2021

INSTALLATION & OPERATION MANUAL

OceanDMX RC

Preface

READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL

WARNINGS

Before installing your DMX Controller, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in property damage, severe injury or even death.

Before installing your DMX Controller, check local laws for restrictions regarding the use of coloured lights in your area.

Salt is an inherently corrosive material. Natural and man-made surfaces are susceptible to corrosion and deterioration when used in and around salt water. Some combinations of plastic and polymer products are impervious to saltwater corrosion, however, screws and fasteners used for the installation must be of a marine grade type stainless steel or equivalent and monitored annually to ensure the controller remains in service for years to come.

Never Use Solvents! Cleaners, fuel, and other products that may contain strong solvents, such as acetone, that attack many plastics greatly reducing their strength and can cause irreversible damage.

Units are not waterproof. You must mount in a dry location. When installing, be sure that the controller fits the area and secures to the mounting location using the appropriate hardware before installing.

DANGER
RISK OF ELECTRIC SHOCK OR ELECTROCUTION

This unit must be installed by a licensed or certified electrician in accordance with all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to installers, or others due to electrical shock, and may also cause damage to property. Always disconnect the power to the system at the circuit breaker before servicing the light. Failure to do so could result in death or serious injury to serviceman, or others due to electrical shock.

Contents

PRE-TEST

Always test the system prior to installation. Failure to do this may result in additional installation time and could invalidate the warranty.

IMPORTANT NOTICE

Attention Installer: This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/ or operator of this equipment.

WARRANTY COVERAGE

Please refer to www.oceanled.com/downloads for full warranty statement.

1 Overview

Description:

The OceanDMX RC allows the user to remotely control the colour or dual colour LED lighting system installed on the vessel via the DMX protocol (the lighting system must be DMX compatible). It consists of two main components: Remote with the waterproof pouch and DMX RF Receiver/ Controller.
The remote connects with the receiver using radio frequency, then the receiver converts RF from the remote controller to a DMX protocol. The DMX controller requires a 12v or 24v DC supply. LED lighting product/s should then be connected to the output on the DMX Decoder, thus enabling DMX control via the RF Transmitter.

Key Features:

- User-friendly interface, easy and simple operation
- Control up to 4 zones*
- Control of third-party DMX devices*
- 3 programmable scenes
- Can be controlled by maximum of 8 different remotes
- Pre-set 10 changing modes, with pause function (Colours only)
- Enable to dim brightness of each R, G, B, W channel (B & W channels for dual colour version), in order to mix colours.

***** See **Section 4 – Zone Control (Advanced Use)** for more information.

OceanDMX RC Contains*:

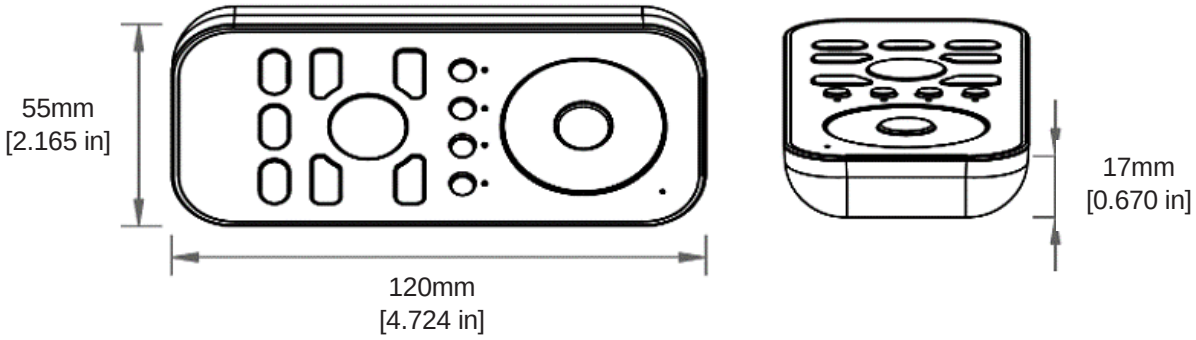
- Colours (EU/US) or Dual Colour (EU/US) Remote (depending on application/ area of the world)
- Turn and lock waterproof pouch for the remote
- DMX Receiver (supplied with 4 mounting screws)

* Additional components may vary depending on which kit has been purchased.

Remote Specifications:

Technical info	Remote
Operation Voltage	4.5v DC (3x AAA batteries – not included)
Operation Frequency	869.5 MHz or 916.5 MHz (depending on model)
Remarks	RF Signal
Operating Temp	-20°C to 40°C
Waterproof grade	IP20 Non-Waterproof (with waterproof bag IP66)
Physical Specifications	
Dimensions:	55mm x 120mm x 17mm
Weight:	50g (without batteries)

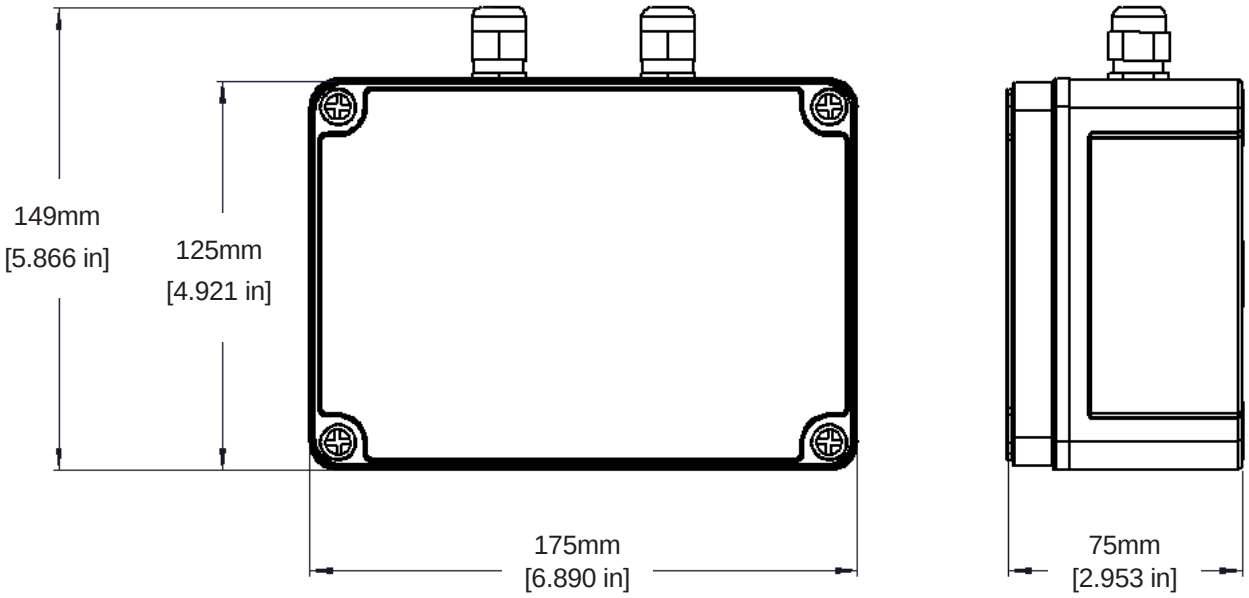
Remote Dimensional Drawing:



DMX Receiver Specifications:

Technical info	DMX RF Receiver
Operation Voltage	12/24v DC (9-32v DC)
Nominal Current	200mA (Max)
Connections	Power In, DMX Out (DMX512 signal)
Input / Output cable glands	IP68 (2x M16)
Operating Temp	-20°C to +50°C
Operation Frequency	869.5 MHz or 916.5 MHz (depending on model)
Wireless Range	Up to 20 meters (depending on installation location)
Physical Specifications	
Dimensions:	175mm x 125mm x 75mm
Enclosure:	IP66 ABS
Weight:	424 g

DMX Receiver Dimensional Drawing:



Units are not waterproof. You must mount in a dry location. When installing, be sure that the controller fits the area and secures to the mounting location using the appropriate hardware before installing.

2 Installation

To understand the system connections / layout required for the install please refer to the relevant installation sections later in this chapter. These are either sections 2.5, 2.6 or 2.7, depending on the kit purchased. Then follow the sections below to install the applicable units.

2.1 FINDING THE MOUNTING LOCATION

When choosing a mounting location for the DMX Controller the following recommendations need to be followed:

1. The unit should be mounted as high as possible in the vessel, and away from metal objects to ensure good radio reception. Avoid areas surrounded by metallic insulation or coverings as this may interfere or restrict the radio signals.

2. Consider the wiring routing / connections:
    - The distance to the 12 / 24 V DC power source and suitable cable gauge (please refer to section **5 Appendix** for cable gauge chart)
    - Space for the routing of the DMX cable to the drivers/ lights

3. Select flat surface in a dry location away from sources of heat, ensure the unit will not be exposed to moisture. Ensure that the ambient temperature where the unit is mounted cannot exceed 50°C - Note that engine compartments can easily exceed this.

