Austin Led Consultants
DMX and Led power over ethernet
ATX-LED

Atx Led Consultants Inc
815-A Brazos #326
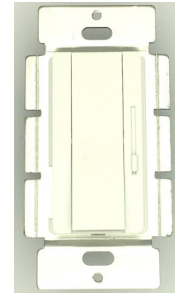Austin Tx, 78701
512 377 6052

http://atx-led.com

AL-WS-DMX v1
wall dimmer
with DMX output

Product Description - AL-WS-DMX

This switch operates just like any standard residential light switch – however it uses DMX512 for communication with other devices.   This DMX source in a standard residential style outline fits into any home, looks like any switch yet requires no licensed electrician for installation – the dimmer itself uses under 50 mw yet controls thousands of watts of lighting. Stand alone it operates as a single Universe for one DMX address.   It has DMX in and DMX out for daisy chaining multiple switches.   The DMX address is set by a dip switch using a sequence of steps – once set, you can forget it. Call if you have difficulty.

The On/Off switch is like any normal switch. The slider sets the brightness.   In Color modes, the slider can adjust the RGB color as well.

Each switch operates in collision detection, multi master mode – each one builds a universe of DMX addresses and learns the status of other switches.   Thus multiple switches can control the complete universe.   In single address, white operation, the device supports 3-way switching – each switch can share the same destination DMX512 address and the last switch moved will control the On/Off and dim level.

To save space – the connector used is a RJ-11 phone type connector with power and data on the same connector.   Supply the switch with 12v to 56v and connect the data pins to your DMX device with a RJ11 to XLR jumper cable as shown below.   Use simple phone wire up to 1000 ft over standard CAT-3 2 pair telephone wire.   Termination of the end of the line is essential.
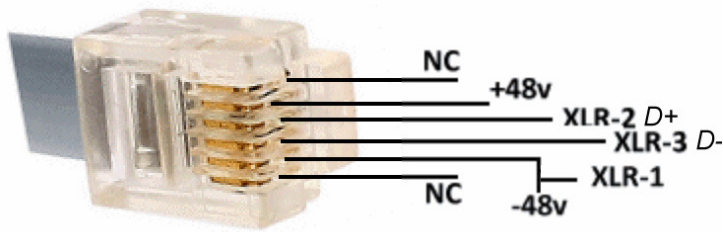
In modes other than single address – this device is designed to be used in a one switch, one DMX address configuration without 3-Way, you can still share the bus between different addresses.

Fully scalable to a 512 light DMX universe, this building block in a 100% low voltage led lighting solution allows low cost installations of wall switches controlling DMX lights;.

Specifications

Power and data source and load	RJ 11 female connectors (2)
Power Protocol	Passive power from the RJ11
Input voltage range	12v to 57 volts
Power pins in	See Diagram
Data pins (DMX512 over Rj11)	XLR2 D+ and XLR3 D- with collision detection
Max Power consumption	50 milliwatts
Addressing	512 unit addresses via dip switch
Protection	Reverse protection and static protection
Operating Temperature	0°C ~ 50°C
Size	108H (metal) 70H x 34 D x 42 W mm
Multi Master shared DMX bus	Supported
3-Way operation with multiple switch	Supported in single address, white only
Termination Resistor	Version 3 hardware adds a switch for simple 120 ohm termination at the end of the run

XLR2 D+ connects to your DMX decoder

XLR-3 D- connects to your DMX decoder

XLR-1 Ground connects to your DMX decoder

DMX wall switch configuration

The AL-DMX wall switch is designed for these operational modes:

- Control of single address, white light DMX drivers with a single address and 3-Way switching – up to 16 addresses are supported in the range of 1 to 16

- Control of DMX512 RGB drivers with three popular RGB channel assignments. Addresses from 1 thru 500 are supported. Multiple switches can share the same DMX bus and control different destination addresses. Contact us for specialty RGB addressing methods.

