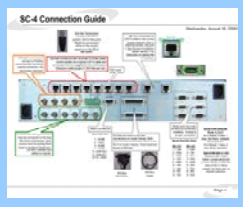
# Getting Started

Wednesday, May 16, 2007

## Step 1

Unpack all equipment and verify that all components are accounted for, that there has been no damage in transit and install equipment in desired location.

## Step 2


Locate the printed “Connection Guide” for each component in your shipment. The guides contain the information you will need to connect the various components of your system and identify the various cables, terminators and etc. Using this information install all inter-connects, terminators, etc and then power up the system. Please note: There are pdf files of all connection guides and your system manuals on the “Utah Scientific System Installation CD”.

## Step 3

Skip to Step 4 if your system includes a configuration laptop.

To configure a PC use the instructions found on the inside cover of the “Utah Scientific System Installation CD” to navigate to the System Installation Guide. This guide will instruct you in preparing the PC, installing Utah Scientific software and provide other helpful information.

Computer recommended spec’s: Pentium IV, XP Pro, 512MB Ram, 384MB free HD space, 17" 1024x768 monitor/video card, CD ROM, 10 base T network and serial port.

## Step 4

You should be able to control your system using either the custom programming information you provided the factory prior to shipment or generic programming that is installed when custom programming is not available.
(Note: step 5 describes how to begin creating your own custom programming.)
To verify operation launch the rMan application, go to the "Graphical" or "Tabular" status tab and verify the router switches when commands are issued from a router control panel or other controlling device.

## Step 5

To create your custom or edit existing router programming launch the UCON application on your configuration PC and precisely follow the instructions in the UCON manual and Appendix C. The manual can be found on your "Utah Scientific System Installation CD" in the "Manuals" folder.
If you have an MC-2020 it may also need custom programming once the router programming is completed. To program the MC-2020 launch the "McConfig" application and follow the instructions in the manual.

# UTAH-400 Audio Card Guide

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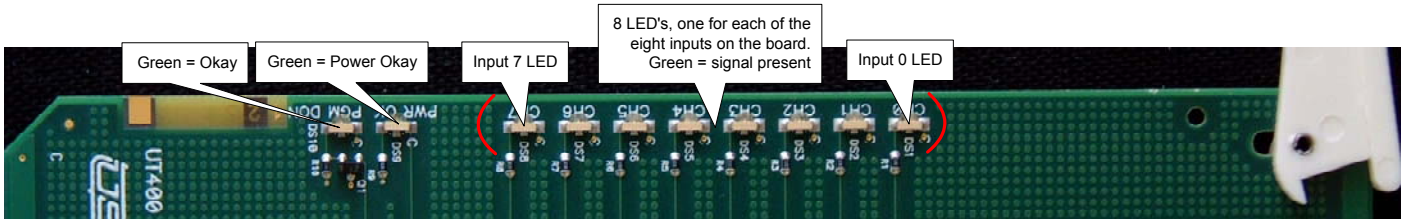
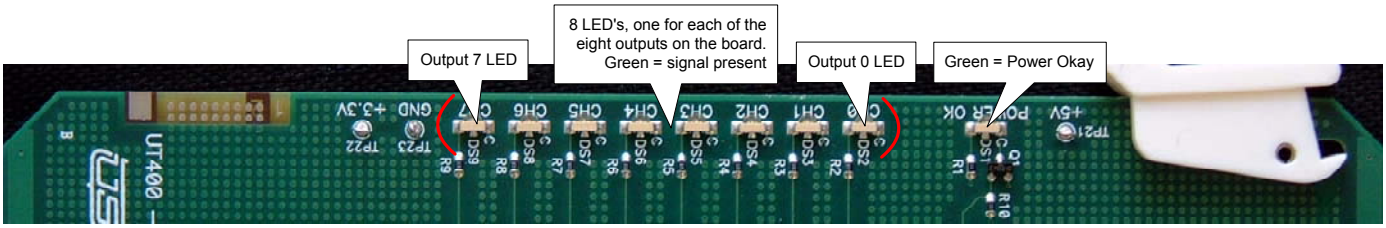
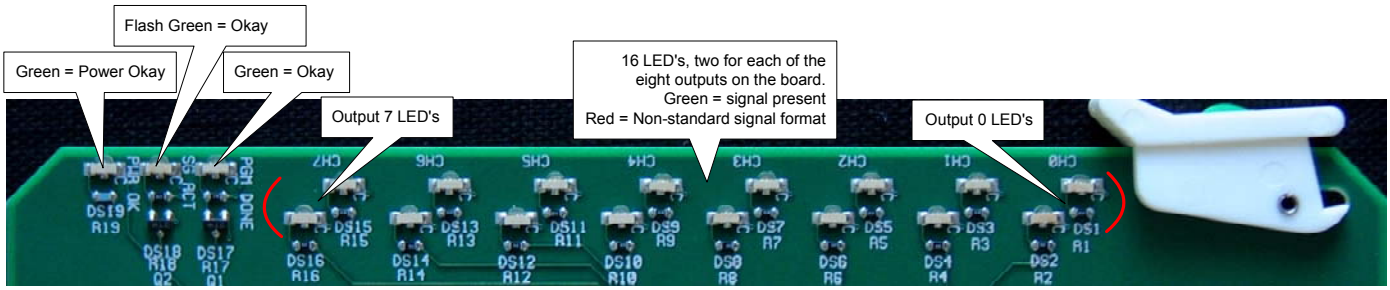


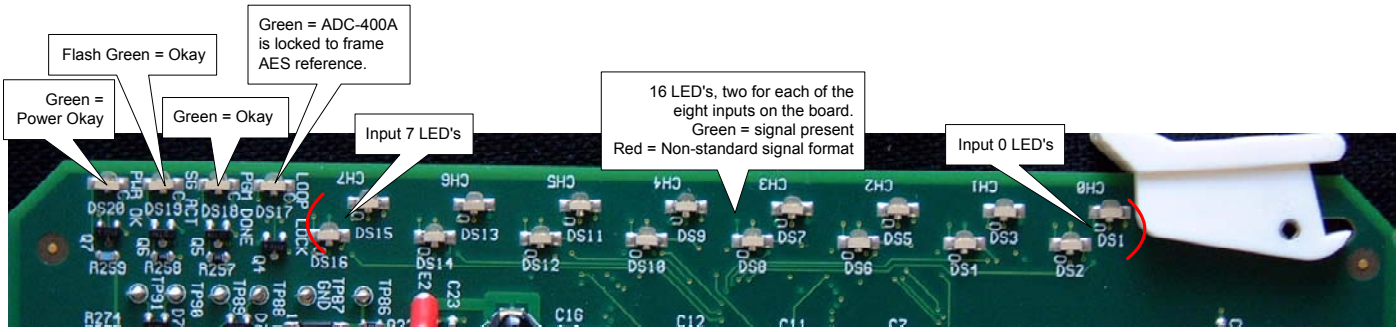

AI-400



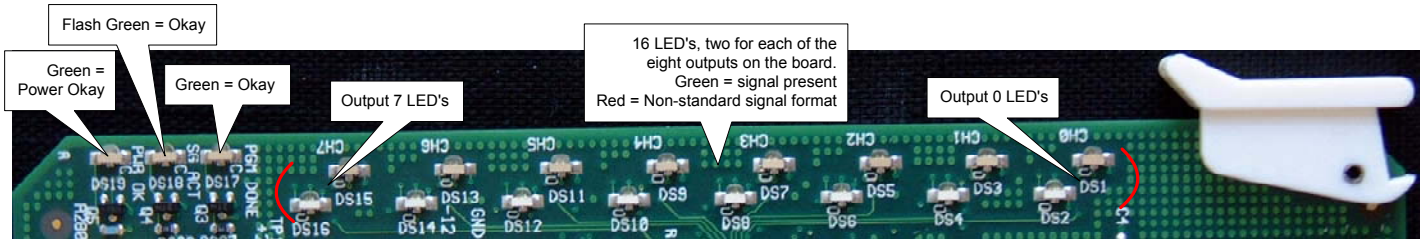

AO-400




AD-400




ADC-400A




DAC-400A

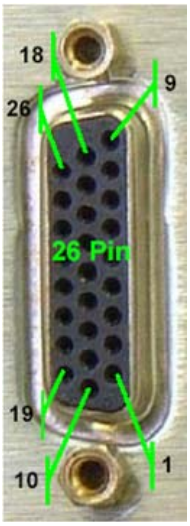
# UTAH-400 Audio Rear Panels

Wednesday, May 16, 2007

Analog Audio (Left & Right) Rear Panel

There are 2 possible connector types for the UTAH-400 audio router. They are 26 pin high density “D” connectors for analog and balanced AES audio, along with BNC’s for unbalanced AES audio. There are also varying configurations of the rear panels with mixtures of balanced, unbalanced and analog audio. The photo’s generally depict the appearance of the analog and balanced AES rear panels. The chart below shows the pin outs for both types of rear panels.

Balanced AES Rear Panel




| Pin # | Audio Signal | Ground Pin | Pin # | Audio Signal | Ground Pin |
|---|---|---|---|---|---|
| 1 | 0+ | 19 | 5 | 4+ | 23 |
| 11 | 0- | | 15 | 4- | |
| 2 | 1+ | 20 | 6 | 5+ | 24 |
| 12 | 1- | | 16 | 5- | |
| 3 | 2+ | 21 | 7 | 6+ | 25 |
| 13 | 2- | | 17 | 6- | |
| 4 | 3+ | 22 | 8 | 7+ | 26 |
| 14 | 3- | | 18 | 7- | |

# UTAH-400 Video Card Guide

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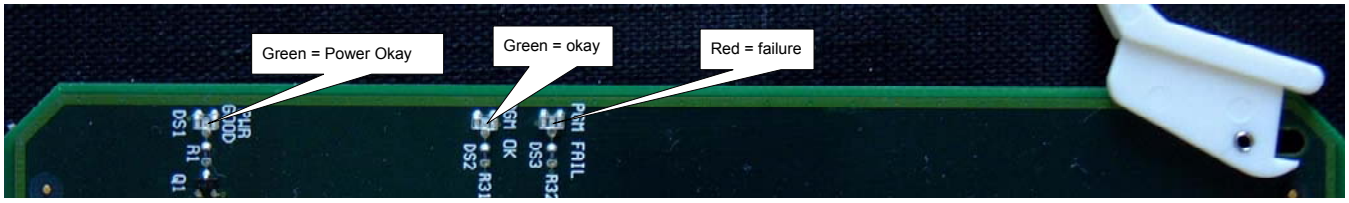
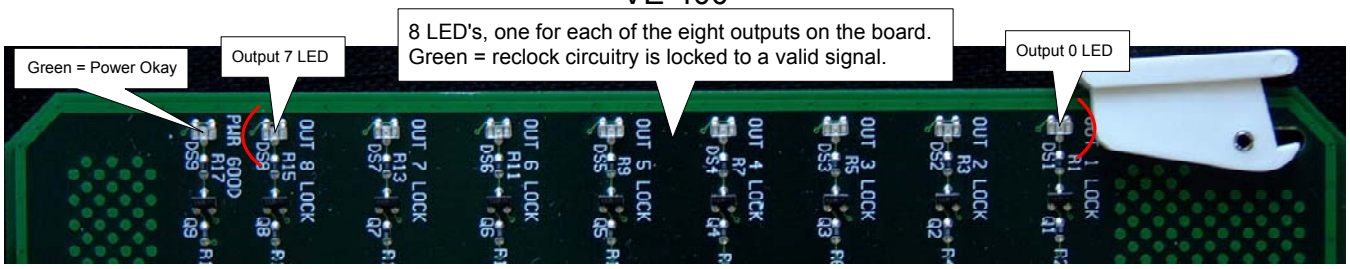
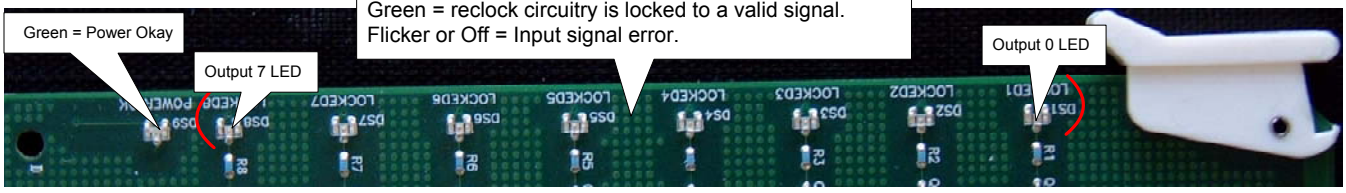
VI-400



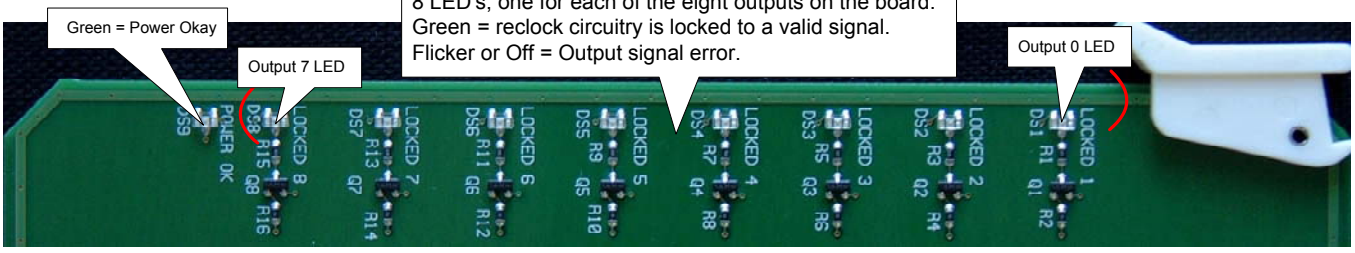

VE-400



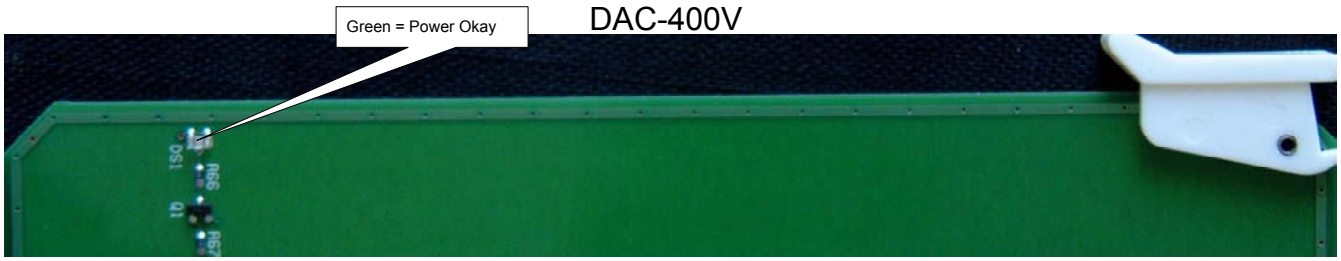

VO-400




ADC-400V




DAC-400V

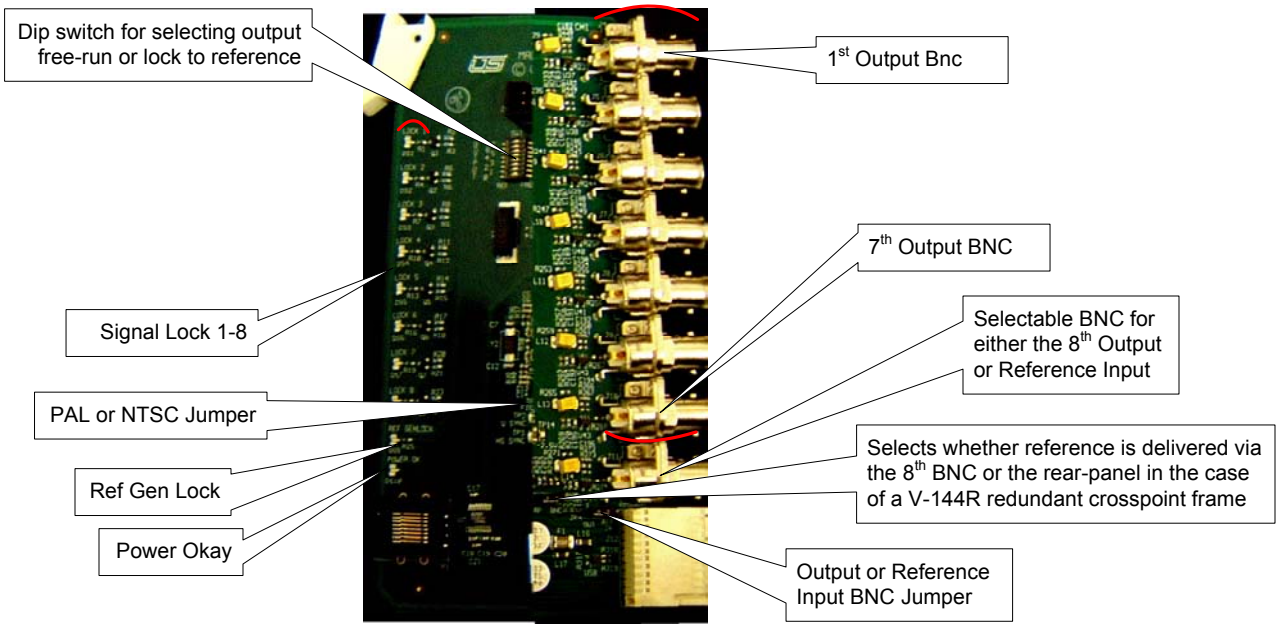


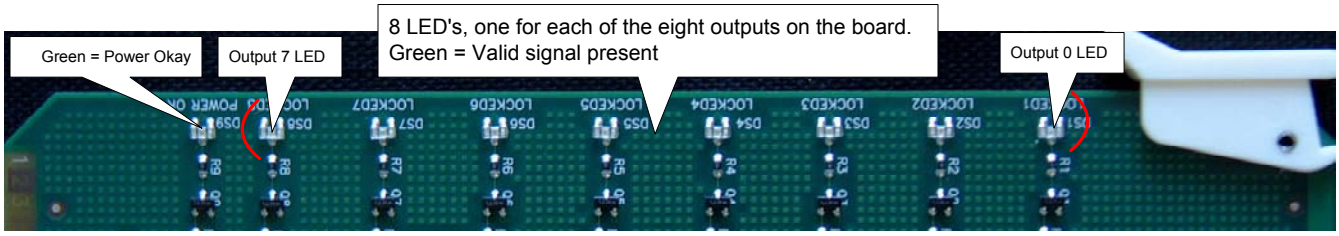

HI-400

# UTAH-400 Video Card Guide

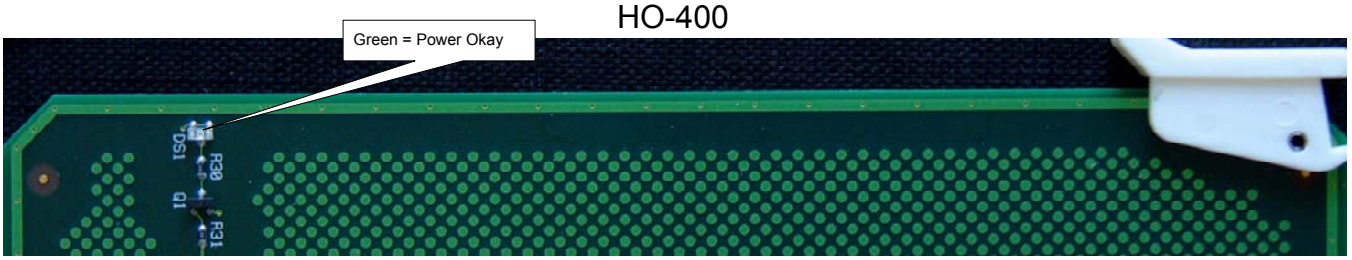
Wednesday, May 16, 2007

## DAC-400VB




## HO-400

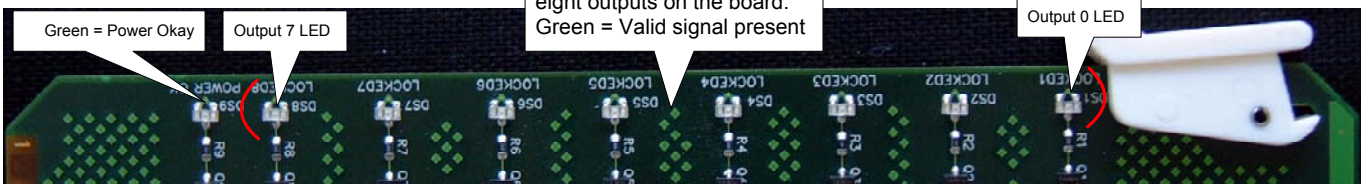



## FI-400

FOI-400 modules are installed in the rearpanel of the FI-400. Each FOI-400 supports two fiber inputs.

## FOO-400

FOO-400 modules are installed in the rearpanel of the FO-400. Each FOO-400 supports two fiber outputs.




## FO-400

# UTAH-400 Video Card Guide

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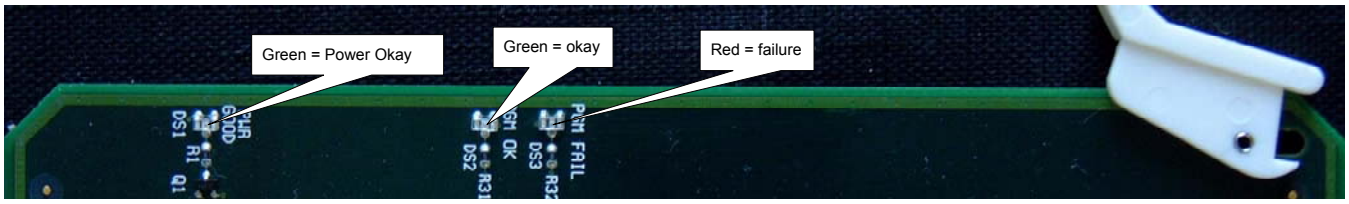
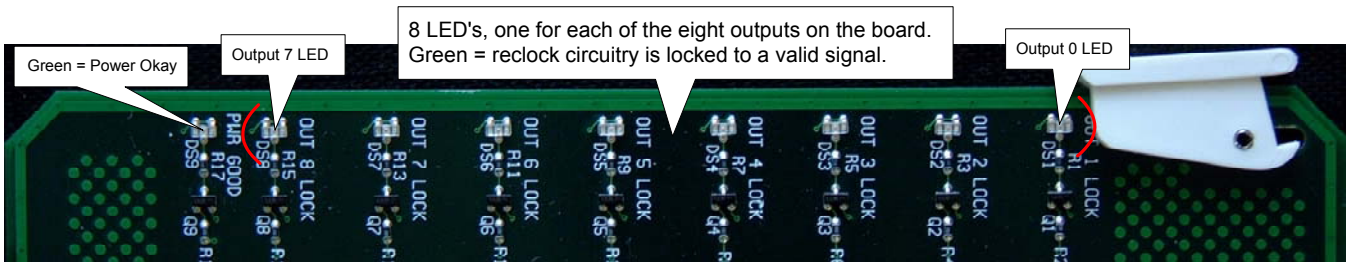
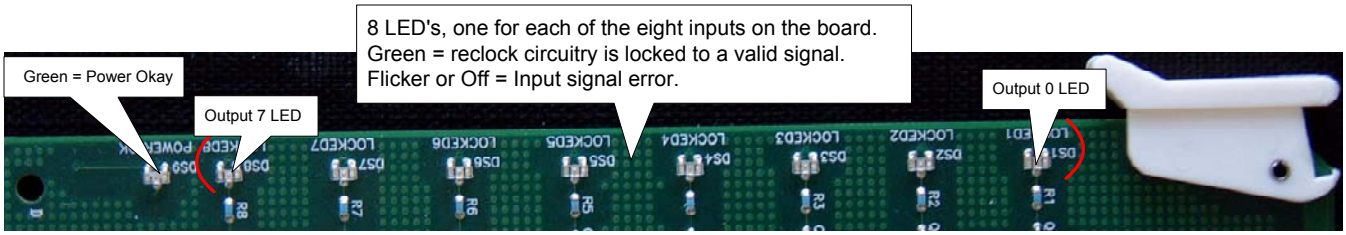
VI-400



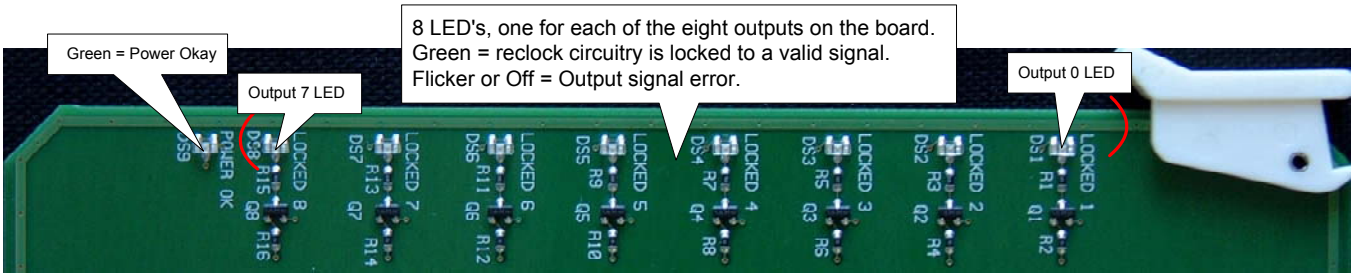

VE-400




VO-400




ADC-400V

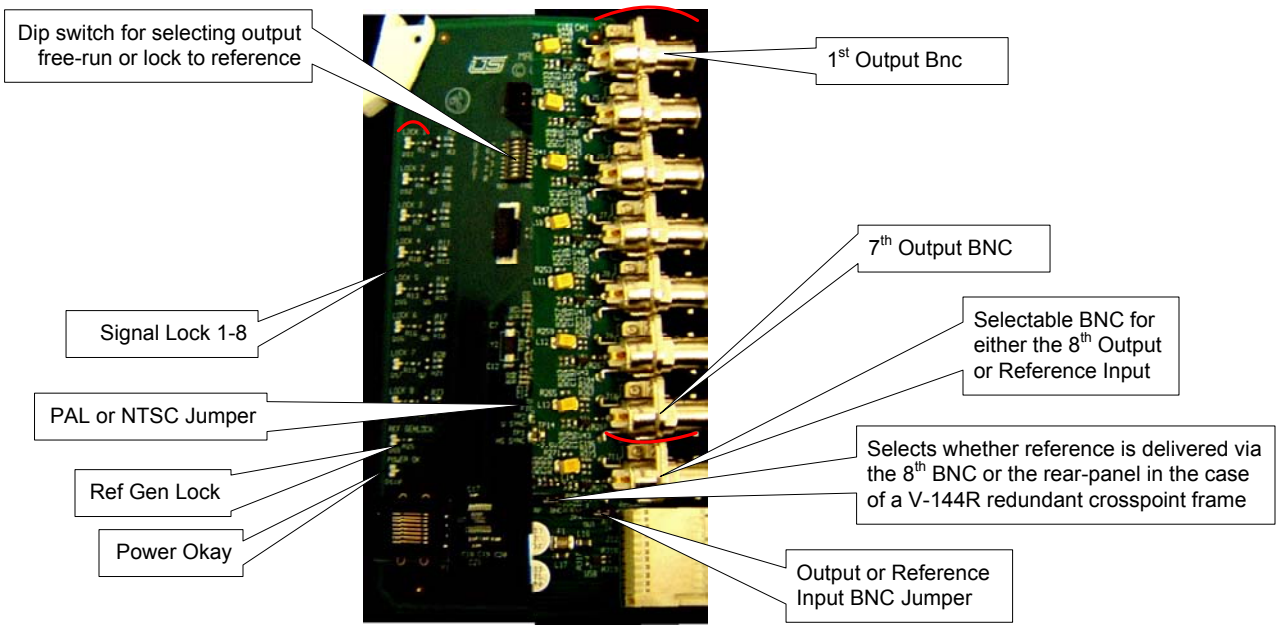


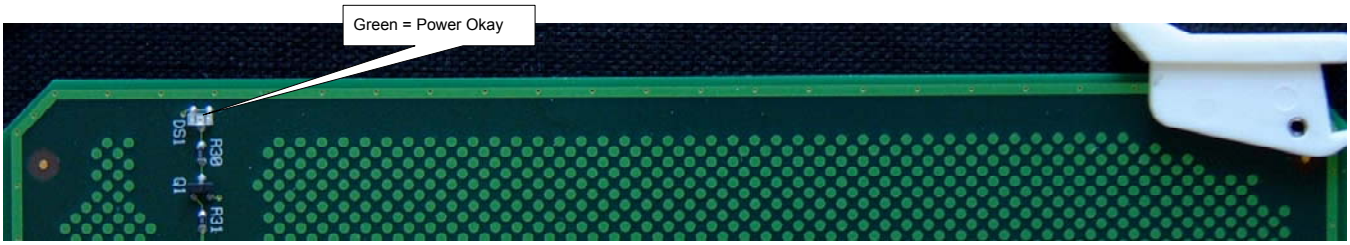

DAC-400V

# UTAH-400 Video Card Guide

Monday, December 10, 2007

## DAC-400VB



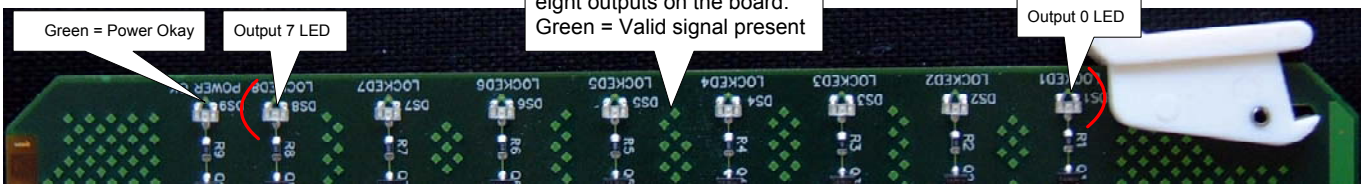

FI-400

## FOI-400

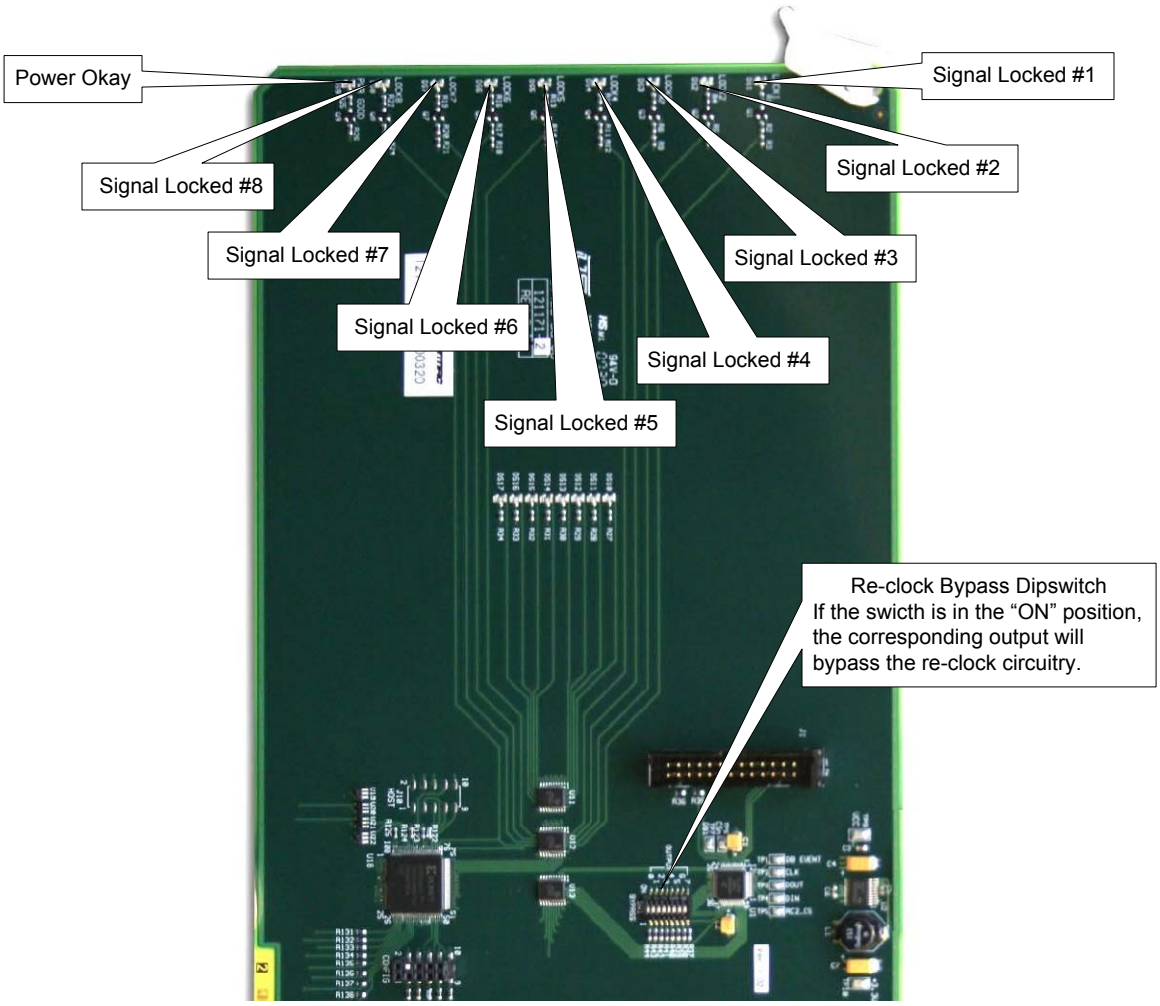
FOI-400 modules are installed in the rearpanel of the FI-400. Each FOI-400 supports two fiber inputs.

