Hypha

User Manual

R5

Better Way Lighting

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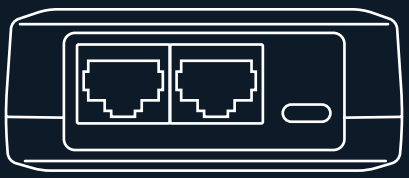
Introduction

The Hypha facilitates easy translation of data signals between sACN, Art-Net, CRMX, and DMX512, and allows for user inspection and generation of signals.



Specifications

Wireless Technologies	LumenRadio CRMX, Dual band Wi-Fi
Ethernet	10/100 Mbps
Input / Output Protocols	DMX512, CRMX, sACN, Art-Net
Ambient Temperature	0 - 45 °C
Body Dimensions	H 32.5 mm x L 120 mm x W 74 mm
Display Dimension	54.9 mm x 28 mm OLED
Weight	221 g

Features

Manual input mode with Blackout and Grandmaster.

Powered by integrated, rechargeable battery or external USB supply.

USB charger included.

Safety

No user serviceable parts.

Do not open the housing.

Not intended for permanent installation.

Store in a cool, dry environment.

For use in dry location only.

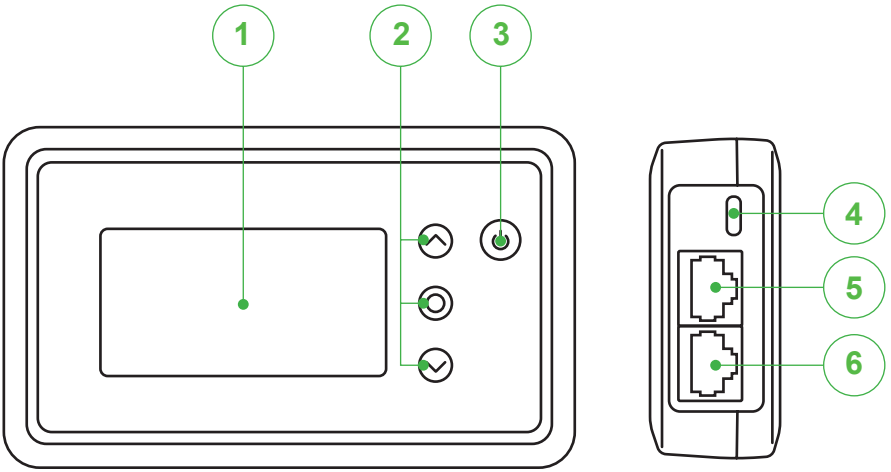
Do not operate in the rain or around excessive moisture.

Do not operate outside of the rated ambient temperature range.

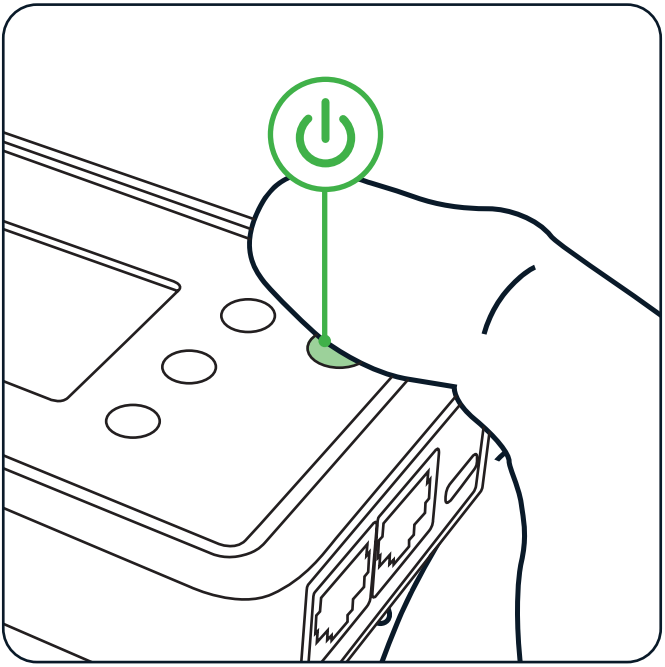
Do not operate if any pieces are broken or deformed.

