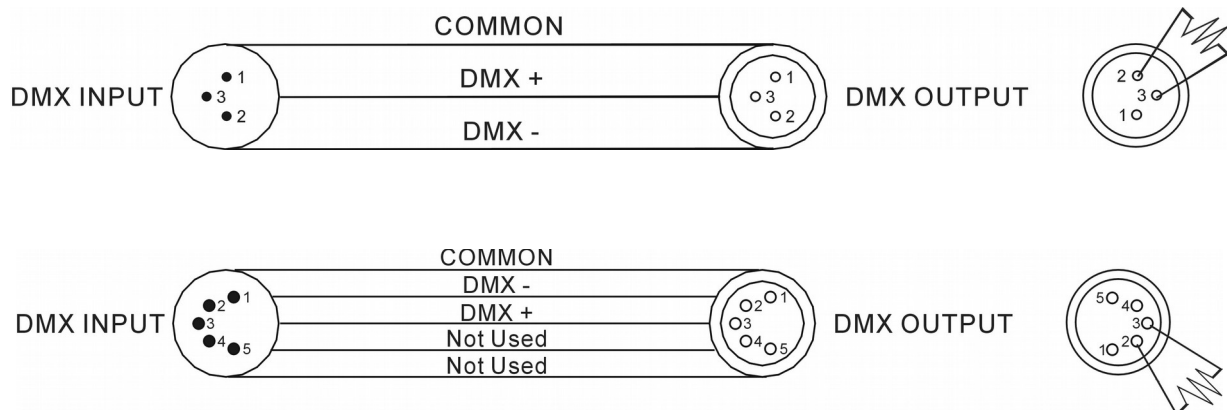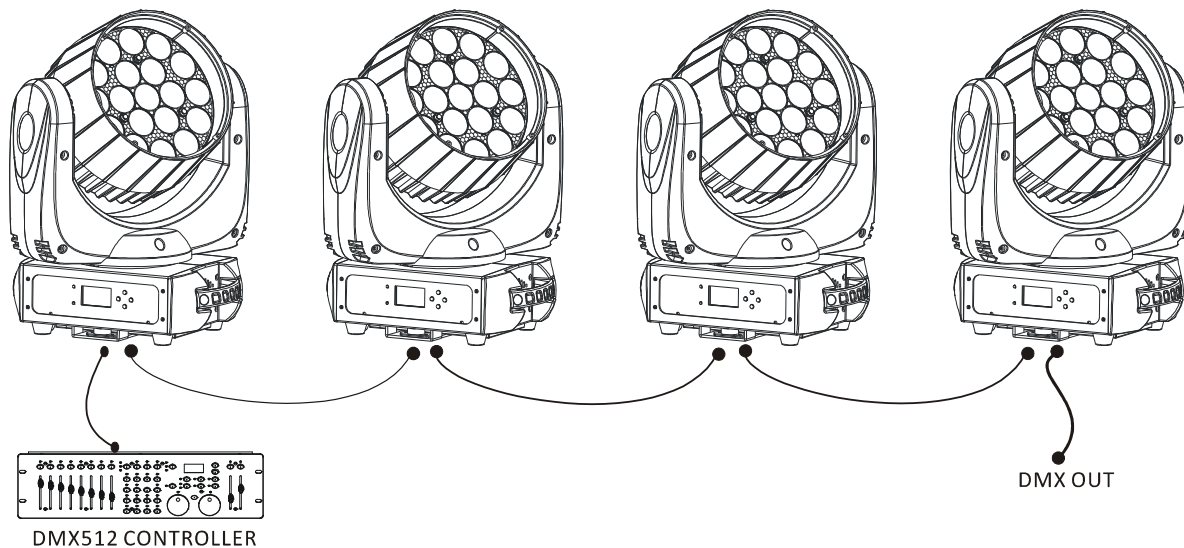
1. If you using a controller with 5 pins DMX output, you need to use a 5 to 3 pin adapter-cable.

2. At last unit, the DMX cable has to be terminated with a terminator. Solder a 120 ohm 1/4W resistor between pin 2(DMX-) and pin 3(DMX+) into a 3-pin XLR-plug and plug it in the DMX-output of the last unit.

3. Connect the unit together in a `daisy chain` by XLR plug from the output of the unit to the input of the next unit. The cable can not branched or split to a `Y` cable. DMX 512 is a very high-speed signal. Inadequate or damaged cables, soldered joints or corroded connectors can easily distort the signal and shut down the system.

4. The DMX output and input connectors are pass-through to maintain the DMX circuit, when

one of the units' power is disconnected.

5. Each lighting unit needs to have an address set to receive the data sent by the controller. The address number is between 0-511 (usually 0 & 1 are equal to 1).

6. The end of the DMX 512 system should be terminated to reduce signal errors.

7. 3 pin XLR connectors are more popular than 5 pin XLR.

   3 pin XLR: Pin 1: GND, Pin 2: Negative signal (-), Pin 3: Positive signal (+)

   5 pin XLR: Pin 1: GND, Pin 2: Negative signal (-), Pin 3: Positive signal (+), Pin 4/Pin 5: Not used.