## FOO-400

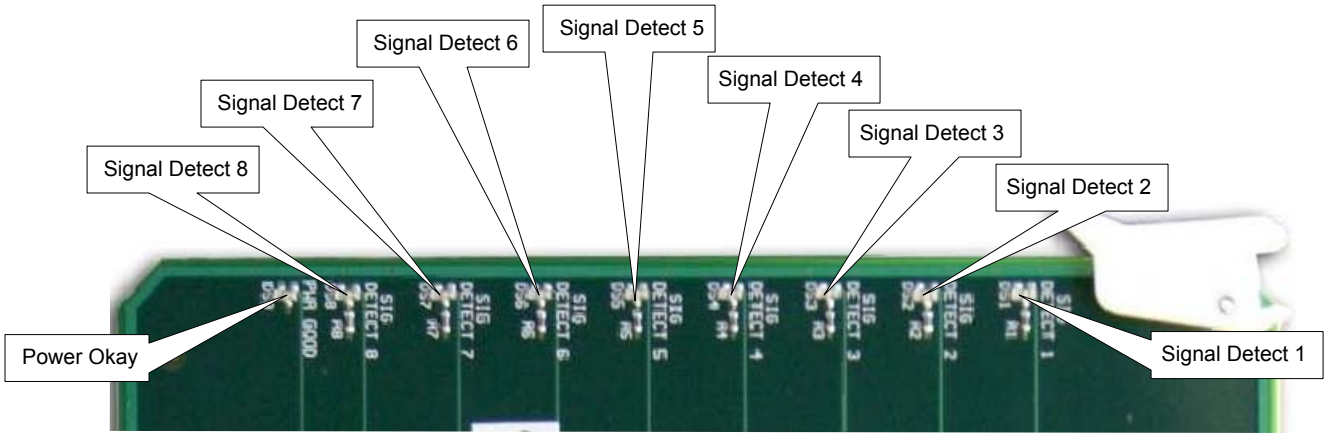
FOO-400 modules are installed in the rearpanel of the FO-400. Each FOO-400 supports two fiber outputs.




FO-400




HO3-400




HI3-400

# BDA-400

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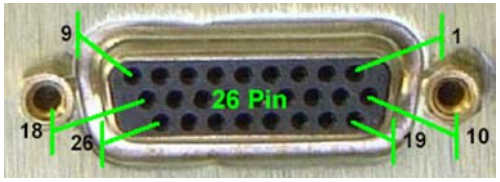
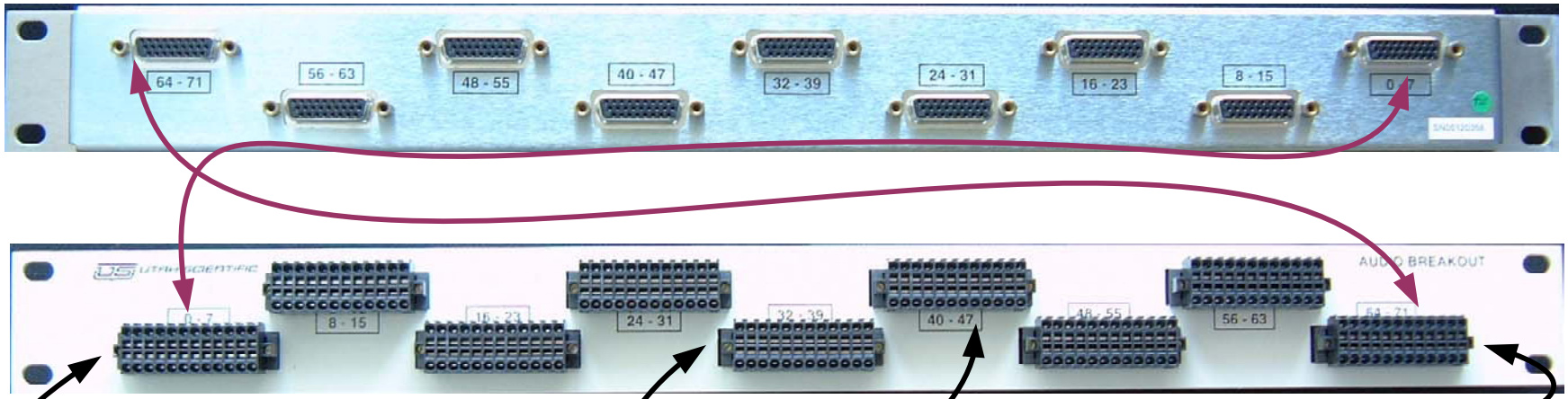
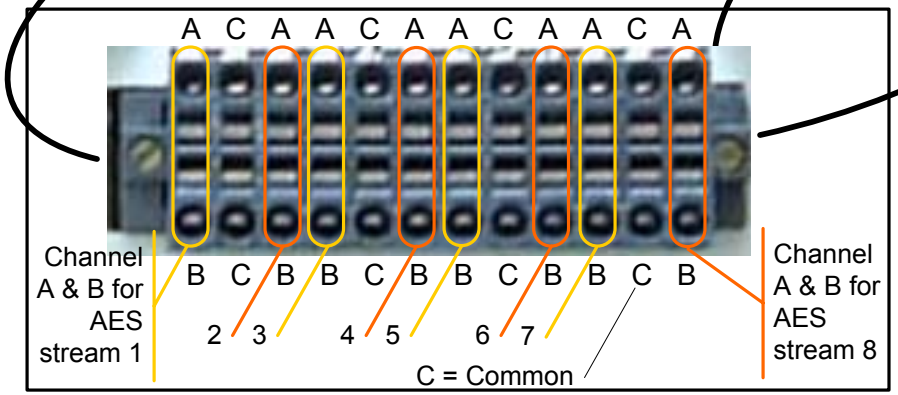
Note: this breakout panel transitions 72 input and / or output connections from “D” connector to compression terminal.

9) Utah supplied audio cables. Connect one end to the breakout panel and the other to the corresponding router input or output “D” connector.




To user supplied wiring & devices.

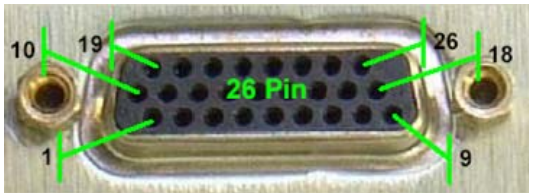


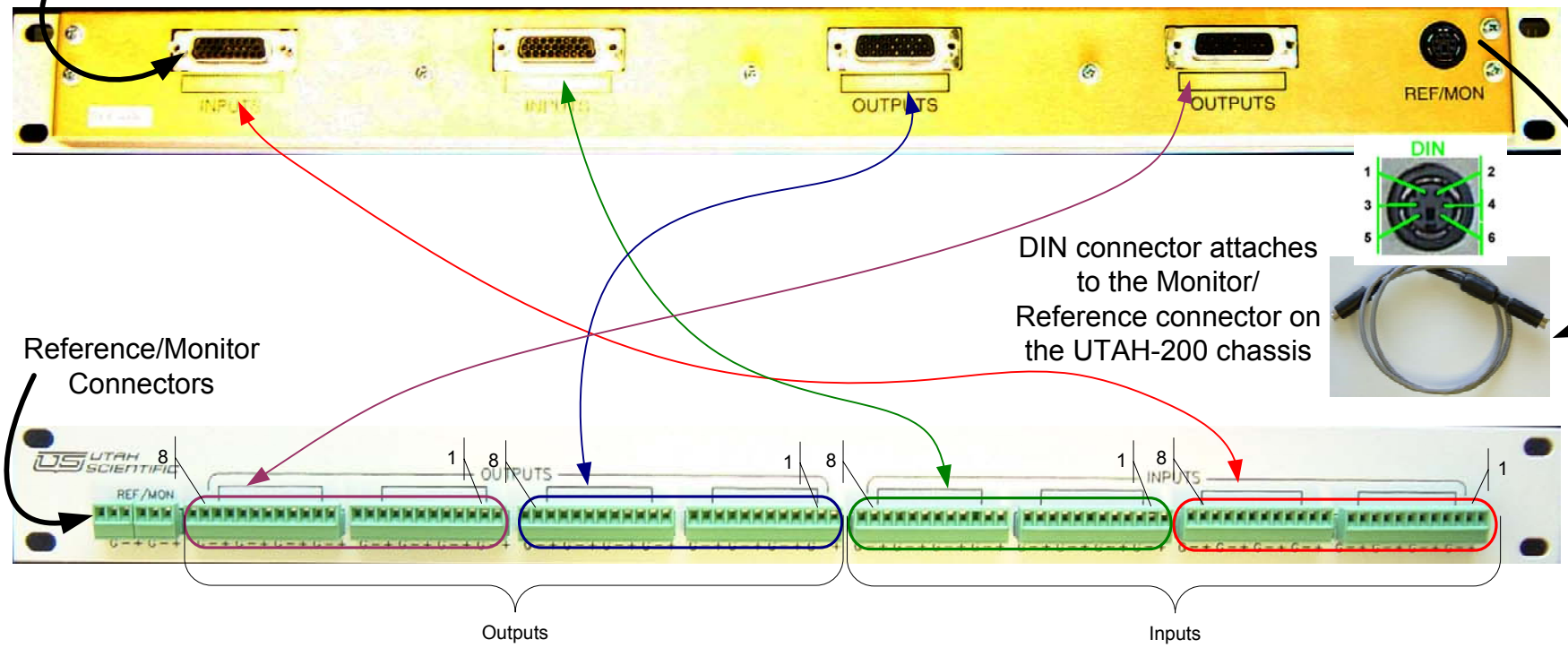

Note: each “D” connector/ terminal block provides connections for router eight inputs or outputs.
Terminal block diagram

The BDA-400 is suitable for either UTAH-400 or UTAH-200 balanced analog audio and balanced digital audio applications.

USI Part #140001-1

4) Utah supplied audio cables connect one end to a “D” connector on the breakout panel and the other end to the corresponding router input or output “D” connector.




Note: each “D” connector/terminal block set provides connections for router eight inputs or outputs.

The BAA-200 is suitable for either UTAH-400 or UTAH-200 balanced analog audio and balanced digital audio applications.

USI Part #80317-1

# BOP-2020 Rear View

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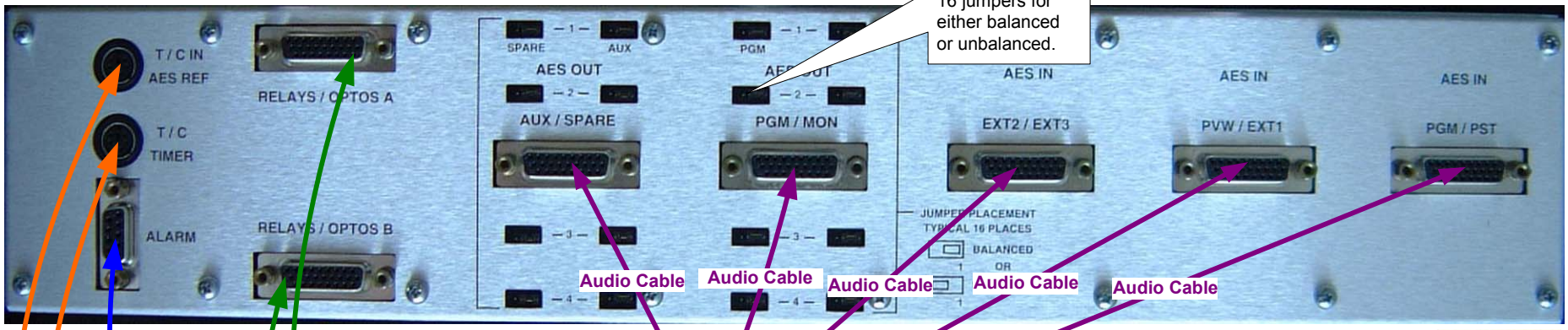



Set each of the 16 jumpers for either balanced or unbalanced.

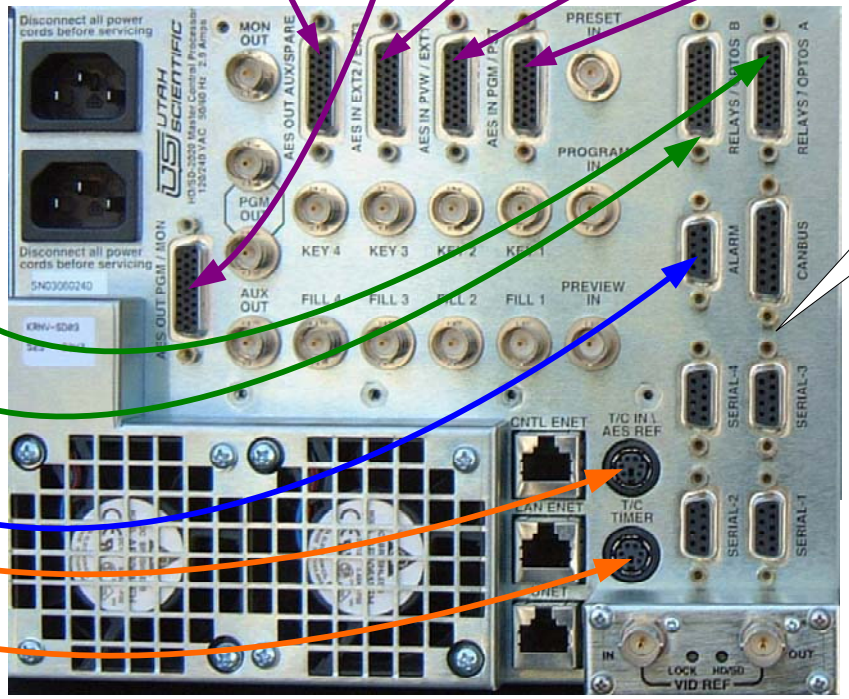
1)9 Pin

2)26 Pin

2)DIN

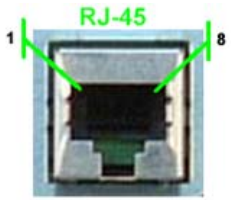
9 Pin

26 Pin

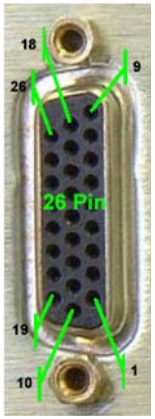



5)Audio Cable

MC-2020 rear panel







2)Din

# BOP-2020 Front View

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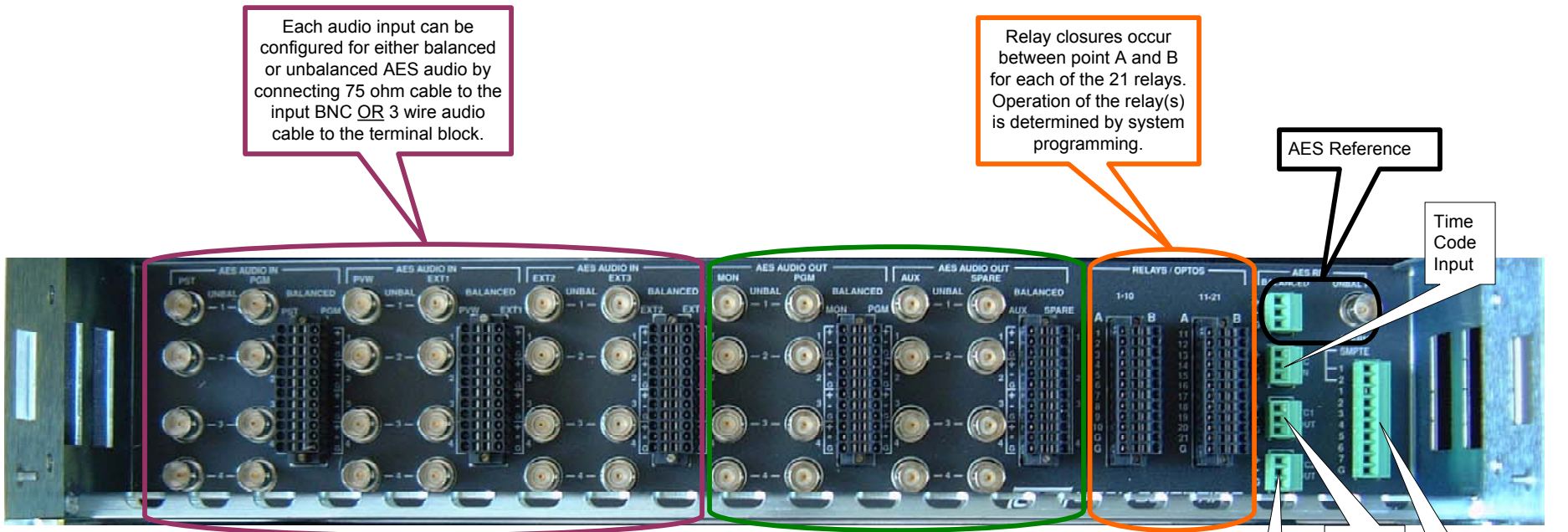

# BPS-2020 Connection Guide

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Note: each audio input "D" connector provides connections for 8 AES inputs that are associated with the 8 video by-pass switcher inputs. Up to four AES streams can be configured for each by-pass input by installing the optional 8X1 AES crosspoint cards. All 4 input "D" connectors use an identical pin out configuration as described in the input pin out balloon.

AES Audio Input Pin Out:
In 1: Pin 1=+, Pin 11=-; In 2: Pin 2=+, Pin 12=-;
In 3; Pin 3=+, Pin 13=-; In 4: Pin 4=+, Pin 14=-;
In 5: Pin 5=+, Pin 15=-; In 6: Pin 6=+, Pin 16=-;
In 7: Pin 7=+, Pin 17=-; In 8: Pin 8=+, Pin 18=-;
Pins 9, 10 & 19-26=gnd
See note above

Note: each audio output "D" connector provides connections for 2 optional AES streams associated with the 8)BPS-2020 video output.

Output Pin Out:
AES 2: 1=+, 2=- (CH 3-4)
AES 4: 11=+, 12=- (CH 7-8)
Pins 3-9, 10, 13-18 & 19-26=gnd

Output Pin Out:
AES 1: 1=+, 2=- (CH 1-2)
AES 3: 11=+, 12=- (CH 5-6)
Pins 3-9, 10, 13-18 & 19-26=gnd

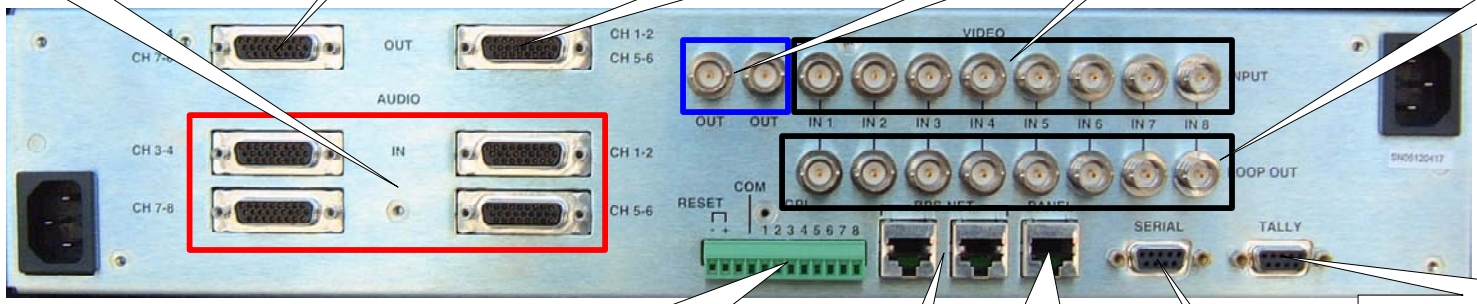
2 video Program output BNC's. The BNC labeled

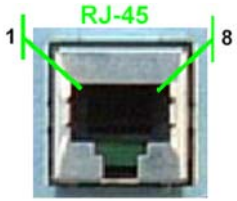
$\overline{\text{OUT}}$

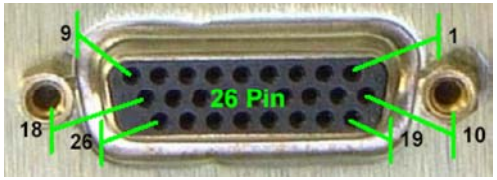
is inverted.

8 source BNC connections. Typically the master control program output connects to the source 1 BNC, with the other source BNC's being connected to sources that are used while the master control is being bypassed. BPS-2020 supports SMPTE259 and 292 digital video sources.

Optional video DA board provides 8 active loop through video sources for use with downstream devices.

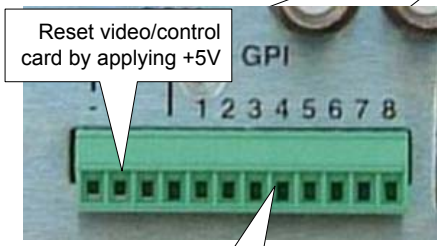




Reset video/control card by applying +5V




Note: both the BPS-8 and BPS-16 can be connected at the same time. Providing local & remote control

BPS-8 control panel connected via a CAT5 cable.

Active Source Tally:
Selected source drives the corresponding pin to >+3V.
Pin#'s
Source 1=1, 2=2, 3=3, 4=4, 5=5, 6=6, 7=7, 8=8.
Pin 9=gnd

BPS-NET provides control of up to 8)BPS-2020's with 1)BPS-16 master panel via CAT5 cable. The BPS-16 terminates one end and a U-NET terminator is installed at the opposite end of the BPS-NET.

RS-232 or RS-422 serial port, 19.2K or 38.4K baud. Protocol is either USI RCP-1 or GVG 10XL.
**RS-232** pin #'s: 2-TX, 3=RX, 5-gnd.
**RS-422** pin #'s: 2=TX-, 3=RX+, 5=gnd, 7=TX+ & 8=RX-.
Jumpers J12 & J13 select RS-232 or RS-422. For RS-232 set both jumpers between pins 1&2; for RS-422 set both jumpers between pins 3&4.

A closure between COM and any of connectors labeled 1 -8 will switch the bypass to the corresponding input.

U-Net Terminator

# BPS-2020 Front View

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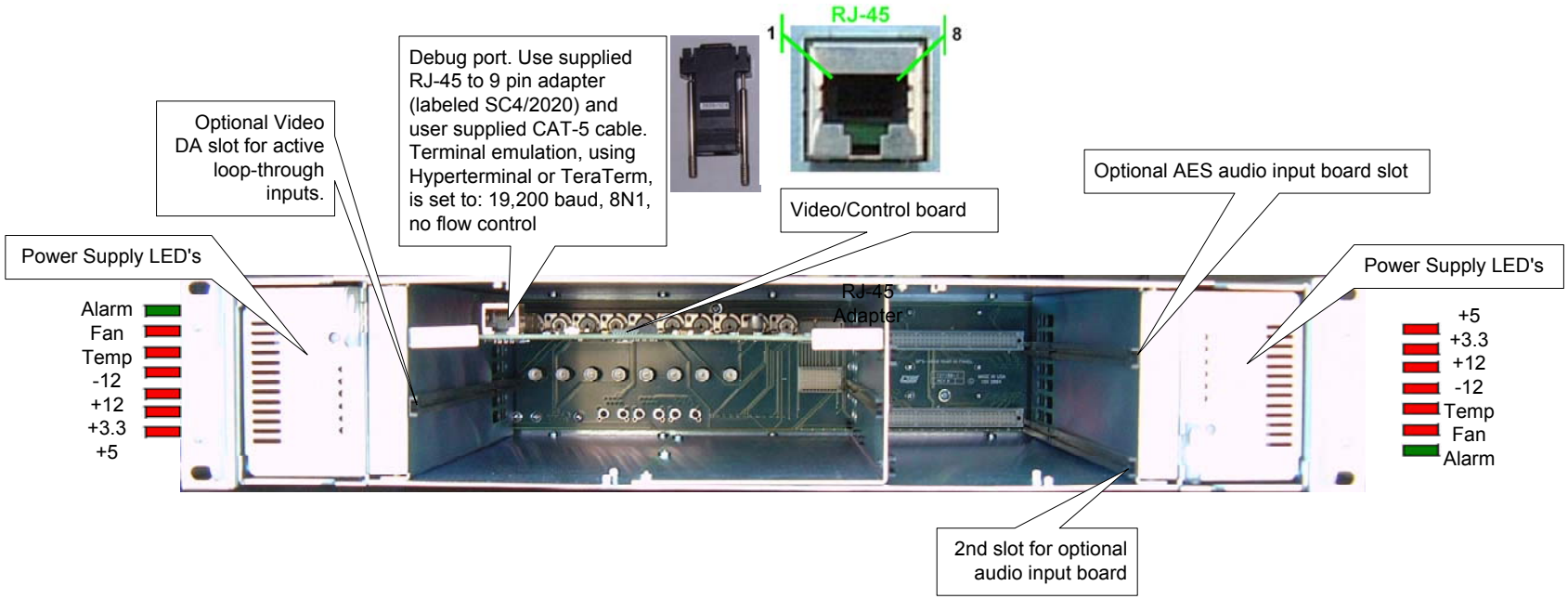
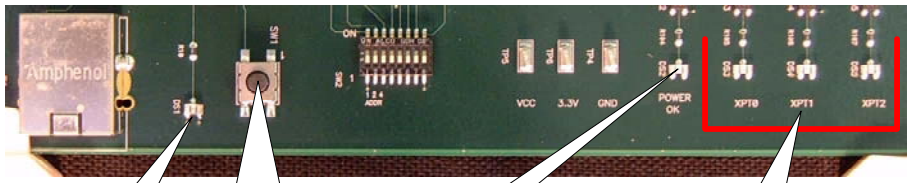


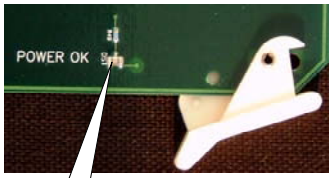




Local board reset

Red = board is in "Reset" and no operation can occur.

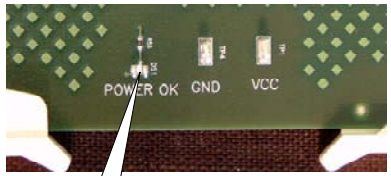
Green = Power Okay

Binary representation of which of the 8 sources is currently selected. All off = source 1; all on = source 8




BPS-VDA

Green = Power Okay




BPS AES

Green = Power Okay

# BPS-8 & BPS-16 Connection View

Wednesday, May 16, 2007


BPS-16

Unused

Power Connector

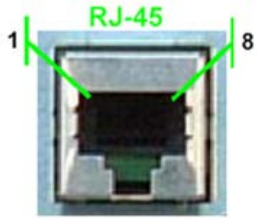
BPS-16 control panel connects to one of the "BPS-Net" connectors on BPS-2020 via CAT 5 cable. The BPS-16 terminates one end and a U-NET terminator is installed at the opposite end of the BPS-NET. Up to 8 BPS-2020 chassis can be independently controlled by one BPS-16


BPS-8

Unused

Power Connector

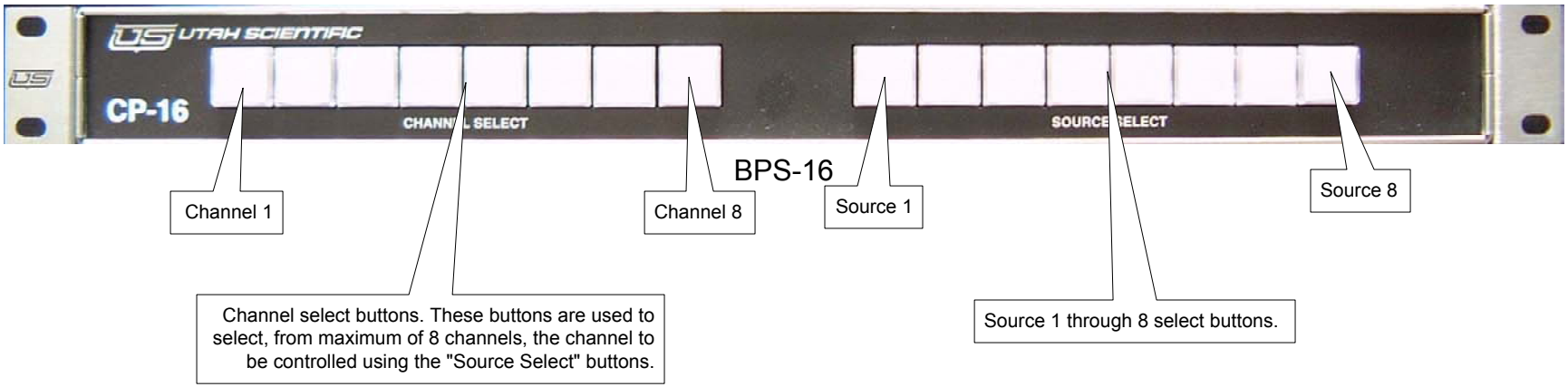
BPS-8 control panel connected via a CAT5 cable to "Panel" connector on BPS-2020 chassis..

