

General

Converting signal types, buffering them, and providing distribution or switching is all part of today's system build. Our LS16A "Linker System" provides a very cost effective means to provide all these functions in one modular 3RU design. Properly configured with the appropriate elements, it can be a "drop-in" replacement for units from APCOM, Apogee Labs, and other companies, but with our ISO9001-2008 quality, capability, and features while using the latest in component technology.

The 16-slot 3RU unit provides an efficient combination of modularity, performance and reliability. Our unique design allows any combination of elements to be installed from the rear of the unit. Most elements provide indicators, adjustments or test points to the user at the front, while having the actual signal connectors facing the rear. Some can be controlled or monitored via the optional controller.

Elements are hot-swappable and the frame can be populated with redundant (two) power supplies to deliver the ultimate in system reliability. The optional CPU (C3-Life) can be added to remotely control various element features (switching, gain adjust, and LNB control). Digital, analog and conversion elements are available which can be mixed/matched within the same frame. The LXI certified CPU provides the user with web browser control, 10/100 port, TCP/IP, SNMP, SNTP, IPv4/6, realtime clock, and other features including unit health, power supply status and fans speeds.

NOTE: This product was originally introduced as the LS1601A. Since then, the model number has been reduced to LS16A to allow more options.

Applications

- Communication installations
- Telemetry & weapons system testing
- Antenna LNB power and 22kHz management
- RF-Over-Fiber antenna communication
- Airborne surveillance systems
- Digital broadcast facilities or production studios
- Protocol or interface converters
- Signal buffering and re-generation
- Remotely locate antennas using RF-Over Fiber
- Distribution, switching or conversion of signals
- Analog, fiber, and digital elements available

Features

- Modular rugged 3RU aluminum frame
- Sixteen element capacity
- Built-in daisy chain bus for scalable distribution
- Monitored cooling fans (CPU not needed)
- Sum-bus available across all element slots
- Various signal connector types available
- Some elements have push-button controls
- Redundant monitored hot-swap power supplies
- Optional C3-Life Controller (10/100) with browser
- International AC power input
- Certified CE EN61010 (LVD)
- LabVIEW drivers available



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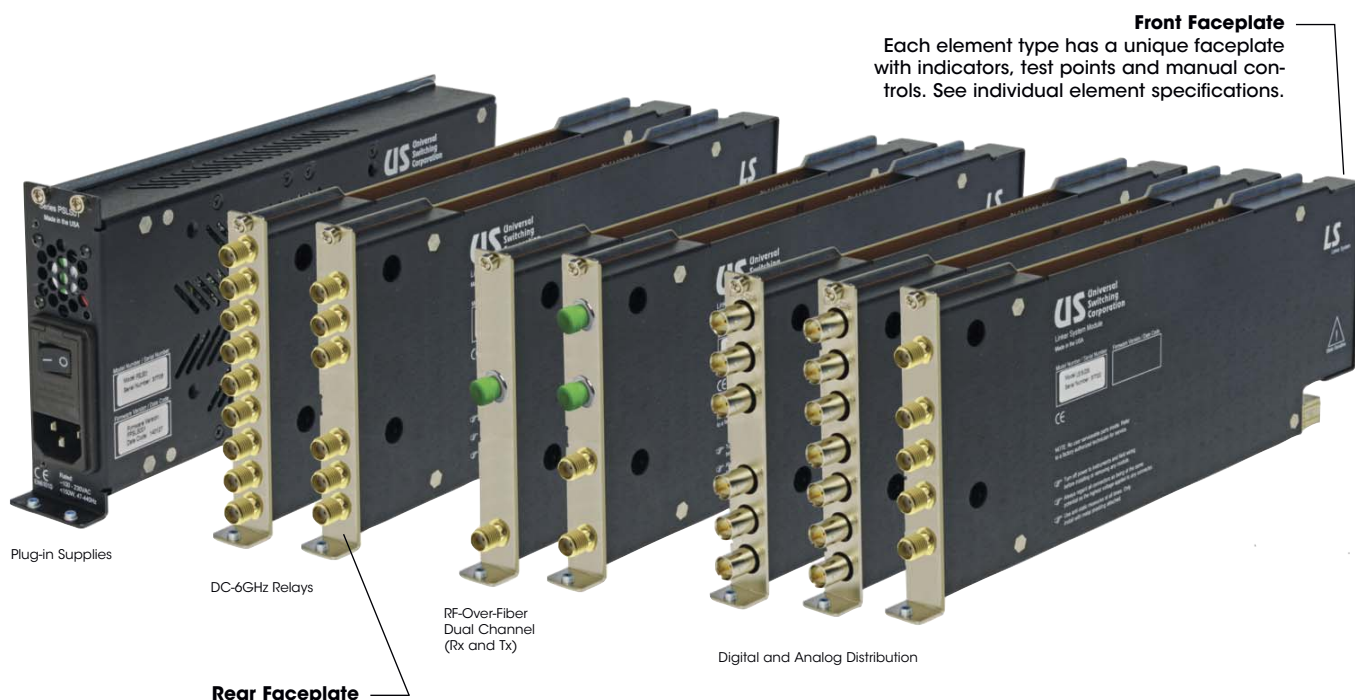
Made in the USA

