# Small Products Technical Manual
## for Powered and Passive Panels

radio SYSTEMS

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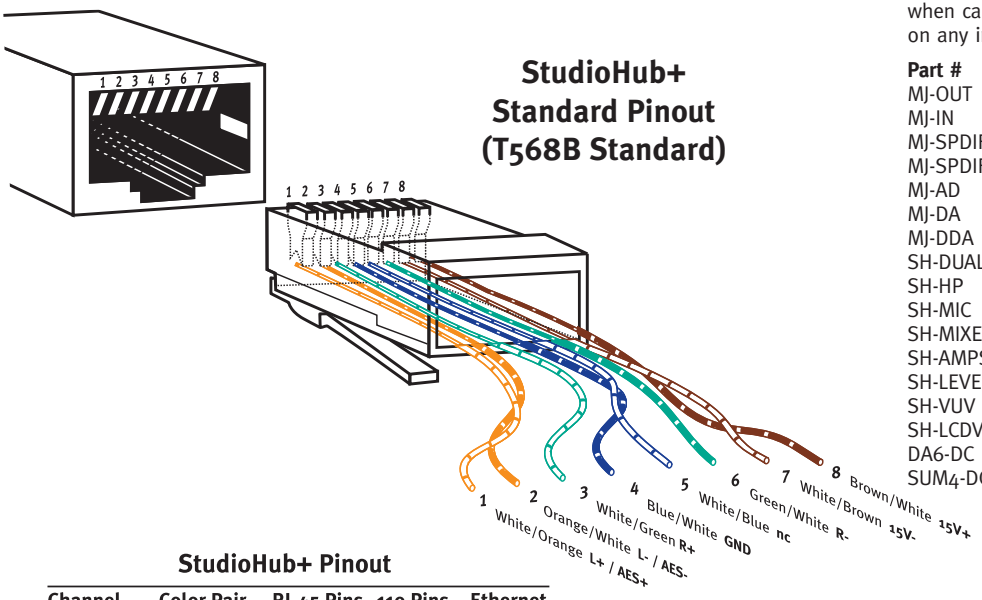
* Obsolete Part




## StudioHub+ Standard Pinout (T568B Standard)

### StudioHub+ Pinout

| Channel | Color Pair | RJ-45 Pins | 110 Pins | Ethernet |
|---|---|---|---|---|
| L+ / AES+ | Wht/Org | 1 | 3 | TR+ |
| L- / AES- | Org/Wht | 2 | 4 | TR- |
| R+ | Wht/Grn | 3 | 5 | R+ |
| R- | Grn/Wht | 6 | 6 | R- |
| nc | Wht/Blu | 5 | 1 | n/c |
| GND | Blu/Wht | 4 | 2 | n/c |
| 15V- | Wht/Brn | 7 | 7 | n/c |
| 15V+ | Brn/Wht | 8 | 8 | n/c |
| Shield | Wht/Slt | Shield | 9 | x |
| Shield | Slt/Wht | Shield | 10 | x |

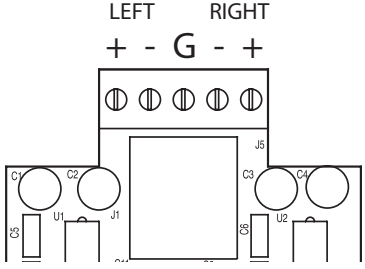
Current consumption for each StudioHub+ active device. Refer to this list when calculating the total number of devices that can be run together on any individual power supply.

| Part # | Description | Current |
|---|---|---|
| MJ-OUT | Analog MatchJack Out (IHF to Pro) | 75ma |
| MJ-IN | Analog MatchJack In (Pro to IHF) | 35ma |
| MJ-SPDIFOUT | SPDIF OUT (S/PDIF and Optical to AES) | 100ma |
| MJ-SPDIFIN | SPDIF IN (AES to S/PDIF) | 0 (passive) |
| MJ-AD | Digital MatchJack A to D | 150ma |
| MJ-DA | Digital MatchJack D to A | 150ma |
| MJ-DDA | Digital MatchJack Distribution Amplifier | 165ma* |
| SH-DUALMATCH | Dual Match Panel | 100ma |
| SH-HP | Headphone Panel | 100ma |
| SH-MIC | Mic Pre-Amp Panel | 55ma |
| SH-MIXER | 3 Input Stereo Mixer with mix-minus | 125ma |
| SH-AMPSPKR | Monitor Amp Panel (w/ Speaker) | 1400ma |
| SH-LEVEL | Monitor Panel | 145ma |
| SH-VUV | Dual VU Meter Panel | 150ma |
| SH-LCDV | LCD Display Panel | 75ma |
| DA6-DC | DA Hub (Single) | 575ma |
| SUM4-DC | Combiner Hub (Single) | 175ma |

* Powered via 9v DC (single ended) wall wart or +/-15vDC StudioHub+ power supply

**Stand-Alone Versions**

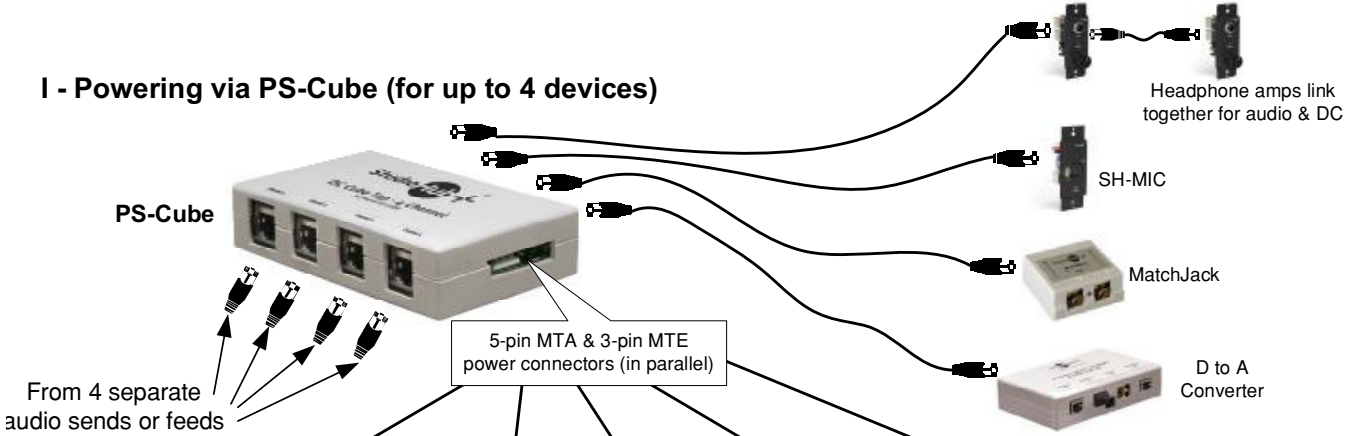
Some active StudioHub+ products were previously available in "Stand-Alone" versions with barrier strip connectivity for audio I/O. The following illustrates the pinout for this barrier strip.



# Powering StudioHub+ Active Devices

Many StudioHub+ devices are active and are powered by +/- 15vDC. Power can be supplied via the StudioHub+ "DC-Link" system that uses CAT-5 pair #4 (White/Brown) for power, or power can be supplied via a separate power supply. See the current consumption chart to determine how many devices can be powered with different systems.

## I - Powering via PS-Cube (for up to 4 devices)




Power a PS-CUBE from a Radio Systems Console
se cable # 16998(6') / 15884(1')
(3-pin MTA to 3-pin MTE)

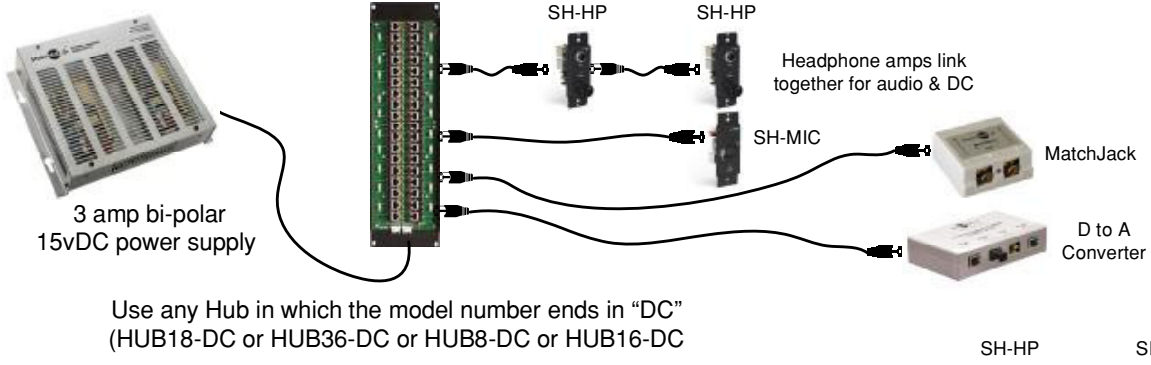
Power a PS-CUBE from a RS Console Power Supply
Use cable # 16600
(16-pin MR-16 to 5-pin MTA)

Power a PS-CUBE from a PS-EXTU Power Supply
(the cable is included)
(4-pin MR-4 to 5-pin MTA)

Power a PS-CUBE from a PS-WWUCUBE Power Supply
(the captive cable is included)
(captive to 3-pin MTE)

Power a PS-CUBE from a PS-WWCUBE Power Supply
(the captive cable is included)
(captive to 3-pin MTE)

## II - Powering Via a Hub (for up to 16 devices)



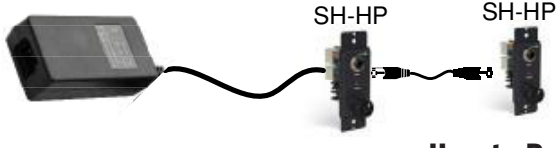

Use any Hub in which the model number ends in “DC”
(HUB18-DC or HUB36-DC or HUB8-DC or HUB16-DC

