

USB I/O CONTROL BOX

USB-I/O-4D2R

The Big Deal

- USB HID device compatible with 32/64 Bit operating systems
- 4 channel TTL/LVTTL adjustable digital outputs
- Noise reduction circuit on digital outputs
- Two channel opto-isolated relay outputs
Each can supply DC 24V/0.375A
- Includes installation software with a friendly GUI and an API DLL com object on CD



Case Style: LB1550



Installation CD



Product Overview

Mini Circuits' USB-I/O-4D2R is a general purpose USB HID control box powered by a +24V_{DC} power adaptor for the analog outputs and a power adaptor selected by the user anywhere from 2.7V_{DC} to 5V_{DC} to power the digital outputs. The control box features four digital TTL/LVTTL output lines and two 24V DC output lines. The four digital output lines are buffered through noise reduction and voltage adjustment circuits creating outputs (with very low noise levels) which can be adjusted from 2.7V_{DC} to 5V_{DC} according to the level of the TTL Vcc supply voltage. These outputs are accessed through a 10 pin IDC connector. The 24V output lines are opto-isolated and supplied through relay contactors.

The USB-I/O-4D2R is packaged in a small plastic case (size of 4.5" X 3.1" X 1.2"), and comes with a 2.7 ft USB cable, a DC connector, a 1 ft 10 wire flat cable assembly, a CD containing a GUI demo program with an API-DLL com object and 24V and 5V AC/DC power adaptors suitable for US, EU and other power systems, see page 7 for details. Longer USB and flat 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).
Four TTL outputs	Allow controlling TTL devices, outputs through a 10 pin IDC connector. Each TTL output can supply up to 32mA.
Two DC high current 24V Outputs	Can be used to operate Mechanical RF Switches(Such as MCL mechanical SPDT and transfer) or any other 24V devices.
Includes noise reduction circuit	Digital outputs are buffered using a noise reduction circuit which reduce the noise on the TTL control output lines.
Adjustable TTL voltage	The USB-I/O-4D2R design allows the TTL voltage level to be adjusted to any value from 2.7V to 5V by selecting the suitable TTL Vcc voltage.
32/64 Bit operating systems	Compatible with Windows® and Linux® operating systems using 32 and 64 bit architecture.
Software CD, USB cable, DC connector, flat cable and power adaptors are included	A CD containing a programming 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-I/O-4D2R. A 2.7 ft USB cable, 4 contact DC connector, 1 ft 10 wire flat cable and power adapters for 5V and 24V suitable for US, EU and other power systems are also included.



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USB I/O CONTROL BOX

USB-I/O-4D2R

Features

- Low cost solution for automatic relay control
- Easy installation and operation
- Two DC 24V/0.375A opto-isolated relay Outputs
- Four TTL outputs with a wide range of TTL voltage
- Noise reduction circuit on digital outputs
- 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 more¹
- Friendly Windows® Graphical User Interface



Case Style: LB1550

Installation CD

Model No.	Description	Price	Qty.
USB-I/O-4D2R	USB I/O CONTROL BOX	\$119.95 ea.	(1-4)
Included Accessories			
AC/DC-24-3W1	AC/DC 24V Adapter (see Ordering Information)		1
CBL-3W1-XX	AC Power Cord (see Ordering Information)		1
AC/DC-5	AC/DC 5V Adapter		1
USB-CBL-AB-3+	2.7 ft USB cable		1
FCBL-10-1+	1 ft 10 wire flat cable assy.		1
TBLK-4+	DC Connector		1
I/O-CD	Installation CD		1

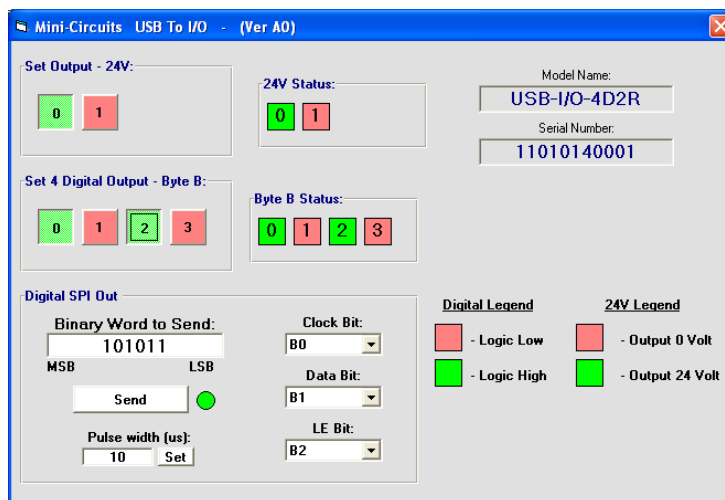
Applications

- Lab
- Test equipment
- Control systems

RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

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



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Electrical Specifications ²

Parameter	Port	Conditions	Min.	Typ.	Max.	Units
Rated Voltage	Vcc 24VDC	provided via external power adaptor	22	24	26	V
	DC OUT 1, OUT 2	—	21.8	24	26	
	Vcc for LVTTTL/TTL	provided via external power adaptor	2.7	—	5	
Rated Current	Vcc 24VDC	Max. Load at outputs	—	—	790	mA
		No load at outputs	—	30	50	
	DC OUT 1, OUT 2	Note 3	—	—	375/750	
	Vcc for LVTTTL/TTL	@'1'=5V	—	15	30	
	IDC connector	@'1'=5V	—	-	32	
	USB	—	—	50	70	
Switching time	DC OUT 1, OUT 2	—	—	4	—	mS
Operation Life (Output relays)	DC OUT 1, OUT 2	30 operations per min.	5 Million	—	—	operations
Operating Frequency (Output relays)	DC OUT 1, OUT 2	under load	—	—	30	operations per minute

