Aurorashow

X3-SPLIT

(Model DMX-X3-ISO Rev C)

User Manual

Revision 140915

Contents

Introduction

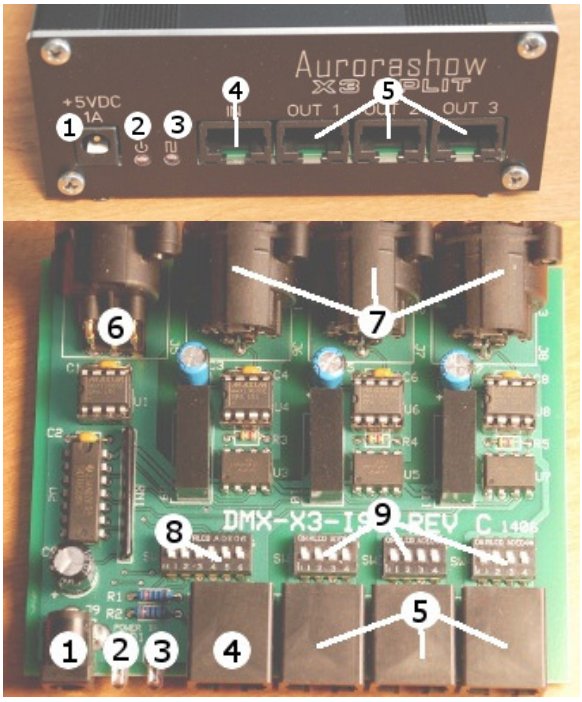
Congratulations on your purchase of the Aurorashow X3-SPLIT. You now own a Splitter/Isolator/Booster with DMX, D-Light, and LOR compatibility. Please read this user manual carefully in order to take full advantage of its various features.

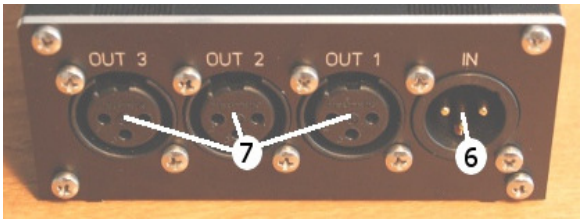
Features

- Split: Splits one DMX, LOR, or D-Light cable 3 ways
  - Simplifies cabling requirements
- Isolate: Input/Outputs are isolated (power and data) from each other
  - Protects your PC and/or upstream devices from downstream electrical failures
  - Fixes data ground loop issues
  - Minimum 1kV isolation per input/output strip
- Boost: Each output generates a new full strength signal
  - Extends the usable cable length and/or number of devices
  - Fixes data issues caused by long cable lengths and/or too many devices
  - Each output drives up to 5000 feet of cable having up to 32 devices (exact usable length will vary depending on application; expect 500 feet in typical use)
- Adapt: Each input/output can be individually configured for one of several wiring modes
  - XLR (3-pin)
  - D-Light/LOR RJ-45
  - J1Sys/Lynx RJ-45
  - "Dual Mode" (see below)
- Signal Conditioning
  - Slew rate limiter improves immunity to data corruption issues caused by HF reflections in some cable runs
- Dual Mode capable
  - Sends to both D-Light/LOR and J1Sys/Lynx wiring simultaneously over a single RJ-45 cable*
  - Eliminates special adapters between controllers

* Use in Dual Mode wiring configuration requires a special line terminator (Aurorashow TERM-1245), sold separately.

Panel & Board Layout





1. DC Power Jack
2. Power Indicator LED
3. Data Indicator LED
4. Data In (RJ45)
5. Data Out (RJ45)
6. Data In (3 pin XLR)
7. Data Out (3 pin XLR)
8. Input Wiring Configuration (SW1)
9. Output Wiring Configuration (SW2, SW3, SW4)

Precautions

- This device is intended for hobbyist usage and is not for use in life safety applications.
- Use only with the supplied power adapter. Use of the wrong adapter can result in damage to the device and/or overheating.
- This device is not waterproof. Do not expose this device to rain, wet, or damp conditions. When used in outdoor applications a water resistant encolsure is required (recommendations: CableGuard CG-2000 or CG-1500).