2.2 ADDITIONAL TOOLS AND MATERIALS REQUIRED

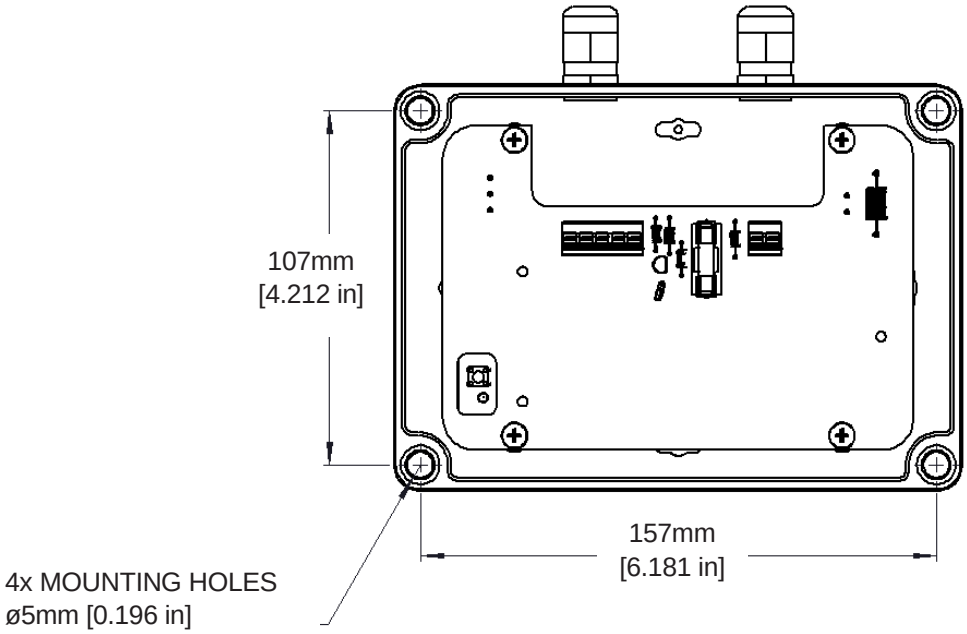
- Drill & Drill Bits.
- Screwdriver, Phillips #2
- Wire Strippers.
- Tape measure and Ruler or Straight Edge.
- Marking Utensil (e.g., Pencil, Sharpie Magic Marker)
- Power switch with correct current rating for system
- Power relay with correct current rating (recommended for most installations – see below)
- Fuse/holder to protect DMX receiver power wiring (500mA recommended).

2.3 DMX RECEIVER INSTALLATION

Once a suitable location has been found, use the following steps to mount the unit:

1. Unscrew the 4 case screws on the box and remove the lid.

2. The mounting holes for the unit are located inside the box, near to each corner - see diagram below.



3. The mounting screws that are provided should be suitable for most surfaces (such as wood / fibreglass). Mark out the required mounting hole centres and drill pilot holes as required – being careful to check for obstructions such as cables / pipes behind the area being drilled.

4. Screw the unit to the surface using the screws provided.

Never use power tools. Hand tighten only!

2.4 ELECTRICAL CONNECTIONS

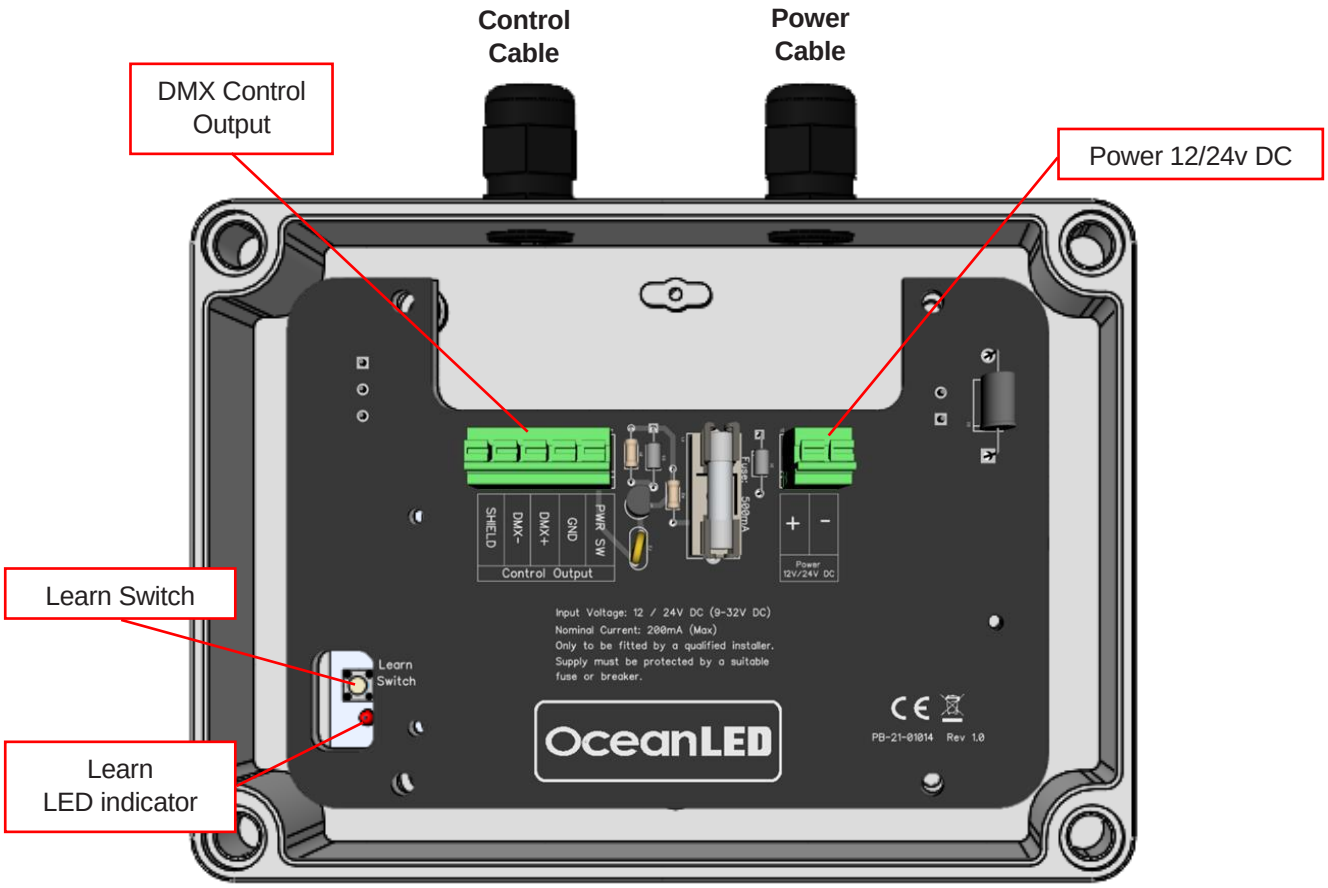


Figure 1: DMX Receiver Overview

	FUNCTION	DESCRIPTION
POWER	+12V DC	POWER +VE
	-12V DC	POWER -VE
CONTROL OUTPUT	SHIELD	CABLE SHIELD/ SCREEN IF AVAILABLE
	DMX -	DMX SIGNAL -VE
	DMX +	DMX SIGNAL +VE
	GND	DMX GROUND
	PWR SW	POWER SWITCH (ONLY X-SERIES)

Table 1: DMX Receiver Connections

1. Loosen the cable glands caps and feed the DMX control cable and power cable through the corresponding cable glands.

2. Connect the bare ends of the 12v/24v DC power wires to the ‘Power’ green push-in terminals, then connect the bare ends of DMX control cable wires to the ‘Control Output’ green push-in terminals. Follow the table below for the different kits as supplied.

DMX CONTROLLER CONTROL OUTPUT	EXPLORE E6 & E7 (4 CORES ORANGE)	PRO SERIES (CAT 5)	X- SERIES (4 CORES ORANGE)
SHIELD	SHIELD	-	SHIELD
DMX -	BROWN	ORANGE	BROWN
DMX +	YELLOW	ORANGE/WHITE	YELLOW
GND	BLACK	BROWN & BROWN/WHITE (TWO WIRES)	BLACK
PWR SW	-	-	RED
	RED (UNUSED, DO NOT CONNECT)		
DMX CONTROLLER POWER	ALL CONFIGURATIONS		
POWER DC +	RED		
POWER DC -	BLACK		

Table 2: DMX Receiver wiring

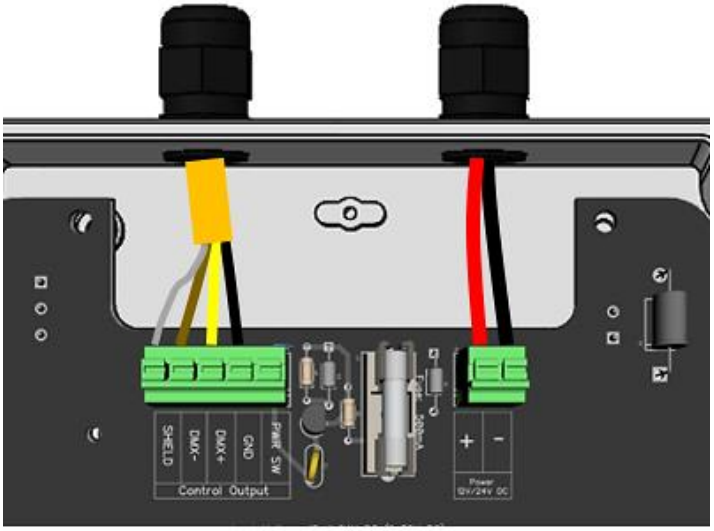


Figure 2: Explore E6 & E7 Receiver wiring
(Note: red wire in control cable is not connected)

