

# SDI Router Selection Guide

How to choose the right broadcast SDI router for your facility, signal formats, and budget

A practical framework for broadcast engineers and facility managers to evaluate SDI routing systems across compact, mid-size, and enterprise deployments. Covers signal format requirements, matrix sizing, control system compatibility, 12G-SDI considerations, IP readiness, and total cost of ownership.

## UDS SERIES

**10×10 to 144×144**

Smaller Studios & OB Trucks

## UHD-12G SWITCHER

**32×32 to 288×288**

4K / UHD Production

## UTAH-400 SERIES 2

**72×72 to 1056×1056**

Enterprise & Hybrid SDI/IP

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## UTAH SCIENTIFIC, INC.

Salt Lake City, Utah · [utahscientific.com](http://utahscientific.com) · +1 (801) 575-8801

Engineering broadcast routing solutions since 1977

**Backed by the broadcast industry's only no-fee 10-year hardware warranty**

*How to use this guide: Start with Section 1 to define your facility's requirements. Use the decision matrix in Section 3 as a quick-reference shortcut if you already know your signal formats and matrix size. The evaluation criteria in Section 4 apply regardless of which product line you select. All Utah Scientific SDI routers are covered by the broadcast industry's only no-fee 10-year hardware warranty.*

## SECTION 1

# Defining Your Requirements

Before evaluating any product, it pays to document what your facility actually needs today and what it will likely need over the life of the router. A broadcast router is a long-term capital investment. The requirements you define now will determine whether you are protected or constrained five years from now.

### Signal Formats

Start by listing every signal format currently in your facility: SD-SDI, HD-SDI, 3G-SDI, 12G-SDI, DVB-ASI, analog, AES audio, fiber. Then identify any formats you expect to add within the next three years. A router that handles today's formats but cannot accept tomorrow's without a chassis replacement is a constraint, not an investment.

### Matrix Size

Count your actual I/O requirements: number of sources, number of destinations, and expected growth. Broadcast facilities consistently underestimate how many I/O points they will need. A router running at 80% capacity has no headroom for growth. Plan for at least 20-30% expansion above your current count, and verify that the router you select can scale within the same chassis architecture.

### 4K and UHD Requirements

If your facility handles 4K content now, or expects to within the next three years, your router selection changes significantly. Processing 4K via Quad Link requires four 3G-SDI paths per signal, multiplying your I/O count and cabling complexity. A 12G-SDI single-link router eliminates this overhead entirely, carrying SD through 2160p60 on a single coax or fiber connection.

### Control System Environment

Consider how operators need to control the router: dedicated hardware panels, software control, automation systems, or all three. Identify whether you have an existing Utah Scientific control system that needs to be preserved, or whether this is a greenfield installation. Also consider whether remote or multi-site control is required.

### IP Transition Timeline

Even if your facility is running pure SDI today, your router selection should account for where you expect to be in five years. If there is any chance you will need to send or receive SMPTE ST 2110 signals within that window, choose a chassis that can accept IP capability incrementally rather than requiring full replacement.

### Environment and Form Factor

Facility type affects router selection as much as signal format. A fixed broadcast facility has different density and reliability requirements than an OB truck, a sports venue, or a distributed campus installation. OB environments prioritize compact form factors, rugged reliability, and fast configuration. Fixed facilities prioritize scalability, deep I/O density, and long-term support.

### Reliability and Warranty Requirements

Calculate the true cost of ownership over a ten-year period, not just the initial purchase price. Most broadcast routers carry one- to three-year warranties. After that, annual support contracts typically run 10% of the original purchase price per year. Over ten years, those costs can exceed the cost of the router itself. Warranty terms are a financial decision, not just a technical one.

SECTION 2

## Understanding the Product Lines

Utah Scientific offers three distinct SDI routing product lines, each purpose-built for a specific range of facility types and signal environments. All three share the same modular architecture philosophy, the same control system compatibility, and the same no-fee 10-year hardware warranty.

### UDS Series

Best for: Studios, OB trucks, flypacks, rental houses, house of worship, campus AV

Matrix: 10×10, 20×20 at 1RU  
 Formats: SD, HD, 3G-SDI, DVB-ASI  
 Control: Web / RCP-1/RCP-3 / hardware panels

The UDS Series delivers full-featured SDI routing in a 1RU form factor without sacrificing the reliability or control flexibility expected in broadcast environments. It supports all current broadcast SDI signal formats including SD-SDI, HD-SDI, 3G-SDI, and DVB-ASI. Signal equalization and reclocking with automatic bypass for non-standard formats is included across all models.

