Luxium Lighting products can be connected to a DMX512 control system by either wired or wireless connection depending on the model being used. This guide describes the wired DMX capabilities and set up procedures using the DIP switch interface for setting unit addresses and operating modes. For additional information please contact us at: support@luxiumlighting.com or check the website for product specific documentation at www.luxiumlighting.com/resources

CONNECTING DMX512:

A wired version receives DMX512 via an RJ-45 connector as detailed in the DMX512 standard and include two RJ-45 connectors that are wired identically. Either may be used as the input. The other jack may be used to daisy-chain the DMX512 wiring to additional fixtures. Adaptors are commercially available to convert the DMX512 5-pin XLR cable to an RJ45 connector on CAT5 cable.

The pin-out of the RJ-45 is as follows:

| Pin	Wire Color	Signal
1	White w/ Orange	Data 1 '+'
2	Orange	Data 1 '–'
3	White w/ Green	Data 2 '+' (passed thru only)
4	Blue	Unused
5	White w/ Blue	Unused
6	Green	Data 2 '–' (passed thru only)
7	White w/ Brown	Signal Common 1
8	Brown	Signal Common 2

NOTE: Lights do not include electrical termination of the DMX512 line. In many instances, DMX512 works perfectly well without electrical termination of the cable. If termination is found to be necessary, an external termination plug must be used.

Warning: Accidental connection to non-DMX512 equipment (e.g., an Ethernet Hub at a patch bay) may result in damage to equipment. Pins 4 and 5 may carry voltages outside the EIA- 485 range in telecom applications (e.g., telephone ringing). Pins 4 and 7 may carry voltages outside the EIA-485 range in other applications (e.g., some manufacturers whose distributed DMX512 buffering products require low voltage DC power may use these wires). Plugging into non-DMX systems could cause serious damage to the TR30 and 40

The wireless versions receive a DMX512 signal via a spread-spectrum radio transmission from a compatible wireless DMX transmitter (available from Luxium). The transmitter is connected to a DMX console or computer and then synchronized with the luminaire for a secure wireless connection that works the same way as a wired DMX system. Note that the wireless models also include an RJ-45 connector that can be used to interface with additional wired DMX products.

SWITCH FUNCTIONS (all models):

Operating modes are set via an 8-position switch.
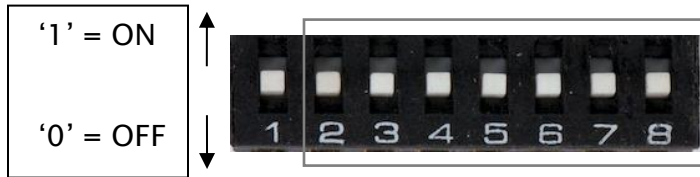
'1' = ON '0' = OFF		When 1 is ON the switches 2 – 8 are used for setting static colors and modes. When 1 is OFF the switches 2 – 8 are used for setting unique DMX addresses for control of single lamps or groups of lamps.

Orientation

In the following discussion, a switch shown with the value of '1' is a switch that is in the up position and a switch that is shown with a value of '0' is a switch that is in the down position.

Switch Summary

The following table summarizes the TR30 switch functionality.

SWITCHES	MODES	SETTINGS
0uuu uuuu	Blended-Color - 4-ch DMX512 mode*	uuu uuuu = zero-based number (0…127)
1010 uuuu	Color-Mixer - 6-channel DMX512 mode*	uuuu = zero-based unit number (1…15)
1000 cccc	Selectable-White - Static CCT mode	cccc = CCT selector (0…15) from table
1001 cccc	Selectable-Color - Static RGBW mode	cccc = Color selector (0…15) from table
1011 0bbb	Ballyhoo mode	bbb = Ballyhoo pattern selector (0…7)

Other switch settings are for factory use only.

The DMX512 modes requires a control signal from a source such as a mobile app, computer program or lighting console. The source creates a DMX signal that is used by the lamp to blend the desired output color and produce the desired brightness level. Other modes use only the DIP switch for control.

