RS232 & USB to SPI

RS232/USB-SPI-N

Bi-Directional Converter: RS232<-->SPI or USB<-->SPI

The Big Deal

- Allows Bi-Directional communication between USB or RS232 to SPI
- Accessory cables for all protocols included.

CASE STYLE: LK1579

Software Package

Typical Applications

- R&D
- High volume production testing / ATE
- Design verification testing

Included Accessories

Model No.	Description	Qty.
MUSB-CBL-3+	2.6 ft USB cable	1
CBL-RJ45-MM-5+	RJ45 Control cable	1
D-SUB9-MF-6+	9 pin D-Sub cable assembly	1

RoHS Compliant
See our web site for RoHS Compliance methodologies and qualifications

Product Overview

Mini Circuits' RS232/USB-SPI is a compact digital convertor allowing two way communication with SPI devices using either a USB or RS232 port. For SPI communication standard TTL levels are used and the model can handle all voltage levels defined in the RS232 protocol. Power to the Converter is supplied via the USB port.

Full software support is provided for USB control, including our user-friendly GUI application for Windows and a full API with programming instructions for Windows and Linux environments (both 32-bit and 64-bit systems). The latest version of the full software package can be downloaded from **https://www.minicircuits.com/softwaredownload/rs232_usb_spi.html** at any time.

The USB-SP4T-63 is housed in a compact plastic case (2.53" X 1.68" X 0.92") with a USB type B female port, standard RJ45 network port for the SPI signals, and a 9-pin D-Sub female port for the RS232 signals. Additional accessories are available - see page 7 for details.

Key Features

Feature	Advantages
Bi-Directional communication	Allows full two way communication from any USB or RS232 port to an SPI device.
$5V_{DC}$ Operating voltage	The RS232/USB-SPI-N uses 5V operating voltage, supplied from either the USB BUS or an external power adaptor.
USB HID (Human Interface Device)	Plug-and-Play (no need to install a driver for the device).
Full software support included	Mini-Circuits' full software package, programming and user manual are available for down load from **https://www.minicircuits.com/softwaredownload/rs232_usb_spi.html** at no extra cost.

Trademarks: Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Linux is a registered trademark of Linus Torvalds. Pentium is a registered trademark of Intel Corporation. Neither Mini-Circuits nor the Mini-Circuits RS232/USB-SPI-N converters are affiliated with or endorsed by the owners of the above referenced trademarks

Mini-Circuits and the Mini-Circuits logo are registered trademarks of Scientific Components Corporation.

Mini-Circuits®

Electrical Specifications

Parameter	Connectors	Conditions	Min.	Typ.	Max.	Units
RS232 port[1]						
Baud rate 9600; 8 bit word; even parity; stop bit = '1'						
Logic levels	9 pin D-Sub	Meets RS232 standard				
SPI port [2]						
Data transferred on rising clock edge, clock signal duty cycle 50% regardless of pulse width						
Pulse width (set by user)	RJ45 Connector	With supplied program	0.08	–	255	µSec
Transmission rate		–	–	330	–	kbit/sec
Logic high		Output	2.4	–	5.2	V
Logic Low			0	–	0.3	
Current Source (per pin)		Pin 2, 6 or 8	–	–	25	mA
Current Sink (per pin)		Pin 3 or 5	–	–	25	
USB port						
Full USB 2.0 capability						
Supply Voltage [1]	USB	–	–	5	–	V
USB current draw (depends on SPI load)		–	–	50	135	mA

[1] When using the Converter as a RS232 to SPI or SPI to RS232 Converter, supply voltage can be provided from either the computer's USB port or the provided power adaptor. When used to convert USB signals, all power is supplied via the computer's USB port.

[2] The converter is the SPI master both when transmitting and receiving data.