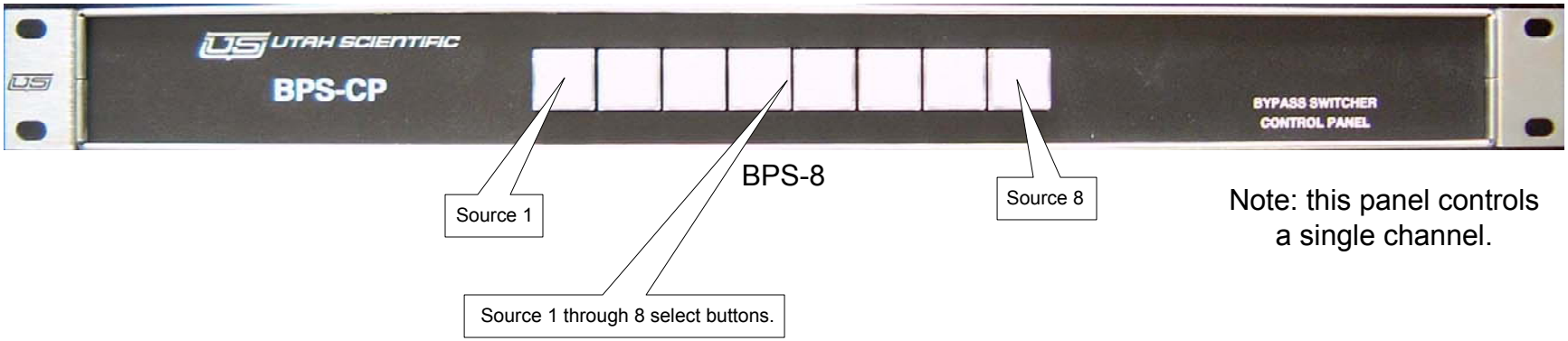



Note: in systems containing more than one BPS-2020 channel, a BPS-8 can be connected to each of the BPS-2020's "Panel" connector for local control of that channel. A BPS-16 may also be connected to the "BPS-NET" connector and looped through other channels; allowing centralized control of up to 8) BPS-2020 channels.

# BPS-8 & 16 Front View

Wednesday, May 16, 2007

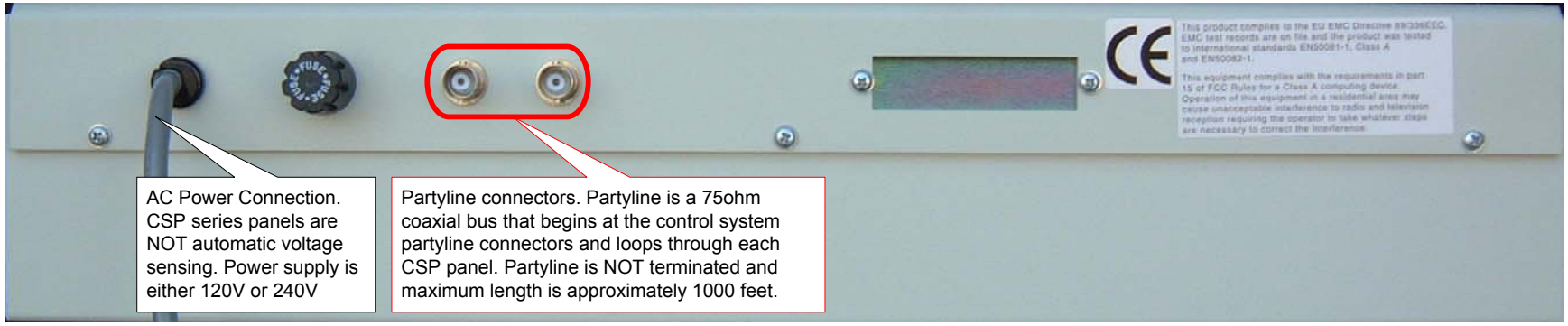


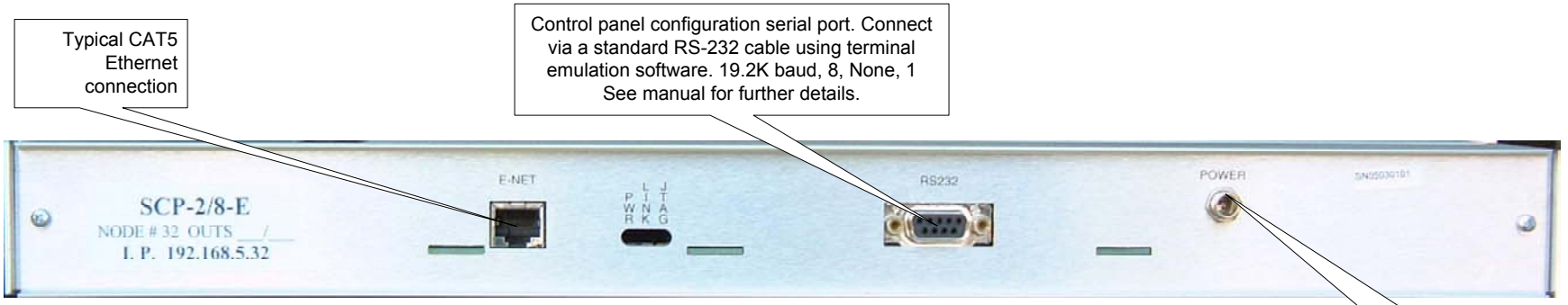

Note: this panel controls a single channel.

# Control Panels

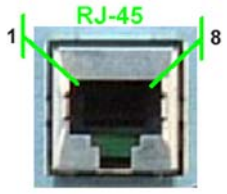
Wednesday, May 16, 2007




CSP Series Control Panel – 1 or 2 RU panels are the same layout.



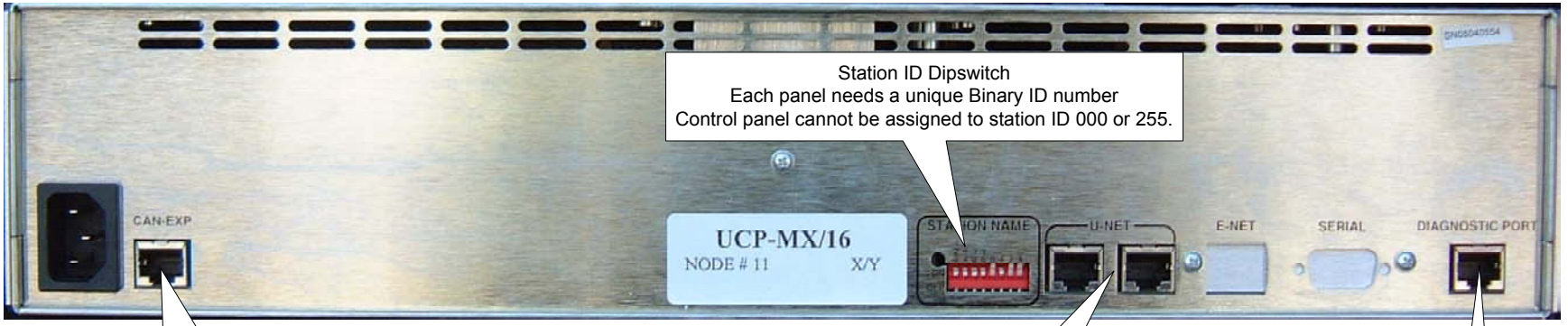

SCP Series Ethernet Control Panel – 1 or 2 RU panels are the same layout.




# Control Panels Continued

Wednesday, May 16, 2007

## UCP U-Net Series Panel




Station ID Dipswitch
Each panel needs a unique Binary ID number
Control panel cannot be assigned to station ID 000 or 255.

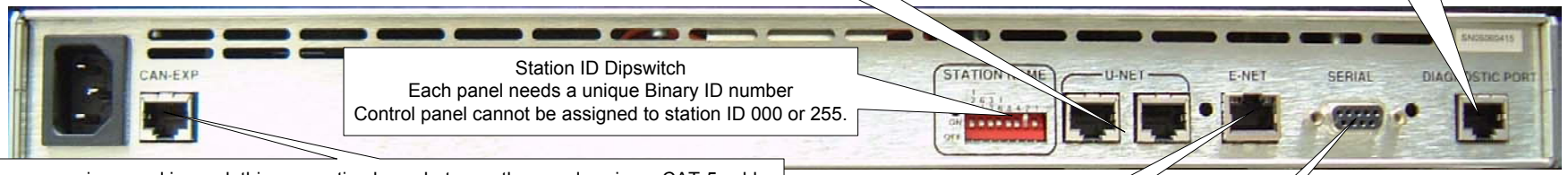
When an expansion panel is used, this connection loops between the panels using a CAT-5 cable. When no expansion panel is used terminate this connection with the supplied U-Net terminator.

U-Net Terminator

U-Net connectors connect to a U-Net port on the SC-4/400 or to a loop-through from another panel via a typical CAT-5 cable. U-Net must be terminated at the end of the loop-through with the supplied U-Net terminators. Maximum cable length of 1000 feet per run.

Configuration port used for panel setup. Use RJ-45 to 9 pin adapter labeled MC-2020. Baud rate 19.2K baud, 8, None, 1

## UCP U-NET, E-Net, Serial Series Panel

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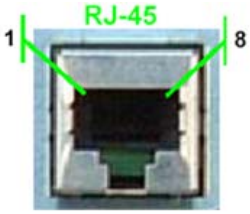
When an expansion panel is used, this connection loops between the panels using a CAT-5 cable. When no expansion panel is used terminate this connection with the supplied U-Net terminator.





Typical CAT5 Ethernet connection

RJ-45 to 9 Pin Adaptor

Serial Port for control via RCP-1 protocol.
Pin Outs: **RS-232=** 1-RI, 2-TXD, 3-RXD, 4-DSR, 5-GND, 6-DTR, 7-CTS, 8-RTS, 9-CD
**RS-422=** 2-TX-1, 3-RX+, 5-GND, 7-TX+, 8-RX-

# ESI-2020 Rear View

Wednesday, May 16, 2007

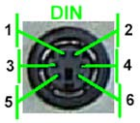
RS-422
1 – TX-
2 – NC
3 – RX+
4 – NC
5 – TX+
6 – GND
7 – RX-
8 - GND

RS-232
1 – TX
2 – DTR
3 – RX
4 – DSR
5 – RTS
6 – GND
7 – CTS
8 - NC

Serial Port Pin Outs


1-GND
2-TX-
3-RX-
4-Transmit Common
5-GND
6-Receive Common
7-TX+
8-RX+
9-GND

RS-422 Pin Outs

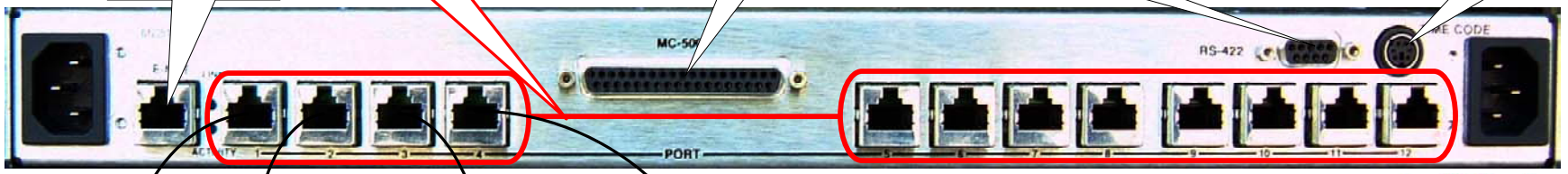



1,2,3&5 – GND
4-TC In -
6- TC In +

Time Code Pin Outs

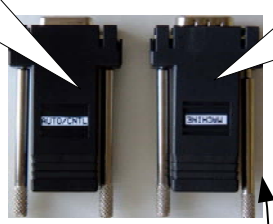
Ethernet Port – connect to system Ethernet hub.

Unused



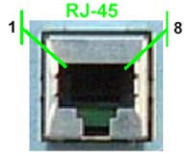

CAT5 cable

6) Automation Adapters are provided for use with automation computer.



12) Machine Adapters are provided for use when controlling up to 12 separate machines.

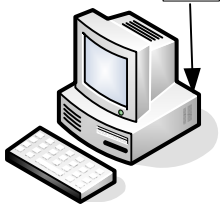
Plug adaptors directly into the serial port of the machine or the automation computer.




Machine with automation

Automation Adapter

Machine Adapter



Machines without automation

Machine Adapter

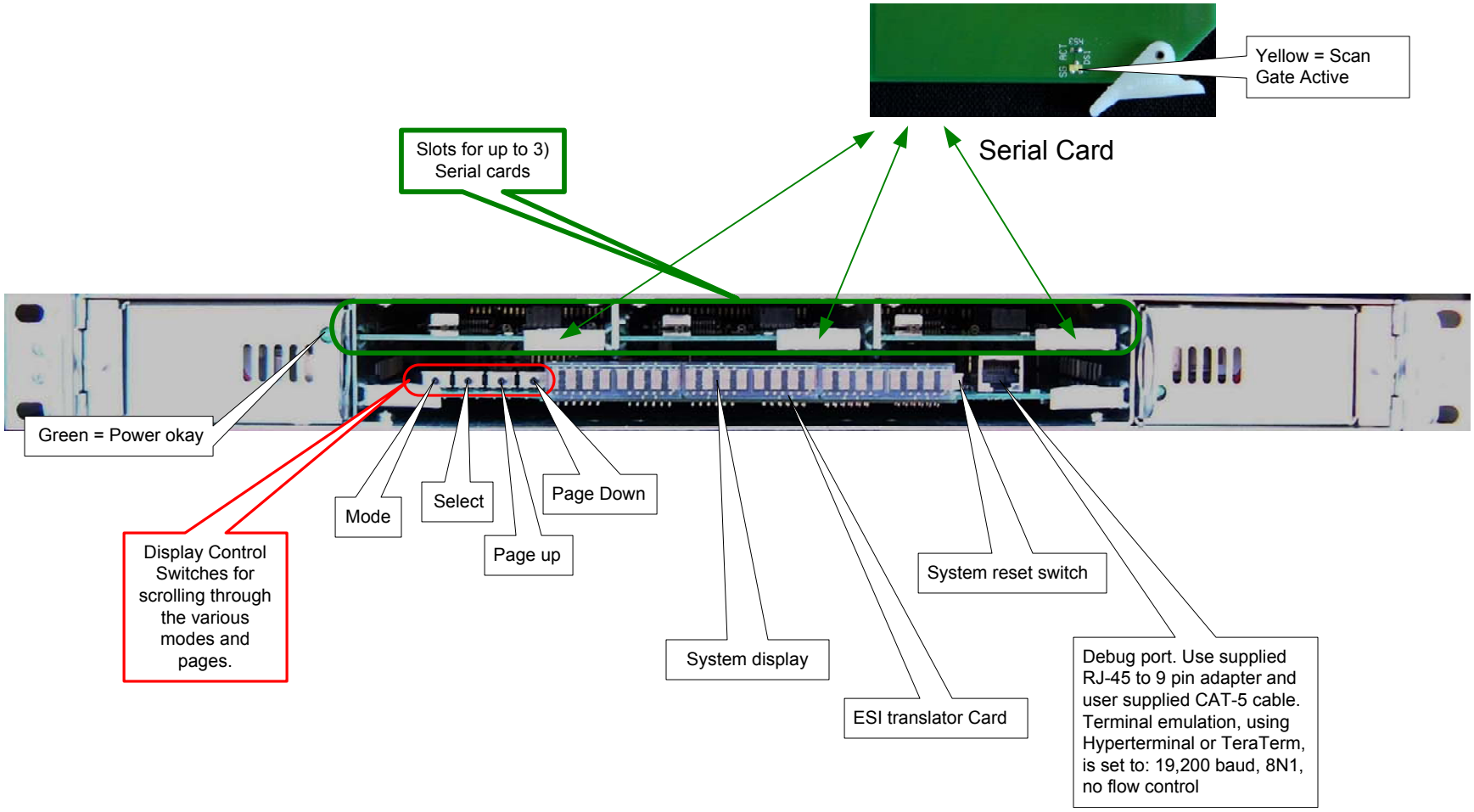
Machine Adapter

Note 1: when interfacing a machine(s) with automation, the machine is plugged into the even number serial port on the ESI-2020, the automation computer into the odd numbered port. A mixture of automated and non-automated machines is permissible.

Note 2: In addition to connecting the hardware, configuration and setup work needs to be done in the MC-2020 and the ESI-2020. See the respective manuals for additional information.

# ESI-2020 Front View

Wednesday, May 16, 2007



# MC-2020 Connection Guide

Wednesday, May 16, 2007

**AES IN PGM & PST Pin #'s;** 1=PS1+, 2=PS2+, 3=PS3+, 4=PS4+, 5=PG1+, 6=PG2+, 7=PG3+, 8=PG4+, 11=PS1-, 12=PS2-, 13=PS3-, 14=PS4-, 15=PG1-, 16=PG2-, 17=PG3-, 18=PG4-, 19=PS1gnd, 20=PS2gnd, 21=PS3gnd, 22=PS4gnd, 23=PM1gnd, 24=PG2gnd, 25=PG3gnd, 26=PG4gnd

**AES IN / PVW & EXT1 Pin #'s;** 1=P1+, 2=P2+, 3=P3+, 4=P4+, 5=E1+, 6=E2+, 7=E3+, 8=E4+, 11=P1-, 12=P2-, 13=P3-, 14=P4-, 15=E1-, 16=E2-, 17=E3-, 18=E4-, 19=P1gnd, 20=P2gnd, 21=P3gnd, 22=P4gnd, 23=E1gnd, 24=E2gnd, 25=E3gnd, 26=E4gnd

**AES IN / EXT2 & EXT3 Pin #'s;** 1=E2 1+, 2=E2 2+, 3=E2 3+, 4=E2 4+, 5=E3 1+, 6=E3 2+, 7=E3 3+, 8=E3 4+, 11=E2 1-, 12=E2 2-, 13=E2 3-, 14=E2 4-, 15=E3 1-, 16=E3 2-, 17=E3 3-, 18=E3 4-, 19=E2 1gnd, 20=E2 2gnd, 21=E2 3gnd, 22=E2 4gnd, 23=E3 1gnd, 24=E3 2gnd, 25=E3 3gnd, 26=E3 4gnd

**MONITOR OUT** – Typically monitors the Preset Bus. User may select to view the PVW/KEY bus.

**AES Out/Aux,Spare Pin #'s**; 1=A1+, 2=A2+, 3=A3+, 4=A4+, 5=S1+, 6=S2+, 7=S3+, 8=S4+, 9&10=n/a, 11=A1-, 12=A2-, 13=A3-, 14=a4-, 15=S1-, 16=S2-, 17=S3-, 18=S4-, 19=A1gnd, 20=A2gnd, 21=A3gnd, 22=A4gnd, 23=S1gnd, 24=S2gnd, 25=S3gnd, 26=S4gnd.

**PROGRAM OUT**
2)Connections; 1 for downstream devices and 1 for monitoring.

**AES Out/PGM,MON Pin #'s;** 1=M1+, 2=M2+, 3=M3+, 4=M4+, 5=P1+, 6=P2+, 7=P3+, 8=P4+, 11=M1-, 12=M2-, 13=M3-, 14=M4-, 15=P1-, 16=P2-, 17=P3-, 18=P4-, 19=M1gnd, 20=M2gnd, 21=M3gnd, 22=M4gnd, 23=P1gnd, 24=P2gnd, 25=P3gnd, 26=P4gnd

PREVIEW or Clean feed out

Standard Ethernet connection. We recommend the ethernet system include only Utah Scientific equipment

Unused

11 Inputs:
SDI: Max length 1000' using 8281
HD: Max length 500' using 1694A
All sources **must** be within +/- 1/2 line of reference

**Time Code IN** / AES reference
Pin 1&2 = Gnd, 3 = AES -, 4 = TC -, 5 = AES +, 6 = TC+

**Relay Port B Pin #'s** ("Rx"=relay number):R11=1&2, R12=3&4, R13=6&7, R14=8&9, R15=10&11, R16=13&14, R17=16&17, R18=19&20, R19=21&22, R20=23&24, R21=25&26, GND=5,12,15&18

**Relay Port A Pin #'s** ("Rx"=relay number):R1=1&2, R2=3&4, R3=6&7, R4=8&9, R5=13&14, R6=16&17, R7=19&20, R8=21&22, R9=23&24, R10=25&26, GND=5,12,15&18, N/A=10&11

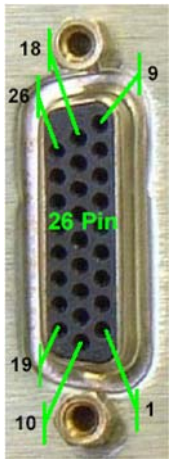
**CANBUS Pin #'s**; 1=reset, 2=CANH, 3,4,7&9=GND, 5=TCK, 6=TDO, 8&15=+5V, 10=CANL, 11=N/A, 12=nTRST, 13=TMS, 14=TDI

**Alarm Port Pin #'s;** 1=SMPTE A1, 2=A1, 3=A3, 4=A5, 5=A7, 6=SMPTE A2, 7=A2, 8=A4, 9=A6 Alarms are TTL outputs.

**4)RS-422 or 232 Serial Ports & Pin#'s**
**RS-232:** 1=CD, 2=RX, 3=TX, 4=DTR, 5=GND, 6=DSR, 7=RTS, 8=CTS, 9=GND
**RS-422:** 1=CD. 2=RX-, 3=TX+, 4=TC, 5=GND, 6=RC, 7=RX+, 8=TX-, 9=GND

**Clock IN / Pin #'s** 1&2 = Gnd, 3 = T1 -, 4 = T2 -, 5 = T1 +, 6 = T2+

**"ACTIVE"** reference loop through. Any downstream device will loose reference in the event of a power outage on the MC-2020.





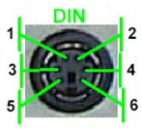

Y Cable

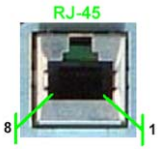
**U-NET Port**
Connects 2020 chassis to the UNET, daisy chain, network via CAT5 cable. Connect "Y" cable to the UNET port and connect the network cable to one side and either terminate the other port or loop to the next device. Max UNET length is 1000'.

Constant Reference Signal:
SD = any SMPTE 259M
HD = any SMPTE 292M

Locked = Green
Not Locked = Red

HD reference = Green
SD reference = Amber
Incorrect reference = Flashing

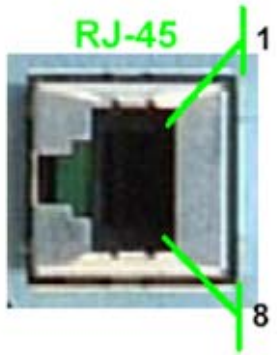


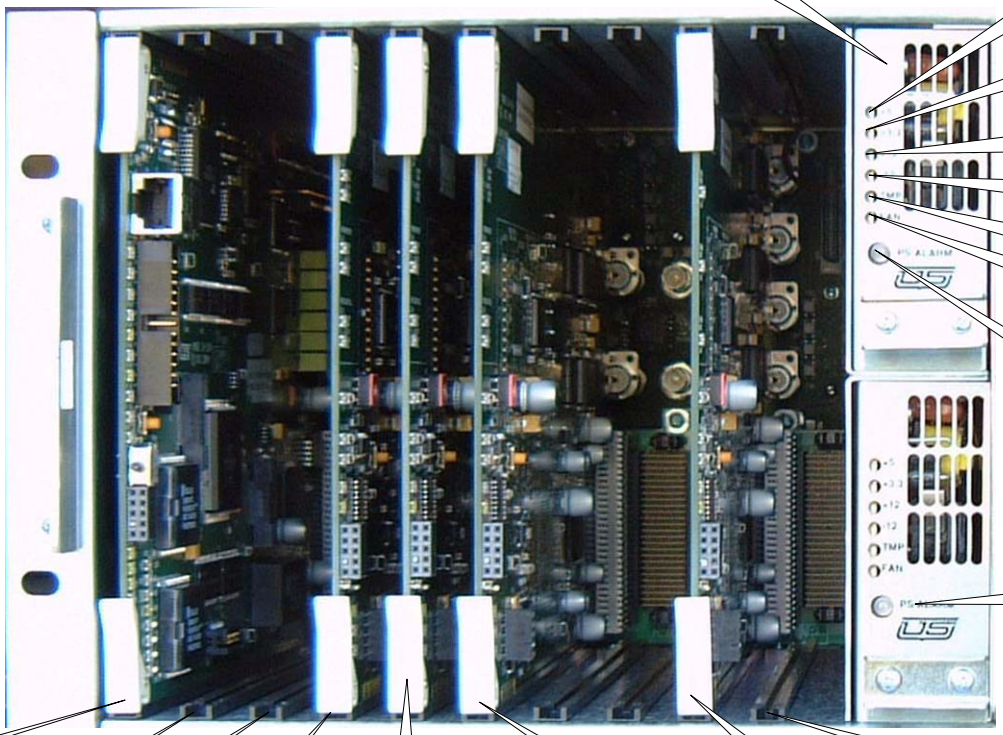




Note: your system may contain 2 rear panels on 1 chassis.

# MC-2020 Front View Guide

Wednesday, May 16, 2007



Power Supply

+5V red=error

+3.3V red=error

+12V red=error

-12V red=error

Temp red=error

Fan red=error

Green = power applied

Power supply

Slot 1 CP-2020 Control card

Slot 2 optional CP-2020 Control card

Slot 3 optional AI-2020 AES audio input card

Slot 4 VI-2020 video input card

Slot 5 KM-2020 slot.

Slots 6 thru 8 optional KM-2020 slots. System includes a minimum of 1 KM-2020

Slot 9 VO-2020 video output card

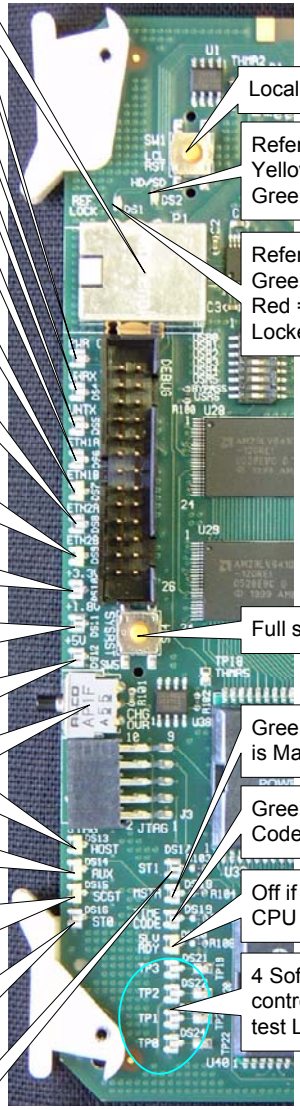
Slot 10 optional AO-2020 audio output card

Note: your system may contain 2 master control systems in 1 chassis.

