

Signal Switching, Conversion & Distribution Specialists  
2022A - Satellite Edition



67 GHz



V-Band  
40 - 67GHz

Q-Band  
33 - 50GHz

Ka-Band  
18 - 40GHz

Ku-Band  
12 - 18GHz

X-Band  
7.0 - 11.2GHz

xC-Band  
4.0 - 8.0GHz

C-Band  
4.0 - 5.25GHz

5G-Band  
2.4 - 4.2GHz (LB)

S-Band  
to 3000MHz

xL-Band  
850 - 2450MHz

L-Band  
950 - 2150MHz

P-Band  
225 - 700MHz

IF  
20 - 200MHz

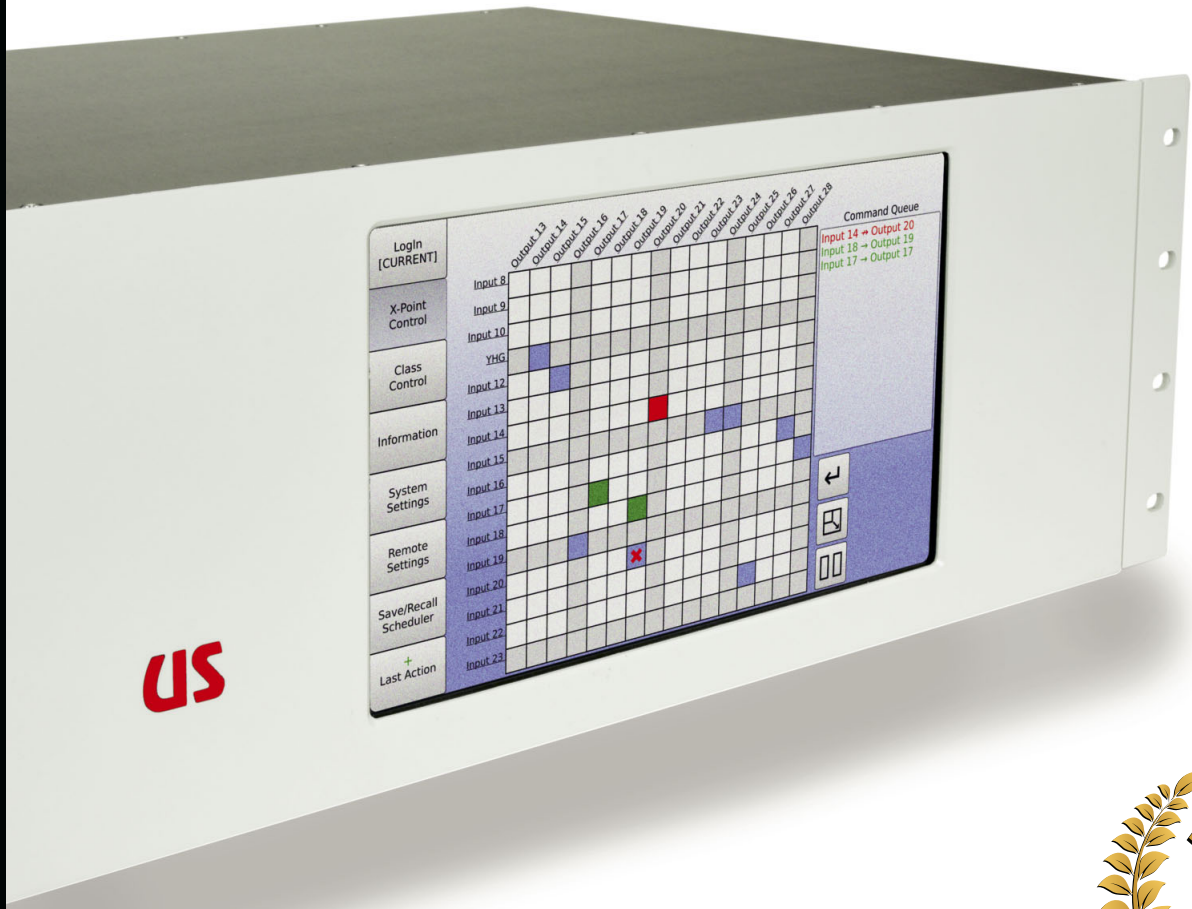
HF / RF  
1.5 - 32MHz

Video  
DC - 200MHz

ATE  
Power  
Low Level AC/DC  
Low Thermal



DC



Made in the USA





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**Hot-Swap dual CPU, power supplies & modules**  
Most products feature hot-swap monitored supplies, control CPUs and modules for the ultimate in hardware reliability.

**Cover**  
Our 2022A cover highlights the advanced SWM16X Wideband Modular matrix with front panel display. See page 7 for more information.



**Features, features and more features**  
We strive to provide as many standard product features during the product design period to extend the life cycle and purpose of our hardware.

**What is the RR all about?**  
The graphic is on our front cover, and throughout our catalog, products, website, Twitter, Facebook & elsewhere. Find out more on page 17.



**Plug-in C3 and C3-Lite Controllers certified LXI with TCP/IP, HTTPS (SSL/TLS), SNMP v1/v2C/v3, SNTp, IPv4/6 and REST.** Latest in hot-swap control interface technology with the best in network security layers and protocols, plus fast 10/100/1GB hardware with auto-negotiation.



Signal Switching, Conversion & Distribution Specialists



# About Universal Switching Corporation

## Global Leader in Switching Technology

Universal Switching Corporation is an internationally recognized leader in the switching industry that manufactures "state-of-the-art" switching, distribution and conversion equipment. Since 1992 (30 years), the USC commitment to Continuous-Process-Improvement and full spectrum technology has been combined to provide a unique blend of cost effective and high quality products.

This product brief showcases only products typically required for use within satellite ground stations, teleports, antenna feeds and other high value and critical communication assets. **For a full product listing, see our website.**

With a corporate culture that includes a modern facility in Burbank, talented personnel, comprehensive Quality Management System and **ISO 9001:2015 certification**, USC provides a standard 2-Year warranty for all equipment, and optional 7-Year warranties.



