

UJWL LIGHTING CONTROLLER

UWL_DM5_CONTROL_OPERATION_MANUAL_2021_v1.5

OPERATION MANUAL
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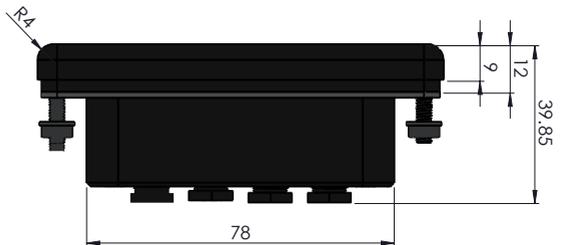
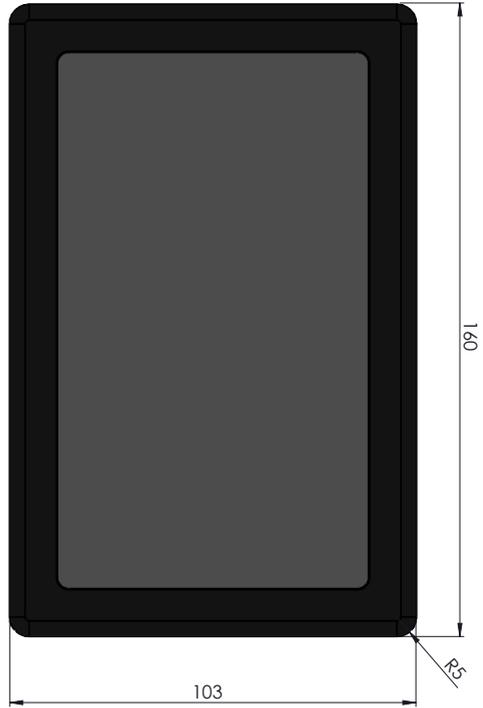
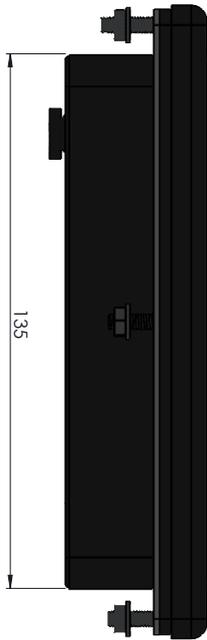
Introduction

The controller is a touch screen-based lighting controller designed to work with the range of UWL DMX controllable lights.

It can operate as a single standalone controller using the integrated touch screen or can be integrated into the Garmin range of helm control products.

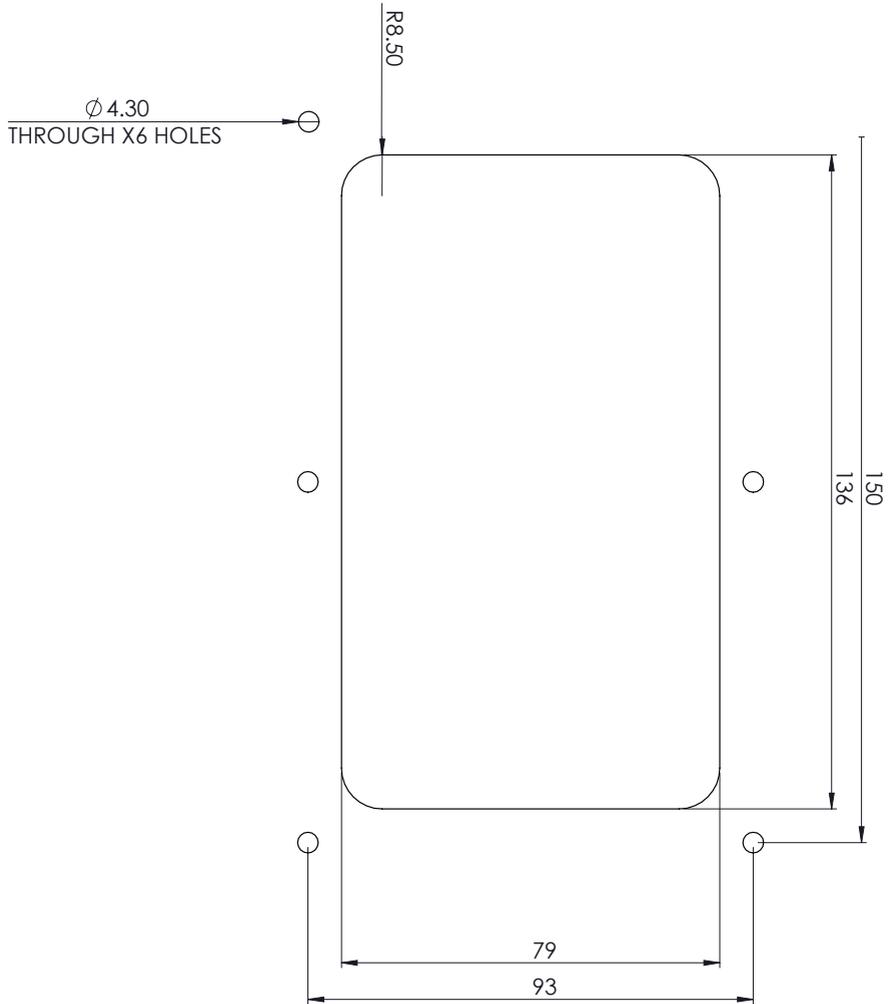
A range of pre-programmed lighting scenes are included within the product, additional custom scenes can be configured by your authorised UWL dealer.