Device Overview

1	Menu Display
2	Navigation Buttons
3	Power / Navigate back
4	USB-C / External power supply
5	Ethernet connection
6	DMX connection



Device Startup



Powering On

When the device is off, hold the power button until the main menu appears.

Powering Off

When the device is on, hold the power button until the screen turns black. If the device is plugged in, the battery icon and charge percentage will remain in the upper right hand corner, and the device will continue charging.

Menu Navigation

Navigation Buttons

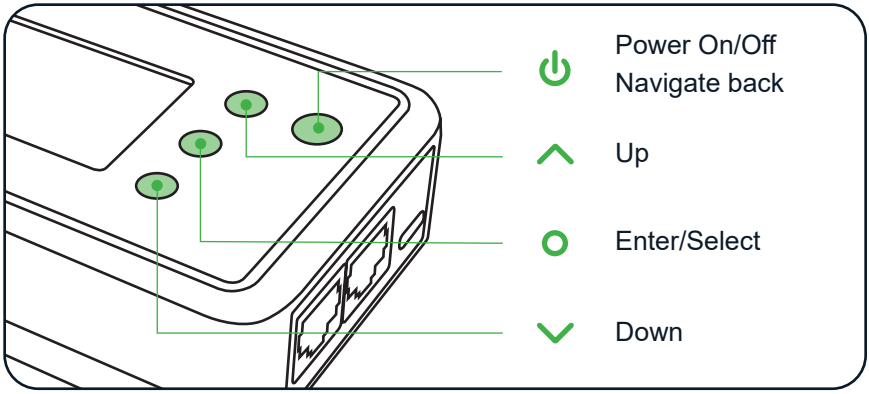
Use the three buttons for menu navigation and option selection. Follow the navigation icons displayed on the screen.

- Up and down will cycle through the items in the current menu.

- Pressing “Enter” while an item is selected, will allow the up and down buttons to cycle through the options available for that item.

- Pressing enter while a navigation item is selected will navigate to the corresponding menu.

- A brief press of the power button will navigate to the previous screen.

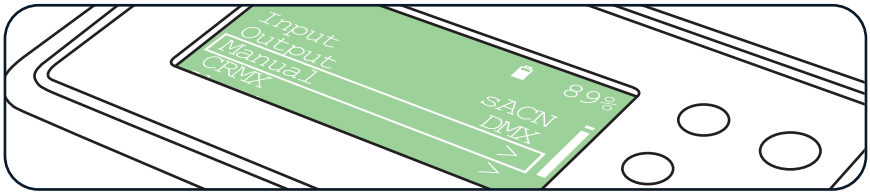


Input & Output Selection

The primary function of the device is routing unique lighting data between inputs and outputs. These options in the main menu allow the selection of how the device should route data.

For example, the device can simply act as a DMX to CRMX transmitter by setting the ***Input*** option to ***DMX*** and the ***Output*** option to ***CRMX***. Setting the ***Input*** to ***Manual*** will allow the device to be used as a testing tool, where the user can enter DMX values manually and have them sent out on the interface specified in the ***Output*** option.

The device can only route data from one input to one output at a time, and cannot route data from an interface to itself (for example, the device cannot route from DMX to DMX). Selecting the same interface in both the ***Input*** and ***Output*** option will cause the device to suspend routing until one of the two options is changed. Selecting ***Manual*** in the ***Input*** option will cause the values in the ***Manual*** menu to be sent out of the ***Output*** interface. The values in the ***Manual*** menu will become editable. Selecting ***None*** in the ***Output*** option will cause the data received from the specified input to be sent nowhere. This is useful when the device is used only for inspecting the values using the ***Manual*** menu.