16-Slot "Open Window"
Any combination of hot-swap elements can be installed

“Linker System” Elements and Assemblies

The LS16A has different element types available with various capabilities. Below are some popular elements and options. Contact the factory for custom options.

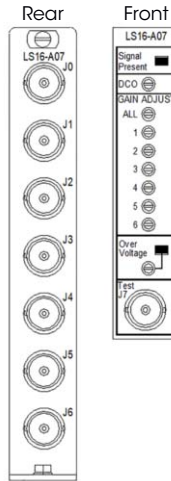
Model	Description	Page
LS16-A07	Single 1x6 DC-40MHz Analog Distribution Amplifier: BNC connectors, 75 ohm impedance, six outputs with individual gain adjustment, DC offset control, wide-band (DC-40MHz min), over voltage detector with set-point adjustment, signal detector	3
LS16-A18	Single 1x4 Wideband (50-3000MHz) Multicoupler: BNC connectors, 50 ohm impedance, isolated outputs, input gain control with -10dB to +20dB gain in 1/2dB steps	3
LS16-A19	Single 1x4 L-Band (850-2150MHz) Multicoupler: BNC connectors, 50 ohm impedance, isolated outputs, input gain control with -10dB to +20dB gain in 1/2dB steps, with LNB power (0V/13V/18V), LO control 22kHz on/off, LNB current monitoring	3
LS16-D05	Single 1x6 Digital Distribution & Converter: Twinax/BNC connectors, jumper selectable input impedance, bal/unbal input selection, 3 differential (422) outputs and 3 single-ended outputs, front panel monitor test point (Equivalent to APCOM 5000-DDS)	4
LS16-D09	Dual 1x2 Digital TTL Distribution: BNC connectors, jumper selectable input impedance (50 or 75 ohm), single-ended TTL outputs, front panel BNC monitor test points, and signal presence indicators	4
LS16-FR2	Dual Section RF-Over-Fiber Rx: FC inputs, SMA output RF connectors, 50 ohm impedance, 50MHz-3000MHz, front panel indicators, signal presence and alarm indicators	4
LS16-FT2	Dual Section RF-Over-Fiber Tx: SMA inputs, FC output connectors, 50 ohm impedance, 50MHz-3000MHz, front panel coupler monitor test point, signal presence and alarm indicators	5
LS16-L02	Dual Section LNB DC Power Injector: BNC connectors, 50 ohm (75 opt), LNB power (0V/13V/18V), LO control 20kHz on/off, LNB current monitoring (850-2450MHz)	5
LS16-L03	Dual Section LNB DC Power Injector: BNC connectors, 50 ohm (75 opt), LNB power (0V/13V/18V), LO control 20kHz on/off, LNB current monitoring, RF power monitor and gain control, (850-2450MHz)	5
LS16-R12	Dual 1x2 Relay: (bidirectional redundancy switch), BNC connectors, 50 ohm impedance, self-terminating	5
LS16-FFP	Front filler plate (single slot)	N/A
LS16-RFP	Rear filler plate (single slot)	N/A
PSLS16-150	Plug-in hot-swap “smart” power supply assembly	N/A
LS1601A	Empty 16-slot element chassis assembly with fans (no elements, power supplies, filler plates or CPU)	N/A
C3L-LS16A	Plug-in control CPU with FLASH memory, TCP/IP, SNMP v1/v2, SNTP, web access and microSD slot	N/A