- For applications with more than 16 DMX addresses, DALI to DMX converters, please see our cloud enabled DMX solution for home automation.

At power up, and every 5 seconds – the PB5 LED will flash to display the operational status – it will flash 1 long pulse for mode 0 (default) or 1 thru 15 pulses for the modes as shown below. This is best viewed if the switch is turned off.

At power up – the color and On/Off/Dim levels will be restored to those values before the power outage

DMX 3-Way control

Multiple DMX switches on the same bus operate in 3-Way mode for up to 16 DMX fixture addresses 1-16. We use DMX addresses 17 thru 512 to construct a representation of up to 256 physical switches. Set each switch to an address from 1 to 16.

One or many switches can have the same DMX address (from 1 to 16). The state information required to resolve the On/Off/Dim status of the combination of all 256 possible combinations is stored in the DMX universe and correctly interpreted by the switches.

NOTE: 120 ohm termination of both ends of the DMX bus is critical and essential.

DMX color control

Turn the switch on to adjust the brightness with the slider. Turn the switch off to adjust the color. Movement of the slider will cause the color to change, (the light will turn on for 2 seconds). To end the color change option, wait 2 seconds or turn the switch on. The color will be stored inside the switch and will be restored at the next power cycle.

Setting the Slider to the top will set White. From bottom to below top will select RGB color mixtures

DMX Standard modes

The factory default setting can be changed from Residential mode to DMX mode.

Set a standard 2.54mm jumper on pins 2-3 of the header on the PCB to enable programming mode, set the address DIP switch, the master rocker and slider per the list below.   Press the reset button to store the values in local flash memory. Remove the jumper. The reset button, if the jumper is installed, will store the feature code into flash memory.

The Rocker switch and the 4 dip switches control the feature code – see the table below.   A function code of 0 (with rocker on) resets all values to factory default (ATX non DMX mode).   Please use modes 1 thru 15 for DMX.

A DMX address has a 9 bit base (starting address) defined by the display on the DMX fixture.   Each fixture then has channels that are addressed starting at the base – up to 4, 8, 16 or any number.

To build that 9 bit address, we use the 4 visible physical bits, times the number channels in the fixture.   The upper 5 bits (4-8) are set by the configuration table on the next page.   Note: 15 base addresses can be configured simply by the 4 bit physical switch, for up to 15 fixtures.

To program the upper 5 bits, set the Rocker off, then the 4 dip switches will be copied to DMX address bits 4-7 after pressing the reset button.   This allows addresses 16 thru 256.   For addresses 257-512, bit 8 must be also set - see command 15 below.

After leaving setup mode, the dip switch is read as 0-15. A setting of 0 isn't allowed. The DIP switch value is multiplied by the multiplier factor.   For most LED fixtures – the multiplier is 8.   The complete starting DMX address for a fixture is therefore:
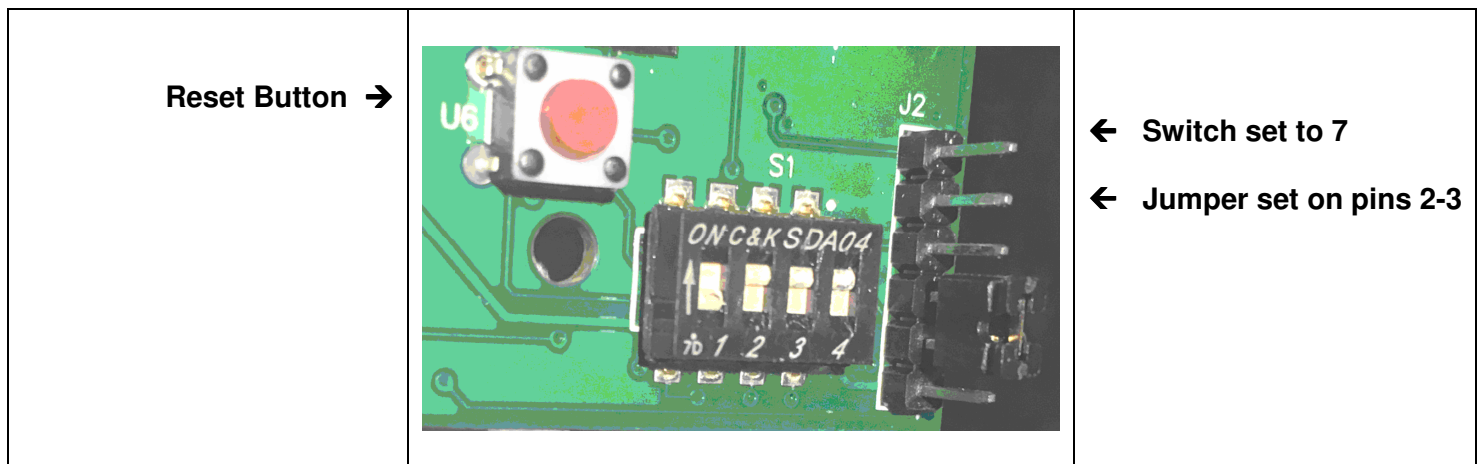
(Dip Switch times multiplier) + Bits 4-7 times 16 + Bit 8 times 256