Connections

USB	(USB B female)
RS232*	(9 Pin D-Sub female)
SPI**	(RJ45 connector)

* 9 Pin D-Sub Pin Connections

PIN Number	Function
2	Transmit
3	Receive
5	GND
1,4,6 - 9	Not Connected

** RJ45 Pin Connections

PIN Number	Function
2	Load Enable
3	Data In
5	Chip Select
6	Clock
8	Data out
1,4,7	GND

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	0°C to +50°C
Storage Temperature	-20°C to +60°C
Voltage input at RS232 receive pin	-30V to +30V
Input Voltage at output contacts	0V to V_{cc}
Input Voltage at SPI Input contacts	-0.3V to V_{cc}+0.3V
V_{cc} Max.	6V

Permanent damage may occur if any of these limits are exceeded.
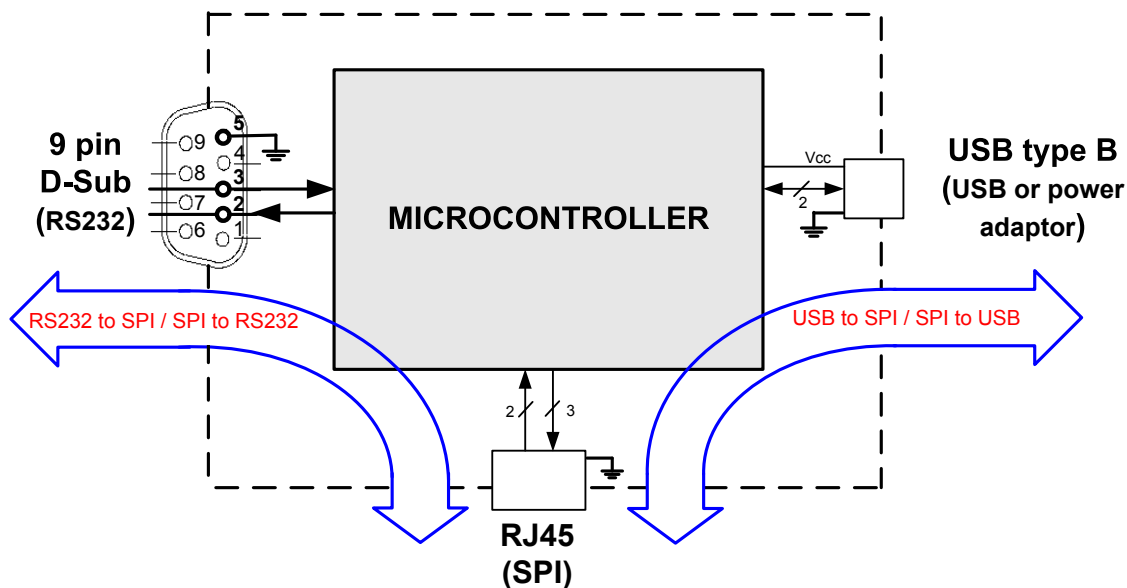
Mini-Circuits®

Block Diagram

*When using the Converter as a RS232 to SPI or SPI to RS232 Converter, supply voltage can be provided from either the computer's USB port or the provided power adaptor. When used to convert USB signals, all power is supplied via the computer's USB port.

Accessories Included

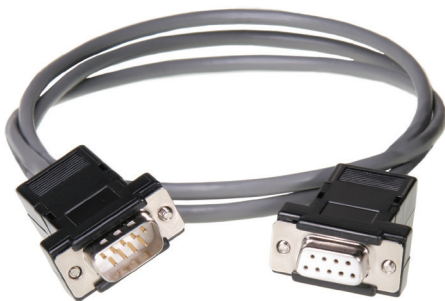
USB Cable: USB type A(Male) to USB type B(Male)
• MCL P/N: USB-CBL-AB-3+ (2.7ft.)

