



**ROUTING SWITCHERS • ROUTER CONTROL SYSTEMS • MASTER CONTROL SWITCHERS**

Utah Scientific has been involved in the design and manufacture of routing switchers for audio and video signals for more than twenty-five years. Starting with the original AVS-1 router and moving through several generations of routing switcher design to the current UTAH-200, 300, and 400 Routing Switchers and the MC-2020 Master Control Switcher for all signal formats, we have participated in the evolution of the broadcast television industry from analog composite through components and various forms of digital video and audio to today's complex mixed environment of analog and multiple digital signal formats.

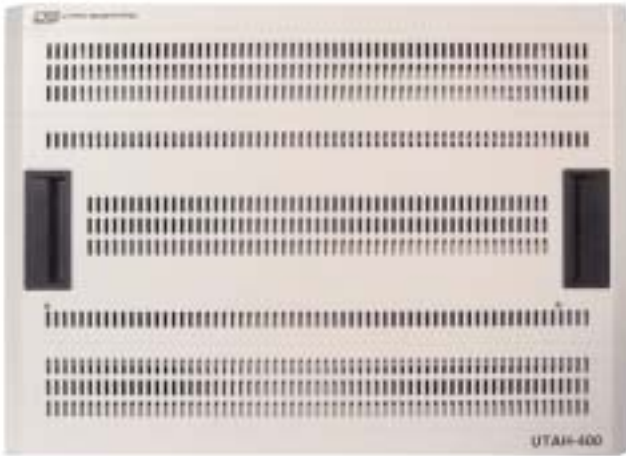
This brochure provides a brief introduction to the current generation of Utah products. Additional details are available in the individual product information bulletins for each of these product families.

**TEN-YEAR WARRANTY**

Utah Scientific products are covered by the industry's most generous warranty—ten years from the purchase date.

Taken together with our long-standing commitments to support all previous Utah products and to provide the industry's best customer service without the hassles of service contracts or support plans, our warranty stands as evidence of our promise to treat you—our customer—as a valued partner in the success of our company.

# UTAH-400 ROUTING SWITCHER

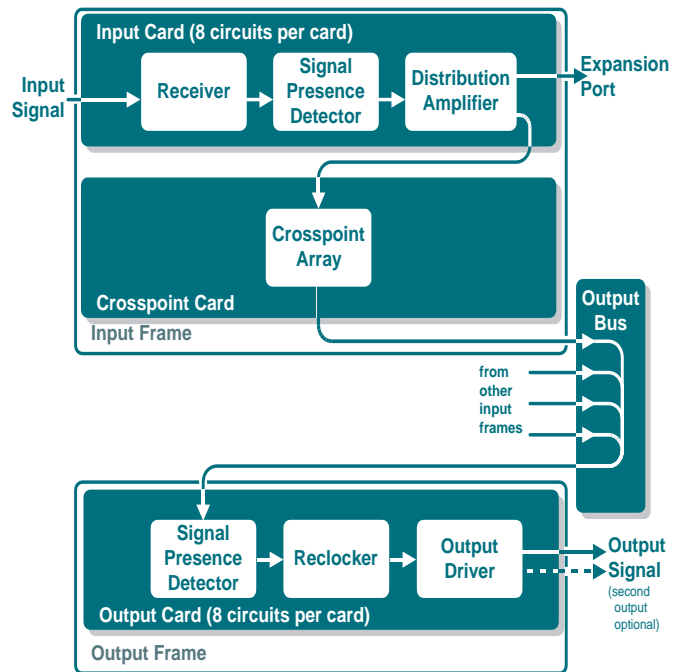


The UTAH-400 was developed to provide a single platform for all digital router applications from very small to extremely large matrix configurations and to handle all digital signal formats. The UTAH-400 offers maximum flexibility in building large switching matrices for Standard Definition, High Definition, or mixed signal environments.

Thanks to an innovative matrix architecture, the UTAH-400 is readily scalable from 8x8 to 1152x1152 and beyond using a single family of matrix building blocks. In addition to this flexibility of configuration, the UTAH-400 offers tremendous reductions in the physical space required for larger matrix systems.