For example, if bit 8 is on, Bits 4-7 equal 6, and the Dip Switch is 7, the multiplier is 8 then the complete address is
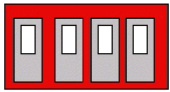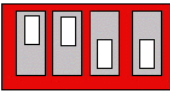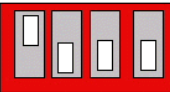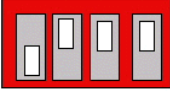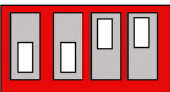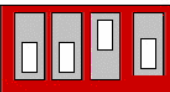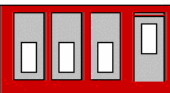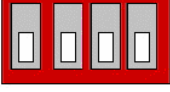
$$7*8 + 6*8 + 256 = 360$$

note: (A DMX address of 0 would be promoted to 8 to avoid our custom header)

Reset Button, Dip Switch and Configuration Jumper

Reset Button ➔

← **Switch set to 7**

← **Jumper set on pins 2-3**

Remove Configuration Jumper after programming!!!

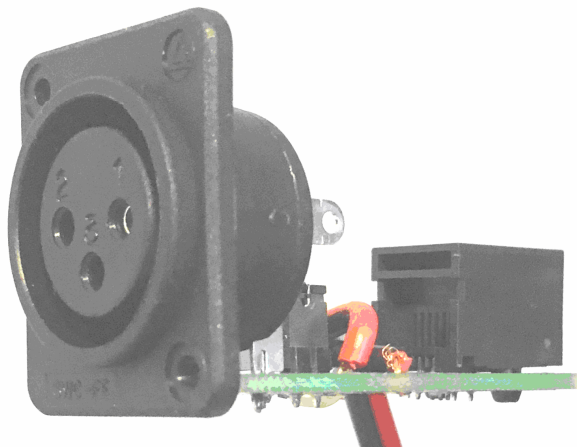| Rocker	DIP Switch	value	Feature Codes – configuration settings	Default Refresh Rate	Default Address Multiplier
on		15	Set DMX address bit 8 to 1 – for addresses 257 to 512	NC	NC
on		14	Consecutive mode 12 DMX address 1 thru 12 will be given the same value from the ON/OFF switch and dimmer	NC	12
on		13	Tunable White mode. DMX Address odd is Warm White, next sequential even address is Cool White. V13 or later firmware required.	NC	NC
on		12	Consecutive mode 8 DMX address 1 thru 8 will be given the same value from the ON/OFF switch and dimmer	NC	8
on		11	RGB Mode type '567' Channel 1 = 255 for ON, 0 for OFF, Red is Channel 5, Green is Channel 6, Blue is Channel 7. Channel 1 is the DMX address (from 8 to 496), the slider selects the Color.	5 Hz	8
on		10	Consecutive mode 4 DMX address 1 thru 4 will be given the same value from the ON/OFF switch and dimmer	NC	4
on		9	Consecutive mode 2 DMX address 1 and 2 will be given the same value from the ON/OFF switch and dimmer	NC	2
on		8	Address multiplier is 4 – all other options unchanged	NC	4
on		7	Support for up to 15 switches in virtual 3-Way. Same as mode 1, plus 3-way. Use addresses 1-15.	5 Hz	1