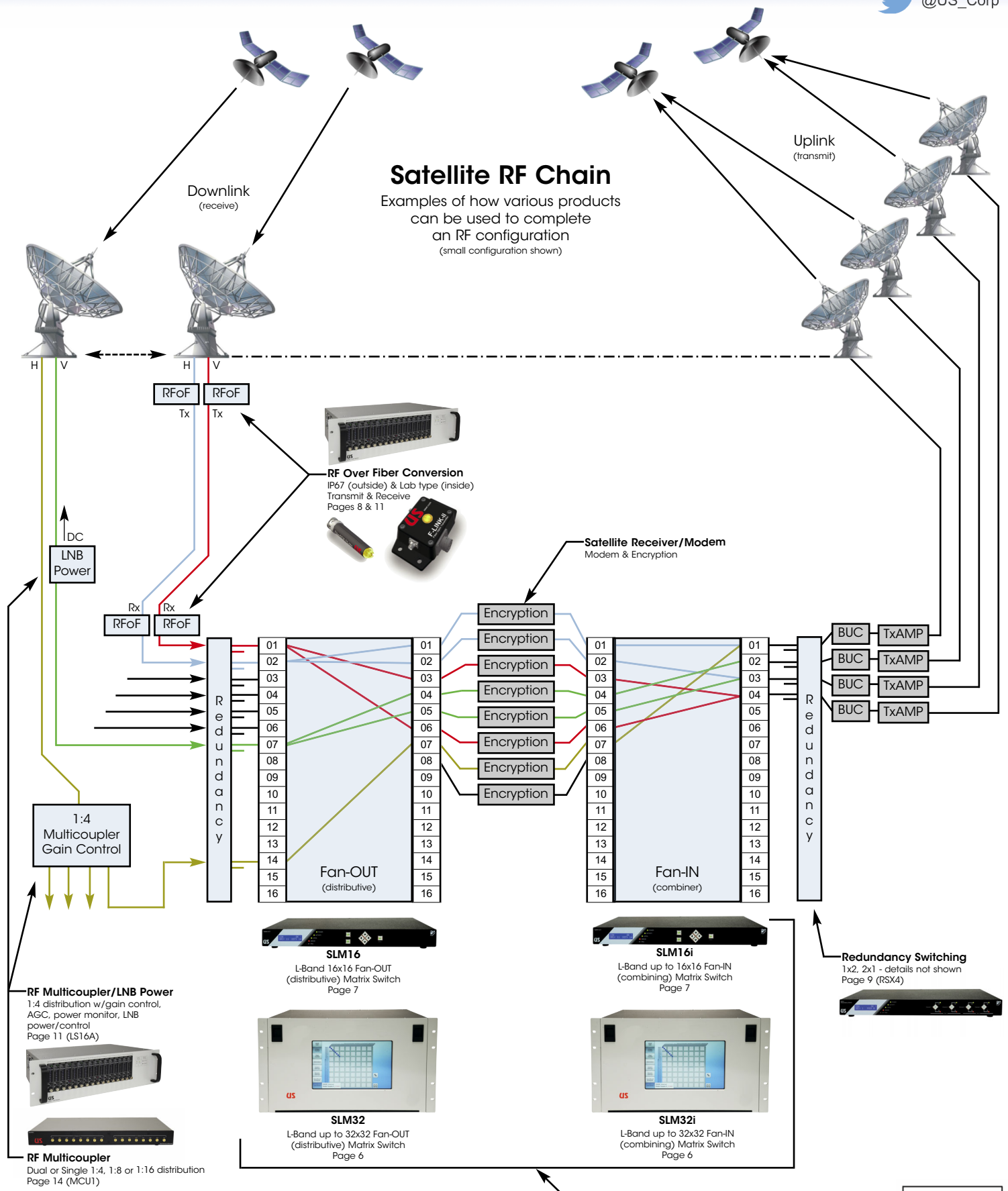
## Products

### Product Page Numbers

	6	7	8	9	10	11	12	13	14
<b>RF Matrices &amp; Switches</b>									
- HF & RF (1-32MHz)	X	X	X	X		X		X	X
- IF Band (40-200MHz)	X	X	X	X				X	X
- L Band (850-2450MHz)	X	X	X	X				X	X
- Wideband (20-3000GHz)	X	X		X		X		X	X
- Ultra Wideband (50-6000GHz)	X	X		X				X	X
- Microwave (DC-18/26,40/50/67GHz)				X		X	X	X	X
- Redundancy Switching				X				X	
<b>Distribution Amps &amp; Multicouplers</b>									
- RF Multicouplers (1.5MHz - 5500MHz)				X	X	X			X
<b>Fiber Transport, ToIP &amp; LNB Control</b>									
- RF Over Fiber			X			X			
- LNB Power and/or Control					X	X			
- Data Distribution					X	X			X

#### NOTE

The table above uses an "X" to denote that a particular product on this page might be used for the application. Note that some pages have multiple products on the same page.



### Satellite RF Chain

Examples of how various products can be used to complete an RF configuration (small configuration shown)

H V

Downlink (receive)

Uplink (transmit)

RFoF Tx

RFoF Tx

**RF Over Fiber Conversion**  
 IP67 (outside) & Lab type (inside)  
 Transmit & Receive  
 Pages 8 & 11

Satellite Receiver/Modem  
Modem & Encryption

Rx RFoF

Rx RFoF

Encryption  
 Encryption  
 Encryption  
 Encryption  
 Encryption  
 Encryption  
 Encryption

BUC TxAMP  
 BUC TxAMP  
 BUC TxAMP  
 BUC TxAMP

1:4 Multicoupler Gain Control

Redundancy

Fan-OUT (distributive)

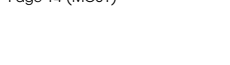
Fan-IN (combiner)

Redundancy

**RF Multicoupler/LNB Power**  
 1:4 distribution w/gain control, AGC, power monitor, LNB power/control  
 Page 11 (LS16A)



**RF Multicoupler**  
 Dual or Single 1:4, 1:8 or 1:16 distribution  
 Page 14 (MCU1)



**SLM16**  
 L-Band 16x16 Fan-OUT (distributive) Matrix Switch  
 Page 7



**SLM32**  
 L-Band up to 32x32 Fan-OUT (distributive) Matrix Switch  
 Page 6



**SLM16i**  
 L-Band up to 16x16 Fan-IN (combining) Matrix Switch  
 Page 7



**SLM32i**  
 L-Band up to 32x32 Fan-IN (combining) Matrix Switch  
 Page 6



**Redundancy Switching**  
 1x2, 2x1 - details not shown  
 Page 9 (RSX4)



**Switching Systems**  
 8x8 to 128x256  
 Pages 6 to 8



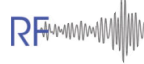
## Modular IF, L-Band, Wideband Switching

**SIM32** 20-250MHz up to 32x32

**SLM32** 850-2450MHz up to 32x32

**SWM32** 20-3150MHz up to 32x32

**SGM32** 20-6000MHz up to 32x32 **New**



- Applications:**
- Communications
  - Teleport and last mile
  - Encryption Tx/Rx modem
  - Satellite ground stations
  - Security installations
  - Uplinks or downlinks

### 6RU - Flexible configurations from 4x4 to 32x32: 20MHz-6GHz

Eliminating multi-couplers, manual patch bays and patch cords, our SxM32 family of units are a highly modular switch array specifically designed for routing of RF signals with respectable crosstalk isolation, noise figure, IP3, and other critical signal parameters. It can be configured in single-channel increments from 4x4 up to 32x32, and with multiple units up to 128x128.

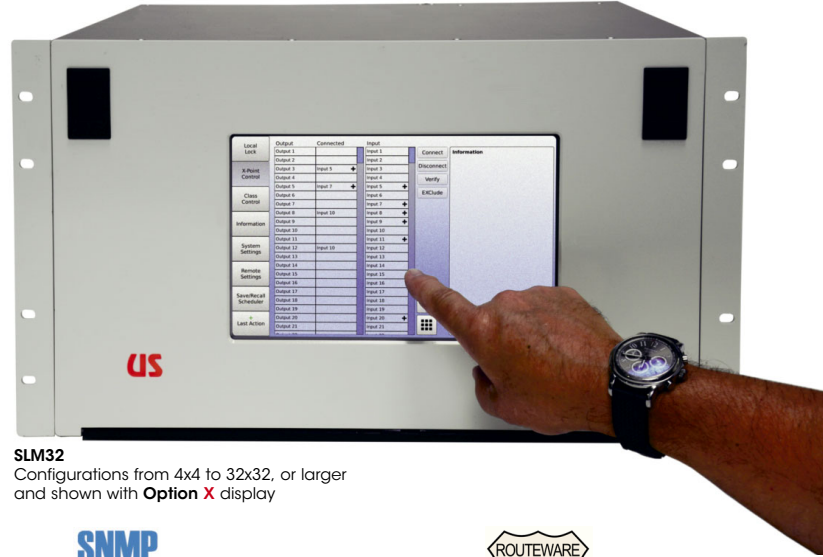
Fully populated, these units provide up to 32 input ports and 32 output ports in a modular 6RU package. The SxM32 is a Fan-OUT unit (a given input can connect to multiple outputs - "distributive"), and the SxM32i is a Fan-IN unit (combine multiple inputs to a given output "combiner"). Within the table below are standard frequency ranges available spanning 20MHz to 6GHz. They are available with SMA or BNC connectors. For N-Type connectors, 1RU panels are available.

Our unique design allows isolated failure capability. Should an element receive a damaging signal level and experience a failure, it will only affect that individual channel and not a group of channels. All elements and modules are secured within the unit for rugged and trouble free operation.

The front panel includes a touchscreen display with menu driven operation. Pick between the standard 4.3" display, or the **Option X** 10.1" display (shown here) which provides enhanced features. The unit can be configured with single or dual power supplies and CPU's (full redundant). Option "L" adds redundant LNB power supply and LNB control/monitor features for antenna applications (0/13/18V, 22kHz tone, current monitoring). Other options include variable gain control, AGC and power monitoring. Compatible with miniature FiberSTIK™ fiberoptic receiver (see below).

System Type	Frequency Range	Features
SIM32	40-250MHz	IF-Band, non-blocking Fan-OUT
SIM32i	40-250MHz	IF-Band, non-blocking Fan-IN
SLM32	850-2450MHz	Extended L-Band, non-blocking Fan-OUT
SLM32i	850-2450MHz	Extended L-Band, non-blocking Fan-IN
SWM32	20-3150MHz	Wideband, non-blocking Fan-OUT
SGM32	20-6000MHz	Extreme WB, non-blocking Fan-OUT