# MC-2020 Card Guide

Wednesday, May 16, 2007

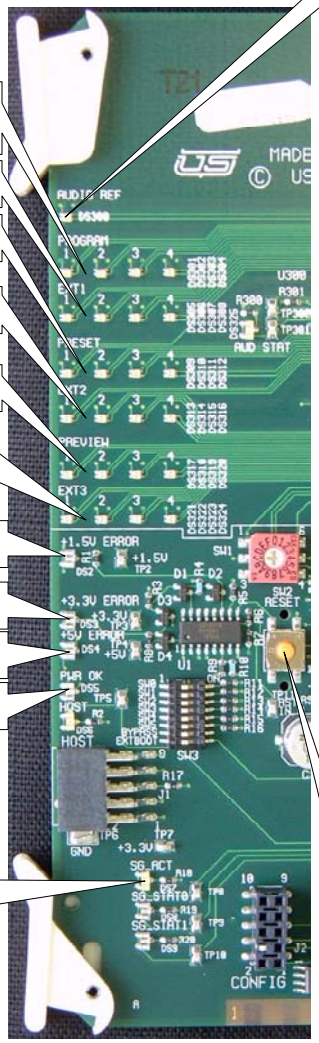
## CP-2020



- Debug port
- Power Okay - Green
- U-NET Receive
- U-NET Transmit
- E-Net 1A Blink Green = active data
- E-Net 1B Solid Amber = active bus
- E-Net 2A Blink Green = active data
- E-Net 2B Solid Amber = active bus
- +3.3V Red = Fault
- +1.8V Red = Fault
- +5V Red = Fault
- Change over switch
- J-TAG Host connected
- Aux connected
- Scangate accessed
- ST0 - red = error on scangate device
- ST1 - red = error on scangate device
- Local board reset
- Reference: Yellow=SD; Green=HD
- Reference: Green = Locked Red = Not Locked
- Full system reset
- Green if CPU is Master
- Green if Time Code present
- Off if Slave CPU is ready
- 4 Software controllable test LED's

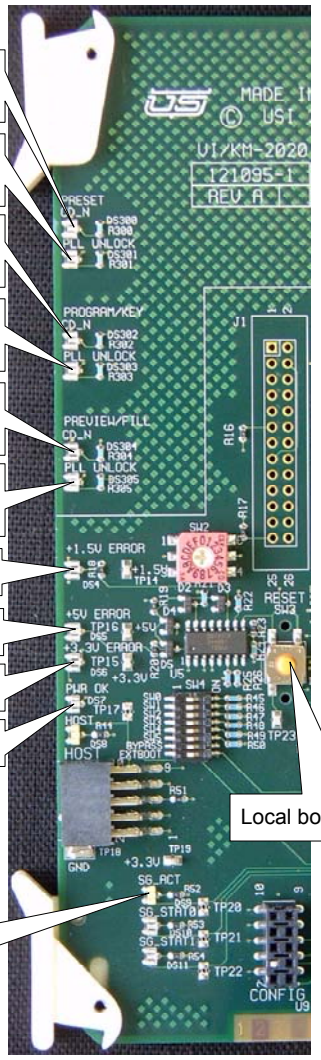
## AI-2020

Note: AES LED's
Green = Sync AES
Red = no audio
Flash= Async AES



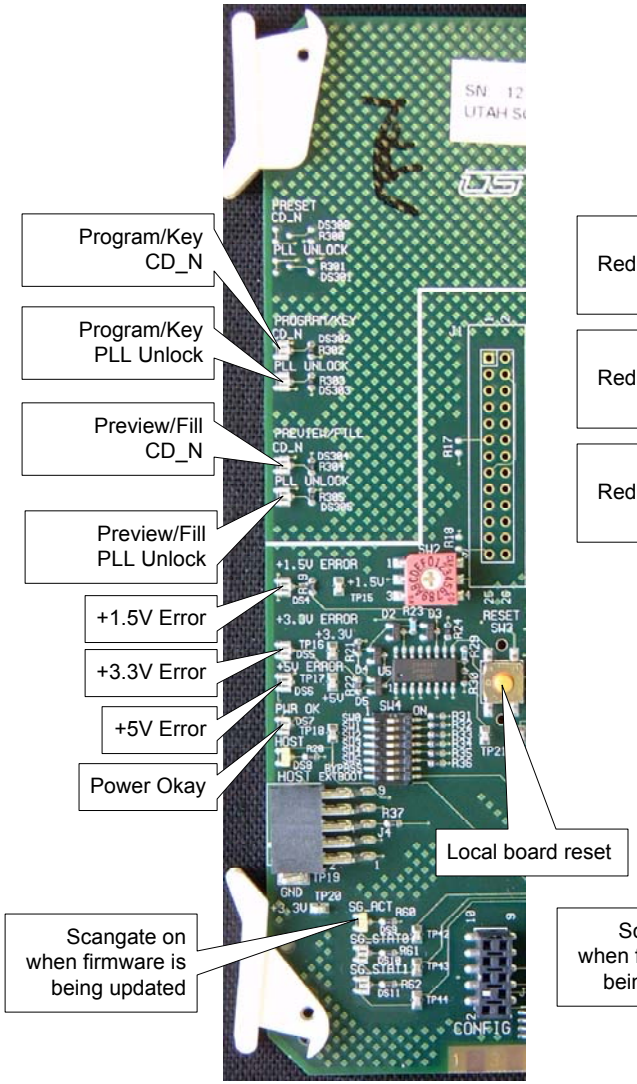
- PROGRAM 4 LED's
- EXT1 4 LED's
- Preset 4 LED's
- EXT2 4 LED's
- Preview 4 LED's
- EXT3 4 LED's
- +1.5V Red = error
- +3.3V Red = error
- +5V Red = error
- Power Green = okay
- Scangate on when firmware is being updated
- Audio Reference
- Local board reset

## VI-2020

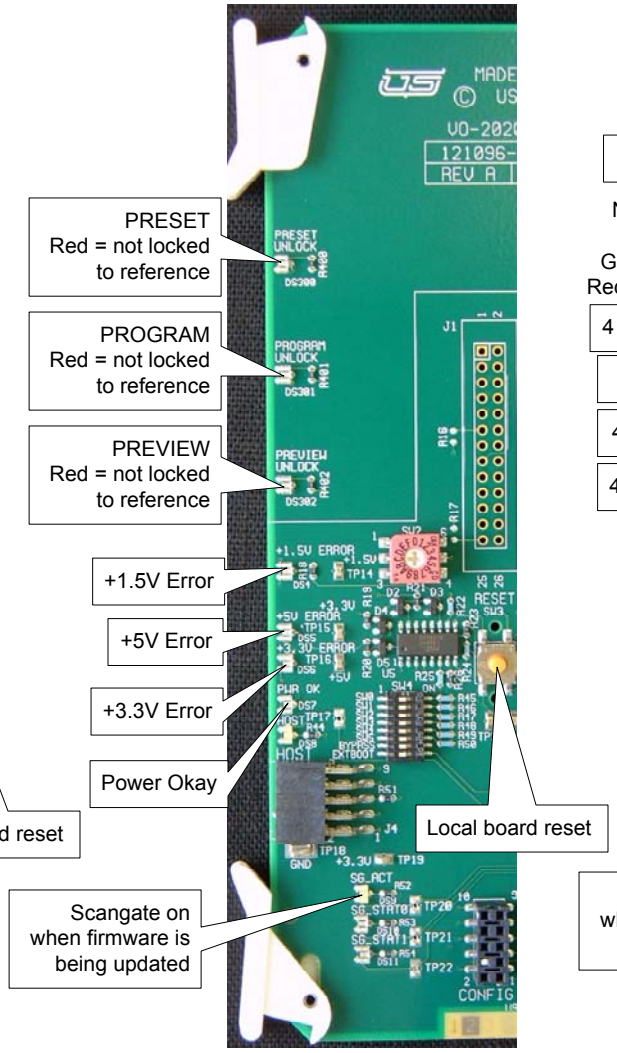


- Preset Carrier Detect Red = no signal
- Preset PLL Detect Red = no signal
- Program Carrier Detect Red = no signal
- Program PLL Detect Red = no signal
- Preview Carrier Detect Red = no signal
- Preview PLL Detect Red = no signal
- +1.5V Red = error
- +5V Red = error
- +3.3V Red = error
- Power Green = okay
- Scangate on when firmware is being updated
- Local board reset

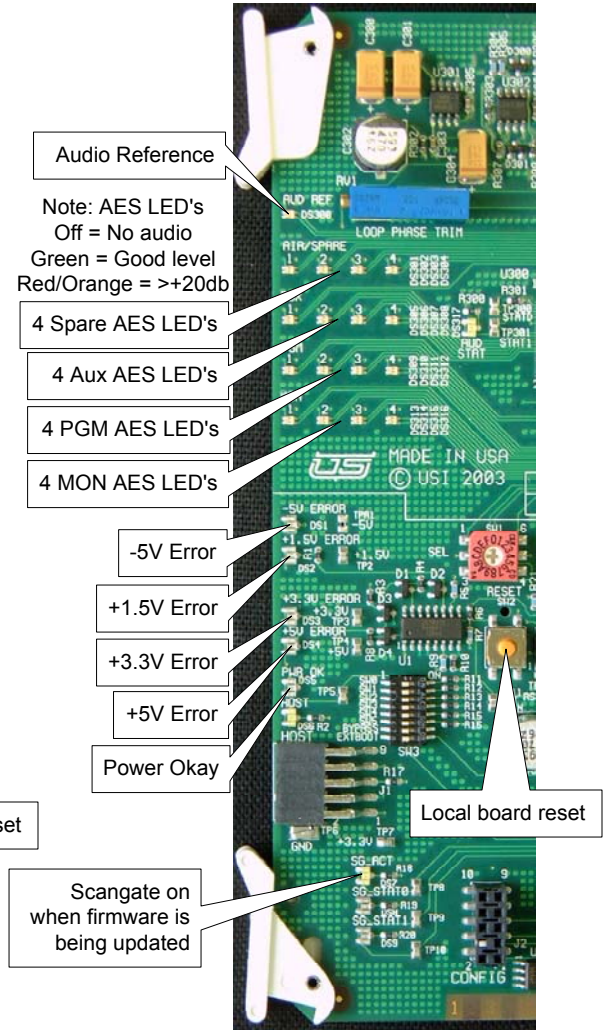
## KM-2020




## VO-2020

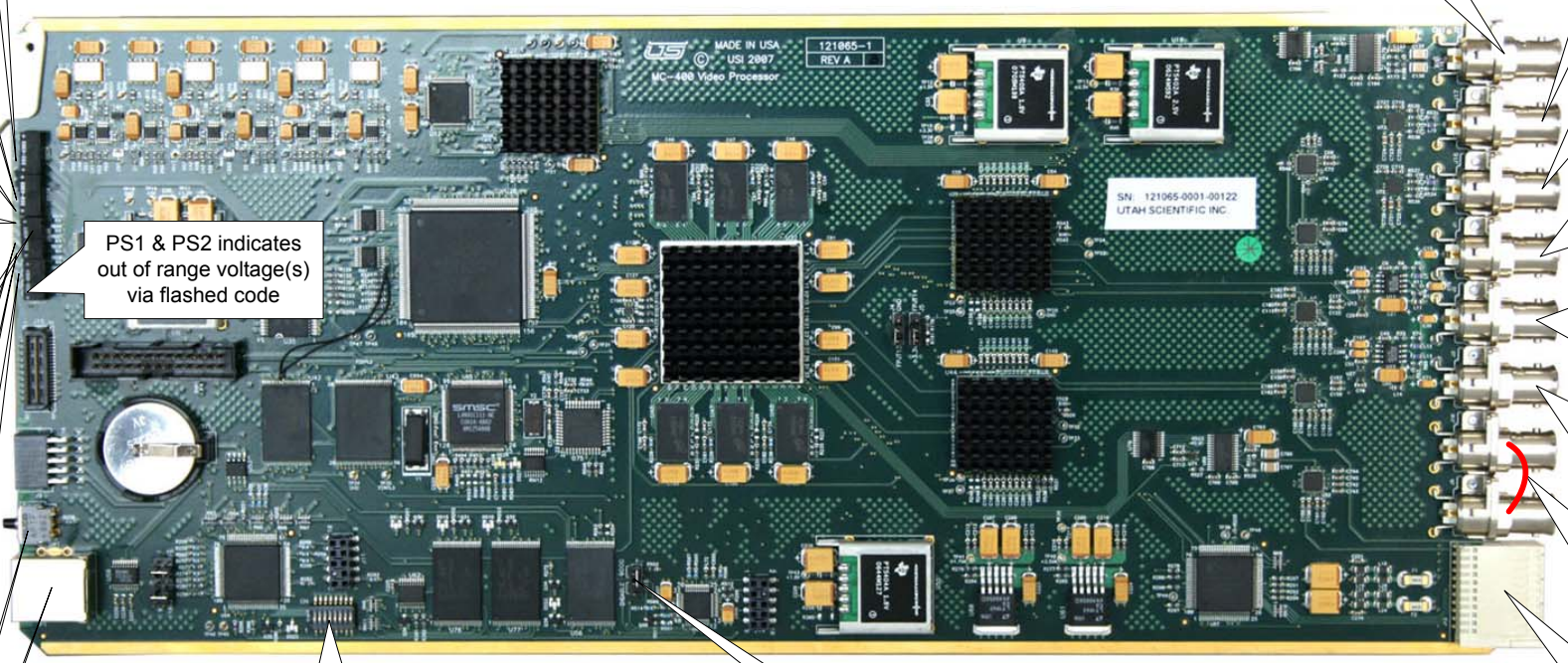



## AO-2020



Tuesday, September 02, 2008

**Note: All other connectors and jumpers are normally not intended for customer use.**




LED's 0-5 indicate valid HD or SD video presence when on.

VR LED indicates valid reference.

A1 indicates valid AES signal.

CPU indicates the CPU is active

CFG indicates programmable devices configured.

PWR indicates all voltages okay.

EN indicates active ethernet

BAT indicates battery failure.

CPU reset switch

Debug port

PS1 & PS2 indicates out of range voltage(s) via flashed code

**DIP Switch**
1 – Do not run Linux if ON
2 – Use partition 1 if OFF, partition 2 if ON
3 – 5 No function
6 – Start Linux, but do not start application if ON
7 – Place scangate part in Bypass if ON
Note: Normal operation has all switches OFF

**Watch-Dog Enable / Disable Jumper**
Place jumper between pins 1 & 2 to enable and 2 and 3 to disable.

Discrete AES Input

Router switch-able Key input

Router switch-able Fill input

Monitor / Time key video out

Program Video Out #1

Program Video Out #2

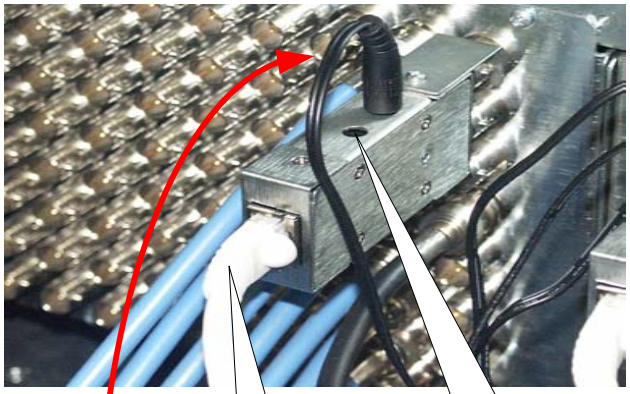
Ethernet dongle connections

Mid-Plane Connector

# MC-400 Connections

Tuesday, September 02, 2008

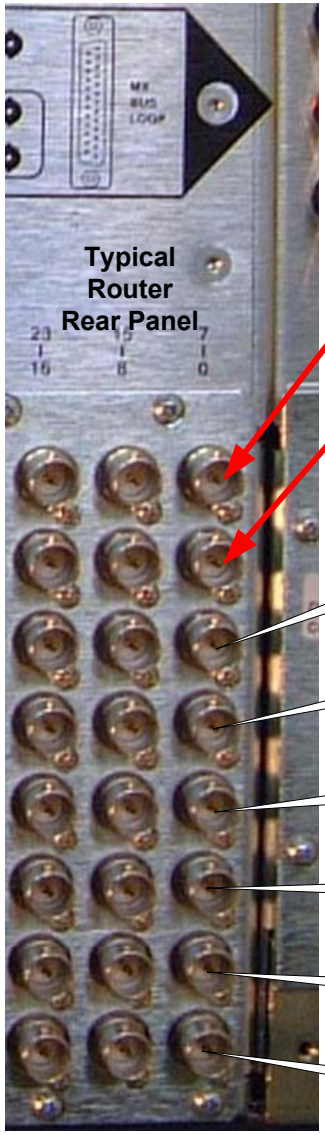
## Typical Ethernet Dongle Connection



2nd Power Supply Connection

Cat-5 Ethernet Cable


Ethernet Dongle Power Supply
(2 Each)




Hold-down clip. Remove screw to release clip, attach dongle to the BNC's and then re-install the clip.

RJ-45 Ethernet Connection

Program Video Out #2

Program Video Out #1

Monitor / Time key video out

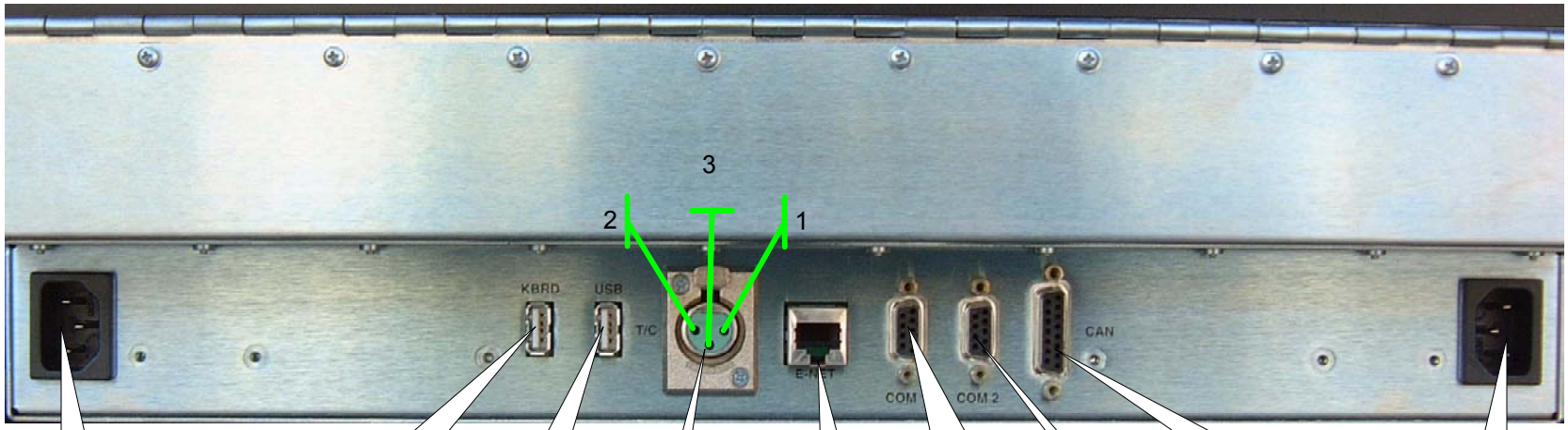
Key 1 Fill/Ext

Key 1 Key/Ext

Discrete AES Input

# MCP-2020 Connection Guide

Thursday, April 10, 2008




Power cord connection
Power consumption:
60 watts

Power Cord

Not currently used

Not currently used

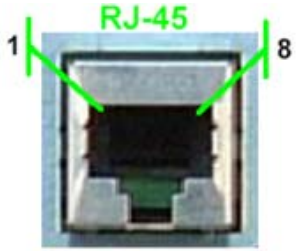
Timecode Pin #'s
1=GND, 2=TC IN+, 3=TC IN-

Ethernet connection. Connect to Utah Scientific ethernet system using CAT5 cable

Not currently used

Not currently used

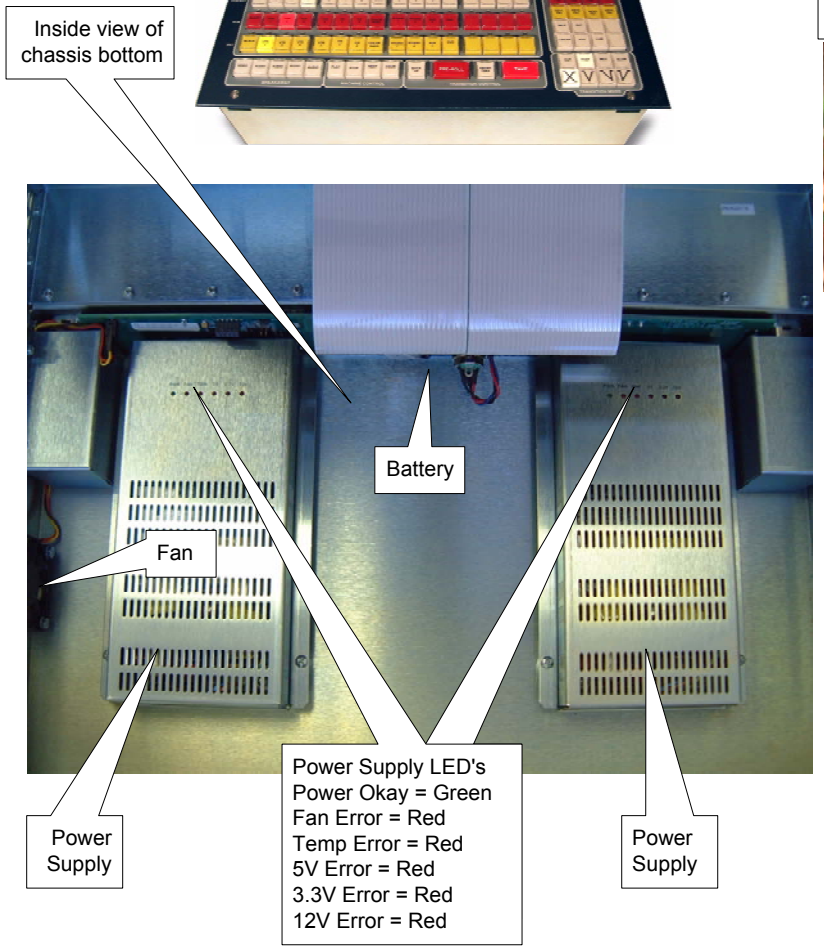
Not currently used

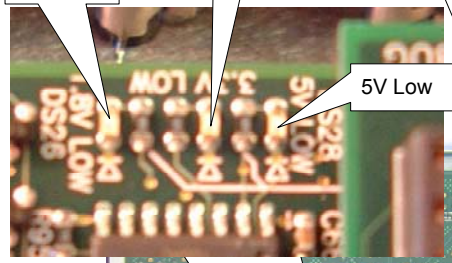



Power cord connection
Redundant power supplies are included. Both power cords must be installed.

# MCP-2020 Inside View

Thursday, April 10, 2008





Note: typically the MCP-2020 control panel would be re-set via the system reset button on the CP-2020 card in the master control frame. The local module reset switch will reset only a specific module and may not correct an error condition.

# MCP-400 Master Control Panel

Thursday, December 20, 2007


**Please see Section 3 of the MC-400 Operations Guide for operating instructions.**
**Connection information is on the reverse side.**

# MC-400 Master Control Panel Connections

Thursday, December 20, 2007

Note: Com 4 may be used as a time code input. If desired set port to RS-422 and use this pin out. 1=TC+, 2-4=Not used, 5=GND, 6-8=Not used, 9=TC-

GPI Connections Top Row = +12v, Bottom Row = GND

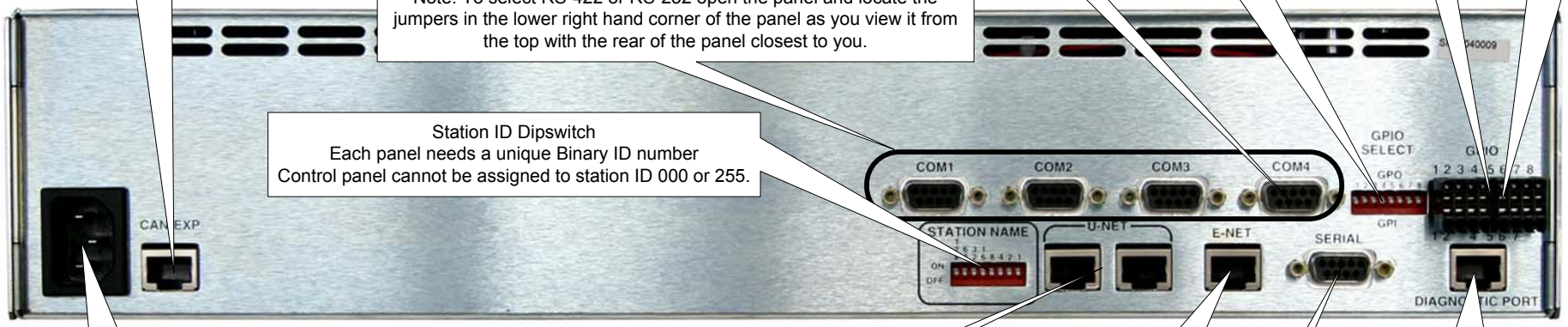
When an expansion panel is used, this connection loops between the panels using a CAT-5 cable. When no expansion panel is used terminate this connection with the supplied U-Net terminator.

**4)RS-422 or 232 Serial Ports & Pin#'s**
**RS-232;** 1=CD, 2=RX, 3=TX, 4=DTR, 5=GND, 6=DSR, 7=RTS, 8=CTS, 9=Not used
**RS-422;** 1=Not used. 2=RX-, 3=TX+, 4=Not used, 5=GND, 6=Not used, 7=RX+, 8=TX-, 9=Not used
Note: To select RS-422 or RS-232 open the panel and locate the jumpers in the lower right hand corner of the panel as you view it from the top with the rear of the panel closest to you.

GPIO Selection Switch
This switch sets the mode for the GPI/GPO connector to the right. Switch 1 corresponds with GPIO 1 etc. Up fo GPO; down for GPI

GPO Connections Relay closure between the upper pin and power pin when relay is closed.

Station ID Dipswitch
Each panel needs a unique Binary ID number
Control panel cannot be assigned to station ID 000 or 255.



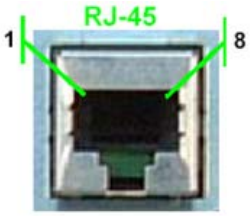

Power Connector

U-Net Terminator

Typical CAT5 Ethernet connection

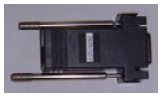
Configuration port used for panel setup. Use RJ-45 to 9 pin adapter labeled MC-2020. Baud rate 19.2K baud, 8, None, 1

U-Net connectors connect to a U-Net port on the SC-4/400 or to a loop-through from another panel via a typical CAT-5 cable. U-Net must be terminated at the end of the loop-through with the supplied U-Net terminators. Maximum cable length of 1000 feet per run.





Serial Port for control via RCP-1 protocol.
Pin Outs: **RS-232**= 1-RI, 2-TXD, 3-RXD, 4-DSR, 5-GND, 6-DTR, 7-CTS, 8-RTS, 9-CD
**RS-422**= 2-TX-1, 3-RX+, 5-GND, 7-TX+, 8-RX-



RJ-45 Adaptor

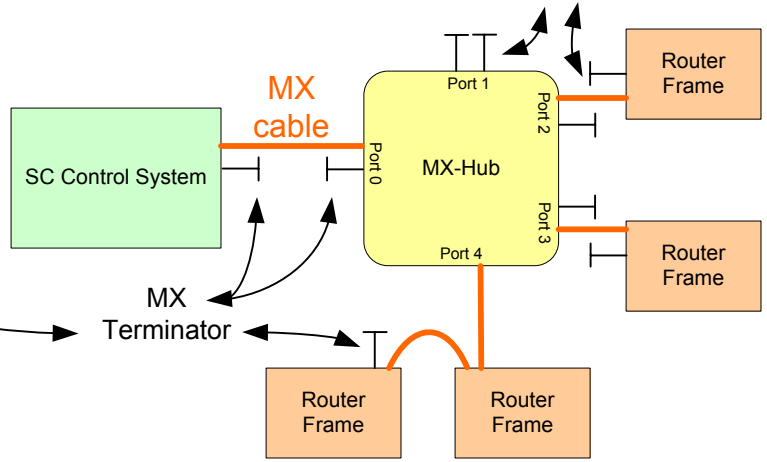
# MX-Hub

Wednesday, May 16, 2007

Note: Maximum MX cable length is 300' from the controller and an additional 300' from the MX-hub. All MX ports must be terminated either on the controller chassis, the MX-hub or on the last router frame in the sequence.


MX cable from one of the system controller MX bus connections. This cable overall length can not exceed 300'.

8 supplied MX-bus terminators. USI part #70797-1





Green = power okay

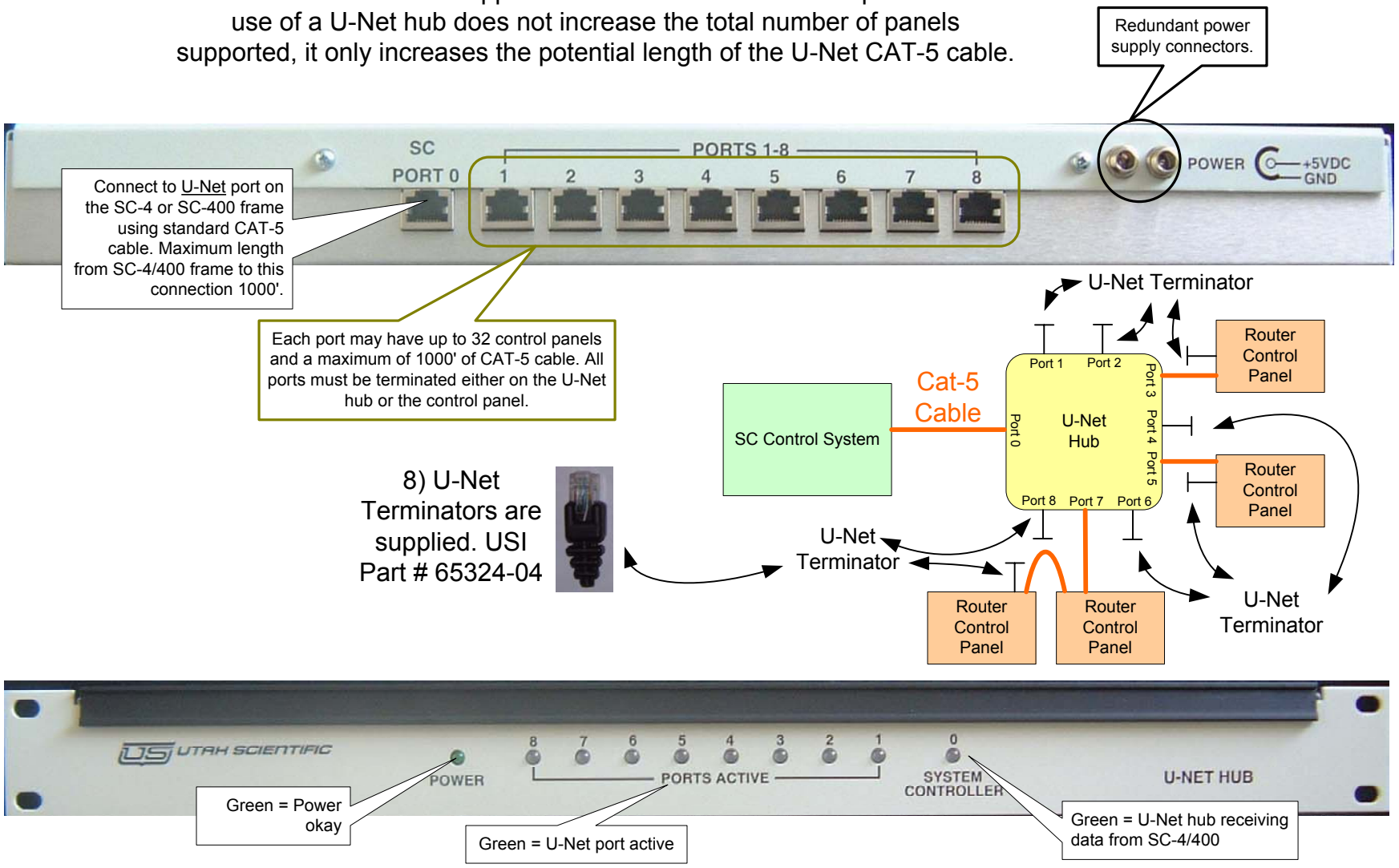
Green = MX bus active

USI Part #80263-3

# U-Net Hub

Wednesday, May 16, 2007

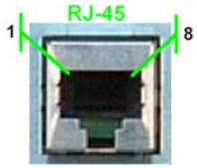
The U-Net control bus supports a maximum of 255 control panels. The use of a U-Net hub does not increase the total number of panels supported, it only increases the potential length of the U-Net CAT-5 cable.




USI Part #80263-2

# MX-Lator/SC-400 Rear View

Wednesday, May 16, 2007




E-Net port connects SC-400 to local network via typical CAT-5 cable. Note: There is a separate E-Net connector for the MX-Lator on the right-hand side of the frame.

U-Net connector is attached to U-Net based control panels via a typical CAT-5 cable and terminated with the supplied U-Net terminators. Maximum cable length of 1000 feet.

U-Net Terminator supplied with SC-400 system. U-Net port MUST be terminated either at the control panel or on the SC-400 rear panel.

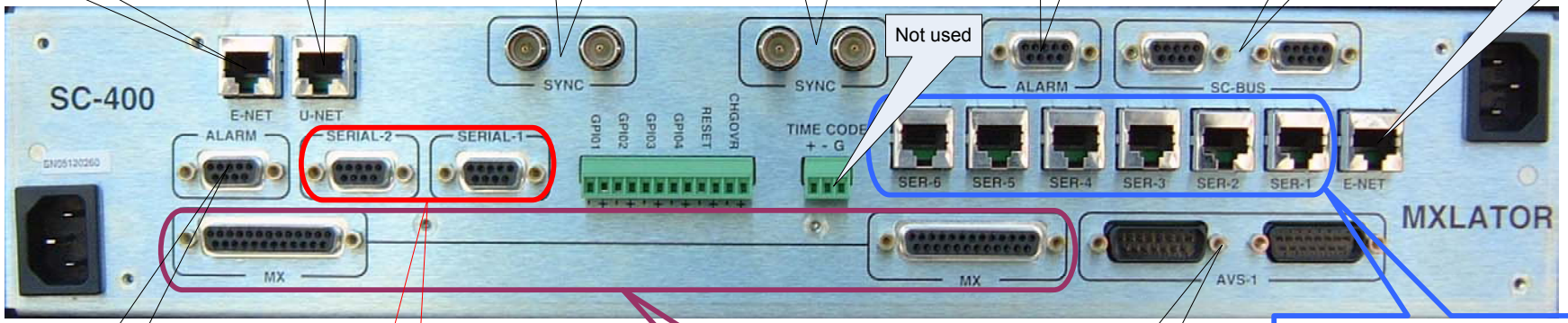
SC-400 Sync: Use analog black burst or analog Tri-level sync.