on		6	Consecutive mode 16 DMX address 1 thru 16 will be given the same value from the ON/OFF switch and dimmer	NC	16
on		5	Set DMX Refresh rate. Slider allows 40 hz (top) or slower refresh rates – LED flashes to show the rate. DMX packets are sent during this setup. When done, turn the rocker off and the speed will be stored.	set	NC
on		4	White spotlight mode. Channel 1 = 255 for ON, 0 for OFF, Channel 5 is dimmable from 0 – 255.	5 Hz	8
on		3	set DMX Color using the slider to Color or White If white, then Channel 1 is brightness from 9-134 if color, then Channel 1 is 255 and Channel 2,3,4 are the colors RGB and the intensity is controlled by the brightness slider	5 Hz	8
on		2	RGB mode type '234' Channel 1 = 255 for ON, 0 for OFF, Red is Channel 2, Green is Channel 3, Blue is Channel 4. Channel 1 is the DMX address (from 8 to 496), The slider selects the Color.	5 Hz	4
on		1	Simple single channel mode. The brightness goes from 0-255 on channel 1 as the DMX address (from 1 to 509), 3-Way not supported (see mode 7)	5 Hz	1
on		0	reset to Factory Default, resets all functions ATX-LED non-DMX Mode is default – see last page	30s	8
OFF	Any	0-15	Copy address bits to DMX address 4-7 (allows addresses 16-256) example: 8 means = 128 9 means = 144 for 256-512 please execute command 15 after setting this function.	NC	NC

DMX multi master mode – Option

In this mode – you simply connect multiple switches on the same DMX bus and each switch will learn the status of all other switches and maintain a complete universe.   This works like RDM using a modified DMX packet that is ignored by DMX devices.   Contact us for details.   This allows 3-way switching on up to 16 DMX12 addresses.
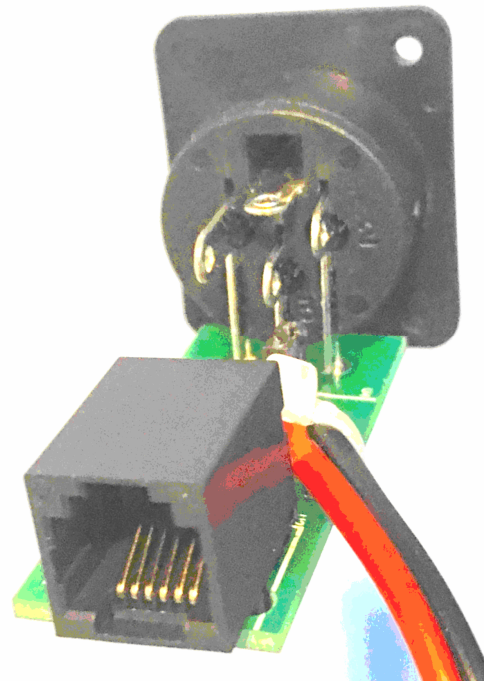
.

XLR to RJ11 Adapter PCB

This device adds power to the RJ11 connector and has an XLR connector for standard fixtures. A standard 2.1mm x 5.5mm DC connector is used for power.