Device Setup/Configuration

Your X3-SPLIT has been designed for several different wiring standards and protocols. Before using your X3-SPLIT it is necessary to configure it for your specific wiring and application. Please follow the directions below to configure (or reconfigure) your device:

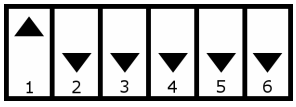
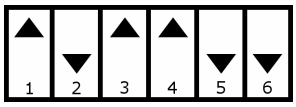
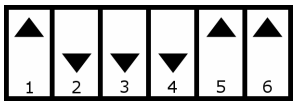
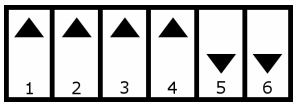
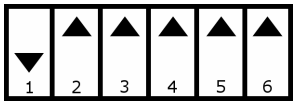
Step 1 – Board Removal

If you purchased your X3-SPLIT with an enclosure then you will first need to remove the circuit board from the enclosure by removing the four screws show below (circled in red) from the back side of the enclosure and then gently pulling the back plate and circuit board out of the enclosure (it is not necessary to remove the other four screws on the back panel or the four located on the front panel).

Step 2 – Data In Wiring Configuration

Locate the DIP switch labeled "SW1" near the front left of the circuit board. Using a ball point pen or similar pointed object, set the switches to the correct position for the data wiring coming **into** your device from table 1 below:

Table 1: Input Wiring Selection

Input Wiring	Switch Positions	Details
XLR (if equipped)		Use this setting if your device receives its incoming data from the 3-pin XLR "IN" jack located on the back panel.
J1Sys / Lynx / Misc. DMX		Use this setting if your device receives its incoming data via the front panel RJ45 connector from a J1Sys E1.31 gateway, Lynx EtherDongle, or from the chain output of a Lynx controller (or any other device which uses pins +1/-2/C7-8).
D-Light / LOR		Use this setting if your device receives its incoming data via the front panel RJ45 connector from a D-Light or LOR USB-485 adapter or from the chain output of a LOR/D-Light controller (or any other device which uses pins +4/-5/C6).
Advanced: Both J1Sys/Lynx and D-Light/LOR (dual wiring)	Standard:  Alternate:  (for better receive performance when used with low skew rate cabling and controllers – if you don't know what this means then use "standard")	Use this setting if your device receives its data from the front panel RJ45 connector from a data line which contains both wiring standards (such as a data line driven by the another X3-SPLIT that has been configured for dual wiring output mode). Use this setting *only* if both wiring types are present on your incoming data cable.

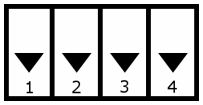
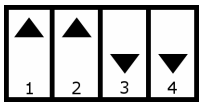
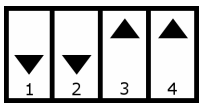
Renard	contact support	Your device does not natively support Renard wiring (-4/+5) but may be configured for such with a simple modification. Please contact support for details on using your X3-SPLIT with Renard wiring.

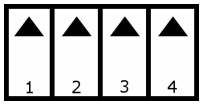
If you are uncertain which input selection you need to use then contact support for further guidance.

Step 3 – Data Out Wiring configuration

Locate the DIP switches labeled "SW2", "SW3", and "SW4" near the front of the circuit board (just behind the RJ45 jacks). Using a ball point pen or similar pointed object, set the switches to the correct position for the data wiring going **out** of your device using the table below (SW2 sets output 1, SW3 sets output 2, and SW4 sets output 3):

Table 2: Output Wiring Selection

Output Wiring	Switch Positions	Details
XLR		Use this setting if you want the output to be routed to the back panel 3-pin XLR connector. The front panel RJ45 connector for this output will be disabled.
J1Sys / Lynx / Misc. DMX		Use this setting if you want the output to be routed to the front panel RJ45 and configured for Lynx / Misc. DMX wired devices (+1/-2/C7-8). This setting can also be used to send to Lynx/DMX wiring on the front panel RJ45 while simultaneously sending to the XLR on the back panel. Although it can work well under most circumstances, simultaneous RJ45 and XLR sending is not fully DMX-512 compliant. If you choose to use both the RJ45 and the XLR outputs at the same time then your maximum cable length will be reduced and the endpoints of <u>both</u> lines must be properly terminated. Recommended termination parts: Aurorashow TERM-1245 and Aurorashow TERM-XLR3
D-Light/LOR		Use this setting if you want the output to be routed to the front panel RJ45 and configured for D-Light / LOR wired devices (+4/-5/C6). Note: This setting can also be used to simultaneously send to D-Light/LOR wiring on the front panel and to the XLR on the back panel. Although it