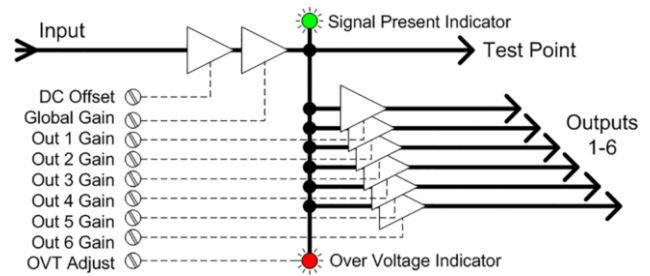
Each hot-swap element type has a unique rear faceplate with all signal connectivity. See individual element specifications.

Element LS16-A07 Analog Distribution Amplifier (1x6): DC-50MHz

Function	1x6 distribution
Frequency	DC-50MHz
Impedance	.75 ohm
Nominal input	+/-5VDC
Maximum input	+/-15V (no damage)
Maximum output	+/-5VDC (terminated)
Input return loss	>20dB typ
Gain adjust	Global and individual (+/-6dB min)
DC offset adjust	Yes (+/-50%)
Over voltage adjust	Yes
Indicators	Signal present, and overvoltage
Signal connectors	BNC (including test point)
Sum-bus access	Yes
Size	Single slot



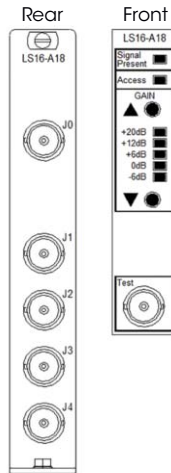
LS16-A07
Analog DC-50MHz distribution amplifier with 1 input, 6 outputs, individual and global gain adjustments, test point, DC offset adjustments, and indicators.



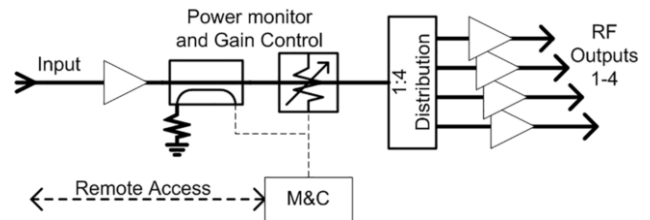
A07

Element LS16-A18 Wideband Multicoupler (1x4): 50-3000MHz

Function	1x4 distribution
Frequency	.50MHz - 3000MHz
Impedance	.50 ohm (75 ohm optional -7)
Flatness	+/-2.5dB typ (full range)
-1dB compression	>0dBm typ
Maximum input	+24dBm (no damage)
Input return loss	>20dB typ
Gain adjust	-10dB to +20dB in 1/2dB steps
Test point	Yes
Faceplate controls	Yes (gain push-buttons)
Indicators	Signal present, access, gain setting
Signal connectors	BNC standard, SMA (add "A" suffix)
Control	Remote C3L via Ethernet
Size	Single slot



LS16-A18
Wideband 50-3000MHz multicoupler (distribution amplifier) with 1 input, 4 outputs, programmable and manual input gain control, signal detect, power monitoring, BNC test point (-24dB).

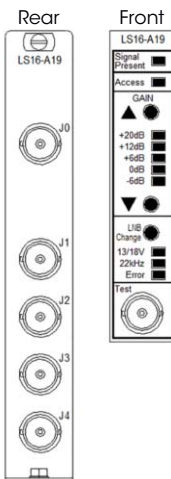


A18

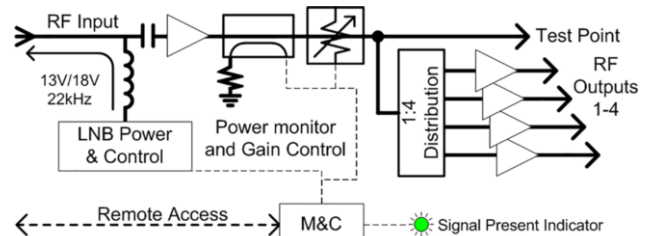


Element LS16-A19 L-Band Multicoupler (1x4) w/LNB: 850-2450MHz

Function	1x4 distribution
Frequency	.850MHz - 2450MHz
Impedance	.50 ohm (75 ohm optional -7)
Flatness	+/-2dB typ (full range)
-1dB compression	>0dBm typ
Maximum input	+24dBm (no damage)
Input return loss	>20dB typ
Gain adjust	-10dB to +20dB in 1/2dB steps
LNB features	.0V/13V/18V & 20kHz, 400mA
Test point	Yes (-24dB)
Faceplate controls	Yes (gain and LNB push-buttons)
Indicators	Signal present, access, gain setting, 13V/18V, 22kHz, LNB error
Signal connectors	BNC standard, SMA (add "A" suffix)
Control	Remote C3L via Ethernet
Size	Single slot