**SYSTEM ARCHITECTURE** — The UTAH-400 uses a three-board architecture consisting of an input board, a crosspoint board, and an output board. This approach has been used for many years in a wide variety of systems, including the current UTAH-300 switchers. Most three-board switchers, however, have been designed around a fixed-frame configuration where the system's card cage sets very specific limits on the size and configuration of the matrix. Because of these constraints, fixed-frame designs offer very limited flexibility in terms of matrix expansion or re-configuration. In contrast to these fixed-frame routers, the frame of the UTAH-400 contains 36 I/O slots which can be filled with any combination of input and output boards and one crosspoint card slot. The UTAH-400 frame and signal distribution components are designed for HD signal compatibility, providing full insurance that an SD system can be upgraded to HD operation by simply exchanging the signal I/O modules.

**ADVANCED CONTROL FACILITIES** — The UTAH-400 offers a glimpse into the future of routing switcher design with its unique signal presence monitoring capability. By continuously monitoring the presence of digital bit streams at each input and each output, the system can support automatic rerouting, or "protection switching", to restore a signal feed that is interrupted by an internal or external fault. For example, simple logic instructions can be set up to cause the switcher to switch a given output to a secondary input if there is loss of signal on the primary input. By providing full user programmability of this control logic, the UTAH-400 brings us one step closer to the ultimate goal of a fully automatic router that offers the operational simplicity that we have become accustomed to in the data networks that we work with every day.





**ANALOG I/O OPTION** — The UTAH-400 family offers optional Analog I/O Boards for both audio and video to simplify the task of placing a digital routing switcher into a mixed-format environment. The I/O modules offer 8 channels per board and can be freely mixed into any UTAH-400 digital matrix. Whether used for accommodating tie-lines to external analog routers or simply to feed analog monitors from the digital matrix, these modules add a tremendous amount of flexibility to the UTAH-400 routing switcher system.

**MATRIX CONFIGURATIONS** — A matrix is built-up from the basic building blocks to accommodate a certain number of inputs and outputs. A single 8 RU frame will house a 144x144 matrix. A maximum of four input frames with 36 input cards in each (8x36=288 inputs per frame) can be bussed to one output frame (288 outputs), making the maximum number of inputs 1152. For system sizes above 288 outputs, an input / crosspoint card stack is created for each set of 288 outputs. Thus, an 1152x1152 matrix would require four input / crosspoint card stacks, each feeding a block of 288 outputs. Each of these stacks must receive an isolated copy of each input signal. This can be done by using a "cascade" arrangement where a second input card is fed from the expansion port of the first input card, by externally splitting the signals into a copy for each stack, or by a combination of the two methods.

**DIGITAL AUDIO MATRIX** — The UTAH-400 digital audio switcher offers a number of innovative functional improvements over existing audio routers, including synchronous / asynchronous operation and the ability to control the configuration of AES/EBU digital audio signals within the router to allow channel swapping and mixing, and other functions that are not normally provided in a digital audio routing switcher. The new switcher also offers an option for "soft transitions", completely eliminating pops and clicks that can accompany the switching of digital audio signals.

**SMALL MATRIX APPLICATIONS** — The UTAH-400/64 frame supports matrix sizes up to 64x64 in just 4 Rack Units of space. UTAH-400/64 frames use the same I/O modules as the larger UTAH-400 frames and offer dual power supplies and dual control cards just like the larger frames. In addition, the UTAH-400/64 frame can be fitted with an optional Redundant Crosspoint Card that provides full backup against an internal path failure in the matrix. UTAH-400/64 frames can be controlled by the same control bus connections used by the larger frames. They also offer the option of having internal controller boards for standalone applications.

## 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.
- **REDUNDANT CROSSPOINT OPTION** — All configurations of the UTAH-400 matrix are available with redundant crosspoint assemblies for the ultimate in operational reliability.
- **REDUNDANT POWER SUPPLIES** — All UTAH-400 systems are supplied with dual power supplies in each frame. These supplies operate in a fully redundant configuration with complete alarm and monitoring capabilities.
- **REDUNDANT CONTROL CARDS** — To further insure operational reliability, all UTAH-400 systems are supplied with dual control cards in each frame.
- **LOW POWER CONSUMPTION** — The UTAH-400 is designed for extremely low power consumption. While the maximum load for each frame is 350 Watts, most systems will operate significantly below this number. This translates to direct savings on operational expense and increased long-term reliability.
- **INTERNAL MONITOR MATRIX** — Each UTAH-400 Chassis is equipped with an internal monitor matrix for monitoring any of the output busses carried in that chassis. In multi-chassis systems, the monitor bus outputs are combined to provide a single monitor output.