**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



**SLM32**  
Configurations from 4x4 to 32x32, or larger and shown with **Option X** display



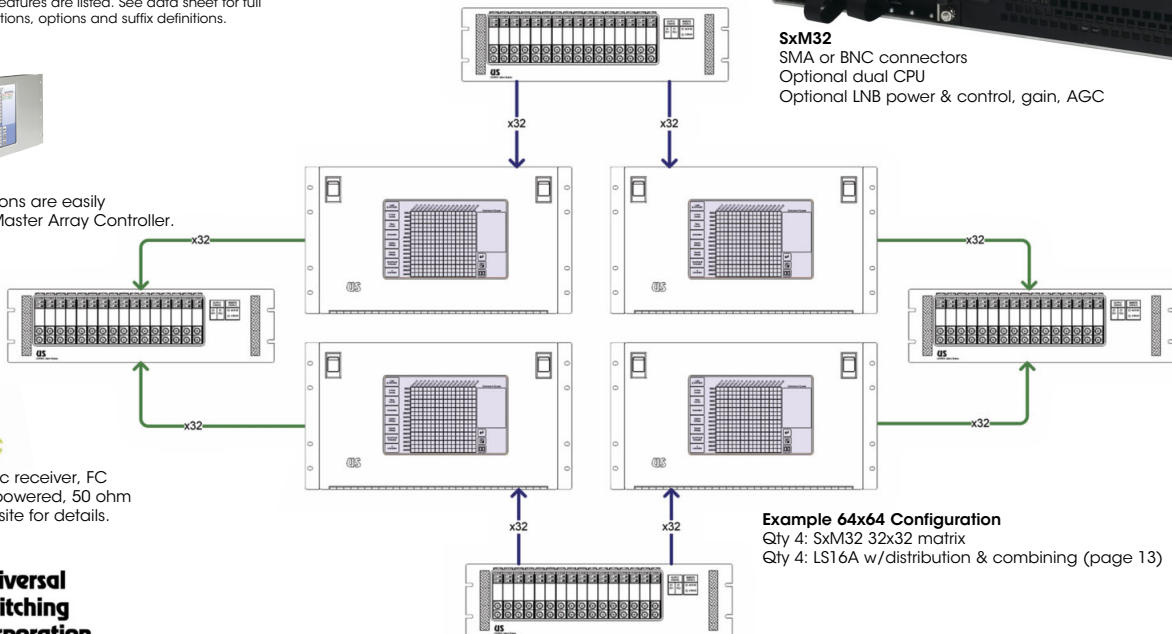
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**SxM32**  
SMA or BNC connectors  
Optional dual CPU  
Optional LNB power & control, gain, AGC



**MAC4**  
Multi-unit configurations are easily controlled with our Master Array Controller. See page 16



**New FiberSTIK™**  
Wideband fiberoptic receiver, FC 200-3000MHz, LNB powered, 50 ohm See page 8 or website for details.

**Example 64x64 Configuration**  
Qty 4: SxM32 32x32 matrix  
Qty 4: LS16A w/distribution & combining (page 13)



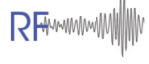
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### L-Band & Wideband Fixed-Sized Switching

**SLM16** 850-2450MHz sizes 8x8 to 16x16

**SWM16** 20-3150MHz sizes 8x8 to 16x16

**New SGM16** 20-6000MHz sizes 8x8 to 16x16



- Applications:**
- Communications
  - Teleport and last mile
  - Encryption Tx/Rx modem
  - Satellite ground stations
  - ENG vans or trucks
  - Uplinks or downlinks



**New FiberSTIK™**  
Wideband fiberoptic receiver, FC 200-3000MHz, LNB powered, 50 ohm  
See page 8 or website for details.

#### 1RU - Fixed configurations loaded with features: 20MHz - 6GHz

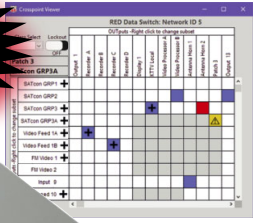
For smaller or budget minded yet performance demanding applications like ENG vans or trucks, these 1RU units are purpose built for IF and L-Band switching. Available in 8x8 or 16x16, and with SMA or BNC connectors, they provide great RF specifications for IP3, noise figure and isolation. They come standard with 10/100 Ethernet & multi-serial control ports, web browser (SNMP/IPv4/6/LXI), redundant fans, and redundant power supplies. Signal connectors are located at the rear while the front panel has LCD display and control keys. Other options include variable gain control, AGC, power monitoring, and LNB power/control features.

**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



**SLM16**  
16x16 L-Band Matrix

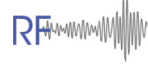
**FREE RWP5 License With Purchase in 2022**



### Modular IF, L-Band, Wideband Switching

**SWM16X** 20-3000MHz up to 16x16

8x8, dual 8x8, 8x16 & 16x16



- Applications:**
- Communications
  - Teleport and last mile
  - Encryption Tx/Rx modem
  - Satellite ground stations
  - ENG vans or trucks
  - Uplinks or downlinks

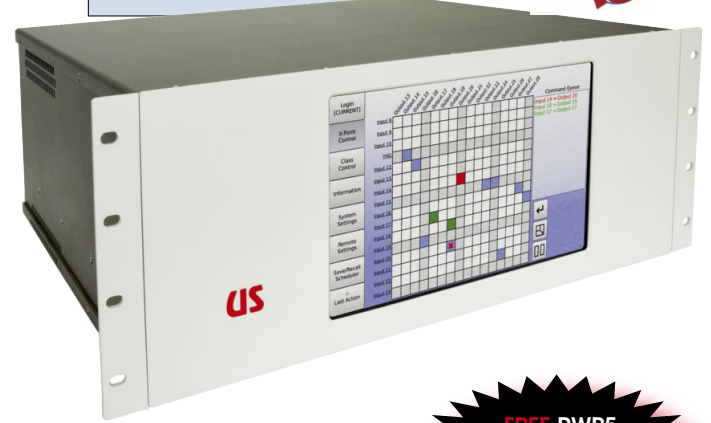


#### 4RU - Modular symmetric or asymmetric configurations

Compact and high performance, the SWM16W provides a cost effective switching capacity for smaller installations. All inputs and outputs are located at the rear of the unit. The SWM16X is a distributive non-blocking (Fan-OUT) product that can be ordered in array sizes from 4x16 to 16x16. The SWM16Xi is a combiner version (Fan-IN) in sizes from 16x4 to 16x16.

Standard redundant hot-swap power supplies with independent AC inputs deliver the ultimate in system reliability for critical applications. The unit can also be configured with dual control CPU capability. An optional Bias-T capability power supply is available (option P). Complete control and status of the unit is available at the single or dual 10/100 ports, built-in web browser, touchscreen display, or via the RouteWarePRO software packaged provided.

Our popular RouteWarePRO software package (included) makes it easy to control multiple units from the same GUI, or you can manage the unit from a web browser window. Our critical new "X-Point Classing" feature is included. Custom configurations are available upon request, even 6GHz capability.



**FREE RWP5 License With Purchase in 2022**

System Type	Features
SWM16X-1608-15N	8 input, 8 output, distributive Fan-OUT, single CPU
SWM16X-1608-25N	8 input, 8 output, distributive Fan-OUT, dual CPU
SWM16X-D1608-25N	Dual 8 input, 8 output, distributive Fan-OUT, dual CPU
SWM16X-2416-15N	8 input, 16 output, distributive Fan-OUT, single CPU
SWM16X-2416-25N	8 input, 16 output, distributive Fan-OUT, dual CPU
SWM16X-3216-25N	16 input, 16 output, distributive Fan-OUT, dual CPU

**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



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**SWM16X**  
N-Type connectors  
Optional dual CPU  
Optional LNB power & control, gain, AGC



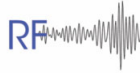
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Available Q4-2022

## Large Format Modular L-Band Switching

**SLX320** 850-2450MHz up to 64x256

**SLX321** 850-2450MHz up to 128x192



### 14RU - Modular symmetric or asymmetric configurations

Designed to be the "gold standard" for large format extended L-Band matrices, these new Tri-Stage products are rich with features. Leveraging the absolute latest in component technology and design concepts, these modular switch arrays are specifically designed for routing high performance signals in symmetric or asymmetric matrix configurations. They provide respectable crosstalk isolation, noise figure, IP3 and other critical RF parameters.

The SLX320 provides Fan-OUT (distributive) configuration up to 64in x 256out in 8-channel port increments. The SLX321 has the same structure, but has different "mid-stage" elements to allow a configuration up to 128x192. Both units are available in complementary Fan-IN configurations (combine multiple inputs to a given output) by adding an "i" to the model number which then provides a modular configuration up to 256x64 or 192x128 Fan-IN with 8-channel port expansion increments.

Units come standard with redundant hot-swap power supplies and can feature either one or two hot-swappable plug-in control CPUs. An extension of our CAS product line, all active modules, power supplies and assemblies are installed via the lockable hinged front panel. No rear panel access is needed to maintain the unit.

System Type	Frequency Range	Features
SLX320	850-2450MHz	Up to 64x256, distributive Fan-OUT
SLX320i	850-2450MHz	Up to 256x64, combining Fan-IN
SLX321	850-2450MHz	Up to 128x192, distributive Fan-OUT
SLX321i	850-2450MHz	Up to 192x128, combining Fan-IN
SWX320	20-3000MHz	Wideband, distributive Fan-OUT

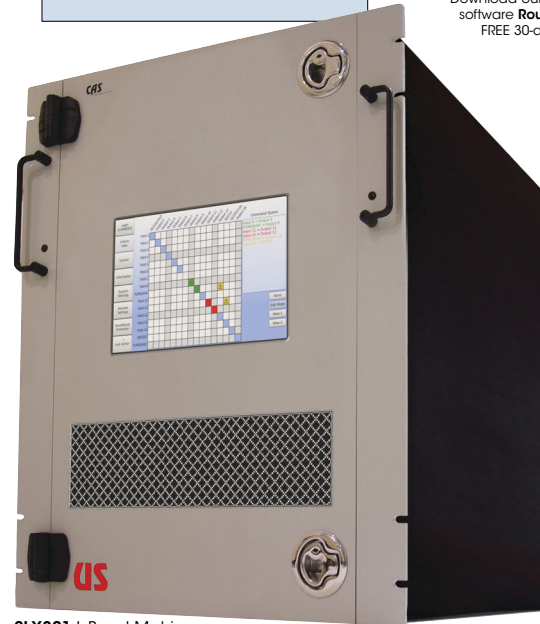
**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.

