INTRODUCTION:

Thank you for purchasing an Applied Electronics Omni DMX splitter. The Omni line has been designed, built and tested with pride in the USA. Your Omni splitter comes with a 5 year warranty and has been constructed to endure years of use in the rough and tumble entertainment environment.

The ANSI E1.11-2008(R2013) standard, commonly know as DMX, is an RS-485 digital protocol for transmitting data from a controller to entertainment lighting and practical devices. While the DMX signal is very robust it is not impervious to outside interference. There are also limitations to transmitting distance and the number of receivers on a line. For these reasons a splitter is an invaluable tool in the data chain to ensure that the data transmitted reaches receivers correctly.

Common data chain issues include:

- **Splitting** – By the DMX standard, only 32 receiving devices may be connected on a daisy chain line. Also “Y” connections used to send signal in different directions are not permitted.
- **Line loss** – Due to DC voltage loss continuous DMX lines in excess of 1000ft are not recommended.
- **Interference** – Outside electromagnetic sources can corrupt the data on a DMX line and cause undesired operation of lighting fixtures.
- **Surges** – Voltage spikes from shorted cables and faulty fixtures can feed down the data chain and damage other fixtures or the console.

The Omni splitter helps eliminate all of these issues by:

- **Isolation** – Each output transmits its own copy of the input signal so that that 32 fixtures may be connected to each port.
- **Amplification** – Because each output transmits with the same full power as the original, total line lengths of more than 1000ft may be obtained.
- **Filtering** – The input data signal is digitally copied in the isolation process so only clean data is fed to the outputs. As a result any (acceptable) interference received at the input is filtered out before being retransmitted.
- **Isolation** – The input as well as each output port are separated from each other by galvanic and optical isolation. This ensures that a damaging voltage spike on one line can’t propagate to another.
- **Voltage suppression** – All data ports have TVS (transient voltage suppression) diodes that short voltage spikes to ground before they can damage internal components.
Power input

- Your Omni DMX splitter is equipped with a universal power supply which will allow it to operate on input voltages of **85-250 VAC @ 47-66Hz**.
- A **1 amp 250V fuse** (3AB 1/4”x1-1/4” style) is provided for protection of internal components and should not be replaced with a fuse larger than 1 amp.
- The power input connector is a Neutrik *powerCON* 20A (NAC3MPA-1) and is compatible with the NAC3FCA cable mount plug.
- The loop-thru *powerCON* connector is an NAC3MPB-1 and is compatible with the NAC3FCB cable mount plug.
- **The loop-thru connection is limited to 10A.** Do not connect more than 10A of load current to this outlet as it may cause damage to the unit.
- Each splitter comes with a 3' *powerCON* to NEMA 5-15 (Edison) input power cable.
- 1' *powerCON* A-B jumper cables may be purchased separately to interconnect multiple units.

Data input

- XLR input and loop-out data connectors are provided for feeding DMX data into the Omni splitter and connecting other devices to the same DMX line.
- The loop-out connector passes all 5 pins directly and is not isolated from the input.
**Termination switch**

When engaged the termination switch places a 120ohm resistor between pin number 2 & 3 of the 5 pin input XLR connector. This resistor prevents data reflection back down the transmission line. The terminator should only be engaged when no other devices are connected to the loop-out data connector. If other devices are connected to the loop-out connector the last device should be appropriately terminated.

When lit the 3 LED indicators on the front of the Omni Splitter inform the user that:
- ✔️ POWER – The universal power supply is converting input voltage to 5VDC
- ✔️ SIGNAL – Digital data is being passed by the RS-485 receiving chip
- ✔️ TERM – The termination switch is pushed in and the line is terminated

**Data output**

- XLR output data connectors are provided for feeding DMX to up to 32 receivers each.
- The power supply for each output is galvanically isolated from the input and the other outputs.
- The data line of each output are optically isolated from the input and the other outputs.

**Maintenance**

No routine maintenance procedures are required as your Omni DMX splitter is a solid state device that should provide years of trouble free operation.

**Cleaning**

Should your unit become dirty, disconnect power and clean the outside of the chassis with mild soap and a damp cloth. Do not submerge the unit in water or use harsh or abrasive cleaners. Do not connect power until the chassis has fully dried.

