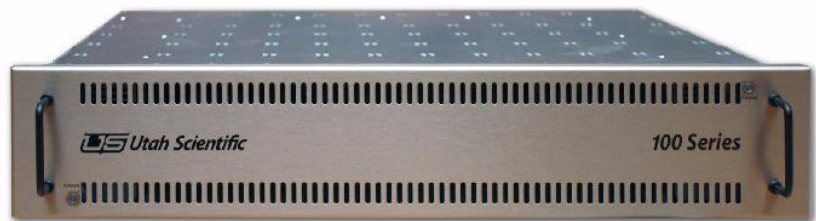




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## UTAH 100-3



*System Setup and Operation*



---

## ***UTAH 100-3 Operations Guide***

- Document Number: 82101-0086
- Document Version: 2.0
- Date: July 31, 2013
- Printed in U.S.A.

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## ***FCC Compliance (USA) and Digital Equipment Compliance (Canada)***

This equipment has been tested and found to comply with the limits for a Class A, digital device, pursuant to Part 15, Subpart B of the FCC Rules and the Canadian EMC Requirement (ICES-003). These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at their own expense. Shielded cables must be used to ensure compliance with the FCC Class A limits.

---

## ***Declaration of Conformity***

### **Utah Scientific, Inc.**

4750 Wiley Post Way, Suite 150  
Salt Lake City, Utah 84116-2878 U.S.A.

We declare our sole responsibility that the Utah-100 Digital Routing Switcher is in conformance with the following standards:

#### **Emission**

- EN55022:1994+A1&A2

#### **Immunity**

- EN55024:1998
- EN61000-3-2
- EN61000-3-3

#### **Safety**

- IEC 60950-1:2001 /EN 60950-1:2001

Following the provisions of the Directive(s) of the Council of the European Union:

- EMC Directive 89/336/EED
- Low Voltage Electrical Directive 72/23/EEC

Utah Scientific, Inc. hereby declares that the product specified above conforms to the above Directive(s) and Standard(s).



---

## ***Important Safeguards and Notices***

This section provides important safety guidelines for the Operator and Service Personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, specifically those instructions related to risk of fire, electric shock, or injury to persons.

### **Safety Symbols**



- Hazardous Voltage symbol



- Caution symbol. The product is marked with this symbol when it is necessary to refer to the manual to prevent damage to the product.

### **Warnings**

Please observe the following important warnings:



- Any instructions in this guide that require opening the chassis, changing a power supply, or removing a board, should be performed by qualified personnel only. To reduce the risk of electric shock, do not perform any service unless you are qualified to do so.
- Heed all warnings on the unit and in the operating instructions.
- Do not use this product in or near water. Disconnect AC power before installing any options or servicing the unit unless instructed to do so by this manual.
- This product is grounded through the power cord ground conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product inputs or outputs.
- Route power cords and other cables so they won't be damaged.
- The AC receptacle (socket) should be located near the equipment and be easily accessible.
- Disconnect power before cleaning. Do not use any liquid or aerosol cleaner - use only a damp cloth.



- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed conductors and components while power is on. Do not insert anything into either of the systems two-power supply cavities with power connected.
- Do not wear hand jewelry or watches when troubleshooting high current circuits, such as power supplies. During installation, do not use the door handles or front panels to lift the equipment as they may open abruptly and injure you.
- To avoid fire hazard when replacing fuses, use only the specified correct type, voltage and current rating as referenced in the appropriate parts list for this product. Always refer fuse replacement to qualified service personnel.
- Have qualified personnel perform safety checks after any service.

#### **Cautions**

Please observe the following important cautions:



- When installing this equipment do not install power cords to building surfaces. To prevent damage when replacing fuses, locate and correct the problem that caused the fuse to blow, before reconnecting power.
- Use only specified replacement parts

#### **Notices**

Please observe the following important notes:



- When the adjacent symbol is indicated on the chassis, please refer to the manual for additional information.
- For the HD-2020 Chassis and Master Control Panel, refer to “Connecting and Disconnecting Power” - Chapter 2 (Hardware Installation).

---

## ***Company Information***

### **Utah Scientific, Incorporated**

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- World Wide Web: <http://www.utahscientific.com>
- **After Hours Emergency:** +1 (800) 447-7204. Follow the menu instructions for Emergency Service.

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### **Hardware Warranty**

Utah Scientific, Inc. warrants to the original purchaser that the Utah Scientific hardware is free from defects in materials and workmanship and will perform substantially in accordance with the accompanying written materials under normal use and service for a period of ten (10) years from the date of shipment. Any implied warranties on hardware are limited to ten (10) years. Some states/jurisdictions do not allow limitations on duration of an implied warranty, so the above limitation may not apply to certain specific purchasers.

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- Return of the price paid, or
- Repair or replacement of the software or hardware that does not meet the above warranties and is returned to Utah Scientific under the returned materials authorization (RMA) process with freight and forwarding charges paid.

After the initial warranty periods, purchaser's exclusive remedy is the repair or replacement of the hardware upon payment of a fixed fee to cover handling and service costs based on Utah Scientific's then-current price schedule. The above warranties are void if failure of the software or hardware has resulted from an accident, abuse, or misapplication. Any replacement software or hardware will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer.

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## *Table of Contents*

### **Section 1**

- Section 1 1-1
  - Introduction 1-1
  - Installation 1-2
    - Initial Inspections 1-2
    - Before Applying Power 1-2
    - Service 1-2
  - Product Overview 1-3
  - Installation 1-3
  - Power 1-5
    - Power Supplies 1-5
    - AC Power Connections 1-6
    - Chassis Layout with Dimensions 1-7

### **Section 2**

- Individual Board (DAs) - Distribution Amplifiers 2-1
  - Analog Audio 1x8 / Dual 1x4 (121271-1) 2-1
  - 171021-11 2-2
  - 171021-12 2-3
  - 3G-HD-SD DA - 1x8 / Dual 1x4 (121276-1) 2-5
  - 171021-08 2-6
  - 171021-09 2-7
  - 3G DA Triple Fan Out - Triple 1x2 (121277-1) 2-8
  - 171021-10 2-9
  - Digital Video DA SD Only - Dual 1x4 (121267-4 2-10
  - 171021-08 2-11
  - 171021-09 2-12
  - Analog Video Clamp / Equalizer DA - 1x8 (121265-1), Dual 1x4 (121265-2) 2-13
  - 171021-08 2-15
  - 171021-09 2-16
  - Analog Video Utility DA - 1x8 (121266-1), Dual 1x4 (121266-2) 2-17
  - 171021-14 2-19

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171021-15 2-20  
DA Power Supply (121260-1) 2-21  
Rear Panel Operation 2-22



# Section 1

## Introduction

Thank you for choosing a Utah Scientific Inc. product. We are convinced that your choice will prove to be a wise and worthy decision for many years to come.

Your product has been tested for performance at the factory according to the specifications given for the system in this manual. However, before putting the device into operation we kindly ask you to read this manual, and act according to the information given. All information given in this document is property of Utah Scientific Inc. To the knowledge of Utah Scientific Inc there are no errors in the manual. Should any errors be discovered, please notify Utah Scientific Inc. We will under no circumstances accept responsibility neither for errors in this manual, nor consequences of such errors.

## Installation

### *Initial Inspections*

Check the contents of the shipment for completeness and possible transport damage.

If the contents are incomplete or damaged, contact Utah Scientific Inc immediately for repairing or replacement parts of the equipment.

### *Before Applying Power*

Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.



The modules of the UTAH 100-3 frame may only be installed in specific positions. Interchanging power and function modules may harm the UTAH 100-3-frame permanently.

The modules of the UTAH 100-3 frame shall always have the components facing to the right. Failure may occur if modules are installed incorrectly.

### *Service*



Servicing, adjustments, maintenance or repair of this product may be performed by qualified personnel only. Adjustments described in this manual may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury. Capacitors inside this product may still be charged even when disconnected from their power source.