# MASTER CONTROL SWITCHERS



The **MC-2020 Master Control Switcher** is a full-featured switcher for multi-channel, multi-format applications with dedicated signal processor channels for Standard Definition (525 and 625 line) and High Definition digital video.

Both processors are fully equipped for embedded audio processing (up to 8 audio channels) with optional AES/EBU Digital Audio I/O Boards available for separate audio operation.

Designed to be fully compatible with all previous generations of Utah Scientific Master Control Switchers, the 2020 processors offer a convenient and cost-effective upgrade path for owners of existing Utah Scientific MC-500-series analog switchers who wish to upgrade their on-air facilities to digital operation.

The 2020 Processor frame can hold two independent signal processing channels, allowing users to build a system in one frame that supports both standard definition and high definition signal formats, as well as dual channel configurations for either format.

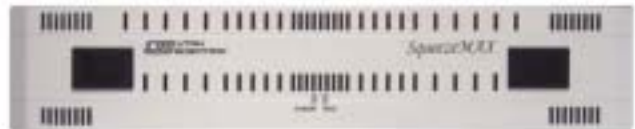
The HD/SD-2020 provides a full range of mixing and keying functionality with one keyer included in the standard package and up to three additional keyers available as plug-in options. The 2020 processors provide full audio mixing facilities, using embedded audio or separate audio inputs. External audio inputs are also provided for voice-over mixing.

An MC-2020 system consists of one or more processor channels, an MCP-2020 control panel, and an associated UTAH routing switcher. Each processor channel receives its program, preset, and program feeds from the router. Using the router for source selection means that every source on the router is potentially available to master control, a very useful feature - especially for multi-channel operations.

**SqueezeMAX** is a very powerful Digital Video Effects unit designed expressly for the requirements of the master control environment. While SqueezeMAX offers a very high degree of integration with the Utah Scientific MC-2020 Digital Master Control Switcher, it can also be used as a stand-alone mix/effects unit for applications where the MC-2020's extensive live-event controls are not required.

SqueezeMAX offers two scalable inputs, an input for the "Background" signal, and an internal graphics plane. Either the Background input or the graphics plane can serve as the background for the resized Program video. The unit's internal graphics plane can display pages created by an external graphics composition system in standard file formats.

SqueezeMAX offers a wide variety of transitions between the two scalable inputs as well as transitions between the scalable inputs and the background and graphics planes. When the application calls for the background of the Squeezedback to display complicated graphics, and especially where the content of the graphics may change very frequently, SqueezeMAX can greatly simplify the workflow of the process.



Since the SqueezeMAX graphics plane works with standard-format files, updates to the graphics content can be readily done "off-line" on any of the many systems that support these industry-standard file formats and then downloaded to the SqueezeMAX unit for display. In addition to text messages, the SqueezeMAX graphics plane can be used to display logos or other branding information and can be linked to "live data" from sources such as newswire and financial service feeds, EAS messages, etc., making the unit ideal for automated operation.

SqueezeMAX offers a tracking audio delay that keeps the program audio lined up with the video signal. Control of SqueezeMAX is handled by a GUI application that allows the user to define up to ten preset events that can be initiated by a single command from the MC-2020 system or triggered externally. When SqueezeMAX is used with an MC-2020 system, the preset events are assigned to a button on the panel.

SqueezeMAX is without question the most powerful and flexible tool for adding video effects and graphics capability to any master control facility.



The **MCP-2020 Master Control Panel** was designed to offer maximum operational efficiency in all master control applications. Fully compatible with all previous generations of Utah Scientific Master Control Switchers, the MCP-2020 offers a convenient and cost-effective upgrade path for owners of existing Utah Scientific MC-500-series analog switchers who wish to upgrade their on-air facilities to digital or multi-channel operation.

