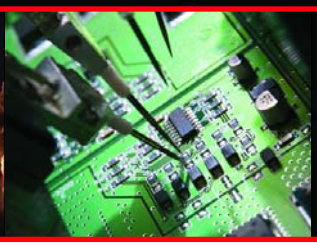
Global leader in high performance signal **Switching** Global leader in high performance signal **Routing** Global leader in high performance signal **Distribution**

Switching Solutions for Global Needs





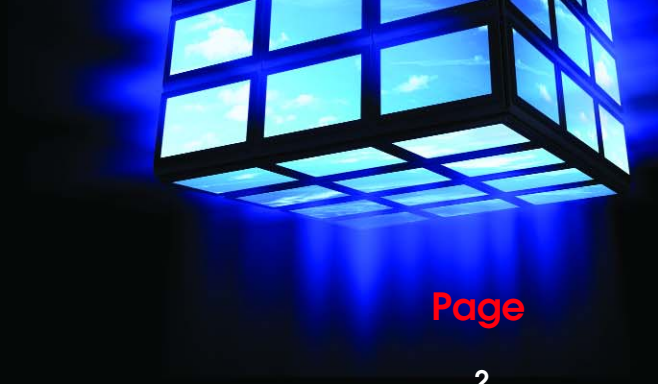
Communications - Automated Testing - Broadcast

Universal Switching Corporation

Product Selector Guide 17

Mission Statement

Universal Switching Corporation is committed to being the leader in the programmable switching industry by providing innovative products and services that continually exceed our customer's expectations



Contents

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NOTE: For full specification sheets on all products in PDF format, see our website: **uswi.com**

The Company

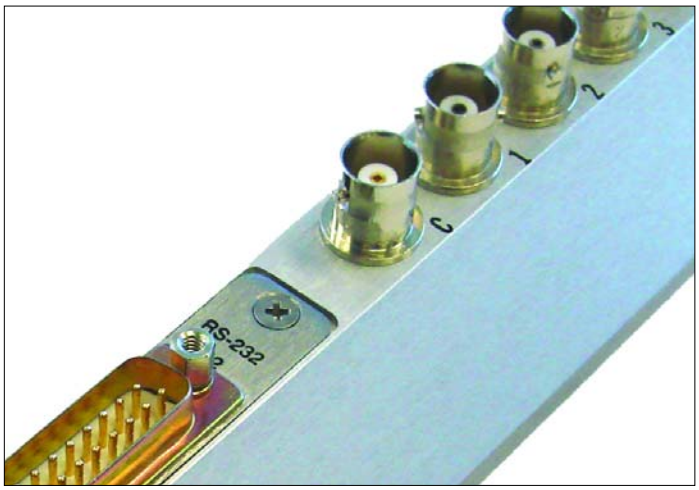
Global Leader in Switching Technology
Universal Switching Corporation is an internationally recognized leader in the switching industry that manufactures "state-of-the-art" switching equipment. For 17 years, the USC commitment to Continuous Process Improvement and cutting-edge technology has combined to provide a unique blend of low cost and high quality products.

With a corporate culture that includes a modern facility, talented personnel, a comprehensive Quality Management System and ISO 9001:2000 certification, USC provides a standard 2-Year warranty for all equipment and offers an optional extended 5-Year warranty.

Product Line Offering
A broad product line of switching systems, switching modules (including VXI and VME), and distribution units span a frequency range from DC to 40GHz. Signal types include AC/DC power switching, audio, ATE instrumentation, composite video, SD & HD, HF, RF and IF signals, high resolution RGB+HV video, high speed `422, LVDS, PECL or ECL digital data, cellular telephone, L-Band plus other >3GHz signals to 40GHz.

Embedded intelligent controllers and software are utilized throughout the product line to provide fast, accurate and easy control and monitoring. Adapter panels and remote control panels provide configurability to meet unique interface and control requirements.

Product Line Expansion
With the acquisition of Matrix Systems Corporation's (MSC) switching product line in 2007, the USC product line now includes a number of unique relay modules in support of existing system installations throughout the world. A number of USC product enhancements have further improved this proven product line.



Closeup of URS70000 series module
Rugged coaxial relay with built-in serial control port

COTS Solutions
Leading the automated switching industry with the largest crosspoint capacity, programmable switching systems and modules are available in "off the shelf" configurations to solve time-sensitive switching requirements. Rather than long lead times for special, modified or custom ordered equipment like other manufacturers, USC's "off the shelf" configurations provide turn-key solutions in real time by utilizing the full spectrum of current technology coupled with the latest in design and manufacturing techniques.

Closeup of front panel controls
Model 10943B L-Band redundancy switcher

In addition to "turn-key" solutions, USC provides custom or EOEM systems and modules with minimal lead time and expedited delivery. USC specializes in switching products and equipment which supports or connects to switching equipment, but also has resources and engineering expertise to fulfill any switching related need including requirement evaluation, system design and system integration.

Switching Experience
With a core competency in the switching arena, USC is focused on switching needs within a variety of industries and the direction of future requirements.

A range of USC products are used in the most sensitive of areas requiring high reliability like aerospace and defense, surveillance stations, satellite communications, as well as "everyday" production testing and evaluation applications.

Technological Accomplishments

Globally recognized industry accomplishments include our field proven G2 Series product line introduced in 2001, the revolutionary System S256xE units, and our new compact high performance digital and analog video product lines. Many of our new or upgraded products are highlighted in this catalog.

Machine assembled boards
Fast turn and consistent high quality

G2 Series

The G2 Series modular product line offers a host of features and improvements including high performance configurations, fully shielded modules, hot-swap module technology, field-upgradeable firmware, plus optional redundant CPU and power supply configurations. Ethernet (TCP/IP) control has been a USC standard for years while other manufacturers are just now embracing the technology.

Modular Design Technology

Modular products are more cost effective than trying to configure "dedicated purpose" boxes that are the mainstay for many companies. The advantages of a modular system offered by the G2 Series line are as follows:

- Flexible system architecture
- Hot swap power supplies
- Efficient modular design
- Common control and command protocol
- Compact physical format
- Multiple configurations in one box
- Simple logistics for sparing items

Scalable Switching Arrays

The scalable design concept used in the revolutionary System S256xE combines the latest in component technology and advanced control and monitoring features. The scalable design is suitable for production video, audio, telemetry or digital data, and up to 1024x1024 in a compact 5RU rack mounted "building-block" package.

The System S256xE features hot-swap modules and hot-swap power supplies as standard features. Optional dual CPUs provide flexibility for meeting unique switching control and system monitoring requirements.

Product Development

Ongoing product development is the driving force behind advanced and innovative designs. USC continues to lead rather than follow the switching industry by investing resources in research and development. Fiber optics, LXI standards, Tri-Stage, and the recently released CAS (Critical Application System) represent the corporate commitment to Continuous Process Improvement and product development.

New product development and designs regularly are introduced on the our web-site, but feel free to contact one of our field engineering representatives or the factory directly for consultation. We are confident that a solution to your technical requirement is available.

Hot-swap power supplies
Most products feature hot-swap monitored supplies

Product Showcase

Application and product showcase

- Uplink / Downlink switching or IRIG timing distribution
- ATE test stations for routing test points to test equipment
- NTSC, CATV and PAL video switching
- Low noise antenna routing to HF receivers
- Airborne surveillance signal switching
- Microwave signal switching (DC to 40GHz)
- High power AC or DC switching (10-90 amps)
- Radar X-Y-Z data, and radar video routing
- Telecommunication routing and broadcasting
- High speed `422, `232, LVDS, PECL and ECL data switching
- Switching inputs from RF analyzers to UUT's
- Security and workstation video systems
- Instrumentation control and monitoring
- RGB+HV video and audio routing and distribution

Model G2S1600CE
Sixteen-slot G2 mainframe
Rear view with modules installed
(8RU)

System 10942B
Four-channel redundancy switch
(1RU - rear view)

U70000 & URS70000
Rugged 800MHz relay modules

Model G2S600CE
Six-slot G2 mainframe
(3RU)

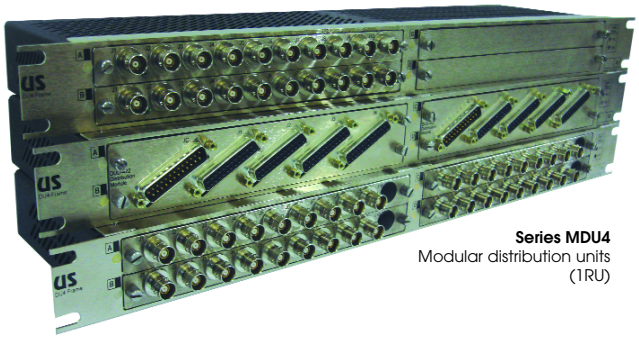
Model VXI-RMR410
Quad 10x1, DC-18GHz

Model VXI-RR161X2
Sixteen 1x2 module
(DC-3GHz)

Model G2S47-6432-25
Four-slot G2 plug-in 32x32 module with expanders
(20-250MHz)

Model VSU2-6432
500MHz 32x32 video router
(2RU - front view)

System 10944B
Fiber optic redundancy switch
(1RU)



Series MDU4
Modular distribution units
(1RU)

NOTE: Information in this product selector guide is in condensed form. For additional information, please call your sales engineer or the factory for the associated specification sheets listed, or download them in PDF format from our website. For the European market, products that are CE marked are identified in individual data sheets and by the CE in the page title area (top corners). Most products are also RoHs 5 compliant.

System S2561E
Scaleable from 32x32 to 256x256
DC-125MHz
(5RU)

Model G2S400CE
Four-slot G2 mainframe
(2RU)

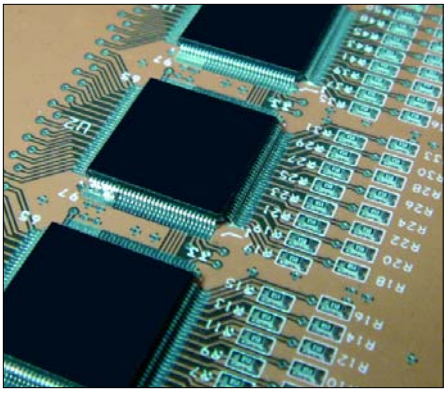
G2-CAS System
Dual 12x128 L-Band matrix
20-3000GHz

Highlights

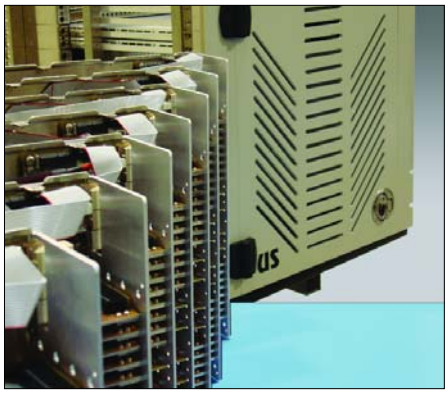
This section features a few company technological achievements, unique product features and company highlights. Universal Switching Corporation is a leader in the switching industry, and strives to be at the leading edge of technology by utilizing the latest in design and manufacturing development.

Quality nickel plating and silkscreen
Rack mounting is built into most products

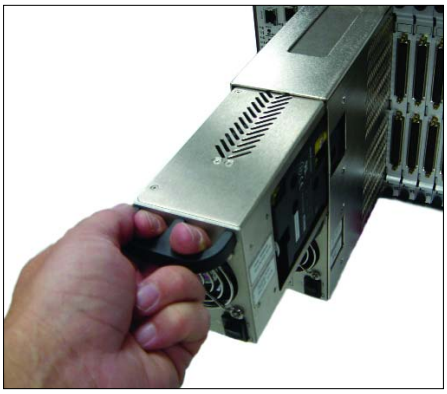
Modular designs
Most products feature some type of modularity



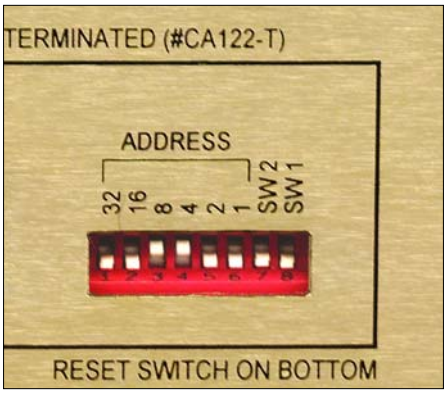
CAD designs and machine assembly
The latest components and assembly techniques



ISO 9001:2000 certified facilities
Constant improvement in quality and efficiency



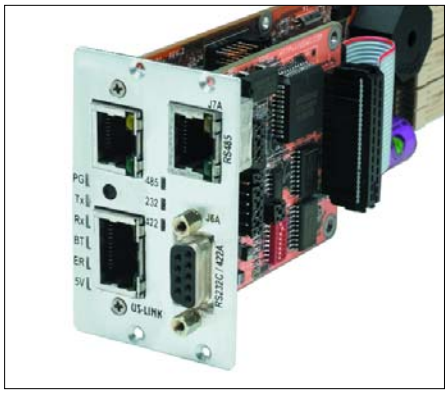
Hot-swap power supplies
Most products feature hot-swap monitored supplies



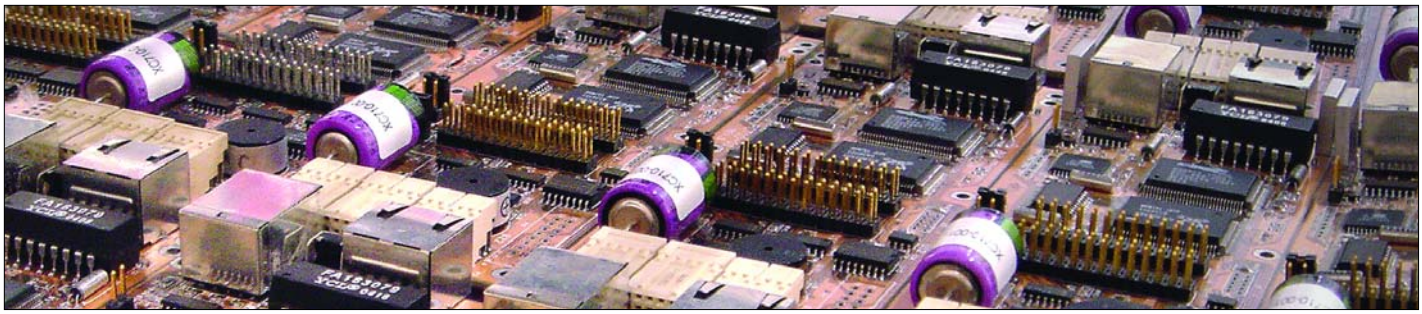
Product labeling
Consideration for simple unit configuration

Liberal use of status indicators
Indicators help during system set up and troubleshoot-

Forced air cooling
Monitored forced air cooling to increase product life



Feature rich high speed control CPUs
All popular remote interfaces are supported



Cost effective production
Product standardization helps reduce production costs

Equipment grounding
Quality stainless steel hardware used throughout

Quality hardware
Name brand quality hardware is designed in

LED control keys
All units contain LED backlighting, no bulbs

Total system responsibility
We can deliver a complete unit to client specifications

Minimum maintenance tools required
Many modules and assemblies do not require tools

Monitored power supplies
Power supplies are monitored for proper operation

VXIbus Modules
We offer unique analog and digital modules

Special shock mounting
Our ruggedized VXI chassis features internal shocks

New modern facilities in Burbank CA
All products are "Made in the USA"

New Burbank Facility

Company Expansion

Since the Company's inception in a Southern California garage in the early `90s, it has grown with each year. The first "real" company building was situated in Panorama City. The company quickly outgrew the building and relocated to Van Nuys in December of 1993 about a month before the January 17th "Northridge" earthquake.

Universal Switching expanded as much at it could at its Van Nuys location. By 2005, the Company was cramped for space and dispersed in four different nearby buildings. With the expanding product line and broader market penetration, the Company needed more space. Once again, it was time to transition to a larger facility and Company officers decided to relocate to Burbank, in the San Fernando Valley, in a new facility designed specifically for the Company's needs.

Lockheed Skunk Works XP-80
490mph - 1940's

Located in busy Southern California, the San Fernando Valley has always been a hub of high technology and industrial companies as well as numerous and unique neighborhoods. Certain areas are going through renewal phases and one area in particular is the Burbank area.

The Property History

Not willing to compromise on the new facility, a new industrial development being built at the historic location of Lockheed's division "Skunk Works" was selected. Skunk Works® was formed in 1943 in buildings adjacent to what was then called the Burbank Airport (it has recently been renamed after the famous deceased actor Bob Hope).

In June of 1943, the Air Tactical Service Command (ATSC) of the Army Air Force met with Lockheed Aircraft Corporation to express its need for a jet fighter. A rapidly growing German jet threat gave Lockheed an opportunity to develop an airframe around the most powerful jet engine that the allied forces had access to, the British Goblin. Lockheed was chosen to develop the jet because of its past interest in jet development and its previous contracts with the Air Force. One month after the ATSC and Lockheed meeting, a young engineer by the name of Clarence L. "Kelly" Johnson and other associate engineers hand delivered the initial XP-80 proposal to the ATSC. Two days later the go-ahead was given to Lockheed to start development and the Skunk Works was born, with Kelly Johnson at the helm. The formal contract for the XP-80 did not arrive at Lockheed until October 16, 1943; some four months after work had already begun. This would prove to be a common practice within the Skunk Works. Many times a customer would come to the Skunk Works with a request and on a handshake the project would begin, no contracts in place, no official submittal process. Kelly Johnson and his Skunk Works team designed and built the XP-80 in only 143 days, seven days ahead of schedule.

Lockheed Skunk Works XP-80A
1940's

Skunk Works Achievements
1940 - Now

What allowed Kelly to operate the Skunk Works so effectively and efficiently was his unconventional organizational approach. He broke the rules, challenging the traditional bureaucratic system that stifled innovation and hindered progress. His philosophy is spelled out in his "14 practices and rules" that he and his team followed. Many of these "rules" are still considered valid today.

Lockheed Skunk Works SR-71
The famous "Blackbird" (1963) still holds the worlds speed record

Other Skunk Works Achievements

The super secret Skunk Works® facility developed numerous aircraft to compete with the Germans, Soviets and other adversaries.

New unmatched technological successes during the war and cold-war years, such as the top secret U-2 (1954), the F104 Starfighter (1958), the USAF A-11 Mach 3 aircraft, the famed (and retired in 1990) SR-71 "Blackbird" as well as the F-117 Nighthawk Stealth Fighter which was retired August 1st, 2008.

New USC Facility
At the new Company facility, USC is determined to continue the traditions of innovation and technical success that were achieved in the last 65 years at the historic location in Burbank.

The new facility is perfectly suited to propel the Company to the next level. With nearly 18,000 square feet of area, the Company can address the production and engineering challenges for continued growth and product development.

From floor to ceiling, the new facility provides an excellent environment for technological achievement. With new state-of-the-art equipment, an integrated communication and data network, secure inventory and stockroom, dedicated test, production, and research and development areas, the Company is well equipped to continue to lead the switching industry.

Production, inventory and stockroom, test, R&D and shipping areas, burn-in room and PCB washing/defluxing station are fitted with advanced technologically superior 3M AntiStatic flooring. An environmental chamber for temperature testing, heat cycling, and storage verification expand the equipment specifications that can be met. These features are a few of many advances designed into the new facility.

ISO 9001:2000 Certified Quality Management System

USC achieved ISO 9001:2000 certification in January of 2007. This is an important quality achievement and is fully supported throughout by company management. Moving forward, USC is currently working on additional improvements to the QMS with the goal of achieving the new requirements for ISO 9001:2008 by years end.

Commitment to Satisfaction
With world-class customer service and support, USC is committed to making sure each and every client is fully satisfied. With a national and worldwide network of sales offices, we want to work directly with each client to meet their switching needs. Our in-house Application Engineering staff is ready to assist you with a timely, on-budget, technically superior solution.

We welcome factory visits. If you are in the area, please call and schedule a factory tour.

3Pouring the foundation
Tilt-up construction begins with the foundation, mid 2005

Building "shell" is complete
Jan 2006 - outside is done, internal construction begins

Modern facility is completed
USC relocates to new facility August 2006

G2 Series Modular Systems

1

About the G2 Series

What is the G2 Series, and how does it work?

The G2 Series is a very comprehensive modular switching product design comprised of three basic system components. The following outlines these three major system components and what's required to build a successful modular switching system.

- Rack mount mainframe unit with plug-in power supplies.
- Plug-in switching module(s)
- Plug-in CPU with remote control interface ports(s)

G2 Mainframes (see page 1-4)
The rack mountable mainframe units are available in four basic rack mount sizes (2RU, 3RU, 6RU and 8RU). The different sizes are offered to meet a various sized switching demands from small to large. They are designed to provide control and power to any of the G2 Series plug-in modules. The modules install into the rear-facing module bay as can be seen in the photo on the opposite page.

Plug-in power sections with different voltage combinations are available to meet the requirements of the different G2 Series modules available. The supplies are self-monitoring with health status reported to the main CPU. Single or redundant power supplies install behind hinged front panels for easy access and simple hot-swapping to satisfy system critical requirements. Two supplies can be installed for redundancy with independent AC power inputs provided.

G2 Plug-in Modules (see page 1-10)
The modules that plug-in to the G2 Series mainframes are designed to install into the rear of the units. This allows the signal I/O connectors to face the rear (inside of the rack) of the mainframe to simplify cable routing to and from the switching system. The G2 Series module series spans DC-40GHz to address many different applications including audio or video, high speed digital data, telemetry, IF or RF, microwave and other types of installations. Each module uses a certain number of module "slots" within a mainframe. Some modules use only one slot while others use up to 12 slots. Power and control for the module is supplied by the mainframe in which the module is installed.

Plug-in CPU (see Section 9)
The two larger G2 mainframes (6RU and 8RU) accept dual plug-in CPU (C710 Series) modules for redundancy. The 3RU mainframe accepts one CPU module, while the 2RU mainframe includes a plug-in CPU. The C710 Series CPU provides control and monitoring for the modules, and remote control interfacing to the user.

The C710 Series CPUs are available in an Ethernet only version, Ethernet with multi-serial type (RS-232C/422A/485), or Ethernet with GPIB (IEEE-488). Two CPU's can be added for redundant control scenarios (6RU and 8RU only). Even though the G2 Series utilizes the C710 CPU, this same CPU is utilized in many other USC products as well.

What equipment do I need?

Typically, the system professional with a switching requirement will inform us of specific needs, and our Application Engineers will choose the equipment best suited to meet the requirement. This is due to the large selection of products we offer, and the fact that the same product can solve more than one type of application. For assistance, an application requirement form is available on our web-site (and in the back of this catalog) so that it can be submitted directly to our sales department, or the form can be downloaded in PDF format and FAXed to us.

Which G2 series are available?

Four types of module in the G2 series are available. For easy identification, the series numbers for solid-state (analog) modules are designated **G2S**; the relay-based products are designated **G2R**; the solid-state "digital" units are designated **G2D**; and the fiber-optic units are designated **G2F**.

Can you meet special requirements?

Many of our product configurations originated by an actual customer need. The G2 Series modules provide an excellent platform to meet custom or special customer requirements in a cost effective manner. If the standard products shown within this catalog don't seem to meet your needs, simply call the factory and talk to one of our Application Engineers.

We may have a new module available that will meet your need, can modify a current module type or design a new or custom product for a surprisingly low cost.

What about Total System Responsibility?

The factory will configure multiple modules or racks of equipment together into a total system configuration including any required cabling, equipment racks, control software or adapters. A unique overall system model number is assigned to make it easy to order and support. All systems are factory tested, burned-in and documented at no additional charge.

Comprehensive system documentation for operating and programming is included with each system. Definition of the system architecture and components required can be done by one of our outside sales representative firms, or one of our Application Engineers.

Captive hardware for easy changes

G2 Series Mainframes

Four, Six, Twelve and Sixteen Slot Units

Our second generation of field-proven modular products introduced in 2001 provides the system engineer with new choices and performance not previously offered. By keeping up with new technologies and with the 2004 introduction of our standard Ethernet control port on every unit, the G2 Series has been the logical choice for many installations.

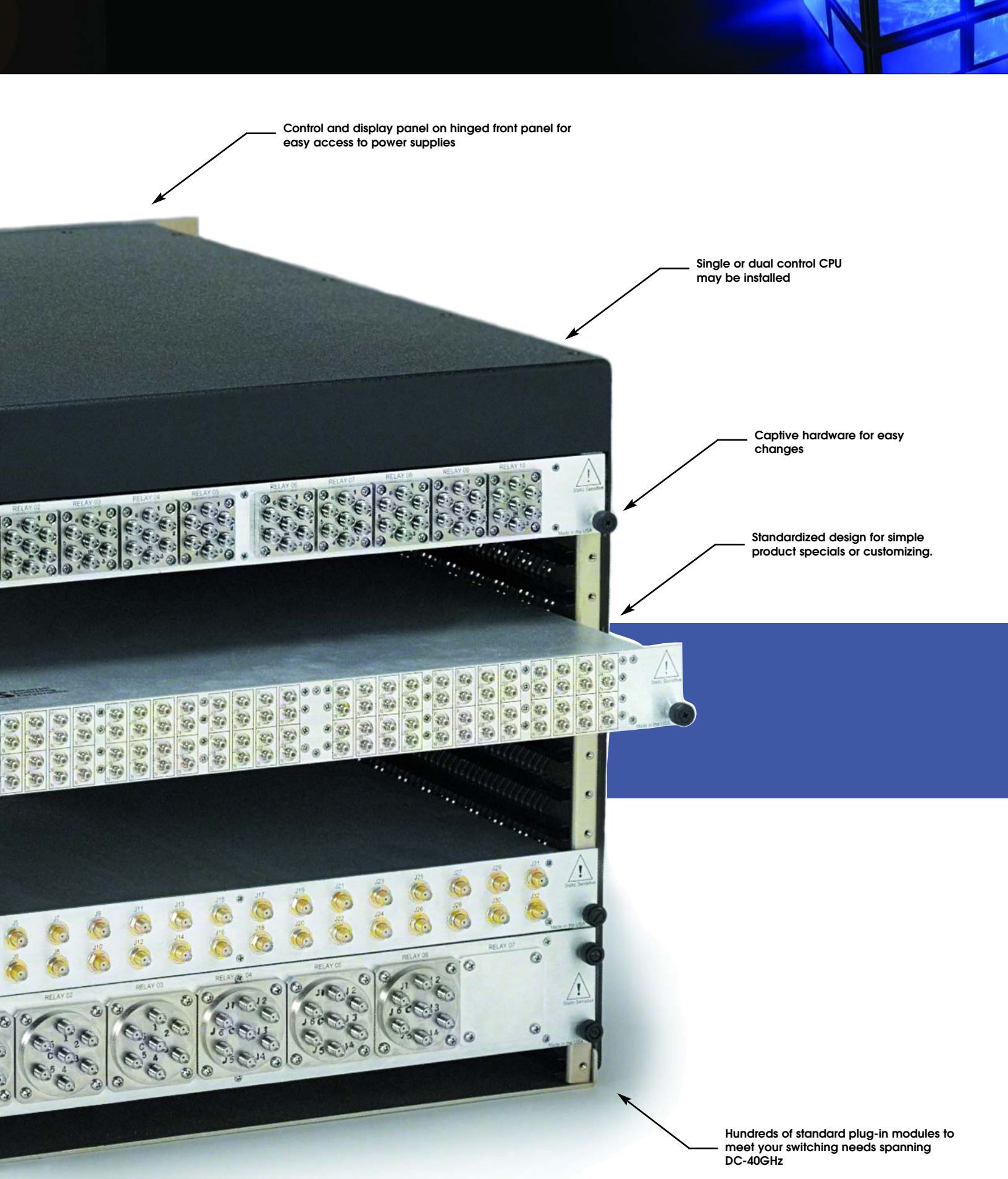
The G2 Series product line provides an enhanced IEEE-488.2 compliant control protocol, additional features and greater system flexibility than ever before. Any G2 Series module can be installed by simply sliding the module into the rear module bay (observing mainframe power supplies installed).

Shown here, a few of the product features are highlighted. All modules are hot-swap and are simple to spare.

Control Options

- Ethernet
- RS-232C
- RS-422A
- RS-485
- GPIB (IEEE-488)
- Manual controls

Universal Switching Corporation


Control and display panel on hinged front panel for easy access to power supplies
Single or dual control CPU may be installed
Captive hardware for easy changes
Standardized design for simple product specials or customizing.
Hundreds of standard plug-in modules to meet your switching needs spanning DC-40GHz

G2 Series Mainframes

Four sizes to meet most needs

The G2 Series provides higher density switching configurations, fully shielded hot-swap module construction, plus redundant hot-swap power supply configurations. It also utilizes the reliable C710 Series plug-in CPU module that features field upgradeable FLASH memory for downloading firmware upgrades while in the field. The twelve and sixteen slot versions allow for dual or redundant CPU configurations.

In addition, dual AC input connectors (3RU, 6RU and 8RU versions) are provided for redundant AC sources, and the universal AC power input capability (90-264VAC, 47-440Hz) allow for global integration including aircraft and mobile environments. DC powered versions are available as a special power option. To assist with system power management, power-factor-corrected (PFC) supplies are designed into the 6RU and 8RU units.

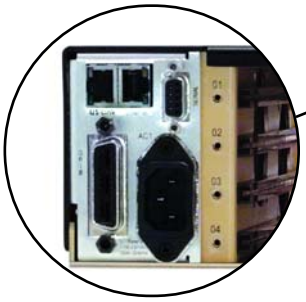
The smaller 2RU version (G2S400CE) includes a front installed plug-in CPU with all three types of remote interface ports (Ethernet, Serial and GPIB).

- Ethernet
- GPIB (IEEE-488)
- RS-232C
- RS-422A
- RS-485
- Manual controls

Model G2S400CE
(4-slot rear module bay)

(module partially installed)

(module installed, one slot open)



2RU

Model G2S400CE
Four slot

3RU

Model G2S600CE
Six slot

Model G2S600CE
Shown with hinged front open

6RU

Model G2S1200CE
Twelve slot

Model G2S1200CE
Shown with CPU installed in CPU-1 slot only

8RU

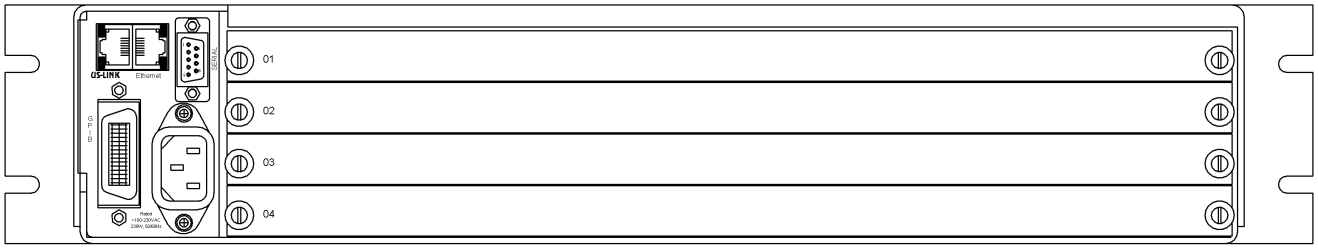
Model G2S1600CE
Sixteen slot

Model G2S1600CE
Shown with various modules installed

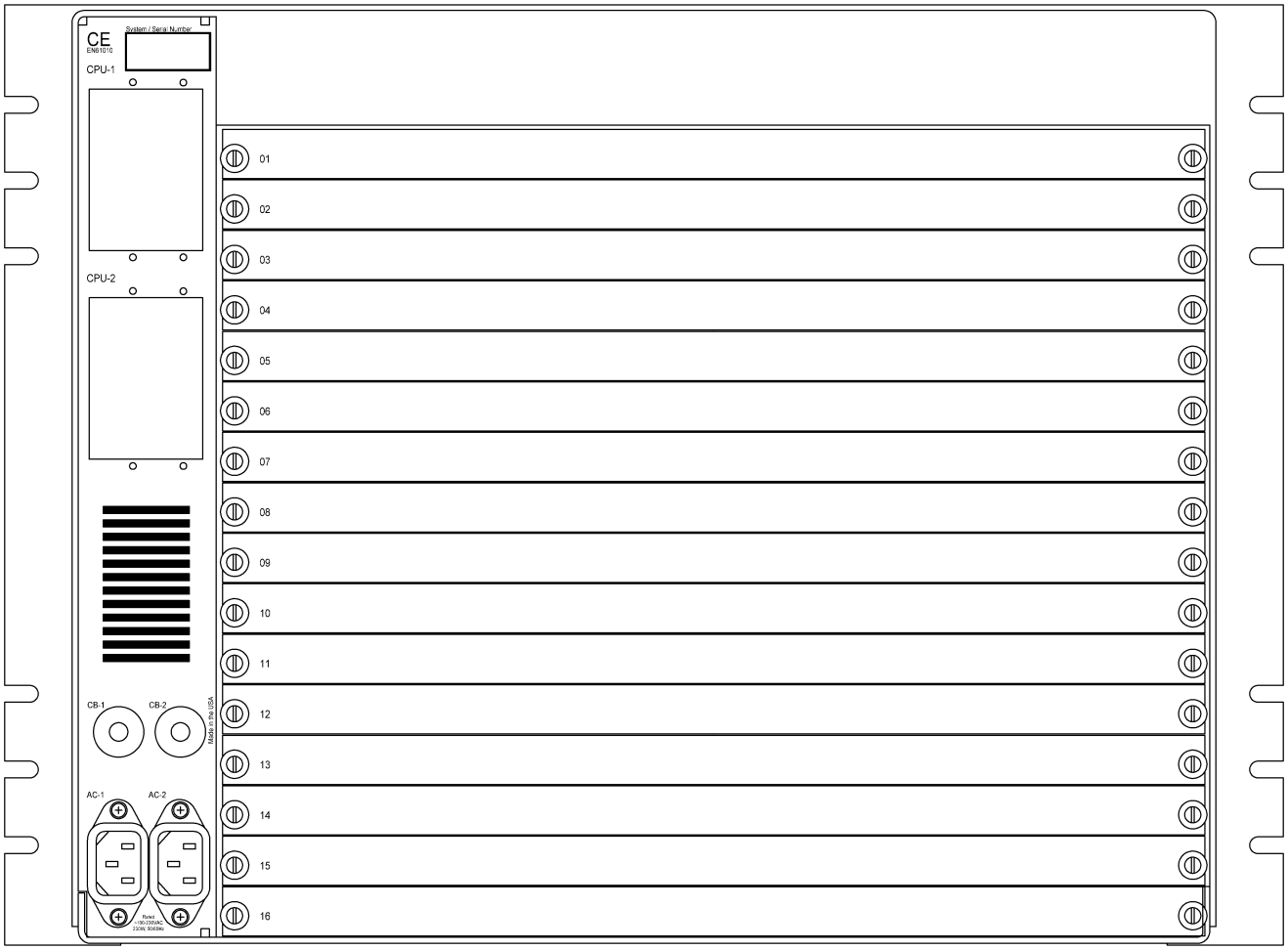
G2 Series Mainframes

NOTE: G2 Series Mainframe rear views (shown with module filler plates installed. Filler plates are needed for proper cooling when mainframe is not fully populated.