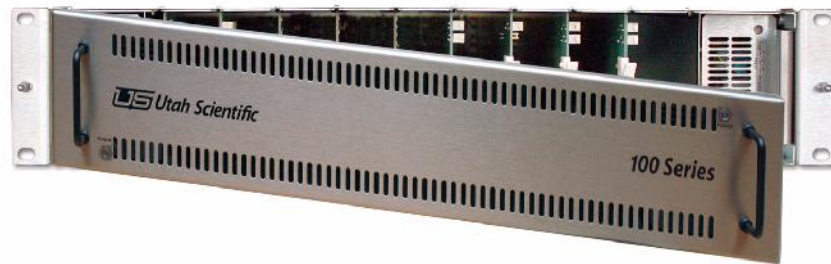
## Product Overview

The UTAH 100-3 family of Distribution Amplifiers provide an economical but highly reliable means of creating multiple copies of both analog and digital video signals.

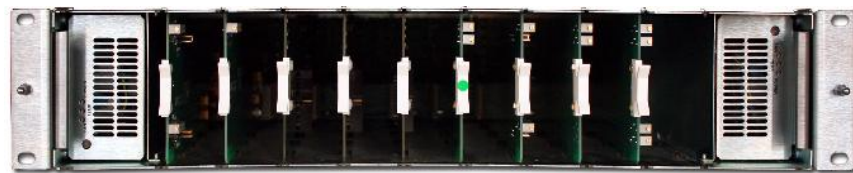
The 2 RU frame holds dual power supplies for maximum reliability and up to ten DA modules. Each module is supplied with a rear panel assembly to match the module's configuration. A 1RU frame which holds up to five modules is also available.

## Installation

1. Remove the front cover and inspect the frame and the cards carefully for damages that may have occurred during transport.



2. Check that the frame is installed so the airflow through the unit is unrestricted. No forced ventilation is required under normal operating conditions.



3. Connect the external power cords to the corresponding power connectors on the rear side of the UTAH 100-3 frame. Check that the Power LED on the primary supply is lit, while the Fan and Temp LEDs remain unlit. If a failure occurs related to no power, inoperative fan, or temperature range, please disconnect power and contact UTSCI support for assistance.

4. Check the power LEDs on the individual DAs. The blinking green "Activity"-LED along the front of the card indicate good power to the board and that the correct jumper setting is present. Normally no changes are necessary if used with Utah Scientific Inc. control software/systems.
5. Install any additional (needed) cards in the frame - while observing the LED status at all times.



6. Reinstall the front cover to ensure that air travels properly through the unit.





## Power

### *Power Supplies*

Part # 121260-1, the dual redundant power supplies are fixed within the chassis and contain alarm indications for fan failure and non-optimal operating temperature.

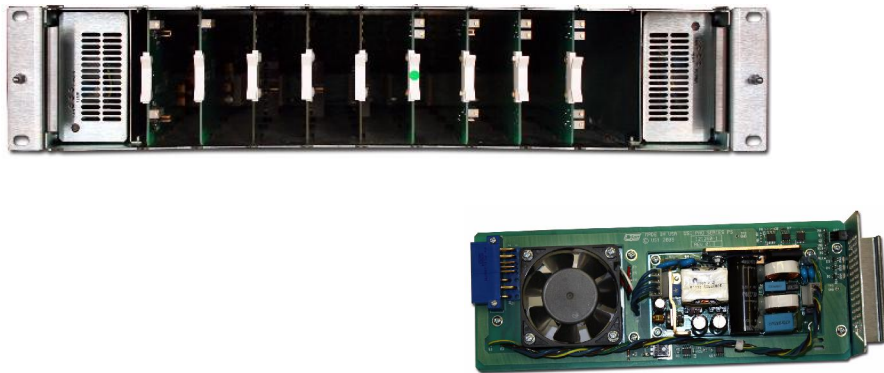


Figure 1-1.

## ***AC Power Connections***

The UTAH 100-3 rear panel has fully redundant AC power supply connections to each chassis section.



**Figure 1-2. Rear Panel power connections**

The recommended AC power cord is USI Part Number 42490-0003; Belden 17500, 10A/125VAC, 1250 Watts, max voltage rating 300 VAC.

***Caution: The socket outlets should be installed near the equipment and be easily accessible to the operator.***





## Chassis Layout with Dimensions

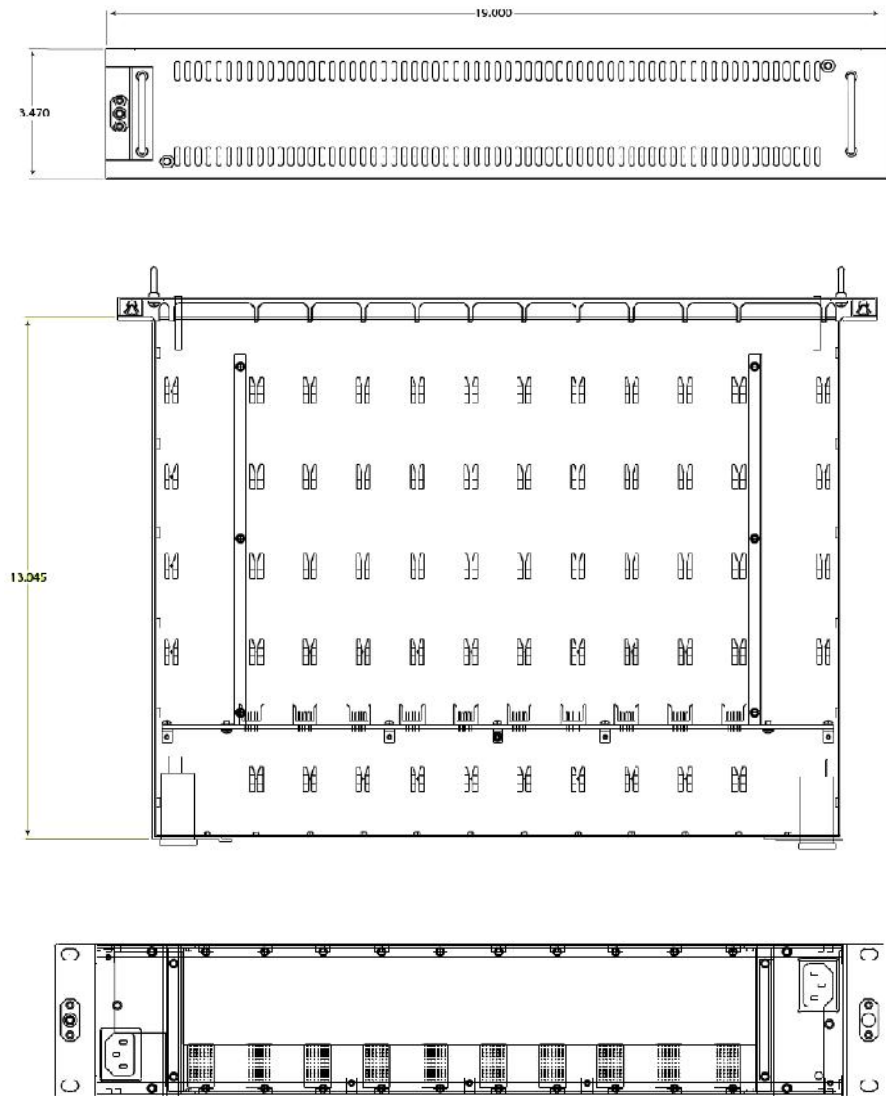


Figure 1-3.





## Section 2

### Individual Board (DAs) - Distribution Amplifiers

#### Analog Audio 1x8 / Dual 1x4 (121271-1)

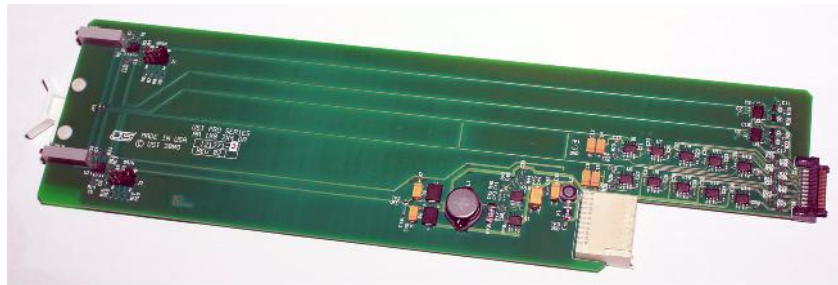


Figure 2-1.

The Analog Audio Distribution Amplifier can be configured within a one input with eight outputs, or a dual, one input by four outputs.