² Power On Sequence: Connect the 24V power, followed by the 5V power and USB control last.

³ Max . total current from both outputs combined 750mA. If only one output used max current from it 750mA, if identical loads at both outputs max. current 375mA.

Absolute Maximum Ratings

Operating Temperature	0°C to 50°C
Storage Temperature	-20°C to 60°C
Voltage @ Vcc 24V connector	20V to 28V
Voltage @ Vcc for LVTTTL/TTL	-0.5V to +6.5V

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

Connections

Vcc 24VDC	(2.1mm center positive DC Socket)
Vcc for LVTTTL/TTL	(2.5mm center positive DC Socket)
DC OUT 1/ DC OUT 1 Return	(3.81mm DC socket)
DC OUT 2/ DC OUT 2 Return	(3.81mm DC socket)
USB Port	(USB B female)
TTL Outputs	(10 pin IDC female)*

* Pin Connections (10 pin IDC)

PIN Number	Function
9,10	GND
1	TTL 1 Output (B0)
7	TTL 2 Output (B1)
5	TTL 3 Output (B2)
3	TTL 4 Output (B3)
2,4,6,8	Not connected

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



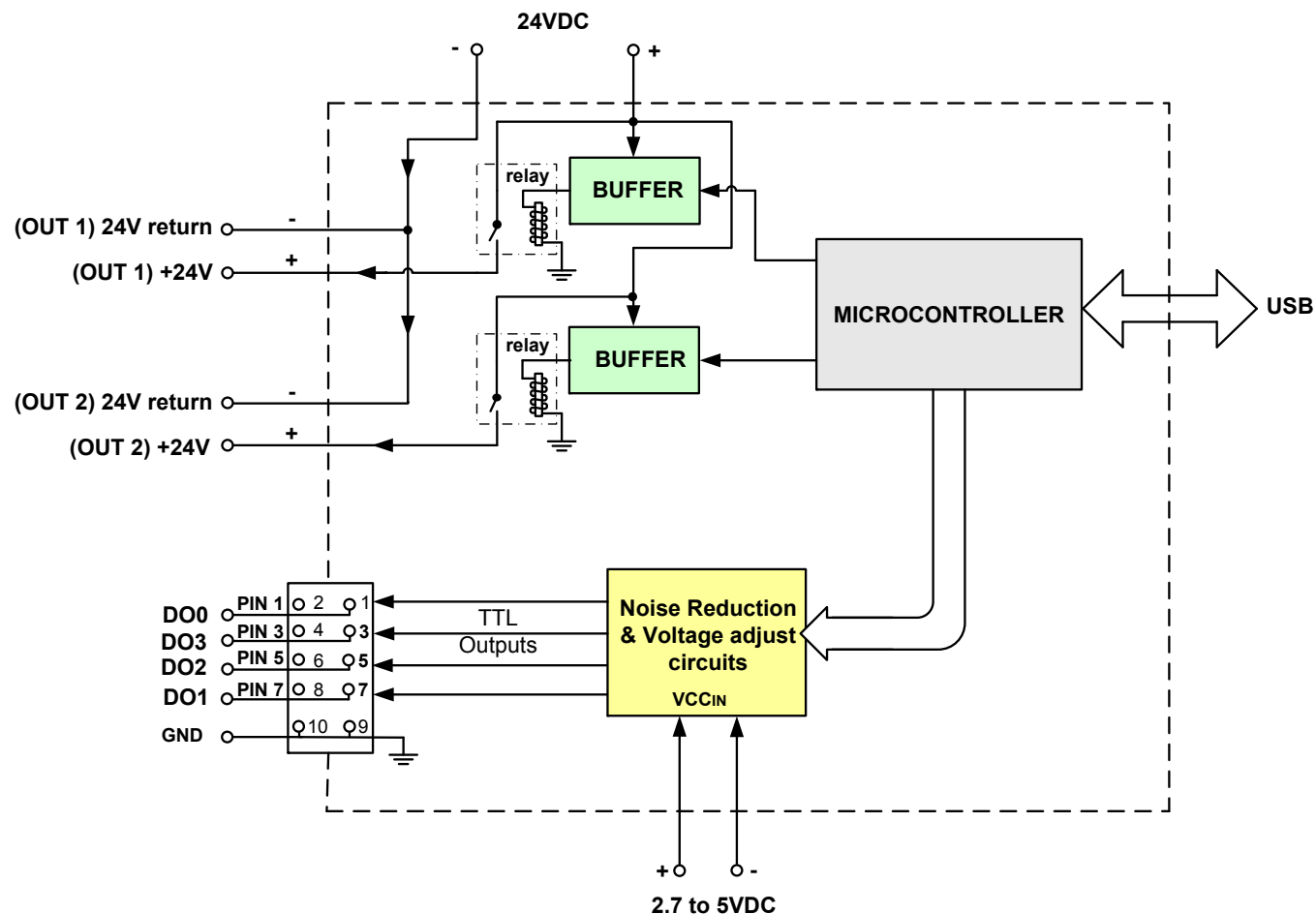
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Block Diagram