The following describe each operating mode in detail.

DMX MODES:

DMX modes are used to control single lamps or groups of lamps which are set up with a DMX address and controlled using a wired or wireless connection to a DMX controller.

Blended-Color - 4-channel DMX512

DMX is an abbreviation for DMX512-A, the ESTA Standard for controlling lighting equipment where up to 512 channels of information are sent one by one from a controller source to many different lamps.

In DMX mode each light receives four channels of DMX information over a wired or wireless interface. The channels are assigned to Red, Green, Blue, and White (RGBW) in that order. Lamp output is based on the request implied by the DMX512 RGBW channel inputs. A colored beam is created by combing the four channels of DMX into an expertly blended and calibrated output using Luxium's advanced lighting engine.

Each lamp is given a user-selected address that represents a sequence of four DMX channels that will be dedicated to that lamp in the DMX universe. The lamp address is set by DIP switches on the side of the lamp. Because the lamp has 7 switches available for address assignments it is possible to have up to 128 different lamp addresses, which use 4 DMX channels each, in a DMX512 universe (128 sets of RGBW channels). Note that more than one lamp may have the same address setting so that lamps can be "grouped".

The switch setting on the lamp represents a sequential group of four DMX channels that a lamp will use for generating light output. The DMX sequences can be calculated as: First DMX channel in an RGBW set = [(position x 4) + 1]. For example; with the DIP switches set to 'zero' the red channel will be at [(0x4) + 1 = 1]. The green channel will be at 2 and white will be at 4.
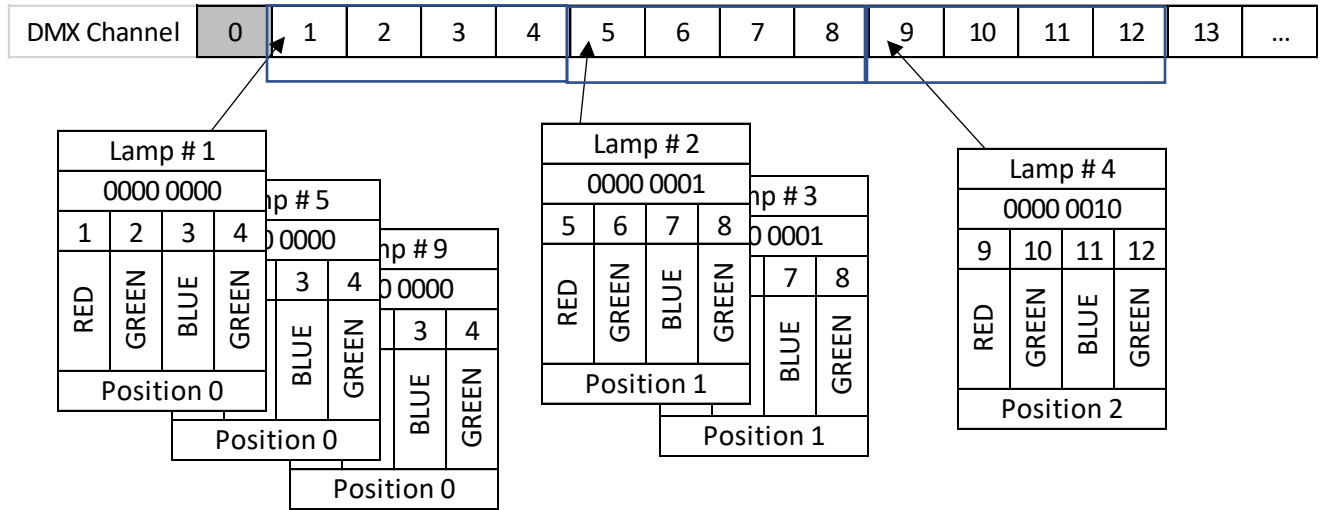
Setting the DIP switches to 0000 0010 will create a binary value equal to (decimal) 2. So, with this switch setting the red channel will be controlled by DMX channel 5. A complete table is included at the back of the user guide to assist in setting the DIP switches.