- RV1 is the Gain adjustment for the Left/Mono channel.
- RV2 is the Gain adjustment for the Right channel.

The DA outputs can be increased +6dB, +12dB or +18dB by moving the shunts on J1 for Left/Mono channel, and J2 for Right channel.

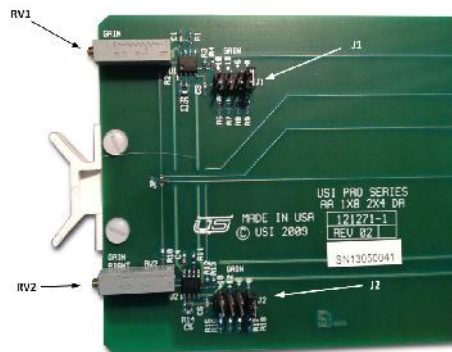


Figure 2-2.

171021-11

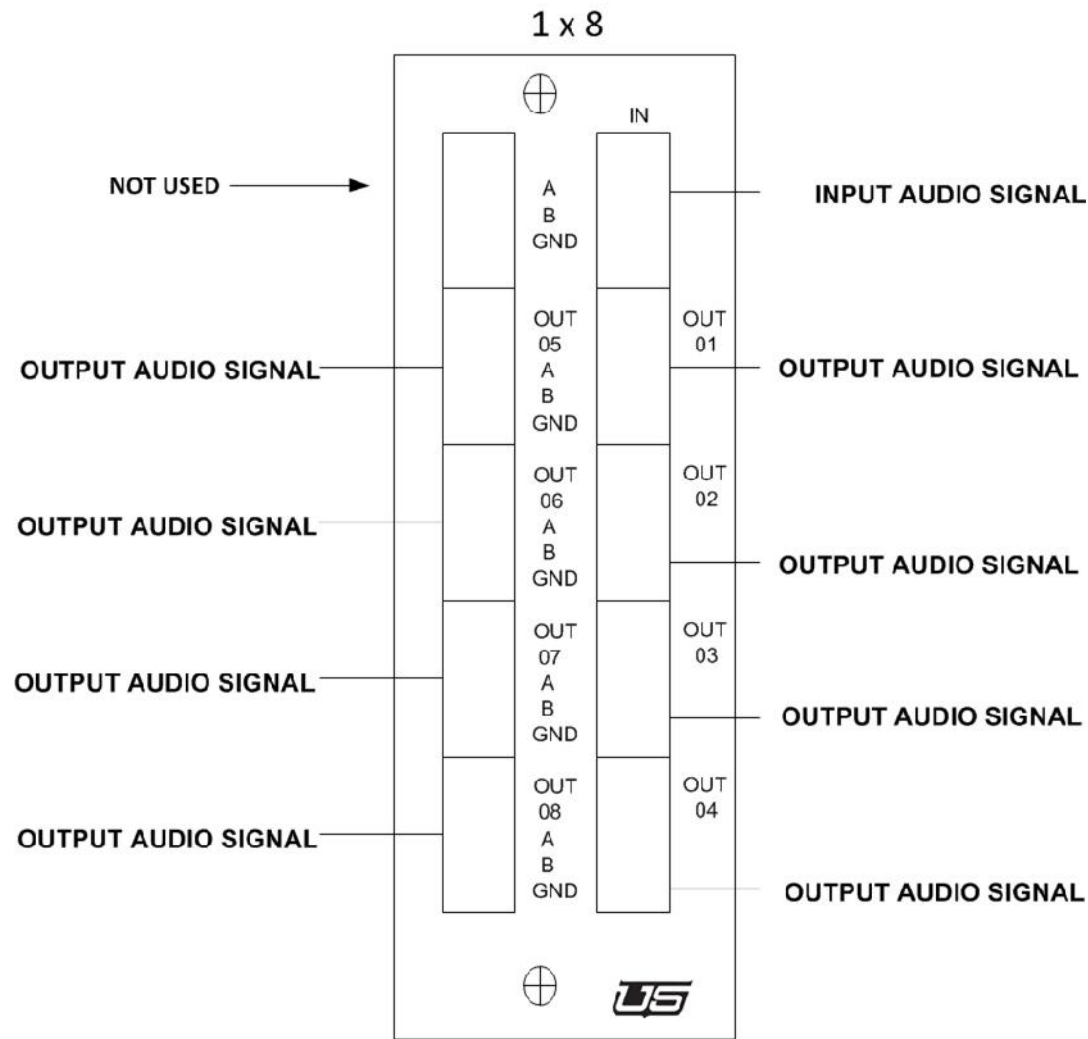


Figure 2-3.



171021-12

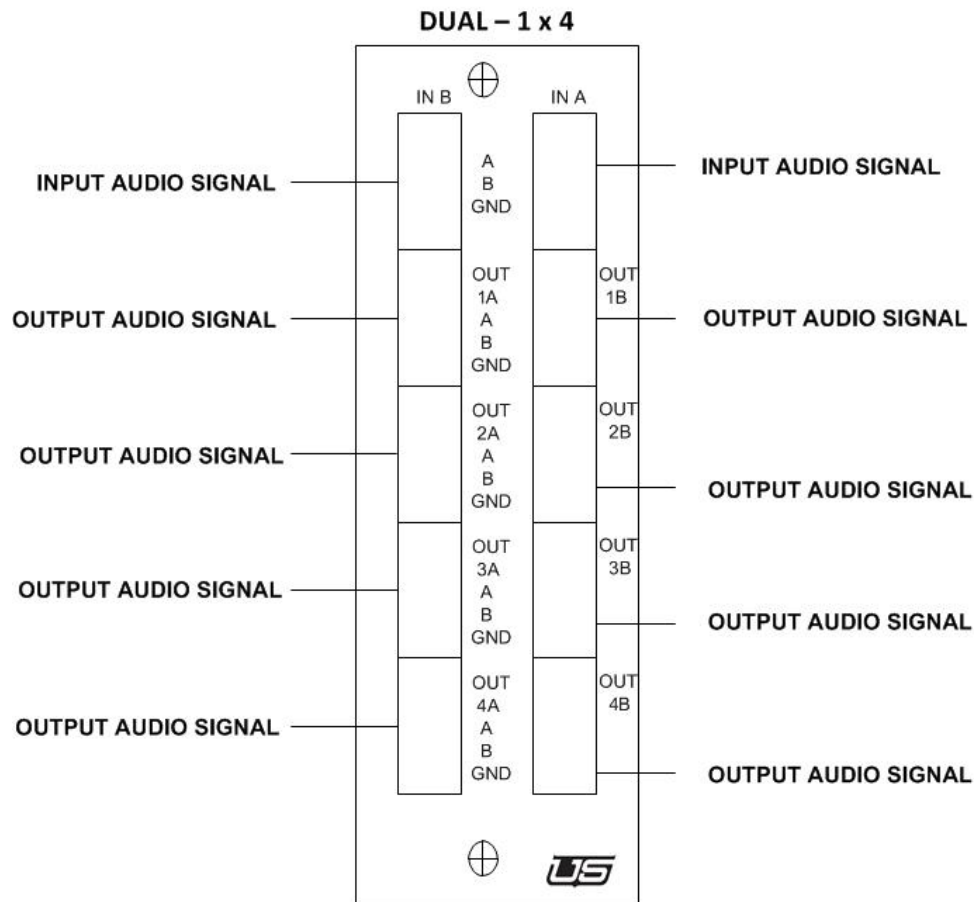


Figure 2-4.

To convert the DA to a Dual one input by four outputs -

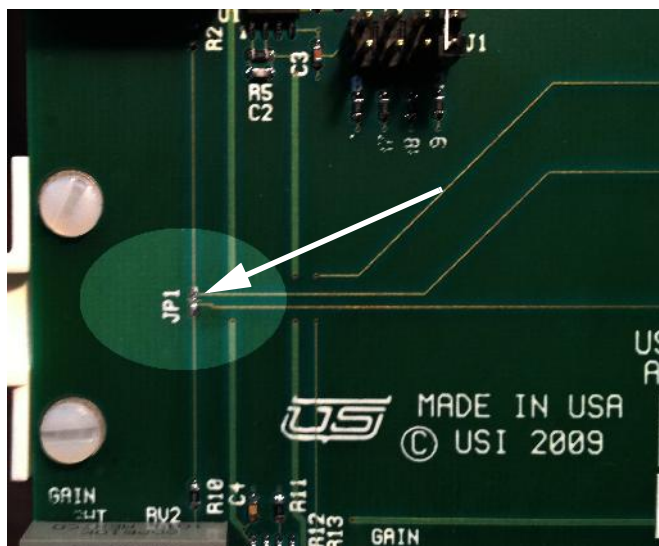


Figure 2-5.

