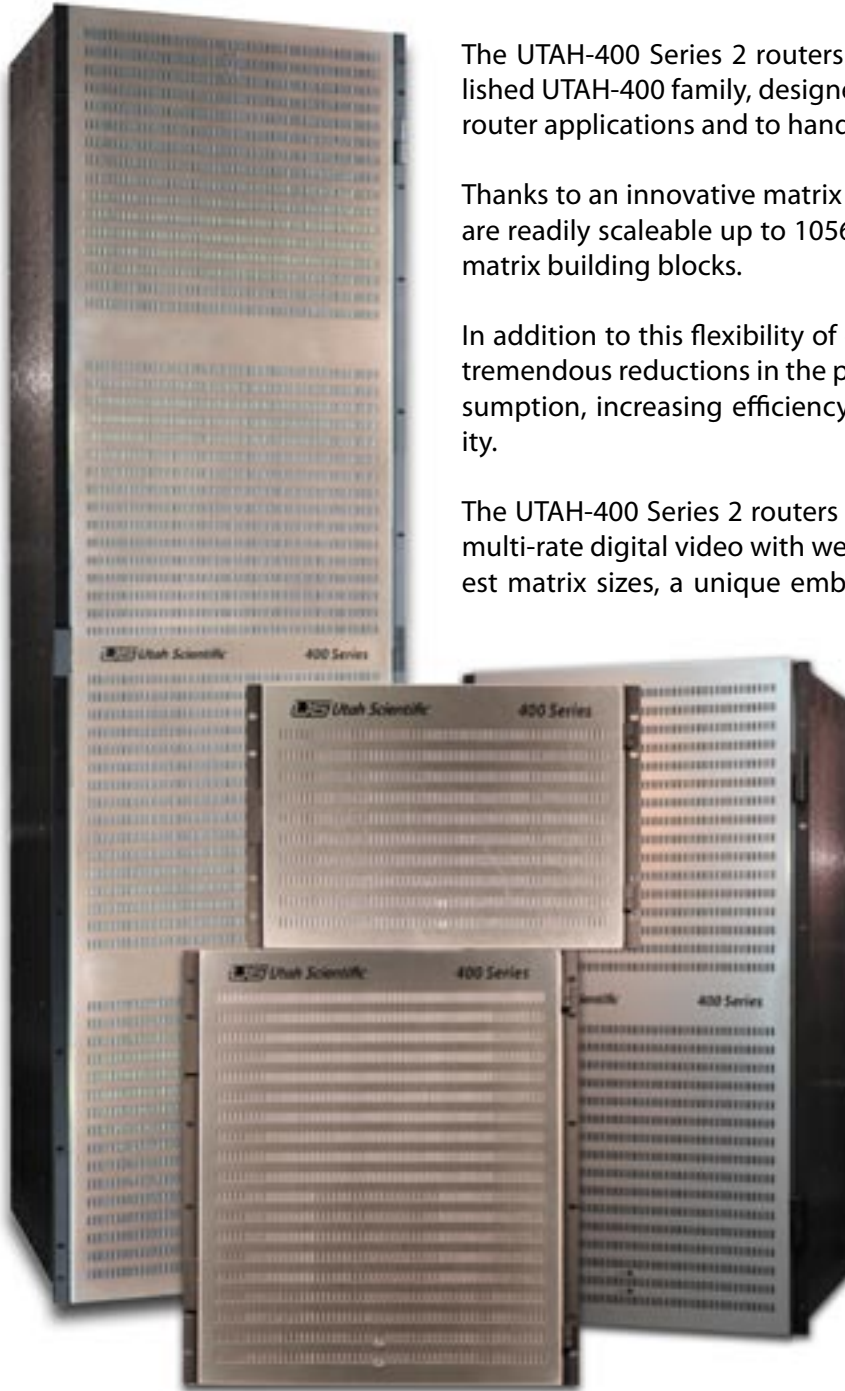


UTAH-400 Series 2

Advanced Digital Routing Switchers



The UTAH-400 Series 2 routers are the latest extension of the well established UTAH-400 family, designed to provide a single platform for all digital router applications and to handle all digital signal formats.