The native internal control system requires no software installation. It provides a genuinely feature-rich control environment for a compact product: source and destination naming, password protection, custom views, salvos, macros, destination blocks for DA grouping, color-coded sources, and logging of all control activity. Automation and third-party control connect via Utah Scientific's industry-standard RCP-1 serial and RCP-3 Ethernet protocols.

- UDS 10 (10×10) and UDS 20 (20×20) routers at 1RU, UDS 64 (64×64) at 3RU, UDS 144 (144×144) at 4RU; also available as UDS DA (8×32 configurable distribution amplifier)
- Native web server with salvos, macros, destination blocks, custom views, and password protection
- RCP-1 serial and RCP-3 Ethernet protocols for third-party automation and control integration
- Optional UDS-CP2 button panel (36 programmable buttons) and UDS-XY full-matrix display panel
- Optional UDS-GPIO unit (16 GPI / 16 GPO) for contact-closure automation integration
- Compatible with On-Ramp for ST 2110 IP gateway capability when needed

*Right for you if: your facility runs SD, HD, or 3G-SDI signals in a compact environment and matrix size stays at or under 20×20. The UDS series is equally at home in a permanent installation or a flypack, and its automation protocol support makes it a clean fit for facilities that need third-party control integration.*

### UHD-12G Routing Switcher

Best for: 4K / UHD production, live events, sports venues, post-production finishing

Matrix: 32×32, 144×144, 288×288  
 Formats: 270 Mbps through 11.88 Gbps on single coax or fiber  
 Control: Standalone (UHD-32) or SC-4/40/400 (all frames)

The UHD-12G is built on a four-board architecture (input, crosspoint, midplane, output) that natively supports and reclocks SMPTE 259C, 292, 424, ST2081, and ST2082 signals with a maximum data rate of 11.88 Gbps. Non-standard signals between 18 Mbps and 11.88 Gbps are passed through without reclocking automatically. All I/O cards use HD-BNC connectors, providing superior density while accepting standard Belden 1694 cable.

For facilities running 4K content, single-link 12G-SDI is a material operational advantage. Traditional 3G-SDI routers require four parallel paths per 4K signal (Quad Link), multiplying I/O count, cabling runs, and rack density by a factor of four. The UHD-12G collapses all of that to a single coax or fiber connection per signal.

- Reclocks all standard SDI rates: 270 Mbps, 1485 Mbps, 2970 Mbps, 5.94 Gbps, and 11.88 Gbps
- Available in 32×32, 144×144, 160×160, and 288×288 frame sizes; input/output cards field-replaceable

- Multi-rate I/O cards (16 ports per card, HD-BNC) handle 270 Mbps through 11.88 Gbps on the same card
- Fiber I/O cards available (8 dual SFP = 16 ports); supports 3G–12G fiber and ST 2110 via SFP (3G)
- UHD-32 supports standalone internal control; UHD-144, UHD-160R and UHD-288 require SC-4/SC-40/SC-400
- UHD-160R features redundant crosspoints
- Compatible with previous-generation Utah Scientific routers via MX Bus hub (up to 16 MX Bus devices)
- Compatible with On-Ramp for full ST 2110 IP gateway capability when needed

*Right for you if: your facility handles or will soon handle 4K/UHD content and you want to eliminate the cabling and I/O overhead of Quad Link 3G. Also the natural choice for live event and sports venue installations where signal density and reliability are both paramount. Note: facilities needing standalone control at 144 inputs or above should plan for an SC-4/SC-40/SC-400 control system alongside the UHD-12G chassis.*

## UTAH-400 Series 2

Best for: Enterprise broadcast facilities, NOCs, government media, hybrid SDI/IP

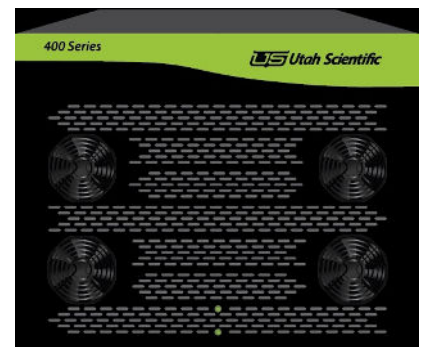
Matrix: 72×72 to 1056×1056 (5 frame sizes)

