USB I/O CONTROL BOX

USB-I/O-8DRV

8 relays, 8 digital I/O lines and 8 HV inputs

The Big Deal

- USB HID device compatible with 32/64 Bit operating systems
- 8 TTL/LVTTL digital I/O channels, 8 High Voltage digital inputs (32V max) and 8 electromechanical Form C buffered relays
- All TTL/LVTTL channels can sink & source 32mA
- All required power drawn from USB bus
- Includes installation software with a friendly GUI and an API DLL com object on CD

Case Style: LE1594

Installation CD

30 day MONEY-BACK GUARANTEE! Click Here For More Details

Product Overview

Mini Circuits' USB-I/O-8DRV is a general purpose USB controlled I/O box which provides 8 form C relays with both outputs available as dry contacts and 16 digital channels. The digital channels are arranged in two bytes, one of High Voltage input only channels('1' 4 to 32V) and the other of I/O channels selectable as either TTL or LVTTL. The digital I/O Byte must be toggled as a unit between input and output modes and can sink or source up to 80mA total (10mA per channel if all channels are active). With selective operation each channel can sink or source up to 32mA in TTL mode('1' is 5V) or 24mA in LVTTL mode ('1' is 3.3V) - selection of TTL or LVTTL modes is done by means of an external switch. The supplied software allows either USB to SPI conversion or direct control of bit states. Other protocols can be programed by the user using the supplied API DLL com object. Each of the 8 relays can support an AC load of $125V_{AC}$ at 0.5A or DC load of $24V_{DC}$ at 1A. Each type of input/output line is accessed via a separate IDC type connector of a different size to help prevent confusion.

The control box draws all required power from the USB bus (500mA max at 5V), no external power adapter is required. The device is housed in a small, rugged plastic case (size of 4.5" X 3.1" X 1.2") with easy connections. The model is supplied with a CD containing installation and control software featuring a friendly GUI. Also supplied are a 2.7 ft USB cable and 1 ft IDC cable assemblies for the Relays and Digital I/O connectors. Longer USB and IDC cables 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).
8 relays with dry contact Outputs	Can be used to operate up to 8 analog devices simultaneously, each with a draw of up to $125V_{AC}$/0.5A or $24V_{DC}$/1A . Each relay has two outputs, allowing them to be used to switch between two devices or to start/stop a single device. Current draw per relay 30mA typical
Monitors 8 digital high voltage inputs	The USB-I/O-8DRV design allows it to monitor digital inputs at high voltage ('1' 4 to 32V) and convert them to USB signals for processing by a PC or other work station.
8 digital I/O outputs selectable TTL or LVTTL	Allows controlling TTL or LVTTL devices, any output can sink or source up to 32mA at TTL or 24mA at LVTTL so long as the total current through all channels remains bellow 80mA.
32/64 Bit operating systems	Compatible with Windows and Linux operating systems using 32 and 64 bit architecture.
Software CD, USB cable and IDC cable assemblies included	A CD containing a programing instructions 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-I/O-16D8R as is a 2.7 ft USB cable and 1 ft. 10, 14 and 34 wire IDC cable assemblies.

USB I/O CONTROL BOX

8 relays, 8 digital I/O lines and 8 HV inputs

Features

- Low cost solution for automatic relay control
- Easy installation and operation
- 8 buffered relays (1A DC) with N_C and N_O outputs available for use
- 8 Digital HV inputs (32V max)
- 8 digital outputs selectable as TTL or LVTTL
- All required operating power drawn from USB
- Compatible with 32/64-bit Windows® or Linux® operating systems
- ActiveX com object and .Net class library for use with other software: C++, C#, CVI®, Delphi®, LabVIEW® 8 or newer, MATLAB® 7 or newer, Python, Agilent VEE®, Visual Basic®, Visual Studio® 6 or newer, and more[1]
- Friendly Windows® Graphical User Interface

Case Style: LE1562

Installation CD

Model No.	Description	Price	Qty.
USB-I/O-8DRV	**USB I/O CONTROL BOX**	$219.95 ea.	(1-4)
Included Accessories			
USB-CBL-AB-3+	2.7 ft USB cable		1
FCBL-10-1+	1 ft 10 wire flat cable assy.		1
FCBL-14-1+	1 ft 14 wire flat cable assy.		1
FCBL-34-1+	1 ft 34 wire flat cable assy.		1
I/O-CD	Installation CD		1