1. Cut trace on JP1 between the top and middle pad.
2. Solder a jumper wire between the bottom and middle pad.

The power consumption is 20mA.



### 3G-HD-SD DA - 1x8 / Dual 1x4 (121276-1)

**Fixed 1x8 (121267-1)**

**Fixed 2x4 (121267-2)**

The 3G-HD-SD Video Distribution Amplifier can be configured within a one input with eight outputs, or a dual, one input by four outputs.

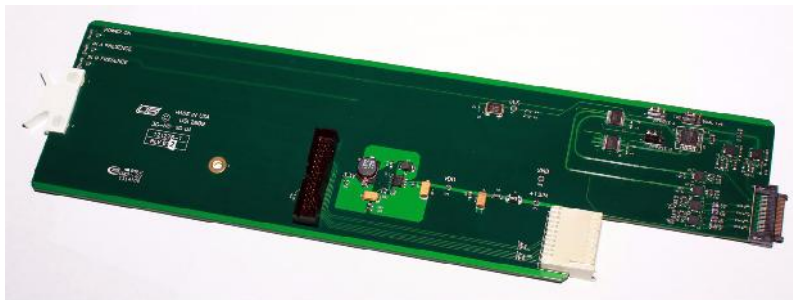


Figure 2-6.

- JP-4 with shunt on pins 1 and 2 make the DA a 1x8.
- JP-4 with shunt on pins 2 and 3 make the DA a dual 1x4.

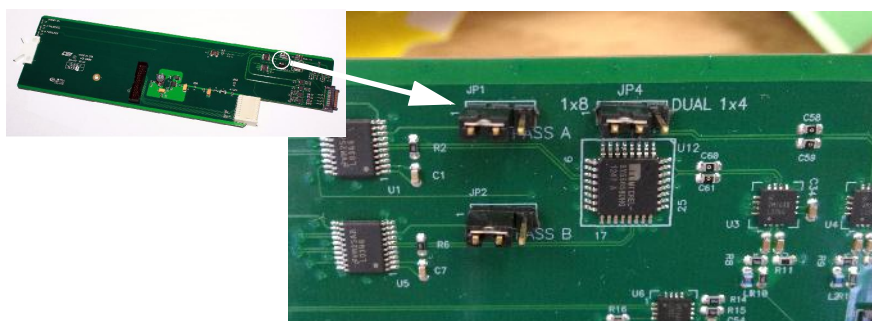


Figure 2-7.

- DS1 indicates Power OK.
- DS2 (in a presence) indicates input signal lock for channel A.
- DS3 (in a presence) indicates input signal lock for channel B.

To bypass the signal re-clocking circuit the shunt on JP-1 and JP-2 should be on pins two and three. When in Bypass mode DS2 and DS3 will not be turned on.

Power consumption is 30mA.

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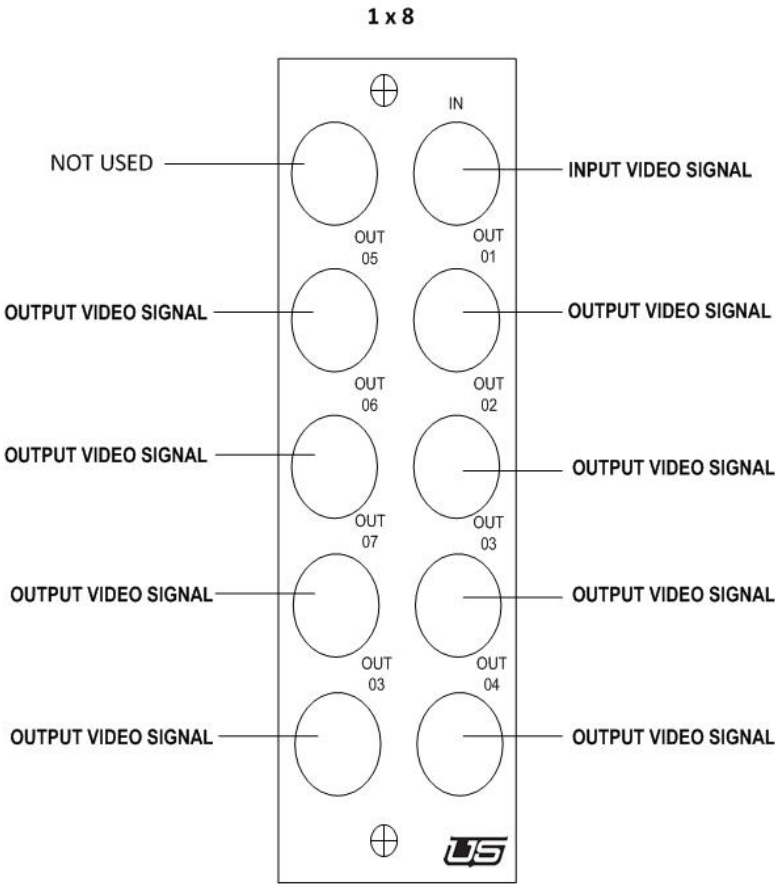


Figure 2-8.





171021-09

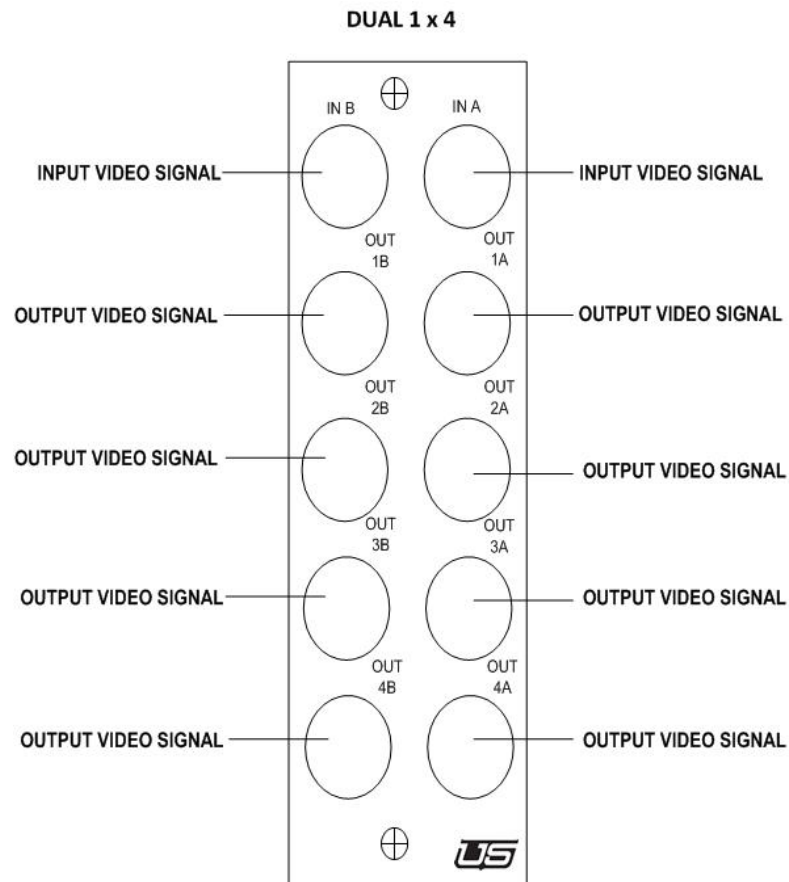


Figure 2-9.

