Universal Switching Corporation

# Specification Sheet S2560E-001

Differential Flexible 256x256 Switching Array
125MHz Analog / 50Mbps Digital Routing System
System S2560E

CE

January 2009

## Applications

- Audio, PCM, 422 Clock & Data or Video routing
- Production studios
- Imaging and animation production facilities
- Production studios
- Telemetry data (clock and data streams)
- NTSC, PAL or SECAM routing

## Features

- True differential I/O design
- High reliability solid-state elements
- Redundant signal paths (Tri-Stage)
- Flexible configuration: 32x32 up to 256x256 in one box
- Multiple units can be grouped to configure 1024x1024
- Available in analog or 422 digital versions
- DC to 125MHz analog bandpass, 50Mbps digital
- Ultra-high density, over 65,500 crosspoint in 5RU
- Hot-swap module technology
- Front panel LED back-lit keypad controls
- High contrast vacuum-fluorescent display
- Various remote interface choices via plug-in CPU
- Dual CPU's optional
- Includes Ethernet with TCP/IP
- Command set is 488.2 compliant
- Rugged 5RU high aluminum chassis (8.75")
- International AC power range
- Self-monitoring hot-swap plug-in power supplies with PFC
- Built-in rack mount design (19 inch)
- Built-in chassis slide mounting (slides not included)
- Certified CE EN61010 (LVD)
- LabVIEW VISA drivers downloadable for FREE
- Compatible with RouteWarePRO control GUI


S2560E with front panel open
(showing mid-stage modules)

## General

The S2560E is designed specifically for high performance digital 422 data and analog audio signal routing in an expandable and compact 5RU format. No other switching system on the market delivers higher density for audio, video or data switching.

The system is field configurable from a small 32x32 and expandable to a full 256x256. The S2560E provides solid-state switching of signals up to 125MHz. To support critical installations, the unit comes standard with hot-swap power supplies.

Adding the the system flexibility, it will accept up to two plug-in control CPU units (one is needed, two would be a redundant configuration). These plug-in CPUs provide a host of control options including Ethernet, Serial and GPIB, plus they contain field upgradable program FLASH for simple updates.

The unique fully non-blocking Tri-Stage™ design delivers high signal performance, small package size and redundant signal paths for the ultimate in reliability. A departure from standard switching system technology, the System S2560E provides over 13,000 crosspoints per vertical rack unit (RU).

Optional I/O connector adapter panels are available to allow the system to be multi-purpose for audio, video, or a combination of both, plus they allow the user to remotely locate the inputs or outputs from the actual switching system chassis. This allows a new higher level of flexibility for the system integrator. See page 6 for additional details.

Rear view of System S2560E
shown with dual CPU's

S2560E-001

7671 North San Fernando Road | Burbank CA 91505 USA
Phn: +1 818-381-5111 Fax: +1 818-252-4846 Email: sales@uswi.com Web: uswi.com

# Defining a System

## How to choose your features

The S2560E is a modular switching system comprised of various plug-in switching modules. Due to the high density of the system, it is delivered standard with fifty-position SCSI-II type multi-position connectors. The user can connect directly to these for low level audio and analog data applications. Each connector provides 16 channels. Optional adapter panels provide other connection schemes (see back page).

The system model number and basic features can be specified by observing the definition below. First, choose how many input modules you will need, then the number of output remembering that each provides 32 channels. Filler plates cover unpopulated slots.