Not used


Alarm Pin Outs:
1 - ALM0, 2 - ALM1, 3 - ALM2,
4 - ALM3, 5 - SMPTE0,
9 – SMPTE, 6,7,8 - GND

SC-Bus for control of Utah AVS-2 series routers using Utah supplied CC-2 cables. Both SC Bus connections must be terminated at all times.

MX-Lator Ethernet interface. In most instances this port must be connected to the SC-4 or SC-400 Ethernet network. Note: There is a separate E-Net connector for the SC-400 on the left-hand side of the frame.




Alarm Pin Outs:

1 - ALM0
2 - ALM1
3 - ALM2
4 - ALM3
5 - SMPTE0
9 - SMPTE1
6,7,8 - GND

SC-400/AC-SYSR 140090-16
MX-Lator/SCSYSR 140090-14
MX-Lator/SYSR 140090-12

Serial Port Pin Outs:

| RS-232 | RS-422 |
|---|---|
| 1 - NA | 1 - N/A |
| 2 - TXD | 2 - TX- |
| 3 - RXD | 3 - RX+ |
| 4 - NA | 4 - N/A |
| 5 - GRD | 5 - GND |
| 6 - NA | 6 - N/A |
| 7 - NA | 7 - TX+ |
| 8 - NA | 8 - RX- |
| 9 - NA | 9 - N/A |

MX-Bus connects to MX bus connections on router frames. Both ports must be terminated, either on the SC-400/MX-Lator or router chassis. Total maximum length of 300 feet.

MX-Bus Terminator

MX-Bus Cable

Data Bus for control of Utah AVS-1 & AVS-1B series routers using Utah supplied DC-1 cables. No termination is required.

6) Third Party Router Control Serial Ports

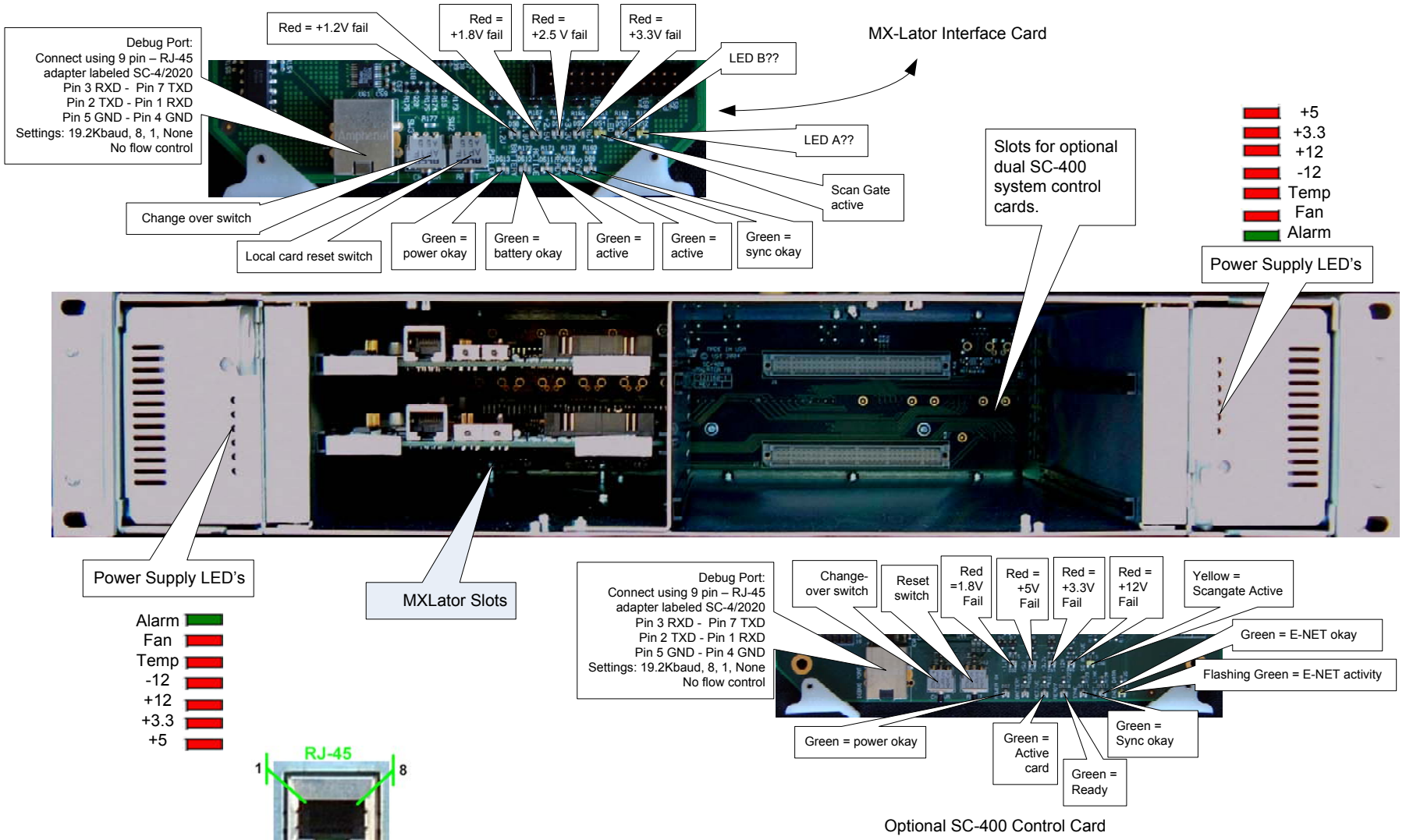
RS-232 Pin Out:
1-TX, 2-DTR, 3-RX, 4-DSR, 5-RTS, 6-GND, 7-CTS, 8-GND

RS-422 Pin Out:
1-TX-, 2-GND, 3-RX+, 4-GND, 5-TX+, 6-GND, 7-RX-, 8-GND

Note: the proper router protocol must be installed in the MX-Lator for the serial port to control a third party router.

# MX-Lator/SC-400 Front View

Wednesday, May 16, 2007



# Pin Numbers

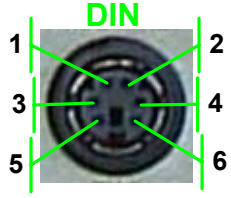
Wednesday, May 16, 2007

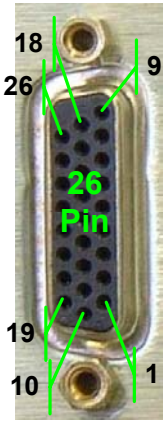


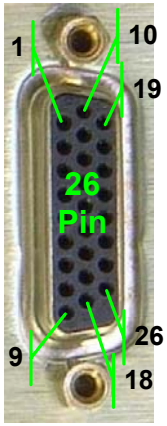


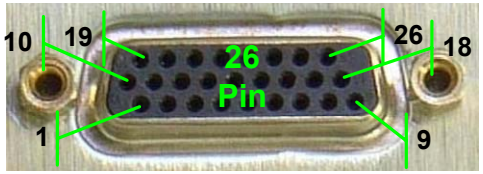


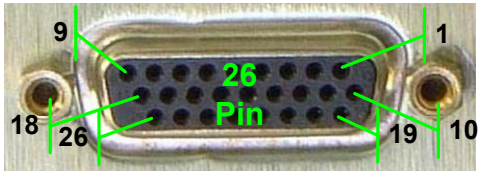


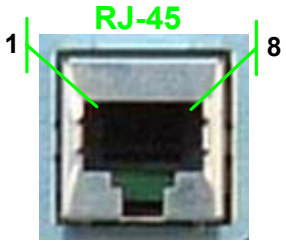



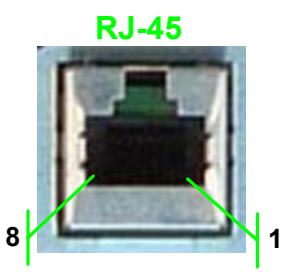



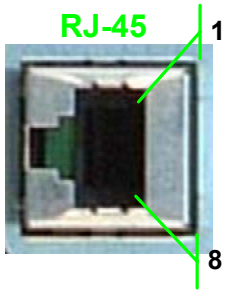



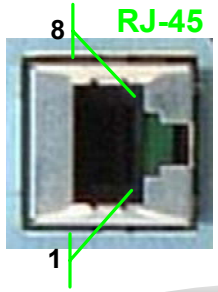



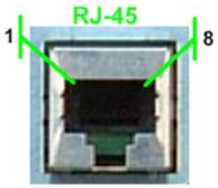



# SC-4 Connection Guide

Wednesday, May 16, 2007

8)U-Net Terminators supplied with SC-4 system. All 8 U-Net ports MUST be terminated either at the control panel or on the SC-4 rear panel.

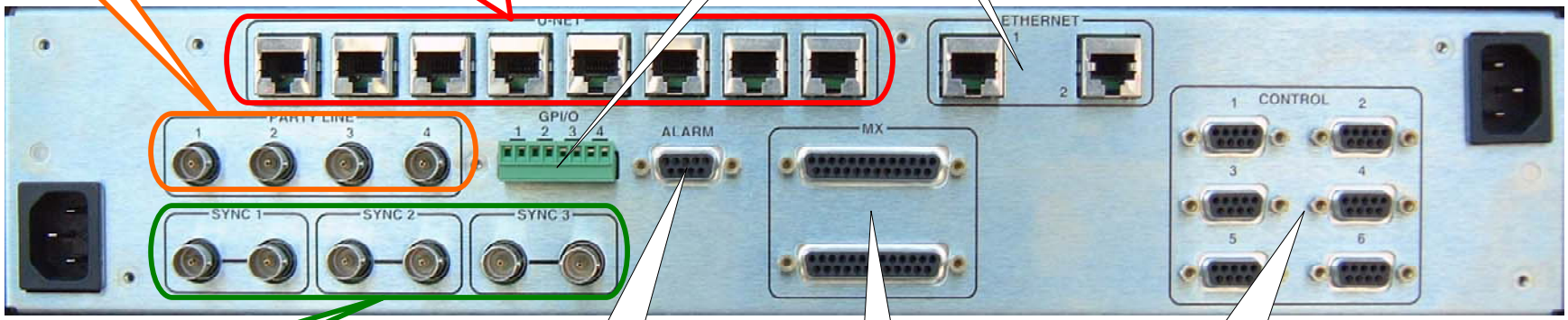
SC-4 is connected via CAT-5 cable to the control system network, Hub or ethernet panels. Use port 1. See System Installation Guide, section 1 for instruction on setting the IP address.




4)Partyline connectors connect to Partline control panels via typical coaxial connection. No termination required.

8)U-Net connectors are attached to U-Net based control panels via a typical CAT-5 cable and terminated with the supplied U-Net terminators. Maximum cable length of 1000 feet per port.

Not used


A maximum of 3 sync sources may be connected to the loop thru Sync Connectors. Sync source must be analog black burst or analog tri-level sync. DO NOT connect SDI reference signals.

Alarm connectors

Alarm Pin Out

1 - ALM0
2 - ALM1
3 - ALM2
4 - ALM3
5 - SMPTE0
9 - SMPTE1
6,7,8 - GND

MX-Bus connects to MX bus connections on router frames. Both ports must be terminated, either on the SC-4 or router chassis. Total maximum length of 300 feet.

MX-Bus Terminator

MX-Bus Cable

Serial ports are used for RS-232 or RS-422 interface. Format is jumper selectable.

**Serial Port Pin Outs**

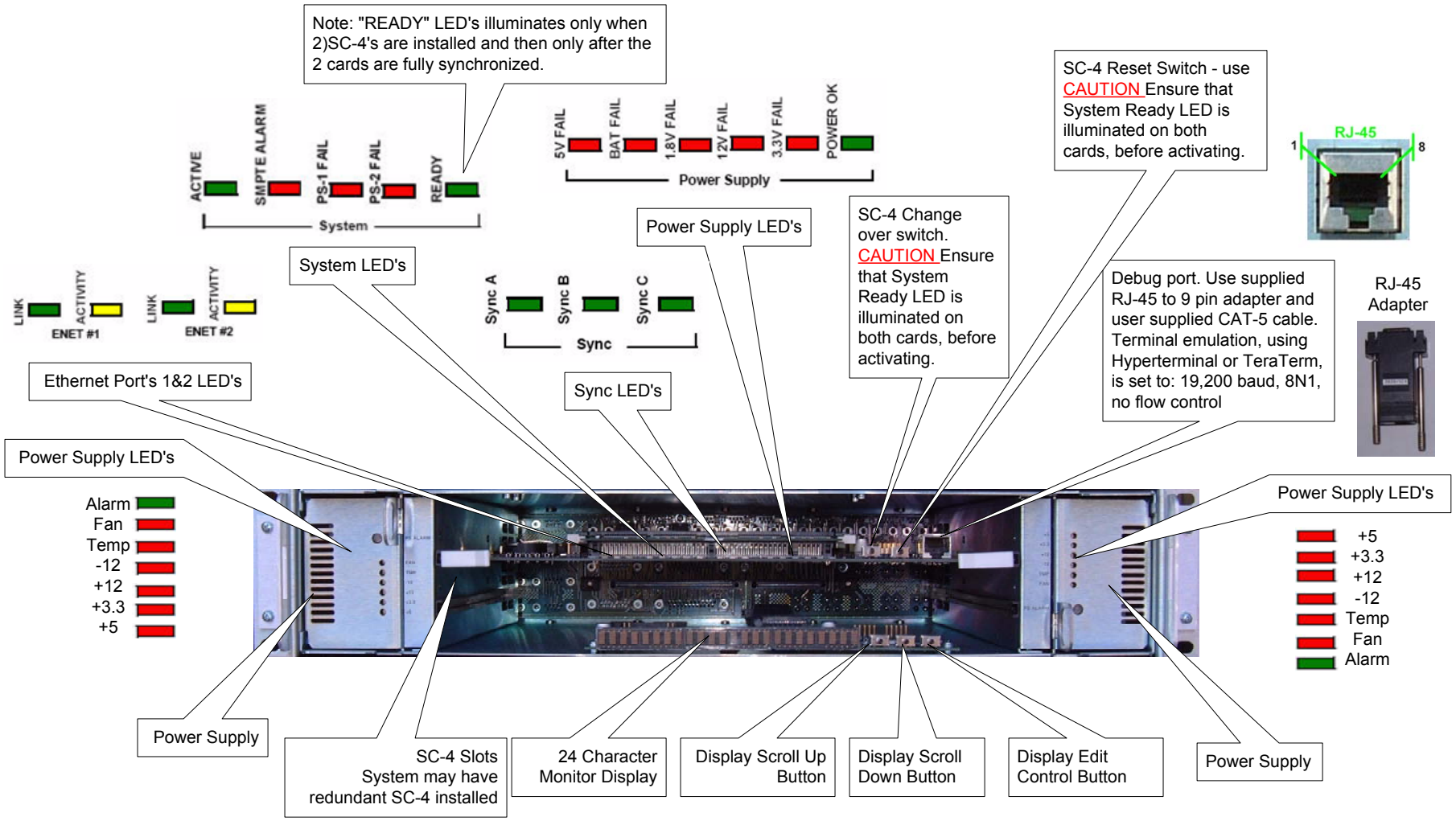
| RS-232 | RS-422 |
|---|---|
| 1 - NA | 1 - N/A |
| 2 - TXD | 2 - TX- |
| 3 - RXD | 3 - RX+ |
| 4 - NA | 4 - N/A |
| 5 - GRD | 5 - GND |
| 6 - NA | 6 - N/A |
| 7 - NA | 7 - TX+ |
| 8 - NA | 8 - RX- |
| 9 - NA | 9 - N/A |

**Serial Port Defaults**
**Ports 1,3 & 5**
38.4 Kbaud, 8 data, 1 stop, No Parity, Indexed
**Ports 2,4 & 6**
19.2 Kbaud, 7 data, 2 stop, Even, Numeric

**Select RS-422 or 232**
Remove SC-4 from frame. Locate serial port jumper blocks on left-rear area of SC-4. Move jumper, for each port, to desired selection.

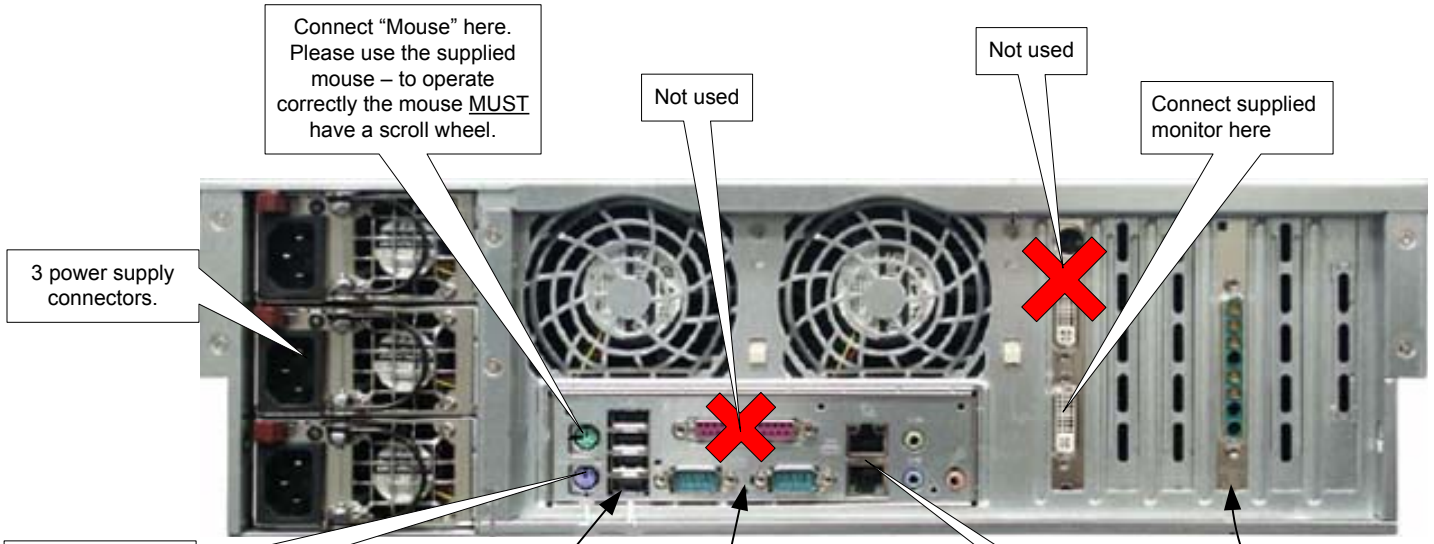
# SC-4 Front View Guide

Wednesday, May 16, 2007



# SqueezeMax HD

Wednesday, May 16, 2007

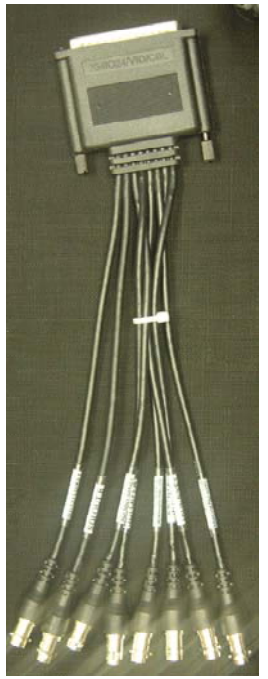



Use this cable (and adapter, if required) to connect your serial EAS device to a USB port or connect directly to one of the serial ports.

Connect HD programming feed to the connector labeled “SDI IN A”

Connect “SDI OUT A” to the downstream device.

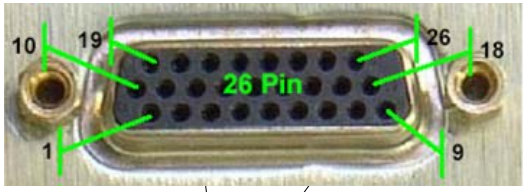
Note: other connectors on breakout cables are NOT used.



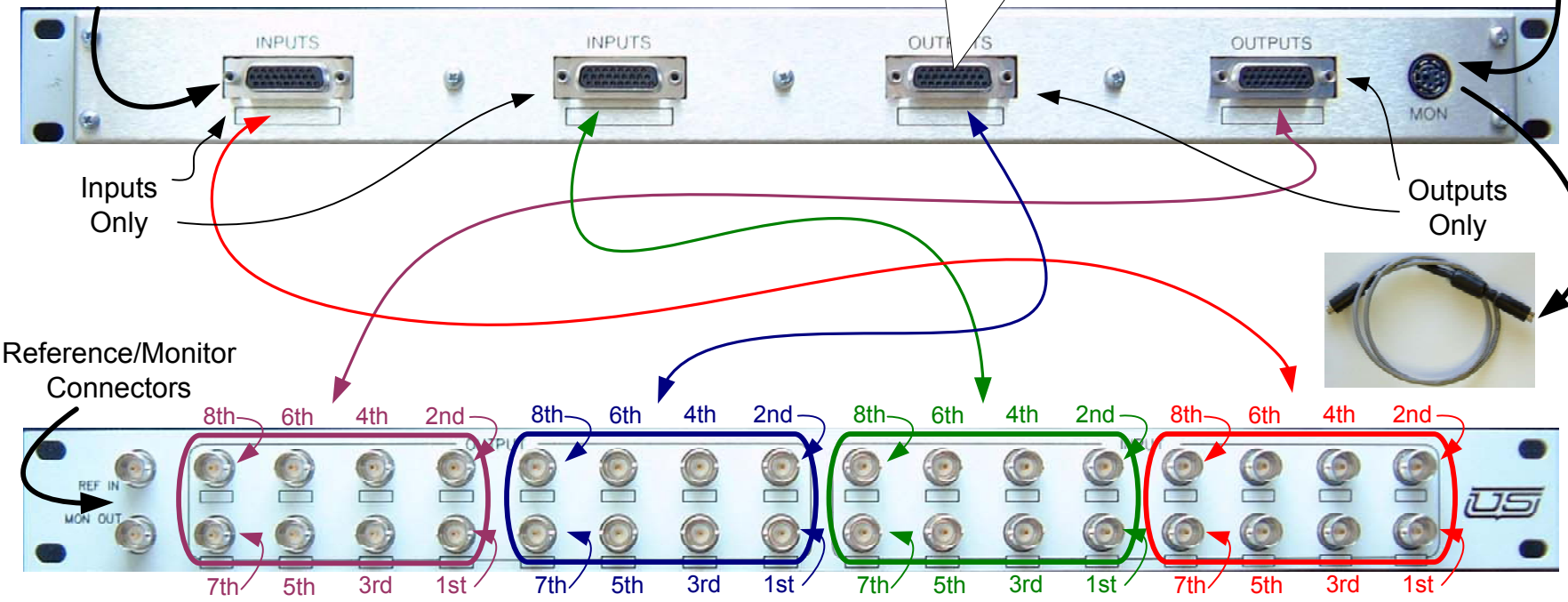
# Coming Soon

Note: each of the four “D” connectors provide connections for router eight inputs or outputs only.

4) Utah supplied audio cables connect one end to a “D” connector on the breakout panel and the other end to the corresponding router input or output “D” connector.



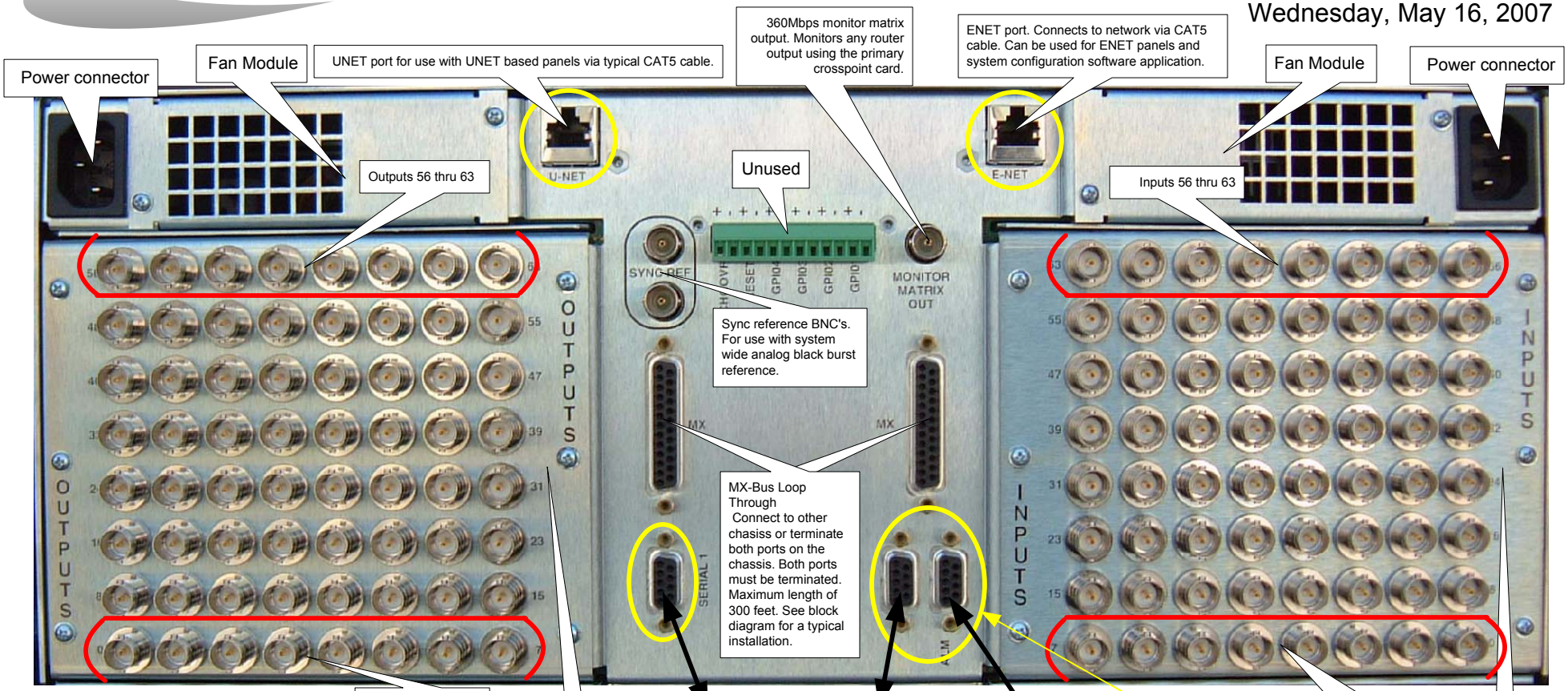

DIN connector attaches to the Monitor/ Reference connector on the UTAH-200 chassis




Note: The numbering on each set of eight BNC’s indicate which input or output the BNC is connected too. For example: If the far right (red) set of eight were connected to the “D” connector on the router for inputs 00 to 07, the BNC labeled “1st” would be connected to Input 00, “2nd” would be input 01 and so forth.

# UTAH-400 Unbalanced A-64 Frame Connector View

Wednesday, May 16, 2007




MX -Bus Terminator

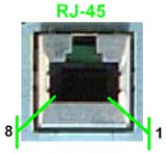
MX Cable

MX-Bus Terminator

UTAH-400/64 with SC-400's

UTAH-400 Frame

UTAH-400 Frame




Serial Port Pin Outs

| RS-232 | RS-422 |
|---|---|
| 1 - NA | 1 - N/A |
| 2 - TXD | 2 - TX- |
| 3 - RXD | 3 - RX+ |
| 4 - NA | 4 - N/A |
| 5 - GRD | 5 - GND |
| 6 - NA | 6 - N/A |
| 7 - NA | 7 - TX+ |
| 8 - NA | 8 - RX- |
| 9 - NA | 9 - N/A |

38.4Kb, 8, 1 and none


Alarm Connector Pin Outs

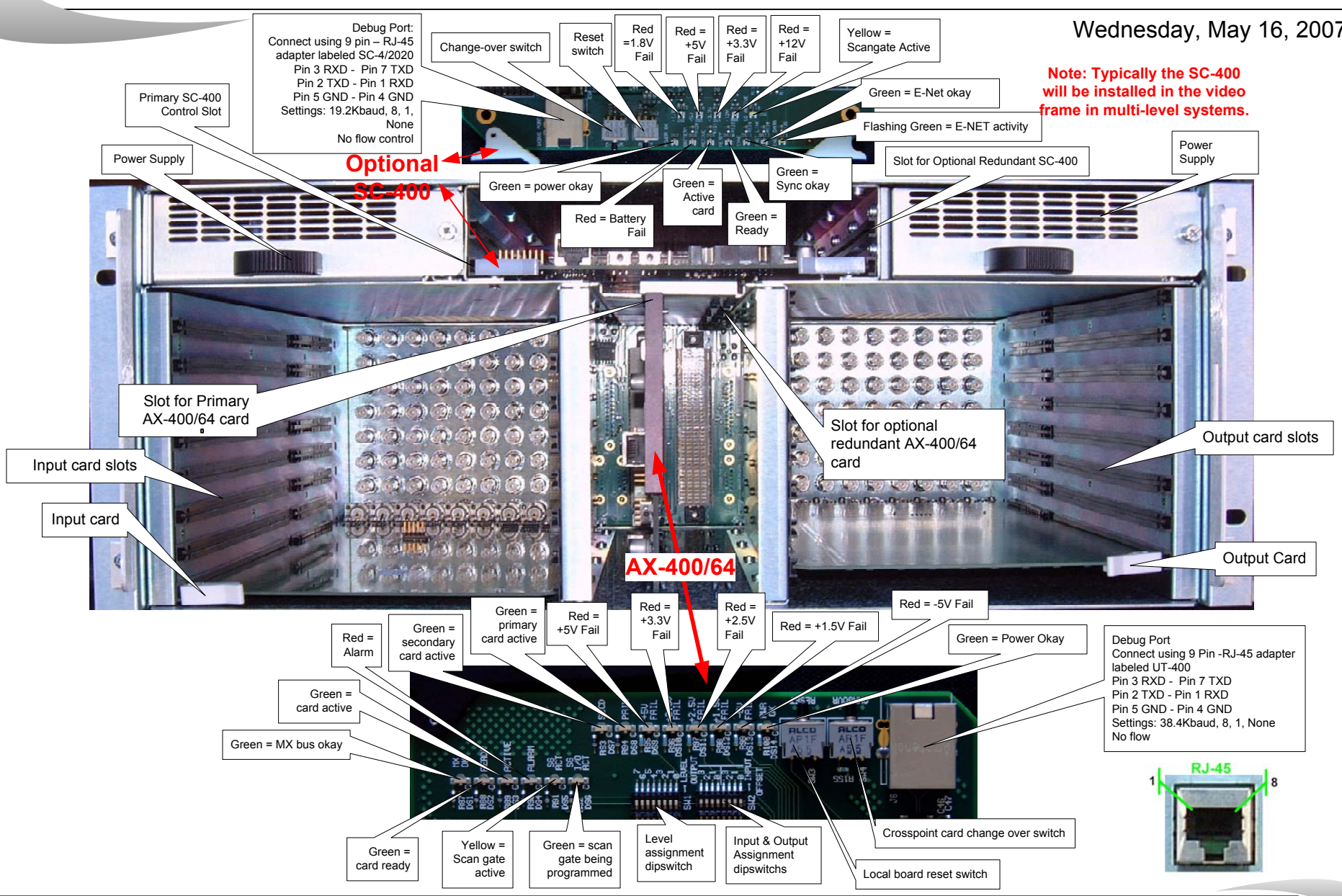
1 - ALM0
2 - ALM1
3 - ALM2
4 - ALM3
5 - SMPTE0
9 - SMPTE1
6,7,8 - GND

38.4Kb, 8, 1 and none

Note:
All connectors circled in yellow are active ONLY when the SC-400 is installed in the frame. Typically the SC-400 will be installed in the video frame in multi-level systems.

