The *Wi-Light* Wireless Control System

System Description

The Wi-light system is a wireless lighting control designed specifically for professional lighting using the universal 2.4GHz radio band.

Unlike other DMX wireless links it provides a direct wireless connection to lighting fixtures using small individual "dongle" type receivers that entirely eliminate control cables. The wireless technology includes automatic frequency hopping to avoid adjacent channels and is completely Wi-Fi immune, it is also unaffected by other 2.4GHz equipment. There is a high level of error checking included which ensures that any data corruption caused by radio reflections or momentary loss of signal is rejected.

The ability of any number of receivers in a Wi-Light installation to become a closed network with only one transmitter allows several installations to be used in close proximity without cross over.

Control data is connected to the transmitter via a standard isolated DMX512 input. The transmitter takes a block of up to 128 channels beginning at a pre-selected address, which are then broadcast. The width of the data stream is limited to make best use of system speed and assumes that many installations will also have wired connections to other equipment like dimmers. The address setting allows the Wi-Light system to integrate easily with an existing installation while the system width is sufficient for entirely wireless control in most situations.

The system consists of three elements:

1. **The Wi-Light transmitter.** This is a small self powered unit fitted with a short rod antenna. It converts a DMX input into broadcast wireless data.
2. **Individual receivers or "Dongles"** fitted to fluorescent fixtures or dimmer packs in place of a wired control connection.
3. **"Break Out" units** offering a wireless source of standard DMX data for connection with any DMX controlled equipment. This unit is made part of a standard IEC type power cable and can be used as the power connection for any DMX controlled light source.

Wi-Light Transmitter

The Wi-Light transmitter accepts a standard DMX512 input of lighting level control (null code) data.

There is a termination switch next to the XLR5 socket which should be used if the transmitter is at the end of the data line.

Setup Controls

The transmitter selects data from the stream beginning at the offset address set by the three rotary address switches on the front panel. The number of channels broadcast by the wireless system is selectable using the two "Width" control switches also on the front panel.

The following table shows the switch combinations and widths available:

Width 2	Width 1	Number of Channels
Off	On	128
On	Off	64
Off	Off	32

Note that the channel width should be kept to a minimum for fastest system speed.

The second switch block allows for the setting of system preferences. The functions are as follows:

Switch	Function
Slave	Not used
Net	All receivers within range will enter network mode based on this transmitter *
Hold	Hold last state if DMX signal stops **or** wireless signal is lost
Multi	Force multi tube light sources to multi channel control (overrides local setting)
Pre-h	Force compatible dimmers to pre-heat mode
Auto-r	Force compatible dimmers to auto-reset trip mode (IGBT type only)

*Any receiver already in network mode from a different transmitter will ignore this command.

LED Indicators

There are four indicator lights on the front panel:

LED	Function
DMX	Green - Indicates receiving DMX data (flashes for invalid address selection)
Power	Green - Transmitter has power
Transmit	Blue - Transmitter sending data (will also light to indicate progress of a system initialise)
Initialise	Yellow - Lights briefly when power is connected or **Initialise** is pressed

Initialise Button

The **Initialise** button is located behind the front panel and is accessible via a small hole. When pressed it causes a complete system reset. All receivers in range and networked to this transmitter are forced into reset and any network settings are erased. It should not be necessary to use it unless the entire network requires returning to default condition.

It is strongly recommended that **Net**work be switched off before pressing **Initialise**.

Transmitter Location

The transmitter should ideally be "line of sight" to all the fixtures it controls. In practice there can be minor obstructions and non-metallic partition walls will have little effect. A fairly low position within a studio space will usually be best and an acceptable mounting position can be found by experiment. Range is around 300m inside typical buildings and will be greater outdoors. Mounting brackets are available as accessories.

Transmitter back panel showing power and DMX inputs

Network Setting

The Wi-Light system has the ability to operate in network mode. This allows two or more transmitters to be used separately in the same space or within range of each other without cross connection. A network consists of one transmitter in contact with a specific group of receivers only. Network mode is selected using the "Net" switch on the transmitter front panel. Since all transmitters have a unique identity, there is virtually no limit to the number of networks that can be used in the same space.

To make sure the network function is set correctly it is important to understand the basic principles and follow the setup procedure. Once set up, the system will continue to work as a network for as long as required and is not affected by loss of power.

How it Works

Basic principles:

- In "open" mode (Net switch off) any receiver dongle can receive from any transmitter. If there are no other transmitters in range the network mode need not be used.
- In network mode the transmitter sends a command to receiver dongles which then "learn" the unique identity of the transmitter and then reject all other identities.
- Groups of receiver dongles are thus networked to an individual transmitter but until the network is closed will receive any transmitter in range. It is therefore vital that **only** the transmitter and receivers required to work together for each network are powered up when the network switch is first set.
- All receiver dongles will power up in "open" mode. This must be so to enable transmitters to be replaced and network settings erased without the need for local reset of each dongle. The receiver will be switched to network by the first transmitter sending the command but will only then continue to receive if that transmitters identity has been learned by the receiver.
- If two or more transmitters are to be used within range of each other they **must** both be set up in network mode for the reason given above.
- The transmitter identity is recorded by each receiver when the network mode is first selected. The identity is only recorded once and the only way to erase a network connection is to do a local reset on the dongle or a full system reset from the transmitter.
- Switching off the "Net" switch on the transmitter will return the network to open mode but will not erase the transmitter identity recorded by the receiver dongle. If Net is switched back on the receiver will return to network. It is not recommended however that Net be switched on and off if other transmitters are in range.
- Only one transmitter can be networked to a receiver dongle.