### 3G DA Triple Fan Out - Triple 1x2 (121277-1)

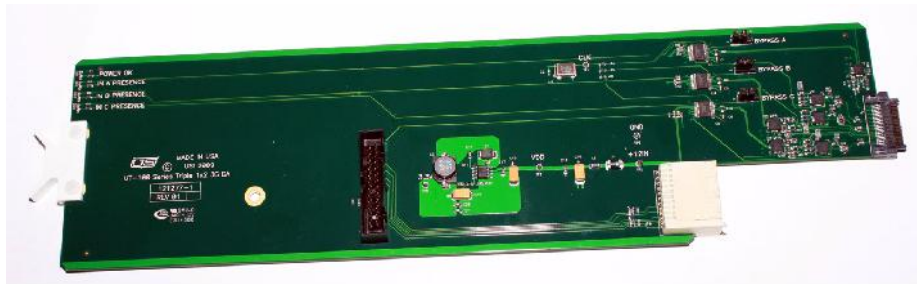


Figure 2-10.

The SD Video Distribution Amplifier contains three (individual) one input by two outputs.

- DS1 indicates Power OK.
- DS2 (In a presence) indicates input signal lock for channel A.
- DS3 (In a presence) indicates input signal lock for channel B.
- DS4 (In a presence) indicates input signal lock for channel C.

The shunts on JP-1, JP-2, and JP-3 should be placed on pins two and three in order to bypass the signal re-clocking circuit. When in BYPASS mode, DS2, DS3, and DS4 will not be turned on.

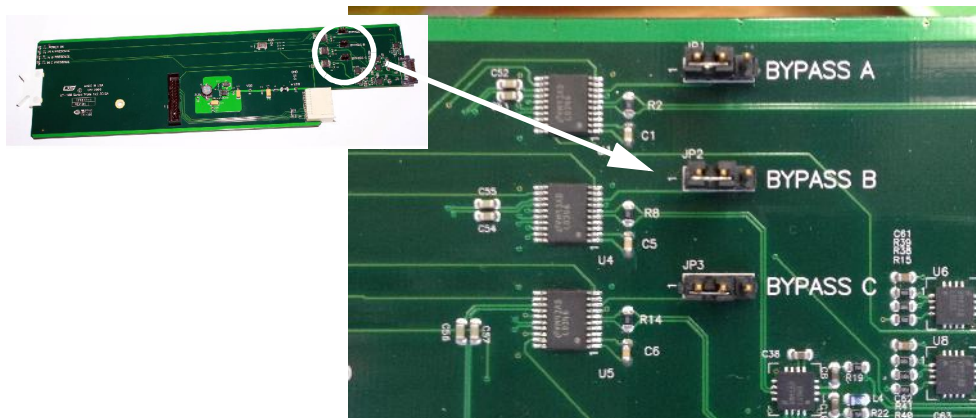


Figure 2-11.

Power consumption is 40mA.



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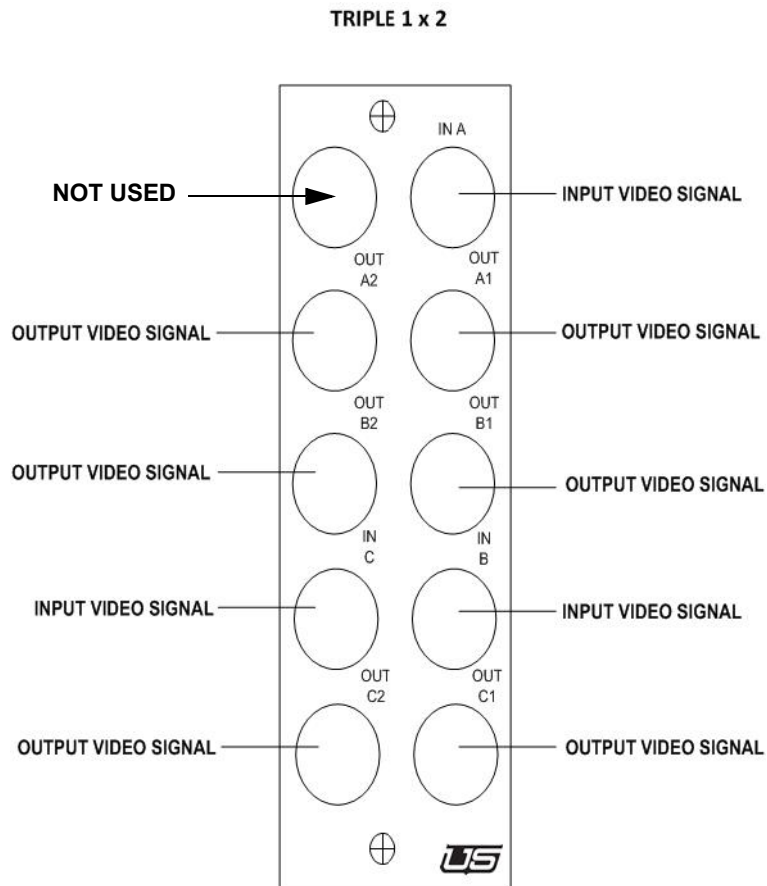


Figure 2-12.

## Digital Video DA SD Only - Dual 1x4 (121267-4) Fixed 1x8 (121267-3)

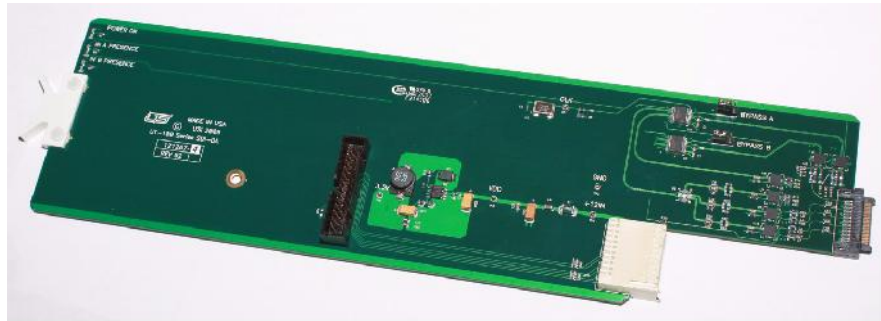


Figure 2-13.

The SD Video Distribution amplifier contains a dual, one input by four outputs SD Video distribution amplifier.

- DS1 indicates Power OK.
- DS2 (in a Presence) indicates input signal lock for channel A.
- DS3 (in a Presence) indicates input signal lock for channel B.

The shunt on JP-1 and JP-2 should be placed on pins two and three in order to bypass the signal re-clocking circuit. When in BYPASS mode, DS2 and DS3 will not be turned on.

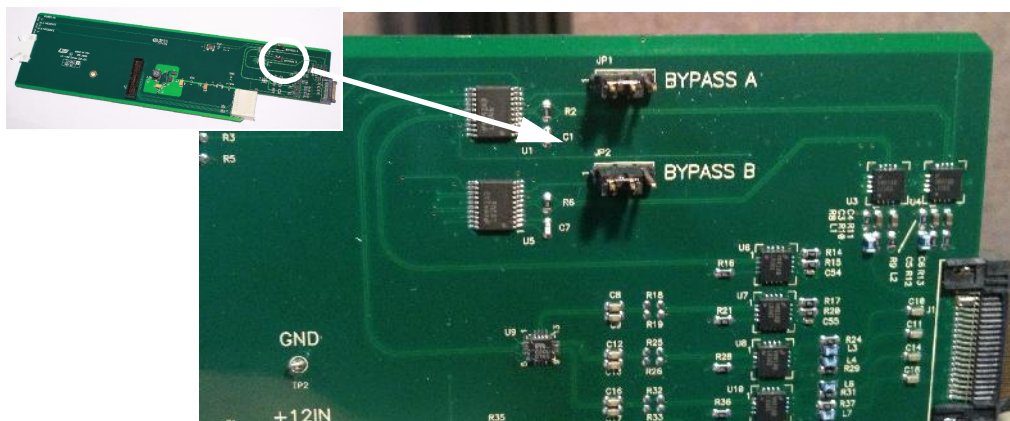


Figure 2-14.

Power consumption is 30mA.