### Applications:

- Communications
- Teleport and last mile
- Encryption Tx/Rx modem
- Satellite ground stations
- ENG vans or trucks
- Uplinks or downlinks



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**SLX321** L-Band Matrix  
Modular configurations up to 128x192 (13RU)



Available Q4-2022

## RF Over Fiber: 200-3000MHz

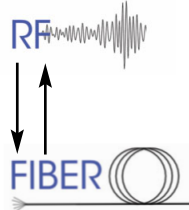
### F-LINK-II Mini and FiberSTIK™

#### Rugged IP67 Waterproof & Miniature

Our small F-LINK RfOf products are designed provide a fiber optic conversion to/from copper for analog signals from 200-3000MHz (min). They are compatible with both the LS16-FR2 & LS16-FT2 from our LS16A product offering (see page 15), and well as our miniature FiberSTIK™ receiver.

F-LINK is designed for bulkhead installation, has a twist-lock DC power connector, stainless steel FC single-mode optical connector, status LED, and a choice of SMA, BNC or TNC connectors (50 ohm). The transmitter has a Class-1 Fabrey-Perot laser with 1310nm wavelength.

FiberSTIK™ product allows the user to pick and choose what port(s) on their system they want to have fiber optic receiver (input) capability. DC power is provided by LNB power sourced from the host system where it is installed (must have LNB power option). The host system can typically monitor current for proper operation as well.



### Applications:

- Antenna fiber links
- Teleport and last mile
- Backup antennas
- Satellite ground stations
- Communications
- Uplinks or downlinks



**New**  
**FiberSTIK™**  
Miniature Fiber Optic Receiver  
BNC



**New**  
**FLINK-II-MTX-A**  
Mini IP67 Fiber Optic RfOf  
SMA, BNC & TNC  
Available in Transmitter (T) or Receiver (R)

Model	Description
FLINK-II-MTX-x	Mini RfOf Transmitter, 200MHz-3000MHz, FC Optic
FLINK-II-MRX-x	Mini RfOf Receiver, 200MHz-3000MHz, FC Optic
FiberSTIK™	Miniature RfOf Receiver, 200MHz-3000MHz, FC Optic

**NOTE:** See data sheet for details.



Signal Switching, Conversion & Distribution Specialists



## Redundancy Switches & Universal Chassis

**RSX4** Modular Redundancy Single, Dual or Quad

**UC1** Modular Universal Chassis PUC Technology

### 1RU Sized Units For Up to Two "PUC" Elements: DC - 67GHz

These two 1RU compact modular units are identical with exception of the front panel button controls. The RSX4 front is tailored for redundancy applications, and the UC1 for any type of module.

#### About the RSX4

The RSX4 front panel is designed specifically for 1-4 channel redundancy (A/B) switching and is a drop-in replacement for our field proven 1094xB redundancy switchers (control, capability & performance). High value satellite communication assets (and other similar critical applications) require high reliability equipment and redundancy switching.



#### Applications:

- Communication centers
- Signal redundancy
- L-Band, IF, RF signals
- Satellite systems
- ENG vans or trucks



Model RSX4 & UC1  
Universal Redundancy Chassis

#### About the UC1

The front panel of the UC1 is designed to control any switching element whether it be a full matrix element, or a simple Nx1 configuration. The front panel allows you to navigate an efficient menu system to name channels, make connections or any other common system operation.



#### Packed with features

Units feature a unique modular design with "PUC" elements that allows the user to remove/install a "PUC" to reconfigure, or field upgrade the unit. PUC's can also be remotely located outside the chassis up to 400 feet away with available extension cables.

Units include 10/100 Ethernet & Multi-Serial control ports (RS232/422/485), front panel control & display, alarm port with status hard contact, dual monitored fans, built-in web browser, real-time clock, cable support bracket, benchtop or flanges for rack mount, redundant power supplies and dual power input. Available in dual AC, DC or AC/DC powered versions.



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PUC Type	Frequency Range	Features
PUC1-0117C	HD/SDI Video	Video Switch & Three-Way Distribution
PUC1-02/03/04/05	DC-18/6/40/26GHz	1 or 2: Transfer Relays (various frequencies to 67GHz)
PUC1-06nic	DC-3GHz	1 to 4: Terminated (1W) 2x1 Relay, BNC/N/SMA
PUC1-07niX	DC-100MHz	1 or 2: Terminated (1/2W) 1553 2x1 Relay, Triaxial
PUC1-08/09n0J	100Mbps/1Gbps	1 or 2: 8-Wire 2x1 Relay, RJ45
PUC1-10/11nic	20MHz-250MHz	8x8 IF Matrix, Distributive (10) or Combining (11)
PUC1-16/17/18/67	DC-6/26/18/67GHz	1 or 2: Non-Terminated 2x1 Relay
PUC1-20n5c	DC-26/50/67GHz	1, 2 or 3: Non-Terminated 6x1 Relay
PUC1-2115N	DC-3GHz	Terminated (1W) 4x1 Relay, N-Type
PUC1-2315N	DC-3GHz	Terminated (5W) 3x1 Relay, N-Type
PUC1-2615A	950-2450GHz	Single 1x4 Multicoupler with +/-10dB Gain Adjust, SMA



PUC Elements can be removed up to 400 feet away.

**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



Signal Switching, Conversion & Distribution Specialists

## Distribution, Conversion & Multicouplers

### MDU4 Modular up to 4 Elements

#### 1RU - Mix up to four digital, RF & analog elements

The MDU4 takes cues from our rugged and high performance products of the past, and yields something new in the process. The 1RU sized unit is at home installed as a rack-mount unit, or on the R&D benchtop. Both rack-mount flanges and rubber feet are included.

It also features modularity so it's simple to specify exactly what type of distribution or conversion elements you need. Up to four single-slot elements can be mixed & matched to meet your needs.

Units include redundant supplies, visual/audible alarms, Ethernet supply SNMP monitoring, hard contact alert, and dual AC inputs. Available in dual AC, DC, or AC/DC powered versions. Includes rubber feet for benchtop use and flanges for rack mount. Low cost custom or modified elements can be done by contacting the factory.



#### Applications:

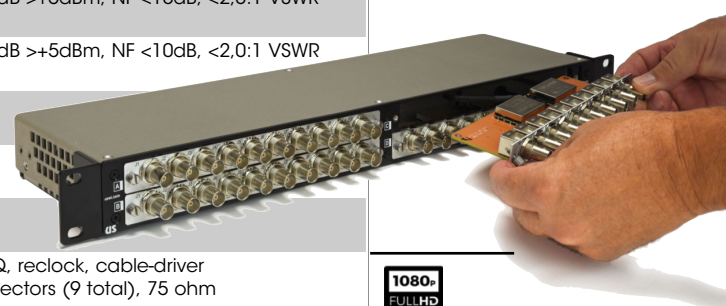
- PCM Telemetry
- TTL Clock and Data
- Mixed analog signals
- 422 Clock and Data
- IRIG time code
- Audio or Video routing
- Digital conversion
- T1 Distribution