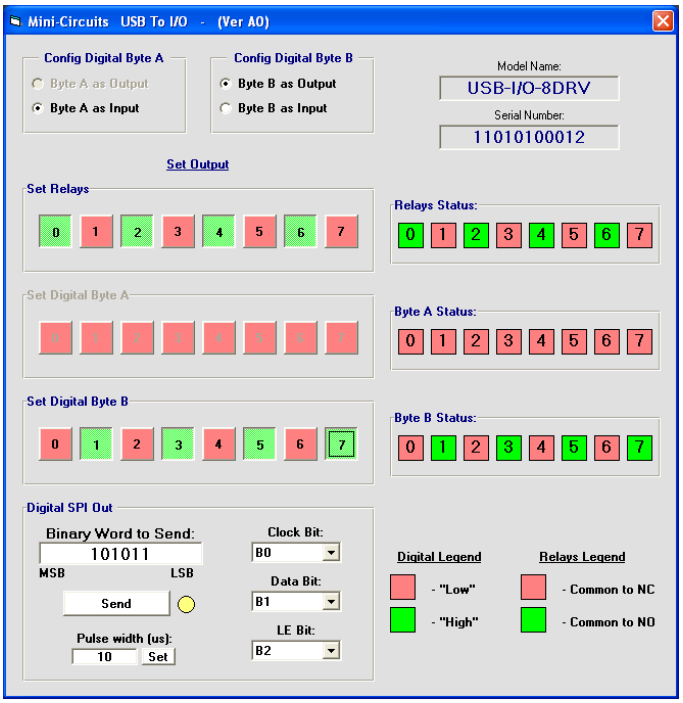
RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

Applications

- Lab
- Test equipment
- Control systems
- Handling HV digital inputs

Mini-Circuits Software GUI for USB I/O Control Box



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Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. **2.** Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. **3.** The parts covered by this specification sheet 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.

Electrical Specifications

Parameter	Connectors	Conditions	Min.	Typ.	Max.	Units
DIGITAL I/O	26 pin horizontal IDC header. See table on page 5 for details.	16 I/O logic '1' levels (selectable) Note	3.3	–	5	V
Digital Input (8 lines, TTL/LVTTL selectable '1'=5V when indicator Green or '1'=3.3V when indicator Red) [2]						
Logic high	10 pin horizontal IDC header. See table on page 5 for details.	TTL mode	V_{USB}x0.7	–	5.0	V
		LVTTL mode	2.0	–	3.3	
Logic Low		TTL and LVTTL modes	0	–	0.8	
Current sink		TTL, Current through a single line [3]	–	–	32	mA
		LVTTL, Current through a single line [3]	–	–	24	
Digital Output (8 lines, TTL/LVTTL selectable '1'=5V when indicator Green or '1'=3.3V when indicator Red) [2]						
Logic high	10 pin horizontal IDC header. See table on page 5 for details.	TTL mode	3.8	–	–	V
		LVTTL mode	2.4	–	–	
Logic Low		TTL and LVTTL modes	0	–	0.6	
Current source		TTL, Current through a single line [3]	–	–	32	mA
		LVTTL, Current through a single line [3]	–	–	24	
Relay Outputs (Contact arrangement: SPDT, form C)						
DC load	34 pin horizontal IDC header. See table on page 5 for details.	@24V	–	–	1	A
AC Load		@125V	–	–	0.5	
Relay On (each relay)		@5V		30		mA
Contact resistance		Relays closed	–	–	0.1	Ω
Operation Life		Mechanical.	5 Million	–	–	operations
Operating time			–	–	10	msec
Release time			–	–	8	msec
Operating frequency	Electrical (under load)		–	–	1,800	Operations / hour
	Mechanical		–	–	36,000	
High Voltage Digital inputs						
Logic high	14 pin horizontal IDC header. See table on page 5 for details.	falls on Internal 7.5KΩ resistor	4	–	32	V
Logic low			0	–	1	
Current sink		@32V	–	–	4	mA
BUS Type	**USB 2.0, USB 1.1 compatible**					
Bus power	USB	+5VDC provided via USB bus up to 500mA,				
Current Draw from USB bus		No relays or digital lines active.	–	60	–	mA
		All 8 Relays are active, no digital lines active	–	300	–	
		All 8 Relays are active, digital lines drawing max. current.	–	380	–	

[2] Switching between TTL and LVTTL modes is preformed by means of an external switch. Switching between input and output modes is a software function.
[3] Total current sink / source through all lines in the byte may not exceed 80mA

Electrical Specifications (Continued)