4.2 Address Setting

If you use a universal DMX controller to control the units, you have to set DMX address from 1 to 512 so that the units can receive DMX signal.

Press **MENU** button to enter menu mode, select *DMX Functions*, press the **ENTER** button to confirm, use the **UP**/**DOWN** button to select *DMX Address*, press the **ENTER** button to confirm, the present address will blink on the display, use the **UP**/**DOWN** button to adjust the address from 001 to 512, and press the **ENTER** button to store. Press the **MENU** button back to the last menu or let the unit idle 7 seconds to exit menu mode.

Please refer to the following diagram to address your DMX512 channel for the first 4 units：

Channel mode	Unit 1 Address	Unit 2 Address	Unit 3 Address	Unit 4 Address
14 channels	1	15	29	43

4.3 DMX 512 Configuration

14 channels mode:

14 Channels Mode

Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8
Pan	Pan Fine	Tilt	Tilt Fine	P/T Speed	Reset	Dimmer	Shutter
255 — 540° 0 — 0°	255 0	255 — 220° 0 — 0°	255 0	255 — Slow 0 — Fast	015-255 No Function 010-014 Reset All 000-009 No Function	255 — 100% 0 — 0%	245-255 open 230-244 burst 225-229 open 210-224 sine wave 205-209 open 190-204 random burst pulse 185-189 open 170-184 burst pulse 165-169 open 150-164 random closing pulse 145-149 open 130-144 random opening pulse 125-129 open 110-124 random strobe 105-109 open 090-104 closing pulse 085-089 open 070-084 opening pulse 065-069 open 025-064 strobe 1 020-024 open 000-019 closed

Ch 9	Ch 10	Ch 11	Ch 12	Ch 13	Ch 14
Red	Green	Blue	White	Color Macro	Zoom
255 — 100% 0 — 0%	255 — 100% 0 — 0%	255 — 100% 0 — 0%	255 — 100% 0 — 0%	250-255 Open 245-249 Slow 240-244 Medium 235-239 Fast (Random Color) 230-234 Open 208-229 Counter-clockwise, slow to fast 202-207 Stop 180-201 Clockwise, fast to slow (Color wheel rotation effect) 175-179 Open 170-174 LEE164 - Flame Red 165-169 LEE135 - Deep Gold Amber 160-164 LEE778 - Millennium Gold 155-159 LEE021 - Gold Amber 150-154 LEE105 - Orange 145-149 LEE179 - Chrome Orange 140-144 LEE104 - Deep Amber 135-139 LEE100 - Spring Yellow 130-134 LEE088 - Lime Green 125-129 LEE738 - JAS Green 120-124 LEE122 - Fern Green 115-119 LEE089 - Moss Green 110-114 LEE139 - Primary Green 105-109 LEE124 - Dark Green 100-104 LEE116 - Medium Blue Green 095-099 LEE118 - Light Blue 090-094 LEE353 - Lighter Blue 085-089 LEE117 - Steel Blue 080-084 LEE202 - Half CT Blue 075-079 LEE201 - Full CT Blue 070-074 LEE161 - State Blue 065-069 LEE200 - Double CT Blue 060-064 LEE132 - Medium Blue 055-059 LEE079 - Just Blue 050-054 LEE120 - Deep Blue 045-049 LEE071 - Tokyo Blue 040-044 LEE181 - Congo Blue 035-039 LEE194 - Surprise pink 030-034 LEE345 - Fuchsia pink 025-029 LEE328 - Follies pink 020-024 LEE332 - Special rose pink 015-019 LEE157 - Pink 010-014 LEE790 - Moroccan pink 000-009 Open	255 — 10° 0 — 60°

5. Troubleshooting

Following are a few common problems that may occur during operation. Here are some

 suggestions for easy troubleshooting:

A. The unit does not work, no light and the fan does not work

1.	Check the connection of power and main fuse.

2.	Measure the mains voltage on the main connector.

3.	 Check the power on LED.

B. Not responding to DMX controller

1.	 DMX LED should be on. If not, check DMX connectors, cables to see if link properly.

2.	If the DMX LED is on and no response to the channel, check the address settings and DMX

	polarity.

3.	 If you have intermittent DMX signal problems, check the pins on connectors or on PCB of

	the unit or the previous one.

4.	 Try to use another DMX controller.

5.	 Check if the DMX cables run near or run alongside to high voltage cables that may cause

	damage or interference to DMX interface circuit.

C. One of the channels is not working well

1.	 The stepper motor might be damaged or the cable connected to the PCB is broken.

2.	 The motor's drive IC on the PCB might be out of condition.

6. Fixture Cleaning

The cleaning must be carried out periodically to optimize light output. Cleaning frequency

 depends on the environment in which the fixture operates: damp, smoky or particularly dirty

 surrounding can cause greater accumulation of dirt on the unit's optics.

•

 Clean with soft cloth using normal glass cleaning fluid.

•

 Always dry the parts carefully.

•

Clean the external optics at least every 30 days.