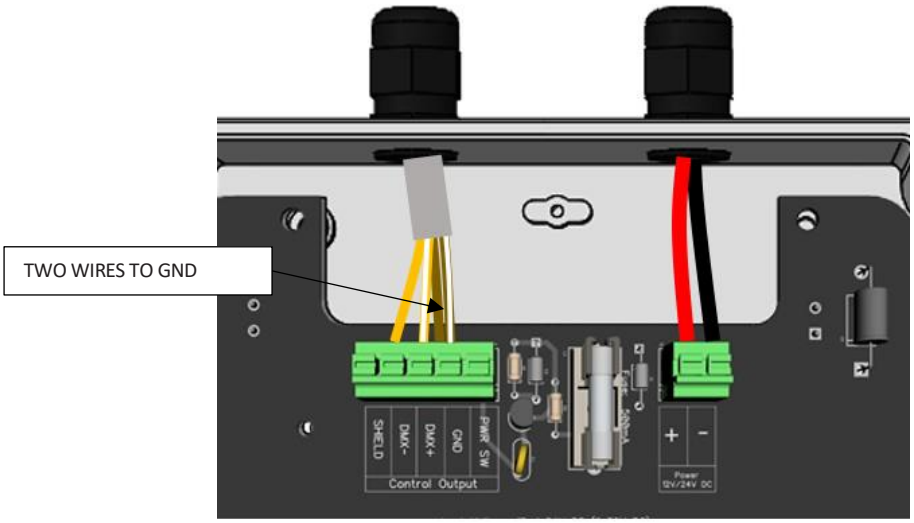


Figure 3: Pro Series Receiver wiring

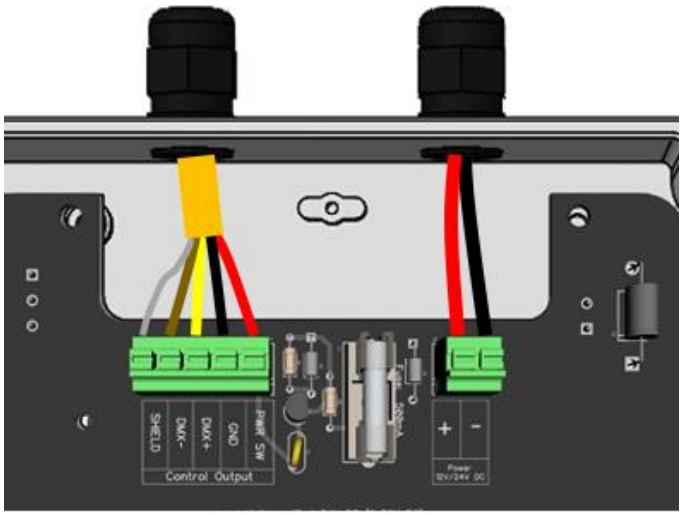


Figure 4: X-Series Receiver wiring

3. Tighten both cable glands.
4. Close the lid of the DMX Receiver box and secure it using the four screws provided.

Note: Please double check all wire connections are secure and correct before closing the box.

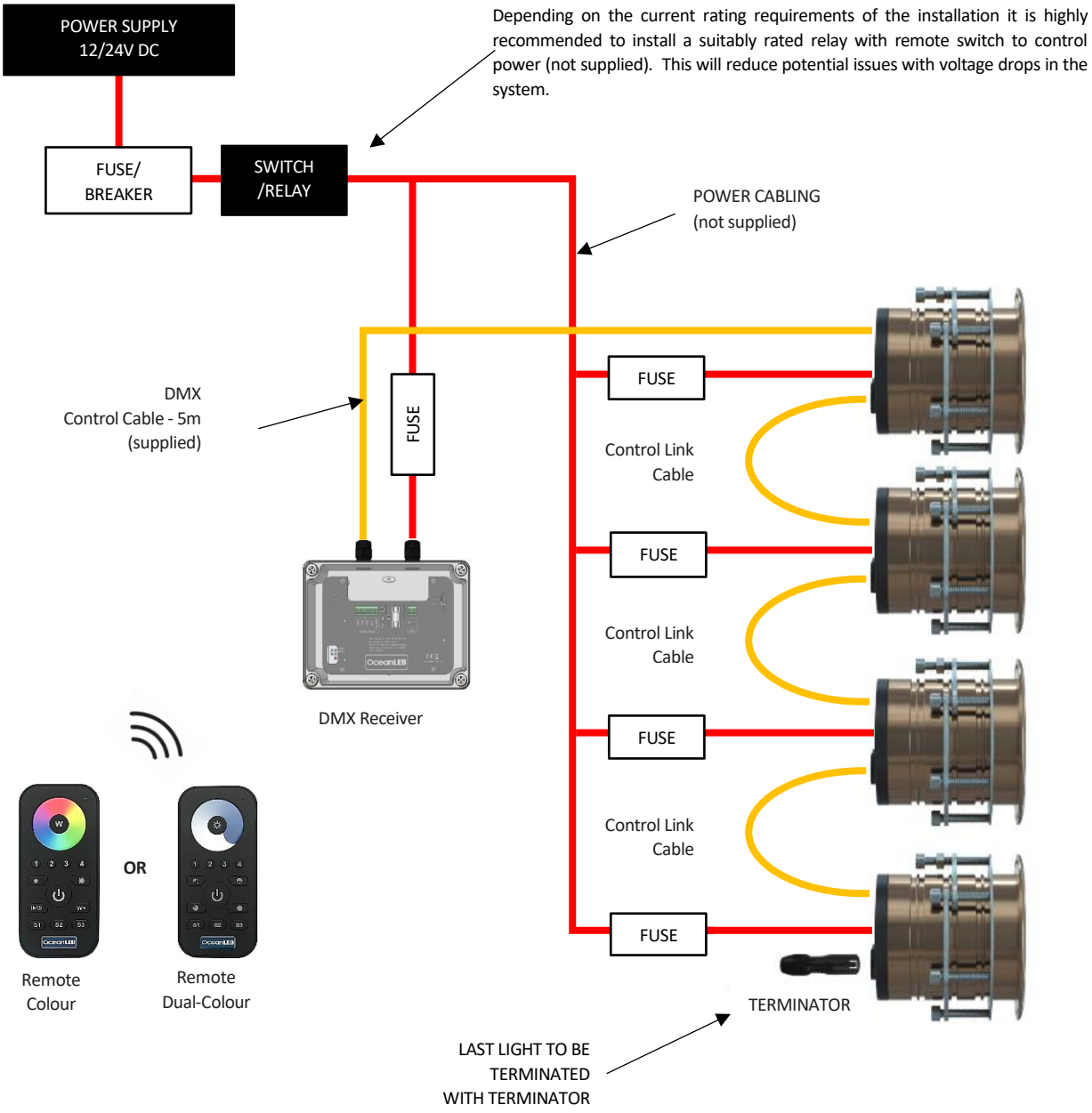
Never use power tools. Hand tighten only!

2.5 INSTALLATION E6/E7

The DMX standard recommends a maximum of 32 devices to be connected in one chain. If installation requires more lights than this, please contact OceanLED for advice.

1. Connect the DMX control cable to the control input of the first Explore E6/7 light. Then connect a control link cable to the next, and so on up to the last light in the chain.
   The power supply to the DMX Receiver should be fused with 500mA inline fuse (not supplied).