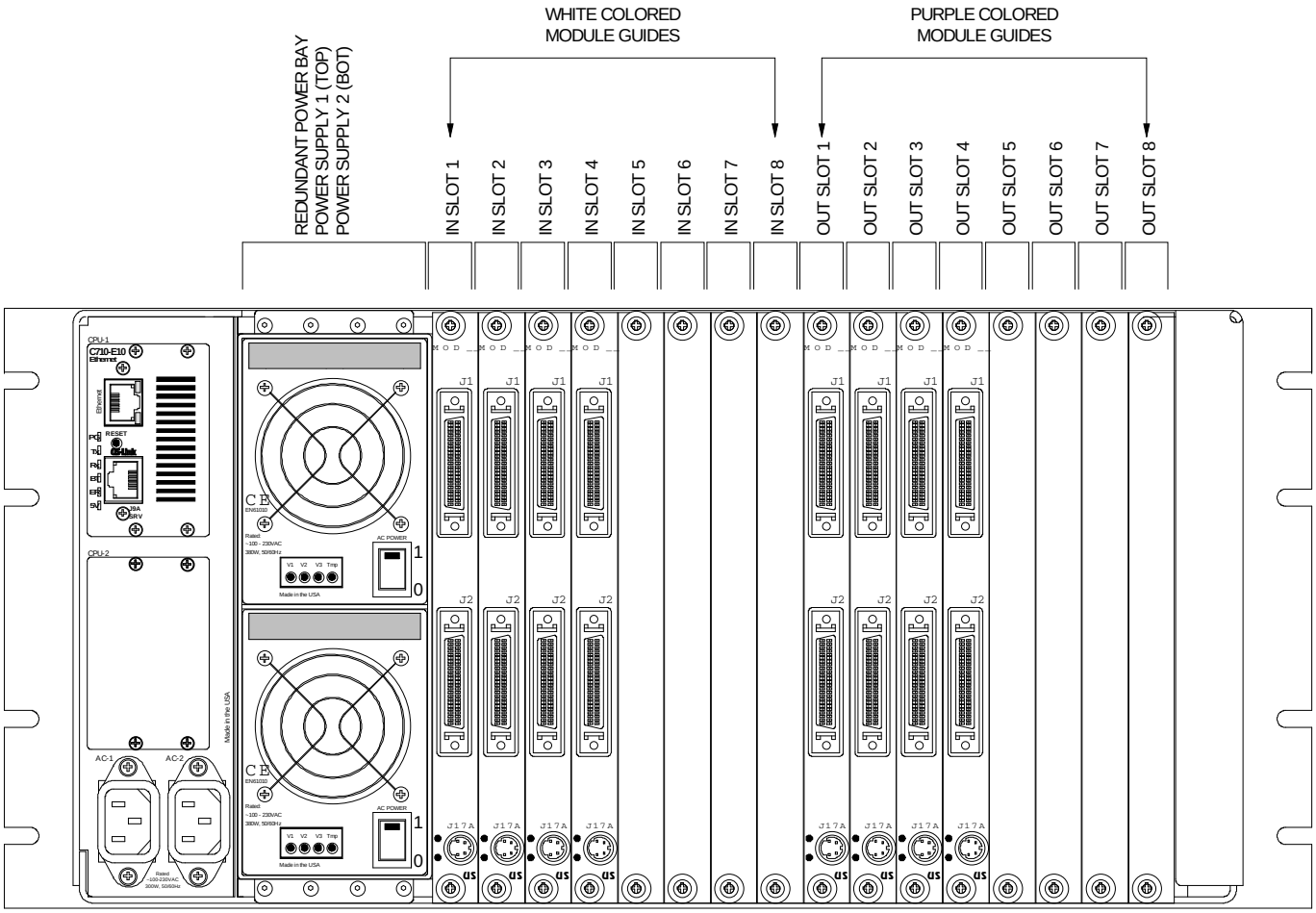
The balance of the system model number specifies the power supply configuration, the type of CPU and remote interface module(s), and finally the I/O impedance for the system. The S2560E uses our Series C710 plug-in CPU and interface modules, and the new Series C820 due for release in 3Q2009.

An optional digital suffix (D) provides a 50Mbps differential (`422) digital I/O capacity. When using the optional "D" suffix, the 100 ohm impedance is standard (input termination only).

**S 2 5 6 0 E - X X - D X X X X**

- Optional Suffix: D = Digital Type I/O (422)
- I/O impedance: 1 = 100 ohm, 6 = 600 ohm
- CPU Slot #2: 0 = None, 5 = C710-E10, 6 = C710-S3, 7 = C710-488, A = C820, B = C820-GS
- CPU Slot #1: 0 = None, 5 = C710-E10, 6 = C710-S3, 7 = C710-488, A = C820, B = C820-GS
- D = Redundant hot-swap power supplies (standard)
- Number of output modules (1 - 8)
- Number of input modules (1 - 8)
- Base model number