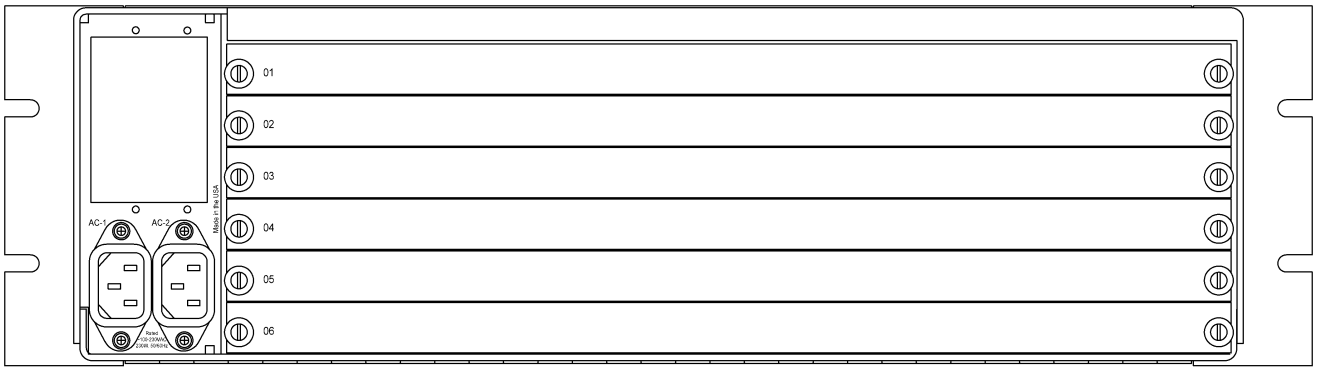
2RU - 4 Slot



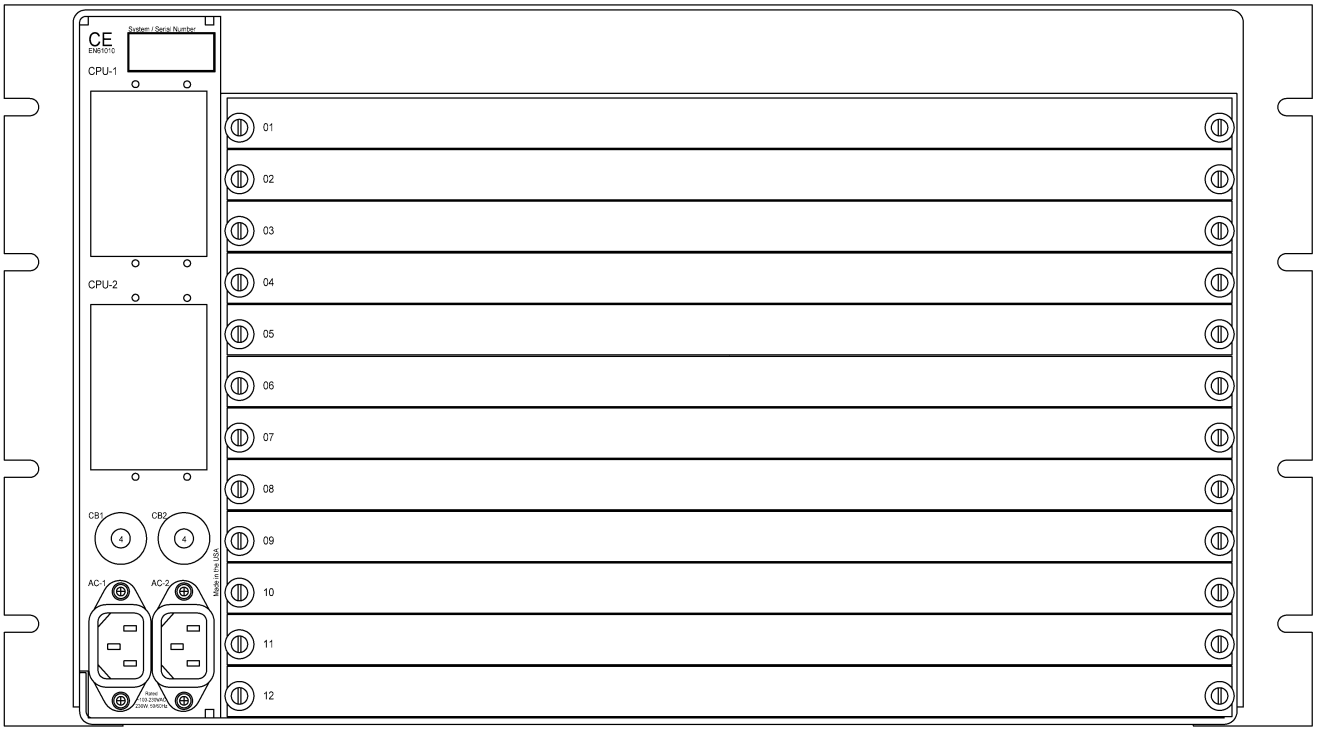
8RU - 16 Slot



3RU - 6 Slot



6RU - 12 Slot



G2 Series Mainframes

Model	Slots	Height	Built-in Control Ports	CPU Slots	Voltages	Supplies	Spec Sheet
G2S400CE-100-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+/-15V, +5V	No	#G2S400CE-002
G2S400CE-200-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+/-5V, +5V	No	#G2S400CE-002
G2S400CE-207-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+7V, -5V, +5V	No	#G2S400CE-002
G2S400CE-600-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+15V, +5V	No	#G2S400CE-002
G2S400CE-D100-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+/-15V, +5V	Yes	#G2S400CE-002
G2S400CE-D200-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+/-5V, +5V	Yes	#G2S400CE-002
G2S400CE-D207-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+7V, -5V, +5V	Yes	#G2S400CE-002
G2S400CE-D600-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	+15V, +5V	Yes	#G2S400CE-002
G2S400CE-000-5	4	3.50 (2RU)	Ethernet, Serial & GPIB	Built-in CPU	none	Note 6	#G2S400CE-002
G2S600CE-100	6	5.25 (3RU)	None	One	+/-15V, +5V	No	#G2S600CE-001
G2S600CE-200	6	5.25 (3RU)	None	One	+/-5V, +5V	No	#G2S600CE-001
G2S600CE-207	6	5.25 (3RU)	None	One	+7V, -5V, +5V	No	#G2S600CE-001
G2S600CE-600	6	5.25 (3RU)	None	One	+15V, +5V	No	#G2S600CE-001
G2S600CE-D100	6	5.25 (3RU)	None	One	+/-15V, +5V	Yes	#G2S600CE-001
G2S600CE-D200	6	5.25 (3RU)	None	One	+/-5V, +5V	Yes	#G2S600CE-001
G2S600CE-D207	6	5.25 (3RU)	None	One	+7V, -5V, +5V	Yes	#G2S600CE-001
G2S600CE-D600	6	5.25 (3RU)	None	One	+15V, +5V	Yes	#G2S600CE-001
G2S600CE-000	6	5.25 (3RU)	None	One	none	Note 6	#G2S600CE-001
G2S1200CE-100	12	10.50 (6RU)	None	Two	+/-15V, +5V	No	#G2S1200CE-001
G2S1200CE-200	12	10.50 (6RU)	None	Two	+/-5V, +5V	No	#G2S1200CE-001
G2S1200CE-207	12	10.50 (6RU)	None	Two	+7V, -5V, +5V	No	#G2S1200CE-001
G2S1200CE-600	12	10.50 (6RU)	None	Two	+15V, +5V	No	#G2S1200CE-001
G2S1200CE-D100	12	10.50 (6RU)	None	Two	+/-15V, +5V	Yes	#G2S1200CE-001
G2S1200CE-D200	12	10.50 (6RU)	None	Two	+/-5V, +5V	Yes	#G2S1200CE-001
G2S1200CE-D207	12	10.50 (6RU)	None	Two	+7V, -5V, +5V	Yes	#G2S1200CE-001
G2S1200CE-D600	12	10.50 (6RU)	None	Two	+15V, +5V	Yes	#G2S1200CE-001
G2S1200CE-000	12	10.50 (6RU)	None	Two	none	Note 6	#G2S1200CE-001
G2S1600CE-100	16	14.00 (8RU)	None	Two	+/-15V, +5V	No	#G2S1600CE-001
G2S1600CE-200	16	14.00 (8RU)	None	Two	+/-5V, +5V	No	#G2S1600CE-001
G2S1600CE-207	16	14.00 (8RU)	None	Two	+7V, -5V, +5V	No	#G2S1600CE-001
G2S1600CE-600	16	14.00 (8RU)	None	Two	+15V, +5V	No	#G2S1600CE-001
G2S1600CE-D100	16	14.00 (8RU)	None	Two	+/-15V, +5V	Yes	#G2S1600CE-001
G2S1600CE-D200	16	14.00 (8RU)	None	Two	+/-5V, +5V	Yes	#G2S1600CE-001
G2S1600CE-D207	16	14.00 (8RU)	None	Two	+7V, -5V, +5V	Yes	#G2S1600CE-001
G2S1600CE-D600	16	14.00 (8RU)	None	Two	+15V, +5V	Yes	#G2S1600CE-001
G2S1600CE-000	16	14.00 (8RU)	None	Two	none	Note 6	#G2S1600CE-001

NOTES: G2 Series Mainframes

1. All dimensions are in inches.

2. Standard front panel paint is FED-STD-595B semi-gloss grey #26440 baked enamel and black "texture" coated chassis cover. Other colors are available by special order. Contact the factory.

3. Standard front panel thickness is .125" with .187" being optional. Contact the factory.

4. All G2 Series units have been CE marked.

5. The different suffix numbers specify the various power supply configurations

6. The -000 suffix can be specified to order the mainframe without any factory installed power supplies. This would be done to spare the unit, or if the user needs the mainframe without any supplies.

7. All units are <20.50" deep measured from the back of the front panel to the rear most feature.

8. Units utilize the C710 plug-in CPU module. By late 2009, all units will feature the next generation C820 plug-in CPU.

General Specifications

- Size . . . . . .2RU: 3.47"H x 19.00"W x 20.50"D
  3RU: 5.23"H x 19.00"W x 20.50"D
  6RU: 10.47"H x 19.00"W x 20.50"D
  8RU: 13.97"H x 19.00"W x 20.50"D
- Local control . . . . . .24 position LED illuminated keypad
  4x20 vacuum fluorescent display
- Power switch . . . . . .Located on plug-in supply
- Power requirements 90-264VAC, 47-440Hz
- Power section . . . . . .Plug-in (redundant optional)
- Power cord(s) . . . . . .Belden 17250 supplied (115VAC 15A)
- Operating temperature .0 to +60C
- Storage temperature . . . .-20 to +85C
- Cooling . . . . . .Fan assisted (monitored)
- Configuration memory . .>200 configurations
- Memory retention . . . . . .>10 years
- Remote interface type . .C710 Series plug-in (C820 Series in late 2009)

G2 Series Modules

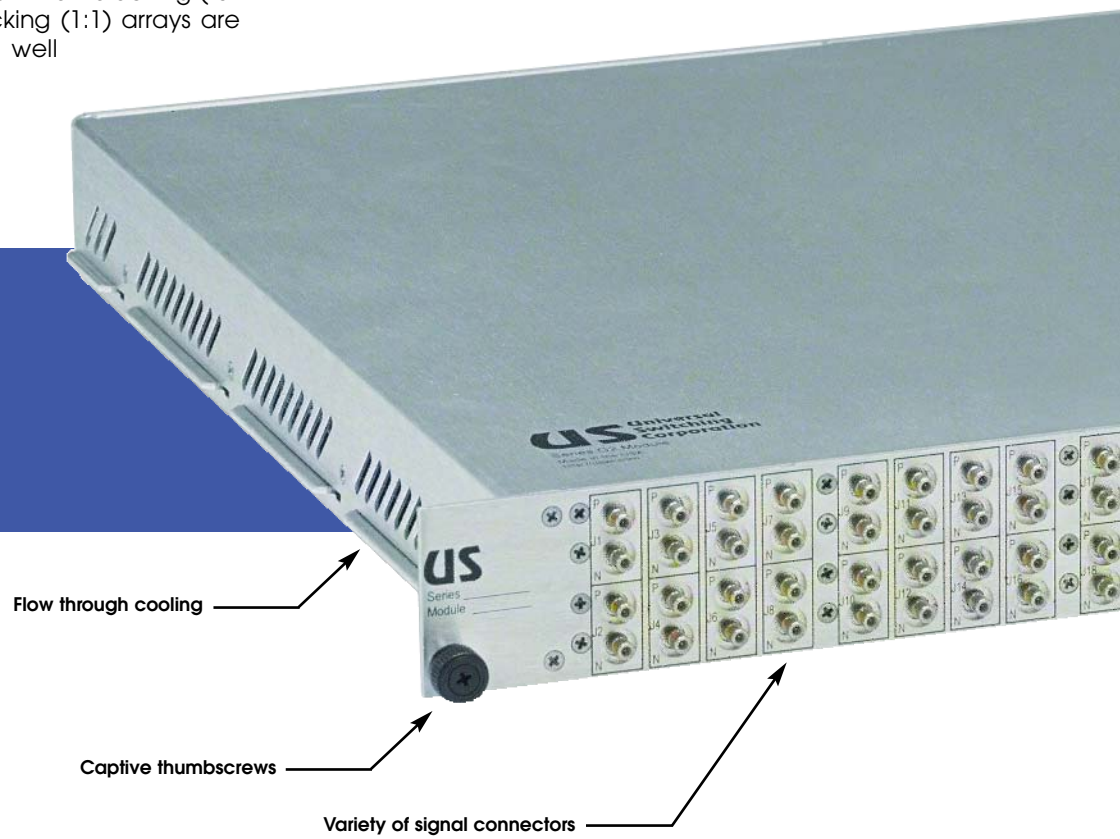
Modules Spanning DC to 40GHz
Configurations from 1x1, up to 64x64

The G2 Series modules are a "second-generation" of modular switching products introduced in 2001. They provide the system engineer with greater choices and performance not previously available, and are very cost effective. Our G2 Series products provide improved control, additional features, higher performance, and greater system flexibility than ever before. Any module can be easily controlled and monitored by simply sliding the module into the rear module bay of a G2 Series Mainframe (see page 1-4) with the correct power supply configuration.

Solid-state, relay-based, fiber optic and digital products are offered to meet most any requirement. The list of module types keeps growing with new products including both NxM switching arrays and 1xN types. Also, both non-blocking (full fanout), combining (summing) or blocking (1:1) arrays are available, plus fully digital types as well including TTL, 422, ECL, PECL and LVDS.

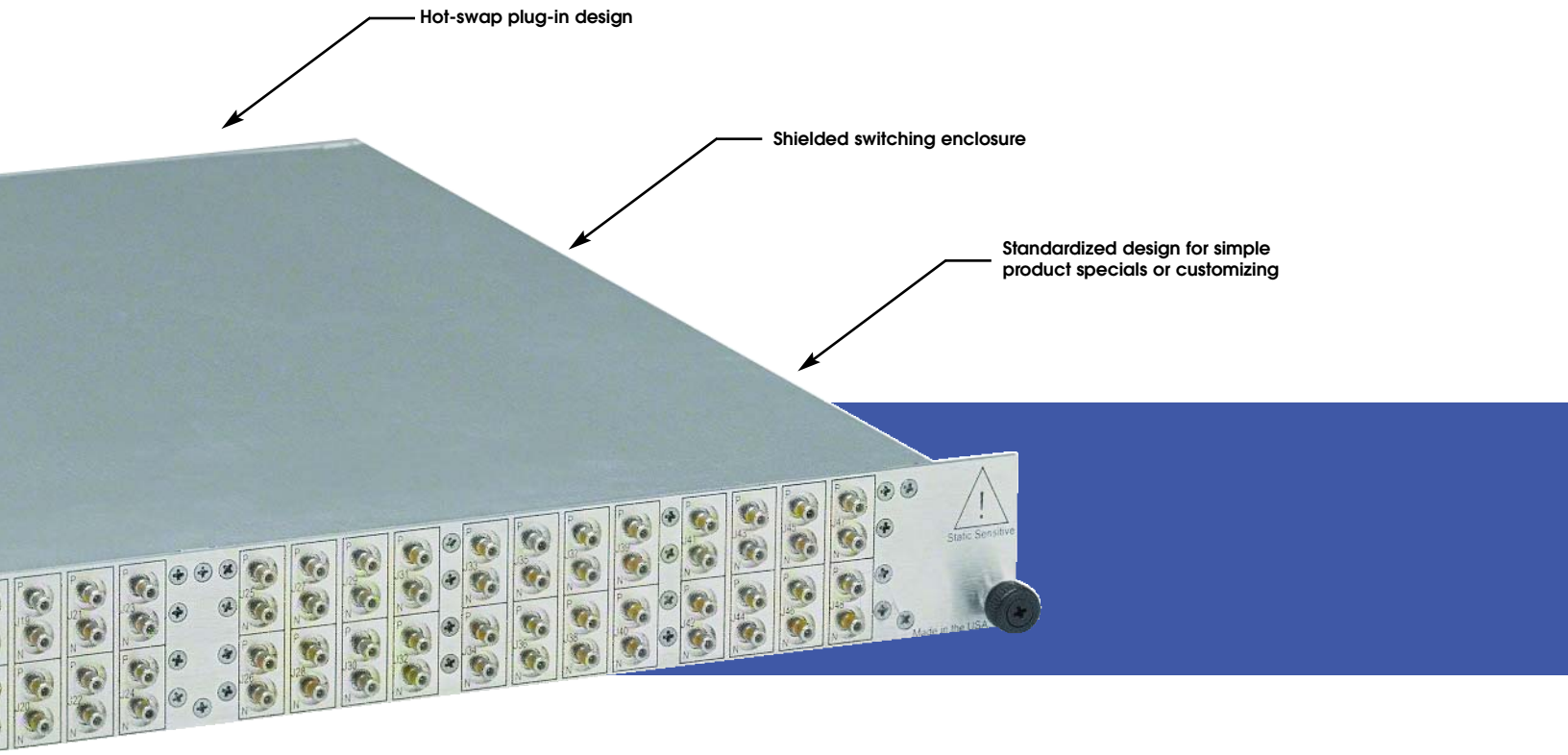
These modules are designed to plug into any of our G2 Series mainframe units (page 1-4). These mainframe units provide control and DC power to the modules in a standard 19 inch rack mounted package (from 2RU to 8RU).

When installed into a G2 Series mainframe unit, the modules are controlled via any industry standard remote control interface, or by the standard illuminated front panel control and display included with each mainframe. Modules are designed for Hot-swap installation allowing for quick and easy sparing and low down-time. Relay-based modules include a coil status feature that verifies the integrity of command execution to insure proper module operation.



Features:

- High reliability and rugged
- Choice of fiber optic, solid-state, relay-based and digital products
- Standard fully shielded compact packaging
- Low cost per crosspoint
- Custom modules easily configured at the factory



Almost any type of signal can be routed including the following:

- Audio (mono and multi-channel)
- Power AC or DC switching up to 90 amps
- Standard Video, NTSC, YC, composite or PAL
- Telemetry data (both analog and digital data)
- High resolution RGB (HV) video
- High performance RF or IF signals
- Differential data (PECL, ECL, LVDS and `422 types)
- Cellular signals including microwave (to 40GHz)
- Automated test station stimulus and measurement
- Digital TTL or ECL data, plus low voltage signals

The latest in switching technology has been paired with state-of-the-art control and status components. Embedded into each module is a field replaceable CPU assembly that provides control and status of the internal switching assemblies. A light-weight rugged aluminum enclosure provides a fully shielded environment for virtually noise free signal routing. Additional module grounding is provided by the aluminum module slides that guide the module into a G2 Series mainframe, plus each module is secured to the mainframe with stainless steel captive fasteners.

For easy identification, the model numbers for solid-state modules begin with a **G2S** designation, while the relay based products begin with a **G2R** designation. The **G2D** designation identifies solid-state "digital" units and the **G2F** products are fiber optic. All information shown is in condensed form. For additional information, please call your sales engineer or the factory for the associated specification sheet listed in the table, or download the data sheet in PDF format from our website.

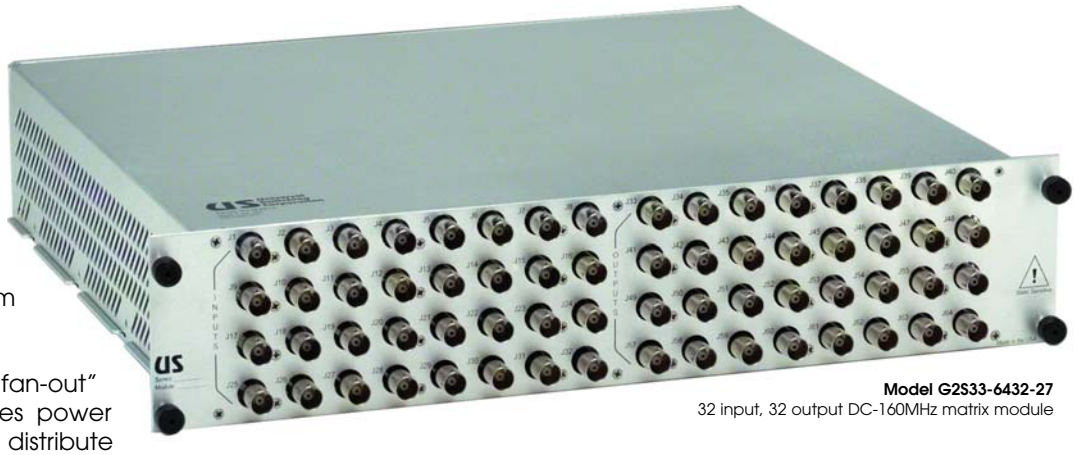
What is MxN and 1xN?

What does MxN and 1xN mean?

These two terms are industry designations describing the type of switching configuration of a given module. The table on the module selection page is broken into sections for MxN (page 1-16) and 1xN (page 1-18).

MxN Modules

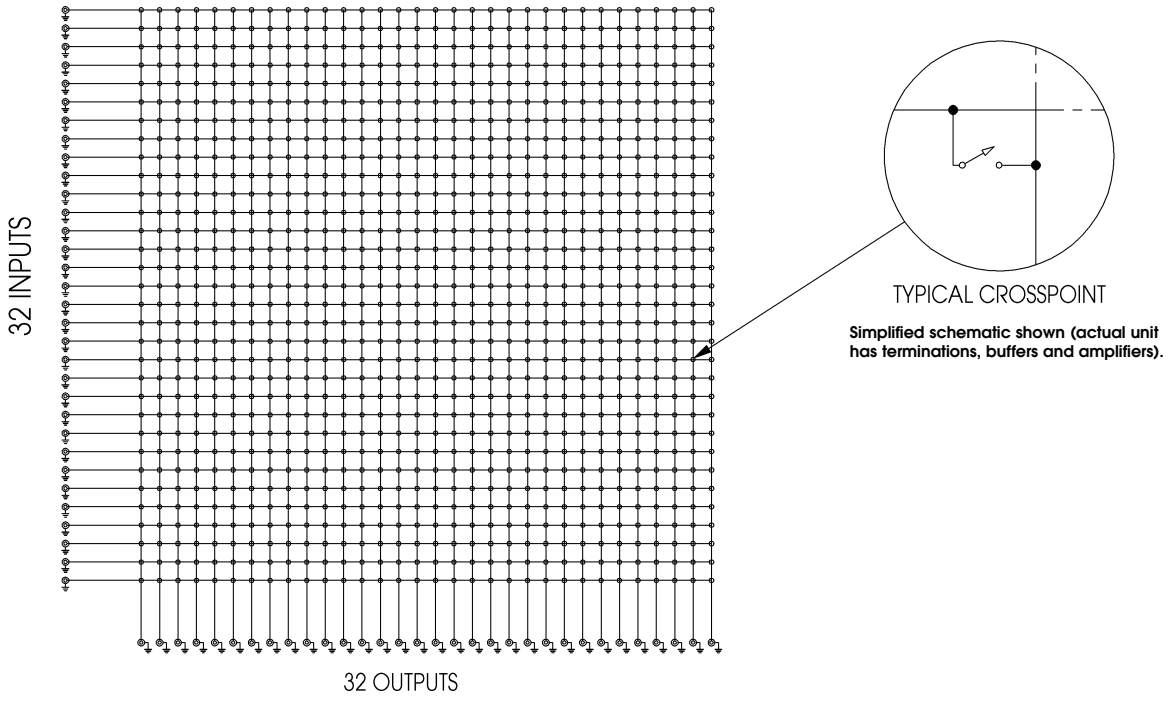
Basically, an MxN type module is a crosspoint matrix with a number of inputs (M), and a number of outputs (N). Any input can be connected to any output on the same module. In many cases, a given input can be connected to one, many or possibly all outputs at the same time. This is referred to as "non-blocking" or a "fan-out" matrix and would allow the signal to be distributed without loading the input. Further details about each module are available on the uswi.com web-site.



Model G2S33-6432-27
32 input, 32 output DC-160MHz matrix module

Typical enhancements on a "fan-out" MxN module is that it includes power dividers and amplification to distribute the signal and yet remain unity gain. A blocking MxN matrix typically does not contain power dividers or amplifiers. Such is the case with the G2R19A module that switches signals spanning DC-18GHz.

Shown above is the model G2S33-6432-27 module which has a 32x32 configuration. A simplified schematic diagram is shown below.



Simplified schematic shown (actual unit has terminations, buffers and amplifiers).

1xN Modules

A very common switching configuration is the "1xN". It is similar to the MxN switching configuration except that one axis of the switch configuration only has one port. The other exception is that it does not normally provide any fanout of the signal, but it is bi-directional.

For example; a 1x16 configuration can be used to connect a single source to one of sixteen destinations, or one of sixteen sources can be selected to connect to a single destination. Further details about each module are available on our web-site.

Model G2R16-11X16-25
Single 1x16 with switched expander port

Shown here is the model G2R16-11X16-25 module with a 16x1 (1x16) configuration that also includes a switched expander port. A functional schematic diagram of the module (Fig 2) illustrates the 1xN "tree" design. This type of design provides excellent high frequency performance.

Other 1xN designs have a common bus so that multiple connections could be closed at the same time (see Fig 1). This is called a "common-line" design and is generally used for lower frequency applications.

Fig 1: Common-Line Design

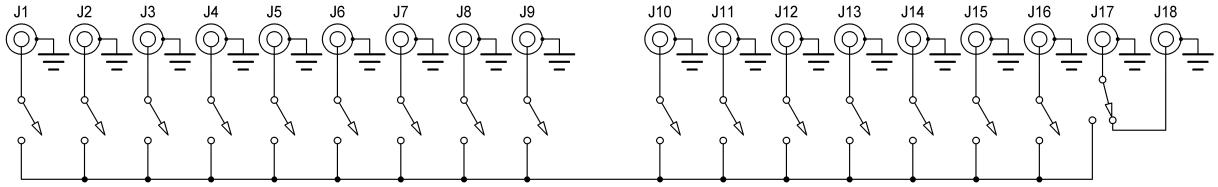
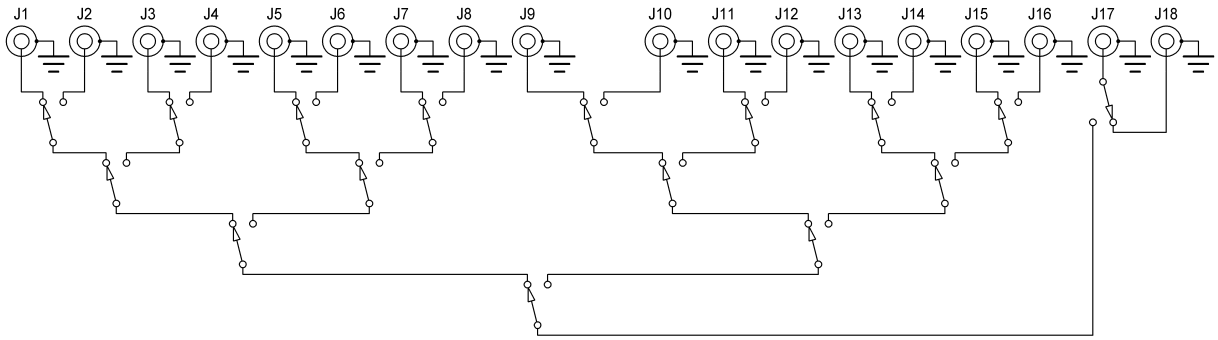


Fig 2: Tree Design



G2 Series Modules

Model G2D70-1608-25A
8 input, 8 output differential ECL
matrix with SMA connectors

Model G2R22-101X6-60
Ten sections of 1x6 DC-26GHz
relays with SMA connectors

Model G2R12-51X6-60
Five sections of 1x6 DC-12GHz
relays with N-Type connectors

Model G2R16-11X16-25
Single 1x16 switch mux, DC-1.3GHz
with BNC connectors and switched expander

Model G2S47-6432-25
32 input, 32 output solid-state coaxial (BNC)
20-250MHz matrix with input and output expander ports

Model G2R20-444-60
Multiple sections of DC-26GHz
relays with N-Type connectors

Model G2F90-81X2-2SC
Eight section 1x2 Fiber optic switch
with SC connectors

Model G2R06-D32-22
Thirty-two DPST relay contacts (2 amp)
with DC-37P connectors

Model G2R18-61X6-60
Six sections of 1x6 DC-18GHz relays
with SMA connectors

Model G2R19-1610-60N
6 input, 10 output blocking DC-18GHz
matrix with N-Type connectors

Model G2S33-6432-27
32 input, 32 output solid-state coaxial
DC-160MHz matrix with BNC connectors

Model G2R14-61X6-65
Six sections of 1x6 DC-18GHz terminated
relays with SMA connectors

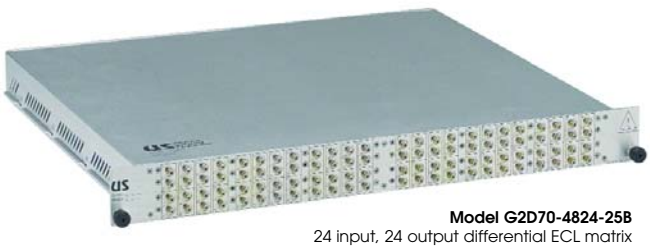
Model G2D70-4824-25B
24 input, 24 output differential ECL matrix
with SMB connectors

G2 Series Modules: MxN

Sorted by Frequency Range

Series	Elements	Frequency Range	Isolation (dB) Typical	Impedance	Minimum Size	
G2S02	Solid-state	DC-500kHz	>70dB @ 100kHz	100, 300, 600 or 50K	16in, 16out	
G2R10	Relay	DC-10MHz (typ)	>45dB @ 10MHz	100 ohm balanced	4in, 4out, 2-wire	
G2S11	Solid-state	T1 & E1 rates	n/a	100 ohm balanced	8in, 8out	
G2D62B	Digital	DC-50Mbps	n/a	100 ohm (422)	8in, 8out	
G2D64B	Digital	DC-50Mbps	n/a	100 ohm (422)	32in, 32 out	
G2S32H	Solid-state	DC-75MHz	>60dB @ 10MHz	50 or 75 ohm	8in, 8out	
G2S32	Solid-state	DC-125MHz	>40dB @ 125MHz	50 or 75 ohm	8in, 8out	
G2S33	Solid-state	DC-160MHz	>40dB @ 125MHz	50 or 75 ohm	8in, 8out	
G2S44	Solid-state	20-250MHz	>60dB @ 70MHz	50 or 75 ohm	8in, 8out	
G2S47	Solid-state	20-250MHz	>60dB @ 70MHz	50 or 75 ohm	8in+EX, 8out+EX	
G2S48	Solid-state	20-250MHz	>60dB @ 70MHz	50 or 75 ohm	8in, 8out+EX	
G2S54	Solid-state	20-250MHz	>60dB @ 70MHz	50 or 75 ohm (combine)	8in, 8out	
G2S57	Solid-state	20-250MHz	>60dB @ 70MHz	50 or 75 ohm (combine)	8in+EX, 8out+EX	
G2S58	Solid-state	20-250MHz	>60dB @ 70MHz	50 or 75 ohm (combine)	8in, 8out+EX	
G2D70	Digital ECL	>360Mbps	n/a	50 ohm (differential)	8in, 8out	
G2D71	Digital	>400Mbps	LVDS in, ECL out	50 ohm (differential)	8in, 8out	
G2D72	Digital	>400Mbps	LVDS in, LVDS out	50 ohm (differential)	8in, 8out	
G2S42	Solid-state	20-1000MHz	>50dB @ 1000MHz	50 ohm	8in, 8out	
G2S75A	Solid-state	800-2400MHz	>50dB @ 2400MHz	50 ohm	8in, 8out	
G2S75X	Solid-state	150-3000MHz	>50dB @ 2400MHz	50 ohm	8in, 8out	
G2S78	Solid-state	20-3000MHz	>50dB @ 2400MHz	50 ohm	8in, 4out	
G2R19A	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm	4in, 2out	

Model G2S33-6432-27
32 input, 32 output solid-state coaxial
DC-160MHz matrix with BNC connectors



Model G2D70-4824-25B
24 input, 24 output differential ECL matrix
with SMB connectors

	Maximum Size	Slots	Conn Type	Features or Applications	Spec Sheet
	64in, 64out	1-2	D-Sub	Low-level audio or ATE switching	#G2S02-001
	16in, 16 out, 2wire	1	D-Sub	Passive ATE relay matrix, bidirectional	#G2R10-001
	16in, 16out	3	RJ45	Great for ATE systems for Telcom	#G2S11-001
	64in, 64out	1-8	Triax (BJ77)	For Differential Clock/Data with Triax	#G2D62-001
	64in, 64out	1 or 2	D-Sub	Suited for Clock/Data, flexible	#G2D64B-001
	64in, 64out	1-8	BNC	High level video module to 75MHz	#G2S32H-001
	64in, 64out	1-8	BNC	General purpose video module to 125MHz	#G2S32-001
	64in, 64out	1-8	BNC	Enhanced range video module to 160MHz	#G2S33-001
	48in, 48out	4-6	BNC	High performance non-blocking fanout IF matrix	#G2S44-001
	48in+EX, 48out+EX	4-6	BNC	Same as G2S44 but with both in and out expanders	#G2S47-001
	48in, 48out+EX	4-6	BNC	Same as G2S44 but with output expanders only	#G2S48-001
	48in, 48out	4-6	BNC	High performance non-blocking combiner IF matrix	#G2S54-001
	48in+EX, 48out+EX	4-6	BNC	Same as G2S54 but with both in and out expanders	#G2S57-001
	48in, 48out+EX	4-6	BNC	Same as G2S54 but with output expanders only	#G2S58-001
	64in, 64out	2-16	SMA or SMB	High speed ECL clock/data applications	#G2D70-001
	64in, 64out	2-8	SMB	Telemetry or Satellite with conversion	#G2D71-001
	64in, 64out	2-8	SMB	Telemetry or Satellite, LVDS in/out	#G2D72-001
	12in, 16out	4	BNC or SMA	Wideband non-blocking small scale matrix	#G2S42-001
	32in, 32out	4-12	SMA or N-Type	High performance non-blocking L-Band matrix	#G2S75A-001
	32in, 32out	4-12	SMA or N-Type	Wideband non-blocking high performance matrix	#G2S75X-001
	16in, 16out	3-6	SMA or N-Type	Very wideband matrix for satellite & cellular needs	#G2S78-001
	8in, 8out	4	SMA or N-Type	Blocking 1:1 low loss microwave matrix	#G2R19I-001

Model G2R06-D32-22
Thirty-two DPST relay contacts (2 amp)
with DC-37P connectors

Model G2S47-6432-25
32 input, 32 output solid-state coaxial (BNC)
20-250MHz matrix with input and output expander ports

G2 Series Modules: 1xN

Sorted by Frequency Range

Series	Elements	Frequency Range	Isolation (dB) Typical	Impedance	Minimum Size	
G2S08	Solid-state	DC-400Hz	Power Relay	AC or DC switch	1ea 1x1	
G2R04	Relay	DC-10MHz (typ)	>50dB @ 10MHz	100 ohm balanced	1ea 1x4, 2-wire	
G2R06	Relay	DC-10MHz	>60dB @ 10MHz	General purpose	8ea 1x1 (DPDT)	
G2R16	Relay	DC-1.3GHz	>55dB @ 1GHz	50 or 75 ohm	6ea 1x2	
G2R16T	Relay	DC-1.3GHz	>55dB @ 1GHz	50 or 75 ohm (self term)	6ea 1x2	
G2R15	Relay	DC-3GHz	>60dB @ 1GHz	50 or 75 ohm	6ea 1x2	
G2R15T	Relay	DC-3GHz	>60dB @ 1GHz	50 or 75 ohm (self term)	6ea 1x2	
G2R13	Relay	DC-6GHz	>50dB @ 3GHz	50 ohm	6ea 1x2	
G2R20	Relay	DC-12GHz	>80dB @ 4GHz	50 ohm	1ea 1x2	
G2R12	Relay	DC-12GHz	>80dB @ 4 GHz	50 ohm	1 ea 1x3	
G2R14	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm (self term)	1ea 1x3	
G2R17	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm	1ea transfer	
G2R18	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm	1ea 1x6	
G2R21	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm	1ea 1x2	
G2R22	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm	1ea 1x6	
G2R27	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm (self term)	1ea 1x8	
G2R28	Relay	DC-18GHz	>60dB @ 18GHz	50 ohm	1ea 1x8	
G2R25	Relay	DC-26.5GHz	>55dB @ 26GHz	50 ohm	4ea 1x2	
G2R40	Relay	DC-40GHz	>50dB @ 40GHz	50 ohm	1ea 1x3	
G2F90	Mems	1300-1610nm	>50dB	n/a	1ea 1x2	

Model G2R06-D32-22
Thirty-two DPST relay contacts (2 amp)
with DC-37P connectors

Model G2F90-81X2-2SC
Eight section 1x2 Fiber optic switch
with SC connectors

Series	Elements	Frequency Range	Range	Impedance	Minimum Size	
G2RA	Attenuator	DC-500MHz	0 - 63.5dB @ 1/2dB	50 or 75 ohm	n/a	
G2RA2	Attenuator	DC-500MHz	0 - 63.5dB @ 1/2dB	50 or 75 ohm	n/a	

	Maximum Size	Slots	Conn Type	Features or Applications	Spec Sheet
	1ea 1x8	3	Terminal Screw	AC or DC power switching, dropout simulation	#G2S08-001
	1ea 1x4, 8 wire	1	D-Sub	Multi-wire configuration for general purpose switching	#G2R04-001
	4ea 1x16 (DP16T)	1	D-Sub	Multi-purpose 2-wire for ATE or general purpose	#G2R06 (multiple)
	1ea 1x16 w/exp	1	BNC or SMA	Highband ATE, digital, or RF switching, normally open	#G2R16-001
	1ea 1x16 w/exp	1	BNC or SMA	Same as G2R16 but with self-terminating inputs	#G2R16T-001
	1ea 1x16 w/exp	1	SMA	High performance for ATE, digital or L-Band	#G2R15-001
	1ea 1x16 w/exp	1	SMA	Same as G2R15 but with self-terminating inputs	#G2R15T-001
	2ea 1x8	1	SMA	High frequency fail-safe type	#G2R13-001
	6ea 1x2, 2ea 1x6	4	N-Type	High power RF and microwave routing to 12GHz	#G2R20-001
	5ea 1x6	4	N-Type	High power RF and microwave routing to 12GHz	#G2R12-001
	6ea 1x6	3	SMA	Multiple 1xN with self-terminating inputs	#G2R14-001
	8ea transfer	2	SMA	Transfer "baseball" relays (A-1, B-2 or A-2, B-1)	#G2R17-001
	7ea 1x6	3	SMA	Multiple 1xN relays for microwave applications	#G2R18-001
	8ea,1x2 & transfer	2	SMA	Multiple transfer relays and 1x2's	#G2R21-001
	10ea 1x6	2	SMA	Same as G2R18 only higher density	#G2R22-001
	4ea 1x10	5	SMA	Same as G2R14, but 1x8 and 1x10 size	#G2R27-001
	7ea 1x10	3	SMA	High density 1x10 relays in a 3-slot module	#G2R28-001
	16ea 1x2	2	SMA	High density compact 1x2 relays to 26GHz	#G2R25-001
	7ea 1x6	3	K-Type	Multiple 1xN to 40GHz with K-Type connectors	#G2R40-001
	8ea 1x2	2	SC or FC	Optical switch with 1x2	#G2F90-001

Model G2R16-11X16-25
Single 1x16 Switch Mux, DC-1.3GHz
with BNC connectors and switched expander

Model G2R18-61X6-60
Six sections of 1x6 DC-18GHz relays
with SMA connectors

	Maximum Size	Slots	Conn Type	Features or Applications	Spec Sheet
	n/a	1	BNC	Single attenuation section	#G2RA-001
	n/a	1	BNC	Dual (independent) attenuation sections	#G2RA-001

Pre-Configured Systems

Pre-Configured SS2 Systems - EXTRA VALUE

Standard switching packages with control software included

We have a new system package called **SS2** which takes common configurations from the G2 Series switching line and makes it simple to order a completely "turn-key" unit. Below are some examples but check our website for additional details. All units are currently based on the 2RU rack mounted G2S400CE unit, include redundant power supplies and contain all three remote interface types (Ethernet, Serial and GPIB). See our website for additional details.