The panel is available in two versions: The MCP-2020A has an angled top for better visibility of the LCD display when the panel is mounted in a flat desk. The MCP-2020B has a flat top for rack-mount or console-mount applications.



## MC-2020 FEATURES

- **MULTI-FORMAT OPERATION** — Standard Definition (625 and 525 lines) and High Definition (1080i and 720p) with embedded audio and/or separate audio (8 channels deep).
- **MULTI-CHANNEL OPERATION** — Up to 12 separate program channels with user-configurable Master/Slave mode to simplify operations.
- **REDUNDANT POWER SUPPLIES** — Signal processor units and control panels are available with dual power supplies for maximum operational reliability.
- **REDUNDANT CONTROL CARDS** — Signal processor units can be fitted with hot-standby controllers.
- **ASSIGNABLE SOURCES** — Router sources can be assigned to master control inputs - from the panel.
- **MULTIPLE KEYS** — Up to four independent keys per channel.
- **FULL-FUNCTION AUDIO MIXER** — Simple control of voice-over mixing, source level adjustment.
- **OPTIONAL INTEGRATED EFFECTS and GRAPHICS** — SqueezeMAX provides full functionality for advanced channel branding operations.

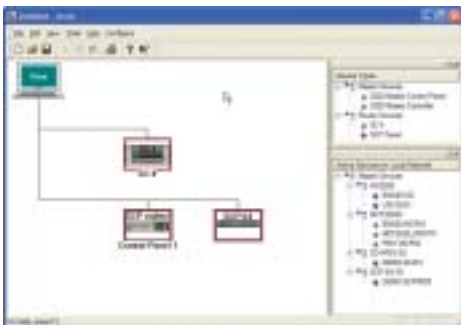
# ROUTER CONTROL SYSTEMS



The **SC-4 System Controller** is the heart of the Utah Scientific Router Control System. In addition to controlling the UTAH Series or AVS Series routing switchers, SC-4 also provides interfaces to many third party control and switching systems. Because of its modular design and advanced software, SC-4 can easily adapt to any application, whether it be simple stand alone applications or the most sophisticated control systems.

Matrix switching is executed using the advanced SCP and UCP Series of control panels, a wide selection of CSP Series control panels or a combination of both. Numerous control ports provide a wide array of computer, remote, custom or networked control capabilities.

The new U-CON configuration software package provides a graphical user interface that gives the user the capability of configuring SC-4's remote control ports, virtual router mapping, system tie-lines and control panel mnemonics. U-CON communicates with the SC-4 using a Windows PC connected through Ethernet (TCP/IP), allowing the user access to all router setup and crosspoint information. This also gives the user the capability of storing critical controller information off-line as a backup.



The SC-4 has both the control and power necessary to reliably manage the increasingly complex world of analog, digital and HDTV signal distribution. SC-4 enables users to centrally control and monitor all multi-format routers and master control switchers from the same control point.

## SC-4 FEATURES

- **ADVANCED ALARM MANAGEMENT** — Receives and processes alarms from connected devices.
- **INCREASED INPUT, OUTPUT AND LEVEL CONTROL CAPACITY** — 1152x1152x16 levels.
- **THIRD PARTY CONTROL** — Allows the SC-4 to control other vendors' routing equipment.
- **WINDOWS-BASED U-CON CONFIGURATION SYSTEM** - User-friendly system programming tool.
- **SNMP AND WEB CONTROL** — Simplified connection to LAN/WAN systems.
- **TRIPLE SYNC INPUTS** — Can execute NTSC, PAL, and HDTV vertical blanking interval switching.
- **ETHERNET CONTROL PORT** — Uses standard TCP/IP LAN communications for networking control.
- **ADVANCED TIE LINE MANAGEMENT SYSTEM** — Simplifies multi-format routing.
- **OPEN CONTROL PROTOCOLS** — Provides several external control interfaces.
- **REDUNDANT CONTROL AND POWER SUPPLIES IN ONE FRAME** — Preserves valuable rack space.
- **BACKWARDS COMPATIBILITY** — Works with all Utah routing systems and control panels.

Utah Scientific offers a wide range of control panels to suit any type of routing switcher application. Whether you need a simple single-bus panel where you select a source by pushing a single button or a very sophisticated multi-bus / multi-level control panel that can operate the entire system, Utah has a panel that will exactly fit your requirement.