		can work well under many circumstances, simultaneous RJ45 and XLR sending is not fully DMX-512 compliant. If you choose to use both the RJ45 and the XLR outputs at the same time then your maximum cable length will be reduced and the endpoints of <u>both</u> lines must be properly terminated. Recommended termination parts: Aurorashow TERM-1245 and Aurorashow TERM-XLR3
Advanced: Both J1Sys/Lynx and D-Light/LOR (dual wiring mode) **No more adapter cables!**		Use this setting if you want the output to be routed to the front panel RJ45 and configured to output ***<u>both</u>*** wiring types ("dual wiring mode"). By using this setting it is possible to chain together D-Light/LOR and Lynx/DMX controllers on the same data line without the use of adapter cables. (+1/-2/+4/-5/C6-8) Use of this setting will result in a reduced maximum cable length (but likely still adequate) and requires the use of the Aurorashow TERM-1245 data line terminator at the end of your data line to function correctly (the termination options available on your controllers is not adequate to terminate a dual wiring mode data line). *Although this setting works well for hobbyist use, it should not be used in situations where absolute compliance with the DMX-512 standard is required since it uses DMX in a non-standard way.* Caution: Do not attach anything to the matching back panel XLR output when using the RJ45 dual wiring mode. It is not possible to reliably send all three wiring types simultaneously.
Renard	contact support	Your device does not natively support Renard wiring (-4/+5) but may be

		configured for such with a simple modification. Please contact support for details on using your X3-SPLIT with Renard wiring.

Step 4 – Reassembly

Gently insert your X3-SPLIT board and back panel into the enclosure (if equipped) using the lowermost slot. Refasten the four corner screws.

Advanced Options

(use only if you know what you are doing)

Input Pass-through:

Although your X3-SPLIT does not contain XLR or RJ45 pass-through jacks for placing the device within the middle of the daisy chain, it is possible to configure the X3-SPLIT for an input pass-through mode such that the back panel XLR “IN” jack will become a pass-through output for the front panel RJ45 input. To do this, set the desired input wiring configuration for the RJ45 using table 1 and then set SW1 switch position 1 to the “off” position. If “dual wiring” input mode is required then use the “Standard” option from the table since the alternate option is not supported with pass-through use. This will enable the unused input jack as a data pass-through output and will also disable the data line termination performed by the X3-SPLIT. If required, an adapter may be used to convert the front panel RJ45 to XLR and/or convert the back panel XLR to the appropriately wired RJ45. (Aurorashow ADAPT-12XLR3F / ADAPT-45XLR3F).

Technical Specifications

Power Requirements	+5VDC, 1A max (100mA-500mA nominal depending on output configuration); 5VDC 1A power adapter included
Supported Protocols	DMX D-Light LOR LOR-HS RS485 (unidirectional 56kbps – 500kbps)*
Supported Wiring	DMX 3-pin XLR J1Sys / Lynx / Misc. DIY (+1/-2/C7-8) D-Light / LOR (+4/-5/C6)
Input Termination	120 ohms
Maximum Output Cable Length (per output)	5,000 feet
Recommended Output Cable Length (per output)	<400 feet
Maximum Attached Devices (per output, 12k receiver impedance [DMX standard])	32
Maximum Attached Devices (per output, 96k receiver impedance)	256
Maximum Data Rate	500kbps*
Standard Transceivers	MAX13085E
Slew Rate Limiting (reduces data reflection and termination issues)	Yes
Output Short Circuit Protection	Yes
Input-Output Isolation	1kV minimum
Output-Output Isolation	1kV minimum
Data-Mains Isolation	1kV minimum
Supported Temperature Range	-40° C to 50° C (-40° F to 122° F)
Inputs	1x 3-pin XLR DMX 1x RJ45 1x DC power connector
Outputs	3x 3-pin XLR DMX 3x RJ45
Indicators	Power Data
Injuries	No elves were injured during the making of this product

* Increasable up to 10MBPS for custom applications using alternate transceiver options- contact support for more information.

Schematic Diagram