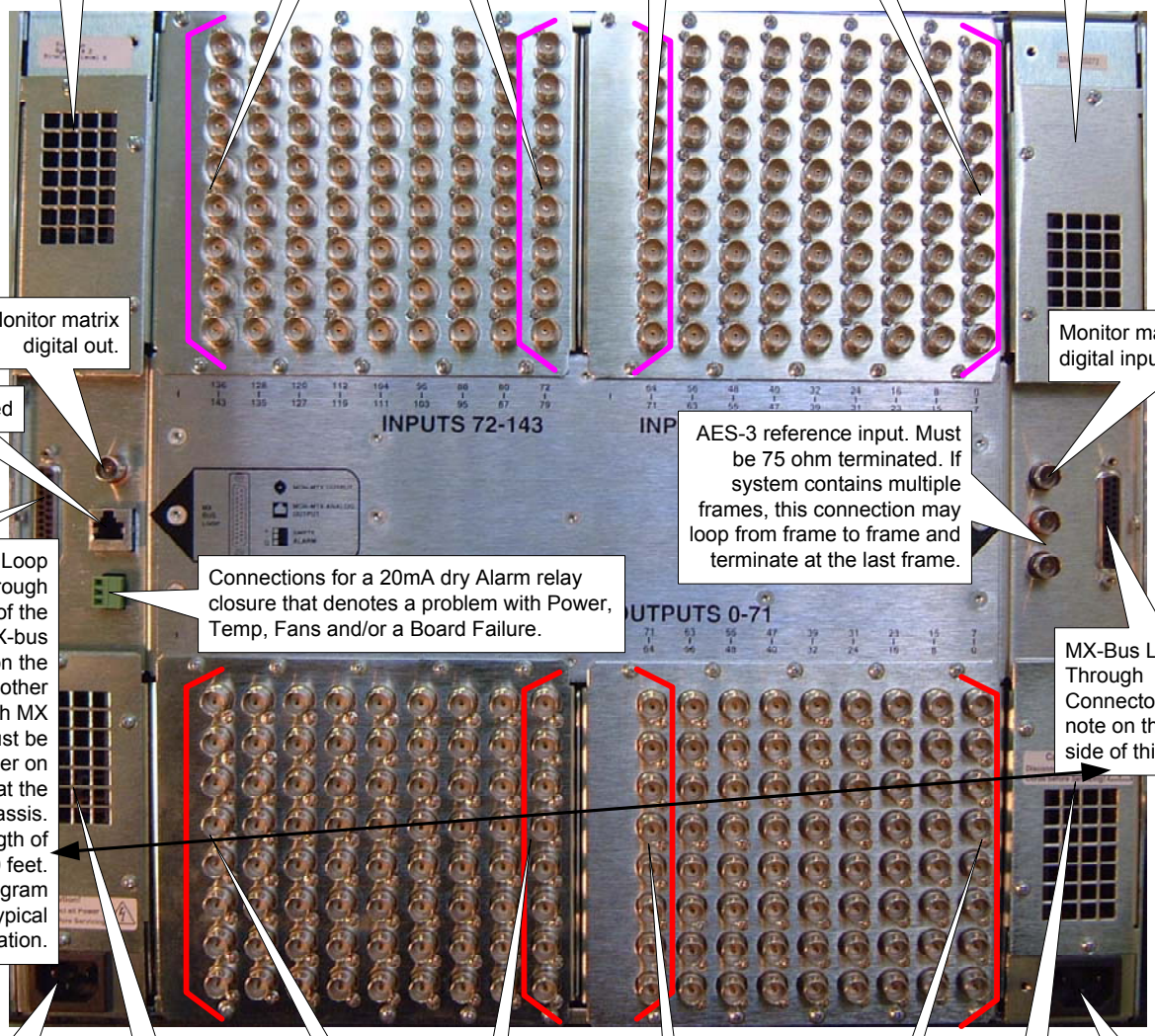
# UTAH-400 Unbalanced A-64 Frame Front View

Wednesday, May 16, 2007



# UTAH-400 A-144R Unbalanced AES Frame

Wednesday, May 16, 2007




Fan Module

Unbalanced AES audio inputs 136-143

Unbalanced AES audio inputs 72-79

Unbalanced AES audio inputs 64-71

Unbalanced AES audio inputs 0-7

Fan Module

Monitor matrix digital out.

Unused

Monitor matrix digital input.

AES-3 reference input. Must be 75 ohm terminated. If system contains multiple frames, this connection may loop from frame to frame and terminate at the last frame.

MX-Bus Loop Through Connect to one of the two MX-bus connections on the SC-4 or another router frame. Both MX ports must be terminated, either on the SC-4 or at the router chassis. Maximum length of 300 feet. See block diagram below for a typical installation.

Connections for a 20mA dry Alarm relay closure that denotes a problem with Power, Temp, Fans and/or a Board Failure.

MX-Bus Loop Through Connector. See note on the left side of this page.

Power connector

Fan Module

Unbalanced AES audio outputs 136-143

Unbalanced AES audio outputs 72-79

Unbalanced AES audio outputs 64-71

Unbalanced AES audio outputs 0-7

Fan Module

Power connector

MX -Bus Terminator

MX Cable

MX-Bus Terminator

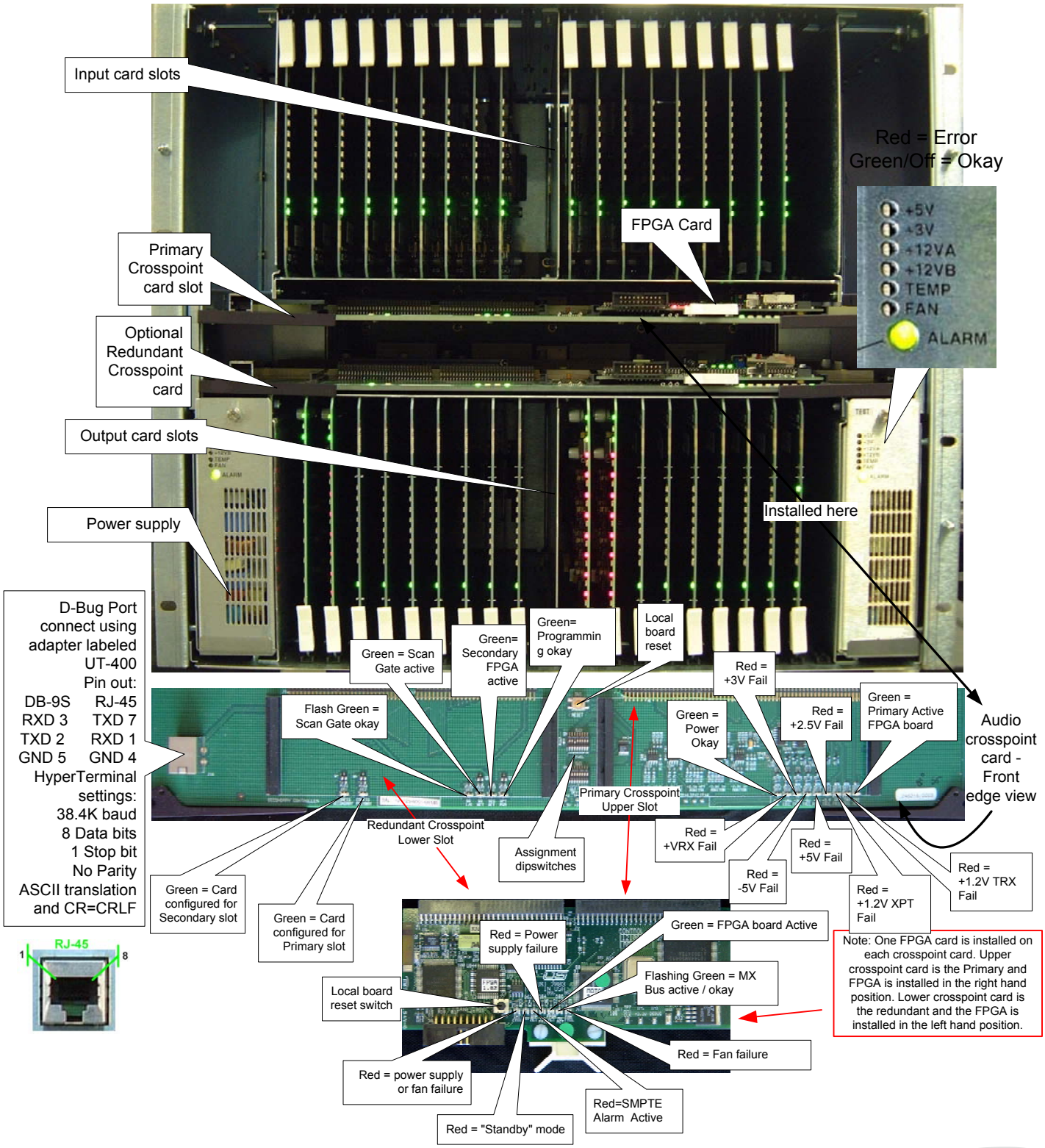
SC-4 Chassis

UTAH-400 Frame

UTAH-400 Frame

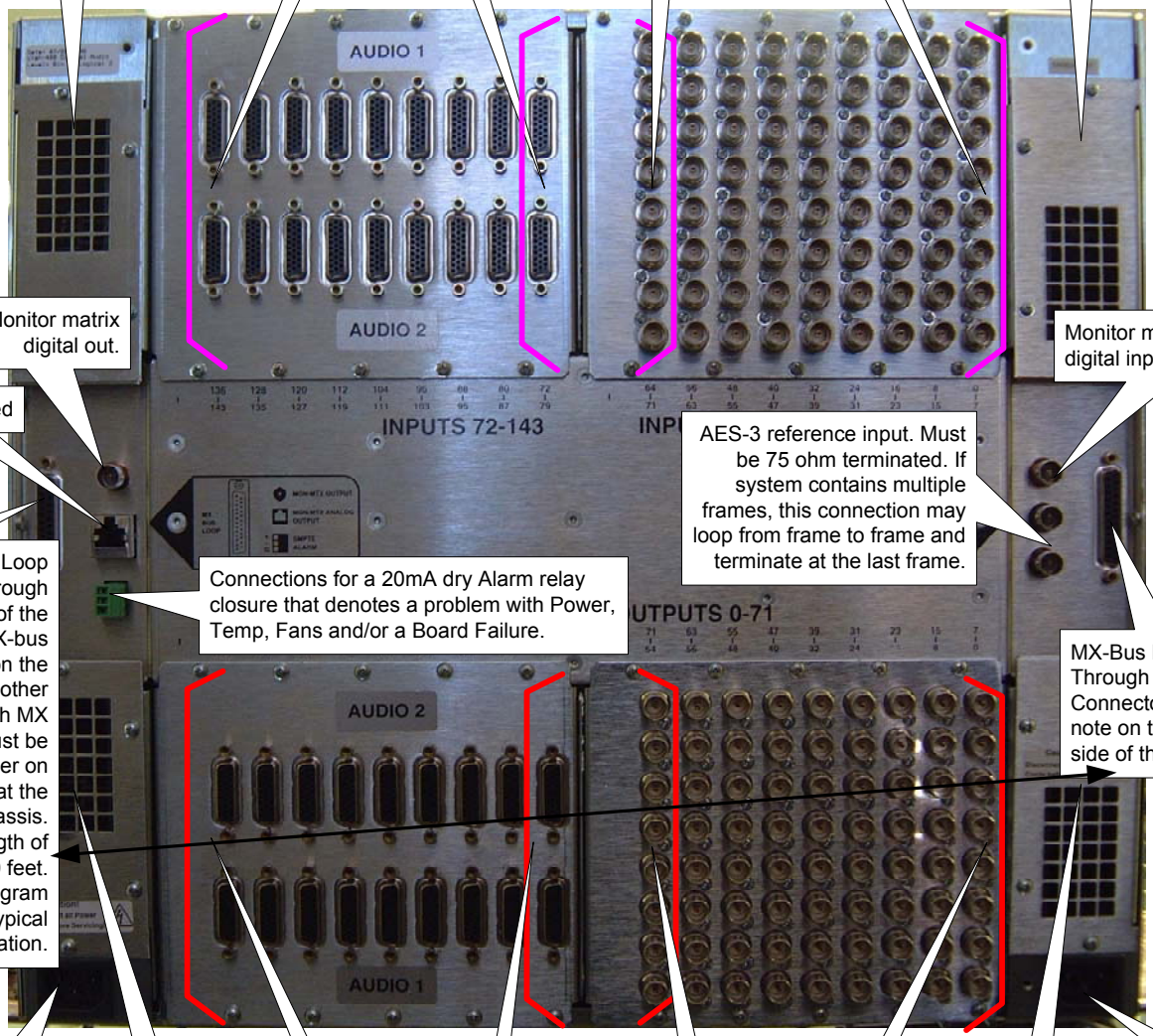
# UTAH-400 A-144R Front View

Wednesday, May 16, 2007



# UTAH-400 A-144R Unbalanced/Analog Frame

Wednesday, May 16, 2007




Fan Module

Analog audio inputs 136-143

Analog audio inputs 72-79

Unbalanced AES audio inputs 64-71

Unbalanced AES audio inputs 0-7

Fan Module

Monitor matrix digital out.

Unused

Monitor matrix digital input.

AES-3 reference input. Must be 75 ohm terminated. If system contains multiple frames, this connection may loop from frame to frame and terminate at the last frame.

MX-Bus Loop Through Connect to one of the two MX-bus connections on the SC-4 or another router frame. Both MX ports must be terminated, either on the SC-4 or at the router chassis. Maximum length of 300 feet. See block diagram below for a typical installation.

Connections for a 20mA dry Alarm relay closure that denotes a problem with Power, Temp, Fans and/or a Board Failure.

MX-Bus Loop Through Connector. See note on the left side of this page.

Power connector

Fan Module

Analog audio outputs 136-143

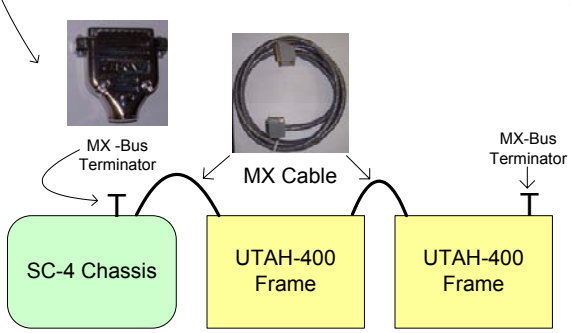
Analog audio outputs 72-79

Unbalanced AES audio outputs 64-71

Unbalanced AES audio outputs 0-7

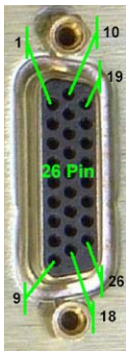
Fan Module

Power connector



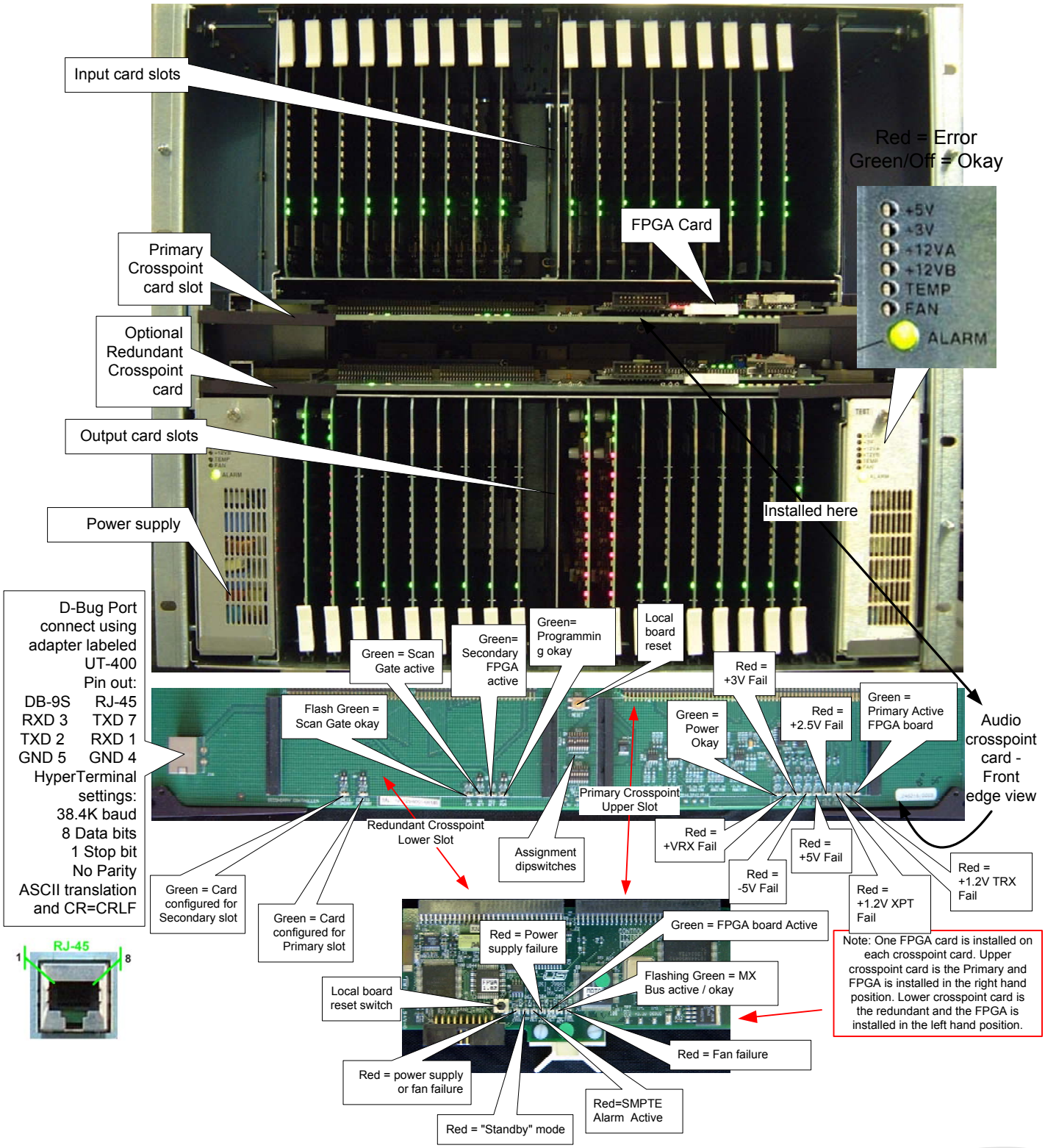

## Audio D Connector Pin Outs

| Pin # | Audio Signal | Ground Pin | Pin # | Audio Signal | Ground Pin |
|---|---|---|---|---|---|
| 1 | 0+ | 19 | 5 | 4+ | 23 |
| 11 | 0- | | 15 | 4- | |
| 2 | 1+ | 20 | 6 | 5+ | 24 |
| 12 | 1- | | 16 | 5- | |
| 3 | 2+ | 21 | 7 | 6+ | 25 |
| 13 | 2- | | 17 | 6- | |
| 4 | 3+ | 22 | 8 | 7+ | 26 |
| 14 | 3- | | 18 | 7- | |



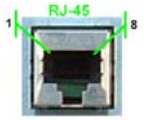
# UTAH-400 A-144R Front View

Wednesday, May 16, 2007



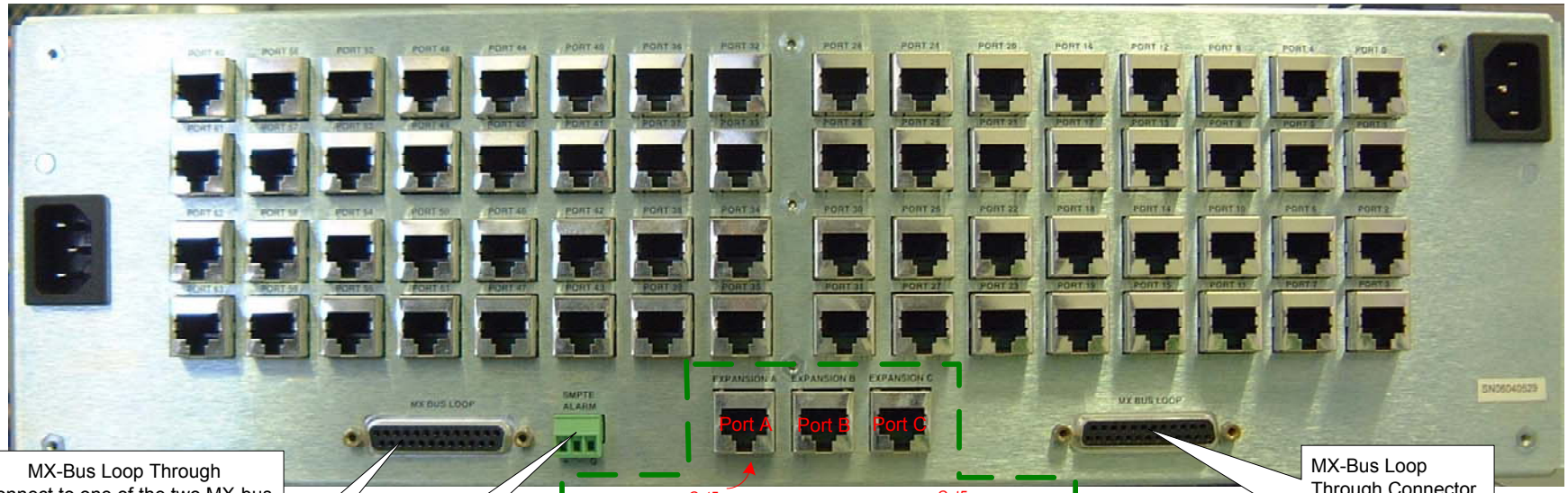
# UTAH-400 Data Rear View

Wednesday, May 16, 2007




Serial Data Connector Pinouts
**Tributary Mode**
1&2 = gnd, 3 = TX Common, 4 = TX-, 5 = TX+, 6 = RX Common, 7 = RX+, 8 = RX-

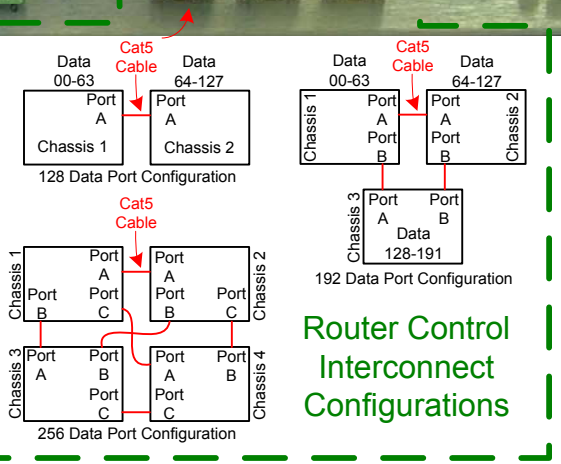
Serial Data Connector Pinouts
**Controller Mode**
1&2 = gnd, 3 = RX Common, 4 = RX-, 5 = RX+, 6 = TX Common, 7 = TX+, 8 = TX-

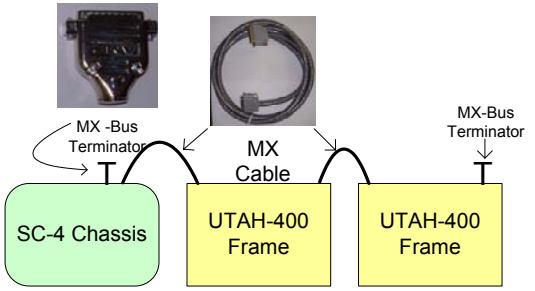



MX-Bus Loop Through
Connect to one of the two MX-bus connections on the SC-4 or another router frame. Both MX ports must be terminated, either on the SC-4 or at the router chassis. Maximum length of 300 feet. See block diagram below for a typical installation.

SMPTE Alarm Relay closure indicating over temperature, power supply or fan failure

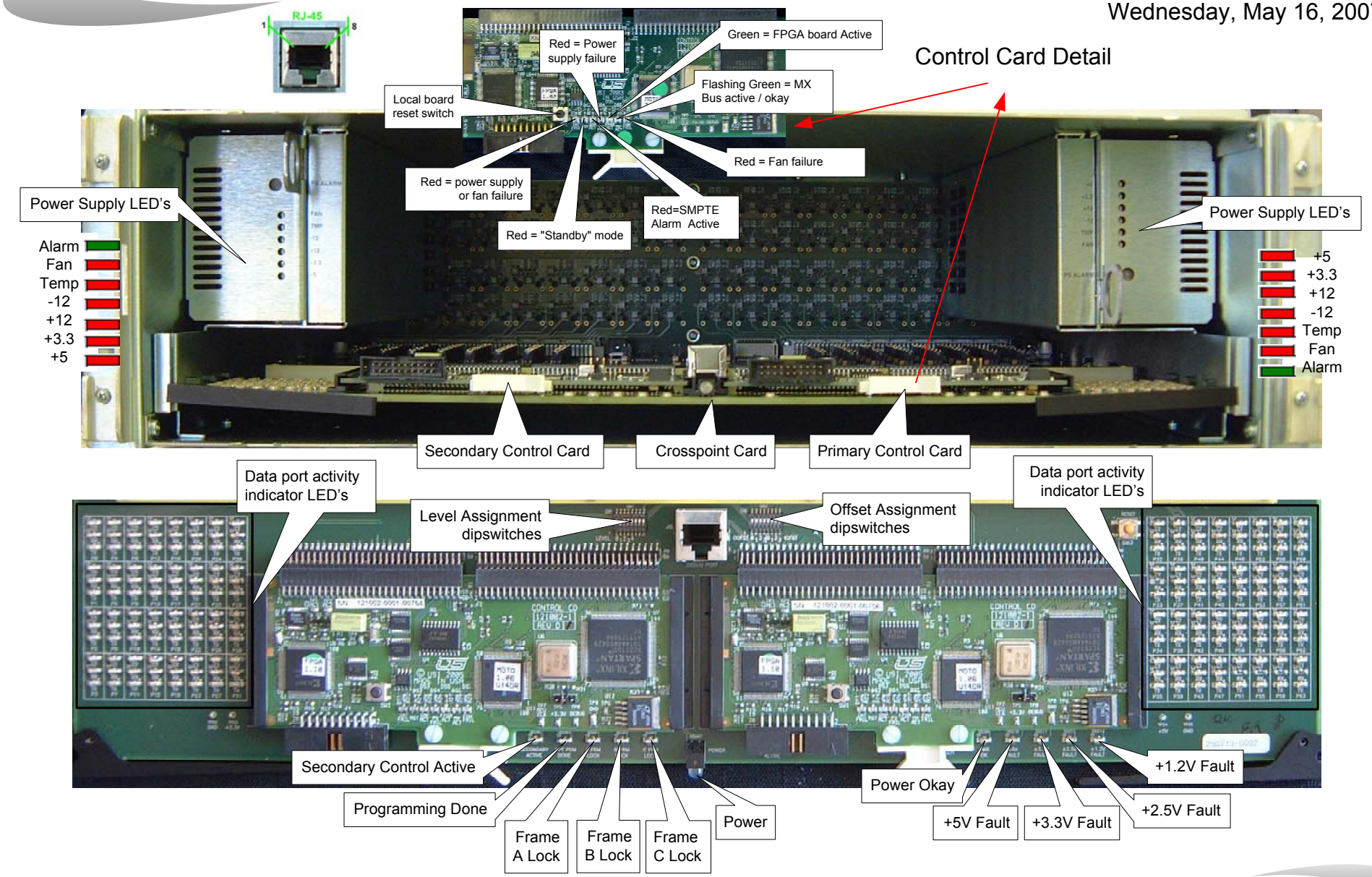
MX-Bus Loop Through Connector. See note on the left side of this page.