2. Fit the supplied terminator to the output of the last E6/7 light. See the following example of the connections:

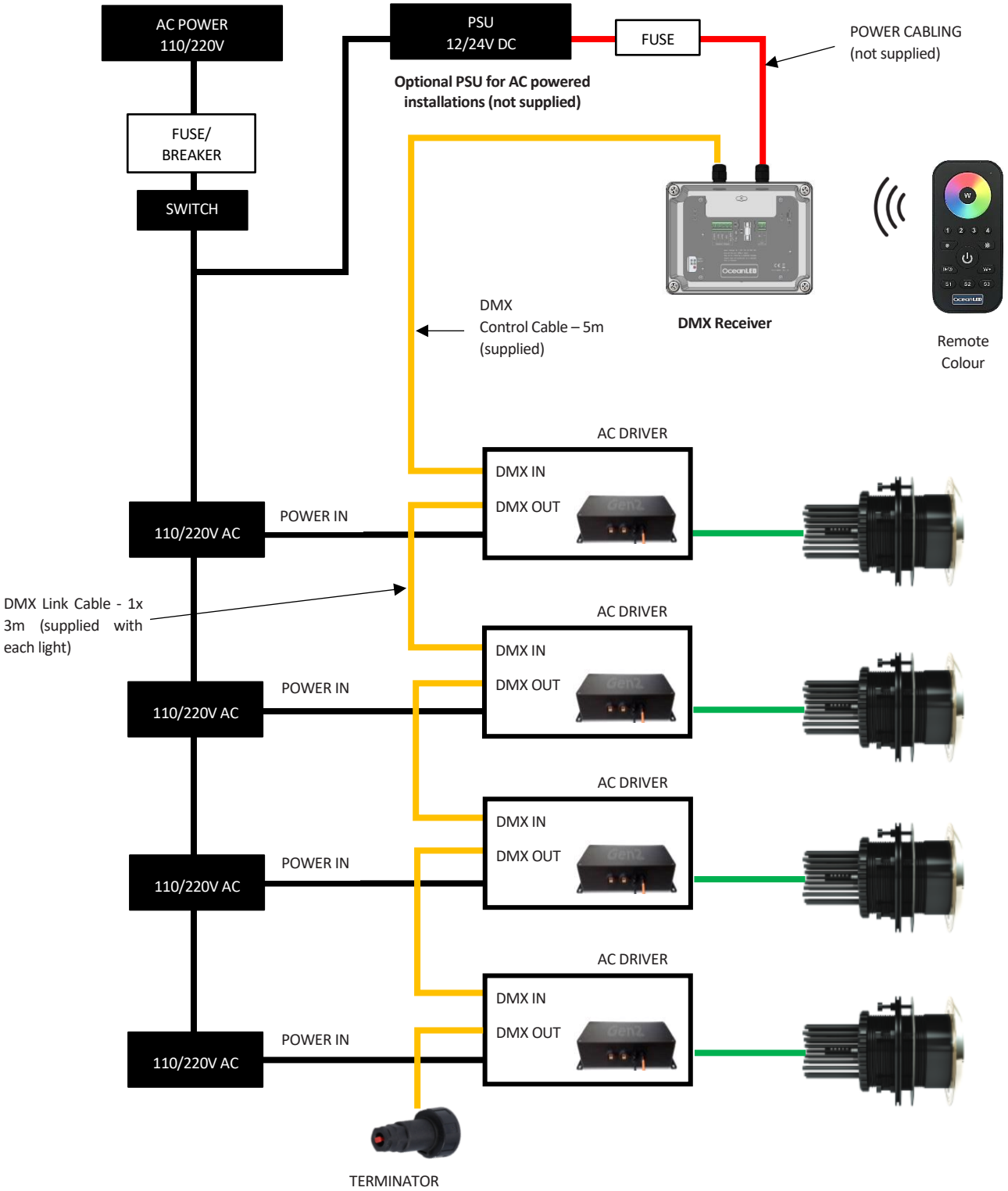


2.6 INSTALLATION – PRO-SERIES

The DMX standard recommends a maximum of 32 devices to be connected in one chain. If installation requires more lights than this, please contact OceanLED for advice.

1. Connect the DMX control cable to the DMX input of the first driver box. The DMX output of this box should be connected to the input of the next, and so on up to the last driver in the chain.
   The power supply to the DMX Receiver should be fused with 500mA inline fuse (not supplied).

2. Fit the supplied terminator to the output of the last driver box. See the following example of the connections:

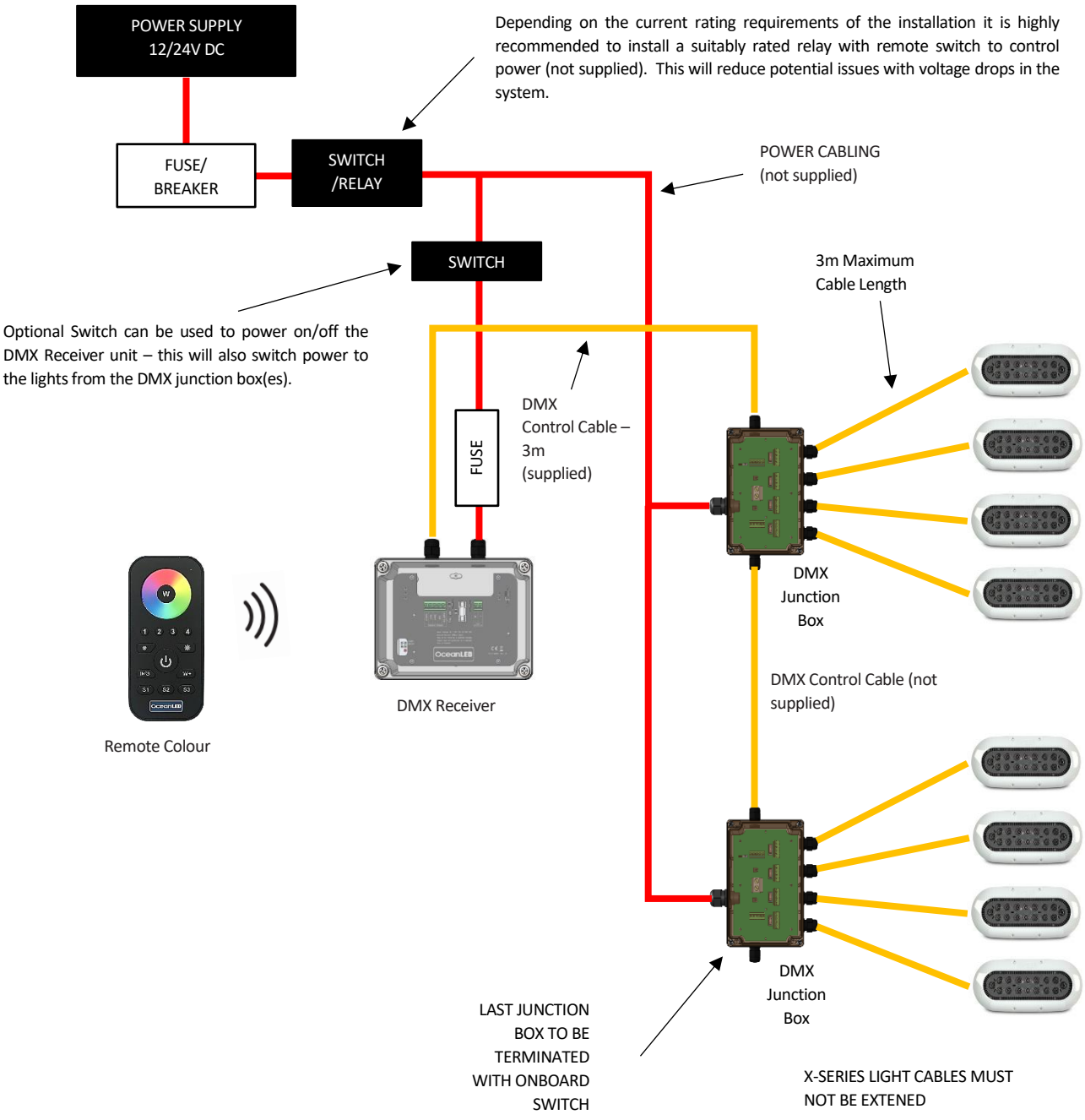


2.7 INSTALLATION – X-SERIES DMX COLOURS

The DMX standard recommends a maximum of 32 devices to be connected in one chain. If installation requires more lights than this, please contact OceanLED for advice.
For the X-Series installation do not extend the 3m cable length to the DMX junction box, for longer connection use of additional DMX junction boxes will be required.

1. Connect the DMX control cable to the DMX input of the first DMX junction box. The DMX output of this box should be connected to the input of the next, and so on up to the last junction box in the chain.
   The power supply to the DMX Receiver should be fused with 500mA inline fuse (not supplied).

2. Switch on the terminator in the last DMX Junction Box.



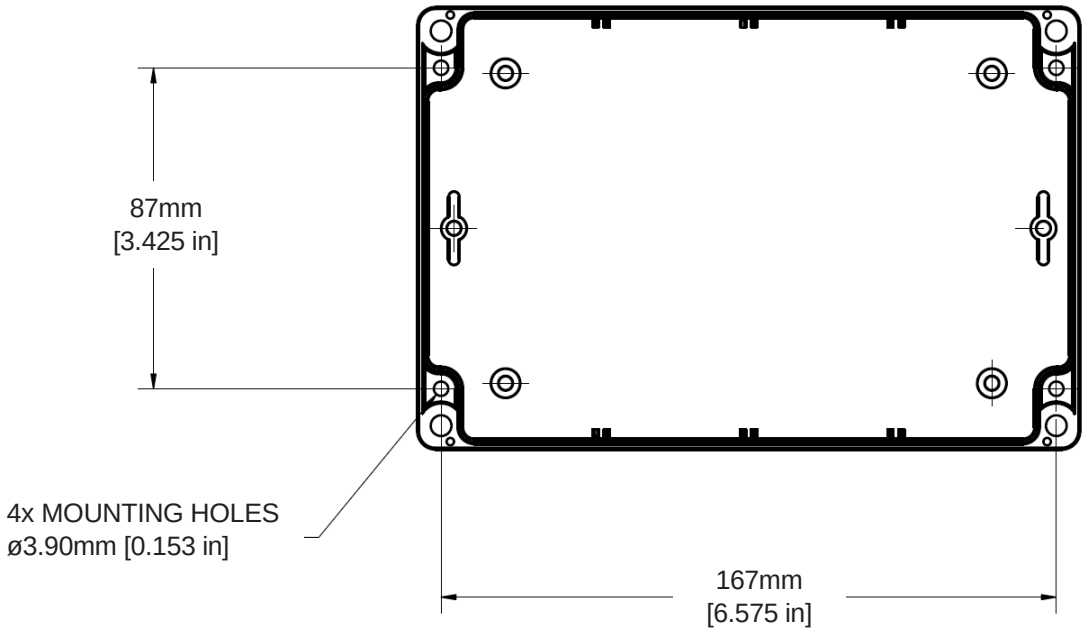
2.7.1 DMX JUNCTION BOX INSTALLATION - X-SERIES