Formats: All SDI + audio + fiber + IP

Control: SC-4/40/400 + NMOS IS-04/05

The UTAH-400 Series 2 is Utah Scientific's flagship enterprise routing platform, providing a single chassis for every signal format a modern broadcast facility uses or is likely to use. Advanced modules deliver SDI management, 2110 decoding and multiplexing of SMPTE ST 2022-6/8, clean-quiet switching, audio shuffling, de-embedding and embedding, AES, MAD1, Dante, and support for fiber and analog formats.

Its defining advantage for long-term planning is IP readiness without IP commitment. PassThrough cards slot directly into existing I/O card positions and add SMPTE ST 2110 encapsulation and de-encapsulation without chassis replacement. The SDI routing fabric continues operating as a live fallback path. NMOS IS-04 and IS-05 support allows SDI crosspoints and IP flows to be managed from the same control plane.



- Five frame sizes: 72×72, 144×144, 288×288, 528×528, 1056×1056; same I/O cards across all frames
- Hot-swappable modular I/O cards; add formats or expand capacity without taking the system offline
- NMOS IS-04 and IS-05 compliant; SDI crosspoints and IP flows managed from one control plane
- PassThrough cards add ST 2110 IP capability incrementally; SDI fallback always live
- Compatible with SC-4, SC-40, and SC-400 control systems

*Right for you if: your facility needs a long-lived, scalable routing platform that handles complex signal environments today and can grow into IP without replacing the chassis. The Series 2 is the right choice for any facility that expects to run this router for ten years or more.*

## UTAH-400 Series 2 Gateway Router

A variant of the Series 2 specifically engineered for facilities running a hybrid SDI/IP core. The Gateway Router integrates SDI routing and SMPTE ST 2110 gateway functionality simultaneously in one chassis. The embedded gateway is not a bolt-on; it is part of the routing fabric.

If the IP control system or network fabric encounters any disruption, the dedicated SDI path inside the same chassis remains live without operator intervention. Configurable as a core router in an ST 2110/SDI hybrid solution, or as a gateway and edge device in a full ST 2110 core. Scalable 72×72 to 1056×1056.



SECTION 3

# The Selection Framework

Use the following tools to match your facility's requirements to the right product line. Start with the signal format matrix to confirm compatibility, then use the decision matrix to identify the recommended router by facility type.

## Signal Format Compatibility

• = Full native support ○ = Supported with configuration or optional cards – = Not supported

SIGNAL FORMAT	UDS COMPACT	UHD-12G	UTAH-400 SERIES 2
SD-SDI (270 Mbps)	•	•	•
HD-SDI (1.485 Gbps)	•	•	•
3G-SDI (2.97 Gbps)	•	•	•
12G-SDI (11.88 Gbps)	–	•	•
4K via Quad Link (3G×4)	–	○	•
DVB-ASI	•	•	•
ST 2110 via fiber SFP (3G)	•	•	•
Analog video / sync	•	•	•
AES audio (embedded)	•	•	• *
MADI	–	–	•
Dante audio	–	–	•
Fiber (SFP)	•	•	•
SMPTE ST 2022-6/8 (SDI over IP via SFP)	•	•	○
SMPTE ST 2110	•	•	•
RCP-1/RCP-3 automation protocols	•	•	•
NMOS IS-04/05	○	○	•

\*Embed/Deembed Available

## Decision Matrix by Facility Type

FACILITY / USE CASE	MATRIX SIZE	SIGNAL FORMATS	RECOMMENDED ROUTER
OB truck / mobile unit	Up to 144x144	SD, HD, 3G-SDI, DVB-ASI	UDS Series
Flypack / rental house	Up to 144x144	SD, HD, 3G-SDI	UDS Series
Small studio / regional broadcaster	Up to 144x144	SD, HD, 3G-SDI	UDS Series
House of worship / campus AV	Up to 144x144	HD, 3G-SDI	UDS Series
Live event / 4K production	32x32 to 288x288	12G-SDI single-link UHD	UHD-12G Switcher
Sports venue / arena production	32x32 to 288x288	SD through 12G-SDI	UHD-12G Switcher
Post-production / finishing	32x32 to 288x288	HD, 3G, 12G-SDI	UHD-12G Switcher
Mid-size broadcast facility	72x72 to 288x288	SD, HD, 3G, ASI, audio	UTAH-400 Series 2
Network / enterprise NOC	288x288 to 1056x1056	All SDI + fiber + 2110	UTAH-400 Series 2
Government / public media	72x72 to 288x288	SD, HD, 3G, ASI	UTAH-400 Series 2
Hybrid SDI/IP core	72x72 to 1056x1056	SDI + SMPTE ST 2110	UTAH-400 Series 2 Gateway Router