Thanks to an innovative matrix architecture, the UTAH-400 Series 2 routers are readily scaleable up to 1056x1056 and beyond using a single family of matrix building blocks.

In addition to this flexibility of configuration, the UTAH-400 Series 2 offers tremendous reductions in the physical space requirements and power consumption, increasing efficiency and ensuing long-term operational reliability.

The UTAH-400 Series 2 routers offer a wide range of I/O options including multi-rate digital video with well-proven 3Gbps operation even at the largest matrix sizes, a unique embedded signal processing (ESP) option, and digital, analog, and MADI Audio options to give system designers a complete set of tools for laying out the ideal system solution for even the most complex signal management requirements.

Fiber I/O options allow the UTAH-400 Series 2 Routers to receive optical systems directly and to launch optical signals for serving long cable runs. Together with Utah's other fiber and coax distribution products, the router can be the hub of a complete optical routing system.

The UTAH-400 Series 2 routers also offer the option of direct integration with the UTAH-400/MV series of multi-view display processors, providing monitoring solutions that do not tie up router I/O ports.

The UTAH-400 uses a three-board architecture consisting of an input board, a crosspoint board, and an output board. All frames and internal signal distribution components are designed for 3Gbps signal compatibility, providing full insurance that every system is ready for 3G operation. The UTAH-400 Series 2 family consists of frames for 144x144, 288x288, 528x528, and 1056x1056 matrix sizes. All of these frames use a common set of modules described below.

MODULE DESCRIPTIONS

INPUT BOARD

The input board carries 12 identical receiver / buffer circuits for bringing the input signals from the rear panel into the matrix and delivering them to the crosspoint board. Each input circuit has a signal presence detector that can send an alarm to the frame’s alarm processor when it detects a loss of signal on the input. The Input Board provides automatic equalization for up to 300 meters of type 8281 or equivalent cable at the input for SD data rates and 100 meters of equalization for HD data rates and can accept digital video signals at any data rate up to 3Gbps.

CROSSPOINT BOARD

The crosspoint board receives its inputs from the input cards and applies these signals to the crosspoint array. This array is fitted with the appropriate number of integrated circuit crosspoints for the frame in which it is to be used. The crosspoint board’s control inputs come from the system controller by way of a pair of Utah MX-Bus connectors mounted on the frame’s rear panel. The outputs of the crosspoint array are passed onto the Output Boards by the Output Bus.

OUTPUT BOARD

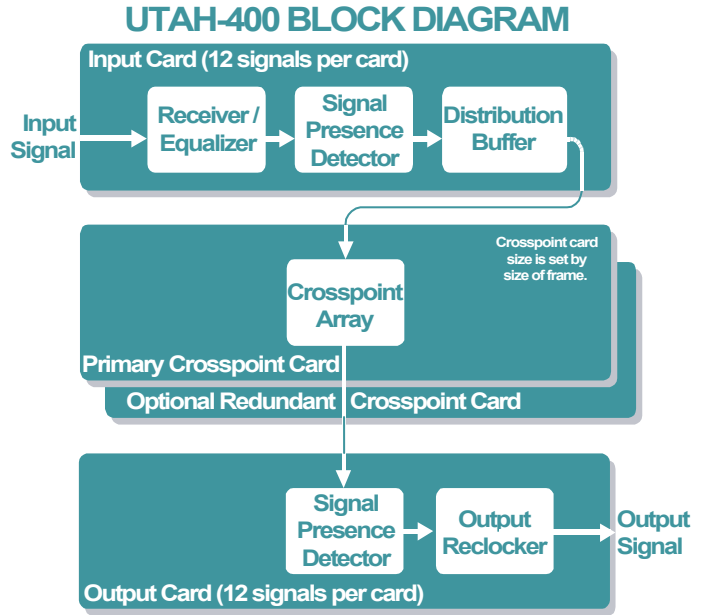
The Output Board carries 12 identical driver circuits that buffer the signals from the Output Bus and present them to the connectors at the rear panel of the frame. Each output circuit has a signal presence detector for alarm reporting and automated troubleshooting and a reclocking circuit to ensure maximum signal quality at the output of the matrix.