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



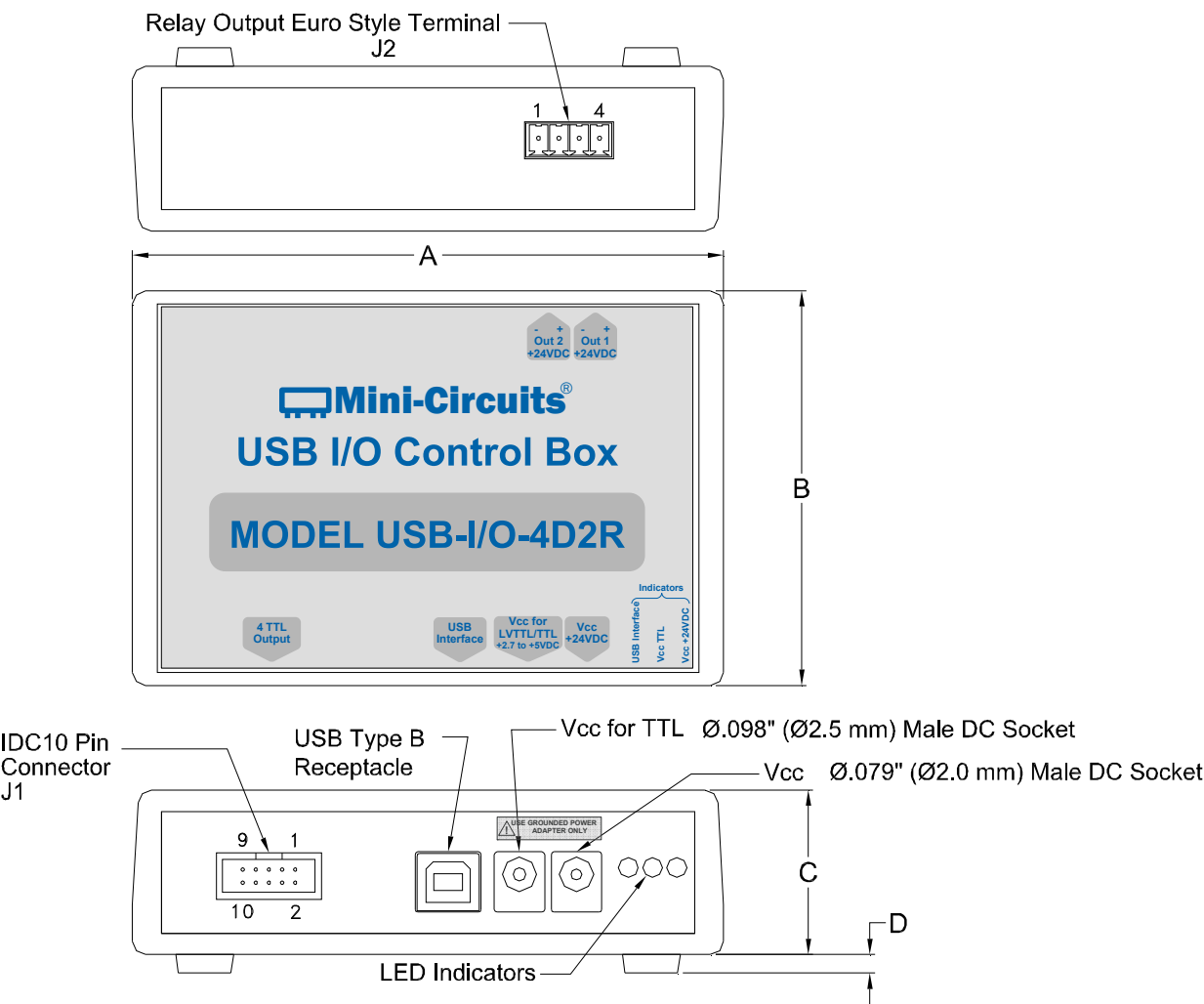
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Outline Drawing: (LB1550)



Outline Dimensions ($\frac{\text{inch}}{\text{mm}}$)

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



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Model	Description
USB-I/O-4D2R	USB I/O Control Box

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 I/O Control box</i>)
AC/DC-5	AC/DC 5V Power Adapter
I/O-CD	Installation CD
USB-CBL-AB-3+	2.7 ft USB cable
TBLK-4+	DC connector
FCBL-10-1+	1 ft (0.3 m) 10 pin cable assembly with IDC conn.

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
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.
TBLK-4+ (Spare)	DC connector



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