*Note on the Gateway Router: The UTAH-400 Series 2 Gateway Router is not a separate product family; it is a configuration of the Series 2 chassis with embedded ST 2110 gateway functionality. If your facility is evaluating a hybrid SDI/IP core or expects to reach that stage within the next three years, plan for the Gateway Router variant rather than adding an external gateway device later.*

## SECTION 4

## Key Evaluation Criteria

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The following criteria apply to any SDI router evaluation, regardless of vendor. Apply them consistently to ensure the comparison is based on operational reality rather than specification sheet marketing.

### Reliability and Uptime Record

Ask for documented uptime records from existing customers, not theoretical MTBF figures from a spec sheet. Broadcast routers operate 24/7/365. A router that requires a power cycle or control restart once a year is unacceptable in a live production environment. Seek references from facilities running the same model in similar operational conditions to yours and ask specifically whether they have ever had to reboot.

### Warranty Duration and Terms

Verify the warranty period, whether it covers the full hardware system including cards and control hardware, and what the process is to access technical assistance. A warranty that requires an active support contract to access support is not a warranty in any meaningful sense; it is a mandatory support contract with a warranty clause attached. Utah Scientific's no-fee 10-year warranty is the only warranty of its kind in broadcast: no fees, no contracts, no fine print, for a full decade from date of shipment.

### Scalability Path

Confirm that I/O cards are common across all frame sizes in the product line. A router that requires different cards for different frame sizes creates inventory complexity and spares costs when scaling. Verify whether the chassis architecture supports hot-swappable I/O changes without taking the system offline. Ensure that the maximum frame size is large enough to accommodate your ten-year growth projection.

### Control System Compatibility

Identify every control touchpoint in your facility: hardware panels, software panels, automation systems, and remote access. Confirm that the router integrates with each without requiring a control system forklift upgrade. For facilities planning an IP transition, verify NMOS IS-04 and IS-05 compliance so SDI crosspoints and IP flows can be managed from a single control plane when the time comes.

### 12G-SDI Architecture

If 4K is in your future, evaluate whether the router uses true 12G-SDI single-link architecture or whether it handles 4K via Quad Link. Single-link 12G eliminates the four-path overhead of Quad Link, reducing cabling complexity, rack space, and I/O count by a factor of four for every 4K signal. This is not a minor efficiency gain; for a 32-input 4K facility, the difference between Quad Link and single-link is the difference between 128 I/O ports and 32.

### IP Readiness

Evaluate whether IP capability is embedded in the router chassis or requires an external gateway device. Embedded gateways eliminate the external device as a single point of failure. Confirm that the SDI signal path remains live independently of the IP fabric, so a network disruption does not take the router offline. Verify PTP compliance and whether the system can manage ST 2110 timing alongside legacy Black Burst references without external clocking hardware.

### Service and Support Infrastructure

Confirm the vendor's domestic support response time and availability. A router under warranty is only as valuable as the support team behind it. Ask whether technical assistance requires a support contract, what the process is for hardware replacement under warranty, and whether the vendor has a history of discontinuing products and leaving customers on unsupported hardware mid-lifecycle.

SECTION 5

## Side-by-Side Comparison

The table below summarizes the key differentiators across Utah Scientific's three SDI routing product lines. Use it as a quick reference alongside the criteria in Section 4.

	UDS SERIES	UHD-12G	UTAH-400 SERIES 2
<b>Max matrix size</b>	144x144 (router) 8x32 (DA)	288x288	1056x1056
<b>Form factor</b>	1-4 RU	1-10 RU	4-40 RU
<b>12G-SDI native</b>	No	Yes	Yes (card-based)
<b>Fiber / ST 2110 SFP</b>	Yes (3G via SFP)	Yes (3G via SFP)	Yes (PassThrough cards)
<b>IP-ready</b>	Via SFP or On-Ramp	Via SFP or On-Ramp	Yes (PassThrough cards)
<b>Audio handling</b>	Embedded SDI audio	Embedded SDI audio	Full (AES, MADI, Dante)
<b>Internal control</b>	Yes (RCP)	UHD-32 only	No (SC 4, 40, 400)
<b>Automation protocols</b>	RCP-1/RCP-3	RCP-1/RCP-3	RCP-1/RCP-3 + NMOS
<b>NMOS IS-04/05</b>	Yes (SFP)	Yes (SFP)	Yes
<b>Scalability</b>	5 frame sizes	3 frame sizes	5 frame sizes
<b>Optional accessories</b>	CP, XY, GPIO	Fiber I/O cards, On-Ramp	Fiber, PassThrough, On-Ramp
<b>Best for</b>	OB, flypacks, small studios	4K/UHD production	Enterprise, NOC, hybrid
<b>Warranty</b>	10-year no-fee	10-year no-fee	10-year no-fee

### THE 10-YEAR WARRANTY ADVANTAGE

Every Utah Scientific SDI router ships with the broadcast industry's only no-fee 10-year hardware warranty. No annual fees. No support contract required. No fine print. It covers the full system including chassis, cards, and control hardware for ten years from date of shipment. Competitors' warranties typically run one to three years, after which annual support contracts cost ~10% of the original purchase price per year. Over a ten-year router lifecycle, that math is significant.

## SECTION 6

## Questions to Ask Any Router Vendor

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Use the following questions in any vendor conversation or RFP process. A vendor that cannot answer these questions clearly and directly is telling you something important about what you can expect from their support over the life of the product.

### Reliability

- Can you connect me with a customer running this specific model in a comparable facility, and will they confirm they have never had to reboot it?
- What is the documented power supply failure rate on this model in the field?
- What is the longest continuous uptime you have recorded for this router chassis?

### Warranty and Support

- What is the full warranty period, and does it cover chassis, cards, and control hardware?
- Is a support contract required to access technical assistance during the warranty period?
- What are the total support costs over a ten-year ownership period?
- What happens if a card is discontinued during the warranty period?

### Scalability

- Are I/O cards common across all frame sizes in this product line?
- Can I expand the router without replacing the chassis?
- Can I make I/O card changes while the system is live, without a maintenance window?

### 12G-SDI and UHD

- Does this router handle 4K via 12G-SDI single-link, or does it require Quad Link?
- What is the I/O count impact if we move from 3G Quad Link to 12G single-link for 4K signals?

### IP Readiness

- Can I add IP capability without replacing this chassis?
- Is the IP gateway embedded in the chassis, or does it require a separate device?
- If the IP control system fails, does the SDI signal path remain live automatically?
- Is the system NMOS IS-04 and IS-05 compliant?
- How does it handle PTP timing alongside existing Black Burst references?

### Control System

- Is this router compatible with my existing hardware panels and automation systems?
- Can the same control system manage both SDI crosspoints and IP flows?
- What is the upgrade path if I need to add NMOS control later?

*"The first and most important element in our decision to renew with Utah Scientific was our current router's dependability. It ran 24/7, 365 for nine years, with no failures: whether power supply failures or control failures. There was never a need to reboot the router."*

— Craig Jutson, City of San Jose

*"When making our purchase decision for a new plant router, the included 10-year support plan was a major factor that stood out among other manufacturers. In the first five years, I've had nothing but great experiences when dealing with the support team at Utah Scientific."*

— Aaron Jones, WCMU Public Media

*"Utah Scientific has outstanding brand recognition in the studio and mobile broadcast markets and a stellar reputation for reliability, longevity, and customer service."*

— Michel Suissa, Managing Director of Professional Solutions, The Studio-B&H

## TALK TO A UTAH SCIENTIFIC ROUTING EXPERT

Utah Scientific application engineers work directly with broadcast facilities to evaluate routing requirements, recommend the right product for your signal environment and budget, and design configurations that protect your existing infrastructure investment.

Visit [utahscientific.com/broadcast-sdi-routing-solutions/](http://utahscientific.com/broadcast-sdi-routing-solutions/) to explore the full SDI routing lineup, request a routing consultation with a Utah Scientific application engineer, or download the UTAH-400 Series 2 datasheet, UHD-12G spec sheet, and UDS product guide.