LS16-A19
L-Band 850-2450MHz multicoupler (distribution amplifier) with 1 input, 4 outputs, programmable and manual input gain control, signal detect, power monitoring, programmable and manual LNB control features, BNC test point (-24dB).



A19

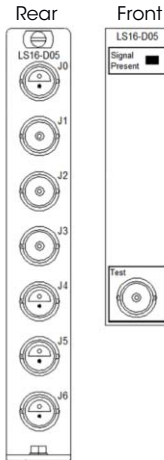


Element LS16-D05 Digital TTL/422 Distribution (1x6): DC-50Mbps

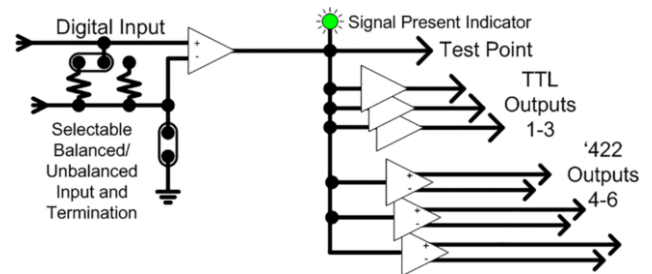
Function1x6 digital distribution/conversion
 Data rateDC-50Mbps
 Input impedance50/75/100 ohm selectable
 Input typeTTL or 422 selectable
 Output types3x TTL, 3x '422'
 IndicatorsSignal present
 Input connectorTwinax (polarized)
 Output connectorsBNC x3 and Twinax x3
 Test portBNC
 SizeSingle slot

D05

NOTE: This element provides same function as discontinued APCOM #5000-DDS



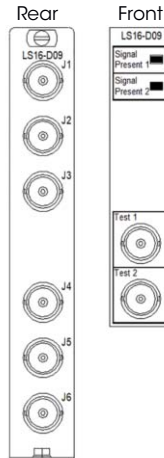
LS16-D05
 Digital DC-50Mbps distribution with 1 input, 6 outputs, selectable input type (TTL or '422', selectable input impedance, test point, signal present indicator.



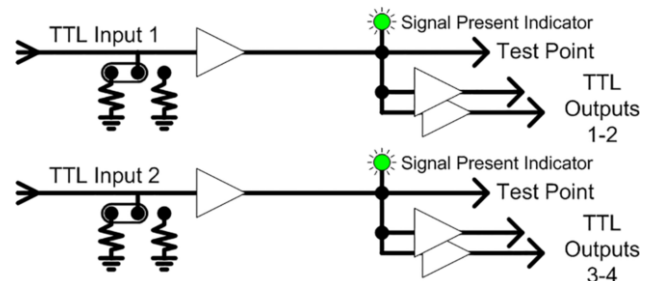
Element LS16-D09 Digital TTL Distribution (Dual 1x2): DC-50Mbps

FunctionDual 1x2 digital TTL distribution
 Data rateDC-50Mbps
 Input impedance50/75 ohm selectable
 Input typeTTL
 Output typesTTL
 IndicatorsSignal present
 Input connectorBNC
 Output connectorsBNC
 Test portBNC
 SizeSingle slot

D09



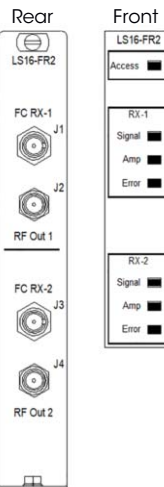
LS16-D09
 Digital DC-50Mbps TTL distribution with dual 1 input, 2 output, selectable input impedance, test point, signal present indicator.