Switches: 0uuu uuuu

Multiple lamps can be set up with different address assignments depending on the desired operation and control plan. It is important to keep track of lamp designations and locations and switch settings. Below is an example of how lamp information might be organized by a designer who is setting up a show or display area.

Lamp #	Position	DIP Switch	DMX Channels
1, 5, 9	0	0000 0000	1- 4
2, 3	1	0000 0001	5 – 8
4	2	0000 0010	9 – 12
6	3	0000 0011	13 – 16
8	4	0000 0100	17 - 20
-	-	-	-
7, 10	9	0000 1001	37 - 40

Each lamp in the system is set to listen to a unique set of DMX channels

DMX Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	...

Lamp # 1

0000 0000

1	2	3	4
RED	GREEN	BLUE	GREEN

Position 0

Lamp # 5

0000 0000

3	4
BLUE	GREEN

Position 0

Lamp # 9

0000 0000

3	4
BLUE	GREEN

Position 0

Lamp # 2

0000 0001

5	6	7	8
RED	GREEN	BLUE	GREEN

Position 1

Lamp # 3

0000 0001

7	8
BLUE	GREEN

Position 1

Lamp # 4

0000 0010

9	10	11	12
RED	GREEN	BLUE	GREEN

Position 2

Color-Mixer - 6-channel DMX512

In Color-Mixer mode the lamp assigns each internal LED string to a DMX channel. Normal color blending algorithms are bypassed so each available color may be adjusted individually. However, heat compensation routines are still operational to prevent color drift. Six addresses are decoded so that all output PWMs are supported with direct control of each LED string. A small range of unit addresses are supported so that multiple units may be used for different color blends.

The DMX address for the lamp is computed as: Address = ((unit x 6) +1).

Switches: 1010 uuuu

STATIC MODES:

Static modes are used for applications where a lamp or group of lamps needs to show a pre-selected color or white CCT. The lamp output is factory calibrated to display a specific point on the gamut to ensure repeatability and consistency across multiple lamps. When the lamps are set to a specific switch setting all of them will show the same color. The lamps can be operated in either a Selectable-White mode or a Selectable-Color mode.

<u>Selectable-White</u>

In static Selectable-White mode the lamp displays one of 16 pre-defined LED combinations to produce a single pre-calibrated CCT at full intensity. Selectable-White mode is used for applications where a calibrated white light of a specific color temperature is required. When in this mode Lamp does not respond to DMX512 input.

Switches: 1000 cccc

<u>cccc settings</u>

0000 = No output	1000 = 4000K
0001 = 2400K	1001 = 4500K
0010 = 2700K	1010 = 5000K
0011 = 2850K	1011 = 5600K
0100 = 3000K	1100 = 6500K
0101 = 3250K	1101 = Half Red
0110 = 3500K	1110 = Half Blue
0111 = 3850K	1111 = Max White (all on)

<u>Selectable-Color</u>

In static Selectable-Color mode the lamp displays one of 16 pre-defined color at full intensity. Static Full-color mode is used for applications where a lamp or group of lamps needs to show a consistent pre-selected color. The colors are calibrated to display a specific point on the gamut and are factory calibrated so all lamps will show the same color when set to a specific switch setting. When in this mode the lamp does not respond to DMX512 input.

Switches: 1001 cccc

<u>cccc settings</u>

0000 = No output	1000 = B.A. (Bastard Amber)
0001 = Red	1001 = Special Lavender
0010 = Green	1010 = Steel Blue
0011 = Yellow	1011 = Violet
0100 = Blue	1100 = Blue-Green
0101 = Magenta	1101 = Orange
0110 = Cyan	1110 = Tungsten (2700K, high CRI)
0111 = Blended White from RGBY (This setting matches DMX RGB=On, W=Off, 6500K)	1111 = All White, RGBW (This setting matches DMX RGBW fully on, CCT~4000K

Ballyhoo

Ballyhoo mode is used for putting the lamp into an automatic operation mode that is able to show a repeating range of color and intensities. In this mode the TR will run one of 8 user-selectable color sequences. These sequences are pre-defined by an internal program stored inside the lamp system. When in this mode the TR does not respond to the DMX512 input.