## III - Powering via a “Wall Wart” or Desk-Top Power Supply

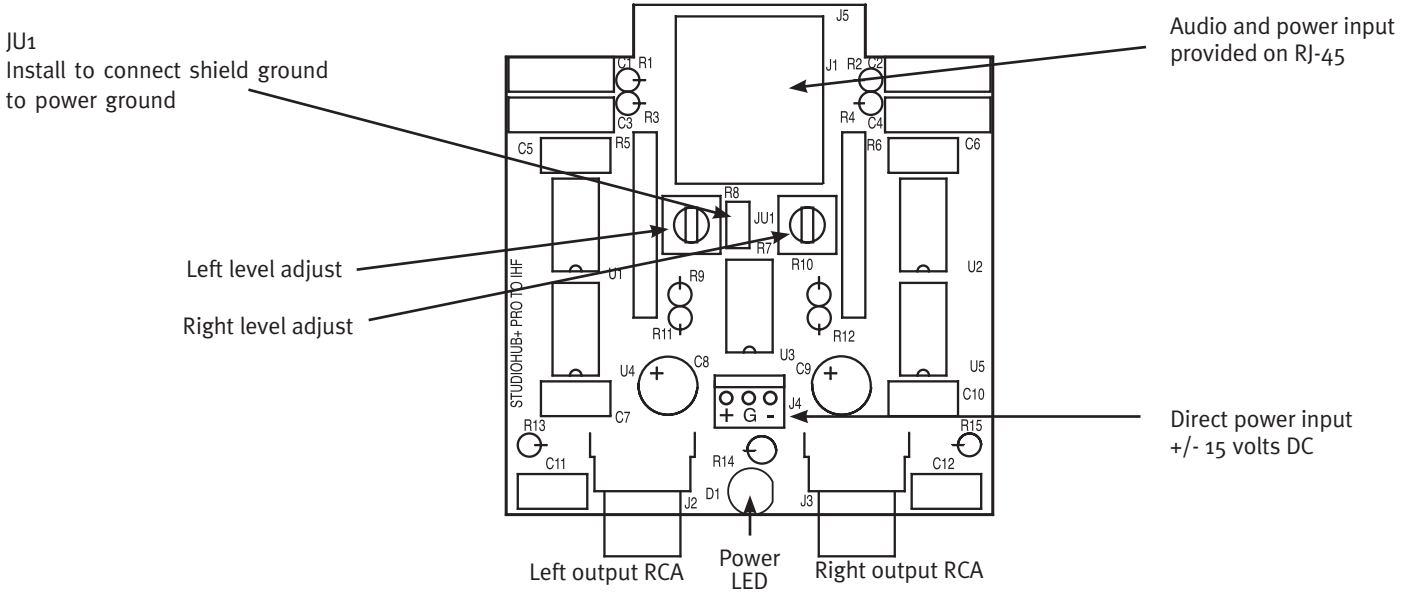
NOTE – All power supplies shown are Universal Voltage switching supplies and accept from 100 to 240VAC input power EXCEPT the “non Universal Wall-Wart” PS-WWCUBE and PS-WWSH supplies which are 110VAC input power only.

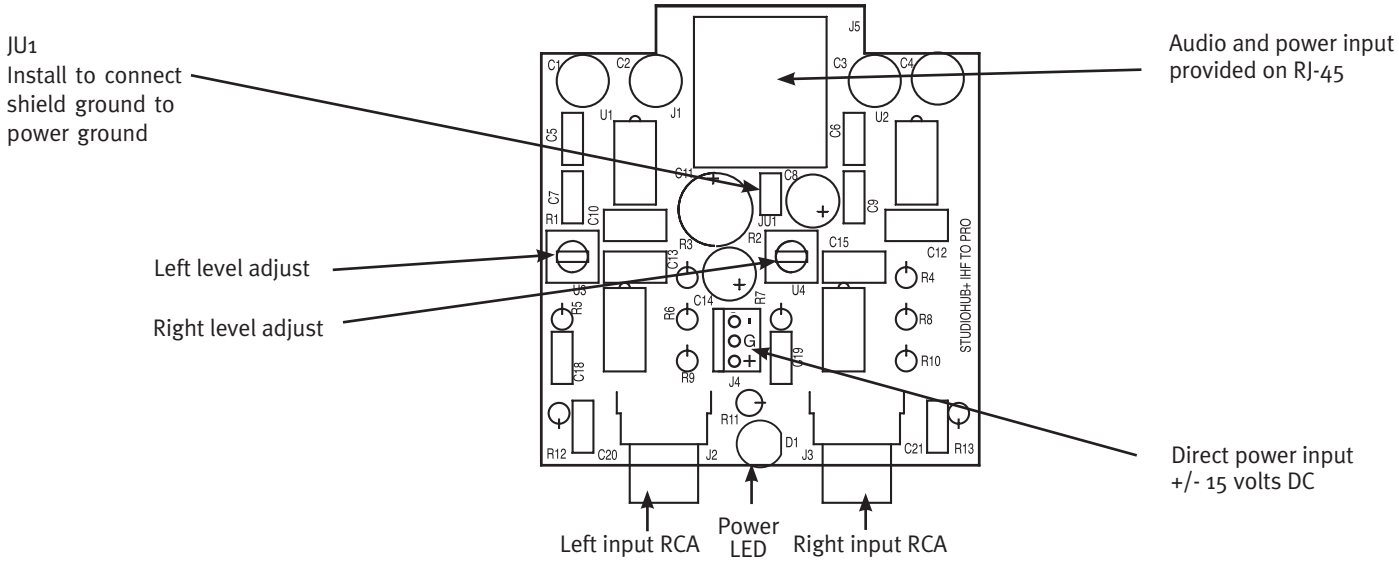
Power an individual MatchJack or Panel from a PSWW-SH Power Supply (the captive 3-pin to MTA cable is included)

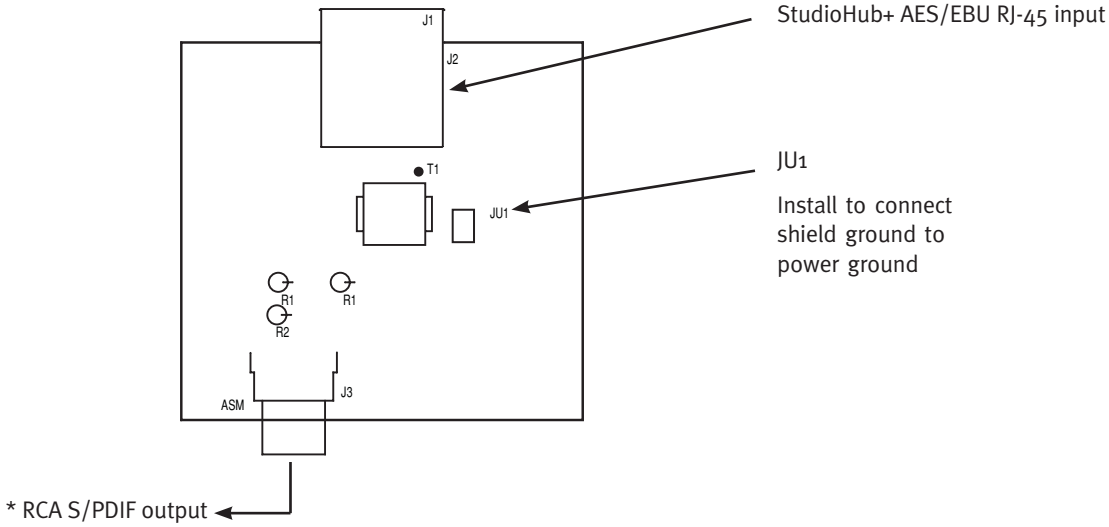
Power multiple Panels from a PSWWU-SH Power Supply (the captive 3-pin to MTA cable is included)

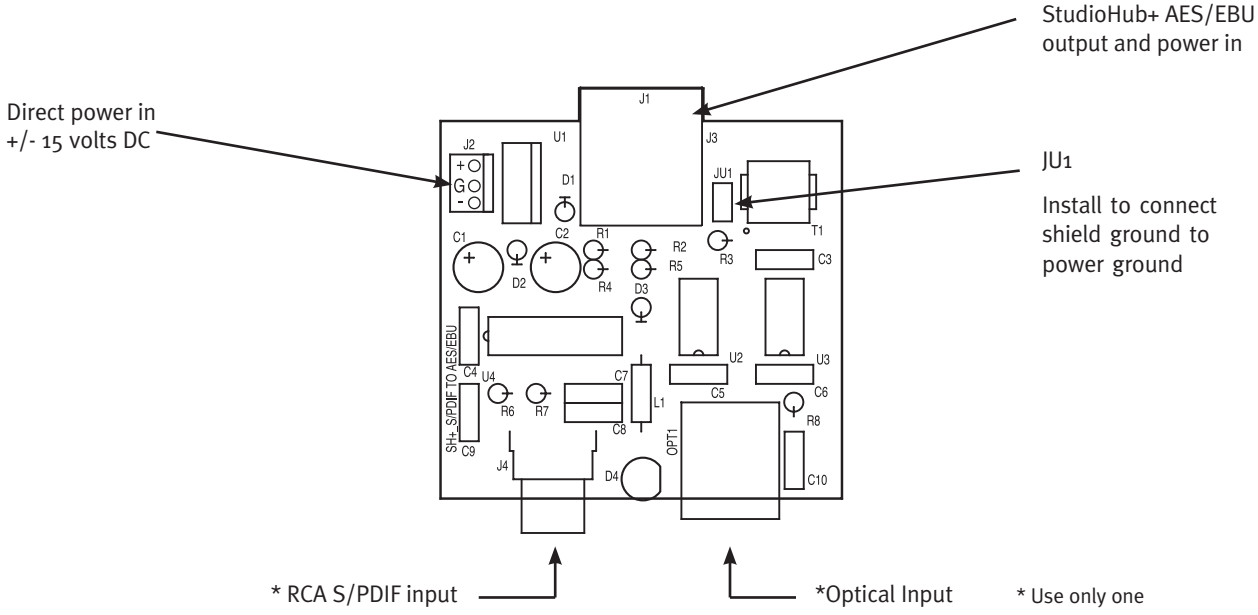



Headphone amps link together for audio & DC. Power up to 4 headphone amps from one PS-WWU and up to 2 headphone amps from 1 PSWW


JU1
Install to connect shield ground
to power ground
Left level adjust
Right level adjust
Audio and power input
provided on RJ-45
Direct power input
+/- 15 volts DC
Left output RCA
Power
LED
Right output RCA
STUDIOHUB+ PRO TO IHF
J5
J1
J2
J3
J4
JU1
D1
+ G -


JU1
Install to connect shield ground to power ground
Left level adjust
Right level adjust
Audio and power input provided on RJ-45
Direct power input +/- 15 volts DC
Left input RCA
Power LED
Right input RCA
STUDIOHUB+ IHF TO PRO


J1
J2
T1
JU1
R1
R1
R2
ASM
J3
StudioHub+ AES/EBU RJ-45 input
JU1
Install to connect shield ground to power ground
* RCA S/PDIF output


StudioHub+ AES/EBU output and power in
Direct power in +/- 15 volts DC
JU1
Install to connect shield ground to power ground
J1
J2
U1
J3
D1
JU1
T1
C1
C2
R1
R2
R3
C3
D2
R4
R5
D3
SH+ SPDIF TO AES/EBU
C4
U4
U2
U3
C7
C5
C6
R6
R7
L1
R8
C8
OPT1
C9
J4
D4
C10
* RCA S/PDIF input
*Optical Input
* Use only one

## Pro Level Input

### Set Input Level

JU3 JU4 JU5 JU6

IHF / PRO

Short all lower pins

### Set Nominal Input Sensitivity*

| JU1 JU2 | JU1 JU2 | JU1 JU2 |
|---|---|---|
| C D | C D | C D |
| 0dBu | +4dBu | +8dBu |
| Short Upper Pins | Short Lower Pins | Short No Pins |

## Consumer Level Input

### Set Input Level

JU3 JU4 JU5 JU6

IHF / PRO

Short all upper pins

### Set Nominal Input Sensitivity*

| JU1 JU2 | JU1 JU2 | JU1 JU2 |
|---|---|---|
| C D | C D | C D |
| -15dBv | -10dBv | -6dBv |
| Short Upper Pins | Short Lower Pins | Short No Pins |