Element	Signal	Config	Description
A2	ECL	Single 1x4	Digital differential ECL distribution (400Mbps) SMA connectors (10 total), 50 ohm impedance, four output pairs
C1	TTL	Single 1x8	Digital single-ended TTL (PCM) distribution (50Mbps) BNC connectors (9 total), 50 or 75ohm impedance (jumper selectable)
C2	TTL	Dual 1x4	Digital single-ended TTL (PCM) distribution (50Mbps) BNC connectors (10 total), 50 or 75ohm impedance (jumper selectable)
C3	TTL	Triple 1x2	Digital single-ended TTL (PCM) distribution (50Mbps) BNC connectors (9 total), 50 or 75ohm impedance (jumper selectable)
C4	TTL	Single 1x16	Digital single-ended TTL (PCM) distribution (50Mbps), wire BNC connectors (17 total), 50 or 75ohm impedance (jumper selectable)
D8	422	8-Pair 1x4	Digital differential 422 distribution (50Mbps), eight pairs of 1x4 DB25 connectors (5 total), 100 ohm
DB	422	2-Pair 1x4	Digital differential 422 distribution (50Mbps), two pairs of 1x4, plus expander DB25 connectors (5 total), 100 ohm
F2	TTL/422	Dual 1x4	Digital conversion and distribution, TTL input, differential 422 outputs (50Mbps) BNC input, Triaxial output connectors, 50 or 75 ohm input (selectable)
F5	TTL/422	Five 1x1	Digital conversion, TTL input, differential 422 output (50Mbps) BNC input, Triaxial output connectors, 50 or 75 ohm input (selectable)
G2	422/TTL	Dual 1x4	Digital conversion and distribution, differential 422 input, TTL outputs (50Mbps) Triaxial input, BNC output connectors, 100 ohm input
G5	422/TTL	Five 1x1	Digital conversion, differential 422 input, TTL output (50Mbps) Triaxial input, BNC output connectors, 100 ohm input
M1	20-3000MHz	Single 1x8	RF multi-coupler (RF distribution), unity gain, wideband, -1dB >+5dBm, NF <10dB, <2.0:1 VSWR SMA connectors (9 total), 50 ohm impedance
M2	20-3000MHz	Dual 1x4	RF multi-coupler (RF distribution), unity gain, wideband, -1dB >+5dBm, NF <10dB, <2.0:1 VSWR SMA connectors (9 total), 50 ohm impedance
T1	422	Single 1x8	Digital differential 422 distribution (50Mbps) Triaxial connectors (9 total), 100 ohm
T2	422	Dual 1x4	Digital differential 422 distribution (50Mbps) Triaxial connectors (10 total), 100 ohm
T3	422	Triple 1x2	Digital differential 422 distribution (50Mbps) Triaxial connectors (9 total), 100 ohm
U1	SDI to UHD-SDI	Single 1x8	Digital video distribution: UHD-SDI (4K & 8K), HD-SDI with EQ, reclock, cable-driver (SMPTE ST-2082, ST-2081, ST-424, ST-292 signals), BNC connectors (9 total), 75 ohm
U2	SDI to UHD-SDI	Dual 1x4	Digital video distribution: UHD-SDI (4K & 8K), HD-SDI with EQ, reclock, cable-driver (SMPTE ST-2082, ST-2081, ST-424, ST-292 signals), BNC connectors (10 total), 75 ohm
U3	SDI to UHD-SDI	Triple 1x2	Digital video distribution: UHD-SDI (4K & 8K), HD-SDI with EQ, reclock, cable-driver (SMPTE ST-2082, ST-2081, ST-424, ST-292 signals), BNC connectors (9 total), 75 ohm
V1	Analog DC-200MHz	Single 1x8	Analog video distribution (DC-200MHz): baseband video, PCM, TTL, NTSC, instrumentation BNC connectors (9 total), 75 ohm
V2	Analog DC-200MHz	Dual 1x4	Analog video distribution (DC-200MHz): baseband video, PCM, TTL, NTSC, instrumentation BNC connectors (10 total), 75 ohm
W1	422	Single 1x8	Digital differential 422 distribution (50Mbps) Amphenol 31-2225 type Twinaxial connectors (9 total), 100 ohm
W2	422	Dual 1x4	Digital differential 422 distribution (50Mbps) Amphenol 31-2225 type Twinaxial connectors (10 total), 100 ohm
W3	422	Triple 1x2	Digital differential 422 distribution (50Mbps) Amphenol 31-2225 type Twinaxial connectors (9 total), 100 ohm



Flexible rack mounting flanges



NOTE: Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



Signal Switching, Conversion & Distribution Specialists

## Distribution, Conversion, Multicouplers & Switching

### LS16A Modular up to 16 Elements

#### 3RU - Mix up to sixteen different elements

Many times there is a need to convert various signal types, buffer them or even provide distribution or switching for these signals. Our "Linker System" provides a very cost effective means to provide all these functions. Properly configured with the appropriate modules it can be a "drop-in" replacement for many units from APCOM or Apogee Labs (and other companies), but with additional capability, features, higher quality, and newer technology.

The LS16A provides the system professional with an uncompromising combination of modularity, high performance and high reliability. Our unique design provides slots where any combination of 16 modules can be installed from the rear of the unit and (depending upon the module type) can also provide front panel indicators, adjustments, controls and test points to the user. Modules typically have the signal connectors at the rear.

The unit's modules are hot-swap capable and the frame can be populated with redundant hot-swap power supplies to deliver the ultimate in system reliability for critical applications.

Digital, analog, conversion, switching and RF-Over-Fiber modules are available and can be mixed and matched within the same frame. Each slot is addressable so that the user can monitor or control an individual module independent of another with the optional plug-in controller with 10/100/1GB Ethernet port. The LXI certified controller provides web browser control and TCP/IP access to monitor & control the system including power supplies, fans and unit health. Customized modules are available.



#### Applications:

- PCM Telemetry
- RF Over Fiber Conversion
- TTL, PCM Clock and Data
- Mixed analog signals
- 422 Clock and Data
- IRIG time code
- SDI Video routing
- Digital conversion
- Redundancy Switching



**Updated**  
LS16A showing the "Open Window" front panel design w/test points & LEDs



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Element	Frequency	C3L	Module Description
LS16-A18	50MHz-3GHz	Y	Wideband Multicoupler (1x4): variable gain, power & gain monitor
LS16-A19	850MHz-2450MHz	Y	L-Band Multicoupler (1x4): variable gain, power & gain monitor, LNB control
LS16-A30	DC-50MHz	Y	Analog Distribution Amplifier (1x6): digital adjust, BNC, 75 ohm
LS16-D05	50Mbps	N	Distribution Module: Digital TTL/422 distribution (1x6), 3x TTL, 3x "422"
LS16-D09	40Mbps	N	Distribution Module: Dual 1x2 TTL digital distribution, 50/75 or High Z input, BNC
LS16-D29	50Mbps	Y	Distribution Module: Flexible 1xX TTL digital distribution, 50/75 or High Z input, BNC
LS16-FR2	50MHz-3GHz	Y	RF Over Fiber (Rx): Dual channel, 1310nm (used with USC <b>F-LINK-II</b> Tx unit)
LS16-FT2	50MHz-3GHz	Y	RF Over Fiber (Tx): Dual channel, 1310nm (used with USC <b>F-LINK-II</b> Rx unit)
LS16-L02	850MHz-2450MHz	Y	L-Band LNB Power: LNB control
LS16-L03	850MHz-2450MHz	Y	L-Band Multicoupler (1x2): variable gain, power & gain monitor, LNB control
LS16-S04	DC-3GHz	Y	Switch Module: 6x1 relay mux with input termination, BNC
LS16-S10	DC-3GHz	Y	Switch Module: dual 2x1 relay mux with input termination, BNC
LS16-S06-x	DC-18GHz (60GHz)		Switch Module: up to three 2x1 relay elements, SMA

**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



Signal Switching, Conversion & Distribution Specialists



**Modular DC-18GHz Matrix, or Mux**  
**MS2010A** 4x4 up to 12x12 Matrix  
**MS2102A** Dual 1x50 or up to 1x100 Mux  
 Cascade multiple for 33x33 Matrix, or larger

**2RU - Relay-based, high performance, simple to maintain**  
 Unique in the industry, this 18GHz product delivers a full matrix configuration in a small 2RU package. It features our proprietary relay element and design construction providing up to a 12x12 in just 2RU plus the added feature of quick and easy relay replacement with simple hand tools in <30 seconds for low MTTR.

Providing complete 1:1 connectivity of any input to any output (no fanout), the MS2010A has very high performance, passive, fully shielded, and bidirectional signal paths. Intended to automate manual patch cords or physical cable swapping (or replace similar bulky and dated competitive products), this unit is designed for switching any coaxial signal within the DC-18GHz frequency while being as transparent as possible. The SMA connectors at the rear panel are standard with N-Type and others optional.

The unit can also be specified with external input and/or output terminations if required (up to 11x12, 12x11 or 11x11). The unit can also include "looping ports" to cascade multiple units into larger arrays that are either symmetrical or asymmetrical (such as 22x22, or 12x44 respectively). Multi-unit arrays are easy to control & monitor with our MAC4 array controller (see below). The MS2102A provides a single or dual 1xN multiplexer up to a 1x100.

The units come standard with redundant hot-swap power supplies and includes our C3 controller, both with convenient access behind the hinged front panel. The C3 controller features 10/100/1000 Ethernet (LXI certified), and multi-serial (RS-232C/422A/485) control port. It also includes an important new feature called "X-Point Clustering".