Setting Up a Network Connection

1. Power up all the light fixtures fitted with dongles and switch off any that are not to be included in the network. **Make sure that the transmitter is off and no other transmitters are running anywhere nearby**.
2. Set the **Net** switch to off on the intended network transmitter and disconnect any DMX feed. It is also recommended that Hold Last State is switched on.
3. Connect power to the transmitter.
4. Check that all receiver dongles have the green led lit to show that a signal is being received. If any are not, try pushing the local reset on the dongle and/or switching power off and on (a tool such as a pin or paper clip will be needed).
5. Using a suitable tool (eg a straightened paper clip) push the system reset button on the transmitter. The transmitter and **all** receivers should now light blue leds for several seconds followed by flashing blue before returning to the green led.
6. Switch on the **Net** switch. The blue leds on the receiver dongles will once again flash three times to indicate that network mode has been detected.
7. If any dongles continue to flash, switch them off and on again.
8. The network should now be closed and all receivers will be controlled only by the network transmitter.

Note - Because all receiver dongles start up in open mode when power is first connected, they may initially respond to another transmitter they are not networked with. If that transmitter also has the **Net** and **Hold Last State** switches set, the dongle will then disconnect but hold any levels already received. To clear these levels simply switch on the correct network transmitter which will immediately update all receivers.

Wi-Light Dongle

The Wi-Light dongle is a self contained wireless transceiver which can be added to any DMX controlled Photon Beard Hilight fixture. It outputs data directly into the DMX decoder and completely removes the need for any control cable. DMX cable may still be connected but priority is given to the wireless connection. The local manual fader and address setting will continue to work as normal.

Fitting the Dongle

The dongle connects via a small port on the base panel of a compatible Hilight fixture (DMX controlled Hilight fixtures manufactured before September 2010 may not be compatible, consult your dealer). Fit the dongle as follows:

1. A small plastic plug is fitted in the port to protect the connector pins, first remove the plug.
2. The dongle has a captive fixing screw which is accessible via a small hole covered by a removable black plug.
3. Carefully insert the connector on the dongle into the slot in the back panel of the Highlight making sure that it mates cleanly.
4. Tighten the retaining screw using a small cross-head screwdriver.

Dongle LED Indicators

There are two led indicators on the dongle:

LED	Function
Green	Active - connected with in-range transmitter
Blue	Reset/Learn/Transmit

The Blue led may flash momentarily when power is switched on.

The green led will light up only if the signal from a transmitter is being received. It will respond to the regular time signal from the transmitter and is not affected by the status of DMX data.

The green DMX indicator on the Highlight will light as normal only if DMX data is connected to the transmitter.

Dongle Initialise Button

Like the transmitter, the dongle has a reset button which can be accessed via a small hole. If the dongle/Highlight behaves in a strange way or refuses to accept control when a wireless signal is being received, the fixture may require reset. This would typically happen with a newly connected dongle receiving from an existing network.

To operate the reset and with power connected, take a pin or a straightened paper clip and carefully push it through the small hole in the casing just below the leds. When the button is pressed the blue led will light continuously and all network settings will be erased. The blue led will then flash for a few seconds and then go out. This has the same effect on the fixture as the global reset available on the transmitter.

DMX "Break Out" Unit

This part of the system will output a stream of standard DMX data up to the maximum address used in the system. The Break Out box is intended to substitute for a standard IEC type power lead to the device under control. It has an IEC inlet socket on the box and a short IEC power lead for onward connection of power. The output lead may be removed if not required.

Only the DMX channels broadcast by the transmitter are active and any channel lower than the start address on the transmitter or higher than the maximum width will be transmitted as 0.

In the Wi-Light system all DMX channels are transmitted with their original addresses so the address of any DMX channel is unaffected by being carried by Wi-Light.

Led indicators and reset button are the same as the standard dongle except that there is also a green power-on indicator.

Connection of DMX data is via an RJ45 type connector as listed in the standard DMX specification. Pinning is as follows:

Connection Schedule for DMX512 systems using RJ45				
RJ45 Pin	Pair	Wire colour*	Function	XLR5 pin
1	2	white / orange	+ DMX512	Pin 3
2	2	Orange	- DMX512	Pin 2
7	4	white / brown	Signal Common (0 v)	Pin 1
8	4	Brown	Signal Common (0 v)	Pin 1
Shield		drain	Signal Common (0 v)	Pin 1

* ISO IEC 11801 cable wire pair/colour for standard RJ45 type data cable

The Break Out unit will drive a standard DMX512 line and can be daisy chained to a number of devices in the usual way.

RoHS

Photon Beard products do not contain more than the maximum permitted levels of hazardous substances as laid down in the European directive on the restriction of use of certain hazardous substances

WEEE

Under the European directive on the disposal of waste electrical and electronic equipment this equipment should only be disposed of through approved recycling facilities and not through landfill waste disposal. Photon Beard is a member of a registered Compliance Scheme in accordance with the WEEE Directive.