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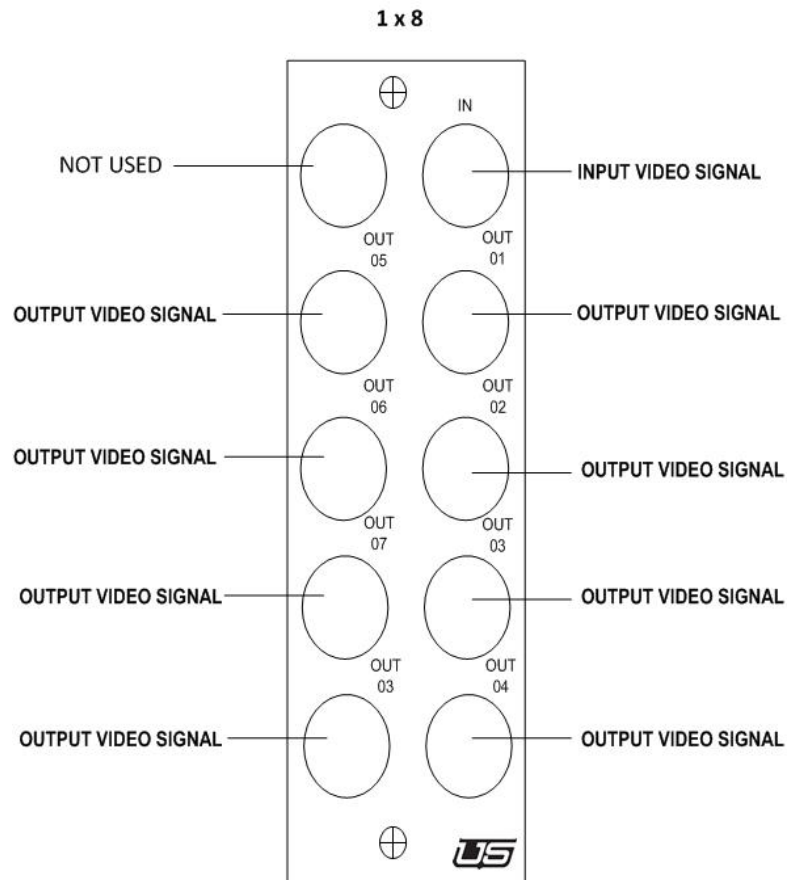


Figure 2-15.

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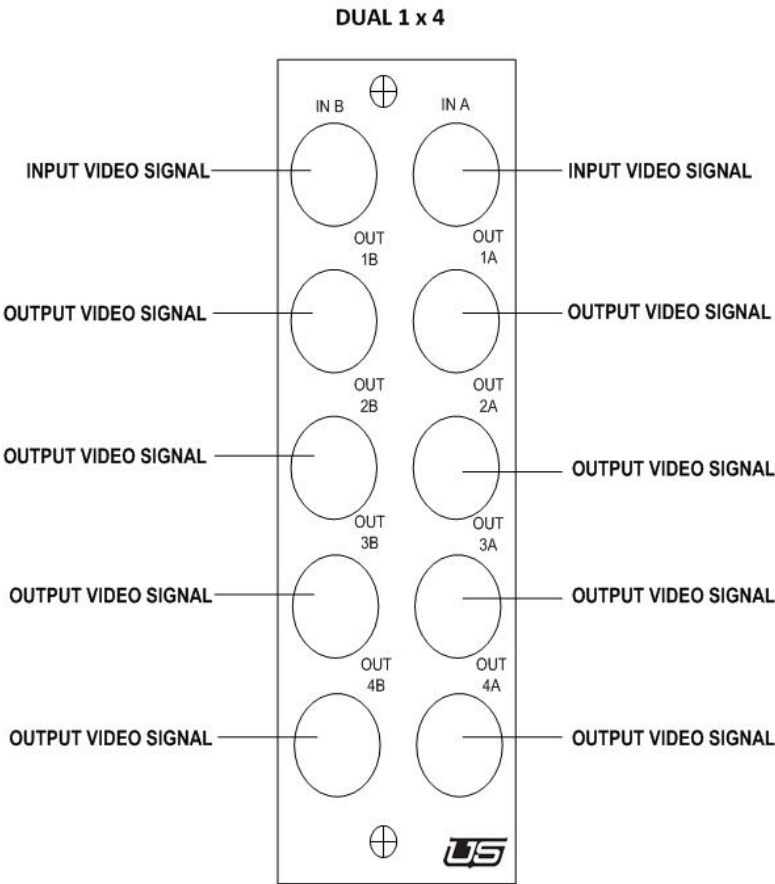


Figure 2-16.



## Analog Video Clamp / Equalizer DA - 1x8 (121265-1), Dual 1x4 (121265-2)

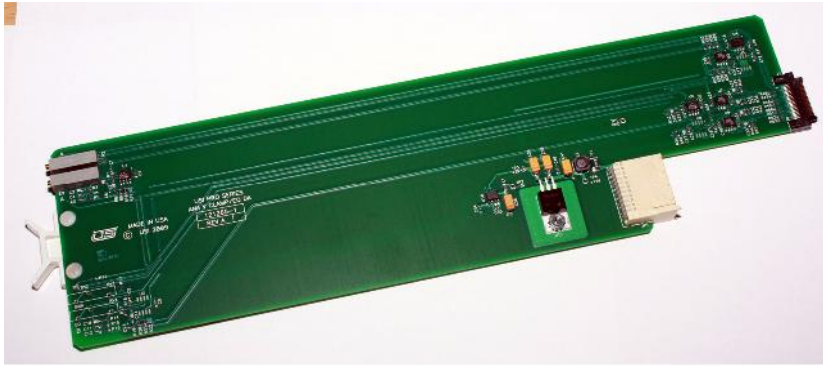


Figure 2-17.

The Analog Video Distribution Amplifier contains two configurations; one input by eight outputs, or dual one input by four outputs.

This DA also contains an adjustment for Gain (RV1 and RV3).

In addition, the DA contains a frequency response Equalizer adjustment for the input of the DA (up to 100 meters of cable length). Frequency response can be adjusted to less than 0.1db (RV2 and RV4).

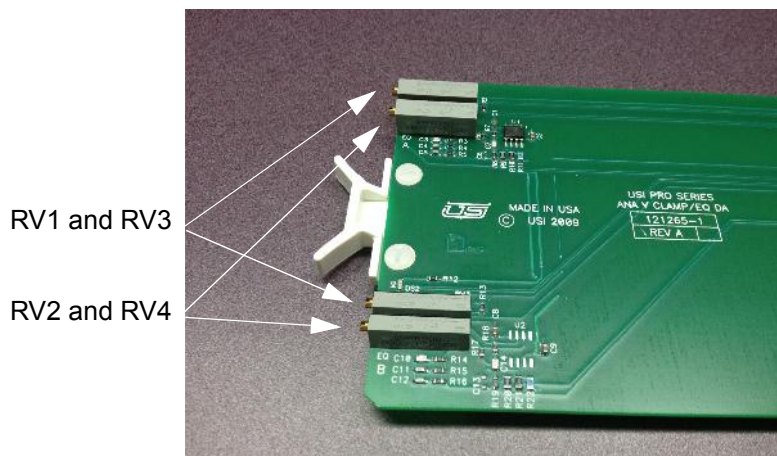


Figure 2-18.

- The DA contains a video DC clamping circuit.
- Differential Gain is less than 0.3% or less.
- Differential Phase is less than 0.3 degrees or less.
- Noise is -65dBu or less.

The above board (121265-2) can be converted to one input by eight outputs. To accomplish this, R34 is removed then placed in the R41 position.

Power consumption is 40mA.