Excess dust may be gently blown from the interior of the unit using a can of electronics cleaner (compressed air). Do not use high pressure, wet or oily “line air.”
**Troubleshooting**

Your Omni DMX splitter requires no configuration or setup, however if something doesn't seem to be working correctly you can check the following items. Please feel free to call Applied Electronics for tech support at any time. (800) 883-0003

When checking data issues it is helpful to have a known working device (dimmer, LED light etc) to test with. If you suspect that your splitter is not working correctly, test a single DMX device by connecting it directly to your console and confirm that it functions normally. You can then compare this “known good” functionality to the operation when connected to a splitter output. This is method is referred to as “test with device” in the troubleshooting table below.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power LED</td>
<td>No power supplied to unit</td>
<td>Check the source power outlet and the power supply cable. Confirm that the powerCON connector is twisted into the “locked” position.</td>
</tr>
<tr>
<td></td>
<td>Input power fuse blown</td>
<td>Remove fuse (¼ turn) and check. If blown, replace with MAX 1A 250V fuse</td>
</tr>
<tr>
<td>No signal LED and no DMX from loop-out port</td>
<td>No data being received from transmitter (console)</td>
<td>Test data line with device</td>
</tr>
<tr>
<td>No signal LED but good DMX confirmed at loop-out port</td>
<td>Failed RS-485 receiving chip</td>
<td>Replace receiver chip by following steps in the repair section</td>
</tr>
<tr>
<td>Signal LED on but no output from any port</td>
<td>Signal may not be compatible DMX</td>
<td>Test data line with device</td>
</tr>
<tr>
<td>Signal LED on but no output from any isolated port</td>
<td>Disconnected jumper cable</td>
<td>Check jumper cable connection between input and output PCBs</td>
</tr>
<tr>
<td>No output from a single isolated output port</td>
<td>Failed optical isolation or RS-485 transmitter chip</td>
<td>Replace opto-iso and/or transmitter chips by following steps in the repair section</td>
</tr>
</tbody>
</table>
Repair

Shorted cables, faulty fixtures and accidents do occur, so it is possible that at some point in the life of your splitter a data port may be subjected to voltages or currents that exceed the capacity of the built in protection. In that case a receiver/transmitter or optical isolation data chip may be damaged. In order to keep down time to an absolute minimum spare data chips are included on board for immediate solder free replacement.

If after following the trouble shooting guide you believe it necessary to replace the input RS-485 chip:

1. Unplug power from the splitter
2. Remove the top cover
3. Remove chip #U1 “INPUT SN75176” by pulling it straight up and out of its socket. (A small flat blade may be used to gently pry the chip up but be careful not to bend the leads or damage the socket)
4. Remove the “SPARE SN75176” from its socket in the same manner
5. Align the spare chip with the U1 socket, being sure that the “dimple” signifying the “pin 1” end of the chip is at the same end as the “notch” in the socket (right hand end as pictured)
6. Gently press the spare chip until it seats fully in the socket, being careful not to bend any leads
7. Replace the top cover
8. Re-test the unit for correct operation

If after following the trouble shooting guide you believe it necessary to replace the output RS-485 and/or optical isolator chip for a specific channel:

* NOTE: It is recommended that the SN75176 be replaced before the 6N37

1. Unplug power from the splitter
2. Remove the top cover
3. Remove the possible faulty chip (U1-U5 6N37 opto-iso or U6-U10 output SN75176) by pulling it straight up and out of its socket. (A small flat blade may be used to gently pry the chip up but be careful not to bend the leads or damage the socket)
4. Remove the SPARE 6N37 or SN75176 (as needed) from its socket in the same manner
5. Align the spare chip with the empty socket, being sure that the “dimple” signifying the “pin 1” end of the chip is at the same end as the “notch” in the socket (right hand end as pictured)