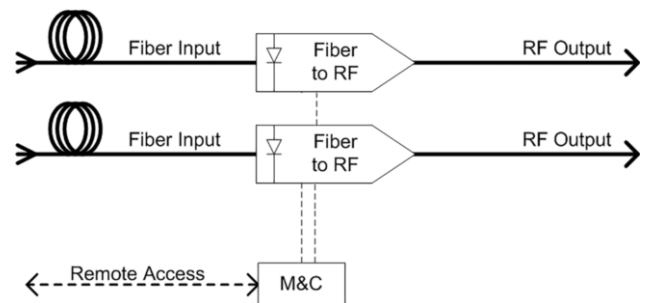
Element LS16-FR2 Wideband RF-Over Fiber Receiver: 50-3000MHz

FunctionDual section RFOF
 Frequency50MHz - 3000MHz
 Output impedance50 ohm
 Flatness+/-2dB typ (full range)
 -1dB compression+5dBm
 Gain adjust0 to +12dB
 Wavelength1310 nm
 IndicatorsSignal present, access, amp health, error
 Signal connectorsFC fiber, SMA RF
 ControlRemote C3L via Ethernet
 SizeSingle slot

FR2



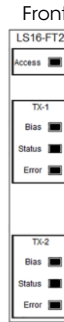
LS16-FR2
 Dual wideband 50-3000MHz RF-Over-Fiber receivers, programmable gain control, signal detect, signal monitoring, single-mode FC fiber connectors, SMA output connectors.



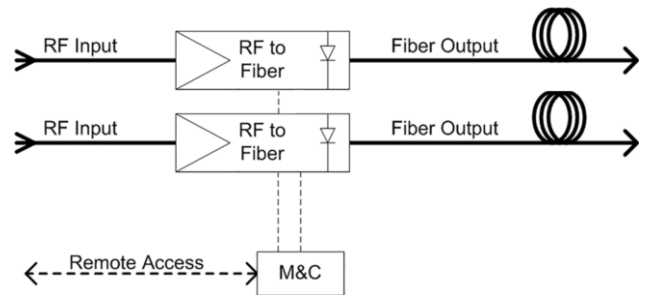
NOTE: This element is designed to be paired with the LS16A-FT2 element or USRM-FT1 ruggedized transmitter unit.

Element LS16-FT2 Wideband RF-Over Fiber Transmit: 50-3000MHz

Function	Dual section RFOF Transmitter
Frequency	50MHz - 3000MHz
Input impedance	50 ohm
Flatness	+/-2dB typ (full range)
-1dB compression	+5dBm
Gain adjust	0 to +12dB
Wavelength	1310 nm
Indicators	Signal present, access, amp health, error
Signal connectors	FC fiber, SMA RF
Control	Remote C3L via Ethernet
Size	Single slot



LS16-FT2
Dual wideband 50-3000MHz RF-Over-Fiber transmitter, programmable gain control, signal defect, signal monitoring, single-mode FC fiber connectors, SMA input connectors.



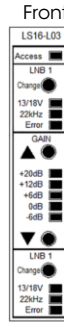
FT2



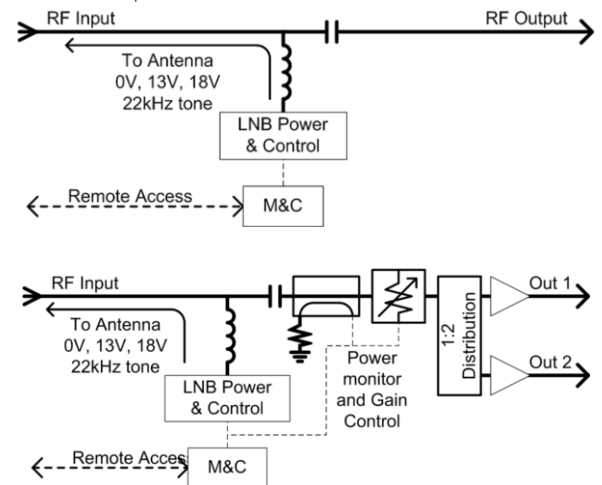
NOTE: This element is designed to be paired with LS16A-FR2, or USRM-FR1 ruggedized receiver unit.