Accessories Included (Continued)

SPI Cable: RJ45 plug to RJ45 plug
(Wire gauge 28$_{AWG}$, Operating Temp. -20 to+60 °C)
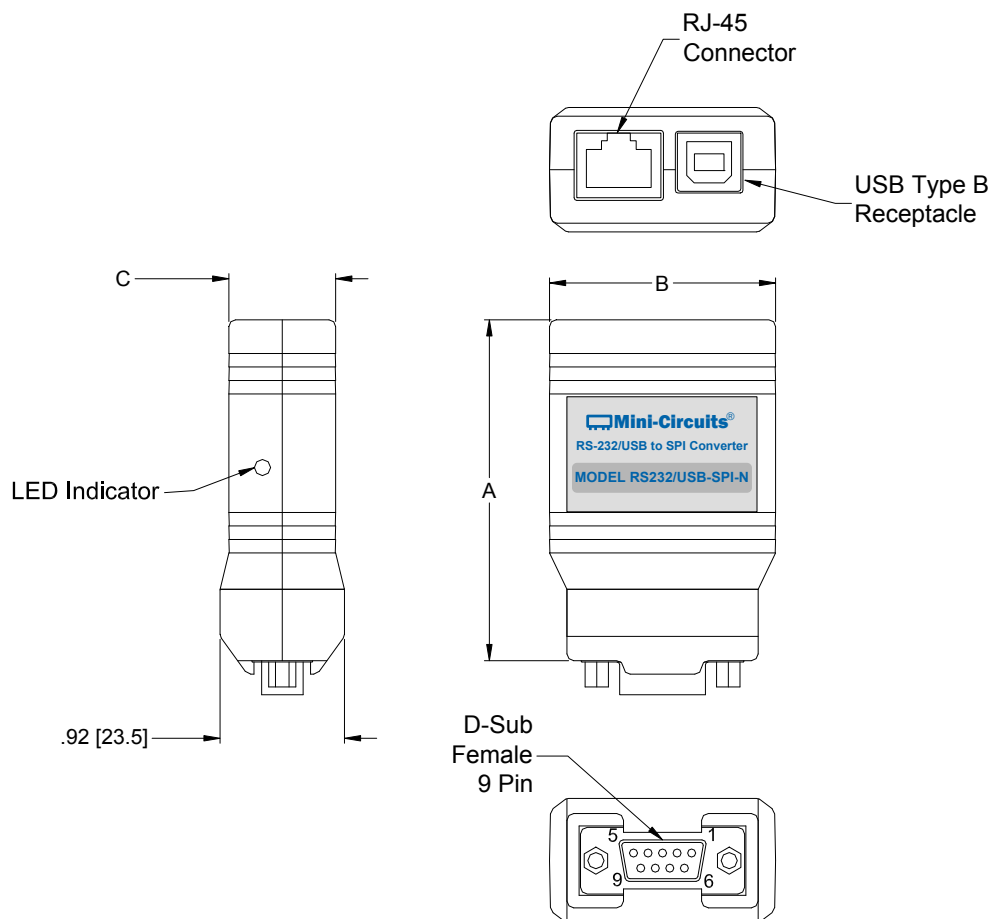
• MCL P/N: CBL-RJ45-MM-5+ (5ft.)

RS232 cable:9 pin D-sub(Male) to 9 pin D-sub(Female)
(Wire gauge 28$_{AWG}$, Operating Temp. -20 to+60 °C)

• MCL P/N: D-SUB9-MF-6+ (6ft.)

Outline Drawing: (LK1579)

RJ-45 Connector

USB Type B Receptacle

C

B

LED Indicator

A

.92 [23.5]

D-Sub Female 9 Pin

5 1
9 6

Outline Dimensions (inch / mm)

A	B	C	D	WT. GRAMS
2.53	**1.68**	**.79**	**.92**	40
64.3	42.7	20.2	23.5	

Software & Documentation Download:
- Mini-Circuits' full software and support package including user guide, Windows GUI, DLL files, programming manual and examples can be downloaded free of charge from **https://www.minicircuits.com/softwaredownload/rs232_usb_spi.html**
- Please contact **testsolutions@minicircuits.com** for support

Minimum System Requirements

Parameter	Requirements	
Interface	USB HID or RS232	
System requirements	GUI:	Windows 32 & 64 bit systems from Windows 98 up to Windows 10
	USB API (ActiveX & .Net)	Windows 32 & 64 bit systems with ActiveX or .Net support from Windows 98 up to Windows 10
	USB direct programming support	Linux, Windows systems from Windows 98 up to Windows 10
	RS232	Any computer with a serial port and RS232 support
Hardware	Pentium® II or higher, RAM 256 MB	