Dimensions Of Unit



Mounting Dimensions

Hole cut dimensions as shown below:



Installation

The controller has been designed to be mounted into a helm control panel using the included fixings and “O” ring.

Cable tails are provided on the rear of the controller. These provide connection for the following signals:

- DC Power Supply
- DMX Control Signal
- Ethernet Connection
- Audio Input.

Matching connectors are provided for the ship run cables to be connected to the controller as follows:

Power

The controller will accept a DC supply between 12V and 24V.

Short term spikes up to 36V can be tolerated by the controller. If there is any possibility that the power could go above that limit, use a regulated converter (e.g. Mascot) designed for the marine environment to prevent damage to the controller.

A 2-Core cable is provided for the power to be connected and should be wired as follows:

Red DC Voltage Positive +
Black DC Voltage Negative -

The power supply should be fused with a 1A fused supply.

DMX

A 5-Core cable is provided for the DMX signal to be connected to and should be wired as follows:

Green DMX Screen
Black DMX Negative
Red. DMX Positive.

Installation

The Blue and White wires are for future expansion and should be left with insulator sleeves fitted as supplied.

Standard practice should be used for the DMX cable infrastructure, screened cable should be used, and the screen should be connected at both ends of the cables a terminator should also be installed at the end of the cable run in the case that the light does not include this.

Failure to follow these steps can result in the lights not behaving as expected.

Ethernet Connection

A standard RJ45 connector should be used for this connection. More networking details are provided in the networking section of this document.

Audio Input

The audio input is used for the sound to light functions of the controller. A line level audio feed can be connected to this input. The signal input is stereo and a 3.5mm mono jack plug is provided for the connection of the source.

Signals from devices such as iPhones etc is accepted. Speaker outputs from third party devices cannot be connected to this input and damage will be caused to the controller if this connection is made.

The device uses a stereo input signal.

If you plug a stereo jack in to the device's input, you will short circuit one of the channels. Always use a mono jack plug as supplied with the unit.

It is recommended to provide a simple resistive mixer if being fed from a stereo source.

The required input level is between 500mV and 1V RMS.

The Audio input only affects the two built-in programs - "Fizz" in the Change group, and "Disco" in the Effects group.

Networking

The unit is supplied with DHCP enabled, and it is recommended that the unit is operated in this way.

If it is required that the unit use a static IP address you will need to initially connect the device to a LAN which has a DHCP server. Identify the IP address the device has been assigned by using the 'settings' button from the Home screen:



So, if the front panel gives an address such as 192.168.1.45, point your web browser at:

<http://192.168.1.45/config.htm>

Click on the NETWORK SETUP tab to see the following screen:

DMX LIGHTING CONTROL CONFIGURATION UNDERWATER LIGHTS LIMITED			
LIGHT FIXTURE SETUP	DMX SETUP	NETWORK SETUP	MAINTENANCE
UNIT MAC ADDRESS:	70:85:05:e7:90:18		
USE DHCP:	<input checked="" type="checkbox"/>		
IP ADDRESS:	192.168.100.10		
DEFAULT GATEWAY:	192.168.100.1		
SUBNET MASK:	255.255.255.0		
SYSLOG IP ADDRESS:	0.0.0.0		
SYSLOG PORT:	0		
SAVE NETWORK PARAMETERS			

Networking

As you can see, this installation uses DHCP, and has 192.168.100.10 set up as a 'backup address' in the event that there is no DHCP available on the network. You do not need to set a Syslog address or port number. If you do have a Syslog receiver, you could set its IP address here. The default port for a Syslog server is 514. When you click 'Save Network Parameters' the unit will require rebooting for them to take effect.