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	0°C to 50°C
Storage Temperature	-20°C to 60°C
Max Voltage on Relay contacts	$36V_{DC}$ or $185V_{AC}$
V_{IN} on digital lines @ Output TTL mode	$-0.5V_{DC}$ to $5.5V_{DC}$
V_{IN} on digital lines @ Output LVTTL mode	$-0.5V_{DC}$ to $3.8V_{DC}$
V_{IN} on digital lines @ Input TTL mode	$-0.5V_{DC}$ to $6.5V_{DC}$
V_{IN} on digital lines @ Input LVTTL mode	
Sink/Source current for entire Byte	95mA
Sink/Source current for single channel	45mA
V_{IN} on High Voltage digital inputs	40 V_{DC}
Sink current for high voltage digital inputs	5 mA

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

Connections

Relays*	(34 pin IDC connector)
TTL/LVTTL**	(10 pin IDC connector)
HV Digital input#	(14 pin IDC connector)
USB Port	(USB B female)

* 34 Pin IDC connector pin connections (Relays)

Relay	Common	Normally Open (N_O)	Normally Closed (N_C)
Relay 1	1	2	3
Relay 2	4	5	6
Relay 3	7	8	9
Relay 4	10	11	12
Relay 5	13	14	15
Relay 6	16	17	18
Relay 7	19	20	21
Relay 8	22	23	24
GND	29-34		
Not connected	25-28		

#14 Pin IDC connector pin connections (high voltage)

PIN Number	Function
1	HV digital input (A0)
2	HV digital input (A1)
3	HV digital input (A2)
4	HV digital input (A3)
5	HV digital input (A4)
6	HV digital input (A5)
7	HV digital input (A6)
8	HV digital input (A7)
11-14	GND
9,10	Not connected

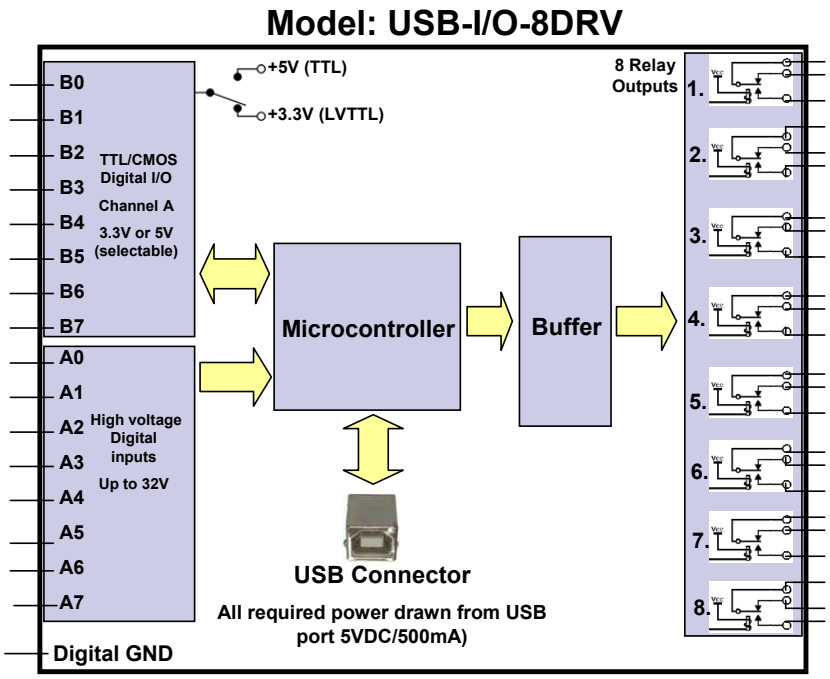
** 10 Pin IDC connector pin connections (TTL/LVTTL)

PIN Number	Function
1	TTL/LVTTL I/O (B0)
2	TTL/LVTTL I/O (B1)
3	TTL/LVTTL I/O (B2)
4	TTL/LVTTL I/O (B3)
5	TTL/LVTTL I/O (B4)
6	TTL/LVTTL I/O (B5)
7	TTL/LVTTL I/O (B6)
8	TTL/LVTTL I/O (B7)
9,10	GND