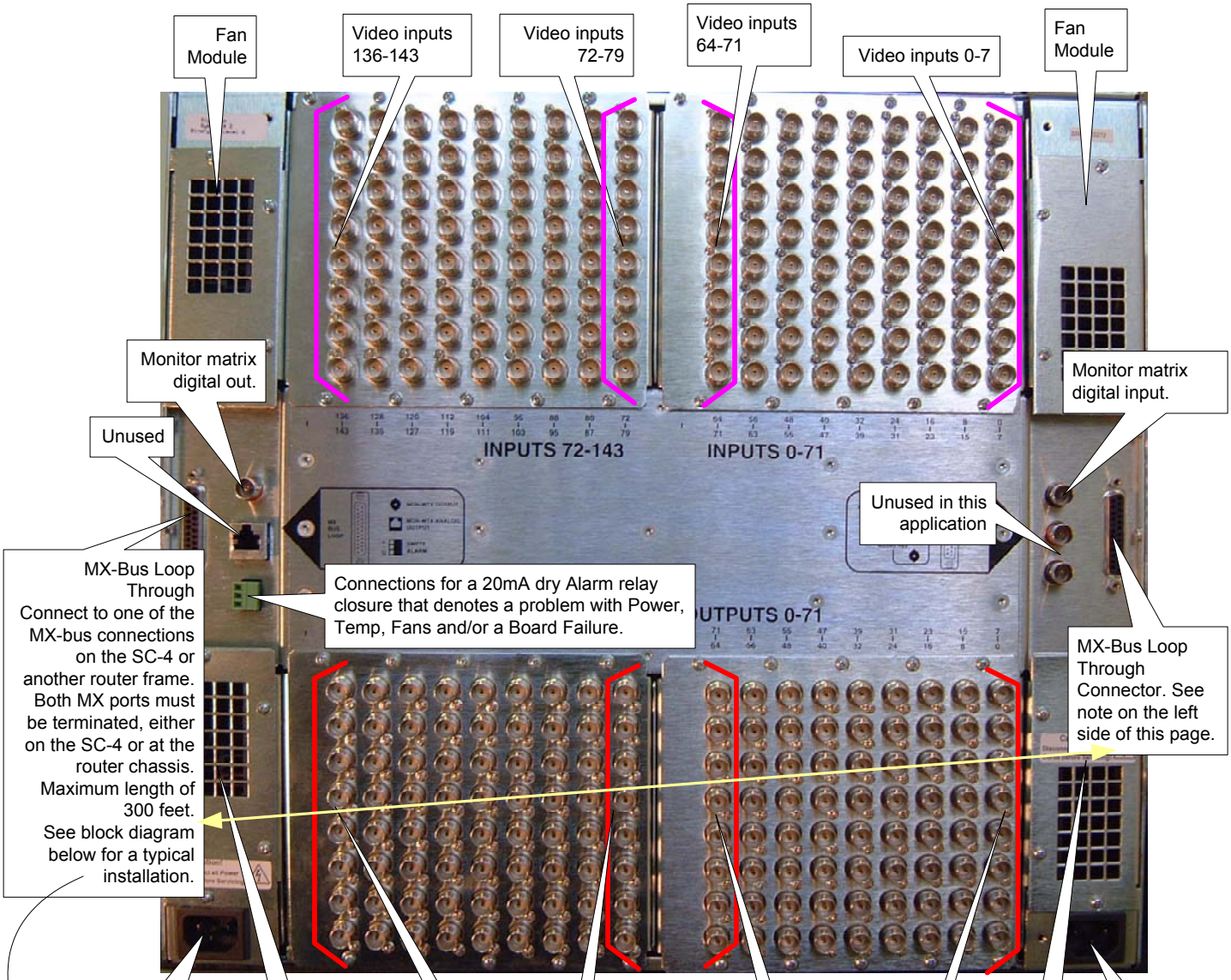
# UTAH-400 Data Front View

Wednesday, May 16, 2007

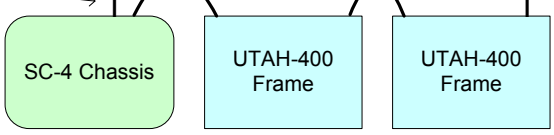


# UTAH-400 V-144R Frame Connector View

Wednesday, May 16, 2007

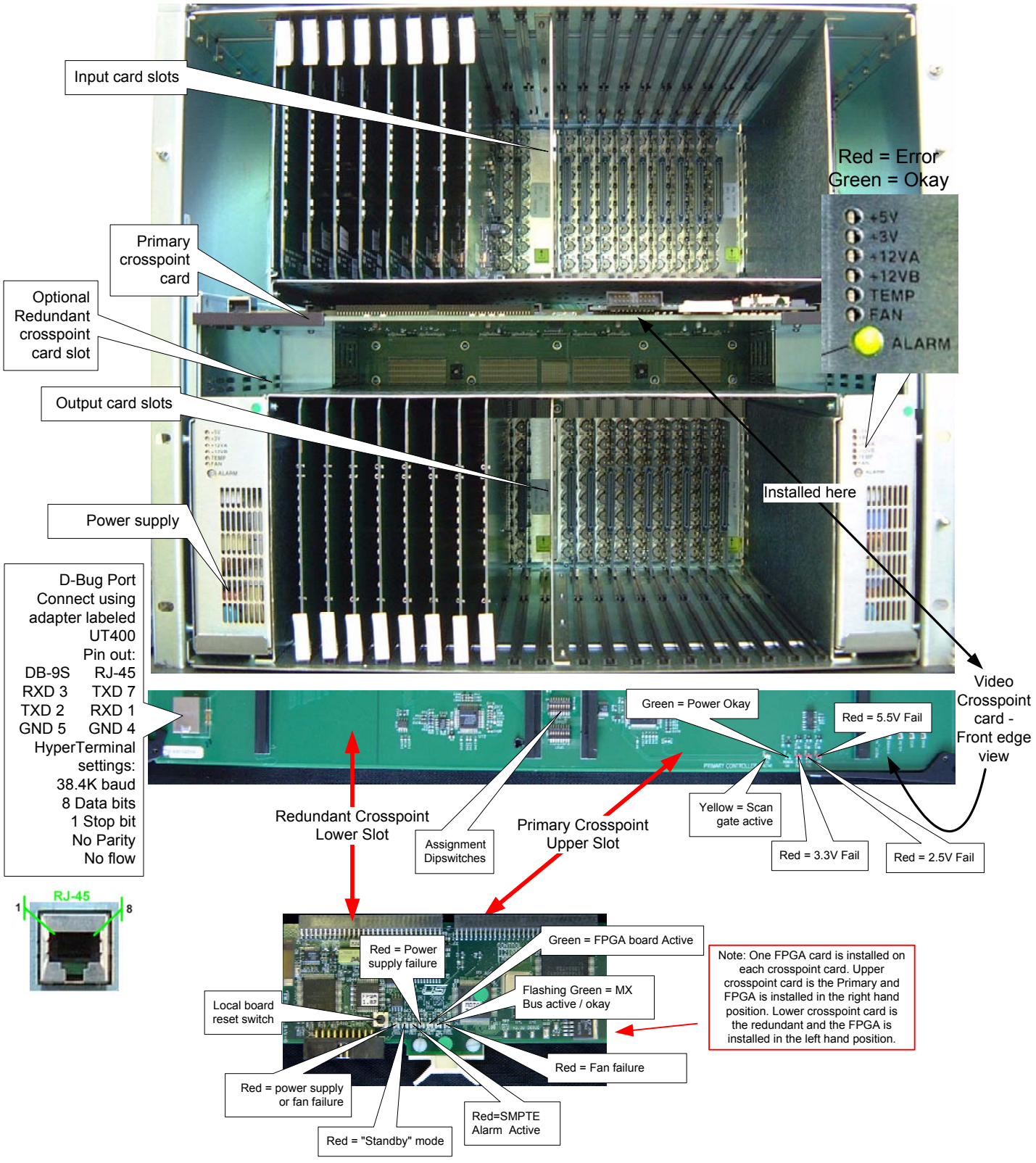




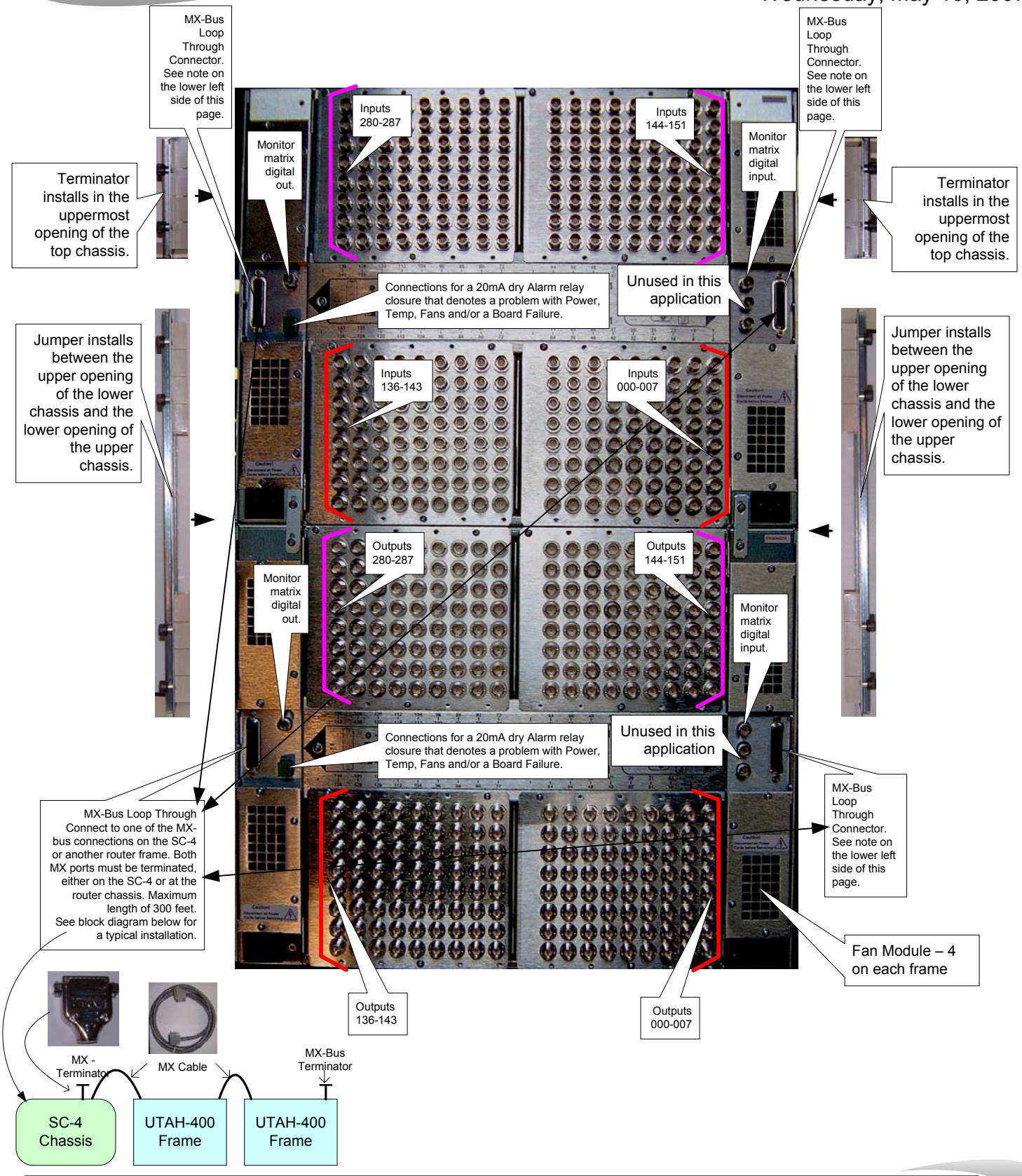
# UTAH-400 V-144R Frame Front View

Wednesday, May 16, 2007



# UTAH-400 Expandable V-288 Frame Rear View

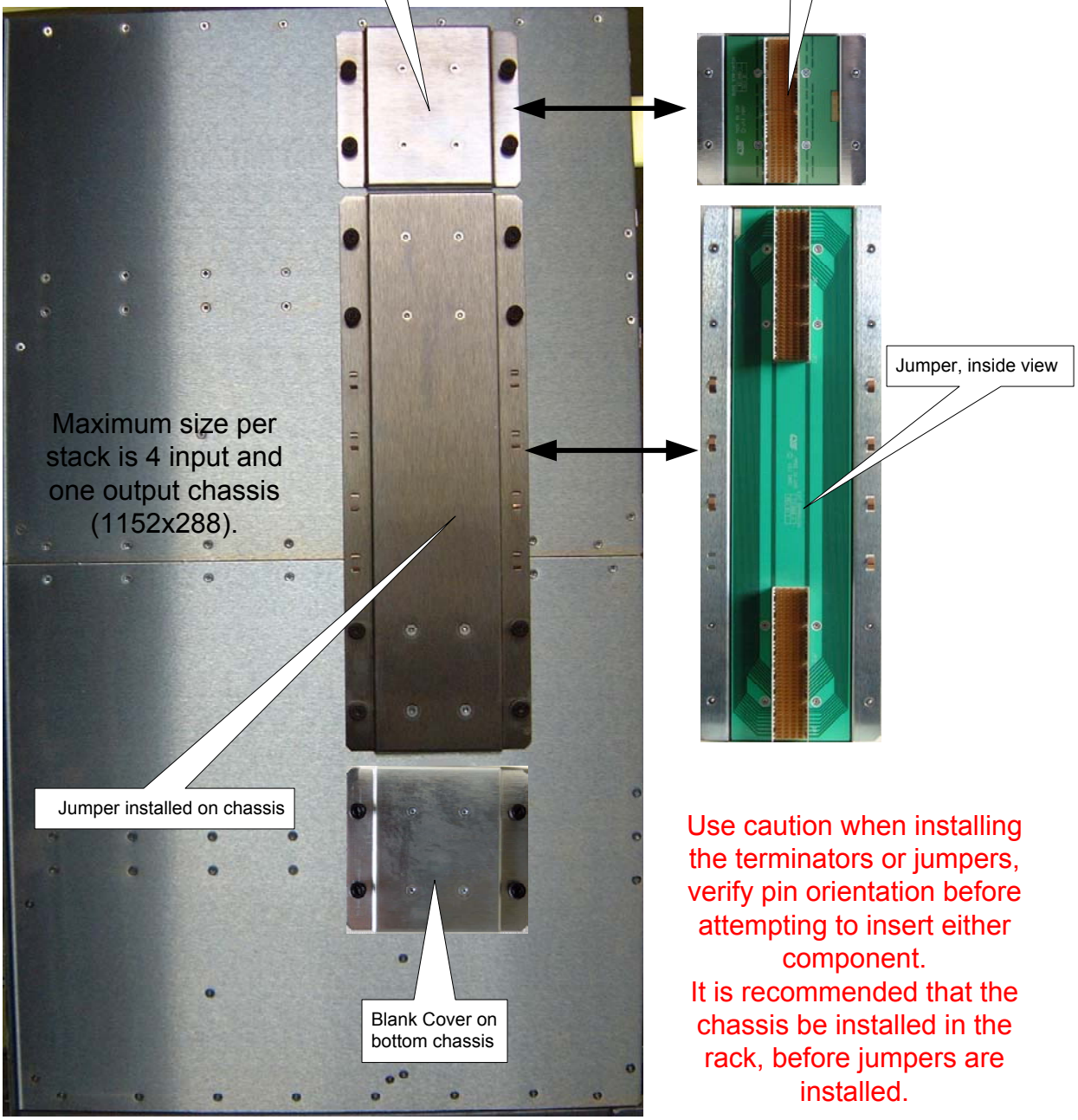
Wednesday, May 16, 2007



# UTAH-400 Expandable V-288 Frame Side View

Wednesday, May 16, 2007

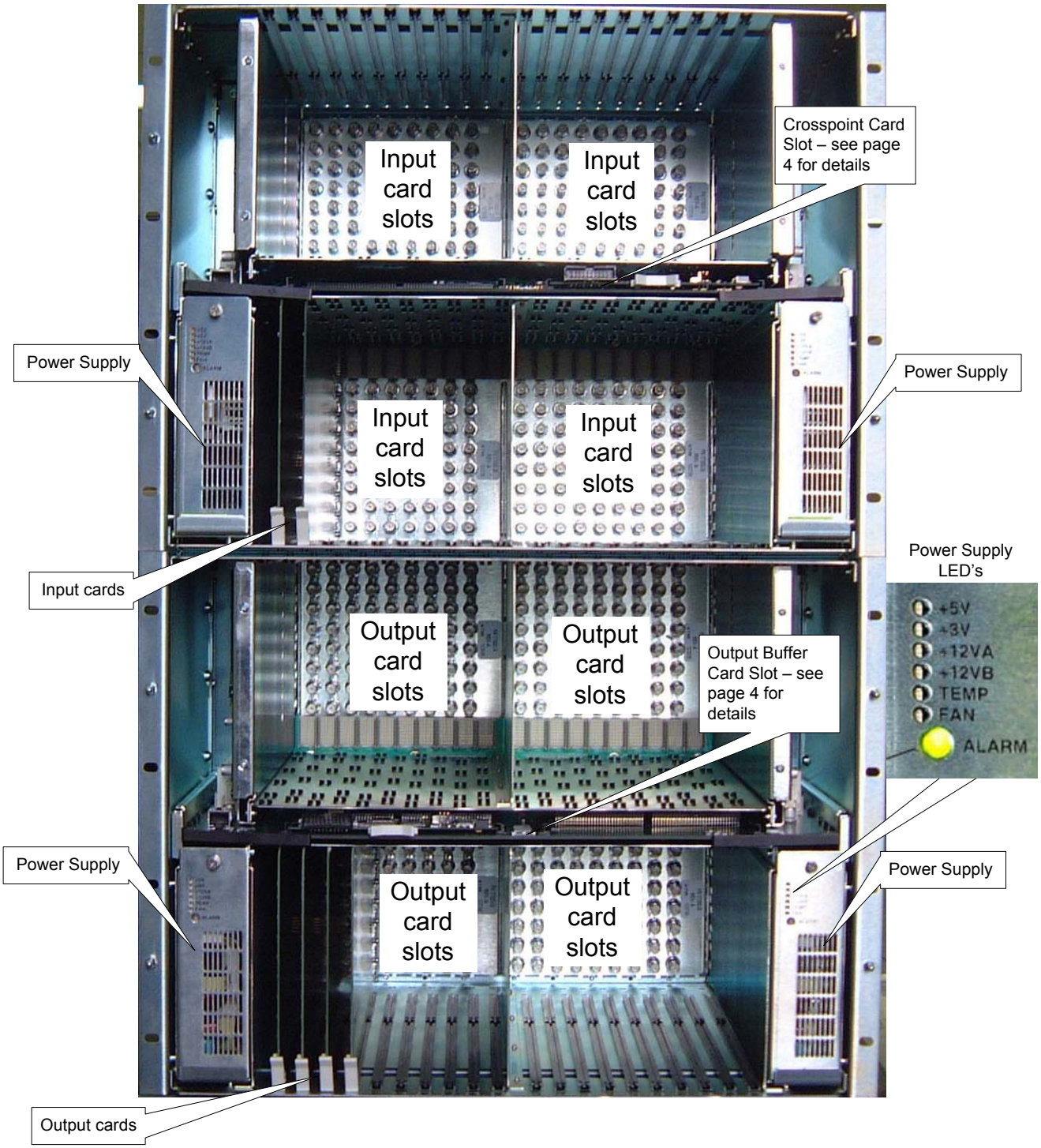
Note: one terminator needs to be installed on each side of the top chassis and one jumper on each side between all chassis in the stack.




Use caution when installing the terminators or jumpers, verify pin orientation before attempting to insert either component.
It is recommended that the chassis be installed in the rack, before jumpers are installed.

# UTAH-400 Expandable V-288 Frame Front View

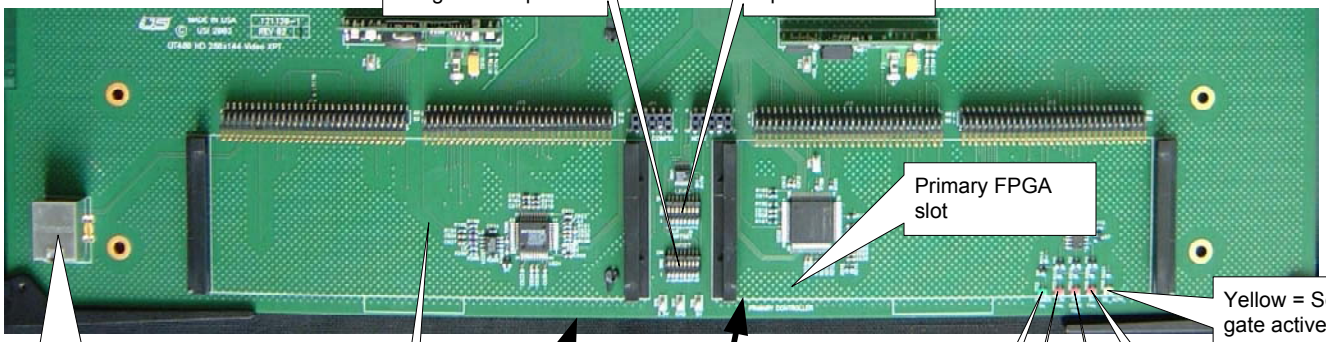
Wednesday, May 16, 2007



# Crosspoint, Buffer and FPGA Card Details

Wednesday, May 16, 2007

## Crosspoint Card



Input/Output assignment dipswitch

Level assignment dipswitch

Primary FPGA slot

Yellow = Scan gate active

Green = Power Okay

Red = 5V fail

Red = 3.3V Fail

Red = VDD Core Fail

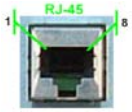
Redundant FPGA slot

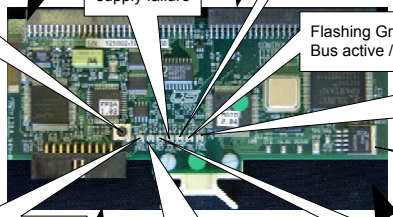
Note: FPGA card may be installed in either or both slots.

D-Bug Port
Connect using adapter labeled UT400
Pin out:

| DB-9S | RJ-45 |
|---|---|
| RXD 3 | TXD 7 |
| TXD 2 | RXD 1 |
| GND 5 | GND 4 |

HyperTerminal settings:
38.4K baud
8 Data bits
1 Stop bit
No Parity
ASCII translation and CR=CRLF



Red = Power supply failure

Green = FPGA board Active

Local board reset switch

Flashing Green = MX Bus active / okay

Red = fan failure

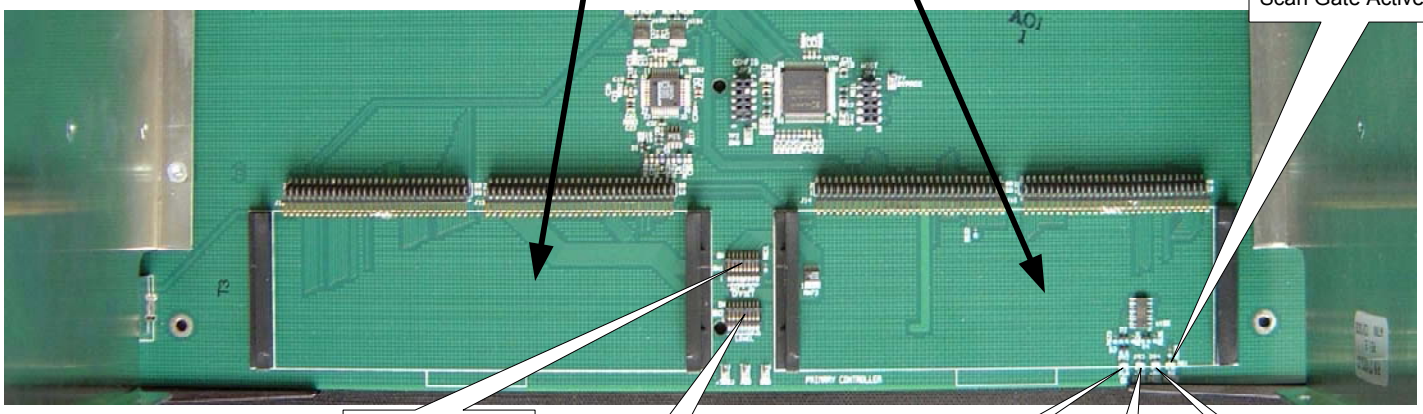
FPGA Card

Red = power supply or fan failure

Red = "Standby" mode

Red=SMPTE Alarm Active

## Output Buffer Card



Scan Gate Active

Output offset dipswitch

Level assignment dipswitch

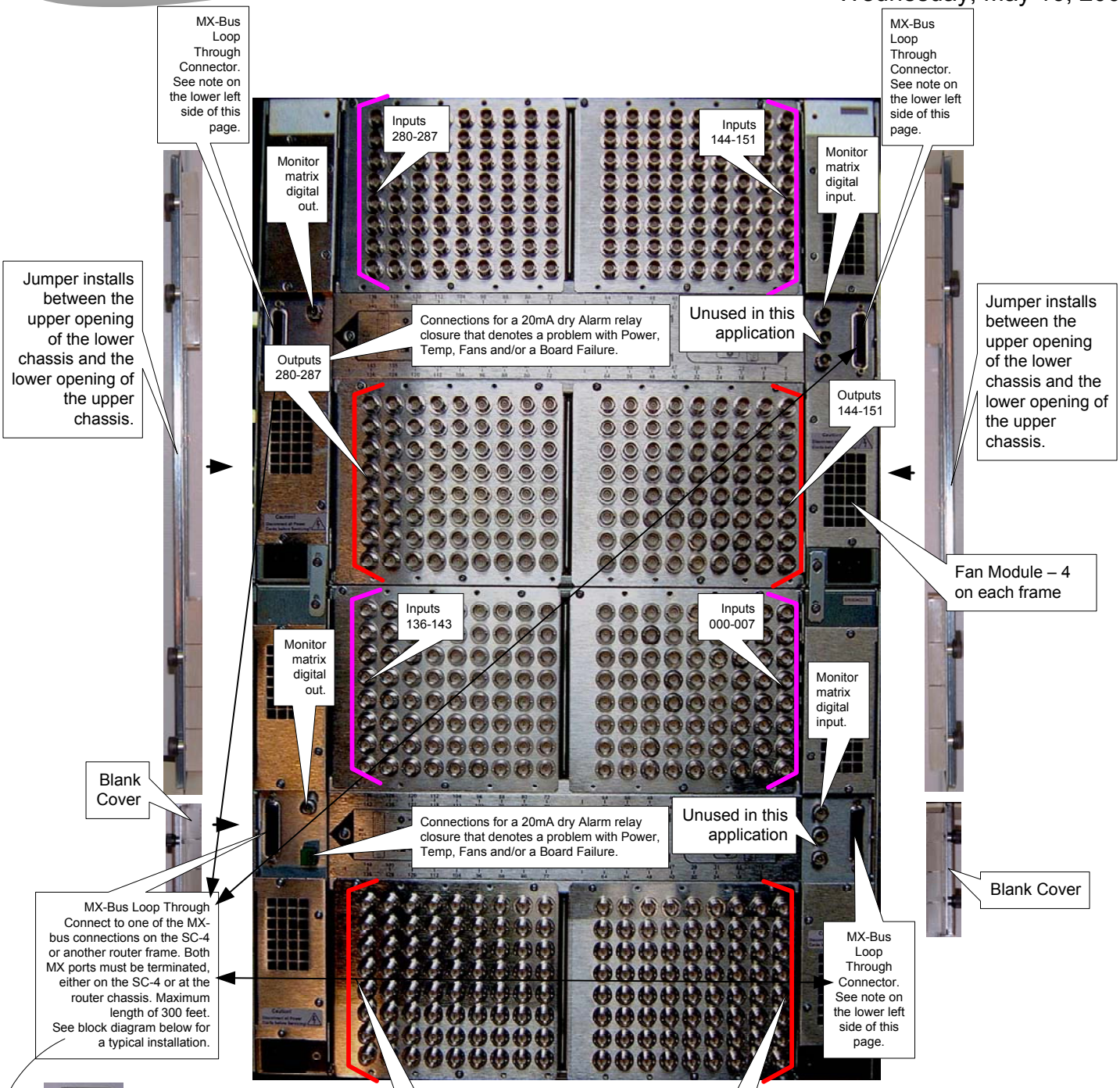
Green = Power okay

Red = +3V Fail

Red = +5V Fail

# UTAH-400 Non-Expandable V-288 Frame Rear View

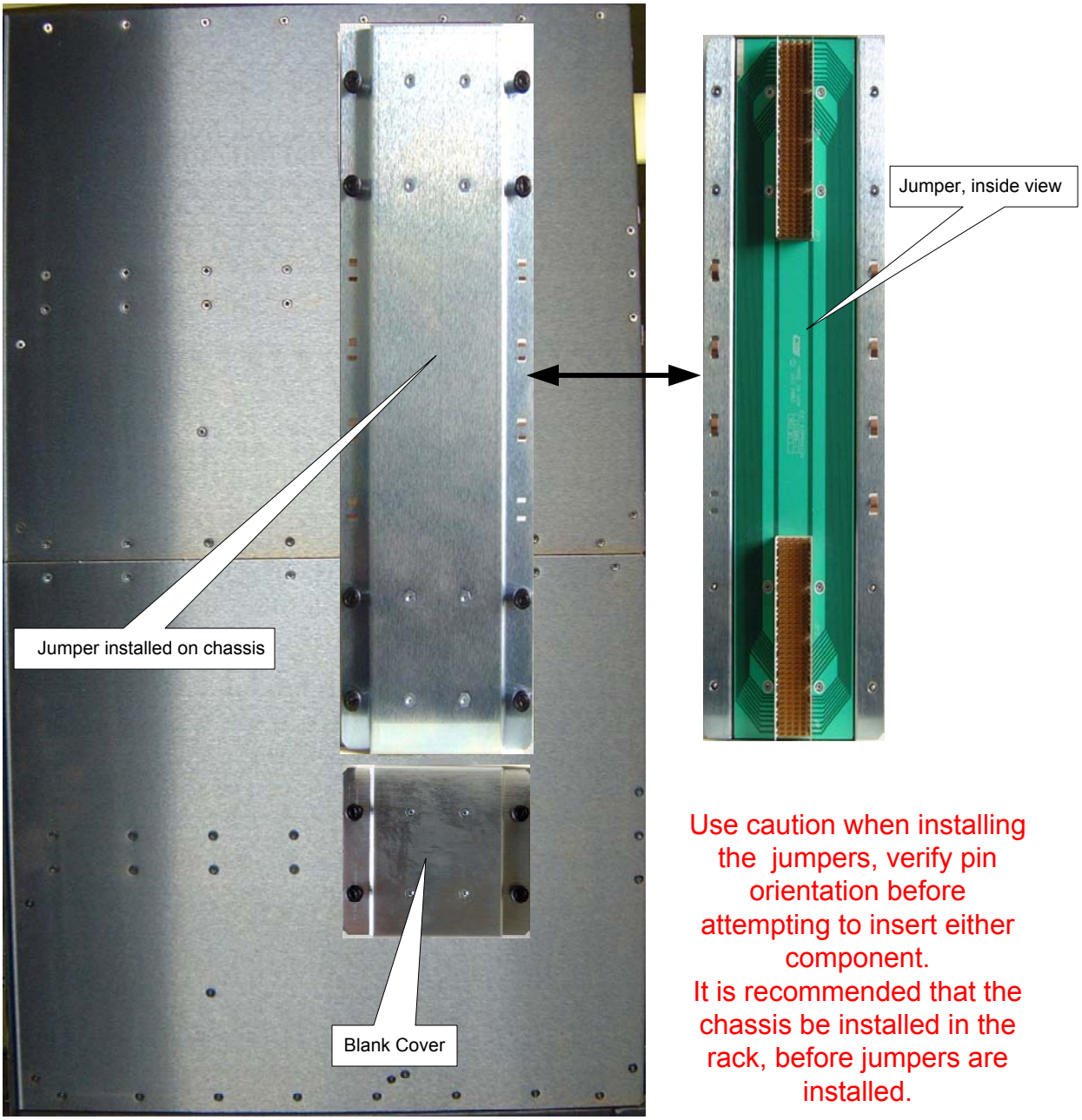
Wednesday, May 16, 2007



# UTAH-400 Non-Expandable V-288 Frame Side View

Wednesday, May 16, 2007

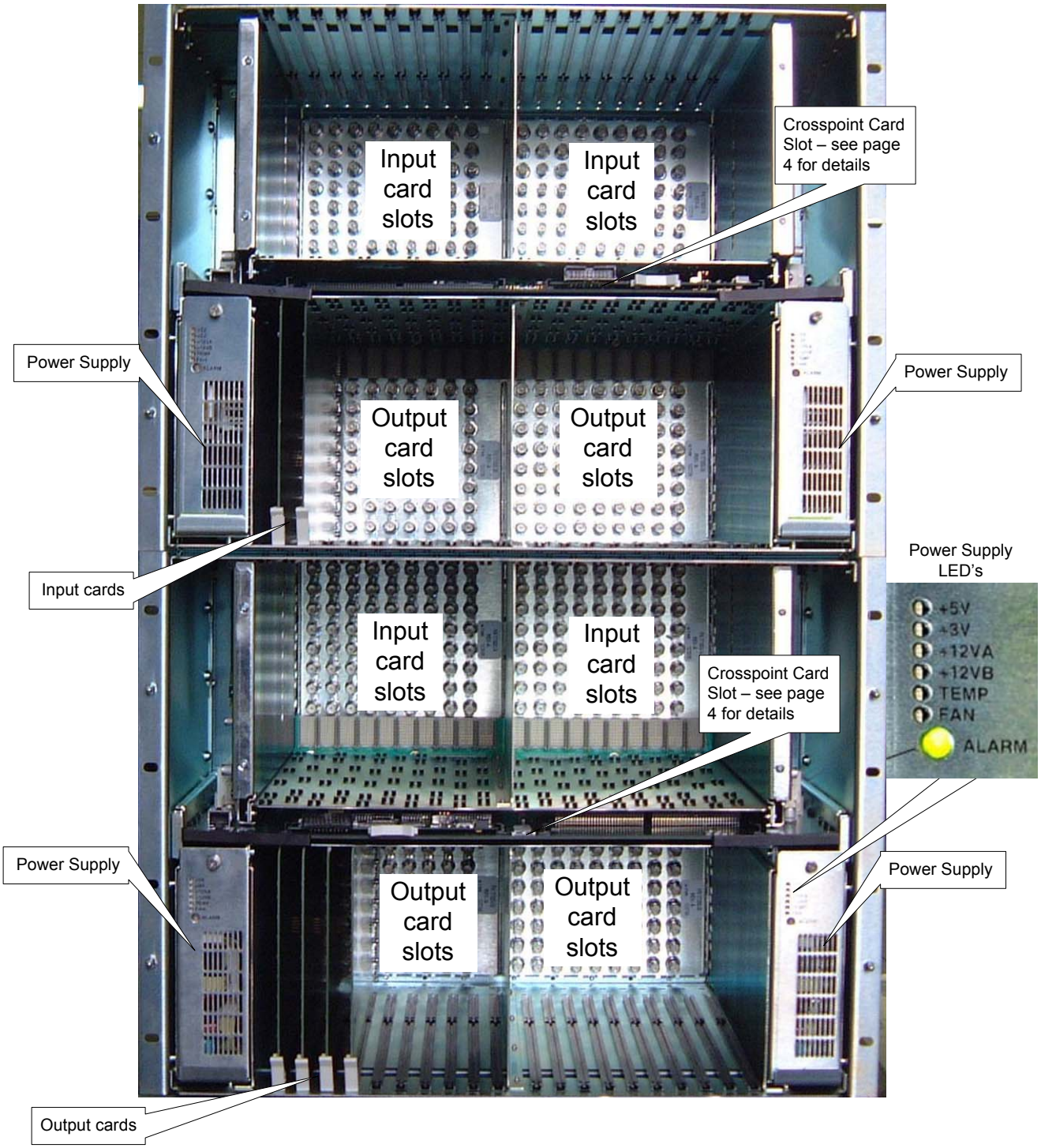
Note: one terminator and one jumper needs to be installed on each side of the chassis'.