## Example: S2560E-44-D50x



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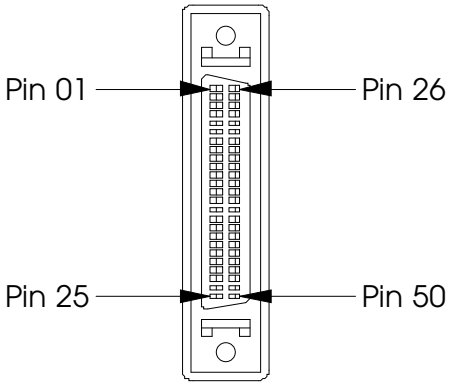
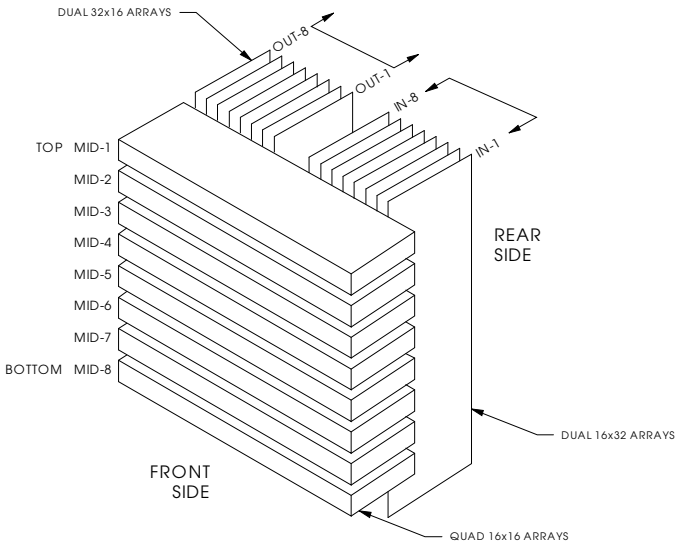
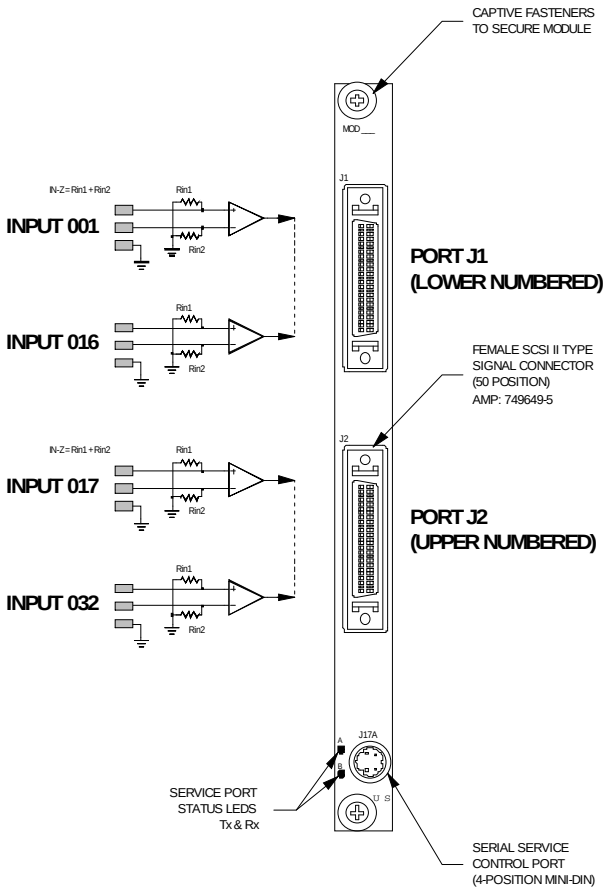