Minimum System Requirements

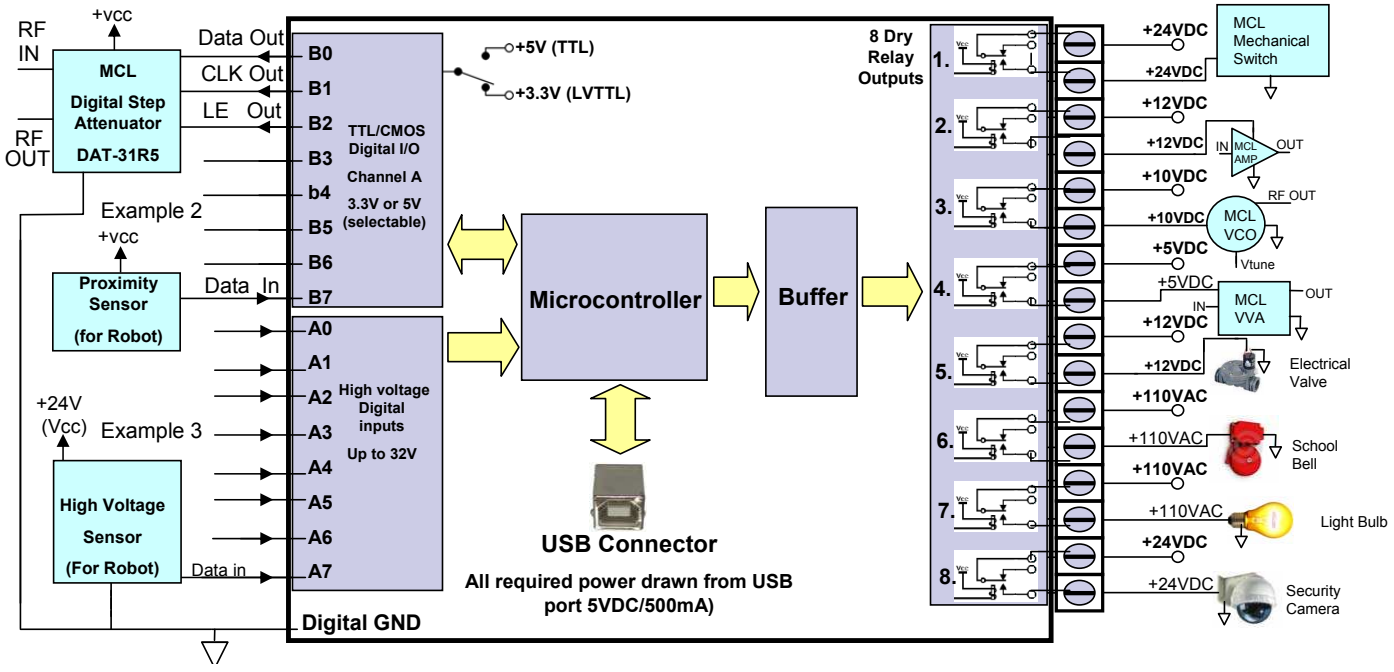
Interface	USB HID
Host operating system	**32 Bit operating system:** Windows 98®, Windows XP®, Windows Vista®, Windows 7® **64 Bit operating system:** Windows Vista®, Windows 7® **Linux® support:** 32/64 Bit operating system
Hardware	Pentium® II or better

Simplified diagram



Application examples

Example 1

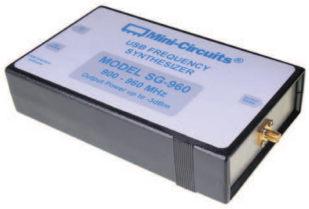


Complementary Products

USB Power Sensors
(8 Models):
1) **PWR-8GHS ; 1 to 8000 MHz**
2) **PWR-8FS ; 1 to 8000 MHz**
3) **PWR-6G ; 1 to 6000 MHz**
4) **PWR-6GHS ; 1 to 6000 MHz**
5) **PWR-4GHS ; 9kHz to 4000 MHz**
6) **PWR-4RMS ; 50 to 4000 MHz**
7) **PWR-2.5GHS-75 ; 100kHz to 2500 MHz**
8) **PWR-2GHS-75 ; 100kHz to 2000 MHz**

USB controlled Synthesized Signal Generators
(2 Models):

1) **SSG-4000LH ; 250 to 4000 MHz**
2) **SSG-4000HP ; 250 to 4000 MHz**



Narrow band USB controlled
Synthesized Signal Generators (Various models):

frequency coverage
400 MHz to 4000 MHz.