Use caution when installing the jumpers, verify pin orientation before attempting to insert either component.
It is recommended that the chassis be installed in the rack, before jumpers are installed.

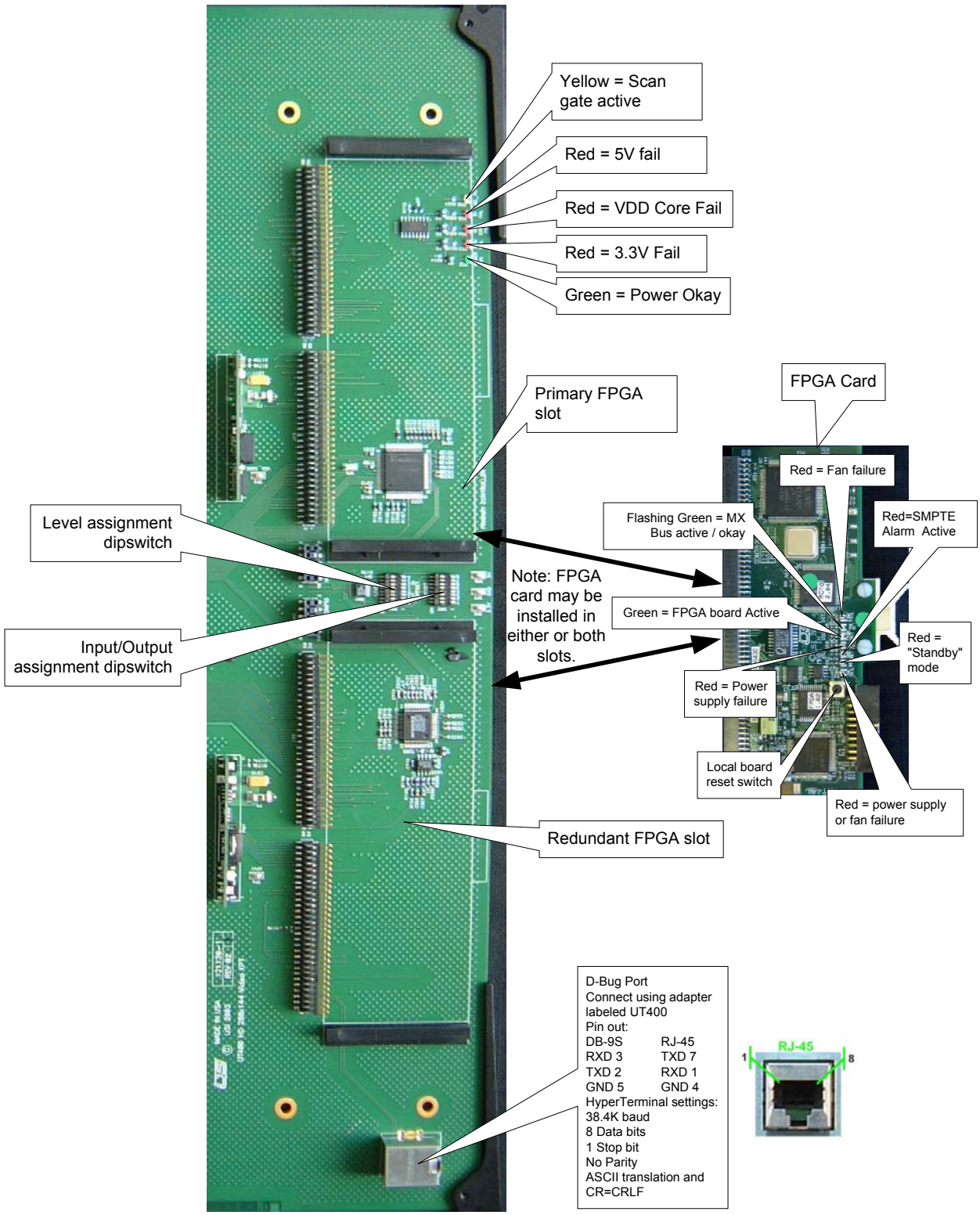
# UTAH-400 Non-Expandable V-288 Frame Front View

Wednesday, May 16, 2007



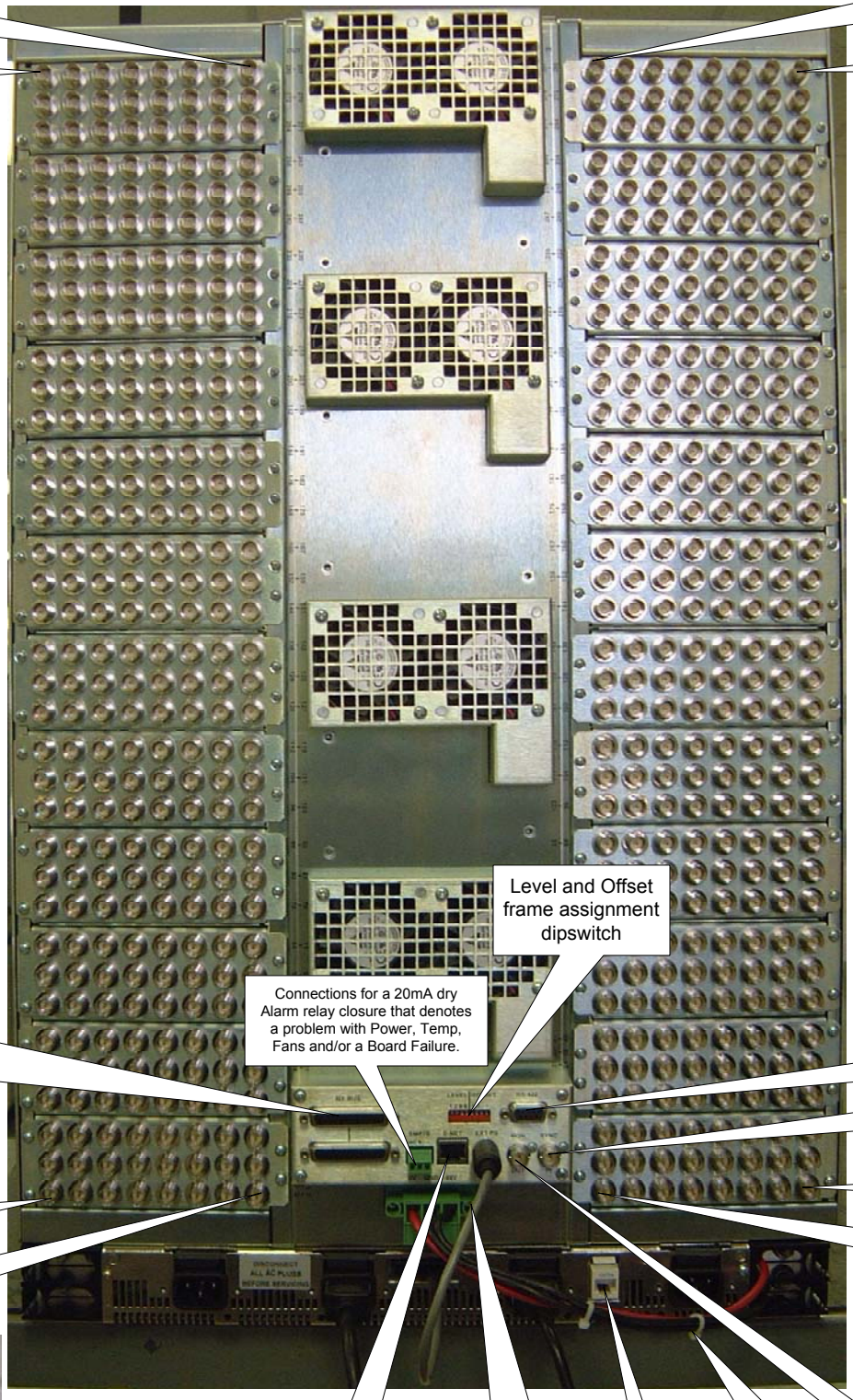
# Crosspoint Card and Control Card Details

Wednesday, May 16, 2007



# UTAH-400 V-288R Frame Rear View

Monday, August 27, 2007



Output 287

Output 280

Input 287

Input 280

Outputs
(See silk-screen for numbering)

Inputs
(See silk-screen for numbering)

MX-Bus Loop Through
Connect to one of the MX-bus connections on the SC-4 or another router frame. Both MX ports must be terminated, either on the SC-4 or at the router chassis. Maximum length of 300 feet.
See block diagram below for a typical installation.

Level and Offset frame assignment dipswitch

Connections for a 20mA dry Alarm relay closure that denotes a problem with Power, Temp, Fans and/or a Board Failure.

Unused

Unused

Input 000

Input 007

Output 000

Output 007

Unused

Power Supply Communications Connection

Unused

Power cable

Monitor matrix digital out

MX - Terminator

MX Cable

MX-Bus Terminator

SC-4 Chassis

UTAH-400 Frame

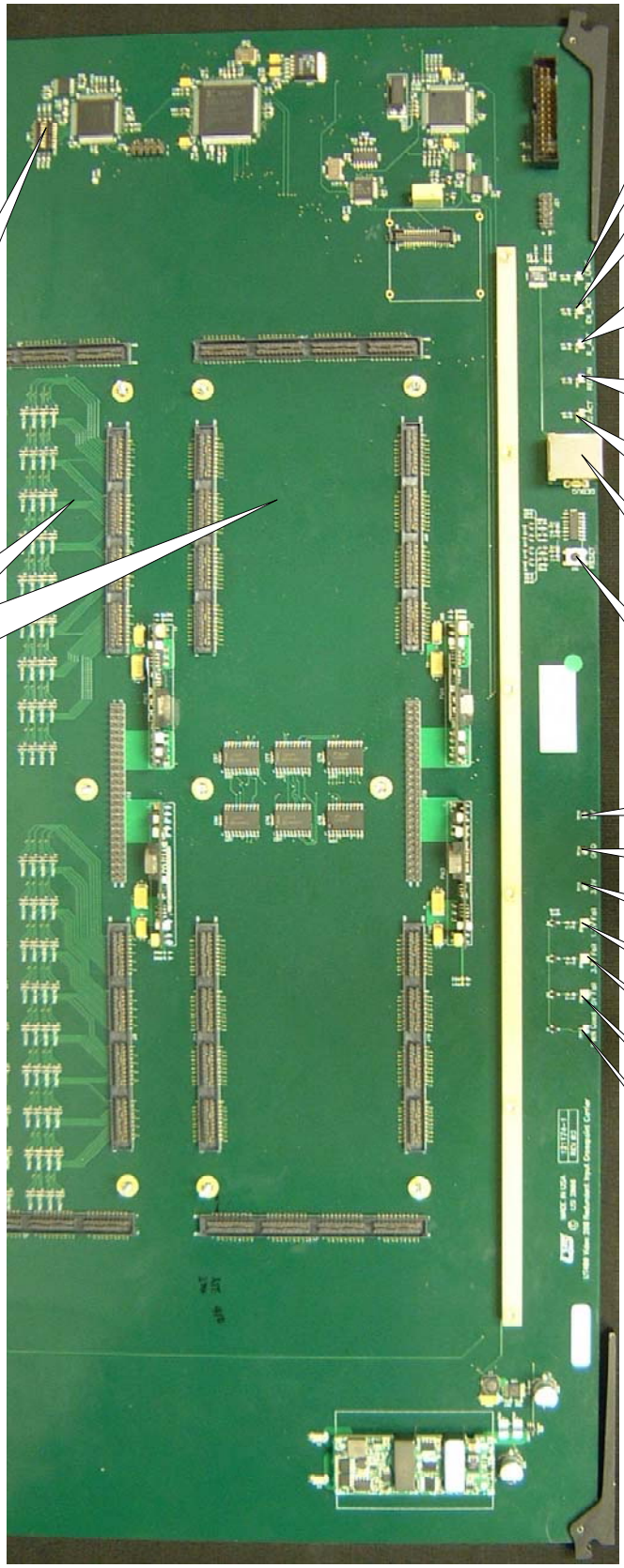
UTAH-400 Frame

# UTAH-400 V-288R Front View

Monday, August 27, 2007

# UTAH-400 V-288R Crosspoint Card

Monday, August 27, 2007



**SW-1**
**Position 1** – On for Primary Crosspoint card installed in the left-hand slot; Off for the redundant card installed in the right-hand slot.

**Positions 2-6 & 8** are not used.

**Position 7** – Bypass; turn Off for normal operation.

Crosspoint modules are installed here.

EN_LINK: ethernet not currently supported. LED will be off.

EN_ACT: ethernet not currently supported. LED will be off.

R_Act: Toggles between an active pair of crosspoint cards indicating they are communicating. Failure to toggle between a pair indicates a failure of the card on which the LED does not light.

REDUN: is illuminated on the redundant crosspoint card. It is Off on the active card.

SG ACT: flashes to indicate communication bus is active.

De-Bug port; Only functional on the "Active" crosspoint card.

RESET: Pressing this switch on the "Active" card causes the redundant card to become active.

5V Test Point

GND Test Point

3.3V Test Point

1.2V Fail

3.3V Fail

5V Fail

Green = Power okay

# UTAH-400 V-32R Frame Connector View

Friday, December 07, 2007

U-Net Terminator Port MUST be terminated either at the control panel or on the rear panel.

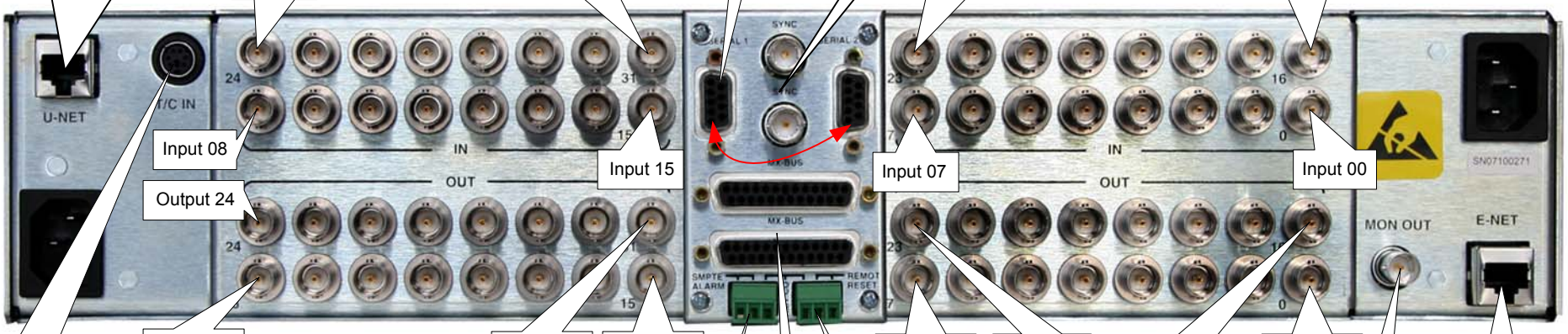
U-Net connector is attached to U-Net based control panels via a typical CAT-5 cable and terminated with the supplied U-Net terminator. Maximum cable length of 1000 feet.

**Serial Port Pin Outs**

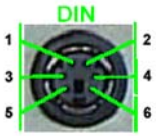
| RS-232 | RS-422 |
|---|---|
| 1 - NA | 1 - N/A |
| 2 - TXD | 2 - TX- |
| 3 - RXD | 3 - RX+ |
| 4 - NA | 4 - N/A |
| 5 - GRD | 5 - GND |
| 6 - NA | 6 - N/A |
| 7 - NA | 7 - TX+ |
| 8 - NA | 8 - RX- |
| 9 - NA | 9 - N/A |

Serial ports are used for RS-232 or RS-422 interface. Format is jumper selectable.

Sync source must be analog black burst or analog tri-level sync. DO NOT connect SDI reference signals.




PIN OUT CONNECTIONS?




MX -Bus Terminator

MX Cable

MX-Bus Terminator

V-32R Frame

UTAH-400 Frame

UTAH-400 Frame

Pin 1 & 2 SMPTE contact. Pin 3 one side of remote change-over.

Pin 1 one side of remote change-over. Pin 2 & 3 remote reset.

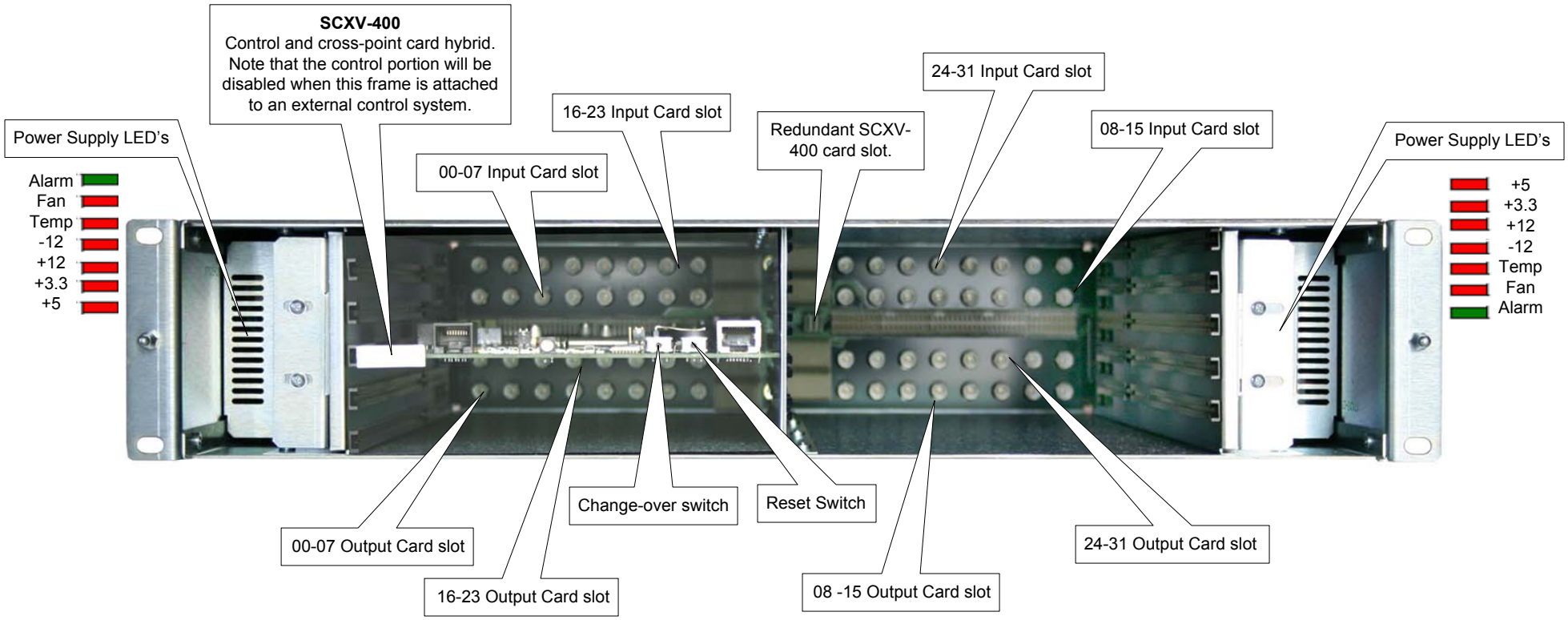
MX-Bus connects to MX bus connections on router frames. Both ports must be terminated, either on the V-32R frame or other router chassis. Total maximum length of 300 feet. Please note that the diagram to the left only applies IF the control section of the SCXV-400 is enabled.

Connected via CAT-5 cable to the control system network, Hub or Ethernet panels.

Monitor Matrix Output

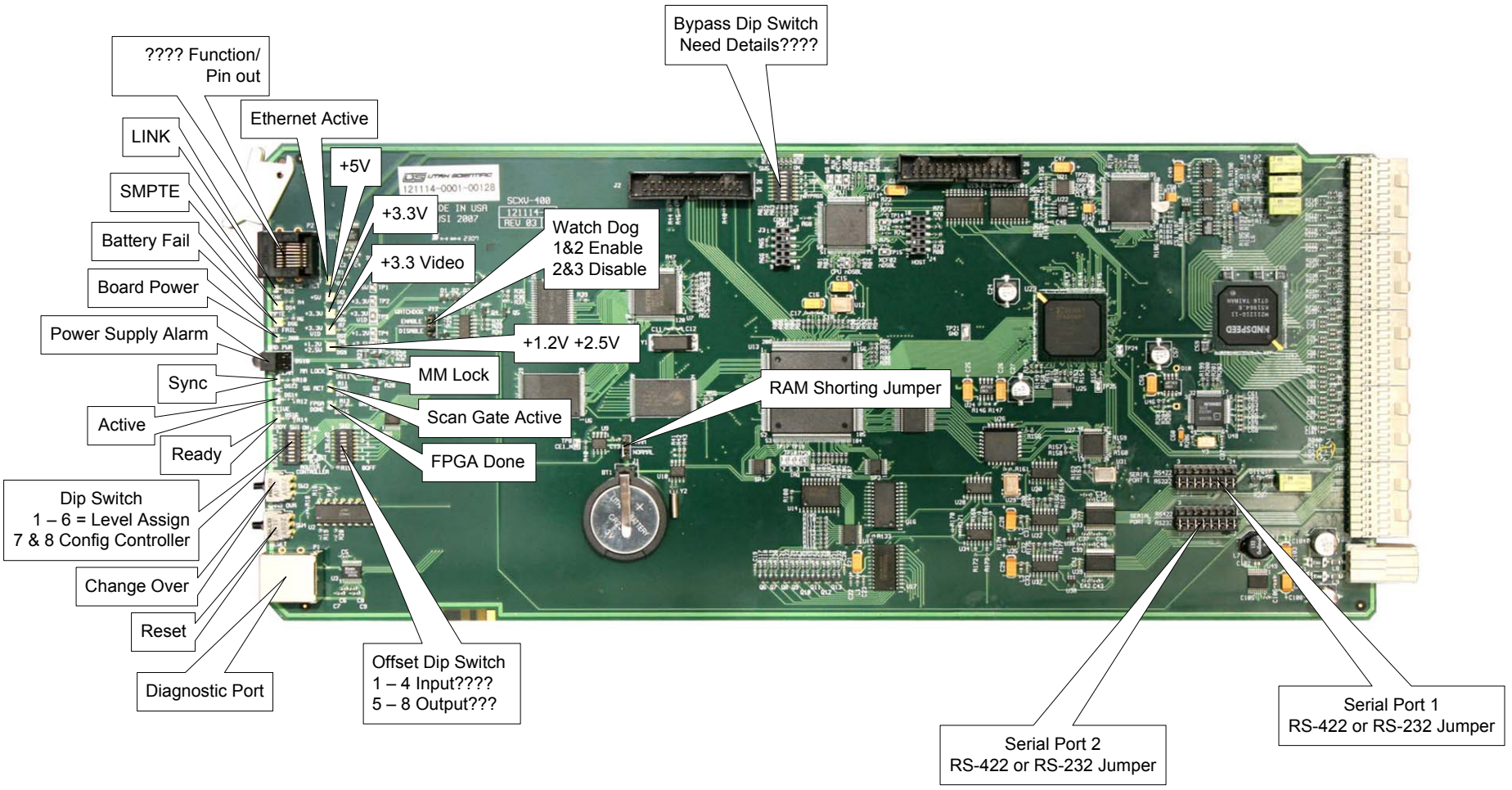
# UTAH-400 V-32R Frame Front View

Friday, December 07, 2007



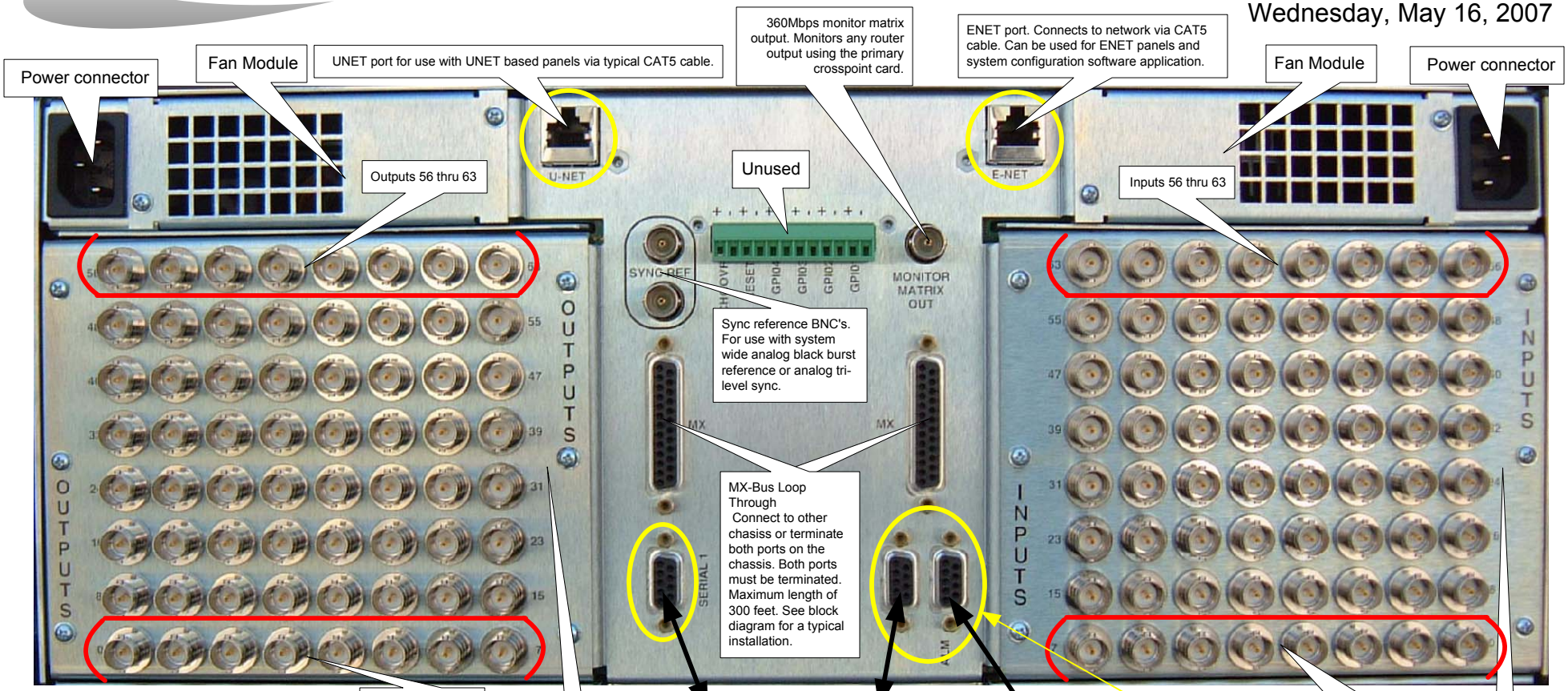
# UTAH-400 SCXV-400 Control & Crosspoint Card

Friday, December 07, 2007



# UTAH-400 V-64 Frame Connector View

Wednesday, May 16, 2007




MX -Bus Terminator

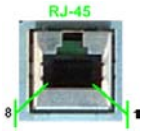
MX Cable

MX-Bus Terminator

UTAH-400/64 with SC-400's

UTAH-400 Frame

UTAH-400 Frame




Serial Port Pin Outs

| RS-232 | RS-422 |
|---|---|
| 1 - NA | 1 - N/A |
| 2 - TXD | 2 - TX- |
| 3 - RXD | 3 - RX+ |
| 4 - NA | 4 - N/A |
| 5 - GRD | 5 - GND |
| 6 - NA | 6 - N/A |
| 7 - NA | 7 - TX+ |
| 8 - NA | 8 - RX- |
| 9 - NA | 9 - N/A |

38.4Kb, 8, 1 and none


Alarm Connector Pin Outs

1 - ALM0
2 - ALM1
3 - ALM2
4 - ALM3
5 - SMPTE0
9 - SMPTE1
6,7,8 - GND

38.4Kb, 8, 1 and none

Note:
All connectors circled in yellow are active ONLY when the SC-400 is installed in the frame.

# UTAH-400 V-64 Frame Front View

Wednesday, May 16, 2007