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6. Gently press the spare chip until it seats fully in the socket, being careful not to bend any leads
7. Replace the top cover
8. Re-test the unit for correct operation
<table>
<thead>
<tr>
<th></th>
<th>Omni 1x5</th>
<th>Omni 1x10</th>
<th>Omni 2x5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power input connector</td>
<td>Neutrik powerCON 20A NAC3MPA-1</td>
<td>Neutrik powerCON 20A NAC3MPB-1</td>
<td></td>
</tr>
<tr>
<td>Power loop-thru connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input power</td>
<td>85-250 VAC @ 47-66Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max loop-thru power</td>
<td>10A @ 250 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>15W</td>
<td>30W</td>
<td></td>
</tr>
<tr>
<td>Input fuse</td>
<td>MAX 1A 250V (3AB 1/4”x1-1/4” style)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of DMX inputs</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Number of DMX loop-outs</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Number of isolated outputs</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>DMX input connector(s)</td>
<td>Neutrik 5 pin male XLR NC5MAH (3 pin XLR also available)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMX output connectors</td>
<td>Neutrik 5 pin female XLR NC5FAH (3 pin XLR also available)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galvanic power isolation</td>
<td>500VAC (1000VDC) per output circuit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optical data isolation</td>
<td>5000VAC per output circuit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage suppression</td>
<td>5.8V @ 57A (330W)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>1 rack space chassis – 19&quot;x5&quot;x1.75&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>4lb 4oz</td>
<td>4lb 6oz</td>
<td>4lb 8oz</td>
</tr>
<tr>
<td>Power cable provided</td>
<td>3' 18 awg NEMA5-15 (Edison) to Neutrik NAC3FCA powerCON</td>
<td></td>
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</tbody>
</table>

**XLR connectors**

5 pin signal list:
1. Signal Common – cable shield (not chassis ground) *connected to isolated ground of 5VDC power for each outlet (i.e. each signal common is independent)
2. Data - or “B”
3. Data + or “A”
4. Data - (for 2nd data line or other manufacturer specific use)
5. Data + (for 2nd data line or other manufacturer specific use)

* In the Omni DMX splitter pins 4 & 5 are connected between the data input and loop-out connectors. This pin to pin connection is not modified by the splitter in any way. Pins 4 & 5 on the isolated outputs are not used or connected in any way.

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APPLIED ELECTRONICS OMNI SPLITTER WARRANTY TERMS AND CONDITIONS

SHIPPING POLICY:
All shipments are "Freight On Board" Newport News, Virginia, and shall be in good order upon release to the carrier. All claims for damage or loss in transit must be filed by the consignee against the carrier. All freight should be checked for quantity against bill provided by the carrier. Inspect shipments by removing all packaging and checking the equipment for damage to chassis, cables, connectors & controls before signing carrier's receipt. Any product exhibiting external damage should immediately be tested for correct operation as internal damage may also have occurred. Damage noted on freight bill will enable consignee to file a claim against the carrier. Any transport insurance is the responsibility of the purchaser. Applied will not be held responsible or liable for damage, loss or delay in transit.

PRODUCT GUARANTEE:
Applied guarantees that its Omni DMX Splitter products will be free from defects in workmanship and materials for a period of five (5) years from date of shipment. Defects in workmanship or materials becoming evident within the warranty period will be repaired by Applied at no cost for parts or labor to the customer. Applied reserves the right to replace any product or part with the same or equivalent item rather than repair it. Replaced items become the property of Applied. This guarantee applies only to products that have been used and maintained according to manufacturers guidelines and does not cover damages incurred in transit or as a result of improper use. These damages include but are not limited to those caused by improper voltage or installation, drops and falls or short circuits in connected equipment. Applied reserves the right to inspect product for damage not covered under this guarantee before conducting repairs. The customer is responsible for shipping product to Applied for service. If repaired under warranty, product return shipping will be paid by Applied. Items repaired or replaced under warranty do not extend or renew the original guarantee period.

Except as expressly stated and warranted herein: (i) Applied disclaims any other warranties, whether express or implied, including any warranty of merchantability or fitness for a specific purpose; (ii) this warranty extends exclusively to the original purchaser of the warranted goods and subsequent purchasers are not covered by this warranty; (iii) this warranty does not apply to a part which the buyer misuses, damages, improperly maintains, repairs, or replaces with a part not of Applied's manufacture; and (iv) except for its duty to repair or replace defective parts, Applied shall not be liable for any additional costs, consequential or incidental damages resulting from a defective part.

Applied reserves the right to change materials or design, when, in our opinion, such changes will improve the product. This warranty is performable in Newport News, Virginia and all obligations, rights, and duties of buyer and Applied shall be governed by the laws of the State of Virginia.

RETURN POLICY:
Prior to returning any item purchased from Applied, a customer must first contact Applied to obtain a Returned Goods Authorization number (RGA#). Returned goods without prior authorization will not be accepted. Applied reserves the right to refuse return shipments where the freight has not been pre-paid by the returning party. A restocking fee of 25% will be charged on all returns in good resalable condition. Items received in poor or damaged condition will be subject to all applicable repair costs plus the 25% restocking fee.

INSPECT ALL ITEMS FOR ANY DAMAGE BEFORE SIGNING BILL OF LADING

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