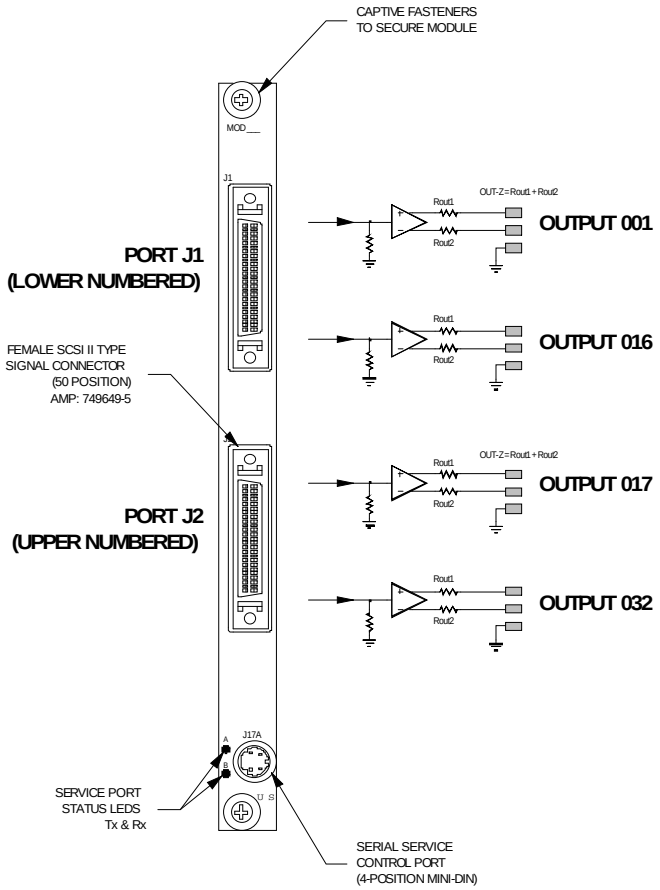

**SYSTEM MODULE MAP**




## Analog Input Module
### VSI2560D-D2x




## Analog Output Module
### VSO2560D-D2x



## Audio Switching

### 32x32 up to 256x256: System S2560E

Configured as an audio switching system, the S2560E offers high performance in a compact 5RU package. Plug-in modules provide a flexible architecture for configurations as small as 32 inputs, 32 outputs and can be expanded to a fully populated system providing 256 inputs and 256 outputs.

Both the input and output can be expanded independently by plugging in additional input or output modules. Each plug-in module provides 32 channels, hot-swap plug-in technology and differential I/O. The system can be connected to directly at the rear panel connectors, or via optional passive I/O adapter panel assemblies. The rear panel connectors are 50 position SCSI-II high density type that offer quick on, quick off connectivity. Each connector provides 16 channels of differential connectivity. See the pin assignment for the I/O connectors J1 and J2 below.

The use of the optional I/O connector adapter panel assemblies provides a host of additional unique features such as individual connectors for each channel, grouping of signals for dual channel audio (stereo) or the simple ability to locate the system I/O connectors on the front of the equipment rack (or mixed, some on the front and some on the rear). The connector panel assemblies also allow the I/O to be located in a different rack from the actual switching system.

## Digital Data Switching

### 32x32 up to 256x256: System S2560E

An additional configuration for the S2560E is for differential `422 type digital data switching. The input modules ("D" version) contain high speed 50Mbps capacity differential receivers with 100 ohm input impedance, while the output modules ("D" version) provide high speed differential drivers.

This type of I/O allows the S2560E to route 422 differential data such as telemetry clock and data. Due to the compact size of the S2560E and unique Tri-Stage™ design, path-to-path skew is very small allowing the possibility to route both clock and data in the same unit, up to 128x128. If larger clock/data configurations are needed, then two S2560E units can be used to configure a dual 256x256 where clock signals would be routed by one unit and data signals routed by the other. Control of the system can be ganged so that both signals switch together under one command.

Plug-in modules provide a flexible architecture for configurations as small as 32 inputs, 32 outputs and can be expanded to a fully populated system providing 256 inputs and 256 outputs. Both the input and output can be expanded independently by plugging in additional input or output modules. Each plug-in module provides 32 channels, hot-swap plug-in technology and differential digital I/O.

The system can be connected to directly at the rear panel connectors, or via optional passive I/O adapter panel assemblies. The rear panel connectors are 50 position SCSI-II high density type that offer quick on, quick off connectivity. Each SCSI-II connector provides 16 channels of differential connectivity. See the pin assignment for the I/O connectors J1 and J2 below.