SS2 Pre-Configured G2 Systems

Sorted by Model Number

Model	Frequency Range	Switching Array Description
SS202	DC-150kHz	Differential analog matrix for audio or telemetry, 16x16 to 64x64
SS214	DC-18GHz	Up to seven 6x1 self-terminating microwave relays
SS215	DC-3GHz	Coaxial Nx1 switching, 2x1, 4x1, 8x1, 16x1 sizes, SMA connectors
SS216	DC-1.3GHz	Coaxial Nx1 switching, 2x1, 4x1, 8x1, 16x1 sizes, BNC or SMA
SS216T	DC-1.3GHz	Coaxial Nx1 switching with self-termination, 2x1, 4x1, 8x1, 16x1 sizes, BNC or SMA
SS218	DC-18GHz	Up to seven 6x1 normally open microwave relays, SMA connectors
SS219A	DC-18GHz	Microwave matrix (1:1 connections) from 4x4 to 8x8, SMA connectors or N-Type
SS232	DC-125MHz	DC coupled system for high frequency video signals (+/- 1.5V)
SS232H	DC-75MHz	DC coupled system for high-level PCM, video, TTL or similar signals (+/-5V)
SS240	DC-40GHz	Up to seven 6x1 normally open microwave relays, SMA connectors
SS244	20-250MHz	High performance non-blocking "fan out" IF matrix, 8x8 to 32x32, 50 or 75 ohm
SS254	20-250MHz	High performance combining "fan in" IF matrix, 8x8 to 32x32, 50 or 75 ohm
SS262A	DC-50Mbps	Differential 422 digital matrix for clock/data, 16x16 to 32x32, single or dual, Triax connectors
SS264B	DC-50Mbps	Differential 422 digital matrix for clock/data, 16x16 to 64x64, single or dual, D-Sub connectors
SS270	DC-400Mbps	Differential ECL digital matrix for clock/data, 8x8 to 32x32, single or dual, SMA or SMB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Critical Application Systems (G2-CAS)

2

About G2-CAS Series

About G2-CAS Series

G2-CAS Series (Critical Application System)
Modules covering DC-30GHz

Designed specifically for applications where low downtime, high performance, modularity and maintainability are of paramount importance, the **G2-CAS** product line outperforms all other manufacturers.

Leveraged from our field proven G2 Series, the **G2-CAS** is a reliable platform unequaled in the switching industry. The rugged aluminum construction provides the ultimate in modularity and durability while the advanced control and power system give the site designer total system confidence.

The typical **G2-CAS** system is comprised of two (or more) rack mount units. The smaller 2RU rack mount "controller/power" head unit contains self-monitoring hot-swap power supplies and up to two hot-swap control CPU units. The supplies and the CPU's are accessed from the hinged front panel. No rear access is needed once the unit is installed.

The 2RU controller/power unit connects to the switching and distribution frame unit(s) via two cables to supply DC power and control. Sized module "frames" are available depending upon what is needed to meet the application. The unique **G2-CAS** design allows us to configure an appropriately sized unit in a cost effective manner.

Systems are factory configured to meet the customer specifications provided. The modular rear panel can host any type of I/O connector without affecting the design of the actual switching modules and amplifiers.

All modules, CPU's and power supplies can be hot-swapped via the hinged front panels without disturbing any signal cabling whatsoever. Simply open the front panel, slide the module out and replace with a spare one.

Example **G2-CAS** switch frame (front view) 17RU

Construction

Quality hardware is used throughout the design of the **G2-CAS** products. Since customers demand the best for their critical application, hinged front panels with vents, lockable folding handles, and all aluminum heavy gauge construction is provided.

Applications

- Ground stations
- Communication centers
- Defense or FAA needs
- Critical missions

Features

- Extreme redundancy built-in
- All items removable via the front
- Open air cooling design on switching frame
- Design supports DC-30GHz
- Easy to configure product for custom needs
- Redundant hot-swap power supplies
- Dual (redundant) control ports available
- LabVIEW drivers available

Plug-in Modules

The "frame" contains all the hot-swap modules whether they be switches, distribution amplifiers or other types. Each module has a built-in CPU that monitors and controls its functions along with driving the on-module status and error indicators.

The modules install from the front of the unit eliminating the need to remove signal cables when replacing or installing a module. This unique design provides for quick replacement. Modules are secured with two high quality positive-lock latch devices. A finger handle is also provided for easy module extraction. Modules can be single slot or multi-slot.

The "frame" backplane is factory configured to meet the user requirement. It can contain blind-mate coaxial connectors, multi-pin connectors or a combination of both depending upon the application. Being completely passive, this part of the system never requires user access.

General Specifications

Module technology	Hot-swappable
Power supply section	Redundant hot-swap supplies standard
Control ports	Ethernet with TCP/IP Serial (RS-232, RS-422, RS-485) GPIB (IEEE-488)
Manual control	4x20 VF display and back-lit keypad
Configuration routing	AutoRoute or manual
Configuration memory	200 lithium-backed locations
Memory retention	>10 years
Cooling	Monitored fan assisted
AC power requirements	90-264VAC, 47-440Hz, <500Watts
Size	TBD-H x 22.00D x 19.00W
Operating temp	0 to +60C
Non-operating temp	-20 to +85C
Humidity	0 to 95% (NC @ +25C)

Plug-in Supplies and CPU

The controller/power head unit provides a **G2-CAS** system with the capability of hot-swap redundant power supplies and hot-swap redundant control CPUs. When redundant CPUs are installed, the user gets a full second set of remote interface ports (Ethernet, Serial and GPIB).

The power supplies and CPUs are installed via the hinged front panel for quick access. The control CPUs can be quickly upgraded while in the field. A FLASH port is available on each unit and a cable is provided with each system so system firmware updates or feature upgrades can be easily uploaded by the user.

Each plug-in CPU provides one set of Ethernet, Serial and GPIB ports. The CPUs utilize our standard 488.2 protocol and is compatible with our control software package called RouteWarePRO.

A front panel LED illuminated control keypad and high contrast 4x20 vacuum fluorescent display are included. Free LabVIEW VISA drivers are also available for download on the uswi.com website, or download RouteWarePRO for a free 30-day free trial of a user friendly professional software control GUI.

G2 Series-CAS
2RU control and power head unit

Front mounted hot-swap power supplies

Dual AC inputs and redundant control ports

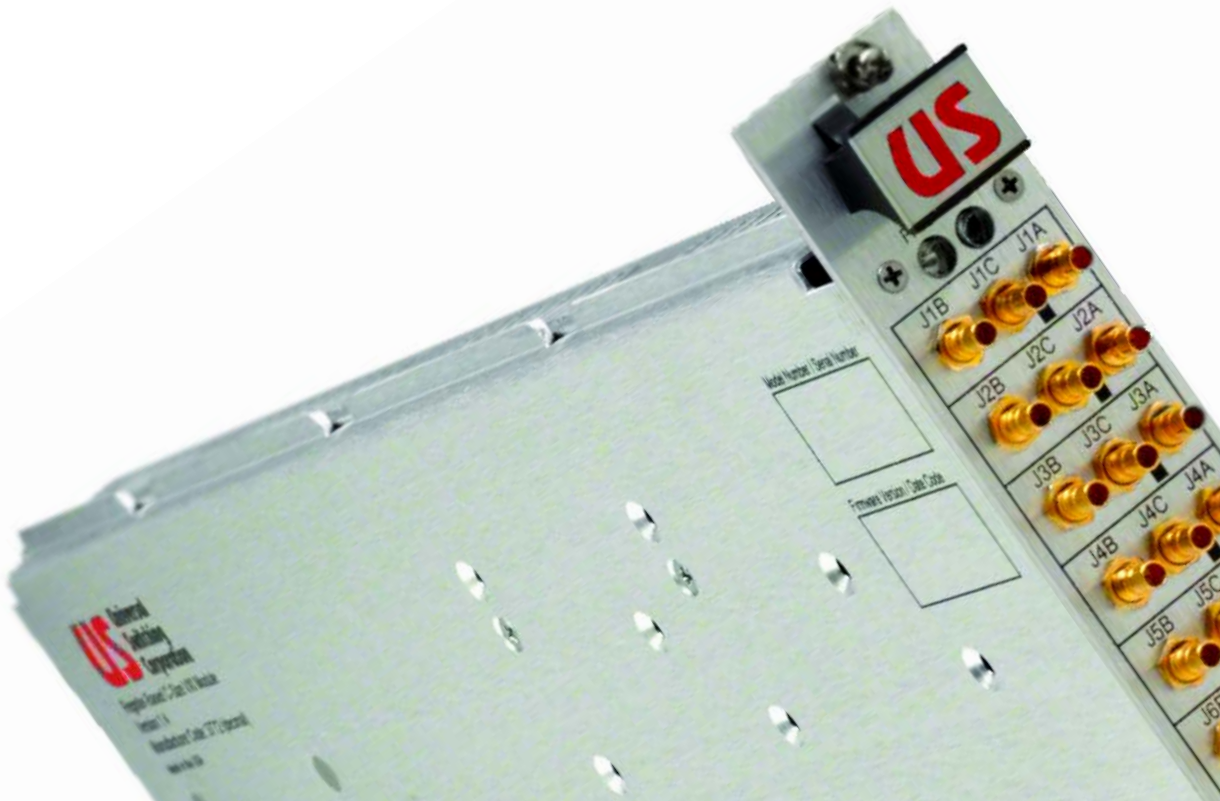
Contact the factory for new configurations or requirements not shown.

Application	Total RU	Max Configuration	Type	Connectors
Wide L-Band (20-3GHz)	19RU	12 input, 128 output	Non-Blocking (fan-out)	SMA or N-Type
Wide L-Band (20-3GHz)	19RU	128 input, 12 output	Combiner (fan-in)	SMA or N-Type
Wide L-Band (20-3GHz)	19RU	Dual 12 input, 64 output	Non-Blocking (fan-out)	SMA or N-Type
Wide L-Band (20-3GHz)	19RU	Dual 64 input, 12 output	Combiner (fan-in)	SMA or N-Type
IF 40-200MHz	19RU	12 input, 128 output	Non-Blocking (fan-out)	BNC
Wide L-Band (20-3GHz)	38RU	48 input, 128 output	Non-Blocking (fan-out)	SMA or N-Type
Microwave DC-18GHz	19RU	Dual 36 input, 36 output	Blocking (1:1)	SMA

QZ-CAS Series
L-Band 12x128 (Rx) and 128x12 (Tx)
in one factory assembled system

VXI & VME Products

3



VXI Switching Modules

Spanning Frequencies DC-40GHz Configurations from 1x2, up to 16x32

VXIbus modules are designed for a number of compact, modular switching applications including ATE, video, digital signals (ECL, LVDS and `422) and microwave equipment. They install into any industry standard C-sized VXI compatible mainframe. Modules sizes include C1 through C5. The width of the module is largely determined by the front panel area required to contain the signal connectors.

VXIbus modules provide the systems engineer with one of the most compact and advanced solutions for routing signals in an automated test environment.

This is achieved by utilizing the ATE industry's VXIbus standard coupled with our latest state-of-the-art switching technology. A complete redesign of our VXIbus modules during 2003 provides for additional features, new module types, new internal controllers and lower overall module cost.

VXI-RR161X2
Sixteen 1x2 relay sections
DC-1.3GHz with SMB connectors

VXI-E3216
16 input, 16 output differential
ECL switch with SMB connectors

VXI-RMR410
Four 1x10 relay sections
DC-18GHz with SMA connectors

VXI-RMR107
Mixed types of relay sections
DC-40GHz with SMA connectors

VXI-RGB3216
RGB 16 input, 16 output non-blocking video switch

VXI-DS4816
32 input, 16 output differential
422 data switch (for clock & data)

VXIbus History

The VXIbus standard was developed by a consortium of companies in 1987, joining forces to define and introduce a modular instrument standard that would be open to all manufacturers. The end result is lower overall system cost, smaller package size, higher performance and multiple sources of manufacturers for the user to shop from.

Universal Switching offers a number of standard C-sized VXIbus modules designed for register-based control. This type of control delivers the fastest control response and lowest cost to the user. They are considered the next generation of switching equipment to meet today's and tomorrow's needs for high performance and cost effective switching solutions.

The product line offers modules which span a bandwidth ranging from DC to 40GHz including digital switching modules with data rates up to 1.2Gbps too. Solid-state, digital and relay based technologies are utilized. This rugged switching equipment offers a variety of plug-in module types for addressing a wide spectrum of applications.

Sorted by Frequency Range, then Data Rate

Model	Elements	Size	Frequency	Figure	Description
VXI-SP6	Solid-state	C-2	DC-440Hz	2	Configurations available for fast power switching to simulate power dropouts as small as 500uS, up to 25 amps, AC or DC
VXI-RGB3216	Solid-state	C-1	DC-200MHz	1	RGB 16x16 high performance non-blocking full fan out video matrix, unity gain, high crosstalk isolation, multi-coax connectors
VXI-RATT6	Relay	C-1	DC-500MHz	5	Six individual programmable coaxial attenuators with 0-63.5dB range, <2dB transmission loss, 1/2 dB steps, SMB connectors, 50 or 75 ohms
VXI-RRQ16	Relay	C-1	DC-1GHz	7	Two individual 1x16 bi-directional coaxial switch sections, fall-back to position 1, SMB connectors, 50 or 75 ohm
VXI-RRD8	Relay	C-1	DC-1.3GHz	6	Four individual 1x8 bi-directional coaxial switching sections, fall-back to position 1, SMB connectors, 50 or 75 ohm
VXI-RR161X2	Relay	C-1	DC-1.3GHz	8	Sixteen 1x2 bi-directional coaxial switch sections, SMB connectors, 50 or 75 ohm Optional version has 3GHz bandwidth
VXI-RMR46	Relay	C-2	DC-18GHz	11	Quad 1x6 sections, normally open contacts, SMA connectors, 50 ohms
VXI-RMR36ST	Relay	C-2	DC-18GHz	15	Triple 6x1 sections, self-terminating contacts into 50 ohms, SMA connectors, with 2 watt 50 ohm terminations
VXI-RMR76	Relay	C-1	DC-18GHz	12	Seven 1x6 sections, normally open contacts, SMA connectors, 50 ohms
VXI-RMR72	Relay	C-4	DC-18GHz	16	Six 1x2 sections and ten 1x6 relay sections, SMA connectors. (1x2 sections are DC-26GHz)
VXI-RMR242B	Relay	C-2	DC-26GHz	13	Twenty-four 1x2 sections, SMA connectors, fail-safe, extra long contact life
VXI-RMR410	Relay	C-2	DC-18GHz	14	Quad 1x10 sections, SMA connectors, normally open
VXI-RMR107	Relay	C-5	DC-18GHz	17	Quad transfer relay sections, dual 6x1 sections and dual 10x1 sections with self-terminating contacts into 50 ohm, SMA connectors
VXI-RMR46-40	Relay	C-2	DC-40GHz	11	Quad 1x6 sections, normally open contacts, K-Type connectors, 50 ohm
VXI-DS3216A	Digital (422)	C-1	DC-50Mbps	3	16x16 non-blocking differential digital data ('422) switching array, SCSI-II type high density multi-pin connectors
VXI-D4816A	Digital (422)	C-1	DC-50Mbps	3	32x16 non-blocking differential digital data ('422) switching array, SCSI-II type high density multi-pin connectors
VXI-E3216	Digital (ECL)	C-2	>600Mbps	10	Differential ECL 16x16 full fanout non-blocking digital data switching array, dual SMB connectors per port
VXI-ET1006	Digital (ECL)	C-2	>600Mbps	9	Triple section, differential 4x6 full fanout non-blocking digital data switching array, dual SMB connectors per port are standard
VXI-L3216	Digital (LVDS)	C-2	>1Gbps	10	Differential LVDS 16x16 full fanout non-blocking digital data switching array, dual SMB connectors per port

Notes:
1. See page 3-4 and 3-5 for above referenced.
2. New or custom configurations are available. Contact the factory.

VXI Switching Modules

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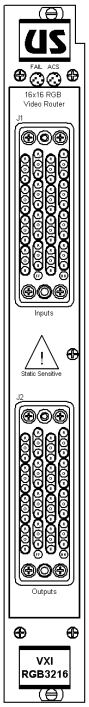

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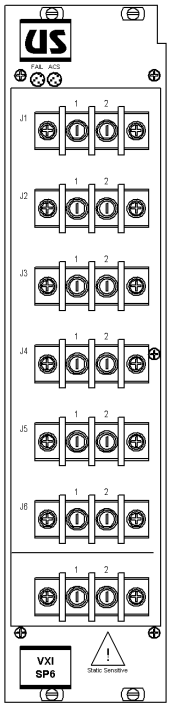

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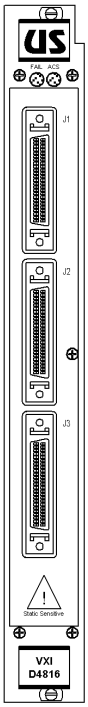

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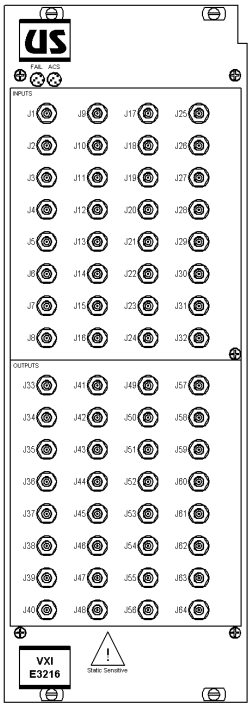

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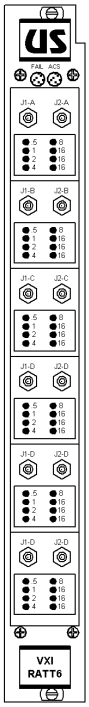

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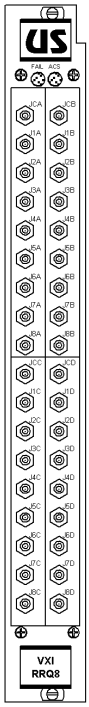

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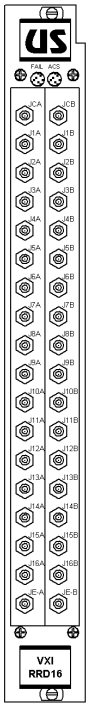

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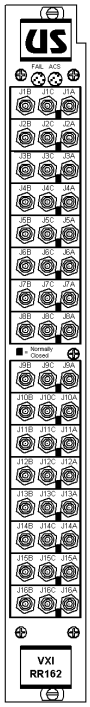

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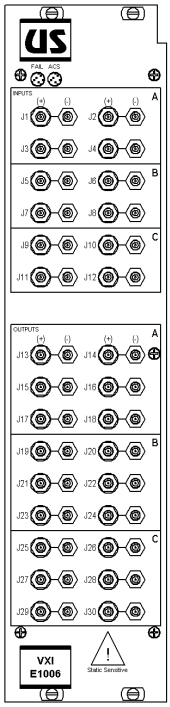

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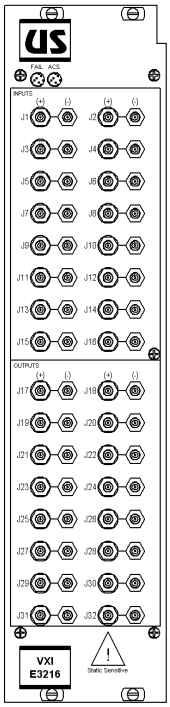

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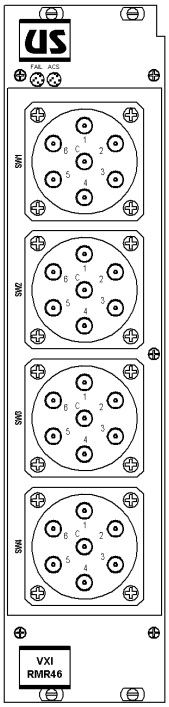

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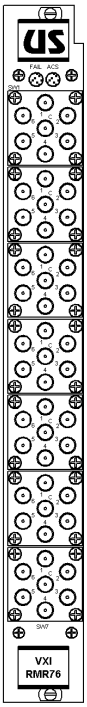

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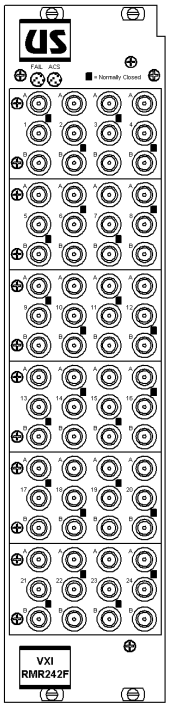

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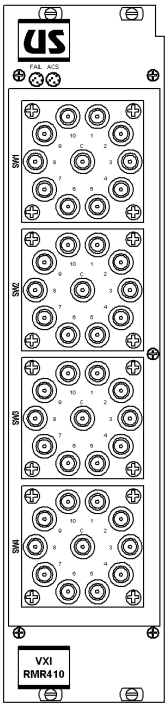

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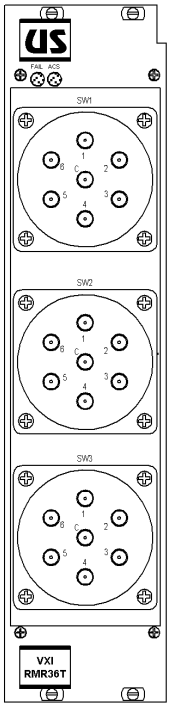

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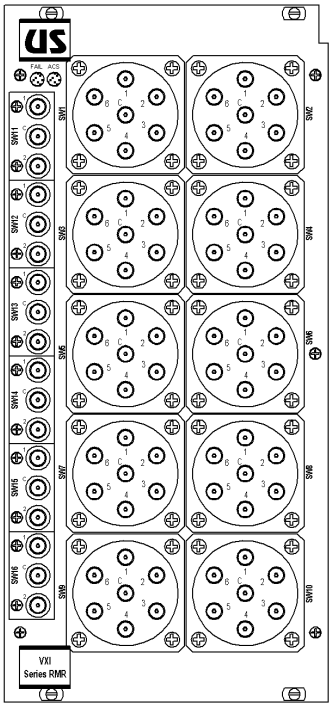

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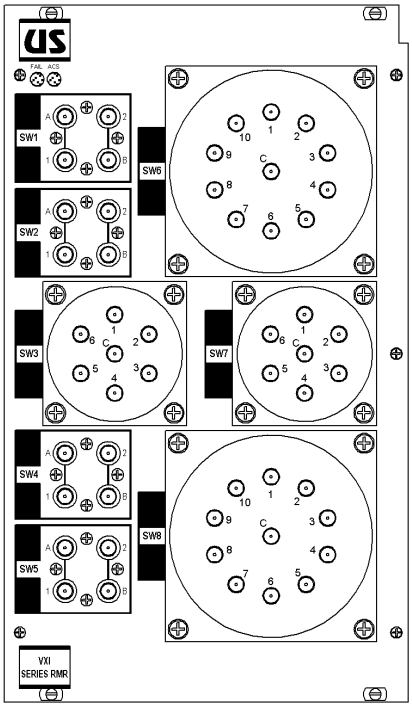


VXI Mainframe

Mil-Rugged VXI

The VXI-RM1 is a rugged 11 slot C-Sized VXI mainframe from our family of VXI products. It can be used in COTS installations, industrial applications and various military programs. It is designed and manufactured to MIL-STD specifications ensuring exceptional levels of ruggedness and EMI/RFI shielding. See table below.

The power supply section within the VXI-RM1 delivers over 2000 Watts of usable power. With integrated shock absorbers, it's built to protect your valuable VXI equipment while in the most demanding of environments.

Packed with advanced and proven design features, the VXI-RM1 also includes ease of use features such as an innovative hinged shelf for smooth power supply changeover. Unique supply mounting features prevent the power supply from being connected incorrectly. The power supply support shelf is fitted with solid gold connector pins for good electrical conductivity and high current capacity.

Front view with hinged front panel closed showing integrated air filter

Applications

The extremely rugged and RFI shielded mainframe can be used for numerous applications:

- For systems with frequencies DC to 50GHz
- Mobile communications centers
- Airborne systems
- Radar installations
- ATE test stations

Features

- Field proven design in a compact 9RU height
- 11-Slot capacity
- Popular C-size modules
- Mil-Spec ruggedized version VXI mainframe
- Passes 100G impact shock and 15G drop tests
- Exceptional EMI/RFI construction and shielding
- Large 2KW of usable DC power
- High peak and dynamic currents
- Multiple cooling configurations possible
- International AC power range
- Built-in rack mount design (19 inch)
- Self-monitoring plug-in power supply (CANbus output)
- Built-in chassis slide mounting (HD slides optional)

Tested to Meet

EMI / RFI

- MIL-STD-461
- MIL-STD-461D

DC Magnetic Field

- DOD-STD 1399 (MIL-STD-2306)

Shock / Vibration

- MIL-STD-901C (Grade A, Type A, Class 1)
- MIL-STD-810 (Method 516)
- MIL-E-16400
- MIL-STD-167
- DOD-STD 1399 (Section 73, Part 1)
- MIL-STD-167B (Type 1)

Temperature

- MIL-STD-2036
- MIL-16400

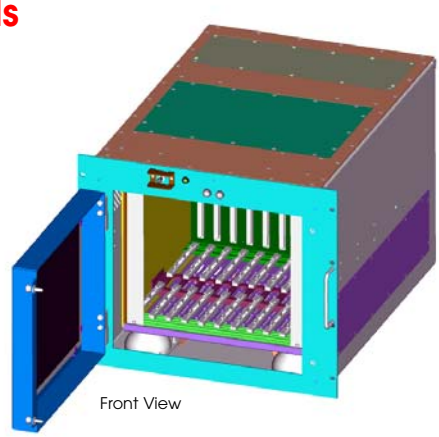
Mainframe Construction

The VXI-RM1 Mainframe is equipped with an integral anti-shock system for long-lasting performance in both industrial or extreme environments. The included heavy EMI/RFI shielding also means that your VXI modules perform as they should without external signals interfering, and for Mil-Spec needs, without your VXI modules leaking unwanted signals into the surrounding environment.

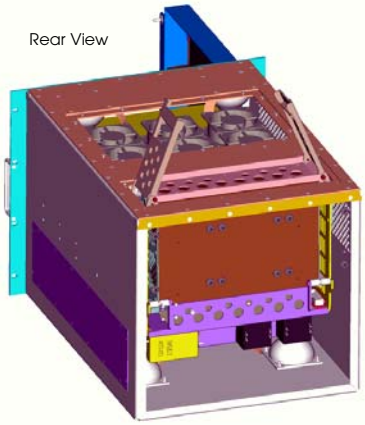
Built-in anti-shock system

Front view with hinged front panel removed exposing the EMI/RFI gasketing, floating internal 11-slot module cage, and integrated anti-shock system

Design Details



Front View



Rear View

Specifications

Size (less handles and door) .....15.72"H x 19.00"W x 24.06"D
Power switch .....Front panel
AC power .....85-264VAC, 47 to 440Hz, <15A
Front panel color .....Grumman Grey
Front panel thickness.....3/16"
Capacity.....Up to 11 single-wide modules
Cooling.....Fan assisted forced air
Venting.....Flexible locations (T/S/F/R)
Supply capacity.....2000 watts
Supply type . . . . . .Field replaceable plug-in

Weight 74lbs
Operating temp . . . . . .0 to +50C
Non-operating temp . . . . . .-62 to +71C
Humidity . . . . . .0 to 95% (non-condensing @ +25C)
Mounting . . . . . .RETMA slots (EIA), 9RU high
Chassis finish . . . . . .Two coats "Grumman Grey" (safflower oil-based paint)
Handles . . . . . .Included

Options

- -100 Side filter kit (2), with back and front blocking plates
- -101 Rear panel cut-out, for custom cabling bundles
- -102 Heavy duty rack slide kit to support 65kg load

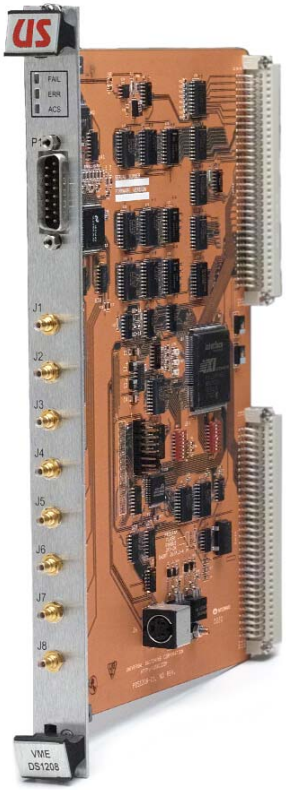
Legacy VME modules

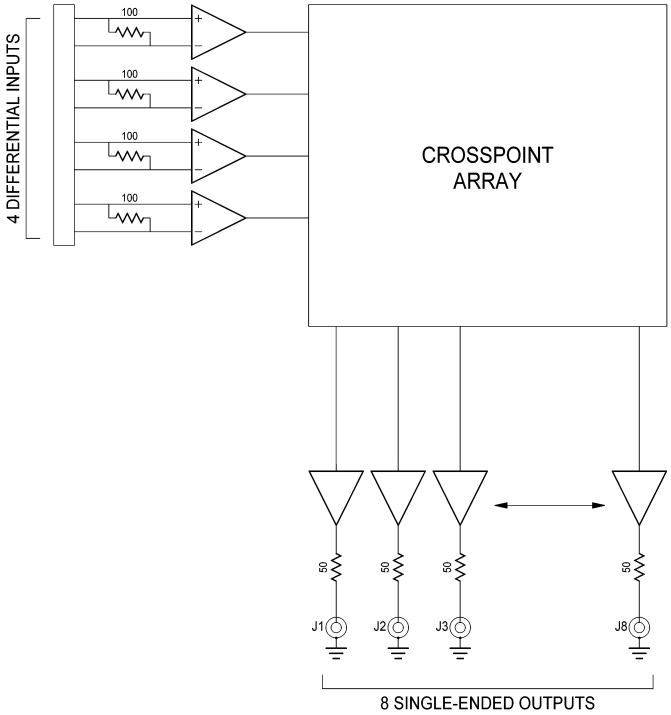
To further expand our switching product line, Universal Switching can develop some VME modules to help support meet specialized legacy needs in the communication and telemetry industries. These modules offer a alternative for system integrators when choosing switching assemblies to support or expand the life of existing VME designs.

Shown here is our Model VME-DS1208 module. It has a 6U style profile that delivers a 4x8 digital non-blocking full fanout matrix function. The four inputs to the module are located on the single DA-15P connector on the faceplate. Each input is a differential 422 type input pair with a 100 ohm input termination across the pair.

The eight outputs are also located on the faceplate and are presented as single-ended 50 ohm TTL outputs on individual SMB connectors. Any input can connect to any output, many outputs, or up to all outputs at the same time. Status LED's on the faceplate indicate the health and control status of the module.

NOTE: If you have a requirement for a new VME module, contact our local sales representative or the factory directly.





Redundancy Switching (backup)

4

System 10942B

Four Channel Redundancy Switch
DC-800MHz, 75 ohm

Large scale communication installations require state-of-the-art equipment. The 10942B provides the systems professional with an uncompromising combination of high performance and high reliability switching elements coupled together in a dual mode system design. Standard front installation redundant power supplies (available in AC or DC versions) plus redundant system control ports deliver the ultimate in system reliability for critical applications

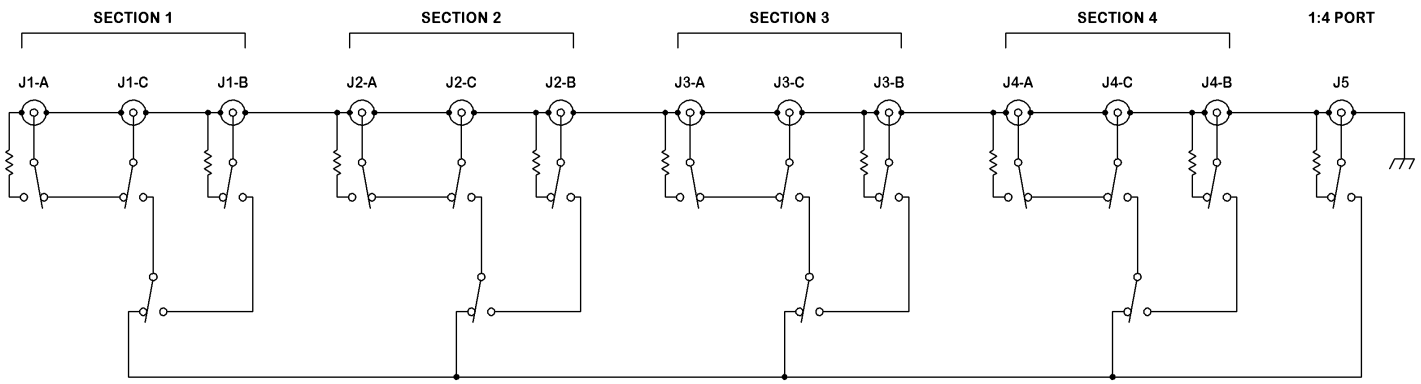
Compact and high performance, the 10942B provides cost effective, flexible switching capacity with 4 channels of A/B (primary or backup) switching in either 1:4 or 1:1 modes. Bandpass is excellent for video, IF or RF signals ranging to almost 1GHz.

Complete control and status of the unit is available at both the front panel controls or the dual remote ports (either dual serial, or single serial and 10/100 Ethernet) .

The 10942B also provides a direct TTL alarm input connector for backup channel selection with priority assignment (for 1:4 mode), plus an 8-bit driver port for controlling external devices. The 10942B has provisions for the user to field configure the serial mode of a serial port (RS-232C, RS-422A or RS-485).

Model 10942B-D485
AC powered dual serial port version

Simplified Signal Schematic
Power-off Mode Shown



Model Number Assignment

The 10942B is available in six standard configurations. The model number specifies the "shipped" serial interface factory configured (can be changed in the field).

Model Number	Interface	Capability	Conn
10942B-D232	Dual RS-232C	1:1 & 1:4	BNC-75
10942B-D422	Dual RS-422A	1:1 & 1:4	BNC-75
10942B-D485	**Dual RS-485**	**1:1 & 1:4**	**BNC-75**
10942B-SE	**Ethernet & RS-232C**	**1:1 & 1:4**	**BNC-75**
10942B-SE-A	Ethernet & RS-422A	1:1 & 1:4	BNC-75
10942B-SE-B	Ethernet & RS-485	1:1 & 1:4	BNC-75

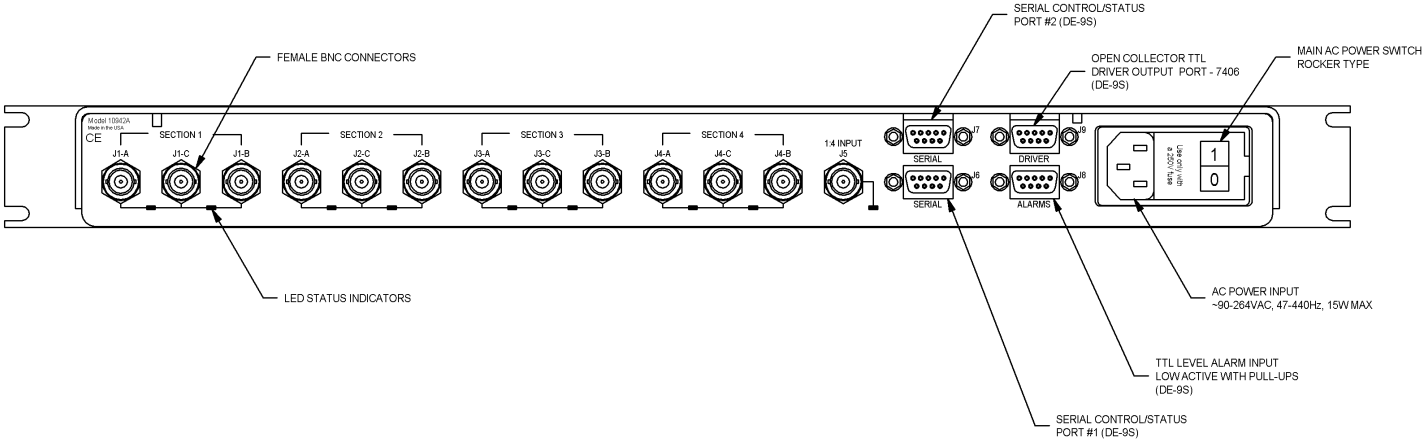
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The "shipped" serial interface configuration can be easily changed via configuration jumpers under the top cover if control needs change.*

Applications

- Airborne surveillance systems
- Communication installations
- Digital broadcast facilities or production studios
- Imaging and animation production facilities
- NTSC, PAL, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High reliability relays
- Four channels of A/B switching
- Dual mode, 1:4 or 1:1 backup switching
- >800MHz bandpass
- BNC signal connectors
- Redundant hot-swap power supplies
- Dual serial control ports available
- Direct TTL alarm inputs (active low)
- Field configurable serial (RS-232C/422A/485)
- 10/100 Ethernet control available
- International AC power input, or optional DC
- Certified CE EN61010 (LVD)
- LabVIEW drivers available



Model 10942B Specifications

Array size . . . . . .Four A/B channels
Switching mode . . . . . .1:1 or 1:4 backup capacity
Switching elements . . . . . .High reliability relays
Type of system . . . . . .A/B selector
Architecture . . . . . .Fixed size
Termination (unused ports) . . . . . .Included
Signal connector location . . . . . .Rear panel

I/O Characteristics
Impedance . . . . . .75 ohm
VSWR loss (1:1 mode) . . . . . .<1.5:1 @ 250MHz
Signal connector . . . . . .BNC female (75 ohm)
Coupling . . . . . .DC
Termination 1/8W, 1%

Signal Characteristics
Transmission loss . . . . . .1/4dB @ 200MHz
(1:1 mode, 75 ohm) 1/2dB @ 500MHz
1dB @ 800MHz
Crosstalk isolation . . . . . .>65dB @ 500MHz
>60dB @ 800MHz
Signal path . . . . . .Passive bidirectional

General Specifications
Switching speed . . . . . .<5mS
Power supply section . . . . . .Hot-swap redundant supplies
Power supply monitoring . . . . . .Included
Serial control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Ethernet port 10/100BaseT
Serial port connectors . . . . . .DE-9S (D-Type female)
Alarm connector (J8) . . . . . .DE-9S (D-Type female)
Driver output connector (J9) . . . . . .DE-9S (D-Type female)
Status LED's . . . . . .Front panel
Front panel display . . . . . .1x20 VF display (high contrast)
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 15Watts (max)
Fuse protection . . . . . .2A, 5mm (dual), AC models
Weight . . . . . .12 lbs
Size . . . . . .1.75H x 6.50D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>55,000 hours
Contact life . . . . . .>1,000,000 (per port)
Warranty . . . . . .2 years
Certifications . . . . . .CE EN61010

System 10943B

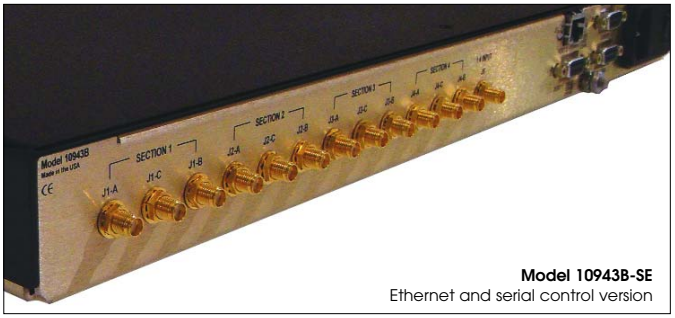
Four Channel Redundancy Switch
DC-2.4GHz (L-Band), 50 ohm

High value satellite communication installations require high reliability equipment. The 10943B provides the systems professional with an uncompromising combination of high performance and high reliability switching elements coupled together in a dual mode backup system design. Standard front installation redundant power supplies available in AC or DC versions plus redundant system control interfaces deliver the ultimate in system reliability for critical SatCom applications.

Compact and high performance, the 10943B provides cost effective, flexible switching capacity for critical installations, providing 4 channels of A/B (primary or backup) switching, in either 1:4 or 1:1 modes. Bandpass is excellent for L-Band, video, IF or RF signals ranging to just beyond 2.4GHz.

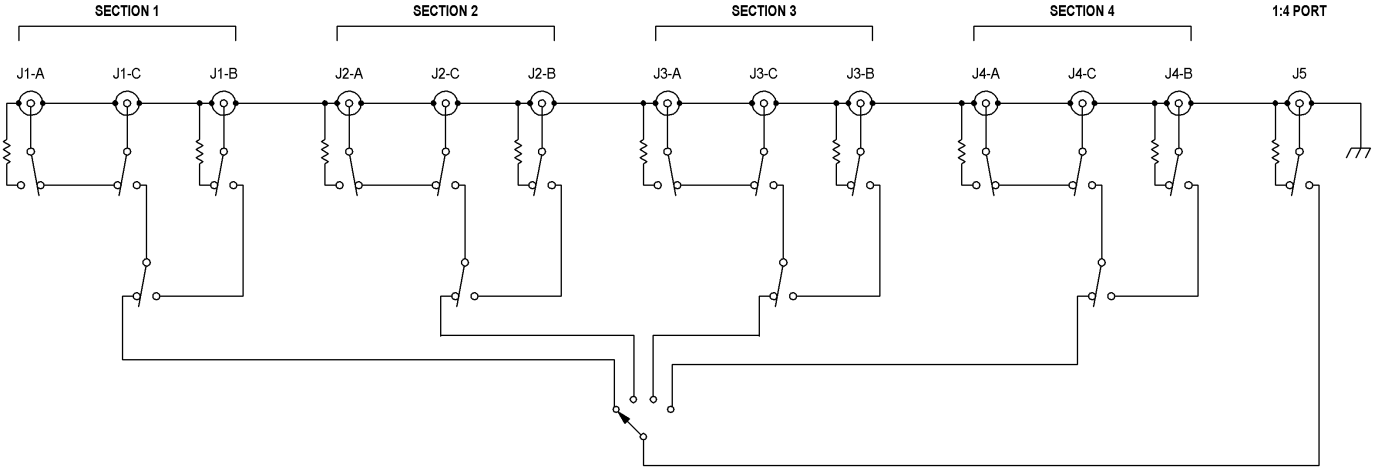
Complete control and status of the unit is available at both the front panel controls or the dual remote interfaces (either dual serial, or single serial and 10/100 Ethernet) .

The 10943B also provides a direct TTL alarm input connector for direct backup channel selection with priority assignment (for 1:4 mode), plus an 8-bit driver port for controlling external devices. The 10943B has provisions for the user to field configure the serial mode of a serial port (RS-232C, RS-422A or RS-485).



Model 10943B-SE
Ethernet and serial control version

Simplified Signal Schematic
Power-off Mode Shown



Model Number Assignment

The 10943B is available in six standard configurations. The model number specifies the "shipped" serial interface factory configured (can be changed in the field).

Model Number	Interface	Capability	Conn
10943B-D232	Dual RS-232C	1:1 & 1:4	SMA-50
10943B-D422	Dual RS-422A	1:1 & 1:4	SMA-50
10943B-D485	**Dual RS-485**	**1:1 & 1:4**	**SMA-50**
10943B-SE	**Ethernet & RS-232C**	**1:1 & 1:4**	**SMA-50**
10943B-SE-A	Ethernet & RS-422A	1:1 & 1:4	SMA-50
10943B-SE-B	Ethernet & RS-485	1:1 & 1:4	SMA-50

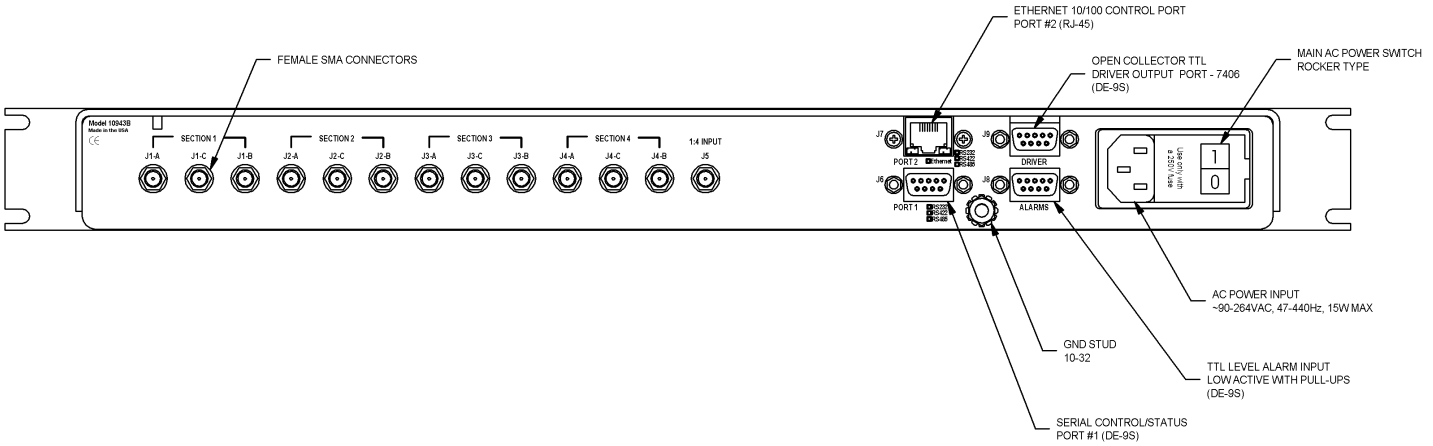
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The "shipped" serial interface type can be easily change via configuration jumpers under the top cover if control needs change.*

Applications

- Airborne surveillance systems
- Communication installations
- Digital broadcast facilities or production studios
- Imaging and animation production facilities
- L-Band, IF, RF signals for communication redundancy
- Satellite redundant ground systems
- Factory automation monitoring

Features

- High reliability relays
- Four channels of A/B switching
- Dual mode, 1:4 or 1:1 backup switching
- >2.4GHz bandpass
- SMA signal connectors
- Redundant hot-swap power supplies
- Dual serial control ports available
- Direct TTL alarm inputs (active low)
- Field configurable serial (RS-232C/422A/485)
- 10/100 Ethernet control available
- International AC power input
- Certified CE EN61010 (LVD)
- LabVIEW drivers available



Model 10943B Specifications

Array size . . . . . .Four A/B channels
Switching mode . . . . . .1:1 or 1:4 backup capacity
Switching elements . . . . . .High reliability relays
Type of system . . . . . .A/B selector
Architecture . . . . . .Fixed size
Termination (unused ports) . . . . . .Included
Signal connector location . . . . . .Rear panel

I/O Characteristics
Impedance . . . . . .50 ohm
VSWR loss (1:1 mode) . . . . . .<2.0:1 @ 2.4GHz
Signal connector . . . . . .SMA female (50 ohm)
Coupling . . . . . .DC
Termination 1/8W, 1%

Signal Characteristics
Transmission loss . . . . . .0.5dB @ 900MHz
(1:1 mode) <1.00dB @ 1.500MHz
<2.50dB @ 2.4GHz
Crosstalk isolation . . . . . .>60dB @ 900MHz
(JxB to JxC) >50dB @ 2.4GHz
Signal path . . . . . .Passive bidirectional

General Specifications
Switching speed . . . . . .<5mS
Power supply section . . . . . .Hot-swap redundant supplies
Power supply monitoring . . . . . .Included
Serial control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Ethernet port 10/100BaseT
Serial port connectors . . . . . .DE-9S (D-Type female)
Alarm connector (J8) . . . . . .DE-9S (D-Type female)
Driver output connector (J9) . . . . . .DE-9S (D-Type female)
Status LED's . . . . . .Front panel
Front panel display . . . . . .1x20 VF display (high contrast)
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 15Watts (max)
Fuse protection . . . . . .2A, 5mm (dual), AC models
Weight . . . . . .12 lbs
Size . . . . . .1.75H x 6.50D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>65,000 hours
Contact life . . . . . .>2,000,000 (per port)
Warranty . . . . . .2 years
Certifications . . . . . .CE EN61010

System 10944B

Four Channel Fiber Redundancy Switch
Fiber Optic A/B

System engineers for large scale communication installations require state-of-the-art redundant equipment configurations. The 10944B provides the systems professional with an uncompromising combination of high performance and high reliability fiber switching elements. Standard front installation redundant power supplies, plus redundant system control ports deliver the ultimate in system reliability for critical fiber applications.

Compact and high performance, the 10944B provides cost effective, flexible switching capacity with 4 channels of A/B (primary or backup) switching.

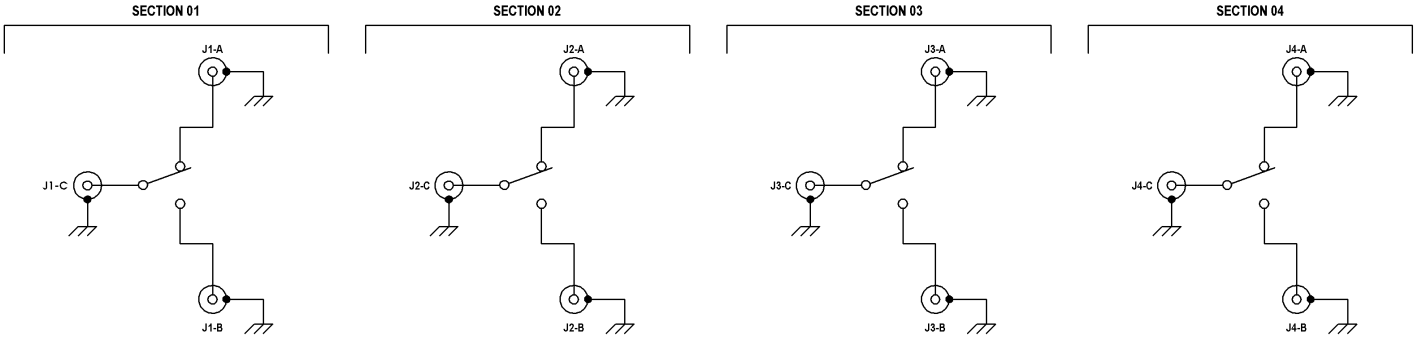
Complete control and status of the 10944B is available at both the front panel controls or the dual remote ports (either dual serial, or single serial and 10/100 Ethernet) .

The 10944B also provides a direct TTL alarm input connector for direct backup channel selection plus an 8-bit driver port for controlling external user devices. The unit has provisions for the user to field configure the serial mode of a serial port (RS-232C, RS-422A or RS-485).

Model 10944B
Ethernet and Serial control ports
Alarm and driver ports

Simplified Signal Schematic

Power-off Mode Shown



Model Number Assignment

The 10944B is available in six standard configurations. The model number specifies the "shipped" serial interface factory configured (can be changed in the field).

	Model Number	Interface	Capability	Conn
■	10944B-D232-n	Dual RS-232C	1:1	SC
■	10944B-D422-n	Dual RS-422A	1:1	SC
■	**10944B-D485-n**	**Dual RS-485**	**1:1**	**SC**
■	**10944B-SE-n**	**Ethernet & RS-232C**	**1:1**	**SC**
■	10944B-SE-n-A	Ethernet & RS-422A	1:1	SC
■	10944B-SE-n-B	Ethernet & RS-485	1:1	SC

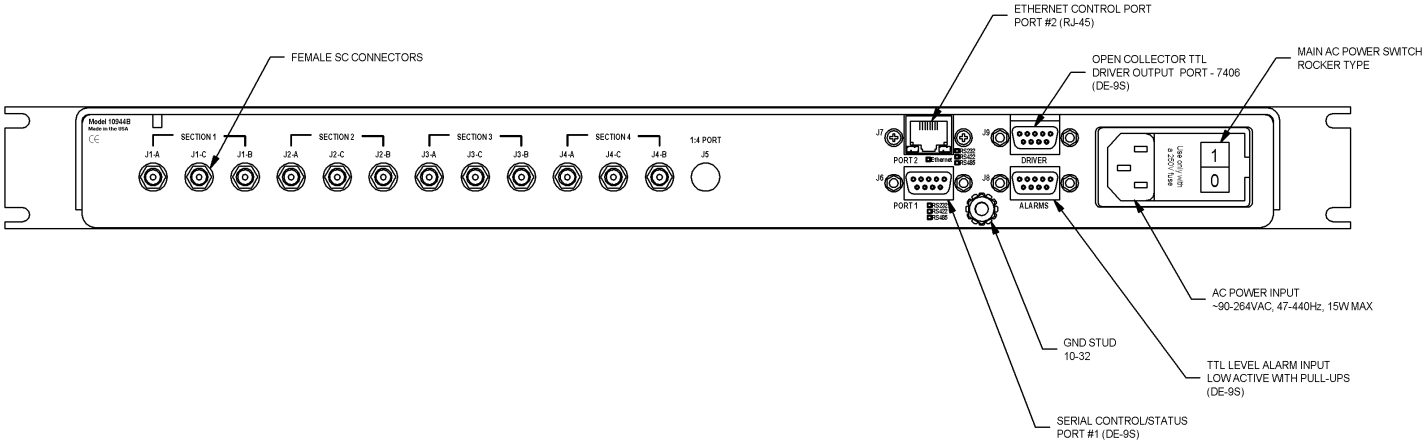
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The "shipped" interface type can be easily change via configuration jumpers under the top cover if control needs change.*
NOTE 3: *The "n" must be specified for multi-mode or single-mode. See specification table below.*

Applications

- Optical protection switching
- Infrastructure backup installations
- Digital broadcast facilities or production studios
- Imaging and animation production facilities
- Security systems
- Factory automation monitoring

Features

- Transparent optical switching
- Multiple configurations available
- Very low insertion loss
- Fast switching speed
- 10/100 Ethernet control
- Excellent repeatability
- Optical elements meet Telecordia GR-1073
- SC signal connectors
- Redundant power supplies
- Dual serial control ports plus TTL alarm inputs
- Field configurable serial (RS-232C/422A/485)
- Hot-swap power supply technology
- International AC power input, or optional DC
- Certified CE EN61010 (LVD)
- LabVIEW drivers available



Model 10944B Specifications

Array size . . . . . .Four A/B channels
Switching mode . . . . . .1:1 backup capacity
Switching elements . . . . . .High reliability mems
Type of system . . . . . .A/B selector
Architecture . . . . . .Fixed size
Signal connector location . . . . . .Rear panel

Signal Characteristics
Transmission loss . . . . . .<1.0dB (typical 0.5dB)
Isolation . . . . . .>60dB
Return Loss . . . . . .>50dB
Signal connector . . . . . .SC (FC optional)
Repeatability . . . . . .<0.1dB

Specifying Single or Multi Mode (n)
-2 . . . . . .Single Mode 9/125/900, 1310/1550nm
-5 . . . . . .Multi Mode 50/125/900, 850/1310nm
-8 . . . . . .Multi Mode 62.5/125/900, 850/1310nm

General Specifications
Switching speed . . . . . .<5mS
Power supply section . . . . . .Hot-swap redundant supplies
Power supply monitoring . . . . . .Included
Serial control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Ethernet port 10/100BaseT
Serial port connectors . . . . . .DE-9S (D-Type female)
Alarm connector (J8) . . . . . .DE-9S (D-Type female)
Driver output connector (J9) . . . . . .DE-9S (D-Type female)
Status LED's . . . . . .Front panel
Front panel display . . . . . .1x20 VF display (high contrast)
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 15Watts (max)
Fuse protection . . . . . .2A, 5mm (dual), AC models
Weight . . . . . .12 lbs
Size . . . . . .1.75H x 6.50D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>65,000 hours
Operations life . . . . . .>10,000,000 (per port)
Warranty . . . . . .2 years
Certifications . . . . . .CE EN61010

System 10946B

Four Channel Transfer Switch
DC-6GHz, 50 ohm

Today's communication installations require reliable and redundant equipment. The 10946B provides the systems professional with an uncompromising backup solution using high performance and high reliability switching elements. Standard front installation redundant power supplies, plus redundant system control ports deliver the ultimate in system reliability for critical applications up to 6GHz.

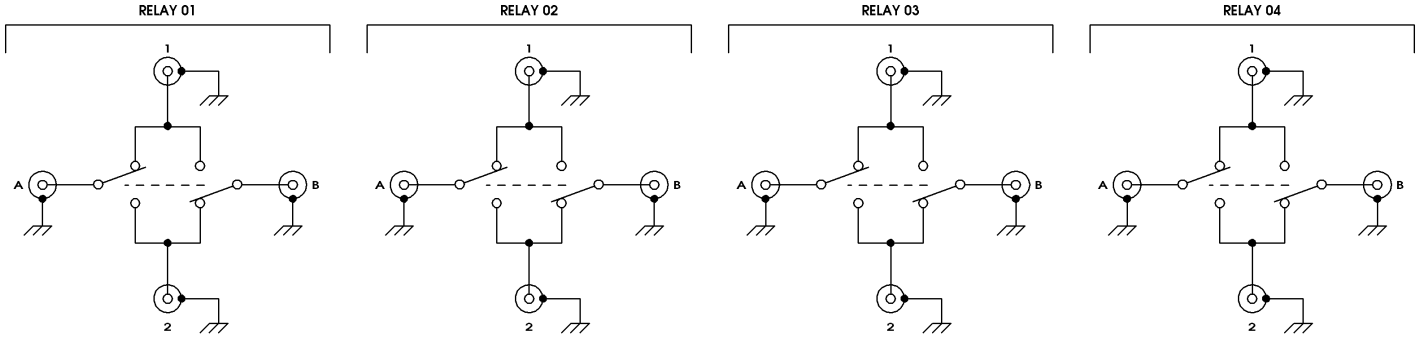
Compact and high performance, the 10946B provides cost effective, flexible switching capacity with 4 channels of A-1/B-2 (primary or backup) switching. Bandpass is excellent for L-Band, HD video, IF or RF signals ranging to beyond 6GHz. Unit can be set to gang mode so all four channels are controlled at the same time (1:4 mode), or individually (1:1 mode).

Complete control and status of the 10946B is available at both the front panel controls or the dual remote interfaces (either dual serial, or single serial and Ethernet) . Also provided is a direct TTL alarm input connector for backup channel selection plus an 8-bit driver port for controlling external user devices. The 10946B is designed with field configurable serial interfaces (RS-232C, RS-422A or RS-485) for service flexibility.

By specifying the optional "-T" suffix, the factory includes a precision 50 ohm 2W termination installed on the "B" port of each relay section. This provides additional system capability as it effectively changes the system configuration to have quad sections of 2x1 self-terminating relays.

Model 10946B
Quad transfer unit

Simplified Signal Schematic
Power-off Mode Shown



Model Number Assignment

The 10946B is available in six standard configurations. The model number specifies the "shipped" serial interface factory configured (can be changed in the field).

Model Number	Interface	Capability	Conn
10946B-D232	Dual RS-232C	1:1 & 1:4	SMA-50
10946B-D422	Dual RS-422A	1:1 & 1:4	SMA-50
10946B-D485	**Dual RS-485**	**1:1 & 1:4**	**SMA-50**
10946B-SE	**Ethernet & RS-232C**	**1:1 & 1:4**	**SMA-50**
10946B-SE-A	Ethernet & RS-422A	1:1 & 1:4	SMA-50
10946B-SE-B	Ethernet & RS-485	1:1 & 1:4	SMA-50

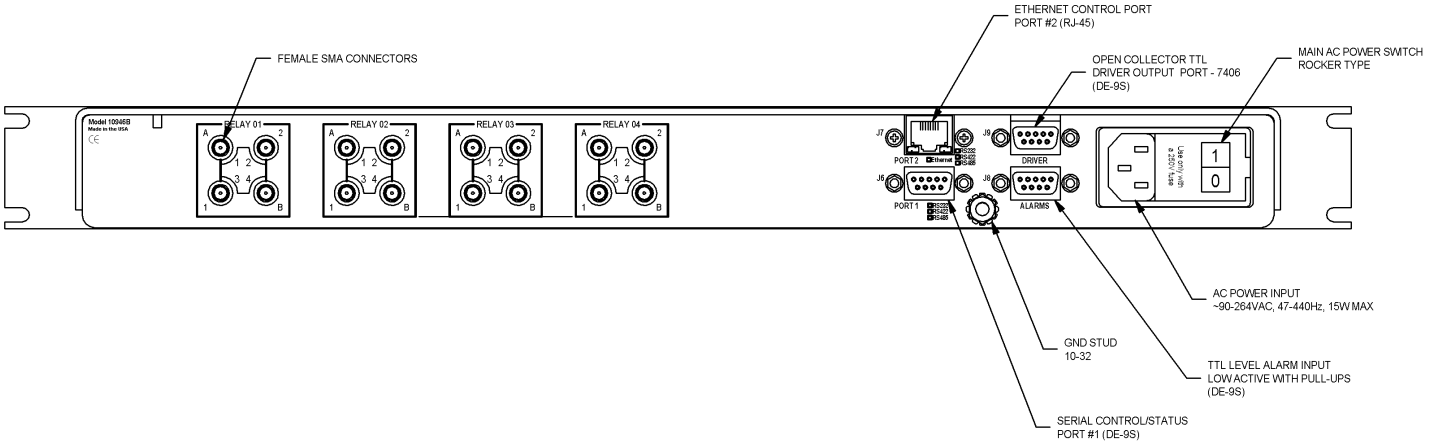
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The "shipped" serial interface type can be easily change via configuration jumpers under the top cover if control needs change.*
NOTE 3: *Adding a "-T" suffix will include a precision 50 ohm termination on all four "B" ports to provide a quad self-terminating 2x1 relay configuration.*

Applications

- Airborne surveillance systems
- Satellite communication installations
- Digital broadcast facilities or production studios
- Imaging and animation production facilities
- L-Band, SHD video, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High reliability relays
- Four channels of A/B switching
- Individual or ganged mode (1:1 or 1:4) switching
- >6.0GHz bandpass
- SMA signal connectors
- Redundant hot-swap power supplies
- Dual serial control ports available
- Direct TTL alarm inputs (active low)
- Field configurable serial (RS-232C/422A/485)
- 10/100 Ethernet control available
- International AC power input
- Certified CE EN61010 (LVD)
- LabVIEW drivers available



Model 10946B Specifications

Array size . . . . . .Four A/B channels
Switching mode . . . . . .1:1 (independent) or 1:4 (ganged) modes
Switching elements . . . . . .High reliability relays
Type of system . . . . . .A/B selector and/or transfer
Architecture . . . . . .Fixed size
Signal connector location . . . . . .Rear panel

I/O Characteristics
Impedance . . . . . .50 ohm
VSWR loss . . . . . .<1.3:1 @ 6GHz
Signal connector . . . . . .SMA female
Coupling . . . . . .DC
Power capacity . . . . . .60W @ 6GHz (average)
Termination . . . . . .Optional (-T) 2Watt

Signal Characteristics
Transmission loss . . . . . .<0.20dB @ 2GHz
<0.30dB @ 6GHz
Isolation . . . . . .>80dB @ 4GHz
>70dB @ 6GHz
Signal path . . . . . .Passive bidirectional

General Specifications
Switching speed . . . . . .<20mS
Power supply section . . . . . .Hot-swap redundant supplies
Power supply monitoring . . . . . .Included
Serial control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Ethernet port 10/100BaseT
Serial port connectors . . . . . .DE-9S (D-Type female)
Alarm connector (J8) . . . . . .DE-9S (D-Type female)
Driver output connector (J9) . . . . . .DE-9S (D-Type female)
Status LED's . . . . . .Front panel
Front panel display . . . . . .1x20 VF display (high contrast)
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 45Watts (max)
Fuse protection . . . . . .2A, 5mm (dual), AC models
Weight . . . . . .12 lbs
Size . . . . . .1.75H x 6.50D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>45,000 hours
Contact life . . . . . .>1,000,000 (per port)
Warranty . . . . . .2 years
Certifications . . . . . .CE EN61010

System 10948B

Four Channel Transfer Switch
DC-18GHz, 50 ohm

For large scale communication installations that require state-of-the-art equipment, the 10948B provides the systems professional with an uncompromising combination of high performance and high reliability switching elements in a dual mode system design. Standard front installation redundant power supplies, plus redundant system control ports deliver the ultimate in system reliability for critical applications.

Compact and high performance, the 10948B provides cost effective, flexible switching capacity with 4 channels of A/B (primary or backup) switching, in either 1:4 (ganged) or 1:1 (individual) modes. Bandpass is excellent for microwave or antenna signals ranging to beyond 18GHz. Unit can be set to gang mode so all four channels are controlled at the same time (1:4 mode), or individually (1:1 mode).

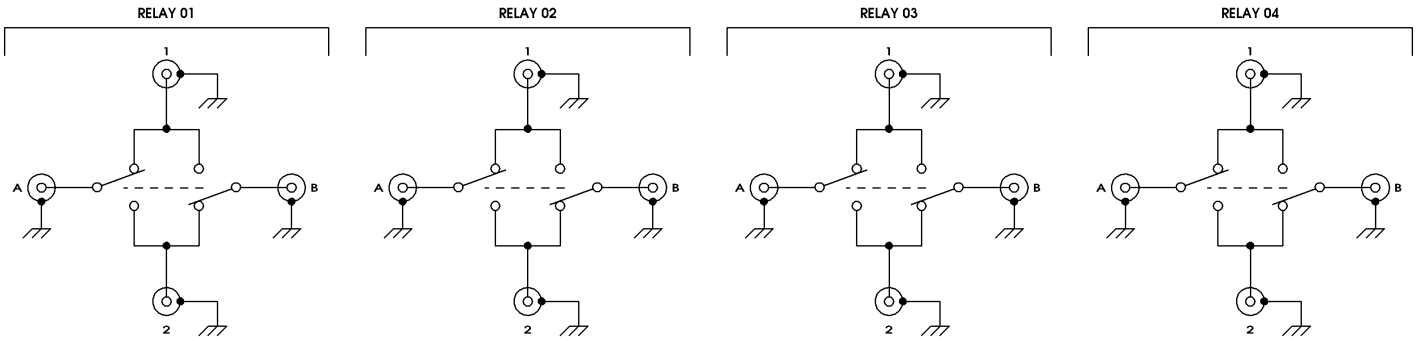
Complete control and status of the unit is available at both the front panel controls or the dual remote ports (either dual serial, or single serial and Ethernet). In addition, the 10948B provides a direct TTL alarm input connector for backup channel selection plus an 8-bit driver port for controlling external user devices. The 10946B is designed with field configurable serial interfaces (RS-232C, RS-422A or RS-485) for service flexibility.

By specifying the optional "-T" suffix, the factory includes a precision 50 ohm 2W termination installed on the "B" port of each relay section. This provides additional system capability as it effectively changes the system configuration to have quad sections of 2x1 self-terminating relays.

Also available in 40GHz version!

Model 10948B
Quad transfer unit

Simplified Signal Schematic
Power-off Mode Shown



Model Number Assignment

The 10948B is available in six standard configurations. The model number specifies the "shipped" serial interface factory configured (can be changed in the field).

Model Number	Interface	Capability	Conn
10948B-D232	Dual RS-232C	1:1 & 1:4	SMA-50
10948B-D422	Dual RS-422A	1:1 & 1:4	SMA-50
10948B-D485	**Dual RS-485**	**1:1 & 1:4**	**SMA-50**
10948B-SE	**Ethernet & RS-232C**	**1:1 & 1:4**	**SMA-50**
10948B-SE-A	Ethernet & RS-422A	1:1 & 1:4	SMA-50
10948B-SE-B	Ethernet & RS-485	1:1 & 1:4	SMA-50

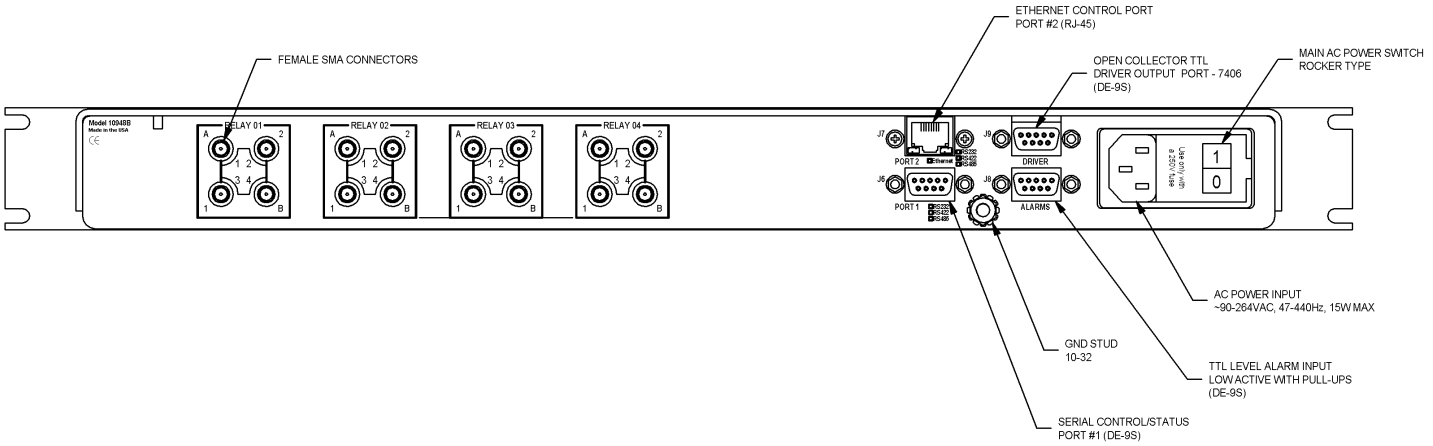
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The "shipped" interface type can be easily change via configuration jumpers under the top cover if control needs change.*
NOTE 3: *Adding a "-T" suffix will include a precision 50 ohm termination on all four "B" ports to provide a quad self-terminating 2x1 relay configuration.*
NOTE 4: *Adding a -4 to the model number provides 40GHz relay elements with K-Type signal connectors.*

Applications

- Airborne surveillance systems
- Satellite communication installations
- Digital broadcast facilities or production studios
- Imaging and animation production facilities
- L-Band, SHD video, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High reliability relays
- Four channels of A/B switching
- Individual or ganged mode (1:1 or 1:4) switching
- True 18GHz bandpass
- SMA signal connectors
- Redundant hot-swap power supplies
- Dual serial control ports available
- Direct TTL alarm inputs (active low)
- Field configurable serial (RS-232C/422A/485)
- 10/100 Ethernet control available
- International AC power input
- Certified CE EN61010 (LVD)
- LabVIEW drivers available



Model 10948B Specifications

Array size . . . . . .Four A/B channels
Switching mode . . . . . .1:1 (independent) or 1:4 (ganged) modes
Switching elements . . . . . .High reliability relays
Type of system . . . . . .A/B selector and/or transfer
Architecture . . . . . .Fixed size
Signal connector location . . . . . .Rear panel

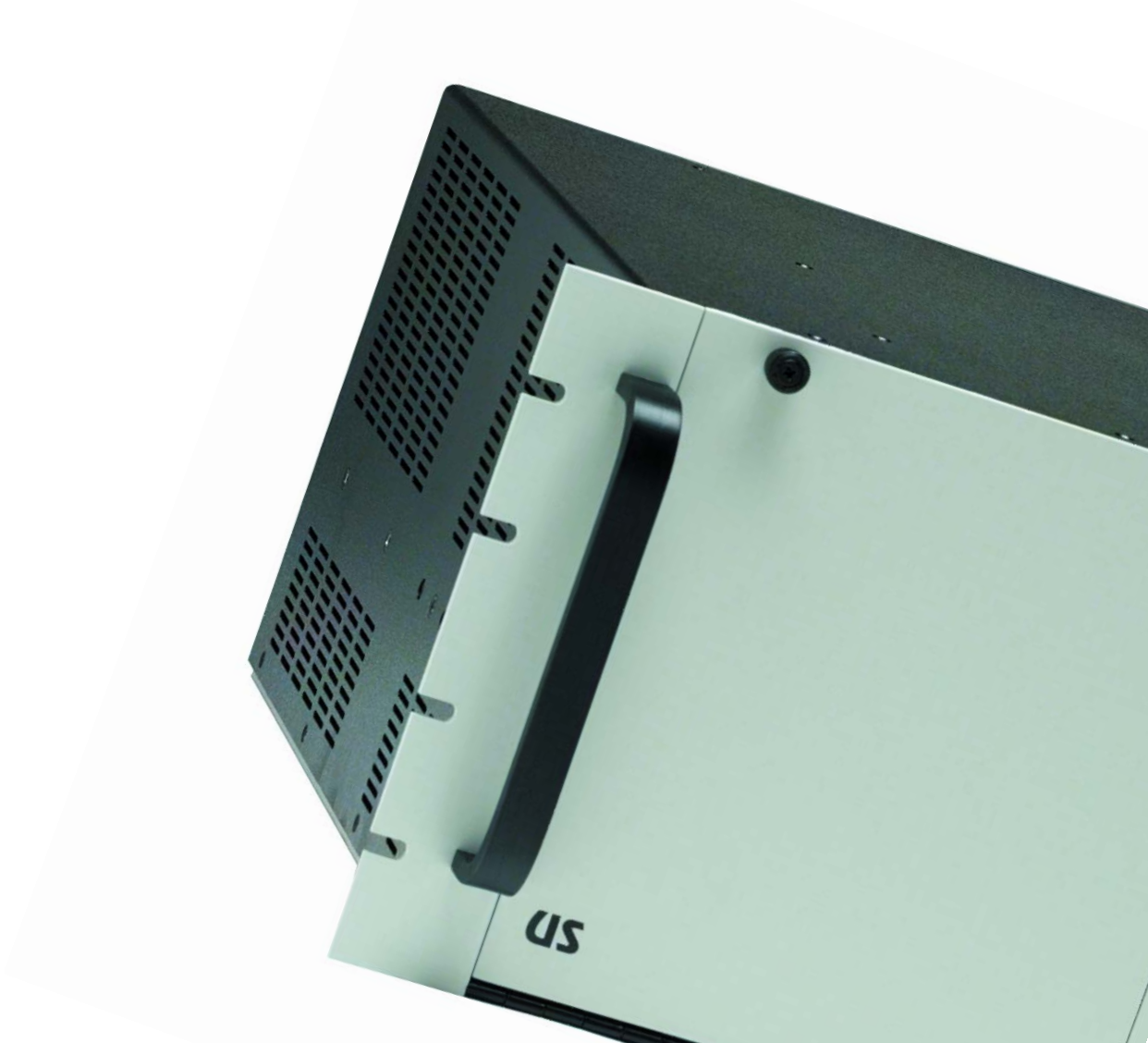
I/O Characteristics
Impedance . . . . . .50 ohm
VSWR loss . . . . . .<1.5:1 @ 18GHz
Signal connector . . . . . .SMA female
Coupling . . . . . .DC
Power capacity . . . . . .40W @ 18GHz (average)
Termination . . . . . .Optional (-T) 2Watt

Signal Characteristics
Transmission loss . . . . . .<0.20dB @ 4GHz
<0.50dB @ 18GHz
Isolation . . . . . .>80dB @ 4GHz
>65dB @ 18GHz
Signal path . . . . . .Passive bidirectional

General Specifications
Switching speed . . . . . .<20mS
Power supply section . . . . . .Hot-swap redundant supplies
Power supply monitoring . . . . . .Included
Serial control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Ethernet port 10/100BaseT
Serial port connectors . . . . . .DE-9S (D-Type female)
Alarm connector (J8) . . . . . .DE-9S (D-Type female)
Driver output connector (J9) . . . . . .DE-9S (D-Type female)
Status LED's . . . . . .Front panel
Front panel display . . . . . .1x20 VF display (high contrast)
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 45Watts (max)
Fuse protection . . . . . .2A, 5mm (dual), AC models
Weight . . . . . .12 lbs
Size . . . . . .1.75H x 6.50D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>45,000 hours
Contact life . . . . . .>1,000,000 (per port)
Warranty . . . . . .2 years
Certifications . . . . . .CE EN61010

Modular and Flexible Systems

5



System S2084E

DC-3GHz Switching and Distribution
System S2084E

The S2084E provides capacity for high performance switching modules or distribution modules in a convenient 5RU rack mount package. Modules are hot-swap and are supported by redundant power supplies and optional redundant plug-in control CPUs.

The large twenty position module bay allows a variety of module types to be installed to perform tasks such as 1xN switching, redundancy (A/B) switching modules, distribution amplifiers and full switching arrays. Each system configuration is factory assembled and tested, and is delivered with a comprehensive operating and programming manual.

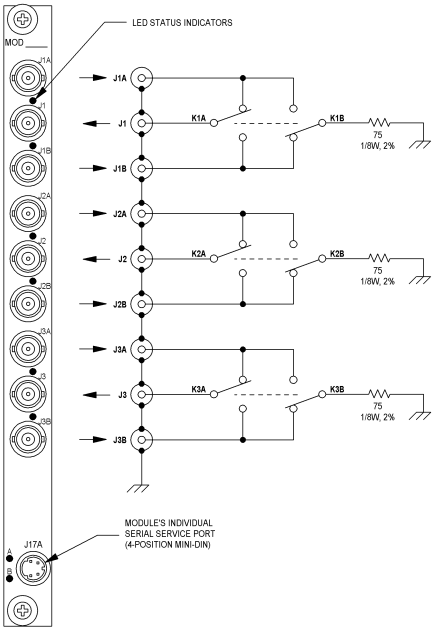
Folding down the hinged front panel reveals the plug-in power supply area with our standard "hot-swap" redundant power supplies. Individual AC power inputs and dual AC power cords are standard as well.

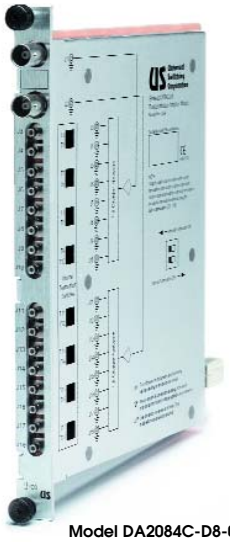
An optional internal backplane offers "stub breaking" connections between each slot position to interconnect signals between modules. Additional backplanes are available to accomplish other interconnection schemes making the S2084E the reliable workhorse for many switching or distribution applications. Mounting provisions are provided for optional chassis slides.

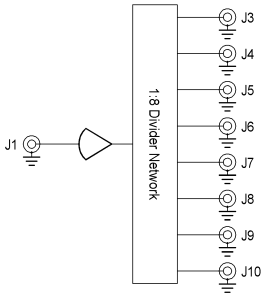
Model S2084E
Hinged front panel to access
hot-swap redundant power supplies

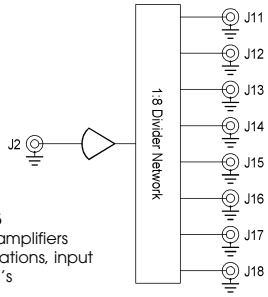
Model S2084E
Rear-facing twenty-position vertical
module bay and dual CPU bay

Model VR2084C-903-075
3-channel A/B switch
with terminations and BNC's









Model DA2084C-D8-05
Two 1x8 IF distribution amplifiers
with switchable terminations, input
BNC's and output SMB's

Switching Modules

Model	Elements	Freq Range	Isolation (dB)	Imped	Configuration	Conn Type	Spec Sheet
VS2084C-2084	Solid-state	DC-1MHz	>40 @ 1MHz		2-wire 4in, 24out array (needs -xx3 backplane)	SCSI-II	#VS2084C-2084
VR2084C-164X1	Relay based	DC-10MHz	>60 @ 1MHz		Sixteen channel ganged 4x1	HD15-24	#VR2084C-164X1
VR2084C-93-075	Relay based	DC-250MHz	>65 @ 100MHz	75	Triple 2x1 with 75 ohm self-termination	BNC	#VR2084C-93-1
VR2084C-93-050	Relay based	DC-250MHz	>65 @ 100MHz	50	Triple 2x1 with 50 ohm self-termination	BNC	#VR2084C-93-1
VR2084C-93-07H	Relay based	DC-1.0GHz	>60 @ 500MHz	75	Triple 2x1 with 75 ohm self-termination	BNC	#VR2084C-93-2
VR2084C-93-05H	Relay based	DC-1.3GHz	>60 @ 500MHz	50	Triple 2x1 with 50 ohm self-termination	BNC	#VR2084C-93-2
VR2084C-93-05G	Relay based	DC-2GHz	>60 @ 1GHz	50	Triple 2x1, no termination	SMA	#VR2084C-93-2
VR2084C-104-075	Relay based	DC-300MHz	>60 @ 100MHz	75	Expandable four channel 1:4 backup switch	BNC	#VR2084C-104
VR2084C-104-050	Relay based	DC-300MHz	>60 @ 100MHz	50	Expandable four channel 1:4 backup switch	BNC	#VR2084C-104
VR2084C-104-07H	Relay based	DC-1GHz	>60 @ 500MHz	75	Expandable four channel 1:4 backup switch	BNC	#VR2084C-104H
VR2084C-104-05H	Relay based	DC-1.2GHz	>60 @ 500MHz	50	Expandable four channel 1:4 backup switch	BNC	#VR2084C-104H
VR2084C-21X4-05	Relay based	DC-1GHz	>60 @ 500MHz	50	Dual 1x4 normally open switch	BNC	#VR2084C-21X4
VR2084C-1X8-05	Relay based	DC-1GHz	>60 @ 500MHz	50	Single 1x8 normally open switch	BNC	#VR2084C-1X8
VR2084C-41X2-05	Relay based	DC-3GHz	>60 @ 1GHz	50	Quad 1x2 normally open switch	SMA	#VR2084C-41X2

Distribution Amplifier Modules

Model	Gain	Freq Range	Compression	Imped	Configuration	Conn Type	Spec Sheet
DA2084C-D8-05	Unity (0dB)	20-2500MHz	+3dBm	50	Dual 1x8 unity gain L-Band distribution amps	SMA/SMB	#DA2084C-D8
DA2084C-D8-07	Unity (0dB)	20-300MHz	+3dBm	75	Dual 1x8 unity gain IF distribution amps	SMA/SMB	#DA2084C-D8
DA2084C-D8-07-5	Unity (0dB)	20-500MHz	+3dBm	75in, 50out	Dual 1x8 unity gain IF distribution amps	SMA/SMB	#DA2084C-D8
DA2084C-D8-D7	Unity (0dB)	DC-250MHz	+/-2V max	75	Dual 1x8 unity gain video distribution amps	SMA/SMB	#DA2084C-D8V

System S2560E

Flexible DC-125MHz Switching Array Differential (Analog or 422 Digital)

Flexible, high performance and low cost differential switching arrays are available in an off the shelf solution with the field proven S2560E. The S2560E may be configured up to a 256 input x 256 output system in a single chassis, or expanded with additional units to 1024 input x 1024 output. In a single, 5RU (8.75" high) rack mount package, the S2560E offers the highest crosspoint density in the industry with 65,500 crosspoints.

Model S2560E
Compact 5RU package delivers 256x256

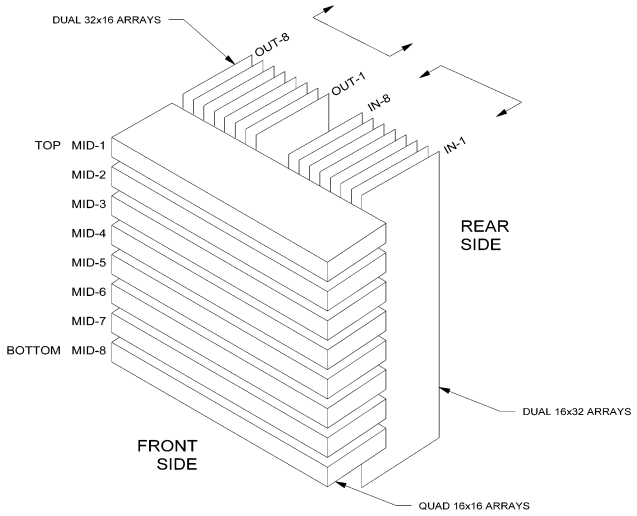
A maximum of eight input modules and eight output modules may be installed. Each module adds 32 differential channels to the system capacity. The system Configuration is sized by installing the desired number of plug-in modules to match the capacity needed.

Model S2560E
Configured as a 256x256

Embedded controllers provide reliable routing of signals through the system. For ultimate reliability, built-in redundant signal paths allow each I/O connection up to 32 different signal paths. The solid-state switching core provides high bandwidth capacity and high isolation. The input and output modules are available in a number of different specifications including analog connectivity for audio or video, or 30Mbps digital 422 modules.

The S2560E uses the field proven C710 plug-in CPU with numerous interface options for multiple remote control choices. A front panel LED illuminated control keypad and high contrast 4x20 vacuum fluorescent display are included. Free LabVIEW VISA drivers are also available for download on the uswi.com website, or download RouteWarePRO for a free 30-day free trial of a user friendly professional software control GUI.

The example on the next page shows two S2560E units as a clock/data router application with Model AP32R 1RU adapter panels delivering a full 256 input, 256 output configuration with over 50Mbps capability. See the accessories section for additional information on adapter panel options. Mounting provisions are provided for optional chassis slides.



Specifications

- Max array size . . . . . .256 input x 256 output (chassis), 1024x1024 max
- Configuration type . . . . . .Non-blocking with full fanout
- Switching elements . . . . . .Solid-state (differential), digital I/O optional
- Frequency range . . . . . .DC to 125MHz (typical -3dB point, Z=100)
  DC to 50Mbps with digital '422 I/O
- Gain . . . . . .Unity
- Input impedance . . . . . .100 or 600
- Crosstalk isolation . . . . . .>80dB @ 1MHz
  >60dB @ 10MHz
  >40dB @ 100MHz
- Signal connectors . . . . . .High density SCSI-II female standard
- Power requirements . . . . . .90-264VAC, <400 watts, 47-440Hz
- Power section . . . . . .Plug-in redundant hot-swap supplies standard
- Operating temperature . . . . .0 to +60C
- Storage temperature . . . . . .-20 to +85C
- Cooling . . . . . .Fan assisted with monitored RPM and temperature
- Configuration memory . . . . . .>20 configurations
- Memory retention . . . . . .>10 years
- Remote interface type . . . . . .C710 Series or C820 plug-in (up to two)
- MTBF . . . . . .>35,000 hours
- Weight . . . . . .<56lbs fully configured
- Size . . . . . .8.75"H x 19.00"W x 22.00"D

Model S2560E
Hinged front panel

Applications

- Digital or analog audio/video routing
- Digital 422 data for clock and data
- Switching sensors to test equipment in an environmental lab
- Composite or YC video signal routing (CCTV)
- Conference centers - video/audio/multimedia
- Security systems, both audio and video selection

Standard Features

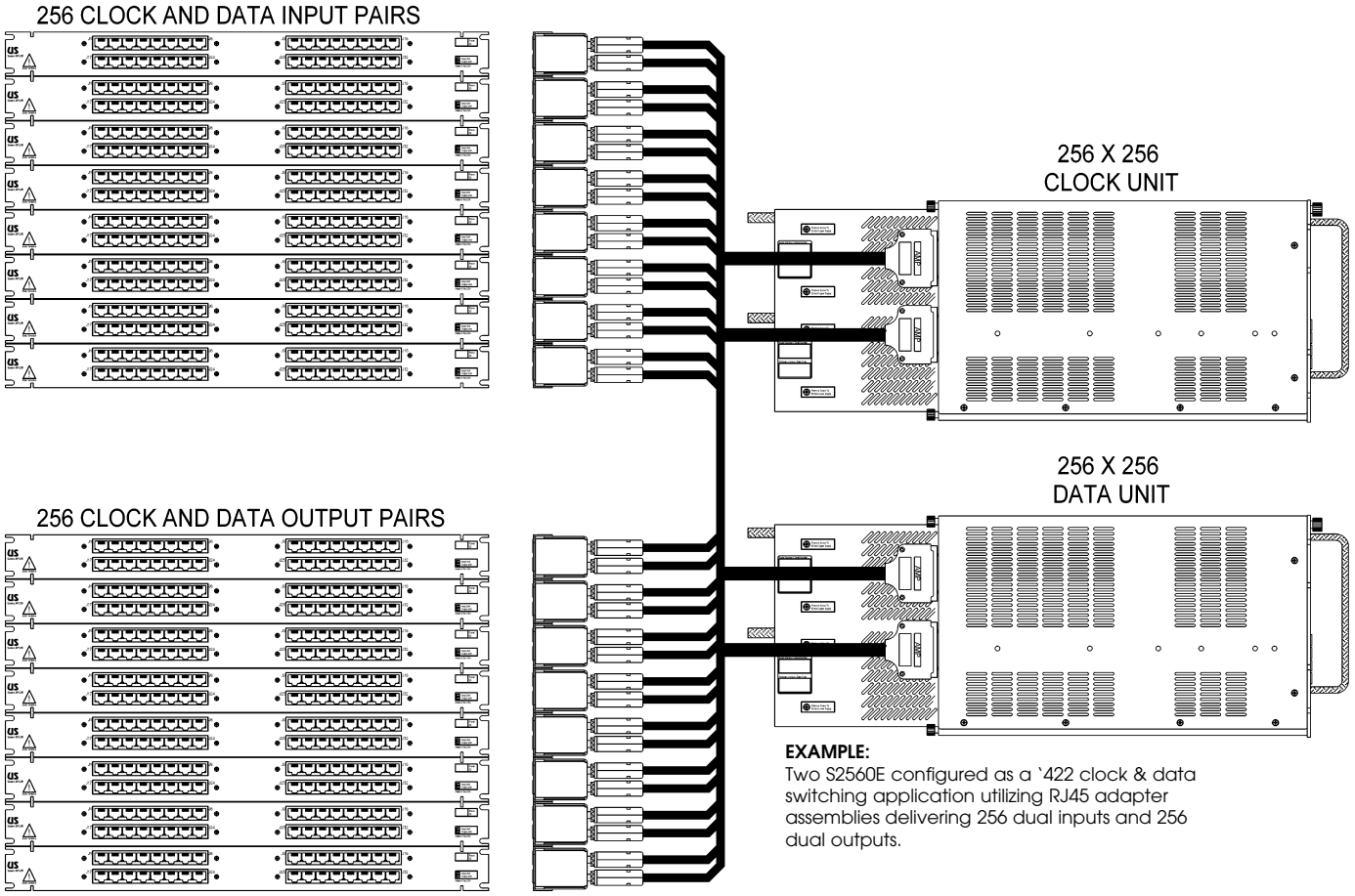
- Individual serial service port on each module
- Low cost per crosspoint
- Redundant signal path Tri-Stage switching architecture
- Chassis slide mounting pattern included
- Ultra high MTBF
- Over 13,000 crosspoints per vertical rack unit (RU)
- Plug-in redundant hot-swap power supplies included

Optional Features

- Digital I/O (differential RS-422 type @ 50Mbps)
- Extended frequency range
- Other connector types via adapter panels (see accessory section)

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:
Two S2560E configured as a `422 clock & data switching application utilizing RJ45 adapter assemblies delivering 256 dual inputs and 256 dual outputs.

System S2561E

Flexible DC-125MHz Switching Array
Single-Ended (Analog, TTL, PCM)

Field proven and reliable, the S2561E delivers high performance and low cost for single-ended switching needs in an off the shelf solution. The S2561E may be configured up to a 256 input x 256 output system in a single chassis, or further expanded with additional units to a 1024x1024. It offers the highest crosspoint density in the industry with an effective 65,500 crosspoints in a single 5RU (8.75" high) rack mount package.

Model S2561E
Compact 5RU package delivers 256x256

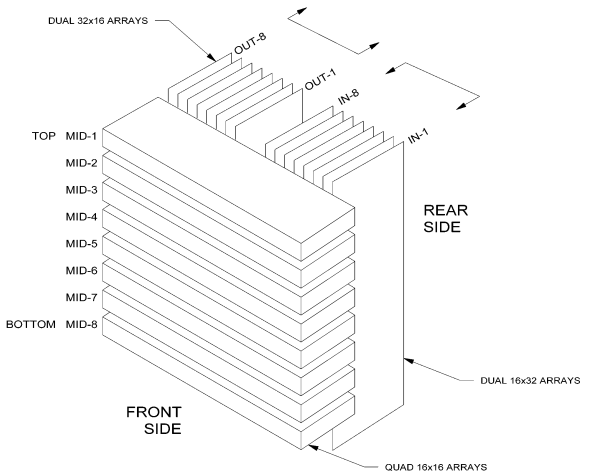
A maximum of eight input modules and eight output modules may be installed in the unit. Each module adds 32 differential channels to the system capacity. The system Configuration is sized by installing the desired number of plug-in modules to match application requirements.

Embedded controllers provide reliable routing of signals through the system. For ultimate reliability, built-in redundant signal paths allow each I/O connection up to 32 different signal paths. The solid-state switching core offers high bandwidth capacity and high isolation. The input and output modules provide sixteen channels per connector. The vast majority of the 62 position connector contains signal grounding for excellent signal performance including crosstalk isolation.

The unit includes hot-swap modules and hot-swap redundant power supply technology. The S2561E also features standard dual AC power inputs, dual AC power cords, and rear located power switches.

The S2561E uses the field proven C710 plug-in CPU with numerous interface options for multiple remote control choices. A front panel LED illuminated control keypad and high contrast 4x20 vacuum fluorescent display are included. Free LabVIEW VISA drivers are also available for download on the uswi.com website, or download RouteWarePRO for a free 30-day free trial of a user friendly professional software control GUI.

The example on the next page shows four S2561E units with 1RU Model AP32B adapter panels connected in a full 512 input x 512 output configuration. See the accessories section for additional information on adapter panel options.



Model S2561E
Hinged front panel

Specifications

- Max array size . . . . . .256 input x 256 output (chassis), 1024x1024 max
- Configuration type . . . . . .Non-blocking with full fanout
- Switching elements . . . . . .Solid-state analog
- Frequency range . . . . . .DC to 125MHz (typical -3dB point, Z=50)
- Gain . . . . . .Unity
- Input impedance . . . . . .50 ohm (standard)
- Crosstalk isolation . . . . . .>80dB @ 1MHz
  >60dB @ 4MHz
  >30dB @ 100MHz
- Nominal signal level . . . . . .+/-1.5VDC, (+/-10 no damage)
- Signal connectors . . . . . .High density 62 position D-Sub male
- Power requirements . . . . . .90-264VAC, <400 watts, 47-440Hz
- Power section . . . . . .Plug-in redundant hot-swap supplies standard
- Operating temperature . . . . .0 to +60C
- Storage temperature . . . . . .-20 to +85C
- Cooling . . . . . .Fan assisted with monitored RPM and temperature
- Configuration memory . . . . . .>20 configurations
- Memory retention . . . . . .>10 years
- Remote interface type . . . . . .C710 Series or C820 plug-in (up to two)
- MTBF . . . . . .>35,000 hours
- Weight . . . . . .<56lbs fully configured
- Size . . . . . .8.75"H x 19.00"W x 22.00"D

Model S2561E
Configured as a 256x256

Applications

- Switching both TTL and PCM signals in one unit
- PCM clock and data
- Switching sensors to test equipment in an environmental lab
- High resolution video signal routing
- Conference centers - video/audio/multimedia
- Security systems, both audio and video selection

Standard Features

- Field proven technology
- Low cost per crosspoint
- Redundant signal path Tri-Stage switching architecture
- Chassis slide mounting pattern included
- Ultra high MTBF
- Over 13,000 crosspoints per vertical rack unit (RU)
- Plug-in redundant hot-swap power supplies included

Optional Features

- Signal verification (signal injection)
- Extended frequency range
- Other connector types via adapter panels (see accessory section)

S2561E-XX-DXX5

- I/O impedance: 5 = 50 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:
Four S2561E configured as a 512 input, 512 output switching application utilizing AP32B adapter assemblies delivering 75 ohm BNC connectivity for analog, TTL or PCM.

System S2562E

Flexible DC-100kHz Switching Array
Single-Ended (Instrument Quality)

Leveraged from years of work in the ATE industry, the S2562E combines instrumentation level performance and low cost for single-ended switching needs in an off the shelf solution. The S2562E may be configured up to a 256 input x 256 output system in a single chassis, or further expanded to 512 x 512 with additional units. The S2562E offers the highest crosspoint density in the industry with an effective 65,500 crosspoints in a single 5RU (8.75" high) rack mount package.

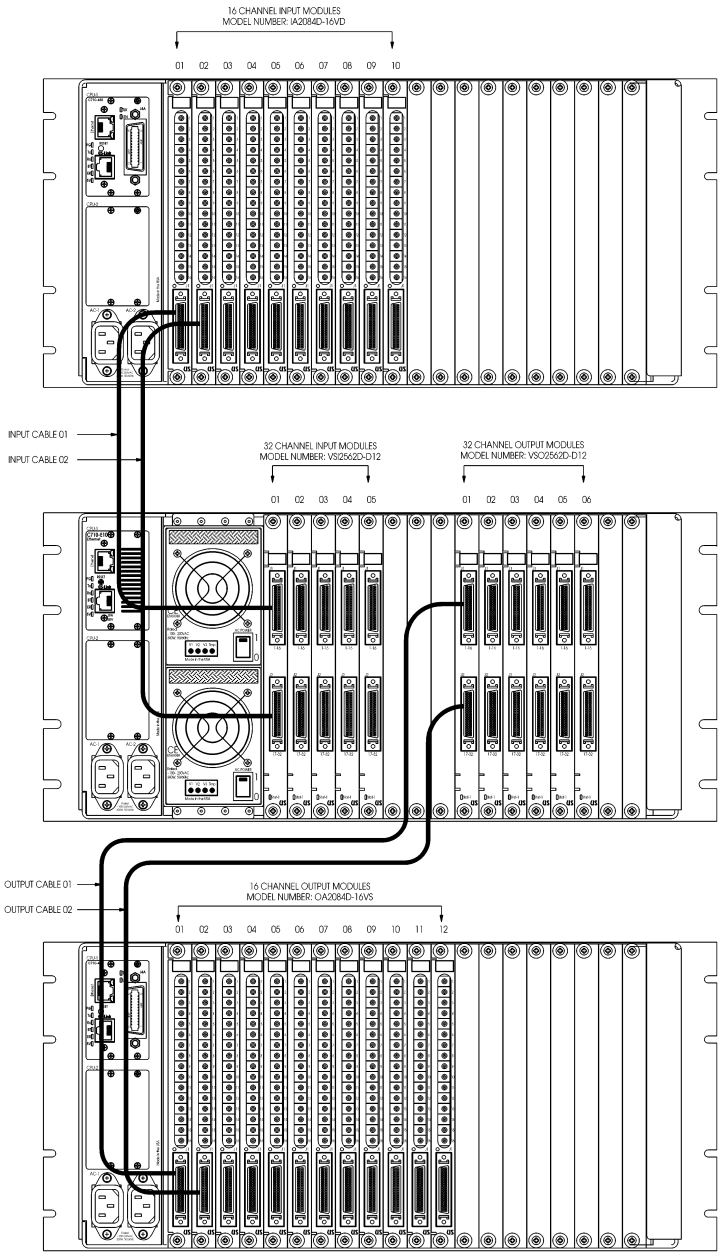
Model S2562E
Compact 5RU package delivers 256x256

A maximum of eight input modules and eight output modules may be installed in the unit. Each module adds 32 differential channels to the system capacity. The system Configuration is sized by installing the desired number of plug-in modules. The addition of an Input buffer/test drawer assembly and output buffer/test drawer assembly provides real time signal path detection and verification.

Embedded controllers provide reliable routing of signals through the system. For ultimate reliability, built-in redundant signal paths allow each I/O connection up to 32 different signal paths. The solid-state analog switching core offers low noise, high isolation and good DC accuracy. Each module has dual 50 position SCSI-II connectors utilizing 16 channels per connector. The vast majority of the connector contains signal grounding for excellent crosstalk isolation.

The unit includes both hot-swap modules and hot-swap redundant power supply technology. The unit also features standard dual AC power inputs, dual AC power cords, and rear located power switches.

The S2562E uses the field proven C710 plug-in CPU with numerous interface options for multiple remote control choices. A front panel LED illuminated control keypad and high contrast 4x20 vacuum fluorescent display are included. Free LabVIEW VISA drivers are also available for download on the uswi.com website, or download RouteWarePRO for a free 30-day free trial of a user friendly professional software control GUI. Mounting provisions are provided for optional chassis slides.



Model S2562E
Configured as a 256x256

Applications

- Accurate gain measurements
- Low noise and DC offset for system measurement
- Switching sensors to test equipment in an environmental lab
- Strain-gauge or accelerometer signal routing

Standard Features

- Low noise and low DC offset
- Field proven technology
- Low cost per crosspoint
- Redundant signal path Tri-Stage switching architecture
- Chassis slide mounting pattern included
- Ultra high MTBF
- Over 13,000 crosspoints per vertical rack unit (RU)
- Plug-in redundant hot-swap power supplies included

Optional Features

- Signal verification (signal injection)
- External test and performance verification units
- Control GUI for simple control

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

- I/O impedance: 5 = 50K ohm input, 50 ohm output
- 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:
The example shown on the opposite page shows the S2562E unit coupled with two other optional drawers. The top one is an input buffer/test drawer that provides a 200K ohm differential isolated coaxial (SMB) input to the user and also provides an OOB test signal. The lower unit provides a <1 ohm single-ended coaxial output via SMB, verifies the testing of the signal path and also filters the OOB test signal.

Specifications

- Max array size . . . . . .256 input x 256 output (chassis), 512x512 max
- Configuration type . . . . . .Non-blocking with fanout of 10 max
- Switching elements . . . . . .Solid-state analog
- Frequency range . . . . . .DC to 100kHz (min)
- Gain . . . . . .Unity
- I/O impedance . . . . . .50K ohm input, 50 ohm output
- Crosstalk isolation . . . . . .>80dB @ 100kHz
- Nominal signal level . . . . . .+/-10VDC
- Signal connectors . . . . . .High density SCSI-II female standard
- Power requirements . . . . . .90-264VAC, <350 watts, 47-440Hz
- Power section . . . . . .Plug-in redundant hot-swap supplies standard
- Operating temperature . . . . .0 to +60C
- Storage temperature . . . . . .-20 to +85C
- Cooling . . . . . .Fan assisted with monitored RPM and temperature
- Configuration memory . . . . . .>20 configurations
- Memory retention . . . . . .>10 years
- Remote interface type . . . . . .C710 Series or C820 plug-in (up to two)
- MTBF . . . . . .>45,000 hours
- Weight . . . . . .<52lbs fully configured
- Size . . . . . .8.75"H x 19.00"W x 22.00"D

Model S2562E
Hinged front panel

System S6025E

Bidirectional Multi-Wire Switching Array Configurations up 60x60, 25-Wire

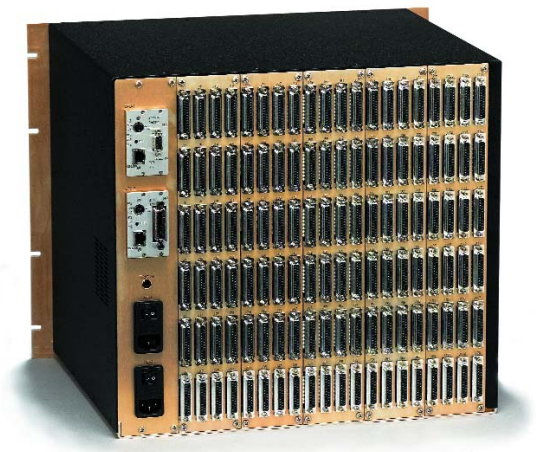
Designed for either analog or digital switching, the single unit S6025E has the capacity to route 25-wire signals (levels) in a full 60 x 60 stacked array. The unit may be de-populated so that fewer levels are included. Each of the 25 plug-in modules provide switching for a single level or "wire". Each level corresponds to a specific pin on the 25 position D-Type I/O connectors. The unit can be populated with any number of modules up to a maximum of 25.

Different array sizes allow you to select the size of the multi-level array you need. The maximum capacity is 60 x 60 with smaller configurations available in increments of eight.

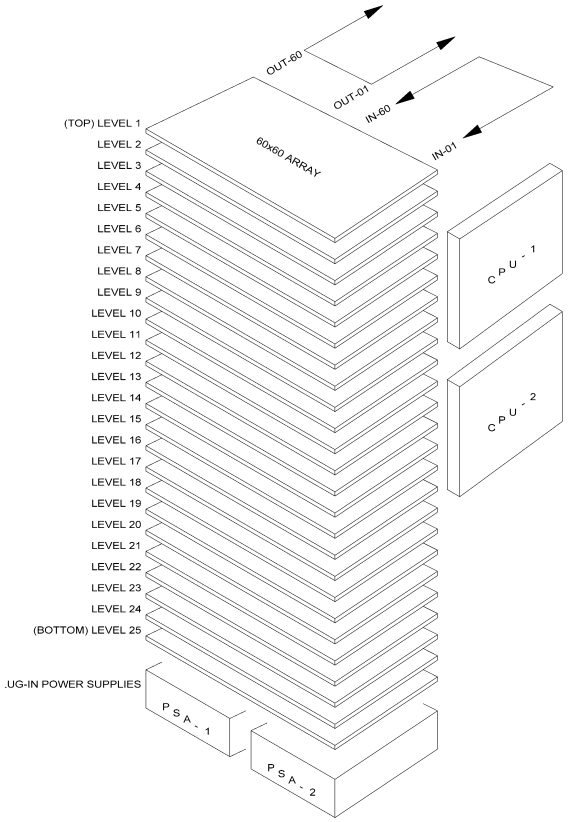
Embedded controllers on each level provide fast routing and status verification of signals being routed through the system. The solid-state analog switching core offers high bandwidth and isolation that is ideal for either digital or analog signals.

The S6025E includes the latest in "hot-swap" modules and system monitoring technology. All modules and power supplies install via the hinged front service panel. The front service panel also includes an intelligently illuminated control keypad and menu driven VF display. Remote communication and power supply status LED's are also provided.

The rear of the unit is divided into five sections allowing the unit to be easily adapted to individual needs with "personality kits" providing the user with a choice of signal connector types and sexes. A factory assigned suffix dash number defines the specific connector choices. The S6025E system is uses the field proven C710 plug-in CPU with numerous interface options allowing the S6025E to be controlled from a variety of remote interface types. The unit can also accommodate redundant (dual) control CPU's. LabVIEW drivers are also available on the uswi.com website.



Model S6025E
Configured as a 60x60



Applications

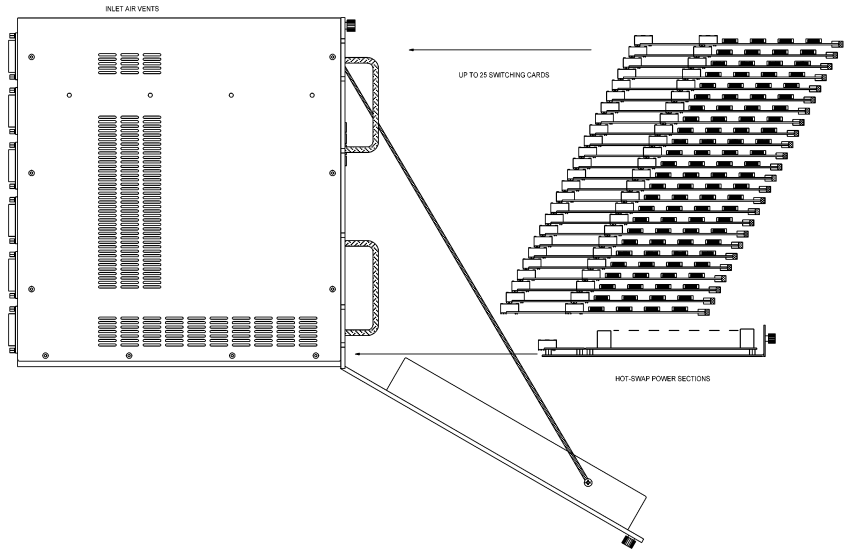
- Digital or analog audio routing
- Full RS-232C digital data routing
- Digital data (`422 or TTL)
- Switching sensors to test equipment lab
- Conference centers
- Control and command stations
- Security systems, both audio and video selection

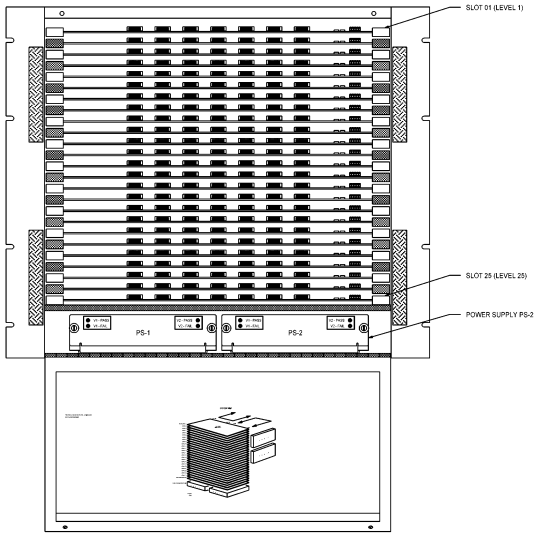
Standard Features

- Individual serial service port on each module
- Low cost per crosspoint
- Plug-in modules and assemblies
- Redundant power supply configuration
- Ultra high MTBF
- Versatile bidirectional signal path
- 90,000 crosspoints in one chassis (60x60x25)

Optional Features

- Reduced configurations
- Digital `422 or `232 drivers and receivers
- Different connector types
- Front panel colors





Specifications

- Max array size . . . . . .60 input x 60 output, 25-wire (single chassis)
- Configuration type . . . . . .Non-blocking with broadcast (no buffering)
- Switching elements . . . . . .Solid-state, bidirectional
- Frequency range . . . . . .DC to 3MHz (-3dB point)
- Crosspoint on resistance . . . . .<60 ohms nominal
- Max switched current . . . . . .10mA per crosspoint
- Max switched voltage . . . . . .+/- 5.2 Volts
- Crosspoint protection . . . . . .Diode clamped to +/-5.3V
- Crosstalk isolation . . . . . .>80dB @ 10kHz
  >70dB @ 100kHz
  >40dB @ 3MHz
- Module design . . . . . .Hot-swap capable
- Signal connectors . . . . . .DB-25S standard, others optional
- Power requirements . . . . . .90-264VAC, <100 Watts, 47-440Hz
- Power section . . . . . .Redundant with hot-swap capability
- Remote interface type . . . . . .Plug-in CPU (up to two)
- Operating temperature . . . . .0 to +60C
- Storage temperature . . . . . .-20 to +85C
- Configuration memory . . . . . .200 locations
- Memory retention . . . . . .>10 years
- MTBF . . . . . .>40,000 hrs
- Weight . . . . . .<55lbs fully configured
- Size . . . . . .15.75"H x 19.00"W x 15.75"D (9RU high)

Video Routers
Digital & Analog

6

DVSU1 & HDVSU1 Router

High Performance Digital
Up to 2.97Gbps (HD)

This aggressive line of serial digital video routers provides the systems professional with an uncompromising combination of high performance, small size and low cost. The lower data version is specifically designed to route serial digital (SD) video per SMPTE 259M (-ABCD) spanning standard data rates 143, 177, 270 and 360Mb/s. The higher performance version (HD) is designed to meet SMPTE 292M and 424M supporting High Definition (HD) data rates 270Mbps, 1.485Gbps and 2.97Gbps.

Compact and high performance, these units provide a cost effective switching capacity for smaller installations providing three different sized choices with each having full fan-out, non-blocking switching configurations. All units include with both 10/100baseT Ethernet and serial control ports.

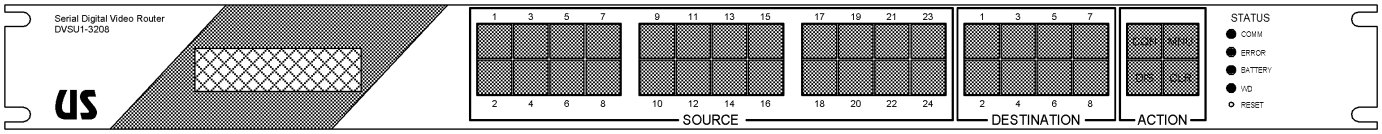
Complete control and status of the unit is available at both the front panel controls or the remote control ports. The front panel includes LED illuminated push-buttons (to control and status the unit), an LED illuminated super-twist LCD display, plus bi-color status LED's.

At the rear are female BNC connectors (75 ohm), the user configurable serial port (RS-232C/422A/485), Ethernet port (10/100baseT), plus the universal AC power input and AC switch.

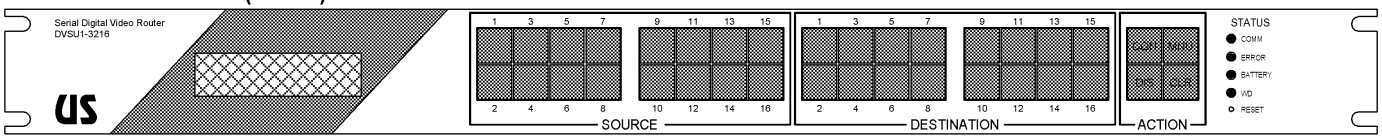
Model HDVSU1-3216
16 input, 16 output

Front Panel Configurations

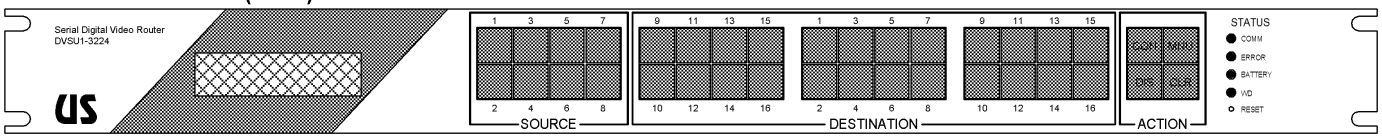
MODEL DVSU1-3208 (24X8)



MODEL DVSU1-3216 (16X16)



MODEL DVSU1-3224 (8X24)



Model Number Assignment

The DVSU1 and HDVSU1 are available in the six standard configurations show in this table.

Model Number	Configuration	Connector	Control
■ DVSU1-3208-SE	24 input, 8 output	BNC (75)	Ethernet & Serial
■ DVSU1-3216-SE	16 input, 16 output	BNC (75)	Ethernet & Serial
■ DVSU1-3224-SE	8 input, 24 output	BNC (75)	Ethernet & Serial
■ HDVSU1-3208-SE	24 input, 8 output	BNC (75)	Ethernet & Serial
■ HDVSU1-3216-SE	16 input, 16 output	BNC (75)	Ethernet & Serial
■ HDVSU1-3224-SE	8 input, 24 output	BNC (75)	Ethernet & Serial

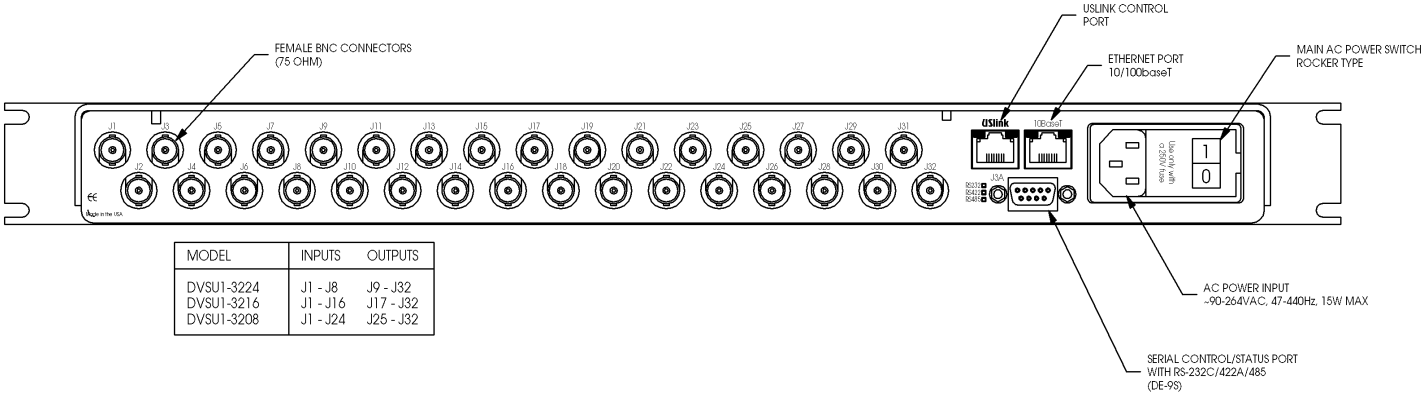
NOTE 1: *Ethernet port can be omitted. Contact the factory.*
NOTE 2: *The serial port interface is configured for RS-232C but can be easily changed via configuration jumpers under the top cover if control needs change.*
NOTE 3: *See the product specification sheet for additional details.*

Applications

- Broadcast facilities or production studios
- Mobile or airborne systems
- Communication installations
- Imaging and animation production facilities
- NTSC, PAL, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High performance digital switch core
- Full fanout non-blocking configurations
- Up to 2.97Gbps digital bandwidth
- Equalization and Re-clocking built-in
- BNC signal connectors (75 ohm)
- Direct control and status at front panel key array
- Attractive studio front panel design
- Super-twist LED illuminated LCD display
- Field configurable serial port (RS-232C/422A/485)
- Standard Ethernet port (10/100baseT) with TCP/IP
- Certified CE EN61010 (LVD)
- Control GUI available



MODEL	INPUTS	OUTPUTS
DVSU1-3224	J1 - J8	J9 - J32
DVSU1-3216	J1 - J16	J17 - J32
DVSU1-3208	J1 - J24	J25 - J32

DVSU1 and HDVSU1 Specifications

Array sizes . . . . . .24x8, 16x16 or 8x24
Switching technology . . . . . .High performance LVDS core
Type of system . . . . . .Non-blocking full fan-out MxN
Architecture . . . . . .Fixed size array
Signal connector location . . . . . .Rear panel
Signal type (DVSU1) . . . . . .Serial Digital Video SMPTE-259M (-ABCD) (143/177/270/360Mb/s)
Signal type (HDVSU1) . . . . . .Serial Digital Video SMPTE-292M / 424M (270Mbps/1.485Gbps/2.97Gbps)
Re-clocking . . . . . .Included

Input Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Impedance . . . . . .75 ohm
Cable equalizer . . . . . .Automatic (300 meters Belden 8281)
Return loss . . . . . .19dB (typical)

Output Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Impedance . . . . . .75 ohm

General Specifications
Switching . . . . . .Asynchronous
Power supply section . . . . . .Universal type (non-redundant)
Power supply monitoring . . . . . .Included
Remote control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Serial port connector . . . . . .DE-9S (D-Type female)
US-Link connector RJ-45
Ethernet 10/100baseT, RJ-45
Status LED's . . . . . .Bi-Color on front panel
Front panel display . . . . . .2x20 LED illuminated super-twist LCD
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 25Watts (max)
Power cord . . . . . .6-foot (Belden 17250)
Fuse protection . . . . . .2A, 5mm (dual), AC models
Weight . . . . . .7 lbs
Size . . . . . .1.75H x 9.55D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>40,000 hours
Certifications . . . . . .CE EN61010

VSU1 Video Routers

High Performance Analog
DC-300MHz

This commercial line of video routers provides the systems professional with an uncompromising combination of high performance, small size and low cost. They are perfectly suited for NTSC, PAL, composite, or RGB analog video signals up to 300MHz.

Compact and high performance, the VSU1 provides a cost effective, flexible switching capacity for smaller installations providing three different choices of full fan-out, non-blocking switching configurations with two different control configurations (serial only, or serial and Ethernet).

Complete control and status of the unit is available at both the front panel controls or remote interface(s). The front panel includes LED illuminated push-buttons (to control and status the unit), an LED illuminated super-twist LCD display, plus bi-color status LED's.

At the rear are BNC female connectors, the user configurable serial port (RS-232C/422A/485), optional Ethernet port (10/100baseT), plus the universal AC power input and AC switch. Also included is our US-Link port for integrating multiple units together for common control (RGB), or connecting our line of control panels (Series RCPA).

Model VSU1-3208
24 input, 8 output

Model Number Assignment

The VSU1 is available in six standard configurations. The model number specifies the shipped factory configuration.

Model Number	Configuration	Connector	Control
VSU1-3208	24 input, 8 output	BNC (75)	Serial
VSU1-3208-SE10	**24 input, 8 output**	**BNC (75)**	**Ethernet & Serial**
VSU1-3216	16 input, 16 output	BNC (75)	Serial
VSU1-3216-SE10	**16 input, 16 output**	**BNC (75)**	**Ethernet & Serial**
VSU1-3224	8 input, 24 output	BNC (75)	Serial
VSU1-3224-SE10	**8 input, 24 output**	**BNC (75)**	**Ethernet & Serial**

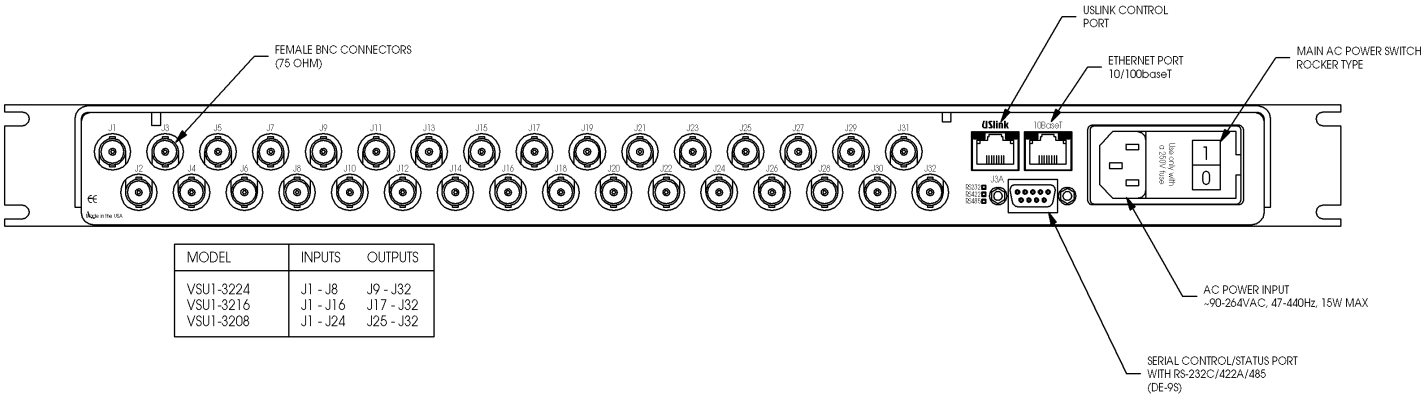
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The serial port interface is configured for RS-232C but can be easily changed via configuration jumpers under the top cover if control needs change.*

Applications

- Broadcast facilities or production studios
- Mobile or airborne systems
- Communication installations
- Imaging and animation production facilities
- NTSC, PAL, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High reliability solid-state switching
- Full fanout non-blocking configurations
- >300MHz analog bandwidth
- BNC signal connectors (75 ohm)
- Direct control and status at front panel key array
- Attractive studio front panel design
- Super-twist LED illuminated LCD display
- Field configurable serial port (RS-232C/422A/485)
- Optional Ethernet port (10/100baseT) with TCP/IP
- Certified CE EN61010 (LVD)
- Control GUI available



MODEL	INPUTS	OUTPUTS
VSU1-3224	J1 - J8	J9 - J32
VSU1-3216	J1 - J16	J17 - J32
VSU1-3208	J1 - J24	J25 - J32

Model VSU1 Specifications

Array sizes . . . . . .24x8, 16x16 or 8x24
Switching technology . . . . . .High reliability solid-state
Type of system . . . . . .Non-blocking full fan-out MxN
Architecture . . . . . .Fixed size array
Signal connector location . . . . . .Rear panel
Frequency response . . . . . .DC-300MHz (1:1 connections)

Input Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Coupling . . . . . .DC (AC coupling optional, call factory)
Impedance . . . . . .75 ohm
Return loss 20dB
Nominal signal level . . . . . .±2VDC
Maximum input level . . . . . .±5.2VDC (no damage)

Output Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Coupling . . . . . .DC (AC coupling optional)
Impedance . . . . . .75 ohm
Maximum output level . . . . . .±2VDC (into 75 ohm load)

General Specifications
Switching . . . . . .Asynchronous
Power supply section . . . . . .Universal type (non-redundant)
Power supply monitoring . . . . . .Included
Remote control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Serial port connector . . . . . .DE-9S (D-Type female)
US-Link connector RJ-45
Ethernet 10/100baseT, RJ-45
Status LED's . . . . . .Bi-Color on front panel
Front panel display . . . . . .2x20 LED illuminated super-twist LCD
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 25Watts (max)
Power cord . . . . . .6-foot (Belden 17250)
Fuse protection . . . . . .2A, 5mm (dual), AC models only
Weight . . . . . .7 lbs
Size . . . . . .1.75H x 9.55D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>30,000 hours
Certifications . . . . . .CE EN61010

VSU1-4P6T Selector

High Performance Analog Selector
DC-135MHz

The VSU1-4P6T router provides the systems professional with a unique selector type of configuration for telemetry, TTL, PCM or similar RGB or RGBS analog signals up to 130MHz.

This compact and high performance 1RU unit provides a cost effective, flexible switching capacity for small installations. There are two different control configurations available (serial only, or serial and Ethernet).

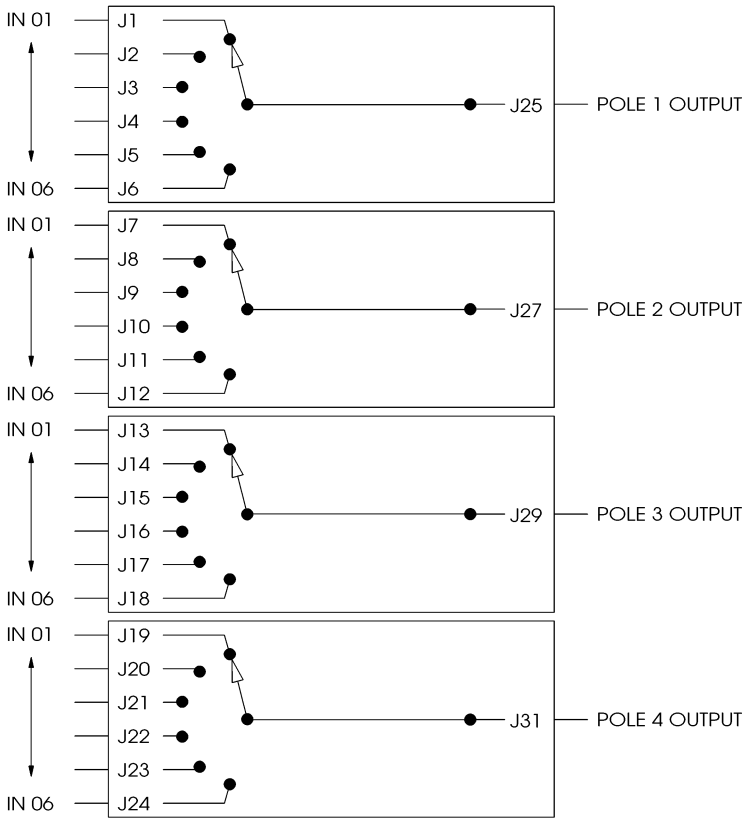
Complete control and status of the unit is available at both the front panel controls or remote interface(s). The front panel includes LED illuminated push-buttons (to control and status the unit), an LED illuminated super-twist LCD display, plus bi-color status LED's.

At the rear are BNC female connectors, the user configurable serial port (RS-232C/422A/485), optional Ethernet port (10/100baseT), plus the universal AC power input and AC switch. The front panel is colored in a studio semi-gloss black finish to augment the image of installations.

An optional version provides an additional A/B selector output to route the selected input set to either the "A" output A set or the "B" output set.

Model VSU1-4P6T-AB
4 pole, 6 throw with AB output

Simplified Signal Schematic



Model Number Assignment

The VSU1-4P6T is available in four standard configurations. The model number specifies the shipped factory configuration.

Model Number	Configuration	Connector	Control
■ VSU1-4P6T	6in, 1out (4 poles)	BNC (75)	Serial
■ **VSU1-4P6T-SE**	**6in, 1out (4 poles)**	**BNC (75)**	**Ethernet & Serial**
■ VSU1-4P6T-AB	6in, 2out (4 poles)	BNC (75)	Serial
■ **VSU1-4P6T-SE-AB**	**6in, 2out (4 poles)**	**BNC (75)**	**Ethernet & Serial**

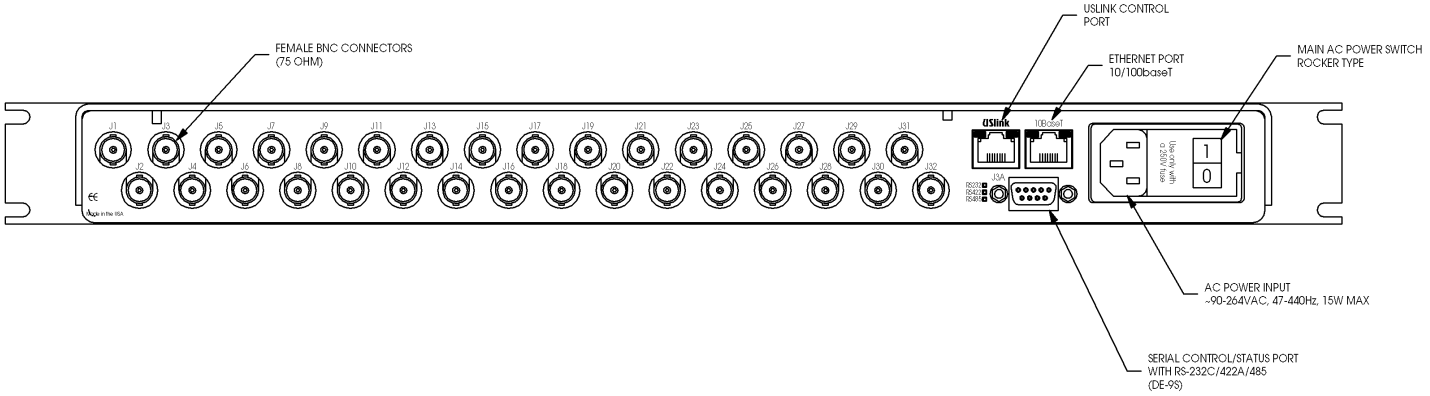
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The serial port interface is configured for RS-232C but can be easily change via configuration jumpers under the top cover if control needs change.*
NOTE 3: *The -AB option adds an A and/or B output function to route the inputs to one of two output groups, or both output groups at the same time.*

Applications

- Mobile or airborne systems
- Communication installations
- Broadcast facilities or production studios
- Imaging and animation production facilities
- RGB, NTSC, PAL, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High reliability solid-state switching
- Fanout (-AB version only)
- >130MHz analog bandwidth
- BNC signal connectors (75 ohm)
- Direct control and status at front panel key array
- Attractive studio front panel design
- Super-twist LED illuminated LCD display
- Field configurable serial port (RS-232C/422A/485)
- Optional Ethernet port (10/100baseT) with TCP/IP
- Certified CE EN61010 (LVD)
- Control GUI available



Model VSU1-4P6T Specifications

Array sizes . . . . . .6 input, 1 output 4-level (pole)
Switching technology . . . . . .High reliability solid-state
Type of system . . . . . .Nx1 selector
Architecture . . . . . .Fixed size array
Signal connector location . . . . . .Rear panel
Frequency response DC-130MHz

Input Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Coupling . . . . . .DC (AC coupling optional, call factory)
Impedance . . . . . .75 ohm
Return loss 20dB
Nominal signal level . . . . . .±5VDC
Maximum input level . . . . . .±6.2VDC (no damage)

Output Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Coupling . . . . . .DC (AC coupling optional)
Impedance . . . . . .75 ohm
Maximum output level . . . . . .±5VDC (into 75 ohm load)

General Specifications
Switching . . . . . .Asynchronous
Power supply section . . . . . .Universal type (non-redundant)
Power supply monitoring . . . . . .Included
Remote control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Serial port connector . . . . . .DE-9S (D-Type female)
US-Link connector RJ-45
Ethernet 10/100baseT, RJ-45
Status LED's . . . . . .Bi-Color on front panel
Front panel display . . . . . .2x20 LED illuminated super-twist LCD
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 25Watts (max)
Power cord . . . . . .6-foot (Belden 17250)
Fuse protection . . . . . .2A, 5mm (dual)
Weight . . . . . .7 lbs
Size . . . . . .1.75H x 9.55D x 19.00W (1RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>30,000 hours
Certifications . . . . . .CE EN61010

VSU2 & HDVSU2 Routers

VSU2 High Performance Analog (DC-500MHz)
HDVSU2 High Performance HD Serial Digital

This mid-sized video router provides the video professional with our uncompromising combination of high performance, small size and competitive cost. The VSU2 is perfectly suited for NTSC, PAL, composite, high resolution RGB analog video signals up to 500MHz. The HDVSU2 is designed to meet SMPTE 292M and SMPTE 424M supporting High Definition (HD) data rates 270Mbps, 1.485Gbps and 2.97Gbps.

Using only 2RU of vertical rack space, this compact and high performance unit provides cost effective, fixed sized switching capacity for mid-sized installations. It provides one fixed size non-blocking full fan out 32 input, 32 output switching configuration. It comes standard with dual serial control ports as well as a 10/100 Ethernet port.

Control and status of the unit is available at both the front panel controls or remote control ports. The front panel includes LED illuminated push-buttons (to control and status the unit), an LED illuminated super-twist LCD display, plus bi-color status LED's.

At the rear are BNC female connectors, the user configurable serial ports (RS-232C/422A/485), built-in Ethernet port (10/100baseT), plus the universal AC power input and AC switch.

Model VSU2-6432
32 input, 32 output

Model Number Assignment

The VSU2 is available in these standard configurations.

Model Number	Configuration	Connector	Control
■ **VSU2-6432**	**32 input, 32 output**	**BNC (75)**	**Serial & Ethernet**
■ VSU2-6432-50	32 input, 32 output	BNC (50)	Serial & Ethernet
■ **HDVSU2-6432**	**32 input, 32 output**	**BNC (75)**	**Serial & Ethernet**

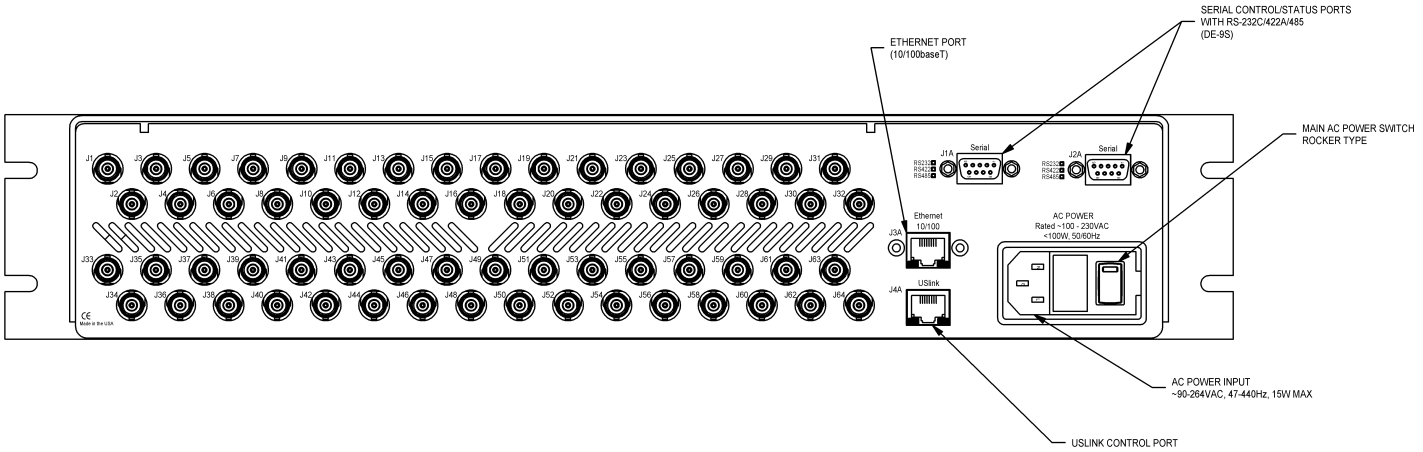
NOTE 1: *Popular models are shown in BOLD.*
NOTE 2: *The serial port interface is configured for RS-232C but can be easily changed via configuration jumpers under the top cover if control needs change.*
NOTE 3: *Contact the factory if you need support for lower rate serial digital types not mentioned for SMPTE 259M (-ABCD).*
NOTE 4: *See the product specification sheet for additional details.*

Applications

- Broadcast facilities or production studios
- Mobile or airborne systems
- Communication installations
- Imaging and animation production facilities
- NTSC, PAL, DS3, DVB or SECAM routing
- Security systems
- Factory automation monitoring

Features

- High performance digital switch core
- Full fanout non-blocking configurations
- Up to 2.97Gbps digital bandwidth
- Equalization and Re-clocking built-in
- BNC signal connectors (75 ohm)
- Direct control and status at front panel key array
- Attractive studio front panel design
- Super-twist LED illuminated LCD display
- Field configurable serial port (RS-232C/422A/485)
- Standard Ethernet port (10/100baseT) with TCP/IP
- Certified CE EN61010 (LVD)
- Control GUI available



Model VSU2 & HDVSU2 Specifications

Array sizes . . . . . .32 input, 32 output
Switching technology . . . . . .High reliability solid-state
Type of system . . . . . .Non-blocking full fan-out MxN
Architecture . . . . . .Fixed size array
Signal connector location . . . . . .Rear panel
VSU2 frequency response . . . . . .DC-500MHz (1:1 connections)

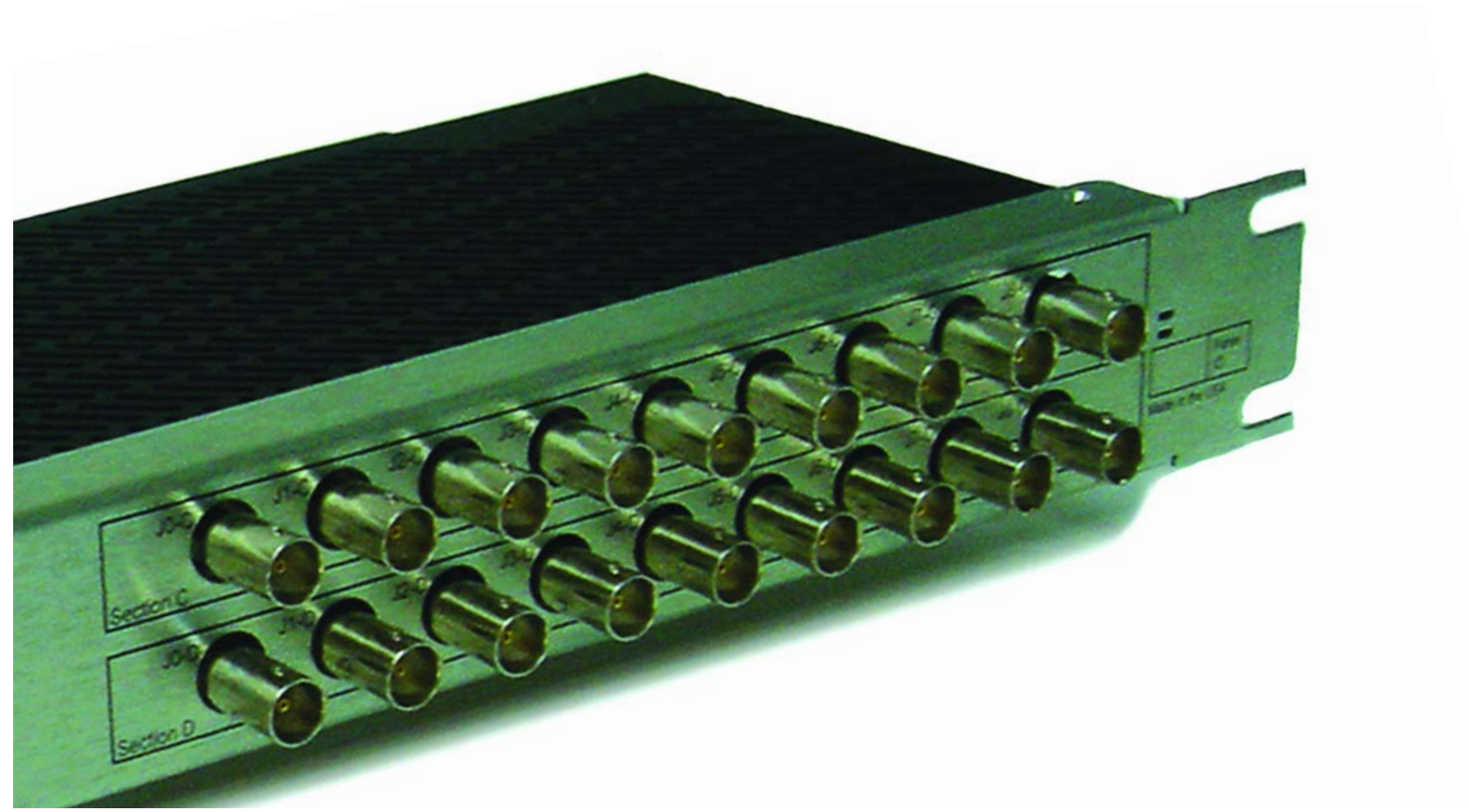
Input Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Coupling . . . . . .DC
Impedance . . . . . .75 ohm
VSU2 nominal signal level . . . . . .±2VDC
VSU2 maximum input level . . . . . .±5.2VDC (no damage)

Output Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .BNC female (75 ohm type)
Coupling . . . . . .DC
Impedance . . . . . .75 ohm
VSU2 maximum output level . . . . . .±2VDC (into 75 ohm load)

General Specifications
Switching . . . . . .Asynchronous
Power supply section . . . . . .Universal type (non-redundant)
Power supply monitoring . . . . . .Included
Remote control interfaces . . . . . .Serial (RS-232C, RS-422A or RS-485 multi-drop)
Serial port connector . . . . . .DE-9S (D-Type female)
US-Link connector RJ-45
Ethernet 10/100baseT, RJ-45
Status LED's . . . . . .Bi-Color on front panel
Front panel display . . . . . .4x20 LED illuminated super-twist LCD
Configuration memory . . . . . .Lithium-back RAM
Memory retention . . . . . .>10 years
Cooling . . . . . .Convection
AC power requirements . . . . . .90-264VAC, 47-440Hz, 100Watts (max)
Power cord . . . . . .6-foot (Belden 17250)
Fuse protection . . . . . .2A, 5mm (dual), AC models only
Weight . . . . . .7 lbs
Size . . . . . .3.47H x 9.55D x 19.00W (2RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>40,000 hours
Certifications . . . . . .CE EN61010

Distribution Units

7

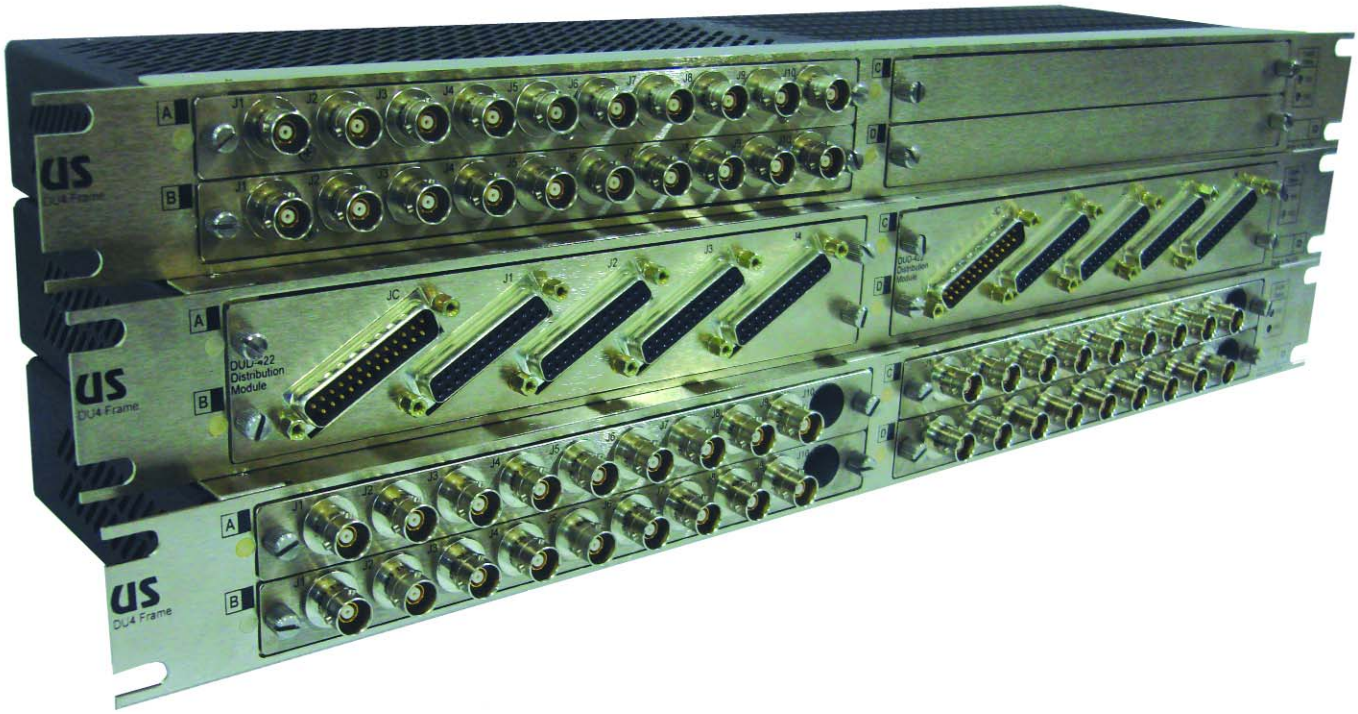


MDU Series

Modular Distribution Units
Digital and Analog

Signal distribution is one of the most popular components included in system designs. The MDU line of modular distribution units provide a flexible, low cost and reliable platform for signal distribution.

The Series MDU consists of a standard 1RU chassis with built-in
redundant power supplies (with monitoring), LED indicators, single universal AC power input and four "element" slots to install a variety of distribution element plug-ins. Compact and high performance, these units provide a cost effective way to add reliable signal distribution to any system design. Both analog and digital distribution plug-ins are available and be mixed and matched to suit your needs. The factory can also build specials to meet any unique signal demands.



Various MDU4 Configurations

MDU4 Specifications

Number of slots	Four
Type of system	Distribution
Architecture	Fixed size array
Power supply section	Redundant
Power supply monitoring	Included (LED and buzzer)
Status LED's	Bi-Color on front panel
Cooling	Convection
AC power requirements	90-264VAC, 47-440Hz, 100Watts (max)
Power cord	6-foot (Belden 17250)
Weight	7 lbs
Size	1.73H x 6.50D x 19.00W (1RU)
Operating temp	0 to +60C
Non-operating temp	-20 to +85C
Humidity	0 to 95% (NC @ +25C)
MTBF	>40,000 hours
Certifications	CE EN61010

Model Number Assignment

The MDU4 is available in many configurations. Shown here are just a few popular models. Please check our website for additional configurations.

Model Number	Configuration	Connector	Signal
DUD422-28W1X4-R	Two 1x4, 8 pair	DB25	Differential 422
DUX422-1111-R	Four 1x8	Triax	Differential 422
DUX422-2222-R	Eight 1x4	Triax	Differential 422
DUX422-3333-R	Twelve 1x2	Triax	Differential 422
DUX422-4X4X-R	Two 1x16	Triax	Differential 422
DUCTTL-1111-R	Four 1x8	BNC	TTL (75 ohm)
DUCTTL-2222-R	Eight 1x4	BNC	TTL (75 ohm)
DUCTTL-3333-R	Twelve 1x2	BNC	TTL (75 ohm)
DUCTTL-4X4X-R	Two 1x16	BNC	TTL (75 ohm)
DUL-1111-R	Four 1x8	BNC	L-Band (50 ohm)
DUL-2222-R	Eight 1x4	BNC	L-Band (50 ohm)
DUL-3333-R	Twelve 1x2	BNC	L-Band (50 ohm)
DUL-4X4X-R	Two 1x16	BNC	L-Band (50 ohm)

NOTE 1: *See the product specification sheet for additional details.*

Applications

- Broadcast facilities or production studios
- Mobile or airborne systems
- Communication installations
- L-Band Signals
- Imaging and animation production facilities
- Clock/Data distribution
- TTL or PCM signals
- Video distribution

Features

- High performance modular design
- Built-in redundant power supplies
- Selection of plug-in elements
- Mix digital and analog element types
- Rugged rack mount included
- Attractive studio front panel design
- Certified CE EN61010 (LVD)

Matrix Systems Relays Modules

8

MATRIX SYSTEMS

Universal Switching Corporation acquired all Matrix Systems Corporation assets and products in April 2007. USC continues to manufacture some MSC products and supports fielded items for repair.

70000 Series Relay

70000 Series Coaxial Relays

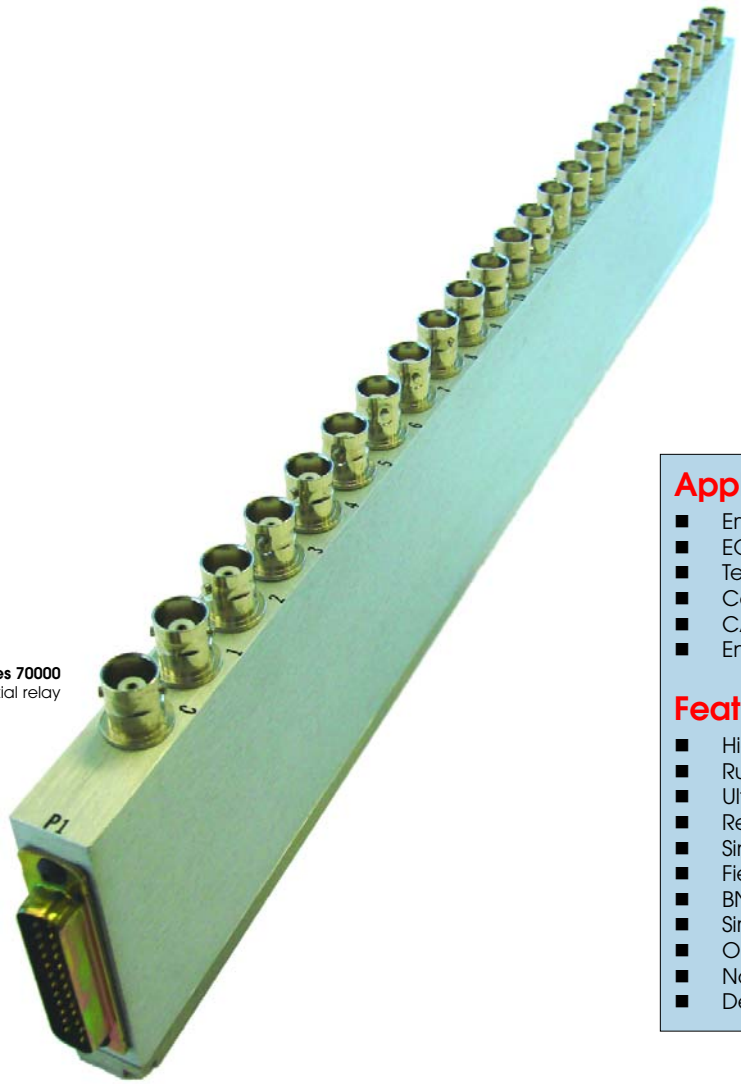
Rugged Coaxial Relays: DC-800MHz (frequency is size dependent)
Sizes from 2x1 to 24x1

The 70000 Series is an Nx1 relay with various coaxial contact types that are controlled by DC voltage. The Series 70000 relay is used by simply applying the appropriate DC voltages, or install into a Model U11600 rack mount chassis complete with relay drivers, remote control ports and power supplies. Contact the factory for information about the U11600 Universal Chassis, or view our website.

USC acquired the product line of Matrix Systems Corporation in April of 2007. One of the product lines that USC will continue to build is the coaxial relay line. The 70000 and RS70000 relays are unique in the relay industry due to the rugged design and excellent shielding characteristics.

These modules are designed to maintain coaxial switching continuity over a wide range of critical and high environmental applications. The relay housings are constructed of precision machined aluminum allow for structural integrity while the housing is hard anodized for environmental durability. All signal paths are nickel plated and gasketed for excellent EMI/RFI protection and signal isolation performance.

USC has changed the model numbering of the original series for compatibility with our inventory system. If you are unsure what your new model number might be, feel free to contact our application staff for assistance. Note that not all combinations or sizes are being built. For exact reorder of an old MSC unit, there will be a minimum order quantity. Contact your salesman or the factory for details.



Series 70000
Coaxial relay

Applications

- Embedded switching
- EOEM switching applications
- Test or measurement needs
- Capacitance measurement
- CATV or MIL-1553 (Triax) routing (Type 90)
- Environmental chambers

Features

- High EMI/RFI performance
- Rugged machined construction
- Ultra high signal isolation available (Type 40)
- Reliable reed relay elements
- Single-ended coax or differential (-I or -S option)
- Field replaceable switching elements
- BNC signal connectors (standard)
- Simple DC power control
- Optional diode suppression available
- Normally open or self-terminating
- Design has decades of proven performance

70000 Model Number Definition

U7(CC)(NT)-(V)(D)(X)

Example: U72512-1PA (contact 25, 12x1, 24vdc, diodes with common positive and SMA's)

(CC) - Contact Configuration Type

10 - Standard (normally open) 100vdc, 250ma, 10W
25 - Standard (self-terminating type, 50 ohm) 4vdc, 250ma, 1/3W
27 - Standard (self-terminating type, 75 ohm) 4vdc, 250ma, 1/3W
30 - Medium isolation (normally open) 100vdc, 250ma, 10W
40 - High isolation (normally open) 28vdc, 250ma, 3W
65 - High isolation (self-terminating, 50 ohm) 4vdc, 250ma, 1/3W
67 - High isolation (self-terminating, 75 ohm) 4vdc, 250ma, 1/3W
70 - Mercury wetted (normally open) 500vdc, 2A, 50W (Note 5)
90 - Standard with Triaxial connector (BJ77) 100vdc, 250ma, 10W

(NT) - Number of throws

02 - 2x1
04 - 4x1
08 - 8x1
12 - 12x1
16 - 16x1
24 - 24x1

(V) - Coil voltage (nominal)

1 - 24vdc to 28vdc (1000 ohm coils)
2 - 15vdc (500 ohm coils)
5 - 5vdc (250 ohm coils) only for contacts types 10-30

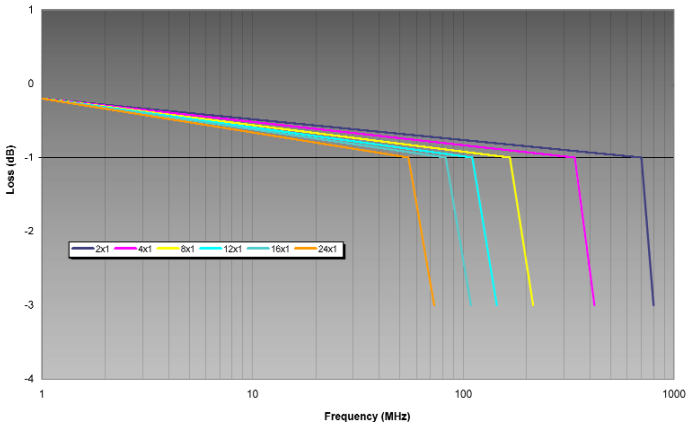
(D) - Coil suppression diodes

0 - Not included
P - Suppression diodes included with coil common positive
N - Suppression diodes included included with coil common negative

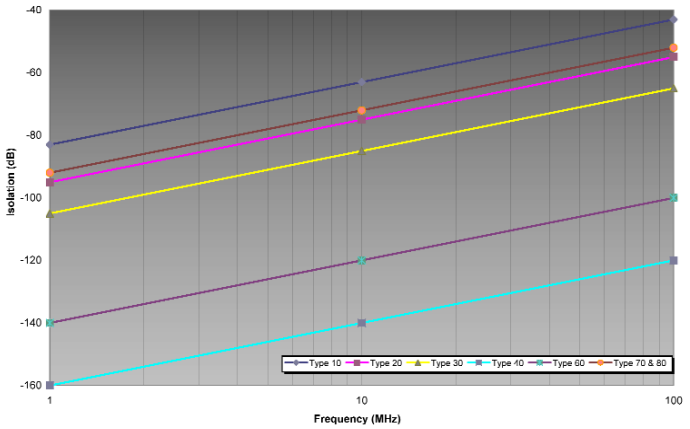
(X) - Extra options

A - SMA signal connectors (only on contact types 10, 25, 27 & 65)
F - F-Type signal connectors (only on contact types 10, 27)
T - TNC signal connectors (only on contact types 10, 25, & 65)
I - Insulated coaxial shield (only on contact types 10, 25, 27 & 70)
S - Insulated & switched coaxial shield (only on contact types 10, 25, 27, 70)
L - Lockscrews on control connector so mate can be secured

Loss vs Frequency



Isolation vs Frequency



General Specifications

Relay sizes	2x1, 4x1, 8x1, 12x1, 16x1 & 24x1
Switching technology	Reed relay
Configuration	Coaxial (except Type 90 is Triax)
Architecture	Nx1 bi-directional
Signal connector orientation	Inline
Impedance	50 ohm (75 ohm optional)
Type	Single-ended
Signal connector	BNC standard (see model number chart)
Termination	1/8 watt, 2% (Type 20 and 60)
Isolation	See graph
Transmission loss	See graph
Switching speed	<1mS dry contacts, <3mS Hg
Control voltage	24V, optional 5V or 15V
Operating temp	-30F to +150F
Humidity	0 to 98% NC
Shock and vibration	50G's @ 1mS, 2G's p-p 20-2kHz
Mounting	Two 8-32 tapped holes
Cooling	Convection
Contact life	100 million operation typical
Certifications	None

NOTES:

1. The I or S options are not available on the optional signal connectors or the contact type 90 (triaxial).
2. The "expander" port is not available any longer.
3. No mating connectors or hardware are included.
4. Contact type 70 must be mounted with signal connectors facing up.
5. Due to new environmental laws, USC may or may not be able to sell relays with mercury wetted contacts.
6. For installing into the U11600 chassis, the "-1" coil voltage is needed.
7. Type 27 and 67 use the standard 50 ohm MSC connector.

RS70000 Series Relay

RS70000 Series Coaxial Relays

Rugged Coaxial Relays: DC-800MHz (frequency is size dependent)
Sizes from 2x1 to 24x1

The RS70000 Series is an 1xN relay with various coaxial contact types depending upon the users need, and also has a built-in serial control port as well. The RS70000 can be used in a standalone installation since the control port and wall mount style power supply is included.

USC acquired the product line of Matrix Systems Corporation in April of 2007. One of the product lines that USC will continue to build is the RS70000 relays coaxial relay product. These relays are unique in the relay industry due to the rugged design and excellent shielding characteristics.

These modules are designed to maintain coaxial switching continuity over a wide range of critical and high environmental applications. The relay housings are constructed of precision machined aluminum allow for structural integrity while the housing is hard anodized for environmental durability. All signal paths are nickel plated and gasketed for excellent EMI/RFI protection and signal isolation performance.

USC has changed the model numbering of the original series for compatibility with our inventory system. If you are unsure what your new model number might be, feel free to contact our application staff for assistance. Please note that not all combinations or sizes are being built. For an exact reorder of an old MSC unit, there will be a minimum order quantity. Contact your salesman or the factory for details.

Series RS70000
Coaxial relay with serial port and wall mount power supply

Applications

- Embedded switching
- EOEM switching applications
- Test or measurement needs
- Capacitance measurement
- CATV or MIL-1553 (Triax) routing (Type 90)
- Environmental chambers

Features

- Built-in serial control port
- High EMI/RFI performance
- Rugged machined construction
- Ultra high signal isolation available (Type 40)
- Reliable reed relay elements
- Single-ended coax or differential (-I or -S option)
- Field replaceable switching elements
- BNC signal connectors (standard)
- Simple DC power control
- Wall mount power supply included
- Normally open or self-terminating
- Design has years of proven performance

RS70000 Model Number Definition

URS7(CC)(NT)-(X)

Example: URS71008-A (contact 25, 8x1, and SMA connectors)

(CC) - Contact Configuration

10 - Standard (normally open) 100vdc, 250ma, 10W
25 - Standard (self-terminating type, 50 ohm) 4vdc, 250ma, 1/3W
27 - Standard (self-terminating type, 75 ohm) 4vdc, 250ma, 1/3W
30 - Medium isolation (normally open) 100vdc, 250ma, 10W
40 - High isolation (normally open) 28vdc, 250ma, 3W
65 - High isolation (self-terminating, 50 ohm) 4vdc, 250ma, 1/3W
67 - High isolation (self-terminating, 75 ohm) 4vdc, 250ma, 1/3W
70 - Mercury wetted (normally open) 500vdc, 2000ma, 50W (Note 5)
90 - Standard with Triaxial connector (BJ77) 100vdc, 250ma, 10W

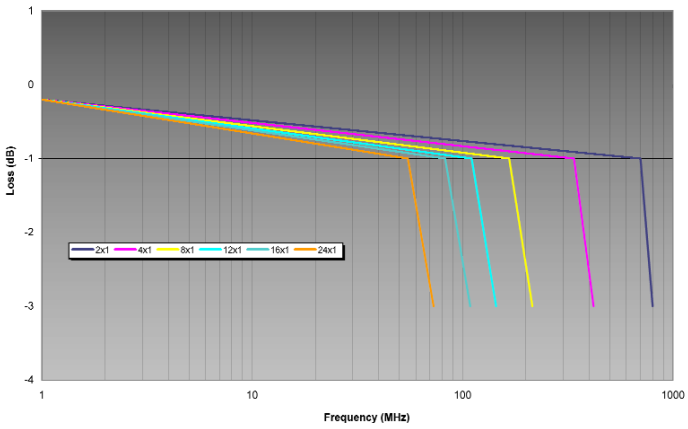
(NT) - Number of throws

02 - 2x1
04 - 4x1
08 - 8x1
12 - 12x1
16 - 16x1
24 - 24x1

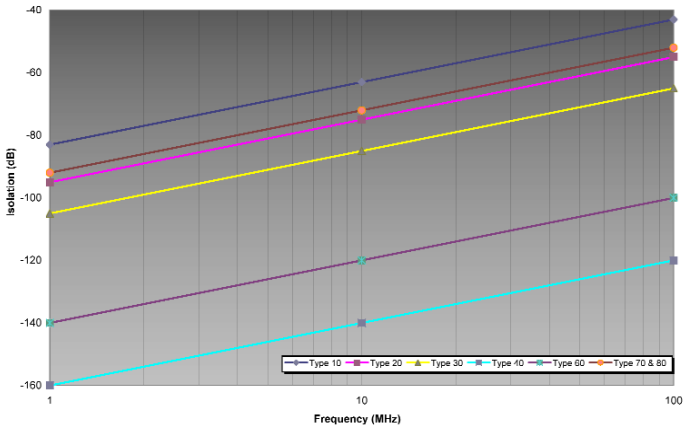
(X) - Extra options

A - SMA signal connectors (only on contact types 10, 25, 27 & 65)
F - F-Type signal connectors (only on contact types 10, 27)
T - TNC signal connectors (only on contact types 10, 25, & 65)
I - Insulated coaxial shield (only on contact types 10, 25, 27 & 70)
S - Insulated & switched coaxial shield (only on contact types 10, 25, 27, 70)

Loss vs Frequency



Isolation vs Frequency



General Specifications

Relay sizes	2x1, 4x1, 8x1, 12x1, 16x1 & 24x1
Switching technology	Reed relay
Configuration	Coaxial (except Type 90 is Triax)
Architecture	Nx1 bi-directional
Signal connector orientation	Inline
Impedance	50 ohm (75 ohm optional)
Type	Single-ended
Signal connector	BNC standard (see model number chart)
Termination	1/8 watt, 2% (Type 20 and 60)
Isolation	See graph
Transmission loss	See graph
Switching speed	<1mS dry contacts, <3mS Hg
Control	Serial control (RS-232C)
Operating temp	-30F to +150F
Humidity	0 to 98% NC
Shock and vibration	50G's @ 1mS, 2G's p-p 20-2kHz
Mounting	Two 8-32 tapped holes
Cooling	Convection
Contact life	100 million operation typical
Certifications	None

NOTES:

1. The I or S options are not available on the optional signal connectors or the contact type 90 (triaxial).
2. The "expander" port is not available any longer.
3. No mating connectors or hardware are included.
4. Contact type 70 must be mounted with signal connectors facing up.
5. Due to new environmental laws, USC may or may not be able to sell relays with mercury wetted contacts.
7. Type 27 and 67 use the standard 50 ohm MSC connector.

Controllers and Accessories

9

C710 Series CPU

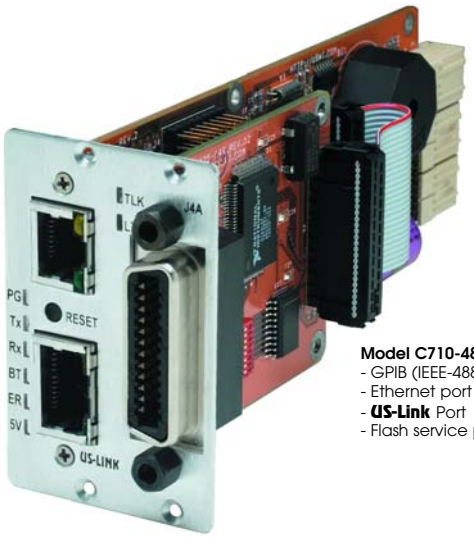
GPIB and Serial Types, with Ethernet

Our plug-in C710 Series controller and remote port module offers a host of features and is compatible with all current Universal Switching Corporation switching systems. USC products utilize a distributed multi-processor design where each module installed in the system has an embedded processor to handle all function and status reporting required. This includes major functions of the mainframe that it's installed into such as the front panel display, power supply health and keypad functions. The C710 replaced the older C700 unit.

One very useful feature of the C710 Series controller card is the fact that the firmware can be updated while in the field. This is achieved by uploading the new firmware to the serial service port. This port is a 10-position modular connector located on the faceplate of the controller.

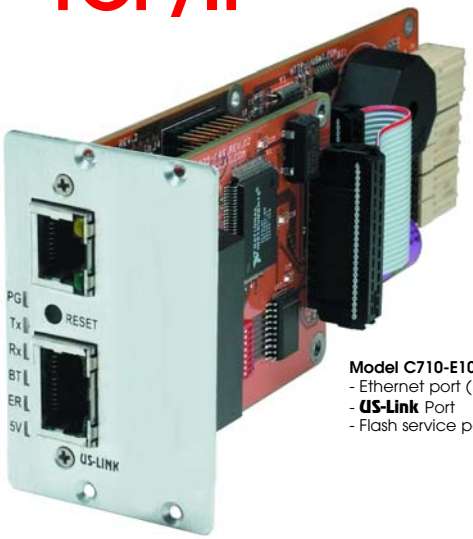
Model Number Assignment

Model	Definition
C710-E10	Controller with Ethernet port only
C710-488	Controller with GPIB and Ethernet
C710-S3	Controller with Serial and Ethernet

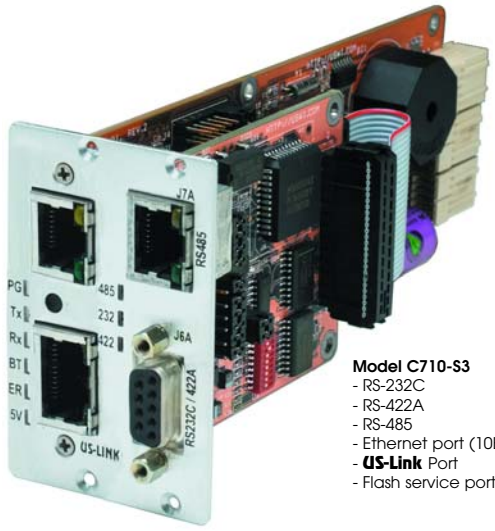


Model C710-488
- GPIB (IEEE-488.2)
- Ethernet port (10BaseT)
- **US-Link** Port
- Flash service port

All Include
TCP/IP



Model C710-E10
- Ethernet port (10BaseT)
- **US-Link** Port
- Flash service port



Model C710-S3
- RS-232C
- RS-422A
- RS-485
- Ethernet port (10BaseT)
- **US-Link** Port
- Flash service port

General Specifications

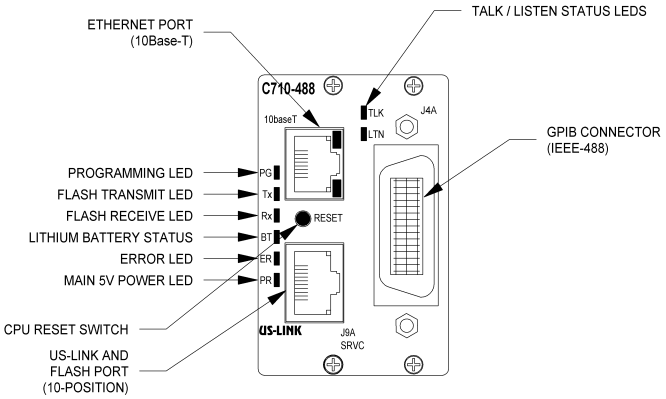
Internal control type	G2 compatible
Memory	Lithium-backed RAM
Memory retention	>10 years
FLASH program area	Field upgradable
Status LED's	Included
Battery monitor	Included
DC power	+5V, 750mA
Flash port	10 position modular
Remote control link	**US-Link**

Ethernet port	10BaseT with TCP/IP
GPIB port	IEEE-488 compliant
Serial combo	RS-232C/422A/485
BITE	Included
Weight	8oz
Operating temp	0 to +70C
Non-operating temp	-20 to +85C
Humidity	0 to 95% (NC @ +25C)
MTBF	>75,000 hours (per MIL-HDBK-217F, N1 ground benign @ +25C)

Model C710-488

The GPIB version of the C710 Series controllers offer a high performance GPIB (IEEE-488.2) port. This type of parallel control port is very popular in ATE applications (automated test equipment). It is high speed and provides data handshaking. The C710-488 is designed as an IEEE-488.2 compatible device.

Pin	GPIB Assignment	Pin	GPIB Assignment
1	ID 1	13	ID 5
2	ID 2	14	ID 6
3	ID 3	15	ID 7
4	ID 4	16	ID 8
5	EOI	17	REN
6	DAV	18	GND (6)
7	NRFD	19	GND (7)
8	NDAC	20	GND (8)
9	IFC	21	GND (9)
10	SRQ	22	GND (10)
11	ATN	23	GND (11)
12	SHIELD	24	LOGIC GROUND



Model C710-S3

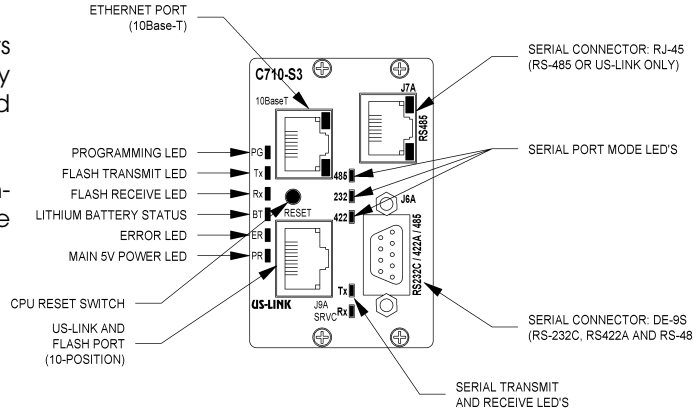
The C710-S3 can be configured for either an RS-232C, RS-422A or an RS-485 multi-drop hardware configuration. The RS-232C mode will connect to a normal serial port from most PC compatible computers.

The RS-422A configuration is less popular, however it will communicate at faster speeds and longer distances than the RS-232C configuration. The RS-422A mode is differential and is terminated in 100 ohms across the data and handshaking pairs.

The RS-485 configuration is normally used with multiple serial units in a multi-drop control scenario. Each unit is assigned a binary address via DIP switch settings on the plug-in. This is a high-speed and long distance control configuration.

Selection of the control mode is done via jumpers on the controller. Simply un-plug the card and change the location of the jumpers per the instruction sheet.

Pin	RS-232C Mode	RS-422A Mode	RS-485 Mode
1	Not Used	Transmit Data: out (-)	Data: (-)
2	Transmit Data: out	Transmit Data: out (+)	Data: (+)
3	Receive Data: in	Receive Data: in (+)	Not Used
4	Not Used	Receive Data: in (-)	Not Used
5	Ground	Ground	Ground
6	Not Used	Clear To Send (-)	Not Used
7	Clear To Send	Clear To Send (+)	Not Used
8	Ready To Send	Ready To Send (+)	Not Used
9	Not Used	Ready To Send (-)	Not Used



Serial Flash Port

The C710 Series contains a serial service (FLASH) port for downloading new firmware drivers to the program area of the CPU. The connector is a standard 10-position modular connector that mates with the cable supplied with your firmware upgrade kit. Upgraded firmware enhancements can easily be added to the system by downloading the new version via this port. A cable is provided with all upgrade kits and connects to your PC computer or other serial control device. The port is fixed at 9600 baud, 8 bits, no parity, 1 start bit and 1 stop bit.

Pin	RS-232C Service Port
1	(n/c)
2	DTR (progr)
3	DSR (progr)
4	- RS485 (**US-Link**)
5	+ RS485 (**US-Link**)
6	GND
7	GND
8	TxD (progr)
9	RxD (progr)
10	PROG (ground to activate programming)

RCPA Series

Rack Mounted Remote Controllers

Our rack mounted controllers provide a means to manually control and status a switching system. These compact 1RU and 2RU remote control panels can allow you to locate them up to 4000 feet way from the actual switching system. The new "E" version includes an Ethernet port that can control units globally via the Internet. Special firmware is needed in many cases to address the users need.

Multiple control panels can be used on the same system to allow different users to access and control input and output channels assigned to the specific control panel.

The keys are LED illuminated and the caps can be removed for custom labeling for individual and unique applications. Optionally, adding a -DS suffix to the part number will include a removable designation strip that can be labeled.

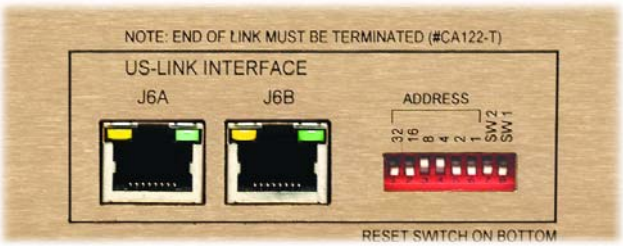
Model Number Assignment

Model	Definition
RCPA-032	1RU Controller with 32 keys
RCPA-064	2RU Controller with 64 keys
RCPA-096	2RU Controller with 96 keys
RCPA-128	2RU Controller with 128 key
RCPAE-032	1RU Controller with 32 keys w/ Ethernet
RCPAE-064	2RU Controller with 64 keys w/ Ethernet
RCPAE-096	2RU Controller with 96 keys w/ Ethernet
RCPAE-128	2RU Controller with 128 key w/ Ethernet

NOTE: *Add a -DS suffix for optional designations strips to be included.*

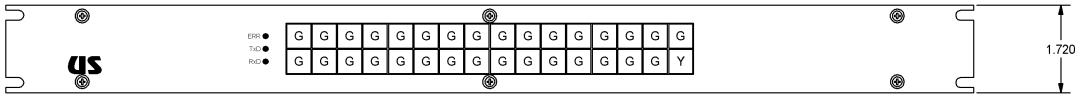
Model RCPA-032
1RU unit with 32 keys

Model RCPA-064
2RU unit with 64 keys

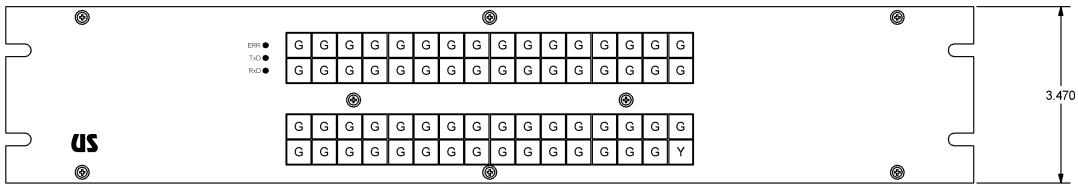


General Specifications

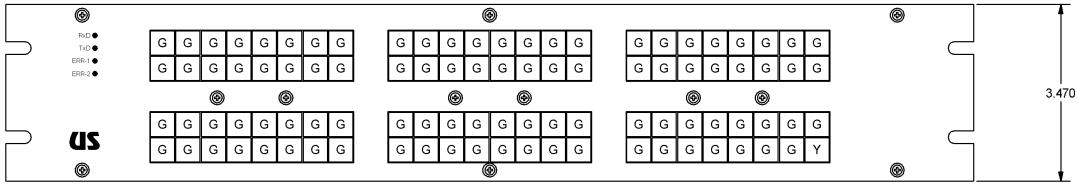
Key type	LED illuminated with tactile feel
Processor type	33MHz, 8051 derivative
Remote control link	**US-Link** (RJ-45) or Ethernet
FLASH program area	Field upgradable
Status LED's	Included
Lamp test	Upon power up only
Key actuation life	>5,000,000 operations (per key)
Link data transmission line	100 ohm twisted pair
Link load impedance	100 ohm termination (P/N #CA122-T, included)
Power requirements	90-264VAC, <10Watts, 47-440Hz
Operating temperature	0 to +60C
Storage temperature	-20 to +85C
Cooling	Convection
Color	Black anodize front and cover
Front panel thickness	1/8"
Weight	<3lbs
Size	1RU or 2RU: 19.00"W x 3.75"D
BITE	Included
Humidity	0 to 95% (NC @ +25C)



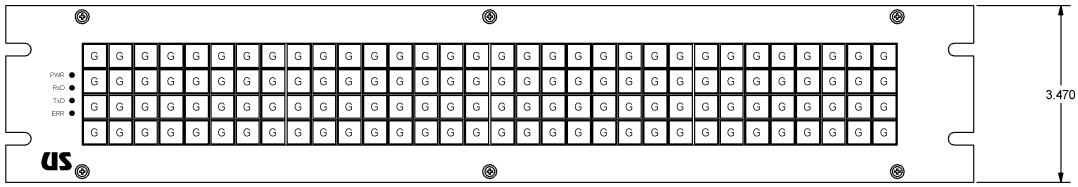
RCPA-032
(1RU with 32 keys)



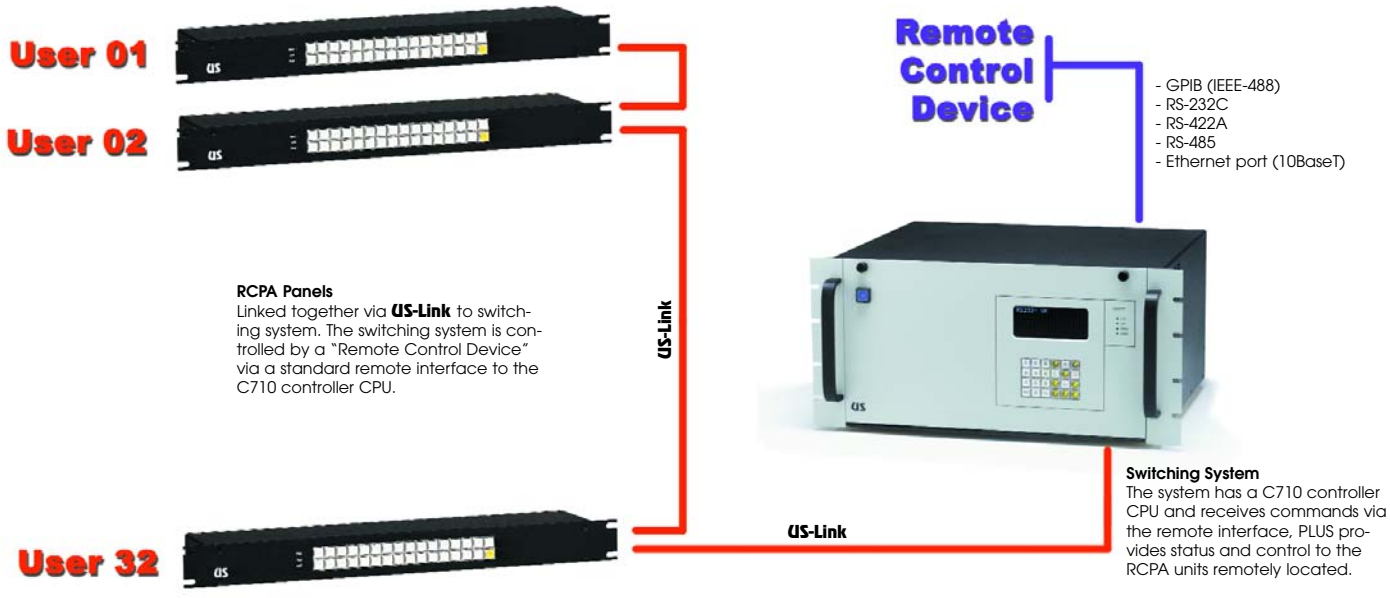
RCPA-064
(2RU with 64 keys)



RCPA-096
(2RU with 96 keys)



RCPA-128
(2RU with 128 keys)



AP Series Panels

Rack Mounted Active and Passive Adapter Panel Assemblies

The AP Series rack mounted panel assemblies provide the system engineer with an optional signal connector interface and/or signal conversion for products. Some of these panels are passive and merely provide a transition function between connector types, while other are active and also provide an electrical transition.

Active Panel Example:

For the System S2561E (a popular programmable 256x256 switching system), the unique high-density design of the unit demanded that the input and output on the rear panel be high-density signal connectors. These connectors are multi-position type and allow for a smaller overall package size for the capability of the S2561E.

The Model AP32B (32 channel) adapter panels allow the user to connect to the S2561E unit via industry standard BNC connectors. The units are 1RU and can be installed on a rear-facing set of equipment rails, or on front-facing equipment rails. The adapter panels are active and convert the high-level BNC signals to low-level signals compatible with the System S2561D. Input and output panels perform opposite functions and are dedicated. The output panel assembly is self-contained and requires only AC power. The interconnecting cables, power cord, and rack mounting hardware are included with each panel assembly.

Model Number Assignment

Active Input Configurations

AP32BI-S73	.75 ohm input, (video)	3-foot
AP32BI-S76	.75 ohm input, (video)	6-foot
AP16RGBI-S73	.75 ohm input, (RGB video)	3-foot
AP16RGBI-S76	.75 ohm input, (RGB video)	6-foot

Active Output Configurations

AP32BO-S73	.75 ohm output, ±1V (video)	3-foot
AP32BO-S76	.75 ohm output, ±1V (video)	6-foot
AP16RGBO-073	.75 ohm output, ±1V (RGB video)	3-foot
AP16RGBO-076	.75 ohm output, ±1V (RGB video)	6-foot

Passive Configurations

AP16D9-P03	.DE-9P with 2-pair (clk/data)	3-foot
AP16D9-P06	.DE-9P with 2-pair (clk/data)	6-foot
AP16D9-S03	.DE-9S with 2-pair (clk/data)	3-foot
AP16D9-S06	.DE-9S with 2-pair (clk/data)	6-foot
AP16R-003	.RJ-45 with 1-pair	3-foot
AP16R-006	.RJ-45 with 1-pair	6-foot
AP16RS-003	.RJ-45 with 2-pair (clk/data)	3-foot
AP16RS-006	.RJ-45 with 2-pair (clk/data)	6-foot
AP32TR-003	.Triax - BJ77	3-foot
AP32TR-006	.Triax - BJ77	6-foot

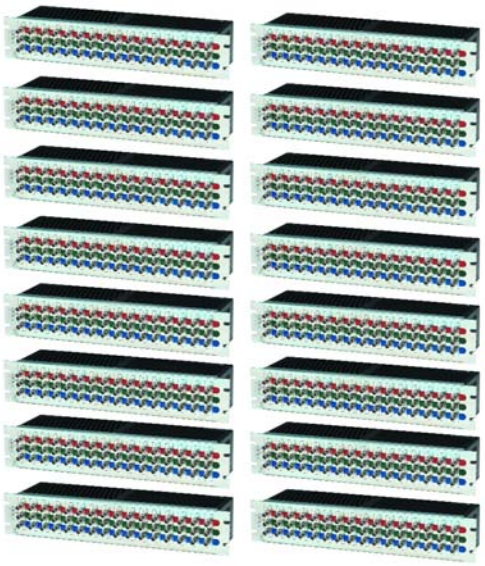
NOTE-1: *The AP32BI, AP32BO, AP16RGBI, AP16RGBO units are available with an "E" option. Adding the "E" option after the main number includes an expander port for expanding beyond a 256x256, up to a 512x512 configuration. Example P/N: AP32BI-E-076*

NOTE-2: *Many other variations of panels are available. Please contact the factory.*

Model AP16RGB
2RU active unit with16 RGB channels and 75 ohm BNC's

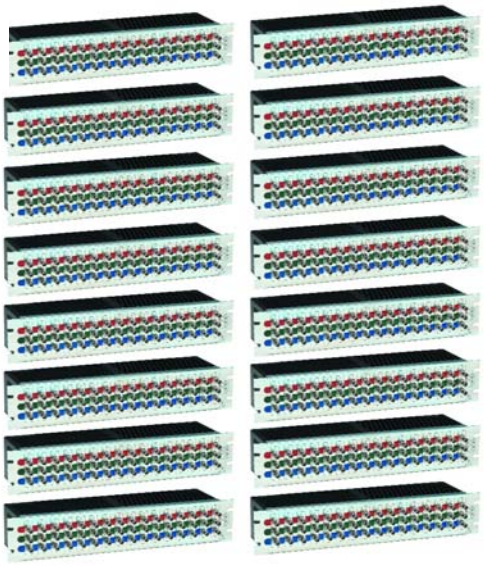
256 input x 256 output RGB System

NOTE: All can be simultaneously controlled via one interface connection.



Model AP16RGBI-S76
2RU active units with 16 RGB channels. 75 ohm BNC's
(16 needed for 256 inputs)

Model S2561E-88-501
5RU unit with 256 inputs, 256 outputs, Ethernet and serial control ports
(3 needed for RGB)



Model AP16RGBO-S76
2RU active units with 16 RGB channels. 75 ohm BNC's
(16 needed for 256 outputs)

AP16RGBI Specifications

Number of channels . . . . . .48 inputs, 48 outputs
Frequency response DC-200MHz
Status LED's . . . . . .VEE and VDT
Nominal signal level . . . . . .±5.0VDC
Maximum input level . . . . . .±5.5VDC (no damage)
SCSI cable length . . . . . .3-foot or 6-foot (2 supplied)
Cooling . . . . . .Convection
AC power requirements 90-264VAC, 47-440Hz, 60Watts
Power cord . . . . . .6-foot (Belden 17250)
Ground stud 10-32
Weight . . . . . .8 lbs
Size . . . . . .3.50H x 5.00D x 19.00W (2RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)

Input Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .75 ohm BNC
Coupling . . . . . .DC
Impedance . . . . . .75 (50 optional)

AP16RGBO Specifications

Number of channels . . . . . .48 inputs, 48 outputs
Frequency response DC-125MHz
Status LED's . . . . . .VEE and VDT
Nominal signal level . . . . . .±1.5VDC
SCSI cable length . . . . . .3-foot or 6-foot (2 supplied)
Cooling . . . . . .Convection
AC power requirements 90-264VAC, 47-440Hz, 60Watts
Power cord . . . . . .6-foot (Belden 17250)
Ground stud 10-32
Weight . . . . . .8 lbs
Size . . . . . .3.50.75H x 5.00D x 19.00W (2RU)
Operating temp . . . . . .0 to +60C
Non-operating temp . . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)

Output Characteristics
Type . . . . . .Single-ended
Signal connector . . . . . .75 ohm BNC
Coupling . . . . . .DC
Impedance . . . . . .75 ohm (50 ohm optional)

AP Series Panels

Expander version for use up to a 512x512 (with System S2561E)

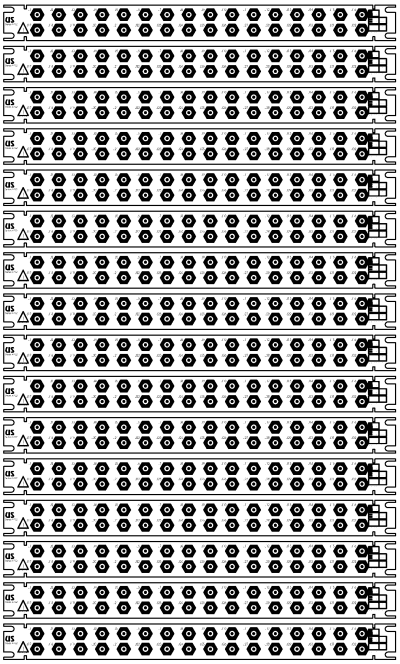
Model AP32B-E
1RU active unit with 32 coaxial channels, expanders and BNC's

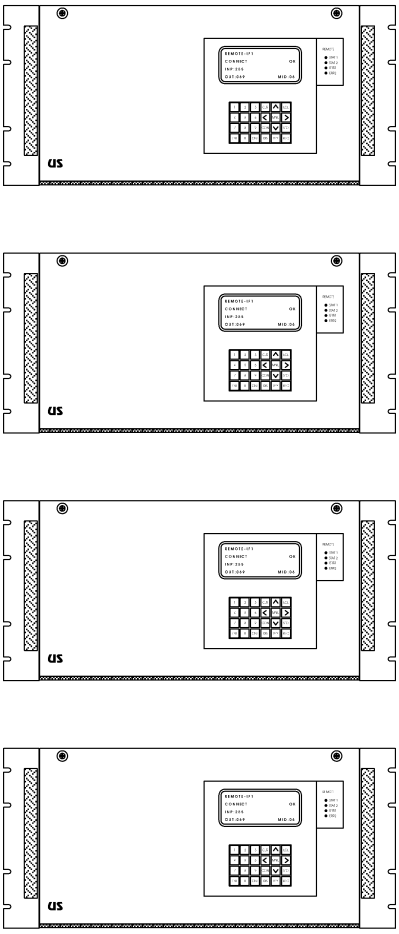
Passive Panel Examples

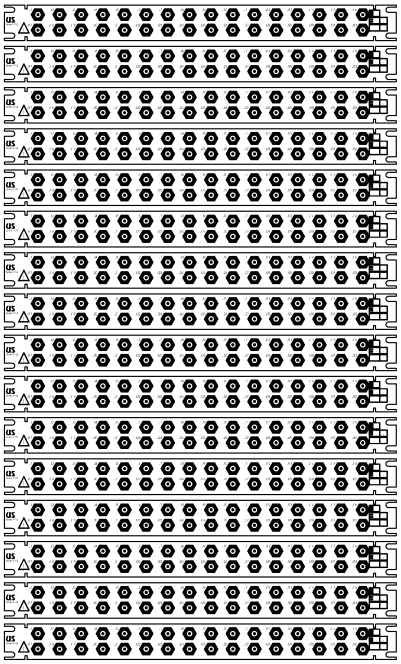
Model AP32RS
1RU passive unit with 32 RJ-45 modular connectors (2 pair per) for clock and data uses

Model AP32R
1RU passive unit with 32 RJ-45 modular connectors (1 pair per)

512 input x 512 output







The system shown is comprised of:

Qty 4: S2561E-88-R601 Switch Chassis
Qty 16: AP32BI-E-S76 Input Adapter Panel w/ Expander
Qty 16: AP32BO-E-S76 Output Adapter Panel w/ Expander

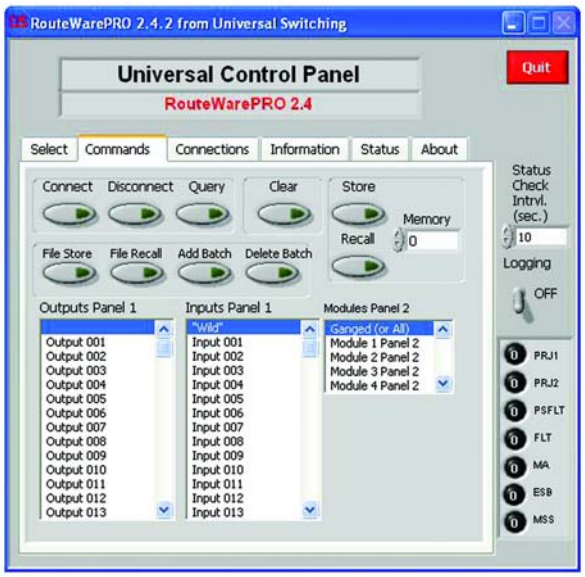
RouteWarePRO

Rack Mounted PC Controller and Software

For a total system solution, Universal Switching offers a complete rack mounted PC controller system with a flexible control software package (RouteWarePRO).

Model PCS500 PC Controller:
Our rack mounted PCS500 system controller provides a whole new level of integrated system solution. Being both high performance and cost effective, the PCS500 includes a PC based 1RU high rack mounted CPU with CD-ROM, 80Gb harddisk, locking hinged access door, front panel status indicators, and rack mounted power strip with power ON/OFF switch.

For security, a 1RU lockable drawer contains the keyboard and roller-ball device. In addition, the system also includes a black 8RU flat-panel rack mounted 17" LCD display. The system is provided with an RS-485/RS-232C interface as a standard item, and Microsoft XP-Professional operating system running on a dual core Intel Pentium-D 2.8GHz processor.



RouteWarePRO 2.4

Control Software Options:

There are quite a few control software options that the system designer can choose from when integrating our switching systems.

1. Purchase a flexible switch control and management software package from Universal Switching Corporation.

2. Utilize a common platform such as National Instruments LabVIEW to interact with other programmable equipment. We provide LabVIEW drivers free of charge.

3. Develop a custom GUI themselves, or contact someone to develop it for them.

Each method has pro's and con's. With RouteWarePRO we offer the means for a user to manage input and output connections, status the system, store and recall user defined configurations, source and destination signal labeling, and more. Multiple switching units can be managed with just one single window. Download our control GUI software **RouteWarePRO** for a FREE 30-day trial today!

Appendix

A

Glossary: A - D

AFV/Audio-Follow-Video - A control mode in a routing switcher (switching array) in which the audio inputs associated with a video input are automatically selected when the video source is selected. That is, audio and video are always switched together. See Breakaway. Audio may be either single channel or multi-channel (stereo).

ASCII - American Standard Code for Information Interchange. A 7-bit binary code representing the English alphabet, decimal numbers and common punctuation marks. Also includes "control characters" such as Carriage Return or End of Text. An 8-bit superset of the standard ASCII codes is often used today to include foreign characters and other symbols. These supersets are often called Extended ASCII Character Sets.

Active Video - The portion of a video signal that contains the visible picture information.

BNC - A type of coaxial connector used in situations requiring shielded cable for signal connections and/or controlled impedance applications.

BPS - The amount of binary data sent in bits per second. Not to be confused with baud rate. Modern data and fax modems, for example, transmit at 14,400 bits per second using a baud rate of 2,400 baud. This is accomplished by complex encoding methods. Also used as a general term to define any rate that digital data flows (see Mbps).

Balanced Input - A differential input circuit pair with equal impedance to ground on each side. See Differential Input. The advantages as opposed to single-ended transmission are noise rejection over long distances of cabling.

Balanced Output - A differential output circuit pair with equal source impedance on each side. See Differential Output.

Bandwidth - The measure of a circuit's ability to pass a full amplitude signal over a range of signal frequencies. Normally measured between the point or points where the signal amplitude falls to -3dB below the passband frequency.

Baseband - An unmodulated signal or band of signals. The video signal seen on a waveform monitor is a baseband video signal.

Baud Rate - The signaling or symbol rate of a digital transmission path or device. A symbol can represent more than one bit of information, depending on the encoding or modulation scheme used to create the symbol. Often used interchangeably with bits per second (BPS), although incorrectly. See BPS.

Blanking/Blanking Interval - The period of time when a television monitor is "blanked" while the electron beam retraces from right to left or bottom to top. In a baseband video signal, the intervals between active video lines and between the last active line in a field and the first active line in the next. Ideally, a video switcher would sense when a blanking period occurs and would switch the video signal during this time. This prevents any visually unpleasant video effects on a monitor. This requires the video switcher to actively monitor each of the user's video sources.

Blocking - A term with multiple and conflicting industry usage. 1) May be used to express the inability to connect a single input of a switching array to multiple outputs simultaneously without any input loading or mismatches. If multiple outputs are connected to a given input, proportional input loading will occur. 2) In multi-stage switching arrays (tri-stage or 3-stage), it refers to the possibility that the user may not be ability to route and input to an output at all times (blocking due to unavailable middle stages). See Non-Blocking. It is possible that even if blocking occurs, the switching array may be able to be reinitialized in a logical order to avoid the blocking connection conditions.

Breakaway - A routing control mode wherein an audio source can be selected independently of the video source and vice versa. See AFV/Audio-Follow-Video.

Break-Before-Make - Disconnecting the present circuit before connecting a new circuit. Also known as Break/Make.

Byte - A grouping of 8 binary bits is called a byte.

Carry Current - See Cold Switching.

Channel Crosstalk - Coupling of a signal from one channel to another or any other output by conduction or radiation. Crosstalk is expressed in decibels (dB) at a specified load impedance and over a specific frequency range or ranges. See Crosstalk/Crosstalk Isolation.

Coaxial Cable - A cable that has one conductor (shield) completely surrounding the other (center conductor), the two being coaxial and separated by an insulator. Standard industry types have a braided shield, or a semi-rigid copper or stainless steel shield material. Braided shield coaxial cable offers more physical flexibility but less shielding.

Cold Switching - Closing the relay contacts before applying voltage and current, plus removing voltage and current before opening the contacts. (Contacts do not make or break current.) Also see Dry Circuit Switching. Larger currents may be carried through the contacts without damage to the contact area since contacts will not "arc" when closed or opened.

Common Mode Rejection - The ability of a differential input circuit to reject a signal common to both inputs, normally "hum" developed by 50 or 60 Hz power line (mains) voltages.

Common Mode Rejection Ratio (CMRR) - A measure in decibels of the effectiveness of a circuit in rejecting a common mode voltage.

Common Mode Voltage - The voltage common to both sides of a differential circuit pair. The differential voltage across the circuit pair is the desired signal, whereas the common voltage signal is the unwanted signal which may have been coupled into the transmission pair.

Component Video - A three-channel video signal wherein the luminance, hue and color saturation information are carried as R, G and B (Red, Green and Blue) signals or as one of several variations of color difference signals.

Composite Video - A single video signal carrying combined luminance, chrominance and raster synchronizing information.

Contact Bounce - The intermittent and usually undesired opening of mechanical relay contacts during closure, or closing of contacts during opening. Contact bounce period depends upon the type of relay and varies from .5mS for small reed relays to 10-20mS for larger solenoid types. Solid-state or mercury wetted contacts (Hg) do not have a contact bounce characteristic.

Contact Life - The maximum number of expected closures before failure. Life is dependent on the switched voltage, current, and power. Failure is usually when the contact resistance exceeds an end of life value. Typical failure mode is non-closure of the contact as opposed to a contact sticking closed.

Contact Potential - A voltage produced between contact terminals due to the temperature gradient across the relay contacts, and the reed-to-terminal junctions of dissimilar metals. (The temperature gradient is typically caused by the power dissipated by the energized coil.) Also known as contact offset voltage, thermal EMF, and thermal offset. This is a major consideration when measuring voltages in the microvolt range. There are special low thermal relay contacts available to address this need. Special contacts are not required if the relay is closed for a short period of time where the coil has no time to vary the temperature of the contact or connecting materials (welds or leads).

Contact Rating - The voltage, current, and power capacities of relay contacts under specified environmental conditions. See Carry Current and Switched Current.

Contact Resistance - The resistance in ohms or milliohms across closed contacts. Also see Path Resistance.

Crosspoint Switch - A switch which, when closed, connects the signal on an input bus to one or more output buses. Also referred to as a matrix switch or switching array.

Crosstalk/Crosstalk Isolation - Unwanted interference in an output resulting from other input and output signals, measured in dB below the nominal signal level, and is expressed in decibels (dB) at a specified load impedance and over a specific frequency range or ranges. Also referred to as All Hostile or Hostile Crosstalk. See Channel Crosstalk.

Current Surge Limiting - The circuitry necessary to protect relay contacts from excessive and possibly damaging current caused by capacitive loads.

Daisy Chaining - The serial control connection of two or more mainframes in a master/slave(s) configuration. Also, some switching modules or cards can be daisy-chained to yield more inputs. This term is also used in reference to control panels daisy chaining (looping) from control panel to control panel to the final destination, the switching system.

Decibels (dB) - The logarithmic ratio between two signal levels. In video and audio, it is normally defined as: dB=20 log10(V2/V1)

Destination - The equipment connected to the output of a routing switcher, crosspoint switch or switching array. Used when defining the size of a switching array, the user must specify how many sources and destination there are in the system. See Source.

Differential Gain - Unwanted variations in a video signal's chrominance subcarrier's amplitude that result from changes in the signal's DC level, usually specified between 10% and 90% of full scale. Expressed in a percentage, or a fraction of a percentage.

Differential Input - An input circuit that actively responds to the difference between two terminals rather than the difference between one terminal and ground. Often associated with balanced input circuitry, but also may be used with an unbalanced source.

Differential Phase - Unwanted variations in a subcarrier's phase as a result of changes in the chrominance signal's DC level, usually specified between 10% and 90% of full scale. Expressed in degrees, or fractions or a degree.

Differential Output - An output circuit where the output voltage appears between two active output terminals rather than between one terminal and ground. Normally associated with balanced circuitry. See Differential Input.

Dry Circuit Switching - Switching below specified levels of voltage and current to minimize any physical and electrical changes in the contact junction. Also see Cold Switching.

Dry Reed Relay - A glass enclosed, hermetically sealed, magnetically actuated contact. No mercury or other wetting material is used. Typical atmosphere inside the glass enclosure is nitrogen.

DUT - Abbreviation for Device Under Test. See UUT.

Glossary: E - Sm

ECL Logic - Abbreviation for Emitter Coupled Logic, a very high speed digital technology.

Electromechanical Effects - A relay that uses an electromagnet to move an armature thereby actuating current.

EMI - Abbreviation for Electromagnetic Interference. A term that defines unwanted electromagnetic radiation from a device which could interfere with desired signals in test or communication equipment. RFI (Radio Frequency Interference) and EMI are often used interchangeably.

Equalization - Selective amplification (signal restoration) applied to a signal in order to compensate for high frequency attenuation and other distortions encountered in long lengths of cable.

F-Type Connector - A threaded medium performance coaxial signal connector typically used in consumer applications (TV's and VCR's). This connector is typically usable as high as 1GHz. It is inexpensive since the pin of the connector is actually the center conductor of the coaxial cable.

fail-safe - In terms of relay technology, when power is lost, the relay contacts fall back to a default position.

Floating - The condition where a common mode voltage exists, or may exist between earth ground and the instrument or circuit of interest. Low side of circuit is not at earth potential.

Full Fanout - See Non-Blocking

Hostile Crosstalk - See Crosstalk.

Hostile Input - An unselected input carrying a signal which causes unwanted interference and coupling in a desired output. See Crosstalk.

Input Bus - A circuit path on the input side of a switching array which connects to the inputs of one or more crosspoint switches. Each input connector leads to an input bus.

Insertion Loss - The attenuation of signals due to routing them through a switching module or system. Specified as a decibel value (dB) over a frequency range. Loss could be due to the resistive, inductive or capacitive features of the signal path, or a combination of all of these.

Insulation Resistance -The ohmic resistance of insulation. It degrades quickly as humidity increases. Lower insulation resistance provides a path for leakage current to ground. This is very critical when making measurements on semiconductor components where picoamp measurements are being made.

K-Type Connector - A small type of threaded coaxial signal connector typically used in higher frequency applications. This connector is typically usable as high as 40GHz. It may be mated by an SMA connector with much lower performance.

Latching - In relay or switching technology, this refers to the ability to keep the contact status in place even if power is removed form the equipment.

Leakage Current - Error current that can degrade sensitive measurements. Even high resistance paths between low current conductors and nearby voltage sources can generate significant leakage currents. Leakage in insulating material, micro-contamination on insulating surfaces, and moisture (humidity) can have catastrophic effects on picoamp and sub-picoamp (femtoamp) measurements.

Looping Input - An input which passes a video signal in and out of a device without terminating the cable or affecting the signal quality. Looping inputs use two connectors normally wired together with no active components between them. If the looping feature is not used, a 75 ohm terminator should be placed on the second connector, or a provision for switching in a 75 ohm termination internally.

Low Thermal - See Contact Potential

Mbps - Megabits per second (millions of bits per second). A measure of digital data transmission rate.

Mainframe - A unit which accepts modules and/or cards. Typically in Universal Switching's equipment, the Mainframe unit provides control and power to the modules installed.

Master / Master Mainframe - A mainframe that has control of other mainframes (slaves) in a serial chain. A master/slave combination has one bus address and appears as one mainframe with increased capacity.

Matrix - An arrangement of signal circuits in which input buses are represented by parallel vertical lines and output buses as overlapping horizontal lines (or visa versa), forming a grid-like array. Crosspoint switches at each crossing point connect inputs to outputs. Also referred to as a switching array, or crosspoint switch.

Mercury Wetted Relay - A reed relay in which the contacts are wetted by a film of mercury (Hg). Usually has a required operating position to avoid liquid mercury from shorting the contacts; other types are position insensitive. This type of relay is usually higher power and longer life, but at a higher dollar cost. Another benefit of this type of contact is the repeatability of contact resistance and virtually no contact bounce.

MTBF - An abbreviation of Mean Time Between Failure, a theoretical period of time between failures in equipment based on stresses in environment, temperature, levels of quality and other parameters.

MTTR - An abbreviation for Mean Time To Repair, a theoretical period of time need to repair a piece of equipment given certain circumstances.

Multiplexer - Being able to connect a single sources to any multiple destinations (one at a time), or the opposite. Also referred to as a Scanner.

N-Type Connector - A larger threaded coaxial connector with high power handling and good high frequency characteristics. Typically usable to 12.5GHz, but some manufacturers offer connectors usable to 18GHz.

Non-Blocking - A term with multiple and conflicting industry usage. 1) May be used to express the ability to connect a single input of a switching array to multiple outputs simultaneously without any input loading or mismatches. This usually results in a constant signal loss because of the use of power dividers (signal splitters) to configure the non-blocking switching array. Non-blocking switching arrays can also be achieved using impedance shifting in place of power dividers. Also referred to as Full Fanout. 2) In multi-stage switching arrays (tri-stage or 3-stage), it refers to the ability to route and input to an output at all times (no blocking due to unavailable middle stages).

NTSC - National Television Standards Committee. This organization developed the original NTSC standard for color television used in North America, Japan and many other countries.

Noise - Any unwanted electronic signal, or an unwanted audible sound (from fans or cooling devices).

Nyquist Frequency - If an analog signal is sampled at a rate more than twice that of its highest frequency component, it can be properly reconstructed when reconverted back to the analog domain. The required sampling rate is called the Nyquist frequency. Conversely, the analog bandwidth required to accurately transmit a properly reconstructed sampled image is one half the image sample (pixel clock) rate. See Wideband.

Output Bus - An output circuit path leading from the output(s) of one or more crosspoint switches arranged in a crosspoint switching array. Typically, only one crosspoint switch at a time can feed a signal to an output bus. Each output connector is fed from an output bus.

Path Resistance - The resistance of a complete signal path, including the switching element's contact resistance, any PC board circuit resistance and connector terminal resistance and or cabling. Also see Contact Resistance.

Piezoelectric Currents - The current caused by mechanical stress to the insulating materials or connectors. To minimize this problem in low current or voltage measurements, the stress must be removed from the insulators, and materials with a low piezoelectric effect must be used.

Propagation Delay - The specified amount of time for a signal to pass through a previously closed signal path. The delay must be considered, for example, when the signal is used to synchronize other signals, or is being used in a Clock / Data configuration. This is due to both the electrical length of the signal path, and any active components in the signal path.

RGB - A three-component video signal in which all the colors in a scene or image are conveyed as three primary colors (Red, Green and Blue) on three separate channels. Some times, the Green signal also carries the Sync information as well. Many high resolution video monitors have RGB inputs.

RS-232 - An asynchronous serial data interchange standard. RS-232 links between equipment are normally limited to 50 feet (16 meters). Also referred to as RS-232C (most popular revision).

RS-422 - A more robust serial digital data interchange standard utilizing individual differential signal pairs for data transmission in each direction. Depending on data transmission rates, RS-422 can be used at distances to 4,000 feet (1,275 meters). Also referred to as RS-422A (the most popular revision).

RS-485 - A very robust serial data interchange standard. An RS-485 communications channel is a party-line (multi-drop) digital signal and, like RS-422, is balanced. It is very immune to interference, making it more reliable in demanding environments. It is usable at distances of 4,000 feet and beyond.

Redundant Power Supply - A second power supply circuit sometimes specified for systems used in critical applications. Redundancy is useful where unexpected power failures can cause a major system to fail, often at great expense. Redundant power supplies could be fed from different AC power (mains) circuits for maximum system reliability. Power supplies are usually "diode or'ed" and should be hot swappable.

Relay - An electrically controlled mechanical device that opens and closes electrical contacts when a voltage (or current) is applied to a coil. A relay provides isolation of control signals from switched signals.

Return Loss - A measure of the undesirable signal reflections from an imperfectly-terminated transmission line. Expressed in dB. Also see VSWR.

SMA - A small type of threaded coaxial signal connector typically used in higher frequency applications. This connector is typically usable to 26GHz.

Glossary: Se - Z

Self-Terminating - A switching configuration which automatically terminates a signal path when it is not connected to any other signal path. It is usually most important to terminate unused inputs to a unit to assist in reducing noise and improve crosstalk isolation.

Settle Time - The time required for establishing relay connections and stabilizing user circuits. For relay contacts, this includes contact bounce.

Shielding - A metal enclosure or gasket for a circuit, or a metal shield surrounding wire conductors (coaxial or triaxial cable) to lessen interference, interaction, or current leakage. The shield is usually grounded.

Single-Ended Input - A circuit that responds to the voltage on one input terminal and ground. See Differential Input.

Single-Ended Output - A circuit whose output is developed between one output terminal and ground. See Differential Output.

Slave - A mainframe that is serially connected to a controlling mainframe (master). The slave is controlled from a master. See Master / Master Mainframe.

SMB / SMC - Types of small coaxial signal connectors typically used in high frequency applications. SMC threads to the mating connector while the SMB "snaps" to the mating connector.

Solid State Relay - A relay that switches electric circuits by use of semiconductor elements without moving parts or conventional contacts.

Source - The equipment providing a signal to the input of a routing switcher, crosspoint switch, or switching array. See Destination.

Switched Current - The maximum current level that can be reliably handled while opening and closing contacts. Also see Carry Current.

Sync - A abbreviation for synchronizing, as in synchronizing pulses. The timing pulses in a video signal which identify lines, fields and frames.

Sync-On-Green - An RGB signal format in which the sync information for all three channels is included on the green channel.

Syntax - The language "spoken" by devices communicating with each other.

Terminated/Termination/Terminator - An impedance used to terminate a transmission line. For example; cables used for video distribution should be terminated with a 75 ohm resistor (terminator) at the last connector on the receiving end if it is not already terminated internally.

Thermal EMF - See Contact Potential

TNC - A threaded type of BNC coaxial connector.

Triaxial Cable - A cable with three conductors: one conductor surrounded by an inner shield and an isolated outer shield. Generally, the inner shield is connected to a guard potential and the outer shield to signal LOW or ground.

Trigger - An external stimulus that initiates one or more instrument functions. Trigger stimuli include : a front panel button (TAKE), an external input voltage pulse.

TTL Logic - Abbreviation for Transistor-Transistor Logic, a very typical medium speed digital technology.

Twinaxial Cable - A cable with three conductors: one twisted pair of conductors surrounded by an outer shield.

UUT - An abbreviation for Unit Under test. Also see DUT (device Under Test).

Voltage Clamping - The circuitry necessary to protect relay or solid-state switching elements from excessive voltage. A possible source of this excessive voltage could be caused by switching current into inductive loads.

VSWR - Abbreviation for Voltage Standing Wave Ratio. The loss due to the mismatch introduced into the signal by the load or source signal path characteristics. Expressed as a ratio of the highest voltage to the lowest voltage found in the signal. Also expressed as Return Loss in dB. The Return Loss expression is the more modern term.

VXI - A newer electrical and mechanical standard (based on the VME standard, with Extensions for Instrumentation) mainly utilized in the ATE industry to assist different vendor's equipment to work together in a common control and packaging environment.

Wideband - 1) an adjective describing the characteristics of a communications circuit or channel that can carry a large quantity of information at a high rate. 2) In video applications, a circuit or system with sufficient bandwidth to convey very high resolution information in an image (video) signal. For reconstructed video images from a computer, the required bandwidth is half the pixel clock rate. See Nyquist Frequency

European CE Requirements

Extensive testing has been performed on most Universal Switching products for eligibility for CE marking. Products that have been certified to be eligible for the mark are identified in the individual data sheets, and by the CE symbol in the tilde bar on the product page (upper left or upper right). This marking enables our products to be imported by participating European nations that require this mark. Products have been tested for EMI, RFI and static parameters per the low voltage directive EN61010.

Need Additional Information?

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. Additional current product information is available on our website:

uswi.com

Our website is kept current with product information, data sheets, performance specifications, industry news, trade shows, useful information and links.

Total System Responsibility

The factory will configure multiple modules or drawers of equipment together into a total system configuration including any required cabling or adapters. All systems are factory tested and documented at no additional charge. A unique overall system model number is factory assigned to a grouping of modules or drawers to make it easy for you to order. A comprehensive Operating and Programming Manual is included with each system. Definition of the system architecture and components required can be done by one of our outside sales representative firms, or a factory sales engineer. All equipment supplied has universal AC power inputs for installation anywhere in the world. Power factor correction is available on some types of units.

LabVIEW Drivers

LabVIEW VISA drivers for National Instruments LabVIEW software are available for free on our website. This makes integration of our equipment into ATE applications much simpler.

Special Requirements

Even though our designs are very flexible and products span a wide variety of applications, we may not have exactly what you need. We can usually tailor our products to meet special requirements with a minimum of engineering cost. If you have a special need or don't see something in this brochure, please contact one of our outside sales representative firms, or a factory sales engineer.

Universal Switching Corporation

Standard Warranty Statement

Universal Switching products are warranted against manufacturing and workmanship defects for a period of two years from the date of shipment. During this period, Universal Switching Corporation will, at its option, either repair or replace products which prove to be defective or out of specification per the original purchase order or contract. Damage by misuse or abnormal conditions of operation, or evidence of partial or complete disassembly beyond normal maintenance or expansion procedures void this warranty in its entirety. Since Universal Switching Corporation has no control over conditions of use or applications for the products it manufactures, no warranty is made or implied as to the suitability for the customer's intended use, beyond such performance specifications set forth in the purchase order or contract at the time of order.

Equipment shipped FOB factory (Universal Switching Corporation) shall become the property of the Buyer upon delivery to the carrier. Equipment shipped FOB destination shall become the property of the buyer upon delivery acceptance of the carrier. All damages during shipment should be handled by immediately requesting the carrier's inspection upon evidence of damage or tampering of the packing material or equipment. This warranty excludes all other warranties expressed or implied. Universal Switching shall not be liable for any special, indirect or consequential damages.

For warranty service or repair, the buyer shall prepay all shipping charges to Universal Switching Corporation, and Universal Switching Corporation shall pay shipping charges to return the repaired or replaced item to the buyer. However, the buyer shall pay all shipping charges, duties and taxes for products returned to Universal Switching Corporation from a country other than that of the United States of America.

Universal Switching Corporation warrants that its software and firmware designated by Universal Switching Corporation for use with an instrument will execute its programming instructions when properly installed on that instrument. Universal Switching Corporation does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error-free.

Factory Authorized Representatives

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March 2009

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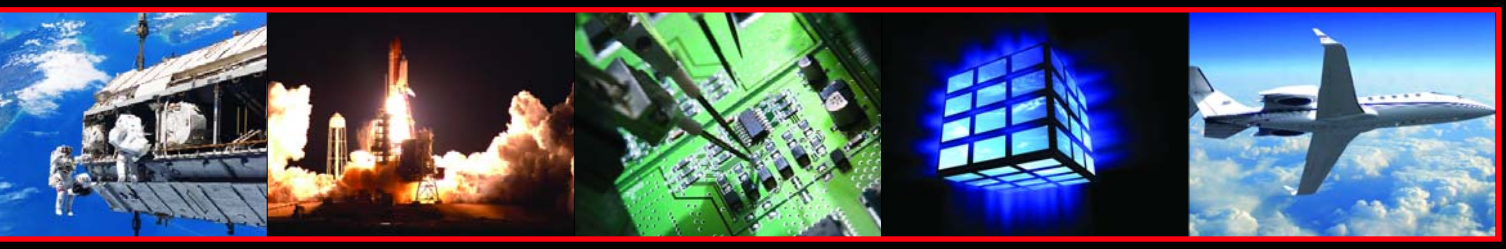
For areas not not mentioned on this list, please contact the factory directly.



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