You can do this in one of two ways:

- a) disconnect power from the unit, then reconnect after five seconds.
- b) Type the URL `http://<unit's IP address>/r3b00t` into a browser (the 00 is two zeros, not capital 'o'). You will receive no response on the browser, but the device's screen will go out immediately on receipt of a request for that page. After sending this command either close the browser or navigate away from the unit's web page. You can then re-access the web page (Leave 60 seconds before navigating back)

Networking - in conjunction with Garmin MFD

For this application, the device **MUST** be set to DHCP, and connected to the Garmin MFD's network segment. Configuration access will only be possible from a PC connected to the Garmin MFD network segment.

Note

The controller is delivered configured to accept DHCP assigned IP address, this requires that network you have connected to provide the unit with an IP address.

If this is not the case you will not be able to connect, we would suggest that a simple portable network router is used to provide an address. Once you have connected you can change the units address to a fixed address.

Please note that if the address is changed the unit will not function with a Garmin MFD if connected, you will need to change the controller back to DHCP.

Lighting

Once installed you will need to configure the controller to communicate with the lights that you have installed to accomplish this.

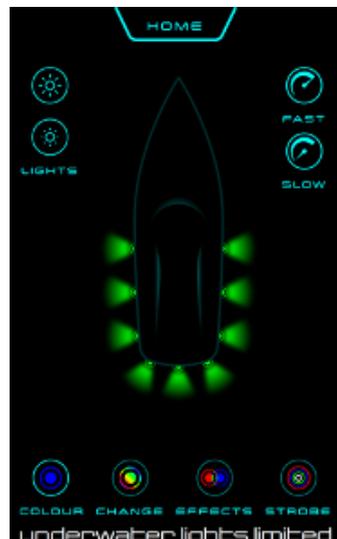
Go to the configuration page and choose LIGHT FIXTURE SETUP to select a representation of where the luminaires are on the vessel:



You can have up to nine differently addressed fixtures. If required, it is permissible to leave gaps in the scheme so that the mimic diagram matches the physical layout on the vessel.

Note:

The nine differently addressed light fixtures, can also be considered to be “groups” these nine groups can include as many fixtures as is required, it should be noted that they all will need to be on the same DMX address group and will all operate identically to the others in that group.



After making the changes hit the save button, you will need to power cycle the controller, for the changes to take effect.

Once you have set up the display layout you need to set up the DMX addressing.

DMX Addressing

The DMX scheme uses a Starting Address, and a 'spacing' interval. The System needs to know the offset from the Start address for the Red, Green, Blue, and White channels.

The Underwater Lights fitments use the following offsets:

Channel	Offset
Red	0
Green	1
Blue	2
White	3

It is recommended that an interval of 10 be left between lights, just for ease of computation when setting up the lights themselves.

In a 9-light vessel, therefore, starting address could be 10, 'spacing' would also be 10, and the offsets as per the table above.

The lights would then have their base addresses set to 10, 20, 30 etc through to 90.

The screenshot below shows this setup:



Sound to Light

The Sound to Light function is selected from the effects page and from there “Disco” is selected.

Incoming audio has to be above a certain level for the effect to kick in, you should adjust the incoming audio level on your audio device to optimize the effect.

If it is below that level, the system drops back to a regular multi coloured “pop” effect (each light comes on at a random colour then decays – all on a regular timer).

When engaged, it produces light colour patterns which alter according to the incoming audio signal.

Technical Overview (And Advanced Set Up)

The incoming spectrum is analyzed into 127 bands, each 62.5Hz wide, and numbered from 1 to 120.

Two boundaries are defined in the configuration – ‘bass to middle’, and ‘middle to treble’.

All bands between 1 and ‘bass to middle’ value is added together to create the ‘bass’ value

All bands between ‘bass to middle’ and ‘middle to treble’ create the ‘mid’ value

And all remaining bands create the ‘treble’ value

Bass is used to drive the red channel, mid for green and treble for blue.

Default settings of the boundaries are 8 for the bass-to-mid (i.e. up to 500Hz) and 60 for the mid-treble (i.e. between 500Hz and 3.75kHz).

Broadly, these settings mean that bass guitar and kick drum hit the bass channel, vocals hit mid-band and snares, cymbals etc the treble.

The config page looks like this:

DMX LIGHTING CONTROL CONFIGURATION UNDERWATER LIGHTS LIMITED				
LIGHT FIXTURE SETUP	DMX SETUP	NETWORK SETUP	SOUND TO LIGHT	MAINTENANCE
BASS-MID BOUNDARY	5		APPROX 500HZ	
MID-TREB BOUNDARY	50		APPROX 3750HZ	
THRESHOLD LEVEL	20			
AVERAGE DECAY	99			
BASS CHANNEL DECAY	25			
MID CHANNEL DECAY	25			
TREBLE CHANNEL DECAY	25			
			SAVE SOUND TO LIGHT	

Sound to Light

(Note: The frequency column is only updated when you press the Save button)

If you like a more 'red' effect, you can broaden the 'bass' bin.