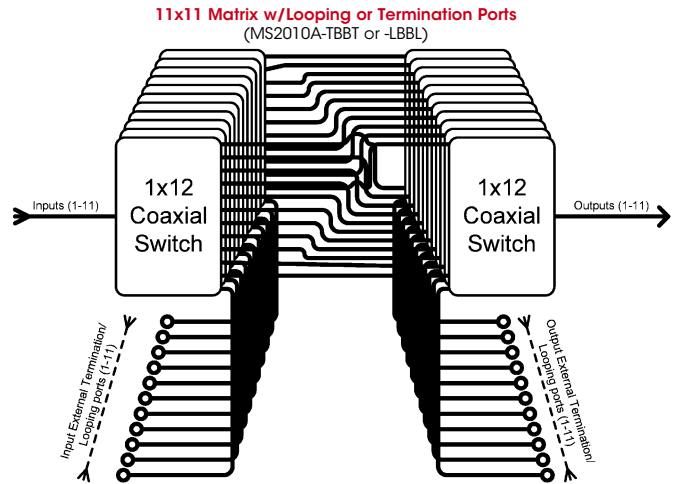
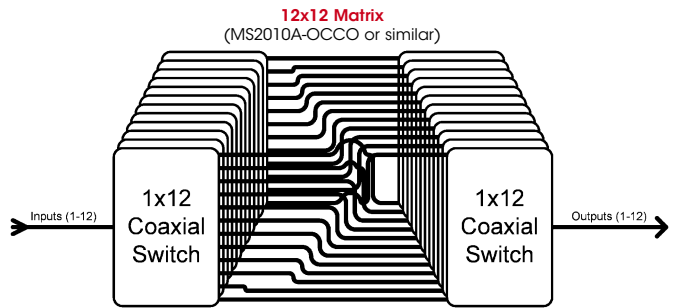
**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



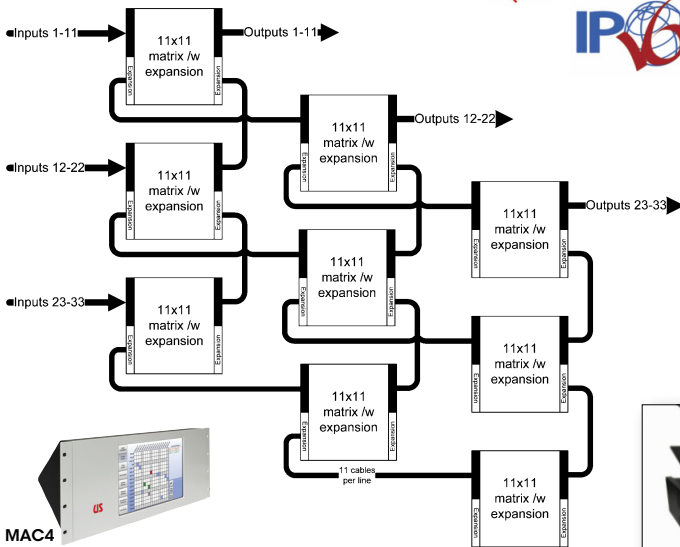
- Applications:**
- Telemetry routing
  - Antenna Selection
  - Mixed analog signals
  - High speed data
  - ATE selector or router



**MS2010A**  
 Modular 18GHz Matrix  
 Up to 12x12 with Low MTTR



**33x33 Matrix**  
 Multiple units forming a 33x33 matrix array



**MAC4**  
 Multi-unit configurations are easily controlled with our Master Array Controller  
 See page 16



User replaceable relay elements  
 (10x10 shown with access panel removed)



Signal Switching, Conversion & Distribution Specialists



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## Other DC-18GHz Configurations (50GHz)

**MSD0601** Dual 6x1 with A/B Select

**MS06X02** 6x2 Matrix

### 2RU - Relay-based, high performance

This selection of units provide relay-based solutions in a few different configurations in a compact cost effective 2RU package. Standard units have DC-18GHz relays, though additional performance is available with optional 26GHz, 40GHz or even 50GHz relays. Units include 10/100 Ethernet & Multi-Serial control ports (RS232/422/485), front panel control & display, built-in web browser, and real-time clock.

### About the MSD0601

This unit has two individual 6x1 self-terminating DC-18GHz switch paths, plus an A/B output selector. For control, it has illuminated LED buttons adjacent to each port as well as 10/100 Ethernet and multi-serial ports. This unit is also available with 26GHz, 40GHz or 50GHz relays as well for additional performance. It can be ordered with connectors on front or rear.

### About the MS06X02

Delivering a blocking (1:1 connection) bidirectional 6x2 matrix array, this unit has SMA connectors that can be ordered with connectors on front or rear. For control, it has illuminated LED buttons in a matrix array as well as 10/100 Ethernet and multi-serial ports.



### Applications:

- Telemetry routing
- Antenna Selection
- Mixed analog signals
- High speed data
- ATE selector or router



## Coaxial Relay Modules: DC-3GHz/6GHz

**RM1X2, RCP1, RCP1R**

### Cascadeable module, optional control panels: DC-6GHz

The RM1X2 is a high performance low cost coaxial relay module with N-Type connectors that can be just a component, or mounted to one of two 1RU rack mount relay control panels. The module has a DE-9P connector with a DE-9S on the opposite side of the module so that one module can plug into another. Relay control lines are passed through the module and kept independent so up to four relays can be either gang controlled, or individually as requirements demand.

The 1RU sized RCP1 and RCP1R rack mount control panels include an integrated serial control port and relay drivers. The RCP1R unit is designed so the signal connectors to face inside the rack, and the RCP1 is designed so everything faces the front of the rack (see below). They can DC powered, or include an optional wall mount power supply.



### Applications:

- Redundancy
- Teleport and last mile
- Backup antennas
- Satellite ground stations
- Communications
- Uplinks or downlinks



Model	Description
RM1X2	Relay module DC-3GHz, N-Type normally open (add -6 suffix for 6GHz version)
RM1X2T	Relay module DC-3GHz, N-Type self terminating (50 ohms)
RCP1	1RU Relay control panel, everything faces front of rack
RCP1R	1RU Relay control panel, everything faces rear of rack

**NOTE:** See data sheet for model number suffix definitions for DC voltages and AC wall mount power options.



**RCP1 Panel Type**  
Up to four relay elements (1RU)

**RCP1R Panel Type**  
Up to four relay elements (1RU)



## Pre-Configured TS2 Systems

### 2RU - Complete systems from our G2 Series of products

This convenient system package called "TS2" which takes common configurations from our Series G2 switching line (see pages 6 & 7) and makes it simple to order a complete "turn-key" unit. All units are based on the 2RU rack mounted G2T4 unit, include redundant power supplies and contain all three remote interface types (10/00 Ethernet, Serial and USB).



The "TS2" supplants the "SS2" units. It incorporates our advanced C3 Controller and touchscreen display. See our website for additional details and individual data sheets.

Model	Frequency Range	Configuration
TS202A	DC-200kHz	Differential input, single-ended output analog matrix, audio/sensors 16x16 to 64x64
TS214	DC-18GHz	Up to six 6x1 self-terminating microwave relays
TS215	DC-3GHz	Coaxial Nx1 switching, 2x1, 4x1, 8x1, 16x1 sizes, SMA connectors
TS216	DC-1.3GHz	Coaxial Nx1 switching, 2x1, 4x1, 8x1, 16x1 sizes, BNC or SMA
TS216T	DC-1.3GHz	Coaxial Nx1 switching with self-termination, 2x1, 4x1, 8x1, 16x1 sizes, BNC or SMA
TS218	DC-18GHz	Up to seven 6x1 normally open microwave relays, SMA connectors
TS232	DC-125MHz	DC coupled system for high frequency video signals (+/- 1.5V)
TS232H	DC-75MHz	DC coupled system for high-level PCM, video, TTL or similar signals (+/-5V)
TS240	DC-40GHz	Up to seven 6x1 normally open microwave relays, SMA connectors
TS244	20-250MHz	High performance non-blocking "fan out" IF matrix, 8x8 to 32x32, 50 or 75 ohm
TS254	20-250MHz	High performance combining "fan in" IF matrix, 8x8 to 32x32, 50 or 75 ohm
TS262A	DC-50Mbps	Differential 422 digital matrix for clock/data, 8x8 to 16x16, single or dual, Triax
TS264B	DC-50Mbps	Differential 422 digital matrix for clock/data, 16x16 to 64x64, single or dual, Dsub

**NOTE:** Not all models or features are listed. See data sheet for full model number, specifications, options and suffix definitions.



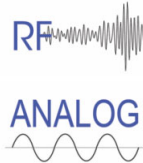
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## High Performance Multicouplers <sup>New</sup>

### MCU1 Single & Dual Channel, up to 5.5GHz

#### 1RU - Sizes 1x4, 1x8 and 1x16, Single or Dual

The MCU1 multicoupler units provide a low cost, high performance RF signal distribution solution for a variety of signals up to 5.5GHz. They are available in 1x4, 1x8 and 1x16 configurations. Sometimes switching is not needed, but signals still need to be distributed to various destinations. This product delivers ultra-high signal performance coupled with rugged construction at an affordable price.