Input power is 12v to 48v, it has a fuse for protection, plus static protection Diodes and an optional termination resistor (120 ohms) - set the Jumper to implement termination.
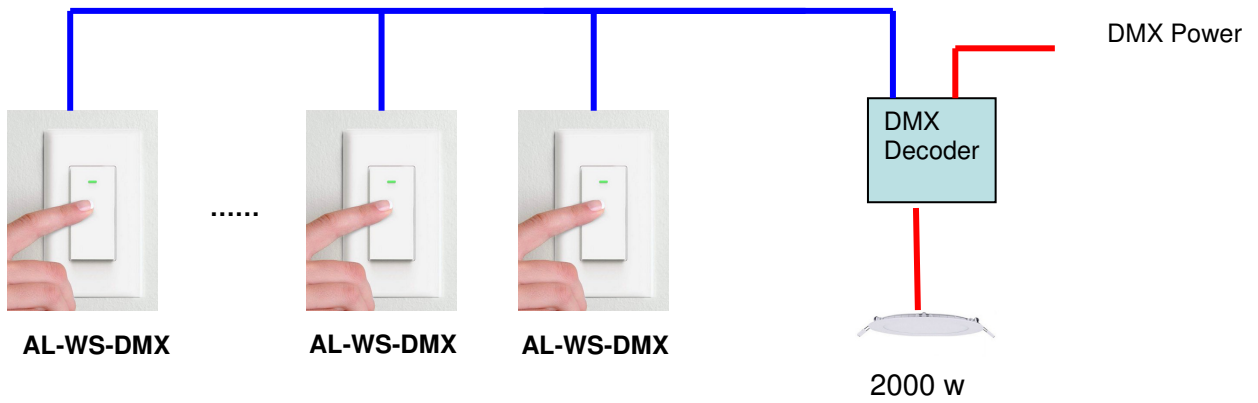
XLR connector	RJ11 connector

DMX House Lighting

ATX LED

100% DC low voltage

DMX universe

DMX twisted pair cable

DMX Power

DMX Decoder

AL-WS-DMX   ......   **AL-WS-DMX**   **AL-WS-DMX**

2000 w

Special ATX LED Residential mode

DMX Packet: Special DMX packet header from the switch, must be used with a PL-DR1 device

DMX address	1	2	3	4	5	6	7	DMX	DMX+1
Content	100	DMX bit 8	DMX 0-7	Random H	Random L			0 if off else DIM	DIM Level

Stand Alone operation:

- In default mode in a small system – simply set the 4 address switches to the address of the ATX-LED LED driver, nothing else needs to be done.
- 4 bits of DIP switch addresses, addresses possible are 8, 16, 24, 32, etc up to 120. This is the DMX Base Address (N)
- Higher addresses are possible with the config options shown on page 4
- DMX512 repeat interval is 1 minute - switch repeats each 60 seconds by default – for higher speeds see page 4
- For 3 -Way operation a 16 bit random number is coded into fields 4 and 5
- Slider is brightness. Slider works in On or Off state.
- DMX512 address is set to brightness if Switch is ON (simple mode) or 0 if off
- DMX512 address +1 is set to the brightness only – for 3-Way resolution.
- Daisy chain up to 8 switches in series using the RJ11 connector – connect one end to a AL-DR driver, if the distance between switches is over 2 feet – terminate the last switch furthest from the LED driver with a 120 ohm resistor.

Consolidated operation:

When combined with a AL-DR1 consolidator - This mode supports:

- N-Way light control – multiple switches on the same DMX address will be XOR'd to control the light on/off and dimming. Last switch moved sets the dim level and On/Off
- Loop prevention. Since we consolidate up to 64 switches in one DMX universe, we create a loop to communicate between up to 8 controllers.
- Any of our AL-DMX-DR devices can consolidate up to 64 switches, resolve 3-way, and output a complete DMX universe.
- Output packet is standard DMX512 – do not assign any fixture to address 1 thru 8

Austin Led Consultants

DMX and Led power over ethernet

ATX-LED

ATX LED Consultants Inc
815-A Brazos #326
Austin Tx, 78701
512 377 6052
http://atx-led.com