The use of the optional passive I/O connector adapter panel assemblies provides a host of additional unique features such as individual connectors for each channel, grouping of signals for dual channel (clock and data on one connector) or the simple ability to locate the system I/O connectors on the front of the equipment rack (or mixed, some on the front and some on the rear). The connector panel assemblies also allow the I/O to be located in a different rack from the actual switching system.

| J1 | Signal Name | J2 | Signal Name |
|---|---|---|---|
| 1 | I/O 01 (+) | 1 | I/O 17 (+) |
| 2 | I/O 02 (+) | 2 | I/O 18 (+) |
| 3 | I/O 03 (+) | 3 | I/O 19 (+) |
| 4 | I/O 04 (+) | 4 | I/O 20 (+) |
| 5 | Ground | 5 | Ground |
| 6 | I/O 05 (+) | 6 | I/O 21 (+) |
| 7 | I/O 06 (+) | 7 | I/O 22 (+) |
| 8 | I/O 07 (+) | 8 | I/O 23 (+) |
| 9 | I/O 08 (+) | 9 | I/O 24 (+) |
| 10 | Ground | 10 | Ground |
| 11 | I/O 09 (+) | 11 | I/O 25 (+) |
| 12 | I/O 10 (+) | 12 | I/O 26 (+) |
| 13 | I/O 11 (+) | 13 | I/O 27 (+) |
| 14 | I/O 12 (+) | 14 | I/O 28 (+) |
| 15 | Ground | 15 | Ground |
| 16 | I/O 13 (+) | 16 | I/O 29 (+) |
| 17 | I/O 14 (+) | 17 | I/O 30 (+) |
| 18 | I/O 15 (+) | 18 | I/O 31 (+) |
| 19 | I/O 16 (+) | 19 | I/O 32 (+) |
| 20 | Ground | 20 | Ground |
| 21 | VEE (-V) | 21 | VEE (-V) |
| 22 | VEE (-V) | 22 | VEE (-V) |
| 23 | Ground | 23 | Ground |
| 24 | VDD (+V) | 24 | VDD (+V) |
| 25 | VDD (+V) | 25 | VDD (+V) |
| 26 | I/O 01 (-) | 26 | I/O 17 (-) |
| 27 | I/O 02 (-) | 27 | I/O 18 (-) |
| 28 | I/O 03 (-) | 28 | I/O 19 (-) |
| 29 | I/O 04 (-) | 29 | I/O 20 (-) |
| 30 | Ground | 30 | Ground |
| 31 | I/O 05 (-) | 31 | I/O 21 (-) |
| 32 | I/O 06 (-) | 32 | I/O 22 (-) |
| 33 | I/O 07 (-) | 33 | I/O 23 (-) |
| 34 | I/O 08 (-) | 34 | I/O 24 (-) |
| 35 | Ground | 35 | Ground |
| 36 | I/O 09 (-) | 36 | I/O 25 (-) |
| 37 | I/O 10 (-) | 37 | I/O 26 (-) |
| 38 | I/O 11 (-) | 38 | I/O 27 (-) |
| 39 | I/O 12 (-) | 39 | I/O 28 (-) |
| 40 | Ground | 40 | Ground |
| 41 | I/O 13 (-) | 41 | I/O 29 (-) |
| 42 | I/O 14 (-) | 42 | I/O 30 (-) |
| 43 | I/O 15 (-) | 43 | I/O 31 (-) |
| 44 | I/O 16 (-) | 44 | I/O 32 (-) |
| 45 | Ground | 45 | Ground |
| 46 | VEE (-V) | 46 | VEE (-V) |
| 47 | VEE (-V) | 47 | VEE (-V) |
| 48 | Ground | 48 | Ground |
| 49 | VDD (+V) | 49 | VDD (+V) |
| 50 | VDD (+V) | 50 | VDD (+V) |

**NOTE:**
*VDD and VEE outputs are for reference only and are current limited (resistor in series) to prevent loading of system supplies.*



7671 North San Fernando Road | Burbank CA 91505 USA
Phn: +1 818-381-5111 Fax: +1 818-252-4846 Email: sales@uswi.com Web: uswi.com

# Example 422 Clock/Data System

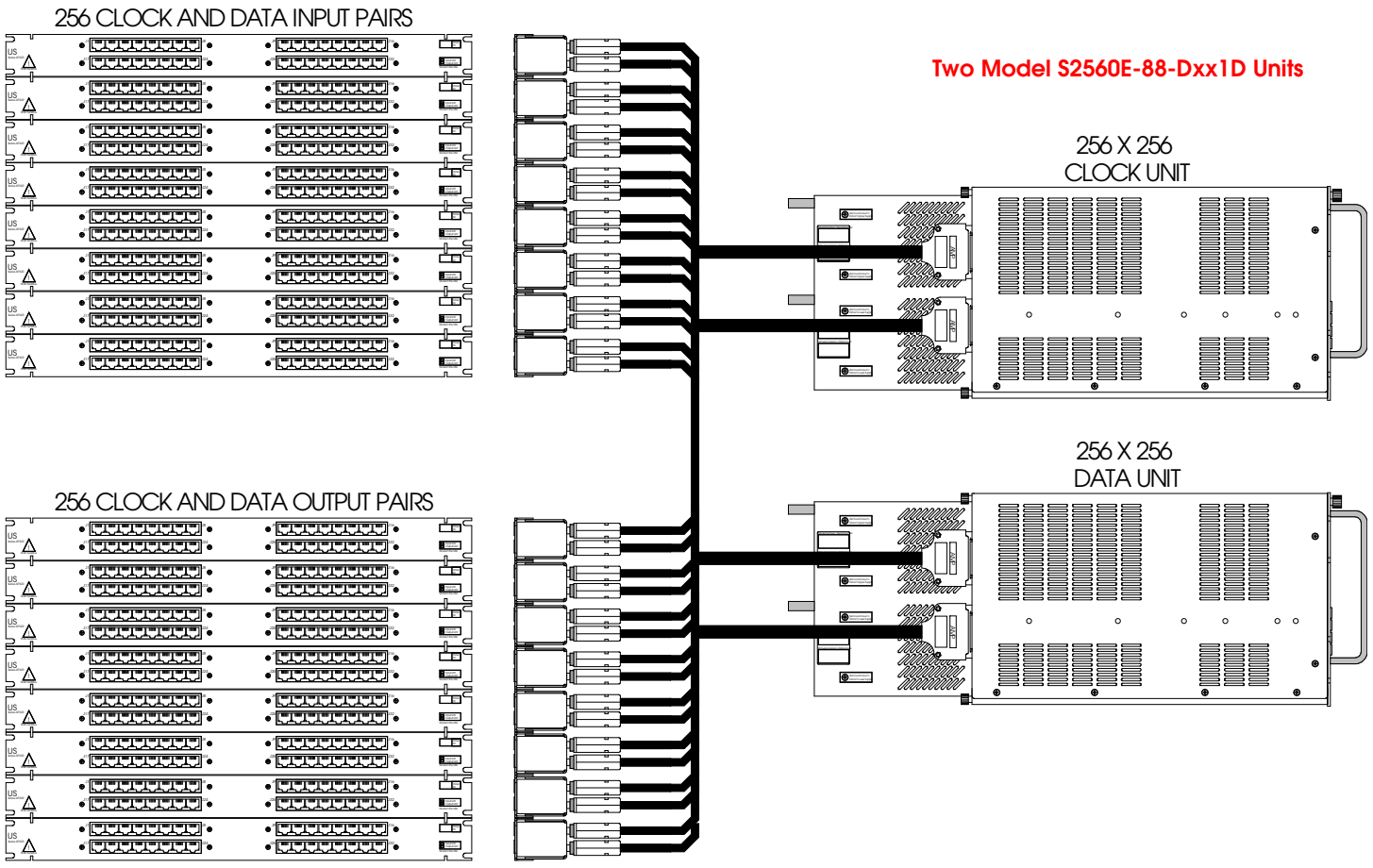
## 256 input, 256 output with RJ-45 adapter panels

Shown below is an example of two fully populated S2560E units (one for clock and one for data) with optional RJ-45 passive I/O adapter panels. These are individual 1RU high (1.75") rack mounted units (Series AP32RS) and serve the following functions:

- Provides individual standard RJ-45 connectors for the user
- Contains two data channels on each RJ-45 (clock and data)
- Allows signal connectors to be located on front or rear of rack
- Ability to remotely locate user signal connectors
- Deliver high performance differential 100 ohm data switching

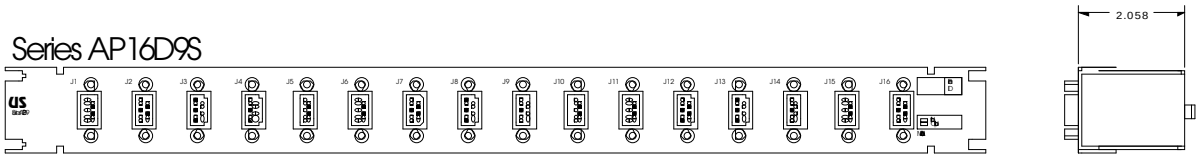
**NOTE:** The same configuration can be used for two channel differential audio (stereo) if the "D" suffix is left off the S2560E, and the appropriate I/O impedance is specified (100, 300 or 600 ohm).

**Sixteen Model AP32RS-003 Units (includes 3 foot cables)**



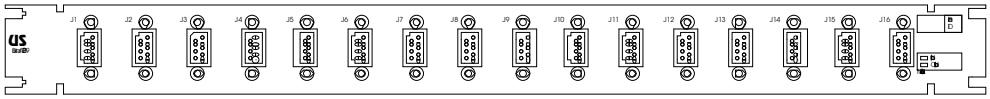
## Example Adapter Panel Assemblies

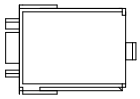
Series AP16D9S



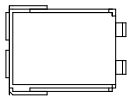



Series AP16D9P

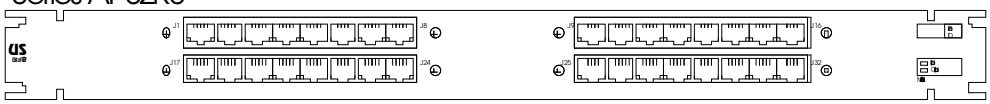


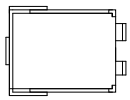


Series AP32R

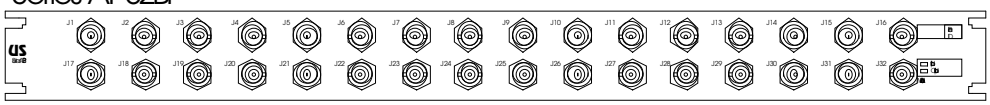


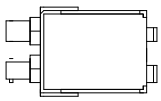
Series AP32RS





Series AP32BF





### System S2560E Specifications

Minimum array size . . . . . .32 input, 32 output
Maximum array size . . . . . .256 input, 256 output
Expansion increment . . . . . .32 ports per module
Switching elements . . . . . .Solid-state
Type of system . . . . . .Non-blocking with full fanout
Architecture . . . . . .Tri-Stage redundant, uni-directional
Status LED's . . . . . .Front panel

**Input Characteristics**
Signal connector . . . . . .50 position SCSI-II
Coupling . . . . . .DC
Impedance . . . . . .100, 300 or 600 ohm differentia
Digital version . . . . . .High speed `422 receivers, 100 ohm

**Output Characteristics**
Signal connector . . . . . .50 position SCSI-II
Coupling . . . . . .DC
Impedance . . . . . .100, 300 or 600 ohm differential
Digital version . . . . . .High speed `422 drivers, 50Mbps

Universal Switching's policy is one of continuous development, and consequently the company reserves the right to vary from the descriptions and specifications shown in this publication.

**Signal Characteristics**
Frequency response . . . . . .DC-125MHz (100 ohm version)
Nominal signal level . . . . . .±1.5VDC
Maximum input level . . . . . .±5.0VDC (no damage)
Crosstalk isolation . . . . . .>50dB @ 4MHz
Digital 422 version . . . . . .Data rate to 50Mbps

**General Specifications**
Module technology . . . . . .Hot-Swappable
Power supply section . . . . . .Redundant hot-swap standard
Remote interface type . . . . . .C710 or C820 Plug-in CPU (up to two)
Manual control . . . . . .4x20 VF display and back-lit keypad
Configuration routing . . . . . .Auto-Route or manual
Configuration memory . . . . . .200 lithium-backed locations
Memory retention . . . . . .>10 years
Cooling . . . . . .Forced cooling with RPM monitoring
AC power requirements . . . . . .90-264VAC, 47-440Hz, 400Watts
Power cords . . . . . .Dual inputs (USA 15A)
Weight . . . . . .56lbs
Size . . . . . .8.75H x 22.00D x 19.00W (5RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>35,000 hours
(per MIL-HDBK-217F, N1
ground benign @ +25C)



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