Graphical User Interface (GUI) for Windows
Key Features:
- Controlling Mini-circuits SPI switches via USB and RS232
- Send and recieve SPI data/commands via USB and RS232 control.
- Set SPI mode
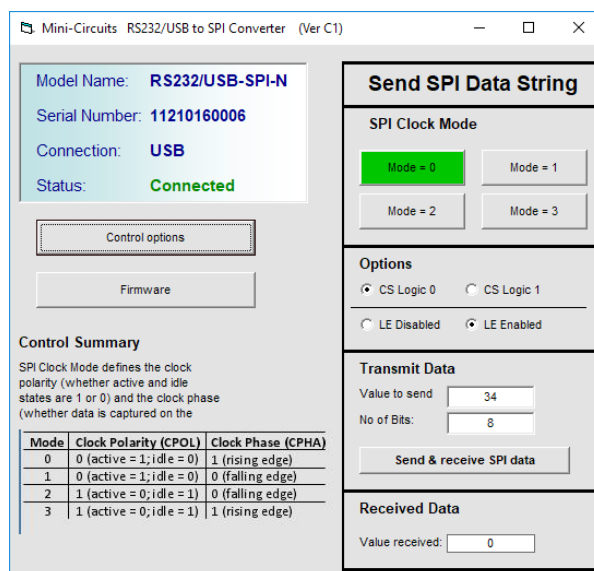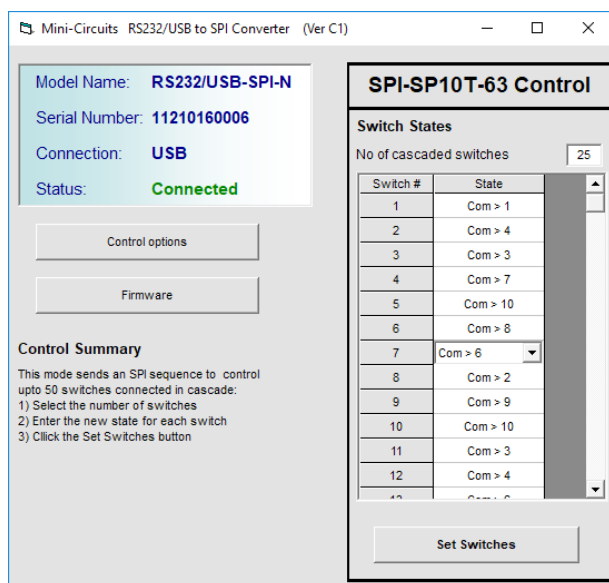
Application Programming Interface (API)
Windows Support:
- API DLL files exposing the full switch functionality
- ActiveX COM DLL file for creation of 32-bit programs
  - .Net library DLL file for creation of 32 / 64-bit programs
- Supported by most common programming environments (refer to application note **AN-49-001** for summary of tested environments)

Linux Support:
- Full switch control in a Linux environment is achieved by way of USB interrupt commands.

Ordering, Pricing & Availability Information see our web site

Model	Description
RS232/USB-SPI-N	Bi-Directional converter for RS232<->SPI and USB<->SPI

Included Accessories	Description
USB-CBL-AB-3+	2.7 ft (0.8 m) USB Cable
CBL-RJ45-MM-5+	5 ft Serial data cable RJ45 plug to RJ45 plug (SPI)
D-SUB9-MF-6+	6 ft 9 pin D-Sub(M) to 9 pin D-Sub(F) cable assembly (RS232)

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
USB-AC/DC-5+	AC/DC 5V_{DC} Power Adapter with US, EU, IL, UK, AUS, and China power plugs [3]
CBL-RJ45-MM-5+ (spare)	5 ft Serial data cable RJ45 plug to RJ45 plug (SPI)
D-SUB9-MF-6+ (spare)	6 ft 9 pin D-Sub(M) to 9 pin D-Sub(F) cable assembly (RS232)

[3] Power plugs for other countries are also available, if you need a power plug for a country not listed in the table please contact **testsolutions@ minicircuits.com** for support.

Additional Notes

A. 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.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

C. 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