Input Values

- Manual
- DMX
- CRMX
- sACN
- Art-Net

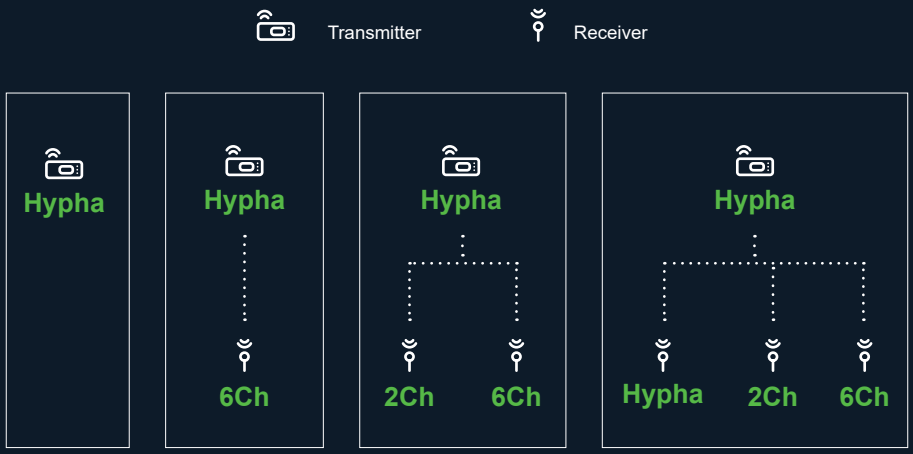
Output Values

- None
- DMX
- CRMX
- sACN
- Art-Net

CRMX System Overview

CRMX is a proprietary wireless DMX system developed by LumenRadio. The system is commonly used in the film and theatre industries. The system uses frequency hopping to avoid interference and operates in the 2.4 GHz band, the same frequency range as microwave ovens, Bluetooth, and Wi-Fi networks.

Network Topology



Any number of CRMX transmitters can be used in the same physical space. Any number of receivers can be linked to one transmitter. A receiver can only be linked to one transmitter at a time. No user-accessible identifier is available to distinguish these networks of transmitter and linked receivers from each other. Rather, a mechanism for pairing (or ***linking*** in CRMX terminology) a receiver to a transmitter is used to establish a relationship between a receiver and a transmitter. CRMX communication is typically one-way.

Quality and Range

The quality of the DMX data received over CRMX tends to depend on the Packet Delivery Rate (PDR) achieved by the connection. This is the percentage of “packets” sent by the transmitter that are successfully received by the receiver. Many receivers, including the Hypha, have a facility for reporting this metric to the user. This rate typically depends on the distance between the two Hyphas, the quality of the transmitter and receiver used, obstacles separating them, any radio interference in the area, and any number of other factors. Typically any PDR greater than 80% is acceptable for smooth fading.

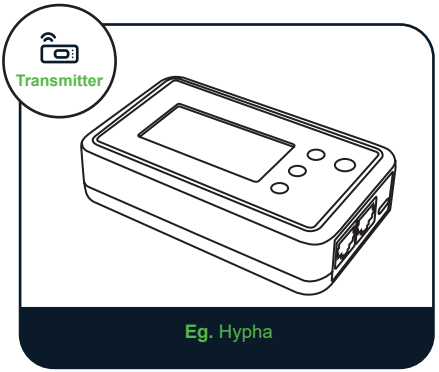
In general, the system can transmit DMX data more reliably and across wider distances than Wi-Fi, but cannot generally match the level of quality and reliability of a wired DMX connection. Data updates may be slower than the maximum rate of a standard DMX512 connection, and split frames may occur.

Terminology

- **Link** A pairing of a receiver to a transmitter. This does not imply that the receiver is currently receiving a signal from the transmitter.The transmitter may be off, or out of range of the receiver.

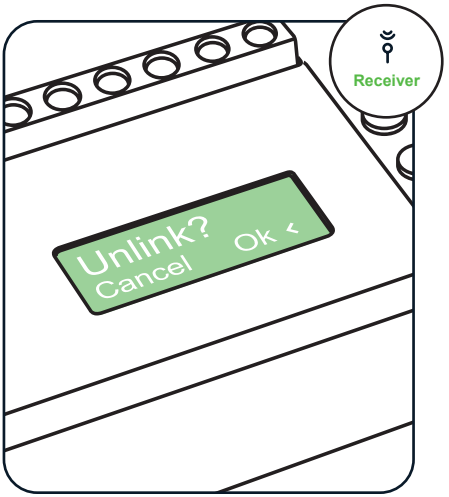
- **Packet Delivery Rate (PDR)** The percentage of packets sent by the linked transmitter over a given window of time that have been successfully received by a given receiver.