FIBER OPTIC I/O OPTION

The UTAH-400 Series 2 routers are also available with optional Fiber I/O in place of the normal coax. Please consult the Fiber I/O Product Information Sheet for details.

DIGITAL AUDIO MATRICES

Each of the UTAH-400 Series 2 frames is available with an optional 2Kx2K audio sub-router installed. The audio router can be fed by AES, Analog Audio, or MAD1 input cards as well as by audio signals extracted from the video inputs. Output cards for all formats are available, including a special embedding video output card that allows any audio signal in the system to be inserted into any of the embedded audio positions on the video output signal.



UTAH-400 FEATURES

SIGNAL PRESENCE DETECTION — The UTAH-400 has signal presence detectors on all inputs and outputs, allowing the matrix to perform a number of unique functions — ranging from simple alarms to automatic restoration of service on critical signal paths.

CROSSPOINT REDUNDANCY OPTIONS — The UTAH-400's unique architecture allows us to place fully redundant crosspoint assemblies in each matrix frame for the ultimate degree of operational reliability.

INTERNAL MONITOR MATRIX — Each UTAH-400 Series 2 chassis is equipped with an internal monitor matrix for monitoring any of the output busses carried in that chassis. The monitor matrix offers 2 independently switchable HD(3G) outputs. An optional third output in H.264 compressed format provides convenient remote monitoring.

REDUNDANT POWER SUPPLIES — All UTAH-400 systems are supplied with dual power supplies for each frame. These supplies operate in a fully redundant configuration with complete alarm and monitoring capabilities.

FLEXIBLE AUDIO OPTIONS — Audio I/O cards can be used to provide audio routing within the video frame. The optional internal audio sub-router offers 2Kx2K capacity for switching external audio signals as well as audio signals extracted from the video input signals. Audio embedding and MADI I/O options round out the comprehensive audio facilities of the UTAH-400 Series 2 routers.

LOW POWER CONSUMPTION — The UTAH-400 switchers are designed for extremely low power consumption. This translates to direct savings on operational expense and increased long-term reliability.

Embedded Signal Processing (ESP) Option

The UTAH-400 Series 2 routers offer a powerful set of tools for switching audio signals that arrive as embedded signals within the video input streams. This option consists of a special version of the video input card that can extract the incoming audio signals from 12 HD inputs, an audio sub-router card that is fitted to the video crosspoint card, and a special version of the video output card that can embed the audio streams created by the audio router into the video signals that appear at the router's outputs.

Using this system it is possible to manipulate the audio in any way that is required, from a simple channel swap to complete shuffling of the audio streams.

When coupled with the optional audio and MADI I/O boards, the internal audio sub-router provides the capability to treat the extracted audio just like a discrete audio signal, routing it out the audio or MADI ports as required. Likewise, audio signals arriving at the audio or MADI inputs can be routed to the embedder boards for insertion into the video streams as necessary.

UTAH-400/528 Matrix Sizes up to 528x528

The UTAH-400/528 is the latest addition to the UTAH-400 family of digital routing switchers. Designed specifically to address the growing requirement for large-scale routing capacity in limited physical space, the new frame offers system designers the ability to place a 528x528 matrix in just 20 rack units of space, without the need for special cable/connector arrangements.

The UTAH-400/528 uses industry-standard 75 ohm BNC connectors for I/O, providing the highest connector density ever seen on a router of this size.

The UTAH-400/528 offers all of the UTAH-400 family's well-known advantages, including redundant crosspoints and power supplies, low power consumption for cooler, more reliable operation, and signal format flexibility – including the ability to handle the new 3Gbps progressive-scan HD signal formats.