**Note:** *The 121265-1 and 121265-2 are back porch clamped DA's and will not accurately pass tri-level sync. For tri-level sync applications, please use the 121266-1 Utility Video DA.*





171021-08

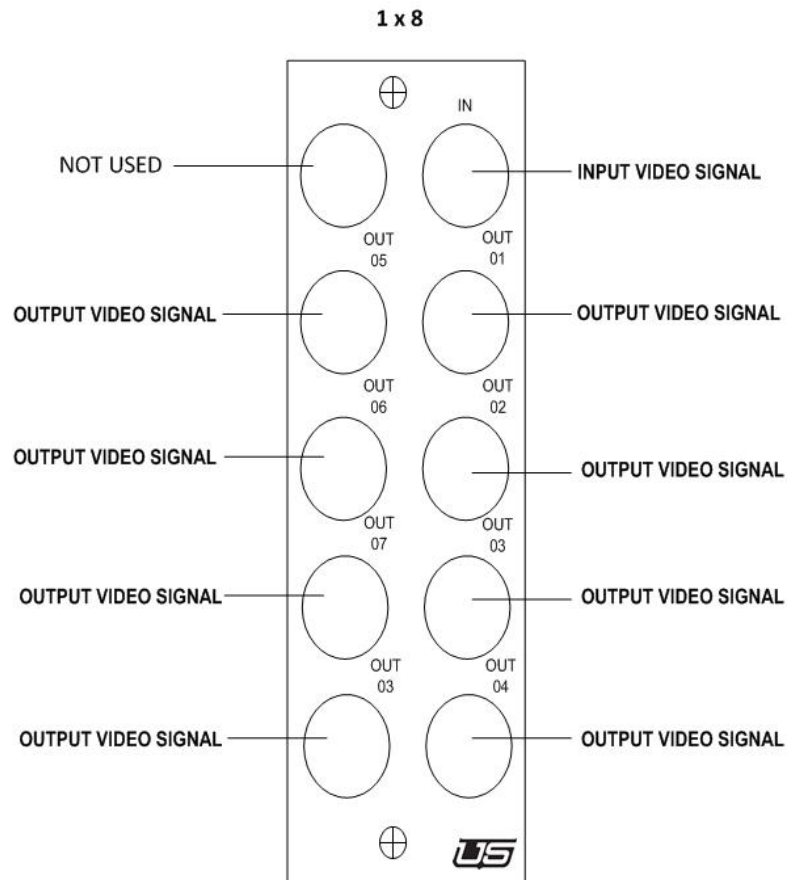


Figure 2-19.

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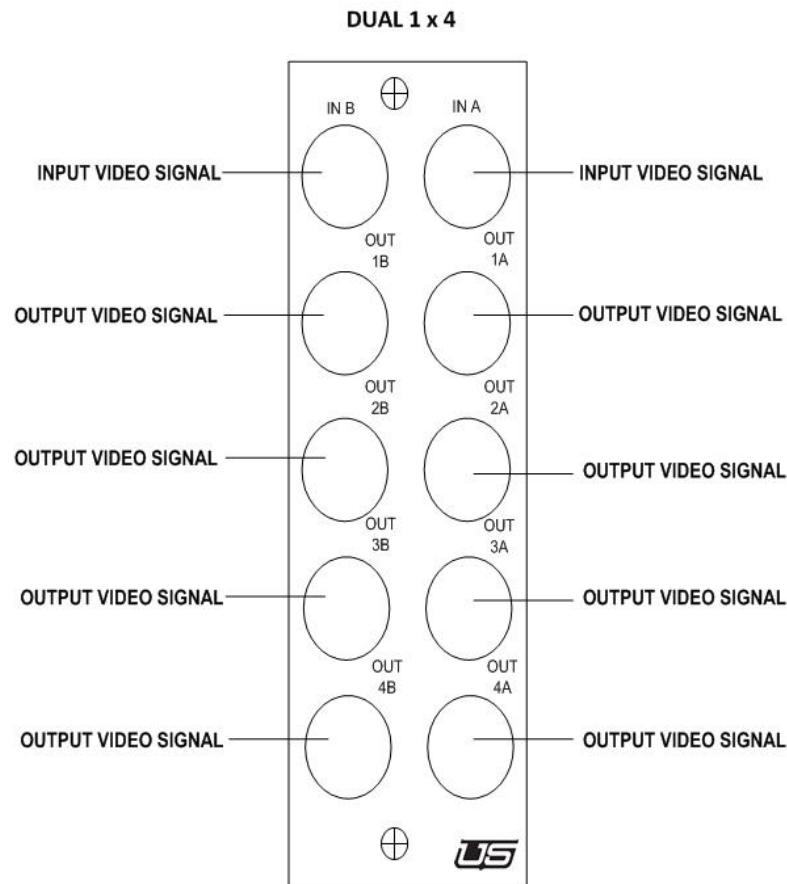


Figure 2-20.



### Analog Video Utility DA - 1x8 (121266-1), Dual 1x4 (121266-2)

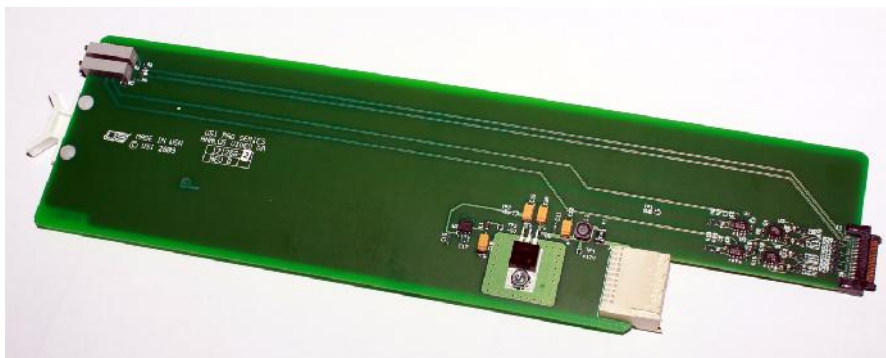


Figure 2-21.

The Analog Video Distribution Amplifier contains two configurations; one input by eight outputs, or dual one input by four outputs.

The DA contains an adjustment for Unity Gain, RV1 - Channel A, RV2 - Channel B, and a video DC clamping circuit.

- Differential Gain is less than 0.1% or less.
- Differential Phase is less than 0.1% degrees or less.
- Noise is -65dBu or less.

Power consumption is 40mA.

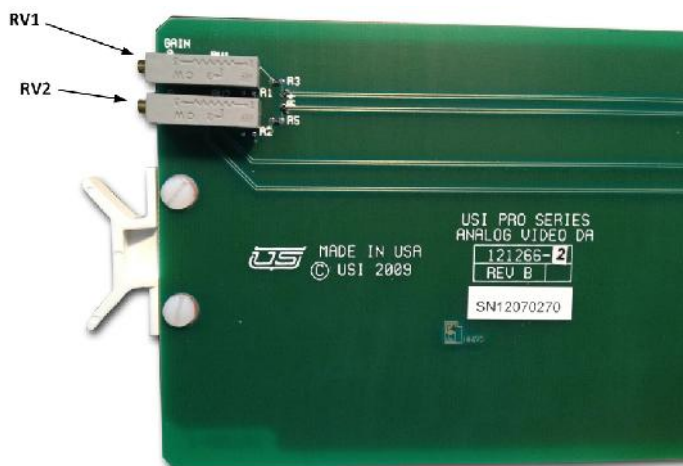


Figure 2-22.

The above board (121266-2) can be converted to a Dual 1 x 4 DA. To accomplish this, R8 should be removed and placed on the two blank pads at the R15 position.

