

Xtra Long Life 100 million cycles

USB RF-SPDT Switch Matrix

USB-1SPDT-A18

50Ω DC to 18GHz

The Big Deal

- Capable of 100 million cycles
- Wide frequency (DC to 18GHz)
- High power, 10W
- SPDT electromechanical, absorptive, RF switch (Isolation 85 dB typ.)
- USB HID device, includes control software with a GUI and an API DLL com object compatible with 32/64 Bit operating systems



Case Style: LM1580



Installation CD



Product Overview

Mini-Circuits' USB-1SPDT-A18 is a general purpose USB controlled RF switch matrix containing an electro-mechanical SPDT, absorptive, fail-safe RF switch constructed in break-before-make configuration and powered by +24V_{DC} with a switching time of 25 mSec typical. The RF switch can be set remotely using the supplied GUI program, or programmed by the user using the included API DLL com object. The RF switch operates over a wide frequency band from DC to 18GHz has low insertion loss (0.2 dB typical) and high isolation (85dB typical) making it perfectly suitable for a wide variety of RF applications.

The USB-1SPDT-A18 is constructed in a metal case (size of 4.5" X 6.0" X 2.25") with 3 SMA(F) connectors (COM, 1, 2), a 2.1mm DC socket, and a USB type B port. The model is supplied along with a CD containing a graphical user interface program featuring an API DLL com object. Also included is a 2.7ft. USB cable, and a power adapter suitable for US, EU, and other power systems, see page 5 for details. Longer USB cables and a mounting bracket are available as additional accessories.

Key Features

Feature	Advantages
USB HID (Human Interface Device)	Plug-and-Play (no need to install a driver for the device).
RF SPDT Electromechanical switch	Wideband (DC to 18GHz) with low insertion loss (0.2 dB typ.), very high isolation (85dB typ.), and high power rating (10W cold switching).
24V _{DC} Operating voltage	The USB-1SPDT-A18 requires 24V/500mA to power the RF switches, supplied from the included power adapter.
32/64 Bit operating systems	Compatible with Windows® and Linux® operating systems using 32 and 64 bit architecture.
Software CD, USB cable, and 24V _{DC} Power adapter included	A CD containing a programing manual for Linux® and Windows® operating systems (32 and 64 bit systems) and a Windows® GUI program containing an API DLL com object is included with the USB-1SPDT-A18. A 2.7ft. USB cable, and a power adapter suitable for US, EU, and other power systems are also included.



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Features

- Capable of 100 million cycles
- DC to 18GHz SPDT absorptive fail-safe RF switch in break-before-make configuration
- Electromechanical switching (Isolation 85 dB typ.)
- High power handling, 10W
- Greatly simplifies complex switching and timing setups
- Easy installation and operation
- Compatible with 32/64-bit Windows® or Linux® operating systems, as well as LabVIEW®, Delphi®, C++, C#, Visual Basic®, and .NET software¹
- Friendly Windows® Graphical User Interface
- Mounting bracket (Optional)
- Protected by US Patents 5,272,458; 6,414,577; 6,650,210; 7,633,361 and 7,843,289

Applications

- Lab
- Test equipment
- Control systems



Case Style: LM1580

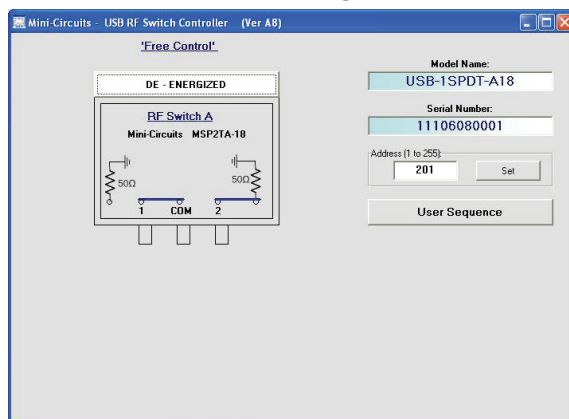
Installation CD

Model No.	Description	Price	Qty.
USB-1SPDT-A18	USB RF SPDT Switch	\$385.00 ea.	(1-9)
Included Accessories			
AC/DC-24-3W1	AC/DC 24V Adapter (see Ordering Information)		1
CBL-3W1-XX	AC Power Cord (see Ordering Information)		1
USB-CBL-AB-3+	2.7 ft USB cable		1
RFSW-CD	Installation CD		1

RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

Mini-Circuits RF Switch Control Program for USB RF Switch Matrix



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Electrical Specifications

Parameter	Port	Conditions	Min.	Typ.	Max.	Units
Rated Voltage ²	24V _{DC} IN USB Port	provided via external power adapter –	23 –	24 5	25 –	V
Rated Current	24V _{DC} IN	Switch in COM->2 position	–	205	285	mA
		Switch in COM->1 position	–	40	70	
	USB Port	Switch in COM->2 position	–	55	80	
		Switch in COM->1 position	–	50	80	
Switching Time		–	–	25	–	mS
Life (per switch) ³		@ 100 mW (hot switching) ⁴	10	–	–	million switching cycles
		@ 1 W (hot switching) ⁴	–	3	–	
RF Power (cold switching) ⁵		–	–	–	10	W
RF Power (hot switching) ⁵		–	–	–	1	
RF VSWR		DC to 1 GHz	–	1.05	1.10	:1
		1 GHz to 8 GHz	–	1.20	1.30	
		8 GHz to 12 GHz	–	1.20	1.35	
		12 GHz to 18 GHz	–	1.25	1.40	
RF Insertion Loss		DC to 1 GHz	–	0.10	0.15	dB
		1 GHz to 8 GHz	–	0.15	0.30	
		8 GHz to 12 GHz	–	0.25	0.40	
		12 GHz to 18 GHz	–	0.30	0.50	
RF Isolation		DC to 1 GHz	85	100	–	dB
		1 GHz to 8 GHz	75	90	–	
		8 GHz to 12 GHz	70	80	–	
		12 GHz to 18 GHz	60	66	–	

² Power On Sequence. Connect the 24V power, followed by the USB control before turning on the Switch Matrix.