Additional flexibility is provided with the option of replacing the coax I/O connections with 3Gbps fiber I/O in blocks as small as 12 inputs or 12 outputs.

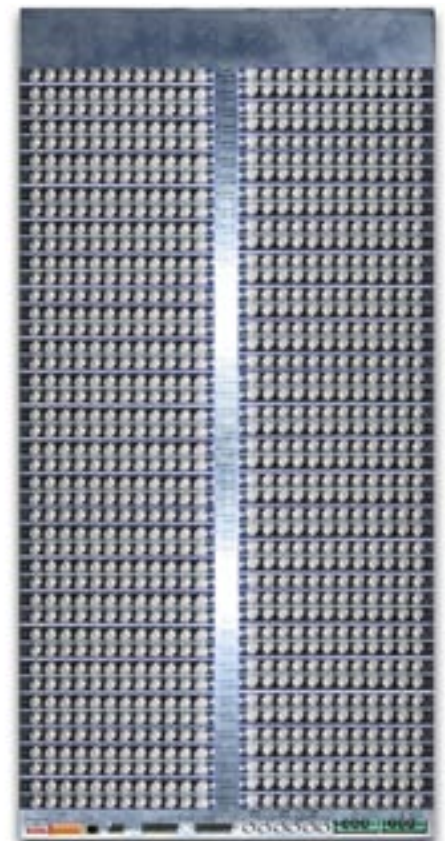
Each Crosspoint Board in the UTAH-400/528 feeds all of the router inputs to half of the router outputs, so two cards are required for a full 528 output matrix. There are additional crosspoint card slots to accept redundant crosspoint cards for one or both of the half-matrix blocks.

A unique feature of this architecture is that each crosspoint card actually has 576 inputs and 288 outputs, providing additional internal input-output combinations that can be used for a number of purposes. One use for these paths is to provide partial crosspoint redundancy by routing the additional outputs from each crosspoint card to one output on each output card fed by the other crosspoint card. In this way, internal crosspoint redundancy is provided for 44 outputs of the router without the need to install redundant crosspoint cards.

The UTAH-400/528 has a very advanced internal monitoring matrix that provides a full HD-capable output that is selected from any of the routers inputs or outputs. In addition, a separate output is provided as a H.264 streaming video output for monitoring the router over a network.

Power is provided to the matrix frame in the form of 48VDC from a pair of external rectifier units that provide full redundancy. In applications where 48VDC power is available from an external supply, the rectifiers are not needed.

The UTAH-400/528 is controlled by the Utah Scientific SC-4 control system, the industry's most powerful, flexible, and easy to use. The SC-4's extensive alarm management capabilities provide comprehensive real-time management of all of the UTAH-400/528's critical components, as well as loss-of-signal alarms to monitor the health of vital circuits on the inputs and outputs of the router.



UTAH-400/XL **Matrix Sizes up to 1056x1056**

The UTAH-400/XL is the largest member of the UTAH-400 family of digital routing switchers. Designed specifically to address the growing requirement for large-scale routing capacity in limited physical space, the new frame offers system designers the ability to place a 1056x1056 matrix in just 40 rack units of space, without the need for special cable/connector arrangements.

The UTAH-400/XL uses industry-standard 75 ohm BNC connectors for I/O, providing the highest connector density ever seen on a router of this size.

The UTAH-400/XL offers all of the UTAH-400 family's well-known advantages, including redundancy options, low power consumption for cooler, more reliable operation, and signal format flexibility – including the ability to handle the new 3Gbps progressive-scan HD signal formats.

Additional flexibility is provided with the option of replacing the coax I/O connections with 3Gbps fiber I/O in blocks as small as 12 inputs or 12 outputs.

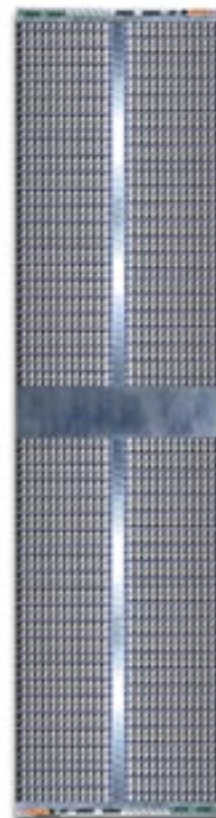
Each Crosspoint Board in the UTAH-400/XL feeds one half of the router inputs to one quarter of the router outputs, so eight cards are required for a full 1056 output matrix.

A unique feature of this architecture is that each crosspoint card actually has 576 inputs and 288 outputs, providing additional internal input-output combinations that can be used for a number of purposes. One use for these paths is to provide partial crosspoint redundancy by routing the additional outputs from the each crosspoint card to one output on each output card fed by the other crosspoint card. In this way, internal crosspoint redundancy is provided for 88 outputs of the router without the need to install redundant crosspoint cards.

The UTAH-400/XL has a very advanced internal monitoring matrix that provides a full HD-capable output that is selected from any of the routers inputs or outputs. In addition, a separate output is available as a H.264 streaming video output for monitoring the router over a network.

Power is provided to the matrix frame in the form of 48VDC from a pair of external rectifier units that provide full redundancy. In applications where 48VDC power is available from an external supply, the rectifiers are not needed.

The UTAH-400/XL is controlled by the Utah Scientific SC-4 control system, the industry's most powerful, flexible, and easy to use. The SC-4's extensive alarm management capabilities provide comprehensive real-time management of all of the UTAH-400/XL's critical components, as well as loss-of-signal alarms to monitor the health of vital circuits on the inputs and outputs of the router.



UTAH-400/144s2

Matrix Sizes up to 144x144

The UTAH-400/144s2 is the smallest frame in this series. At a compact 7RU, the UTAH-400/144 will support matrix sizes from 12x12 to 144x144.



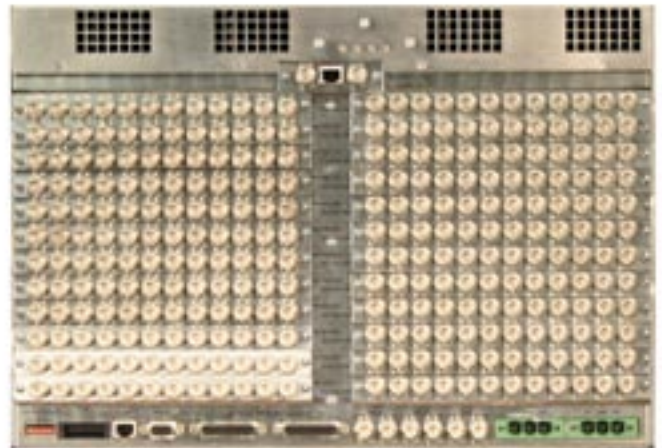
Thanks to the UTAH-400's unique 12-port I/O cards, matrices can be easily expanded in very cost-effective increments. The full range of I/O options is available in the 144 frame, including fiber and audio I/O cards for the ultimate in system flexibility.

Like the other frames in this series, the UTAH-400/144 frame can be fitted with an optional Redundant Crosspoint Card that provides full backup against an internal path failure in the matrix.

The UTAH-400/144s2 frame has dual power inputs that are fed with power at 48VDC from an external 1RU power rectifier frame with dual redundant rectifier units. For applications where 48VDC power is available from an external source the frame can be fed directly, eliminating the need for the rectifier frame.



UTAH-400/144s2 frame is controlled by the same control bus connections used by the other frames in the UTAH-400 family.



UTAH-400/288s2

The UTAH-400/288 brings all of the features of the UTAH-400 High Density Digital Routing Switcher family to large matrix size applications. Housed in a compact, 12 RU frame, the UTAH-400/288 will support matrix sizes from 12x12 to 288x288.

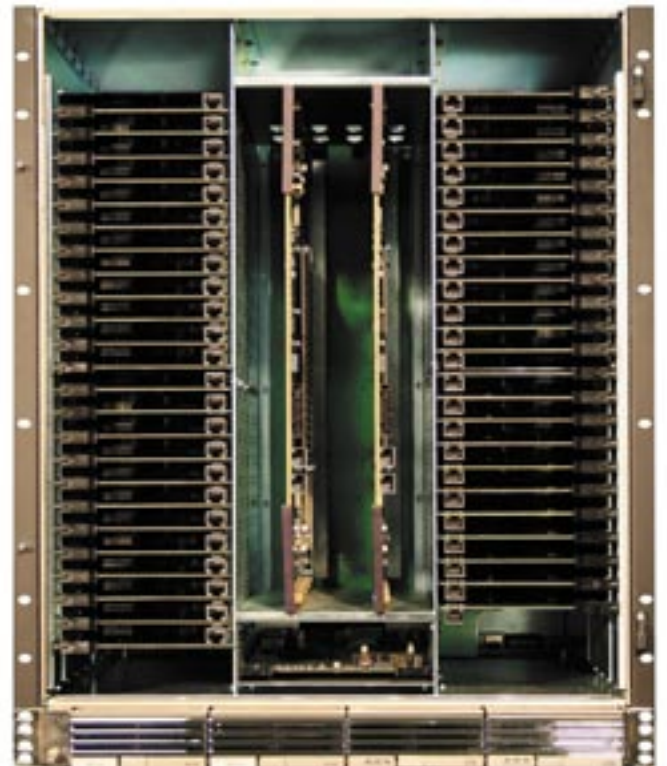
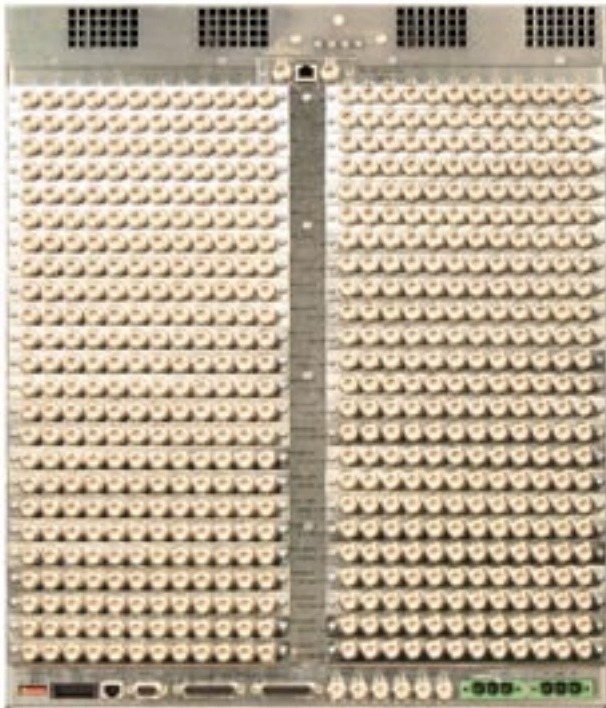
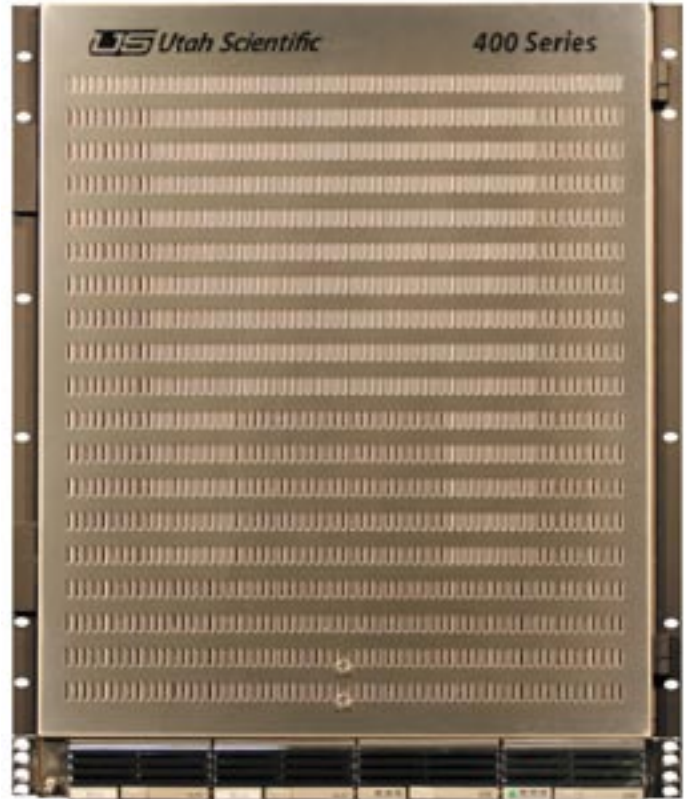
Thanks to the UTAH-400's unique 12-port I/O cards, matrices can be easily expanded in very cost-effective increments. The full range of I/O options is available in the 288 frame, including fiber and audio I/O cards for the ultimate in system flexibility.

The UTAH-400/288 frame can be fitted with an optional Redundant Crosspoint Card that provides full backup against an internal path failure in the matrix.

The UTAH-400/288 frame has dual power inputs that are fed with power at 48VDC from an external 1RU power rectifier frame with dual redundant rectifier units. For applications where 48VDC power is available from an external source the frame can be fed directly, eliminating the need for the rectifier frame.

UTAH-400/288 frame is controlled by the same control bus connections used by the other frames in the UTAH-400 family.

Matrix Sizes up to 288x288



UTAH-400 SPECIFICATIONS

Digital Video Matrix

(SMPTE 259M, 292M, 424M; DVB-ASI)

Data Rates:

540, 360, 270, 177, 143 Mbps
plus 1.485 Gbps and 3.0 Gbps
(Other rates from 3Mbps to 3Gbps can be
handled by disabling the output reclocking)

Input Return Loss

to 1.5GHz: 15 dB

to 3.0GHz: 10dB

Automatic Input Equalization (8281 coax)

143,177,270 Mbit/s: 1000 ft

1.5Gbps and 3Gbps: 300 ft

Signal Level 800mV p-p \pm 10%

Output Return Loss

to 1.5GHz 15 dB

to 3.0GHz 10dB

Reclocking: Yes, on outputs

Digital Audio Matrix

(AES3id)

Unbalanced Differential Inputs / Outputs

Input Impedance: 75 Ohms

Input Level Minimum: 200 mV p-p

Maximum: 7 V p-p

Output Impedance: 75 Ohms

Environmental

Operating Temperature Range: 0-45° C

Relative humidity: 0-90%
(non-condensing)

Power Requirements

(All supplies are UL-listed and IEC950 approved)

Input: 100-240 VAC, 50/60 Hz

Max Consumption:

RF-400/144s2 250W

RF-400/288s2 500W

RF-400/528 750W

RF-400/XL 1500W

Physical

EIA 19" Rack Space requirements:

RF-400/144s2 7RU (12.25" / 311mm)

RF-400/288s2 12RU (21.0" / 533mm)

RF-400/528 20RU (35.0" / 890mm)

RF-400/XL 40RU (70.0" / 1780mm)

(Plus AC Rectifier Frame 1RU (1.75" / 45mm))

All units are 17"/430mm deep

Notes:

Specifications are subject to change without notice.

www.utahscientific.com

E-mail: sales@utsci.com

4750 Wiley Post Way -- Suite 150

Salt Lake City, Utah 84116

Phone: +1 (801) 575-8801

Fax: +1 (801) 537-3099

Via Filli Bandiera, 52

20050 Verano Brianza (MI)

Italy

Phone: +39 0362 330 001

Thoroyaveien 11

3209 Sandefjord

Norway

Phone: +47 33 522 700

 Utah Scientific

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