Power Supply Connector

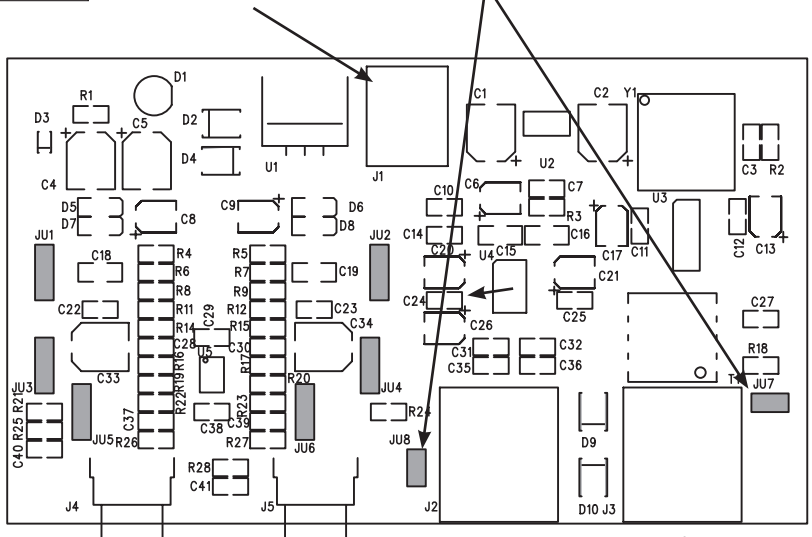
WHT BLU RED

-15v G +15v

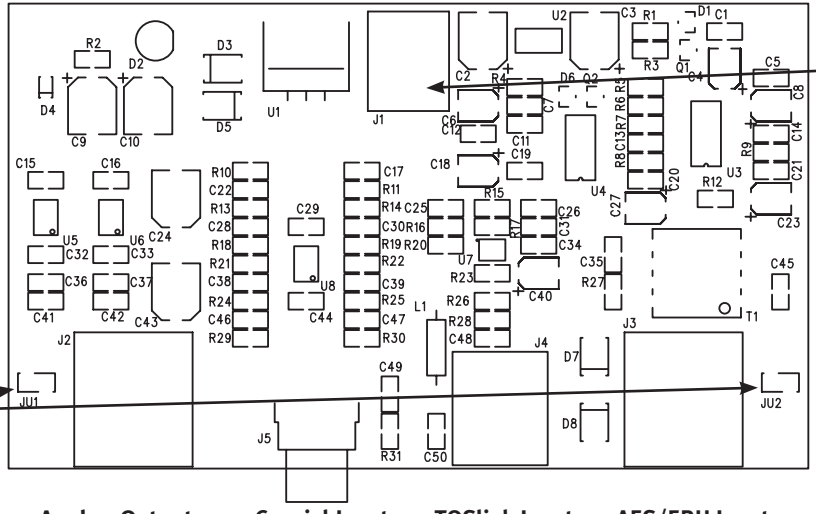
DC power in +/- 15 volts DC included (Radio Systems Part # PS-UCUBE) Unit can also be powered by StudioHub+ "DC-Link" via RJ-45's.

JU7, JU8

Install to connect RJ-45 shield to ground to power ground

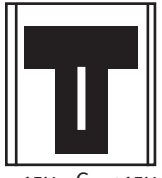



* Set for station standard reference level to provide unit output headroom of 20dB.



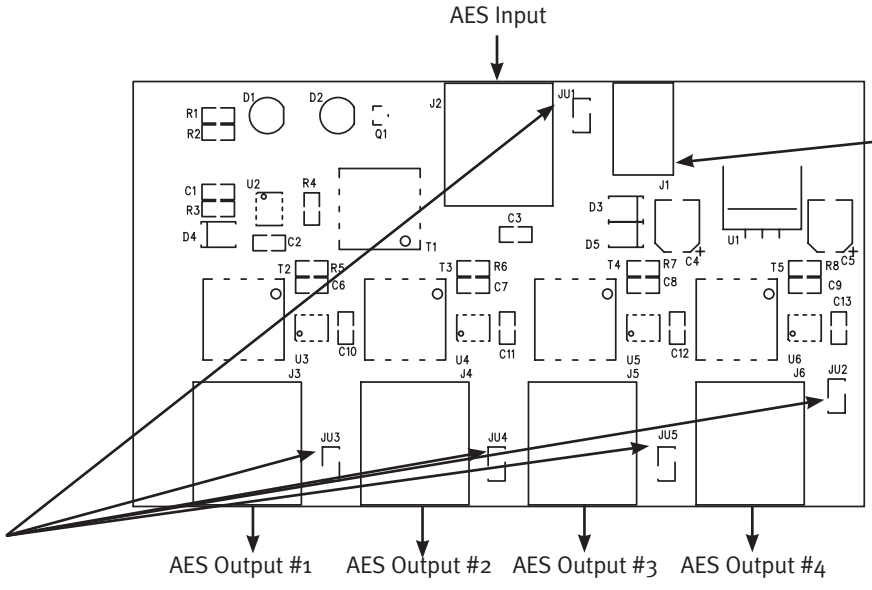

DC power in +/- 15 volts DC included
(Radio Systems Part # PS-UCUBE)
Unit can also be powered by StudioHub+ “DC-Link” via RJ-45’s.

Power Supply Connector

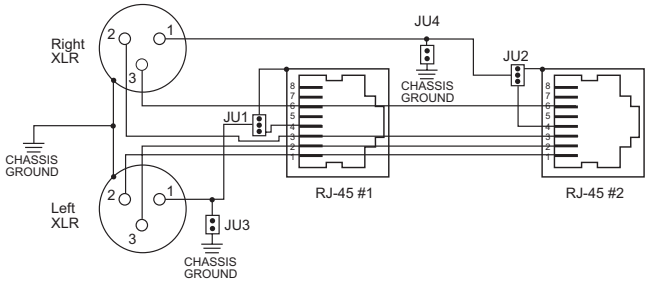



JU1 and Ju2

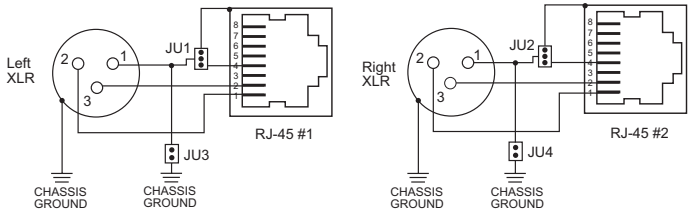
Install to connect RJ-45 shield to ground


AES Input
DC power in +9 volts DC included. (Radio Systems Part # 16213). Unit can also be powered by StudioHub+ "DC-Link" via RJ-45's
JU1 - Ju5
Install to connect RJ-45 shield to ground
AES Output #1
AES Output #2
AES Output #3
AES Output #4

**When programmed for stereo operation:**
L & R XLR feed both RJ45's in stereo.




**When programmed for Mono Operation:**
Left XLR feeds RJ45-1, pins 1 & 2 only.
Right XLR feeds RJ45-2, pins 1 & 2 only.




**To configure for stereo operation**

JU5

JU6

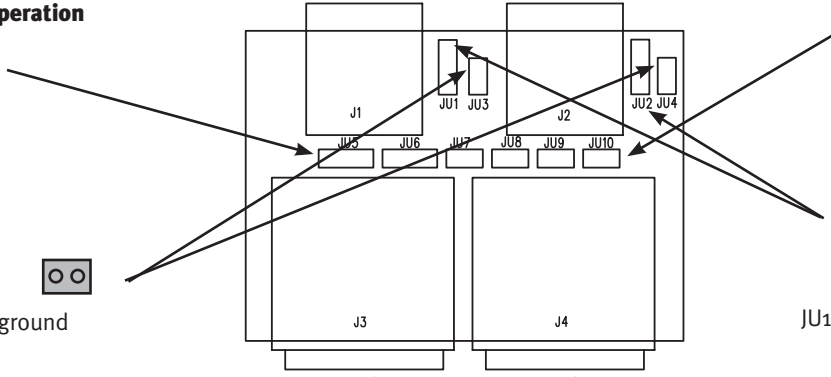
JU7, JU8, JU9, JU10

**To configure for mono operation**

JU5

JU6

JU7, JU8, JU9, JU10




**XLR PIN1 select jumper** 

Install JU3 to connect
Left XLR pin 1 to chassis ground

Install JU4 to connect
Right XLR pin 1 to chassis ground

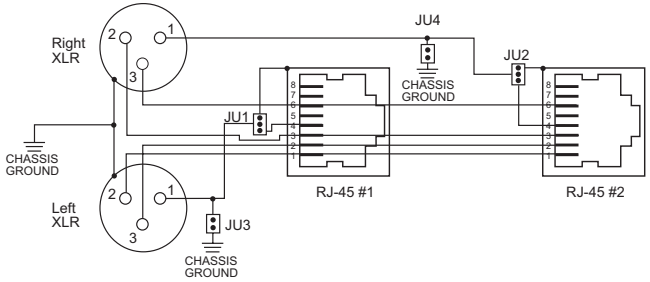
StudioHub+ RJ45 "A" for mono only or stereo operation

StudioHub+ RJ45 "B" for stereo operation

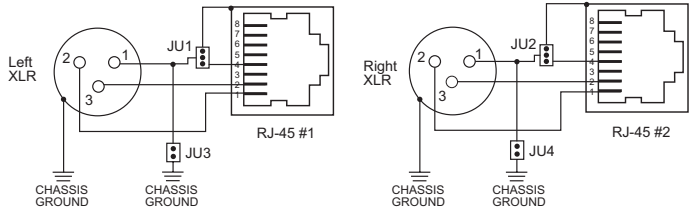
**RJ45 shield and ground select jumpers**

| | Left | Right | |
|---|---|---|---|
| JU1 | JU2 | Install to connect XLR Pin 1 to RJ-45 shield |
| JU1 | JU2 | Install to connect XLR Pin 1 to RJ-45 power ground (RJ-45 pin 4) |

**When programmed for stereo operation:**
L & R XLR feed both RJ45's in stereo.




**When programmed for mono operation:**
Left XLR feeds RJ45-1, pins 1 & 2 only.
Right XLR feeds RJ45-2, pins 1 & 2 only.




**To configure for stereo operation**

JU5

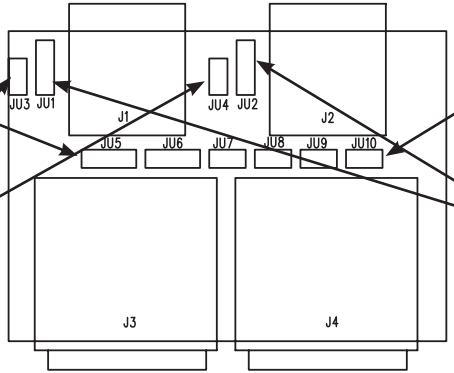
JU6

JU7, JU8, JU9, JU10

**XLR PIN1 select jumper**

Install JU3 to connect
Left XLR pin 1 to chassis ground

Install JU4 to connect
Right XLR pin 1 to chassis ground




StudioHub+ RJ45 "A" for mono only or stereo operation

StudioHub+ RJ45 "B" for stereo operation

**To configure for mono operation**

JU5

JU6

JU7, JU8, JU9, JU10

**RJ45 shield and ground select jumpers**

Left Right

JU1 JU2

Install to connect
XLR Pin 1 to RJ-45 shield

JU1 JU2

JU1 JU2

Install to connect XLR Pin 1 to RJ-45 power ground (RJ-45 pin 4)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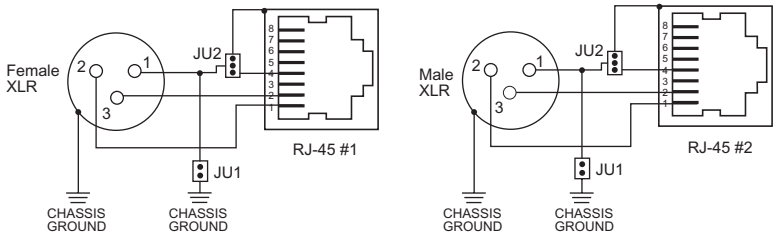
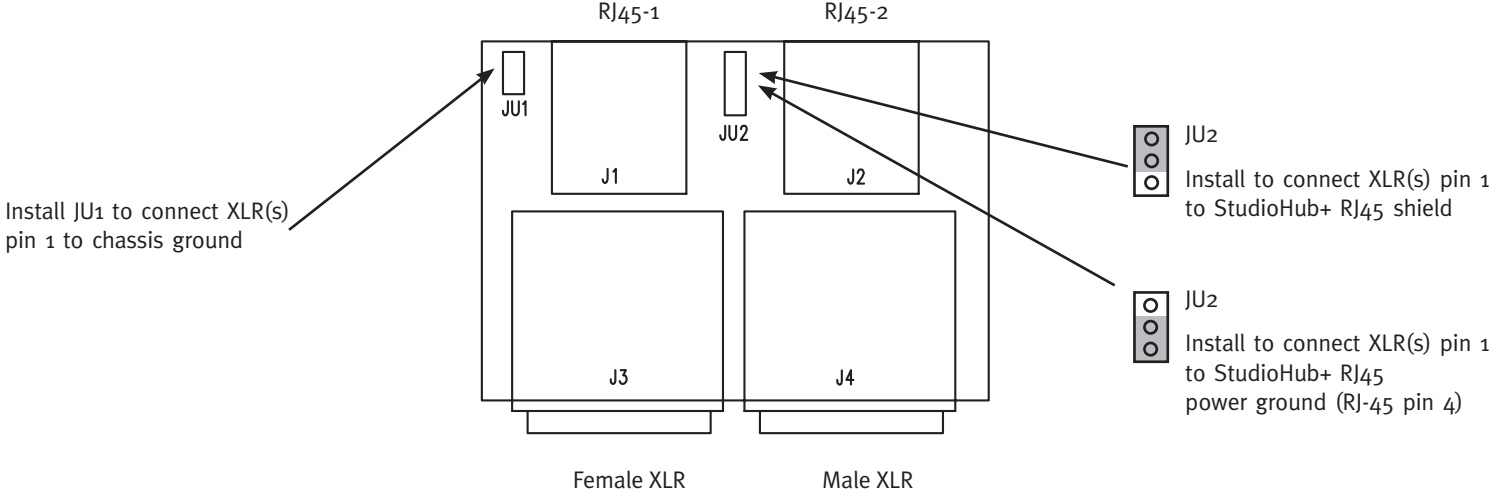

Female
XLR
2
1
3
JU2
JU1
RJ-45 #1
CHASSIS
GROUND
CHASSIS
GROUND
Male
XLR
2
1
3
JU2
JU1
RJ-45 #2
CHASSIS
GROUND
CHASSIS
GROUND


RJ45-1
RJ45-2
JU1
JU2
J1
J2
J3
J4
Female XLR
Male XLR
Install JU1 to connect XLR(s) pin 1 to chassis ground
JU2
Install to connect XLR(s) pin 1 to StudioHub+ RJ45 shield
JU2
Install to connect XLR(s) pin 1 to StudioHub+ RJ45 power ground (RJ-45 pin 4)

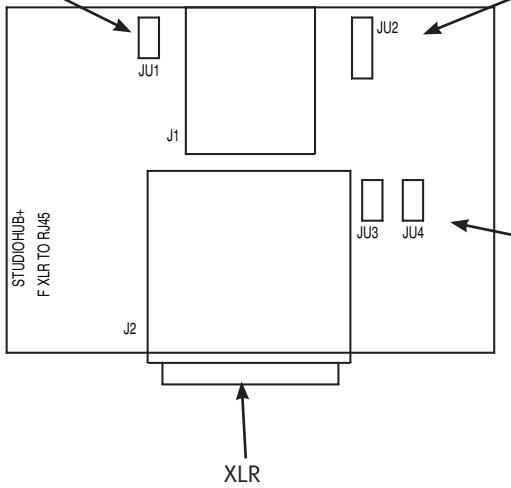
JU1

Install to connect XLR pins to chassis ground

JU2

Install to connect XLR pins to power ground

Install to connect XLR pin 1 to shield ground




JU3, JU4

Install for left and right in parallel
Remove for left only

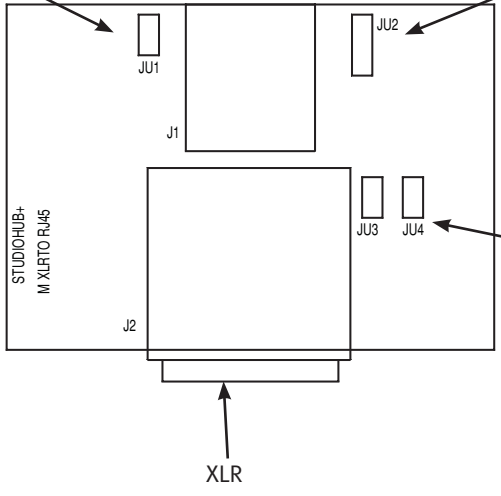
JU1

Install to connect XLR pins to chassis ground

JU2

Install to connect XLR pins to power ground

Install to connect XLR pin 1 to shield ground




JU3, JU4

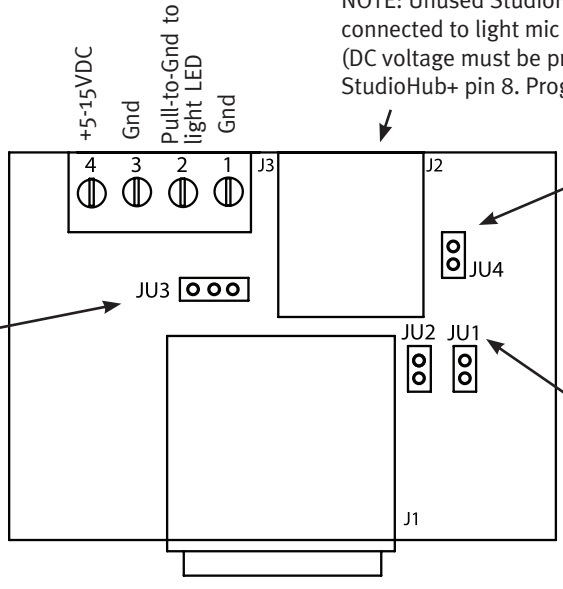
Install for left and right in parallel
Remove for left only

Install to connect external power to light mic boom LED (5-15VDC) via pins 3 & 4 on barrier strip connector

JU3

Install to connect external power to light mic boom LED (15VDC) via pin 8 of RJ-45 when connected to a standard StudioHub+ powered Cube or Hub.

NOTE: Unused StudioHub+ RJ-45 pin 5 (CAT-5 wht/blu wire) is connected to light mic boom LED when connected to ground (DC voltage must be provided either via barrier strip pin 4 or StudioHub+ pin 8. Program JU3 accordingly).




JU4

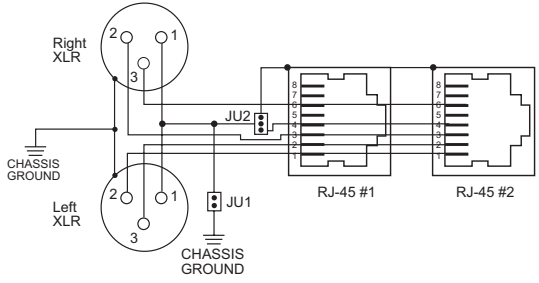
Install to connect XLR pins to XLR chassis ground

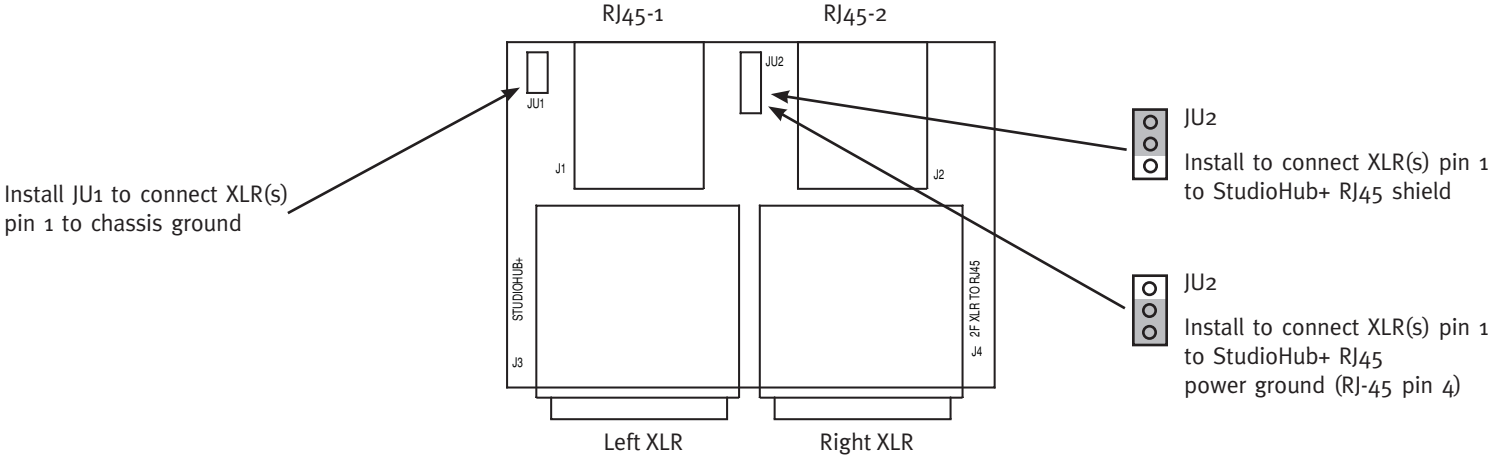
JU1, JU2

Install both jumpers to apply left and right mic audio in parallel on RJ-45 connector (StudioHub+ standard pins 1 & 2 for left, and pins 3 & 6 for right). Remove both jumpers to apply mic audio to left channel only.