If you'd like a bit more green, you can broaden the mid bin.

You could eliminate one of the colours almost altogether by making the band just one notch wide.

Threshold level

This is a number which controls the point at which the system determines there is an audio signal present. If you choose the lowest level - 20 - you will need to have an audio signal above about 250mV RMS to trigger the effects. At that - rather low - level, system background noise will slightly impair the processing.

Ideally you need a signal between 400mV and 1V RMS.

Average Decay

The system uses a 'long term average' when deciding whether the signal is above or below the Threshold. This avoids the system 'dropping out' during short silences in the music.

For the most consistent effects, we recommend leaving this set to 99 which equates to about 2 or 3 seconds, depending on the incoming sound level and the Threshold set.

If you want the system to drop back to the "popping" effect more quickly try a lower setting.

The system uses the 'long term average' to scale the red/green/blue channels, meaning that there is a degree of tolerance to level settings.

Bass/Mid/Treble Decay

The normal value for this is 25, which gives a display which is reasonably responsive, but not 'jittery'

If you would like the colours to just ooze from one to another, you could try setting this higher. However, for many genres used for 'party' music, this can just leave all the colours on all the time.

If your objective is to achieve manic excitement, you could try dropping the level.

Operation with Garmin MFD

The controller can be directly connected to Garmin MFD displays that support applications once the controller has been successfully connected to the controller an application icon will be presented on the MFD display.

Please follow the instructions below to connect the two systems:

Network setup

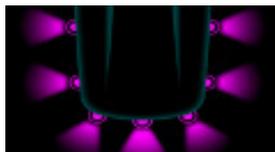
The Underwater Lights Ltd DMX-5 controller must be connected to the same LAN segment as one of the 'Network' ports on the Garmin MFD. This could be via a direct cable, or via a LAN switch .

There are no network setup options on the Garmin MFD.

The DMX-5 must be set to DHCP.

Initial discovery

- Make sure there is a LAN connection between the DMX-5 and the Garmin. You may wish to use a direct LAN cable for setting up to avoid any uncertainties associated with the LAN switch
- Start with both units powered down
- Power up the DMX-5
- On the DMX-5 press the Settings button and make sure no IP address is shown below the Screen bright/dim buttons.
- Then press the 'Home' button on the DMX-5
- Power up the MFD and wait for it to show its main screen.
- On the DMX-5, press the Settings button again, and check that there is now an IP address shown - it will be something like 172.16.xxx.yyy.
- On the MFD go to ONEHELM A/V, GAUGES from the main menu
- After two or three minutes, you should see the 'Waterlights' icon appear on the screen - it looks like this:



DMX Addressing

- Tab the icon, and after a few moments, you will see the 'home screen' from the DMX-5. You can now operate the DMX-5 from the MFD almost exactly as you can from its own front panel
- You will see that the device's front panel will follow what you are doing from the MFD.

If the LAN switch is 'Smart', 'Layer 2 aware', or 'Layer 3 aware' ensure that Multicast group 224.0.0.251 (MDNS) is not blocked.

Interface differences between MFD and device

There are a small number of intentional differences between the MFD control and control from the device's screen:

- The 'Settings' cogwheel is not present on the home screen for the MFD as this purely controls the DMX-5 display. Equivalent functions such as display brightness are provided by the MFD itself.
- When the Waterlights icon is first pressed, you are always taken to the Home screen. As soon as a button is then pressed on either display, they start to follow each other
- There are some minor differences in color rendition from the Color Wheel due mainly to differences in screen technology
- If very fast pattern rates are chosen, the display on the Home screen of the MFD cannot always keep up owing to network and screen refresh delays
- The 'sleep' button on the MFD switches off the backlight on the DMX-5 but does not affect the MFD display itself.

Troubleshooting

Once the DMX-5 is associated to the MFD, it should continue to be available via the ONE HELM menu. However, if the DMX-5 loses power while the MFD is using it, you may see the message:

'Searching for One Helm Device WaterLights' when selecting 'Waterlights'.

The following steps will restore connection:

- Press 'Home' on the MDF to return to the OneHelm menu
- Wait 10 seconds
- On the DMX-5 Home screen, press the 'settings' button (cog-wheel on the foredeck). This forces a 'service advertisement' on the network
- Wait a further 10 seconds
- On the MFD select 'WaterLights' again, and you should see the screen from the DMX-5 displayed on the MFD.
It may be necessary to repeat this process. If the procedure above fails, it is possible that the network connection between the devices has been broken – please check all network cables and intervening switches.



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