Mounting the DMX Junction Box

Once a suitable location has been found, use the following steps to mount the unit:

1. Unscrew the 4 case screws on the box and remove the lid.

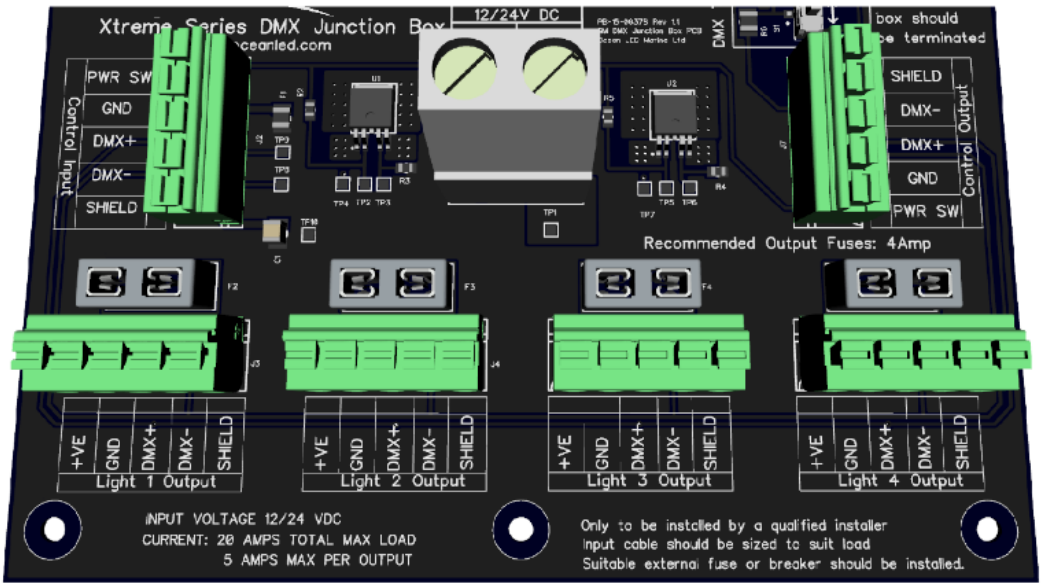
2. The mounting holes for the unit are located inside the box, near to each corner - see diagram below.



3. Mark out the required mounting hole centres and drill pilot holes as required – being careful to check for obstructions such as cables / pipes behind the area being drilled.

4. Screw the unit to the surface using the screws provided.

DMX Junction Box Connections

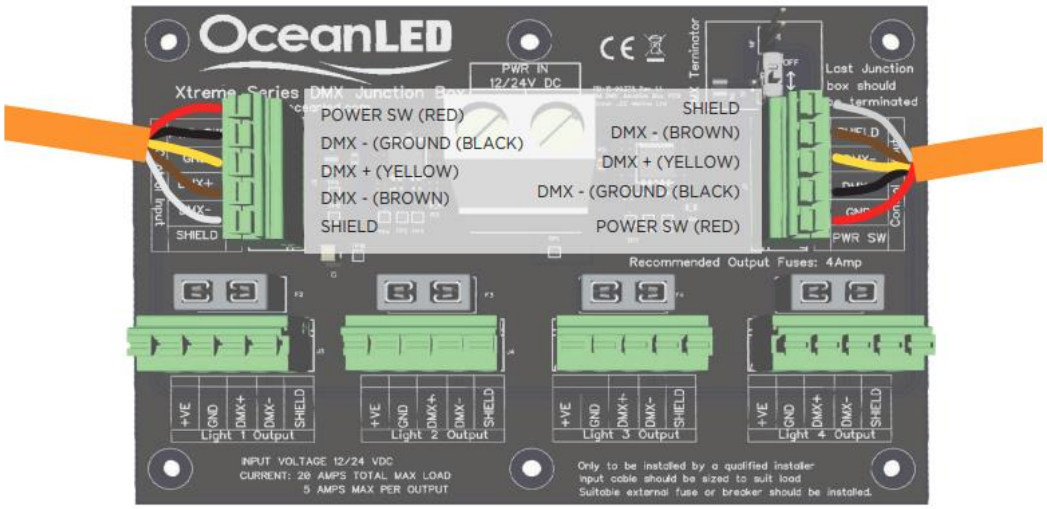


NAME		FUNCTION	CONNECTION
PWR IN	+	DC POWER +VE	CONNECT TO A FUSED +12/+24 VDC FROM FUSE PANEL / BATTERY
	-	DC POWER -VE	CONNECT TO BATTERY GND RETURN
CONTROL INPUT / OUTPUT	PWR SW	POWER SWITCH	CONNECT TO DMX POWER (RED)
	GND	DMX GND	CONNECT TO DMX GND (BLACK)
	DMX+	DMX CONTROL SIGNAL +VE	CONNECT TO DMX+ (YELLOW)
	DMX-	DMX CONTROL SIGNAL -VE	CONNECT TO DMX- (BROWN)
	SHIELD	CABLE SHIELD CONNECTION	CONNECT TO CABLE SHIELD / SCREEN IF AVAILABLE
LIGHT 'X' OUTPUT ('X' CAN RANGE FROM 1- 4)	+VE	LIGHT 'X' +VE	CONNECT TO LIGHT +VE (RED)
	GND	LIGHT 'X' -VE	CONNECT TO LIGHT -VE (BLACK)
	DMX+	DMX CONTROL SIGNAL +VE	CONNECT TO LIGHT DMX+ (YELLOW)
	DMX-	DMX CONTROL SIGNAL -VE	CONNECT TO LIGHT DMX- (BROWN)
	SHIELD	CABLE SHIELD CONNECTION	CONNECT TO LIGHT CABLE SHIELD / SCREEN IF AVAILABLE
DMX TERMINATOR (SEE FIGURE 5 FOR DETAILS)	ON	DMX TERMINATION ON	SWITCH ON TO TERMINATE DMX SIGNAL (LAST JUNCTION BOX IN CHAIN)
	OFF	DMX TERMINATION OFF	SWITCH OFF TO CONTINUE DAISYCHAINING OTHER JUNCTION BOXES

Table 2: DMX Junction Box wiring

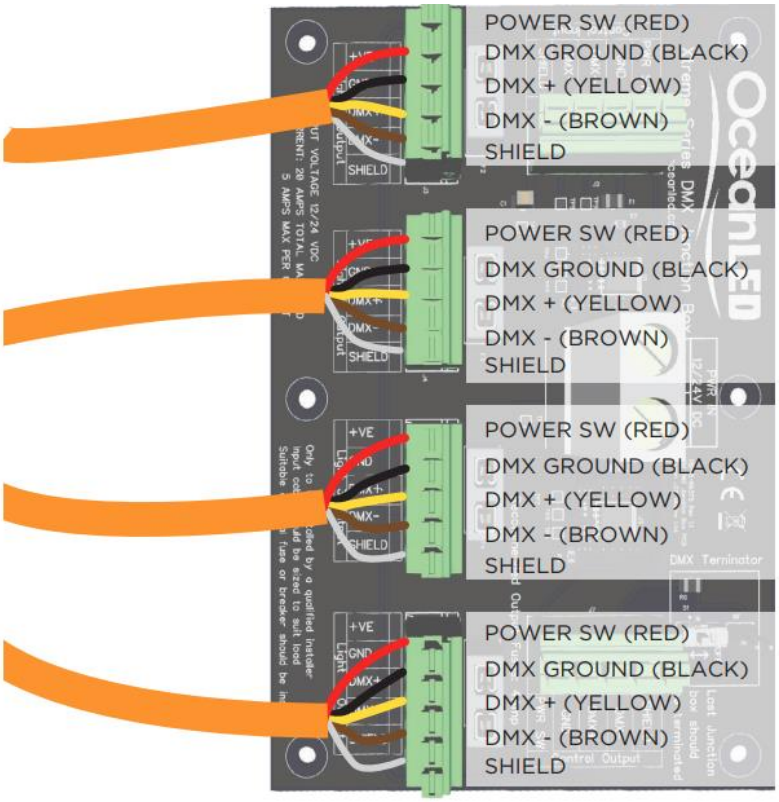
X-Series light cables must not be extended. Additional DMX junction boxes can be added if the lights are positioned too far from each other beyond cable length

1. Loosen the cable glands and feed through the DMX cable from the DMX Receiver and the DMX cable to next junction box (optional) and connect as follows:



2. Tighten the cable glands.

3. Loosen the cable glands and feed the light cable ends through and connect as follows:



4. Tighten the cable glands

5. Repeat steps 1-4 for each DMX Junction Box in the system, connecting in a ‘daisy chain’ fashion.

6. Turn on the terminator switch in the last DMX Junction Box in the chain (the other junction boxes if fitted should have the switch turned off).