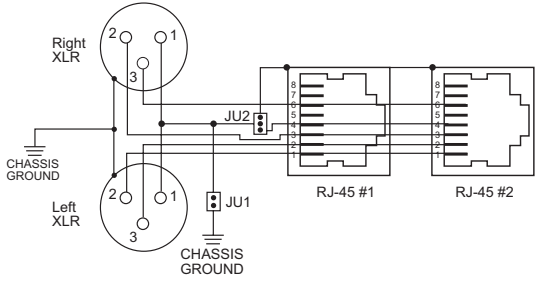
5-Pin XLR
(Mating 5-pin male in-line male XLR connector included)

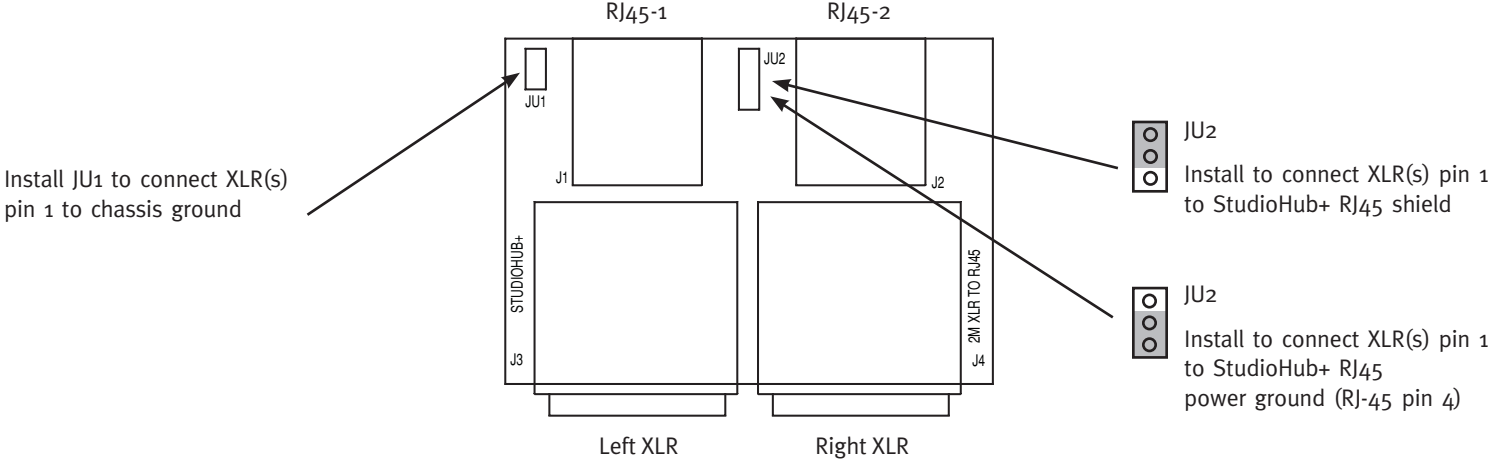
**For Stereo Operation:** L & R XLR feed both RJ45's in stereo.



**For Stereo Operation:** L & R XLR feed both RJ45's in stereo.



JU1 and JU2*

Install to tie StudioHub+ RJ45 right - connection to StudioHub+ shield.

Install to tie StudioHub+ RJ45 right - connection to StudioHub+ power ground.

JU3 and JU4*

Install to tie StudioHub+ RJ45 left - connection to StudioHub+ shield.

Install to tie StudioHub+ RJ45 left - connection to StudioHub+ power ground.

JU5 and JU6*

Install to tie 1/4" and mini TRS sleeve to StudioHub+ RJ45 shield.

Install to tie 1/4" and mini TRS sleeve to StudioHub+ RJ45 power ground.

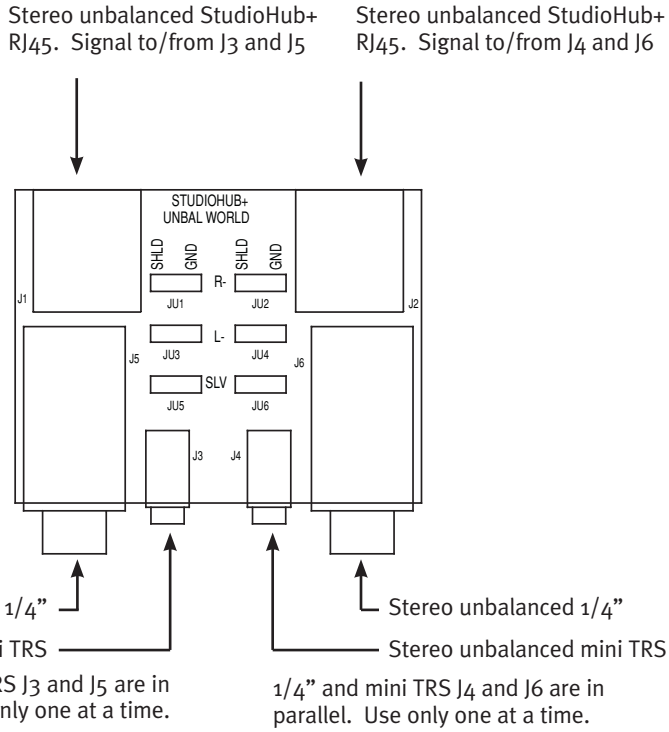
***Improper use of JU1, JU2, JU3, JU4 may result in no output, excessive noise, crosstalk, oscillation, or circuit failure.**

1/4" and mini TRS wiring

Tip = Left + StudioHub+ RJ45 connection

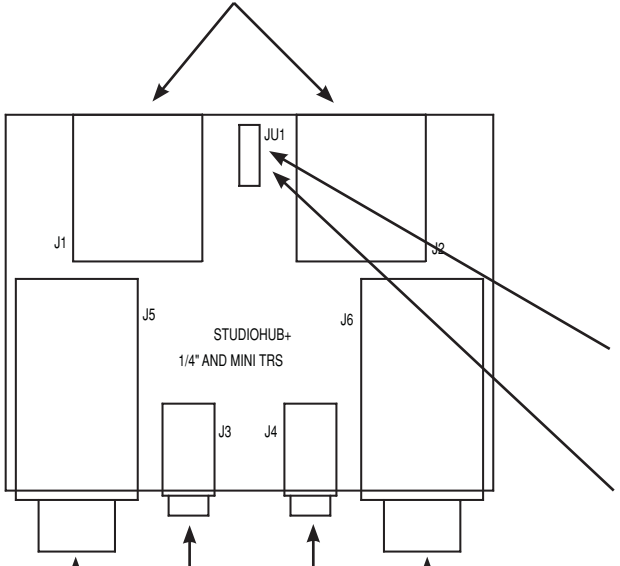
Ring = Right StudioHub+ RJ45 connection

Sleeve = See JU5 and JU6



1/4" TRS & mini TRS, (J3/J4 and J5/J6) are in parallel. Use only one at a time.

2 Stereo StudioHub+ RJ45(s) in parallel




1/4" mini TRS
(J3, J4, J5, J6) wiring
Tip = +
Ring = —
Sleeve = See JU1 pinouts below

JU1 (upper pins)

Install to connect sleeve of all 1/4" and mini jacks to StudioHub+ RJ45 shield

JU1 (lower pins)

Install to connect sleeve of all 1/4" and mini jacks to StudioHub+ RJ45 power ground

Note:

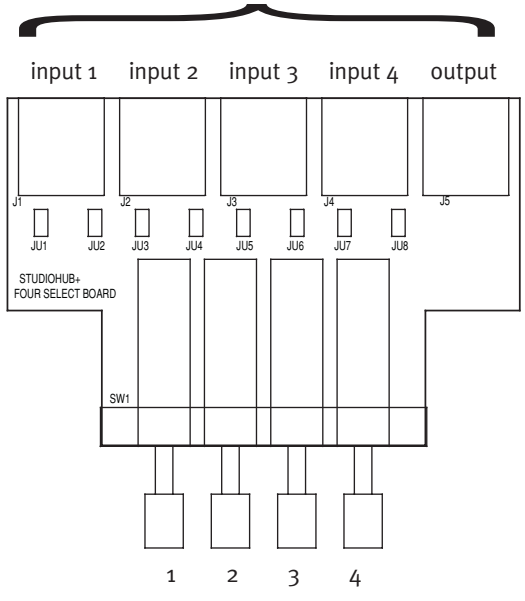
This part obsolete as of September 2012.

Replaced by active model SH-4SWA

**Jumpers JU1-JU8 tie +15volt and –15volt from input RJ45(s) to the output RJ45 J5**

**JU1** –15volts input 1
**JU2** +15volts input 1
**JU3** –15volts input 2
**JU4** +15volts input 2
**JU5** –15volts input 3
**JU6** +15volts input 3
**JU7** –15volts input 4
**JU8** +15volts input 4

Stereo StudioHub+ RJ45




Input selects

**These internal buses and jumpers allow +15volts, –15volts and shield to be connected from the two studioHub+ RJ45(s) and the terminal block.**
A circuit path requires at least two jumpers.

**JU1** install to tie terminal block shield to internal shield bus.

**JU2** install to tie terminal block –15volts to internal –15volt bus.

**JU3** install to tie terminal block +15volts to internal +15volt bus.

**JU4** install to tie StudioHub+ RJ45 J2 +15volts to internal +15volt bus.

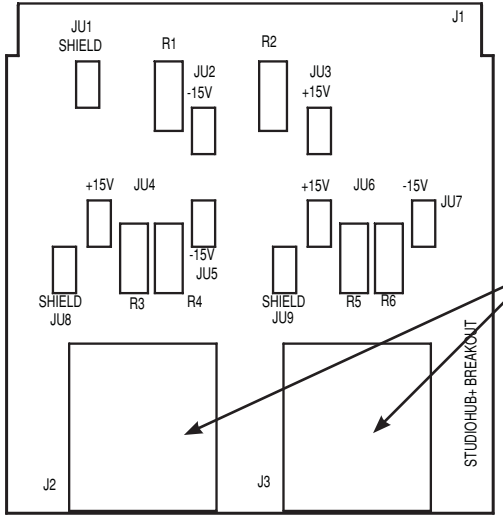
**JU5** install to tie StudioHub+ RJ45 J2 –15volts to internal –15volt bus.

**JU6** install to tie StudioHub+ RJ45 J3 +15volts to internal +15volt bus.

**JU7** install to tie StudioHub+ RJ45 J3 –15volts to internal –15volt bus.

**JU8** install to tie StudioHub+ RJ45 J2 shield to internal shield bus.

**JU9** install to tie StudioHub+ RJ45 J3 shield to internal shield bus.

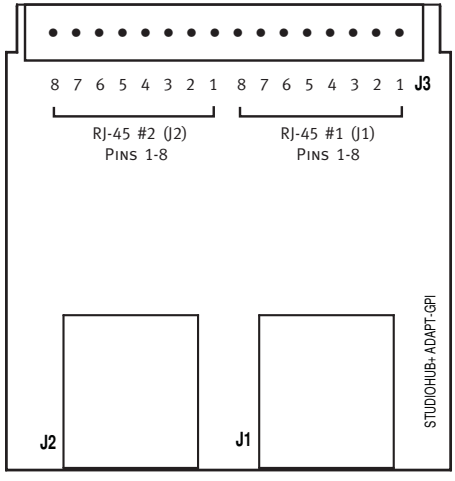



2 StudioHub+ RJ45 with pins below in parallel

1. Left + or AES/EBU+
2. Left – or AES/EBU–
3. Right +
6. Right –
4. Power Ground
5. Future

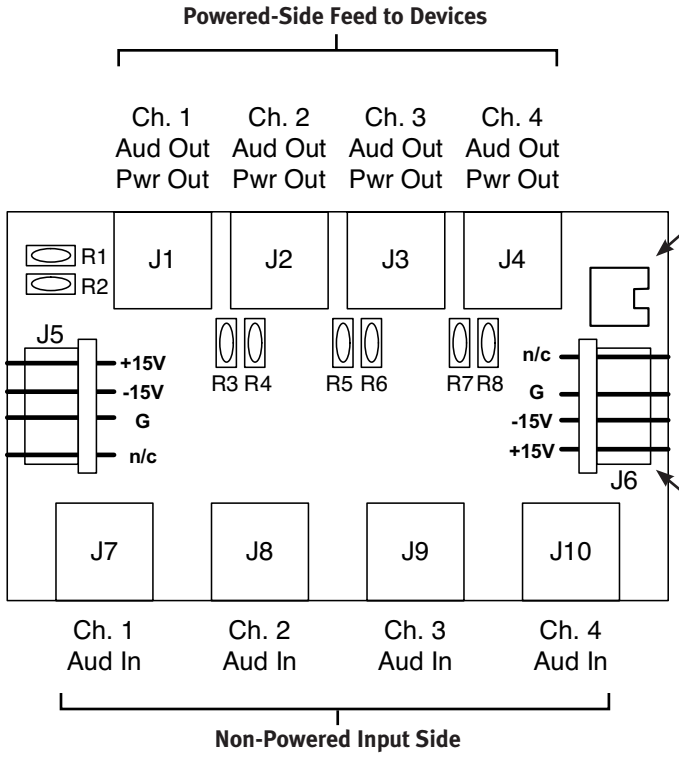
**RJ-45 ADAPT-GPI Pin Out for Wheatstone BLade GPIO**

RJ-45 Pin1- Audio Ground
RJ-45 Pin2- Logic 7 In/Out
RJ-45 Pin3- Logic 8 In/Out
RJ-45 Pin4- Logic 9 In/Out
RJ-45 Pin5- Logic 10 In/Out
RJ-45 Pin6- Logic 11 In/Out
RJ-45 Pin7- Logic 12 In/Out
RJ-45 Pin8- +5V Digital



**Notes:**
Power is added to audio connections and available on the 4 output RJ-45's (J1-J4). The four stereo audio feeds are kept seperated and isolated.

Channels are independent, isolated and independently fused with self resetting thermal fuses.




**PS-WW Cube Power Connector.**
Allows P/N PS-WWCube or PS-WWUCube desktop power supply to provide power. Max power provided 400 ma.

Power Supply
+/-15v In (or) Out
Max power provided 3 amps.

Power Supply
+/-15v In (or) Out.
Max power provided 3 amps.

**PS-EXTU Power Connector.**
Allows P/N PS-EXTU wall-top power supply to provide power. Max power provided 3 amps.

**Loop-Thru Power Connector.**
Power supply cable P/N 11516 (1 ft.) required. Contact the factory to acquire at no charge if needed.

(Note - There are older versions of this product.
See www.studiohub.com/legacyproducts)

**StudioHub+ 4 Source Switcher**

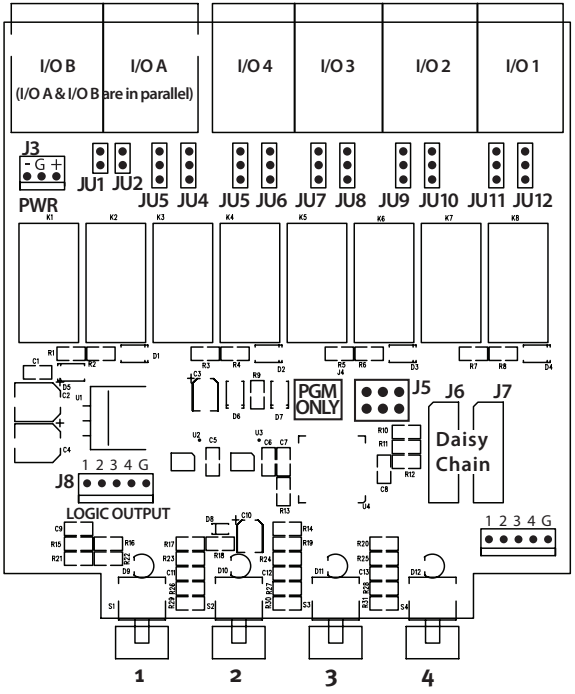
The SH-4SHSS is an active device and must be powered via +/- 15VDC. Power flows via StudioHub+ "DC-Link" if connected to any Cat-5 cable with +/- 15VDC active on Pins 7&8. Or, utilize optional power supply is part # PS-WWUSH.

Input selects will be maintained in the event of a power failure.

Input select switches may be remote controlled via pins on connector J4.

The unit is fully bidirectional and may switch
4 inputs to 1 output or
1 input to 4 outputs

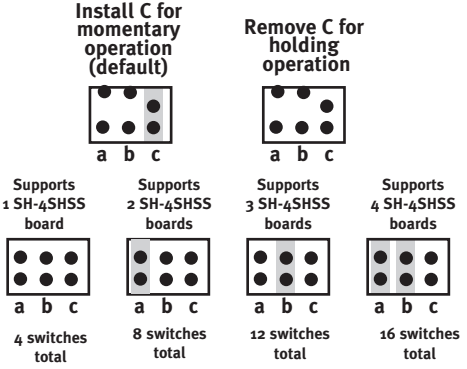
This circuit board is packaged alone for single 1x4 use, or up to 4 maybe interconnected for up to a 1x16 switching application.




Special Purpose Logic Output J8
(Special PROM required)

1 +5VDC
2 NC
3 Pull to Ground #1
4 Pull to Ground #2
5 GND

**J5 – Programing**
(Note- power must be cycled for mode change)




**Shielding Jumpers:**
**JU1** – insert to connect power ground to chassis ground
**JU2** – insert to connect power ground to shield

**Mono/Stereo Jumpers JU5-JU12:**
To make inputs stereo set both jumpers to upper position

To make inputs mono set both jumpers to lower position

StudioHub+ RJ45 Output and power in. Output appears on both left (1 & 2) and right (3 &6) connector pins

JU2

XLR pin 1 select

Install to connect XLR pin 1 to RJ-45 shield.

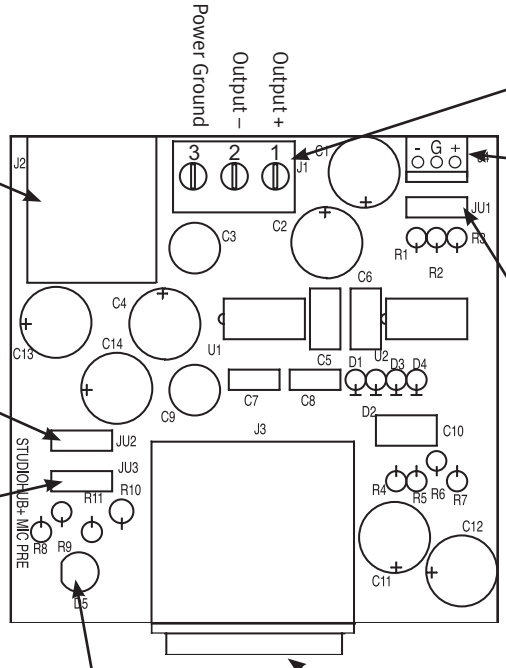
Install to connect XLR pin 1 to power ground & J1 pin 3

JU3

Phantom Power

Off

On (+15 Volts)




Power LED

XLR Microphone input

Output Audio

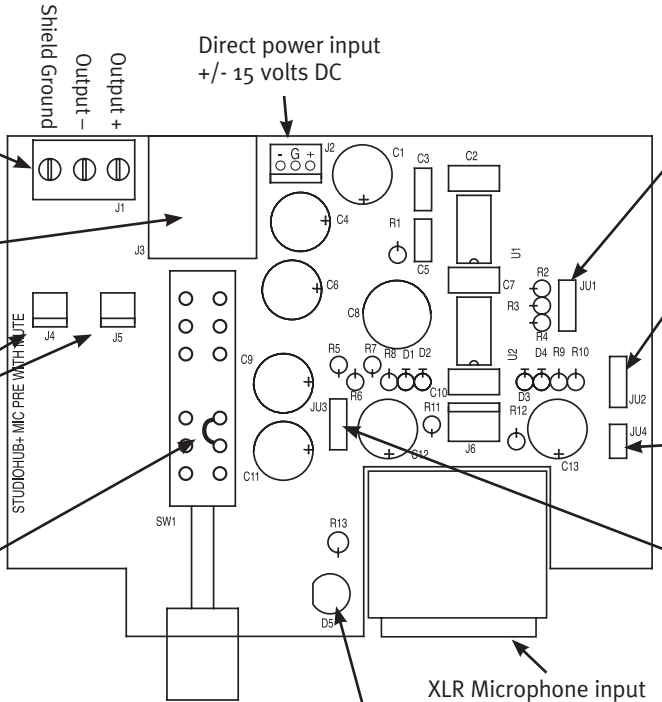
Direct power input
+/- 15 volts DC

JU1 Gain

26dB

46dB

66dB




Output audio provided on barrier strip

StudioHub+ RJ45 Output and power in. Output appears on both left (1 & 2) and right (3 &6) connector pins

JU1 & JU2

Isolated dry N. O. switch contacts

Install jumper to defeat push to talk (on/off switching of mic output)

Direct power input
+/- 15 volts DC

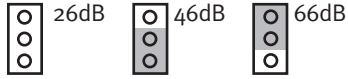
Push to talk

Note: Specify on order Push On/Push Off or momentary operation

Switch “pushed” LED

XLR Microphone input

JU1 Gain




JU2 XLR pin 1 select

Install to connect XLR pin 1 to shield ground

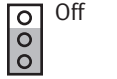
Install to connect XLR pin 1 to power ground