How to Link CRMX Devices



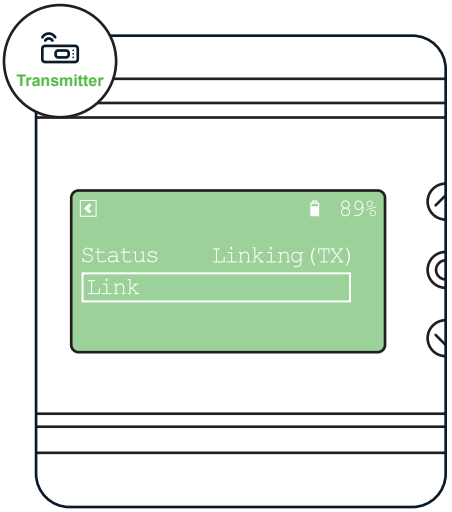
1. **Prepare the receivers and the transmitter.**

   Ensure that the receivers are within range of the transmitter. Ensure that no other CRMX devices nearby are attempting to link.



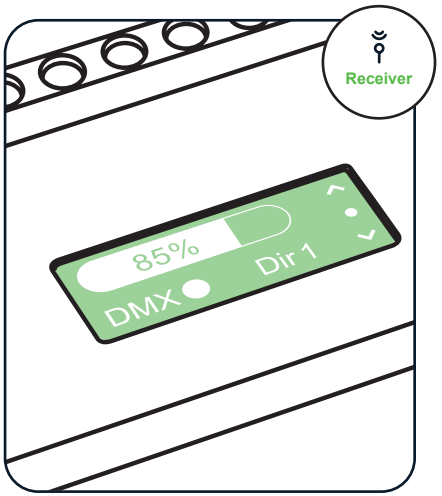
2. **Unlink the receivers.**

   If any of the receivers were previously linked to a transmitter, use the on-board link option to unlink them.



3. **Use the link option on the transmitter to put the transmitter into linking mode.**

This will cause it to stop transmitting DMX and begin transmitting a special linking signal. All nearby unlinked CRMX devices will become linked to this transmitter. After several seconds, the transmitter will return to its normal DMX transmission mode.

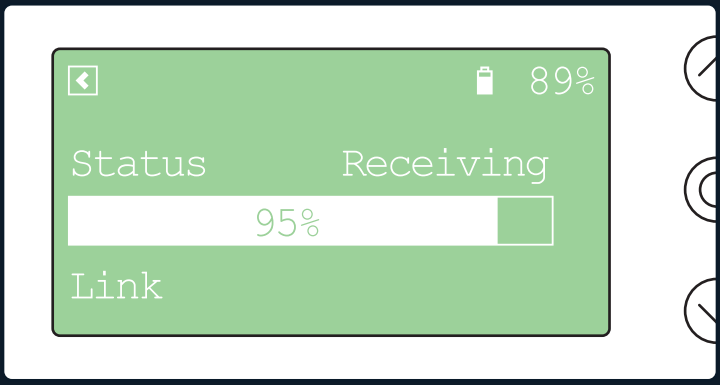


4. **Verify that the receivers are successfully linked to the transmitter.**

Wait until the transmitter resumes transmitting its normal DMX signal. If the receivers show an active link status indicator, signal presence indicator, or DMX activity indicator, then they are linked to a transmitter. The quality of the connection can be tested by sending DMX data to the device and checking the device output.

CRMX Control

The device can act as either a CRMX transmitter or receiver.
All CRMX-related settings are configured from the ***CRMX*** menu, which is accessible from the main menu.



Transmitter Mode

Receivers can be linked by putting the device in “Linking” mode. Linking is initiated by using the ***Link*** option in the ***CRMX*** menu.
This causes the device to enter “Linking” mode for the next 15 seconds.

In Transmitter Mode, the CRMX status can display one of the following values:

- Linking (TX)
- Transmitting

Receiver Mode

The device can be unlinked from an existing linked transmitter using the ***Link*** option in the ***CRMX*** menu.

If a transmitter signal can be detected, a progress bar visualizing the packet delivery rate will be shown.