Switches: 1011 0bbb   (bbb = Ballyhoo pattern selector as follows)

0bbb settings

0000 = six-color cycle: [magenta, blue, cyan, green, yellow, red] medium-speed fades.
0001 = six-color cycle: As above. slow-speed fades.
0010 = seven-color cycle: As above with white interspersed, medium-speed fades.
0011 = salsa: pseudo-random bounce of saturated colors.

0100 = traffic: [blue-green, yellow, red] snap to each color.
0101 = x-mas: [red, tungsten, blue-green, tungsten] slow fade.
0110 = winter wonderland: [cyan, steel-blue, white, steel-blue, blue] slow fade.
0111 = sunset: [special-lavender, amber, orange, violet, blue, black, tungsten], slow fade

DMX512 Address Settings:

The Luxium RGBW control method occupies 4 slots on the DMX512 network, starting at the address shown in this chart.

Switch	DMX	Switch	DMX	Switch	DMX	Switch	DMX
0000 0000	1	0010 0000	129	0100 0000	257	0110 0000	385
0000 0001	5	0010 0001	133	0100 0001	261	0110 0001	389
0000 0010	9	0010 0010	137	0100 0010	265	0110 0010	393
0000 0011	13	0010 0011	141	0100 0011	269	0110 0011	397
0000 0100	17	0010 0100	145	0100 0100	273	0110 0100	401
0000 0101	21	0010 0101	149	0100 0101	277	0110 0101	405
0000 0110	25	0010 0110	153	0100 0110	281	0110 0110	409
0000 0111	29	0010 0111	157	0100 0111	285	0110 0111	413
0000 1000	33	0010 1000	161	0100 1000	289	0110 1000	417
0000 1001	37	0010 1001	165	0100 1001	293	0110 1001	421
0000 1010	41	0010 1010	169	0100 1010	297	0110 1010	425
0000 1011	45	0010 1011	173	0100 1011	301	0110 1011	429
0000 1100	49	0010 1100	177	0100 1100	305	0110 1100	433
0000 1101	53	0010 1101	181	0100 1101	309	0110 1101	437
0000 1110	57	0010 1110	185	0100 1110	313	0110 1110	441
0000 1111	61	0010 1111	189	0100 1111	317	0110 1111	445
0001 0000	65	0011 0000	193	0101 0000	321	0111 0000	449
0001 0001	69	0011 0001	197	0101 0001	325	0111 0001	453
0001 0010	73	0011 0010	201	0101 0010	329	0111 0010	457
0001 0011	77	0011 0011	205	0101 0011	333	0111 0011	461
0001 0100	81	0011 0100	209	0101 0100	337	0111 0100	465
0001 0101	85	0011 0101	213	0101 0101	341	0111 0101	469
0001 0110	89	0011 0110	217	0101 0110	345	0111 0110	473
0001 0111	93	0011 0111	221	0101 0111	349	0111 0111	477
0001 1000	97	0011 1000	225	0101 1000	353	0111 1000	481
0001 1001	101	0011 1001	229	0101 1001	357	0111 1001	485
0001 1010	105	0011 1010	233	0101 1010	361	0111 1010	489
0001 1011	109	0011 1011	237	0101 1011	365	0111 1011	493
0001 1100	113	0011 1100	241	0101 1100	369	0111 1100	497
0001 1101	117	0011 1101	245	0101 1101	373	0111 1101	501
0001 1110	121	0011 1110	249	0101 1110	377	0111 1110	505
0001 1111	125	0011 1111	253	0101 1111	381	0111 1111	509

For DMX geeks:
The dip switch sets the zero-based unit number. The DMX base address is computed as:
DMX512 Address = ((unit_number x 4) + 1)