There are three main families of Utah control panels: the new UCP-Series, offering a full selection of panel types designed to access the full power and flexibility of the Utah SC-4 Control System, the SCP-Series panels – our previous control panel family, and the lower-cost CSP-Series panels which offer a more limited set of features.

All of the Utah Scientific control panels are fully compatible with any Utah Scientific Routing Switcher, from the first AVS-1 switchers to the current Utah 200, 300, and 400 Series routers.



The UCP-Series family of control panels includes three multi-bus panels which can access all sources and destinations in the router or a subset of the sources and destinations, according to the system configuration programming. These panels offer "Direct Take" buttons that can be pre-programmed for direct access to frequently-used sources and destinations.

There are several different 1 RU panels in the UCP family for single-bus or multi-bus operation. All of the new UCP-Series panels are designed to be fully compatible with the U-CON System Configuration Utility, allowing the panel definitions to be easily updated as the system requirements change.

### CONTROL PANEL FEATURES

- **FIELD PROGRAMMABLE** — Customize panels to suit each specific application or location.
- **LARGE RE-LEGENDABLE BUTTONS** — Print your own custom legends and change as needed.
- **SEPARATE GROUP NAMES FOR SOURCES AND DESTINATIONS** — Use up to 20 mnemonic labels for source selection and an additional 20 mnemonics for destination selection.
- **8 CHARACTER ALPHANUMERIC LED STATUS DISPLAYS** - Eliminate confusing labels.
- **16 LEVEL SWITCHING CAPABILITY** — Extra flexibility for mixed analog / digital environments.
- **OUTPUT MONITOR SWITCHING** — Control the monitor bus directly from the normal panel.
- **OUTPUT LOCK AND PROTECT** — Disable switching of an output by any other control panel.
- **SCROLL SOURCES AND DESTINATIONS** — Rapidly scan the lists of sources and destinations.
- **SOURCE AND DESTINATION COLOR DISPLAYS** — Different colors for easy visual recognition.
- **AUDIO ATTRIBUTE SWITCHING AND STATUS** — Change audio attributes directly from the panel.
- **SALVO EXECUTION** — Execute multi-bus salvos just like making a single source selection.

## OTHER UTAH ROUTERS

The **UTAH-200** is a powerful yet compact routing switcher designed to meet the needs of users who require flexible control, multiformat routing, and expansion capability in a small package. Available in analog and digital audio and video signal formats, the UTAH-200 can function as part of an SC-4 control system or as a stand-alone matrix with its own internal controller.

The UTAH-200 utilizes a 16x16 matrix card housed in a two rack-unit frame that can hold matrix cards for a 16x16 or 32x32 single format switcher or a 16x16 mixed format configuration. The optional internal controllers can be provided in a fully redundant pair. Power supplies are also available with a redundancy option within each frame. A built-in X-Y control panel is available for use with the internal controller. This on-board control helps reduce the system's space requirements, providing a complete, self-contained 32x32 router in only 2RU.

The **UTAH-300** provides an alternative solution for large and medium-sized routing systems where analog signals make up a large part of the switching requirement. The UTAH-300 features high crosspoint densities and interchangeable analog/digital cards, making it very well suited for a mixed analog/digital system. An efficient 32x32 matrix building block provides the optimal balance between rackframe density and modularity.

The UTAH-300 is a cost efficient routing solution featuring solid analog video performance and a cost-effective modular growth path. All analog video systems can be configured for either component or composite signaling and offer the specifications you expect from all Utah Scientific routing systems. The basic UTAH-300 Frame occupies 12RU, housing a 128x128 matrix block. Redundant Power Supplies are housed in a separate 2RU frame. The UTAH-300 matrices are controlled by an external SC-4 (or earlier) system controller.

**Legacy Utah Scientific Products** — Utah Scientific has always maintained a strong policy of supporting all of its products as long as there are customers who are depending on them. In line with this objective, we continue to offer full support for all of our earlier routers and control systems. Whether you need replacement parts or assemblies or help with a system upgrade, please contact your Utah Scientific representative or our Customer Service department.