In Receiver Mode, the CRMX status can display one of the following values:

- Unlinked (RX)
- Linked (RX)
- Receiving

Before the device has been linked to a specific transmitter, the device begins with the ***Unlinked (RX)*** status. An external transmitter must begin a ***Link*** operation, after which the status will change to the ***Linked (RX)*** status. This indicates that the device is linked to a transmitter, but is not currently receiving its signal. Once the transmitter finishes the linking operation, the status will change to ***Receiving***. The ***Link*** operation can be used to unlink the receiver, reverting the status back to ***Unlinked (RX)***. The receiver is now awaiting a linking signal from another transmitter.

- **Disabled (X)** When the CRMX status reads as “Disabled (X)”, it has not being selected as an input or output. (Go to page 8)

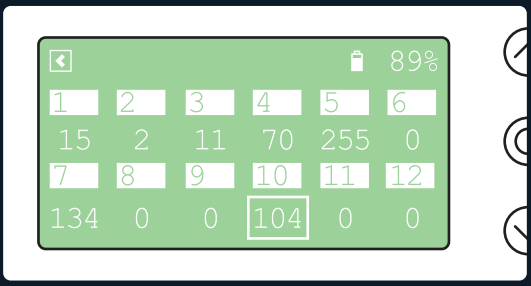
Manual Control

Manual mode allows the user to directly view and manipulate the DMX data passing through the device via the buttons and display.

Transmit

When ***Manual*** is selected for the ***Input*** option in the main menu, the values in the ***Channels*** menu become editable, and are used as the source for the data sent to the selected output.

The ***Clear*** option sets all user-entered values back to zero. When the ***Blackout*** option is set to ***Enabled***, all values in the DMX frame will be transmitted as zero. The user-entered values in the ***Channels*** menu will be retained. The ***Grandmaster*** option is set to a value between 0 and 255, and scales each of the channels entered in the ***Channels*** menu before they are transmitted. The user-entered values in the ***Channels*** menu remain unchanged; the scaling is applied only to the transmitted values.



Default values

Blackout	Disabled
Grandmaster	255 (scaling disabled)

Blackout

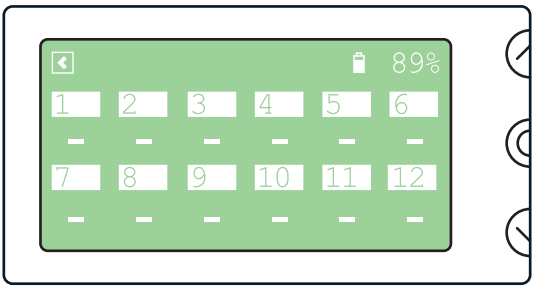
When this option is enabled, the values set in the Channels submenu are overridden, and all channels are temporarily output with a value of zero.

Grandmaster

The grandmaster scales each channel in the Channels submenu proportionally by its value prior to output. Its maximum value is 255, at which no scaling occurs.

Monitor

When a selection other than ***Manual*** is made in the ***Input*** option, the values in the ***Channels*** menu are read-only, and reflect the values flowing through the system. The ***Blackout***, ***Grandmaster***, and ***Clear*** options have no effect in this case.



When no data is received from the input device, hyphens are displayed in each channel position under the ***Channels*** menu. When the received frame is shorter than 512 slots, the unused slots will be displayed with hyphens.

Network configuration

sACN and Art-Net

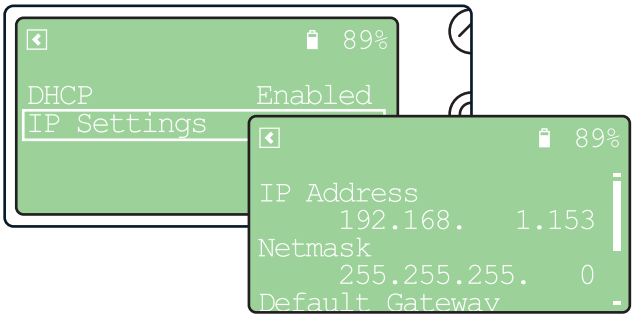
The device supports data input and output over sACN or Art-Net. Both protocols are supported over Ethernet 10/100 and 2.4 / 5 GHz Wi-Fi. When receiving sACN data, the device will automatically detect when data is transmitted on the Ethernet and Wi-Fi interfaces. There is no need to select this manually in the device configuration. If your configuration supports both protocols, we recommend the use of sACN for best performance.