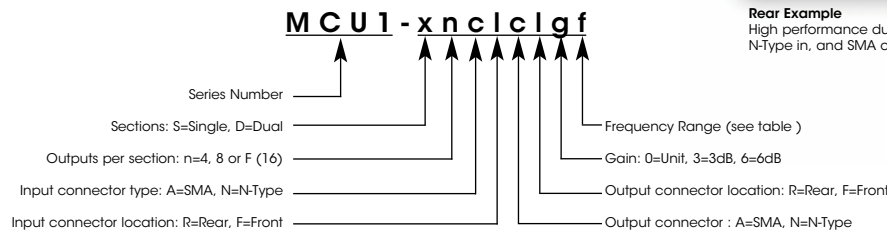
#### Applications:

- Ground stations
- Head-in feed distribution
- Expanding matrix configs
- Antenna distribution
- Satellite installation
- Teleports

The unit comes with removable rack mount flanges, but can also has rubber feet for bench-top use. The flanges can be installed four different ways to provide installation flexibility. An optional cable restraint/support bracket is available as well.



**Rear Example**  
High performance dual 1x8 multicoupler with N-Type in, and SMA connectors out



"f"	Frequency Range
1	1.5MHz to 32MHz
2	20MHz to 250MHz
3	20MHz to 3000MHz
4	350MHz to 5.5GHz
5	850MHz to 2450MHz



**Example: MCU1-D8NRAF34**  
Unit has two sections of 1x8, inputs on the rear via N-Type connectors, outputs on front via SMA, +3dB gain and frequency range "4" (see table above).



**Universal Switching Corporation**

Signal Switching, Conversion & Distribution Specialists

### Custom, OEM & Special Build Services

**Complete switching, distribution and purpose built**  
Since 1992, Universal Switching Corporation has been engineering & developing products for industry, Government agencies and subcontractors. With 30 years of experience, we are looked to for delivering quality products fitted with the latest in technology and excellent reliability.

We can design something to suit most any application and most any specification. We've developed OEM products for numerous companies, produced "build-to-print" items, custom RF boxes, and have delivered entire multi-rack systems complete with custom software. All products are built in our ISO 9001:2015 certified facilities. Contact our local representative or the factory directly.



**Complete Systems**  
Building entire turnkey systems with software



**Custom Products**  
Develop and build what you need



**Build-To-Print Manufacturing**

**Custom RF Boxes**  
Design unique purpose built RF boxes with documentation & software



**OEM Products**  
Private label our products for you



**Custom Finishes**  
We can provide any paint or finishes you need for your application



**Legacy Updates**  
Update older legacy MSC products



Signal Switching, Conversion & Distribution Specialists



## Take Control of Your Requirements

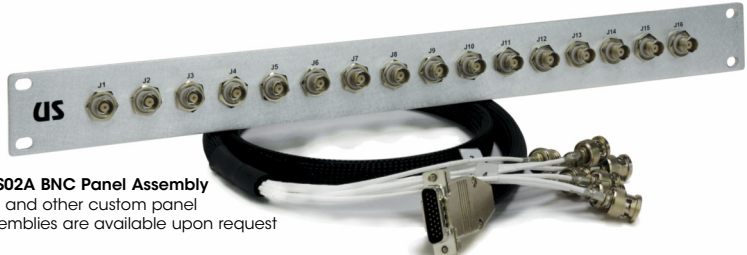
### Controllers, Adapters and Interfaces

Universal Switching Corporation can provide the complete solution to your switching needs including remote control and status panels, rack-mounted control PC units, plus monitor and control software. All units are designed to be remotely controlled. We offer many choices including 10/100/1GB Ethernet, Serial (RS-232C, RS-422A & RS-485), GPIB and manual.

**New**  
**MAC4: Master Array Controller**  
 Remote display, desktop or rackmount (4RU)



**Updated**  
**Plug-in C3 and C3-Lite Controllers certified LXI with TCP/IP, HTTPS (SSL/TLS), SNMP v1/v2C/v3, SNT, IPv4/6 and REST.** Latest in hot-swap control interface technology with the best in network security layers and protocols, plus fast 10/100/1GB hardware with auto-negotiation. Also includes multi-serial port (RS-232C/422A/485), realtime-clock, hard contact alarm port, plus microSD memory slot for high security applications.



**G2502A BNC Panel Assembly**  
 This and other custom panel assemblies are available upon request

## Control & Monitor Software

### RouteWarePRO 5.0

Individual license, 5-pack. USB-KEY type available too.

Our product called RouteWarePRO is a self-contained GUI software package designed specifically to control and monitor Universal Switching Corporation's products. Engineered for ease of use, most users are up and running within minutes where you can control 1, 10 or 100+ units from anywhere. Download our Monitor & Control software **RouteWarePRO** for a FREE 30-day trial today!

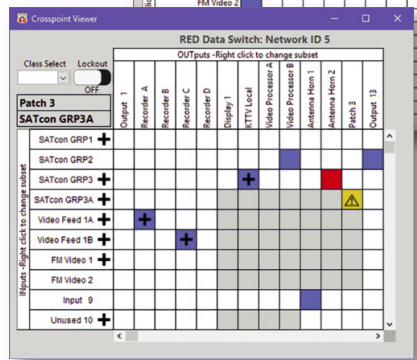
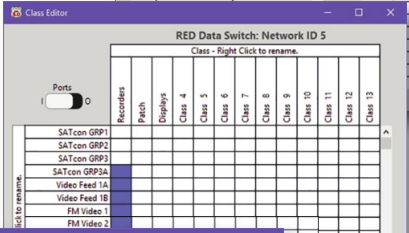
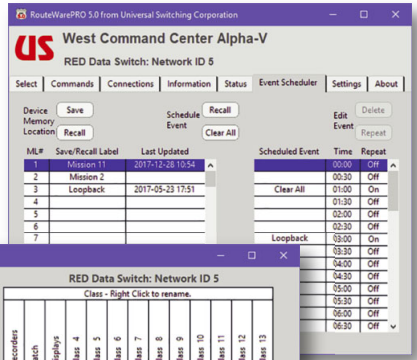


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GUI colors, channel labeling and configuration uploads are all user definable.

#### Version 5.0 new features:

- Updated Metro visual style and improved functionality
- Improved X-Point grid features
  - \* Touchscreen friendly grid size
  - \* Subset assignments and view to simplify navigating large matrices
  - \* Lockout/Summary view for status-only display
- Fully updated for Windows 11/10/8.1/8/7 compatibility
- Class assignment/editor for creating connection restrictions
- Direct support for C3 generation CPU functions
  - \* Class assignment and management
  - \* Names/Labels (Port, Memory Location, and Class)
  - \* Event Scheduler & Device Log
  - \* Time stamped memory locations & Device Log
  - \* Upload/download channel labels
- Signal activity status indicators (on supported hardware)
- Tri-Stage diagnostics (exemption table and active scan support)





## Quality Management System

Since 2007, Universal Switching Corporation has implemented and maintains a Quality Management System (QMS) which serves as the backbone for the products, services and innovative designs offered. Continuing our commitment to being the leader in the programmable switching industry, the company is certified to the ISO 9001:2015 quality standard.

Universal Switching Corporation's management fully supports the ISO process and its function within the company. The tremendous teamwork and dedication shown by all "Team USC" members to our Quality Management System has resulted in continuous re-certification by National Quality Assurance since our QMS was effected. Of all QMS regimes, the ISO 9000 family of standards is the most widely implemented across the globe.

### Quality Policy

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 expectations.

### Quality Statement

Universal Switching Corporation has a Quality Policy that serves as the backbone for the products, services and innovative designs it offers. As a global supplier of cutting-edge switching equipment and associated support products, Universal Switching Corporation's management fully supports the ISO process and its function within the company. In achieving ISO 9001:2015 certification, Universal Switching Corporation has demonstrated to ANAB accredited third party auditors (National Quality Assurance) that we have an effective Quality Management System in place. These include the following types of processes:

- **Management responsibility**
- **Management review**
- **Resources and work environment**
- **Product realization**
- **Design and development**
- **Customer relations**
- **Measurement, analysis and improvement**
- **Purchasing**
- **Outsourcing**
- **Production and service provisions**
- **Control of monitoring and measuring devices**
- **Control of nonconforming product**
- **Analysis of data**
- **Continual improvement**
- **Corrective action**
- **Preventative action**



## What Is That RR All About?

A new graphic is on our front cover, throughout our catalog, products, website, Twitter, Facebook & elsewhere. Some switching manufacturers focus only on resiliency. While this common, it is only half of our product development mission. What sets Universal Switching Corporation apart from our competition is the first part of our mission; **engineering absolute reliability into our products**. We are displaying this graphic as a reminder that our mission is to engineer BOTH reliability and resiliency into each and every product we build.

**reliability** [ri-lahy-uh-bil-i-tee] noun

1: the ability to be relied on or depended on, as for accuracy, or achievement.

**resiliency** [ri-zil-yuh n-see] noun

1: the power or ability to return to the original form.  
2: ability to recover readily from adversity, or the like.

The company was established with three objectives in mind:

1. Provide the best switching, distribution and conversion equipment on the market.
2. Provide superior service and serviceability utilizing modular, expandable, leading edge designs by blending the full spectrum of available technology.
3. Provide our customers with timely and cost-effective solutions for all their signal applications.

A little known fact is that the property that Universal Switching Corporation sits on was formerly Lockheed's secret division called "Skunk Works". This division was operated by Clarence L. "Kelly" Johnson where very famous aircraft were secretly conceived such as the XB80, U-2, F-117 Stealth Fighter, and the beautiful SR-71 Blackbird (which still hold the worlds flight speed record).



Signal Switching, Conversion & Distribution Specialists

## Standard Warranty Agreement

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.

**Extended warranties are available from the factory up to 7 years. For other support options, we also provide customized service contracts as needed. Contact the factory for more information.**

## Return Loss to VSWR Conversion Table

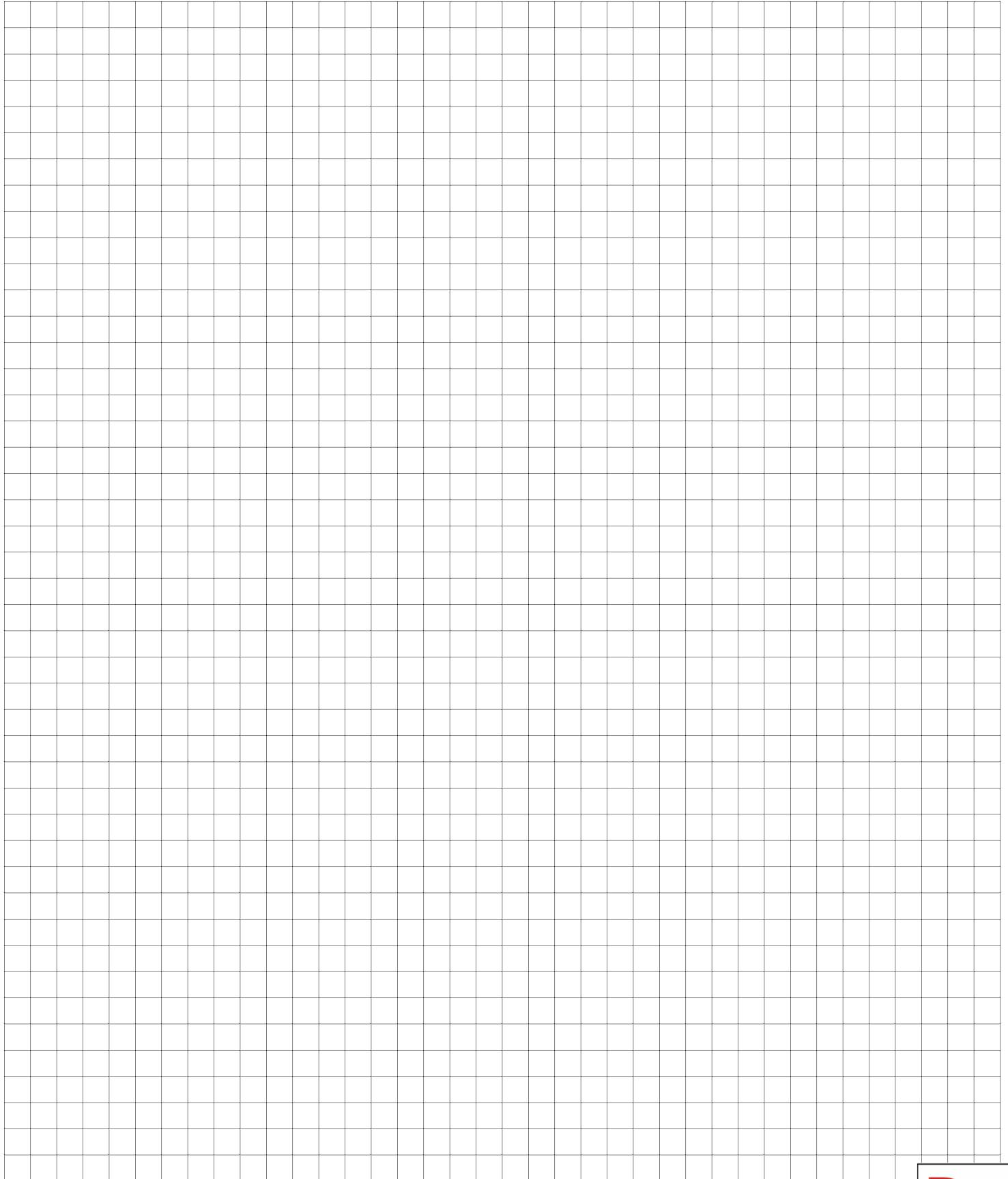
Return Loss (dB)	VSWR (ratio)	Reflection Coefficient	Mismatch Loss (dB)	Reflected Power (%)	Through Power (%)
1	17.39	0.891	6.868	79.43	20.57
2	8.72	0.794	4.329	63.10	36.90
3	5.85	0.708	3.021	50.12	49.88
4	4.42	0.631	2.205	39.81	60.19
5	3.57	0.562	1.651	31.62	68.38
6	3.01	0.501	1.256	25.12	74.88
7	2.61	0.447	0.967	19.95	80.05
8	2.32	0.398	0.749	15.85	84.15
9	2.10	0.355	0.584	12.59	87.41
10	1.92	0.316	0.458	10.00	90.00
11	1.78	0.282	0.359	7.94	92.06
12	1.67	0.251	0.283	6.31	93.69
13	1.58	0.224	0.223	5.01	94.99
14	1.50	0.200	0.176	3.98	96.02
15	1.43	0.178	0.140	3.16	96.84
16	1.38	0.158	0.110	2.51	97.49
17	1.33	0.141	0.088	2.00	98.00
18	1.29	0.126	0.069	1.58	98.42
19	1.25	0.112	0.055	1.26	98.74
20	1.22	0.100	0.044	1.00	99.00
21	1.20	0.089	0.035	0.79	99.21
22	1.17	0.079	0.027	0.63	99.37
23	1.15	0.071	0.022	0.50	99.50
24	1.13	0.063	0.017	0.40	99.60
25	1.12	0.056	0.014	0.32	99.68
26	1.11	0.050	0.011	0.25	99.75
27	1.09	0.045	0.009	0.20	99.80
28	1.08	0.040	0.007	0.16	99.84
29	1.07	0.035	0.005	0.13	99.87
30	1.07	0.032	0.004	0.10	99.90
31	1.06	0.028	0.003	0.08	99.92
32	1.05	0.025	0.003	0.06	99.94
33	1.05	0.022	0.002	0.05	99.95
34	1.04	0.020	0.002	0.04	99.69
35	1.04	0.018	0.001	0.03	99.97
36	1.03	0.016	0.001	0.03	99.97
37	1.03	0.014	0.001	0.02	99.98
38	1.03	0.013	0.001	0.02	99.98
39	1.02	0.011	0.001	0.01	99.99
40	1.02	0.010	0.000	0.01	99.99



**Universal  
Switching  
Corporation**

Signal Switching, Conversion & Distribution Specialists

Sketch your secret design concept here.....



Grid = 0.200 x 0.200

# Factory Authorized Representatives

Domestic and International Offices - March 2022

## Alabama

**GenTek Inc**  
Phn: (813) 961-0689  
GenTekRep.com

## Alaska

**Elotek Systems**  
Toll Free: (888) 435-6835  
elotek.com

## Arizona

**Elotek Systems**  
Toll Free: (888) 435-6835  
elotek.com

## Arkansas

**CentraMark**  
Phn: (972) 414-8188  
cmatex.com

## California

**Elotek Systems**  
Toll Free: (888) 435-6835  
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## Colorado

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## Connecticut

**Clafin Associates**  
Toll Free: (888) 252-3546  
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## Delaware

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## Florida

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## Georgia

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## Idaho

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**JR Johnson Associates**  
Toll Free: (800) 637-6775  
jamesr.com

## Illinois

**JR Johnson Associates**  
Toll Free: (800) 637-6775  
jamesr.com

## Iowa

**JR Johnson Associates**  
Toll Free: (800) 637-6775  
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## Kansas

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## Massachusetts

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## New Jersey

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## Utah

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Phn: +61-3-9459-4963  
southtechsystems.com.au

## Belgium

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eemc.nl

## Brunei

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tmesystems.net

## Egypt

**SHIMCO Engineering Consultants**  
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## France

**Milexia**  
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milexia.fr

## India

**AUM Microwave**  
Phn: +91 (0) 9908806426  
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## Ireland

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Phn: +44 (0)1635 271300  
castlemicrowave.com

## Israel

**A.Telemetry LTD**  
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a-telemetry.com

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## Taiwan (R.O.C.)

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## United Kingdom

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castlemicrowave.com

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