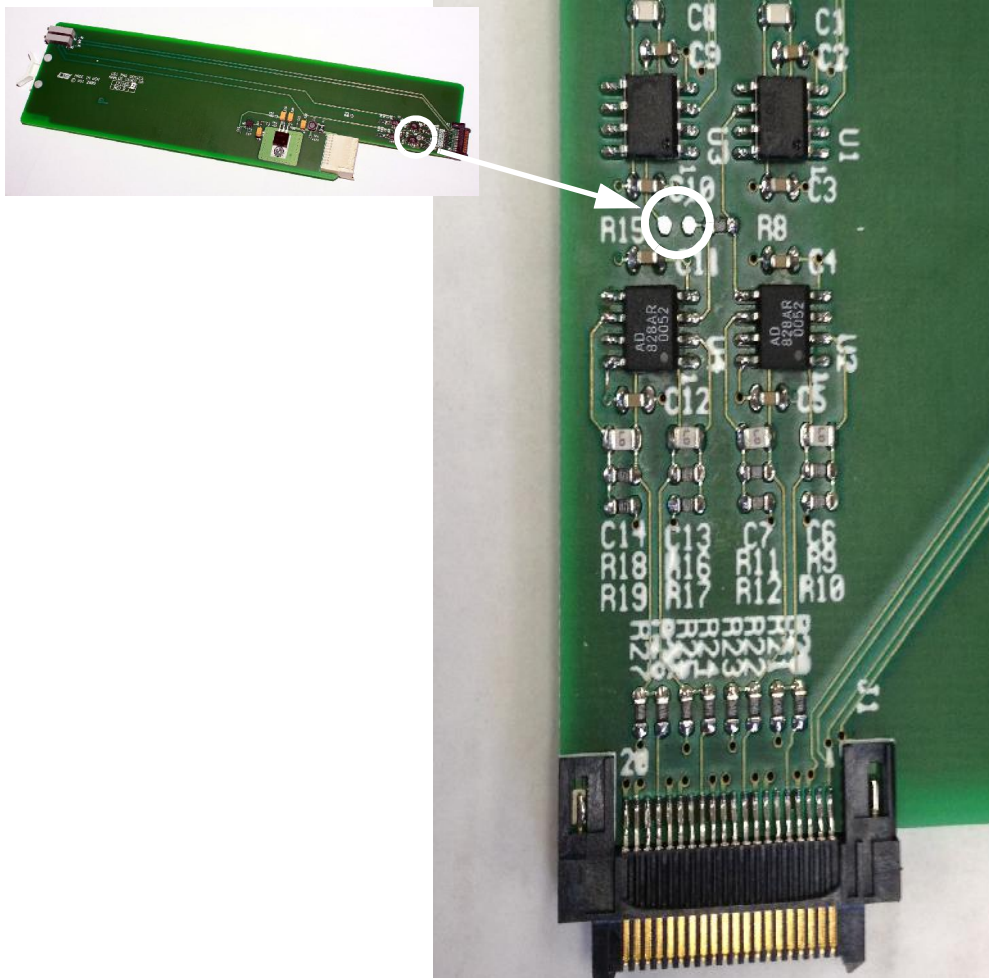


Figure 2-23.



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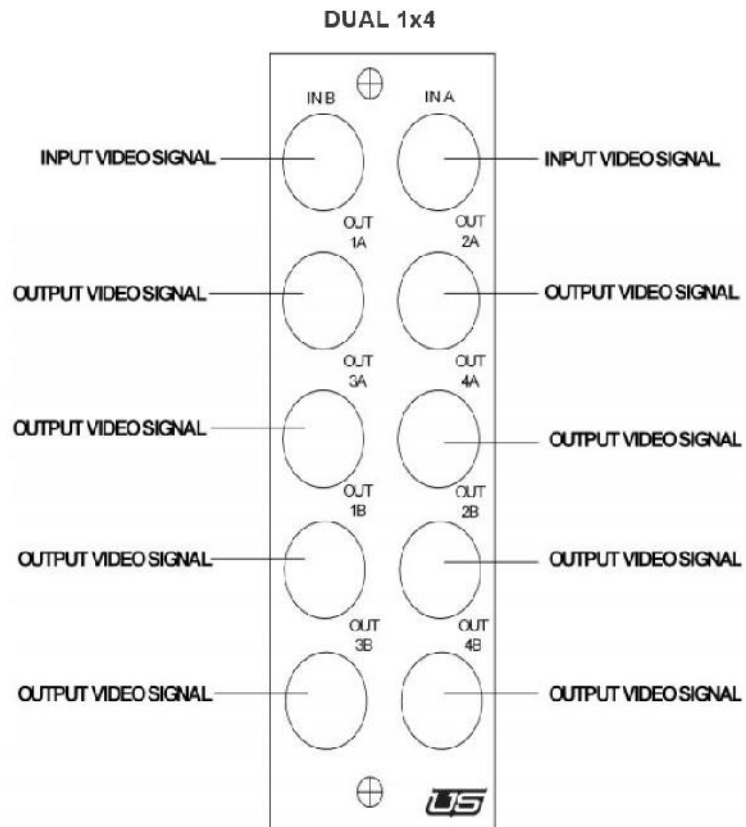


Figure 2-24.

171021-15

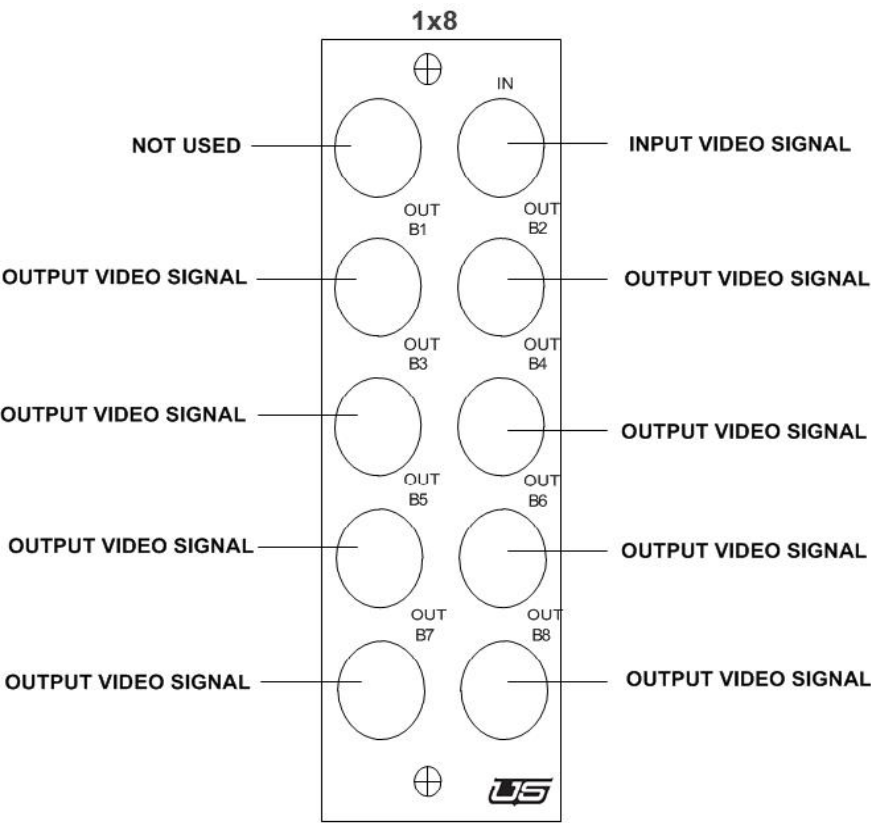


Figure 2-25.



### **DA Power Supply (121260-1)**



**Figure 2-26.**

The Distribution Amplifiers are powered by a +12V power supply.

- The output of the supply is adjustable.
- Input 100 - 240VAC 50/60Hz 1.9A.
- Output +12V DC 8.3A 100W MAX.
- The power supply contains Power, Temperature, and fan alarm LED indicators.

Power consumption is 50mA.

## Rear Panel Operation

The UTAH 100-3 rear panel assembly is custom configured to the specific operation. Each panel is supplied with the associated card, and all panel slots must be filled prior to operation. (Blank panels should occupy the rear slots when not enough active cards are present.)



Figure 2-27.



**Numerics**

121260-1 2-21  
121265-1 2-13  
121265-2 2-13  
121266-1 2-17  
121266-2 2-17  
121267-4 2-10  
121271-1,2 2-1  
121276-1 2-5  
121277-1 2-8  
171021-09 2-20  
171021-10 2-20  
171021-11 2-2  
171021-12 2-3  
171021-14 2-20  
171021-15 2-20  
3G DA Triple Fan Out - Triple 1x2 2-8  
3G-HD-SD DA - 1x8 / Dual 1x4 2-5

**A**

AC power cord  
    part number 1-6  
Activity LED 1-4  
airflow 1-3  
Analog Audio 1x8 / Dual 1x4 2-1  
Analog Video Clamp / Equalizer DA - 1x8 2-13  
Analog Video Utility DA - 1x8 2-17

**B**

Belden 1-6

**C**

Chassis Layout  
    dimensions 1-7

**D**

DA Power Supply 2-21  
Digital Video DA SD Only - Dual 1x4 2-10  
Dimensions 1-7  
Distribution & Changeover 2-6  
Distribution Amplifiers 2-1

**F**

failure 1-3

**I**

Initial Inspections 1-2  
Installation 1-2  
    procedure 1-3

Introduction 1-1

**P**

Power 1-5  
Power application 1-2  
Power Connections 1-6  
    power cords 1-3  
Power LED 1-3  
power LEDs 1-4  
Power Supplies 1-5  
Product Overview 1-3

**R**

Rear Panel 2-22

**S**

SD Video Distribution Amplifier 2-8  
Service 1-2

**T**

temperature range 1-3

**V**

ventilation 1-3  
Video Distribution Amplifier  
    3G-HD-SD 2-5