Ethernet and Wi-Fi

The device supports both wired Ethernet 10/100 and 2.4 / 5 GHz Wi-Fi connections. When the device is turned on, a 5 GHz Wi-Fi access point with the SSID “bwl-bridge” appears. Ethernet provides high performance, and in most cases, the result matches or exceeds that of DMX512 over RS-485. Wi-Fi is acceptable in many applications where portability is desirable at the expense of performance.

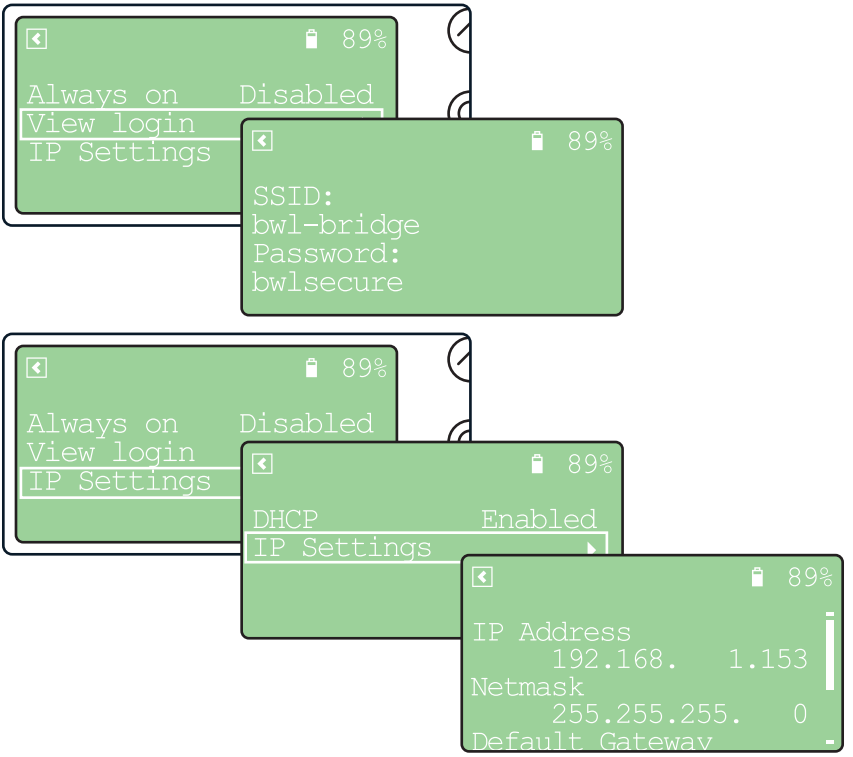
Ethernet Configuration

The IP settings for the ***Ethernet*** interface can be configured through the Ethernet menu, accessible from the main menu. The ***DHCP*** option selects whether the device’s local DHCP client is enabled, and will attempt to obtain a DHCP lease from the network’s DHCP server. When the ***DHCP*** option is disabled, the user must manually enter static IP settings under the ***IP Settings*** submenu.



Wi-Fi Configuration

The settings for the Wi-Fi interface can be configured through the ***Wi-Fi*** menu, accessible from the main menu. Currently, the Wi-Fi interface always operates as an access point with an SSID of “bwl-bridge” and a password of “bwlsecure”. The ***Always on*** option determines whether the access point will be available any time the device is on, or only when ***sACN*** or ***Art-Net*** is set as one of the input or output interfaces. ***View login*** displays the SSID and password clients can use to connect to the access point. The same settings as those shown in the ***Ethernet*** menu are likewise available for the Wi-Fi interface under the ***IP Settings*** submenu. When DHCP is enabled in Wi-Fi AP mode, the Hypha acts as a DHCP server, providing clients DHCP leases in the specified subnet. When the Input option is set to ***sACN*** or ***Art-Net***, unicast lighting data can be sent to the address specified for the Hypha itself.



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