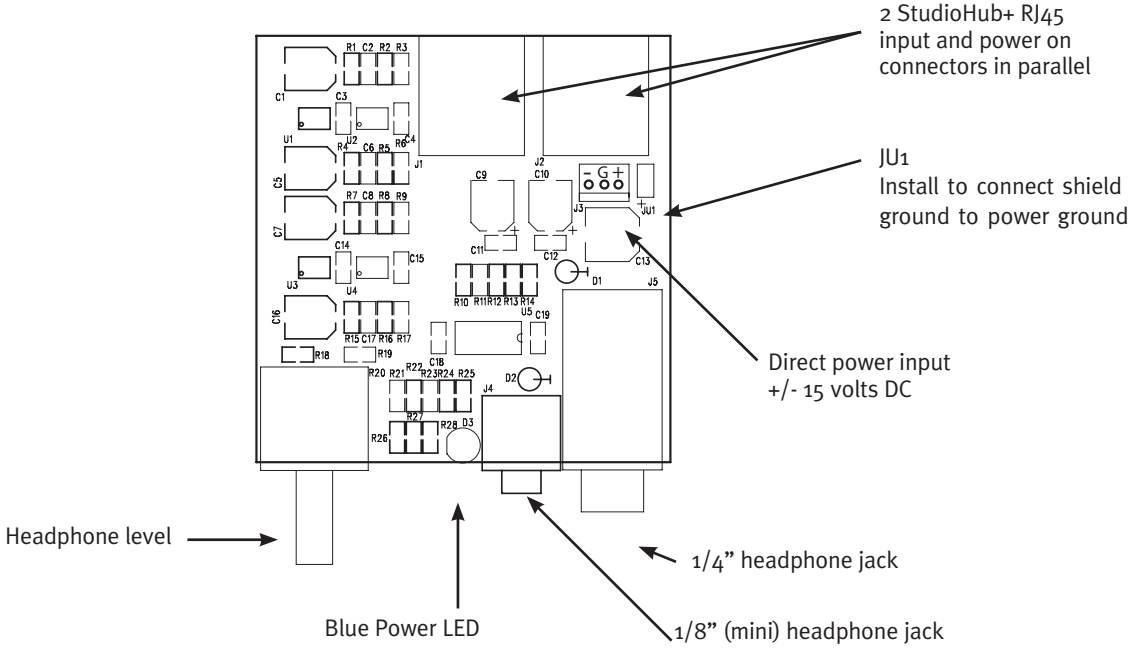
JU4

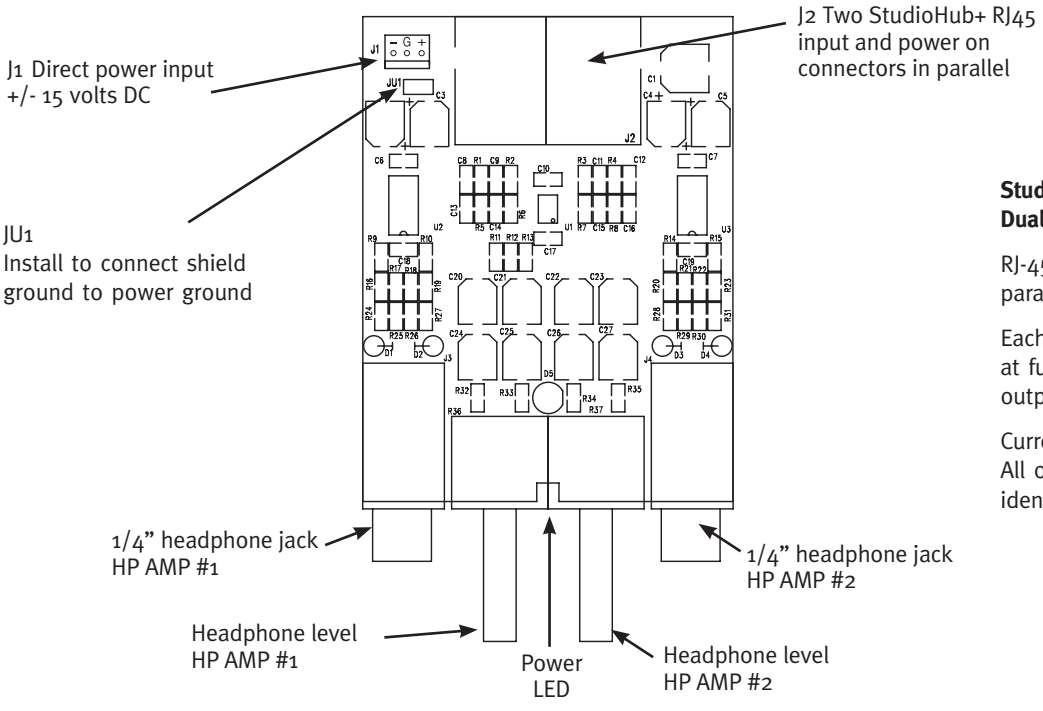
Install to connect XLR pin 1 to chassis ground

JU3

Phantom Power




2 StudioHub+ RJ45
input and power on
connectors in parallel
JU1
Install to connect shield
ground to power ground
Direct power input
+/- 15 volts DC
Headphone level
Blue Power LED
1/4” headphone jack
1/8” (mini) headphone jack




**StudioHub+ Heaphone Amplifier Dual Output Version**

RJ-45 input jacks remain in parallel (there is only 1 input.)

Each output is isolated and at full power (with separate output amplifier chips.)

Current consumption is 100ma. All other specifications are identical to single (SH-HP) model.

Audio and power input
provided on barrier strip

Stereo StudioHub+ RJ45(s)
stereo output and power in

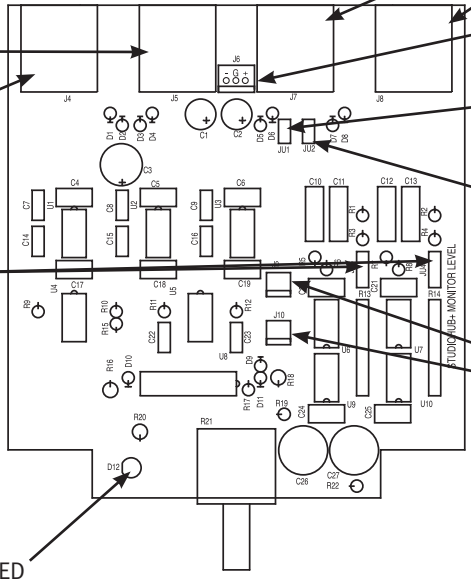
Stereo StudioHub+ RJ45(s)
mono output and power in

JU3, JU4 gain select

Unity -
no jumper

+10dB

+20dB




Power LED

Level

2 StudioHub+ RJ45
input and power in
connectors in parallel

Direct power input
+/- 15 volts DC

JU1

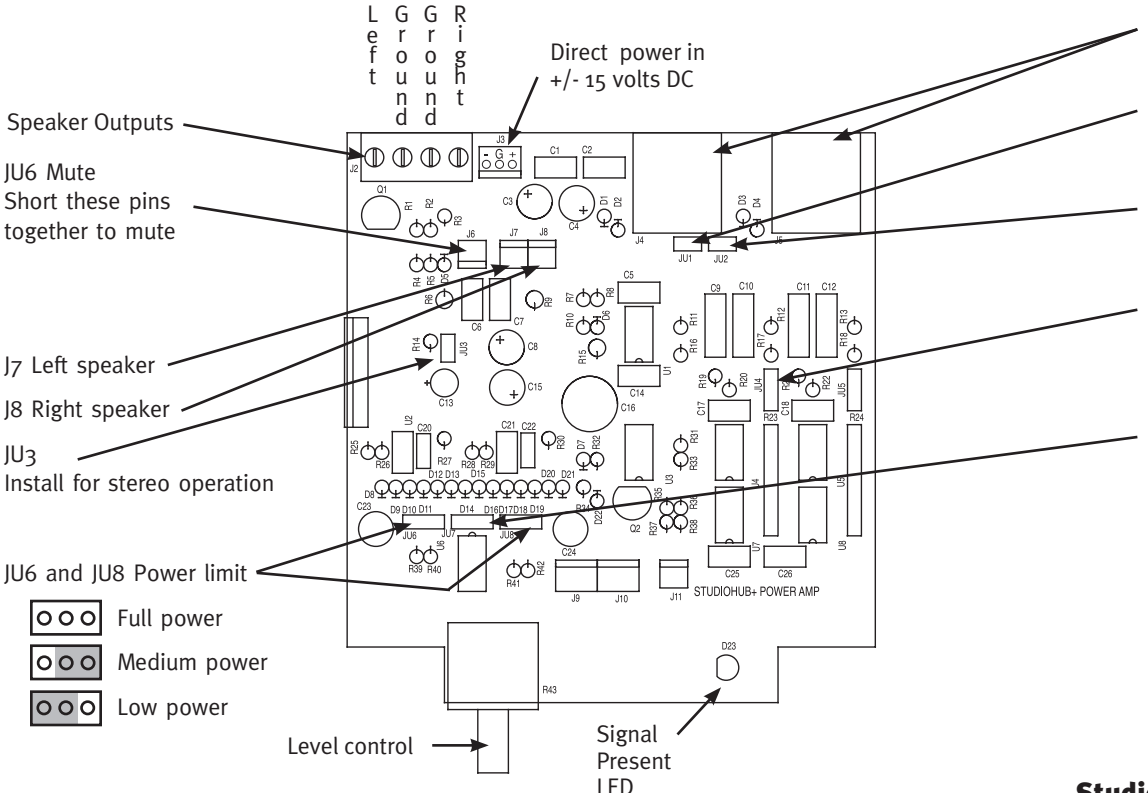
Install to connect shield ground
and power ground

JU2

Install to connect shield ground
and chassis ground

JU9, JU10

2 mute control connectors in
parallel. Short the pins on either
connector together for mute




2 StudioHub+ RJ45 Input and power in connectors in parallel

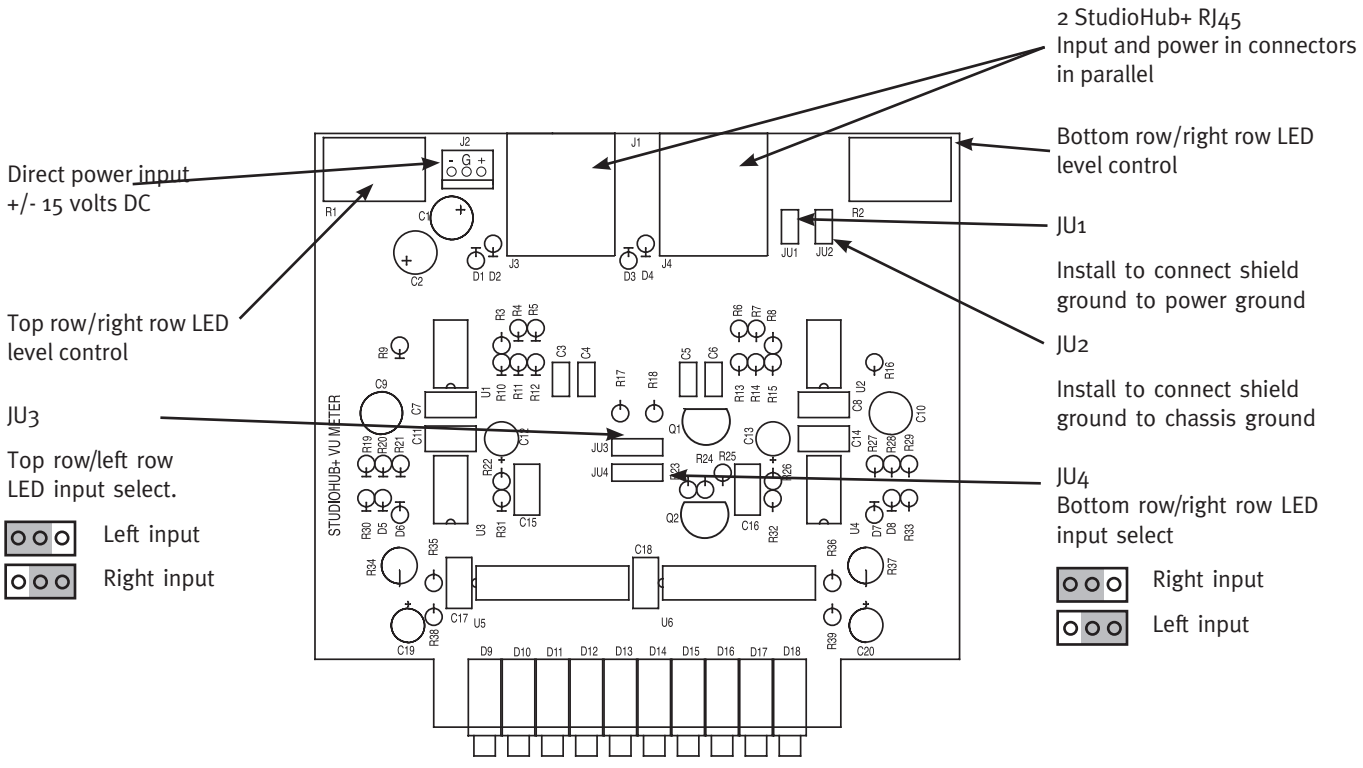
JU1
Install to connect shield ground to power ground