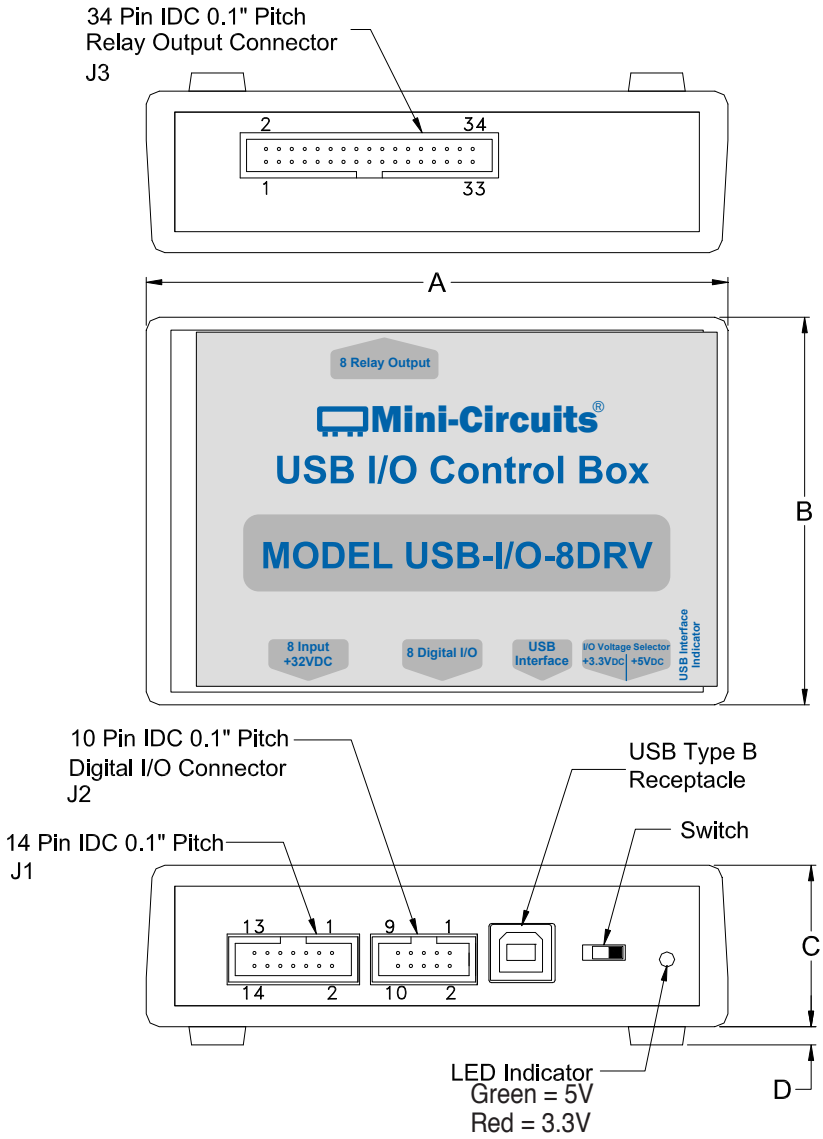
USB controlled Frequency Counter:

• **UFC-6000 ; 1 to 6000 MHz**

USB controlled RF switches
(5 Models, DC to 18GHz range):

1) **USB-1SPDT-A18 ; Single SPDT switch**
2) **USB-2SPDT-A18 ; Two SPDT switches**
3) **USB-3SPDT-A18 ; Three SPDT switches**
4) **USB-4SPDT-A18 ; Four SPDT switches**
5) **USB-8SPDT-A18 ; Eight SPDT switches**

Outline Drawing: (LE1594)



Outline Dimensions (inch / mm)

A	B	C	D	WT. GRAMS
4.50 114.3	**3.00** 76.2	**1.25** 31.8	**0.14** 3.6	150

Ordering, Pricing & Availability Information see our web site

Model	Description
USB-I/O-8DRV	USB I/O Control Box

Included Accessories	Description
I/O-CD	Installation CD
USB-CBL-AB-3+	2.7 ft USB cable
FCBL-10-1+	1 ft (0.3 m) 10 pin cable assembly with IDC conn.
FCBL-14-1+	1 ft (0.3 m) 14 pin cable assembly with IDC conn.
FCBL-34-1+	1 ft (0.3 m) 34 pin cable assembly with IDC conn.

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
FCBL-10-1+ (Spare)	1 ft (0.3 m) 10 pin cable assembly with IDC conn.
FCBL-10-2+	2 ft (0.6 m) 10 pin cable assembly with IDC conn.
FCBL-10-3+	3 ft (0.9 m) 10 pin cable assembly with IDC conn.
FCBL-14-1+ (Spare)	1 ft (0.3 m) 14 pin cable assembly with IDC conn.
FCBL-14-2+	2 ft (0.6 m) 14 pin cable assembly with IDC conn.
FCBL-14-3+	3 ft (0.9 m) 14 pin cable assembly with IDC conn.
FCBL-34-1+ (Spare)	1 ft (0.3 m) 34 pin cable assembly with IDC conn.
FCBL-34-2+	2 ft (0.6 m) 34 pin cable assembly with IDC conn.
FCBL-34-3+	3 ft (0.9 m) 34 pin cable assembly with IDC conn.