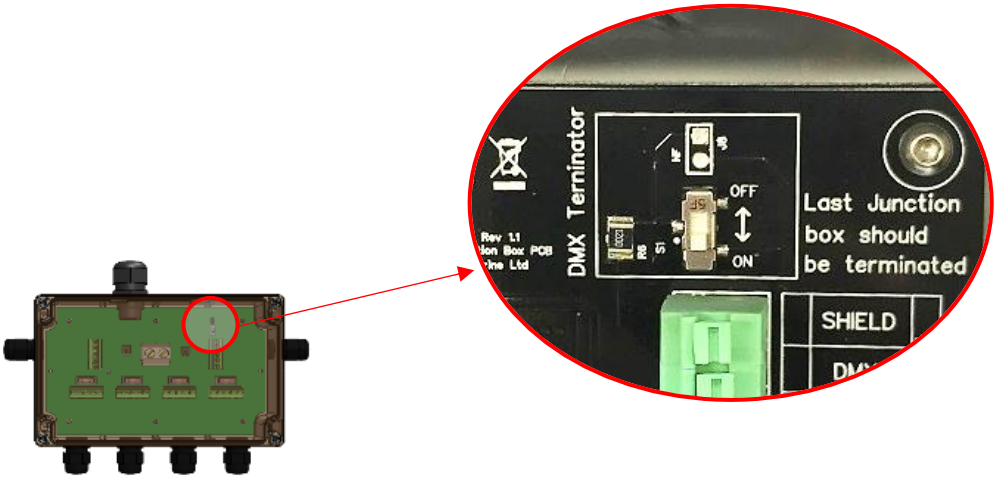


Figure 5: DMX Terminator switch

7. Connect DC power. See below table for supply requirements

The DMX junction box(s) require a 12 / 24v DC supply. DO NOT CONNECT TO MAINS AC! The power requirements vary depending on the type and number of X8 / X16 Colours lights connected to the junction box.

The tables below show the nominal maximum current draw for each junction box depending on the number of connected lights (ensure the correct table is used depending on the supply voltage). For example, the supply current to a junction box with three X16's and one X8 connected would be 11.6 Amps with a 12V DC supply.

NUMBER OF X8'S	12V DC SUPPLY					24V DC SUPPLY				
	NUMBER OF X16'S					NUMBER OF X16'S				
	0	1	2	3	4	0	1	2	3	4
0	N/A	3.3 A	6.6 A	9.9 A	13.2 A	N/A	1.6 A	3.2 A	4.8 A	6.4 A
1	1.7 A	5.0 A	8.3 A	11.6 A	N/A	0.8 A	2.4 A	4.0 A	5.6 A	N/A
2	3.4 A	6.7 A	10.0 A	N/A	N/A	1.6 A	3.2 A	4.8 A	N/A	N/A
3	5.1 A	8.4 A	N/A	N/A	N/A	2.4 A	4.0 A	N/A	N/A	N/A
4	6.8 A	N/A	N/A	N/A	N/A	3.2 A	N/A	N/A	N/A	N/A

The required supply cable gauge will depend on the current draw (from the tables above) and the length of the cable run from the fuse / breaker panel and system switch to the junction box. Please use the cable gauge table in the appendix for the required cable conductor size per junction box. If in doubt always select the next larger conductor size up (i.e., the next lower AWG number).

The supply cable must be protected by a suitable fuse or breaker.

3 Operation

3.1 POWERING ON THE SYSTEM

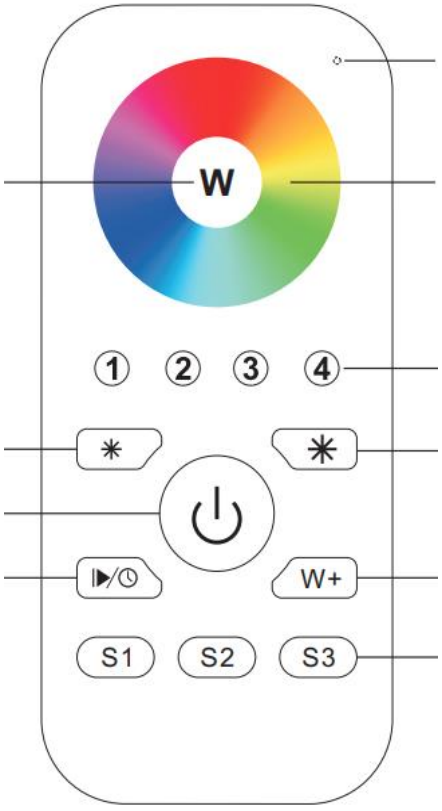
- Before powering up the system, ensure the necessary connections are made and suitable fuses are installed
- Power on the system
- Use remote to control the lighting system (follow the instructions in the paragraph **3.3** for the remote functions)

3.2 GENERAL OPERATION

When not in use to save power, the system should be turned off (lights and receiver unit), via the system power switch.

It is recommended to turn the lights on and off via the system power switch (rather than the remote). Then after power is restored, the lights will return to their previous colour setting.

3.3 COLOUR REMOTE FUNCTIONS



White channel: the 4th channel Click to turn on/off. Press and hold down to increase/decrease light intensity of W (white) channel

Indicator: shows the active state of the remote control

Touch colour wheel

Zone number: Click to choose the zone/zones. (Lights as default will always be on zone 1)

Press and hold down to decrease light intensity of RGB channels

Press and hold down to increase light intensity of RGB channels

Click to turn ON/OFF all zones

Click to play / pause the 10 built-in effects, Press and hold down to speed up/down the running effect.
The effects are run in cycle, so each time play / pause is selected it goes to next effect.

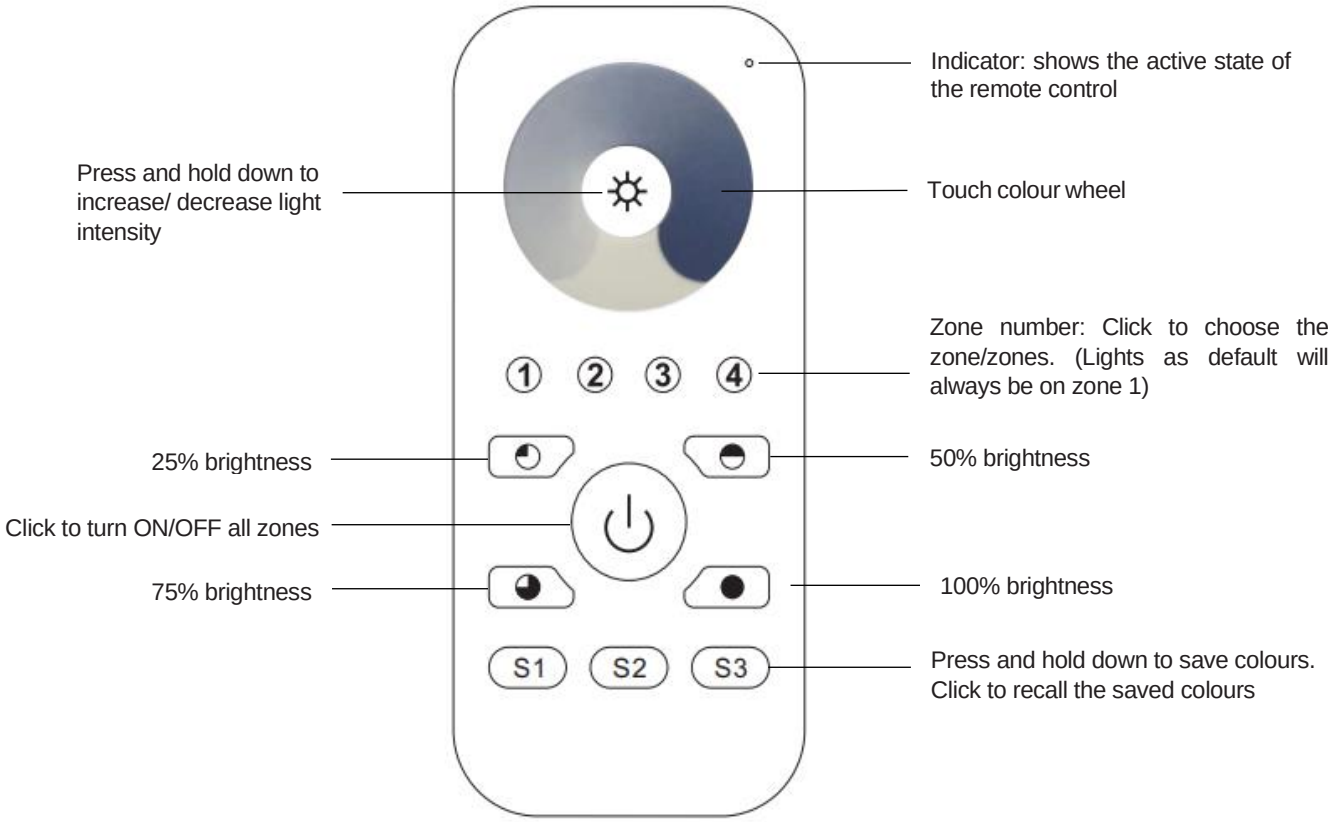
Click to switch Cool White, Neutral White, Warm White mixed by RGB, double click to toggle RGB channels on/off.

Press and hold down to save colours.
Click to recall the saved colours

To enable the white channel only, ensure the white channel is on (by clicking the 'W' button in the centre of the colour wheel – the hue of the lights should change to a more pastel shade) and then double click the W+ button to toggle off the RGB channels (this may sometimes need to be double clicked twice).

DO NOT expose the device to moisture; please use provided waterproof pouch.

3.4 DUAL-COLOUR REMOTE FUNCTIONS



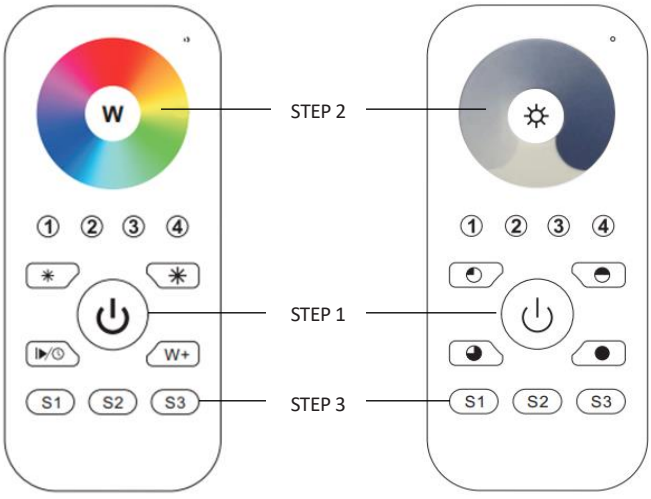
DO NOT expose the device to moisture; please use provided waterproof pouch.

3.5 SAVE COLOUR / SCENE / MODE

STEP 1: Click **ON/OFF** button to activate the remote.

STEP 2: Touch the colour wheel or click the other buttons to select the scene you like.

STEP 3: Press and hold any scene buttons of **S1-S3** (e.g., **S3**), LED lights connected with the DMX Receiver flash off then on once. This means the colour/scene was saved successfully.

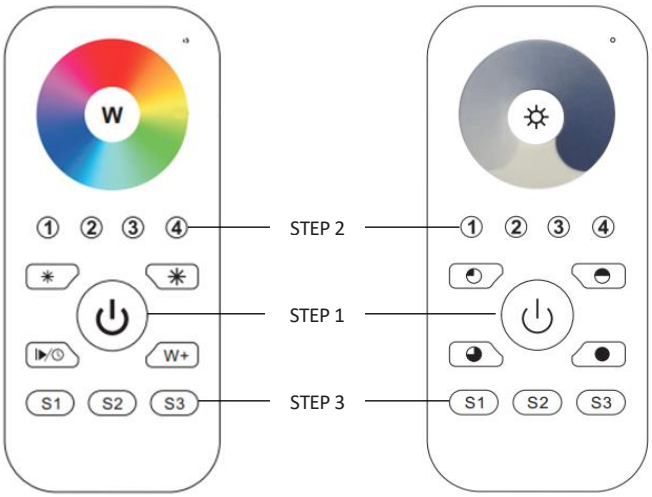


3.6 RECALL THE SAVED COLOURS / SCENES

STEP 1: Click **ON/OFF** button to activate the remote.

STEP 2: (Optional) Choose and click one or multiple paired zone numbers (Lights as default will always be on zone 1).

STEP 3: Click any scene buttons of **S1-S3** (e.g. **S3**) to recall the saved scene.

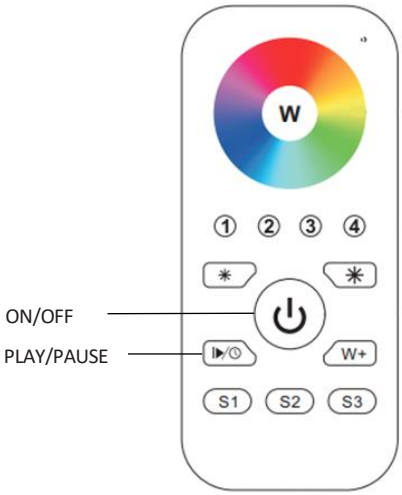


3.7 BUILT IN CYCLE MODES (COLOURS ONLY)

Activate the remote with ON/OFF button; Click the play button on the remote to play the 10 built-in effects; Press and hold down to speed up/down the running effect, click play/ pause to cycle trough the modes.

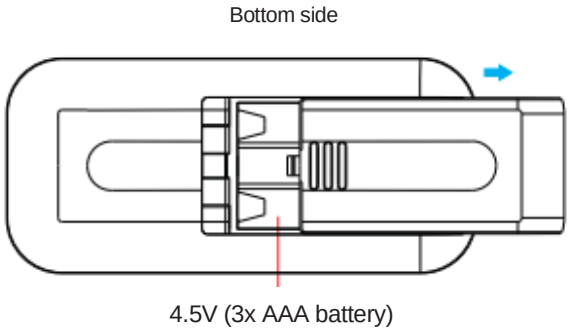
BUILT-IN 10 COLOUR CHANGING MODES	
Mode 1:	Any two colours of RGB mix fade-in & fade-out
Mode 2:	RGB three colours mix fade-in & fade-out
Mode 3:	RGB three colours mix fade-out & fade-in
Mode 4:	RGB flash
Mode 5:	RGB three colours fade-in & fade-out successively
Mode 6:	RGB three colours fade-in successively
Mode 7:	RGB three colours fade-out successively
Mode 8:	RGB three colours jump changing successively
Mode 9:	R&B two colours mix fade (R in B out), then G fade-in, then R&B mix fade (R out B in), then G fade-out
Mode 10:	B fade-out, then G&B mix fade (G out B in), then R&G mix fade (R out G in), then R fade-in

Table 3: Built-in 10 colour changing modes



3.8 PARING THE REMOTE

Fit 3x AAA batteries to the remote (not supplied).



Pairing additional remote with DMX Receiver

STEP 1: Connect and wire up the DMX Receiver according to wiring diagram (Table 2), power on.

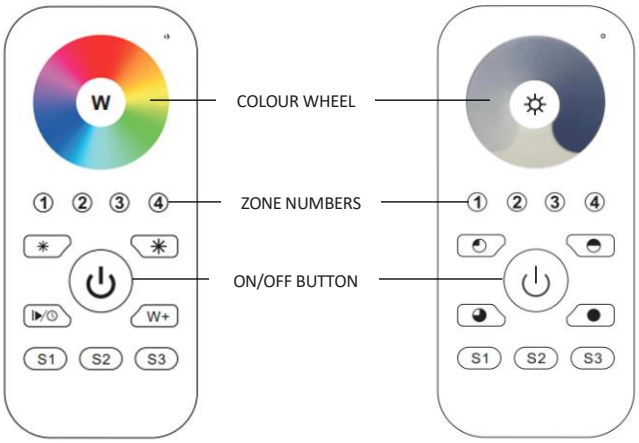
STEP 2: Click **ON/OFF** button to activate the remote

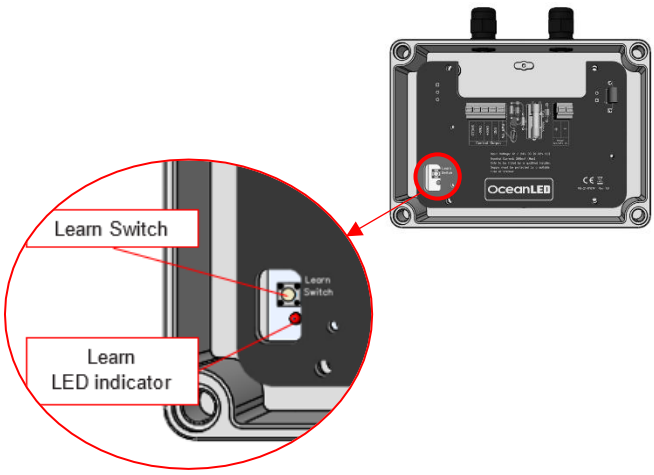
STEP 3: Click the "Learn Switch" button on the DMX controller, the LED light next to the learn switch should light-up (see Figure 1 for details).

STEP 4: Immediately touch the colour wheel. The LED light next to the learn switch of the receiver should flash on and off once, meaning the receiver has paired with the zone successfully.

The learning mode lasts around 4 seconds so the steps 3 - 4 must be done within this period of time.

Note: Up to 8 remotes can be paired with one DMX Receiver. Please follow the same procedure for pairing with additional remote/s.





Delete the pairing (all stored remotes):

1. Wire up the DMX Receiver correctly, power on.
2. Hold down the "**Learning Switch**" button on the DMX controller for over 3 seconds until the LED light next to the button flash on and off twice, which means pairing deleted.

4 Zone Control (Advanced Use)

This section is for advanced users of DMX networks and DMX addressing. If you are unsure about DMX addressing and DMX networks, it is advised to research into this before proceeding or seek assistance from a qualified person.

4.1 OVERVIEW

The OceanDMX RC DMX controller has the ability to control up to 4 separate lighting zones, either independently or simultaneously. Each 'zone' uses four DMX addresses. For Colours, the Red, Green, Blue, and White channels respectively, and for Dual Colour the Blue, White channels plus two unused addresses.

Each of the four available zones are assigned to a separate DMX address range. These addresses are as follows:

Zones - DMX Address	
Zone 1:	DMX base address 1* (Addresses 1-4)
Zone 2:	DMX base address 5 (Addresses 5-8)
Zone 3:	DMX base address 9 (Addresses 9-12)
Zone 4:	DMX base address 13 (Addresses 13-16)

* As default all OceanLED light are set to base address 1.

The additional zones can be used to control OceanLED lights that have had their DMX addresses changed from default*, and/or used to control third party RGBW devices (such as RGBW LED tape drivers / yacht signs etc).

* only applicable to Explore, and Pro-Series Colours lights – it is not possible to change the default DMX address of the X-series lights.

4.2 CHANGING DMX ADDRESS - EXPLORE SERIES

To change the DMX base addresses of the Explore series lights, either a Remote Data Management (RDM) controller can be used, or an OceanLED Explore series configuration tool, along with a suitable Windows PC/Laptop is required:

Explore Configuration Tool	
Model	**P/N - Description**
E6/E7	019909 - Explore XFM USB Configuration Interface
E8/E9	023108 - Explore Weld-In USB Configuration Interface

If using a third party RDM controller, please follow the instructions provided with the unit.

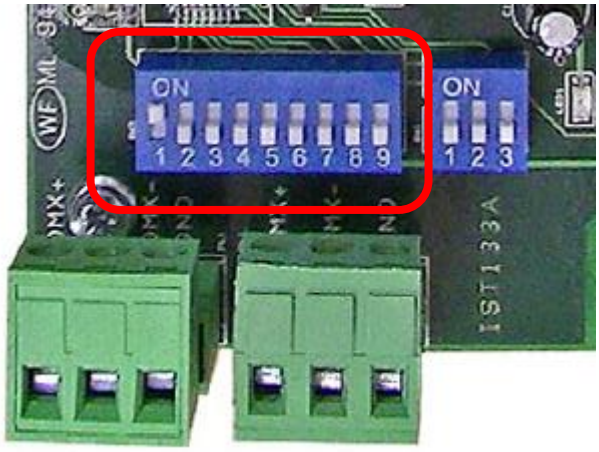
If using the Explore Configuration interface, follow the instructions provided with the interface to change the DMX base address of the lights as required.

4.3 CHANGING DMX ADDRESS – PRO-SERIES

To change the DMX address of the Pro-Series lights, the switch positions on the 9-way DIP switch inside the driver box need to be adjusted as follows:

Ensure power is turned off to the driver box before opening!

1. Turn off power to the driver box.
2. Open the driver box and locate the 9-way DIP switch on the driver card PCB (see photo below).



3. Change the DMX address to the required zone as follows:

DMX DIP Switch Settings		
Zone 1	DMX base address 1	1 ON, 2 to 9 OFF (default)
Zone 2:	DMX base address 5	1 ON, 2 OFF, 3 ON, 4 to 9 OFF
Zone 3:	DMX base address 9	1 ON, 2 & 3 OFF, 4 ON, 5 to 9 OFF
Zone 4:	DMX base address 13	1 ON, 2 OFF, 3 & 4 ON, 5 to 9 OFF

4. Close the driver and turn the power back on. (Note when changing DMX address the driver needs to be power cycled to make the change take effect).

4.4 CONTROLLING THE ZONES

The zones can be controlled by either selecting a single zone, or multiple zones if more than one zone is needed to be controlled together. To select a single zone, simply press the required zone number on the remote. To select multiple zones, double click the required zone numbers on the remote one after the other.

The remote can then be used as described in **Chapter 3** to control the colour/intensity of the lights within the selected zone(s).

4.5 CONTROLLING THIRD-PARTY DMX DEVICES

The controller can also be used to control third party DMX RGBW or dual colour devices. These devices will typically have their own DMX driver. For setting the DMX address of the unit(s), refer to the instructions provided by the manufacturer.

4.6 CONNECTING THIRD-PARTY DMX DEVICES

To control a third-party DMX device, this will have to be connected to the DMX network.

For X-Series installs it is recommended to connect the unit to the end of the DMX chain. Connect the device(s) to output of the last DMX junction box in the DMX chain. Ensure that the terminator in the DMX junction box is OFF, and that there is a DMX terminator added to the last device added in the chain.

For the Explore and Pro-Series, it is recommended to connect the third-party device(s) at the start of the DMX chain – this prevents the need to purchase extra connectors to connect to the last light in the chain. Connect the first third-party device to the output of the DMX receiver, and then the DMX out of the last third-party device to the DMX in of the first light. Ensure that there is a DMX terminator fitted to the last light/driver in the chain.

Note it is important to keep to the DMX specifications – of a maximum of 32 devices to be connected in one chain, and the total network chain length to be less than 300m. If more than 32 devices need to be connected, then DMX splitters should be added to the system.

5 Troubleshooting

OceanDMX RC			
Problem	Check	Cause	Fix
DMX receiver does not power on	Check Power to Controller is on	No Power	Connect Power
		Power OK	Check Connections
	Check Connections to the push-in connector	Connected incorrectly	Correct Connections
		Connected OK	Contact Warranty Department
	Check internal fuse	Blown	Replace the fuse. If the fuse blows again contact Warranty Department
		Fuse OK	Contact Warranty Department
Lights do not respond to controller and / or random flickering of lights / colours	Check DMX connection is daisy chained between controller and all drivers/ lights	Not connected correctly	Correct cabling connections
	Check all other cables are connected correctly and are not damaged	Not connected correctly	Correct connections
		Damaged cable	Replace Cable
	Check Terminator is fitted to last driver box/ light/ Check Terminator in last DMX Junction box in the chain is on.	Terminator not fitted/ Terminator switched off	Fit terminator/ Switch on terminator
		Terminator fitted/ Terminator on	Contact Warranty Department
Controller does not respond to remote.	Indicator on the RF Remote does not turn on.	Check the remote batteries.	Replace batteries
		Batteries OK	Contact Warranty Department

6 Appendix

5.1 CABLE GAUGE CHART 12V DC

Supply & Return Cable Conductor Size Chart 3% drop for when using 12V DC supply											
Cable length (feet)*	Circuit Current										
	2 Amp	4 Amp	6 Amp	8 Amp	10 Amp	15 Amp	20 Amp	25 Amp	30 Amp	40 Amp	50 Amps
0-5	18 AWG	18 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	8 AWG	8 AWG
5-10	18 AWG	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG
10-15	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG
15-20	16 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG
20-25	14 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG
25-30	14 AWG	10 AWG	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG
30-35	14 AWG	10 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG
35-40	12 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG
40-45	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG
45-50	12 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG
50-55	12 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG
55-60	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	3/0 AWG	4/0 AWG
60-65	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG
65-70	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG
70-75	10 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	0 AWG	2/0 AWG	2/0 AWG	4/0 AWG	
75-80	10 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	
80-85	10 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	
85-90	10 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	
90-95	8 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	2/0 AWG	3/0 AWG	3/0 AWG		
95-100	8 AWG	6 AWG	4 AWG	2 AWG	2 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG		

*One-way cable length from supply (usually battery) to load.

5.2 CABLE GAUGE CHART 24V DC

Supply & Return Cable Conductor Size Chart 3% drop for when using 24V DC supply

Cable length (feet)*	Circuit Current										
	2 Amp	4 Amp	6 Amp	8 Amp	10 Amp	15 Amp	20 Amp	25 Amp	30 Amp	40 Amp	50 Amps
0-5	18 AWG	18 AWG	18 AWG	18 AWG	18 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
5-10	18 AWG	18 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	8 AWG	8 AWG
10-15	18 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG
15-20	18 AWG	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG
20-25	18 AWG	14 AWG	12 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG
25-30	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG
30-35	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG
35-40	16 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG
40-45	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	4 AWG	2 AWG	2 AWG
45-50	14 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG
50-55	14 AWG	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG
55-60	14 AWG	10 AWG	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG
60-65	14 AWG	10 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG
65-70	14 AWG	10 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG
70-75	12 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	2 AWG	0 AWG	2/0 AWG
75-80	12 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG
80-85	12 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG
85-90	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG
90-95	12 AWG	8 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG	1 AWG	1 AWG	2/0 AWG	2/0 AWG
95-100	12 AWG	8 AWG	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG

*One-way cable length from supply (usually battery) to load.

7 Warranty

Please remove this page and keep for your files.

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