Elements LS16-L02, LS16-L03 Dual LNB power/control/gain: 850-2450MHz

Function	Dual LNB power/control/gain
Frequency	850-2450MHz
Input impedance	50 ohm (75 ohm optional -7)
Input	Antenna RF, LNB power and control
Output	RF
Indicators	13V/18V, 22kHz, error, access
Faceplate controls	Yes (gain & LNB push-buttons)
Gain	L03 version has power monitor and gain control and two outputs
Signal connector	BNC standard, SMA (add "A" suffix)
Control	Remote C3L via Ethernet
Size	Single slot



LS16-L02 and LS16-L03
LNB power injector (0V/13V/18V) and 22kHz control with BNC connectors. The L03 version adds RF power monitor, programmable & manual input gain control, and two outputs.



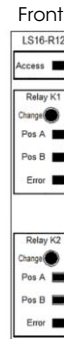
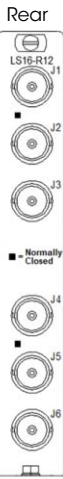
L02

L03

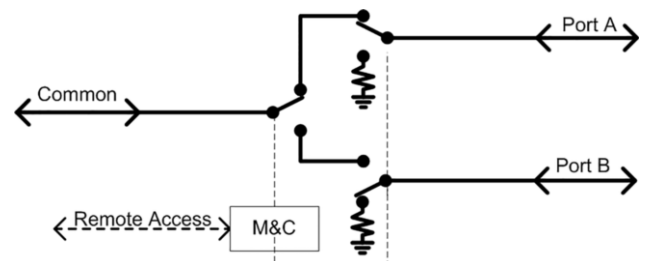


Element LS16-R12 Dual Coaxial 2x1 Relay: DC-3000MHz

Function	Two 2x1 relay sections
Frequency	DC - 3000MHz
Impedance	50 ohm (75 ohm optional -7)
Transmission loss	<1dB typ
Isolation	>60dB typ
Termination	50 ohm, 1/8W (75 ohm optional)
Indicators	Switch position
Faceplate controls	Yes (switch position push-buttons)
Signal connectors	BNC standard, SMA (add "A" suffix)
Control	Remote C3L via Ethernet
Size	Single slot



LS16-R12
Two sections of 2x1 coaxial DC-3000MHz with 50 ohm terminations (internal), programmable and manual switch control.



R12





Plug-In Control CPU
 Optional C3-Life with 10/100 control port, SNMP, web browser, microSD card slot, realtime clock

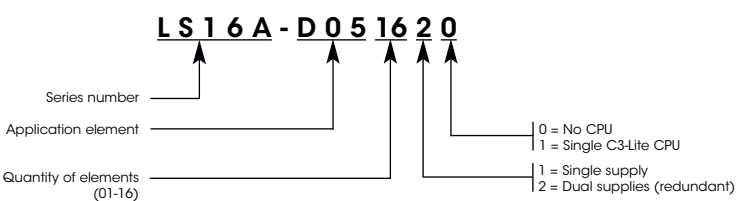
Redundant Supplies
 Optional hot-swap individual supplies are monitored (front LED & remote control)

16-Position Element Bay
 Up to 16 hot-swap elements can be mixed and matched. Filler plates included for empty slots.

Chassis Ground
 (10-32)

System Number Definition

Must all be the same type of element. If a mix of elements are needed, contact the factory for a unique easy order part number (example: LS16A-xxxx), or just order the items you want and assemble your own unique system.



NOTE: This product was originally introduced as the LS1601A. Since then, the model number has been reduced to LS16A to allow more options.

Specifications

Capacity Sixteen application elements
 Signal connector location . . .Rear facing
 Element installationRear
 Element typesDigital, analog and fiber
 Power supply sectionPlug-in type, redundant available
 Power supply monitoring . . .Included
 ControllerOptional 10/100BaseT (C3-Life)
 Status LED'sFront panel and individual faceplates
 Front panel typeOpen window
 Configuration memoryFLASH (C3-Life optional)
 CoolingDual fan assisted (monitored)
 AC power requirements90-264VAC, 47-440Hz, 160Watts (max)
 Fuse protection2A, 5mm (dual)

Weight<20lbs (configuration dependent)
 Front panel colorSemi-Gloss White (Fed-STD-595C-27875)
 Size3.72H x 10.50D x 19.00W (3RU)
 Operating temp0 to +60C
 Non-operating temp-20 to +85C
 Humidity0 to 95% (NC @ +25C)
 MTBF>125,000 hours
 Warranty2 years
 CertificationsCE EN61010

Universal Switching's policy is one of continuous development. Consequently, the company reserves the right to vary from the descriptions and specifications shown in this publication.