JU2
Install to connect shield ground to chassis ground

JU4, JU5 Gain Straps
Unity Gain
+10dB
+20dB

JU7 Mono - Stereo jumper
Stereo operation
Mono operation
Left output is a mix of left and right inputs. Right output is muted

**StudioHub+ Monitor Amp Panel**
Part # **SH-AMP w/o Speaker**
Part # **SH-AMPSPKR w/Speaker**


2 StudioHub+ RJ45
Input and power in connectors
in parallel
Bottom row/right row LED
level control
JU1
Install to connect shield
ground to power ground
JU2
Install to connect shield
ground to chassis ground
JU4
Bottom row/right row LED
input select
Right input
Left input
Direct power input
+/- 15 volts DC
Top row/right row LED
level control
JU3
Top row/left row
LED input select.
Left input
Right input
STUDIOHUB+ VU METER

StudioHub+ RJ45
input 1 and power in

Stereo StudioHub+ RJ45
input 2 and power in

Gain Straps (pre-fader)

JU3, JU4 Input 1

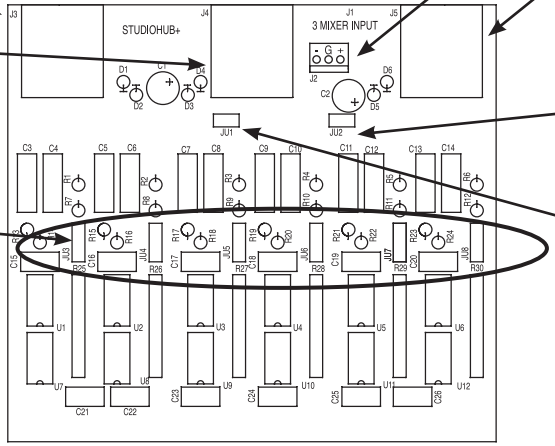
JU5, JU6 Input 2

JU7, JU8 Input 3

No jumper for unity gain
normal for +4dBu applications

+10dB gain

+20dB gain




Direct power input
+/- 15 volts DC

StudioHub+ RJ45
Input 3 and power in

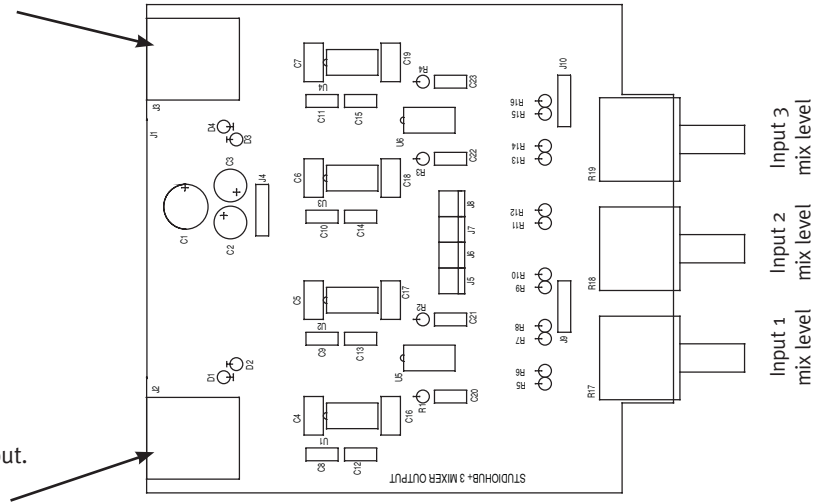
JU2

Install to connect shield
ground to chassis ground

JU1

Install to connect shield
ground to power ground

StudioHub+ RJ45 main output.
Mix of inputs 1, 2 and 3.
Also power in




StudioHub+ RJ45mix minus output.
Mix of inputs 1 and 2 only.
Also power in

JU1

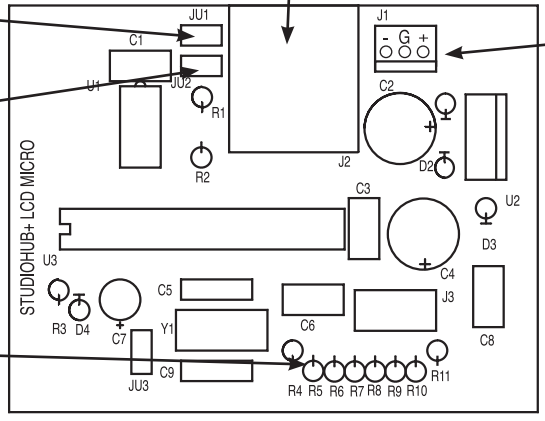
Install to connect shield ground to chassis ground

JU2

Install to connect shield ground to power ground

JU3

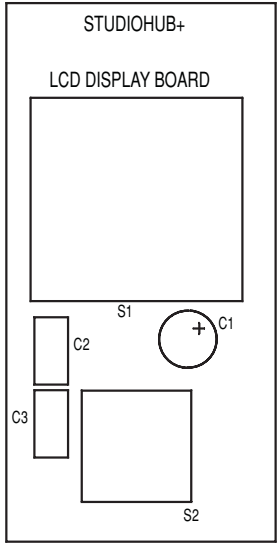
Install/remove to reverse direction of rotary encoder




Interface Pin-Outs

| RJ-45 Pin-Outs | Function |
|---|---|
| 1 | TxD+ |
| 2 | TxD- |
| 3 | RxD+ |
| 6 | RxD- |
| 8 | +15 volt |
| 4 | ground |

This board must be used in conjunction with the LCD display board.

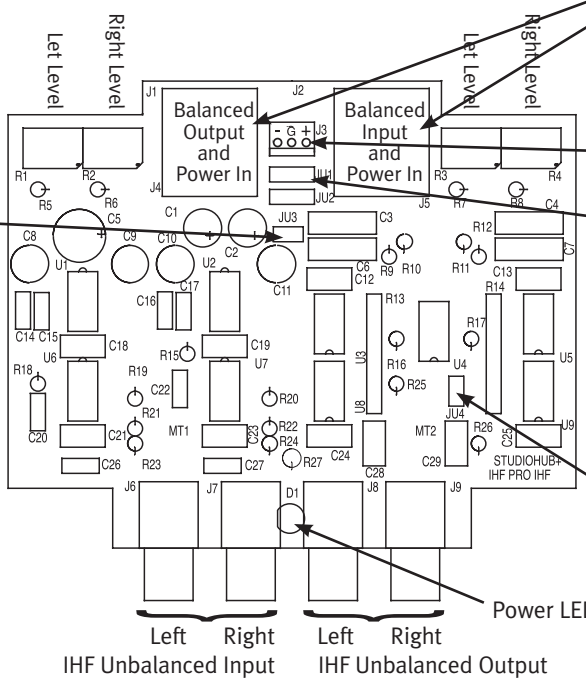



This board to be used in conjunction with the LCD micro board

Audio in/out and power input provided on RJ-45's

JU3

Install to connect shield ground to chassis ground




J3

Direct power input +/- 15 volts DC

JU1 and JU2

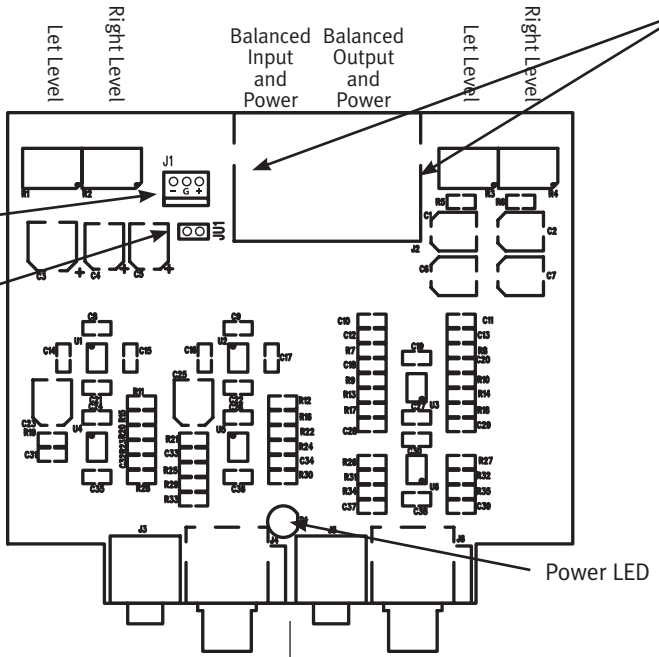
(install both the same)

Board power from J5

Board power from J4

JU4

Install to connect shield ground to power ground


Let Level
Right Level
Balanced Input and Power
Balanced Output and Power
Let Level
Right Level
Audio in and out and StudioHub+ "DC-Link" +/- 15VDC power provided on RJ-45's
J1
Direct power input +/- 15 volts DC
JU1
Install to connect shield ground to chassis ground
Power LED
1/8" (mini) TRS Phone IHF Unbalanced Input
Left & Right RCA IHF Unbalanced Input
1/8" (mini) TRS Phone IHF Unbalanced Output
Left & Right RCA IHF Unbalanced Output

## Warranty

Radio Systems, Inc., warrants this equipment to be free from defects in materials and workmanship for a period of one (1) year.

This warranty extends to first users of the product and future owners who purchase the product within the warranty period.

The terms of this warranty are null and void if this product is stored or operated in an environment not conducive to electronic equipment, or shows signs of misuse or modifications which affect the proper functioning of the product. This warranty does not apply to damage caused by fire, smoke, flood, lightning, or acts of nature and physical abuse.

Radio Systems, Inc., and its associated companies, authorized distributors, and personnel are not liable for loss of revenues or other damages, or effects to the broadcast signal quality or coverage which may result from the from the improper functioning of this product.

## Repair Policy

Technical assistance is available at any time, at no charge, by phone or correspondence.

During the warranty period, there will be no charge for parts or service made to units which show no sign of misuse by customer or lightning caused damage. The customer is responsible for the cost of shipping their unit back to Radio Systems for repair.

During the warranty period, shipment of small parts and assemblies may also be made at a charge to the user. Emergency shipments of replacement parts and circuits will be made at the user's request for an extra shipping and service charge. Chargeable services will be made COD or on Net-30 day terms to users with established accounts.

During the warranty period, full credit or return of COD charges (less any service and expedited shipping charges) will be made to users who return the defective parts or circuits within 30 days, if the damage is covered under the terms of the warranty.

## Return Instructions

Contact Radio Systems for a return authorization number.
Pack all items carefully and ship prepaid, via UPS insured, to:

Radio Systems, Inc.

Attn: R.A. # _____
601 Heron Drive
Logan Township, New Jersey 08085-1741

Enclose a note which includes your name, company, phone number, the serial number, return address (no box numbers), and a complete description of the problem.

601 Heron Drive • Logan Township, New Jersey 08085 • (856) 467-8000 • Fax (856) 467-3044
www.studiohub.com • www.radiosystems.com