³ Capable of up to 100 million cycles with proper maintenance, contact Mini-Circuits.

⁴ Exceeding these limits will result in reduced life.

⁵ Power handling is specified with RF applied to the COM port and output load connected to either 1 or 2 of the respective switch.

Minimum System Requirements

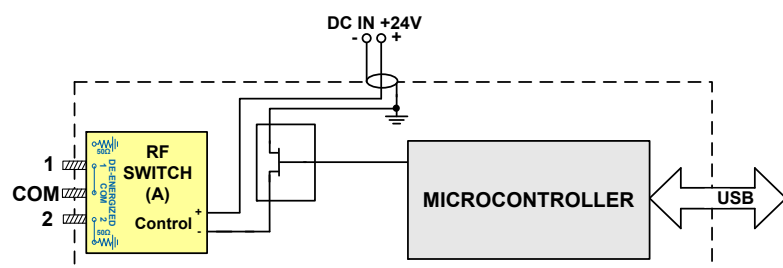
Interface	USB HID
Host operating system	32 Bit operating system: Windows 98®, Windows XP®, Windows Vista®, Windows 7® 64 Bit operating system: Windows Vista®, Windows 7® Linux® support: 32/64 Bit operating system
Hardware	Pentium® II or better

Absolute Maximum Ratings

Operating Temperature	0°C to 40°C
Storage Temperature	-15°C to 45°C
DC Voltage max.	26V
RF power (at COM port)	10W
RF power (at 1 and 2)	1W

Permanent damage may occur if any of these limits are exceeded.

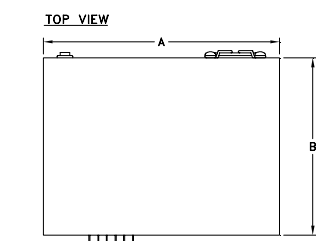
Block Diagram



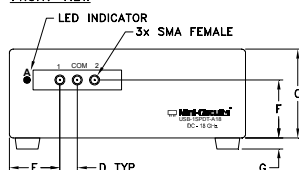
Connections

24V DC IN	(2.1 mm center positive DC Socket)
RF Switch A (1, COM, 2)	(SMA female)
USB	(USB type B receptacle)

Outline Drawing (LM1580)

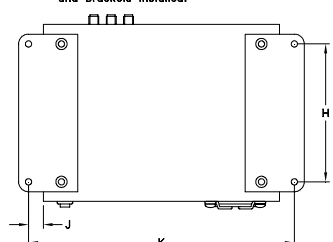


FRONT VIEW

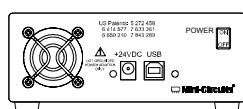


BOTTOM VIEW

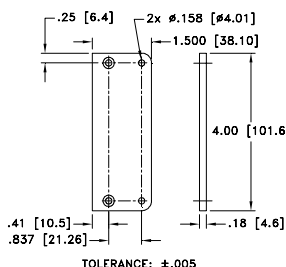
Shown with Rubber feet removed and Brackets installed.



REAR VIEW



BRACKET OPTION ONE SET OF 2 EACH



INSTRUCTION FOR MOUNTING BRACKETS:
TOOL REQUIRED:
PHILLIPS HEAD SCREW DRIVER
STEP 1: REMOVE RUBBER FEET FROM THE BOTTOM OF THE UNIT. DO NOT DISCARD THE FASTENERS.
STEP 2: MOUNT THE BRACKETS WITH THE FASTENERS REMOVED IN STEP 1, USING THE COUNTER-BORE HOLES IN THE BRACKET.

Outline Dimensions (inch)

A	B	C	D	E	F
6.00	4.50	2.25	.440	1.29	1.47
152.4	114.3	57.2	11.18	32.8	37.3
G	H	J	K	wt	
.28	3.500	.375	6.75	grams	
7.1	88.9	9.5	171.5	875	

Ordering, Pricing & Availability Information see our web site

Model	Description
USB-1SPDT-A18	USB RF SPDT Switch Matrix

Included Accessories	Description
AC/DC-24-3W1	AC/DC 24V Power Adapter
CBL-3W1-XX	AC Power Cord (<i>Select one power cord from below with each USB Switch Matrix box</i>)
RFSW-CD	Installation CD
USB-CBL-AB-3+	2.7ft. USB cable

AC Power Cords	Description
CBL-3W1-US	US Power Cord
CBL-3W1-EU	EU Power Cord
CBL-3W1-UK	UK Power Cord
CBL-3W1-AU	AU Power Cord
CBL-3W1-IL	IL Power Cord

Optional Accessories	Description
USB-CBL-AB-3+ (Spare)	2.7 ft (0.8 m) USB cable
USB-CBL-AB-7+	6.8 ft (2.1 m) USB cable
USB-CBL-AB-11+	11 ft (3.4 m) USB cable
BKT-272-08+	Bracket (One set of 2 each)

Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp